

**PPF 14: PROOF OF
EVIDENCE OF SIMON
ELLIOTT –
APPENDICES**

**SOCIOECONOMIC
IMPACT ASSESSMENT**

APPENDIX SE1: DORSET LEP CONSULTATION RESPONSE

M Garrity Esq
Head of Planning
Dorset Council
DORCHESTER
DT1 1UZ

30 November 2020

Dear Mr Garrity

Proposed Portland Energy Recovery Facility (Application Ref: WP/20/00692/DCC)

I write on behalf of Dorset Local Enterprise Partnership (LEP) in response to the above planning application. Dorset LEP was set up by the Department for Business, Innovation and Skills and works in partnership with businesses, local government, education institutes and other industry and community organisations to drive economic growth, attract funding and investment, increase productivity and develop local industrial strategies for Dorset. Our priorities are to:

- Create new jobs
- Attract new businesses and grow existing ones
- Secure funding for projects that have long-term economic benefits
- Support businesses
- Develop skills, employment and career opportunities
- Support the development of appropriate housing

National Policy

In line with government policy, Dorset LEP wants to respond to the Government's 25 Year Environmental Plan and "build back better" to repair the economic damage from Covid-19 prioritising action across improvements in clean air, minimising waste, mitigating/adapting climate change and investing in infrastructure. The Government's £12bn green industrial revolution will support up to 250,000 jobs, with the aim of securing three times this investment from the private sector by 2030. Clean hydrogen, carbon capture and storage, zero-carbon transport and offshore wind are all key pillars of the Prime Minister's Ten Point Plan and the recently published National Infrastructure Strategy (November 2020) to push the UK towards net-zero emissions.

A number of LEPs around the UK have put substantial focus on supporting green business and the delivery of a net zero economy which will require major commitments from public and private organisations and the wider public. At a LEP Network event in October 2020 Chair of the LEP Network, Mark Bretton, said:

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“Green innovation is a central thread of our Rebuild and Recovery Deal ...These roundtables underline that approach and LEP’s commitment to the government’s ambitions to Build Back Greener and help accelerate the country towards its net zero carbon goals ...With an eye to the long term, LEPs are helping to drive that green innovation forward, creating the environment which will nurture new skills and generate the jobs upon which the green revolution will depend.”

We understand that this project will help to deliver these Government and LEP objectives by reducing carbon emissions from landfill, transport and shipping, improving air quality (by reducing shipping emissions), generating electricity and heat from renewable and low carbon sources and helping position the Port of Portland to become a hub for green technologies such as clean hydrogen.

Dorset Local Industrial Strategy and the Port of Portland

Dorset LEP has submitted its Local Industrial Strategy (LIS) to Government and is presently awaiting feedback. In the meantime the LEP is helping local businesses in response to Covid-19 and the substantial job losses that have occurred within Dorset. The LIS sets out a number of objectives under the key themes of ideas, infrastructure, business environment, people and place. Under “ideas” the aim is to promote Dorset as a centre of innovation with the expertise, infrastructure and environment and culture to develop ideas and solve challenges such as achieving clean growth. For “infrastructure”, the LIS seeks to secure additional investment to drive significant road, rail, port and air connectivity to strengthen opportunities for new and growing businesses. The LIS supports investment in infrastructure to make Dorset an exceptional and attractive “business environment”. For the “people” theme, the LIS promotes “inclusive growth” to more disadvantaged individuals and communities. Weymouth and Portland are both displaying characteristics of an area of marked relative deprivation. Finally, under the “place” theme the LIS seeks to promote our coastal communities.

The Port of Portland is identified in the LIS as a key asset of the Dorset economy and one which the LEP is keen to see continue to develop and thrive. This is a timely opportunity to help the Port and Dorset’s visitor economy which has been so deeply impacted in 2020. The cruise industry is a lynchpin of our visitor economy with visiting ships generating an onshore spend of around £3.8M per annum based on Cruise Lines International Association (CLIA) data for 2018. The Port reports its bookings for 2021, assuming a Covid recovery, would bring 93,000 booked passengers visiting Portland. Using average spend figures from CLIA 2018 global survey, this contribution would be worth around £8m to the local economy.

Dorset LEP is aware of the constraints to development on Portland by a limited power supply and of the need for the Port to become more energy resilient, utilising local renewable and low carbon energy sources. In order to reduce carbon emissions, cruise ships will require shore power in all of the ports that they visit. The Royal Navy presence and associated ships of the Royal Fleet Auxiliary, which are also important to the local economy, are already shore power enabled and will also require this facility in future. That is why it is critical for the region that we support the Port to be competitive on a global stage by delivering a sustainable solution to its power needs in order that the Port of Portland remains a destination of choice for cruise ships, the Royal Navy and other marine vessels in coming years.

Given the Dorset LEP’s stated objectives to support business growth, it is of great concern that a potential inability to host cruise ships due to an absence of shore power could lead to a reduction of at least £2-3M per year of on-shore tourism spend, resulting from the loss of cruise liner visits. This could also have an adverse effect on existing jobs with an estimated 36-52 jobs supported by the cruise industry at risk in sectors that have been hard hit by the Covid-19 pandemic, such as retail, transport, accommodation and food, tours, entertainment and culture.

/cont’d

Conclusions

The £100M investment in this project will be one of the largest recent private sector investments into Dorset. It will benefit the Port and the cruise sector, but by providing shore power, it also represents a strong backing for our local supply chains, transport links, retail and hospitality businesses that rely on the customer base generated by activity at the port of Portland.

The potential impact of this project extends beyond the much-needed local solution for sustainable waste management and increased electricity supply for Portland from low carbon energy. The direct economic benefits of job creation during construction and operation, and the wider stimulus they provide to bring forward other green technology development at this key employment site. We note that applicant's commitment to an apprenticeship scheme working in collaboration with a successful programme run by another renewable energy business at the Port (Manor Renewables) and Weymouth College. This is an opportunity to expand training for Dorset's residents to benefit from the job creation in the green economy. This investment could help to support one of the areas with the lowest social mobility by providing jobs and training within the new and emerging eco tech sector.

Alongside this, we have an unprecedented opportunity to bring forward a greener recovery for Dorset, dealing with its waste needs in a more sustainable manner, reducing emissions at sea, providing shore power and bringing forward plans for a district heating work. These are all proposals which chime with the national plans for a green recovery, Dorset LEP's clean growth agenda and locally Portland's Economic Plan and Neighbourhood Plan.

We recognise that this is a matter for the planning authority to determine the balance of issues but Dorset LEP notes and would like to highlight the economic implications and economic importance of the Proposed Portland Energy Recovery to Dorset. Many Dorset Sites are suffering with poor grid infrastructure and capacity and this facility could have a positive influence on the county's energy security.

For these reasons the LEP wishes to draw your attention to the strong synergies with this planning application and national strategy for industry, energy and the environment and will help to deliver Dorset's Local Industrial Strategy and green recovery plan and the Portland Economic Plan.

Yours sincerely

A black rectangular redaction box covering the signature of Lorna Carver.

Lorna Carver
Dorset LEP Director

APPENDIX SE2: CARNIVAL PLC CONSULTATION RESPONSE

15th December 2022
M Garrity Esq
Head of Planning
Dorset Council
DORCHESTER
DT1 1UZ

Dear Mr Garrity,

Portland Energy Recovery Facility, Portland Port, Dorset
Application Reference: WP/20/00692/DCC

Letter of Support

Introduction

I am writing in respect of the above planning application for an Energy Recovery Facility (ERF) at Portland Port, and Carnival Corporation's specific interest in the infrastructure that would allow power from the proposed ERF to provide shore power to ships at berth in the Port (the **Portland ERF Shore Power Facility**). This letter explains our intent that if shore power is available at Portland Port, Carnival cruise ships visiting the Port which are capable of receiving shore power would connect to and use the ERF Shore Power Facility, consistent with our published corporate sustainability policies, and subject to viable commercial terms and agreements being reached.

Carnival Background and Sustainability Commitment

Carnival Corporation is the world's largest cruise operator and parent company of nine global cruise line brands. These include AIDA, Carnival, Cunard, Costa, Holland America, Princess, P&O Cruises and Seabourn.

Carnival is an important customer of Portland Port and a number of our ships call at this port including some of the largest ships in our fleet. This relationship has been established through consistent calls over many years. We have additional bookings with Portland Port in 2023.

As a major international cruise operator we take sustainability seriously. Our Sustainability Policy "*From Ship to Shore*" (available [here](#)) sets our sustainability goals for 2030, and aspirations for 2050, developed to reflect the United Nations' Sustainable Development Goals. Our 2030 goal is aligned with the International Maritime Organization's commitment to reduce carbon emission intensity by 40% by 2030 and we aspire to achieve net carbon-neutral ship operations by 2050. In addition to decarbonisation we have committed to targeting initiatives that reduce air quality emissions. To meet these goals we are actively improving the existing fleet's energy efficiency and specifically "*expanding shore power capabilities*".

Shore Power

Carnival have a specific goal to *“Increase fleet shore power connection capability to 60% of the fleet by 2030”* and we are currently on track, with 43% already having this capability.

Our Sustainability Report notes: **“Shore Power Connections:** *Cruise ships equipped with shore power capabilities can plug into specific port connection facilities, allowing the ship to receive electricity from the electrical grid in the port instead of using the ship’s engines and fuel to generate power. We developed the first port with shore power capability for cruise ships in Juneau, Alaska in 2001. Currently there are approximately 21 ports worldwide that have the infrastructure capable to provide shore power connections to our fleet.”*

Whilst there are details to be addressed, we understand that subject to the approval and construction of the ERF, Portland Port expects to be able to offer the 60Hz shore power to the capacity that even our largest cruise ships require, in the relatively near term. It is well recognised in the industry that despite the benefits, commercial viability is the main impediment to the delivery of shore power in the UK and that energy grid constraint and the costs of connecting to the electricity network is a critical factor, as noted in the recent UK Government shore power consultation that can be reviewed [here](#).

We understand the Portland ERF will be able to offer shore power as a component of a wider ERF project business case (that also provides a solution for Dorset’s waste management needs). This is advantageous as it reduces the need for customer investment or public subsidy.

Carbon and Emission Reduction Benefit

The use of shore power would significantly reduce the carbon impact of our fleet whilst it is berthed at Portland Port, consistent with our “Climate Action” objective. In addition, shore power would reduce particulate emissions and other emissions from cruise ships berthed at Portland Port, leading to an improvement in air quality in the local area consistent with our corporate objective to *“Reduce absolute particulate matter air emissions by 50% relative to our 2015 baseline”*.

Commitment

If shore power is provided at Portland Port we would expect that our cruise ships which visit the Port which are capable of receiving shore power would connect to and use the ERF Shore Power Facility, subject to the power being made available on commercially viable terms.

As mentioned, 43% of our fleet is already equipped to accept shore power and the roll out across our fleet is increasing rapidly so we would expect to benefit from the ERF Shore Power Facility as soon as it is available.

Carnival would be pleased to share information with Powerfuel Portland Limited and Portland Port/Portland Harbour Authority to ensure that the shore power infrastructure is suitable for our fleet. We have developed a standardised requirement for 60Hz shore power systems we require which we understand will be provided at Portland.

ERF Infrastructure not a barrier to Cruise calls

We understand that certain objector parties have claimed that the presence of the ERF would significantly reduce Portland Port's attractiveness and reduce cruise calls. Our ships already visit a number of ports globally where power stations are co-located and we do not expect that the presence of the Powerfuel Portland ERF would dissuade Carnival, its customers or other cruise ship companies from visiting Portland. By way of example, Southampton was one of the first UK Port's to offer shore power, provided by a private wire supply from the Veolia Marchwood Integra Energy from Waste facility (a 220,000 tonne pa EfW plant) which is located directly across the River Test from the cruise terminal. The presence of the Marchwood plant in the port location has not changed our approach to calling at Southampton and Carnival's ships have benefited from shore power from the Marchwood EfW plant.

Protecting the Economic Contribution from the Cruise Business

The availability of the ERF Shore Power Facility at Portland should ensure that it remains an attractive destination for inclusion for Carnival Group cruise calls. In turn, this will protect the local tourist economy with contributions to the local tourist economy with excursions, casual spend and port dues.

Kind regards



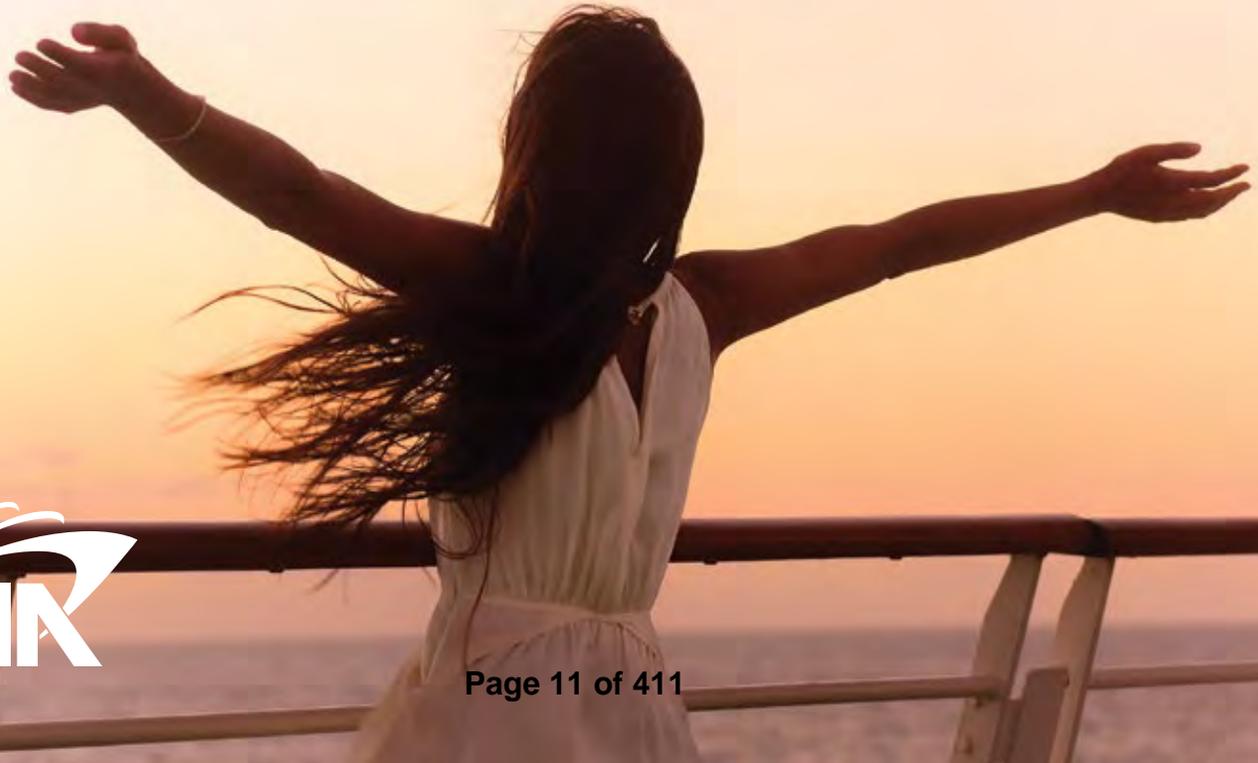
Tom Strang

**Senior Vice President, Maritime Affairs
Carnival Corporation & plc**

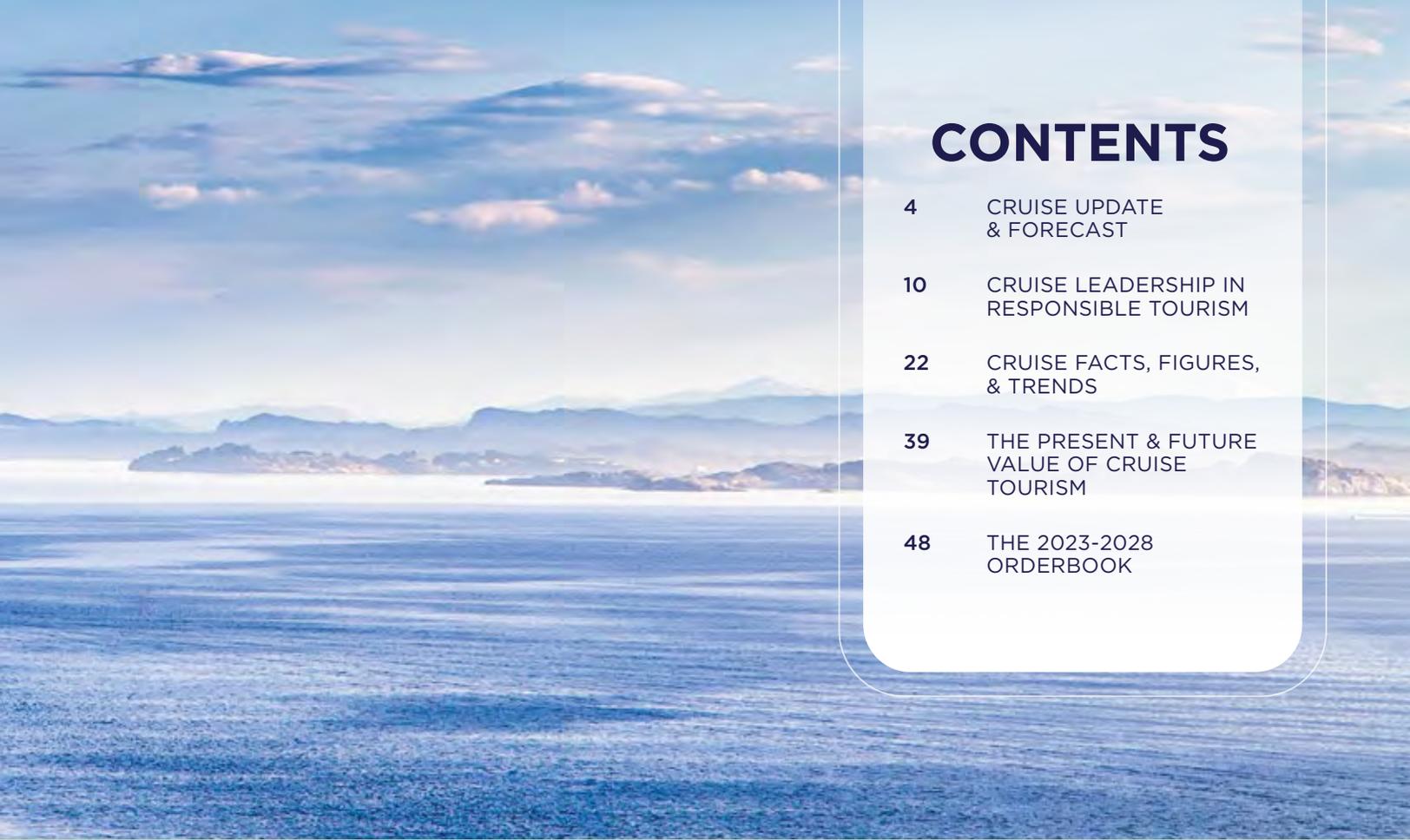
APPENDIX SE3: CLIA, SEPTEMBER 2023 UPDATE ON THE STATE OF THE CRUISE INDUSTRY

STATE OF THE CRUISE INDUSTRY

SEPTEMBER 2023 UPDATE







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CRUISE UPDATE & FORECAST



CRUISE UPDATE & FORECAST

Intent to cruise is higher than it was in December 2019—continuing a trend that began in the last quarter of 2020

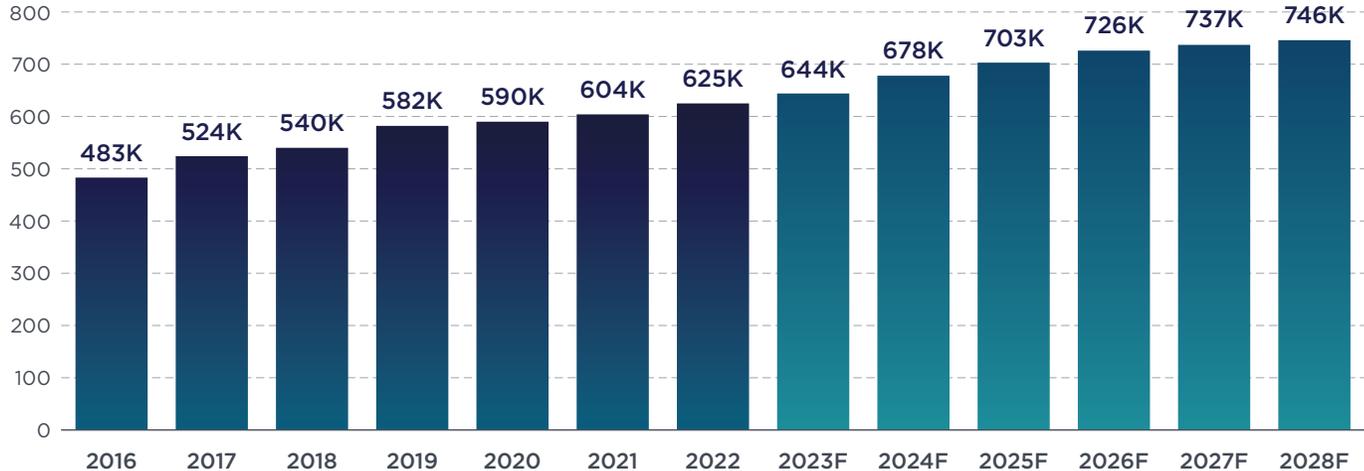
85% of travelers who have cruised will cruise again, **6%** higher than pre-pandemic

Source: CLIA Cruise Traveler Sentiment, Perception, and Intent Survey (Dec.2022)

CRUISE UPDATE & FORECAST

Global cruise capacity is forecast to grow 19% to more than 746K lower berths from 2022 to 2028

Cruise capacity projections



Source: CLIA Cruise Forecast /Tourism Economics Note: Capacity measured at the beginning of the year.

CRUISE UPDATE & FORECAST

Attracting 4 million new-to-cruise travelers is key to meeting the increase in global cruise capacity projected from 2023 to 2025

Every 1% increase in first-time cruise travelers (international travelers who have never cruised and are open to cruise) is equivalent to 4 million new-to-cruise travelers.

Source: Analysis of CLIA Passenger Data, 2019 – 2021, CLIA Cruise Forecast /Tourism Economics (Dec. 2022); and UNWTO international tourist arrivals data (Jan. 2023)

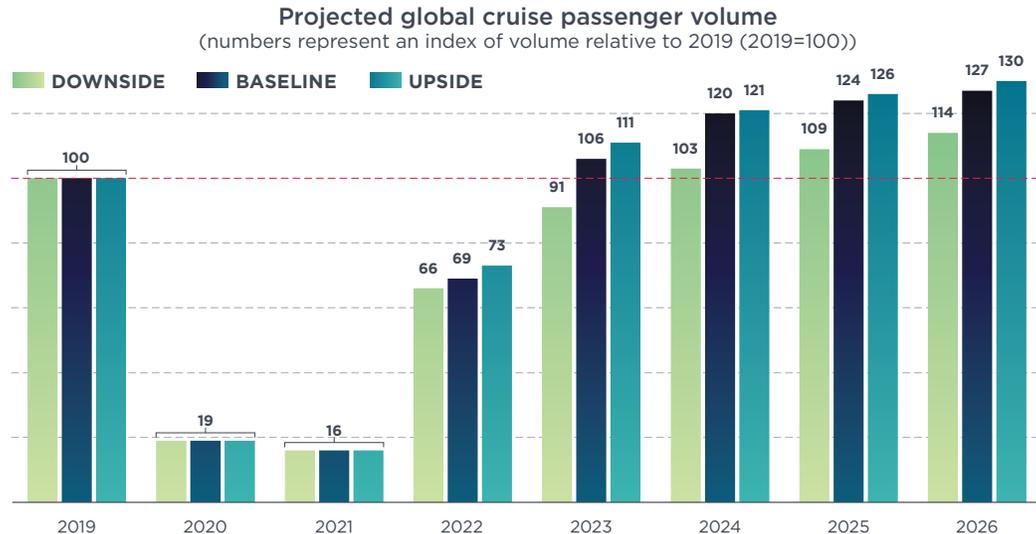
CRUISE UPDATE & FORECAST

Cruise tourism is rebounding faster than international tourism arrivals

Cruise tourism is forecast to reach 106% of 2019 levels in 2023—with 31.5 million passengers sailing.

This compares to the January 2023 UNWTO forecast that international tourist arrivals in 2023 will be 80% to 95% of 2019 levels.

**Forecast based on the baseline forecast from CLIA's Cruise Forecast (December 2022). This chart shows the range of passengers forecast based on a downside to upside analysis. The middle bar provides the baseline percentage of 2019 passenger volume; bars to the left and right provide the downside and upside forecast, respectively). CLIA analysis indicates the baseline forecast is the most likely scenario.*



Source: CLIA Cruise Forecast/Tourism Economics (December 2022)

CRUISE UPDATE & FORECAST

Cruise continues to be one of the fastest-growing sectors of tourism



Source: CLIA Passenger Data, 2019 – 2021 and CLIA Cruise Forecast/Tourism Economics (December 2022)



CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

Cruise lines are following a path to decarbonisation with advancements in technology, infrastructure, and operations

- Multiple pilot projects and collaborative initiatives are underway.
- New engines and propulsion technologies are actively being planned and tested for use on cruise ships.

Technology



Infrastructure



Operations



CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

Cruise lines are investing in fuel flexibility, including LNG, a fuel in transition

- LNG is currently the cleanest fuel available at scale while cruise lines are exploring the use of sustainable marine fuels, including advanced biofuels and other renewable energy solutions, such as synthetic fuels, methanol, hydrogen, fuel cells and batteries.
- Ships designed with LNG engines and fuel supply systems will be able to switch to more sustainable, alternative fuels such as bio or synthetic LNG in the future, with little or no modifications.
- The LNG engine technology and infrastructure of today offers a clear pathway to more sustainable cruising in the future.

15% of ships launching between 2023 and 2028 will have battery storage and/or fuel cells for hybrid power generation

60% of ships scheduled to debut between 2023 and 2028 will rely on LNG fuel for their primary propulsion

CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

The number of CLIA-member cruise ships with shoreside power capability will more than double by 2028*

Every CLIA-member ship being built today through 2028, except expedition, is scheduled to be fitted with shoreside power capabilities

- Currently, 30% of ships, representing 40% of capacity, is plug-in ready; 30% to be retrofitted

29 cruise ports worldwide have at least one berth with onshore power; 20 additional ports funded or planned (by 2025)

- Less than 2% of the world's cruise ports have on-shore power; by 2025, 3% will have shoreside power



**Based on scheduled orders as of the February 2022 order book*

PORTS WITH AT LEAST ONE CRUISE BERTH WITH SHORESIDE POWER (as of September 2023)



Plugging into shoreside electricity allows ship engines to be switched off, reducing emissions by up to 98%, depending on the mix of energy sources, while a ship is in port, according to studies conducted by a number of the world's ports and the U.S. Environmental Protection Agency.

ACTIVE 34

CANADA Halifax, NS | Montreal, QC | Vancouver, BC

CHINA Guangzhou | Qingdao | Sanya | Shanghai
Shenzhen | Tianjin | Xiamen

DENMARK Aarhus

FINLAND Turku

GERMANY Hamburg | Kiel | Rostock

ICELAND Hafnarfjörður

LATVIA Ventspils

NORWAY Ålesund | Bergen | Fredrikstad
Karmsund (Haugesund) | Kristiansand | Lyngdal
Skjolden (Sognefjord)

SOUTH KOREA Incheon (Seoul)

SWEDEN Verkö

UK Southampton

USA Brooklyn, NY | Juneau, AK | Long Beach, CA
Los Angeles (San Pedro), CA | San Diego, CA
San Francisco, CA | Seattle, WA

FUNDED 24

AUSTRALIA Sydney

CANADA Victoria, BC

FRANCE Marseille | Toulon

GREECE Piraeus (Athens) | Heraklion

ITALY Genoa | La Spezia | Livorno
Civitavecchia (Rome) | Savona

MALTA Valletta

NETHERLANDS Amsterdam | Rotterdam

NORWAY Flåm | Oslo | Stavanger | Tromsø

SPAIN Barcelona | Bilbao | Cádiz

SWEDEN Stockholm

UK Portsmouth

USA Miami, FL

PLANNED 16

DENMARK Copenhagen | Fredericia | Skagen

ESTONIA Tallinn

FINLAND Helsinki | Mariehamn

FRANCE Le Havre

GERMANY Bremen

ICELAND Reykjavik

NORWAY Arendal | Trondheim

SWEDEN Goteborg (Gothenburg) | Helsingborg
(Scania)

UK Tyne

USA Fort Lauderdale, FL | Galveston, TX

Onshore power supply (OPS) is also referred to as shoreside electricity (SSE), shore connection, shore-to-ship power (SSP), alternative maritime power (AMP), high-voltage shore connection (HSCV), or cold ironing.

Source: CLIA port analysis (15 September 2023)

CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

Cruise is a model for responsible and sustainable tourism

Managed tourism

- Active collaboration with ports and destinations helps maximize the benefits of tourism for communities.
- Ship arrival and departure schedules are established with ports up to three years in advance—and most passengers participate in shore excursions organized by the cruise lines with local providers—providing destinations with advance information about tourism flows so they can plan accordingly.
- Collaborative, sustainable tourism initiatives led by the cruise industry, destinations, ports, community organizations, and stakeholders are helping to achieve mutual objectives to preserve the integrity, cultural heritage, and beauty of the world's most treasured destinations for future generations.

“We’re seeing the cruise industry acting much more proactively in collaborating with port managers to better manage visitor flows.”

Randy Durband, CEO
Global Sustainable Tourism Council



CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

Cruise is a model for responsible and sustainable tourism

Responsible sourcing for food and supplies

- Cruise lines are working with organizations to source food responsibly (e.g., Marine Stewardship Council, the Aquaculture Stewardship Council, and others).
- Prioritizing local sourcing of food and other supplies:
 - Reduces the carbon footprint of the supply chain by reducing the distance food and supplies need to travel to get to the ships.
 - Supports local businesses and communities and, as a result, helps improve lives and the quality of life in the destinations our member-line ships visit.

Water production and conservation

- Cruise ships produce up to 90% of fresh water onboard and, through state-of-the-art systems and practices, conserve and repurpose water rather than draw from areas where resources are limited.

The top three food trends this year and next are local culinary (61.11%), sustainable seafood (35.19%) and meat substitutes (24.07%).

2023 F&B at Sea Trends Report



CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

Cruise is a model for responsible and sustainable tourism

Sustainable and locally sourced tour excursions

- Many cruise lines offer a variety of shore excursion programs that are focused on sustainability and are pursuing sustainable tour excursion certification with respected conservation organizations and other groups based on the Global Sustainable Tourism Council's Industry Standard criteria.
- The wide range of sustainable shore excursions include those that take travelers to national parks, wildlife rehabilitation centers, biodynamic farms and sustainable businesses, as well as support species and habitat protection.
- In addition, many excursions include carbon-free walk, cycle, paddle or sail experiences rather than a coach tour.
- And because shore excursions are locally sourced, they create jobs that benefit local communities.

Cruise travel also provides opportunities for personal growth and greater understanding of the world by connecting people to places in ways that create greater understanding and appreciation for each other's cultures, as well as better awareness of the environment.



CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

Ocean and marine life protection

Cruise lines have a range of dedicated programs for ocean and marine life protection. Examples include:

- Coral reef restoration
- Advanced wastewater treatment systems that rival land-based systems
- Agreement by CLIA cruise line members to avoid or voluntarily reduce vessel speed in sensitive areas or when marine life is observed
- Underwater noise and vibration reduction systems, including specially designed hulls, propellers, and noise suppression devices
- Partnerships with a variety of research and ocean and marine life protection organizations
- On-board scientists to support important research for the benefit of the ocean and marine life



CRUISE LEADERSHIP IN RESPONSIBLE TOURISM

CLIA-member cruise ships and operations become more sustainable and efficient every year

Cruise ships are subject to multiple inspections each year –announced and unannounced – for compliance with strict environmental and safety regulations.

Source: CLIA Environmental Technologies and Practices Report (October 2022) and individual cruise line sustainability reports. Projections are for the CLIA-member cruise line fleet, inclusive of current ships in service plus new ships coming online from the date of this report through 2028, and do not account for vessel retirements during that period. Vessels most likely to be retired first are those without, or unable to be retrofitted with, advanced environmental technologies.

Using digital technology to be more energy efficient

- From tracking the energy use of appliances in a ship's galley to routing ships optimally, digital technologies offer a new energy-saving tool
- Each new class of ship that is launched is around **20% more efficient** than the last

Average age of ships in the CLIA-member fleet is **14.1 years**

96% of ships have low-friction hull coatings

Air lubrication systems and special hull coatings increase fuel efficiency by nearly **10%**

100% of new ships specified for Advanced Wastewater Treatment Systems

- Advanced wastewater treatment systems (AWTS) rival land-based facilities
- 78%** of CLIA-member ships sailing fitted with AWTS

38 LNG-powered ships specified to be in service by 2028

- LNG reduces GHG **more than 20%**, SOx (**99%**), soot particles (**98%**), NOx (**85%**)
- LNG-fueled vessels can transition to bioLNG and renewable synthetic LNG once available at scale

Some ships repurpose 100% of waste

- Programs supporting land-free ship operations
- Surplus heat transferred from machinery to heat water for showers and pools
- Bio-digesters reduce food waste

Up to 90% of fresh water produced onboard

Through state-of-the-art systems and practices, cruise lines are able to conserve and repurpose onboard rather than drawing from areas where resources are limited

Every CLIA-member ship being built today, except expedition, is specified to have shoreside power capability

- 40%** of the CLIA cruise line member fleet is plug-in ready, **30%** to be retrofitted
- Only 3%** of the world's ports have onshore power

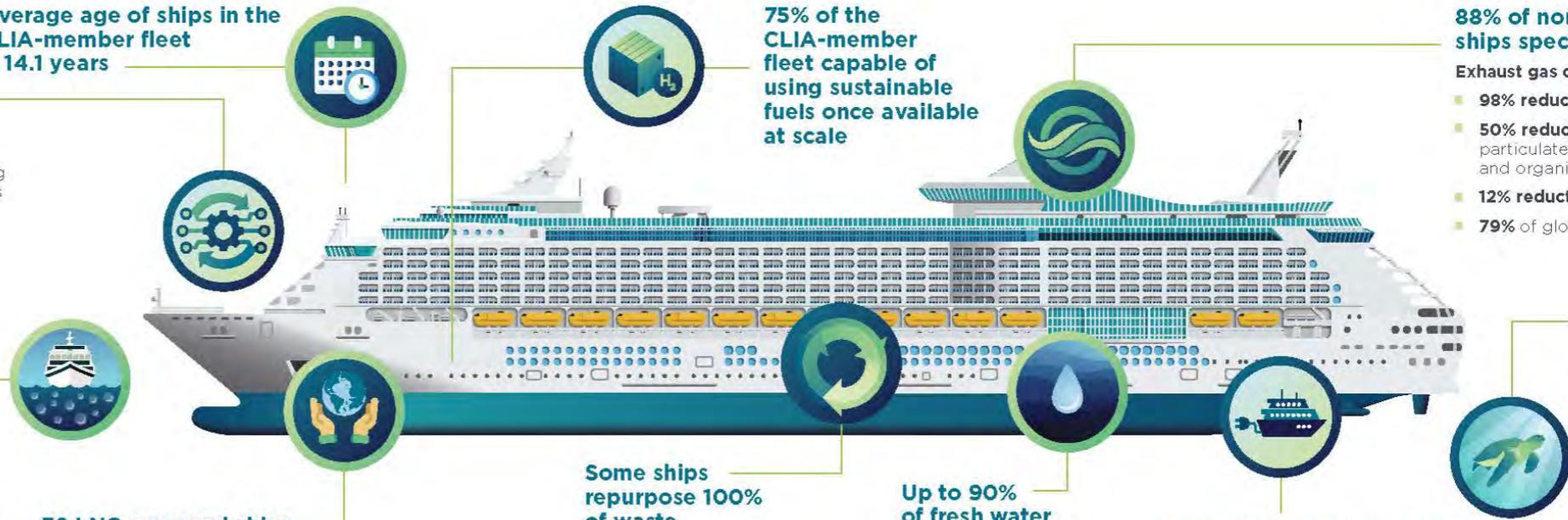
88% of non-LNG new-build ships specified for EGCS

Exhaust gas cleaning systems (EGCS)

- 98% reduction** in sulfur oxide levels
- 50% reduction** in typical total particulate matter (including elemental and organic carbon and black carbon)
- 12% reduction** in nitrogen oxides
- 79%** of global capacity utilizes EGCS

Cruise lines have dedicated programs and systems designed to protect marine life

- Members agree to avoid or voluntarily reduce vessel speed in sensitive areas
- Underwater noise and vibration reduction systems
- Onboard scientists to support important ocean and marine life research





CRUISE FACTS, FIGURES, & TRENDS

CRUISE FACTS, FIGURES, & TRENDS

Top 15 trends we are tracking now

1. Younger generations are the future of cruise with 88% of Millennials and 86% of Gen-X travelers who have cruised before say they plan to cruise again.



Percentage of Millennials and Gen-X cruisers that plan to cruise again

2. There is more interest than ever before among Millennials and Gen-X travelers to take their first cruise with 73% of those who have never cruised indicating they will consider a cruise vacation. Millennials were most interested at 77%, followed by Gen-X at 73%.

Percentage of first-time cruisers interested in cruising



3. To attract more first-time cruisers and meet the needs of repeat cruisers, cruise lines are offering both shorter and longer cruise itineraries. As a result, while the average cruise length continues to be around 7 days, the range of options for cruise duration has expanded.

CRUISE FACTS, FIGURES, & TRENDS

Top 15 trends we are tracking now



4. Solo cruise travel is on the rise. Cruise lines are responding by building more single-cabins in new ships—and retrofitting some of their current ships to include additional cabins designed for those traveling alone.

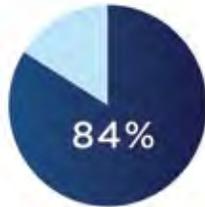
5. There is an acceleration of environmental technologies and practices on ships, as the industry pursues net-zero carbon cruising by 2050. See pages 20-21 for some of these features.



6. The commitment of cruise travelers and potential new-to-cruise travelers to the environment is increasing with 50% of current and potential cruise travelers saying they are more committed to making travel decisions based on environmental impacts than they were three years ago.

CRUISE FACTS, FIGURES, & TRENDS

Top 15 trends we are tracking now



Cruise lines are increasingly offering environmental education and sustainable tour experiences for passengers. As a result, 84% of cruise travelers are more aware of the responsible nature of cruise travel and the importance of the environment.

8. The number of accessible cabins across the cruise line fleet is increasing.

The increase is helping to meet the needs of cruise travelers who have limited mobility, or who are traveling with someone with limited mobility—the vast majority of whom (across every generation) say they view a cruise holiday as the only travel option that meets their needs. Similar results are showing up regarding cognitive considerations.



9. Younger cruise travelers—from Gen Z to Millennials to Gen X—turn to travel advisors to book their cruises more so than any other generation (in fact, 50% more than Traditionalists and Baby Boomers).

CRUISE FACTS, FIGURES, & TRENDS

Top 15 trends we are tracking now

10. Cruise holidays appeal to those looking for multi-generational travel options.

Today 73% of cruise travelers are sailing with family members that represent at least two generations.

11. The CLIA-member cruise line fleet of ships is projected to exceed 300 ocean-going vessels for the first time in 2024.

The increase in ships and itineraries is well-timed to meet strong demand for cruise travel, which is rebounding faster than international arrivals. Based on CLIA's forecast, cruise tourism will likely reach 106% of 2019 passenger volume in 2023. This compares to the UNWTO forecast (January 2023) that international tourist arrivals in 2023 will be 80% to 95% of 2019 levels.

12. Traveler interest in booking an expedition cruise is higher than ever as travelers seek more immersive, responsible, bucket-list travel experiences. The trend is evident across all age groups as the number of passengers sailing on expedition cruises more than doubled from 2016 to 2022. Other signs: Search results for expedition cruise travel to Antarctica increased 51% in 2022 compared to 2019. In addition, during 2022, 137,000 cruise travelers sailed on expedition ships. Though this number is lower than 2019 when 187,000 cruise travelers chose an expedition cruise, 2022 expedition passenger volume was nearly 70% higher than it was in 2016.

CRUISE FACTS, FIGURES, & TRENDS

Top 15 trends we are tracking now

13. Cruise lines are offering more immersive cruise travel opportunities to passengers. Cruise lines are scheduling longer stays, including overnight stays, in certain ports of call.

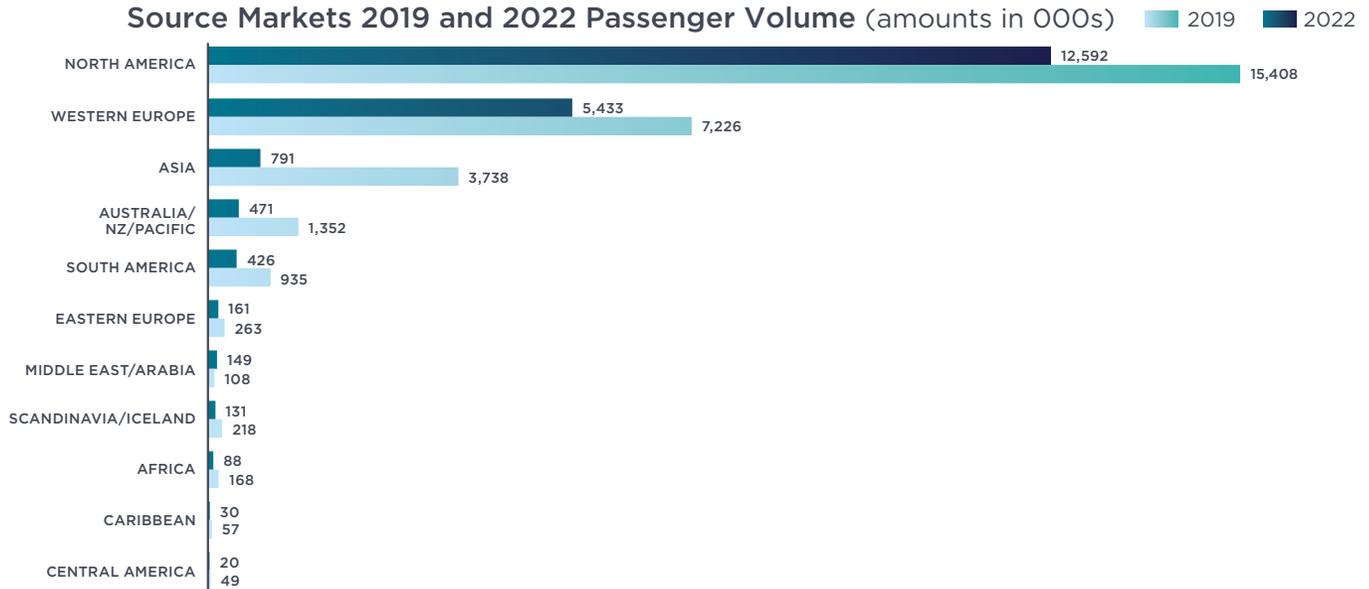


14. More cruise travelers plan to book longer cruises for their next holiday with 43% saying they plan to book a longer cruise and 43% saying they plan to book a similar-length cruise.

15. Family and friends have the most influence on traveler decisions to book a cruise or not with 86% of cruise travelers saying family and friends had either some influence or significant influence in their choice to cruise.

CRUISE FACTS, FIGURES, & TRENDS

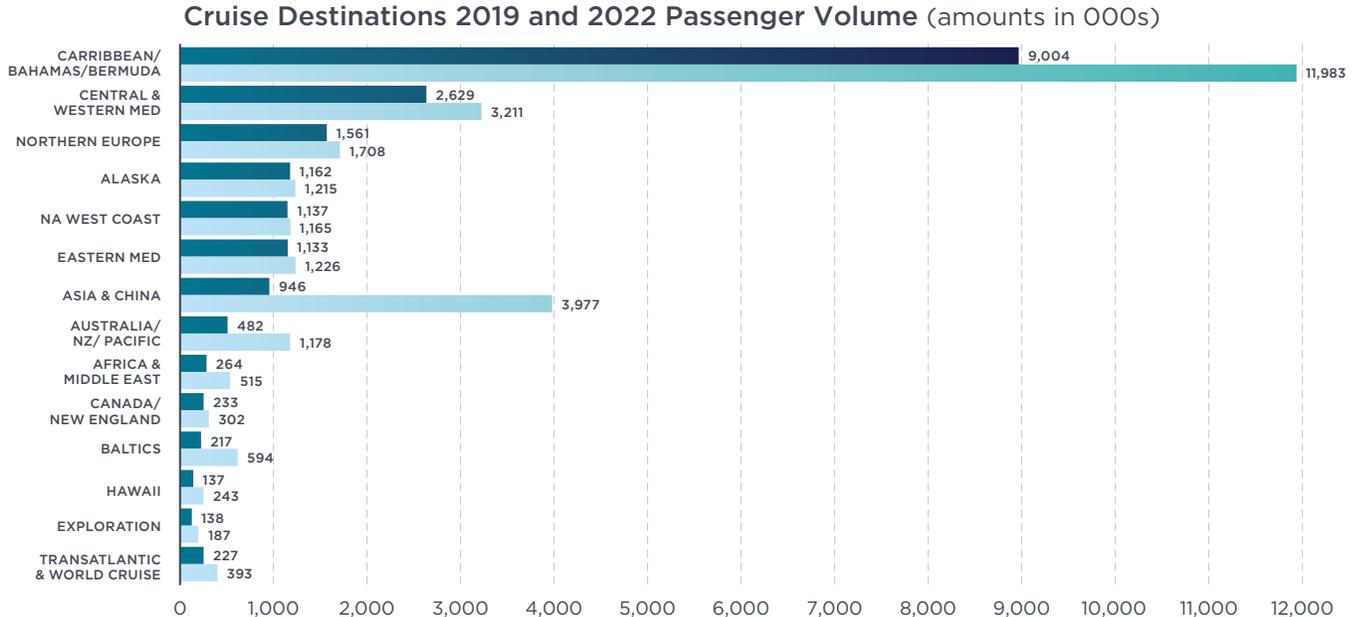
North America remains the largest source market with other markets increasing in popularity, especially the Med



Source: CLIA One Resource 2022 Passenger Data

CRUISE FACTS, FIGURES, & TRENDS

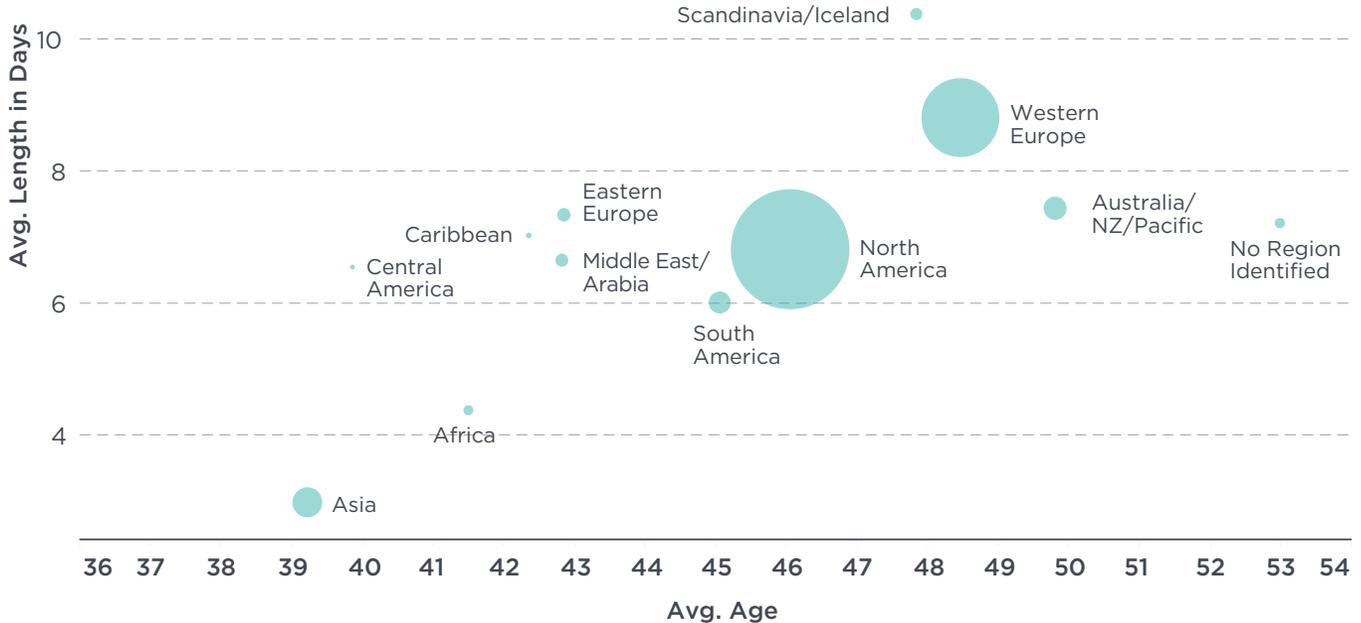
The Caribbean remains the top destination for cruise travelers



Source: CLIA One Resource 2022 Passenger Data

CRUISE FACTS, FIGURES, & TRENDS

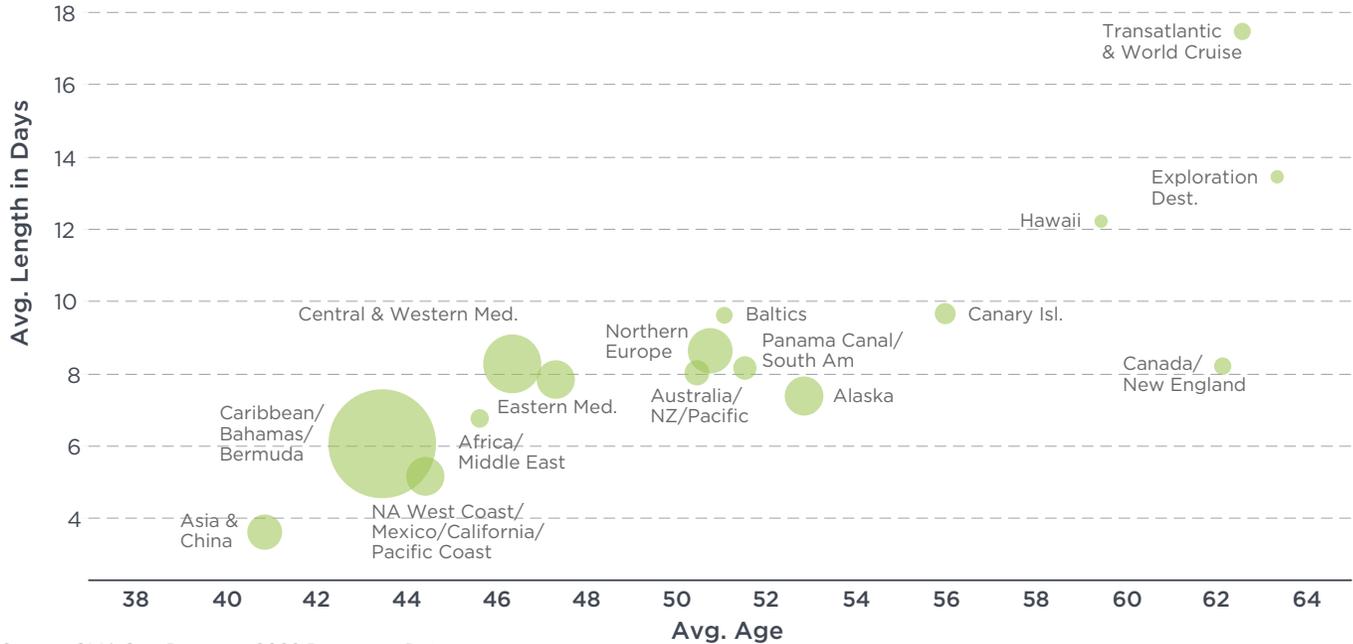
Average age and cruise length for top source markets, 2022



Source: CLIA One Resource 2022 Passenger Data

CRUISE FACTS, FIGURES, & TRENDS

Average age and cruise length by destination/itinerary, 2022



Source: CLIA One Resource 2022 Passenger Data

CRUISE FACTS, FIGURES, & TRENDS

Top 10 ports in 2022 (ranked by total passenger capacity)

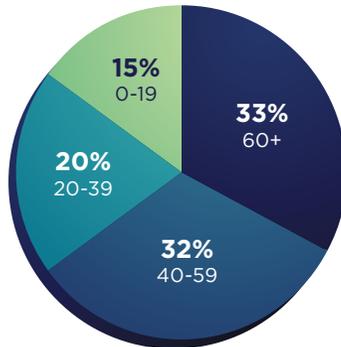
PORT/DESTINATION	LOCATION	COUNTRY	SHIP CALLS	EMBARK & DISEMBARK	TRANSIT	TOTAL
PortMiami	Miami, Florida	USA	982	5,581,535	292,272	5,873,807
Barcelona Cruise Port	Barcelona	Spain	794	3,529,771	1,950,373	5,480,144
Port Canaveral	Cape Canaveral, Florida	USA	799	4,582,880	462,660	5,045,540
Civitavecchia Port	Rome	Italy	744	3,198,989	1,795,678	4,994,667
Port of Marseille	Marseille	France	584	2,791,938	1,913,441	4,705,379
Nassau Cruise Port	Nassau	Bahamas	971	404	3,115,104	3,115,508
Port of Genoa	Genoa	Italy	318	1,971,943	1,068,892	3,040,835
Port Everglades	Fort Lauderdale, Florida	USA	479	2,811,494	208,480	3,019,974
Puerta Maya	Cozumel	Mexico	984	2,798	3,010,022	3,012,820
Port de Palma	Palma de Mallorca	Spain	449	1,488,051	1,074,726	2,562,777

CRUISE FACTS, FIGURES, & TRENDS

The future of cruise is the younger generation—and getting younger. GenX and Millennials are the most enthusiastic about planning a cruise holiday

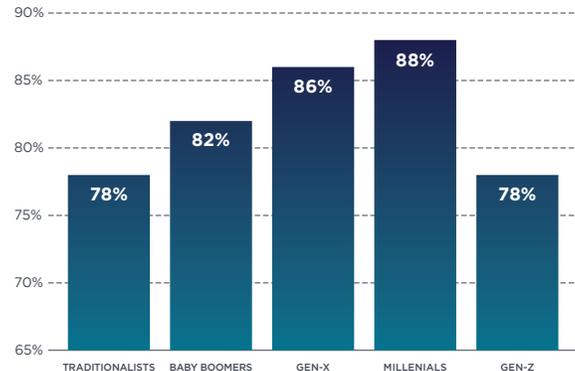
46.5 Average age of cruise tourist

Cruise Tourist Age Averages from 2018-2022



Millennials are the most enthusiastic cruisers of the future

% of Cruise Passengers Who Plan to Cruise Again



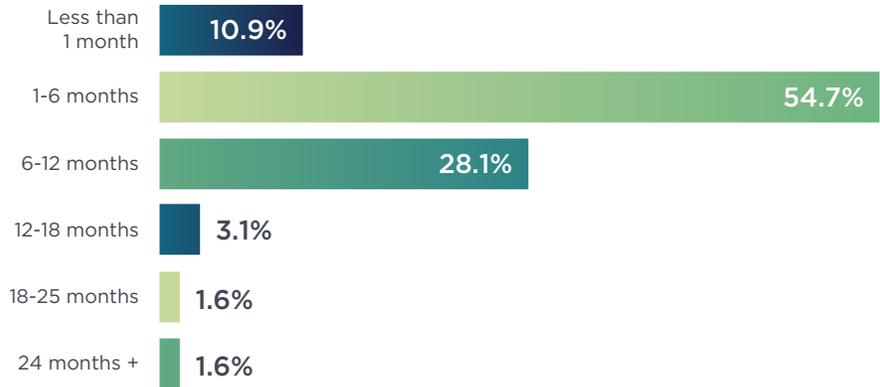
Source: CLIA Cruise Traveler Sentiment, Perception, and Intent Survey (March 2023)

CRUISE FACTS, FIGURES, & TRENDS

Many cruise lines are increasing the number of single cabins as an increasing number of cruise travelers choose to cruise solo. Here's how far in advance solo travelers book their cruises:

Most solo travelers book their cruises between 1 and 12 months prior to sailing

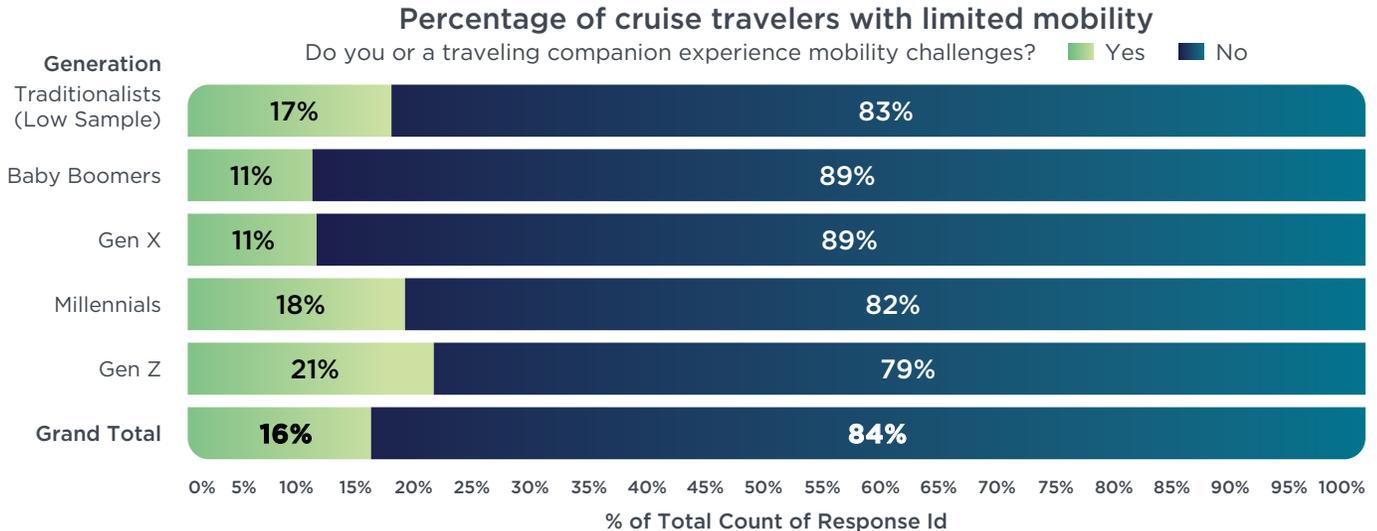
How far in advance do you book your sailing?
(solo travelers who have cruised before and will cruise again)



Source: CLIA Cruise Traveler Sentiment, Perception, and Intent Survey (March 2023)

CRUISE FACTS, FIGURES, & TRENDS

Accessibility is a growing need...and cruise lines are providing more wheelchair accessible options



Source: CLIA Cruise Traveler Sentiment, Perception, and Intent Survey (March 2023)

CRUISE FACTS, FIGURES, & TRENDS

A cruise holiday meets the needs of travelers with limited mobility more often than other holiday travel options

Percentage of travelers who said cruise is the only holiday travel option for them

Percentage of cruise travelers or those traveling with someone with limited mobility who responded yes

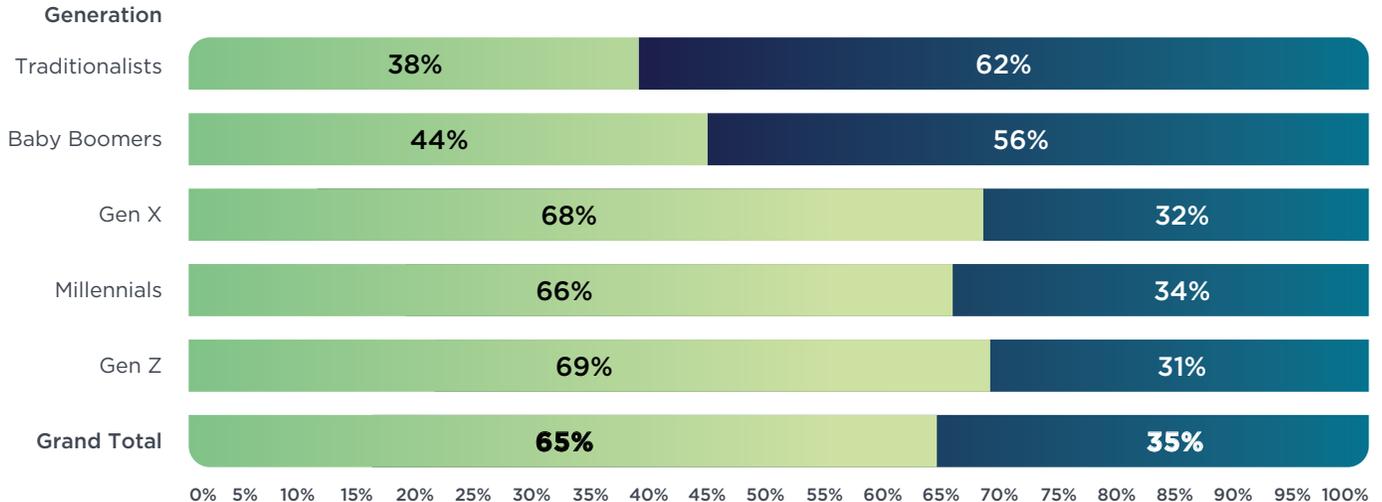


Source: CLIA Cruise Traveler Sentiment, Perception, and Intent Survey (March 2023)

CRUISE FACTS, FIGURES, & TRENDS

Younger generations are using travel advisors to book cruises at a higher rate than other generations (who are more seasoned cruisers)

Percentage of cruise travelers by generation who answered “yes” to the question:
Did you use a travel advisor to book your cruise in the last six months? ■ Yes ■ No

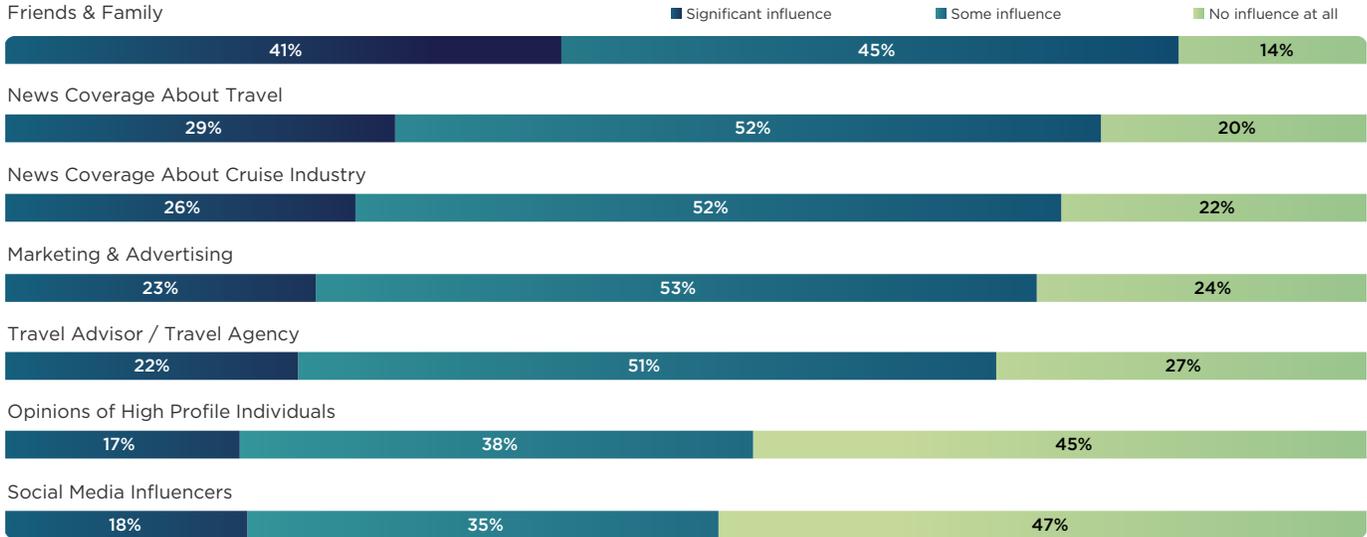


Source: CLIA Cruise Traveler Sentiment, Perception, and Intent Survey (March 2023)

CRUISE FACTS, FIGURES, & TRENDS

Family and friends have the strongest influence on traveler decisions to book a cruise or not

What level of influence do the following have on your decision to book a cruise?



Source: CLIA Cruise Traveler Sentiment, Perception, and Intent Survey (December 2022)



THE PRESENT & FUTURE VALUE OF CRUISE TOURISM

THE PRESENT & FUTURE VALUE OF CRUISE TOURISM

Economic impact highlights 2021

Operational ramp up and shipbuilding helped cruise contribute meaningful economic contributions despite loss in passenger volume

Although the majority of cruise markets remained closed during 2021, and restart in North America did not begin until the end of June, the cruise sector still produced some meaningful economic benefits.



Global:

\$75B in total economic contribution, supporting 848K jobs



Europe:

\$44B in total economic contribution, supporting 315K jobs



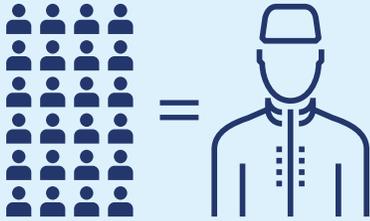
Rest of the world:

\$11B in total economic contribution, supporting 411K jobs

Source: CLIA 2021 Economic Impact Study, Oxford Economics, 2022 (Economic Impact results to be released in September 2023)

THE PRESENT & FUTURE VALUE OF CRUISE TOURISM

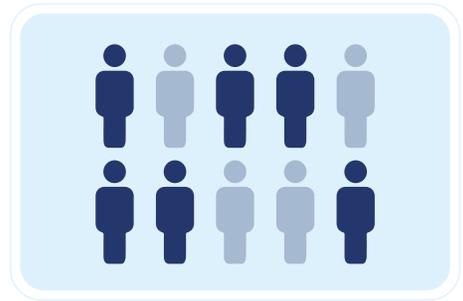
Cruise tourists add value before, during, and after sailing



**Every 24
cruisers**
worldwide supports
one full-time
equivalent job



Cruisers spend an average of
**\$750 USD per
passenger**
in port cities over the course of a
typical seven-day cruise



**More than 6 in 10
people (63%)**
who have taken a cruise say that
they have returned to a destination
that they first visited via cruise ship

Source: The Global Economic Contribution of Cruise Tourism in 2019, BREA

Source: CLIA SPI Survey, November 2021

THE PRESENT & FUTURE VALUE OF CRUISE TOURISM

Economic impact set to rebound

Strong demand and forecast for passenger volume bodes well for future economic contributions from cruise

Looking ahead, the cruise sector is expected to move closer to 2019 levels in 2023 with passenger volume forecast to reach 27 million to 33 million cruisers globally.

\$155B

TO THE GLOBAL ECONOMY



1.2M

JOBS



\$50B

IN WAGES



Source: CLIA 2019 Economic Impact Study, Oxford Economics

THE PRESENT AND FUTURE VALUE OF CRUISE TOURISM

Economic impact highlights 2021

Even though passenger and crew onshore visits were down nearly 90% in 2021 compared to 2019, total economic contribution from global cruise activity was only down 53% for the year.

As part of the responsible resumption of cruise, cruise lines generated direct spend as they ramped up operations. This helped mitigate the loss of cruise activity during a year where the largest cruise market in the world was open for just six months and other key markets had virtually no cruise activity (e.g., Asia, Australia, and Canada).

LEVELS	2021	2020	2019
PASSENGER AND CREW ONSHORE VISITS, MILLIONS	16	26	148
DIRECT EXPENDITURES, \$ BILLIONS	\$34	\$29	\$72
TOTAL OUTPUT CONTRIBUTION, \$ BILLIONS	\$75	\$63	\$54
TOTAL INCOME CONTRIBUTION, \$ BILLIONS	\$25	\$26	\$51
TOTAL EMPLOYMENT CONTRIBUTION, HEADCOUNT	862,025	576,451	1,166,213

% CHANGE RELATIVES TO 2019	2021	2020
PASSENGER AND CREW ONSHORE VISITS	-89%	-82%
DIRECT EXPENDITURES	-53%	-60%
TOTAL OUTPUT CONTRIBUTION	38%	17%
TOTAL INCOME CONTRIBUTION	-51%	-49%
TOTAL EMPLOYMENT CONTRIBUTION	-26%	-51%

Source: CLIA 2021 Economic Impact Study, Oxford Economics (2022 Economic Impact results to be released in September 2023)

THE PRESENT AND FUTURE VALUE OF CRUISE TOURISM

Economic impact highlights 2021



Cruise line purchases were the main driver of economic contribution from cruise in the United States during 2021:

- U.S. embarkations in 2021 were 86% lower than levels in 2019—directly affecting the level of passenger and cruise spend during the year.
- However, cruise line purchases as part of the ramp-up of operations for cruise resumption in the U.S. at the end of June 2021 limited the impact.
- Wages for crew and staff appear to have been relatively stable during the pause in operations, and even increased in nominal terms.

Source: CLIA 2021 Economic Impact Study, Oxford Economics (2022 Economic Impact results to be released in September 2023)

THE PRESENT AND FUTURE VALUE OF CRUISE TOURISM

Economic impact highlights 2021

ECONOMIC CONTRIBUTIONS	2021	2019	%CHANGE
DIRECT			
DIRECT CRUISE INDUSTRY EXPENDITURES, \$ BILLIONS	\$8.7	\$25.1	-65%
EMPLOYMENT	52,461	178,104	-71%
GROSS INCOME, \$ BILLIONS	\$3.0	\$9.0	-67%
TOTAL ECONOMIC IMPACT			
TOTAL OUTPUT, \$ BILLIONS	\$19.0	\$55.0	-65%
EMPLOYMENT	109,517	436,611	-75%
TOTAL GROSS INCOME, \$ BILLIONS	\$8.0	\$24.0	-67%
EXPENDITURES			
PASSENGERS SIURCED FROM US, MILLIONS	2.5	14.2	-82%
US EMBARKATION, MILLIONS	2.0	13.8	-86%
CRUISE LINES, \$ BILLIONS	\$6.3	\$18.1	-65%
PASSENGERS AND CREW, \$ BILLIONS	\$0.7	\$5.1	-86%
CREW GROSS WAGES, \$ BILLIONS	\$1.7	\$1.9	-12%
DIRECT US-BASED SPENDING, \$ BILLIONS	\$8.7	\$25.1	-65%

Source: CLIA 2021 Economic Impact Study, Oxford Economics (2022 Economic Impact results to be released in September 2023)

THE PRESENT AND FUTURE VALUE OF CRUISE TOURISM

Economic impact highlights 2021

A strong shipbuilding sector was key to supporting economic impact in Europe

Regional view of direct economic impact

MARKET AREA	TOTAL SPEND	CRUISE LINE PURCHASES	PAX SPEND	SHIPBUILDING	CREW/STAFF INCOME
\$ AMOUNTS IN MILLIONS					
GLOBAL	\$35,371	\$15,415	\$1,912	\$13,033	\$5,011
EUROPE	\$20,740	\$5,944	\$847	\$12,381	\$1,558
USA	\$8,676	\$6,310	\$654	\$37	\$1,674
REST OF THE WORLD	\$5,955	\$3,160	\$411	\$605	\$1,779
€ AMOUNTS IN MILLIONS					
EUROPE	€17,629	€5,052	€720	€10,533	€1,324
REGIONAL DISTRIBUTION					
EUROPE	59%	39%	44%	95%	31%
USA	25%	41%	34%	0%	33%
REST OF THE WORLD	17%	21%	22%	55%	36%

Source: CLIA 2021 Economic Impact Study, Oxford Economics (2022 Economic Impact results to be released in September 2023)

THE PRESENT AND FUTURE VALUE OF CRUISE TOURISM

Economic impact highlights 2021

Direct spend (cruise line purchases) by region



Source: CLIA 2021 Economic Impact Study, Oxford Economics (2022 Economic Impact results to be released in September 2023)



THE 2023-2028 ORDERBOOK

THE 2023-2028 ORDERBOOK

14 new ships will enter service during 2023, offering new itineraries and experiences

CRUISE LINE	SHIP	SHIPYARD	FIRST SAILING*
CARNIVAL CRUISE LINE	<i>Jubilee</i>	<i>Meyer-Werft (Germany)</i>	<i>Dec 2023</i>
CELEBRITY CRUISES	<i>Ascent</i>	<i>Chantiers de L'Atlantique (France)</i>	<i>Dec 2023</i>
EMERALD CRUISES	<i>Sakara</i>	<i>Halong Shipbuilding (Vietnam)</i>	<i>Aug 2023</i>
EXPLORA JOURNEYS	<i>Explora I</i>	<i>Fincantieri (Italy)</i>	<i>July 2023</i>
MSC CRUISES	<i>Euribia</i>	<i>Chantiers de L'Atlantique (France)</i>	<i>June 2023</i>
NORWEGIAN CRUISE LINE	<i>Viva</i>	<i>Fincantieri (Italy)</i>	<i>Aug 2023</i>
OCEANIA CRUISES	<i>Vista</i>	<i>Fincantieri (Italy)</i>	<i>May 2023</i>
REGENT SEVEN SEAS CRUISES	<i>Seven Seas Grandeur</i>	<i>Fincantieri (Italy)</i>	<i>Nov 2023</i>
SCENIC YACHT CRUISES	<i>Eclipse II</i>	<i>Rijeka (Croatia)</i>	<i>April 2023</i>
SEABOURN	<i>Pursuit</i>	<i>T. Mariotti (Italy)</i>	<i>Aug 2023</i>
SILVERSEA CRUISES	<i>Silver Nova</i>	<i>Meyer Werft (Germany)</i>	<i>Aug 2023</i>
SWAN HELLENIC CRUISES	<i>Hellenic Diana</i>	<i>Helsinki (Finland)</i>	<i>April 2023</i>
VIRGIN CRUISE LINE	<i>Brilliant Lady</i>	<i>Fincantieri (Italy)</i>	<i>Dec 2023</i>
VIRGIN CRUISE LINE	<i>Resilient Lady</i>	<i>Fincantieri (Italy)</i>	<i>May 2023</i>

Source: CLIA orderbook data (*CLIA cruise line member vessels scheduled for delivery in 2023, launch dates subject to change)

THE 2023-2028 ORDERBOOK

CLIA cruise line members are introducing 44 new ships from 2023 through 2028

YEAR	# SHIPS	# LB CAPACITY	AVG. CAPACITY	MIN. CAPACITY	MAX. CAPACITY
2023	14	29,527	2,109	100	5,610
2024	12	30,064	2,505	200	5,714
2025	8	31,820	3,978	1,200	6,000
2026	4	14,082	3,521	922	5,610
2027	4	10,894	2,724	922	5,400
2028	2	4,572	2,286	922	3,650
Total	44	120,959	2,749	100	6,000

Source: CLIA orderbook data (2023-2028)

About Cruise Lines International Association

Cruise Lines International Association (CLIA) is the world's largest cruise association, providing a unified voice for the industry as the leading authority of the global cruise community. Together with our members and partners, CLIA supports policies and practices that foster safe, healthy, and sustainable cruise operations; tourism strategies that maximize the socio-economic benefits of cruise travel; and technologies and innovations that protect and preserve our planet.

Our commitment to sailing to a better future extends well beyond minimizing environmental impacts to also include harnessing the power of travel to contribute to responsible tourism, connect people and places, and create positive travel experiences that inspire lifelong cruisers and generations of new-to-cruise travelers to sail responsibly.

CLIA's global headquarters are in Washington, DC, with regional offices located in North and South America, Europe, Asia, and Australasia. To learn more about the advancements our industry is making toward sustainable development goals that make cruise the best way to see the world, please visit cruising.org and cruiseinfohub.com.

CLIA MEMBERSHIP

53 Member Cruise Lines

- 43 Ocean Members (28 global + 15 regional)
- 10 River Cruise Marketing Affiliates (3 global + 7 regional) with approximately 144 vessels

OCEAN LOWER BERTHS	2021	2022	2023
Global	514,000	547,000	580,000
Regional	46,000	32,000	34,000
Total	560,000	579,000	614,000

Includes 95% of global ocean-going cruise passenger capacity

- Nearly 300 Executive Partners
- 75,000 Travel Trade Members:
15,000 Agencies
60,000 Agents



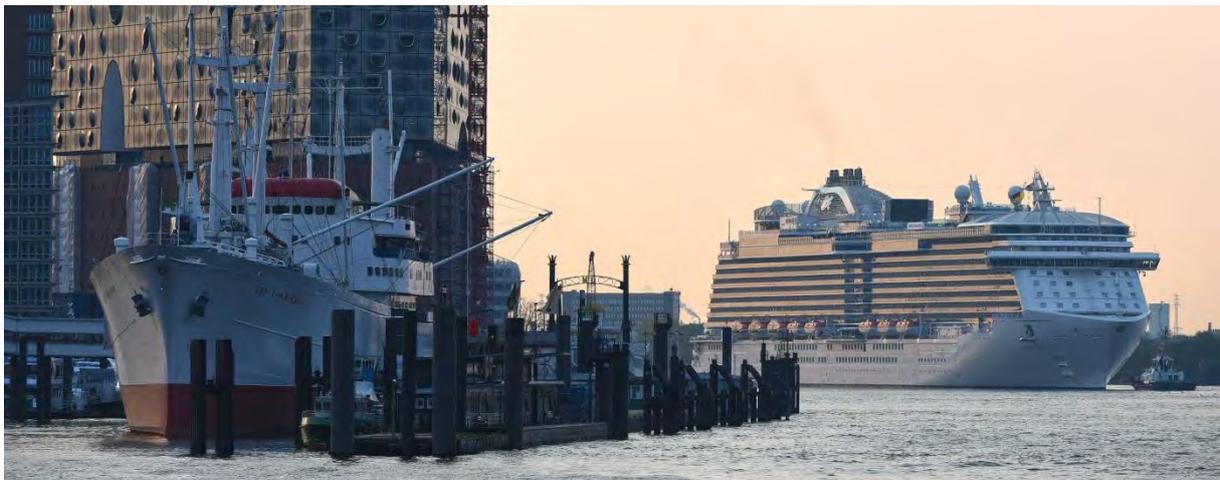
APPENDIX SE4: COMMON STANDARDS IN THE MEASUREMENT OF ECONOMIC EFFECTS BY CRUISE TOURISM

Common standards in the measurement of economic effects by cruise tourism

Green Cruise Port project, Activity 4.1.2a

Concept Study conducted by Maritime Institute in Gdansk:

Urszula Kowalczyk, Jakub Piotrowicz, Marcin Burchacz, Marcin Kalinowski, Rafał Koba and Antoni Staśkiewicz



30.06.2017

GREEN CRUISE PORT is an INTERREG V B project, part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument).

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Introduction

One of the main differences between cruise tourism and traditional tourism is that factors of production of the cruise industry can be acquired from a range of countries. Generally, a tourist destination capital can be sourced internationally but the other factors inputs are obtained from the tourist destination country. No such limitations apply to cruising. Cruise companies can operate as multinational entities, where resources do not need to be acquired from a specific country¹.

The cruise tourism has a significant economic impact, both globally and at regional and local levels. Recently, the cruise ship industry has been the fastest growing segment in the overall tourism worldwide.

Cruise industry contributes substantially to local, regional and national economies. The cruise lines also boost global economy supporting around 940 thousand jobs and paying around \$40 billion in wages worldwide. Handling around 22 million passengers, cruise industry contributed nearly \$129 billion to global economy in 2014². In Europe the cruise industry supported nearly 350 thousand jobs, paying €10.75 billion in wages in 2014. Cruise lines spend substantial amount of money every year purchasing supplies and services from numerous businesses, including food services, agriculture, textiles, airlines, hotels, etc. By 2020 the cruise industry will invest over \$25 billion in its fleet development, driving job creation and purchases of goods and materials that support local economies worldwide³.

Despite the importance that cruise tourism gained in recent years, there are still few studies that attempt to quantify its economic impact. Those few include the worldwide economic impact estimates that are conducted periodically by the International Association of Cruise Lines. These reports however, do not show any territorial disaggregation below country level. The European Commission has also made an attempt to estimate the economic impact of cruises, although the final results are aggregated for all European ports⁴. At a more disaggregated level, there are the impact studies eg. Port Canaveral in Florida, Barbados, Barcelona or Civitavecchia, and others⁵. Apart from the above mentioned elaborations, the number of studies that estimate in detail the economic impact of cruise tourism at regional or local level remains scarce.

The aim of the elaboration is to develop the seaport economic impact model applicable for the cruise port of calls and home port in the Baltic Sea area. The economic impact of cruise tourism and its benefit to local communities depends on various external and internal factors. Also the distribution of revenues resulting from cruise passengers is disparate, with some businesses generating the majority, over 75% of revenues from cruise passengers, while similar businesses receive less than 25% of their revenues from cruises. Moreover, economic impact is determined by a number of

¹ Cruise tourism: economic, socio-cultural and environmental impacts,(2014)

² Travel & Tourism. Global economic impact& issues 2017. World Travel and tourism Council

³ Fact Sheet. The cruise industry's economic impact. Cruiseforward.org

⁴ Tourist facilities in ports. The economic factor. Policy Research Corporation, August 2009 Commissioned by: European Commission,

⁵ Juan Gabriel Brida and Sandra Zapata: Cruise tourism: economic, socio-cultural and environmental impacts. Int. J. Leisure and Tourism Marketing, Vol. 1, No. 3, 2010, T. Boccioni: Analisi dell'impatto socio-economico delle attività crocieristiche del porto di Civitavecchia 2015, Economic Impact of Cruise Activity: The port of Barcelona – IREA 2015

factors depending on particular itinerary and destination's value chain and on the degree to which passengers are able to increase or decrease spending within a destination.

Cruise tourism might be blamed for generating less spending per passenger in the local economy than non-cruise tourists, with passengers staying less time and less tax collected from entry via cruise terminals than airports or via overnight lodging taxes.

Also, cruise tourism may generate less employment at the destination than other forms of tourism, especially at transit ports. Moreover, the cruise tourism tends to keep the majority of associated revenues within the cruise line whilst the local communities, which may provide a large part of the attractiveness and experience, are not benefitting sufficiently from the cruise passengers.

The economic impact of cruise tourism on local economies consists of three different types of spending categories: passenger, crew and ship expenditures. The economic impact generated by shipbuilding, cruise ship suppliers and the setting up of headquarters of the cruise companies do not ultimately affect coastal regions⁶. The average amounts per passenger going onshore shall be extracted, and broken down by category: transit or turnaround passenger. The share of passengers participating in an organised tour is estimated at 65%. It is assumed that around 80% subsequently purchase a tour on the ship, while 20% purchase the tour onshore. This has consequences for expenditures, since tours that are pre-booked on a cruise ship tend to be more expensive by around 50%. By subtracting the intermediary purchases from the total money spent in a local economy, the value added is obtained.

Usually the majority of economic data on cruise ship contributions to local, state and national economies are derived from the cruise shipping industry itself, primarily through its principal trade association. The Cruise Lines International Association (CLIA). While the CLIA's economic impact studies are increasingly comprehensive, with mixed method research approaches and improved transparency, there is no way to independently confirm much of the underlying data. This is especially true for findings showing passenger and crew spending in ports of call, which are derived from proprietary, self-response surveys distributed onboard. In addition, extrapolating ship-wide passenger and crew expenditures on the basis of self-response surveys risks the misstatement of total spend, as individuals who complete such questionnaires may not be representative of other passengers⁷. Much of tourism impacts investigations are the work of economists and have concentrated on the effects of income and employment. Economic impacts are interlinked and cannot be separated from other types of impact.

The economic impact surveys should not be limited to only the direct effects derived from the expenditure of cruise passengers in the destination city, but also additional dimensions of expenditure including spending by shipping companies in terms of a ship's stores, mooring and pilot services, terminal services, waste management etc. as well as and spending by crew members during

⁶ Tourist facilities in ports Growth opportunities for the European maritime economy: economic and environmentally sustainable development of tourist facilities in ports. Study report. Directorate-General for Maritime Affairs and Fisheries, European Communities, 2009.

⁷ Economic Opportunities and Risks of Cruise Tourism in Cairns. Prepared by: Joseph (Mark) Thomas^{1*} under the supervision of Natalie Stoeckl^{1, 2} for The Australian Marine Conservation Society and WWF-Australia, April, 2015

visits in the destination. Hence, the direct effect affects the port, but it also extends to the entire city and its surrounding environment in terms of demand for services in general, including transport, hotels and catering infrastructure, leisure, culture, retail among others. This impact could be extended in turn, to consider the indirect impact, derived from the demand for goods and services generated by this business, and induced impact from the expenditure of the worker's income that has been generated by the direct and indirect effects.

1 Methodology

The methodology is based on the economic theory of multiplier effects where the direct spending are measured and on investigating how these spending circulate and are induced in the economic system. Multiplier effect is a common tool for assessing economic impact. The model will estimate the impacts of current and potential cruise operations at the sea port. The model might also be used to estimate the economic impact on the cruise passengers arriving for the cruise (for example by air). Using the purchase patterns, and the appropriate jobs to sales ratios and personal income measures for the supplying companies, the visitor industry model calculates the direct jobs, induced and indirect impacts that are generated by the cruise service at homeport or the port of call. The methodology is based on a scientific and objective approach to measure the direct, indirect and induced economic effects of ports in relation to the hinterland i.e. the state/region and/or the municipality in which the port is located.

Statistics include maritime transport and tourism as separate categories. Therefore, economic effects are not explicitly interpreted as the services provided at the port itself benefit the maritime transport and all services after leaving the cruiser are beyond broader maritime economy and are instead considered as economic effects typical of the tourism sector.

Economic effects of cruise industry in the sea port are calculated like any other cargo category, in addition with calculation of passengers spending (e.g. hotel transport).

Economic impacts created by a port of call, rather than a homeport call, generate impacts primarily on the landside consisting of tour packages and individual sightseeing excursions. To estimate these impacts, only passenger purchases for local retail/restaurants and tour packages are usually included in the impact analysis. Interviews with local tour operators provide an estimate of the share of passengers that typically purchase land-side tours while on a port of call. These local purchases are converted into direct, induced and indirect impacts using the visitor industry methodology. In addition to the passenger expenditures, the vessels also spend money for line handling, pilots, tender services, and in some cases miscellaneous emergency purchases. These purchases shall also be included in the port of call impact analysis.

The survey shall quantify the impact of cruise tourism in Baltic ports. Information source are based both on direct information provided by the different agents involved and also personal interviews with different institutions, companies and organizations linked directly or indirectly to cruise activity in selected ports. The investigation will go step by step beyond other studies on impacts at a sector level.

While focussing on jobs the identification of direct port related jobs is generally based on questionnaire and calculation of indirect port related jobs on questionnaire and Input-Output-Charts (regional, sector specific)⁸. Indirect detection of added value contains number of jobs multiplied with value added per head (regional, sector specific)

For each destination the average amount of value added for one job in the industries affected by cruise tourism might be calculated. By dividing the total value added by this figure, the number of jobs per industry (and subsequently per country) shall be calculated.

The Economic Impact Analysis Model of cruise industry for the sea port proposed by Port of Rostock includes four levels of effects generated by port activity.

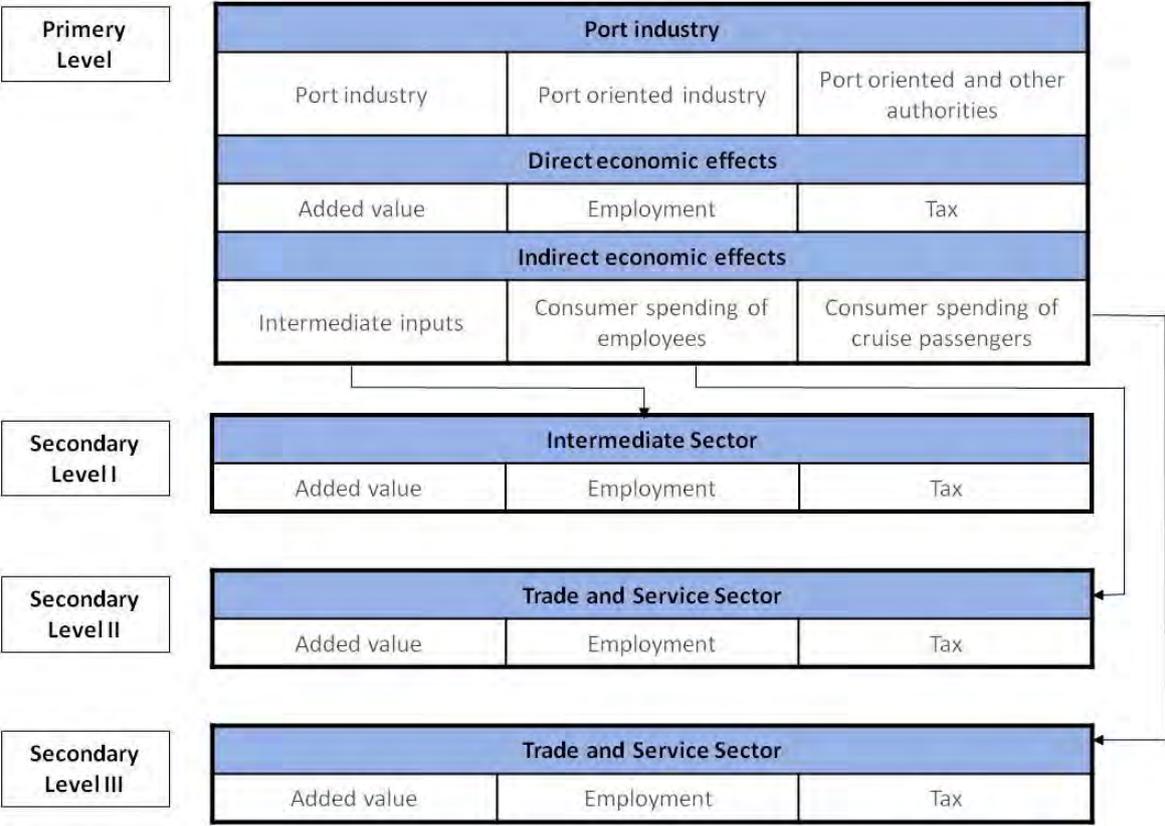


Fig. 1. Economic Impact Analysis Model generated by port activity

Source: Breitzmann, K.-H. et al: *Wirtschaftliche Effekte und Ausstrahlung der Hafen-und Seeverkehrswirtschaft Mecklenburg-Vorpommerns, Rostocker Beiträge zur Verkehrswirtschaft und Logistik, Heft 10, Universität Rostock 2000, S. 12.*

Definitions set by the model include: Port industry, Ship supply and other service providers, Port oriented industry, Port oriented and other authorities.

Port industry: handling and storage companies, port operating companies, shipping agents, transport and forwarding companies, pilots and towage companies, shipping companies (e.g. ferry and cruise operators).

⁸ „With-and-Without“- approach: Port related jobs and added value Scientific standard

Ship supply and other service providers: ship insurance companies, maintenance industry for ships and port infra- and/or suprastructure, other port related industry and service provider.

Port oriented industry: trading companies settled in the respective port, production companies settled in the port, import and export companies for different kinds of goods, fishery industry, hotel and restaurant industry, tourist service agencies, other port related industry

Port oriented and other authorities: city administration, water police/coast guard, boarder police, custom, maritime and hydrographic agency, shipping authority, other institutions and authorities.

In order to assess the economic impacts of potential cruise business at the sea port a spreadsheet framework shall be proposed, which can be used to assess the impacts of such factors as:

- Number of cruise vessel calls;
- Number of passengers;
- Passenger characteristics:
- Local expenditures;
- Local residents versus tourists;
- Length of time and where stayed after disembarking;
- Different types of cruise service, including:
- Homeport;
- Port of call;
- Size of crew; and
- Size of vessel.

Calculation of indirect economic effects -secondary level I is focused on:

- Intermediate effects including identification of intermediate inputs for different industry branches in different regions. Projection shall be based on questionnaire return rates and mapping with the multi-level approach
- Employment effects based on a branch related turnover-employment-ratio.
- Tax effects shall be reported by respective tax offices / administrations

Calculation of indirect economic effects - secondary level II is focused on:

- Intermediate effects including expenditures for consumption of goods are calculated based on interviews and projections according to the multi-level approach
- Employment effects set on a branch related turnover-employment-ratio. Calculation of net wages in different regions related to the consumption of goods by port industry employees through different methods (mostly base on publicly available statistics). Development of a concept to structure expenditures of goods in different trade and service industry branches as well as Calculation or projection of turnover per employee in the trade industry.
- Tax effects are reported by respective tax offices / administrations

Calculation of indirect economic effects - secondary level III is focused on:

- Intermediate effects based on interviews with cruise shipping companies, hotel and restaurant industry, touristic service providers, transport operators, incoming agencies
- Employment effects including calculation of a value for expenditures per day and cruise passenger. Projection is based on available studies to passenger spending in the ferry industry sector - very similar to cruise passenger spending
- Tax effects are reported by respective tax offices / administration

The required data will be collected from different sources and approach including:

- Development of a comprehensive questionnaire
- Interviews with relevant stakeholders, companies and passengers
- Interview period should cover the peak cruise season, at least a minimum time of three consecutive months
- Interviews with cruise passengers at different locations in the cruise city, but predominantly very close to the cruise ship piers -> if approved by incoming agencies even on day tours
- Time of interviews: after arrival and before the day trips started; during the day with passengers staying in the cruise city; after passengers return from the day trip
- Additional data collection with questionnaires outside of the interview period to reach a critical mass of data
- Research of available statistics at the relevant statistical offices or administrations before the data collection and/or interviews start

The analysis of economic effects will be combined with an analysis of customer satisfaction in order to get a comprehensive picture.

Cruise ship expenditure data are collected from cruise operator⁹ via interview. The results of these interviews are used to develop a typical ship disbursement account profile. Associated with each vessel expenditure category are jobs to sales ratios with the types of firms providing the goods and services to a vessel at homeport. The jobs to sales ratios as well as personal income levels are developed from official statistics data sources for the area. The total annual expenditures, by type of service, is multiplied by the corresponding jobs to sales ratios to estimate the total direct job impacts in the maritime service sector, by type of service.

Surveys of local vendors calculated as to the origin of the goods (produce, liquor, flowers and retail items) that are loaded onto the vessels at port. In general, the cruise service at the homeport have low impact on employment levels with these firms. In addition, the majority of the food and goods originate from all parts of the region or the country. Majority of products supplied on cruise vessels is purchased from distributors sourcing nationwide. The revenue impacts are estimated directly from the expenditure profiles provided by the carriers. Direct income is estimated from the average annual salaries developed by type of firm, from the interviews.

⁹ For example data for calculation of the cruise ship expenditure for port of Seattle were provided by Princess Cruises, Holland America Line and Norwegian Cruise Line

In order to quantify the economic impact of cruise activity for cruise ports the traditional methodology is usually adapted, used in impact studies based on CLIA surveys.¹⁰ Knowing the average daily spending for all categories of cruise passengers, their average stay in the city, and the quantification of the flow of cruise passengers in the city, the calculation of the direct impact generated by cruise passengers in the city can be made. Analysis of passenger spending are by large based on estimation. Figures might be compiled by local business owners.

¹⁰ Contribution of Cruise Tourism to the Economies of Europe 2015 Edition, CLIA

2 Cruise traffic overview

2.1 Global and European tendencies

Tourism is perceived as an industry that has a positive impact on economic growth. Economic benefits are probably the main reason why so many countries are interested in this sector; its contribution to the world economy is obviously important¹¹.

Cruising is a driving force of economic growth worldwide. The cruise industry supports 939,232 jobs, paying almost \$40 billion in wages worldwide. With of 22 million passengers worldwide the cruise industry contributed \$119.9 billion to the global economy in 2014. By 2020, the cruise industry will invest more than \$25 billion to update and grow its fleet, driving job creation and purchases of goods and materials that support local economies around the world.

In the USA the cruise industry in 2013 the industry generated \$119.9 billion globally and provided more than 891,000 direct and indirect jobs as a result of cruise line, passenger and crew spending. The cruise industry positively impacts other sectors. Cruise lines spend billions each year purchasing supplies and services from country businesses, including food services, agriculture, and apparel and textiles. U.S. Passengers spend an average of \$416 flying to their cruise port, \$258 on lodging the night before their cruise, and \$122 each day at port, supporting airlines, hotels, and local tourism businesses.

In Europe the cruise industry supported 348,930 jobs, paying €10.75 billion in wages in 2015. In Asia in 2015, the cruise industry will add nearly a thousand port calls in Asia, bringing more passengers to the Far East than ever before and generating billions in positive economic impact for the Asian economy. In Australia a record breaking 1 million passengers cruised from Australia in 2014, translating to more than \$3 billion for the Australian economy¹².

The cruise industry experienced rapid growth. In 2011, the cruise industry generated US\$40 billion in overall economic activity and 350,000 jobs. Vessels range in size from the gigantic, Royal Caribbean's Oasis of the Seas, which accommodates 5400 passengers and 2165 crew, to the small elite, like Polar Pioneer, which carries 56 passengers and 20 crew. The majority of the fleet today is in the 3000 to 4000 passenger range. International cruisers average age is 46 years¹³. To meet the changing patterns and preferences of customers, most cruise lines work around specific cruise themes and voyage lengths.

CLIA projected that more than 24 million passengers will take sail in 2016 globally, compared to 10 million in 2006 and 1.4 million in 1980. The OECD recently predicted that the cruise ship market will grow 3.3% by 2030¹⁴. Demand for new vessels might outpace delivery. The capacity of shipyards is not sufficient to meet demand for new cruise ships.

¹¹ Juan Gabriel Brida, Sandra Zapata. *Anatolia: An International Journal of Tourism and Hospitality Research* Volume 21, Number 2, pp. 322-338, 2010, Anatolia. Printed in Turkey.

¹²<http://www.australiancruiseassociation.com/reports>

¹³ CLIA

¹⁴ CLIA

Tabl. 1. Cruise Ship Orders 2016-19 (€27,275 million of the new investment is placed in European yards)

Year of completion	No of ships	No of berths	Investment €million
Total	50	133,265	28,442
2016	10	27,621	6,071
2017	11	27,820	6,180
2018	13	27,629	6,215
2019	16	50,195	9,976

Source: CLIA

The world cruise ships are growing in size, the biggest can accommodate more than 6 thousand passengers and 2.5 thousand crew members, for example Oasis of the Seas (360m length, 47 m width and 9.3m draft) can accommodate 6630m passengers and 2160 crew members.. Currently 21 % of world cruise fleet capacity represent ships with length more than 300 m, 78 % of cruise tourists travel on vessels over 250 m in length, whilst 57 % of world cruise fleet consists of vessels with length more than 275 m.¹⁵

At the same time, smaller ships, and some larger ones as well, are able to bring tourists to new ports which were previously inaccessible or off the routine voyage. There are clearly benefits to be gained from cruise ship visits, however there are also issues which have to be considered in order to optimize benefits and reduce negative impacts of cruise ship visits. Destinations are not equal, they differ in various characteristics, which determine the attractiveness of each destination to a cruise line. This also relates directly to the importance that a destination may have in dealings with potential and current cruise operators¹⁶.

On the European cruise market in 2015 the capacity of 42 cruise lines domiciled in Europe, operating 123 cruise ships totalled 146,000 berths. Additional 18 non-European lines, deployed in Europe 60 cruise ships of vessels with total capacity of around 89,000 berths. About 30% of worldwide cruise passengers totalling 6.4 million European residents booked cruises and 5.85 million passengers embarked from a European port, of which 4.9 million European nationals. Around 250 European port cities hosted altogether 29 million cruise visitors an 14.4 million crew. Majority of cruises visited ports in Mediterranean, Baltic and other European regions.

Cruise activity is beneficial for tourism and economic activity in major port cities. The Mediterranean area accounts for almost 20% of the global cruise market, being the second most popular cruise destination after the Caribbean . The cruise industry has thus become an engine of economic acceleration for many local economies in the Mediterranean. The Port of Barcelona is the European

¹⁵ Travel & Tourism. Global Economic Impact& Issues 2017. World Travel and tourism Council

¹⁶ Managing Cruise Ship Impacts: Guidelines for Current and Potential Destination Communities A Backgrounder for Prospective Destination Communities by Ted Manning, President Tourisk Inc. 2006

leading port for moving cruise passengers. The Port of Barcelona has relevance not only as a port of call but also as a home port, where boarding and disembarkation account for 52% of the total movement of cruise passengers in 2014. A total of 2,364,292 cruise passengers visited Barcelona in 2014.

2.2 Cruise traffic on the Baltic Sea

The Baltic Sea is one of the world's most densely operated marine areas. The number of passengers visiting the Cruise Baltic destinations increased by an average annual rate of 9.9% per year, from 1.1 mill. in 2000 to 4.3 in 2016 and by 1.2% in 2016 compared to number of passengers in 2015. Expected number of passengers in 2017 is expected to increase by 13% compared to 2016. The number of calls totalled 2,163 calls in total. From 2000-2016 the number of calls increased by an average annual rate of 2.7% per year, from 1.453 in 2000 to 2,163 in 2016. An increase of 15.2% in the total number of calls is expected in 2017¹⁷.

Baltic Sea region receives more than 350 cruise ships with over 2100 port calls each year, 40 cruise lines and 88 ships (2015), 4,3 million passengers (10 % of total cruise passengers), annual turnover of around € 443 million and 5500–11500 jobs, most of ports located to the city centers and attractions, many piers and terminals within walking distance, variety of bigger and smaller ports – various itinerary opportunities. During the 2014 cruising season, 77 different cruise ships owned by 37 operators sailed in the Baltic Sea. Half of these were smaller vessels with a of 1,500 or less persons, including staff and passengers, 8 vessels, or 10%, were large vessels with a maximum capacity of 4,000 persons or more, 5 main destinations St. Petersburg, Copenhagen, Tallinn, Helsinki and Stockholm, account for 67 % of the cruise ship traffic in terms of calls. In 3 ports, including Visby, large ships anchor outside the port and use shuttle boat transportation to the shore. Voyages between two ports lasted commonly between 8 and 20 hours at sea, and the cruise ships stayed usually in port between 8-10 hours. the international cruise ship voyages involved in total 6,55 million person-days, comparable to year-around habitation of 18,000 people.

¹⁷ Cruise Baltic Market Review 2017

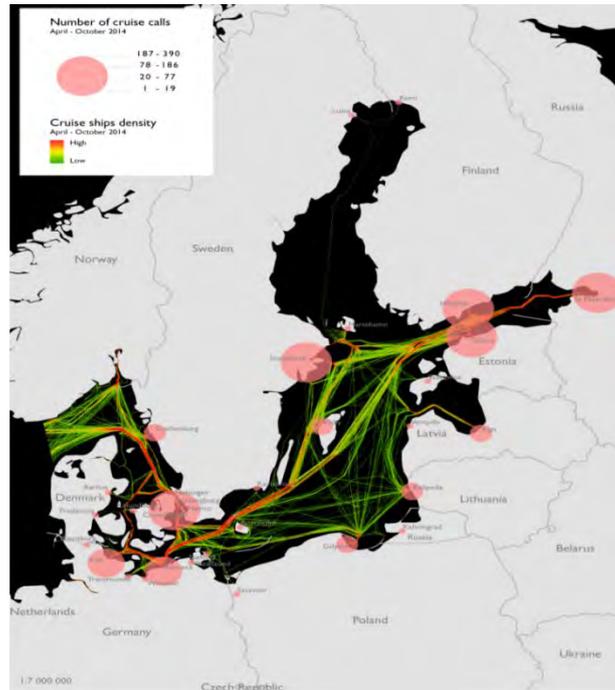


Fig. 2. Cruise ships number of calls and traffic density in the Baltic Sea in 2014.

Source: HELCOM

The number of turnarounds in 2016 increased by 14.1% from a total of 403 in 2015 to 460 turnarounds. In 2017 an increase of 3.5% is expected. From 2000-2016 the number of turnarounds increased by an average annual rate of 9.6%.

Tabl. 2. Cruise ships calling Northern Sea and Baltic Sea ports in 2014 - by country

Country	Number of calls	Capacity thous GT
TOTAL	9291	495768
Denmark	404	25138
Germany	401	24320
Sweden	388	21017
Estonia	344	19955
Finland	319	16904
United Kingdom	298	10422
Ireland	162	7736
Latvia	66	2738

Lithuania	40	1387
Netherlands	19	1301

Source: EUROSTAT

Copenhagen is the largest port in terms of passengers. The number of passengers in 2016 totalled 677 thousand, which represented a 9.3% compared to 2015. Rostock recorded 553 thousand in 2016 representing 14% growth against 2015. Stockholm and St. Petersburg experienced a decline in 2016¹⁸. Top 5 Baltic Cruise ports recorded 1.319 calls out of the total 2.163 calls in 2016, accounting for 63.9% of all calls.

The segment of large liner ships consists of Rostock 181calls, Kiel 147, Oslo 82, Kristiansand 66), Riga 63, and Klaipeda 52 calls. The segment grew in passenger numbers 7.9% in 2016. The destinations had 591 calls in 2016 and will increase by 2.2% in 2017 to 604 calls.

The medium segment consists of Visby with 43 calls, Goteborg 34, Gdansk 32 and Aarhus 29 calls. The segment increased in passenger numbers by 2.5% in 2016 and is expected to increase 21.4% in 2017. Gdansk and Aarhus both grew by 16.2% and 144.2%. The destinations had 138 calls in 2016 and will increase with 40.6% in 2017 to 194 calls.

Tabl. 3. Cruise traffic in selected Baltic Sea ports

Port	2010	2012	2014	2015
Copenhagen	662.000	840.000	740.000	677.000
Gdynia	125.005	108.628	85.000	71.923
Goteborg	51.730	83.000	188.000	100.000
Helsinki	342.000	368.000	420.000	436.000
Kiel	341.391	348.180	360.000	458.152
Klaipeda	35.201	26.769	57.797	60.202
Kristiansand	31.700	70.000	120.369	109.866
Oslo	261.000	303.486	235.509	169.616
Riga	58.248	83.000	59.520	69.164
Rostock	214.800	385.800	500.000	485.000
St. Petersburg	427.500	452.000	513.885	505.359
Stockholm	415.000	470.000	467.000	530.229

¹⁸ Cruise Baltic Market Review 2017 (Feb. 2017)

Tallin	390.000	440.504	479.031	500.622
Bergen			422.759	458.000

Source: Cruise Europe

The Baltic and Northern European ports are ports that mostly handle freight traffic. Taking care of passengers traveling on both passenger/freight, or freight/passenger ferries usually takes place at ferry terminals located at dedicated wharves equipped with appropriate infrastructure to ensure smooth and safe handling of cargo and passenger operations. Cruise service is provided at selected ports interested in passenger traffic and with varying degrees of infrastructural adaptation to the special needs of cruisers and their passengers. The broader range of services is provided by the ports where passenger embarkation and disembarkation takes place, with adequately equipped terminals. In this case, the plane and local transport (taxis, buses), restaurants and other services bring additional revenues also before boarding and after the cruise. Cruisers, like most of commercial fleet, are operated under foreign flags, which significantly diminishes their ability to generate tax revenues.

The Baltic Sea destination market accounted for just under 9% of German passengers. Destination Markets for German Cruise Passengers in 2014 was as follow (in %)¹⁹:

Mediterranean/Black Sea	31,1
UK/Ireland/Western Europe	14,6
Norway/Arctic	12,5
Atlantic & Canary Isles	11,2
Baltic Sea	8,9
Caribbean/Bermuda	8,6
Arab Gulf/Indian Ocean	..3,9
US/Canada	.. 1,5

There were eleven German national brands that were identified for 2014, namely: AIDA, Cruises Passat Kreuzfahrten GmbH, SEA CLOUD CRUISES GmbH, FTI Cruises GmbH, Phoenix Reisen GmbH, TransOcean Kreuzfahrten, Hansa Touristik GmbH, PLANTOURS Kreuzfahrten, TUI Cruises GmbH, Hapag-Lloyd Kreuzfahrten GmbH, Reederei Peter Deilmann GmbH. These are cruise lines and tour operators that are registered in Germany and/or have their principal administrative offices in Germany. All other cruise lines are considered to be international cruise brands. These lines source passengers from Germany and may have marketing offices in Germany but their principal administrative offices are located elsewhere. In total there are more than 40 additional cruise lines that are considered as international cruise brands but not all of these source passengers from Germany.

Germany is a source market for cruise passengers and is also a cruise destination with major cruise ports along the North and Baltic Seas. During 2014 there were over 600 cruise ship calls at German ports handling altogether nearly 1.56 million cruise passengers including embarkations,

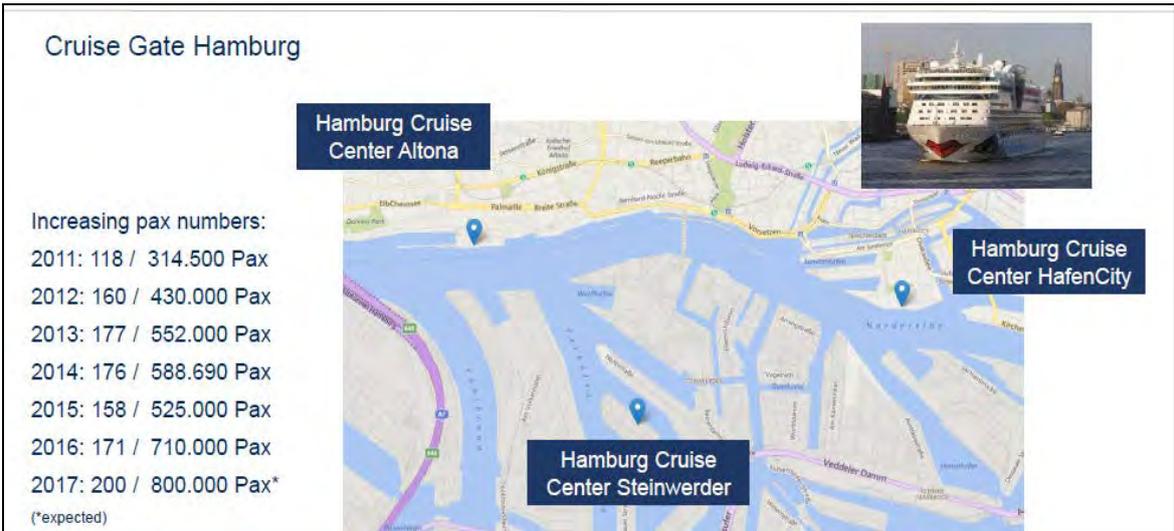
¹⁹ CLIA Germany)

disembarkations and transit. Hamburg is principal homeport of Germany with 281,458 embarkations followed by Kiel with 145,050 embarkations²⁰. Hamburg is primarily a homeport with embarkations and disembarkations accounting for 95% of the cruise passenger traffic, while Kiel is slightly more diversified with transit passengers accounting for 17% of the cruise passenger traffic and Rostock/Warnemünde is Germany’s largest transit port with 261,350 transit passengers accounting for 54% of the total cruise passenger traffic at the port. The remaining ports, which include Bremerhaven, Travemünde, Sassnitz, Sylt and Wismar, handled approximately 107,000 cruise passengers during 2014.

2.3 Overview of selected Sea cruise ports in the Baltic Sea area and neighbouring ports of North Sea

Hamburg

In Northern Europe Hamburg is gradually becoming one of Europe’s top cruise destinations. Cruise Gate Hamburg is a subsidiary of the Hamburg Port Authority. Cruise Gate Hamburg (CGH) recorded 170 cruise ship visits in 2016 and more than 700,000 passengers compared to 153 calls and 520,000 passengers in 2015.



Source: Hamburg Port Authority

Since the beginning of 2017 CGH has been operating all three of Hamburg’s cruise centres: Altona, HafenCity and Steinwerder²¹. Port of Hamburg as a cruise home port is perfectly adapted to handle very large cruise ships. The port is well placed both in terms of technical equipment and capacities. The management of CGH is currently working on further improvement of the accessibility of the Cruise Center Steinwerder by public transport. From 2016 CGH has been providing free-of-charge shuttle bus services from the Veddel S-Bahn station to the Cruise Center Steinwerder. CGH will have more berth assignment options after the widening of the Entrance to the Vorhafen Harbour Basin, which will create the possibility of berthing ships with a maximum beam of 40 metres at Altona Terminal.

²⁰ German Ocean Cruise Market 2015, CLIA Deutschland, prepared by BREA

²¹ <https://www.cruise-gate-hamburg.de/en/news/hamburg-cruise-shipping-industry-steering-towards-success-cgh-announces-record-figures>

Helsinki

The Port of Helsinki receives over 360 000 cruise passengers and 270 cruise calls a year. Helsinki Airport offers the largest number of international destinations in Northern Europe and 10 destinations in Asia. Good flight connections and its location in the heart of cruising area provide significant opportunities to business. Helsinki airport handles 13.4 million passengers annually, providing sufficient capacity for cruise passengers to travel to Helsinki.

Helsinki Cruise Terminal offers spacious accommodation and a very smooth passenger service in tested surroundings. Passenger arrival by bus is in front of the terminal. There is no need for your cruise guests to carry baggage or to queue. A spacious transit area leading passengers to the pier. From the ship to the aircraft: boarding passes and flight check-in are provided in the same location. Baggage is transferred directly to and from the ship. The distance between the airport and the cruise terminal is 15 km. The access from the buses to the terminal and through the concourse into the cruise ship and vice versa has been tested by a turnaround of 40,000 passengers a season.

Main characteristics of the Port of Helsinki²²:

- 11.530 vessel calls in total annually
- 8.5 million passengers in total annually
- 270 cruise calls per year
- 360 000 cruise passengers per year
- 8 cruise quays
- 2175 meters (1.352 miles) total cruise quay length

All quays equipped with facilities for discharging waste water

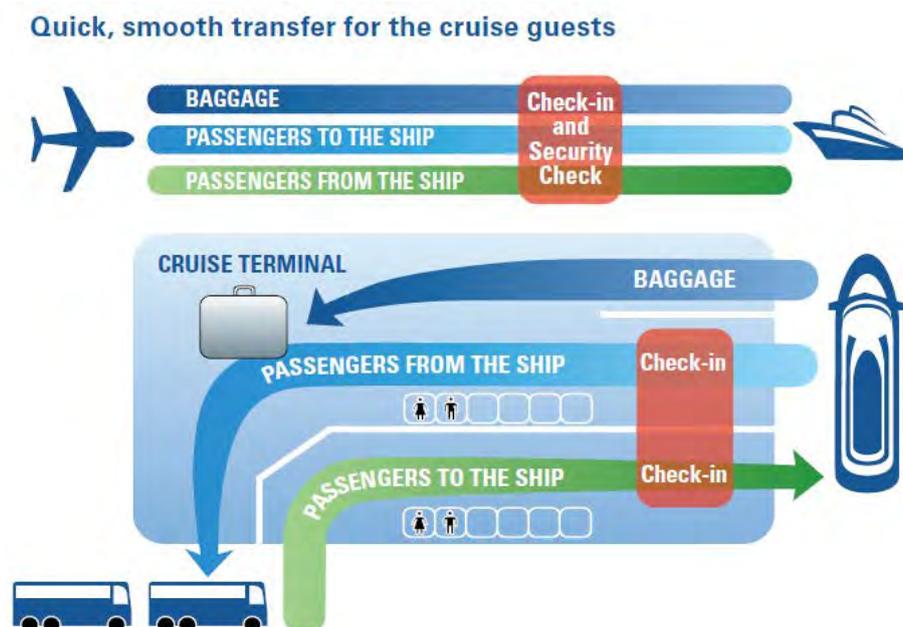


Fig. 3. Helsinki Cruise Terminal passenger managing system

Source: HELSINKI HOME PORT for Cruises around the Baltic Sea. www.portofhelsinki.fi

²² Source: HELSINKI HOME PORT for Cruises around the Baltic Sea. www.portofhelsinki.fi

Helsinki Home Port partners, the Port of Helsinki and Helsinki Airport, combine to provide smooth-running service and have extensive experience of turnarounds in Helsinki.

Oslo

Norway is the leading nature-based cruise destination in Europe. The coast line is of 1300 nautical miles. The cruise ships dock in the port of Oslo on four different piers, all close to the city center and to each other. The following cruise piers are used:

Cruise pier	Length (metres)	Draft (metres)	Other
Søndre Akershus Pier	345	10,3	No limitation on air draft and beam
Vippetangen	249	7,3	
Revierkaia	294	8,3	
Filipstad	330	8,5	



Fig. 4. Cruise piers at port of Oslo

Source: http://www.oslohavn.no/en/passengers/passenger_traffic/cruise/

Most of the cruises that visit Oslo are continuing on to other destinations after a day or two in the capital. A popular route is the Northern European route, where the ships sail on to the Baltic Sea and visit cities such as Tallinn and St. Petersburg. Another popular route is along the Norwegian west coast, visiting the Norwegian fjords.

Cruise traffic in port of Oslo:

	Calls	Passengers
2013	159	298 000
2014	128	255 000
2015	102	198 268

Riga

In port of Riga cruise ships mainly dock on the river fairly close to the old town though smaller ships may dock a bit more south. Cruise ships have also been known to dock at Krievu Island (Krievu Sala) much further out. Three berths are dedicated to cruise ships:

- MK-3 and MK-4 (closest possible location to the Old Town), total length: 463 m, depth 9.5 m, max particulars of vessel allowed 290 m at 8.2 m draft
- JPS-1, max vessel's length allowed 110 m, max vessel's draft allowed 7.6 m
- Berth No. JPS-2, located next to JPS-1, is dedicated to ferries however can also be used for cruise ships. Terminal building is located next to berth No. JPS-2. Max particulars of vessel allowed: 280 m at 7.6 m draft.



Fig. 5. Cruise port of Riga

Source: <http://www.rigapt.lv/services/ship-services/cruise-ships/>

The following dues are set at the Port of Riga: Tonnage Dues, Canal Dues, Sanitary Dues, Berthing Dues, Passenger Toll and Small Tonnage Duty. The Port dues and charges are paid to the Port Authority. The berthing Due are forwarded by the Freeport Authority to the berth owner or possessor, withholding administrative costs from the collected Berthing Due, which amount shall be fixed by the mutual Agreement. Administrative costs are the costs pertaining to the technical condition control measures related to the mentioned berth, and the costs related to the access fairway maintenance and the Freeport Authority administration costs. Tonnage Dues are not collected from a passenger ship or a cruise ship. The attached table indicates the port dues rates charged from cruise ships at Port of Riga

Type of dues	Unit	Rate in €	Remarks
Canal Dues	€/GT	0.10	calculated separately for each ship's call at the port, shifting from one berth to the other, leaving for the roadstead, arriving at the berth from the roadstead, and departure
Sanitary Due	€/GT	0, 06	0.02 €/GT for cruise and passenger ships operated by a shipping line providing for at least 350 ship calls per calendar year
Berthing Dues	€/GT	0.007	collected for usage of any berth from all ships for every case of using the berth or applying hourly rate for berth use
Passenger Toll	€/pax	1	for each passenger upon arrival and departure of the ship
use of tugs in mooring and unmooring operations	€/GT	0.17	mooring and unmooring
		0,22	shifting from one berth to another
		0,17	shifting within limits of one berth
delivery of the ship generated oily waste (MARPOL Convention, Annex I) to the specially equipped vessel, truck or to the treatment facilities	€/m ³	19.90 6	to a specially equipped vessel or a truck to the treatment facilities
delivery of garbage (MARPOL Convention, Annex V)	€/m ³	21.15	waste is collected at the berth, where the ship is located.
fresh water supply to a ship	€/t	2	water supplied from berth
		4.50	water supplied by floating craft
		2	water supplied to vessels staying on outer roads

Tallinn

Port of Tallinn is one of the biggest cruise and passenger ports in the Baltics. Cruise vessels are mainly accommodated in the Old City Harbour, located in the very heart of Tallinn and from May 2006 in Saaremaa Harbour. Old City Harbour is Estonia's Biggest Tourism Gateway: territory 54.2 ha, aquatory 75.9 ha, total length of berths 5 km, number of berths 25, max. depth 10.7 m, max. length of a vessel 340+ m. Up to 85% out of over 0,5 million of cruise tourist in port of Tallin are on connection Tallinn – Helsinki. Shuttle service is usually provided to the main gate (Viru) but it is an easy half mile walk to the old city through the Pikk gate. There typically is a small market setup on the pier.



Fig. 6. Cruisers in Port of Tallinn

Source: <http://www.portoftallinn.com/cruise>

Stockholm

There are several main piers in central Stockholm. Smaller ships may dock right at old town at Skeppsbron. Larger ships could be docked at either Stadsgården, Frihamnen, or Värtahamnen. Statsgården is the most convenient for larger ships. The distance to old town is 1.6 miles. It is very convenient to take the hop-on, hop-off boats or ferries that have a stop at the end of the pier. BÖJ1 Förtöjning På Strömmen is a mooring buoy between Gamla Stan and Statsgården and passengers can be tendered to a pier just south of Skeppsbron. Some ships may tender or dock at Nynashamn which is 36 miles south of Stockholm. Trains run twice hourly to Stockholm and the journey takes just over an hour. In Nynahamn in 2016 a SeaWalk floating pier was installed similar to the one used in Geiranger.



Fig. 7. Port of Stockholm - Cruise Ship Docked at Stadsgården

Source: <http://dmcsweden.se/port-of-stockholm>

Sankt Petersburg

Sankt Petersburg in Russia is a major cruise destination of the Baltic Sea, with cruise ships touring Northern Europe, Scandinavia, and the Baltics. It is Russia's most popular cruise port, and the only one with a dedicated passenger port. In 2015 Passenger port of Saint Petersburg recorded 223 cruise and 6 ferry calls, which brought a total of 491.507 visitors to the city.

Passenger port is located on around 60 islands in the mouth of the Neva River. Passenger port of Saint Petersburg has 7 berths, which allows it to berthing up to 7 cruise ships at once. The total length of the berths is 2 171 meters (two of them are designed to serve ferries as well). There are 4 terminal buildings that provide access to the berths. The total space of those terminals is 29 770 m². The total area of the port territory is 33.03 hectares.

The Port can handle vessels up to 320 meters in length, to 42 meters in width, and with draft of up to 11 meters. Larger vessels must have written permission to enter or exit the Port of St. Petersburg. Only small cruise ships can dock in Sankt Petersburg close to the city center at either English Embankment or Lieutenant Schmidt Embankment. Large cruise ships dock at the new Marine Facade complex three miles northwest of the city center, where there is a need to clear customs in the cruise terminals. Smaller cruise ships sail up the Neva river and dock at either English Embankment or Lieutenant Schmidt Embankment much closer to the city center²³. Since 2003 cruise and ferry passengers visiting Sankt Petersburg in a tourist group do not need a visa while staying for less than 72 hours.

The port can handle up to 18.000 passengers per day and up to 2 million passenger per year. The transport infrastructure of Passenger port of Saint Petersburg is modern and well-developed. There is enough space to park 518 cars and 221 buses, and a helicopter landing pad for helicopters weighing up to 13 tons.

Most lines offer two full days (and one night) in the city; some stay for two nights (and offer 2.5 days in the port of call).

The Sea Port of St. Petersburg commonly features in the cruise ship schedules of Cunard, Princess, and other major cruise companies but these larger cruise ships have traditionally docked at the commercial harbour which meant a lengthy wait to get through customs and poor facilities catering to tourists.

²³ <http://www.portspb.ru/en/>



Fig. 8. Sankt Pertersburg – cruise ships docked at Marine Façade

Source: <http://www.portspb.ru/en/>

Copenhagen/Malmo

Copenhagen/Malmo Port is the leading northern European cruise ship port and is the ideal home port for cruises in the Baltic Sea and along the western coastline of Norway. Copenhagen is the hub for the cruise industry in the region. About 45% of all calls are turnaround calls.

Copenhagen port water depth is up to 10,5 m depending on quay-location and there is no limitation for length, beam and air draft. Capacity of quays:

- Nordre Toldbod 225m, water depth of 7.4m
- Langelinie 710m, water depth at the southern end is 9.1m, there is space for from two to four ships, depending on their length and draught, the northernmost 345m of quay water depth is 10m.
- Orientkaj Freeport 525m, water depth of 9.5m
- Levantkaj 400 m
- and Ocean Quay 1.100m, with state-of-the-art terminals, water depth over all is 10,5m.

Tug service is non-compulsory however cruise vessels with a draft more than 6 meters are recommend to use pilot.

The expansion of the port consider the challenges of future demands and develop the facilities even further. The pier allow berthing for three large cruise ships along a 1,100 metre long and 70 metres wide dedicated cruise quay. There are three terminal buildings, each of 3,300 m² with green roofs. Each terminal building have 1,800 m² for passenger handling and 1,500 m² for luggage handling.

Malmö water depth is up to 9.1m, draft 8.6, depending on quay-location, length max 240 m, beam, max 32,5 m. air draft, no limitation. Tugs are on pilot's request, pilotage, compulsory for ships exceeding 90 m length. Capacity of quays:

- Frihamns kajen: 500 m, max length of ship is 240m, water depth of 9,1m, beam max. 32,5m.
- Västra hamnen: 150 m

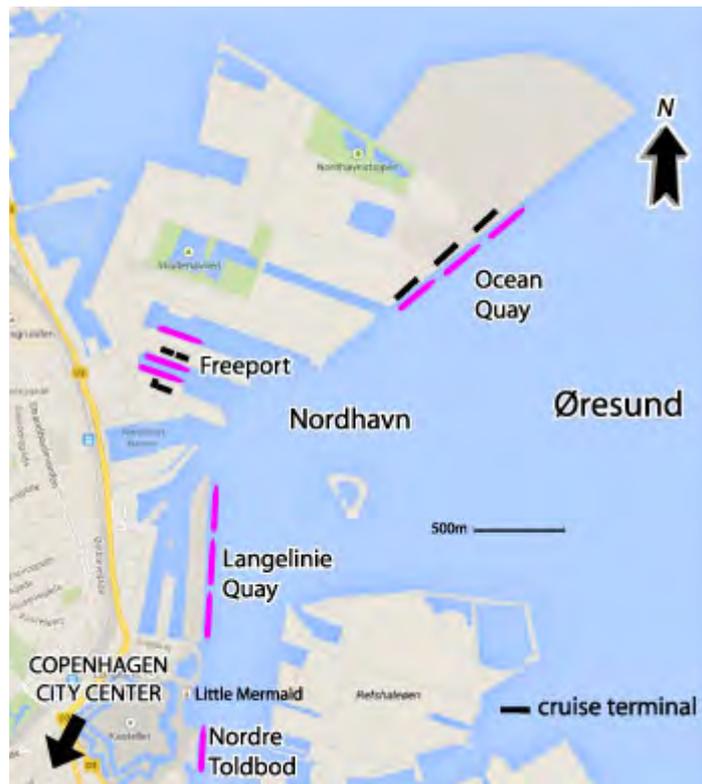


Fig. 9. Copenhagen cruise port location

Source: <http://www.cruisetimetables.com/cruises-from-copenhagen-denmark.html>

Kaliningrad

Kaliningrad region is a Russian exclave separated from the main part of Russia by Lithuania and Belarus. Therefore, an excursion trip to Moscow would take 20 hours by train and crossing two countries, which makes quite a difference with a similar trip from another Russian cruise port on the Baltic Sea, namely Sankt Petersburg. The trip takes only 4 hours by a high speed train. This limits the tourist attractiveness of the port to Kaliningrad region.

The key factor shaping the economic activity in the Kaliningrad region are the cruise passenger flow and average spending per passenger. There are average 250 thousand cruise passengers per year whilst the average spending per passenger is 3750 rub. The average yearly spending of cruise passengers is 937,5 mill rub.

Cruise ships to Kaliningrad dock at the Baltiysk port. Their passengers are then transported to the city via charter buses.

- Kaliningrad is served by the Khrabrovo Airport connecting it to other Russian territories, as well as to some European cities.
- From Baltiysk there is a regular ferry service to St Petersburg Russia, Stockholm Sweden, Copenhagen Denmark, Riga Latvia and Kiel Germany.
- The Kaliningrad Passazhirsky railway station connects the city to Moscow, St Petersburg, Adler and Chelyabinsk.
- Regional trains from Kaliningrad-North (on Victory Square, in the city centre) depart to the local Russian towns (in Kaliningrad Oblast) Sovetsk, Svetlogorsk and Zelenogradsk.



Fig. 10. Port of Baltiysk

Source: <https://port.today/a-new-russian-cruise-port-to-be-built-in-kaliningrad/>

In order of gaining competitiveness on cruise market Kaliningrad port infrastructure should offer 2 berths with length 350 m each, and 10,5 m depth.

The borders of the port of Kaliningrad in Russia have been extended to include the site for development of a new terminal in the town of Pionersky. The terminal's construction is expected to start in 2017. International marine terminal Pionersky will be constructed on the basis of the current infrastructure of Pionersky port in Kaliningrad region, located on the Russian coast of the Baltic Sea, bordering Poland in the south and Lithuania in the north.

2.4 Environmental impact of cruise tourism

Despite the significant economic benefits that cruise activity generates in the economy, such activity also generates negative externalities associated with congestion and environmental issues. Main activities at the seaside are in hands of private shipping lines and international bodies, e. g. the International Maritime Organization (IMO), whilst on land the responsibility is in hands of national port administrations and terminal operators.

Cruise ship environmental impacts can be associated with ship operations or tourist activities. Conservation International (and many jurisdictions) have created guidelines for ship operations which are a key point of reference for control of damage from e.g. emissions, anchors, waste disposal, oil spills etc. Most major cruise lines corresponds to these guidelines, and in some jurisdictions there is strict enforcement. On-shore effects and actions by cruise ship visitors include:

- Impacts of shore tours on ecological resources.
- Impacts of sea tours on fragile ecology.
- Impacts of levels of use on natural systems.
- On shore tourist waste management.
- Resource consumption (water, energy).

As ship order book and passenger number grow, so do cruise impacts on the environment and local communities, such as:

- Modifications to the natural and existing environment, exploitation of local construction.
- Operational impacts related to the use of energy, water and those such as antifouling and accidental or deliberate physical damage to marine ecosystems.
- Impacts associated with transferring people to and from departure and destinations points; which increases the use of air travel.
- The impacts of recreational activities on wildlife such as disturbance and littering, and pressures on endangered species.

Port related environmental issues are subjects to many EU initiatives resulting in specific environmental regulations associated with particular problems, and contributions to sustainability. In recent times, cruise lines and ports have put a lot of efforts into reducing, selecting and managing generated wastes implementing the requirements of MARPOL 73/78 as well as those imposed by the European legislation. There are different requests in the case of cargo and oil markets, from those in the case of cruise ports. Different wastes are produced in the case of each shipping market²⁴.

The environmental costs of the sector are mostly non-measurable. Cruise ships, which can carry as much as 5,000 passengers and crew, are producing large volumes of waste. The different types of waste and damage produced by a typical ship are included in the Protocol 1978 known as MARPOL 73/78. These environmental impacts are mainly generated in coastal areas close to the busiest port destinations. One of the difficulties in implementing MARPOL regulations arises from the diversity of 'flag states' in which cruise ships are registered. Despite port destinations can perform its own inspection to verify a ship's compliance with international standards, sometimes they do not have an appropriate infrastructure.

Among diverse impacts on the environment caused by cruise shipping is the generation of garbage that might be harmful when it is not properly managed. The amount and types of waste may vary from one ship category to another, but cruise ships are at the highest amount of garbage producers. Cruise ports seek to implement solid waste management and develop facilities, technologies or services aiming to allow continuity to a cruise ship's garbage life cycle in a more efficient way. As there are differences between land-based and maritime waste management, the MARPOL Annex V garbage classification varies from the segregated types of garbage put in practice onboard and ashore with destination for recycling²⁵. The Annex V of the international Convention for the

²⁴ Athanasios A. Pallisa, Aimilia A. Papachristoua and Charalampos Platias, Environmental policies and practices in Cruise Ports: Waste reception facilities in the Med, SPOUDAI Journal of Economics and Business, Vol.67 (2017), Issue 1, pp. 54-70.

²⁵ A. Pallis, A. Papachristou, C. Platias, SPOUDAI Journal, Vol.67 (2017), Issue 1, pp. 54-70

prevention of pollution from ships (MARPOL 73/78) sets restrictions on the handling of garbage, including all food, domestic, and operational waste. Garbage might be dumped overboard when a vessel reaches a certain distance from shore as long as the ship follows waste discharge guidelines. Annex V prohibits dumping garbage from 3 to 25 miles from shore, unless it is ground into small pieces. Disposing of plastics is also prohibited in territorial waters. In addition, MARPOL imposes an obligation on certain parties to provide facilities for the reception of ship-generated residues and garbage that cannot be discharged into the sea.

The quantity and types of garbage to deliver by cruises into a port reception facility may vary significantly and that makes the ports waste services planning and provisions more difficult to manage in terms of demand, capacity and adequacy under Annex V of MARPOL. Main principles for waste management are:

- Self-Sufficiency at community (of an integrated and adequate network of waste disposal facilities,
- Implementation of best available techniques not entailing excessive cost (reducing environmental costs as much as possible and in the most economically efficient way),
- Proximity (wastes should be disposed of as close to the source as possible),
- Producer Responsibility (economic operators and manufacturers have to be involved in the objective to close the life cycle).

Mandatory compliance is not enough to secure uniformity of port level practices. Given the differences in size and traditions of European (cruise) ports, the variation of infrastructure, or the dissimilarities between WRH (Waste Reception and Handling Plan) plans developed by port authorities, and approved by relevant competent authorities, might be significant. The same might apply as regards the on-shore selection of the wastes that are segregated on board²⁶.

New ships are generally far more efficient and environmentally sound than older ones. A cruise ship is a de-facto floating resort hotel. Larger new ships have facilities like wave riders, water slides, ice rinks. Ship have all of the challenges and opportunities which relate to greening a hotel and resort facilities, as well as those related to transportation. Like any 1500 room hotel, a cruise ship consumes energy, uses water, produces waste, and uses toxic substances (e.g. paint, solvents, and cleaners)²⁷.

The average cruise ship of 3,000 passengers and crew generates about 50 tons of solid waste in a single week. These vessels, or the ones with double capacity (i.e. the Royal Caribbean Oasis class vessels that exceed capacities of 6.000 passengers) cruise with a capacity utilisation that exceeds 90%, thus produce significant wastes and residues to be delivered at the cruise ports they visit.

Pollutants and waste from cruise ships include air emissions, ballast water, waste water, hazardous waste and solid waste. An average cruise ship generates a minimum of 1 kg of solid waste plus two bottles and two cans, per passenger per day and an average of 50 ton of sewage (black water) per day. A figure of 3.5 kg/passenger/day is quoted by the IMO. the estimated amount of generated

²⁶ Technical Recommendations on the Implementation of Directive 2000/59/EC on Port Reception Facilities. EMSA 2016

²⁷ Sustainable Destinations: Indicators and Observatories Informing Sustainable Development of Tourism Destinations. Dr. Edward W.(Ted) Manning, Tourisk Inc., UNWTO Madrid 2013

waste (typical one-week voyage) includes 25,000 gallons of oily bilge water, 210,000 gallons of sewage (or black water), 1 million gallons of non-sewage wastewater from showers, sinks, laundries, baths, and galleys (or grey water) and eight tons of solid waste (i.e. plastic, paper, wood, cardboard, food, cans, glass).²⁸

Tabl. 4. Summary of Cruise Ship Waste Streams

Type of waste	Est. amount generated in 1 week voyage (in gallons)	Content type
Sewage (black water)	210.000	Waste water and solids from toilets
Gray water	1.000.000	Waste water from sinks, showers, laundries. Contains detergents, cleaners, oil and grease, metals, pesticides, medical wastes
Hazardous wastes	110	Photo chemicals
	5	Dry cleaning waste (chlorinated solvents)
	10	Used paint
	unknown	Other waste, such as print shop waste, used fluorescent and used light bulbs and batteries
Solid waste	8 tons	Plastic, paper, wood, cardboard, food, cans, glass
Oily bilge water	25.000	Liquid collected in the lowest point in the boat

Source: MARAD (2002).

The U.S. EPA estimates that a cruise ship with 3,000 people on board generates 210,000 gallons of sewage weekly (enough to fill 10 backyard swimming pools), and 1 million gallons of grey water (another 40 swimming pools full of waste). One cruise ship equals 50 swimming pools full of highly polluted waste which can be dumped into sea each week.²⁹

Cruise sewage has to be properly neutralized. The enormous amounts of food and drink consumed on cruise ships, along with water from laundry, pool, medical facilities, photo labs, spas, and dry cleaning stations, is produced on each cruise voyage. At sea, what is flushed down the toilet can actually be dumped untreated into the ocean, which causes contamination of fish and other marine life, so long as the ship is at least three nautical miles from shore.

With cruise activities contributing substantially to the growth of the ports of call, it is important to secure cruise port infrastructure and related port services. The existing waste reception facilities

²⁸ Based on the US Department of Transportation data (MARAD 2002).

²⁹ <https://www.epa.gov/vessels-marinas-and-ports/vessel-sewage-discharges>

need to secure a smooth ship-shore interface during the process of waste handling that the regulatory framework has foreseen.

The European PRF Directive pursues the same aim with MARPOL, which has been signed by all EU member states. However, MARPOL Convention regulates discharges by ships at sea, while the Directive applies only on ship operations in EU ports. It addresses in detail the legal, financial and practical responsibilities of the different operators involved in delivery of ship-generated waste and cargo residues.

Under MARPOL and the EU PRF Directive, ports are obliged to provide adequate port waste reception facilities with no undue delay of the ship. The key requirements of the PRF The European PRF Directive requests cruise ports to establish cost recovery systems to encourage the delivery of waste on land and discourage dumping at sea. In line with the Directive, all ships calling at a member state port should bear a significant part of the cost (meaning at least 30% of the costs) whether they use the facilities or not. In practice, the most commonly applied fee selection scheme is that of collecting indirect fees irrespectively of the actual use of the facilities. When delivered waste exceeds specific quantities there is an extra charge.

Directive include an obligation of member states to ensure the availability of PRF adequate to meet the needs of ships normally visiting the port, without causing undue delay. Ports have to develop and implement a waste reception and handling plan. The master of a ship completes a notification form and forwards it at least 24 hours prior to arrival, in order to inform the port of call about the ship's intentions regarding the delivery of ship-generated waste and cargo residues. There is a mandatory delivery for all ship-generated waste, taking into account a possibility for the vessel not to deliver waste if it has sufficient dedicated waste storage capacity until the next port of delivery. The covering of the associated costs, the implementation of a cost recovery system (e.g. a waste fee) is foreseen, providing an incentive to ships not to discharge ship-generated waste at sea.³⁰

Different types of garbage need different type of handling facilities. Trucks, containers, vessels and skips are the most commonly garbage reception facility. Special vessels and containers are also used, while the least commonly used facilities are barrels, packages, drums, bags and pipes. Containers are the basic storage facility in most ports for all types of garbage, except cooking oil, whereas liquid tank is the most appropriate type of storage. Other types of storage include skips and platforms, but these are less used. Some ports have storage facilities inside their port area. Different types of storage facilities exists for the treatment of each type of waste and cargo residues.

Many of the cruise ports do not offer segregation services prior to waste disposal, mainly because ports have typical assigned this type of services to external contractors, who transfer the garbage in their premises, where the segregation is taking place prior to disposal. Similar to the segregation

³⁰ Commission of the European Communities (CEU), 2000. Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues - Commission declaration. Official Journal L 332, 28/12/2000 P. 0081 – 0090.

Commission of the European Communities (CEU), 2015. Inception Impact Assessment: REFIT Revision of EU Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues. DG MOVE-UNIT D.2.

services prior to disposal, the vast majority of cruise ports do not offer treatment services prior to disposal. Landfill and recycling are the most used disposal methods.³¹.

The available waste port reception facilities are under different proprietary status. This status is typical based on the specialization. In the case of all waste reception facilities private ownership is dominant. In the case recycling plants, 56% of the available facilities are privately owned. This percentage equals to 31% in the case of incineration and biological plants, and storage areas, and 25% in the case of the energy recovery plants. Comparing to the other PRF, the public proprietary status is comparatively high in the case of the storage areas. The biological processing and energy recovery plants are not public owned.

The most common practice and related technology that is used by cruise ports as preparatory activity for disposal or/and for use of the treated garbage in case of reuse, energy recovery, etc., is segregation. Segregation takes place outside the port premises, specifically in dedicated plants. When incineration is used the ashes are re-used in the cement industry. As regards biological reprocessing, which is applied mainly in animal carcasses and food waste, these are processed for inactivation and composting. The landfill disposal method is used when no other method can be applied and the waste is not dangerous. In general, cruise ports follow the rules of the municipal waste management plan.

Regarding energy recovery disposal method many ports report that there are not such practices in place. New terminals should install shore electric power facilities to encourage ships to turn off their diesel engines while at berth. Among strategies for cleaner operations is the global strategy trend for stakeholders, particularly ships and ports. On the other hand, shore power is expensive when compared with fuel switching. The per tonne costs of reducing NO₂, PM, SO₂ and CO₂ are close to \$56000, \$1.4 million, \$290000, and \$2300³². Among ports using shore power in the Baltic and Nord Sea area are: Goteborg, Zeebrugge, Kotka, Kemi, Oulu, Antwerp, Lubeck, Karlskrona, Oslo, Rotterdam, Ystad, Trelleborg.

The emissions in ports represent a relatively small percentage compared to emissions at sea. The levels are low, especially if SO₂ is taken into consideration, especially that EU Directive 2005/33/EC, require that all ships must use 0.1% sulphurous fuel. Emissions in local communities cause damage to society, causing i.e. health damage and reduced life expectancy. Therefore, emissions can also be expressed in terms of monetary damage to society (rising health costs)³³.

Cruise ships differ in types and sizes, but are generally substantial in size therefore at berth, a cruise ship still needs significant power to maintain its operations as on average 25% of the passengers and 50% of the crew remain on board³⁴. Due to the berthing locations, quite often in city centres, the

³¹ A. Pallis, A. Papachristou, C. Platias, SPOUDAI Journal, Vol.67 (2017), Issue 1, pp. 54-70

³² Wang H. and others: Costs and benefits of shore power at the port of Shezhen. The International Council on Clean Transportation (ICCT). December 2015. www.theircct.org

³³ Tourist facilities in ports Growth opportunities for the European maritime economy: economic and environmentally sustainable development of tourist facilities in ports. Study report. Directorate-General for Maritime Affairs and Fisheries, European Communities, 2009.

³⁴ Since the turn of the century the average size of cruise vessels increased to 200 metres long, 26 meters beam, and a passenger capacity of 3,220 passengers (Cruise Industry News, 2016).

environmental impact caused by ships can bear problems for local communities in port cities, i.e. the reduced value of property as a consequence of pollutants might mitigate the economic development of coastal regions.

Analyses of ship movements, passenger capacity and port facilities help to clarify what the real needs of cruise traffic might be in terms of sewage management in the Baltic Sea cruise ports. HELCOM provides information on port reception facilities for sewage (PRF) and their use by international cruise ships in the Baltic Sea area: length of sea voyages, frequency, duration of port visits, sewage facilities and traffic trends. Dumping the waste in the port or port entrance is forbidden (except grey waters). It must be removed by specialized equipment and companies.

The Baltic Sea is a relatively small area with special environmental characteristics and business potential for ports. The cruising ports are also close to each other. This indicates that vessels do not need to hold on to produced waste for extended times. Efficient waste management in cruising ports around the Baltic Sea is a crucial element in minimizing environmental impacts.

A range of incentives are commonly used in the Baltic Sea area to encourage discharge of wastes at harbours. From 1 June 2019 a ban on new ships discharging sewage into the Baltic Sea special area will come into force. For current cruise ships the deadline is 1 June 2021 and ships sailing straight to Saint Petersburg will have a two-year transition period until 1 June 2023.

To protect the Baltic Sea environment, the Helsinki Commission (HELCOM) introduced the NSF-system in 1998. HELCOM's definition of the NSF is "a charging system where the cost of reception, handling and disposal of ship generated wastes, originating from the normal operation of the ship, as well as of marine litter caught in fishing nets, is included in the harbour fee or otherwise charged to the ship irrespective of whether wastes are delivered or not". Thus, ships calling at ports with the NSF-system implemented will pay the same port fee whether the ship leaves waste or not. Passenger ships or other ships calling at the port regularly during the year can have an authorized certification not to leave their waste in the port. Thus, these ships are obligated to handle their own waste management. The NSF-system encourages ships to deliver waste ashore, thereby avoiding undesirable waste streams between ports and preventing discharges into the sea. The NSF system requires every ship to pay for the reception, handling and disposal of oil residues, sewage and garbage at any calling port. The fee involved covers waste collection, handling and processing, including infrastructure, and is usually counted on the basis of a ship's gross tonnage. Moreover, the waste management fee does not cause financial profit for the port. The fee only covers investments in reception facilities, the operation of reception facilities, repair and maintenance costs of such facilities and the costs of handling, treatment and final disposal of received wastes. Hence, the system should not be economically competitive amongst the ports. As ships are required to leave any waste generated from their last port of call at the following port.³⁵

³⁵ Port Waste Management in the Baltic Sea Area: A Four Port Study on the Legal Requirements, Processes and Collaboration. Irina Svaetichin and Tommi Inkinen. MDPI 2017.

3 Overview of the cruise sector economic impact

3.1 Factors determining cruise lines visit at destination

The market drivers of the cruise industry are similar to those of tourism in the world, particularly the rising affluence of the global population and the growing popularity of exotic and resort destinations.

Local enthusiasts of cruise tourism claim that it is valuable due to its considerable economic impacts on the ports of call, while opponents maintain that the economic impacts of cruise visitors are relatively marginal. The economic impact of cruise tourism on local economies consists of three different types of spending categories: passenger, crew and ship expenditures.

Impacts of various forms of tourism, including cruise tourism, and economic and environmental impacts, are subjects of concern for destinations, tourism planners, policy makers and research sector.

Tourists spending money in a port region contribute to the local economy and consequently to the generation of jobs. In order to calculate the number of jobs, the value added that is generated in a local economy has to be calculated.

An economic impact analysis uses the expenditures of tourists to calculate the direct economic impact on a local economy. For every product sold in (for example) a shop, a shop owner made purchases from its suppliers. These costs are qualified as intermediary purchases. Input-output models, containing the relative share of intermediary purchases for every euro spent in an industry, were obtained to quantify this information for each EU Member State.

The indirect economic benefits derive from the cruise industry result in part from the additional spending by the suppliers to the cruise industry. For example, food processors must purchase raw foodstuffs for processing; utility services, such as electricity and water, to run equipment and process raw materials; transportation services to deliver finished products to the cruise lines or wholesalers; and insurance for property and employees. Consequently, the indirect jobs are generated in virtually every industry with a concentration in those industries that produce goods and services for business enterprises.

The induced economic benefits are derived from the spending activities of those directly and indirectly employed as a result of the European cruise industry. This spending supports jobs in retailing, the production of consumer goods, residential housing and personal and health services.

Cruise related tourist (direct) expenditure are classified into four principal categories: passenger, crew, vessel (including state and federal charges and taxes), and supporting expenditures (i.e., expenditures related to the promotion and marketing of cruise tourism payable within the local economy).

Cruise tourism has significant environmental, economic and socio-cultural impact on visited ports. It is an activity that provides economic income to the harbour and creates new jobs³⁶.

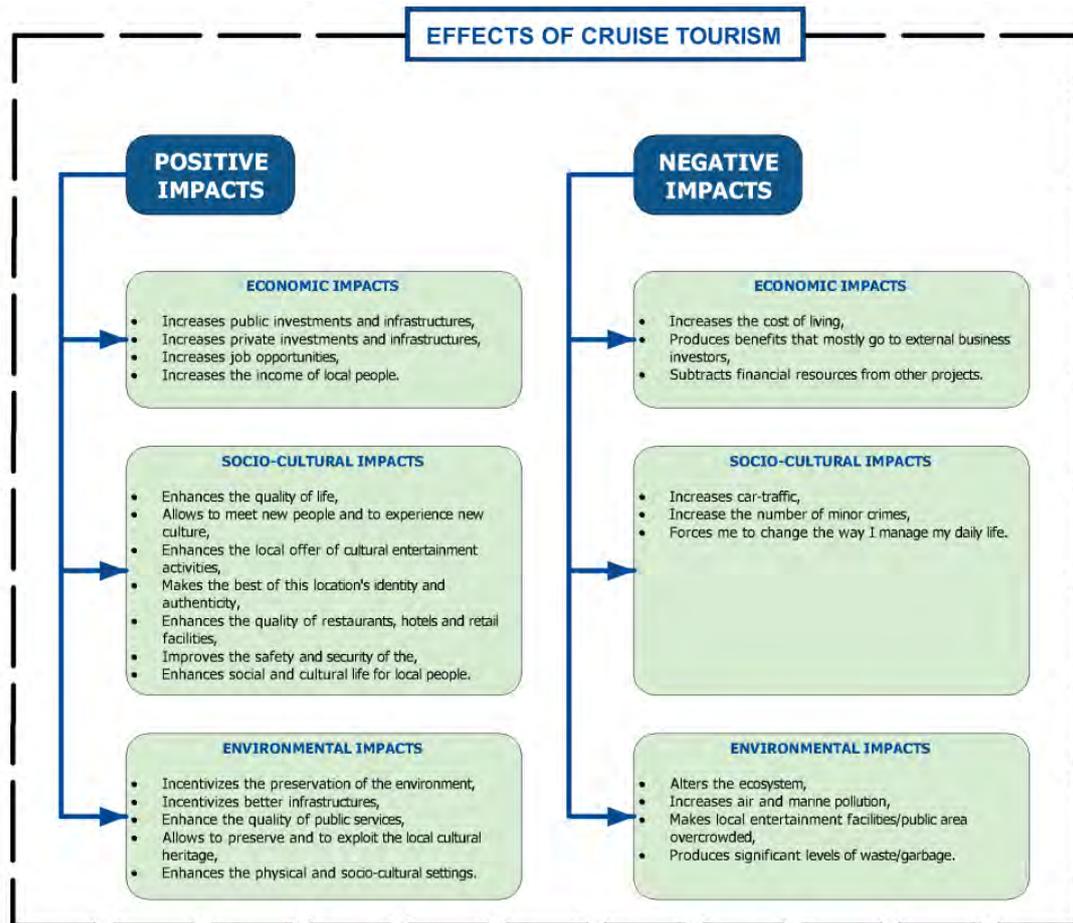


Fig. 11. Socio-economic and environmental effect of cruise industry

Source: Economic and Law Department, Maritime Institute in Gdansk

The influx of large numbers of visitors in a short period of time has the ability to overstretch the usage of community services and facilities. These negative impacts influence the visitor impression and also creates discomfort for local community. It is also important to balance cruise tourism with other sectors of tourism. Moreover, the tourism industry often creates seasonal jobs and promotes the influx of new workers. Escalated use of the environment during the peak visitor season caused competition between visitors and locals for resources and space. Also, tourism might cause changes in the character of community life, pace of life, commercialization, social friction, and cultural exploitation. However, in many cases the economic effects of tourism have been adequately balanced with the socio-cultural and environmental effects.

Cruise lines visit a destination are determined by the following factors³⁷:

³⁶ Sirvan Sen Demir and others: The role of port operations in the development of cruise tourism: The case of port of Antalya. Journal of Human Sciences. Volume 13. Issue 3. Year 2014.

³⁷ Juan Gabriel Brida, Sandra Zapata: Cruise tourism: economic, socio-cultural and environmental impacts. Int. J. Leisure and Tourism Marketing, Vol. 1, No. 3, 2010 205. Inderscience Enterprises Ltd.

- Consumer demand – passengers tell the cruise lines and travel agents which regions and destinations they want to visit, and cruise lines plan their itineraries accordingly
- Revenue opportunities – cruise lines analyse the choice of shore side programs and tour options to be offered to their guests and how much revenue it can produce on each specific destination
- Return on investments – Cruise lines look at the costs of operating a vessel when visiting a destination / region and compare it to the revenue that they are able to create. At the end of the day, a cruise line wants to make sure that they actually make a profit when visiting a destination
- Visitor satisfaction levels – if cruise passengers are happy, they will rate the destination high and the cruise lines will most likely visit again. If the ratings are low, they will probably not return
- Safety and security – Operations (either at berth or anchor) need to be conducted safely, the port needs to be ISPS certified, there need to be a safety plan for the port area, and the city and port need to provide a safe environment for the cruise passengers
- Fit in greater itinerary – a destination does not exist on its own in the itinerary. Cruise lines look for destinations that complement each other in an itinerary and that are able to sell well to the consumer.



Fig. 12. Cruise lines destination factors

Source: Department of Shipping, Trade and Transport, University of the Aegean, Greece.

3.2 Economic impact of cruise sector in Europe

Leisure cruising has expanded from a very small part of the oceanic passenger industry into a complete and complex vacation business, including many sectors of the travel industry. Currently, there are more than 30 ships scheduled to join the global fleet over the next four years representing investments over US\$ 20 billion. North Americans represent around 80% of all worldwide market. The participation of the cruise sector in the international worldwide tourism corresponds to 1.6% of the total tourists and 1.9% of the total number of nights. Revenue of cruise corporations represents the 3% of the total international tourism receipts. For many destinations cruises constitute substantial percentage of the total of tourism arrivals generating important income through the services supplied by the port and expenditures of passengers and crew. It is expected that the cruise industry continues growing regardless of being perceived as a direct contender of sun and stay over tourism.

Segments of the industry:

- Serving as major source and destination markets for cruise passengers,
- Maintaining headquarters facilities and providing crew,
- Providing shipbuilding and/or repair services (4,6 billion Euro),
- Provisioning and fuelling for cruise ships

Direct economic impacts of the cruise industry are derived from a broad range of activities including:

- port services and cruise industry employment;
- transportation of cruise passengers from their place of residence to the ports-of-embarkation;
- travel agent commissions;
- spending for tours and pre- and post-cruise stays in UK port cities;
- passenger spending for retail goods in UK port cities; and
- purchases of supplies by the cruise lines from UK businesses.

Direct employment impact includes jobs directly generated by seaport activity. Direct jobs supported by the passenger cruise service include jobs with companies providing services to the vessel as well as local hotels, restaurants, transportation firms and retail stores providing services to the passengers. These jobs are, for the most part, local jobs.

The indirect economic benefits derived from the cruise industry result in part from the additional spending by the suppliers to the cruise industry. For example, food processors must purchase raw foodstuffs for processing; utility services, such as electricity and water, to run equipment and process raw materials; transportation services to deliver finished products to the cruise lines or wholesalers; and insurance for property and employees. Consequently, the indirect jobs are generated in virtually every industry with a concentration in those industries that produce goods and services for business enterprises.

Indirect jobs are generated in the local economy as the result of purchases by companies that are directly dependent upon activity at the seaport, cruise activity at the cruise terminals in the port. These purchases are for goods such as office supplies and equipment, maintenance and repair

services, raw materials, communications and utilities, transportation services and other professional services. The indirect jobs are generated in virtually every industry with a concentration in those industries that produce goods and services for business enterprises. These jobs to sales ratios include numerous spending rounds associated with the supply of goods and services. Special care has to be undertaken to avoid double counting the indirect impacts, and to specifically include only the expenditures by the directly dependent companies, which are mainly local.

The Economic Impact Analysis Model is shown in the attached graphic:

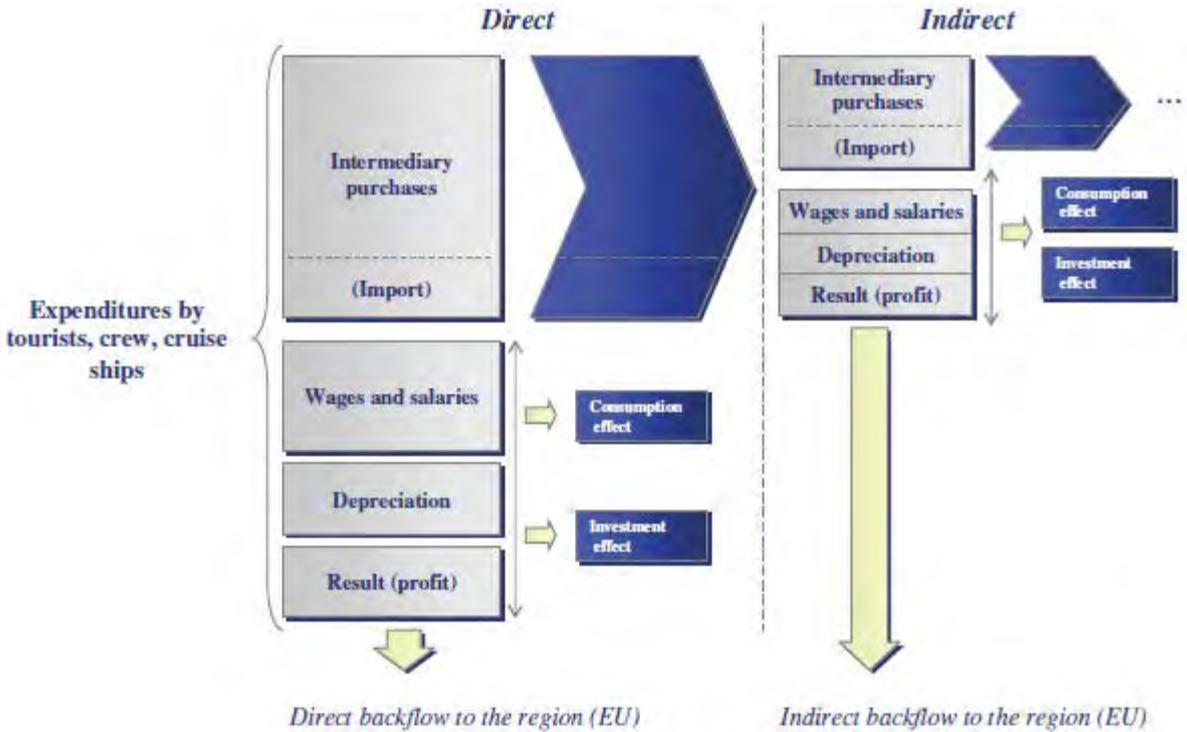


Fig. 13. Economic Impact Analysis Model

Source: Policy Research Corporation

The induced economic benefits are derived from the spending activities of those directly and indirectly employed as a result of the cruise industry. This spending supports jobs in retailing, the production of consumer goods, residential housing and personal and health services. Induced employment impact includes jobs created throughout the local economy because individuals directly employed due to seaport activity spend their wages locally on goods and services such as food, housing and clothing. These jobs are held by residents located throughout the region, since they are estimated based on local and regional purchases. Moreover, indirect jobs are created in the region due to purchases of goods and services by companies.

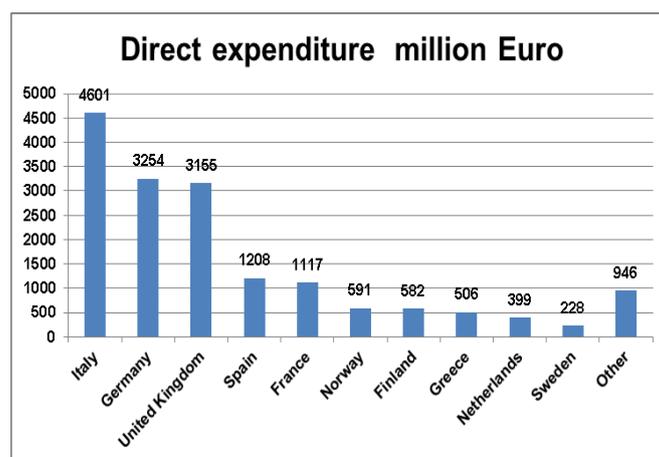
Related user employment impact is associated with jobs with companies using the seaport to ship and receive cargo and with companies whose employees are regular users of the seaport. These jobs are not entirely dependent upon the seaport, but reflect the importance of the seaport to local companies. While the facilities and services provided in the seaport are a crucial part of the infrastructure allowing these jobs to exist, they would not necessarily be immediately displaced if

marine activity were to cease. These include shippers of agricultural products, as well as importers of consumer goods, and local manufacturers located within the state .

The personal earnings impact is the measure of employee wages and salaries (excluding benefits) received by individuals directly employed due to seaport activity. Re-spending of these earnings throughout the region for purchases of goods and services has to be estimated. This, in turn, generates additional jobs, namely the induced employment impact. This re-spending throughout the region is estimated using a personal earnings multiplier, which reflects the percentage of purchases by individuals that are made within a region. A larger re-spending effect occurs in regions that produce a relatively large proportion of the goods and services consumed by residents, while lower re-spending effects are associated with regions that import a relatively large share of consumer goods and services (since personal earnings leak out of the region due to these out-of-region purchases). The direct earnings are a measure of the local impact since those directly employed by seaport activity receive the wages and salaries. The re-spending effect is regional. Part of this total personal earnings impact is next allocated to specific local purchases These purchases are next converted into retail and wholesale induced jobs in the regional economy.

Regional and local tax impacts are tax payments to the state and local governments by companies and by individuals whose jobs are directly dependent upon and supported (induced and indirect jobs) by activity at seaport. The tax impacts include state and local taxes collected from all sources, both personal and business taxes.

Induced impacts are those generated by the purchases of the individuals employed as a result of seaport, airport and real estate activity. For example, a portion of the personal earnings received by those directly employed due to activity at the seaport and airport is used for purchases of goods and services, both in the region, as well as out-of-region. These purchases, in turn, create additional jobs in the region, which are classified as induced.



Source: Contribution of Cruise Tourism to the Economies of Europe 2015 Edition, CLIA



Source: *Contribution of Cruise Tourism to the Economies of Europe 2015 Edition, CLIA*

Expenditures by a transit tourist in EU destinations include: tours and entrance fees (passenger participating in organised tours -30, not participating in organised tours -10), food beverages (both categories of passengers – 10), shopping ((both categories of passengers – 15), transportation ((passenger participating in organised tours -0, not participating in organised tours -5), port fees (both categories of passengers – 5), other (both categories of passengers – 5). Weighted average expenditures was assumed at €60.

For turnaround passenger the average expenditure per turnaround passenger visit is estimated at around €100, of which:

	Overnight stay	No overnight stay
Tours and entrance fees	15	5
Food and beverages	35	5
Shopping	20	20
Transportation and parking fees	20	20
Hotels	70	0
Port fees	5	5
Other	5	5

Crew tend to spend € 25 per disembarkation, and on average) 50% of the crew disembark per port visit. For ship expenditures in ports, it was calculated that ships spend €6 per transit passenger per transit call and € 24 per turnaround passenger for a turnaround call (embarkation and disembarkation combined). The difference between these costs is due to the necessary costs for luggage handling and customs for turnaround passengers.

The economic impact of cruise industry in Europe in 2014 based on CLIA surveys is shown in the tables included below.

Tabl. 5. Total economic impact of cruise sector in 2014

Specification	Direct expenditures € million	% of direct expenditure	Total jobs number of employees	% of total jobs	Compensation € million	% of compensation
Total Europe	16.637	100,0	348.930	100,0	10.753	100,0
of which:						
...direct			169,851	49	5.08	47
indirect			127,720	36	4.08	38
induced			51,379	15	1.59	15
Germany	3.254	19,6	49.559	14,2	1.801	16,7
UK	3.155	19,0	71.022	20,4	2.594	24,1
Norway	591	3,6	14.745	4,2	477	4,4
Finland	582	3,5	8.743	2,5	330	3,1
Sweden	228	1,4	3.022	0,9	119	1,1
Netherlands	399	2,4	6.481	1,9	187	1,7
Denmark			2,942	0,8	103	1,0
Poland			4,000	1,1	20	0,2
Cruise line employees - total	1.480	8,9	64.873	18,6	1.480	13,8

Source: CLIA

Tabl. 6. Cruise industry expenditures for newbuildings & refurbishment in Europe in 2014

Specification	Total	Newbuildings	Refurbishment
	€ million		
Total Europe	4,552	3,646	906
of which:			
...Germany	1,651	1,204	447
% of total	38,3	33,8	49,3
Finland	460	407	53

% of total	18,2	11,2	5,8
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Source: CLIA

National or regional taxation and fees collected from cruise operations and passenger spending may not be equally distributed within the local economy. Other entities within the local value chain such as ground transportation, receptive handlers, attraction/excursion operators, shopping and food and beverage facilities may be owned by foreign entities or non-local national entities whose economic gain is generally distributed elsewhere, even though they are not owned by the cruise line.

Ships also purchase goods and services with significant economies of scale and benefit from negotiating reduced purchase prices, often with choice of procurement among the countries along the itinerary. However, the infrastructure required for a transit destination to bring cruise tourism is different from required for overnight visitors. Transit ports do not require airports, hotels, adequate food and beverage outlets and general support infrastructure and supply chain required to accommodate overnight visitor arrivals and activities³⁸.

Passenger spending in turnaround ports prior to or after their cruise voyage may not be counted as cruise passenger spending. Therefore a comparative analysis of spending and revenue of cruise tourists should not necessarily be benchmarked against that of non-cruise tourists within the same destination without proper life cycle cost analysis to include costs of infrastructure development and maintenance.

3.3 Economic impact of cruise sector in Baltic Sea Region

During 2013 there were 2,960 cruise calls at Baltic ports, of which: transit calls 2.551, turnaround calls 409. An estimated 540,527 passengers embarked on cruises from Baltic ports. The principal turnaround ports were: Copenhagen, Kiel and Rostock, which accounted for about 90% of total embarkations in the region. Another 3.35 million passengers arrived at ports in the Baltic. Of these, an estimated 3,23 million (96%) disembarked and visited the port and destination. The five largest transit ports – Sankt Petersburg, Tallin, Helsinki, Stockholm and Copenhagen accounted for 67% of the Baltic total. An estimated 425,700 crew disembarked during cruise calls during 2013 and visited the Baltic ports.

The impacts of cruise industry in the Baltic Sea region are based on surveys from 2011 to 2013 at 12 Baltic ports in 9 different countries, namely: destination Copenhagen, Ronne and Aarhus (Denmark), Stockholm and Malmo (Sweden), Helsinki (Finland), Oslo (Norway) Klaipeda (Lithuania), Tallin (Estonia), Gdynia (Poland), Rostock (Germany), Sankt Petersburg (Russia)³⁹.

The results of the cruise market activity and economic impact on the economy including direct cruise industry expenditure is regularly recorded in CLIA reports. For selected Baltic countries the information extracted from CLIA reports are shown in the table below.

³⁸ By technical definition cruise ship passengers on transit calls can be classified as visitors or excursionists and not tourists.

³⁹ Overview Economic Impact of Cruise Tourism Baltic Sea Region. Peter Wild for BREA and G. P. Wild (International) Limited

Tabl. 7. Direct cruise industry expenditures, employment and compensation share in selected Baltic countries in 2014

Specification	Direct spending		Total employment		Compensation share
	€ million	% share in total	Number of jobs	% share in total	% share in total
Total Europe	16,637	100,0	348,930	100,0	100,0
of which					
...Germany	3,254	19,5	49,559	14,2	7,6
UK	3,155	19,0	71,022	20,4	39,2
...Norway	591	3,6	14,745	4,2	6,6
Finland	582	3,5	8,752	2,5	
Netherlands	399	2,4	6,481	1,9	0,8
Sweden	228	1,4	3,022	0,9	
Denmark	221	1,3	2,942	0,81,1	
Poland			4,000	1,1	

Source: CLIA

As for estimated passenger and crew spending in 2013 the analysis of transit passengers and crew visiting Baltic ports during the 2013 cruise season the average spending per passenger or crew was as follows:

- Transit passengers visiting Baltic ports spent an average of €76.74 in each port with tours and retail shopping accounting for 80% of their expenditures.
- Crew visiting these ports spent an average of €25.97 with food and beverages, entertainment and retail shopping accounting for 73% of their expenditures.
- Average expenditures by turnaround passengers at the Baltic turnaround ports indicate that the average passenger spends €152 per visit.
- Average turnaround passenger spent €115.35 on lodging and food and beverages, which was 75% of total turnaround passengers expenditures.

Total expenditures of passengers and crew totalled €346 million in 2013. Turnaround passengers accounted for 24% of the total with transit passengers accounting for another 71% and crew 5%. More details showing passenger and crew spending are in the table below.

Tabl. 8. Baltic Cruise Ports – Average Expenditure per Passenger/Crew

Category	Average Expenditure per Passenger/Crew in €		
	Turnaround	Transit	Crew
Total	152.23	76.74	25.97
F&B&Entertainment	52.39	5.54	8.07
Tours & Ground Transportation	14.94	43.75	2.54
Retail Goods	12.68	17.88	10.97
Other Purchases	9.26	9.57	4.39
Accommodation	62.96	-	-

Source: Overview Economic Impact of Cruise Tourism Baltic Sea Region. Peter Wild for BREA and G. P. Wild (International) Limited

Passengers and crew spent €151 million on tours and other ground transportation, accounting for 44% of total expenditures. Expenditures for lodging and food and beverages totalled €85.3 million. Turnaround passengers accounted for 71% of these expenditures. Purchases of retail goods totalled €71.5 million and accounted for 21% of total spending by passengers and crew.

Tabl. 9. Baltic Cruise Ports – Total Expenditures € Million

Category	Total Expenditure in € Million			
	Total	Turnaround	Transit	Crew
Total	346.50	82.29	247.92	16.29
F&B&Entertainment	51.27	28.32	17.89	5.06
Tours & Ground Transportation	151.01	8.07	141.34	1.59
Retail Goods	71.50	6.86	57.76	6.88
Other Purchases	38.69	5.01	30.93	2.76
Accommodation	34.03	34.,3	-	-

Source: Overview Economic Impact of Cruise Tourism Baltic Sea Region. Peter Wild for BREA and G. P. Wild (International) Limited

Cruise lines spent an estimated €339.4 million throughout the region as a result of the cruise calls at the Baltic ports. These included:

Spending for provisions, hotel supplies, fuel and equipment used onboard the cruise ships. Spending in the manufacturing sector totalled €176.4 million, 52% of the total. These expenditures were concentrated in the food processing, petroleum and the machinery industries. Another €85.6 million, 25% of the total, was spent in the transportation and utilities sector. These expenditures were comprised primarily of port fees.

Tabl. 10. Economic impact of cruise spending 2013 – Baltic Cruise Ports

Industry	Total Expenditures - €Million
Total	339.37
Manufacturing	176.39
Wholesale & Retail Trade	35.66
Transport & Utilities	85,61
All Others	41.71

Source: Overview Economic Impact of Cruise Tourism Baltic Sea Region. Peter Wild for BREA and G. P. Wild (International) Limited

The €685.9 million in spending by the cruise lines and their passengers and crew generated an estimated 6,155 direct jobs and €161.3 million in compensation throughout the Baltic Sea Region. Of these the transportation sector, primarily tour operators and cruise ports, had the highest direct economic impact with 1,856 jobs and €56.7 million in compensation. The hospitality sector (hotels, restaurants, bars) had the second highest direct employment impact with 1,464 jobs paying €28.2 million in compensation. The manufacturing sector had the second highest direct compensation impact with €41.9 million from 1,365 jobs.

Tabl. 11. Direct economic impact of cruise industry throughout the Baltic Sea Region

Industry	Direct Expenditures €Million	Direct Employment	Direct Compensation €Million
Total	685.87	6,155	161.31
Manufacturing	176.36	1,365	41.91
Whole Sale & Retail Trade	145.85	1,019	24.13
Transportation and Utilities	236.62	1,856	59.69
Hospitality	85.30	1,464	28.15
All Others	41.71	457	7.43

Source: Overview Economic Impact of Cruise Tourism Baltic Sea Region. Peter Wild for BREA and G. P. Wild (International) Limited

The €685.9 million in spending by the cruise lines and their passengers and crew generated an estimated €1.4 billion in total (both direct & indirect) output throughout the Baltic Sea Region:

This output generated 11,987 jobs throughout the region paying €305.2 million in compensation. Because the direct impacts account for about half of the total impacts, the total impacts remain concentrated (just over 50% in the trade, transportation and hospitality sectors). However, the indirect impacts do spread into other sectors, including manufacturing, business and financial services, etc.

Tabl. 12. Cruise Industry total economic impact in the Baltic Sea Region

Industry	Total Output €Million	Total Employment	Total Compensation €Million
Total	1,422.72	11,987	305.17
Manufacturing	299.86	1,922	60.69
Whole Sale & Retail Trade	119.51	1,886	43.90
Transportation and Utilities	511.59	3,304	91.15
Hospitality	81.50	1,611	26.94
Financial & Business Services	212.62	1,918	51.12
All Others	197.64	1,346	32.37

Source: Overview Economic Impact of Cruise Tourism Baltic Sea Region. Peter Wild for BREA and G. P. Wild (International) Limited

In addition other major highlights of the total economic impacts indicate that every €1 million in cruise related spending generated 17.5 jobs throughout the Baltic Sea Region. On average each of these jobs paid €25,500 in employee compensation. The trade, transportation and hospitality sectors accounted for about 70% of the direct impacts. The manufacturing, financial, business and personal services sectors accounted for approximately 60% of the indirect impacts. Every 100 direct jobs generated by passenger and crew spending resulted in another 95 jobs elsewhere in the Baltic Sea Region.

Total employment Impact throughout the Baltic Sea Region in 2013 was 11,987 and by industry it was as follow:

Manufacturing	1,922 (16%)
Whole Sale & Retail Trade	1,886 (16%)
Transportation and Utilities	3,304 (28%)
Hospitality	1,611 9 (13%)
Financial & Business Services	1,918 (16%)
All Others	1,346 (11%)

The jobs generated in the visitor industry/tourism sector (for example, hotels, restaurants, etc.) are in practice estimated based on a survey of adequate number of passengers and crew. Of particular interest is the total number of passengers per vessel call, the percentage of those passengers arriving by air as well as the percentage that stay in local hotels prior to or after the homeport cruise, as well as the purchases made by the passengers in the local economy. These purchases include expenditures on hotels for embarking and debarking passengers, as well as local purchases for retail items, food and local landside tours. The average expenditures on hotel lodging and nights stayed pre- and post-cruise, as well as food and in-town taxis are being placed into the visitor industry model.

4 Regional economic effects of cruise tourism

4.1 Factors determining the cruise terminal location

Cruise ports come into three main categories depending of the role they serve within their regions⁴⁰:

- Destination cruise port - the cruise terminal and its immediate area essentially act as a tourist bubble. In some cases there may be safety and security issues outside the port area.
- Gateway cruise port - cruise port act as technical stop since they offer no significant cultural or physical amenities, but are used because they are servicing a major touristic destination (like Civitavecchia is the gateway to Rome).
- Balanced cruise port - the port can be a destination, but excursions are also available, the balance varies according to what each port and its region has to offer.

There has been a growing number of hub ports where passengers in whole and in part can begin or end their journey and partial itineraries and dedicated facilities may be included.

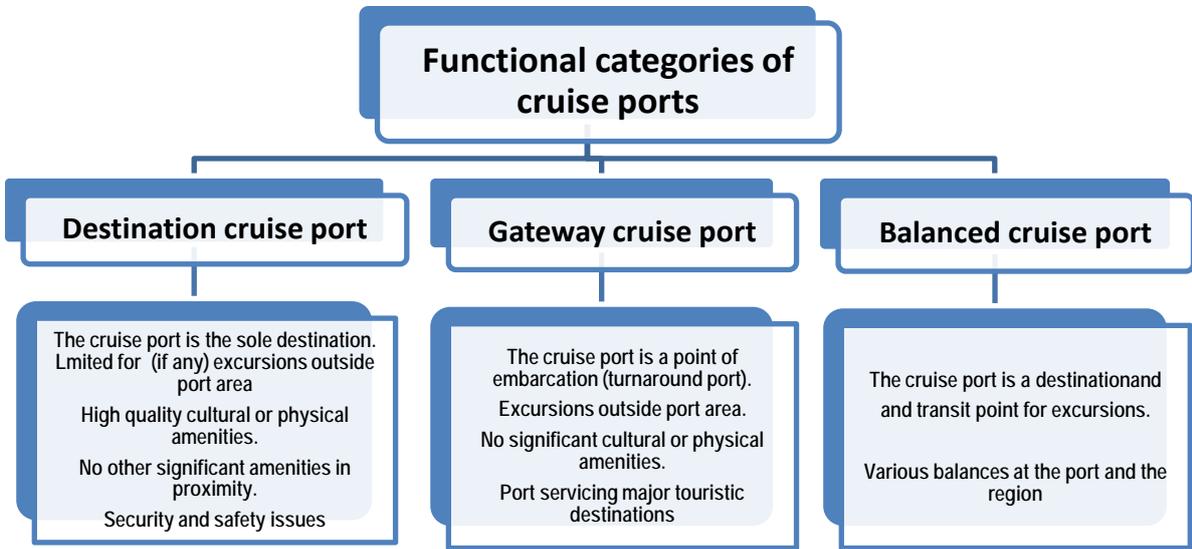


Fig. 14. Functional categories of cruise ports

Source: Economic and Law Department. Maritime Institute in Gdansk
 Cruise companies favour new port facilities, with amenities and infrastructure customized specifically for cruise ships, however, ports can become involved through adaptation of existing facilities. Least cost solutions may involve tendering to existing municipal docks, use or minor adaptation of existing

⁴⁰ Juan Gabriel Brida, Sandra Zapata: Cruise tourism: economic, socio-cultural and environmental impacts. Page 205-206

cargo docks. As the destination becomes more popular, pressure to renovate or create new cruise docks is likely to occur.

Tabl. 13. Factors determining locations of cruise facilities

Location considerations	Benefits		
	Marketing	Logistics	Guests experience
Navigational access	✓	✓	
Security	✓	✓	✓
Congestion Cruise Area vs Cargo		✓	✓
Traffic & Access	✓	✓	✓
Ease of Ingress & Egress	✓		✓
Expansion Potential	✓	✓	
Proximity to Parking		✓	✓
Exposure	✓		✓
Desired to work with Cruise Line	✓	✓	✓

Source: *Decision Criteria for Cruise Port Selection in the North Sea Region Cruise Gateway North Sea – Work Package 3 Study*

Infrastructural limits can be changed by investment. Destinations need to consider whether they have sufficient assurance that the port or attraction will continue. Cruise lines often change ports for security, economic or visitor satisfaction reasons, and major facilities or services may be left unused.

In many ports where cruise ship callings have increased, public and private investments have been dedicated to revitalize older port areas encompassing housing, hotels, maritime heritage projects, sports, recreation, tourism and local commerce. Cruise ship facilities are often found in these waterfront conversion zones so that cruise passengers are within walking distance of cultural sites and life in the city center. Cruise vessels near the city reinforce the maritime link between cities and ports and are visible signs of the touristic attractiveness of the city (Hamburg, Bergen, Antwerp).⁴¹ With many cruise terminals located close to historical city centers, cruise ship activity provide jobs linked to bars, restaurants, convenience shops, etc. Increased tourism expenditure through the multiplier effect can create new investment and employment opportunities. Cruise passengers may also spend time in the metropolitan area before or after their voyages, generating additional economic impacts through their tourism expenditures.

Main factors considered when choosing destinations by cruise line are⁴²:

- Key natural and cultural assets of the port and of sites which can be visited while the ship is in port. Most port visits tend to last from ten to twelve hours on land, therefore sites may be considered as assets for the destination only if they are accessible on tours of eight hours or less. Variety of experiences is important. In some destinations the location of port facilities is important, and

⁴¹ Jean-Paul Rodrigue, Theo Notteboom: The geography of cruises: Itineraries, not destinations Applied Geography. journal homepage: www.elsevier.com/locate/apgeog. J.-P. Rodrigue, T. Notteboom / Applied Geography 38 (2013) 31e42

⁴² Managing Cruise Ship Impacts: Guidelines for Current and Potential Destination Communities. A Backgrounder for Prospective Destination Communities by Ted Manning, President Tourisk Inc. 2006.

may be an issue between destination values and those of the cruise line. Docking in town may help town merchants but reduce the ability to sell tours, as visitors walk from the ship.

- Port facilities including accessibility and convenience for those embarking and disembarking. However ships may use tendering to ports where there are no or unsuitable shore facilities, but this is not seen as a good or permanent solution. Sometimes ports invest in fast comfortable tenders in order to mitigate the problem. Nevertheless tendering time means that tourists have less time on shore.
- Location relative to other destinations and departure ports. Most tours favour ports where the entire day can be spent in port, and passage to the next port occurs overnight. Many tourists do not find days at sea as interesting as port days.
- Security - is very important, particularly near the docking facility and in areas where tours or pedestrians may go. Cruise and tour operators may have their own requirements for safety, insurance, site certification, tour and guide certification etc.
- Infrastructure - suitable numbers of buses, guides, police, toilets, parking to handle the tourist numbers considering that some destinations like Bergen or Sankt Petersburg are docking more cruisers at one time.
- Provisioning - for some lines local provisioning of food, drink, clean water is done in tour ports. A growing trend is to carry nearly all goods from the home port, due to the rapid growth of shorter tours, concerns regarding food safety, and economies of scale of provisioning at major ports.
- Port costs – higher dockage fees may result in cruiser shift to another port or even another country. In the past this also was used to avoid environmental regulations, but operators calling EU ports are now party to international standards⁴³.
- Marketing – most cruises are marketed as a package of several destinations and experiences. Specific cruises may alter the general formula to sell to a niche market. This is less true of large lines.

One of the services that is scarce in the competition for a space is transport (taxis and tourism buses) because cruise passengers create an artificial large demand only for some particular days. Other space is fought for the informal salespeople (mobile) who also want to benefit from the presence of the cruise passengers.

The above mentioned factors have been taken into consideration in Federal program of Kaliningrad region development, where development of tourism, including construction of cruise terminal in the Port of Kaliningrad. Currently there is lack in condition of Cruise terminal construction in Kaliningrad

⁴³ Conservation International, Lighthouse Foundation, and WTO Indicators – Cruise Destinations section

region, which is struggling from lack of sufficient port infrastructure for modern cruise vessels in region. New facilities are viewed as solution for mitigating isolation of Kaliningrad in terms of accessibility.

4.2 Potential jobs generated by cruise industry

Cruise sector has substantial employment impact related to the port activity through: direct employment impact, induced employment impact, indirect jobs, related user employment impact as well as through related user employment impact and personal earning impact.

Cruise vessels calling a port generate jobs at the level of pilotage, tugs, provisions, fuel, crew shore leave, passenger services, inspections, immigration, hotels, restaurants, local attractions and other tourism activities in the port area. Further employment is provided by inland transportation involving cruise passengers including air, private car, bus, transit and taxi. Yet, the benefits of cruise ports for local economies can be controversial, particularly in light of the revenue capture strategies pursued by cruise lines that may leave less than expected impacts and infrastructural and environmental burdens.

An example of economic employment impacts generated by the port based on Port of Bergen reveals (FTE) full time economic effect – jobs and tax income for 11 municipalities for all port, not cruise separately:

- 181 FTEs directly related to the port activities,
- 1 367 FTEs indirectly involved
- 600 induced FTEs
- 149 FTEs in total

The economic impact totalled NOK 406 million, including: direct tax income NOK 208 million, indirect tax income NOK 136 million and induced tax income NOK 62 millioner

The methodology used for the above calculation was based on a scientific and objective approach to measure the direct, indirect and induced economic effects of ports in relation to the hinterland i.e. the state/region and/or the municipality in which the port is located. The methodology is based on the economic theory of multiplier effects where not only the direct spending are measured but also how these spending circulate and are induced in the economic system⁴⁴.

In ports where cruise ship operations are not considered as priority activities and where there are no dedicated passenger terminals, generally no additional workplaces are created. Analyses of Port of Hamburg activities contain quite detailed information about the size of employment and revenue from the various types of activity, but no revenue from cruise operations is recorded. Traditionally, dedicated passenger terminals belong to the operators of the cruise fleet and are not included in the port activity analyses, as are traditional transshipment, storage and logistics services and investments in basic port infrastructure and facilities. In the case of the port of Hamburg the gross value added of the cruise industry was €383 million in 2013 and €411 million in 2014, which made 3,3% of total Port of Hamburg activity. In addition the gross value added in 2014 at regional and national level was

⁴⁴ Information from GreenCruisePort partner – Port of Bergen

€452 million and €658 million accordingly.⁴⁵ The Port of Hamburg provided in 2014 a total of 129761 jobs, including 10.9% in port management, 59% directly linked to port management and 41% indirectly⁴⁶. Total employment in cruise industry in the Port of Hamburg in 2014 was 3.977 of which 1834 in direct jobs and 2.142 indirect jobs.

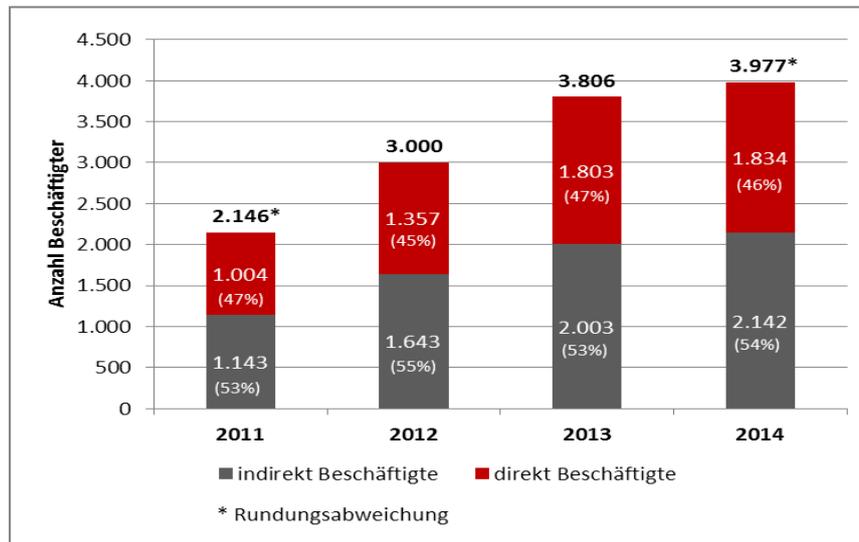


Fig. 15. Direct and indirect Employees in Cruise industry in Hamburg

Source: PLANCO Consulting GmbH (2015): Fortschreibung der Berechnung zur regional- und gesamtwirtschaftlichen Bedeutung des Hamburger Hafens für das Jahr 2014.

In Italy, which is still the major centre for cruise activity in Europe and participates in all aspects of the industry from shipbuilding, to crewing, to serving as a destination market⁴⁷, the €4.45 billion in direct cruise tourism expenditures in 2011 generated an estimated 100,089 jobs (direct, indirect and induced). The 42,235 direct jobs, including the employees of the cruise lines, the direct suppliers to the cruise lines and the employees of those establishments that provide goods and services to cruise passengers, that were generated by cruise-related expenditures paid €1.33 billion in employee compensation.

Tabl. 14. Direct cruise industry employment impacts in Italy in 2011.

⁴⁵ Information from GreenCruisePort partner – Port of Hamburg

⁴⁶ Fortschreibung der Berechnungen zur regional- und gesamtwirtschaftlichen Bedeutung des Hamburger Hafens für das Jahr 2014. PLANCO Consulting GmbH, Essen, December 2015.

⁴⁷ Contribution of Cruise Tourism to the Economies of Europe 2011 Country Report, Italy. The European Cruise Council Euroyards July 2012

Sector	Number of employees	Compensation in € million	Remarks
Italian manufacturers	12,856	420	30% of the direct jobs, 32% of the direct compensation impacts
Italian shipyards	8,332	271	construction of new cruise ships and refurbishment and repair of existing ships, 65% of the direct manufacturing impacts
Food, beverages & tobacco industry	639	19	produce fabricated metal products, such as tanks and other sheet metal products, computers, material handling equipment, engine parts and communication equipment used in offices and cruise ships
Metals and machinery industries	2,378	77	including furniture and medical equipment.
Manufacture of other durable goods	700	21	8% of the direct employment impacts
Wholesale and retail trade sector	3,345	43	
Transportation and utilities sector	17,900	640	These included employees of the cruise lines, lorry drivers who deliver goods to cruise ships, and tour operators that provide onshore excursions for cruise passengers. Also included are employees in the power generation and communication industries 42% of the total direct jobs, in support of the cruise industry, 47% of the direct compensation impacts
Financial and business service providers	3,387	98	These included employees of insurance companies and agencies, advertising and market research firms, computer programming companies, engineering and management consulting firms, law firms and accounting agencies.
Hotels, restaurants and amusement enterprises	2,147	39	Direct result of passenger spending as part of their cruise vacations
All other sectors	2,569	90	Jobs generated elsewhere in the Italian economy, principally personal services and government, including photographers, health care employees and social service providers among others.

Source: *Contribution of Cruise Tourism to the Economies of Europe 2011 Country Report, Italy. The European Cruise Council Euroyards, July 2012*

In Italy approximately 22 jobs were generated for every €1 million in direct cruise industry expenditures. Furthermore, the average job generated by the cruise industry paid nearly €30,400 in employee compensation. Given the direct impacts of 42,235 jobs and €1.33 billion in employee

compensation, the effective economic multipliers for the cruise industry in Italy were 2.37 for employment and 2.29 for compensation⁴⁸.

In Spain the €1.19 billion in direct cruise tourism expenditures during 2010 generated an estimated 25,220 jobs (direct, indirect and induced)⁴⁹. The workers who held these jobs earned €764 million in employee compensation. Manufacturers in Spain employed around 4,000 workers, and paid them €120 million in wages and benefits. Cruise lines spent an estimated €31 million on compensation for employees who resided in Spain during 2010. The cruise lines employed approximately 1,100 residents of Spain in their administrative offices and as crew onboard their ships. The 10,636 direct jobs that were generated by cruise-related expenditures paid €344 million in employee compensation. An estimated 14,584 indirect and induced jobs were generated throughout Spain by the cruise industry in 2010. These jobs generated €420 million in employee compensation.

In Spain just over 21 jobs were generated for every €1 million in direct cruise industry expenditures. Furthermore, the average job generated by the cruise industry paid just over €30,000 in employee compensation. With the direct impacts of 10,636 jobs and €344 million in employee compensation, the effective economic multipliers for the cruise industry in Spain were 2.37 for employment and 2.22 for compensation⁵⁰.

The €2.83 billion in direct cruise tourism expenditures in the UK during 2011 generated an estimated 63,834 jobs (direct, indirect and induced). The 29,820 direct jobs that were generated by cruise-related expenditures paid €1,045 million in employee compensation. Manufacturers in the UK employed an estimated 14,028 workers, and paid them €555 million in wages and benefits. Moreover an estimated 30,414 indirect and induced jobs were generated throughout the UK by the cruise industry in 2011. These jobs generated €1.16 billion in employee compensation. The indirect and induced impacts of cruise industry spending generated just over 9,400 jobs within the Manufacturing sector during 2011, Impacted manufacturing employees were paid an estimated €368 million in compensation. The cruise lines employed nearly 14,500 residents of the UK in their administrative offices and as crew onboard their ships.

These jobs included the employees of the cruise lines, the direct suppliers to the cruise lines and the employees of those establishments that provide goods and services to cruise passengers.

In 2011 in the UK just under 23 jobs were generated for every €1 million in direct cruise industry expenditures. Furthermore, the average job generated by the cruise industry paid slightly more than €36,500 in employee compensation. Given the direct impacts of 29,820 jobs and €1,045 million in employee compensation, the effective economic multipliers for the cruise industry in the UK were 2.14 for employment and 2.23 for compensation.

The sectoral distribution of direct impact is characterized by a remarkable concentration in a few sectors. For example in Barcelona, full-time jobs generated by cruise activity totalled 6,759, of which

⁴⁸ Contribution of Cruise Tourism to the Economies of Europe 2011 Country Report, Italy. The European Cruise Council Euroyards July 2012

⁴⁹ Contribution of Cruise Tourism to the Economies of Europe 2010 Country Report, Spain. The European Cruise Council September 2011

⁵⁰ WTO Indicators of Sustainable Development for Tourism Destinations: A Guidebook for greater details.

3,995 were in the five tourist branches (hotels, restaurants, retail, land transport and travel agencies and tour operators). In other sectors 2,764 jobs were generated mainly in the areas of storage and related activities for transportation, food manufacturing, metallurgy, chemical industry, services, waste management and sanitation, or medical services.

4.3 Passengers' behaviour

There is an increasing interest in the economic and environmental impact of cruise ship tourism, but relatively little consideration is given to the community impact or culture as a resource that requires sustainable management practices. Cruise passengers represent a wide spectrum of interests, travel styles and expectations. Overall, passengers seek port destinations which have a good climate, access to an area possessing either a landmark of historical importance or an exotic or foreign culture. The general thought in the city is that passengers spend minimal money on-shore, rarely purchasing meals or drinks and taking photographs of postcards instead of buying them.

There is a relationship between tourism and transport. Time spent in a destination area seems to be the most influential criterion shaping tourist behaviour because it can directly constrain or expand the number and range of potential activities available and the depth at which individual activities can be experienced⁵¹. The total destination time is usually fixed well in advance of arrival. Decisions on expenditure often involve a trade-off between transit time and time spent at an attraction or place. Some tourists see time in an opportunity/cost framework, where greater transit time leaves less available at the desired objective. These tourists seek to maximize time spent at a place by minimizing transit time. They prefer to follow the most direct routes. Others see transit time as a commodity that generates benefits in its own right. These tourists are finding value in the journey as much the objective. They are more likely to engage in sightseeing, take indirect routes, and travel to outlying areas to explore a destination more widely. Main tourists have greater destination knowledge and make a stronger psychological investment in its overall role in providing a satisfying trip. Stopover tourists, on the other hand, tend to restrict themselves to visiting convenience-based attractions in well-known nodes or along main transportation corridors. Also differences were noted between first timers and repeaters, who prefer more social activities such as shopping, dining, and visiting friends and relatives⁵².

To investigate cruise embarking passengers' characteristics, preferences, perceptions and expenditure, a non-parametric and a parametric approach are used. It is important to distinguish between the behaviour of the passengers who are either at the beginning of their trip or are calling in the destination within the cruise trip. Cruise passengers making a short stop are visitors of a port of call. During their short visit, cruisers have the opportunity to visit the main attractions of the destination, to do some shopping, take land tours and enjoy other activities. The findings from various investigations show that factors such as the city's attractions and the overall visit experience are the most important determinants of the intention to return and to recommend the destination to friends and relatives. Passengers beginning their trip at a destination are expected to behave in a

⁵¹ Alan Lew at al MODELING TOURIST MOVEMENTS. A Local Destination Analysis. *Annals of Tourism Research*, Vol. 33, No. 2, pp. 403–423, 2006

⁵² Alan Lew at al MODELING TOURIST MOVEMENTS. A Local Destination Analysis. *Annals of Tourism Research*, Vol. 33, No. 2, pp. 403–423, 2006

remarkably different manner. This type of passenger is more likely to be in contact with the local population, as they use local tourism infrastructure such as: lodging, food and beverages, transport and entertainment.

Passengers' behaviour is a concern for all destinations. To some extent cruise tourism can reinforce some of the behavioural issues. Because cruise tourism is in many ways day tourism, the impacts of large numbers of tourists can be concentrated in a few places in a short time period. Cruise ship excursionists are less likely than stay over ecotourists to be sensitive to the environmental consequences of their actions. Several factors associated with cruise ship excursionists, including their focus on a few sensitive sites, clustering and crowding, litter, and loss of ground vegetation, soil erosion and damage to trees in sites targeted by tours. High visitor numbers disguise lower numbers of visitor days, due to the concentration of visits on a few days.

Ships may visit many countries on a trip, but few tourists have the interest or incentive to learn much about a destination culture or ecosystem they will only visit for a day or a few hours. Tourists in large groups do not behave like they do at home, hence excessive drinking, loud behaviour, showing off behaviours which may be completely out of character with their normal behaviour at home where there is community peer pressure and the norms are known. This can result in offence to local communities, destruction of ecosystems unless controlled and managed by guides and coordinators.

Cruise tourism is in many ways day tourism, therefore the impacts of large numbers of tourists can be concentrated in a few places in a short time period. Significant numbers of tourists can be insensitive to the host community and its ecosystems. Often few tourists have the interest or incentive to learn much about a destination culture or ecosystem they will only visit for a day or a few hours.

A passenger's decision to cruise is based on many factors such as whether to go on a cruise in the first place, where to go, the choice of cruise line and the choice of ship. That decision can be motivated by such diverse factors as a desire to return to a familiar destination, own research; the influence of friends, family and travel agents, brand loyalty to a cruise line, or even preference for a particular ship. The port experience may be influenced by an apprehension due to not knowing the local language, fear of becoming lost, and fear of crime⁵³.

Cruise destinations must both understand and address these factors in order to attract not only cruise passengers but also the type of passenger who will make a positive economic contribution to the destination. Otherwise, the destination may not attract passengers who spend very little whilst onshore.

CLIA Australia reported recently that the average international cruise passenger spends over \$200 per day on shore excursions in Cairns. This is 66% higher than the amount reportedly spent by an average domestic passenger. The average international passenger reportedly spends \$98 per day on retail shopping, nearly five times the average spent by either domestic cruise passengers or land-based, domestic tourists to the region. Though CLIA Australia's figures cannot be independently

⁵³ Reiner Jaakson BEYOND THE TOURIST BUBBLE? Cruiseship Passengers in Port. *Annals of Tourism Research*, Vol. 31, No. 1, pp. 44–60, 2004

verified, the results suggest that cruise tourism targeting international passengers would be substantially more profitable to shore excursion and retail operators in Cairns than domestic (coastal) cruise tourism⁵⁴.

Cruise passengers on the average spend less money at the destination. The restricted land time allowed for passengers limit their opportunities to spend money at the visited destination and thus functions as an encouragement for tourists to spend their money on board. Typically about 20–40% of passengers do not even leave the ship while at port. Compared to the land based tourism sector, revenues generated by cruise passengers are considerably lower. Particularly since other tourists tend to stay longer and thus seek accommodation and food at the destination. This in turn creates jobs and tax incomes for local communities. However, cruise tourists overestimate their expenditures to a larger degree than other tourists do⁵⁵.

Location assessed within the scope of the natural quality dimension of destination quality refers to accessibility and distance of the destination. Some of investigations discovered that hospitality and customer care factors are considered important to British visitors, whilst German visitors consider accommodation services as most important as destination quality⁵⁶.

Although cruise ships make regular port stops, many passengers prefer to stay on board during a port visit. These tourists do not benefit the local economy or sufficiently experience the destination but at the same time, cruise tourism is criticized for passenger's pollution and traffic congestion due to the scale of visitation.

Motivation for cruise trip considered by tourists as extremely important⁵⁷:

- Discovering new places
- Experiencing different cultures and ways of life
- Visiting historical and cultural sites
- Enjoying a variety of nature and scenery
- Learning about the Greek history
- Experiencing pleasant climate/temperature
- Getting away from demands of everyday life
- Buying local crafts and handiwork
- Practicing shopping

⁵⁴ Economic Opportunities and Risks of Cruise Tourism in Cairns. Prepared by: Joseph (Mark) Thomas^{1*} under the supervision of Natalie Stoeckl^{1, 2} for The Australian Marine Conservation Society and WWF-Australia, April, 2015

⁵⁵ Svein Larsen a,b, Katharina Wolff a, Einar Marnburg b, Torvald Øgaard b; Cruise line passengers' expenditures. *Tourism Management Perspectives*, Volume 6, April 2013, Pages 142-148, journal homepage: www.elsevier.com/locate/tmp

⁵⁶ Cevat Tosunan, Bekir Bora Dedeoğlub, Alan Fyallc Destination service quality, affective image and revisit intention: The moderating role of past experience. *Journal of Destination Marketing & Management*, November 2015

⁵⁷ Andriotis, K. and Agiomirgianakis, G. (2010). Cruise Visitors' Experience in a Mediterranean Port of Call. *International Journal of Tourism Research*, 12(4): 390-404.

Satisfaction statements of cruise tourists obtained in one of the surveys were as follows⁵⁸:

- Feelings of personal safety and security
- Friendliness of local residents
- Quality of offered services
- Transportation while in destination
- Level of hygiene and sanitation
- Cleanliness of the local port
- Level of language communication
- Availability of facilities and services at port
- Availability of written material in visitors language
- Value for money
- Environmental quality
- Time availability to use comfort facilities and shop

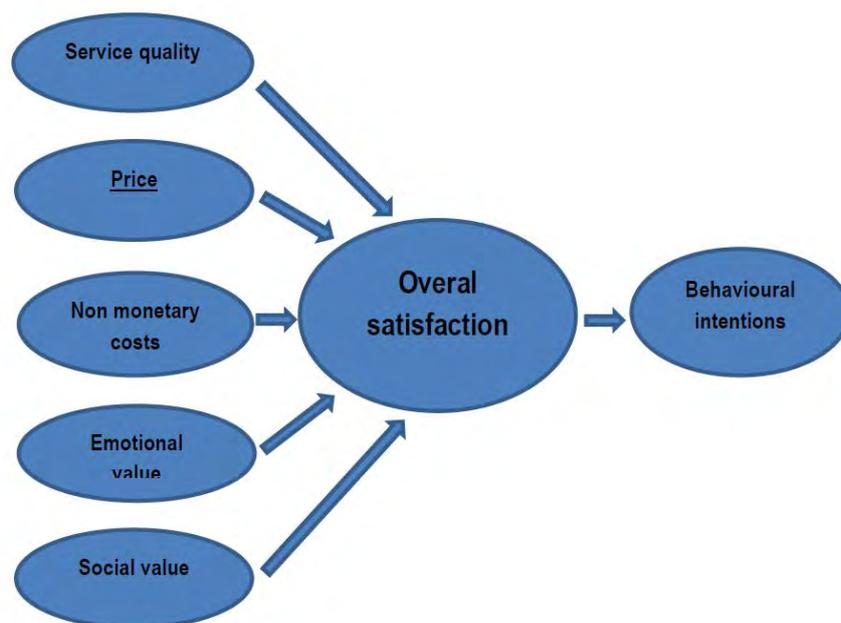


Fig. 16. The proposed structural model

Source: Economics and Law Department, Maritime Institute in Gdansk

Budgets alone cannot fully explain variations in travel patterns. Also personality influences behaviour. Special interest tourists are more purposeful and directed in their actions and more willing to visit lower-order attractions. They also spent more time at each place visited. Organized groups are more restricted in their choice of transportation mode, destinations visited, expressions of interest, and time budget allocations. The sociocultural background of tourists also appears to have an influence. Tourists from culturally proximate source markets are seeking different

⁵⁸ Andriotis, K. and Agiomirgianakis, G. (2010). Cruise Visitors' Experience in a Mediterranean Port of Call. International Journal of Tourism Research, 12(4): 390-404.

attractions and traveling to different areas within a destination than those from culturally distant origins.

The tourist's ability to understand a destination and choose what activities to pursue is highly individualistic, though subject to considerable external influence. Tourists feel obliged to visit primary attractions even if they are located in relatively out of the way places.

German passengers predominantly purchase cruises from German national brands, approximately one third of German passengers cruise on ships of the other major European and North American cruise brands. European destinations dominate the cruise itineraries purchased by the passengers sourced from Germany, accounting for about 80% of all German passengers. German national and international cruise brands sourced 1.77 million German nationals (15,633,110 cruise nights) during 2014. Average length of cruise journey was 8.83 days, gross average net revenue per passenger was €1,530 and average net revenue per night €173,37⁵⁹.

From a holistic perspective, destination quality includes not only physical products but also services. Destination image perceptions and revisit intentions differ according to whether a tourists are first-timer or repeat visitor. Destination image can be defined as both the total effect of a destination on tourists and their perceptions regarding a destination's properties. Perceived service quality, which is based on tourists' actual travel experience, is significant in the formation of image. Image based on selected overall impressions plays an important role in people's travel decisions.

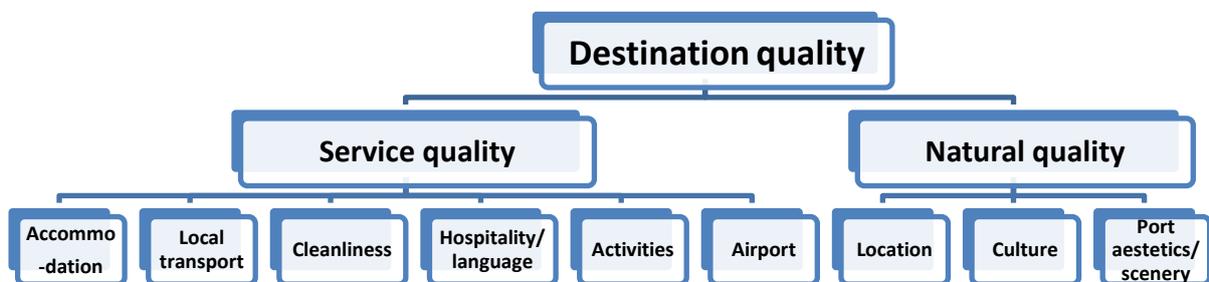


Fig. 17. Conceptual framework of destination quality.

Source: C. Tosun et al./Journal of Destination Marketing&Management 4(2015)222–23

Shopping is a mainstay activity for cruise passengers. Many passengers will spend their entire port call shopping, whilst others will shop as part of their shore excursions or other activities. A welcoming retail environment is particularly necessary in order to encourage passengers to spend money onshore. Closely allied to shopping is restaurants and cafés activity, especially among those passengers who seek to experience the local cuisine at any cost. Also, there are different national and cultural characteristics of visiting passengers.

Cruise ship passengers tend to arrive in large numbers, all at once. In some ports, several ships may arrive almost simultaneously. Generally, cruise ships try to arrive early in the morning in a port, and leave between late afternoon and midnight. In ports where a ship is docking near the city centre,

⁵⁹ German Ocean Cruise Market 2015, CLIA Deutschland, prepared by BREA

many tourists choose to walk around the town and market areas. Those taking short tours may also have the opportunity to do more than one experience. In ports where a ship has to use tenders to take passengers ashore, or docks some distance from a town or commercial centre, there may be little opportunity to shop or interact with locals, unless this is provided on a tour leaving from dockside. Often those taking tours will have nearly no opportunity to spend money in the destination.

Social impacts include increased contact with foreigners who may have different customs, behaviours than local residents. Noise, occupation of spaces (churches, restaurants, parks, beaches etc.) which were previously the exclusive use of the local community will occur. Cruise ship environmental impacts are of two types: those associated with ship operations and those associated with tourist activities. There are guidelines created for ship operations which are a key point of reference for control of damage from e.g. emissions, anchors, waste disposal, oil spills etc. Most major cruise lines subscribe to these guidelines, and in some jurisdictions there is strict enforcement.

In recent years there have been numerous surveys and analysis focused on cruise tourist behaviour aspects including: satisfaction with cruise experience (i.e. shore services, residents attitude, cruise passenger expenditures, return as land tourists). The example of survey results for the port of Riga indicate that: average time (hours) spent by cruise tourists in the city of Riga was nearly 5 hours (4,94) including tourists from Germany – 5,11, Northern countries – 5,55, UK and Ireland – 4,31, other European countries – 5,53, North America – 4,5.

Tabl. 15. Satisfaction of cruise tourists visiting Riga with shore activities (scale 1 to 10)

Specification	Germany	Northern countries	UK and Ireland	Other European countries	North America
Initial city welcome	7,76	7,34	8,11	7,48	8,1
Guided tours	5,52	6,67	8,12	7,75	7,94
Historic sites/museums	8,1	7,65	7,95	7,42	7,98
Variety of activities	7,59	7,31	7,47	7,31	7,49
Shopping	7,85	8,08	8,13	7,54	8,1
Friendliness of residents	8,23	8,11	8,57	7,89	8,06
Atmosphere	8,48	8,19	8,49	8,16	8,73
Taxis/local transportation	7,77	7,31	8,15	7,69	7,36
Value for money	8,01	7,64	7,87	7,85	7,66
Overall visit in Riga	8,4	8,11	8,31	7,98	8,48

Source: Port of Riga

It is important to understand how cruise passengers behave at destinations, and to ensure that tourist attractions, facilities and services provided at destination are well managed and not overcrowded, in order to provide a positive experience, since those factors have important implications for destination planning, transport development, planning new attractions or managing the existing ones, and for the management of social, environmental, and cultural impact of cruise tourism at destination.

Gaining feedback from cruise passengers by measuring how well a port of call is doing, can provide guidelines to decision-makers on how to improve the offered product and services, create a positive image and increase the likelihood of return. Visitors who are satisfied beyond expectation are more likely to return to the same destination and recommend it to others.

About three-quarters of all cruise passengers book at least some of their cruises through travel agents. The ship represents in itself the destination, essentially acting as a floating resort (or a theme park) with all the related facilities (bars, restaurants, theatres, casinos, swimming pools, etc.) . While many cruise lines offer basic low cost cruise packages to attract large flows of passengers, they are also seeking ways for more exclusive customers ready to spend more for exceptional experience.

There are some spin-off effects from tourist spending. For some destinations, the investment stimulated by cruise and other visitors can help to create critical mass for some services, those with a tourist focus, enhancing such elements as public safety, range of shops, and availability of health services. At the same time, cruise tourism can be very seasonal, in Northern Europe for example from May to off season in October, depriving locals of both access to services and of employment in the off season.

4.4 Value of extended tourism footprint

The economic impact of seaports has a complex structure. Initial impact generates a number of complex intersectoral relationships, since the intermediate consumption needs of the beneficiary companies in the first instance. A multiplier effect on the entire system, an indirect impact in terms of turnover, gross value added (and wage income) and employment is thus generated. Also the induced impact, of the consumption expenditure made by those workers whose jobs have been generated directly or indirectly due to cruise activity must be considered. The induced impact is also reflected in terms of turnover, gross value added and occupation. The impact generated by cruise activity extends beyond the purely economic sphere it is also in social and environmental implications.

The marine cargo and vessel activity initially generate business revenue to the companies supplying marine services. This revenue is used to purchase employment (direct jobs) to provide the services, to pay stockholders and for retained earnings, and to purchase goods and services from local firms,

as well as national and international companies, creating indirect jobs with these enterprises⁶⁰. Businesses also pay taxes from the business revenue.

Tabl. 16. Sample list of types of entities that make up the cruise tourism value chain⁶¹

Entity	Role in cruise tourism	Entity scope	Direct supply goods or services to	Direct procurement goods or services from	Key issues
Cruise passengers	Represent demand for cruise tourism and experience	Global, mainly focused on source market	n/a	Travel agents, cruise lines, ground handlers and excursion operators, ground transportation providers	-Respecting natural and cultural heritage at destination -Creating positive economic impact to host destination -Awareness of responsible travel
Cruise lines	-Central provider of cruise experience -bring passengers to destination -cooperate with potential destination countries	Global or regional companies	Cruise passengers, travel agents, cruise terminals	All other entities within the value chain	-fuel use -waste management -mitigating the impact to marine environment -economic benefits to local economies
Cruise ship crew	Perform operational functions aboard cruise ship at sea and port of call Procure goods and services at port of call/destination	Multinational	Cruise lines	Site amenity operators, ground transportation providers, shipping agencies, site amenity operators	-respecting natural and cultural heritage at destination -creating positive economic impact to destination at destination
Cruise terminals and port operators	Facilities of infrastructure and for operations of cruise ship and passengers at arrival	Local, often owned and operated by government entities or public-private partnership	Cruise lines and passengers	Other third party service providers, site amenity operators	-impact from dredging when developing cruise terminals, from developing permanent jetties -transportation and infrastructure related issues for serving passengers in disembarking and transporting to shore sites
Ground handlers and excursion operators	Responsible for logistic operations providing cruise lines with shore excursion packages	Local – with regional or global affiliations	Cruise lines and passengers, shipping agencies	Ground transportation providers, site attraction operators, site amenity operators	-capacity constraints in cities and visitors flows -responsible operations with respect to environmental and social aspects -responsible behavior of passengers at sites
Airports	Transporting	Global,	Cruise	Destination waste	-adequate lift to match

⁶⁰ Sibel Bayar Çağlak and others: The Impact of Seaport Investments on Regional Economics and developments. International Journal of Business and Management Studies vol 3, no 2, 2011 issn: 1309-8047

⁶¹ Sustainable Cruise Tourism Development Strategies – Tackling the Challenges in Itinerary Design in South-East Asia. World Tourism Organization (UNWTO) and Asia-Pacific Tourism Exchange Center (APTEC). Madrid, Spain 2016

	fly@cruise passengers to destination	regional or local	passengers	management companies and haulers	cruise demand -logistics between airport and cruise terminal -waste minimizing and recycling
Hotels	Accommodation of cruise passengers according to cruise voyage and passenger requirement	Global, regional or local	Cruise passenger, cruise lines	Destination waste management companies and haulers	-suitable design -Efficient resource -responsible travel promotion
Ground transportation providers	Passenger transport within between cruise terminals at destination and hotels, airports, site amenities	Local – with regional or global affiliations	Cruise passengers and crew, ground handlers and excursion providers	Other third party service providers	-Overcrowding of transit infrastructure, fuel use and emissions from operations -Management of waste from management -Mobility of destination port areas and site attractions
Destination waste management companies and haulers	Responsible for waste management and resource recovery for waste materials landed by cruise ships	Global, regional or local	Cruise ships, hotels, airlines, cruise terminals and port operators	Destination waste infrastructure	Proper handling, disposal and resource recovery of landed waste
Site attraction operators	Operate and maintain the attraction facilities and areas visited by cruise passengers	Local	Cruise ships, ground handlers. Cruise passengers	Destination waste infrastructure	-Adequate maintenance -Heritage preservation -Community benefits -Carrying capacity and crowd management
Site amenity operators (retail, food, beverages)	Operate and maintain facilities and areas visited by passengers (restaurants, shopping areas, etc.)	Global, regional or local	Cruise ships, ground handlers. Cruise passengers	Destination waste infrastructure	-Economic multiplier/leakage of cruise passenger revenue -Community benefits from cruise passenger spending -Ethical trade of handicrafts
Host communities	Intangible heritage as part of passenger experience at destination	Local	Cruise passengers, all other value chain entities (employment and business)	Various entities as businesses	-Preservation of traditional way of life -Interaction with visitors -Local economic benefits and cruise passenger spending
Destination management organizations	Promotion of the destination's brand image and visitors experience	Local (government and public entities from tourists business)	Cruise lines, NTOs	Site amenity operators, ground transportation providers, site attraction operators	-Promotion of responsible travel and awareness of natural and cultural heritage
Destination managers and policy makers (ministries, NTOs, tourism boards)	Development of policies and management of operations at destination regarding activities, of cruise lines, passengers, environmental	Local, government or founded from local tourism trade	Cruise lines, ground handlers, cruise terminal operators	Cruise industry media	-Adequate policy to maintain destination -Maximize economic and community benefit -Minimizing environmental and social impacts

	monitoring and other value chain entities				
Port site agents and handlers	Provide logistic coordination of goods and services procured by cruise passengers and crew	Global or regional companies	Cruise ships	Ship supply storage providers, cruise ship suppliers	-Relationship with cruise line preferred procurement
Travel agents	Selling cruise tourism products to cruise passengers	Global, regional or local	Cruise passengers	Cruise lines, ground handlers, inbound tour operators	-Credibility in claims and promotion of cruises experiences -Promoting responsible travel and cruise tourism
Inbound tour operators	Packing and selling cruise tourism products (or packaged products containing cruise and other forms of tourism) to cruise passengers	Global or regional companies	Cruise passengers, travel agents	Cruise lines, ground handlers	-Promoting responsible travel and cruise tourism
Cruise industry associations	Trade associations for cruise ships and terminals	Global or regional	Cruise ships or cruise terminals	n/a	-Promotion of responsible cruise tourism development -Development of resources for members regarding key components of sustainable cruise tourism development and operations
Cruise industry media	Media channels for cruise industry, information, magazines, websites, conferences, seminars	Global or regional	Most of cruise tourism value chain	n/a	-Promotion of responsible cruise tourism development -Development of resources for members regarding key components of sustainable cruise tourism development and operations
Shipyards	Facilities used for building or repairing cruise ships	Local	Cruise ships and cruise terminals	Portside maintenance and repair contractors, destination waste management companies and haulers	-Downstream impacts of waste materials -Environmental management systems (EMS) -Environmental health and safety (EHS) in operations
Ship supply storage facilities	Provide warehousing facilities for supplies and materials sourced by cruise terminals	Local	Ship suppliers, portside agents and handlers	Destination waste management companies and haulers	-Construction of facilities and land use change or environmental impact -EHS in operations
Ship suppliers	Provide goods and services to cruise ships at destination	Global, regional or local	Cruise ships portside agents and handlers	Manufacturers of goods procured by cruise ships	-Responsible procurement
Portside maintenance and repair contractors	Provide maintenance and repair services to cruise ships at destination	Local (with regional or global affiliations)	Cruise ships	Other third party service providers	-EMS and EHS in operation
Destination	Provides landfilling,	Global,	Destination	Other third party	-Adequate waste

waste infrastructure	innovation, recycling and transferring of waste management	regional or local	waste management companies and haulers	service providers	infrastructure -Responsible resource recovery
Other third party providers	General supply chain of products and services for sell all types of entities within the value chain	Global, regional or local	All (directly or indirectly) depending on type of provider	Other third party service providers	-Respective issues to be identified per entity type

Source: Ying Wang a,1, Kyung-Ae Jung a,1, Gi-Tae Yeo a,* , Chien-Chang Chou *Selecting a cruise port of call location using the fuzzy-AHP method: A case study in East Asia. Tourism Management 42 (2014), pp 262-270*

The homeport cruise activity mainly affects two sectors of the destination economy, that is the maritime service sector and the tourist service sector. The maritime service sector includes the companies that provide services to the cruise ships while in port, such as: chandlers and other local retailers, and wholesalers that provide ship stores and provisions to be used by passengers and crew; towing services that assist vessels in docking and undocking; pilots, who assist the vessels navigating the channels from the open sea to the docks, stevedoring services and dockworkers including handling baggage and ship supplies; line handling services that are required when a vessel enters into the port; bunkering companies, parking services for the passengers driving from their place of residence to embark on the ship, ground transfers from the airport and hotels to the ship prior to and after the cruise trip.

Industries to benefit from cruise tourism are: transportation (taxis, buses, automobile, boat rentals), tour operators(including organizers, guides) selected attractions located close to the dock, or marketed directly by the ship activities staff and, restaurants and bars not always benefit from visits as passengers return to the ship for meals.

Cruise ships cause municipality expenditures, including tourism information guides, printed maps, toilets, garbage collection and other facility maintenance. The library/culture house, information services, and facilities/grounds management do not receive additional funds to compensate for more use.

The natural sites also have economic importance - in terms of both use and non-use value, but it can be difficult to measure non-use and existence values. The value of such an attraction, if it is free at the point of entry, will not create profit for the local community and instead will be captured by the tourists.

Investment in cruise ports affects either economy or regional developments. Investment of seaport have been increased urban developments with employment and infrastructures opportunities, taking migration, land valuation, technology developments, economic growth, etc.

Port and city shuttles can present logistical and financial issues for cruise lines and the service providers. The basis of provision varies and is a function of whether the cruise line funds the supply of shuttles, whether the passenger pays on a per ticket basis, or whether the destination provides them on a courtesy basis. However, with the provision of free shuttles comes the risk that the service may not be as frequent as the passengers would like. On the other hand, where passengers pay for their use of the shuttle, the expectation is that there will be sufficient capacity and frequency. Either

the passenger pays, or it costs the cruise company. If the cruise lines are charged, they will rather move out of those ports. The decision about build cruise port facilities need to be balanced between the port companies' willingness to invest in an activity, and the port community's willingness to provide attractive facilities for cruise ships and their passengers⁶².

There have been some analyses of economic impact in destinations conducted for Caribbean and Latin American Ports⁶³. Total spending amount was based on 85% of passenger arrivals and 38% crew arrivals. Cruise tourism's direct expenditures totalled \$2.2 billion, passenger visits 17.6 million and 3.2 million crew to 29 destinations generated \$1.7 billion and \$288.7 million, respectively. Average cruise passenger spending per port of call was \$97.26, and average spending per port of call by crew members was \$89.24. Cruise ship carrying 2,550 passengers and 480 crew members generates \$227,088 in passenger and crew expenditures during a single port-of-call visit.⁶⁴.

In the survey conducted for the port of Seattle, for example the key findings indicate that on average 82% of the passengers arrive via air, and about 55% spend about 1.7 nights in Seattle area hotels (both post and pre cruise). The typical cruise passenger that stays in area hotels spend about \$94 per night per person in local hotels. For those passengers making local purchases on specific items, on average each passenger spends \$13 in restaurants, \$9 on retail purchases, \$4 on local transportation and \$3 on entertainment and land-side tours. Also included in the visitor industry impacts are the impacts created by crew spending. On average, each crewmember spends an average of \$287 per call at Seattle, the majority of which is spent on restaurant and retail purchases.

Cruise tourism is growing rapidly in recent years causing various impacts on destinations. From the social and economic perspective, the interactions between the different actors of the exchange process related to cruise passengers, crew, residents, and producers of the tourism products can bring both positive and negative consequences.

The cruise ships at destination can negatively affects cross locations, which are invaded by thousands of tourists and are visited in a few hours with organized tours. But it also tends to homologue sites, making them equal to each other: local crafts is replaced by souvenir made in China, the traditional foods from international products, responding to a kind of tourism basically reduced to the "right to see".

Cruise tourism might have limited direct economic effect if provisions are purchased only in home country. In addition it can be a very seasonal business (many shops close after the cruise season). Cruise passengers boarding and/or disembarking have additional expenditure in terms of the use of air links, rail or road transport to get to their destination, as well as increased spending during the pre- and post-cruise: accommodation, catering and consumption of complementary offers.

⁶² Wendy R London, « Economic Risk in the Cruise Sector », Études caribéennes [En ligne], 18 | Avril 2011, mis en ligne le 15 avril 2011, consulté le 19 juin 2017. URL : <http://etudescaribeennes.revues.org/5134> ; DOI : 10.4000/etudescaribeennes.5134

⁶³ Economic Impact Study conducted by Business Research & Economic Advisors (BREA) – focused on Caribbean and Latin American Ports (2009)

⁶⁴ This situation differs from ports as Barcelona and other European destinations, where the number of cruise visitors is small compared with tourists or the number of residents.

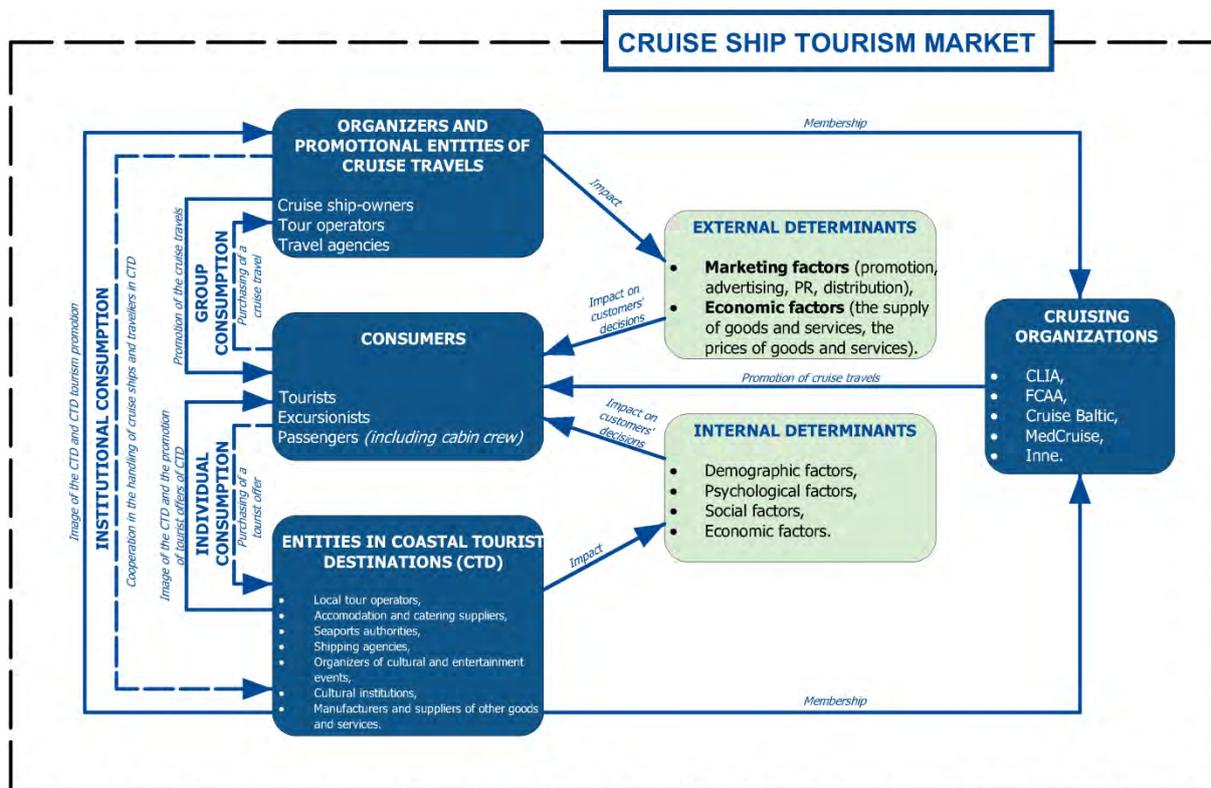


Fig. 18. The model for the development of cruise travellers' consumption in coastal tourist destinations

Recently increased attention has been focused on the social and cultural effects of tourism. Communities are constantly creating and reinventing culture in social processes and these social effects refer to the ways in which tourism contributes to changes in value systems, family relationships, individual behaviour, safety levels, moral conduct, collective lifestyles, creative expressions, traditional ceremonies, and community organisations. The level of satisfaction in a destination depends on the good experience that a tourist has in it. There are series of reactions triggered by the increasing cruise tourism. There is competition for a space in the smaller destinations, where the ratio cruise tourists per resident are large. To support, in a day, more than one mega cruiser with 6-8 thousand passengers, the overcrowding would be imminent and extremely difficult to handle. There might be scarcity of a public service such as transport. In a day with a high presence of cruise passengers, the destination provides 50 buses that bring congestion and pollution, and compete with pedestrian on the roads. Often local residents avoid the central business district while cruise ships are in port.

4.5 Port direct and indirect income

Seaports are increased business and employment opportunities (direct and indirect), GNP, land prices etc. with their developments. The economic effects of maritime tourism for both ports and city/region depend on the role of ports in the tourism services market, the quality of infrastructure and accessibility, the traffic volume and the length of the tourist season. In case of ports, revenues from port dues are undoubtedly comparable.

There is a distinction between a port of call and a port of embarkation. While a port of call is just an intermediate stop, a route to another destination, a homeport is a port where passengers begin and end their cruise, and vessels often take on supplies. Currently, competition for both port of call and homeport business is growing, with worldwide ports promoting themselves either for cruise way calls or for embarking cruise business.

In the case of ports of call, the large flow of cruise passengers can generate an outstanding economic impact on the visited port. Regarding homeports, the total impact for an embarkation port it is generally regarded as higher than that of a port of call, as cruise lines tend to purchase higher levels of goods and services from port suppliers, and passengers potentially stay overnight at local hotels.

In Baltic and Northern European ports, fees charged on the gross tonnage of ships calling at the port are similar in all ports, as are the fees for each passenger. As part of the tonnage fee, the port administration is required to provide a safe berth at the quay and to receive ship's waste.

The ports that have the highest value added levels are mainly in the Mediterranean area.

Tabl. 17. Distribution of cruise tourist spending (in thous €) in Baltic Sea and North Sea basins

Specification	Total expenditure	Total direct value added	Passengers	Crew	Ships
Total	1.872.182	821.957	1.498.980	131.233	241.969
of which:					
Baltic Sea	183.031	73.281	146.700	13.244	23.088
% share in total	9,8	8,9	3,1	10,1	9,5
...North Sea	131.132	58.910	103.520	6.760	20.852

Source: Policy Research Corporation (EU)

In addition to its direct economic impact, cruise tourism also generates an indirect economic impact. For example the intermediate purchases made by a shop owner in a cruise destination create turnover for its suppliers. This turnover leads in turn to intermediate purchases from those supplying the suppliers, payment of wages, et cetera, however it is hard to determine whether this impact is actually generated in the coastal/port regions because a shop owner may buy its goods from a supplier in another country, city or region.

Every cruise ship calling the port has to pay for docking fees, pilot services and other kinds of services, so that the per capita revenue for port- and coast services has its importance.

Public or private port owners are convinced that cruise lines should be paying for using the facilities and services in port. Sometimes the local government inspired by local residents or lobby groups are convinced that the lines should also pay on their passengers behalf for their use of the facilities and resources in the visited area. However, most cruise companies focused on the minimal cost to the destination, regard that apart from being taxed per passenger, they should in fact be paid for

bringing tourists to destinations, because the tourists will spend money, support jobs and possibly return in the future for a longer stay, providing that the first short cruise visit was satisfying. Often lowering taxes on business leads to increased investment.

An important market issue is who pays who and how much. For example in China cruise lines often are being offered some special deals or incentives. Sometimes costs are lowered at the particular season. For example Aida cruises are determined to have longer season in Northern Europe, however the port costs are much higher than in the Mediterranean, therefore in order to extend the cruise season there should be cuts in port dues of 30%. Generally Cruise Baltic ports are open for negotiation and ready for introducing lower costs for late calls in order to extend the cruise season.

According to surveys of the World Travel and Tourism Council, the average revenue per cruise trip is almost as high as the average receipts per international tourist arrivals. But the distribution of income from cruise industry is not equitable. Most ports obtain small contributions from the use of the port as a cruise destination and cruise tourism provide few real jobs and business opportunities for local residents. Cruise passengers seem to spend less than 30% of the expenditure of a land tourist. Approximately 40% of the bed days sold by the cruise industry are to Caribbean but, according to the World Travel and Tourism Council, 'the economic contribution of cruise tourism to the Caribbean economies is very low.

Moreover, most cruise ships are registered under foreign flags like Bahamas, Panama, or Liberia, thanks to that because cruise lines as foreign corporations, avoid taxation, labour laws, environmental standards, etc. Flags of convenience also restrict the rights of workers and are used to pay low wages.

As ship order books and passengers number grow, so do significant impacts at different levels: socio-cultural, economic, politic and environmental. There are not many surveys concerning the effects of cruising in destinations, particularly those related to cost-benefits analysis of the cruise industry activity. Furthermore, it is uncertain whether major players in the cruise industry (local governments, population, shore operators, etc.) are taking proactive measures to ensure a sustainable future for cruise tourism destinations⁶⁵.

Ports are quick to claim that each cruise passenger spends more than \$100 during a port call, even without any serious argument. From this they simply deduce that a cruise with 4,000 passengers and 2,000 crews generates revenues for \$6,000,000⁶⁶. This believe do not take into account that cruises today are accessible to almost everyone and that some type of cruising must be considered part of the low cost tourism. On average, cruise passengers today have even less income than those who cruised in the 1980s.⁶⁷

The substantial part of income generated by the cruise activities remains to the cruise companies, but ports have still some profits. However, they also have to face costs and problems associated with the arrivals of ships, cruise passengers and crews. This part still lacks reliable surveys.

⁶⁵ Cruise tourism: economic, socio-cultural and environmental impacts,p.207

⁶⁶ Cruise tourism: economic, socio-cultural and environmental impacts,p.207

⁶⁷ According to Florida-Caribbean Cruise Association study (1994) passengers spent on average \$89.72 per passenger per port in the Caribbean region

There is a range of vessel-related expenditures, including: port agency fees; storage; terminal charges, water; pilotage, berthing, baggage handling and stevedoring; fuel bunkering; marine engineering; dry-dock charges; waste disposal; and towage. Vessel-related expenditures in these categories tend to be higher at a home port than a port of call. In addition, vessel-related expenditure may include state and federal charges and taxes that vary according to cruise route and ports of call. Support expenditures include, inter alia, the component of shipping agent commissions and marketing expenses paid directly to operators in the port. Cruise line payments for local marketing and travel agent services are substantially higher in the ship's home port than in ports of call. In this case, economic impacts of the seaport can be classified in 4 different ways: direct impact, indirect impact, induced impact, catalytic impact.

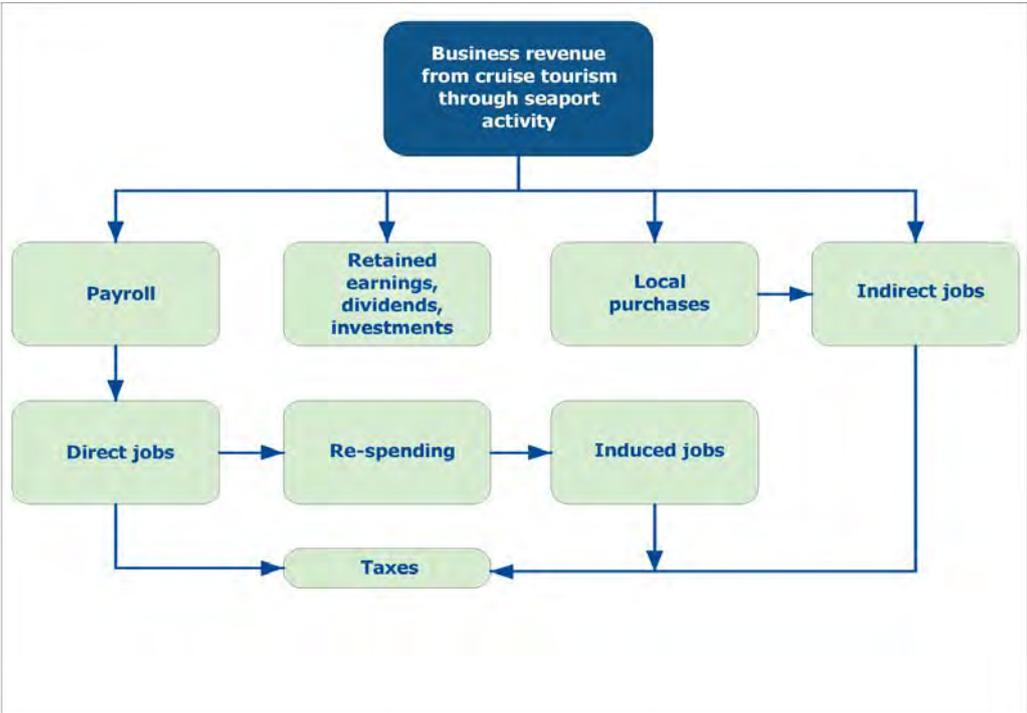


Fig. 19. Flows of Economics Impact Through the Economy⁶⁸

Source: Sibel Bayar Çağlak and others: *The Impact of Seaport Investments on Regional Economics and developments. International Journal of Business and Management Studies vol 3, no 2, 2011 issn: 1309-8047.*

Direct impact is the employment and income generated by the direct construction and operation of the port. Indirect impact is the employment and income generated by the Direct impact is the employment and income generated by the direct construction and operation of the port. Indirect impact is the employment and income generated by the chain of suppliers of goods and services, and the induced impact is the employment and income generated by the spending of incomes by employees created by the direct and indirect effects. Finally, the catalytic impact is the employment and income generated by the role of the port as a driver of productivity growth and then as an attractor of new enterprises.

⁶⁸ Sibel Bayar Çağlak and others: *The Impact of Seaport Investments on Regional Economics and developments. International Journal of Business and Management Studies vol 3, no 2, 2011 issn: 1309-8047*

The direct impact consists of the sum of initial spending by the three agents involved in cruise activity: shipping companies, cruise passengers and crew. The initial direct spending generated by shipping companies includes all goods and services needed when cruise ships dock at a port. The following expenses are included: services provided by shipping agents, services provided by the cruise terminals (luggage, safety, handling, check-in, etc.); services provided by the Port Authority of Barcelona (including taxes and port fees); nautical pilotage and the mooring and unmooring of ships - technical services waste collection and treatment; fuel supply services; food, beverages and drinking water (among other provisions); crew trips and airport charges; medical care for both crew and passengers; and services provided by travel agencies and tour operators.

The initial direct spending by cruise passengers includes spending on trips, visits to museums and other cultural and entertainment activities; accommodation (hotels, hostels and tourist apartments); expenses (restaurants and cafes); various purchases (souvenirs, clothing and footwear, etc.); the city internal transport (including transfers from the airport/train station to the port and vice versa) and airport charges. Finally, direct spending by the crew in the city includes: expenses (restaurants and cafes); various purchases (souvenirs, clothing and footwear, etc.); and internal transport around the city.

The indirect impact is the effect on other sectors of the economy, generated as a result of the goods and services required by the companies that are receiving direct expenditure. For example, for a hotel to accommodate a cruise passenger, it also needs to purchase a set of goods (such as textiles, food products, etc.) and services (cleaning, transportation, etc.). Similarly, companies mooring, and pilot boat, require a range of goods and services to carry out their activity in port based on the cruise companies. In turn, these "second order" providers require goods and services for the development of their activity and so on. Thanks to the impact of the spending by shipping companies, cruise passengers and crew, production in all sectors is increased, thereby generating a multiplier effect throughout all economic sectors.

Ship-related expenditures in an individual port are a product of the ship's needs, which tend to be greater in all categories for larger ships, but also depend on existing supply chain arrangements. Initial direct expenditure made by the crew in the city can be estimated from information provided by the port about the name of the cruise ships that dock at the port, and the technical specifications of these ships, which include, among other information, the number of crew members. Port service and supply agreements are negotiated in light of alternatives available in neighbouring ports that may be incorporated within cruise itineraries. As these itineraries are typically marketed twelve months or more in advance of departure, a ship's procurement flexibility is strictly limited in the short term. With cruise lines not keen to continually renegotiate supply contracts, ports will experience considerable pressure to retain existing business through lower prices and incentives⁶⁹.

Public or private ports need direct or indirect financial support from their local, regional and possibly even national government. The reason for that is basically the fact that some of the key payments applied on visiting cruise ships do not go to the port authority but to other public or private bodies.

⁶⁹ Economic Opportunities and Risks of Cruise Tourism in Cairns. Prepared by: Joseph (Mark) Thomas^{1*} under the supervision of Natalie Stoeckl^{1, 2} for The Australian Marine Conservation Society and WWF-Australia, April, 2015

Considering that most ports in Europe are publicly owned by quasi-governmental entities, their costs are regulated and often are not motivated by tourism issues. As a result port or tourist bodies are not authorised to decide about lowering costs. Lack of direct control by the port over the price level can cause significant changes in attracting ship calls. For example, Turkey had no cruise tourism until it came up with a fiscally creative way of attracting cruise calls⁷⁰.

Port authorities and port management organizations should evaluate the cruise ship and passenger fees to balance the total cost of port operations, services, maintenance and security appropriately. Proper analysis should be followed by mechanisms to allocate a portion of the fees collected for future restoration of historic areas and maintenance of protected areas.

The homeport cruise activity mainly affects two sectors of the destination economy, that is the maritime service sector and the tourist service sector. The maritime service sector includes the companies that provide services to the cruise ships while in port, such as: chandlers and other local retailers, and wholesalers that provide ship stores and provisions to be used by passengers and crew; towing services that assist vessels in docking and undocking; pilots, who assist the vessels navigating the channels from the open sea to the docks, stevedoring services and dockworkers including handling baggage and ship supplies; line handling services that are required when a vessel enters into the port; bunkering companies, parking services for the passengers driving from their place of residence to embark on the ship, ground transfers from the airport and hotels to the ship prior to and after the cruise trip.

The tourist services sector consists of companies providing services to the passengers and crew of the current cruises prior to and after the cruise ship. Within this category are: local hotels and motels; local taxi drivers, airports, bus or train stations, restaurants/bars; retail goods; entertainment establishments such as ground tours, movies, amusements, etc.

Every cruise ship calling the port has to pay for docking fees, pilot services and other kinds of services, so that the per capita revenue for port- and coast services has its importance.

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⁷⁰ Contribution of Cruise Tourism to the Economies of Europe 2011 Country Report United Kingdom The European Cruise Council July 2012. United Kingdom

of their activity and so on. Thanks to the impact of the spending by shipping companies, cruise passengers and crew, production in all sectors is increased, thereby generating a multiplier effect throughout all economic sectors.

Example of cruise industry income in the Port of Tallin⁷¹:

Port dues in Port of Tallin in 2017 are: tonnage charge €0,48/GT, mooring €88/114/134/per operation. Passenger fee is €1,46/passenger. There is discount for 2nd & 3rd call 35%, 4th & 5th call 55%, from 6th call 65% and special agreements for turnarounds.

In the survey 97% respondents reported that they went ashore in Tallinn. The each passenger spent an average of 5.0 hours ashore. The average length of a purchased onshore tour was 4.0 hours. About 54% of the cruise passengers that went ashore purchased a shore excursion. Passengers visiting Tallinn who purchased a tour spent an average of €93 per party or €44.90 per passenger for their tour.

Passengers reported spending another €34.90 per passenger while ashore for other goods. 70% of passengers purchased local crafts and souvenirs at an average price of €16.80 per purchase and a weighted average of €11.71 per passenger visit. Another 60% of the passengers made purchases of food and beverages with an average expenditure of €11.61 per purchase and a weighted average of €6.94 per passenger visit 25% of the passengers made purchases of clothing with an average expenditure of €25.29 per purchase and a weighted average of €6.27 per passenger visit.

The survey revealed that 56% of the crew respondents were going ashore during the current cruise call in Tallinn. Another 40% who did not go ashore during the current call did so at least once in the previous month. The typical crew member spent an average of 2.3 hours ashore. Passengers and crew spent an estimated €26.4 million during 2012

Transit passengers accounted for 95% of the total with crew accounting for the remaining 5%. Passengers and crew spent €12.1 million on tours and other ground transportation, accounting for just over 45% of their total expenditures. Passengers and crew spent another \$10 million on retail items, accounting for 38% of their total expenditures.

Specification	Total Expenditures €		
Category	Transit	Crew	Total
F&B & Entertainment	2,123,229	417,295	2,540,525
Tours & Ground Transportation	12,038,974	96,442	12,135,416
Retail Goods	9,462,026	588,541	10,050,567
Other Purchases	1,352,347	295,507	1,647,854

⁷¹ Survey ordered by City of Tallinn and conducted by TNS Emor in 2014 (www.visittallinn.ee)

Total	24,976,578	1,397,785	26,374,363
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Source: Port of Tallin

The €26.4 million in passenger and crew spending generated an estimated 177 direct jobs. The transportation sector (primarily tour operators) had the highest direct employment impact with 63 jobs. The wholesale and retail sector had the second highest direct impact with 32 jobs. The hospitality sector (primarily restaurants and entertainment venues) benefitted from 23 jobs.

The €26.4 million in passenger and crew spending generated an estimated €50.6 million in total (direct + indirect) output throughout Estonia. This output resulted in the employment of 365 residents of Estonia paying €9.07 million in compensation. Because the direct impacts account for about 45% of the total impacts, the total impacts remain concentrated in the trade and transportation sectors. However, the indirect impacts do spread into other sectors, including manufacturing, business and financial services to name a few.

Tabl. 18. Passenger and Crew Spending – 2012

Industry	Total Output € Millions	Total Employment	Total Compensation € Millions
Manufacturing	9.10	37	1.64
Wholesale & Retail Trade	6.60	106	1.77
Transportation & Utilities	21.40	89	2.88
Hospitality	2.60	29	0.63
Financial & Business Services	6.60	69	1.39
All Others	4.30	35	0.76
Total	50.60	365	9.07

Source: Port of Tallinn

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Manufacturing	9.10	37	1.64

Wholesale & Retail Trade	6.60	106	1.77
Transportation & Utilities	21.40	89	2.88
Hospitality	2.60	29	0.63
Financial & Business Services	6.60	69	1.39
All Others	4.30	35	0.76
Total	50.60	365	9.07

Source: Port of Tallin

Every €1 million in passenger and crew spending generated 14 jobs in Estonia. On average each of these jobs paid €24,800 in employee compensation. The trade, transportation and hospitality sectors accounted for about 67% of the direct impacts. The manufacturing, financial, business and personal services sectors accounted for nearly 55% of the indirect impacts. Every 10 direct jobs generated by passenger and crew spending resulted in about another 11 jobs elsewhere in the economy of Estonia.

On average, cruise passengers spend 4,2 hours in Tallinn. Average total spending per person during one day was €71. Total direct impact €25,56 million. The majority of cruise passengers spent money on souvenirs and gifts as well as food and drink. Total turnover of turnarounds was 2,3 times higher than of transit calls.

Positive spread of word of Tallinn & Estonia reported 98% of all cruise passengers – they would very likely or quite likely recommend a trip to Tallinn to their friends or acquaintances. Around 47% visitors will very likely or quite likely return for land based vacation and 52% of the crew respondents reported that they were either very or extremely likely to return to Tallinn for a land-based vacation.

4.6 Support of local businesses

Cruising is, after all, a business, it is a social phenomenon designed for generating profit. Cruise lines are considered as the most benefited with the cruise sector activity. More than 50% of land-based activities are sold on board by themselves. From the value paid by cruisers for on shore activities, the local tour operator receives between a 50% and sometimes 25% of that value. Tourism service providers have to pay if they want to appear in advertisements delivered on board (videos, brochures, etc.). There is a high cost of participation in the most important annual industry event. The range goes from \$16,500 including registration and booth⁷².

The essential benefits for the destinations where cruise ships arrive include:

- expenditures on destination: form of purchases, excursions and hotel nights in home ports
- importance and benefits for the local commerce

⁷² Compare Miami annual event for tourism

- desire to at least 50% of total passengers arrived to return by other means of transport in ports (expenditures, investments in terminals and basic element in the policies of the city).

In addition to the direct economic effects of offshore tourism, cruise industry also generates indirect effects. Particularly important is creation of tourists' interest and making them visit the city and region again, but for a longer stay instead of just a few hours during the cruise. According to the assessment of tour operators this happens even in relation to over 50% of passengers (e.g. in case of Gdansk). Clearly, it results in the much higher income for the local economy.

The total price of a cruise is not just the ticket price and some government fees. While accommodations, most meals and tons of activities are included in the cruise fare, one has to pay extra for many of tempting amenities and activities, like spa treatments, shore excursions and cocktails. It can be tricky to figure out what total cruise trip cost will be and what kind of extra charges to anticipate.

The figure below illustrates the circulation of spending within the region

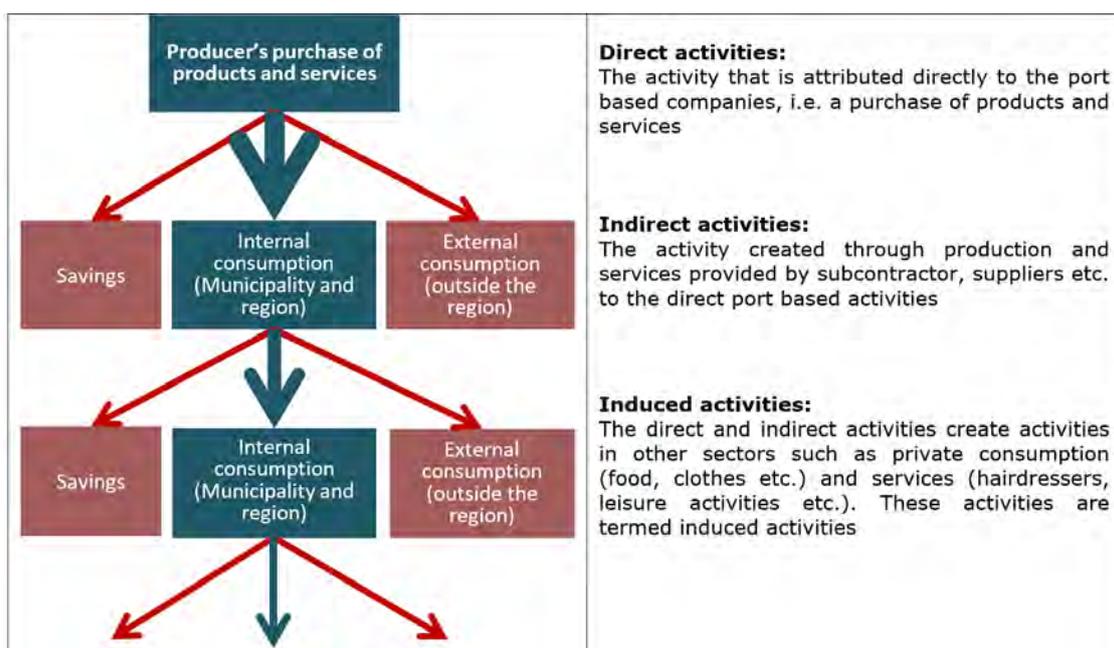


Fig. 20. The circulation of spending within the region

The tourist services sector consists of companies providing services to the passengers and crew of the current cruises prior to and after the cruise ship. Within this category are: local hotels and motels; local taxi drivers, airports, bus or train stations, restaurants/bars; retail goods; entertainment establishments such as ground tours, movies, amusements, etc.

The table below shows an example of a breakdown of the estimated 2015 average cruise revenue and expense per passenger for all cruise lines worldwide. The average per passenger per day is projected to be \$222.00, with \$168.43 ticket price and \$53.57 on board spending (average cruise duration 8 days, median duration 7 days).

Tabl. 19. Financial breakdown of typical cruiser (worldwide, across all cruise lines)

REVENUE \$		EXPENSES		
		\$		%
Ticket	1,350	Other operating costs	258	14.5
Onboard Spending	429	Agent commission	231	13.0
-Casino & Bar	236	Ship fuel costs	192	10.8
-Shore excursions (cruise line portion)	86	Corporate Operating Costs	206	11.6
-Spa	43	Payroll	196	11.0
-All other onboard spending	64	Depreciation/Amortization	171	9.6
Total spending	1,779	Victualing (food)	107	6.0
		Onboard and other	78	4.4
		Other and transportation	59	3.3
		Interest Expense	55	3.1
		Total Expenses	1,553	
		Profit before taxes	226	12.7

Sources: Royal Caribbean Cruises, Ltd., Carnival Corporation and plc, NCL Corporation Ltd., Cruise Lines International Association (CLIA), The Florida-Caribbean Cruise Association (FCCA) and DVB Bank.

Activity at the seaport generates business revenue for enterprises providing services. This business revenue impact is dispersed throughout the economy in several ways. It is used to hire people to provide the services, to purchase goods and other services, to pay for the use of airports and seaports and to make federal, state and local tax payments. The remainder is used to pay stockholders, retire debt, make investments or is held as retained earnings. It is to be emphasized that the only portions of the revenue impact that can be definitely identified as remaining in the region are those paid out in salaries to region's employees, for local purchases by individuals and businesses directly dependent on the seaport and airport, and in contributions to state and local taxes, as well as regional taxes. Landing fees and terminal rentals paid by airlines provide for some of the costs of operation of the airport and capital costs of new construction, while terminal leases pay to the Port Authority by terminal operators; wharfage and dockage fees paid by the steamship lines and cruise lines; and revenue from real estate leases, generate revenue to the Port Authority.

Cruise ships and the tourists on board stimulate economic activity. Some economic effects are direct, like purchase of fuel, water, payment for berthing, port fees etc. However most of the economic impact is connected with tourists and their activities. The regional economic impact of cruise related expenditures is influenced by several factors. Passenger spend depends heavily on whether the port

serves as a home port or port of call, the amount of time a ship spends in port, personal preferences passengers and income, as well as the duration and arrangements of the cruise itinerary.

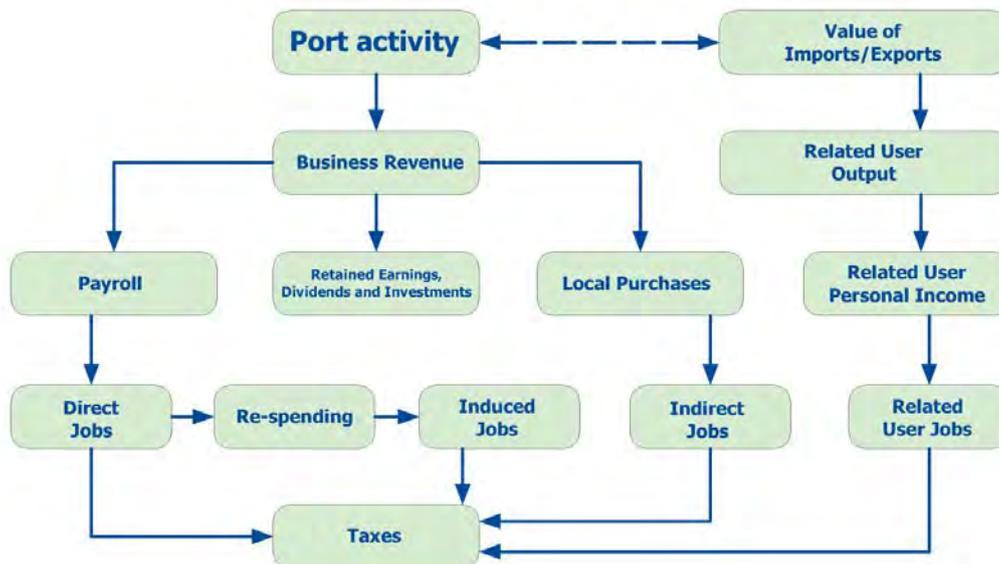


Fig. 21. Flow of Economic Impacts Generated by port cruise activity

Source: *The 2013 economic impact of the Port of Seattle*. Prepared by: Martin Associates, www.martinassoc.net, 2014

The size of the destination influences the intensity of economics effects of the cruise activity. A cruise ship represents all four segments of the tourism industry: transportation, accommodation (including food and beverages), attractions and tour operators. In this sense, cruise ships are also direct competitors of the major land based resorts. The season peaks of cruise tourism and other form of tourism occurs at the same time putting cruise passengers in direct competition with other tourists for the same touristic services. In taking people to various destinations the cruise ships are a substitute for air travel. As floating hotels, they offer accommodation services. More and more, cruise ships features as resorts and a substantial minority of cruise ship passengers do not even disembark in the different port destination that are visited.

There is a diversification of the business impact of cruise passengers in a wide range of economic sectors not directly related to tourism. Sectors with higher indirect and induced impact were not only tourism sectors (as with direct expenditure) but also include other sectors such as real estate, wholesale trade, construction, legal activities and the manufacture of food products. The importance of cruise activity is therefore noted as a new source of economic activity in areas that are not strictly tourist sectors.

Supporting local businesses not directly related to maritime affairs is similar to support by land tourism but on a much smaller scale. Revenue can be generated in such areas of economy as: gastronomy, transport, shipyards, shops, insurance, banks, galleries, cultural attractions, guides, construction industry, construction of facilities, renovation of the wharfs.

Cruise visits have considerable potential as a source of economic development for coastal communities. However, as with various development initiatives, cruise tourism brings both

potentially positive and negative impacts. Therefore coastal communities interested in regular cruise visits should take into consideration a number of factors. Due to the nature of the cruise tourism, particularly for smaller communities, cruise ships visits with many passengers may stimulate or require considerable change, which may involve the entire destination and its communities⁷³. “All stakeholders need to become involved early in the process, to ensure that all the values and concerns are addressed, and to delineate the negotiation position to be taken in dealing with cruise lines and other partners”⁷⁴.

“The regional economic impact of tourism expenditure is generally greater than the direct spend of tourists. If a visitor spends money that has been earned outside the region at a local grocery store (say \$100 – often termed the direct expenditure), the store-owner (and hence the region) earns an extra \$100 in income. The owner of the store may put aside some money for savings/profit (say \$10) and for taxation (say \$20). He/she may also spend money importing stock from overseas (say \$30), and may spend the rest on fresh produce from the local gardener (say \$40 – often termed indirect or knock-on expenditure). So the gardener (and hence the region) earns an extra \$40 in income. The economic impact of the tourist expenditure is thus greater than just the \$100 spent: it is equal to the \$100 earned by the grocer, plus the \$40 earned by the gardener – and if the gardener spends more locally, then the impact will be larger still”⁷⁵. The ‘multiplier’ effect indicates how tourist spending generates extra regional benefit.

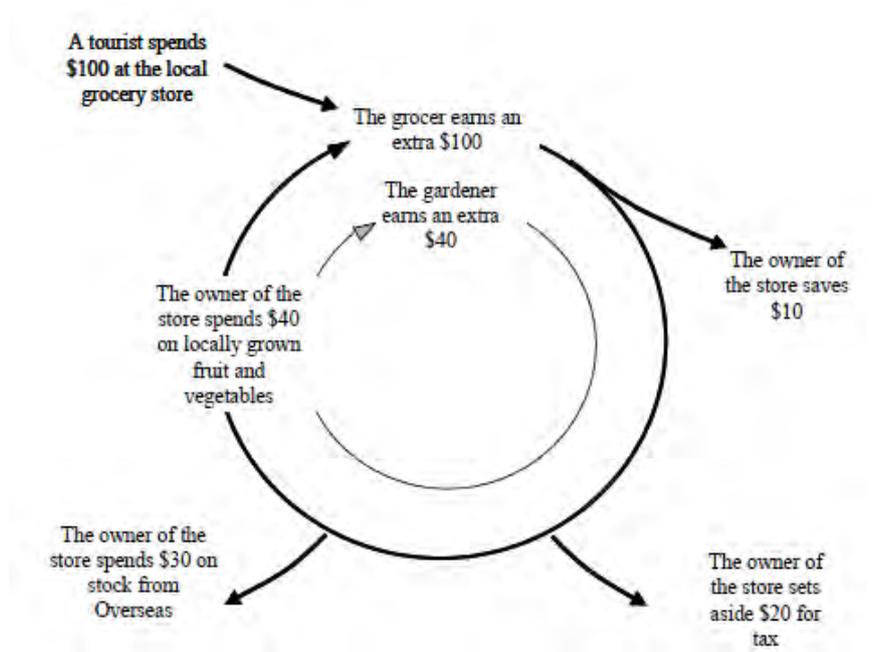


Fig. 22. The “multiplier effect: how tourist spending generates extra regional benefit

⁷³ Managing Cruise Ship Impacts: Guidelines for Current and Potential Destination Communities A Backgrounder for Prospective Destination Communities by Ted Manning, President Tourisk Inc. 2006

⁷⁴ Managing Cruise Ship Impacts: Guidelines for Current and Potential Destination Communities A Backgrounder for Prospective Destination Communities by Ted Manning, President Tourisk Inc. 2006

⁷⁵ Economic Opportunities and Risks of Cruise Tourism in Cairns. Prepared by: Joseph (Mark) Thomas1* under the supervision of Natalie Stoeckl1, 2 for The Australian Marine Conservation Society and WWF-Australia, April, 2015

Source: Economic Opportunities and Risks of Cruise Tourism in Cairns. Prepared by: Joseph (Mark) Thomas under the supervision of Natalie Stoeckl for The Australian Marine Conservation Society and WWF-Australia, April, 2015

The size of various multipliers in the region depends upon the industrial mix of the local economy, its interactions with business and the industry/sector of interest. Revenues generated by the sale of traditional crafts to ship passengers would bear a relatively high multiplier, as substantial amount of such items value-added is locally produced. Heavy fuel oil for ships, on the other hand, is typically imported from outside the regional economy. Since value-added of this product is mostly generated elsewhere, less of its sale flows through the local economy⁷⁶.

Fuel, food stuffs and consumer goods for sale on a cruise ship each require their own particular supply chain infrastructure. Thus the ability of a port city to benefit from a cruise ship's demand for goods and services depends on its local industrial capacities. Furthermore multipliers tend to be lesser in rural/regional economies than in urban centres, mainly because there are fewer opportunities for people to spend money on local goods and services.

In order to attract ships and their passengers, however, destinations has to maintain good relationship with cruise line management responsible for choosing the ports of call and services. The effort of attracting cruise ships may often be hampered by a lack of information and the consequent lack of understanding by the cruise lines of the destination. If the share of the destination in the global cruise market is rather modest, the cruise lines are unlikely to invest substantial sums to recognise and familiarise themselves with such destinations. However, in reality the priority of the cruise line is these efforts must be counterbalanced against the reality that the cruise line's first priorities are to sell its ships and encourage passengers to spend money onboard.

The economic impact of cruise activity is not limited to the initial expenditure estimate. In case of the city and surrounding areas, cruise passengers generate similar revenues as other type of tourists. This particularly applies to the traditional activities associated with exploring local attractions, which necessitates transportation, guides, information, bars and restaurants, etc. However, there are no typical hotel services as accommodation and full meals are provided on board. In this case, no tax revenue is paid to the city budget.

The investigation conducted in the port of Bergen (a total of 1891 tourists to Western Norway during the summer of 2010 filled in a questionnaire) covering various aspects of holiday making and tourism revealed that, cruise passengers stayed for considerably shorter time at the destination than other tourists. Typically they stayed about 9 hours. Only 9.6% of cruise passengers stayed for more than 24 hours. Cruise passengers on the average reported that they spend NOK 493 (€66) on the day they filled in the questionnaire.

Among the most widely encountered head taxes in travel and tourism are entry and departure taxes employed by many countries to generate revenue from international tourism. Economic analyses of tourist taxes have focused largely on the hotel occupancy tax and daily car rental tax. There is no homogeneity on the application of taxes to cruises. Some ports maintain reasonable fees. The ports

⁷⁶ Economic Opportunities and Risks of Cruise Tourism in Cairns. Prepared by: Joseph (Mark) Thomas^{1*} under the supervision of Natalie Stoeckl^{1, 2} for The Australian Marine Conservation Society and WWF-Australia, April, 2015

and communities that receive cruise tourism are confronted with a series of hidden costs not normally take into account when making concessions in order to attract cruises. Between these costs are:

- depreciation of the port infrastructure, the buses, taxis, public toilets
- cost of ensuring transport and public security in the destination
- emergency medical services
- cost of enhancing streets and attractions
- cleaning and trash collection
- costs of cancelling or changing itineraries for a port
- damage in the long term of marine life and the cost to preserve the destination's tourism inventories.

However, currently, many of these home ports and ports of calls do not have an income that enables them to cope with the mentioned costs.

In ports with lesser cruise traffic, larger investments in handling ships and passengers are not anticipated. Nevertheless, the use of existing berths by cruise ships provides a source of additional revenue for the port by making better use of existing infrastructure, especially the berth providing the necessary potential for a better competitive position.

Turnaround ports, where the embarkation and disembarkation of passengers takes place, have a substantially larger share in influencing the port and regional economy, since the range of provided services is much wider than the ports of call where cruisers spend just a few hours.

Expenditures of cruise crews are very limited as short stopovers at ports do not reduce the scope of work and sometimes in addition to routine duties. Often it even requires additional involvement in cleaning, repairs and incidental work.

Cruise operators may choose different forms of organization of sightseeing programs in the ports of call. With the increased volume of cruise traffic at the port and the longer tourist season, cruise operators usually run their own travel agencies in the destination areas, or cooperate with local travel agencies to carry out orders for the organization of passengers' time. In Poland, for example, the main tour operator serving cruise ships is Baltic Gateway Poland, followed by Sport Tourist and Mazurkas Travel. Besides exploring historic sites, also shopping including souvenirs, regional products, works of art, etc. is an important element of the program.

For some destinations, the investment stimulated by cruise and other visitors can help to create critical mass for some services, for example enhancing such elements as public safety, range of shops, and availability of health services⁷⁷. However cruise tourism in Northern Europe is seasonal and some services will close in the off season, reducing both access to services and employment in the off season.

⁷⁷ Cruises, Seas and Ports of Call. Sailing toward sustainability. Managing the Impacts of Cruise Tourism, 2012. By Dr. Ted Manning, President Tourisk Inc. September 2012

Cruise activity has a very remarkable multiplier impact on the regional economy. For example, from an initial direct expenditure of €442.5 million, cruise activity in Port of Barcelona ultimately generated a total turnover of €796 million (over €2.2 million a day and a multiplier of 1.8) in Catalonia, a contribution to the GDP of €413.2 million (of which €197.6 million were income wages), a total of 6,759 full-time equivalent jobs and 152 M € of tax revenue. In this sense, the high proportion of cruise passengers who use Barcelona as the base port for their cruise and its profile as a quality tourist port (after finding the highest relative expenditure of cruise visitors compared to holidaying tourists in the city of Barcelona) are shown as relevant factors when explaining the magnitude of the effect. All sectors, not just the traditional tourism-related sectors, profit from cruise activity. Proof of this is that, of the 6,759 jobs created in total, more than 40% (2,764) were concentrated in non-tourism sectors⁷⁸.

Many cruise lines promote shopping excursions arranged by concessionaires. Ports may encourage and facilitate retail shopping excursions by reimbursing berthing fees, and participating retailers typically pay the cruise line fees. A cruise ticket is typically inclusive of all meals, so disembarking passengers tend to spend much less in local restaurants than land-based tourists. However, passengers do accumulate some spending on food and beverages during their stay. The arrival of a cruise ship can also be beneficial to taxi drivers, who experience a temporary jump in demand among passengers en route to activities throughout the city⁷⁹.

Considering the sectoral breakdown, the benefits of activity not only affect the sectors commonly considered tourist-related, but extend throughout the economy. There is also catalytic activity of cruises in the development of other means of transport, especially air traffic. The importance of home port increases as many cruise passengers boarding or disembarking at the port use aircraft as a means of transportation to or from the port and this is crucial in the creation and maintenance of international routes that have their origin or destination in the airport at destination. Cruise traffic has therefore become a catalyst, especially for intercontinental routes (ex. Lufthansa or American Airlines).

The 1.77 million passengers sourced from Germany generated a total of €3.11 billion in gross cruise revenues across all cruise brands. Gross cruise revenues include the ticket revenues of the cruises, onboard revenues and the cost of transportation of passengers between their place of residence and the cruise port of embarkation and disembarkation. The transportation costs are predominantly collected by European-based cruise lines and are included in ticket revenues. Subtracting these transportation costs (€400 million), net cruise revenues of the German national and international brands totaled €2.71 billion in 2014. Average net revenues per German passenger was €1,530 in 2014. Net revenues are defined as gross revenues minus the passenger transportation costs. In general, net revenues are about 15% lower than gross revenues for the German national brands and 5% lower than gross revenues for the international brands.

⁷⁸ Barcelona 8. Murillo, J., Vayá, E., Romani, J., and Suriñach, J.: How important to a city are tourists and daytrippers? The economic impact of tourism on the city of Barcelona. *Tourism Economics* 2013, 19(4), 897-917.

⁷⁹ Economic Opportunities and Risks of Cruise Tourism in Cairns. Prepared by: Joseph (Mark) Thomas under the supervision of Natalie Stoeckl, 2 for The Australian Marine Conservation Society and WWF-Australia, April, 2015

Cruise revenues generated by passengers sourced from Germany in 2014 (€billion) were as follow:

	Gross revenue	Net revenue
Total	3.11	2.71
German national cruise brands	2.33	1.97
International cruise brands	0.78	0.74

On a per passenger cruise night basis, net cruise revenues generated by passengers sourced from Germany averaged €173.37 in 2014. The German national brands generated an average of €184.93, which was 25% more than the average for international brands of €148.48.

Net revenue per passenger in German cruise sector in 2014 was as follow:

All cruise brands	€ 1,530
German national cruise brands	€ 1,670
International cruise brands	€ 1,248

The cruise industry employed nearly 5,800 German residents in their administrative offices and onboard their cruise ships. The German national brands employed the majority, totalling 78% of the cruise industry's German based employees. The German national brands employed 86% (1,373) employees, of the total landside employment and 75% (3,127) of the total crew.

Tabl. 20. German Employees of Cruise Lines, 2014

Specification	Total	Landside	Crew
All cruise brands	5,796	1,599	4,197
German national cruise brands	4,500	1,373	3,127
International cruise brands	1,296	226	1,070

Source: CLIA Germany and BREA

Public or private port owners are convinced that cruise lines should be paying for using the facilities and services in port. Sometimes the local government inspired by local residents or lobby groups are convinced that the lines should also pay on their passengers behalf for their use of the facilities and resources in the visited area. However, most cruise companies focused on the minimal cost to the destination, regard that apart from being taxed per passenger, they should in fact be paid for bringing tourists to destinations, because the tourists will spend money, support jobs and possibly return in the future for a longer stay, providing that the first short cruise visit was satisfying. Often lowering taxes on business leads to increased investment.

An important market issue is who pays who and how much. For example in China cruise lines often are being offered some special deals or incentives. Sometimes costs are lowered at the particular season. For example Aida cruises are determined to have longer season in Northern Europe, however the port costs are much higher than in the Mediterranean, therefore in order extend the cruise

season there should be cuts in port dues of 30%. Generally Cruise Baltic ports are open for negotiation and ready for introducing lower costs for late calls in order to extend the cruise season.

Public or private ports need direct or indirect financial support from their local, regional and possibly even national government. The reason for that is basically the fact that some of the key payments applied on visiting cruise ships do not go to the port authority but to other public or private bodies. Considering that most ports in Europe are publicly owned by quasi-governmental entities, their costs are regulated and often are not motivated by tourism issues. As a result port or tourist bodies are not authorised to decide about lowering costs. Lack of direct control by the port over the price level can cause significant changes in attracting ship calls. For example, Turkey had no cruise tourism until it came up with a fiscally creative way of attracting cruise calls⁸⁰.

Port authorities and port management organizations should evaluate the cruise ship and passenger fees to balance the total cost of port operations, services, maintenance and security appropriately. Proper analysis should be followed by mechanisms to allocate a portion of the fees collected for future restoration of historic areas and maintenance of protected areas.

In order to quantify the economic impact of cruise activity, the traditional methodology is broadly used in impact studies based on the quantification of three types of effects: direct impact, indirect impact and induced impact.

⁸⁰ Contribution of Cruise Tourism to the Economies of Europe 2011 Country Report United Kingdom The European Cruise Council July 2012. United Kingdom

5 Role of ports in generating business opportunities and mitigating pollution

Cruise ports play significant role in generating business opportunities and in protection of the marine environment and in avoidance pollution from ships by providing adequate port reception facilities and suitable quayside energy infrastructure.

Fierce competition among cruise ports is forcing the terminals to continuous improvement of their productivity. In some ways productivity is measured by the same standard in cruise ports as in cargo ports. It is concentrated on the question how effectively the port/terminal can move passenger/tourists in and out of the terminal. The port's success depends on its ability to get cruise ships in and out of port within eight hours or so. The disembarking of, for example 3,000 or more passengers and then checking in the same number for the next excursion, all within eight hours, is all about the infrastructure that is there at the port. The cruise port has to keep up with the needs of the cruise market. Otherwise it will not attract cruise lines as a port of call. Port has to work very closely with the cruise line in order to manage.

Cruise activity acts as a clear catalyst that contributes to increasing investment in port infrastructure, revitalizing existing businesses and creating new activities. Often the significant growth of the cruise segment leads to the implementation of significant investments in port infrastructure, both in adapting the existing terminals and creating new ones dedicated exclusively to cruise ships, like in the case of Port of Hamburg or the Port of Barcelona. There are also business and attractions that are offered during the stays of cruise passengers in the city. Moreover, the relevance as a base port, not only as a port of call, generates a clear driving factor, that leads various shipping companies and other in the sector, locating their headquarters in the city (e.g. Aida or Carnival and Royal Caribbean).

When tourists arrive in large numbers they inevitably place stresses on the destination. They can overwhelm infrastructure if there has been insufficient planning. They also have positive or negative impact on the society, economy and environment of a destination. The average cruise ship now exceeds 2000 passengers and 1000 crew. There should be appropriate planning for handling more cruisers. Facilities to accommodate only one ship are likely to be insufficient on a day that three arrive at once and will require adequate berths, taxis, buses, seats in restaurants, toilet facilities, trained guides, parking places etc.

Several studies have detected a variety of effects from cruise tourism, both quantitative and qualitative, on the cities where ports are located and their surrounding environment. First of all, the improvement of the external image of the city: satisfied visitors describe positive experiences to their relatives, friends and acquaintances, and recommend it as a tourist destination. In the case of cruise passengers calling at the city, since the duration of their visit is limited (a few hours) if the visit was enjoyable, they are likely to decide to make a longer visit in the future.

There are several potential benefits of cruise tourism for a port. Possibly, this is the reason why destinations may be interested in being part of the selected group of ports chosen by major cruise lines. A similar argument is raised by policy makers to justify substantial spending for building new cruise ship terminals and expanding their infrastructure. However, there are also negative aspects linked to cruise tourism, such as: the cost of infrastructure in support of cruise tourism, including

docking facilities, displacing or replacing shipping and cargo handling facilities, the cost of ensuring transport and public security in the destination, emergency medical services, enhancing streets and attractions; the cost of cancelling or changing itineraries for a port; and, in the long term, the damage to marine life and the cost of preserving the destination's tourism inventories⁸¹.

There is an increasing cost-base in cruise sector due to stricter security standards and regulations imposed by governments and international regulatory bodies (ISPS code) and rising insurance costs. Those cost-related issues are expected to increase along with ship sizes and growing number of passengers.

It is important to distinguish between hotel operations onboard a cruise ship and cruise operating. Cruise operating has a wider scope, involving the management of both land- and ship-based resources. Managing a cruise fleet is fundamentally different from managing a hotel department onboard a cruise ship. The structure of cruise tourism for supplying the travel to the destination and overnight accommodation differs from other types of tourism. Cruise ships generate rather low profitability in inbound passenger transport. Airlines arriving to destinations may be foreign owned or they do not stream their passenger revenues into the local economy.

Homeports act mainly as goods and services suppliers to vessels and their crew, and to passengers. In homeports often cruise business has a direct impact on almost every segment of the travel industry. These impacts are generated by the spending made by the ship and its crew, as well as by embarking and disembarking passengers who stay in port town for either one or two nights before or after their cruise trip.

Multiplier effect and leakage are common concepts in tourism. The tourism multiplier effect describes the circulation of tourism revenue within a local economy. Cruise lines might develop their own port reception facilities in order to have more influence and control on the retail outlets allowed to operate within the facilities and may give preference to their international partners over local business. When cruise lines are allowed to bring their own support services and ground handlers to destinations, those entities then compete for other businesses in addition to cruise passengers and have guaranteed revenue from ships.

When cruise lines operate their own tendering services and shore excursions, the operation's revenues may stay within their parent company or global partners. They also have stronger position in negotiating visitor entrance fees and food and beverage outlets. Furthermore, the scale of visitation from cruise passengers may maximize capacity and displace other visitors who would have paid a higher fee for products or services. These aspects cause a low tourism multiplier effect and increased economic leakage, which is unfavourable to the destination. In a common example, a tour operator will purchase services from a local ground handler, who will in turn hire bus companies to provide transportation for an excursion. The transportation company will purchase and maintain vehicles, utilizing the services of local mechanics and auto repair shops for service and repair. The auto shop will purchase spare parts from its vendors and so on.

⁸¹ Juan Gabriel Brida a,*, Manuela Pulina b, Eugenia Riaño a,c, Sandra Zapata-Aguirre Cruise passengers' experience embarking in a Caribbean home port. The case study of Cartagena de Indias. *Ocean & Coastal Management* 55 (2012) 135e145

When cruise passengers arrive to a destination within a highly controlled environment on a package tour spending within the destination is vulnerable to significant leakage. Large and mega cruise ships are nowadays increasingly vertically integrated and cruise passengers may shop, dine and purchase excursions while on board the cruise ship rather than at port. Leakage occurs when the local revenues generated from tourism are received by foreign entities or are sent outside the local (or national, depending on the evaluation boundary) economy and those benefits remain outside the destination. When local businesses are owned by a foreign entity and not by a foreign national residing within and have registered the businesses within that community, the predisposition for leakage increases.

However, cruise tourism spending may remain within the local economy, but it does not benefit the communities impacted by cruise tourism, especially indigenous groups or other community constituents, when subject to decisions of local authorities who may use benefit from tourism for other interests and lack transparency in its distribution.

The approach of port of Helsinki towards the environmental impact issues can be a good example of best practice. The port administration is taking responsibility for minimising the harmful environmental impacts of port and maritime operations⁸².

The air emissions of the Port of Helsinki are relatively small, compared to other sources. One of the Helsinki movable air quality monitoring stations is located within the Port of Helsinki area every other year⁸³. When a moored vessel is connected to shore electricity, the need to use auxiliary engines is reduced.

Vessels can discharge their waste waters directly into the sewage system for no additional charge at all Port of Helsinki quays. The Port of Helsinki's price incentive is working: in 2016 almost 90% of international cruise ships discharged their waste water. An increasing number of vessels are discharging their waste water to be processed on shore. In 2016 nearly 90% of international cruise ships discharged waste water at the Port of Helsinki's quays.

The Port of Helsinki provides waste management services primarily for international cruise ships and some cargo vessels. All Port of Helsinki harbours (South Harbour, West Harbour, Vuosaari Harbour) have their own waste management plans. Each of the Port of Helsinki's quays is equipped to allow for direct discharge of waste water into the sewer network, from where it is transported directly to HSY for processing. A separate charge is not levied for discharging waste waters.

The vessel waste management charges in the Port of Helsinki's are based on the size of the vessel, rather than on whether the vessel is discharging waste at the harbour or not. The port does not charge separately for discharging of waste water, and in 2016 also implemented a price incentive of a 20% discount on solid and oily waste charges if waste water is also discharged at the harbour.⁸⁴

⁸²<http://www.portofhelsinki.fi/en/port-helsinki/environmental-responsibility/management-environmental-impacts>

⁸³ HSY - Helsinki Region Environmental Services Authority

⁸⁴ Finnish Transport Safety Agency, Trafi.

In the case of the port of Rostock for the disposal of oily residues from the engine area and of residues from exhaust gas cleaning which are covered by the flat-rate fee the collective total of all such waste types per port call amounts to 7.5 m³ for ship over 20,000 GRT. Oily residues the cargo area are to be disposed of through the waste disposal companies bound by contract to the port operator and shall be invoiced separately by Rostock Port Development Company. Costs exceeding the standard disposal (e.g. larger amounts, insufficient pumping capacity, waiting times, empty runs) shall be charged to the ship by Rostock Port Development Company. Removal of such wastes takes place by a tank truck. Any additional costs incurred through non-compliance with this stipulation may be charged to the ship's command. The pumping is to be done by the ship.

Port authorities and managers must carefully calculate fees to cover the expenses of port operations, services, maintenance, and security such a way that the cruise ships are not overcharged. It is also important to include the costs of local infrastructure to accommodate cruise passengers. Cruise lines can work out deals with regional, national or higher level governments to generate profit, even when the local community does not. However, a tourist tax can provide revenue for sustainable management investments.

6 Required standards and best practices in the cruise industry development

6.1 Factors determining cruise sector development

The global demand for cruises is likely to see further growth given the increasing level of cruise participation of customers from various age groups, background and regions. While large hub ports have the capacity to accommodate additional port calls, it is the smaller 'exotic' or 'must see' ports that cruisers are seeking to visit that present challenges for additional capacity.

The main impact on cruise sector development and on cruise port investments can be attributed to:

- Economic changes – cruise industry increased substantially, thanks to economic growth, growing importance of logistics to organize complex services,
- Technical changes - growth in ship size to better achieve economies of scale has been a prevalent technical change, required dedicated port terminal facilities, pressures on ports to upgrade and improve their facilities.
- Organizational changes – cruise industry is increasingly controlled by large cruise operators, port and city cooperation.

There is the challenge posed by new technologies particularly by the impact and potential of technology advancements related to energy efficiency, propulsion, hull-construction, safety and security technology and employee productivity (information and communication technologies). Also the growth of the cruise growth is constrained due to limitation in cruise ship supply. Over the last decade, the concentration in the cruise-ship building industry has been observed. At the same time the backlog of ship orders and the time required to produce and deliver a new vessel ultimately imply planning risks for cruise operators.

The cruise port main characteristics criteria can be related to the site (natural port characteristics, port efficiency, port management, port infrastructure, port services to passengers, port services to cruise ships, cost of port services, city amenities, political conditions and regulation framework) or to the situation (sea connections, land/air connections, proximity of markets for cruise passengers and regional attractions). The main influencing factors for cruise port selection include the key natural and cultural assets of the port, port facilities, location access to other destinations and the home port, security, infrastructure (vehicles, well-trained guides and coordinators, etc.), provisioning (local supply of food, drink, and clean water), port costs (dockage fees, etc.), and marketing (the variety of itineraries available for passenger selecting)⁸⁵.

⁸⁵ Ying Wang a,1, Kyung-Ae Jung a,1, Gi-Tae Yeo a,*, Chien-Chang Chou Selecting a cruise port of call location using the fuzzy-AHP method:A case study in East Asia. *Tourism Management* 42 (2014), pp 262-270



Fig. 23. Trends and opportunities for cruise ports

Source: Economic and Law Dept. Maritime Institute in Gdansk

The operation of cruise ships within a destination depends largely on government regulation which should be consistent and fair to all stakeholders and should not impose any extraordinary costs for compliance. Regulation which is obscure, inconsistent or fragmented can pose a significant risk to the smooth operation of a cruise ship as well as lead to added costs for compliance.

Berth availability and the capacity of small communities to accommodate large tourist influxes of short duration is a serious issue. This is likely to boost the additional involvement of the cruise industry in terminal operations.

Cruise ports of call should provide local and regional land-based attractions, such as cultural and nature attractions, shore excursions, traditional native activities, and so on for passengers to experience and enjoy. These experiences should not be available onboard determined that cruise passengers prefer to stay longer at ports and to limit the number of ports they will visit.

Cruise ports should provide cruise vessels with basic supplies (water, food, and fuel), waste handling and repair services, passenger shore facilities (shops and foreign exchange bureaus), and tourism information offices. In the hybrid and combination cruise industry, relative laws, policies, etc. should be initiated as a cooperative exercise between government and stakeholders so that the regulations could be more efficient and reflect the overall needs of operators and passengers. Passenger

shipping legislation and taxation are key factors for cruise lines, as are maritime law and policy, relaxed visa requirements, reasonable head tax and port charges, and expedited clearance procedures at ports.

In Northern Europe, due to climatic conditions, the cruise season usually lasts from May to September. Marketing operations in less frequented ports of call usually involve local tour operators. Cruisers' stay in the transit ports usually takes 8-12 hours, although in Poland and some less frequented ports this time takes just 6-8 hours. The choice of both the port and the customized offers of sightseeing and touristic attractions is influenced by the attractiveness of the region, quality of the provided services and the duration of the stay in the port. The final decision about place of cruise calls is taken by shipowner after taking into account such factors as the state of port facilities for cruise service, port fees, port distance from main cruise routes plus quality vessel maintenance services⁸⁶.

The geography of cruise and commercial ports is completely different in terms of the dominant ports and the regions being serviced. A cruise involves two travel segments, the first being travel to the hub port (with a return trip) and the second is the cruise itself. It is therefore important that the hub port is accessible to a large customer market, i.e. by a well-connected airport, with significant airlift capacity and which represents in itself a touristic destination. This is the case for example Barcelona and Civitavecchia are major hub ports for the Mediterranean and Hamburg or Copenhagen for the Baltic, which are well serviced by air transportation.

Poorly connected airports are commonly associated with higher airfares. There are a number of customer benefits linked to having more cruise embarkation points available such as drive-to convenience and fewer airport burden. More "close to home" ports also increase the likelihood of cruising⁸⁷.

The port is primarily a working area and looks as such. It should, however, be clean and free from dangers for walking passengers. Infrastructural limits can be changed by investment. Minor modifications are rather inexpensive and can be financed through port fees and taxes, but large projects can result in overdevelopment and lost investment. Destinations need to consider whether they have sufficient assurance that the port or attraction will continue to attract visitors over a period long enough to justify the investment.

6.2 Infrastructure at destination

Integrated approach between cruise industry, ports and coastal tourism stakeholders for cruise tourism at local, regional, national and European level is needed. The main solutions for common challenges might be found through provision of adequate services and facilities in ports, carrying capacity of destinations, connections from ports to touristic centres, coordinated implementation of legislation. Seaports are a business and employment opportunities (direct and indirect), hence the

⁸⁶ Kizielewicz J.: Attractiveness of the region of Gdask Coast in the light of research on cruise ship passengers. Research Papers o Wroclaw University of Economics. ISSN 1899-3192, p.152

⁸⁷ Jean-Paul Rodrigue a,1, Theo Notteboom b,* The geography of cruises: Itineraries, not destinations Applied Geography. journal homepage: www.elsevier.com/locate/apgeog. J.-P. Rodrigue, T. Notteboom / Applied Geography 38 (2013) 31e42

improvements of seaports is important. For this reason port's investment is a key issue in modern ports economics with respect to planning to port development, financing and assessing to return on investment.⁸⁸

Cruise ships introduce a significant economic impact into port areas. A ship spends money on port and handling fees and it brings in large groups of tourists that visit the area around the port and its cultural or historical attractions. The growth rates and related economic impact recorded in the past decade have tempted many policy makers, from the local to the European level, to attract this industry to their ports. With ships becoming larger and carrying more passengers, attracting an average cruise ship can boost local shop sales, tour sales and other businesses. However, attracting cruise ships also comes with costs attached, as it is necessary to provide a berth (quay), security (ISPS), transport facilities (parking areas for coaches, trains, etc.) and (dis)embarking facilities (terminal) for those ports that want to become a turnaround port. These facilities may require substantial investments by port authorities.⁸⁹

The increasing size of ships and the increasing number of visitors causing overcrowding effect, are posing significant demands on the infrastructure of the ports and surrounding resorts. Such demands are associated with significant economic, social, and environmental implications.

The key short-term challenge is to be able to accommodate the rapid growth in the cruise line industry and the parallel growth in the numbers of mega-ships. Port serving the cruise industry today needs at least two mega-ship berths if they are to make an impact.

Cruise terminals and port facilities are the point of entry and often the focus of destination in regards to cruise tourism development, especially in cases where no prior cargo terminals exist and facilities need to be constructed. The associated capital costs, investment structure and policy framework create the foundation for long-term viability of cruise tourism within the destination.⁹⁰

The extremely competitive market require adequate maintenance and investment in cruise ports. In Europe ports need to invest in new infrastructure in order to⁹¹:

- respond to the demand for more capacity and to the increasing size of ships,
- develop infrastructure to meet new environmental requirements and to prepare for the energy transition,
- maintain and, if needed, upgrade the existing security infrastructure,
- optimise and green their hinterland connections,
- attract and satisfy cruise ship passengers.

⁸⁸ Sibel Bayar Çağlak and others: The Impact of Seaport Investments on Regional Economics and developments. International Journal of Business and Management Studies vol 3, no 2, 2011 issn: 1309-8047

⁸⁹ Tourist facilities in ports – Growth opportunities for the European maritime economy: economic and environmentally sustainable development of tourist facilities in ports – Study report. European Commission 2009.

⁹⁰ 1. Indicators of Sustainable Development for Tourism Destinations – A Guidebook. World Tourism Organization (UNWTO), Madrid 2004

⁹¹ Like for example Carnival's "Faster to Fun". Some terminals, like Royal Caribbean's at PortMiami, offer digital luggage tracking to allow passengers to follow the location of their bags on their smartphones.

Communities and destination authorities need sufficient infrastructure provided. First impression of cruise passengers of a port destination is often the port and its facilities. The port must be able to provide a pleasant image and maintain excellence in all areas of service because any negative experiences will have an equally negative impact on passengers' perceptions of the port.

Cruise ports have to invest in modern facilities that are able to serve the needs of the new generation of cruise vessels and to handle the produced waste in a most efficient and effective way. On the one hand, cruise ports must comply with their applicable environmental laws and regulations in order to avoid enforcement actions by the responsible government agencies. On the other hand, the presence of societal pressures motivates them to develop 'greening' initiatives that go further than just the regulatory approach. From an investment point of view, there should be a positive return on investment for the local community.

Investments in port facilities can attract (additional) cruise tourism to a port region and can therefore provide a return on investment if the additional economic impact that will be created outweighs the necessary investments. Before a port invests in port facilities it should consider its strategic position as a cruise destination. Infrastructural limits can be changed by investment. Minor modifications are rather inexpensive and can be financed through port fees and taxes, but large projects can result in overdevelopment and lost investment⁹².

The cruise tourism facilities at destination can refer either to port-related facilities or pure tourist facilities.

Port-related facilities include:

- berthing facilities,
- fuelling and water supply facilities,
- loading and unloading facilities
- and sea rescue security systems

Tourist facilities include:

- accommodation,
- shopping, and entertainment.

In addition, IT facilities, and customs, immigration, and quarantine facilities are crucial factors.

⁹² Sustainable Cruise Ship Tourism: A Carrying Capacity Study for Ísafjörður, Iceland, Megan Anne O'Brien. University of Akureyri. Reykjavík, February 2014

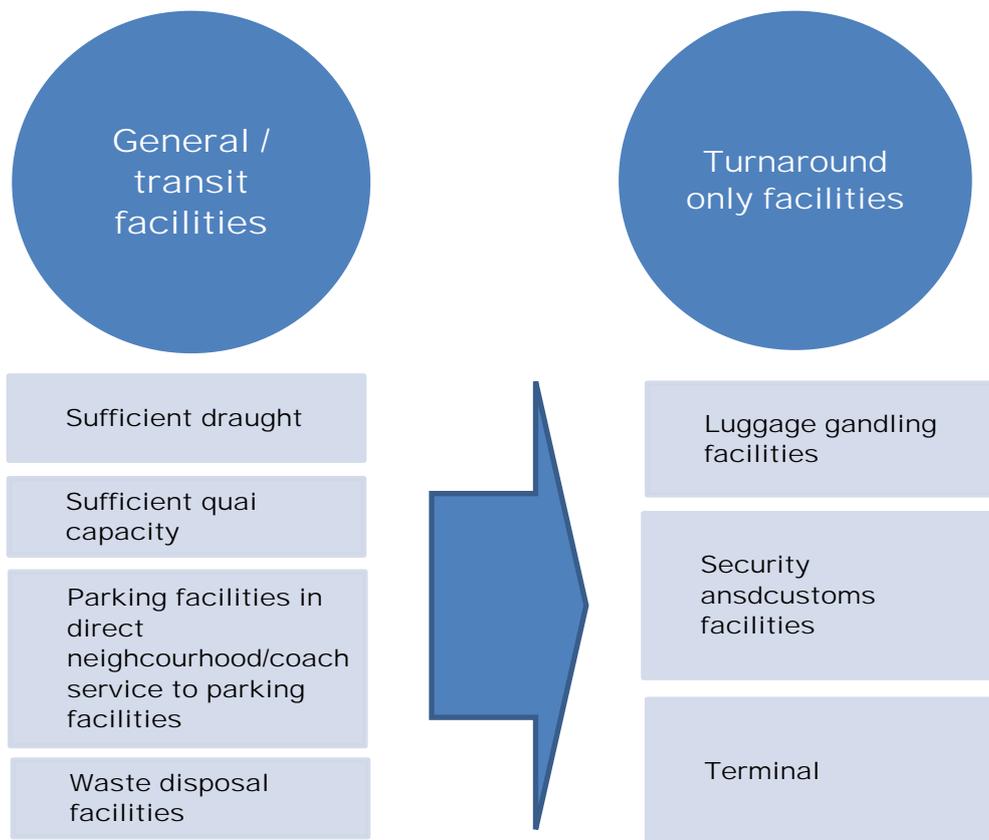


Fig. 24. Level of facilities needed for different type of ports

Source: Economic and Law Dept. Maritime Institute in Gdansk

For the transit port the involvement in cruise sector comes from the need to increase the use of the under-trafficked port facilities to increase revenue and pay for prior investments. Cruise ships are welcomed by some ports in order to stimulate development and economic activity⁹³.

Port development projects should ensure that the taxes and fees charged to cruise ships reasonably cover the cost of maintaining the facilities. The operationally excellent destination is driven by minimising costs and handling tourism flows most efficiently. This type of destination is mass-driven, has excellent accessibility and facilities for the reception of substantial tourist flows. Therefore investments in port facilities in ports should be focussed on improving the passenger-ship-destination interface (e.g. dedicated quays for cruise ships, sufficient handling capacity, sufficient coach parking places, etc.). Considering the individual tourist orientated destination, which is focused on delivering the highest value for individual tourists who want to schedule their own time and activities during a visit, the destination shall offer high accessibility (to tourist attractions) and excellent tourist facilities in the port and the immediate surroundings. This type of destination is either a pure transit destination or a cruise tourism hub, therefore the investments in port facilities should be focused on improving the passenger-to-destination interface (e.g. dedicated cruise quays,

⁹³ Sustainable Cruise Ship Tourism: A Carrying Capacity Study for Ísafjörður, Iceland, Megan Anne O'Brien. University of Akureyri. Reykjavík, February 2014

sufficient and high quality public transport, sufficient coach parking places, tourist information, etc.)⁹⁴.

The type and availability of port facilities vary according to: the size of the port, the level of its modernisation and the system of management. Ports operating within a region with high tourist attractiveness can focus on becoming either a pure transit destination or a cruise tourism hub.

The minimum requirements for cruise transit port infrastructure are:

- depth,
- appropriate quay length,
- wide apron for handling passengers,
- ISPS rules implementation, immigration and customs,
- close vicinity or a high-quality connection to the local tourist attractions,
- good temporary anchorage in vicinity of touristic attraction can be sufficient for a cruise transit port.

Cruise turnaround port infrastructure is more demanding and requires:

- good connection with the arrival/departure point of passengers (airport/railway station/bus station). Especially for airports, a vast amount of international connections is needed,
- in the case of turnaround operations, vast parking areas near the cruise passenger terminals are essential.
- Port suprastructure can be classified into fixed assets built on the infrastructure, such as terminals and sheds, fuel, tanks, office buildings and fixed and mobile equipment such as cranes and van carriers.

Ancillary services may include suppliers, repair facilities, security and clearance. Terminals and sheds are required for passengers to pass through security, customs, embarkation procedures and as place where consignees can carry out their administrative paperwork for the ship and the passengers permits (sanitary, customs, etc).

The cruise industry has the potential to provide economic benefits to a port state. However, accommodation of large cruise ships into port requires a great deal of initial capital investment in infrastructure as well as maintenance costs. As cruise ships continue to grow larger, further investment may be required. Under these types of tourism scenarios with high infrastructure or environmental costs, rapid growth of tourism may result in a stagnation of or even a decline in GDP⁹⁵ Without significant foreign investment into this infrastructure, it is questionable whether construction of large cruise ship terminals could pass a cost-benefit analysis. The cruise terminal location can take place on city property, port property or private property.

Many transit ports in the Baltic Sea area lack the potential of accommodation as many cruise ships over the course of the season have in ports in Hamburg or Copenhagen, hence they have to develop

⁹⁴ European Commission 2009. Tourist facilities in ports – Growth opportunities for the European maritime economy: economic and environmentally sustainable development of tourist facilities in ports – Study report

⁹⁵ Cruise tourism: economic, socio-cultural and environmental impacts,(2014)

flexible technical solutions and new business models to achieve synergies with other vessels also interested in using green fuel.

Main cruise ports are investing heavily in infrastructure improvements⁹⁶. In the early '90s the largest cruisers accommodated 2,500 passengers. Nowadays the large cruisers accommodate over 6,000 with almost twice as many bags and suitcases. As a consequence, more laydown area for the bags is needed, more check-in desks, custom signs and security lanes. The terminals nowadays have to be renovated and upgraded accordingly⁹⁷.

At present, an increasing number of cruise terminals are owned or partially owned by the cruise line companies, therefore there is an upstream integration of the supply chain observed, rather than pure integration with the service provider.

For ports having a port region with low tourist attractiveness, should from an economic point of view only attract cruise tourism to its region if there is sufficient domestic or international demand for a turnaround point in the port's region. Moreover, accessibility is the main factor in the success of a turnaround destination. Investments in port facilities should therefore be aimed at improving the ship-destination-passenger interface (dedicated cruise berths, sufficient parking lots for coaches, etc.).

Regional efforts and/or investments in enhanced tourist friendliness are important enabling the destination to exploit the opportunities of exploring tourists and/or budget driven cruise tourists.

Rational planning of tourism facilities require broader involvement of the destination and region. Many of the key assets from the point of view of cruise visitors, and regular tourists as well, are managed by other industries. These include the small boats which make the port attractive, the main street facades where historic architecture is the valued feature, the protected habitats, etc.

In designing and investment in shore facilities at the port and for tours the cruise lines and/or visitors could help in funding the infrastructure they need, partnerships in environment protection etc. for the sites to be visited. There are a number of specific areas of concern:

- Impacts of shore tours on ecological resources. Specifically control of numbers, timing and behaviour are of concern.
- Impacts of sea tours on fragile ecology, notably sensitive areas, awareness, and negotiation of conditions of access for tours etc. There is a capability to negotiate where ships can anchor, which ecosystems are to be accessible to them, and the conditions of access.
- Impacts of levels of use on natural systems.

⁹⁶ For example port of New Orleans recently added 150 chairs, more embarkation counters, additional X-ray and screening machines, state-of-the-art electronic wayfinding stations and tripled the size of the Captain's Lounge at the Terminal to keep passengers comfortable while they are waiting to board their ship.

⁹⁷ Port Canaveral is the second busiest cruise port in the world in multi-day embarkations. Port Canaveral has 6 cruise terminals. Recently the port completed a nearly \$50 million renovation of terminal 5, and is in the process of upgrading terminal 10. Terminal 5 can handle ships with up to 4,000 passengers. Its primary user will be Carnival Cruise Line. Improvements included a 1,044-space parking garage, 120-foot pier extension and new passenger boarding bridges.

- On shore tourist waste management. Tourists will create waste, solid and liquid. Waste management needs to be a central element in any tour management.

Considering that previously, the cruise season in Northern Europe and the Baltic Sea area extended only three months and the short season aggravated the concentration of cruise tourists. However the season has been extended to almost 140 days (May-September). There will be more ships over a longer period but with more days in-between. With a longer cruise season, the port and city will be able to accept more ships without overcrowding effect and shortage of services.

“The cruise industry worldwide is subject to a wide range of risks, threats and vulnerabilities. These risks can attach to any aspect of cruising and invariably, at some time, do. Risks can affect the cruise line itself, individual ships, ports and terminals, passengers, and onshore providers.”⁹⁸.

There are certain cruise port facilities which can be standardised, like for example:

- No separate cargo/container loading/unloading when cruise ships are in port,
- Well organized rest area with information signs showing where passengers can leave the port area (buffer zone, designated walkways to alleviate conflict with dock workers),
- Increased number of public toilets,
- Bus parking with clear loading and unloading area (away from the work operations on the dock,
- Information such as signs about taxi and bus locations, tourist information sign and map, notice board with city map or other information about activities/events in popular foreign language, signs showing direction to/from port enabling avoidance of congestion and interference.

Concerning common standards, cruise ships should meet the same standards and rules in every port. For example measuring cruise port productivity. All ports depend on development of port infrastructure including: berths, fenders, piers, docks and port basins. For the port it is essential to have sufficient depth for visiting cruisers/ships at all states of tide. In situation where berths are not available or the necessary manoeuvring is not possible, cruisers may anchor or moor at the buoys that will vary in size according to the size of ship. Berthing service include: pilotage, towing and mooring.

The construction of berthing facilities for cruise ships, as any kind of construction, inevitably causes some form of environmental impact. Best practice for mitigation of these impacts can be attributed to proper site selection and construction techniques. Also when dredging is needed to enable cruise ship access, best practices, environmental impact assessment and benchmarking of dredging procedures and impacts should be carefully analysed.

⁹⁸ Wendy R London: Economic Risk in the Cruise Sector.

7 Conclusions/Recommendation.

In order to quantify the economic impact of cruise activity, the traditional methodology is broadly used in impact studies based on the quantification of three types of effects: direct impact, indirect impact and induced impact.

Usually cruise passengers number is cited as a measure of demand. Passengers day and passengers expenditure are the main output measurement of the cruise industry. Average expenditure per person by port is usually computed from questionnaires and the quality of this data might be questionable. The amount depends on the destination and on the category of the port⁹⁹.

Cruise tourism is viewed as generating less revenue per passenger than overnight tourists in a destination, however this aspect often is not distinguished in the cost and impacts of building the infrastructure, marketing the destination and operating the support services needed to fly in and accommodate a similar number of overnight tourists. Cruise lines maintain strategies to maximize passenger spending within their operating agreements.

Considering the recent boom of the cruise industry activity it is difficult to find data to analyse the economics of cruise tourism. Most works today has been based on observational data. Data collected by cruise lines provide estimates of cruise-related expenditure but many required data are not available. Cruise data are scarce and not homogenous¹⁰⁰.

There are many economic impact studies being conducted by cruise line or by local business entities. Depending on the methodology and beneficiary. Following the best practice in assessment and monitoring cruise tourism might produce satisfying results, however economic impact studies may indicate different results for the same cruise passenger. Destinations should consider how the studies will be undertaken and ensure that scope of expenditure and impact will generate results best illustrating the reality.

Improving and further developing common methodologies for assessment of passenger spending and economic impact is important, considering that it shall enable benchmarking and data aggregation, as well as improve monitoring's effectiveness across destinations within a country and a region.

Economic impact and passenger spending calculations are limited to the moment of cruise visit and do not account for potential future gains. Cruise passengers who have a positive experience within a destination may decide to return to that destination by air or land in subsequent visits.

Cruise tourism, especially considering currently operating large ships, might generate some problem in applying sustainable development due to its large-scale at a time causing overcrowding and substantial disruption for local communities. Cruise shore excursions often differ from best practices common for other forms of tourism. Cruise tourism is not always the most welcome option for some communities and destinations. Therefore, there is a need for a balanced approach that focuses on

⁹⁹ For example, Florida-Caribbean Cruise Association (FCCA) reported, during the 2005–2006 the average per cruise passenger spending per port-of-call was \$98.01, and average spending per port-of-call by crew members was \$74.56. The expenditures at other ports are not easily available.

¹⁰⁰ Cruise tourism: economic, socio-cultural and environmental impacts,(2014)

minimizing impacts and risks. Efforts should be focused equally on the passengers and distribution channels of cruise tourism.

In economic impact assessment applying shared methodologies and common indicators are important to facilitate understanding and calculations. However, benchmarking may be more important than establishing required thresholds for many indicators¹⁰¹. The indicators should be integrated into a more comprehensive set, for destinations, not just tourism. Some measures are optional but in some cases useful for supporting decisions about investment or organisational purpose. However it will raise costs. Indicators and evaluation are not final results in themselves, they are only tools. The measures should be clearly defined considering: economic factors, socio-cultural and environmental factors, governance, external changes or threats.

In economic impact assessment of cruise tourism transparent and adequate standards should be adapted reliable calculation and cost benefit analysis. Apart from business aspects, there is need for appropriate management of noise levels, waste, water, air quality and energy efficiency. Port authorities and terminal management should evaluate the cruise ship and passenger fees to balance the total cost of port operations, services, maintenance and security appropriately.

A clear policy framework is important. Cruise destinations should collaborate with the region in which they are located, and with the cruise lines in order to develop a comprehensive policy and means of ensuring compliance. There are various examples of best practice and success stories. Adequate initiatives should be followed.

ESPO elaborated the Code of Good Practices for cruise and ferry ports including following recommendations:

- dress up your port to impress
- match the long-term nature of planning port infrastructure with the quickly changing market needs
- involve the stakeholders at an early stage in the port planning
- good hinterland connections are a major success factor for the cruise and ferry port
- greening the infrastructure as to mitigate the environmental impact of cruise and ferry port business
- optimise the use of dedicated cruise and ferry port infrastructure

Cruise tourism should be considered within the context of a destination's long-term operation capacity. Cruise lines may change itineraries or reduce calls to some destinations and attractions that become rundown, overcrowded, unsafe, or lose too much of their original authenticity. Also, if cruise tourism causes or exacerbates social impacts or the revenues generated from cruise tourism are not properly utilized to manage risks, it can lead to reduced arrivals and income while the problems continue.

¹⁰¹ Criteria Indicators and Performance Measures. Informing Sustainable Development of Tourism Destinations. Ted Manning, Tourisk Inc., GPST Seminar, ITB Berlin 2013

The harbour, which is run as a business, should not only look out for its best interests, but also those of the broader community. Part of the revenue should be set aside for infrastructure, community and environment funds. In places where ships land at several destinations there may be greater national capacity to set standards. For example, international waste management protocols. Dedicated approach to different regional challenges should be considered.

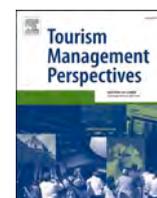
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APPENDIX SE5: ESTIMATING CRUISE PASSENGER'S EXPENDITURE: A CENSORED SYSTEM APPROACH



Estimating cruise passenger's expenditure: A censored system approach

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ARTICLE INFO

Keywords:

Cruise passenger expenditure during stopovers
Economic impacts onshore
Canary Islands
Multivariate tobit system
Drivers of expenditure by category

ABSTRACT

Cruise ship passenger spending patterns are analyzed for the archipelago of the Canary Islands, as such patterns represent a key element in the evaluation of the economic impact of cruise ships on residents and local stakeholders. Over six cruise seasons, data regarding cruise passenger expenditures were collected via survey responses at each stopover. Since the five categories of expenditure analyzed are censored and possibly correlated, we have estimated a multivariate tobit system. This approach offers more efficient estimates of the determinants of cruise passengers' onshore spending, which can be useful in designing economic policies. Our results show that gender, age and socioeconomic status affect cruise passenger spending patterns significantly and, more importantly, in different ways depending on the expenditure category. Therefore, it seems that more personalized marketing strategies (i.e., gender/age/nationality-oriented) classified by expenditure category should be more efficient and, therefore, implemented to achieve greater local economic impact.

1. Introduction

During the last two decades, with the only exception of the COVID-19 pandemic, the cruise ship business has recorded a steady rate of growth. Although this is a resilient industry that was able to successfully overcome previous crises, it is, within the tourism sector, one of the most adversely affected by the pandemic (Sharma & Nicolau, 2020). After the voluntary suspension of cruise operations worldwide in mid-March 2020, the industry timidly resumed the activity in some destinations in Europe, Asia and the South Pacific in July 2020, by the implementation of enhanced health measures and new security protocols.

Following the 2020 industry trends recently published by CLIA, it seems that there is a place for hope and optimism in relation with the 2021 (CLIA, 2021). Moreover, the COVID-19 crisis has shown that in the post-pandemic era not only guest and crew safety is key to the cruise restart, but also the protection and management of cruise destinations. The COVID-19 crisis has made the cruise industry aware that the sector and destinations should work together ensuring that sustainability remains on the agenda, and especially helping to generate a positive global (economic) impact on the destination.

As an industry, cruises accrue benefits at their destinations in terms of investment, employment, tax, economies of scale, positive externalities and overall economic growth (Dwyer & Forsyth, 1998). Namely,

the economic benefits generated by cruise tourism in a port of call are related to the expenditure incurred by passengers, crews and shipping companies (Chen, Petrick, Papathanassise, & Li, 2019; Tattara, 2014).

The direct expenditure by cruisers during a stopover usually includes spending on one or several of the following categories: tours, museum visits and other entertainment and cultural activities; cafeterias and eating out; shopping (souvenirs, clothing and footwear, etc.); local city transport, and so on (Vayá, García, Murillo, Romaní, & Suriñach, 2018). An understanding of the different types of expenditure, as well as the quantities purchased, will allow policy actors and local entrepreneurs to better design suitable marketing strategies, enabling them to understand the profiles, expectations and market-based needs of cruise passengers. Thus, entrepreneurs and sellers will be able to access essential information to direct their efforts towards local products or services included in one category or another to maximize the passengers' expenditure onshore.

As our literature review (see Section 2) shows, only a few studies exist that analyze cruiser expenditure (through econometric techniques) taking into account different expenditure categories, but none of these consider the potential presence of correlations (simultaneity) between those expenditure categories. That is, these studies do not consider the possibility that the total amount spent in one category could influence the total amount spent in the others. This is an important issue because if

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<https://doi.org/10.1016/j.tmp.2021.100808>

Received 7 July 2020; Received in revised form 28 February 2021; Accepted 14 March 2021

Available online 19 April 2021

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this correlation exists and if it is not considered in the model estimated, the results obtained will be less efficient (see, for example, Arias & Cox, 2001). Moreover, these correlations provide useful information regarding the relationship between expenditure categories (complements/substitutes) that better orient not only policy actions but also marketing strategies looking to increase the impact of this kind of tourism on the local economy.

The present study fills this gap in the literature by estimating a multivariate tobit system, in which decisions on different types of onshore expenditures of cruise passengers are analyzed simultaneously. We use a large dataset of ship passengers who disembarked in the Archipelago of the Canary Islands over six cruise seasons from 2001 to 2015. Data on tourists' expenditure at each port of call were compiled via survey responses. We gathered data regarding per capita expenditure for five categories: shopping, food and beverage, transport (taxis and ground transport), tours and cultural activities.

The aim of the paper is twofold. Our first goal is to identify whether there are correlations between the expenditure categories considered. This identification is important for choosing the most appropriate econometric model and for identifying, if these correlations are confirmed, what type of relationship (complements/substitutes) exists between expenditure categories. The second goal is to ascertain whether the identified drivers (country of residence, demographic features, socioeconomic status, etc.) differ between expenditure categories. In this way, this study contributes to designing practices that will ensure the success of stopovers by increasing the potential for achieving and maintaining a higher expenditure onshore. This can be done by using the results to design more personalized marketing strategies to better reach different customer segments, which would lead to a greater local economic impact. In terms of geographical scope, this study is based on scheduled cruise itineraries and includes all the Canary Islands except the islands of El Hierro and La Graciosa. It should be noted that the Canary Islands are one of the main destinations in the European tourism market (see, for example, Díaz-Pérez, Bethencourt-Cejas, & Álvarez-González, 2005; Pérez-Rodríguez & Ledesma-Rodríguez, 2019).

2. Literature review

Despite the fact that in recent decades, the cruise business has represented one of the most rapidly expanding economic segments in the tourist sector, the industry also faces many challenges in terms of the higher concern regarding cruise ships' environmental impact (i.e., air pollution and waste), especially in port cities, and more recently, concerns regarding COVID-19.¹ Indeed, studies on the environmental cost and eco-efficiency of in-port vessel emissions and their derived external costs, related not only to every type of ship but also to cruise traffic, can be found in the recent literature (Tichavska & Tovar, 2015a, 2015b, 2017; Tovar & Tichavska, 2019; Tichavska, Tovar, Gritsenko, Johanson, & Jalkanen, 2019).

Moreover, the availability of an extensive range of onboard entertainment, recreational, personal and commercial services, plus the shorter stopovers enjoyed by cruise passengers (Larsen, Wolff, Marnburg, & Øgaard, 2013), have raised questions as to the real net benefits of the business from the standpoint of the local population and government (Klein, 2002). One of these questions relates to the distribution of value that cruise tourism generates as well as how much of this value, if any, actually remains in the port of destination (Del Chiappa, Lorenzo-Romero, & Gallarza, 2018; Lopes & Dredge, 2018; MacNeill & Wozniak, 2018). This last issue, added to the environmental and social impacts derived from cruise activity in a destination, has motivated various studies focused on the attitudes of port city residents towards the

development of the cruise industry (for example, Brida, Del Chiappa, Meleddu, & Pulina, 2014; Del Chiappa & Abbate, 2016; Tovar, Espino, & Lopez-del-Pino, 2021).

Ceteris paribus, an increase in cruise passenger expenditures at a stopover will positively impact the local economy, although this effect could be reduced if onshore activities are offered by the cruise line company affiliates (Rodrigue & Notteboom, 2013) or if the cruise lines retain a sales margin from local agencies (Brida & Zapata, 2010; Gui & Russo, 2011). Additionally, it is paramount to study not only total cruiser expenditures but also the sort of product or service acquired, together with those factors that could potentially influence these purchases, one of these being the possible correlation between different expenditure categories.

The analysis of cruise ship passenger spending patterns through econometric techniques has been undertaken by several studies; in some of them, the total expenditure is considered, whereas other papers focus on different expenditure items. The first group includes studies such as Pino and Tovar (2019), Brida, Fasone, Scuderi, and Zapata-Aguirre (2014), Brida and Risso (2010), Cuéllar-Río and Kido-Cruz (2008), Domènech, Gutiérrez, and Anton Clavé (2020), Gargano and Grasso (2016), Henthorne (2000), Lynch (2004), Marksel, Tominc, and Bozicnik (2017) and Parola, Satta, Penco, and Persico (2014), which have been recently summarized by Pino and Tovar (2019). Brida, Bukstein, et al., (2012), Brida, Pulina, et al., (2012), Brida, Bukstein, & Tealde (2015), Lee & Lee (2017), and Risso (2012) scrutinized these latter papers in-depth because the present study belongs to this second group. Table 1 below summarizes their main characteristics.

The fact that the first paper focusing on different expenditure categories was published in 2012 clearly indicates that the related literature is relatively novel at present. All the studies involve data collection using face-to-face interviews carried out via a questionnaire to cruise passengers on their offshore stops. Authors such as Brida et al. (Brida, Bukstein, et al., 2012; Brida, Pulina, Riaño, & Zapata-Aguirre, 2012) have designed their own ad hoc questionnaires, while other studies—four out of six—have instead taken advantage of external databases compiled by others (Risso, 2012; Brida et al., 2015; Lee & Lee, 2017; the present study).

Out of the six studies, four have included more than one port of call (Brida et al., 2015; Lee & Lee, 2017; Risso, 2012; the present study), all of them situated in the same country. With respect to the period of analysis, four articles considered a single season, whereas the other two analyzed more than one (Risso, 2012; the present study). Last, regarding the respondents questioned, four articles consider only cruise passengers, while two studies also include cruise crews (Brida et al., 2015; Brida, Pulina, et al., 2012).

Moreover, with respect to strategies for selecting samples, studies tend to be divided between those using the convenience random sample (Brida, Pulina, et al., 2012), the focal sampling method (Brida, Bukstein, et al., 2012) or the two-step stratified procedure (Brida et al., 2015; Lee & Lee, 2017; Risso, 2012 and the present study).

In terms of the model used here, the literature review discusses articles that examine those passenger and trip characteristics that best explain the probability of spending or not for each passenger expenditure category considered. For this purpose, the regression models chosen are OLS (Brida, Bukstein, et al., 2012), logit models (Brida et al., 2015; Brida, Pulina, et al., 2012) and probit models (Lee & Lee, 2017). Furthermore, five out of the six studies examine which characteristics best explain the amount of expenditure for each category using tobit models (Brida, Pulina, et al., 2012, Brida et al., 2015 and the present study), a Heckman model (Risso, 2012) or an ordered probit model with sample selection (Lee & Lee, 2017). Finally, all of the studies assume that the probability of incurring expenditure in one particular category is independent of the probability of incurring expenditure in the other categories. This paper contributes to the literature because it is the first in which the possible correlation between passenger expenditure categories is taken into account. To do this, a multivariate tobit system for

¹ "No cruise ships? No problem, Say Some Cities" <https://www.bloomberg.com/news/articles/2020-05-20/no-cruise-ships-no-problem-say-some-cities> (Accessed 03/07/2020).

Table 1
Papers using econometric techniques to explain cruise passenger's expenditure categories.

Study	Data	Dependent V (OUE)	Methodology	Independent V
Brida, Pulina, et al., (2012)	<ul style="list-style-type: none"> - Port: Cartagena de Indias - Country: Colombia - Period: October–December - Year = 2009 - 402 questionnaires - Population = cruise passengers over 18 	Four PCEC: <ul style="list-style-type: none"> - Accommodations, (402 TO) - Food and beverage, (402 TO) - Transport, (402 TO) - On Board, (381 TO) DBCB = Authors	SE: Focal sampling method For each PCEC: <ul style="list-style-type: none"> - OLS model - Tobit model 	<ul style="list-style-type: none"> - Age, -Civil status - Education level - First time cruising - First time visitors - Gender - Group size - Income level - Nationality - Number of visit - Stayed in Cartagena - Time in Cartagena - Transport - Visit City Center
Brida, Bukstein, et al., (2012)	<ul style="list-style-type: none"> - Port: Cartagena de Indias - Country: Colombia - Period: October–November - Year = 2009 - 1,361 questionnaires - Population = cruise passengers and crew (over 18) 	Four PCEC: <ul style="list-style-type: none"> - Tours, (743 TO) - Food and beverage, (743 TO) - Souvenirs, (743 TO) - Jewelry, (750 TO) DBCB = Authors	SE: Convenience random sample of visitors For each PCEC: <ul style="list-style-type: none"> - Tobit model - Logit model 	<ul style="list-style-type: none"> - Age, - First time cruising - Gender - Group size - Hours offshore - In group - Income level - Number of previous cruises - US resident dummy - Visited Ciudad Vieja
Risso (2012)	<ul style="list-style-type: none"> - Ports: Montevideo, Punta del Este - Country: Uruguay - Period: November–March - Year = 2008/2009 - 1803 questionnaires - Year: 2009/2010 - 3348 questionnaires - Population = cruise passengers 	Three PCEC: <ul style="list-style-type: none"> - Food: 2008/09, (380 UO) - Food: 2009/10, (661 UO) - Total: 2008/09 (1522 UO) - Total: 2009/10 (2803 UO) - Shopping: 2008/09 (557 UO) - Shopping: 2009/10 (1114 UO) DBCB = the Uruguayan Tourism Board	SE: a two-step stratified approach. For each PCEC: <ul style="list-style-type: none"> - Tobit model - Heckman model 	<ul style="list-style-type: none"> - Age - Dislike price - First time visitors - Gender - Like - Nationality - Number of visit - Occupation
Brida et al., 2015	<ul style="list-style-type: none"> - Ports: Montevideo, Punta del Este - Country: Uruguay - Period: November–March - Year: 2009/2010 - 3,348 questionnaires - Population = cruise passengers and crew (over 18) 	Four PCEC: <ul style="list-style-type: none"> - Food and beverage <ul style="list-style-type: none"> - Logit: (3348 OT) - Tobit: (2686 CO, 662 UO) - Tours <ul style="list-style-type: none"> - Logit: (3348 OT) - Tobit: (3118 CO, 230 UO) - Transport <ul style="list-style-type: none"> - Logit: (3348 OT) - Tobit: (3271 CO, 77 UO) - Shopping <ul style="list-style-type: none"> - Logit (3348 OT) - Tobit: (2234 CO, 1114 UO) - Total <ul style="list-style-type: none"> - Logit: (3348 OT) - Tobit: (546 CO, 2802 UO) DBCB = the Uruguayan Tourism Board	SE: Two-step stratified approach. For each PCEC: <ul style="list-style-type: none"> - Logit model - Tobit model 	<ul style="list-style-type: none"> - Age - Dislike prices - Gender - Group size - Montevideo port arrival - Nationality - Number of visit Cities visited: <ul style="list-style-type: none"> - Montevideo - Punta del Este - Colonia
Lee and Lee (2017)	<ul style="list-style-type: none"> - Ports: Busan, Jeju, Yeosu, Incheon - Country: South Korea - Period: May–October - Year: 2012 - 1,805 questionnaires - Population: foreign cruise passengers 	One PCEC: <ul style="list-style-type: none"> - Shopping in the shore excursion (912 UO) DBCB = Korea Tourism Organization.	<ul style="list-style-type: none"> - SE: Two-step stratified approach. - Ordered probit model with sample selection 	<ul style="list-style-type: none"> - Age - Gender - First time visitors - Occupation - High income - Nationality
Present study	<ul style="list-style-type: none"> - Port: Fuerteventura, Gran Canaria, La Gomera, Lanzarote, La Palma and Tenerife - Country: Spain (Canary Islands) - Period: Collected annually - Years: 2001–2002, 2003–2004, 2004–2005, 2008–2009, 2011–2012, 2014–2015. - 12,578 questionnaires - Population = cruise passengers 	Five PCEC: <ul style="list-style-type: none"> - Food and beverage <ul style="list-style-type: none"> - Tobit: (5395 CO, 7064 UO) - Tours <ul style="list-style-type: none"> - Logit: (3348 OT) - Tobit: (10,683 CO, 1778 UO) - Transport <ul style="list-style-type: none"> - Tobit: (5808 CO, 7064 UO) - Shopping <ul style="list-style-type: none"> - Tobit: (5262 CO, 7199 UO) - Cultural activities <ul style="list-style-type: none"> - Tobit: (5662 CO, 7199 UO) DBCB = EDEI commissioned by the island Government	<ul style="list-style-type: none"> - SE: Two-step stratified approach. - It is not assumed that the probability of spending in one category is independent of the other ones. - Multivariate tobit system estimation for cruise passengers' expenditure. 	<ul style="list-style-type: none"> - Age - Age square - Gender - Socioeconomic status - Previous cruises - Group composition - First Visit Canary Islands - Cruise season - Nationality - Port of call

Note: V = Variable; PCEC = per capita expenditure categories; OUE = Observations used in the model estimation; O = observation, CO = Censored observation, UO = Uncensored observation; SE = Sampling strategy; DBCB = Database constructed by.

cruise passenger expenditure is estimated.

In relation to the passenger expenditure categories considered, three out of six studies include four categories (Brida et al., 2015; Brida, Bukstein, et al., 2012; Brida, Pulina, et al., 2012), and the other three include one (Lee & Lee, 2017), three (Risso, 2012) and five (the present study). Several categories are used in almost all the studies, such as food (five), beverage and tours (four out of the six) and transport and shopping (three out of the six). This paper is the first to include spending on cultural activities as a passenger expenditure category.

Last, with respect to the principal independent variables, age, gender, nationality and group size are the most common for almost all studies. It should be noted that these are also relevant factors influencing tourism consumer behavior in general (Cohen, Prayag, & Moital, 2014; Moutinho, 1987).

3. Data

The Canary Islands could be described as a “cruise island cluster” since islands with completely different characteristics are situated at short distances from each other (Stefanidaki & Lekakou, 2012). As a destination for cruise tourism, the archipelago has been promoted by the Canary Islands government, which has tried to encourage cruise passengers to spend more time at destinations as a means of increasing their onshore expenditure and, as a result, the local economic impact derived from this industry.

Since March 2020, due to the COVID-19 pandemic, cruise ships have been banned from Spanish ports. Afterwards, several companies have negotiated the activation of the Autumn-Winter cruise season only for the Canarian ports. Seven months ago, since the closure, the Canary Islands Government stated that it was vital for its economy to restart cruise ship traffic and gave the go-ahead for these vessels to resume operations between its ports from 5 November 2020.² The authorized ships should comply with the new health standards set by the regional authorities.³

The two Canary Island Port Authorities⁴ have commissioned various studies that have been designed to improve knowledge of both the impact of the regular presence of cruise ships in port cities and their more general effects on the islands of call.⁵ At the beginning, three specific objectives were defined: providing a description of the current organization of the cruises’ activities and gathering assessments of the destinations from operators, as well as from cruise passengers. In subsequent studies, these tasks have been complemented to obtain deeper

² Since the beginning of November 2020, TUI Cruises have been operating permanently in the Canary Islands, while Aida and Hapag Lloyd’s operate intermittently.

³ The conditions include an insurance policy to cover possible incidents related to COVID-19 among the passengers while they operate in the Canary Islands. The cruise lines have also been required to enter into agreements with hospitals and hotels on each of the islands, in case it is necessary, to activate a quarantine, in addition to a special hygiene plan for ships and the hiring of health personnel. Moreover, cruise passengers must fill out a form that includes all their movements in the last 15 days before arriving in the Canary Islands so that they can be monitored in case of an incident, and confirm if they have been in contact with someone who has tested positive for Covid or if they have been tested positive in a recent diagnostic test.

⁴ The Canaries comprise the Spanish provinces of Las Palmas and Santa Cruz de Tenerife, each one having four main islands (the rest of the archipelago is made up of a host of smaller islands, islets and roques). Main ports in the Canary Islands are managed by different Port Authorities, one for each province. For a detailed analysis of the port management model in Spain, see Rodríguez-Alvarez and Tovar (2012) and Tovar and Wall (2014, 2021a, 2021b).

⁵ Currently, cruise ships call on all main islands except one (La Graciosa).

knowledge about cruise ship passengers (profile, satisfaction, spending patterns, and so on) and the views of different stakeholder groups. The present paper uses data collected from these studies for its empirical estimation.

The population of each study comprises passengers who disembarked from cruise ships calling in at one or more ports of the Canary Islands. From December to May (the high cruise season), person-to-person interviews were performed. We specifically employ information from a total of 12,578 valid interviews of cruise tourists during the period 2001–2015. Table 2 shows the characteristics of each study for the six cruise seasons included in our analysis.

The questionnaire consisted of five sections, and the sampling strategy was a two-step stratified approach. (for more details, see Pino & Tovar, 2019 and Table 1). The relevant data for this paper are contained in the fourth section, which includes questions concerning cruise passenger expenditure behavior, such as how much the visitor spent per day during his/her time onshore. This expenditure comprises the amount of purchases of several items not included in the cruise: shopping, food and drink, transport (bus, taxi, car rentals, tram, and bicycles), museum fees, sightseeing and leisure services and booking organized excursions. Note that this last item is only referred to for those cases where cruise passengers buy the tour on their own during the stopover. Otherwise, such an excursion would be an onboard expenditure, which is not the topic of this paper. The survey also gathers information about sociodemographic variables such as age, gender, civil status, education level, occupation and nationality.

Cruisers allocated their overall travel expenses into those incurred onboard and those incurred onshore as well as the cruise ticket and airfare. On average, regarding the shore expenses analyzed here, cruise passengers spent €52.10 per stopover, but the maximum (€1191) and minimum (€0) figures show important variation. As shown in Table 3, the average cruise passenger expenditure by stopover (during the six seasons analyzed) also shows differences between different expenditure categories: €24.66 on shopping, €9.14 on food and beverage, €8.10 on transport, €7.24 on tours and €1.06 on cultural activities when all the observations were taken into account. Obviously, the average is higher when only positive expenditures were considered (€42.69 on shopping, €16.12 on food and beverage, €26.67 on transport, €50.77 on tours and €12.53 on cultural activities). Using the retail price indices for the Canary Islands, these monetary variables were deflated to 2016 prices to adjust for inflation. The Canary Islands Consumer Price Index (CPI) group series “Clothing and footwear” was used for the shopping category deflator, the CPI group series “Restaurants” for food and beverage, the CPI subgroup “Transport services” for transport and tours, and the CPI subgroup “Recreational and cultural services” for cultural activities. Last but not least, Table 3 indicates the presence of a large portion of null observations in all the cruiser expenditure categories in the sample.

In accordance with the literature review in Section 2, the variables used to explain the determinants of the different types of cruise passenger expenditure in this paper have been grouped into the following two categories: sociodemographic attributes (age, gender, socioeconomic status and country of residence) and travel-related features (group composition, previous cruise experiences, first visit to the Canary Islands, cruise season and port of call). Table 4 provides some descriptive statistics for this set of explanatory variables.

4. Methodology

Consumer behavior has been analyzed not only in general marketing studies (Al-Tarawneh, 2012; Hawkins & Mothersbaugh, 2010) but also in tourism research (Baker & Crompton, 2000; Cohen et al., 2014; Sirakaya & Woodside, 2005) and, more recently, for the cruise industry (Hung, Lee, Wang, & Petrick, 2020; Hung & Petrick, 2011; Petrick,

Table 2
Characteristics of each Market Study on Cruise Tourism study.

Cruise season	2001–02	2003–04	2004–05	2008–09	2011–12	2014–15
Sample (n° questionnaires)	1613	2389	2421	2031	2000	2124
Sample error	0.0244	0.0200	0.0199	0.0217	0.0219	0.0212

Table 3
Cruiser’s expenditure categories. Descriptive statistics.

Expenditure	Shopping	Food and beverage	Transport	Tours	Cultural activities
Mean (2016 euros)	24.66	9.14	8.10	7.24	1.06
Std. Dev.	44.87	17.47	20.45	24.06	5.91
Min	0.00	0.00	0.00	0.00	0.00
Max	1174.74	371.29	302.11	431.59	188.71
Mean (2016 euros) if expenditure > 0	42.69	16.12	26.67	50.77	12.53
N° null expenditure observations	5262	5397	8678	10,683	11,408
% null expenditure observations	42.23	43.31	69.64	85.73	91.55

Table 4
Explanatory variables and descriptive statistics.

Socioeconomic characteristics		Trip-related characteristics	
Age (mean years)	55.81	Group composition (%)	
		Alone	5.21
Age square (mean years)	3295.03	With a partner	62.21
		With the family	13.64
Gender (%)		With friends	18.94
Male	41.14	Previous cruises (mean number)	4.19
Female	51.86	First visit Canary Islands (%)	
		No	48.70
Socioeconomic status (%)		Yes	51.30
Low	11.24	Cruise season (%)	
Low-medium	33.04	2002/2003	12.62
Medium	45.36	2003/2004	19.00
Medium-high	6.91	2004/2005	19.00
High	3.46	2011/2012	16.04
		2014/2015	17.05
Origen (%)		Port of call (%)	
British	43.49	Lanzarote	22.98
Spanish	2.01	Santa Cruz de Tenerife	22.56
German	34.48	Santa Cruz de La Palma	20.01
North American	3.66	Las Palmas	20.50
Italian	4.37	Puerto del Rosario	9.24
Other European	10.18	La Gomera	4.71
Rest of the world	1.83		

Note: Numbers indicate percentages when not otherwise specified.

2004).

Various studies have analyzed the influence of several factors on the purchase behavior intentions of cruise passengers: satisfaction (Brida, Lanzilotta, Moreno, & Santiñaque, 2018; Parola et al., 2014), motivation (Andriotis & Agiomirgianakis, 2010), affective factors (Duman & Mattila, 2005), quality (Petrick, 2004), critical incidents (Petrick, 2006), brand perception (Ahmed, Johnson, Ling, Fang, & Hui, 2002; Li & Petrick, 2008) or price sensitivity (Petrick, 2005).

The present work focuses on the economic benefits that cruise tourism generates in a port of call, which is related to the money spent by passengers because, ceteris paribus, an increase in cruiser expenditure during a stopover will inevitably have some type of direct impact on the local economy. For this reason, many studies analyze cruise

passengers’ spending patterns, but as our survey showed, only a few take into account different expenditure categories. To the best of our knowledge, no study exists that considers the interdependency across the equations that explain those expenditure categories.

According to the neoclassical theory of consumer behavior (Deaton & Muellbauer, 1980), adapted by Syriopoulos and Sinclair (1993) to tourism economics, it is unrealistic to assume that cruise passenger shore expenditure among different categories (shopping, food and beverage, transport, tours, cultural activities) are independent. Curiously, as Disegna and Osti (2016) have stressed, there are very few studies in the literature that have analyzed the interrelationship between the different categories of tourist expenditure made during a trip, with Bilgic, Florkowski, Yoder, and Schreiner (2008) and Divisekera (2010) constituting the only outstanding exceptions. Furthermore, until the present research, the possible correlations among the goods and services forming part of cruise passenger expenditure incurred at a port of call has not been considered (see, for example, Brida, Bukstein, et al., 2012, Brida, Pulina, et al., 2012, Brida et al., 2015).

Following Disegna and Osti (2016), Divisekera (2010) and Syriopoulos and Sinclair (1993), we assume that the cruise passenger’s utility function is weakly separable and that his/her decision-making process goes through three stages. Initially, consumers allocate their budget between taking cruise holidays and other goods and services (including other tourist activities). In the second stage, tourist spending is allocated between different cruise products. In this sense, Whyte (2018) has highlighted the relationship between cruise ships and ports of call as co-destinations, since not only onboard but also onshore attributes are considered by cruise tourists when purchasing a cruise vacation. Finally, in the third stage, cruise passengers allocate their expenditure onshore between the different goods and services offered at the destination. For the remainder of the present study, we will focus on this third stage, where the willingness to spend on a certain category may be correlated to spending on another category.

Since all the components of the different types of cruise passenger expenditure are censored at zero, we have chosen to estimate a tobit-type model to explore the determinants of expenditure. Indeed, as can be appreciated in Table 3, our data are characterized by several observations with zero expenditure. Thus, the censoring rates for expenditure on food and beverage, shopping, tours, transportation, and cultural activities are 43.31%, 42.23%, 85.73%, 69.64% and 91.55%, respectively.

As is well known, the tobit model is a useful econometric tool for addressing the problem of censoring in the dependent variable (left-censored at zero in the present work). Consequently, the cruise ship passenger spending patterns can be written as an *M*-equation multivariate tobit system:

$$y_{im}^* = x_{im}\beta_m + \varepsilon_{im}$$

$$y_{im} = \max(y_{im}^*, 0), m = 1, \dots, M \tag{1}$$

where y_{im}^* is a latent variable for the *m*th type of spending carried out by the *i*th cruise ship passenger, which is a function of a vector of explanatory variables x_{im} (sociodemographic and trip-related characteristics). β_m is the set of coefficients to be estimated, y_i measures the observed expenditure, *M* is the number of tourist expenditure categories and ε_{im} is the error term, $\varepsilon_i \sim N(0, \sigma_m^2)$.

We assume that the vector of error terms [$\varepsilon_{i1}, \varepsilon_{i2}, \dots, \varepsilon_{iM}$] follows a multivariate normal distribution with mean zero and variance-covariance matrix Σ . It should be noted that if there were no cross-

equation correlations, [expression \(1\)](#) could be estimated consistently equation by equation using a univariate tobit model. However, given that decisions about the M different types of cruise passenger expenditure are usually determined simultaneously, the error terms ε_{im} in [\(1\)](#) are likely to be correlated. Then, efficiency gains occur if the M-equations are estimated jointly as a system.

The likelihood function for the system of M censored equations for an observation or, equivalently, for the expenditure pattern of a cruise passenger, can be written as:

$$\int_{-\infty}^{-X_1\beta_1} \dots \int_{-\infty}^{-X_M\beta_M} f(\varepsilon_1, \dots, \varepsilon_M) d\varepsilon_1 \dots d\varepsilon_M = \int_{-\infty}^{-X_1\beta_1} \int_{-\infty}^{-X_2\beta_2} \dots \int_{-\infty}^{-X_5\beta_5} f(\varepsilon_1, \varepsilon_2, \dots, \varepsilon_5) d\varepsilon_1 \dots d\varepsilon_5 \tag{2}$$

where f is the multivariate normal density function and, in our case, M = 5. As can be seen, the parametric estimation of system (1) requires evaluating definite integrals in up to five dimensions, which raises an important computational problem. In this paper, we apply a simulation method to resolve this issue, and among the different existing techniques (see, for example, [Cappellari & Jenkins, 2006](#); [Greene, 2003](#); [Train, 2009](#)), we use the Geweke–Hajivassiliou–Keane (GHK) simulator ([Geweke, 1989](#); [Hajivassiliou & McFadden, 1998](#); [Keane, 1994](#)).

The GHK maximum simulated likelihood estimator considers that the joint multivariate normal distribution can be replaced with the product of sequentially conditioned univariate normal distribution functions, which can be calculated more easily even though doing so is computationally expensive in relative terms. The GHK simulator performs draws from upper-truncated univariate normal distributions and then recursively uses the Cholesky factorization to compute the multivariate probability distribution.

Therefore, this maximum simulated likelihood approach will allow for estimates of the multivariate tobit system for the different categories of tourism expenses, taking into account the possible cross-equation correlations. That is, the GHK procedure allows us to estimate the β_m coefficients for each M-equation along with the cross-equation correlations and the variance of the error terms. We estimated the multivariate tobit using the Stata mvtoit program developed by [Barslund \(2015\)](#).

Then, once the variance-covariance matrix Σ is estimated,

$$\Sigma = \begin{pmatrix} \sigma_1^2 & \rho_{21}\sigma_1\sigma_2 & \rho_{31}\sigma_1\sigma_3 & \rho_{41}\sigma_1\sigma_4 & \rho_{51}\sigma_1\sigma_5 \\ \rho_{12}\sigma_1\sigma_2 & \sigma_2^2 & \rho_{32}\sigma_2\sigma_3 & \rho_{42}\sigma_2\sigma_4 & \rho_{52}\sigma_2\sigma_5 \\ \rho_{13}\sigma_1\sigma_3 & \rho_{23}\sigma_2\sigma_3 & \sigma_3^2 & \rho_{43}\sigma_3\sigma_4 & \rho_{35}\sigma_3\sigma_5 \\ \rho_{14}\sigma_1\sigma_4 & \rho_{24}\sigma_2\sigma_4 & \rho_{34}\sigma_3\sigma_4 & \sigma_4^2 & \rho_{45}\sigma_4\sigma_5 \\ \rho_{15}\sigma_1\sigma_5 & \rho_{25}\sigma_2\sigma_5 & \rho_{35}\sigma_3\sigma_5 & \rho_{45}\sigma_4\sigma_5 & \sigma_5^2 \end{pmatrix}$$

where each $\rho_{jk} = \rho_{kj}$ off-diagonal element is the correlation between the error terms, and we can test the cross-equation dependence. Thus, in our application, the five types of cruise passenger expenditure are independent if and only if $\rho_{12} = \rho_{13} = \rho_{14} = \rho_{15} = \rho_{23} = \rho_{24} = \rho_{25} = \rho_{34} = \rho_{35} = \rho_{45} = 0$.

5. Results

In this section, we report the results of the proposed econometric model used to analyze the five categories of cruise passenger expenditure in the Canary Islands. Before discussing the parameter estimates, [Table 5](#) is presented, which shows the correlation in the error terms among the possible combinations of the five categories of cruise

passenger expenditure during a stopover, estimated using the multivariate tobit model. As can be observed in this table, all correlation terms are significantly different from zero at the 1% significance level, justifying the use of a multivariate tobit system to estimate cruise passenger spending. That is, the tobit system will provide a more efficient estimation than will estimating each univariate tobit expenditure equation separately. In addition, the null hypothesis that all the pairs of covariance parameters are jointly equal to zero is also strongly rejected (log-likelihood ratio test: $\chi^2(10) = 1812.81$), reinforcing the assumption that the error terms are correlated across equations.

It should be noted that the positive/negative correlation coefficient for the disturbance terms of two expenditure categories means that the unobservable factors that increase/decrease one of these types of cruise passenger expenditure also increases/decreases the other. The positive correlation coefficient between the disturbance terms of the shopping and the food and beverage equations (0.25), shopping and transport equations (0.24), shopping and cultural activities equations (0.22), and transport and cultural activities equations (0.32) implies that these categories of cruise passenger spending are complementary. Equally, the food and beverage component also complements transport and cultural activities, although with smaller correlation magnitudes. However, the correlation is negative between tours and food and beverage (-0.09), between tours and shopping (-0.05), and especially between tours and transport (-0.29), indicating that spending on tours acts as a substitute for the other spending components.

Once the existence of correlations between the categories of expenses considered has been verified, we continue to investigate and discuss the determinants of the five categories of cruise passenger expenditure. The results obtained from the maximum simulated likelihood estimator for the multivariate tobit system (see [Table A1](#) in Appendix A) reveal that most of the explanatory variables are statistically significant for all expenditure categories.⁶ However, for the gender, cruise season, and port of call variables, the sign of their effect varies depending on the expenditure category analyzed.

Moreover, with the aim of comparing the results of the multivariate tobit system with those of the previous literature, the univariate tobit regressions (five separate tobit equations, one for each type of expenditure) were also estimated without allowing for correlations between the equations. The Maddala pseudo-R2 was calculated to check the goodness-of-fit between the system and each of the equations separately ([Veall & Zimmermann, 1996](#)). By comparison, the Maddala pseudo-R2 of 0.272 for the multivariate tobit is larger than the values of 0.053, 0.064, 0.019, 0.063 and 0.046 for the univariate “Shopping”, “Food and beverages”, “Tours”, “Transport” and “Cultural activities” equations, respectively, which clearly supports the system specification.

On the other hand, it should be noted that a continuous variable for income is not available in the database because the survey designers decided not to include a question about income, not only to avoid problems derived from the high rates of nonresponse but also due to a likely high percentage of unreliable answers. Therefore, to circumvent the aforementioned problems, the designers opted for an alternative method for determining the purchasing power of cruise passengers, which consists of using socioeconomic status as a proxy for income.⁷ The

⁶ One of the typical explanatory variables used when analyzing cruisers’ expenditures is tourist destination satisfaction. When this variable was included in our analysis all the estimated coefficients were positive, indicating that satisfaction is a key element to incentivize cruise passenger consumption. This is because traveler satisfaction leads to an increase in expenditure during stopovers, confirming the previous results in the literature (see [Brida et al., 2018](#) or [Parola et al., 2014](#)). However, it should be noted that this variable could generate endogeneity problems, so we decided to exclude it from the present model.

⁷ It should be noted that the use of proxies of income is something usual (see, for example, [Brida, Fasone, et al., 2014](#)).

Table 5
System correlated errors.

Correlation	Shopping	Food and beverage	Tours	Transport	Cultural activities
Shopping	1.0000				
Food and beverage	0.2491***	1.0000			
Tours	-0.0448***	-0.0945***	1.0000		
Transport	0.2444***	0.1215***	-0.2961***	1.0000	
Cultural activities	0.2208***	0.1110***	0.0808***	0.3242***	1.0000

Note: *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

socioeconomic status variable is derived from both the respondent’s education and occupation level. Given an occupation level, a higher degree of education is linked to a higher socioeconomic status among one of the five categories considered (low, low-medium, medium, medium-high and high). Our results show that all the coefficients linked to this variable are positive and statistically significant (except for transport), which means that the higher one’s social status is, the higher that person’s expenditure.

6. Discussion and managerial implications

To facilitate the interpretation of the results, the marginal effects of the explanatory variables on the expected values of all observed expenditure, computed at the sample means, together with their associated t-values are calculated for both models (Table 6). These marginal effects, $\partial E(y_m|x) | \partial x$, are the changes in the dependent variables expressed in Euros.

As shown in the table, except for “food and beverages”, for the rest of the four cruise ship expenditure categories, the independent tobit models either underestimate or overestimate the magnitude of the marginal effects. This is especially relevant in the case of “cultural activities” and “tours”, where the marginal effects of the univariate tobit model represent 10% and 20%, respectively, of those of the multivariate system, while for “transport”, they account for 40%. In contrast, for “shopping”, the univariate model overestimates the magnitude of the marginal effects by almost 35%. This is evidence of the bias that can be incurred by ignoring correlations across expenditure equations, with implications for economic policy recommendations.

The estimated effects of the multivariate tobit system suggest that an additional year added to the average age of the tourists (55.8) reduces cruise passenger expenditure on shopping by €0.41, on food and beverage by €0.09, and on transport by €0.11. However, the positive and significant coefficient on age and the negative and significant coefficient on age squared for the shopping, food and beverages and transport equations (Table A1) indicate that the true relationship between these expenditures and age takes the form of an inverted U-shape. We have confirmed this hypothesis by checking that the turning point of the curves falls within the range of data (see Assaf & Tsonas, 2019). In this sense, the marginal effects for age rise initially until it reaches these turning points (at age 31.5 in shopping, at age 37.9 in food and beverages and at age 38.9 in transport), and afterward, a negative relationship prevails. This finding that age exerts an inverted U-shaped curvilinear effect on tourist expenditure is consistent with previous studies (Nicolau & Más, 2005 or Thrane & Farstad, 2012). Our result also echoes the findings of Brida, Bukstein, et al. (2012) and Brida, Pulina, et al. (2012) for cruise passengers’ expenditure in Cartagena de Indias (Colombia), which conclude that older tourists spend less on food and drink, souvenirs or transportation. This result suggests that policies that encourage the arrival of younger cruise tourists through specific marketing strategies could increase onshore expenditure.

Interestingly, we have found that there are significant differences in spending patterns between men and women on shopping, food and beverages, tours, and, to a lesser extent, cultural activities. Thus, while men spend €1.10 more than women on food and beverage and €3.69 more on tours, they spend less on shopping (€4.01). These results

contrast with most previous studies, which highlight that gender is not an influencing factor in travel spending, such as in Jang, Bai, Hong, and O’Leary (2004) for the case of Japanese travelers to the United States, in Wang, Rompf, Severt, and Peerapatdit (2006) for visitors to Northern Indiana (except in the category of entertainment expenditures) and in Marrocu, Paci, and Zara (2015) for tourists who spent their holidays in Sardinia (Italy). However, the positive relationship we found between female cruisers and shopping expenditure is in line with the results of Kim et al. (2011) for visitors to Macau (China) and with that of Rizzo (2012) for cruise passengers in Uruguay during the 2008–2009 season. Furthermore, the result that female cruisers spend less than males on food and beverages is in keeping with the findings of Brida et al. (2015; Brida, Bukstein, et al., 2012). Therefore, it seems that gender-oriented marketing strategies classified by expenditure categories should be more efficient than generalized strategies.

On the other hand, socioeconomic status has positive effects on the expenditure patterns of cruise ship passengers. Our results suggest that a tourist with a high socioeconomic status, relative to individuals with lower status, spends on average €5.32 more on shopping, €9.56 more on tours or €6.36 more on cultural activities. This finding of a positive relationship between cruise tourist expenditures and socioeconomic status, a proxy of household income, is consistent with most previous research (see, among others, Lee & Lee, 2017 for cruise passengers in Korea).

Regarding the trip-related variables, except in the case of tours, we estimated a positive marginal effect associated with traveling in a group. For example, we must highlight that compared to individuals who travel alone, those who travel with the family will spend €12.97 more on shopping and €7.66 more on transport. Thus, traveling with family or friends significantly increases expenditure per capita onshore on food and beverages and transportation, which agrees with the results reported by Brida et al., 2015 for the expenditure patterns of cruise ship passengers at the ports of call of Montevideo and Punta del Este (Uruguay). Nevertheless, the number of previous cruises does not have any effect on expenditure (except for shopping), in line with the findings of Marksel et al., 2017.

Other travel-related characteristics, such as being a first-time visitor versus a repeat visitor, have also been analyzed in the literature on tourism spending and lead to contradictory conclusions. Our result that first-time visitors to the Canary Islands spend more on tours (€8.39) is in accordance with what Oppermann (1996) obtains for Rotorua (New Zealand), Alegre and Juaneda (2006) for the Balearic Islands and Brida et al. (2015) for cruise ship passengers in Uruguay. Moreover, the positive relationship we found between repeat cruise passengers in the Canary Islands and increased spending on food and beverages is consistent with the findings of Dayour, Adongo, and Taale (2016) for tourists in Ghana, although it is the opposite of the result of Brida, Pulina, et al. (2012) for cruisers in Colombia. Consequently, it is necessary to launch customized marketing policies that take into account how these sociodemographic characteristics affect the different cruise passengers’ expenditure categories at the port of call.

Furthermore, our results also show the reduction in all categories of expenditure that occurred in the 2008–2009 season, holding constant the other explanatory variables, which is associated with the effect of the global financial crisis and is in line with, for example, the study of

Table 6
Marginal effects for cruise passengers' expenditure: multivariate tobit system vs. univariate tobit models.

Explanatory variable	Shopping		Food and beverages		Tours	
	MST	UT	MST	UT	MST	UT
<u>Socioeconomic characteristics</u>						
Age (years)	-0.4134***	-0.5560***	-0.0958***	-0.0955***	0.0031	0.0002
Gender (ref. male)	-4.0109***	-5.4196***	1.1014***	1.1419***	3.6981**	0.8590**
Socioeconomic status (0 = low, 1 = low-medium, 2 = medium, 3 = medium-high, 4 = high).	1.3301**	1.8116**	0.2461*	0.2592*	2.3998**	0.5142**
<u>Trip related characteristics</u>						
Previous cruises (number)	0.1701**	0.2356*	0.0281	0.0289	-0.2199	-0.0481
Group composition (ref. alone)						
With a partner	8.1130***	10.9101***	1.8320***	1.7678***	2.5002	0.5627
With the family	12.9674***	17.6355***	2.2665***	2.1828***	5.7015	1.3156
With friends	10.3750***	14.0140***	2.7328***	2.6725***	6.7987	1.5557*
First visit Canary Islands (ref. No)	-0.5776	-0.7256	-0.7847***	-0.7917***	8.3949***	1.8842***
Cruise season (ref. 2002/2003)						
2003/2004	11.4848***	15.4646***	4.0832***	4.0076***	-2.3990	-0.4456
2004/2005	10.2126***	12.7372***	2.4351***	2.2591***	-9.9950***	-2.0852***
2008/2009	-3.9045**	-6.8027***	-3.0801***	-3.4112***	-13.0061***	-2.6412***
2011/2012	6.0896***	7.0498***	-2.8167***	-3.0974***	-25.0022***	-5.4939***
2014/2015	7.8064***	9.6467***	3.8787***	3.7358***	-16.0079***	-3.5343***
Origen (ref. English)						
Spanish	13.9082***	18.9196***	0.9899	0.9087	9.1972	2.1749*
German	-2.4776**	-3.2575**	-1.8863***	-1.8166***	3.9012*	0.8212*
North American	4.4870*	6.2256*	0.1132	0.1017	9.1953**	2.1250**
Italian	10.5872***	14.3901***	0.1114	0.0736	12.9932***	2.5971***
Other European	4.7460***	6.4433***	0.0421	0.0270	6.5000**	1.4352**
Rest of the world	11.3798***	15.9506***	0.2568	0.3825	1.7999	0.3989
Port of call (ref. Lanzarote)						
Santa Cruz de Tenerife	14.7992***	19.8074***	1.3545***	1.3476***	8.7936***	1.8920***
Santa Cruz de La Palma	0.4513	0.2921	-0.5278	-0.5903	-0.9207	-0.4540
Las Palmas	9.6469***	12.9558***	1.1260***	1.0746***	-3.4007	-0.8013
Puerto del Rosario	-3.2776*	-4.7021**	-1.2092**	-1.3092***	-4.1993	-0.9606
La Gomera	-0.4886	-1.1789	0.8299	0.7712*	0.8793	0.1173
N° obs.	12,461		12,461		12,461	
Obs. Uncensored	7064		7199		1778	
Explanatory variable	Transport		Cultural activities			
	MST	UT	MST	UT		
<u>Socioeconomic characteristics</u>						
Age (years)		-0.1099**	-0.0507**	-0.1125	-0.0087	
Gender (ref. female)		0.4233	0.2914	0.9227*	0.1330**	
Socioeconomic status (0 = low, 1 = low-medium, 2 = medium, 3 = medium-high, 4 = high).		0.3771	0.2130	1.5902***	0.1366***	
<u>Trip related characteristics</u>						
Previous cruises (number)		0.0027	0.0011	0.0117	0.0021	
Group composition (ref. alone)						
With a partner		3.9630**	1.6908**	0.6672	0.0578	
With the family		7.6649***	3.4170***	2.0910	0.1917	
With friends		7.5005***	3.3319***	3.5387*	0.2883*	
First visit Canary Islands (ref. No)		0.4603	0.1595	-0.9127	-0.0908	
Cruise season (ref. 2002/2003)						
2003/2004		3.6476***	1.6531***	3.8889***	0.2812***	
2004/2005		-4.3270***	-1.9529***	-8.6594***	-0.8031***	
2008/2009		-9.7101***	-4.5650***	-17.3901***	-1.5901***	
2011/2012		-9.0206***	-4.3183***	-15.2046***	-1.3506***	
2014/2015		-8.0166***	-4.1104***	0.6116	-0.0796	
Origen (ref. English)						
Spanish		-0.0107	0.0252	2.5202	0.1624	
German		-0.9278	-0.4400	3.4910***	0.2967***	
North American		4.5064**	2.0705**	5.5188**	0.4298**	
Italian		5.1981***	2.1162**	4.9009***	0.4589***	
Other European		1.1092	0.5587	2.4614**	0.1658	
Rest of the world		6.3019***	3.1104***	7.7841***	0.7794***	
Port of call (ref. Lanzarote)						
Santa Cruz de Tenerife		-3.0809***	-1.4675***	-3.8206***	-0.2730***	
Santa Cruz de La Palma		-15.0884***	-7.2142***	0.1339	0.0159	
Las Palmas		-1.3302	-0.6611*	-0.3288	-0.0442	
Puerto del Rosario		-5.9915***	-2.6596***	-2.8016**	-0.2044*	
La Gomera		-17.5916***	-8.2706***	-19.8043***	-1.6937***	
N° obs.		12,461		12,461		
Obs. Uncensored		3783		1053		

Notes: *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively. MST = Multivariate system tobit. UT = Univariate tobit.

Eugenio-Martin and Campos-Soria (2014) that analyzed the reduction in tourism expenditure in the EU-27 during this period. Because of this, the average passenger expenditure on cultural activities and transportation were more strongly affected, being reduced by €17.39 and €9.71, respectively, in relation to the 2002/2003 season. The negative effects extended until the 2014–2015 season, except for the average amount of expenditure on food and beverage, which increased by €3.88, and expenditures on shopping, which rose by €7.81.

Taking the United Kingdom as the reference for country of residence, the marginal effects obtained indicate that a cruise traveler from Germany spends €1.89 less on food and beverage, a Spanish tourist spends €13.91 more on shopping, an Italian cruise passenger spends €12.99 more on tours and €5.19 more on transport and a North American spends €5.52 more on cultural activities. Aguiló and Juaneda (2000), Laesser and Crouch (2006) and Thrane and Farstad (2012) likewise found that the nationality of travelers is one of the main determinants of tourism expenditure. In the field of cruise tourism, Brida et al. (Brida et al., 2015, Brida, Pulina, et al., 2012), Lee and Lee (2017) and Risso (2012) come to similar conclusions. Our results that cruise passengers from nationalities other than German tend to have a higher level of spending on shopping compared to the British are in line with those obtained in Aguiló, Rosselló, and Vila (2017) for the Balearic Islands, as is the finding that Germans spend less on food and beverages than British cruise tourists.

This result suggests that to boost onshore expenditure, marketing campaigns should be oriented to the expenditure category whose marginal effect is greatest for each nationality. For example, shopping tours for Spaniards could be organized where special incentives encourage shoppers to make more purchases, such as discounts at the shops or malls visited while on tour or discounts for the second item purchased at the same retail shop.

Finally, the marginal effects point to significant differences in cruise passenger expenditure between islands. In comparison with Lanzarote, the average expenditure on shopping is €14.79 higher in Tenerife and €9.65 higher in Gran Canaria, while spending on transport is €15.08 lower in La Palma and €17.59 lower in La Gomera.

After discussing the determinants of the five categories of cruise passenger expenditure, it is worth returning to the correlations between their disturbance terms, since these indicate whether the different types of spending are complements or substitutes. Thus, when there is a positive correlation between two items, creating joint marketing campaigns could be more effective because common unobserved factors tend to increase both categories of expenditures. Therefore, it is necessary to design activities catered to different complementary categories of cruise passenger spending, such as shopping tours around the city that include stops at restaurants, where tastings of local products are offered (tapas and wine, typical sweets, etc.) and in this way, expenditure can be reinforced.

On the other hand, when the correlation is negative, as occurs, for example, between tours and shopping, practical strategies could also be designed to reverse or at least ameliorate this effect. This negative correlation means that tour and shopping activities are substitutes, that is, cruisers who undertake a tour have lower expenditures on shopping. This could be because there are no (or only a few) opportunities for shopping during the excursion. Since these tours are to a large extent organized by the cruise companies, this situation could be changed if such tours were designed to include shopping activities. One way to facilitate these purchases could be to create guides and brochures to be handed out before/during the tour. In fact, this could be a way for cruise companies to improve residents' perceptions and attitudes towards cruise tourism's impact on the destination city (Tovar et al., 2021).

Divisekera (2009) and Divisekera and Deegan (2010) study the expenditure behavior of foreign tourists in Australia and Ireland,

respectively, finding that the major groups of commodities consumed by these tourists, which include shopping, food and transport, behave as complementary goods. This would suggest that compared to cruise ship passengers, other tourists at the same destination would need to purchase all those goods and services to maximize the utility from their visit.

To sum up, these correlations, jointly considered with the marginal effects, provide important information to policy-makers, sellers and entrepreneurs to help better orient their policies and marketing strategies to maximize the impact that cruise passenger expenditure can have on the local economy. In summary, we suggest the following managerial implications that, in light of our findings, would lead to a greater impact of cruise tourism onshore:

- 1) Further promotion of cruises in the Canary Islands should be targeted at younger tourists and those traveling in a group.
- 2) Other personalized marketing strategies (gender-oriented, nationality-oriented or for first-time visitors to the Canary Islands) would need to be specific for each expenditure category. This should be more efficient than more generalized strategies and therefore should be implemented to better reach different customer segments.
- 3) Joint marketing campaigns should be designed for complementary expenditure categories of cruise passenger spending (for example, "shopping" and "food and beverages") so that they are more successful.

7. Conclusion and future research

The present study fills a gap in the literature by estimating a multivariate tobit system in which the decisions regarding cruise passenger expenditures measured as per capita expenditure for five categories during stopovers are analyzed simultaneously. Our results confirm the existence of correlations among the error terms of the equations for the expenditure categories considered. In addition, the goodness-of-fit measures imply that the use of a multivariate tobit system is justified and allows us to obtain more efficient estimates of the determinants of onshore cruise passenger spending, which can be useful for designing economic policies in destinations that receive cruise lines. Therefore, from a theoretical standpoint, this study provides an important contribution in terms of the proper methodology for exploring the determinants of different expenditure categories when there are several observations with zero expenditure and there are correlations among the different categories of expenditure.

Moreover, from a practical point of view, this paper has shown that it is paramount to study not only the visitors' total spending but also the factors influencing the types of goods and services purchased by cruise tourists and their cross-correlations. The knowledge of all the marginal effects derived from the factors influencing different expenditure categories allows for a more efficient design of the commercialization process by directing marketing efforts towards expenditure components that have a greater local economic impact on destinations, such as shopping and food and beverage. Moreover, marketing strategies would produce a greater effect if their design took into consideration the cross-equation correlations among expenditure categories.

We have also found strong empirical evidence on the importance of sociodemographic characteristics, such as gender, age, socioeconomic status and even nationality, to explain the determinants of the different types of cruise passenger expenditure. Consequently, it is necessary to launch customized marketing policies that take into account how these sociodemographic characteristics affect the different cruise passengers' expenditure categories at the port of call. The estimates of all these marginal effects allow for the concentration of marketing efforts on expenditure components that have a greater local economic impact on

destinations.

Some limitations of this study should be considered. First, the dataset available was collected at only a single destination (Canary Islands); thus, the results should not be generalized until further similar studies can be replicated for other destinations. Moreover, the data set was gathered before the COVID-19 pandemic, therefore, it should be noted that the results could vary due to, for example, variations in the cruiser’s profile (sociodemographic characteristics). Second, it would be interesting to check whether our results might be affected by using a higher number and/or different types of expenditure. The improvement in the economic effects related to land expenditure may be addressed by exploring what new products and/or services may also be offered that have not been considered before, especially those that could also be useful for branding the port city with a local identity and providing tourists with higher quality experiences (Dai, Hein, & Zhang, 2019).

Finally, another possible avenue for future research is to extend the time span of the analysis past 2015 in order to study whether the onshore behavior of cruise passengers has changed in recent years due to, for example, variations in their geographical origin or the recent pandemic (COVID-19). It should be noted that prevention measures and new health protocols that minimize the possibility of transmission of the virus between the local population and visitors also limit cruise passengers’ options for spending at a destination. Whether COVID-19 changes could last long-term is an open question. Like the rest of the travel industry, the cruise sector and local entrepreneurs are looking forward and pinning their hopes on the vaccination.

Whatever the outcome of the COVID-19 crisis, the cruise industry will have to face increasing pressure to operate sustainably. Therefore, together with the cities — and their residents — the cruise industry should develop a more sustainable tourism after the pandemic from

which all sides would equally benefit. We hope the results offered in this paper could be useful to attain it.

Author contribution

Authors contributed equally to the development of the present paper.

CRediT authorship contribution statement

J.F. Baños: Conceptualization, Methodology, Formal analysis, Writing - review & editing. **B. Tovar:** Conceptualization, Methodology, Formal analysis, Writing - review & editing.

Declaration of Competing Interest

None.

Acknowledgements

The authors would like to thank the two anonymous reviewers and the editor for their insightful comments on the article. Addressing the raised points has led to the improvement of this work. The authors wish to acknowledge the help provided by Mr. Juan Francisco Martín Naranjo and Mr. Jose Luis Saavedra Alvarado who provide the data used in this paper. Financial assistance for this work was provided by Grants ECO2015-68345-R (MINECO/FEDER) and MINECO-18-ECO2017-86402-C2-1-R from the Spanish Ministry of Economy and Competitiveness and also the Project PAPI-18-GR-2011-0026 from the University of Oviedo.

Appendix A. Appendix

Table A1

Estimated System Tobit for cruise passengers’ expenditure.

Explanatory variable	Shopping	Food and beverages	Tours	Transport	Cultural activities
Socioeconomic characteristics					
Age (years)	0.7254***	0.4061***	-0.0884	0.4081*	0.2180
Age square (years)	-0.0115***	-0.0054***	0.0008	-0.0052**	-0.0032
Gender (ref. male)	-5.4383***	2.2141***	5.8513**	0.6828	1.6849*
Socioeconomic status (0 = low, 1 = low-medium, 2 = medium, 3 = medium-high, 4 = high).	1.8034**	0.4948*	3.7498**	0.6072	2.0336***
Trip related characteristics					
Previous cruises (number)	0.2305**	0.0564	-0.3414	0.0043	0.0149
Group composition (ref. alone)					
With a partner	11.0002***	3.6826***	3.9066	6.3817**	0.8532
With the family	17.5822***	4.5561***	9.0071	12.3628***	2.6739
With friends	14.0673***	5.4935***	10.7234	12.0976***	4.5252*
First visit Canary Islands (ref. No)	-0.7832	-1.5774***	13.2622***	0.7425	-1.1687
Cruise season (ref. 2002/2003)					
2003/2004	15.5720***	8.2079***	-3.7660	5.8927***	4.9794***
2004/2005	13.8470***	4.8950***	-16.2520***	-6.9904***	-11.0875***
2008/2009	-5.2941**	-6.1915***	-20.1958***	-15.6615***	-22.2380***
2011/2012	8.2568***	-5.6621***	-39.8124***	-14.5493***	-19.4185***
2014/2015	10.5846***	7.7970***	-25.6127***	-12.9301***	0.7831
Origen (ref. English)					
Spanish	18.8578***	1.9898	14.4383	-0.0173	3.2269
German	-3.3594**	-3.7918***	6.1630*	-1.4965	4.4642***
North American	6.0838*	0.2276	14.4126*	7.2802**	7.0664**
Italian	14.3550***	0.2239	20.2386***	8.3841***	6.2672***
Other European	6.4350***	0.0846	10.2041**	1.7977	3.1475**
Rest of the world	15.4297***	0.5162	2.8479	10.1644***	9.9541***
Port of call (ref. Lanzarote)					
Santa Cruz de Tenerife	20.0659***	2.7229***	13.8920***	-4.9612***	-4.8920***
Santa Cruz de La Palma	0.6120	-1.0609	-1.4499	-24.4149***	0.1717
Las Palmas	13.0800***	2.2635***	-5.2807	-2.1455	-0.4215
Puerto del Rosario	-4.4440*	-2.4307**	-6.6131	-9.6637***	-3.5872**

(continued on next page)

Table A1 (continued)

Explanatory variable	Shopping	Food and beverages	Tours	Transport	Cultural activities
La Gomera	-0.6625	1.6683	1.3804	-28.3735***	-25.3901***
Constant	-28.3284***	-11.6355***	-11.7766***	-26.8689***	-42.4512***
N° obs.	12,461	12,461	12,461	12,461	12,461
Obs. Uncensored	7064	7199	1778	3783	1053

Notes: *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

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APPENDIX SE6: CRUISE TOURISM IN SCOTLAND



**Cruise Tourism in Scotland: Review &
Sustainable Development Opportunities
for
VisitScotland
Scottish Enterprise
Highlands and Islands Enterprise
Scottish Government**

FINAL REPORT
October 2020





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Preface

ekosgen, in partnership with Reference Economic Consultants and Context Economics, were commissioned in 2019 to undertake a review of the cruise tourism opportunity in Scotland, and to provide insights and recommendations for future planning. At this time, and up until early 2020, cruise tourism was a growing industry, and the 2020 cruise tourism season was anticipated to be another significant season in Scotland. This was prior to the onset of the global pandemic. As such, while the research, resulting analysis and reporting, and therefore the conclusions and recommendations flowing from the study, are informed by and based on a pre-COVID-19 context, the conclusions and recommendations flowing from the study remain relevant for future planning.

Both the COVID-19 pandemic and the effect it has had on the economy and communities of Scotland is unprecedented. We are arguably only just beginning to understand the true scale of the impact on all sectors, and the change that has been – and will be – brought about as a result has yet to become clear.

Tourism is one of a number of industries in Scotland that has been hit particularly hard. We know that for many businesses and sectors, the 2020 season has effectively been wiped out. For rural areas dependent on tourism for employment and economic prosperity, this has increased the socio-economic fragility. Nearly all tourism businesses in Scotland have experienced cancellations, a decline in bookings or fewer visitors. Almost 60% of tourism businesses have had to reduce staff numbers, with further losses expected. Many of the challenges are compounded by the seasonality of tourism in Scotland.¹

Whilst there is currently no indication of when restrictions will be lifted and cruise operations in the UK will recommence, the 2020 cruise tourism season in Scotland has effectively been cancelled. Cruise Lines International Association (CLIA) member operators unilaterally agreed to suspend global operations in mid-March, at the beginning of the Scottish cruise season. The coronavirus pandemic has also led to the closure or scaling back of work at all the major European shipyards, with knock-on delays to refurbishments and new-builds. As of mid-April 2020, those shipyards began re-opening slowly². More recently on the 16th August MSC Cruises' fleet returned to the Mediterranean to implement the Company's new Covid19 health and safety protocol.³

However, what is apparent is that for cruise tourism, and tourism more generally in Scotland, new markets and new models of operation will come to the fore in a post-COVID-19 environment. Though the recommendations of this report were made in a pre-COVID-19 context, they anticipated the need to ensure sustainability across the wider cruise ecosystem in Scotland, and to take a place-based approach to cruise tourism. As such, the conclusions and recommendations of this report – and therefore the learnings that stakeholders can take from this research to inform future planning and decision-making – hold true in a post-COVID-19 environment.

¹ VisitScotland (2020) monitoring the effects of COVID-19 on the Scottish Tourism Industry, Wave 2 Results (20-30 March 2020), at: <https://www.visitscotland.org/research-insights/about-our-industry/impact-covid19>

² <https://www.cruise critic.co.uk/articles.cfm?ID=167>

³ <https://www.traveldailynews.com/post/msc-cruises-welcomes-back-first-quests-on-msc-grandiosa>

1 Introduction to the research

About the review

1.1 This review of cruise tourism in Scotland is a pan-Scotland study led by VisitScotland, Highlands and Islands Enterprise, Scottish Enterprise and Scottish Government. It has been conducted by ekosgen, in partnership with Associates Reference Economic Consultants and Context Economics.

What it covers

1.2 The objectives of the study are to provide a comprehensive understanding of the Scottish cruise tourism ecosystem and the relative opportunities at individual local port, regional and national level whilst identifying pressure points and impacts on infrastructure, environment and local communities. The study should help inform future planning by providing insights to inform future sustainable development at port, regional and national level and provide the evidence base for local, regional and national cruise development assessments and strategies, aligned to *Scotland Outlook 2030*, the new national tourism strategy for Scotland.⁴ It should also consider how the changing cruise market may affect Scotland's position in the market.

1.3 At a headline level the review has assessed the scale and scope of cruise tourism activity across Scotland. Specifically, the research:

- Provides an overview of the size, shape and composition of Scotland's cruise tourism market, including an assessment of the economic value of the sector to Scotland. The review examines the market by each port and its destination hinterland to provide insights into where cluster activity is prominent and where opportunities for niche development exist or where there is a need to better manage existing levels of activity.
- Reviews the existing and newly gathered information on market demand, and identifies the most significant sustainable growth opportunities for the sector in Scotland and the implications for infrastructure and investment requirements to meet and accelerate these opportunities. The role of the public sector, private sector and landowners in meeting these requirements is also explored.
- Identifies barriers impacting on Scotland's capability to meet the infrastructure and investment requirements, providing recommendations on how these may be addressed.
- Analyses how competitive and innovative the Scottish cruise tourism product offering is against destinations worldwide, identifying where Scotland has the best competitive advantage and how it can improve its position.

How the research was conducted

1.4 The research has been wide ranging, seeking to achieve breadth of coverage and more in-depth sector insight. In line with the study objectives, it has sought to establish the shape and composition of the sector, how key players interact with one another and to identify growth opportunities and sector support requirements. This has been achieved through extensive primary research supplemented by desk-based research and an international benchmarking exercise. Fieldwork was undertaken between September 2019 and March 2020.

1.5 The study tasks have consisted of:

⁴ Scottish Tourism Alliance, Scottish Government, VisitScotland, Highlands and Islands Enterprise, Skills Development Scotland, Scottish Enterprise (2020) *Scotland Outlook 2030: Responsible tourism for a sustainable future*

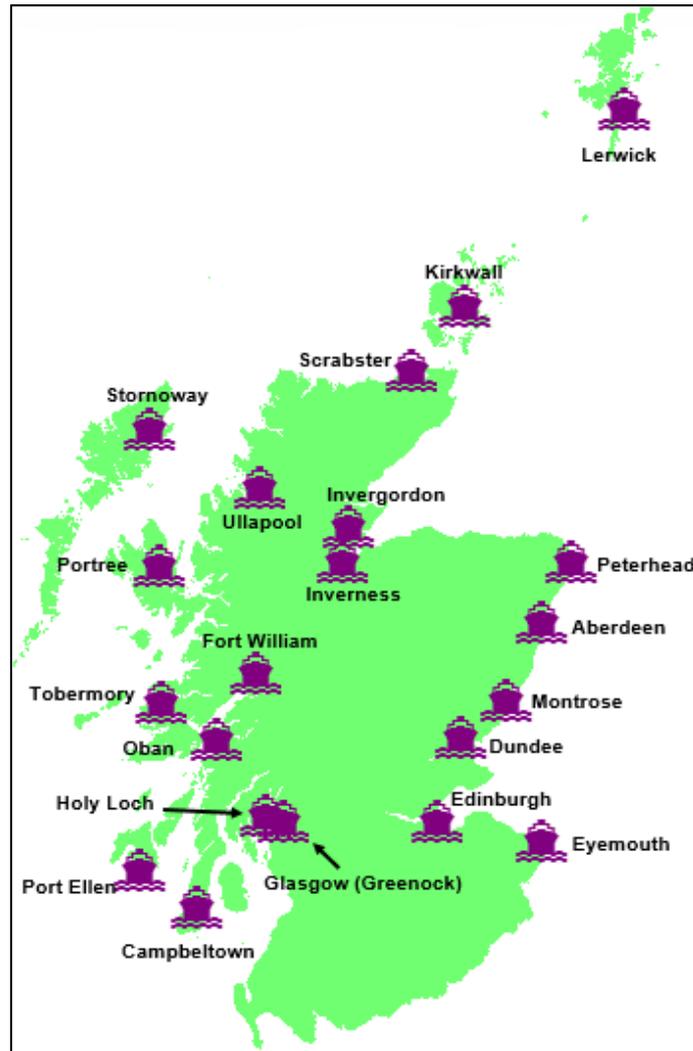
- **Desk research** on the background of the global and European cruise markets and their current trends and developments. A specific analysis of cruise line companies operating in Scotland was also undertaken. This is highlighted at **Appendix 1**.
- A **consultation programme** with a representative sample of all actors in the cruise tourism ecosystem. The numbers and types of organisations are shown at Table 1.1 below. A total of **102** in-depth telephone interviews were carried out. Organisations consulted are listed at **Appendix 2**.

Table 1.1: Consultees by organisation type

Organisation type	No. consultees
Cruise line companies	11
Port operators	22
Port agents and ground handlers	8
Visitor attractions	13
Destination groups	12
Local authorities	12
Public sector	18
Membership/trade bodies	6

- A **data collection exercise** which consisted of engagement with each of the 21 Scottish ports in scope for the study. Data on the annual volume of cruise calls and passengers from 2014 to 2019 was gathered as well as forecast numbers of calls for 2020-2022. Data on the breakdown of these calls by size of vessel was also collected. Vessel sizes are defined as follows:
 - Mega vessel – over 3,000 passengers
 - Large vessel – 1,750 to 2,999 passengers
 - Medium vessel – 750 to 1,749 passengers
 - Small vessel – 250 to 749 passengers
 - Boutique vessel – fewer than 250 passengers
- Figure 1.1 below depicts the ports researched and consulted.

Figure 1.1: Cruise ports in Scotland (2019)



Source: *ekosgen*

- The creation of a **Scottish Cruise Data Matrix** designed to inform planners of the scale and scope of activity at port, local authority, regional and national spatial levels. Its functionality allows users to ‘look up’ cruise call and passenger information and provides detailed cruise line data and an overview of destination information at the individual port level.
- An **online survey** to gather the views and experiences of local businesses and community representatives across Scotland’s key cruise destinations. The survey was distributed via Destination Management Organisations and Community Groups. In total **291** responses were secured, with a completion rate of 49% – **42** from community representatives and **249** from businesses. The following table shows the geographical breakdown of survey respondents. Full survey results are presented in **Technical Annex C**.

Table 1.2: Survey respondents in communities and businesses

Geographical Area	Community Representatives	Businesses
Aberdeen City	-	1%
Aberdeenshire	2%	6%
Argyll and Bute	10%	9%
City of Edinburgh	5%	11%
Dundee City	-	1%
East Lothian	-	1%
Fife	2%	1%
Glasgow City	-	2%
Highland	38%	15%
Inverclyde	5%	1%
Midlothian	-	1%
Orkney Islands	10%	26%
Shetland Islands	10%	2%
West Lothian	-	1%
Western Isles	19%	20%
Elsewhere in Scotland ⁵	-	2%

Source: *ekosgen survey of community groups (n=42) and businesses (n=249)*

- Developing a method and approach to **calculating the value** of cruise tourism to Scotland. A full description of the methodology used in this study is provided at **Appendix 3**.
- Preparation of 21 individual **Port Profiles** each of which expands on the port information in the Data Matrix and contains a short SWOT analysis of each port based on desk research and consultation findings. These are contained in **Technical Annex A**.
- The development of four **case studies** demonstrating current practice in sustainable cruise tourism management in Orkney and at three other cruise ports: Bergen, Barcelona and Juneau in Alaska. These are contained in **Technical Annex B**.

How the report is structured

1.6 The report is structured in the following way:

- **Chapter 2** considers the global, Northern Europe and UK and Scottish cruise markets and their trends. It also describes the environmental and social impacts of cruise tourism and the cruise ecosystem in Scotland;
- **Chapter 3** presents an overview of the volume and value of the Scottish cruise tourism market;
- **Chapter 4** discusses Scottish ports and their infrastructure and engagement with the cruise market;
- **Chapter 5** presents the views of cruise operators and intermediaries;
- **Chapter 6** considers the challenges and opportunities for Scottish destinations and their communities;
- **Chapter 7** discusses the key challenges and inhibitors to the sustainable development of cruise tourism in Scotland;
- **Chapter 8** considers the key development opportunities for cruise tourism in Scotland; and

⁵ This includes business responses from Clackmannanshire, Falkirk, Moray, Perth and Kinross, Scottish Borders, South Lanarkshire.

- **Chapter 9** presents conclusions and recommendations for future planning and investment decisions with respect to cruise tourism in Scotland's ports and their hinterland destinations.

2 Cruise tourism in Scotland: what we already know

Introduction

2.1 The aim of this chapter is to provide the wider context for the research and the rest of this report. It presents a definition of cruise tourism as a specific sector of the tourism industry. It then discusses the size and trends of the market at a global, European and UK and Scottish level, including emerging market and passenger trends, before describing the cruise tourism ecosystem in Scotland.

Defining cruise tourism

2.2 Cruise tourism can generally be defined as a luxury, all-inclusive way of travelling, usually for at least 48 hours, following a specific itinerary during which the cruise ship calls on a variety of ports and their connected cities or hinterland. It is a tourism product that offers and combines attractions, activities, access, accommodation, and amenities. The nature of cruise ships can make them destinations in their own right, where features and amenities are comparable or even superior to resorts on land.

2.3 For the purposes of this research cruise tourism refers to:

- **Sea cruises** which cover large distances, sailing the world's seas and oceans. Ships range in size from large to mega-sized vessels which include a wide variety of facilities and services to cater to different target passenger groups.
- **Expedition or boutique cruises** which are speciality in nature, offering visits to more unusual and sometimes less accessible locations. These cruises are targeted to those interested in wildlife, nature, and adventure. Ships are often small or medium in size in order to access more remote places.

The cruise tourism market

2.4 This section presents a brief overview of global, Northern Europe and UK and Scottish markets for cruise tourism. It focuses on the following aspects of the industry: size and characteristics of each market and emerging trends; the scale of passengers; future forecast trends in terms of passengers and cruise calls; and the progress of the sector towards sustainable tourism.

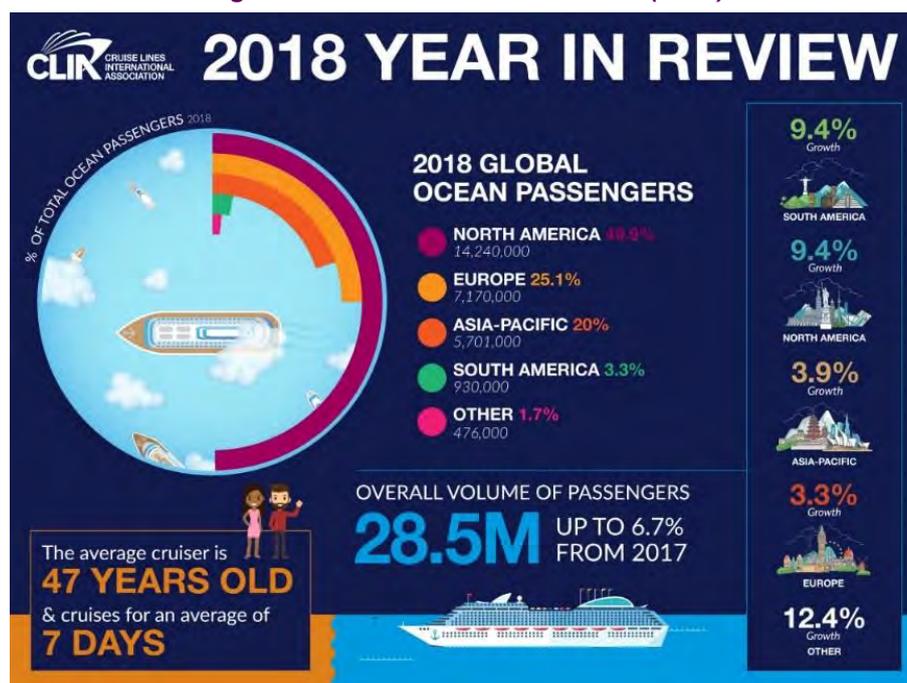
The global market

2.5 The worldwide cruise industry has grown steadily and significantly over the last two decades. Worldwide, the number of passengers on cruise trips has increased from 16.3 million in 2008 to 28.5 million in 2018⁶, as shown at Figure 2.1. This is a 75% increase exceeding all previous projections. The North America region remains the largest source market, accounting for 50% of global cruise passengers. Europe has also experienced strong growth over the last decade, with passengers sourced from Europe increasing 60% over this timeframe and accounting for a quarter of all passengers, some 7.2 million. At the time of writing some 32 million passengers globally were expected to cruise in 2020.⁷

⁶ The Contribution of the International Cruise Industry to the Global Economy in 2018, CLIA, 2019

⁷ 2020 - State of the Cruise industry Outlook, CLIA, 2019

Figure 2.1: Global cruise statistics (2018)



Source: CLIA, 2019

2.6 This growth is expected to continue in the longer term. The number of worldwide cruise passengers is expected to grow by a further 30% by 2028, as new ships come into the market^{8,9}. In 2019, some 115 new ships were on order, with 19 new ships added to the global fleet and three ships removed¹⁰. As well as the size of the cruise market fleet, ships are getting bigger, with more than a third (36%) of the new ships coming on stream having capacity to carry over 4,000 passengers. Conversely, around 30% of these new ships will carry fewer than 1,000 passengers, catering for more specialist expedition and boutique markets.

Emerging market trends

2.7 Cruise tourism has diversified into specialist areas and expanded its offering in the past decade. They offer more remote destinations, more adventurous excursions and cruises targeted at specific markets. There is a general trend for cruises of shorter durations and, while heritage and history continue to drive enthusiasm for cruising, operators expect a growing demand for a wider range of onshore activities as well as a positive passenger experience in the port and its immediate environs.

2.8 Whilst mainstream cruising has changed a great deal, with mega-sized ships now offering, for example, go-karting tracks, spas, water-parks, climbing walls, ice rinks, open air cinemas and zip lines – the trend of expedition and boutique cruising is growing, albeit still a niche market. For example, Cruise Lines International Association (CLIA) data indicates that between 2017 and 2018, passengers on expedition cruises to Antarctica, the Arctic, Galapagos, and Greenland increased by nearly a third, with 148,000 passengers¹¹. There is also evidence of expedition elements creeping into the everyday cruising offering.

2.9 Boutique cruises provide a luxury offering with more space and fewer fellow passengers. The vessels are typically much smaller, accommodating between 30 and 200 people. Some cruise operators are actively targeting this market with new luxury vessels coming on stream. Going further, some

⁸ Expedition cruise sector 'to grow by 30% by 2022 – Travel Weekly (March 2019): <http://www.travelweekly.co.uk/articles/327946/expedition-cruise-sector-to-grow-by-30-by-2022>

⁹ No data available on decommissioned vessels

¹⁰ CLIA Environmental Technologies and Practices Report (2019)

¹¹ <https://skift.com/2019/07/30/expedition-cruising-is-still-small-but-going-mainstream-for-travel-advisors/>

operators are providing themed cruises or providing cruises for specific markets, e.g. LGBT+, while one operator has introduced all-female crews on some of its cruises.

2.10 There has also been a shift away from passengers on mainstream cruise voyages booking guided tours and itineraries to planning a more independent visit at destinations. Cruise operators have stated that up to 60% of passengers, on boutique cruises in particular, can organise and book their own itineraries. Allied to this is the demand for a more personalised experience by some passenger types.

2.11 Worldwide, the age profile of cruise passengers has been falling. Recent figures show that the average age of cruise passengers is 47, although in the UK market it is 55.¹² This changing demographic reflects that cruise lines have continued to add new on-board features, as well as shore experiences and itineraries which appeal to more diverse and younger markets.

2.12 Cruise tourism is a relatively well-established sector in the North American and European markets and a developing sector in several other emerging markets. However, industry data indicates that market penetration rates are still low, and that a significant portion of cruise tourists are first-time cruisers. Recent research also shows that around 80% of cruise passengers are likely to book a cruise as their next holiday¹³. Both of these factors present an opportunity for long-term growth and a potential for increased profitability¹⁴.

Western and Northern European markets

2.13 Passengers on European cruises increased by 72% from 2007 to 2017, from 4.1 million to 6.9 million¹⁵. In terms of the Western European market, Germany has the largest market share, at just under a third in 2017 (32%, 2.2 million passengers) and growth of +8.5% from 2016 to 2017 (see Table 2.1). The UK and Ireland had the second largest market share (28%, 2.0 million passengers), with growth of +0.5% over this period. After Germany, the country to experience the greatest growth over this period was Spain (+6.4%). France and Scandinavia both experienced a decline in their share, at -9.2% and -4.6% respectively. Overall, Western Europe experienced growth of +2.5% during this period.

Table 2.1: Western European cruise market (2017)

Geographic area	Passengers (000s)	% share of European market	% change from 2016
Germany	2,189	32	+8.5
UK and Ireland	1,959	28	+0.5
Italy	769	11	+2.4
France	503	7	-9.2
Spain	510	7	+6.4
Scandinavia	227	3	-4.6
Benelux	187	3	+5.1
Switzerland	151	2	+3.4
Austria	129	2	+3.2
Other	317	5	-5.7
Total	6,941	100	+2.5

Source: CLIA, CLIA Europe, CLIA UK and G. P. Wild (International) Limited. In G. P. Wild (2018) *European Cruise Market Source and Destination Report*. * Please note Benelux is Belgium, Netherlands and Luxembourg.

¹² Why are more under 45s choosing cruise holidays? – BBC News (July 2017) <https://www.bbc.co.uk/news/uk-england-40030147>

¹³ CLIA Consumer Survey Spring 2019, 8 countries

¹⁴ Marine Tourism Market Size Expected to Reach 92800 million US\$ by 2025, with a CAGR of 6.7% - NBC (August 2019) <https://www.nbc29.com/story/40888709/marine-tourism-market-size-expected-to-reach-92800-million-us-by-2025-with-a-cagr-of-67>

¹⁵ CLIA; CLIA One reSource 2016 & 2017. Cited in CLIA (2018) *The Contribution of the Global Economy in 2017*, p. 5

2.14 Considering the Northern European market in particular, from 2013 to 2018 cruise capacity (available space for passengers on cruise ships and sailings) grew by over 40% (see Table 2.2), from 13.5 million passenger nights in 2013 to 19.4 million in 2018.¹⁶ From 2016 to 2018, there was an increase in the pace of expansion, with growth being strongest in the North-West European and British Isles sectors, rather than the Baltic and Norwegian markets, which have traditionally been stronger markets. This shift is reported to be partly due to changes in environmental regulations, reducing volumes to Baltic and Norwegian markets. This has been a conscious decision on the part of governments in countries such as Norway to limit the number of cruise arrivals, in order to reduce the negative environmental and community impacts of cruise tourism, and ultimately be more sustainable. The popularity of cruises linking different capital cities has also been a factor in growth patterns across Europe (see Table 2.2).¹⁷

Table 2.2: Northern European cruise capacity by sub-region (2013-2018)

Geographic area	% increase 2013-2018	
	Potential passenger throughput	Available passenger nights
NW Europe	+108.6	+112.8
British Isles	+68.6	+94.0
Arctic	+30.7	+24.1
Baltic	+18.7	+20.7
Norwegian Fjords	+16.6	+36.2
Total	+40.7	+43.8

Source: G. P. Wild (International) Limited. In G. P. Wild (2018) *European Cruise Market Source and Destination Report*, p. 18

2.15 In terms of future trends for Europe as a whole (see Table 2.3), forecasted growth in visiting passengers from 2017 to 2022 suggests that Scandinavia will experience the greatest increase in percentage terms (+85%), followed by France (+56%) and Benelux (+42%). The UK's passenger numbers are expected to grow by 11% from 2017 to 2022, reaching 2.2 million by 2022.

Table 2.3: Forecast growth in passengers in Europe (2017-2022)

Geographic area	2017	2022	% change 2017-2022
Scandinavia	227,000	419,872	+85.0
France	503,000	782,654	+55.6
Other Western Europe	317,000	488,768	+54.2
Benelux	187,000	265,667	+42.1
Germany	2,189,000	2,860,147	+30.7
Italy	769,000	950,287	+23.6
United Kingdom	1,959,000	2,173,962	+11.0
Iberia	556,794	565,507	+1.6
Other Europe	91,541	56,548	-38.2
Total	6,799,335	8,563,411	+25.9

Source: G. P. Wild (International) Limited. In G. P. Wild (2018) *European Cruise Market Source and Destination Report*, p. 7

The UK and Scotland

2.16 The UK cruise market is rapidly evolving, with the commissioning of a larger number of expedition craft, bringing smaller numbers of passengers who are often seeking a deeper experience. This trend will affect Scotland by creating both opportunities and challenges.

¹⁶ G. P. Wild (2018) *European Cruise Market Source and Destination Report*, p.8

¹⁷ G. P. Wild (2018) *European Cruise Market Source and Destination Report*, p.18

2.17 Research suggests that in 2017, the cruise industry generated approximately €10.4 billion for the UK economy, representing approximately 22% of the industry's total output across Europe.¹⁸ Of this, €3.9 billion was spent on direct expenditures, an 18% increase from 2015, with the remainder being indirect and induced expenditure.¹⁹

2.18 The scale of marine and cruise tourism has grown year on year in Scotland. In 2019, there were 893 cruise ship calls bringing 817,000 passengers to Scotland²⁰, equating to 5% of all tourism visits. This was an 8% increase in calls from 2018 and a 17% increase from 2017. Initial forecasts for 2020 predicted passenger numbers to pass the 1 million mark. However, at the time of writing we recognise that this forecast was before the COVID-19 pandemic which will undoubtedly have a negative impact on cruise passenger numbers globally and for the UK and Scotland.

2.19 To illustrate the diversification of destinations and market growth in Scotland, since 2014, the number of passengers to Invergordon has more than doubled (133%), Kirkwall²¹ has grown by 109% and Shetland by 74%.²² In 2019, the most visited British port was Invergordon, with an estimated 168,000 passengers, followed by Greenock (c.144, 000), Edinburgh²³ (c.139,000) and Kirkwall (c.132,000).²⁴

2.20 The Scottish cruise industry supports more than 800 employees, generating around £23 million GVA for the Scottish economy²⁵. It also helps to extend the tourism season in some areas, for example in Orkney and Shetland. Figure 1.1 in Chapter 1 demonstrates the spread of cruise tourism to some of the more remote and rural parts of the country.

2.21 Whilst there are undoubtedly economic benefits of cruise tourism in Scotland, growth must be planned and managed with certain factors considered and risks mitigated. It is clear that the cruise industry has large growth potential and a great deal to offer Scotland economically, to a lesser degree, socially, for example by providing jobs which will help to retain and attract talent and by supporting local amenities and infrastructure and so contributing to the sustainable development of destinations and their communities

Cruise tourism and sustainable tourism

2.22 As discussed, cruising is of local, regional and national significance, providing jobs, revenue and supporting sustainable enterprise development. However, sustainable cruise tourism development must be the overarching requirement.

2.23 Sustainable tourism as defined by the United Nations World Tourism Organisation is:

“Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities”

2.24 In 2018, research estimated that there were 28.5 million cruise passengers, with 1.17 million full-time equivalent employees, \$50.24 billion in wages and salaries, and a total output worldwide of \$150 billion.²⁶ Globally, passenger spending in port was estimated to be \$376 before boarding, and

¹⁸ Business Research & Economic Advisers Research (2017) on behalf of Cruise Lines International Association

¹⁹ Business Research & Economic Advisers Research (2017) on behalf of Cruise Lines International Association

²⁰ Cruise Scotland, 2020

²¹ Please note that throughout this report, 'Kirkwall' refers to Kirkwall port while 'Orkney' refers to Kirkwall and Stromness ports.

²² ekosgen 2020

²³ Please note that throughout this report, 'Edinburgh port' encompasses Leith, Newhaven, South Queensferry and Rosyth

²⁴ ekosgen 2020

²⁵ Scottish Ports: Gateways for Growth (2018)

https://www.britishports.org.uk/system/files/documents/scottish_ports_gateways_for_growth_2018_final.pdf

²⁶ CLIA (2018) Global Impact Study, cited in CLIA (2020) State of the Cruise Industry Outlook, p. 19

\$101 in port while visiting during a cruise. Economic impacts can be both direct and indirect, with key industries likely to benefit including transportation, tour operators, visitor attractions and retail.

2.25 However, despite these cited economic benefits, some evidence suggests that they do not always benefit the local communities where ports are based. There is variable evidence regarding how far cruise visits benefit local businesses, with some cruisers only spending minimal amounts whilst ashore, or choosing not to get off the ship at all. It is therefore important to consider how the economic impact of cruise tourism can be maximised in local and national economies through passenger and crew spend when they are onshore. Changing consumer habits may represent an opportunity for sustainable cruise tourism growth, most notably in relation to the environment and the perceived contribution to climate change.

2.26 These environmental industry challenges and pressures must be understood and managed in a strategic way, and therefore must also minimise extended negative environmental and social impacts. Environmental impacts include those arising from ship operations and tourist activities, with cruising being one of the highest CO₂ contributors in tourism.²⁷ Cruise vessels are also responsible for other pollutant emissions. Notably, a recent study by European research think tank Transport & Environment concluded that Carnival Corporation alone emitted nearly 10 times more sulphur oxide (SOX) around European coasts in 2017 than the estimated 260 million cars in Europe – with emissions concentrated at major cruise port destinations such as Barcelona, Venice and Southampton.²⁸ Massive influxes of tourists increase those pressures on small areas with little management infrastructure in place. In terms of the marine environment, the ships are a major source of marine pollution through the dumping of waste and untreated sewage at sea, and the release of other shipping-related pollutants²⁹. Every year, the industry consumes millions of tons of fuel and produces almost a billion tons of sewage. It is estimated that 24% of all waste produced by shipping comes from cruising, with the average person producing 2.6 to 3.5kg/person/day and 8 litres of toxic bilge water disposed of per person/day. Pollution from bilge water and fuel release alone can potentially be higher than acute spills and collisions.³⁰

2.27 Cruise operators are under increasing pressure to limit or offset their environment impact on the destinations that they visit. They are also under pressure to consider the sustainability of their onshore activities, with large numbers of passengers disembarking at specific destinations or visiting certain attractions at the one time.

2.28 It is important to make the distinction between the environmental and community impact of large and small cruise operators. The impact of boutique and small-sized vessels is minimal when compared to large and mega vessels, as they require less power, have fewer passengers and leave less of a footprint on the ports and communities that they call at. Larger vessels require more supporting infrastructure to help manage passengers and waste streams. As a result, cruise lines operating larger vessels tend to receive the bulk of the negative publicity around the impact of cruising.

2.29 Liquefied natural gas (LNG) is a natural gas that has been cooled to liquid form and is used predominantly as an alternative transportation fuel. LNG is non-toxic and non-corrosive and so more environmentally friendly than many other types of transport fuel. It has negligible sulphur content and approximately 30% less particular matter, whilst Nitrogen Oxide emissions are reduced by up to 85%³¹. Many new build cruise vessels will be powered with LNG, and some existing vessels have been/are being re-fitted to include LNG engines, such as AIDA on their AIDAnova vessel in 2018. It is expected that 44% of new-build capacity will rely on LNG fuel for primary propulsion.³² Cruise terminals such as Rotterdam, Tenerife and Barcelona currently offer LNG bunkering, and Southampton is developing this

²⁷ Manning, T. (2006) Managing Cruise Ship Impacts: Guidelines for Current Potential Destination Communities,

²⁸ Transport & Environment (2019) One Corporation to Pollute Them All: Luxury cruise air emissions in Europe, at: <https://www.transportenvironment.org/publications/one-corporation-pollute-them-all>

²⁹ http://www.coastalwiki.org/wiki/Impact_of_tourism_in_coastal_areas:_Need_of_sustainable_tourism_strategy

³⁰ Caric, H. and Mackelworth, P. (2014) Cruise tourism environmental impacts – The perspective from the Adriatic Sea

³¹ IMO. (2019) International Convention for the Prevention of Pollution from Ships (MARPOL)

³² CLIA (2020) State of the Cruise Industry Outlook

capability.³³ However, retrofitting existing vessels is not always economically viable, is a lengthy process that requires vessels to be out of commission for some time, and may require vessel modification to achieve.³⁴ In some instances, retrofitting is not a feasible option due to the space requirements for LNG fuel tanks.³⁵ The lack of a developed LNG supply-chain infrastructure is also a challenge.³⁶ Thus whilst cruise operators are pursuing LNG as an solution to reducing emissions, the prospect of a large-scale switch to LNG in the short-term is low, and so the cruise industry is also exploring other solutions and technologies for medium- to long-term deployment, e.g. battery.³⁷ Additionally, recent analysis published by the International Council on Clean Transportation indicates that LNG use might not reduce greenhouse gas (GHG) emissions on a life-cycle basis, and does not deliver the emissions reductions required by the International Maritime Organization (IMO)'s initial GHG strategy – rather, its use may actually worsen climate impacts.³⁸

2.30 Another approach to reducing emissions is through the use of exhaust gas cleaning systems (EGCS), or 'scrubbers'. Around two thirds (68%) of existing vessels have these systems fitted and 42% of new build-capacity have committed to doing so³⁹. However, there is a concern that scrubber systems, many of which are 'open-loop' and discharge process liquid into the sea, are simply diverting pollutants into the marine environment.^{40,41} As more vessels adopt scrubbers to meet IMO regulations, using closed-loop systems instead would help to eliminate water pollution emissions, but as of yet there is no requirement for vessels or operators to do this.⁴²

2.31 Shore power, also known as cold-ironing, is the process of supplying shore-side electrical power to a cruise vessel at berth while its main engines are shut down. The power can come from the national grid, an external generator or through renewable energy sources. Shore power reduces the consumption of fuel, and the associated air and noise pollution that would otherwise be used to power the vessel while in port. In 2019, 30% of the global cruise ship fleet were fitted with shore power systems, 18% were planning to retrofit the system and a further 39% were configured to add the system in the future⁴³. However, as of late 2019, there were only three ports in Europe offering this service – Oslo, Kristiansand and Hamburg. Countries such as Denmark are leading the way in the integration on their ships on their path to carbon-neutrality⁴⁴. Whilst high investment costs may be a constraint to implementing shore power, options such as the Green Maritime Fund have been proposed to support such projects⁴⁵.

2.32 These environmental issues are recognised by the cruise industry. There is a commitment from members of CLIA of over \$22 billion to reduce their environmental impact through new, energy-efficient ships and technologies, with an aim to reduce carbon emissions by 40% by 2030, from a baseline in

³³ <https://www.abports.co.uk/news-and-media/latest-news/2020/cruise-upgrade-reaches-milestone-at-the-port-of-southampton-with-double-air-bridge-delivery/>

³⁴ See for example research conducted through the EU TEN-T *Motorways of the Seas* Maritime Pillar: <https://www.onthemosway.eu/wp-content/uploads/2015/06/6-Case-Studies-about-New-building.pdf>

³⁵ <https://www.offshore-energy.biz/carnival-corp-retrofitting-to-lng-is-not-an-option/>

³⁶ <https://www.cruiseindustrynews.com/cruise-news/22236-msc-spending-billions-on-lng-cruise-ships.html>

³⁷ <https://www.reuters.com/article/us-shipping-electric/first-battery-powered-cruise-ship-sails-for-the-arctic-idUSKCN1TW27E>

³⁸ Pvalenko, N. et al. (2020) The climate implications of using LNG as a marine fuel, International Council on Clean Transportation Working Paper 2020-02, at: https://theicct.org/sites/default/files/publications/Climate_implications_LNG_marinefuel_01282020.pdf

³⁹ CLIA Environmental Technologies and Practices Report (2019)

⁴⁰ <https://www.theguardian.com/environment/2018/oct/29/thousands-of-ships-could-dump-pollutants-at-sea-to-avoid-dirty-fuel-ban>

⁴¹ <https://www.independent.co.uk/environment/shipping-pollution-sea-open-loop-scrubber-carbon-dioxide-environment-a9123181.html>

⁴² Georgeff, E. et al. (2019) A whale of a problem? Heavy fuel oil, exhaust gas cleaning systems, and British Columbia's resident killer whales, ICCT Consulting Report, at: https://theicct.org/sites/default/files/publications/HFO_in_killer_whale_habitat_consulting_20200413.pdf

⁴³ CLIA Environmental Technologies and Practices Report (2019)

⁴⁴ City & Port Development, CMP and the City of Copenhagen (2015) Options for establishing shore power for cruise ships in port in Copenhagen Nordhavn

⁴⁵ <https://seanews.co.uk/features/green-maritime-fund-critical-to-emissions-reductions/>

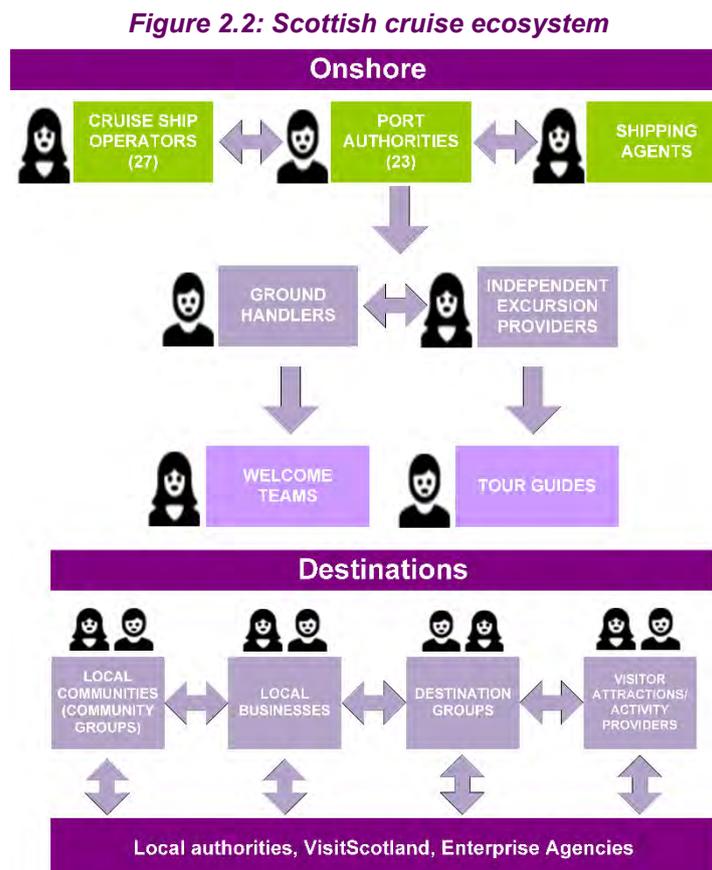
2008.⁴⁶ However, research published in 2016, based on analysis of the corporate sustainability strategies of a variety of different cruise operators, found a great ‘variation in the extent to which the leading cruise companies publicly report on their sustainability strategies and achievements.’⁴⁷

2.33 If these socio-environmental impacts are not correctly managed, there is a risk that the visitor experience will be diminished; that there will be negative impacts on the marine and coastal environment, as well as on coastal and wider communities; and that there may be a failure to maximise the yield and value added by the industry. In areas where visitor numbers continue to increase it is recognised that unmanaged growth may be unsustainable.

2.34 These impacts are as relevant to Scotland as they are to other parts of the world, particularly given the ‘1,000 calls’ target for the Scottish cruise market for 2019. As a result, the Scottish Government is currently looking at ways in which to ensure that Scotland’s cruise destinations do not go over capacity.⁴⁸

The Scottish cruise tourism ecosystem

2.35 This section presents an overview of the cruise tourism ecosystem in Scotland; it is based on the research carried out as part of this study. Figure 2.2 below depicts the main actors in the sector. It should be noted that there are a significant number of interdependencies and relationships at play and these differ from area to area. There are also other interactions in the wider tourism ecosystem that have a bearing on cruise, e.g. SE and HIE interacting directly with ports and destinations.



⁴⁶ CLIA (2020) *State of the Cruise Industry Outlook*, p. 4

⁴⁷ Jones, P., Hillier, D. and Comfort, D. (2016) *The Environmental, Social and Economic Impacts of Cruising and Corporate Sustainability Strategies*, *Athens Journal of Tourism*, p. 273

⁴⁸ https://www.parliament.scot/CrossPartyGroups/Session5CrossPartyGroup/Minutes/20190115_JointMeeting.pdf

2.36 This section goes on to describe the role and activities of each of these actors as recognised within the cruise tourism industry.

Cruise ship operators

2.37 In 2020 it is estimated that 27 cruise lines operating 67 different vessels will call at Scottish ports as part of a cruise. However, these cruises vary widely in factors such as size of fleet, vessels, target markets, frequency of visit and type/length of cruise.

2.38 Most of the cruise operators are headquartered in USA (primarily Miami and Seattle), Germany or the UK, although they employ staff globally. Some of the largest cruise operators have a number of cruise lines/brands under their overall umbrella. For example, Carnival UK operate P&O and Cunard, while Royal Caribbean operate the Royal Caribbean brand, as well as Silversea, Celebrity X and Azamara. Some cruise lines operate globally, whilst other smaller lines focus on one specific region, e.g. Northern Europe.

2.39 Cruise companies also vary widely in terms of number and frequency of vessels calling at Scottish ports. AIDA, a German cruise operator, has seven vessels in their fleet calling at Scotland in 2020, while Cruise & Maritime Voyages, Phoenix Reisen, Oceania Cruises, Fred Olsen and Holland America Line all have four vessels calling at Scottish ports. In contrast, a number of operators have one vessel that services the Scottish or British destinations, including large lines such as Celebrity X, Disney and Royal Caribbean. Cruise & Maritime Voyages are scheduled to be the most frequent caller to Scottish ports in 2020, with their four vessels calling 71 times throughout the year. Princess Cruises (53), AIDA (47), and Viking Ocean (47) will also be regular callers at Scottish ports in 2020.

2.40 Cruise vessels calling at Scottish ports differ widely in size. MSC operates a fleet of 'mega ships', which carry over 3,000 passengers, while other operators such as Windstar, Hapag-Lloyd Cruises and Regent specialise in smaller, more boutique vessels which carry under 750 passengers and have an ultra-luxury or adventure focus.

2.41 The largest vessel scheduled for 2020 is MSC's *MSC Preziosa* and *MSC Splendida*, which have maximum capacities for 4,345 and 3,900 passengers respectively. *MSC Preziosa* is due to stop at Invergordon and Kirkwall during an 11 night cruise in July 2020 and at Edinburgh, Invergordon and Lerwick on a 12 night cruise in August 2020. These are two of eight 'mega ships' that will call at Scottish ports in 2020. The remainder of the vessels are categorised as 19 'large ships' with between 1,750 to 3,000 passengers, 24 'medium ships' carrying 750 to 1,749 passengers and 16 'small or boutique ships' with fewer than 750 passengers.

2.42 Aside from their vessels and itineraries, cruise lines target a variety of passenger markets. Some target particular nationalities, for example Fred Olsen is almost exclusively British passengers and operates primarily round-Britain cruises, while AIDA, Hapag Lloyd and TUI operate some German-speaking only cruises. The market is also segmented by age, with Saga targeting older guests, the German cruise lines more focused on family groups and Silversea targeting younger, more affluent cruisers. Some cruise lines or cruises are adult only.

2.43 These markets are further segmented by length of cruise, for example shorter cruises of one week or less tend to be targeted at a younger market who are still working and are 'money rich and time poor', while longer cruises of three weeks or more are marketed to retired couples who have no work commitments. Seasonality also plays a factor, with family-targeted cruises predominantly scheduled during the school summer holidays.

2.44 **Itinerary planning** is a key function for every cruise company. Most operators begin the planning process up to three years in advance of cruise dates. They utilise a range of methods and approaches when planning itineraries. Operators most commonly draw upon passenger feedback from

previous cruises to specific destinations; destination research teams keep abreast of emerging holidaying trends for their various target markets engaging with travel bloggers and the like. Itinerary planning also, and importantly, must take into account a number of port related factors, namely, the length of piers and the number of bollards available, security at ports, weather conditions at specific times of the year and the need for tendering passengers ashore at destinations, as well as port onshore facilities.

2.45 Closely aligned to itinerary planning is **shore excursion planning** and this involves the cruise company developing the range of tours, excursions and experiences offered to passengers onshore at various destinations. Traditionally, this involves procuring the services of usually one shore excursion company to design and provide this service, typically as part of a two to three year contract. However, there has been a move more recently to engaging directly with local port agents and activity providers especially at smaller destinations and where a more bespoke and/or specialist tour or experience is required by the cruise operator for a specific cruise line.

2.46 Like cruise itineraries, most cruise operators tend to plan a cruise's shore excursions well in advance of the cruise. This process can begin up to a year before the date of the cruise. Once the range of shore excursions has been agreed, most operators send the brochure to booked passengers between three and six months prior to the cruise for them to browse, select and purchase the excursions they want. This is particularly important given the limited number of spaces on many excursions due to travel or attraction capacity constraints. Many cruise passengers have their entire onshore itineraries fully booked before they even set foot onto the vessel. Operators, however, make sure there are still opportunities for other passengers to book excursions during the cruise or on the day of the port call.

2.47 Full details of all 27 cruise operators and the fleets that visit Scotland are provided in **Appendix 1**.

Port authorities and agents

2.48 Port authorities are the official organisations that control and manage activities in a port and are primarily responsible for safely handling ship arrivals and departures. Within the scope of this research there are 19 port authorities and some 21 ports in Scotland currently receiving cruise ship calls. Ports can be classified as marquee or boutique ports. A marquee port is a gateway to 'a must see venue or destination' that plays a key role in attracting customers for a cruise; they are Invergordon, Edinburgh, Kirkwall, Lerwick and Greenock.

2.49 Shipping agents are licensed companies who conduct business on behalf of the cruise line operator such as insurance and port documentation. There are three main agents in Scotland; they engage sub-contractors in some of the more remote areas. They also arrange for the supply of fuel and ship provisions where required. Shipping agents are therefore the first line of contact for cruise operators and are frequently called upon to signpost them to onshore service providers and other organisations.

Ground handlers and other onshore service providers

2.50 Ground handlers or shore excursion companies as they are sometimes known, are contracted by cruise operators and as mentioned above, their role is to develop, organise and sell shore excursion itineraries to cruise ship companies who then sell these on to their passengers. There are five main ground handlers operating in Scotland, the largest of which is London based with an Edinburgh office, and agents in Aberdeen, Dunfermline and Orkney.

2.51 Shore excursion companies need to have a wide-ranging knowledge of what individual destinations and their attractions and other activities can offer the cruise passenger. They rely on their staff and in some cases local agents to have local knowledge and established relationships with local tour operators, tour guides and visitor attractions in order to develop tours and experiences which will both appeal to cruise passengers and be commercially viable for cruise operators.

2.52 From a shore excursion perspective there are three broad cruise passenger demographics: those desiring unique experiences; large, no frills groups (e.g. visitor attraction admission only customers), and those wishing for panoramic tours (no visitor attraction admissions).

2.53 There are also independent excursion providers who provide services directly to cruise passengers. A proportion of passengers want to be 'independent' whilst ashore – a growing trend – and wish to discover or experience more unusual places or activities and prefer not to be part of a large tour group. They are likely to have researched activities and tours available at the individual ports of call on their cruise itinerary and booked online in advance of their trip. Independent providers range from local tour guides and taxi services to local attractions providing an offer directly to cruise passengers. Independence, however, is very reliant on the availability of transport links between a port and its destination hinterland.

2.54 Other onshore service providers include the welcome teams (often volunteers from the local community) who work at some ports and/or local cruise groups to co-ordinate cruise activities to ensure an efficient welcome and information service and most of all a positive visitor experience.

Destination actors

2.55 In each of the destinations in the hinterlands of Scotland's ports there are a number of actors which are part of or are supporting the cruise tourism sector. Some of these are local businesses (including shops, bars, cafes and restaurants), visitor attractions and activity providers; their level of engagement with other actors in the cruise tourism ecosystem varies greatly from destination to destination.

2.56 The most established relationship is between visitor attractions and the shore excursion companies. For example, larger organisations like Historic Environment Scotland and the National Trust for Scotland have travel trade teams who negotiate packages and prices for organised cruise passenger tours to their numerous sites and attractions. They tend not to deal directly with cruise lines themselves, however, with the growth in expedition cruising, there is a growing appetite to deal directly with these smaller cruise lines.

2.57 Local activity providers, in packaging offers for cruise passengers, attempt to engage with shore excursion companies in the first instance in order to become part of a cruise line's shore excursion offering. In some cases, they liaise directly with smaller cruise lines to provide bespoke products, e.g. on-board food and drink tasting events.

2.58 Local businesses in port of call towns may adapt for example, their retail offering to suit the nationality and type of cruise passenger expected on a particular day which may involve having menus or signage in the language of visiting passengers or stocking particular products known to be popular with certain types of passengers.

2.59 An important actor in the ecosystem is the destination management organisation (DMO) or destination group. DMOs have an important role in managing and marketing those destinations to cruise passengers and cruise lines as well as supporting local businesses to take advantage of the market opportunities that cruise tourism can bring. In some areas, destination (cruise) groups have specifically come together to manage, co-ordinate and consolidate the onshore visitor offering and can comprise, for example, the local authority, community council, local tourism association/DMO, harbour master and local businesses, for example Port of Oban Cruise and Cruise Forth. There are some 15-20 DMO/groups serving destinations which welcome cruise tourists.

Supporting the ecosystem

2.60 Finally, within this complex ecosystem we have public sector organisations whose role it is to foster sustainable economic growth, maximise the potential of high-growth companies and sectors, and ensure a place-based approach to socio-economic development – especially where tourism

destinations are concerned. As well as this, they provide other support and guidance to local destinations' communities and businesses. This includes local authorities (who are port authorities in some places), and Scotland's enterprise agencies, SE, HIE and the new South of Scotland Enterprise. The enterprise agencies in particular have a remit to direct regionally- and nationally-significant investment to help realise development opportunities. Specific to tourism and cruise tourism, this includes VisitScotland (Scotland's national tourism organisation), the Scottish Tourism Alliance (the representative body for the tourism industry), and Cruise Scotland (a membership-based marketing organisation for ports and other organisations with an interest in the cruise industry in Scotland).

2.61 The interplay between all the actors in the cruise tourism ecosystem is multifaceted and differs from port to port and from island to mainland destination.

Summary

2.62 Globally the cruise industry has grown steadily over the last decade. This trend is expected to continue, with large numbers of cruise vessels being debuted over the coming years. Cruise tourism has also diversified into specialist areas, with growth in boutique, expedition and themed cruises. Passengers have also moved away from booking tours offered by the cruise line to planning more independent visits while onshore.

2.63 Europe has experienced high growth in cruise passenger numbers in the last decade, and capacity in North-West Europe and the British Isles has outstripped that of other European destinations. The UK cruise market is rapidly evolving with the commission of expedition craft for cruising. Given strong growth in the Scottish cruise market, over 1 million passengers were forecast in Scotland in 2020, although this was prior to the COVID-19 pandemic which will undoubtedly impact on this.

2.64 Cruising is of local, regional and national significance to Scotland, providing jobs and supporting businesses. However, the cruise industry does not automatically benefit the communities where ports are based, and the industry faces pressure relating to its sustainable community and environmental impact. Large vessels, in particular, face – and present - these environmental challenges. New technology such as LNG and shore power are helping to limit environmental impacts.

2.65 The Scottish cruise ecosystem is a complex one, with multiple actors involved. These include the cruise operators, port authorities, port agents and shipping agents. These key players have varying interdependencies with other onshore actors (ground handlers, excursion providers, welcome teams, tour guides) and destination actors (local businesses, groups, attractions and the public sector). These relationships differ from cruise operator to cruise operator and from area to area.

3 Cruise tourism: volume and value to Scotland

Introduction

3.1 This chapter sets out the estimated volume of cruise tourism to Scotland in recent years, and that forecast over the next few years. It also estimates the value of passenger and crew spend from cruises calling at Scottish ports, using a robust methodology, and gives consideration to the spread of this expenditure throughout the country. The methodology is set out in detail in **Appendix 3**.

3.2 Please note that the data in this chapter relate to the 21 ports covered within this research. There are a small number of other, smaller ports in Scotland receiving cruise calls, such as Gairloch, Iona, Kyle of Lochalsh, Raasay and Rum. The number of calls at these ports is very low, and are not considered in this chapter, although it is assumed that they bring localised impacts (e.g. berthing fees, some visitor) that are positive to the remote economy and should not be overlooked.

Data collection

Data collection

3.3 The research team consulted with all 21 ports within scope for the research to gather qualitative and quantitative information. This was then followed-up with an emailed proforma which asked for data on cruise calls and passengers by vessel size for the years 2014 to 2019, as well as port information such as quay, berthing and anchorage facilities. This was supplemented by information provided by Cruise Scotland on each port, including port infrastructure, other port users and key attractions.

3.4 A number of cruise operators were also consulted for the research. This covered qualitative and quantitative information on past and future cruise calls to Scottish ports, key onshore attractions for visited ports and any information on passenger and crew expenditure. In addition, this was followed up by an emailed proforma asking for data on the type of cruise ship, cruise calls, passenger and crew numbers by vessel size over the period 2014 to 2019, and any data held on average passenger and crew expenditure and the proportion of passengers and crew disembarking at ports.

3.5 The information gathered from both ports and cruise operators was then supplemented by a review of previous studies on the economic impact of cruise, including average passenger and crew expenditure. It should be noted that there is little by way of robust passenger and crew spend data, particularly at the Scotland and UK level. That is due to the lack of existing passenger surveys and the general reluctance of cruise companies to ask their passengers about onshore expenditure. However, some benchmarks are available through CLIA and GP Wild research. These have informed our development of the expenditure model (see **Appendix 3**).

Data analysis

3.6 The study team sorted data on cruise calls, passengers and expenditure by the following spatial levels:

- Scotland;
- Scottish Enterprise, Highlands and Islands Enterprise, and South of Scotland Enterprise regions;
- Local authority; and
- Port.

3.7 The data was then input to a data matrix and analysed for trends over time by vessel size and geography.

Scottish calls and visitor numbers

3.8 The Scottish ports in the research received approximately 862 cruise calls and 773,000 passengers in 2019. This accounted for c.5% of all overnight tourist visits (and c.1% of total tourist visits) in Scotland in 2019. The numbers of calls and passengers have grown continuously year-on-year since 2014, as shown in Table 3.1. Cruise calls have grown strongly by 90% over this period while the number of passengers has grown by 89%.

3.9 This is particularly strong growth, and is higher than overall passenger growth at the Northern European level for 2013 to 2018, as shown in Chapter 2.

Table 3.1: Cruise calls and passengers to Scotland, by vessel size (2014-2019)

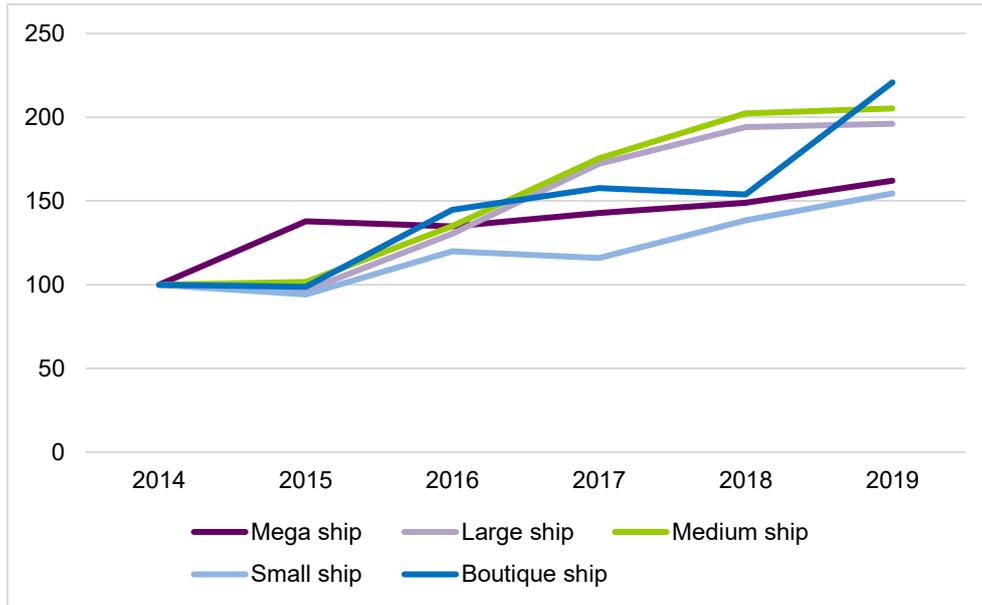
	2014	2015	2016	2017	2018	2019	% change (2014-2019)
Cruise calls	454	463	607	686	747	862	90%
<i>Mega ship</i>	36	50	49	52	54	59	64%
<i>Large ship</i>	61	59	79	105	118	119	95%
<i>Medium ship</i>	92	93	124	161	185	188	104%
<i>Small ship</i>	129	121	155	149	178	199	54%
<i>Boutique ship</i>	139	137	201	218	213	306	120%
Passengers	409,334	455,081	519,535	626,323	727,056	772,879	89%
<i>Mega ship</i>	128,377	172,383	168,996	189,324	211,182	195,008	52%
<i>Large ship</i>	114,728	118,866	143,176	188,706	220,919	253,720	121%
<i>Medium ship</i>	99,218	89,597	119,323	146,086	186,005	204,532	106%
<i>Small ship</i>	49,447	54,374	63,204	85,734	83,093	86,125	74%
<i>Boutique ship</i>	15,345	15,802	20,433	23,312	24,454	33,483	118%

Source: ekosgen primary research. Please note the column totals may not sum due to incomplete data on breakdown by vessel size. Missing data for some years and ports will impact on the trend shown. The data is for the 21 Scottish ports within scope of the research. The data includes all passengers on cruise vessels, regardless of whether they disembark at each port.

3.10 The growth in cruise calls and passengers has been driven by growth across all vessel sizes. However, there has been particularly high growth in the boutique and medium-sized vessel cruises. Calls by these vessels at Scottish ports have more than doubled over the period – by 120% and 104%, respectively. The rise in calls from boutique vessels in particular is linked to the growth in luxury and expedition cruising.

3.11 The percentage growth in calls from large ships is also faster than average (95%), whilst growth from mega and small ships have been slower, at 64% and 54% respectively. The indexed change in cruise calls by vessel size is shown at Figure 3.1.

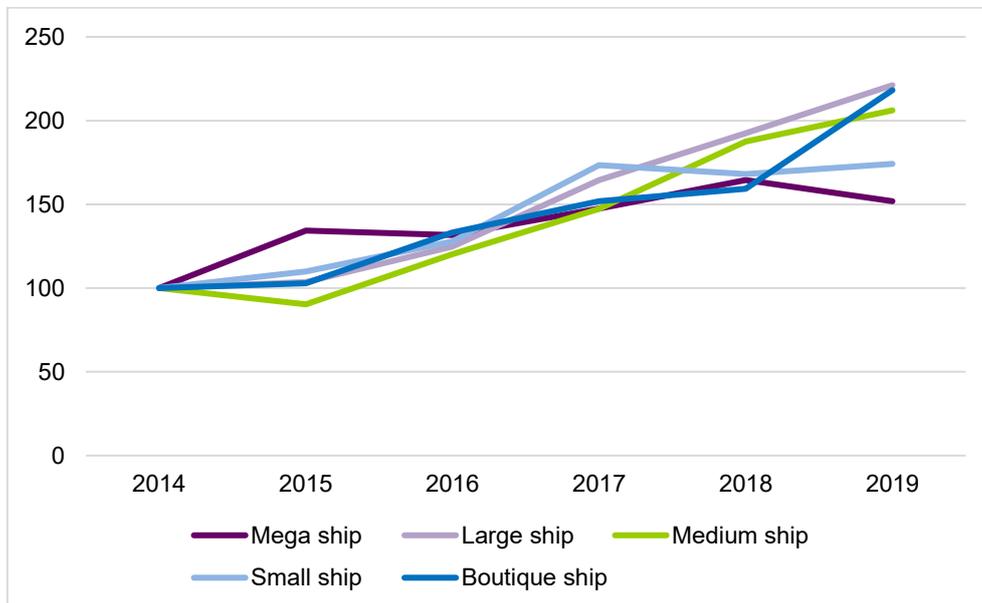
Figure 3.1: Index of cruise calls by vessel size (2014-2019)



Source: ekosgen and Reference primary research. Please note the data is for the 21 Scottish ports within scope of the research.

3.12 The percentage growth in passenger numbers by vessel size broadly follows the trends in calls, as shown in Figure 3.2. Again, this illustrates the strong growth in boutique cruises and large cruise vessels in particular. Passenger numbers on both types of vessels more than doubled in number between 2014 and 2019.

Figure 3.2: Index of passengers by vessels size (2014-2019)



Source: ekosgen and Reference primary research. Please note the data is for the 21 Scottish ports within scope of the research.

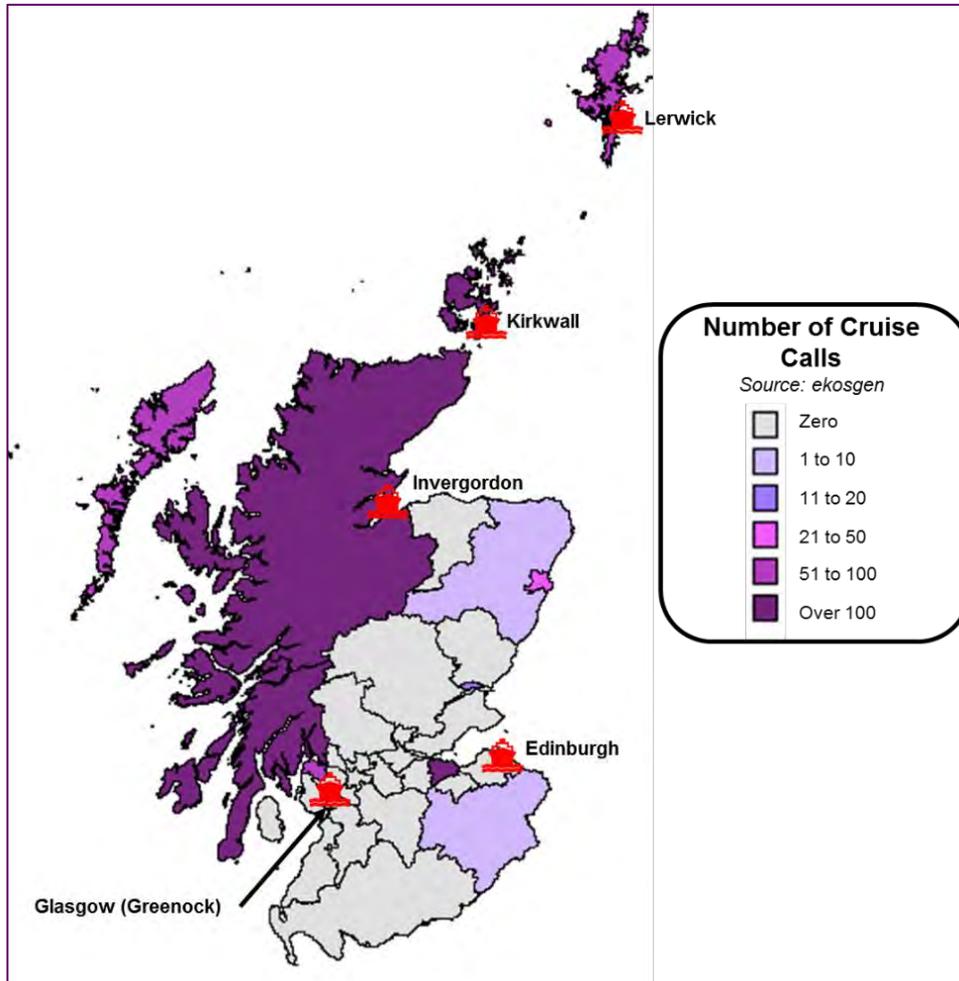
Port calls and passenger numbers

3.13 Cruise tourism to Scotland has been strongly concentrated in the Highlands and Islands. This is illustrated in the following figures which show the spread of cruise calls (Figure 3.3) and passengers

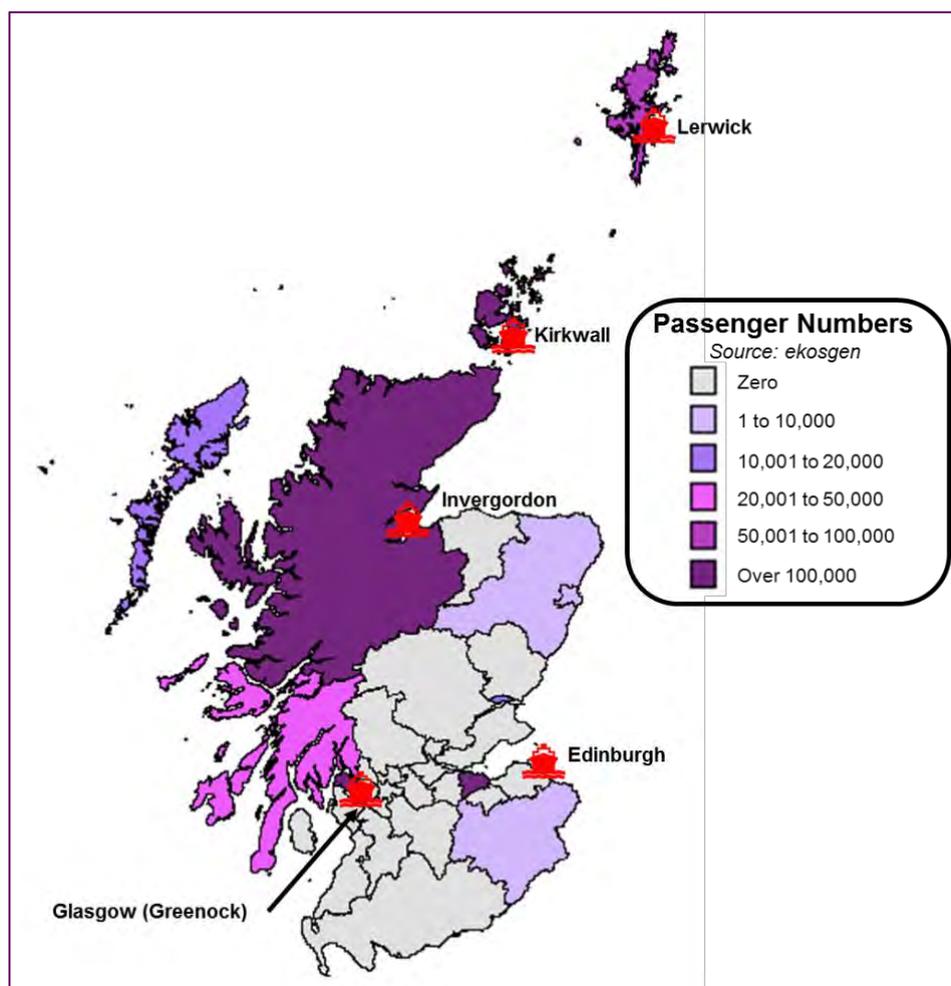
(Figure 3.4) in 2019 by local authority. During this year, the Highlands and Islands had almost three in four (73%) of Scotland's total cruise calls, and welcomed 61% of cruise passengers.

3.14 Within the Highlands and Islands, these are particularly concentrated in Orkney, Shetland and some ports in Highland, due to the high numbers at Kirkwall, Lerwick and Invergordon ports.

Figure 3.3: Cruise calls by local authority (2019)



Source: Analysis based on ekosgen primary research. Please note the data is for the 21 Scottish ports within the scope of the research.

Figure 3.4: Passengers by local authority (2019)

Source: Analysis based on ekosgen primary research. Please note the data is for the 21 Scottish ports within scope of the research.

3.15 The 21 Scottish ports within scope for the research can be categorised as marquee and boutique ports. The marquee ports are Invergordon, Edinburgh, Kirkwall, Lerwick and Greenock, and the other 16 are boutique ports.

3.16 As expected, the marquee ports attract larger cruise vessels than smaller, boutique ports. In 2019, the five marquee ports accounted for almost two thirds (63%) of all Scottish cruise calls and a much higher proportion (85%) of the passengers.

3.17 However, growth rates over time have been stronger amongst the boutique ports. From 2014 to 2019, the number of cruise calls at Scottish boutique ports more than doubled (111%, +167 calls) and the passenger numbers almost trebled (182%, +74,000). This was faster growth than the marquee ports, which saw an 80% (+241) rise in calls and 79% (+388,000) rise in passengers.

3.18 Trends in cruise call and passenger numbers for individual ports are given at Table 3.2.

Visitor spend

Introduction

3.19 This section sets out our estimates of passenger and crew expenditure from cruise calls to Scottish ports in 2019. The expenditure model goes further than existing estimates of cruise passenger

expenditure by considering: the type of cruise (size of vessel); the port of call (marquee or boutique); the proportion of passengers and crew who disembark at each port; and the proportion of passengers who book an organised tour from the cruise operator. The expenditure methodology is explained in full at **Appendix 3**.

3.20 Please note that expenditure in this section relates to *direct* passenger and crew spend during their time onshore during cruise calls at Scottish ports. It does not include the following:

- Indirect and induced effects
- Additional spend by passengers at turnaround or embarkation ports e.g. on hotels
- Spend by the vessel at Scottish ports e.g. port charges, fuel, supplies etc.
- Spend by passengers on organised tours purchased through the cruise operator.

Spend across Scotland

3.21 It is estimated that **£40.6 million** was spent directly onshore by the passengers and crew of cruises visiting Scotland in 2019. This represented 0.7% of all tourism expenditure in Scotland in 2019. Estimated spend by passengers and crew arriving at individual ports is given at Table 3.2 below. It shows the dominance of the five marquee ports in terms of cruise calls, passenger numbers and estimated passenger and crew expenditure.

Table 3.2: Calls, passengers and spend by Scottish port (2019)

Port	Calls		Passengers		Estimated average passenger spend	Estimated passenger and crew spend
	Number	% change since 2014	Number	% change since 2014		
Invergordon	104	89	167,702	133	£44	£8.9m
Edinburgh	107	45	139,055	n/a	£45	£7.6m
Kirkwall	158	108	132,388	109	£47	£7.6m
Greenock	76	55	143,855	55	£41	£7.1m
Lerwick	99	102	76,233	74	£50	£4.7m
Portree	32	33	22,690	-	£32	£0.9m
Tobermory	37	68	20,300	80	£29	£0.7m
Stornoway	57	46	16,347	39	£32	£0.7m
Ullapool	31	138	11,747	85	£33	£0.5m
Oban	51	219	10,452	90	£33	£0.4m
Dundee	11	450	11,360	n/a	£31	£0.4m
Fort William	15	-	6,290	-	£35	£0.3m
Holy Loch	14	180	4,000	627	£35	£0.2m
Aberdeen	28	133	3,340	67	£40	£0.2m
Scrabster	10	25	2,808	32	£36	£0.1m
Campbeltown	8	100	1,600	700	£36	£0.1m
Peterhead	7	600	1,253	1,593	£40	£0.1m
Inverness	8	-	926	-	£40	£0.1m
Port Ellen	8	60	299	56	£40	<£0.1m
Eyemouth	1	-	234	-	£40	<£0.1m
Montrose	0	-	0	-	-	£0
Total	862	90	772,879	148	£43	£40.6m

Source: Analysis based on ekosgen primary research. Please note the data is for the 21 Scottish ports within scope of the research.

3.22 Cruise tourism represents 5% of Scotland's overnight tourist volume and 1% of total (overnight and day) tourist volume; it also comprises less than 1% of both overnight expenditure and all tourism expenditure, as shown at Table 3.3. However, this masks variations across the country. The contribution of cruise spend as a proportion of the local tourism economy varies significantly from port to port and their hinterlands. Cruise tourism is of little importance in some landlocked regions or regions without major (cruise) ports, such as Fife, Perthshire, Dumfries and Galloway, Scottish Borders and Ayrshire and Arran.

3.23 However, analysis of domestic and international tourism volume and spend by VisitScotland region shows that cruise tourism in the Highlands and Islands region⁴⁹ accounts for up to 17%⁵⁰ of overnight tourism volume and 3% of all tourism volume, and 3% of overnight expenditure and 2% of all tourism expenditure. There are further significant variations within this region. For example, it is estimated that cruise tourists make up the vast majority of overnight tourists to Orkney and Shetland each year, although associated expenditure from cruise tourism is much smaller. In large urban centres, such as Glasgow and Edinburgh, cruise tourism represents a smaller but still sizeable share of overnight tourism, but is negligible when compared to the scale of all tourism in these areas.

Table 3.3: Cruise tourism as a proportion of all tourism, by region (2018)

Region	Overnight tourism only		Overnight and day tourism	
	Pax %	Spend %	Pax %	Spend %
L. Lom, Stir, Tross, Argyle	2%	>1%	>1%	>1%
Ayrshire & Arran	0%	0%	0%	0%
Dumfries & Galloway	0%	0%	0%	0%
Dundee & Angus	3%	>1%	0%	0%
Fife	0%	0%	0%	0%
Grampian	>1%	>1%	0%	0%
Gtr Glasgow, Clyde Valley	5%	1%	1%	>1%
Highlands & Islands ⁵¹	17%	3%	3%	2%
<i>Outer Hebrides</i>	6%	1%	<i>n/a</i>	>1%
<i>Orkney</i>	84%	13%	<i>n/a</i>	<i>n/a</i>
<i>Shetland</i>	79%	17%	<i>n/a</i>	<i>n/a</i>
<i>Isle of Skye</i> ⁵²	11%	2%	<i>n/a</i>	<i>n/a</i>
Lothian	3%	>1%	>1%	>1%
Perthshire	0%	0%	0%	0%
Scottish Borders	>1%	0%	0%	0%
Scotland	5%	1%	1%	>1%

Source: ekosgen, IPS, GBTS and GBDVS.

3.24 When compared to other tourism sectors, there are similarities. For example, the value of cruise tourism and mountain biking tourism to Scotland are comparable, as shown at Table 3.4, although the mountain biking and sailing figures includes accommodation spend, which, of course, is not required for cruise tourism. It is estimated that cruise tourism generates the same average day spend as day trips in Scotland. Golf tourism has a higher average day spend than cruise tourism; however, golf tourism is typically associated with a high-spending type of visitor and is a relatively high cost sport.

⁴⁹ Please note that VisitScotland regions have been used here given that data is collected at these spatial levels. Here, the VisitScotland Highlands region includes the Highland, Moray, Orkney Islands, Shetland Islands and Eilean Siar local authorities.

⁵⁰ Calculations based on VisitScotland and VisitBritain visitor numbers 2018

⁵¹ Lack of day visitor data available below Highlands and Islands level precludes calculation of proportion of all tourism visits and spend.

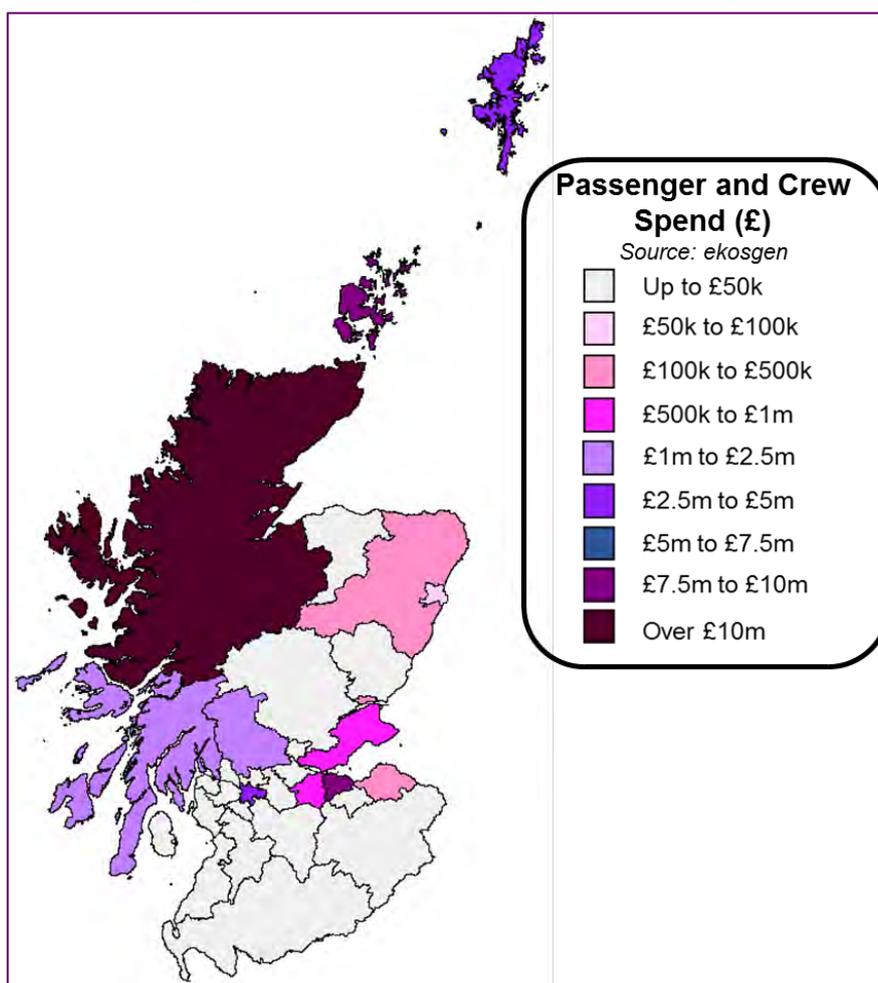
⁵² Available GBTS data on overnight visitor spend for Skye includes domestic overnight visitors only.

Table 3.4: Benchmarking the value of cruise tourism

Sub-sector	Average day spend	Total expenditure	Source
Cruise	£43	£41m	ekosgen, 2019
Mountain biking	£69*	£45m	Frontline, 2014
Golf	£64	£230m	VisitScotland, 2016
Sailing	£122*	£21m	Ekos, 2016
Live music	£197^	£183m	UK Music, 2016
Day tourism	£43	£5,777m	Great Britain Day Visitor Survey, 2019

Please note: * denotes average spend per night and ^ denotes average spend per visit

3.25 Figure 3.5 shows an estimate of the breakdown of this expenditure by local authority. This takes into account where passengers and crew tend to visit during port calls. For example, many passengers that call at Greenock visit Glasgow or Edinburgh and spend money there. Again, this shows the concentration of spend in the Highlands and Islands, but also that there are some pockets of high spend in the Central Belt, particularly Edinburgh, Glasgow and Stirling.

Figure 3.5: Passenger and crew expenditure by local authority of spend (2019)

Source: Analysis based on ekosgen primary research. Please note the data is for the 21 Scottish ports within scope of the research.

Spend at marquee ports

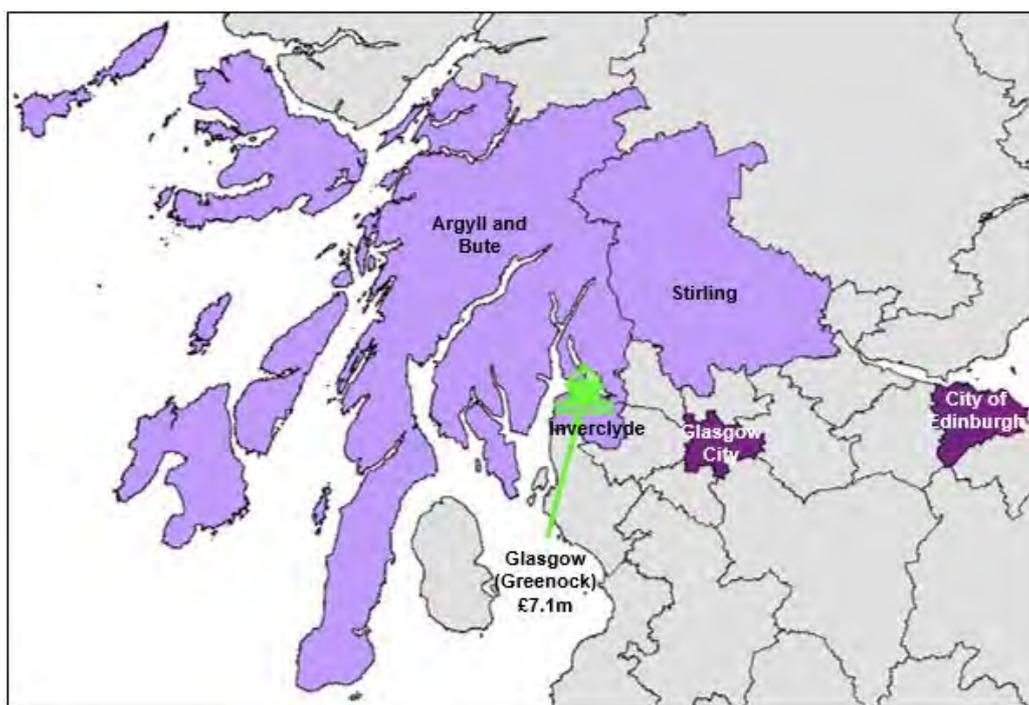
3.26 As well as being concentrated geographically, passenger and crew expenditure is strongly concentrated at calls to marquee ports. Calls to these five ports accounted for an estimated £9 in every

£10 spent by cruise passengers and crew to Scotland in 2019 (88% of the total). This illustrates the scale of cruise tourism impacts that are generated by these five ports.

3.27 The following figures set out the local authority areas where the expenditure by passengers and crew to marquee ports are estimated to be spent. Note that Kirkwall and Lerwick ports have not been included given that spend at these ports is assumed to be self-contained within Orkney and Shetland respectively.

3.28 Figure 3.6 shows the estimated spread of the £7.1 million spend generated through Greenock port. Greenock is highly distinctive, when compared to other Scottish ports, in that very little of the passenger spend is retained within Inverclyde, although anecdotal evidence suggests that a lot of the crew spend is local. Much of the passenger spend is concentrated in Scotland's two main cities – Glasgow and Edinburgh – where the majority of tours go from Greenock, while a smaller proportion is seen in Stirling and Argyll and Bute through trips to Loch Lomond.

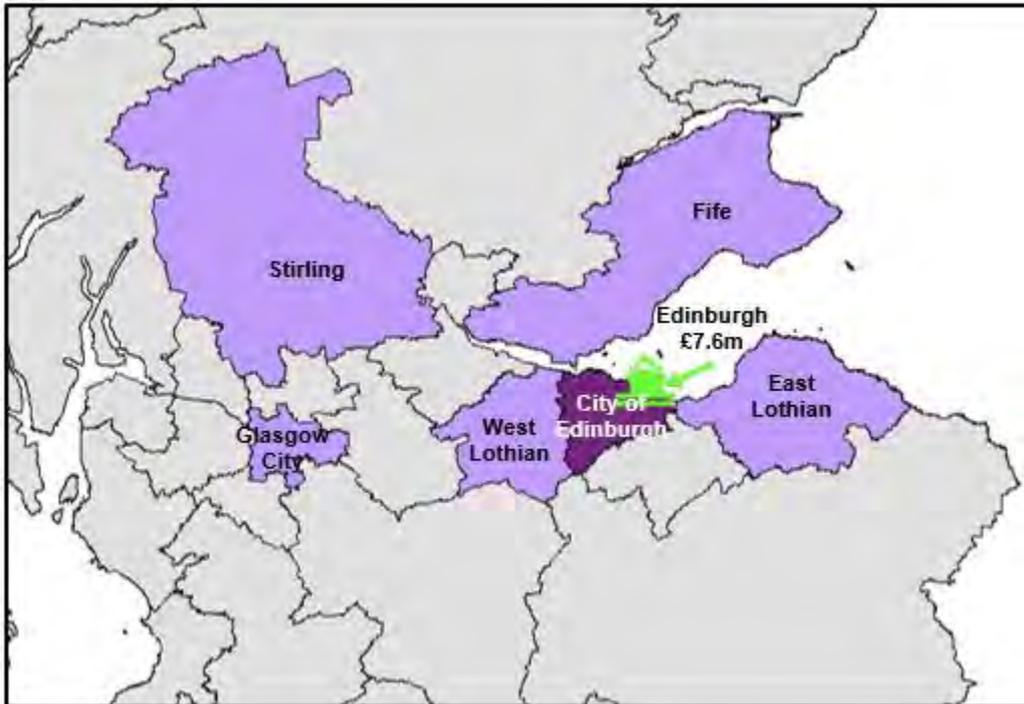
Figure 3.6: Estimated spread of passenger and crew spend from Glasgow (Greenock) (2019)



Source: Analysis based on ekosgen primary research. Please note: the darker the colour, the higher the spend in the local authority.

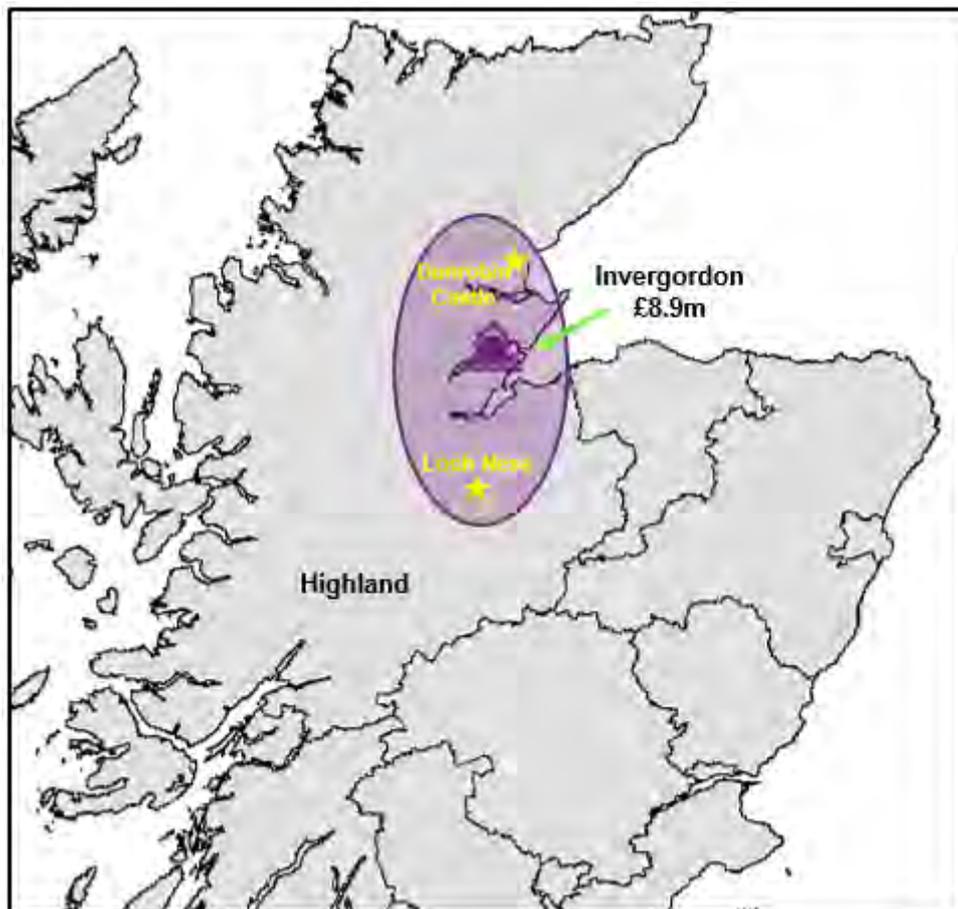
3.29 The estimated spread of the £7.6 million generated through Edinburgh port is shown at Figure 3.7. This spend is more focused, covering a smaller geographical area than Greenock, with the majority staying within the City of Edinburgh, and some leaking out to Fife (e.g. for tours to St Andrews), Stirling (e.g. for tours to Stirling Castle), East and West Lothian (for various tours and shopping, such as Linlithgow Palace, Glenkinchie Distillery and Livingston Designer Outlet) and Glasgow.

Figure 3.7: Estimated spread of passenger and crew spend from Edinburgh (2019)



Source: Analysis based on ekosgen primary research. Please note: the darker the colour, the higher the spend in the local authority.

3.30 Finally, Figure 3.8 illustrates the geographical spread of the estimated £8.9 million passenger and crew expenditure from cruises calling at Invergordon. Given the location of Invergordon port within Highland, all of this spend is retained within Highland and mainly within a 40 mile circumference of Invergordon. This includes trips to Inverness and tours to Loch Ness, Dunrobin Castle and other popular attractions in the surrounding area.

Figure 3.8: Estimated spread of passenger and crew spend from Invergordon (2019)

Source: Analysis based on ekosgen primary research.

Spend on tour bookings

3.31 The expenditure model used for the preceding analysis is for the *direct* spend by passengers. In this model, the price of a tour booked through the cruise operators stays with the cruise line, i.e. this spend is excluded as the direct spend leaks out of the Scottish economy. However, we know that a proportion of that spend will go to local agents, for example the tour operator, coach operator, admission to the attraction etc.

3.32 By focusing on spend outwith the cruise vessel and activities organised by or through the cruise operator, this understates the total passenger expenditure onshore in Scotland. Anecdotal evidence gathered through the consultations suggests that up to half of the price of a tour could go to local agents. If we assume that 25-50% of the price of a booked package tour (an average of £45, see **Appendix 3**) be retained locally through these agents, then it is estimated that the total expenditure of cruise passengers and crew in 2019 would **increase from £40.6 million to between £45.5 million and £50.4 million.**

Forecast volumes

3.33 As of January 2020, there were an estimated 520 cruise calls scheduled for the 21 Scottish ports within the scope of the research, and 410 in 2021. This was a conservative estimate given that forecast calls were not available for a small number of smaller ports e.g. Port Ellen, Peterhead.

3.34 However, given the current COVID-19 pandemic, and in particular the high profile case of the Diamond Princess Cruise left quarantined off the Japanese coast in February 2020, it is highly likely that

there will be a significant negative impact on the number of booked cruise calls and passengers globally in the short to medium term as cruises are cancelled during 2020 or redeployed away from Europe.

3.35 However, early signs are that the pandemic has the potential to be more disruptive to large/mega vessels, given the volume of passengers and crew. If current trends in the type of vessels continue in Scotland, then the country may still be positioned to market to and receive cruise calls from expedition and boutique cruise ships.

Summary

3.36 Cruise calls and passenger numbers have grown strongly and continuously in Scotland between 2014 and 2019, by 90% and 89% respectively. This is faster growth in passengers than for Northern Europe over a similar period.

3.37 Growth in the Scottish cruise market has been across all vessel sizes, although calls from boutique and medium-sized vessels more than doubled over this period. The growth in boutique vessels is linked to the growing trend for luxury and expedition cruising which tend to require small ships.

3.38 The Scottish cruise market is heavily concentrated geographically and by type of port. Firstly, cruise tourism is focused in the Highlands and Islands region, which accounts for over 7 in 10 cruise calls and over 6 in 10 passengers. Within this, cruise activity is largely concentrated in the north east areas of the region, largely due to the presence of Kirkwall, Lerwick and Invergordon ports. Secondly, cruise tourism is also concentrated at the five marquee ports, which account for 85% of all passengers. Despite this, cruise activity at boutique ports grew faster than marquee ports between 2014 and 2019.

3.39 Although cruise tourism accounts for around 5% of Scottish overnight tourism volume and 1% of overnight and day tourism volume in 2019, it represents less than 1% of spend for both. It is estimated that £40.6 million was spent directly onshore by cruise passengers and crew in Scotland in 2019. This is a conservative estimate and does not include indirect and induced effects or some spend on tours booked through the cruise operator that is retained locally.

3.40 The economic benefits of cruise tourism are not evenly spread across Scotland. Much of the spend is focused in parts of the Highlands and Islands and the Central Belt. The five marquee ports account for £9 in every £10 spent by cruise passengers and crew in 2019.

3.41 It is currently unknown what impact the COVID-19 pandemic will have on booked cruise calls and passengers to Scottish ports beyond 2020.

4 Cruise tourism: Scottish ports

Introduction

4.1 This chapter considers issues arising from cruise tourism in Scotland with relation to Scotland's ports. The chapter draws on findings arising from consultations with ports and destinations, strategic stakeholders and cruise operators, as well as from the analysis of port data as set out in the port profiles presented in **Technical Annex A**.

4.2 The effect on cruise tourism is considered, along with any impacts for ports and their immediate surroundings. The significance of cruise traffic and its fit with other port uses is examined, along with relationships between ports. The chapter also discusses the factors attracting cruise operators to particular ports, and the evident appetite for cruise tourism activity and development amongst Scotland's ports. The discussion is framed by a suggested typology for Scotland's cruise ports.

A possible port typology

4.3 Based on discussion with ports, it is possible to establish a Port Typology for Scotland. This is informed by the current level of cruise traffic received, growth aspirations, available infrastructure, and access to finance. The typology is as follows:

- **Leading:** Ports already having significant cruise activity and looking to continue to grow, including through further investment as required. This includes Forth Ports (Edinburgh and Dundee), Greenock, Orkney, Invergordon, Lerwick.
- **Aspirational:** Looking to invest or currently investing in port infrastructure to grow cruise business and move to/towards leading status. This includes Aberdeen, Stornoway, Scrabster.
- **Growth potential but financially constrained:** Notably local authority ports, including Portree, Fort William, Inverness, Oban, Eyemouth, Tobermory, Ullapool.
- **Reactive:** Smaller ports aiming to benefit from overall market growth but with limited marketing effort and investment. Campbeltown, Holy Loch, Montrose, Peterhead, Port Ellen.

4.4 This typology helps to frame the subsequent discussion.

Significance of cruise traffic income

4.5 For most ports in Scotland, cruise is not a major part of their current or expected future income. This reflects the fact that the number of cruise calls is generally low in absolute terms, and cruise tourism is seasonal. However, many ports are keen to benefit from the growing cruise market.

4.6 It appears that in general, revenue from cruise tourism is at or below 5% of turnover for ports. While not all ports contacted through the research provided the relevant information, only four reported cruise accounting for as high as between 10% and 15% of total turnover (Invergordon, Lerwick, Orkney and Tobermory).

4.7 The first three of these ports have relatively high cruise numbers but also have significant other traffic, such as scheduled ferry services, oil and gas related activity and cargo vessels. Tobermory has lower cruise activity but compared to the other three ports, a smaller amount of non-cruise business.

Fit with other port uses

4.8 There is a wide range of use of the ports beyond cruise. The most common ones noted were bulk or container freight vessels; scheduled ferry services; fishing; and marine leisure. Others included offshore renewables, decommissioning and timber handling. Also reported but less common were oil and gas related traffic and aquaculture vessels. Based on the evidence gathered, there is no indication that these other activities are declining. Oil and gas vessels and aquaculture calls were the most likely to be reported as increasing.

4.9 Very few ports reported conflicts between cruise and these other uses. The only conflict appears to be with freight or container ships for use of larger berths at Greenock. However, this will be addressed through the port's dedicated cruise berth which is anticipated to be completed in 2020.

Relationship between Scottish ports

4.10 The main perceived competition is between smaller Scottish ports that are relatively close to one another – for example, between Oban, Tobermory and Portree. This also includes competition between mainland and island ports. The former tend to see island destinations as having a cachet for cruise lines that makes them more likely to call, for example at Stornoway rather than Ullapool. However, the *extent* to which it is felt there is competition between ports is unclear.

4.11 Other ports framed competition in terms of overlapping drive times to key onshore attractions, destinations and activities. For example, Invergordon and Ullapool were seen as competing for cruise calls, due to their proximity to Ross-shire and Loch Ness. This is despite the two ports being on different sides of the Scottish mainland. The same was also stated for Greenock and the Edinburgh ports, with calls at Greenock involving tours to Stirling Castle or Edinburgh.

4.12 A number of ports stated that they did not see Scottish ports as competing against one another. This was for two main reasons. First, itineraries are multi-port, so a call at one port is reliant on calls at other Scottish ports. Second, each Scottish port's hinterland has a different range of attractions and activities, though in some instances there is a degree of overlap (e.g. Greenock and Edinburgh ports, as discussed above).

4.13 Where new port facilities are built (e.g. Aberdeen, planned deep water berth at Stornoway) they provide needed additional capacity for specific parts of the cruise market. Thus, they increase overall cruise activity in Scotland.

4.14 There were mixed views regarding international competition for Scotland from Ireland, the Baltic and Scandinavia. Whilst some cruise lines see these other areas as competing against Scotland, some Scottish ports see the other countries as forming part of some international itineraries and thus the ports are interdependent.

Scottish port infrastructure

4.15 Scotland's port infrastructure is seen as having a number of **strengths**. The range of available ports on both the east and west coasts offers variety to the cruise industry, in terms of potential destinations, and also facilities for different types of vessels. In addition, there are ports with a number of quays (e.g. Invergordon, Orkney, Lerwick, Forth Ports) and anchorages, capable of accommodating a range of vessel sizes. As well as this, there are a number of anchorages at smaller ports that are a short distance from shore, and well sheltered – e.g. in Campbeltown, Fort William and Portree.

4.16 A further strength is that there is clear segmentation of different users at some ports, such as at Lerwick and Inverness. This reduces the potential for any negative social or environmental impacts, and can positively impact on the immediate impression of cruise tourism visitors.

4.17 Ports are aware of the need to invest in their infrastructure. As a result, a range of investments are being made or proposed that will increase capacity *per se* or allow larger vessels to berth alongside where they currently have to use anchorages.

4.18 This points to what is seen as the main **weakness** of Scottish ports infrastructure, given an increasing market for larger vessels – that there is a *limited number of berths for larger vessels to come alongside*.⁵³ This is particularly so on the west coast, with a lack of dedicated cruise berths. This has led to some lines making fewer calls at Scottish ports than would otherwise be the case.

4.19 There are a number of reasons for this:

- The cost of investment relative to financial return on investment from cruise activity is considered too great. One example given suggested that an acceptable return on investment at a small-medium sized port not currently able to accommodate cruise vessels alongside (and thus only seeing one or two cruise calls per year, with vessels anchoring and tendering passengers) could only be generated by c.100 calls per annum.
- There is a perceived better financial return from investments catering for other port users, because of the scale of activity, and also the potential for additional revenue streams.
- There is limited funding available for local authority ports (in particular) and Trust Ports to undertake port improvement or expansion activity.
- There is considerable financial risk involved in creating a dedicated berth for cruise ships.

4.20 It is arguable that there is a co-ordination failure amongst port user groups, whereby one user group is unwilling to assume the financial risk of port development by itself. Without agreement and co-ordination amongst users for joint investment (as is the case in Stornoway's development proposals), port development does not happen.

4.21 *Some lines or specific ships will not anchor off.* That is because of the time it takes to tender passengers, and uncertainty regarding weather conditions. The latter can mean delays or a poor experience for passengers while tendering, or even a planned call at a port being omitted. This can be exacerbated when anchorages are quite distant from the shore, e.g. 1½ miles at Stornoway. Anchoring off also means that a ship cannot take on water or stores, nor can it dispose of waste during the call.

4.22 Thus, *lines that are willing to anchor off generally do not want to do so at two ports in a row, or more than once during the itinerary.* This limits calls to ports that are well-known or perceived by cruise operators as having the best offer for onshore activities, e.g. Portree, Tobermory.

4.23 An added weakness is that many ports do not offer *shelter* for passengers awaiting tendering. These include ones where large vessels call, e.g. Newhaven, South Queensferry. Some other ports offer limited facilities such as toilets and space for coaches, e.g. at Portree and Newhaven. This offers a poor experience for cruise passengers, and therefore can act to deter cruise vessels from calling. Other research has identified that infrastructure in smaller ports in Scotland, in line with smaller ports elsewhere in the UK, is in need of modernisation or refurbishment.⁵⁴

Infrastructure immediately surrounding ports

4.24 A number of consultees identified weaknesses in onward public transport infrastructure for cruise passengers wishing to travel independently; at marquee ports, it is estimated that up to 40% of cruise passengers can be independent travellers, whilst elsewhere, independent travellers can make up to 60% of cruise visitors in destinations. There was an identified insufficient capacity on bus services to

⁵³ Typically vessels 250m+ in length

⁵⁴ ekosgen (2020) Supporting the Economic, Social and Environmental Sustainability of the UK's Marine Sectors: A research report for Marine Scotland

accommodate passenger numbers, such as from Invergordon. The distance from the port to bus stops and railway stations, e.g. at Greenock and South Queensferry also serve to act as a barrier to independent travel, though improvements to wayfinding in Greenock between the cruise terminal and Greenock Central have sought to mitigate this as far as possible, with further investment planned. Additionally, the limited frequency of public transport, e.g. train services from Thurso for Scrabster cruise passengers, is an issue. These issues all serve to constrain the options available to travellers.

Factors attracting cruise operators to choose particular ports

4.25 There are three key factors that influence cruise operators' decisions in choosing to call at particular ports. The first is logistical. A port's location vis-a-vis other ports in the itinerary is an important consideration, in terms of vessel sailing times (it is understood that this is typically 12 hours between ports). For larger vessels, the ability to berth alongside, or the availability of a sheltered anchorage close to the shore is also important – as discussed elsewhere in this chapter.

4.26 Second, the perceived status of the port and its hinterland is of significance – and in particular, the passenger rating of it on previous calls. Larger lines operate on the basis that including less well-known destinations in an itinerary will lead to lower demand. Edinburgh is therefore seen as a must-visit call for many cruises. This reflects Edinburgh Castle as a major attraction and the city's global profile. Repeat cruise passengers still have a high demand for Edinburgh – although they would not want to visit Edinburgh Castle on two cruises in a row.

4.27 The third factor is the range and quality of attraction and activities for cruise passengers within a reasonable travel distance. These should be different at each port, so individual calls complement one another rather than providing more of the same. They will include iconic themes (e.g. whisky), locations (such as St. Andrews for golf, Loch Lomond) and locally based experiences or activities, e.g. Shetland ponies. Some smaller ports focus on the experience in their village. For example, Ullapool promotes itself as an authentic Highland village, while Tobermory sees its attractive Main Street as a key selling point.

Appetite for cruise tourism activity and development aspirations

Marketing and contact with cruise lines

4.28 Ports believe that they have sufficient cruise market information. The main sources of information for ports are online industry publications such as Cruise News and Seatrade, along with industry intelligence (such as from Cruise Lines International Association (CLIA)) and other online information, e.g. on new ships being built, vessel itineraries. Ports also draw on information provided by Cruise Scotland. In general, it does not seem that ports are failing to achieve their cruise potential because of a lack of market information.

4.29 Ports report that they have an appropriate level of contact with the cruise lines. There was very little evidence of ports not having enough contact, or not knowing who to target. That said, the ports do not appear to be targeting specific parts of the market (e.g. nationality of passenger). In most cases, there is only a limited awareness of changes in cruise passenger demographics or nationalities calling at their own port. Rather, they base their marketing activity on what size of vessels they can accommodate and an understanding of what the hinterland will bear in terms of number of passengers on a single day, based on the ports' own knowledge and discussion with stakeholders. They are, however, aware of general trends such as future growth expectations at the small end of the market (expedition vessels) and largest ships (c.4,000+ passengers).

4.30 The majority of ports attend the major cruise trade shows in Miami and Europe on a regular basis. Four ports (each with relatively low numbers of cruise calls) do not do so (Fort William, Montrose, Peterhead, Portree). Their only contact with the sector is via agents making cruise bookings on behalf

of the lines. It is worth noting that two of these ports are local authority owned with marketing activity undertaken by Economic Development staff. However, there is evidence that one or two ports may have representation through group companies (e.g. Ayr and Troon, through Associated British Ports).

4.31 Almost all ports are members of Cruise Scotland. In most cases it is very well regarded as a source of market information, its organisation of stands at major cruise shows, and as a means of members sharing information and advice.

4.32 A small number of ports are also members of one or more of Cruise Britain, Cruise Europe and CLIA. These tend to be the ports with the highest levels of cruise activity, such as Kirkwall. They are also the ports that visit lines' offices either in the UK or United States. However, a number of other ports are looking to establish direct relationships with cruise operators in an effort to familiarise lines with their port and to generate calls in the light of planned investment in new port facilities.

4.33 A number of ports' marketing activity includes email contact with lines between trade shows and hosting FAM visits (familiarisation trips).

Investments in port infrastructure

4.34 The development aspirations of some ports are evident in recent, current and prospective investments. These provide a useful indication of the relative importance of cruise to port activity. These are summarised below.

Recent

- **Invergordon:** Over the last three years additional walkways, secure areas, trip hazard warnings and a new exit around the main road crossing. They have also built premises at the port for a local volunteer tourist information group. Over £200,000 was invested in berthing additions and a taxi rank in 2018.
- **Tobermory:** £400,000 investment in 2018 on a pontoon for small vessels to come alongside, a landing area for tenders, and a new bridge.

Current

- **Greenock:** c.£19 million for new cruise berthing and a visitor centre, scheduled for completion in 2020. This will increase the length of time that vessels can stay at the port, including overnight.
- **Invergordon:** Construction of a 218m long quayside and other elements at a total cost of £30 million, due to be completed in 2020. It will be capable of accommodating the largest cruise ships currently being designed while acting as a multi-user facility, e.g. serving the energy market.
- **Aberdeen:** Facility at new Aberdeen South Harbour – accommodating 300m long vessels with a maximum 10.5m draft. Expected to be operational in 2021. This is part of a total investment of £350 million being made at Aberdeen South Harbour.
- **Scrabster:** Redevelopment of an existing pier to increase the length of vessels alongside from 180m to 250m with a deeper draft than at present. For use by cruise ships and offshore vessels. Total estimated cost of c.£17 million.

Prospective

- **Stornoway:** Development of a multi-user deep water berth. This would be capable of accommodating cruise ships up to 330m compared to the current 156m maximum. This investment is at design stage and public sector funding is being sought, aiming to be operational in either 2022 or 2023.

- **Fort William:** Fort William Marina & Shoreline Company Limited have plans to extend pontoons to allow the smallest cruise ships to berth alongside. Total project cost is estimated at between £850,000 and £1 million and funding is being sought.
- **Portree:** Portree and Braes Community Trust's vision for Portree harbour includes improved roads and access, and development of the port infrastructure to provide a secure location for cruise ship passenger transfer.
- **Forth Ports:** Forth Ports are currently undertaking a strategic analysis to examine the financial case for a dedicated deep water berth at one of their facilities (as yet unidentified).

4.35 It should be noted however, that the information generated on investments shows that they are, in very many cases, currently ongoing (e.g. Invergordon) or prospective (e.g. Stornoway). Thus, it is not possible to evaluate the impacts of the investment in terms of increased cruise activity alone or indeed at this point in time.

4.36 Further, in a number of cases the new or upgraded facilities will be multi-user for example, cruise plus oil and gas and renewables related vessels. Investment may also generate other additional traffic at the port by freeing up space in areas of the port currently used by cruise ships and vessel types. Thus, it would be misleading to compare any changes in cruise activity as analysed earlier in Chapter 3, against the total cost of an investment which will cater for a range of markets.

Other investments

4.37 In addition to physical infrastructure, ports also make other investments to support cruise activity. For example, some ports provide printed guides or promotional material for cruise passengers. Peterhead provides local area maps for visitors, whilst Invergordon publishes around 70,000 copies of a Gateway magazine to issue to cruise passengers, in which local businesses can advertise. Similar investment includes erecting marquees with visitor information for passenger reception (e.g. Ullapool).

4.38 Others provide additional transportation. Some bring in coaches from outside the local area to meet demand from larger cruise ships, such as at Lerwick and Kirkwall. For example, Lerwick Port Authority spent £50,000 on bringing coaches into Shetland. Others have provided a shuttle bus to the town centre (e.g. Scrabster).

Capacity for increased cruise calls

4.39 Very few ports and their hinterlands appear to be near capacity for cruise activity. This reflects that most ports have low absolute number of calls and smaller passenger capacity vessels. However, there is some evidence of areas nearing capacity. For example, Orkney is reportedly turning away around 20 vessels per year because of lack of capacity/daily cap on number of passengers (4,500 per day).

4.40 Two other ports have, or will have, passenger limits: Scrabster will not take ships of more than 3,000 passengers – with most being less than 2,000 passengers – when their redeveloped pier is operational; and Ullapool will not take vessels of 1,200 passengers or above. This reflects the capacity of the local infrastructure, the desire to provide cruise passengers with a good experience, and to reduce negative impacts on – and antipathy from – the local community. This, and the other investments described above, indicate that it is not generally the case that “the port is really only interested in the ship”. Greenock was also reported as turning away a number of small cruise ships in 2019, but this was in preference to freight vessels, rather than any capacity issues in the town, or in Greenock’s visitor hinterland.

4.41 However, it is worth noting that ports are generally reluctant to turn away any type of ship. That is, first, for commercial reasons. A second reason is that Trust Ports and local authority harbours exist to benefit port users and the local community. Forth Ports and Lerwick are not turning away any ships

at present. However, the former believe that they lose a number of calls per year because of lack of a dedicated cruise berth.

4.42 Lerwick believe their port and the wider onshore infrastructure could take up to 150 ships per annum depending on the passenger capacity of the vessels (that compares to 99 calls in 2019). However, they foresee challenges in visitor management in accepting more than one cruise ship on the same day, arising from passenger volume.

Importance of sustainable development

4.43 Ports recognise that shipping in general, including cruise, will have to become more environmentally friendly. However, there was no clear indication of what ports are beginning to consider in terms of investment, recognising that these issues are likely to affect only a small number of them.

4.44 Some ports argued that cruise lines are already doing a lot to address environmental issues, including fitting EGCS or 'scrubbers'. Cruise lines are fitting scrubbers to their existing fleet and acquiring new build ships that operate on cleaner fuels (e.g. LNG). Yet they were less clear on what that means for port investment. There is an expectation that not all vessels will operate on new fuels. Further, those that do so would only require to take on fuel at just a few ports per voyage, or even just one (i.e. the turnaround port).

4.45 A small number of ports also referred to the discharge of water and waste handling. One example was the need for waste to be segregated by category, which was mentioned by Forth Ports in particular. Lerwick referred to a need for cruise ships to be more environmentally friendly in their waste disposal. Some others referred to vessels in future looking to "cold iron" while in port.

Future development – opportunities and challenges for ports

4.46 As noted earlier, many of the ports are not targeting specific parts of the market. Those that do are either aiming for: smaller vessels, as this is an identified growth market; or the growing number of larger/est vessels, in some cases supported by investment in enhanced port infrastructure.

4.47 Some ports believe that Scotland could attract some of the larger vessels that currently call at Dublin or the major ports in Norway, such as Bergen – though the consideration of Scotland attracting larger vessels should be balanced carefully with consideration of the environmental impacts that Norway itself is seeking to mitigate/reduce. Norway is perceived as becoming less welcoming to cruise. This is due to the negative impact on local communities from cruise visits, and the environmental impacts of larger vessels (notably emissions).

4.48 For example, Forth Ports reported that:

- Some cruise ships might no longer call at some Norwegian ports due to an increase in port charges related to vessel emissions; and
- Dublin will be making a 50% reduction in cruise calls in favour of freight vessels. This was also mentioned by Greenock.

4.49 However, it was recognised that this could actually result in the affected lines moving some of their ships from North Europe to another part of the world. Thus, the number of calls in Scotland could actually fall.

4.50 The number of port calls are reduced by the *weaknesses of port infrastructure*, as described at 4.18-4.23. In particular, the limited ability to berth alongside is constraining. This includes the lack of a second large berth on the west coast in addition to Greenock, which a number of lines referred to. This

was reported as negatively impacting the number of calls at ports – Stornoway in particular. Port infrastructure that is in need of modernisation or refurbishment is another potential weakness.⁵⁵

4.51 Further, the cost of *new/upgraded port infrastructure* could restrict future development given that cruise is only one of a number of strands of ports' business. Ongoing constraints on public sector finances will limit the funding available for infrastructure improvements at both Trust Ports and local authority facilities, though arguably there may be public good/public safety grounds for investment in port infrastructure generally, besides taking advantage of economic opportunities. For example, there have been longstanding ambitions to improve the infrastructure at Highland Council's harbour at Portree, which have not yet been fully realised.

4.52 Ports identified *onshore capacity issues* that could act as barriers to growth. These included:

- Congested road and public transport links from ports;
- Local road capacity in the wider area, including a lack of circular routes in more remote locations, e.g. in Shetland and Lewis/Harris;
- Limited parking spaces, or available space for coaches;
- Failure to develop sufficient new, distinctive onshore activities;
- Lack of tour coaches; and
- A limited number of available tour guides, e.g. Greenock, and shortage of local accredited guides in the Fort William area.

4.53 A smaller number of ports also referred to possible negative impacts on *demand* through:

- A global economic downturn;
- Projected cruise growth not being achieved; and
- Scotland possibly being seen as an expensive visitor destination as a result of Brexit and/or the introduction of a tourist tax.

Summary

4.54 It is possible to characterise ports according to a typology based on growth aspirations, infrastructure, investment plans and access to finance: Leading, Aspirational, Growth potential, Reactive. Forth Ports, Greenock, Orkney, Invergordon and Lerwick can be considered leading cruise ports, but for many ports in Scotland, cruise is not a significant part of their business and operation. As a result, there is little conflict with other port uses, and any notable disruption or competition for berth or quayside space will be addressed through current investment (e.g. at Greenock). That said, there appears to be some overlap in terms of destination markets served by some ports – this is particularly the case for Greenock and ports around Edinburgh.

4.55 There is also little competition between ports in Scotland. Where this is the case, it tends to be between smaller Scottish ports in close proximity to each other, on Scotland's west coast. However, development activity at ports appears to be providing additional capacity for specific market segments.

4.56 The range of ports available in Scotland, and the clear segmentation of cruise sub-sectors, is a strength of Scottish port infrastructure – but this is offset by the limited availability of berths and associated port infrastructure that can accommodate larger vessels. In some instances, this is exacerbated by shortcomings in infrastructure immediately surrounding ports. Despite this, cruise

⁵⁵ ekosgen (2020) Supporting the Economic, Social and Environmental Sustainability of the UK's Marine Sectors: A research report for Marine Scotland

operators are attracted by three main factors: a port's location in relation to other ports in Scotland; the perceived status of the port's hinterland; and the attractions that it can offer access to.

4.57 Recent and planned investments at Scottish ports demonstrates the ambition for developing the cruise sector in Scotland. This includes expansion of quayside, berths and landside facilities at Greenock, Invergordon and Scrabster, and a new harbour facility at Aberdeen.

4.58 Few ports and hinterlands appear to be near the capacity provided by current levels of infrastructure. Where this is the case, such as in Orkney, measures are in place to manage the number of calls and passengers received per day. Limits at some other ports indicate that there is generally a willingness to proactively manage visitor volume.

4.59 Cruise sub-sectors with smaller vessels are an identified growth market. Those ports that serve the larger vessel types are also keen to grow this market further. However, growth may be impacted by internal factors, such as port infrastructure limitations, and the cost of upgrade, or the (constrained) capacity of road and transport infrastructure (particularly given the trends towards independent travellers, which transport infrastructure is constraining to an extent), as well as that of activities, amenities and facilities in destinations.

4.60 It should also be noted that the cruise sector is susceptible to global market changes outwith the control of cruise tourism actors in Scotland, and indeed the cruise operators themselves.

5 Cruise tourism: the cruise operators and intermediaries

Introduction

5.1 This chapter examines the supply side of cruise tourism. It presents the views of cruise operators across a number of areas: the importance of Scotland to their operations; destination attractiveness and product development; factors influencing cruise itinerary planning; relationships with onshore actors in the cruise ecosystem; environmental and sustainability considerations; and partnership working.

5.2 The information presented in this chapter is drawn primarily from consultations with cruise operators, ground handlers and port agents. This was supplemented by a web search of cruise operators and itineraries (as of January 2020), and data proformas completed by some of the interviewed operators.

The importance of Scotland to cruise operators

5.3 Northern Europe is an important region for cruise operators, particularly during summer deployment, and it is generally increasing in market share. Within this, Scotland is an important cruise destination to operators, and it is becoming more important over time. Scotland is typically included in round-Britain cruises and itineraries that include Iceland, the Faroe Islands and parts of Scandinavia. One operator said that:

‘Northern Europe has grown more than other regions due to investment put into the growth of cruise in some countries’ (cruise operator)

5.4 The growing importance of Scotland as a cruise destination was reported by the majority of cruise operators consulted and is supported by the analysis of cruise trends in Chapter 2. This is particularly strong for some operators, such as Hapag-Lloyd who more than doubled their calls at Scottish ports between 2017 and 2019, driven by growth in the expedition cruising market. It is also illustrated by the following quotes:

‘Scotland is becoming more and more important for us’ (cruise operator)

‘Scotland has and will become more important’ (cruise operator)

‘The passenger demand for the UK and Scotland is very high, and is increasing year-on-year’ (cruise operator)

‘The Scotland and Northern Europe market has increased in importance in the last five years’ (cruise operator)

5.5 The only exception to this was Disney, for whom Northern Europe is not a core market. Despite being highly rated by passengers, they haven’t been able to grow this market in the last decade, and only have one ship serving the Northern European market. However, Northern Europe is part of their planned future expansion.

5.6 When asked about Scotland’s relative importance within the Northern Europe region, operators generally felt that Norway and Iceland, and possibly the Baltics, had experienced the largest growth and investment in cruise tourism by ports. These markets are also the most popular amongst passengers, with Scotland and Ireland next on the list. However, some operators felt that strong growth in other Northern Europe destinations presented an opportunity for Scotland to link into these growing cruises,

rather than competing against these destinations. For example, if cruises to Norway and Iceland are increasing in popularity and supply, then Scotland is a natural calling point on the way to these destinations.

'Based on our market research, passengers favourite destination is Norway, followed by Scotland, Ireland and Great Britain' (cruise operator)

5.7 Looking to the future, many operators expected the growth of Northern European destinations to continue, with growing numbers of calls at Scottish ports forecast. This is supported by most operators looking to expand their fleet of vessels in the short to medium term. As stated in Chapter 2, there are currently 115 cruise vessels on order across all operators (an average of 1-2 per operator), and so increased supply is likely to translate to increased cruise calls and passengers visiting popular destinations.

Destination attractiveness and product development

5.8 Scotland as a cruise destination has a number of distinct and fairly unique selling points. A point that came out strongly through the research was that cruise operators clearly recognise Scotland's unique selling points (USPs) to passengers as being the history, culture and heritage and nature, rather than any specific destinations or attractions. These are set out in Table 5.1.

Table 5.1: Scotland's USPs to cruise passengers

History	Culture and heritage	Nature
Ancestral links Story-making and telling Historical sites and stories People and historical figures Mystery and mystique	Castles Whisky Golf Events Shopping	Flora and fauna Islands and lochs Remoteness Attractive boutique destinations Gardens

5.9 Scotland's **history** appeals to many tourists. The ancestral link to Scotland and Britain is particularly attractive to North American cruisers, who are often very interested in their history. Ireland holds a very similar appeal in this respect, and many operators link Scotland and Ireland on cruises for this reason. Cruise operators also reported that foreign passengers particularly like the story-telling behind some of Scotland's historical sites and destinations.

'Guests are attracted to Scotland for culture, history, mystery, charm, mystique, rather than for specific destinations... the most compelling market is Scotland and Ireland due to the people and the environment' (cruise operator)

5.10 Scotland has a rich **culture and heritage**, particularly when compared to other destinations in the world. Increasingly cruise operators are looking to move away from simple sightseeing to developing more bespoke activities and experiences for guests, linking in to Scotland's cultural and events offerings. For example, Carnival are trying to promote soft adventure (e.g. kayaking), food and drink and other activities over sightseeing, while Silversea has booked groups on a captain's guided tour of the Royal Yacht Britannia in Edinburgh. This move away from sightseeing is illustrated in the following quotes from cruise operators:

'Guests want to buy bespoke, different products that they can't get back home' (cruise operator)

'We have a saying when in Scotland – 'NAC' – not another castle' (cruise operator)

5.11 In terms of **nature**, Scotland's islands, lochs and seascapes are very important in attracting cruise passengers. One operator stated that this was particularly so for UK passengers who are aware of these destinations but are unlikely to visit them outwith a cruise. The fact that many of Scotland's

destinations are remote and can be difficult to get to by land makes them particularly appealing to some passengers, particularly UK and North American cruisers, as illustrated by the following quotes from cruise operators:

‘Scotland’s USP is the wild and untapped nature... we don’t find these in any other destinations, including Norway and the Baltics’ (cruise operator)

‘The most important offer in Scotland is the islands and lochs, Orkney and Shetland mostly, which are hugely desirable for UK passengers’ (cruise operator)

5.12 Linked to this point, operators consulted for the research were unanimous in reporting that Scotland’s mix of marquee and boutique/new destinations makes it particularly appealing to passengers. A cruise incorporating Scotland takes in the larger cities that foreign guests may not otherwise visit for a long weekend and also scenic cruising to the smaller, newer destinations that are less well-known and harder to get to.

5.13 As well as the uniqueness of experiences that Scotland can offer in terms of culture, iconic sites and landscapes, cruise lines also reported that Scotland’s worldwide image of having ‘a big sense of hospitality’ is a key factor in itinerary planning. Scotland’s ongoing presence and position in pop culture i.e. films and music appeals to the younger generation of cruisers and cruise lines factor this into their planning, e.g. AIDA line introduced in 2019 Fort William as a port of call to allow families to visit the Jacobite Steam Train, as featured in the Harry Potter films.

5.14 In terms of future market opportunities, cruise operators acknowledge that Scotland currently delivers well across the board and this is reflected in their growing market share. However, as the expedition and boutique market continues to grow, cruise operators in this market segment feel there is an opportunity for Scotland to translate its wildlife and outdoor experiences into a range of products/offers for this visitor group – adventure tourists and a younger demographic – which desires to visit smaller communities in more remote locations causing less environmental impact and site degradation, and potentially involves more expenditure by wealthier passengers. However, this should be done with due cognisance of the need to ensure that sustainability and community capability is at the centre of Scotland’s tourism offering. Neglecting this would arguably risk degrading two of Scotland’s most critical and valuable tourism assets.

Cruise operator planning

Factors influencing itinerary planning in Scotland

5.15 As mentioned in Chapter 2, cruise operators consider a range of factors when planning a cruise that is visiting Scotland. Passenger/customer feedback from previous cruises to Scotland is one of the most common considerations, although there are a number of other factors. Table 5.2 sets out the factors used by cruise operators when itinerary planning, split into experiential, financial, physical and natural factors. The table illustrates the complexity of itinerary planning and the wide range of considerations for cruise operators, some within their control and others outwith.

Table 5.2: Considerations for cruise itinerary planning

Factor	Description
Experiential factors	
Customer feedback	Cruise operators regularly survey passengers about their overall cruise experience, but also their experiences of individual destinations. Previous feedback is taken into account. Kirkwall and Edinburgh tend to rate very highly. Some operators survey passengers prior to a cruise to ask about their expectations. This is the most common factor taken into account when itinerary planning.

Authentic and unique experiences	Many operators look to achieve a balance between 'marquee' ports (Edinburgh, Greenock, Kirkwall) which customers expect and 'boutique' ports (Tobermory, Ullapool, Holy Loch) which customers wouldn't otherwise visit. Operators are also continually looking for more improved, unique onshore experiences for their guests, including bespoke experiences that the normal tourist could not book online. Some will even change the cruise itinerary and shore excursion offer every cruise, so that they are never the same. Operators report that Scottish destinations are good at continually authentic and unique experiences for cruise passengers.
Events	Where possible, cruise operators like to coincide port calls with particular events, festivals or the opening of an attraction, for example calling at Edinburgh during the Tattoo or Lerwick during Up Helly Aa. In contrast, some will avoid certain ports on certain days, for example most attractions and offers are closed in Stornoway on a Sunday for religious reasons.
Word of mouth	Networking and sharing experiences is common in the cruise industry. Cruise operators often communicate with one another to share experiences, learning and understanding from different destinations. This is particularly relevant to the more boutique Scottish ports (e.g. Holy Loch, Campbeltown) that are less visited by cruise operators.
Financial factors	
Port fees	Port fees vary widely and can be a considerable expense for operators. Anecdotal evidence suggests that they are more expensive on the east coast of Scotland than the west coast, and this can be factored into itinerary planning.
Shore excursion	Cruise operators sell more shore excursions in marquee ports, such as Edinburgh, Invergordon and Kirkwall, where the excursion offer is particularly attractive.
Economies of scale	Although most cruise operators try to continually change and update their itineraries, some keep the same itineraries for each cruise in order to benefit from marketing and shore excursion economies of scale.
Physical/infrastructure factors	
Port infrastructure	This is primarily the ability to come alongside. This is particularly important to cruise lines operating larger vessels because tendering passengers to the port is costly, inefficient and passengers do not like it because of the time taken to tender. It can also be challenging for older or disabled guests. TUI Cruises operate large vessels and only call at ports with large enough berths. Currently, vessels over 250m in length can only berth alongside at Greenock, Invergordon, Kirkwall and Lerwick, although proposed investment in Stornoway and capital investment in Aberdeen that is nearing completion is set to offer additional deep water berths on the west and east coasts.
Port capacity	A number of cruise operators consulted stated that they can sometimes base whole itineraries around what date they are able to call at specific marquee ports, such as Kirkwall or Edinburgh.
Distance from the berth to the attraction	Cruise operators usually abide by a 1.5 hour journey time from the port to the onshore attraction. If operators are particularly keen on a particular attraction then this can determine which port they call at. For example, calls at Greenock can still allow tours to Edinburgh Castle, meaning that vessels can access Edinburgh from both the east and west coasts of Scotland.
Natural factors	
Geography	The geography of ports can often determine which ports are included or excluded in a cruise. For example, some cruises primarily targeting either Iceland or Norway but calling at Scotland are unlikely to take in both the west coast and east coast. Fred Olsen often use Rosyth for its proximity to Norway. Kirkwall and Lerwick are often used as a call between mainland Scotland and the Faroe Islands/Iceland. Similarly, operators welcome investment in a deep berth at Stornoway because it would give larger ships a second deep water berth on the west coast and offer a call between, for example, Greenock and Kirkwall.
Weather	Although the weather is out of an operator's control, the tendency for poor weather conditions in parts of Scotland in certain months can make calling at some ports difficult, dangerous and unattractive for guests. This is particularly true for more exposed ports on the west coast of Scotland where passengers need to be tendered, such as Tobermory.
Tidal restrictions	This only affects some ports, such as Inverness, and means that vessels can only enter or leave a port at certain times, which cruise operators don't like and prefer to avoid.

5.16 However, although some operators take a formulaic and analytical approach to these itinerary planning considerations, some operators consulted said that it can be unstructured and that they often go 'on a hunch'. The following quote is from a cruise operator:

'Planning itineraries is an art form that you cannot put into spreadsheets' (cruise operator)

5.17 In summary, although there are many considerations for cruise operators, the main factors influencing itinerary planning in Scotland are passenger feedback, as is the case in other cruise regions, but also the ability for vessels to berth alongside and selecting destinations that can provide authentic, unique and memorable onshore passenger experiences.

Factors influencing shore excursion planning in Scotland

5.18 Most cruise operators deal with one or more ground handlers who operate their shore excursion activities. These operators sometimes procure ground handlers in different countries to operate their shore excursions for, for example, one year at a time. Those that don't have contractual arrangements with ground handlers will tend to purchase their services on a case-by-case basis.

5.19 Often, cruise operators will rely heavily on the ground handler(s) to develop a range of shore excursion offerings for different destinations on their cruise itineraries. Some operators, for example Hapag-Lloyd, ask their contracted ground handler to present them with a brochure of excursions from which the operator will select their preferred excursions.

5.20 Chapter 2 describes how cruise operators tend to plan the menu of onshore excursions for a cruise and offer it to passengers. Although the vast majority of cruise lines operate all-inclusive cruises, this usually does not include shore excursions. Only one operator consulted for the research (Viking Cruises) offers one free excursion per passenger per port of call (as well as the normal paid excursions).

5.21 Where cruise operators are involved in the planning of shore excursion itineraries, there are a range of factors that they tend to consider. These are set out in Table 5.3.

Table 5.3: Considerations for shore excursion planning

Factor	Description
Getting a balance	It is important for cruises to offer a good range of excursions to cater to all ages and abilities, for example offering one active and one non-active excursion per port, and/or one full-day and one half-day excursion. Some cruise operators get high numbers of repeat passengers (up to 40% in some cases, such as Fred Olsen and Disney) and so changing and refreshing excursions is important.
Passenger demography	Operators will often take into account the demographics on certain cruises in order to inform the shore excursion offering. For example, a younger average passenger age might demand more active excursions, or a cruise with primarily North Americans might demand more heritage-related experiences in Scotland.
Bespoke experiences	Increasingly, cruise operators, particularly luxury brands, are putting together more bespoke excursions for their guests; excursions that the general public could not book themselves. These include connecting with the local through 'meet the owner/head chef/head gardener' type excursions that go beyond just sightseeing. An example of this is a captain's tour of the Royal Yacht Britannia or a talk from the head gardener at Dunrobin Castle.
Passenger feedback	As with itinerary planning, feedback from previous passengers about particular attractions or excursions are important when excursion planning. Cruise operators generally report Edinburgh Castle, Stirling Castle, Loch Lomond and Loch Ness as the most popular attractions amongst passengers.
Capacity	Some visitor attractions – both private and those operated by the public sector – have constraints on the number of cruise groups or passengers that they accommodate. For example, Highland Park distillery in Orkney has limited the number of cruise groups to two per day. This impacts on excursion planning, particularly for larger vessels. The differing investment models for private and publically-operated attractions will also impact on their ability to fund capacity expansions where needed.
Financial return	Excursions that demand a higher price and can attract and hold a larger number of passengers are more attractive financially to operators. For example, a tour of

Factor	Description
	historical places and palaces in Edinburgh commands a much higher price than a walking tour of Kirkwall.
Recommendations from ground handlers	Given that some of Scotland's ground handlers are based in, and are well-established at running tours in, Scotland (e.g. Excursions Ltd, Island Smart), some operators will delegate decisions on shore excursions to the ground handlers, as the 'experts'.

Relationships with onshore ecosystem

5.22 Given the complex cruise ecosystem discussed in Chapter 2, it is important to understand the relationships between cruise operators and Scottish onshore key players (e.g. port authorities, shipping agents, ground handlers, excursion companies) and their experience of Scottish providers. These are discussed in this section.

Partnership working

5.23 Cruise operators have varying degrees of communication with the other key players in the cruise ecosystem. At one extreme, some operators only deal directly with ports to book calls and delegate the planning of shore excursions to their contracted ground handlers, with very little contact with other destination or public sector organisations. These operators tend to do so because they find the ecosystem in Scotland confusing, and are not clear on the roles and responsibilities of the various players, including industry bodies, DMOs and local authorities. On the Scottish cruise ecosystem, one such cruise operator said:

'I am not sure it is clear... Overall, it is not a joined-up approach, communication goes via ports and ground handlers' (cruise operator)

5.24 At the other extreme, some operators liaise regularly with ports, port agents, ground handlers and industry bodies such as Cruise Scotland and Cruise Forth. These operators tend to recognise Cruise Scotland as the main body with responsibility for promoting cruising in Scotland. One such operator stated:

'Cruise Scotland are very proactive and represent all ports and promote attractions well' (cruise operator)

5.25 Some operators pointed to experiences in other European countries, such as Norway and Spain, where there is one clear representative body that they liaise with on all matters relating to cruise. This can minimise any confusion over the roles of various organisations and allow clear communication between industry and destination. Illustrating this, one operator in the research stated:

'It is always better if there is a single source of information and if destinations are working collaboratively... there is no such thing as going solo with destinations, it needs to be collaborative get together' (cruise operator)

5.26 Examples of this can include forums for each destination, to bring together the port(s), businesses, community, public sector and local government, and present it as one. Currently, cruise operators feel that Scotland does not have one clear representative cruise body to liaise with.

5.27 On the whole, there is an appetite amongst cruise operators for greater partnership working with the Scottish cruise ecosystem. There is an expectation amongst cruise operators that the various players should communicate important information to them proactively, and that this would be welcomed by operators. For example, cruise operators would find it more useful if ports communicate when they are particularly busy and if attractions or industry bodies communicate when there is a new attraction opening or a festival or event happening. This information helps cruise operators with cruise and excursion itinerary planning, but is required long enough in advance to help with planning.

Environmental and sustainability considerations

5.28 Environmental and sustainability considerations are key themes which run throughout the new Scottish tourism industry strategy, Scotland Outlook 2030: Responsible tourism for a sustainable future⁵⁶. With respect to cruise tourism, these considerations are discussed in this section, including visitor management, the environmental impact of cruising and future requirements to offset impacts.

Onshore visitor management

5.29 Given the growth of cruise tourism in Scotland in recent years and the large number of calls at some ports, some destinations, ports or attractions have placed a limit on the number of cruise vessels or passengers that they will accommodate. Examples include Orkney, where harbour guidance has been developed to try to keep disembarking passengers below 4,500 per day to alleviate pressures (see also Technical Annex B).

5.30 Cruise operators recognise the importance of visitor management approaches, particularly for some of the busier ports, such as Kirkwall and Lerwick. Operators prefer to be the only cruise vessel at a port, as this gives greater capacity for shore excursions and onshore infrastructure (e.g. coaches), but it also gives the feeling of the cruise being more unique and special for passengers. However, this is not always possible, particularly at marquee ports such as Kirkwall.

5.31 The cruise operators consulted for the research felt that Orkney and Shetland, in particular, are now a challenge due to over-crowding and port congestion issues (i.e. the ability to berth and get passengers to excursions). Operators felt that these two destinations were at risk of 'perception damage' from cruise tourism, similar to what has happened with some Norwegian destinations. However, the operators were positive about visitor management strategies, and felt that they have been particularly effective in Kirkwall to date, where it is most needed.

5.32 During the itinerary planning process, many operators will factor in other operators' calls, the time of their calls and the time for shore leave, and may re-organise if the port looks too crowded. Some operators will rely on their tour operators to highlight any potential onshore clashes with other cruise operators. However, some marquee ports, such as Edinburgh, are a 'must do' regardless.

5.33 There is a feeling amongst cruise operators that visitor management in Scotland has to be driven by the destination. As one cruise operator said:

'It is up to the destination to understand their own capacity and not schedule too many ships on the same day' (cruise operator)

5.34 Cruise operators feel that it is not their role to understand the capacity of Scotland's cruise destinations, and that this is the role of the destinations themselves. Operators reported that some destinations could benefit from a greater understanding of their capacity, and therefore how best to manage cruise, and other types of tourism. Generating a greater self-awareness of destination capacity and preventing 'over-tourism' aligns with the wider ethos of Scotland Outlook 2030.

Actions to limit environmental impacts

5.35 In 2019, 1% of the global cruise fleet were primarily powered by LNG. However, many new built cruise vessels are now being powered with LNG, and some existing vessels are being re-fitted to include LNG engines. AIDA was the first cruise operator to launch an LNG-powered vessel when they unveiled *AIDAnova* in late 2018.

⁵⁶ Scotland Outlook 2030: Responsible tourism for a sustainable future

5.36 Twenty-six vessels that were being built in 2019 (or 44% of new build cruise vessel capacity) will rely on LNG as their primary source of fuel⁵⁷; the vast majority of these vessels will be operational by 2022⁵⁸. This includes orders from TUI, Disney, Seabourn, Royal Caribbean and Carnival. Although LNG is dramatically changing the way that cruise vessels are built, powered and operated, the infrastructure requirement for Scottish ports could be minimal. LNG fuelled cruise vessels can run for up to two weeks without needing to refuel. This means that for many round-Britain cruises, the vessel can fuel up at the port of embarkation (often Southampton) for the duration of the cruise.

5.37 One large operator said:

'We have a contract with Shell [to provide LNG to vessels] so ports having charging facilities isn't really a big deal' (cruise operator)

5.38 However, although the adoption of LNG is the most high-profile step taken to address their environmental impact, there is some debate as to the extent to which LNG reduces cruise ship emissions, as discussed in Chapter 2.

5.39 Cruise operators are undertaking a number of other activities to address environmental concerns. Many operators focus on on-board recycling of plastic, glass and other materials, and Disney is taking steps to eliminate as much plastic on-board as possible. However, this needs to be supported by onshore recycling facilities. For example, some vessels separate glass recycling by colour, but it is not always possible to recycle by colour at ports. However, on the whole, operators reported that recycling and sewage and waste disposal is not an issue in Scotland.

5.40 Some cruise vessels are already fitted, or are being fitted, with scrubbers to control air pollution. This reduces the vessel's emissions and makes them cleaner. In addition, Royal Caribbean are taking steps to move to no waste discharges into the sea ahead of regulations. However, the extent to which cruise vessels are using closed- or hybrid-system scrubbers versus open-system scrubbers, which may discharge pollutants into the marine environment, is unclear.

5.41 Passengers also play a role in limiting the environmental impact of cruise. Some operators consulted for the research stated that non-flying cruises – where a passenger departs from their own country without the need to fly to the embarkation port – are becoming more important due to the increasing societal pressure from 'flight shaming'. This could see more British passengers on-board cruises departing from Scotland and the UK.

Future requirements

5.42 Increasingly, cruise operators are looking towards shore power as a way of powering ships. Carnival has committed to using shore power across its fleet by 2022; Royal Caribbean's new vessels from 2020 will have shore power capability (with Celebrity Apex being the first, which is due to be launched in late-2020); Viking has a new fleet of ships on order which will be delivered with shore power and are retrofitting their existing fleet; Disney has stated that vessels deployed in Europe in the future will be shore power-ready; and Fred Olsen has expressed interest in shore power capability if ports can provide it. However, currently only three ports in Europe – Hamburg, Oslo and Kristiansand – have the facilities to offer shore power to cruise vessels⁵⁹.

5.43 The downside of shore power is that it can be very expensive, although it can significantly reduce levels of emissions from cruise vessels. One operator stated:

⁵⁷ CLIA Environmental Technologies and Practices Report (2019)

⁵⁸ <https://www.cruisecritic.co.uk/articles.cfm?ID=167>

⁵⁹ CLIA Environmental Technologies and Practices Report (2019)

'If ports have shore power available at a sensible price we would definitely plug in and be net zero emissions' (cruise operator)

5.44 Cruise vessels generate a lot of 'grey water', i.e. shower, bath and sink water. Some ports allow vessels to dispose of their grey water through the port's sewage lines. Cruise operators prefer to 'plug in' straight to a port's sewage system where possible, and may increasingly expect this facility at Scottish ports in the future.

5.45 It is important that Scottish ports are forward-thinking and understand what facilities are required on land to support cruise vessels to reduce their environmental impact. Ports need to update their facilities in line with continual developments in the way that cruise vessels operate. With respect to port infrastructure to support recycling, LNG and shore power, one cruise operator said:

'Ports need a ten to twenty year forward view on this' (cruise operator)

5.46 While another operator stated:

'Ports and regions have to be transparent about the impact of cruise tourism on their region and communities. They need to communicate this better and understand the efforts taken by cruise lines' (cruise operator)

5.47 However, the challenge with this is that port upgrades require considerable resource, and for many Scottish ports they are not possible without collaboration of different users groups or significant public sector input. It is very difficult for Scottish ports to justify significant investment in cruise tourism when they are just one of a range of sectors operating at the port.

5.48 The Environmental Ship Index (ESI)⁶⁰ is a system which scores every cruise vessel based on their greenhouse gas emissions and encourages vessels to perform better in reducing air emissions than is required by current standards and legislation. In some parts of Europe, ports offer cruise vessels discounted port fees based on their ESI, and Norway run their own system of assessing vessels' environmental score. Increasingly, cruise operators of smaller vessels are encouraging ports to welcome ships based on their ESI score. Some larger operators, such as Royal Caribbean, are already deploying their more environmentally friendly vessels in countries where environmental issues are strongest, for example Norway. If this trend extends to Scottish ports, then it could impact on the cruise lines and types of vessels that are welcomed by Scottish ports, although, as discussed in Chapter 4, some Scottish ports are hopeful of attracting some vessels that are now less welcome in countries like Norway due to their environmental score.

Summary

5.49 Northern Europe has become an increasingly significant region for cruise operators, and, within this, Scotland has become a more important destination over time. Most operators have increased their calls to Scottish ports in the last few years, and feel that Scotland, as a destination, has experienced growth almost in line with Norway, Iceland and the Baltics. Most operators expect this trend to continue, given the planned fleet expansions.

5.50 Cruise operators report Scotland's USP to be distinct and unique. Passengers are attracted to Scotland due to its history (ancestral links, story-telling), culture and heritage (castles, whisky, golf) and nature (islands and lochs, remoteness), rather than specific destinations. These products are particularly attractive to North American cruisers. Operators are generally looking to move away from simple sightseeing to more bespoke activities and experiences, and these products are being successfully developed in Scotland.

⁶⁰ Environmental Ship Index <https://www.environmentalshipindex.org/Public/Home>

5.51 Numerous considerations go into cruise itinerary planning, including experiential, financial, infrastructure and natural factors. Each cruise operator approaches itinerary planning slightly differently, although, for cruises involving Scotland, previous passenger feedback on destinations and attractions, the ability to berth alongside and not have to tender passengers to shore, and providing authentic and unique experiences are the main considerations factored into itinerary planning.

5.52 Similarly, there are a range of considerations for shore excursion planning. Most operators rely heavily on contracted ground handlers to develop a range of shore excursion offerings in Scotland. Again, previous passengers' feedback and packaging bespoke and authentic experiences are important considerations for the Scottish market, as well as developing a balance of excursions for all ages/abilities and ensuring sufficient onshore capacity (i.e. at the attraction, coaches etc.).

5.53 Cruise operators have varying degrees of relationships/communication with other players in the Scottish cruise ecosystem. Some find the Scottish ecosystem confusing, and have little understanding of the roles of the industry bodies, public sector and DMOs etc. In general, there is an appetite for greater partnership working between operators and key Scottish players, and having one clear point of contact, such as Cruise Scotland, can support this. Cruise operators are positive about the impact of visitor management strategies and feel that they are particularly needed in busy cruise destinations with limited capacity, such as Kirkwall and Lerwick. However, operators generally feel it is the role of the destination to understand and manage their own capacity.

5.54 New developments such as LNG, shore power and scrubbers are helping cruise lines limit their environmental footprint. The ESI is becoming an increasingly important tool in demonstrating the environmental performance of cruise vessels. However, vessels need support from ports, for example to access shore power or dispose of waste safely. The required port infrastructure needs considerable resource, and, for many Scottish ports, these upgrades are not possible in isolation or without collaboration with other users, the public sector and/or the financial sector.

6 Scottish destinations and communities

Introduction

6.1 This chapter considers the challenges and opportunities posed by cruise tourism for local destinations and their communities. It draws on findings from consultation with key strategic stakeholders, port and cruise operators and tourism industry representatives. It also draws on the results of a survey of businesses and communities within destinations that serve the cruise industry.

Destination attractiveness

6.2 As with Scotland's tourism offering overall, the destinations for cruise tourists are wide and varied, from remote rural and island offerings, to cities and attractions of international significance. Anywhere within 90 minutes of a port is regarded as within range for cruise tourists, and this brings into play large swathes of Scotland. The section considers the attractiveness of destinations that form part of cruise itineraries for passengers, i.e. those beyond the cruise port destinations themselves. This is an important consideration in considering and indeed articulating the offer of different local cruise destinations within Scotland.

6.3 Given the variety of destinations we present the findings of this chapter using a Destination Typology as follows:

- Large internationally recognised urban destinations
- International rural destinations
- Island destinations
- Mixed urban/rural
- Other important rural destinations

Large internationally recognised urban destinations: Glasgow and Edinburgh

6.4 The cities of Glasgow and Edinburgh are key, established destinations for cruise tourists, particularly the latter. Edinburgh has attractions and a city-scape which are world class. Cruise tourists visit Edinburgh from the Forth Ports, but also from Greenock in Inverclyde (as detailed previously in Figure 3.6). However, it is worth noting that there is some cruise line dissatisfaction with having to tender and use limited facilities at Newhaven and South Queensferry, which can result in a lost cruise tourism market. The number of cruise visitors seeking to travel independently is growing, and this provides an opportunity for businesses to capitalise further on this market.

International rural destinations: Highland (and Inverness), Loch Lomond

6.5 Equally there are mainland rural locations of international significance, notably the Highlands and Loch Lomond. The Highlands are an important destination for cruise visitors, although not all of the Highland area is accessible within the 90 minute travel time desired by cruise operators, and so not able to form part of cruise itineraries for passengers.

6.6 Loch Lomond is the other internationally recognised mainland rural area, typically forming part of passenger itineraries for cruise ships docking at Greenock in Inverclyde. Both the Inverness/Loch Ness area and Loch Lomond are well established areas for cruise tourism.

Island destinations: Orkney, Shetland, Western Isles, Skye

6.7 The key island destinations for cruise visitors in Scotland are Orkney, Shetland and the Western Isles. Orkney offers the greatest range of attractions and is not as geographically remote from the

Scottish mainland as Shetland, although Lerwick lies on the Scotland to Iceland/Faroe/Norway route, and also attracts calls on round-Britain cruises. The Western Isles offer impressive land and seascapes, although fewer internationally renowned attractions in comparison to Orkney, though only Lewis and to a lesser extent Harris benefit from Stornoway cruise calls to any great extent. Portree on Skye is constrained by vessels having to tender passengers in, and by limited coach and road infrastructure access.

Mixed urban/rural: Fife, Dundee, Forth Valley, Clyde Valley

6.8 There are several secondary urban centres which benefit from cruise tourism, and mixed urban/rural areas. These include Fife, where destinations include the central Fife town of Dunfermline (within easy reach of Rosyth) and the international destination of St Andrews.

6.9 Dundee is another city location for cruise visitors, although its location on the Firth of Tay means that cruise tourism currently plays a relatively minor role in the destination's overall visitor profile. The same is true for Stirling, located a long way up the Forth. Other parts of the Forth Valley closer to Edinburgh, notably Falkirk, have visitor attractions of note, which have the ability to capture a larger share of cruise visitors.

6.10 The Clyde Valley, particularly west of Glasgow closest to the port of Greenock, and even the Ayrshire coast, are within distance for cruise visitors, although these locations do not currently capture a large share of the cruise market. There are opportunities for boutique and smaller cruise vessels to continue past Greenock further towards Glasgow, and similarly the Ayrshire coast. Despite the presence of the port of Greenock which is able to host mega-ships, Inverclyde also captures only a small proportion of visitor spend from those alighting at Greenock, largely from cruise ship crew members.

Other important rural destinations: Aberdeen City and Shire, Moray, Argyll, Borders (part)

6.11 There are other quality rural destinations, within which there are some internationally recognised areas and attractions. Aberdeenshire falls into this category (in particular Royal Deeside) and destinations in the Borders (e.g. Floors Castle). For Aberdeenshire, the area is an attractive tourism destination, although the cruise market, whilst growing, remains under-developed. The considerable investment in Aberdeen's south harbour (and associated initiatives) is designed to take advantage of the opportunities to develop the cruise market. It is also worth noting that Aberdeen's north harbour is located within Aberdeen City centre and that some cruise visitors will only visit the city centre, whilst others will travel outside the City (and some will do both).

6.12 For Moray, the destination has much to offer, such as the Whisky Trail and the Moray Coast, yet it is on the periphery of the distances cruise visitors are willing and able to travel. The same is true for more remote parts of Argyll and the more distant (from the Forth) parts of the Borders.

Other

6.13 There are parts of Scotland that are strong destinations with large numbers of visitors, but these are not easily served by the current port infrastructure. These areas include the southern part of the Borders, Dumfries & Galloway, Perth & Kinross and the Clyde Valley east of Glasgow. Angus is also not easily served by the ports used by cruise ships. These areas are characterised by the lowest levels of cruise passenger spend (see Chapter 3, Figure 3.5).

6.14 Table 6.1 illustrates the destinations and their maturity/status *vis-a-vis* cruise tourism.

Table 6.1: Destinations and their cruise tourism maturity/status

Destination/Area	Attractiveness	Access from Ports⁶¹	Cruise Ship market
Large international urban			
City of Edinburgh	High	High	Mature/established – sustainable
Glasgow City	High	High	Growing
International rural			
Highland (Loch Ness)	High	High (Loch Ness, Inverness)	Growing – emerging management issues
Loch Lomond	High	High	Mature
Islands			
Orkney	High	High	Mature – established visitor management schemes
Shetland	High	High	Growing – some emerging management issues
Western Isles	High	High (if and when Stornoway upgrade complete) – Lewis and Harris only (other parts less accessible from Stornoway)	Growing – some emerging management issues
Skye	High	High	Growing – some emerging management issues
Mixed urban/rural			
Fife	Medium to High (St Andrews)	High	Growing – e.g. Dunfermline from Rosyth
Dundee	Medium to High	Medium	Small but growing – port not suitable for all ships
Forth Valley	Medium to High (Stirling, Kelpies)	High	Growing
Clyde Valley	Medium	Medium to High (e.g. Inverclyde)	Small – growth opportunities
Ayrshire	Medium	Medium	Small – growth opportunities
Other rural – growth opportunities			
Aberdeenshire (& City)	Medium to High (Royal Deeside)	High (City) to Medium (further from port)	Small – growth opportunities
Highland (East)	Medium	High (Scrabster) – good access for those parts of Highland East within 90 minutes of Thurso	Small – growth opportunities
Argyll and Bute	Medium	Medium (distant from larger ports)	Small but growing – growth opportunities
Borders	Medium	Medium (some locations within range)	Small – growth opportunities
Other rural – some growth opportunities			
Highland (north, west and south west)	Medium to High	Low	Small – some prospects for growth
Angus	Medium	Low (of those currently used by cruise ships)	Small – some prospects for growth (Montrose)
Moray	Medium	Low	Small – some prospects for growth
Other rural – limited current growth opportunities			
Dumfries & Galloway	Medium	Low	Small – limited prospects for growth
Perth & Kinross	Medium	Low	Small – limited prospects for growth

⁶¹ Refers to the extent to which the destination/area is accessible from the main port access point i.e. typically within 90 minutes travel time

Impacts and benefits

Economic

6.15 The economic impacts vary according to the size of the cruise tourism visitor market. Importantly, the significance of economic impacts also vary in relation to the size of the local economy; cruise tourism visitor numbers and thus impact are lower in absolute terms in, say, Stornoway, than in the City of Edinburgh, however in relation to the local economy the economic impacts of cruise tourism for Stornoway may be proportionately higher than in the capital.

6.16 The identification of economic impacts therefore cannot be divorced from the local geographic area (destination, communities) being considered. Economic impacts for destinations/communities from cruise tourism are greatest where these represent a higher proportion of the economy than in other areas.

6.17 Without a detailed economic impact assessment in each destination, economic impacts are estimated through the extensive stakeholder, business and community consultations. We can use the typologies developed above to assess economic impact, supplemented by passenger spend data presented in Chapter 3 and port-related data set out in Chapter 4.

Large international urban destinations

6.18 For the City of Edinburgh, there is a high volume of cruise tourism generated by cruise ship visits to the four Forth Ports. Additionally, cruise ships berthing at Greenock in Inverclyde offer day trips to Edinburgh. Edinburgh is both well served by ports in the neighbouring area (Firth of Forth) and good infrastructure by road from other ports. Passenger spend in 2019 in the City of Edinburgh local authority area was estimated at between £7.5 million and £10 million.

6.19 Although based on relatively low numbers, businesses and communities in Edinburgh⁶²:

- Believe cruise tourism boosts visitor spend, particularly at attractions (71% say 5, 6, or 7 out of 7 where 7 = a significant extent).
- Just over 4 in 10 (44%) consider the visitor spend to be significant for businesses, and
- Around a third consider that cruise tourism helps to extend the tourist season into shoulder months and to deliver new employment opportunities.

6.20 Glasgow does not attract the same volume of visitors as Edinburgh, and this is also true for cruise tourism. Whilst large ships berthing at Greenock will run tours through to Edinburgh, ships in the Firth of Forth may not travel in the same volumes in the other direction west to Glasgow. Although lower than the estimated passenger spend in the City of Edinburgh, spend in 2019 was nonetheless estimated at between £2.5 million and £3 million in the Glasgow City local authority area.

International rural destinations

6.21 The economic impact in the internationally renowned rural areas around Loch Ness and Loch Lomond is also considerable, although as with Glasgow and Edinburgh, these areas would experience considerable volumes of visitors (and visitor spend) even without the existence of cruise tourism. As Chapter 3 highlights, visitor and crew spend associated with the cruise ships docking at Invergordon (the main port for accessing Loch Ness) was some £8.9 million in 2019, with Loch Ness, at just under 40 miles from the port, one of the key visitor destinations.

⁶² From ekosgen online survey of businesses and communities, 2020

The islands

6.22 For the islands, there are considerable economic benefits, with cruise tourism strong in Orkney and growing in Shetland, the Western Isles and in Skye. In Orkney, the strength of cruise tourism is reflected in business and community feedback: 71% think cruise tourism has increased visitor spend at attractions significantly (5 or more out of 7 where 1 = not at all and 7 = a significant extent) and 59% think it has increased spend in local businesses significantly. More than half of businesses and communities (55%) think cruise tourism has generated new employment for Orkney to a significant extent, i.e. answering 5 or more on a scale where 1 = not at all and 7 = a significant extent.

6.23 For Skye, the recent increase in cruise tourism has been particularly strong, translating into benefits for businesses. Some business sectors benefit more than others (e.g. car hire, crafts) with the larger ships bringing passengers to Skye during the day (rather than overnight).

The Isle of Skye (Portree)

For Skye, 10-15 years ago there were 18 cruise ship visits to Portree, now the figure is 38 (2018 data) ranging from the large 3,400 passenger ships to the Hebridean Princess with 30-40 passengers. It is estimated that 15% of all Portree harbour income is from cruise ships, a considerable revenue stream for the local authority.

Quality, high-end craft shops and galleries benefit from the cruises, as do coffee shops. During the daytime most large ship passengers will dine on-board the vessel. With big numbers coming ashore (there has been a 58% increase in cruise ship visits 2014-2018), there is a lot of work for local guides. Once arrived at Skye, boat trips are one of the most popular activities for cruise passengers, involving small boats from Portree. There has been a considerable rise in the numbers looking to book self-drive hire cars (including in advance of arrival), with pre-bookings for one day car hire rising rapidly.

Skye Connect, the DMO, would like to be able to get a greater number of cruise visitors (as well as visitors to Skye more generally) to the more remote places, i.e. to spread out/disperse the numbers. Technology is making independent travel easier, with rising numbers of passengers doing things on their own, and not booking the cruise excursion.

6.24 For Shetland too, there has been a rapid rise in passenger numbers, more than doubling in the last 3-4 years, so that cruise passenger and crew spend is estimated at between £2.5 million and £5 million. Again, some sectors (e.g. crafts) and locations (mainland Shetland only) benefit more than others; however, there is a recognition that cruise tourism brings more money into the local economy, and through multipliers, this benefits the whole of the Shetland Islands economically, albeit mostly in mainland Shetland. Although based on small numbers, there is evidence to support a positive economic impact from cruise tourism:

- Half the surveyed businesses and communities consider that cruise tourism has increased visitor spend at local Shetland attractions (rating this 5 or above in terms of significance out of 7); and
- Forty-two percent believe cruise tourism has increased spend in local businesses.

6.25 The economic (and social) benefits can be quite localised, which at times makes generalisation more difficult. For example, whilst Lewis benefits from large cruise ships (which is accessed via Stornoway on Lewis), other parts of the Western Isles (not connected by road) do not benefit economically in the same way (e.g. Barra).

6.26 For the Western Isles, therefore, smaller cruise ships can offer wider economic benefits (with longer stays and often higher spending per head) than the large vessels. The variability of the economic benefits within the Western Isles – and the fact that major investment in Stornoway harbour is planned rather than in place – is reflected in a lower proportion of businesses and communities reporting

economic benefits. Whilst just under a quarter of those surveyed (23%) consider economic benefits to businesses from cruise tourism to be significant (5 or above out of 7), 41% do not think businesses have benefited at all, with some citing the limited time passengers spend in destinations as a factor. Businesses and communities in the Western Isles do not think cruise tourism has yet brought any extension to the tourism season, although there may be future opportunities to do so associated with smaller ships aligned to adventure, wildlife and outdoor pursuits.

Mixed urban/rural

6.27 For the mixed urban/rural areas such as Fife, the economic benefits are growing, and for some towns/destinations this is having a positive regeneration effect, bringing income to the town. Dunfermline is a good example of this, as a direct result of the work of Cruise Forth, working in conjunction with the Port (in this case Rosyth) and the cruise operators.

Fife as a cruise passenger destination

Cruise Forth was established as a project in 2011, initially to raise the profile of Dunfermline (and West Fife) to enable them to better benefit from cruise ships at the Forth Port of Rosyth. At that time, Forth Ports had no real offer at all at Rosyth, only security staff and an empty car park. Forth Ports/Fife Council/Fife Chamber therefore decided to try for a season to provide a welcome and to promote Fife. A development manager was recruited and a project was formed: an information desk was provided in a building; an information point for cruise passengers. The project trialled a bus, and by 2012, a bus service was available up to Dunfermline and the project was showing signs of success.

The project has since expanded to include all four Forth Ports, and the project Steering Group involves City of Edinburgh Council, other local authorities, Scottish Enterprise, other agencies and transport operators. Scottish Enterprise has supported the project financially.

The Cruise Forth project manager a) manages the volunteer effort and b) works with local businesses to help them understand how to be more cruise-friendly. Part of the project (and volunteers help with this) is to identify opportunities/destinations for those passengers that do not want to go on the scheduled offerings e.g. half-day tour to Dunfermline – which has Pittencrieff Park, the built heritage and history, including Carnegie, of particular interest to US visitors. This has generated benefits for Dunfermline businesses. A half-day trip is ideal for the passengers, who may later go somewhere in the evening, such as the Tattoo in Edinburgh.

The 'offer' is promoted as far as St Andrews in Fife, and Dundee and Angus in Tayside. The Cruise Forth project is about communicating what there is to do at various places (not just "go to St Andrews"). The escorting volunteer will gather information and the businesses feed into this – and it all collectively enhances passengers' awareness of the destination and what it has to offer.

6.28 Other mixed urban/rural areas are also seeing increasing economic benefits. Dundee is an example of this. Tourism is a key sector for Dundee and one that is growing rapidly, thanks in part to the successful first year of operation for V&A Dundee and its global profile, and the wider waterfront regeneration enhancing the existing offer related to golf and leisure in Dundee and the wider Tay Cities region. Cruise tourism is a relatively small part of the offering presently, with modest economic benefits (estimated to be up to £500,000 from passenger and crew spend in 2019), yet it is a sector that is growing, and which has further growth potential. The Regional Tourism Partnership across the Tay Cities is aiming to capitalise on established and high-profile visitor assets in order to develop a coherent regional offering that can stand alongside more established destinations such as the Highlands.

6.29 Other mixed urban/rural areas derive modest economic benefits from cruise tourism. This includes Ayrshire and the Clyde Valley, although both have considerable potential for economic benefits to be greater. For Ayrshire in particular, it is able to draw upon key culture and heritage assets and attractions such as Robert Burns, castles and estates, e.g. Kelburn, Culzean, Dunure, Brodick, as well as museums such as Vikingar and the Dick Institute in Kilmarnock. It also boasts significant golf tourism

attractions such as Turnberry and Royal Troon, and natural attractions in its countryside and coastline. Whilst projects such as the Coig are beginning to package some of these attractions, it is arguable that Ayrshire as a destination is under-developed, despite its close proximity to Greenock – and capability in taking some cruise visits at Ayr and Troon (albeit requiring anchorage to do so).

Other important rural destinations

6.30 In many other rural areas, the economic impacts are also modest (though consideration should be given to their scale in relation to the size of local economies). For some, these are growing, with further growth opportunities (e.g. parts of Argyll and Bute). For other areas, the benefits are modest and are likely to remain so, at least in the short-to-medium term (e.g. Dumfries and Galloway). This relates to either the lack of port infrastructure, distance from ports, or both.

6.31 For Argyll and Bute, there are differences within the area, with some locations (Tobermory, Mull and Oban) experiencing a rise in economic activity and benefits associated with cruise tourism and the trend of expedition cruising in particular, whereas other parts (e.g. Rothesay, Dunoon) are not yet benefiting from the opportunities afforded by the sector. Survey data from businesses and communities indicates little economic benefit in parts of Argyll and Bute, with more than half surveyed (55%) saying cruise tourism has not (as yet) brought any economic benefits to attractions or businesses and 75% saying it has not brought new employment opportunities.

Social

6.32 Economic impacts also bring social benefits for communities, although there are times when the two are out of kilter, which can lead to social disbenefits (see challenges below).

6.33 Positive social impacts are greatest where the cruise tourism brings economic benefits that would not otherwise have been derived, increasing income in the local community. In Dunfermline, for example, without dedicated efforts to take cruise tourism visitors from Rosyth, by bus to the town, then these social benefits (increased local spend contributing to increased community wealth building, vibrancy and activity) would not otherwise have existed.

6.34 Footfall from cruise passengers can bring considerable levels of activity to town centres, both positively and negatively. Lerwick is a good example of positive benefits, with around half of all cruise ships docking right on the waterfront in the town centre (and the others a short shuttle bus ride). With Anderson High School moving out of town, consultees report considerable benefits in the summer months arising from the good levels of town centre footfall. Other island locations have benefited in this way, including Castle Bay on Barra in the Western Isles, as well as the main town of Stornoway.

6.35 For rural areas, economic and social benefits are very closely linked, and indeed given the nature of more remote rural communities it can be difficult to separate the two as income generated by tourism helps to support livelihoods, retain people in an area and sustain services. Those destinations where businesses and communities report the greatest economic benefits from cruise are also those that are most likely to report increased employment as a result of the cruise tourism: Orkney and Shetland, followed by Highland and City of Edinburgh local authority areas.

6.36 Some wider social benefits have been identified by a small number of communities from cruise tourism. These include population retention – people enabled to stay in their local area (or attracted to rural and remote areas) for job opportunities as a result of cruise tourism (again bringing social benefits related to sustainable rural/island populations). The proportion stating this as 4 or more out of 7 (where 7 is significant) was highest in Orkney (38%) and City of Edinburgh (28%).

6.37 Communities report some increased awareness of their local area, culture and history, averaging 36% across those surveyed (as 4 of more out of 7), highest in Orkney (46%), City of Edinburgh (40%) and Shetland (38%). Some communities and businesses in Orkney say cruise tourism has

brought improvements in the area's appearance (49% state 4 or more out of 7, where 7 is to a significant extent, compared to around 27% overall).

Environmental

6.38 There are no direct environmental benefits from cruise tourism, although the increased income generated via cruise tourism can (and does) fund some environmental management via infrastructure usage charges to cruise (and other visitors) which can be used by local authorities to support environmental management activities. One example of this is Skye, where the increase in tourists (not just cruise tourist visitors, but all visitors) and the strain on the infrastructure has led to the introduction of parking charges. This has, in turn, been re-invested in environmental protection and enhancement measures to ensure continued access to attractions, and to mitigate any negative impacts from visitor levels (e.g. parking charge at the Fairy Pools). Similarly, the new charging regime at the Italian Chapel in Orkney contributes to maintenance and conservation measures for the chapel. However, it is important to note that such measures address the immediate environmental impact of cruise tourism visitors in destinations and at attractions, rather than addressing the wider environmental impact of cruise vessels.

6.39 Some environmental challenges were identified through the survey of businesses and community groups. Traffic congestion and overcrowding in towns/villages and at attractions were identified as particular issues by businesses, along with demand on local amenities. However, communities were less likely to report such challenges. For example, whilst 46% of businesses reported environmental degradation arising from cruise tourism as a considerable challenge (at least 5 out of 7 on a scale of significance), only 14% of communities did so (albeit with a low base number).

Concerns and challenges

Economic

6.40 For mature and fast-growing locations, the economic challenges are predominantly associated with the distribution of economic benefits. Benefits can be concentrated in certain locations (e.g. near the port) or at certain attractions, where one attraction benefits by being on the tour route and others do not.

6.41 Examples of locations where the limited distribution of economic benefits is a challenging factor include:

- **Shetland**, where the town centre and certain mainland locations benefit (typically those with infrastructure, notably toilet facilities);
- **Skye** (see case study above), where the DMO is seeking to encourage cruise passenger benefits to be more spread out/dispersed across the area; and
- **Caithness** (see case study below), where there are active steps being taken to broaden the economic benefits of cruise passenger spend more widely beyond Wick.

6.42 For other locations, the challenge is capturing a greater proportion of the cruise tourism market. These include those destinations with a port but few attractions or product offerings (or perceived to be few). These include:

- **Inverclyde**, where a relatively low proportion of passengers choose to stay in the Inverclyde or surrounding area, but where there have been an estimated 1 million passengers disembarking at Greenock over the last 10 years. Passenger and crew spend in 2019 alone from those alighting at Greenock was some £7.1 million;

- **Fife**, although there has been the recent success of Dunfermline in attracting passengers from Rosyth; and
- **Ayrshire**, where there is a strong tourism offering and coastline within close proximity, but where the potential of cruise tourism remains largely untapped, despite Ayrshire's proximity to Greenock (and the around £7 million per year market), and a travel from port time at least comparable to that for Edinburgh.

6.43 The challenge of developing a coherent, accessible tourism offering for cruise operators is dealt with in more detail in Chapter 7, but the example below provides an illustration of the experience of Caithness in the Highland local authority area.

Caithness

For Caithness, the challenge is to extend the economic benefits of cruise tourism more widely. The majority of benefits for businesses are concentrated in Wick town centre, which is 30 minutes from Scrabster Harbour (and which received 5,500 passengers in 2019). There is a recognition that there is scope to spread these benefits more widely. The majority of passengers go on pre-booked cruise excursions, and there can be challenges and barriers to independent travelling. The availability and reliability of public transport is weak, for example, making independent travel more difficult.

Highland Council, Venture North (DMO equivalent), Caithness Chamber of Commerce and partners are trying to encourage more tours/passengers to go to Thurso, and not just Wick. They are also seeking to develop new tours, which can take two to three years to develop given the cruise operators' planning cycles; and it is the port or excursion companies, rather than the DMO and partners, which have the relationship with the cruise companies. The destination finds it difficult to link cruise tourism with local activities/events, such as food festivals, for example. It is doing what it can – there is a good volunteer welcome at Scrabster, and the private sector, Harbour Trust and public sector have come together successfully to fund a mini-bus at the harbour. However, some businesses can be slow to react to the potential presented by cruise passengers (e.g. retaining standard opening hours) and so collectively more can be done to capitalise on cruise related opportunities.

Social

6.44 In social terms, for communities, the challenges are also typically about distribution of benefits arising from cruise tourism, and, in some cases, mitigating against the negative impacts (e.g. local resident access to services when cruise ship visitors are in the area). In rural and more remote areas, the social concerns and challenges often mirror the economic ones, i.e. how to capture a greater share of the economic benefits in more rural areas (e.g. parts of Aberdeenshire).

6.45 At the same time, social disbenefits or negative impacts do arise from cruise tourism. These issues include pressure/congestion on the local transport network, demand for amenities such as public toilets and services and overcrowding, not just at visitor attractions but also in town centres. These effects can be considerable and are illustrated in the survey responses:

- Between 60% and 90% of those businesses and communities surveyed in Orkney and Shetland report that these negative impacts are significant; and
- Overcrowding and pressure on services and amenities also reported in the Western Isles and in Edinburgh.

6.46 In Orkney and Shetland in particular, but in other destinations too, this is a high proportion of survey respondents reporting pressure/congestion at certain times as a result of cruise tourism visitors.

6.47 The survey responses with respect to overcrowding and pressure on services and amenities, particularly at the times when the large and mega-cruise ships visit rural and island town ports, indicate

the challenge of balancing the economic benefits to these areas with negative social impacts. The management of large numbers of passengers at certain points in time and in specific locations is clearly important in addressing the issues of overcrowding and pressure on services. This can be achieved through the implementation of passenger limits by harbour authorities, particularly where overcrowding or pressure from volume tourism in smaller destinations or in more popular marquee destinations are challenges (such as is done in Orkney; see port profile and case study in Technical Annexes A and B for further details). Ensuring better dispersal and spread of visitors throughout the day, e.g. by making greater use of timeslots at attractions can also ease pressure from cruise visitors. Additionally, limits on the number of larger vessels in ports, such as those in place in Juneau, Alaska, can help to mitigate overcrowding and pressure from high volumes of visitors.

6.48 Overcrowding is not solely a challenge for smaller destinations, however. In Edinburgh, the seasonality of the cruise tourism season often means that cruise visits coincide with peak visitor months, putting additional pressure on the city and creating capacity issues at key tourism attractions. This negatively impacts on the visitor experience and has the potential to degrade the assets on which tourism in Edinburgh depends. Cruise tourism is therefore at odds with the new Tourism Strategy for Edinburgh⁶³, and in particular the priorities around *Place* and *Reputation*, and there is a perception that effective mechanisms to manage such challenges need to be found.

Environmental

6.49 In addition to the previously noted environmental impact from CO₂ and other exhaust emissions from cruise vessels, at a destination level the environmental challenges are typically site-specific, or occasionally destination specific. These are caused where there are large numbers of passengers converging on an area or site at the same time, and repeatedly. When not managed effectively, this causes erosion (of landscapes, built heritage) and other environmental damage.

6.50 Pressure points include Orkney, certain places in Shetland, places/attractions in Skye and the Western Isles. They are greatest where the infrastructure is modest or outdated (particularly roads for accommodating coach traffic) and where there are few route alternatives. The challenges are both site-specific constraints related to accommodating large numbers in one location at one time or repeated visits to a site over the whole of the tourist season, and transport/access related constraints, i.e. negative environmental impacts caused by excessive road use and congestion, including pollution.

6.51 Chapter 7 expands on these destination-related infrastructure constraints, however it is clear that at some locations, particularly at certain times, there are negative environmental impacts arising from over-crowding, congestion, and repeated use of natural and built heritage resources. Damage can be caused to paths, access routes, landscapes and, on occasions, to attractions themselves.

6.52 It can clearly be challenging to manage peaks and flows, both to historic (paid, built environment) sites and to natural attractions, beauty spots and landscapes. Historic Environment Scotland (HES) accept and acknowledge the challenge of managing demand at sites arising from cruise tourism. This requires timed ticketing (at paid attractions) and capacity management, the latter involving increased infrastructure (usually coach parking) and co-ordination of tour timings. The Rings of Brodgar, a free site in Orkney, has experienced negative environmental impacts, for example, and HES has needed to respond (e.g. by increasing coach parking capacity) although there remains much to do. For the National Trust for Scotland (NTS) it can be challenging managing demand to their islands portfolio in particular.

6.53 Some destinations are therefore working with HES and NTS, and other partners, on how best to manage cruise passengers. Urquhart Castle (managed by HES) has started opening in the evenings since cruise ship passenger coach parties were filling the available daytime capacity. Similar

⁶³ <https://www.etag.org.uk/wp-content/uploads/2014/01/Final-Draft-Edinburghs-Tourism-Strategy-2030.pdf>

approaches, e.g. staggering or arranging visits from cruise passengers into 'blocks', are being taken on Orkney, e.g. at council-owned attractions.

6.54 Overall, there are opportunities to tie the management of cruise tourism visitors to the environmental components of area tourism strategies. This would help ensure that cruise tourism growth is accommodated in a sustainable way, as part of balanced approaches to area tourism development and management.

Future development – opportunities and challenges

6.55 For many destinations, there are opportunities to develop and scale-up the benefits of cruise tourism in a sustainable way. However, maximising the opportunities arising from cruise tourism is not always easily achieved.

- **Developing the offering/tour packages** – for many destinations seeking to capture more of the cruise tourism market, there is a need to marshal the offering and to package experiences and attractions better. Examples include Inverclyde (and the neighbouring local authority areas), and Aberdeenshire (see below). This will involve more proactive engagement with excursion planners and tour operators in the first instance who deal directly with the cruise companies in developing new products and offerings. As mentioned in earlier chapters, some cruise operators' shore excursion planners are also now dealing directly with destination providers as they seek to develop specialist and bespoke experiences for their passengers.
- **Capturing the independent traveller** – more cruise passengers want to travel independently, and technology (notably online booking and itinerary research) increasingly makes this easier. Not all cruise passengers want to travel independently (those with limited experience or language to enable independent travel) yet for others booking activities, experiences and trips for when they land at port is all part and parcel of the holiday. Destinations need to be better at getting their offer right, and at getting their offer, digitally, in front of cruise passengers who are seeking to travel independently. This is both at the pre-cruise journey planning stage and during trip online research and booking.
- **Accessing cruise companies** – even where an offering has been developed by a destination, this is not easy to put in front of the cruise companies. Many destinations report this as a challenge. Tours and excursions can have a relatively long lead time before they are adopted by cruise companies, who are often regarded as risk averse. Promote Shetland, for example, has faced challenges getting cruise companies to update on-board literature, which can be so dated that some attractions have either since closed or are not available to visit.
- **Infrastructure (see next chapter)** – having the right infrastructure in place to manage cruise passenger demand is necessary for maximising economic and social benefits, and for mitigating against environmental impacts. This can be a considerable challenge, particularly for popular remote rural locations.
- **Considering communities and destinations** – the perspectives of communities, and the nature of the tourism destinations that they live and work in, are an important consideration. There is both an opportunity and a challenge here. Factoring in community opinions and considerations in destination development can result in a more 'authentic' experience; however, not doing so can create friction between cruise tourism and communities, and thus reduce public support for cruise tourism, and drive negative perceptions of it.

Aberdeen City and Shire

Aberdeen City and Aberdeenshire currently have a limited cruise tourism market, however this is set to change with the development of the south harbour which will allow large cruise ships to dock. This has the potential to massively increase visitor numbers above the current levels of c.3,300. VisitAberdeenshire, with partners, as part of the Cruise Tourism Project, is working with the harbour to plan for the increase in cruise passenger numbers and to plan the best ways of maximising the economic and wider benefits arising.

In terms of outward marketing, VisitAberdeenshire is an associate member who, as part of Cruise Scotland, attends international cruise trade conferences. Cruise companies typically work with the harbour agent, and so a better route to the market for VisitAberdeenshire is building relationships with the excursion companies – who work with DMOs and destinations to develop itineraries – thus gaining a better understanding of what cruise companies desire.

VisitAberdeenshire is working with the four main excursion companies in Scotland (Excursions Ltd, InterCruises Ltd, Communications and Destinations). They have developed a menu of trips to take to the cruise lines, reporting that excursion companies are constantly impressed with what North East Scotland has to offer. The top offers include: Royal Deeside as the main attraction (Balmoral etc.); the Castle trail; and specialist offers such as BrewDog in Ellon, and the Glen Garioch distillery. This mix of attractions means that Aberdeenshire is viewed as a unique concept and offering.

For Aberdeenshire there are a host of challenges, from assembling new packages, to ‘selling’ these to the excursion companies and cruise ships, to practically planning the logistics of handling larger numbers of passengers (coach parking, infrastructure). Businesses need to be geared up and ready to take advantage of the opportunities, including those arising from independent travellers. Much can be learned from the experiences of other destinations and organisations, notably Cruise Forth.

There has already been considerable development work undertaken. The dedicated part-Scottish Enterprise funded Cruise Project Manager employed by VisitAberdeenshire has to date focused on ensuring that tourism businesses are aware of the opportunities presented, developing products relevant for the cruise market and understanding how to take these products to market. The range of activity to date to achieve this includes:

- Delivery of several cruise ready workshops;
- Engagement with businesses on a 1 to1 basis;
- Engagement with business and community groups;
- “Cruise Ready” Business Opportunities Guide – to help local businesses understand the dynamics of the cruise sector and how they can develop their product offering to benefit from this new business area;
- Development of a cruise map for visitors; and
- “Welcome to Aberdeenshire” Cruise ambassador training.

The cruise ready work has resulted in a considerable amount of new product development offering authentic visitor experiences that makes the region an attractive proposition for cruise companies and shore excursion firms. The Cruise Aberdeenshire initiative is aiming to optimise the cruise tourism potential for the region from the £350m investment in the new South Harbour as well as the existing facilities in the North Harbour and at Peterhead Harbour. The North Harbour will continue to welcome the smaller expedition type cruise ships after the new harbour opens.

Summary

6.56 The experiences of destinations indicate a wide range of economic, social and environmental impacts, both positive and negative.

6.57 Overall, there are a number of economic and social benefits, with cruise tourism bringing visitor expenditure to a wide range of Scottish destinations, which in turn supports jobs and communities. The

economic benefits are not universal across Scotland, with mature destinations (e.g. Orkney, parts of Highland, Edinburgh) deriving the greatest economic impacts.

6.58 Many destinations are seeing growing markets, with increasing economic impacts. There are also parts of Scotland where there is the potential for a much greater economic impact, and where sustainable cruise tourism could bring positive economic and social impacts. For example, the smaller cruise ships of expedition and boutique cruises can offer wider economic benefits (with longer stays and often higher spending per head) than the large vessels. Areas with growing markets, and destinations with under-developed markets with the potential to grow cruise tourism, would benefit from sustainable cruise tourism growth strategies as part of wider area tourism strategies.

6.59 It is clear there are also negative social effects arising from overcrowding and competition for amenities, issues which are further discussed next in Chapter 7 under challenges and inhibitors to growth. In some parts of Orkney, Shetland and the Western Isles in particular, but also in large urban areas such as Edinburgh, the pressure on local services at certain times can be considerable. Destination management plans (like the one in place in Orkney) and site-specific management (e.g. Urquhart Castle on Loch Ness) can help with visitor management as part of the sustainable development of cruise tourism.

6.60 In some mature and growing market locations there is evidence of negative environmental impacts. These are at certain sites and in some locations, where the cruise passenger numbers need to be actively managed and these will continue to need to be managed as cruise passenger numbers increase. Sustainable cruise tourism development should form part of the environmental components of area-based tourism strategies alongside specific destination visitor management plans.

6.61 Finally, in some growing markets in rural locations (e.g. the Western Isles), there will need to be significant onshore infrastructure and supporting ecosystem investment alongside any port/harbour investments (e.g. road upgrade, amenity provision), to further ensure negative environmental impacts do not materialise, and to ensure the realisation of economic and social impacts and benefits.

7 Key challenges and inhibitors to sustainable development of cruise tourism in Scotland

Introduction

7.1 This chapter presents an in-depth analysis of the growth constraints and challenges facing the sustainable development of the cruise tourism sector in Scotland. It gives consideration to issues that are evident at the local level, destination/regional level, and national strategic level. It draws on findings from the stakeholder consultations, as well as from consideration of issues raised in the survey of businesses and community groups.

Port-specific constraints

7.2 As discussed in Chapter 4, the key port-specific constraints relate to existing port infrastructure and the land infrastructure immediately surrounding ports, and the cost of upgrading or developing new port infrastructure to accommodate additional or increased port activity. Evidence indicates that port infrastructure weaknesses are impacting on the number of cruise calls in Scotland, either through limiting the capacity or capability of ports to accommodate cruise vessels, or by reducing the attractiveness of ports. This also serves to concentrate cruise activity in a smaller number of ports.

7.3 Land infrastructure constraints will also impact on the attractiveness of ports, and attractiveness of Scotland as a cruise market. They will also serve to limit the range of attractions and destinations that cruise passengers can visit, e.g. by restricting travel from port distances as a result of congestion on road networks and public transport links. These are discussed in more detail below, regarding destination infrastructure constraints.

7.4 There is widespread recognition that Scotland's port infrastructure, specifically in smaller ports, is in need of modernisation and refurbishment. This is a market failure in terms of ensuring adequate port infrastructure to support the sustainable development of sectors reliant on port facilities in Scotland. In some cases this is a result of access to finance, whereas in others it is co-ordination failure between different interest or user groups – no single user group is able to make a financially viable port without the contribution of other users.

7.5 It is a particular issue for smaller harbours: investment activity has appeared to have consolidated around strategically important ports. UK cruise tourism hubs such as Southampton⁶⁴ and Portsmouth⁶⁵ have seen significant sums invested in recent years. However, investment has been more limited outside of these – except where port investment plans explicitly aim to attract a larger market share of cruise tourism, e.g. at Invergordon, where significant investment has been made^{66,67}. Therefore, without suitable port infrastructure, the cruise market in Scotland will not realise its full potential, where there is capacity and appetite to do so. In current and future investments that target cruise, the cost and availability of significant public sector funding will be an issue, e.g. Stornoway. However, many pier/berth developments that can accommodate larger cruise vessels can also be used by other port users, e.g. for oil and gas, renewables, etc. or can ease pressure on existing piers freeing up space for other users. Likewise, investment to upgrade or refurbish port infrastructure may meet a wider public good or public safety need, benefitting the wider community and not just economic activity.

⁶⁴ <https://worldmaritimeneews.com/archives/192487/royal-caribbean-chooses-southampton-as-its-uk-home/>

⁶⁵ <https://www.cruiseandferry.net/articles/brittany-ferries-extends-partnership-with-portsmouth>

⁶⁶ <https://www.ross-shirejournal.co.uk/news/invergordon-25m-investment-plan-amidst-cruise-business-shake-up-147845/>

⁶⁷ Cruise-related investment at Scrabster was also supported by HIE

Destination, social and environmental constraints

7.6 For some destinations, there are constraints associated with attracting and managing cruise tourists. These issues relate to:

- Destination infrastructure (and the supporting ecosystem) constraints – these can limit the ability of a destination to capitalise on the potential benefits of cruise tourism, and which can cause negative impacts where there is a lack of or inadequate infrastructure;
- A weak cruise tourism offering – this often relates to an ineffective packaging or marshalling of the offering, rather than a weak tourism offering per se, although some destinations naturally have a stronger offering for cruise tourists than others; and
- Weak or low levels of destination group, business or community capacity – this can be a reason for a poor packaging of the offering, with stronger destination or tourism groups, businesses and communities better able to capitalise on the cruise tourism opportunities. Those destinations where the DMO or local tourism strategy does not explicitly address cruise tourism are not as strong in harnessing and managing cruise tourism as those where this is the case.

Destination infrastructure constraints

7.7 Infrastructure constraints exist in several destinations, which limit the sustainable development of cruise tourism. This can be close-to-port infrastructure (e.g. handling large numbers of passengers once they have left the port); infrastructure constraints associated with travelling around a destination and/or accessing attractions (e.g. road infrastructure); or site/attraction specific infrastructure. Many of these can generate negative social and environmental impacts, and thus present a barrier to sustainable tourism development.

7.8 There are a number of examples of each of these forms of infrastructure constraint.

Close-to-port infrastructure challenges

7.9 The infrastructure close to the Port is important, however constraints are evident in several locations:

- **Greenock, Inverclyde:** the infrastructure close to the port, including the connection between the terminal area and the town centre, is an example of under-developed provision. The majority of cruise ship passengers will take cruise packaged tours directly from the ship to their destination, but those wishing to undertake more independent travel (and the significant numbers of crew), will find the route to the town complex and low quality. There are however, measures in hand to address this constraint.
- **South Aberdeen Harbour:** when the new harbour opens for large cruise ships there will be significant volumes of passengers in an area close to residential areas and in a location with weak pre-existing infrastructure. Work is currently underway to plan for the large increases in passenger numbers once they leave the Port, including bus shuttle connections.

7.10 Each destination must have good infrastructure provision connecting the port area to the local towns and attractions, in order to maximise the benefits of cruise passenger visits. This varies in quality across destinations. Some locations (e.g. Dundee, Scrabster, Rosyth) have a good supporting ecosystem, for example in relation to good volunteer welcome arrangements and shuttle bus connections. In Dundee, good use is made of the link to Dundee and Angus College, with students providing a welcome as part of their hospitality course, providing useful work experience.

Transport/access infrastructure

7.11 A number of destinations struggle to accommodate large volumes of cruise passengers as they travel along similar routes to key attractions, using the roads available. This negatively impacts on remote rural areas in particular, where the pre-existing road infrastructure may be weak in terms of congestion, bottlenecks and pinch-points. This can add to local resident travel to work and travel to learn times and local business costs (e.g. longer journey times), and can inhibit local resident access to services. Many rural roads on Scottish islands are single track with passing places, which can make coach tour travel journeys problematic. Coaches understandably tend to favour the better roads, which can produce bottlenecks and high coach volumes on those roads.

7.12 The greatest challenges are faced in island areas:

- **Skye:** The number of coaches has become an issue (though it should be acknowledged that this is not just from cruise passenger tours). Coaches can only travel on the major roads, which typically means the north end of Skye loop, and some key destinations (incorporating the A87, A850 and A855 to visit Old Man of Storr, Dunvegan Castle, some of Eileen Doran Castle). This creates bottlenecks, and although Skye is getting better at managing flows (Castles can be pre-booked etc., improved parking), dispersal remains a challenge.
- **Orkney and Shetland:** The pressures in Shetland are not as great as those in Orkney; however, even in Shetland the available tours tend to visit the same attractions, so even with good management of coach flows (x minutes each in y museum), the logistics of managing within the existing infrastructure are challenging. The issue is highlighted in the business and community survey data:
 - 75% of those surveyed in Orkney say there is a significant impact (5 or more out of 7) at certain times of the year in terms of pressure/congestion on the local transportation network.
 - In Shetland, 60% say there is a significant impact.
- **Western Isles:** Again, the road infrastructure is typically weak. The destination is just able to manage coach flows based on the current number of cruise passengers, however with the planned investment in Stornoway harbour and an increase in passenger numbers this will no longer be the case without infrastructure investment. As it is, unplanned (non-cruise) coach visits can cause havoc on Lewis when these coincide with cruise passenger visits. Half of those surveyed in the Western Isles think road infrastructure will constrain cruise tourism in the future, and 54% say that currently there is a significant pressure/congestion on the local transport network at certain times of the year.

7.13 It is important therefore that planned upgrades of port infrastructure goes hand in hand with onshore infrastructure investment. Planning in this regard is underway in Aberdeenshire, via the Cruise Tourism project, where VisitAberdeenshire is making provision (including through the planning system) for coach-friendly infrastructure in the region, particularly in more rural parts and close to important attractions. It is also important that destinations manage cruise tourism flows so that the impact on local residents and businesses is minimised.

Site-specific infrastructure constraints

7.14 There are also constraints at specific sites and destinations, whether this be toilets, coach parking or food and drink provision. This affects both paid-for and free attractions. A range of management approaches are being adopted, from timed ticketing to extended opening hours, yet managing cruise volumes sustainably can remain a challenge. Urquhart Castle, for example, has extended opening hours into the evening so that non-cruise visitors can access the attraction more easily, given that cruise visitors arriving on coaches often fill most of the available capacity (see also end of Chapter 6).

7.15 Findings from the business and community survey indicate that capacity at local visitor attractions will constrain future cruise tourism growth. More than 6 in 10 (61%) surveyed in Orkney think this is the case for example, as do 45% in the Western Isles, compared to the Scotland-wide average of 27%.

Amenity constraints and overcrowding

7.16 In some locations, findings from the business and community survey indicate that the high levels of existing cruise passengers may be a constraint on further growth, indicating that these respondents think cruise tourism growth in their location is not sustainable, i.e. that the high growth in numbers will itself be a barrier to further growth. This is highest in Orkney, where 43% across businesses and community groups think this. There are also concerns about the ability of local services and amenities to support further cruise tourism growth, highest in the Western Isles (45%) followed by Orkney (38%).

7.17 There are different views between business respondents and community respondents in destinations on the perceived ability of their location to accommodate further cruise tourism:

- 38% of those in Orkney and 31% in the Western Isles believe there is no capacity at all to accommodate further cruise tourism;
- Across all respondents 20% believe there is no additional capacity and 19% no appetite, at all to increase cruise tourism); whereas
- In contrast, business and community respondents in Highland, Argyll and Bute and Shetland are more likely to believe there is considerable capacity to accommodate additional cruise visits, with 54%, 40% and 33% respectively reporting that this was the case (v.17% overall).

Effective packaging of the offering

7.18 The effectiveness of the local destination group/destination management organisation and/or local authorities and/or Development/Community Trusts to marshal the cruise tourism offering (packages) is variable, and in some places weak. In the majority of cases this is not a reflection on the quality of the tourism offering per se, but rather the ability of the destination to package the offering to make it attractive (and readily available) to cruise companies and independent travellers.

7.19 Several DMOs and local groups/partnerships are seeking to address this issue. Examples include Caithness (see Chapter 6) where partners are seeking to spread the visitor numbers beyond Wick Town Centre and Inverclyde (see box below). The Cruise Forth project (also see Chapter 6) is a good example of partners/businesses coming together to make the destination offerings as accessible to cruise passengers as possible.

Destination Inverclyde

Inverclyde is home to the deep-water Port of Greenock, which is also close to Central Belt road and rail connections. Cruise ship passengers travel from Greenock on tours through to Glasgow and Edinburgh and to Loch Lomond. There have been an estimated 1 million passengers arriving at Greenock over the last 10 years, although arguably the economic and social benefits to Inverclyde – which has some of the poorest areas in Scotland – have been limited.

Destination Inverclyde is the DMO, which relies on a volunteer board. Although more recently supported by the local authority its capacity remains modest, and there is little packaging of a local Inverclyde offering for cruise passengers. Current economic benefits from cruise ships are principally via the crew, many of whom visit the new out-of-town retail development at Port Glasgow.

Although the majority of cruise passengers will continue to visit Edinburgh, Glasgow and Loch Lomond, the pontoon improvements at Greenock (which will see ships able to stay for up to 36 hours rather than 12) provide an opportunity for Inverclyde to capture more passenger spend locally. In turn, this requires better packaging alongside infrastructure improvements (terminal improvements including a restaurant and upgraded walk route to Greenock Town Centre are planned).

There is much to the Inverclyde offering that could appeal to cruise passengers – from genealogy links to the US (3 million migrated from the area to the US in the late 19th Century/early 20th Century) to heritage walks, to Food and Drink experiences (cheese and chocolate factories), to local coasts. These 'packages' could attract passengers who are repeat visitors (and who have done the other major tours); independent travellers increasingly looking for experiences; and those with more time than was previously the case given the longer ship dock time.

Destination group capacity and influence

7.20 Some of the inability to package or marshal the offering effectively relates to the lack of destination group⁶⁸ capacity and/or staff resource. For Moray, a small local authority area, resources are a challenge. Moray Speyside Tourism is a two-person resource with a modest budget with which to promote all forms of tourism. Its approach therefore has been to actively target specific travel operators, and to work collaboratively with other DMOs. The smaller tours market is important for Moray, and in terms of cruise ships, it seeks to work as closely as possible with other ports.

7.21 Despite its modest budget resource, Moray has ambitions to double the overall value of tourism by 2025 (and they are ahead of schedule). They consider that they have a good tourism offering – distilleries, castles, dolphins (Moray Firth), scenery, dark-sky zone – all linked to the wild, natural outdoors, heritage and experiences. In time, they hope to develop some of their nine coastal ports, all the time seeking to extend their reach through targeted travel operator engagement and packaging of the offering. However, the challenge here is to be able to package this offering in a way that is easily presented to both tour operators and the increasing number of (higher-spending) independent travellers. This may actually require the packaging of tours and attractions to other markets first (e.g. coach tour operators) before factoring in the cruise market and engaging the ports themselves.

7.22 Destination groups often find it a challenge to engage with tour operators and to get in front of cruise ship shore excursion planners. Some, such as Promote Shetland, are more successful in this regard, including promoting alternatives to cruise tours, such as experiences (e.g. local crafts, making traditional foods, outdoor trails). Other destinations, however, find making inroads into the cruise ship market very challenging, even where they are close to Ports and cruise ship traffic (e.g. large parts of Argyll and Bute, Ayrshire). In some instances, this may be due to relative proximity to existing ports and

⁶⁸ This includes Destination Management Organisations (DMOs) and other organisations, bodies, groups, etc. responsible for the management of tourism within destinations

destinations, but often the degree to which the destination's offering is developed is a factor. As noted in the preceding chapter, Ayrshire has a wealth of visitor attractions, yet these are relatively undeveloped from the point of view of cruise tourism.

Promote Shetland

Shetland has benefited from a steep rise in cruise ship and passenger numbers. However, visitors typically do very similar tours to the same places and attractions. Promote Shetland, the DMO, has therefore sought to bring benefits to more Shetland businesses and to make it easier for businesses to attract independent cruise ship travellers.

As a result, Promote Shetland has launched a microsite www.shetland.org which enables businesses to promote what they do directly to passengers. The site includes events listings, promotion of exhibitions, activities etc. and is directly aimed at cruise ship passengers who do not want to go on the available excursions. The site allows local events/businesses to advertise available spaces for activities and events, allowing cruise passengers to then pre-book a space. For example, an individual business is able to specify their available activities, the time(s) these are scheduled for and provide directions on how to access these. It has been designed to create a better experience for cruise passengers, especially those who wish to travel independently.

In Shetland, there are cruise visitors who do not want to take bus tours organised by the cruise operators, and Promote Shetland are recognising that they need to be able to respond to this market (e.g. those that want/need a taxi). The microsite developed forms part of this response.

7.23 Whilst almost half of respondents overall think that their local visitor management strategy is at least moderately effective in managing cruise visitors, in some locations, businesses and communities think that the lack of an effective visitor management strategy will constrain future cruise tourism growth (the findings imply a variable understanding amongst businesses and communities of whether a visitor management strategy is in place – and indeed, the extent to which one exists is also extremely variable). This is highest in the Western Isles (57% say the lack of an effective visitor management strategy has a significant negative effect), the City of Edinburgh (50%) and in Orkney (44%). Across all respondents Scotland-wide, the proportion that think this will have at least a moderate negative impact on future cruise tourism growth is 65% (43% think a lack of an effective strategy will have a significant negative impact). Whilst some of these views will represent a lack of knowledge of the visitor management strategy, the data nonetheless suggests stronger and more effective visitor management strategies would be beneficial to supporting sustainable cruise tourism growth and securing the co-operation and support of local businesses and communities.

Regional constraints

7.24 There are some regional constraints that inhibit the sustainable growth of the cruise tourism market. These typically relate to the extent to which different destinations work effectively together. There can be a degree of competition between destinations with particular visitor attractions working in isolation to capture a greater share of the cruise tourism market, rather than a more planned and joined up regional approach.

7.25 Part of this diminished regional co-ordination is a result of a lack of communication (and sometimes information) between destinations. This is related to the challenge faced by destination groups and other partners of engaging with cruise companies, so that it is not easy to make packages available that can promote alternative destinations. Cruise companies do not always wish to promote independent travel or tours they are not providing, which can make it difficult for destinations to promote their offering in advance. However, a lack of direct engagement between destinations and cruise operators means that new products, destinations etc. cannot easily be promoted either.

7.26 One example of how regional co-ordination is being achieved is via the app being developed by Cruise Forth. It allows cruise passengers to forward book, once they know they may not be taking the cruise company organised tour (the idea of the 'next port' box). As a passenger returns to the ship after their day at port, information is provided on the next destination (especially useful since cruise excursions are booked at least 24 hours in advance). This information could be a map of tomorrow's destination. For example, two or three ships regularly travel from the Forth/Forth Ports to Ullapool, so Cruise Forth can then help promote things to do for passengers in advance of their arrival at Ullapool.

7.27 There are some good examples of destinations working together across regions and destinations. These include the work of Cruise Forth as a coordinated response across Fife, Falkirk and Edinburgh local authority areas. This is partly helped by the fact that Forth Ports owns all the ports in this locality. However, even across the Cruise Forth partnership there are challenges in promoting alternative destinations/attractions (giving passengers the information on these alternatives) and encouraging businesses to think in ways that best promote their offering to cruise visitors.

7.28 Some regions (e.g. Ayrshire) are generally less developed in relation to their ability – or readiness in terms of promotion and destination management – to take advantage of the cruise ship offering, or may indeed be prioritising other sectors in pursuing a more sustainable form of economic development. Sometimes this relates to the positioning/emphasis given to cruise tourism in strategic planning. Argyll and Bute, for example, now explicitly make reference to the potential of marine tourism and are seeking (through the Rural Growth Deal and other mechanisms) to put in place the infrastructure (and to package the offering) to exploit this potential.

National-level strategic constraints

7.29 There is some evidence in the research to suggest that there is limited co-ordination to planning for cruise tourism. Feedback from consultations indicated a lack of clarity on which organisation had the strategic lead for developing cruise tourism at the national level. A similar picture exists at the local level, with no clear agreement on whether a strategic approach to cruise within destination management exists, or on who has responsibility for the industry's development.

7.30 Whilst some examples of local strategic co-ordination exist (e.g. in Orkney), there appears to be little co-ordination at the national level. For example, destination groups in Wick and elsewhere in Caithness think that they are well-placed to take any 'overflow' from Orkney, but in order to fully achieve this, co-ordination as part of a nation-wide strategy is required.

7.31 Changing consumer habits may represent a future constraint on cruise tourism growth, most notably in relation to the **environment and the reported contribution of cruise tourism to climate change**. These changing attitudes also provide an opportunity for environmental considerations to help shape more sustainable growth in cruise tourism in the future, including changes to greener vessels and improvement of visitor management at destinations. Across all business and community survey respondents, 24% think changing consumer responses to climate change will have a significant impact on the future growth of cruise tourism, reinforcing the opportunity to use consumer perceptions as a driver for more sustainable cruise tourism growth. This is an important consideration, and one to which the response should be formulated at the national level, to ensure coherence across Scottish destinations.

Summary

7.32 Port infrastructure constraints, including related support ecosystems, are a considerable challenge for the development of the cruise industry in Scotland, although considerable growth opportunities exist within the existing port infrastructure particularly for smaller, boutique vessels (e.g. on the west coast). Port infrastructure constraints impact on the ability of ports and destinations, where there is capacity and appetite, to develop their cruise offering and activity. Targeted investment at some ports is seeking to attract a larger market share, but the cost of such investment means that in many

cases, public sector intervention is required to support development – but this can then be used to serve other sectors and activity.

7.33 At the destination level, infrastructure challenges can also limit the extent to which large volumes of cruise passengers can be accommodated, or impact the visitor experience, for example in relation to post-disembarkation transition to local transport services, and in towns and at attractions where overcrowding can occur. This in turn can impact negatively on communities and affect how communities perceive the industry, while causing concern about the viability of local services and amenities.

7.34 A number of destinations in Scotland are also unable to – or do not – present a coherent and attractive offering or package for cruise operators. A key factor here is destination group capacity and resource to develop offerings, and to engage with industry actors. Some parts of Scotland, such as Ayrshire, are less developed, though others are now beginning to address shortcomings to develop their offering. Inter-regional competition between destinations as a result of a lack of co-ordination also limits opportunities for development, though there is evidence of some good collaboration to offer passengers alternative destinations and activities, thus helping to spread the impact and benefits of cruise visits.

7.35 At the national level, there appears to be a lack of co-ordination amongst strategic actors. This constrains Scotland's ability to tackle the opportunities and challenges presented by cruise tourism, including managing visitor numbers across destinations, or responding to changes in consumer preferences. There is a growing awareness amongst consumers of the environmental issues, including the potential for this to constrain future cruise tourism growth. This presents an opportunity for the cruise tourism sector – and for national, regional and local stakeholders – to take a more sustainable approach to cruise tourism development.

8 Key development opportunities for sustainable cruise tourism in Scotland

Introduction

8.1 This chapter gives consideration to opportunities for the **sustainable development** of cruise tourism in Scotland. It draws on the findings from consultations with strategic and industry stakeholders, as well as our survey research with businesses and community organisations in Scotland's cruise-focused destinations.

8.2 The chapter follows on from the discussion of constraints and challenges facing cruise tourism in Scotland and seeks to identify areas for activity that can help to develop cruise tourism in a way that optimises economic benefits while avoiding or mitigating any negative impacts on community and the environment.

Development opportunities

Strategic action

Place-making and integrated development

8.3 As an important part of ensuring the sustainable development of the cruise tourism industry in Scotland, there is an opportunity for partners to reframe how cruise tourism is viewed in terms of its development. Findings from the research indicate that incorporating cruise tourism development into wider economic development activity, and positioning it as an integral part of place-making activity – where desirable and relevant, and in the context of cruise as one of a number of tourism sectors that may operate within a destination – can help to mitigate and manage any negative impacts arising from cruise tourism, and to maximise benefits where they exist. The place, i.e. the destinations and communities that support cruise tourism, must be at the heart of this partnership approach. The approach taken in Orkney regarding cruise management is a very good example of this. There is proactive management by the Destination Orkney Strategic Partnership, coupled with limits on the number of passengers in any one day (capped at 4,500) and the development of a draft tourism strategy for Orkney. The aim is to ensure that economic prosperity is increased, and benefits are dispersed throughout the Orkney Islands, whilst managing numbers to protect the visitor experience, key sites, infrastructure and Orkney's natural and cultural heritage.

8.4 It was reported through the research that cruise can and does contribute to the vitality of high streets and town centres, particularly in smaller destinations, such as Tobermory or Lerwick, by bringing increased footfall. However, this needs to be managed carefully, and done so within the carrying capacity of places – hence the need for integrating cruise tourism with wider place-based development approaches. There is split opinion amongst businesses and community groups on whether they think that their local areas have any capacity for additional cruise tourism visitors. For example in Orkney, and to a lesser extent in the Western Isles, only a small proportion (32% and 31% respectively) feel that there is any substantial capacity to accommodate an increase in cruise tourism visitors. In contrast, almost two thirds (64%) of business and survey respondents in Highland, and around 60% in Argyll & Bute, feel that there is notable capacity to accommodate an increase in cruise tourism visitors.

8.5 This reinforces findings from research on wider tourism and destination development issues. A lack of joined-up discussion or consideration of a wide range of tourism and non-tourism issues (such as infrastructure and service provision) that serve to make tourism a success in many destinations and meet the needs of host communities, is a current challenge. Taking a coherent, integrated approach across all relevant stakeholders is essential for sustainable development: non-tourism matters need to be factored into decisions regarding the development of cruise tourism, and conversely cruise tourism

considerations must be part of planning and strategy for economic and community development. Taking a more holistic approach to cruise management, beyond the management of visitors, would be beneficial here.

8.6 This also aligns with the direction of travel in the new national tourism strategy, *Scotland Outlook 2030*. The strategy recognises that the role of tourism has changed substantially as a result of the climate crisis, technological developments, Brexit and changes in consumer behaviour reflected in the demands of visitors to Scotland. The vision for the strategy is that “*tourism can and will benefit every person who lives in Scotland, visits Scotland and works in Scotland*”, and an integrated approach to cruise tourism as part of a wider approach to economic and social development is essential to help realise this vision.⁶⁹

8.7 In light of the discussion above, it is therefore crucial for destinations to define what the offering in terms of cruise tourism is. The offering must be in keeping with the characteristics and needs of each place that supports cruise tourism, and in light of the relative importance and value of cruise compared to other sectors. It must also complement sustainable development ambitions at a local, community level as well as at regional and national levels. Taking this approach means that cruise tourism becomes more driven by what communities need and what Scotland as a cruise destination can offer rather than what cruise companies demand. It also helps to frame the approach to offer diversification (discussed below).

Increasing cruise industry engagement to diversify the offering

8.8 There is an opportunity to drive engagement with cruise industry operators at the national, strategic level to better influence what cruise companies do in Scotland, in terms of itinerary planning and product offering to passengers. In general, cruise operators respond to customer demand and this largely corresponds to existing marquee attractions or destinations. Those operators that actively seek out new destinations or experiences for passengers tend to be smaller expedition cruise companies, or those providing higher-end, boutique cruises. From a destination or product development point of view, cruise operators are sometimes not clear on who to engage with at the destination level; this can be a function of resource within companies, since they often visit hundreds of ports and destinations at a global level. Engagement with cruise operators is therefore sporadic, and not done in any consistent or systematic way.

8.9 By managing this engagement through a single point of contact, it will be easier to demonstrate what Scotland can offer, ensure coherent and consistent messaging, and reduce barriers for cruise operators and destinations to engage with each other. A national-level collaboration, working on behalf of the sector as a whole, can help to achieve this. A coherent offering for local destinations can then be communicated to cruise operators, consistent with branding and messaging for Scotland. This will help to raise awareness of alternative or niche options that can help to diversify products and itineraries made available to passengers. Ultimately this will support destinations to develop and diversify their cruise tourism offering, giving cruise operators more options, and assist the more equitable spread of impacts. This also affords local businesses within destinations a greater opportunity to engage with cruise operators (indirectly or directly), or to better understand the needs of cruise operators, and ultimately visitors. This will increase the opportunity to optimise economic benefit for businesses within the definition of the offering (as above).

8.10 There is an aligned opportunity here relating to destination development. By providing support to destinations and attractions, strategic partners (e.g. VisitScotland, STA, Cruise Scotland, SE, HIE, SoSE) can help to develop a variety of itinerary packages and alternative attractions, and can help to better spread the impact and benefits of cruise tourism, where desirable, relevant and sustainable. Consequently, this will enable partners at all levels to better articulate the offering to cruise operators, and thus more effectively influence them in terms of itinerary and product planning. In addition, taking

⁶⁹ Scottish Tourism Alliance, Scottish Government, VisitScotland, Highlands and Islands Enterprise, Skills Development Scotland, Scottish Enterprise (2020) *Scotland Outlook 2030: Responsible tourism for a sustainable future*

a partnership approach such as this will help to improve passenger experience, but can also serve to determine what works for destinations, attractions and their communities. This is something that Trust Ports such as Invergordon are obliged to do, through a stakeholder group. Formalising such an approach across all destinations can drive greater consistency of messaging and engagement with cruise operators, and give destinations a route to cruise operators, potentially through national strategic organisations, with common messaging that cruise operators can understand.

Data gathering

8.11 Better data gathering is an opportunity for all stakeholders to be better informed about the cruise tourism industry in Scotland. Fully understanding cruise tourism and its impacts on an ongoing basis is crucial for sustainable management and development of the sector. This requires robust, credible and up-to-date evidence but there is the view amongst stakeholders that data and data collection is currently patchy and not fit for purpose. Through the research process, it was clear that data availability was limited, and not sufficient to provide comprehensive, granular insight at the Scotland level.

8.12 This results in a lack of understanding and clarity about the sector. In turn, this can potentially result in tension between stakeholder groups, or in lobbying with limited or imperfect information. Ultimately, the lack of good data can result in policy or legislative decision-making targeted at cruise tourism that is only partly informed.

Sustainability considerations

A diverse offering to achieve a more sustainable pattern of development

8.13 As noted above, engaging cruise operators on product and destination development is a key strategic opportunity. However, addressing cruise line reluctance to develop new products, and encouraging operators away from marquee destinations – particularly those that may be under pressure from high volumes of visitors – can help to mitigate negative impacts of cruise tourism visits. Stakeholders consider that overcoming this barrier would make a significant contribution to a more sustainable mode of development for cruise tourism. However, this must be done and managed in a way that does not simply transfer the negative impact of cruise tourism. It must also recognise the demand for marquee destinations and attractions from cruise operators and visitors, and alternative attractions should be positioned such that they are seen as comparable in quality of experience as more established attractions.

8.14 Responding to the opportunity presented by the emerging market segment of expedition cruises, and smaller vessels offering bespoke or boutique experiences, will spread positive impacts. Smaller vessels can serve more destinations and areas where port facilities are otherwise constraining. This will also help to mitigate negative impacts realised in high-volume destinations. There is some evidence through the research of some smaller destinations and attractions increasing their appetite for accommodating cruise tourism. In the Highland Council area, and to a lesser extent in Argyll and Bute, the majority of respondents (c.82% and 50% respectively across both business and community respondents) feel that there is at least a reasonable degree of appetite to accommodate increased cruise visits.

8.15 Cruise passenger involvement in organised activities whilst on-board can also have other benefits. For example, participating in activities such as kayaking or nature watching whilst at sea can complement and benefit other marine tourism sectors where these activities are provided by local businesses.

Proactive approaches for conservation

8.16 There is an opportunity to take proactive steps to preserve attractions for the longer term, in conjunction with all partners – including cruise operators. Evidence from the research indicates that rather than serving to deter cruise operators, taking open and transparent decisions to put in

safeguarding measures, such as charging or limiting visitor numbers, can be achieved in conjunction with the operators.

8.17 A good example of this is the Italian Chapel in Orkney, which introduced charging and an upper limit on the number of visitors at any one time in an effort to preserve the Chapel's physical integrity. This was achieved with the buy-in of a cruise operator as a result of a proactive approach and clear communication. Likewise, engaging communities in decisions regarding cruise tourism management can result in greater support for conservation measures, where these may otherwise be seen as restrictive. For example with the Ring of Brodgar, also in Orkney, stakeholders are considering measures that may ultimately be restrictive in terms of access to the site, to counter the evident impact of both the high volume of visitors and also climate change. As the local community is heavily involved, there is buy-in to the process.

8.18 Such approaches could tap into the increasing popularity of green or eco-tourism, often considered a smaller-scale, higher value and lower impact alternative to standard volume tourism. This is popular amongst German tourists in particular. By taking into account environmental considerations, the needs of local residents and businesses, and the visitors themselves, there is potential for pressure on sites and destinations to be alleviated.

8.19 This trend towards better destination stewardship is not only being driven by destinations themselves. Industry evidence suggests that cruise operators are increasingly concerned with visitor management and responsible tourism.^{70,71}

Sustainable power as an opportunity

8.20 Through consultation with stakeholders and cruise operators, shore power and LNG as a fuel were identified as an opportunity for Scotland to reduce consumption of fuel, and also air and noise pollution whilst ships are in port, e.g. scrubbers. A number of cruise operators are moving towards increasing use of shore power, and others are considering LNG as a fuel in the longer term. However, it should be noted that the transition to these solutions are expected to occur over a considerable length of time, and so any positive environmental benefits expected to stem from these changes may take a number of years to realise. Further, there are concerns over the extent to which LNG may reduce GHG emissions, and a lack of requirement for closed-system scrubbers may result in increased marine environment pollution.

8.21 Shore power appears to be a real opportunity to increase the sustainability of cruise operations in Scotland. However, it is felt by stakeholders, and public sector consultees in particular, that the cost of providing the necessary infrastructure may be prohibitively high at present for a large scale roll-out. Despite this, shore power facilities exist elsewhere in Scotland for other vessel types, at Stromness for ferries, and at Macduff. Though shore power facilities for cruise are only available at a small number of ports in mainland Europe presently, Southampton aims to bring shore power online in 2020. This may impact on the economic viability of new shore power schemes in Scotland, at least in the short term.

8.22 Such developments could put Scotland at a competitive advantage, at a time when other cruise markets in Northern Europe, such as Norway, are beginning to take stronger stances on environmental issues. It would also align with trends amongst cruise operators. New cruise ships are increasingly equipped with the ability to turn off the engines and receive shore-side electricity while in a port where clean energy is available; the latest evidence from CLIA suggests that 88% of new build capacity will have or will be configured to add this ability, although as previously stated, this will take many years to achieve more widely.⁷²

⁷⁰ CLIA (2020) *State of the Cruise Industry Outlook*

⁷¹ <https://www.cruise1st.co.uk/blog/cruise-news/sustainable-cruising-how-cruise-lines-are-thinking-about-the-environment/>

⁷² Ibid.

8.23 As noted above in discussion of integrated development and place-making, this could be achieved to benefit a number of different sectors in addition to cruise, and may also be useful as a driver for wider infrastructure or service improvements in port towns and destinations. Greening port facilities, such as the provision of shore power, recycling or waste management facilities, may also help to offset any negative impacts arising from cruise tourism.

Complementarity with other marine uses

8.24 A further sustainable development opportunity is the consideration of cruise's complementarity with other marine uses. A balance is needed with other marine user groups, in the same way that aquaculture development may need to consider ways of sharing the same marine space with renewable energy generation or marine tourism. Scotland's National Marine Plan⁷³ and the marine planning process already have an established principle of multi-use within marine planning areas (MPAs) to promote compatible use across different sectors and user groups, and an aim to minimise conflicts. The opportunity here is in better integrated management of Scotland's marine resources to gain the optimum from them, rather than growing one resource at expense of another.

Port infrastructure improvement

8.25 As discussed in Chapter 7, Scotland's port infrastructure, and particularly on the West coast, is in need of upgrading in terms of quay length, water depth, ancillary infrastructure etc., but the nature of the market failure means that it requires co-ordination across multiple user groups and stakeholders to achieve. Additionally, infrastructure improvement is too costly to deliver everywhere in Scotland, particularly for local authority- and trust-owned ports. Whilst each port will decide what investment to make based on a business case that considers cruise and other port uses, any port infrastructure development funded through Scottish Government or other public sources should be linked to a specific identified market opportunity that can bring clear and identifiable economic, social and environmental benefits. Whether this is significant investment in a single port (e.g. a marquee port or port targeting larger cruise vessels), or a package of investment across a group/network of ports to attract or manage higher value smaller expedition or boutique cruise vessels, it should be informed by the scale and equitable distribution of these benefits.

8.26 The development plans for Stornoway port and the proposed deep water facilities are a good example of responding to opportunities across multiple sectors including cruise, and also where an identified co-ordination failure is being addressed to position the port to serve and target multiple sectors through its redevelopment.⁷⁴ This would meet an emerging market demand amongst cruise operators – a number expressed a desire for an alternative 'remote island' destination to Orkney or Shetland, identifying 'an option on the west coast of Scotland' as preferable. However, serving market demand and maximising cruise tourism opportunities would need to be balanced off against capacity and appetite. As discussed above, there appears to be at least some appetite and capacity amongst west coast destinations in Argyll & Bute and Highland, and to a lesser extent in the Western Isles.

8.27 Aberdeen's near-complete South Harbour development is another specific opportunity to develop cruise in a destination that appears to have both capacity and appetite to grow. The opportunity here is to develop a destination and attractions that are comparatively unknown to cruise tourism, and this has been recognised by partners within the destination. The work across Aberdeen City and Aberdeenshire Councils, VisitAberdeenshire, Aberdeen Inspired, Scottish Enterprise and others has positioned the region to respond to cruise tourism opportunities. Stakeholders in the region consider that this can open up Aberdeen City, Shire and the Eastern Cairngorms and offer a microcosm of Scotland within one destination.

8.28 The interconnectivity between ports and Scotland's land-based transport infrastructure and public transport interchanges is another opportunity. This can help to make cruise ports a more

⁷³ <https://www.gov.scot/publications/scotlands-national-marine-plan/>

⁷⁴ <https://www.hie.co.uk/latest-news/2019/february/14/funding-boost-for-stornoway-port-developments/>

integrated part of the transport system. Despite some wayfinding improvements in certain port towns, there is a disconnect at ports such as Greenock or South Queensferry, for example, between the terminal and rail station. This is in contrast to many ferry terminals in Scotland being co-located with rail stations, and a result of many cruise facilities developing at ports handling commercial (e.g. freight) activities. There is also an anticipated requirement for additional infrastructure immediately outside ports in future for smooth, rapid onward transit (e.g. Aberdeen).

Responding to market trends

8.29 A key market trend in recent years is the emergence of expedition and boutique cruises as distinct sub-sectors, alongside a trend towards larger vessels in the high-volume segment. Since expedition and boutique cruises operate smaller ships, these segments are arguably better suited to Scotland's offering in terms of existing port infrastructure. Whilst a small number of Scottish ports can handle larger cruise ships – the size of which is expected to increase – many of Scotland's ports are better suited to smaller cruise vessels. In addition, expedition and boutique cruises are generally accepted to attract higher spending passengers, and so this offers a greater potential for visitor spend impact. To achieve this will require greater engagement and influence with cruise operators to encourage new routes and ports of call

8.30 This is a particular opportunity for the ports on Scotland's west coast – often limited in terms of berthing capacity, draft etc. as well as hampered by their proximity to Greenock, and to a lesser extent Orkney: between these two ports, (larger) cruise vessels often do not want or need to call at other ports. The cost of infrastructure upgrade to accommodate large vessels is prohibitive, and thus would not generate sufficient return on investment. However, smaller vessels in the boutique or expedition cruise sub-sectors represent a more achievable – and sustainable – market opportunity.

8.31 Diversification in terms of passenger market segments is also a key opportunity, in terms of accessing additional markets, and in helping to realise more sustainable patterns of cruise tourism. There are three main elements to this:

- **Younger passengers:** It is accepted that younger passengers seek alternative attractions and destinations. Developing offerings that appeal to younger cruise tourists can help to attract visitors away from high-demand attractions, and towards less visited attractions and outdoor experiences and destinations that can accommodate an increase in visits.
- **Returns:** a number of consultees recognised the value of cruise, and particularly volume cruise, as an initial showcase of what Scotland has to offer. By exploiting this role as a 'gateway attractor', destinations and partners (industry and strategic) can develop follow-up itineraries and packages to encourage return visits by passengers. This can contribute towards managing visitor numbers at marquee destinations and attractions.
- **Independent travellers:** Evidence gleaned through the research suggests that the incidence of independent travellers is increasing, though that scale at which the proportion of independent travellers is growing is unclear. Package tour cruise passengers still represent a majority, but there is a necessity to meet needs of independent travellers. One way of enabling this is to ensure smooth access to Scotland's public transport system, or potentially alternative/independent tour operators.

8.32 A final opportunity relating to market trends is in capitalising on the strength of Scotland's brand, and its status as a secure destination. A number of Scottish-based and cruise operator consultees reflected on the value of the perception of Scotland as 'safe', in comparison to cruise markets elsewhere globally that are subject to political instability, conflict or civil unrest. It appears that this perception is not significantly affected by uncertainty caused by Brexit, or the current independence debate in Scotland. Building on this position can consolidate Scotland's position as a high-value cruise market, particularly for North American tourists.

Destination development

8.33 There are a number of opportunities relating to responsible cruise destination development. Arguably the most important of these is an opportunity to build more bespoke itineraries and packages to offer cruise operators. There is evidence that some ground handlers and tour companies are starting to look for more bespoke offerings, whilst some cruise operators either approach specific attractions (e.g. Disney directly approaching Corrigall Farm on Orkney), or liaise with specialist excursion or activity operators rather than just package tour companies. However, there is an onus on attractions and destinations to proactively develop new product and package offerings that can be promoted to cruise companies and tour operators. Evidence also suggests that there is a trend towards experiences over sightseeing.

8.34 Such development activity can help to broaden the offer and appeal of outlying areas, or attractions that may be considered 'off the beaten track'. For example, this may mean attractions on outlying areas and islands of Orkney and Shetland such as Fethaland, a historic *haaf* (deep sea fishing station) on the northern tip of Shetland mainland, or slight variation in existing mainland travel itineraries to accommodate new or alternative tourist sites. One such example of this is Kingsbarns Distillery, which lies adjacent to an existing itinerary route serving St. Andrews; the distillery is actively trying to engage both tour operators and cruise companies.

8.35 Cruise can also be used as a driver to extend the tourism season, at least where there is a significant number of cruise calls per year. On Orkney, it is recognised that being able to influence when cruise ships call has helped to extend the tourism season – providing much needed revenue to sustain businesses in Kirkwall and more widely across Orkney.

8.36 There is some scope to exploit opportunities for additional cruise-related growth in some port towns and cities. For example, consultees consider that Greenock, amongst other ports, is not fully benefitting from a growth in cruise tourism just yet. This is despite investment in wayfinding, signage, etc. through the town, to attract passengers who opt to walk through, usually en route to the train station. Ultimately, many visitors are bussed onwards to destinations immediately following disembarkation. Dundee is also considered to be in a similar position, and is seeking to grow its tourism industry on the back of the recent success of V&A Dundee. One way of achieving this is to consider the extent to which Scotland can encourage cruise visitors prior to embarkation or following disembarkation, at the start or end of their cruise. It is estimated that almost two-thirds of cruise passengers spend a few extra days at embarkation or disembarkation ports.⁷⁵

8.37 Some attractions see this as an ideal way of maximising the time (and thus spending potential) of visitors who would otherwise be relatively time-poor if on pre-booked excursions. Cruise passengers, particularly those on booked excursions, have a finite window for spending as part of sightseeing excursions.

8.38 An additional opportunity for cruise-related growth is to capitalise on crew leisure time and retail spend. Consultees report that levels of crew spend can be considerable, made on purchases for personal supplies or spent on recreation and leisure activities where the time is available. Maximising this spend with local, independent retailers can help to increase economic benefits to port towns.

Summary

8.39 It is important to view cruise tourism as part of wider economic development activity and position it as an integral part of place-making in cruise destinations. Cruise can and does contribute to the economic development and prosperity of places, but this needs to be managed responsibly. A joined-up, coherent approach involving all stakeholders is required to ensure that cruise develops in line with

⁷⁵ CLIA (2020) *State of the Cruise Industry Outlook*

capacity, appetite and, importantly, the sustainable development priorities of the cities, towns and communities that support the cruise tourism industry in Scotland.

8.40 To that end, better and co-ordinated engagement with cruise industry operators is needed, with management dealt with at the national level. This offers two key opportunities – the communication of a coherent offering from all destinations to the cruise operators; and support to destinations to be able to develop such an offering. A single conduit for this activity will be invaluable for destinations and attractions. In particular, new and bespoke itineraries can more readily be taken to cruise operators. Some ports or destinations may also be able to position themselves as ‘pre-embarkation’ or ‘post-disembarkation’ areas for cruise visitors, or to produce a specific offering for crew members.

8.41 Diversifying the offering in terms of product and destination development can help to spread tourism visits around Scotland and mitigate any negative impacts that may arise from the volume of cruise passengers at particular destinations. There is a specific opportunity in responding to a market opportunity in expedition and boutique cruises, since smaller vessels – which can have a smaller environmental impact – can serve more destinations and ports in Scotland. Further, Scotland’s existing port capability is suited to smaller vessels – particularly on the west coast. Diversification in passenger market segments can also help to move away from high-volume cruise tourism, and spread benefits to other, less-frequented parts of Scotland. Scotland’s strong brand can help to facilitate this diversification.

8.42 Port infrastructure development should be targeted at specific opportunities and where capacity exists. Aligning development to serve other sectors besides cruise can achieve economies of scale, but the associated transport infrastructure requirements should not be overlooked.

8.43 Implementation of sustainable power solutions at ports can help position Scotland at a competitive advantage. Whilst these may be relatively expensive, the industry direction of travel for vessels is towards more sustainable fuel and power sources. This is a clear opportunity that could help to offset negative impacts from cruise tourism activity.

8.44 There appear to be few barriers to implementing proactive measures for sustainability and conservation at specific tourism attractions. Taking these decisions in dialogue with cruise operators, and with full involvement of local stakeholders and communities, can result in much more positive management of attractions, and of visitors, and help to generate strong buy-in and positive perceptions of the sector.

8.45 Given the paucity of consistent and robust data, there is an opportunity for Scotland to provide a lead here. This is particularly the case with international stakeholders demonstrating an interest in the findings of this study, and more widely in how Scotland is approaching data gathering on cruise tourism. Improvements in data collection can help to inform better policy, legislative and operational decision-making for cruise tourism.

9 Conclusions and recommendations

Introduction

9.1 This chapter sets out conclusions from the research, framed around economic, social and environmental considerations. Based on these, a series of recommendations are made for the future sustainable development of the cruise tourism industry in Scotland.

Conclusions

9.2 In line with global growth in the cruise tourism industry, cruise in Scotland has developed into a significant tourism sector. Cruise accounted for 5% of all overnight tourist visits and 1% of all tourism volume, and less than 1% of spend for both overnight and all visitors in Scotland in 2019. However, there are considerable variations across the country – for example, cruise tourism in the Highlands region⁷⁶ accounts for 17% of tourism volume and 3% of expenditure. Calls and passenger numbers grew by around 90% between 2014 and 2019. The ecosystem in Scotland is complex, with multiple stakeholders and actors involved in its operation at the local, regional and national level. Whilst cruise industry undoubtedly brings economic value, the impacts felt in the communities and destinations do not always equate to positive benefits.

Economic considerations

9.3 It is estimated that £40.6 million was spent directly onshore by cruise passengers and crew in Scotland in 2019. However, since the industry is heavily geographically concentrated, the economic benefits are not evenly – or equitably – spread across Scotland. Much of the economic benefit from passenger and crew spend is concentrated in the Central Belt and in particular parts of the Highlands and Islands, with the five marquee ports (Forth Ports, Greenock, Orkney, Invergordon, Lerwick) accounting for 90% of the spend in Scotland.

9.4 Whilst ports in Scotland can be characterised by their current cruise activity, growth ambitions, investment plans, etc., cruise is frequently not a significant revenue stream amongst Scottish ports. Despite this, recent and planned investments demonstrate the ambition of some ports to increase their cruise activity and secure a larger market share.

9.5 Cruise sub-sectors with smaller vessels are an identified growth market, and – aside from those ports already serving the volume cruise tourism segment and larger cruise ships – the nature of ports in Scotland is well-suited to this emerging market segment. However, available port infrastructure, and the supporting infrastructure of the immediate hinterland infrastructure serves to constrain the further development of these specific cruise tourism sub-sectors in Scotland.

9.6 Scotland is an important market for cruise operators, within the wider Northern Europe market. Scotland has a strong brand, and the main attractors for cruise operators are history, culture and heritage, and nature.

9.7 Despite this, port infrastructure constraints are a considerable challenge for the development of the cruise industry in Scotland. This impacts on the ability of ports and destinations, where there is capacity and appetite, to develop their cruise offering and activity. Targeted investment at some ports is seeking to attract a larger market share, but the cost of such investment means that in many cases, public sector intervention is required to support development – but this can then be used to serve other sectors and activity.

⁷⁶ VisitScotland *Highlands* region. This includes the Highland, Moray, Orkney Islands, Shetland Islands and Eilean Siar local authorities.

Social and community/destination considerations

9.8 Cruise tourism can bring demonstrable social benefits, such as population retention and increased vitality in town centres. For more rural and isolated destinations in particular, economic and social benefits are interlinked. Income generated by tourism helps to support livelihoods, retain and attract people in/to an area and sustain services. Those destinations where businesses and communities report the greatest economic benefits are also those that report increased employment as a result of the cruise tourism. Whilst these impacts are primarily economic in nature, it is important to recognise that in more remote communities, they are invariably linked to social benefits – e.g. employment contributing to population retention and wealth generation in local communities, safeguarding service provision, increasing community vitality, etc.

9.9 However, there are undoubtedly some disbenefits. There have been a number of high-profile instances of the negative impacts of cruise tourism on communities and destinations in recent years. These can be significant particularly in island or remote destinations and attractions where there is limited capacity in transport infrastructure and amenities to cope with short-term and significant increases in demand. This can cause undue pressure on or even degrade important attractions, or negatively impact on the characteristics of communities that host cruise tourism. Whilst cruise operators recognise the need for visitor management approaches, these should be led by destinations and their strategic partners.

9.10 Destination infrastructure challenges limit the extent to which large volumes of cruise passengers can be accommodated, and can impact on the visitor experience. This in turn affects how the communities that support tourism perceive the cruise industry and causes concern about the viability of local services and amenities.

9.11 Consequently, cruise visits need to be managed carefully, and within the carrying capacity of cruise destinations and the communities that serve the industry. Whilst island destinations such as Orkney and the Western Isles appear to have limited capacity – and appetite – to accommodate increased cruise tourism, areas such as Highland and Argyll & Bute report that they have capacity to respond to a growing market. Orkney's approach to visitor management is well-regarded, and there are some important lessons to be learned from other destinations where this is done well (e.g. Juneau), and also less so (e.g. Barcelona), as identified in the case studies presented in Technical Annex B.

Environmental considerations

9.12 Cruise tourism has a range of negative environmental benefits, and the measures currently being implemented arguably do not go far enough to offset the negative environmental impacts of cruise operations. Cruise vessels are responsible for significant CO₂ and SO_x emissions, as well as marine pollutants from waste and bilge water. Crucially, there are some questions around the effectiveness of measures such as LNG and scrubbers, and whether they actually reduce the environmental impact of cruise operations. As well as implementing measures as described above, better environmental monitoring systems at ports could help to encourage more environmentally sustainable vessels.

9.13 The cruise industry is trending towards cleaner vessels. New developments such as LNG, shore-power and scrubbers are helping cruise lines limit their environmental footprint, though many of these new and retrofitted vessels are not anticipated to be in operation in the short-term future. Port-side developments such as shore power can also help to offset any negative impacts arising from cruise tourism, and put Scotland at a competitive advantage, though such developments are currently expensive, and are likely to be unachievable without public sector intervention, and collaboration with other port user groups.

9.14 There are also some specific examples of environmental challenges and negative impacts within destinations, and these typically relate to site-specific issues arising from large numbers of passengers converging on an area or site at the same time, and repeatedly. Examples include site degradation at

the Rings of Brodgar on Orkney, and also on Skye. This pressure is greatest where the infrastructure is modest and where there are few travel or visitor attraction alternatives.

9.15 Importantly, some businesses and communities that serve the cruise tourism industry feel that changing consumer responses to climate change will have a significant impact on the future growth of cruise tourism. Whilst this may be a *negative* impact on the pattern of cruise tourism evidenced to the end of 2019, there is also the prospect of positive opportunities through different modes of cruise tourism, particularly where the environmental impacts are lower, or more easily mitigated. This must be seen as a considerable opportunity for Scotland. Coupled with the opportunity to increase the provision of sustainable, low-carbon infrastructure on land at ports and within destinations, there is a chance to position Scotland at the vanguard of a more sustainable mode of cruise tourism. This may be through greater availability and use of shore power, or a focus on market segments such as boutique and expedition cruising, which use smaller, less polluting vessels and are also able to help spread visits to other attractions and destinations – reducing pressure on marquee destinations and flagship attractions.

Taking a more joined-up, place-based approach

9.16 Though at a national level cruise tourism comprises a relatively small part of tourism overall in terms of visitor numbers and visitor expenditure, it can play a more important role in some destinations – particularly those that are more remote and rural. Cruise tourism is able to contribute to the vitality and prosperity of places. However, because of the actual – and potential – negative social and environmental impacts, the role cruise tourism plays in the economies of destinations must be managed carefully. Its management must also be cognisant of the carrying capacity of places, and the ability to accommodate cruise tourism visitors, however short the visit. This will ensure a positive experience for visitors and help to maintain the integrity and character of the very places and communities that cruise tourism depends on.

9.17 There is frequently a lack of joined-up consideration of a wide range of tourism and non-tourism issues, such as infrastructure and service provision, that serve to make tourism a success in many destinations and meet the needs of host communities. This is a challenge that must be addressed through the management of cruise tourism, as well as in other forms of tourism. One component of this could be the development of wider strategies to manage cruise tourism, which go beyond simply focusing on visitor management to consider all aspects of cruise, as is done in Bergen (see Technical Annex B).

9.18 Implementing a coherent, integrated approach is essential for sustainable development; a ‘do nothing’ approach or maintaining the current management strategy and growth trajectory is not an option. Cruise tourism considerations must be part of planning and strategy for economic and community development and indeed environmental management, and vice versa, and this must be done at the local, regional and national levels.

9.19 Addressing these wide ranging issues, opportunities and challenges will need a co-ordinated approach at national level if the cruise sector is to continue to develop. This is discussed in more detail in the next section.

Recommendations

9.20 A much more strategic, co-ordinated approach is needed at each level of the cruise ecosystem to address the challenges and opportunities presented by the cruise tourism sector in Scotland and ensure that the sector follows a sustainable pattern of development that contributes to the realisation of benefits for communities, destinations and visitors. The following recommendations directly address this need for a strategic approach and the right levers to be in place and applied for sustainable development at the national, regional, destination and local/community levels.

National level

Recommendation 1: Pursuing sustainability as an opportunity. The evidence suggests that Scotland has a timeous opportunity to gain a competitive advantage versus a number of other cruise destinations in Europe. There is a growing awareness amongst consumers of environmental issues in general and those associated with cruising. Changing consumer responses to climate change may have a significant impact on the future perceptions and type of growth of cruise tourism, therefore there is an opportunity to use consumer perceptions as a driver for more sustainable cruise tourism development. Scotland should grasp the opportunity to develop as a world-leading, responsible cruise destination for the 21st Century.

Government and key partners must ensure that the sustainable tourism approach influences all planning and investment decisions by strategic stakeholders and partners and engage with the cruise industry on this issue. For example, considering investment in the provision of on-shore powering at key port locations, or in renewable energy and storage infrastructure at ports. This type of investment would also provide a number of social and environmental returns rather than economic returns alone for local communities and Scotland as whole, e.g. affordable heating in winter for local communities. Equally, targeting market segments that operate smaller and less polluting vessels, e.g. expedition or boutique, can help to drive a more sustainable pattern of development in cruise activity in Scotland.

Putting this approach at the heart of all decision-making represents an opportunity to promote cruise tourism in Scotland as more environmentally friendly and as adopting a more sustainable approach. This approach may consider some of the practices adopted in comparable cruise locations. In **Bergen, Norway** the city council's cruise tourism strategy includes limiting the number of passengers and ships docked in port in any one day as well as an ambition to become fossil-free by 2030. The latter involves plans to provide shore power to all vessels by 2020 and the development of a new system characterising each cruise ship's environmental footprint, an Environmental Port Index to be implemented in all of Norway's 11 ports. In **Juneau, Alaska** sustainable cruise tourism development is driven by their Tourism Best Management Practices programme that brings together stakeholders, including industry and community tour operators, cruise lines, transport providers and other businesses involved in the industry. Some 130 organisations have agreed to operate within programme parameters which include for example, following congestion-related guidelines and conducting training sessions with new employees hired mid-season; the TBMP group also runs a hotline for local residents to report any immediate concerns. (More details can be found at Technical Annex B: Case Studies).

Recommendation 2: Addressing the lack of clear Industry Leadership within the sector. This is a key priority for future planning and sustainable development. Government and public and private sector partners need to collectively recognise the benefits and impacts of the cruise market to the wider tourism sector and that it is an integral part of place-making in cruise destinations. A lack of co-ordination amongst key actors in the sector and confusion as to the roles and responsibilities of individual organisations and the cruise industry inhibits the responsible development of priorities for the cities, towns and communities that are part of the cruise tourism ecosystem. It also constrains the ability to sustainably manage visitor numbers across multiple destinations at a regional level, develop new or alternative offerings or more bespoke products, and respond to changes in cruise visitor preferences. Ports would also benefit from a clearer understanding of overall cruise industry plans to inform development and investment decisions.

The establishment of a leadership group or representative body for the cruise sector as a whole, is a key priority. Any such body or group must include public and private sector representation.

Recommendation 3: Adopting a co-ordinated approach to public sector planning and investment in cruise-related infrastructure. Currently there is a patchwork of development approaches across regions and local authority areas and this must be more joined up. Not all actors are involved; there is especially no direct dialogue with cruise lines. There is a requirement to bridge the gap between what ports require, what destinations and communities need, and what cruise lines and passengers demand. An overarching strategy should be developed and led by a central organisation or representative body

(refer to Recommendation 2). Flowing from this partners and stakeholders must develop an Action Plan, allocate roles and responsibilities and implement the strategy for sustainable cruise tourism development.

Recommendation 4: Engaging and including the supply side of the industry. Steps should be taken to establish a closer working relationship between strategic public sector bodies and port authorities, cruise operators and key intermediary organisations. This will help to set priorities and inform planning and investment decisions. A recognised lead body should facilitate regular communication and inclusion of supply side actors (see recommendation 1 above). Cruise operators in particular, are unfamiliar with the national and to a lesser extent the local landscape and would respond well to a single point of contact in the sector.

At a national level there is an opportunity to put in place the recommendations 2 and 3 as part of a process which will be required to reconsider the scale and scope of a sustainable cruise tourism opportunity for Scotland going forward as a result of the current COVID 19 pandemic.

Recommendation 5: Investment in port and destination infrastructure should be considered at a national level. Closely linked to Recommendation 1 above, adopt a more joined up and strategic approach nationally to investment decisions. This includes rationalising the number of individual business cases for project development and subsequent investment and giving greater consideration to where investment in ports (and their destinations) can achieve the most benefit and growth for the cruise tourism sector alongside the wider tourism sector and its supply chain. Doing so will also better ensure the provision of necessary public services and benefit the wellbeing of local communities in cruise destinations.

This approach will in turn **inform investment decisions at the regional and individual port level.** Specific port infrastructure improvement projects should be underpinned by a multi-party approach to investment including the private sector, with due consideration given to the national strategic position. Port investment must meet the needs of other port uses, and the public good where modernisation is addressing safety issues for example. The planned upgrade of port infrastructure must sit alongside/ go hand in hand with onshore infrastructure investment for cruise and other sectors. Whether this is significant investment in a single port (e.g. a marquee port or port targeting larger cruise vessels), or a package of investment across a group/network of ports this should be informed by the scale and equitable distribution of these benefits.

Regional level

Recommendation 6: Addressing inter-regional competition between ports and destinations. Collaboration across all Scottish cruise ports, Cruise Scotland and regular (and potential new) cruise operators is needed to better spread the economic benefits amongst destinations whilst minimising negative environmental and social impacts. A recognised industry sector lead (refer to Recommendation 2) must facilitate this type of planning and co-ordination activity.

Competition between destinations (and their ports) as a result of a lack of co-ordination limits the ability to respond to emerging market opportunities, for example, the expedition and boutique cruise market, more suited to the smaller ports in Scotland. Recognising the complementarity (as well as competition) between ports and destinations through more partnership working and itinerary planning for example, would allow the further development of the 'Next Port' planning approach as discussed earlier in this report, allowing visitors to enjoy a seamless journey around and through Scotland whilst maximising economic impacts and minimising negative impacts on communities and the environment.

Destination level

Recommendation 7: National lead(s) to promote co-ordination at destination level. Currently visitor management and wider cruise strategies are 'owned' by different groups across cruise destinations. This can range from the DMO, a local cruise tourism partnership, a BID group, the local

authority, an individual port, or individual visitor attractions (or their owner organisation, e.g. HES). Whilst some destinations have an area tourism strategy, the extent to which cruise tourism features is variable. Where there are groups proactively working to manage cruise tourism in a sustainable way, many are under pressure due to limited resources and working outside their remit in many instances.

Consequently, a mechanism (for example a programme or guidelines) to implement/ensure a joined-up, co-ordinated and effective approach that all actors at a destination can sign-up to should be established. Local guidelines or strategies for cruise tourism development, based on a sustainable model, must be considered as part of wider area-based tourism development. This may require the design and promotion of a new delivery model, or development of the reach and influence of existing models, i.e. destination groups like a DMO or BID group. It should be about the destination 'speaking with one voice' and building appropriate and desired capacity and the ability to access financial resource to overcome visitor management challenges and exploit market opportunities. Managing and addressing infrastructure and visitor management challenges alike is best done collectively and in partnership across the industry.

Recommendation 8: Working with onshore excursion operators: The approach to engaging cruise operators at a national level as at Recommendation 4 above can be replicated at a destination level. Excursion providers/companies and their local sub-contractors/agents are important influencers and conduits to cruise line companies directly. They understand both the commercial requirements of cruise operators and the trends in passenger demand for experiences. Establish and co-ordinate a number of regional fora where activity providers and attractions, who wish to target both large and smaller expedition/boutique cruise operators directly, can engage with operators. This activity can link to national efforts as excursion operators are more likely to 'come to the destination table' if cruise operators are also engaging and sharing plans and requirements.

Local/community level

Recommendation 9: Connect local communities with the cruise ecosystem. Evidence from this research shows that there are few barriers to implementing proactive measures for sustainability and conservation at specific tourism attractions and sites of interest. However, taking these decisions with the full involvement of local communities as valued stakeholders (alongside other stakeholders and tour operators) is likely to result in much more positive management of attractions, and of visitors. It will help to mitigate negative impacts on the community, generate stronger buy-in and positive perceptions of the cruise industry and increase understanding of the economic benefits that cruise tourism can bring. Widen community involvement in destination groups and provide a variety of channels which will allow individual members of a community to feedback and contribute to decision making. It can also help to identify opportunities to maximise positive social impact (e.g. population retention and create sustainable employment opportunities) and ensure that sector development reflects the appetite and capacity of local areas to accommodate cruise tourism.

Further research

Conducting this study has highlighted a number of areas which merit further research to provide a clearer picture of the cruise sector and its contribution to Scotland. This includes:

- It will be useful to compare the value of other significant tourism sectors in Scotland, to help guide investment decision-making – comparable research and analysis into other tourism sub-sectors should therefore be conducted;
- Designing and conducting bespoke local level economic impact assessments for certain destinations to guide planning and investment decisions;
- Carrying out research with cruise passengers and crew members to identify actual spend onshore and at destination towns and attractions. This could be done through regular surveys at major destinations, combined with online surveys targeted at cruise passengers with the engagement and co-operation of cruise line companies; and

- Research into the extent to which current and future planned environmental legislation can/will affect the cruise market and what the implications are for investment in port facilities.

Appendices

Appendix 1: Cruise operator profiles

Operator	Headquartered	Scottish calls (2020)	Vessels visiting Scotland	Vessel pax capacity	Target market	Notes
AIDA	Rostock, Germany	47	AIDAaura	1,300		
			AIDAbella	2,500		
			AIDAcara	1,186		
			AIDAdiva	2,050		
			AIDAluna	2,100		
			AIDAsol	2,174		
			AIDAvita	1,266		
Azamara (Royal Caribbean)	Miami, USA	13	Azamara Pursuit	777		
			Azamara Quest	686		
Celebrity X (Royal Caribbean)	Miami, USA	6	Celebrity Reflection	3,046		
Costa	Genoa, Italy	7	Costa Fortuna	3,470		
Cruise & Maritime Voyages	Essex, UK	71	Astoria	556		
			Columbus	1,856		
			Magellan	1,452		
			Marco Polo	820		
Crystal	Los Angeles, USA	5	Crystal Symphony	848	Ultra-luxury	
Cunard (Carnival UK)	Southampton, UK	8	Queen Mary 2	2,685		Capacity growth to 2022
			Queen Victoria	2,081		
Dave Koz & Friends at Sea		2	Brilliance of the Seas	2,501	Jazz cruise	
Disney	Celebration, USA	2	Disney Magic	2,700		Small operation in Europe
Fred Olsen	Ipswich, UK	32	Balmoral	1,325	UK-based. 98% British, average age 67	All cruises depart from the UK. Largely round-Britain cruises.
			Boudicca	881		
			Braemar	924		
			Black Watch	799		
Hapag-Lloyd Cruises	Hamburg, Germany	12	Ms Europa	408	5* + luxury. mS Europa German speaking only	Launching new expedition vessels
			Ms Europa 2	516		
Holland America Line	Seattle, USA	25	ms Nieuw Statendum	2,650		
			ms Rotterdam	1,404		
			ms Veendam	1,350		

Operator	Headquartered	Scottish calls (2020)	Vessels visiting Scotland	Vessel pax capacity	Target market	Notes
			ms Zuiderdam	1,916		
Marella (TUI)	Berlin, Germany	2	Marella Explorer 2	1,814	Adults only	
MSC	Geneva, Switzerland	17	MSC Poesia	3,605		
			MSC Preziosa	4,345		
			MSC Splendida	3,900		
Norwegian Cruise Line	Miami, USA	32	Norwegian Jade	3,590		
			Norwegian Star	2,348		
Oceania Cruises	Miami, USA	16	Insignia	698		
			Marina	1,250		
			Nautica	824		
			Sirena	826		
P&O (Carnival UK)	Southampton, UK	5	Aurora	1,950		Capacity growth to 2022
			Arcadia	2,388		
Phoenix Reisen	Bonn, Germany	18	Albatros	812		
			Amadea	624		
			Artania	1,260		
			Deutschland	520		
Princess Cruises	Santa Clarita, USA	53	Island Princess	2,214		
			Regal Princess	3,560		
			Sky Princess	3,660		
Regent	Miami, USA	19	Seven Seas Splendor	750	Small pax capacity cruises	
			Seven Seas Navigator	490		
			Seven Seas Explorer	750		
Royal Caribbean	Miami, USA	4	Brilliance of the Seas	2,501	Largely North American.	
Saga	Folkestone, UK	7	Saga Sapphire	600		
			Spirit of Adventure	999		
Seabourn	Seattle, USA	16	Seabourn Ovation	604	Ultra-luxury. 70% North Americans, older (65+).	
			Seabourn Quest	450		
Silversea (Royal Caribbean)	Fontivielle, Monaco	21	Silver Spirit	600	Ultra-luxury	Silver Wind will soon move to Antarctica deployment
			Silver Whisper	380		
			Silver Wind	290		
TUI	Hamburg, Germany	21	Mein Schiff 3	2,500	Premium brand, German speaking only, average age 50	Will debut 3 new LNG vessels by 2026
			Mein Schiff 4	2,790		
Viking Ocean	Basel, Switzerland	47	Viking Jupiter	930		

Operator	Headquartered	Scottish calls (2020)	Vessels visiting Scotland	Vessel pax capacity	Target market	Notes
			Viking Star	930	80% North Americans, mostly retired, high net worth guests.	Very new fleet launched from 2015. Viking Venus will launch and call at Scotland in 2021.
			Viking Sun	930		
Windstar	Seattle, USA	12	Star Legend	208	Small pax capacity cruises	
			Wind Surf	386		

Appendix 2: Consulted organisations

Port Operators	
Aberdeen Harbour (Aberdeen)	Highland Council (Portree)
ABP Ayr and Troon (Ayr)	Lerwick Port Authority (Lerwick)
ABP Ayr and Troon (Troon)	Montrose Port Authority (Montrose)
Argyll and Bute Council (Campbeltown)	Oban Harbour (Oban)
Caledonian Maritime Assets Ltd (Port Ellen)	Orkney Islands Council (Kirkwall)
Clydeport (Greenock, Glasgow)	Peterhead Port Authority (Peterhead)
Cromarty Firth Port Authority (Invergordon)	Port of Inverness (Inverness)
Eyemouth Harbour Trust (Eyemouth)	Scrabster Harbour (Scrabster)
Forth Ports (Dundee)	Stornoway Port Authority (Stornoway)
Forth Ports (Edinburgh)	Tobermory Harbour Association (Tobermory)
Highland Council (Fort William)	Ullapool Harbour Trust (Ullapool)

Local Authorities	
Aberdeenshire Council	Orkney Islands Council
Argyll and Bute Council	Shetland Islands Council
Dundee City Council	South Ayrshire Council
East Lothian Council	South Lanarkshire Council
Fife Council	Stirling Council
Moray Council	West Lothian Council

Cruise Specific Organisations	
Cruise Britain	Hapag Lloyd Kreuzfahrten
Cruise Scotland	Royal Caribbean Cruises
AIDA Cruises	Seabourn Cruise Line
Carnival Cruises	Silversea Cruises
Disney Cruise Line	TUI Cruises
Fred Olsen Cruise Lines	Viking Ocean Cruises

Ground Handlers	
Communications and Destinations Ltd	Intercruises Ltd
Excursions Limited	Island Smart
Fort William Marina and Shoreline Company	

Port Agents
Clarksons Port Services
Denholm Port Services
GAC Shipping (UK) Ltd

Visitor Attractions	
National Trust for Scotland	Orkney Distillery
Cruise Loch Lomond	Scotch Whisky Experience
Dunrobin Castle	Skara Brae
Edinburgh Castle	St Magnus Cathedral
Highland Park Whisky	The Helix
Jarlshof	Urquhart Castle
Kingsbarns Distillery	V&A Dundee

Destination Management Organisations (DMOs)	
Caithness and Sutherland Chamber	Riverside Inverclyde
Cruise Forth	Shetland Tourism Association
Dundee City Council	Skye Connect
ETAG	VisitAberdeenshire
Inverclyde Tourist Group	Visit Inverness Loch Ness
Moray Speyside Tourism	Visit West Lothian
Outer Hebrides Tourism	

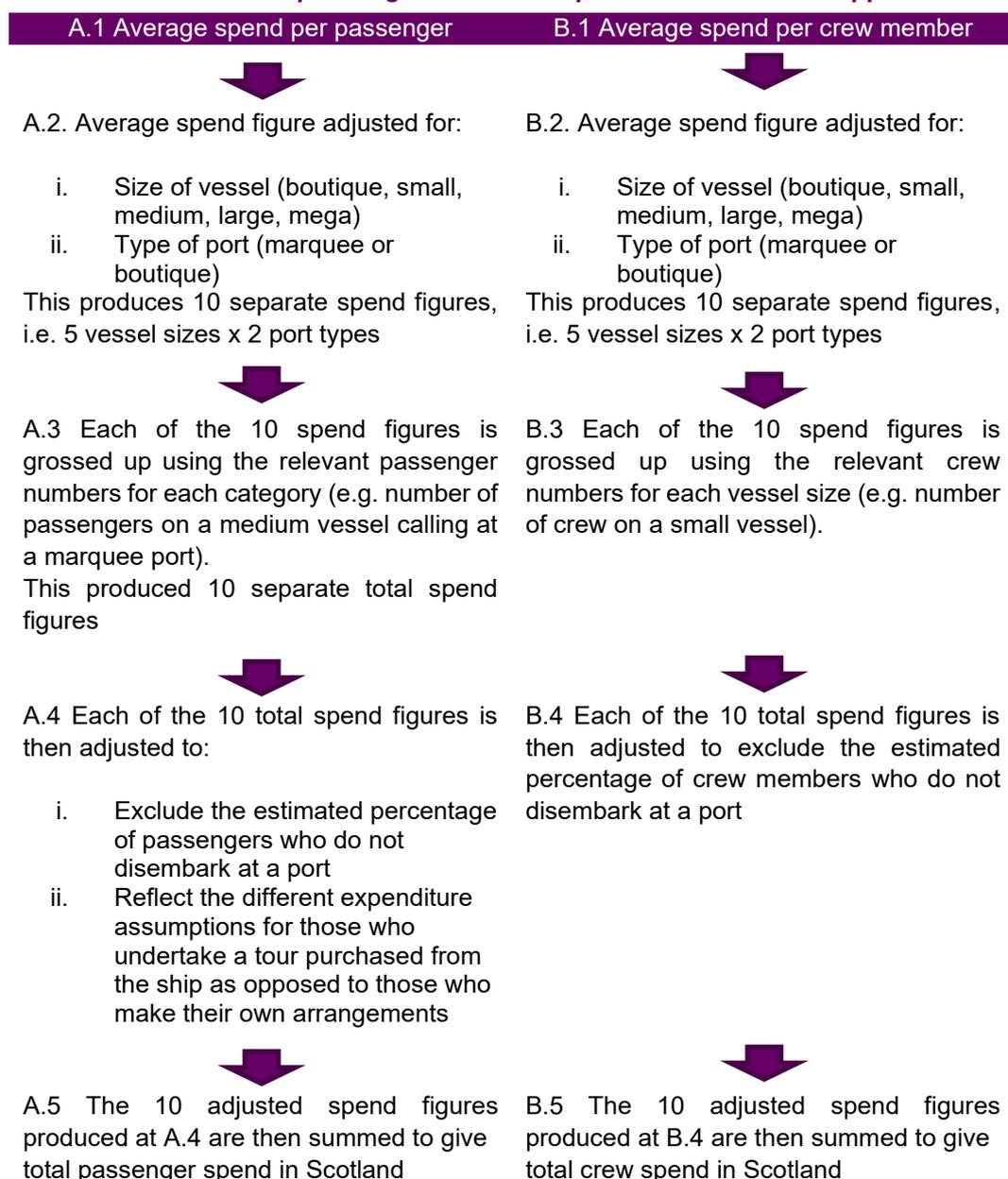
Public Sector Organisations	
FSB Scotland	Scottish Natural Heritage
Highlands and Islands Enterprise	Scottish Tourism Alliance
Historic Environment Scotland	Transport Scotland
Marine Scotland	VisitScotland
Scottish Enterprise	VisitScotland – Aberdeenshire Region
Scottish Enterprise – Aberdeen and Shire	VisitScotland – Argyll and Bute Region
Scottish Enterprise – Edinburgh	VisitScotland – Ayrshire, Arran, Renfrewshire and Inverclyde Region
Scottish Government	VisitScotland – Shetland Region

Appendix 3: Method and approach to calculating value

Cruise value calculations

We have produced an estimate of cruise passenger and crew expenditures in Scotland in 2019. The approach taken is described below.

Table A3.1: Cruise passenger and crew expenditure calculation approach



The data underlying the spend estimates are based on our consultations, port/cruise operator proformas and a review of secondary research on cruise passenger and crew expenditures.

The base average passenger spend (A.1) was £65 and the base average crew spend (B.1) was £21. As shown above these were adjusted on the basis of:

- Different passenger and crew spend by ship size, i.e. higher spend for smaller vessels, lower for larger vessels. (A.2 i, B.2 i)
- Different passenger and crew spend by type of port, i.e. higher spend at marquee ports, lower at boutique ports. (A.2 ii, B.2 ii)
- Crew numbers estimated using passenger: crew ratios for different ship size. (B.3)
- Different percentages of passengers and crew disembarking by type of port, i.e. higher for marquee ports, lower for boutique ports. (A.4 i, B.4)
- Different proportion of passengers who book an organised tour through the cruise line by type of port, i.e. 60% for marquee ports, 40% for boutique ports. (A.4 ii)
- The average spend by passengers who booked a tour through the cruise line was reduced by £45. This reflects an estimate of the average price of this type tour-which is excluded from the total passenger spend because direct payment for it goes to the cruise lines and thus leaks from the Scottish economy. (A.4 ii)

Detailed analysis

We have broken down the Scottish level estimates of passenger and crew expenditures:

- a) By individual port.
- b) By local authority area. That is based on information gathered through our consultations-with ports and ground handlers in particular.
- c) By combining a. and b. to show the geographical distribution of spend by individual port.

APPENDIX SE7: CONTRIBUTION OF CRUISE TOURISM TO THE ECONOMIES OF EUROPE 2017



Contribution of Cruise Tourism to the Economies of Europe 2017

PUBLISHED 2018



CLIA CRUISE LINES

GLOBAL



REGIONAL



FOREWARD

The cruise industry contributed a record €47.86 billion to the European economy in 2017, according to new figures released by Cruise Lines International Association (CLIA) in its updated European Economic Contribution Report.

This represents an increase of 16.9 per cent against the previous figure released in 2015.

The cruise industry continues to make significant contributions to Europe's economy. Its positive economic benefit is clear as cruise continues to contribute significantly to the European economy through smart sustainable growth.

This is thanks to more Europeans choosing a cruise holiday, more cruise passengers sailing in Europe, and more cruise ships being built in European shipyards. This all translates into substantial economic benefits for the entire continent.

Last year, the direct expenditures generated by the cruise industry reached €19.70 billion, up from €16.9 billion in 2015

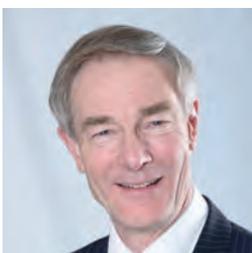
In terms of employment, between 2015 and 2017 the cruise industry generated more than 43,000 new jobs across Europe, with 403,621 now employed in cruise and cruise-related businesses. Wages and other benefits for European workers reached €12.77 billion.

As the global cruise industry continues to grow and expand into new destinations, Europe remains a vibrant hub for cruising. This trend is supported by three key factors:

- Europe represents the world's second biggest source passenger market – 6.96 million Europeans went on a cruise holiday in 2017, 7.8 per cent more than in 2015
- Europe remains the world's second most popular cruise destination, second only to the Caribbean. The study showed that 6.50 million passengers embarked on their cruises from European ports in 2017, 6.1 per cent more than in 2015.
- European shipyards are the heart of the world's cruise ship building industry. They continue to build the world's most innovative and largest ships, with spending on new builds and maintenance increasing for a sixth year. In 2017, cruise lines spent €5.6 billion in European shipyards, representing a 22.4 per cent increase compared to 2015. 66 cruise ships are currently on the order books of European shipyards for delivery by 2021, with a total value of more than €29.4 billion

Europe's economic contribution is a direct result of the impressive growth the cruise industry saw in 2017 as it reached 26.7 million passengers on ocean cruises globally.

We are confident that the cruise industry's growth in Europe will be sustained for years to come. CLIA continues to work with policymakers, regulators and other stakeholders across a variety of important industry subjects including environmental and sustainability areas.



David Dingle

Chairman of CLIA Europe and
Chairman of Carnival UK

Executive Summary

G. P. Wild (International) Limited (GPW) and Business Research and Economic Advisors (BREA) were engaged by CLIA Europe to conduct a comprehensive analysis of the global cruise industry's operations in Europe and its contribution to the European economy in 2017.

For the purposes of this report, unless otherwise stated, Europe is defined as the EU with 28 members plus Switzerland, Norway and Iceland. The EU-28 member states are fully defined in the Glossary.

Some of the major highlights of cruise operations in Europe during 2017 were:

- **During 2017 there were 40 cruise lines domiciled in Europe, operating 137 cruise ships with a capacity of around 164,000 lower berths. Another 75 vessels with a capacity of around 95,000 lower berths were deployed in Europe by 23 non-European lines.**
- **An estimated 6.96 million European residents booked cruises, a 7.8 percent increase over 2015, representing about 26 percent of all cruise passengers worldwide.**
- **An estimated 6.50 million passengers embarked on their cruises from a European port, a 6.2 percent increase over 2015. Of these around 5.5 million were European nationals and about 1.0 million came from outside Europe.**
- **The vast majority of these cruises visited ports in the Mediterranean, the Baltic and other European regions, generating 34.10 million passenger visits at a total of around 260 European port cities, an increase of 9.4 percent from 2015.**
- **In addition, an estimated 16.8 million crew also arrived at European ports.**

As a result of the European cruise operations and the investment in new cruise ships by the global cruise industry, this industry generated significant economic impacts throughout Europe. In 2017, cruise industry direct expenditures grew by 17 percent from 2015 to €19.7 billion. As will be discussed below this increase was the net result of gains across all major categories, including expenditures for shipbuilding and maintenance (22%), cruise lines purchases (18%), passenger and crew spending (10%), and employee compensation of the domestic employees of the cruise lines (7.7%). The total economic impacts of the cruise industry included the following:

- **€47.9 billion in total output¹, which is up about 17 percent over 2015.**

¹ By definition, total output includes all intermediate inputs, taxes net of subsidies, net surplus (profits, net interest, dividends and other items) and employee compensation.

² Full time equivalents.

- **€19.7 billion in direct spending by cruise lines and their passengers and crew,**
- **403,621 jobs², and**
- **€12.8 billion in employee compensation.³**

These impacts are the sum of the direct, indirect and induced impacts of the cruise industry. In summary, each €1 million in direct cruise industry expenditures generated:

- **€2.43 million in business output, and**
- **approximately 21 jobs paying an average annual wage of approximately €31,650.**

Direct Economic Impacts

The direct economic impacts include the production, employment and employee compensation that were generated in those European businesses that supplied goods and services to the cruise lines and their passengers and crew. The direct impacts also include the compensation paid to the European employees of the cruise lines.

In 2017, the cruise industry generated direct expenditures of **€19.70 billion**. These expenditures included the following:

- **€5.63 billion** in spending for the construction of new cruise ships and the maintenance and refurbishment of existing ships with European shipyards, a 22 percent increase from 2015. The €1 billion increase in shipbuilding and maintenance expenditures accounted for 37 percent of the net increase in total cruise expenditures in 2017 over 2015.
 - As of May, 2018, including deliveries during the first half of 2018, European shipyards are under contract to build 66 cruise ships with a combined value of €29.4 billion through to 2021.
- **€8.17 billion** in spending by cruise lines with European businesses for goods and services in support of their cruise operations represented an 18 percent increase from 2015. This represented a €1.27 billion increase in cruise line spending. Among the major expenditures were the following.
 - Cruise lines spent more than €1.95 billion on transportation and utilities in 2017, up about 17 percent over 2015. This segment included spending for public utilities, travel agent commissions, port charges and ground transportation
 - As a result of the growth in cruise passengers sourced from Europe, an

³ As defined by the OECD. Compensation and remuneration are used interchangeably in the report and are considered to mean the same thing. Also, compensation is included in output.

estimated €815 million in commissions were paid to European travel agents.

- The cruise lines' expenditures of €1.68 billion for financial and business services, including: insurance, advertising, engineering and other professional services, increased by 18 percent from 2015.
 - Cruise lines purchased nearly €807 million in provisions consumed on board cruise ships from European food and beverage manufacturers, an increase of 17 percent from 2015.
- **€4.23 billion** in cruise passenger and crew spending. Passenger expenditures included spending for shore excursions, pre- and post-cruise hotel stays, air travel and other merchandise at ports-of-embarkation and ports-of-call. Crew spending was concentrated in expenditures for retail goods and food and beverages.
- Given the 6.1 percent increase in embarkations and the 9.6 percent gain in passenger visits at European ports-of-call, total passenger and crew expenditures rose by 10.4 percent from 2015. The €400 million increase in passenger and crew expenditures accounted for about 14 percent of the net increase in total industry spending during 2017.
- Including airfares, embarking passengers spent an average of €294.
 - Excluding airfares, cruise passengers spent an average of €81.86 at embarkation port cities.
 - On average, cruise passengers then spent another €64.37 at each port visit on their cruise itinerary.
 - Crew spending at each port call averaged €24.50 per crew member.
- **€1.67 billion** in wages and salaries plus benefits, an increase of 7.7 percent from 2015, were paid to the European administrative staff and crew of the cruise lines.
- Cruise lines employed about 5,600 European nationals in their headquarters and administrative offices.
 - An estimated 63,500 European nationals were employed as officers and ratings on cruise ships.

These expenditures generated employment and employee compensation across a wide range of industries and in virtually every country that sourced passengers and/or hosted cruise ship calls. As indicated in Table ES - 1, the €19.70 billion in direct expenditures generated **195,241 direct jobs** paying **€6.023 billion in employee compensation**.

Table ES - 1: Direct Economic Impacts of the European Cruise Sector by Industry, 2017

	Expenditures € Million	Jobs	Compensation € Million
Agr., Mining & Constr.^②	€ 23	244	€ 5
Manufacturing	€ 9,591	52,536	€ 2,071
Nondurable Goods	€ 2,269	8,187	€ 296
Durable Goods	€ 7,323	44,349	€ 1,775
Wholesale & Retail Trade	€ 887	12,554	€ 255
Transportation & Utilities	€ 4,307	26,470	€ 975
Hospitality^③	€ 467	7,287	€ 167
Financial & Business Svcs.	€ 2,002	15,794	€ 553
Personal Svcs. & Govt.	€ 748	11,284	€ 322
Subtotal	€ 18,024	126,169	€ 4,349
Cruise Line Employees	€ 1,674	69,072	€ 1,674
Grand Total	€ 19,698	195,241	€ 6,023

^① The aggregate (bold) and sub-industries are based on standard industry definitions used by the OECD in its input-output accounts. The level of detail in each table may vary but the definitions remain the same.

^② Agr, Mining & Constr. is the aggregation of the Agriculture, Mining and Construction industries. Generally, the estimated impacts for each of these industries individually is too small and imprecise to show.

^③ Hospitality includes hotels, restaurants and bars and amusement and recreation establishments.

Note: Figures may not add due to rounding.

The following three economic sectors accounted for 79 percent of the direct economic impacts of the European cruise industry:

- The Manufacturing sector, accounted for 49 percent of the cruise industry's direct expenditures, 27 percent of the direct jobs and 34 percent of the direct employee compensation. All of these share percentages increased slightly from 2015 due to the higher growth in the shipbuilding industry relative to the other expenditure categories.
- European employees of the cruise lines accounted for 35 percent of the direct jobs generated by the cruise industry and 28 percent of the compensation. These percentages are down slightly from 2015.
- The Transportation and Utilities sector, including tour operators and travel agents among others, accounted for 22 percent of the direct expenditures, 14 percent of the direct jobs and 16 percent of the compensation impacts. These relative percentages were little changed from 2015.

Total Economic Impacts

The total economic impacts are the sum of the direct, indirect and induced impacts. The indirect impacts result from the spending by the directly impacted businesses for those goods and services they require to support the cruise industry. The induced impacts result from the spending by the impacted employees for household goods and services. Thus, the indirect impacts primarily affect business-to-business enterprises while the induced impacts primarily affect consumer businesses. The total economic impacts are shown in Table ES - 2.

The total economic impacts are more evenly spread among the various industries than the direct economic impacts as the indirect and induced impacts affect non-cruise sectors. Yet the manufacturing (primarily shipbuilding) and transportation sectors still account for more than half of the cruise industry's total impact throughout Europe.

- The Manufacturing sector, which includes the shipbuilding industry, accounted for 36 percent of the total output, 24 percent of the jobs and 30 percent of the total compensation generated by the cruise industry.
- The Transportation and Utilities sector, accounted for 17 percent of the total output, 13 percent of the total employment and 16 percent of the total compensation impacts.

Table ES - 2: Total Economic Impacts of the European Cruise Sector by Industry, 2017 ①

Industry	Output € Million	Jobs	Compensation € Million
Agr., Mining & Constr.	€ 2,655	19,722	€ 381
Manufacturing	€ 17,390	98,091	€ 3,795
Nondurable Goods	€ 5,359	23,306	€ 861
Durable Goods	€ 12,031	74,785	€ 2,934
Wholesale & Retail Trade	€ 2,841	38,043	€ 700
Transportation & Utilities	€ 8,375	51,836	€ 1,995
Hospitality	€ 1,496	19,418	€ 448
Financial & Business Svcs.	€ 11,220	77,090	€ 2,814
Personal Services & Govt	€ 2,207	30,349	€ 962
Cruise Line Employees	€ 1,674	69,072	€ 1,674
Total	€ 47,858	403,621	€ 12,769

① Since compensation is included in total output, these impacts are not additive. Output is a measure of the industry's impact on the overall economy while compensation is a measure of the industry's impact on employees and the household sector.

Country Impacts

The economic impacts were spread throughout Europe. However, as indicated in Table ES - 3 the majority of these impacts were concentrated in five countries, which accounted for about 79 percent of the cruise industry's impacts throughout Europe.

Once again, Italy, UK and Germany accounted for 63 percent of the direct expenditures of the cruise industry, unchanged from 2015. These three countries experienced a combined increase of 16 percent in direct expenditures

from 2015. These countries participated in all segments of the industry:

- Serving as major source and destination markets for cruise passengers,
- maintaining headquarters facilities and providing crew,
- providing shipbuilding and/ or repair services, and
- provisioning and fuelling of cruise ships.

Table ES - 3: Total Economic Impacts of the Cruise Sector by Country, 2017

Country	Direct Expenditures € Million	Growth from 2015	2017 Total Output	Total Jobs	Total Compensation € Million
Italy	€ 5,463	20.0%	€ 13,210	119,052	€ 3,686
UK	€ 3,850	18.1%	€ 10,390	82,410	€ 3,159
Germany	€ 3,140	6.6%	€ 6,432	48,490	€ 1,804
France	€ 1,679	35.65%	€ 3,516	19,973	€ 925
Spain	€ 1,481	12.0%	€ 4,252	31,233	€ 959
Top Five	€ 15,613	17.2%	€ 37,800	301,158	€ 10,533
Norway	€ 712	18.9%	€ 1,798	16,831	€ 567
Finland	€ 703	12.2%	€ 1,573	10,756	€ 405
Netherlands	€ 563	20.9%	€ 1,058	8,992	€ 270
Greece	€ 546	11.8%	€ 913	10,721	€ 204
Sweden	€ 269	-0.7%	€ 532	3,385	€ 141
Next 5	€ 2,795	14.0%	€ 5,874	50,685	€ 1,587
Rest of the EU+3	€ 1,290	15.9%	€ 4,184	51,778	€ 649
Total	€ 19,698	16.7%	€ 47,858	403,621	€ 12,769

The remaining two countries in the top five tended to be impacted in two or three major segments:

- Spain serves primarily as a source and destination market with some headquarters operations.
- France is principally a source and destination market with the addition of shipbuilding.
- As shown in Table ES - 3 the top five countries experienced a combined increase of just over 17 percent in direct cruise industry expenditures during 2017.

France led the way with a 36 percent increase in direct expenditures –and accounted for nearly 11 percent of the total direct expenditures among the top 5 countries. Spending increased in the shipbuilding and passenger and crew spending categories. Shipbuilding led the way with an 81 percent increase. Spending by cruise lines, including the compensation of their employees residing in France was up by 7.4 percent.

Italy experienced a 20 percent growth in direct expenditures over 2015. These gains were driven by a 54 percent gain in shipbuilding and repair – representing nearly 75 percent of the total gains Italy experienced since 2015. Cruise line purchases for goods and services, including employee compensation rose by 11 percent. Passenger and crew spending across Italy's ports was down by 2.1 percent over 2015. This is due to an overall decrease in all passenger types – sourced, embarks and port of call.

Direct expenditures in the UK rose by 18 percent from 2015 to 2017. Spending by passengers and crew at UK port cities increased by 13 percent as a result of a combined 21 percent increase in embarkations and transit visits at these ports. Spending by at UK shipyards was up slightly at 2.1 percent. Cruise lines spending for goods and services in support of cruises, including resident employee compensation was up by 20 percent over the 2015 levels.

Spain experienced a 12 percent increase in direct cruise industry expenditures in 2017 over 2015. Gains were seen across all four major expenditure categories, including a 15 percent increase in the combined passenger and crew spending at cruise destinations in Spain. Cruise line purchases at Spanish ports were up 12 percent from two years earlier, and ship repair and maintenance increased by 6.4 percent.

Germany experienced smaller gains in direct cruise sector expenditures with an overall gain of 6.6 percent. The growth in Germany occurred across three of four of the major categories of spending. The growth was led by a 34 percent increase in the combined spending of passengers and crew members. Overall, passengers visiting German ports were up 39 percent, with a larger growth in embarking passengers. The total direct spending by cruise lines – including employee compensation was up by 13 percent. These gains were somewhat tempered by a 6.7 percent decrease in shipbuilding and repair expenditures in Germany from 2015 to 2017.

Five-year Growth Trend

Since 2012 European-sourced passengers have grown by 13 percent from 6.14 million to 6.96 million in 2017. This translates to an average of 2.5 percent per year increase over the past 5 years.

Embarkations at European ports have grown at a similar pace -increasing by nearly 13 percent over the 5-year period, from 5.77 million in 2012 to 6.5 million in 2017. Embarkations at European ports experienced an increase of 6.1 percent in 2017 over 2015 and reached a new high.

Finally, port-of-call passenger visits have risen by 19 percent over the 2012-2017 period, growing from 28.69 million to 34.15 million. Port-of-call visits increased by 9.6 percent in 2017 over 2015.

Table ES - 4: European Passenger Statistics¹, 2012 – 2017 (Millions)

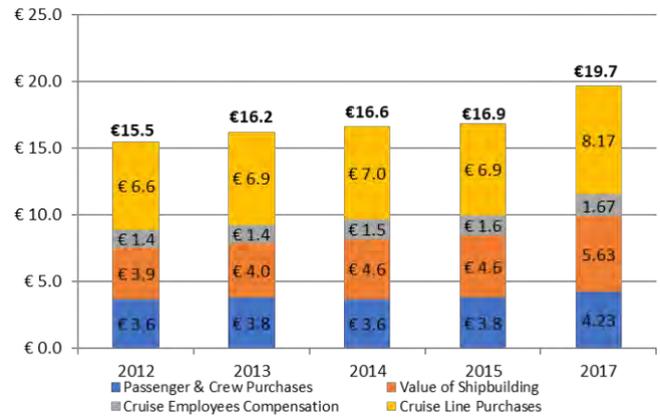
Category	2012	2013	2014	2015	2017	% Chan 2012-20
European-Sourced Passengers	6.14	6.36	6.39	6.46	6.96	13.4%
Percent Change	1.2%	3.6%	0.5%	1.0%	7.8%	
Embarkations from European Ports	5.77	6.07	5.85	6.12	6.50	12.6%
Percent Change	3.2%	5.2%	-3.6%	4.6%	6.1%	
Port-of-Call Passenger Visits	28.69	31.19	28.96	31.17	34.15	19.0%
Percent Change	4.3%	8.7%	-7.1%	7.6%	9.6%	

① Including Russia and Central and Eastern European countries outside the EU +3.

Note: Historical data for European-sourced passengers has been revised to be consistent with data published by CLIA.

As shown in Figure ES -1, direct expenditures have increased by 27 percent from €15.5 billion in 2012 to €19.7 billion in 2017, representing an average annual increase of 4.9 percent over the five-year period.

Figure ES - 1: Direct Cruise Industry Expenditures in Europe, 2012 – 2017 (Billions)



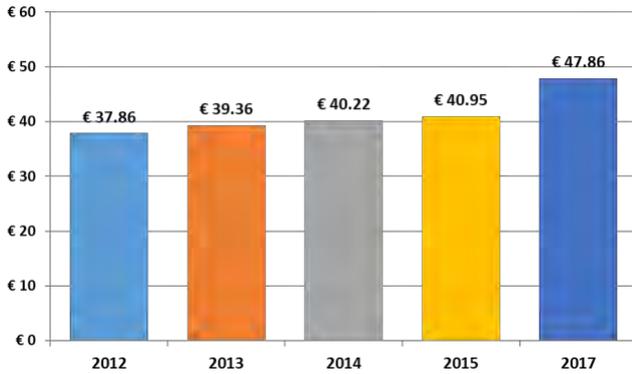
While total direct expenditures of the cruise industry have steadily increased over the five-year period, the growth in spending by category has varied. Over the five-year period, spending by cruise lines for goods and services and employee compensation has experienced a total increase of 24 percent, representing an average of 4.4 percent per year.

Expenditures for shipbuilding and repair had declined in 2010 and 2011 primarily in response to recession conditions. Since 2012, however, annual shipbuilding and repair expenditures have increased by 46 percent from €3.85 billion to €5.63 billion in 2017.

Passenger and crew visits at European ports continued to grow in 2017, increasing by about 9.9 percent. As a result, passenger and crew expenditures at European ports rose by 10 percent since 2015 and reached a new high of \$4.23 billion. Over the 2012-2017 period, expenditures of passengers and crew have increased by 17 percent, or an average of 3.1 percent per year.

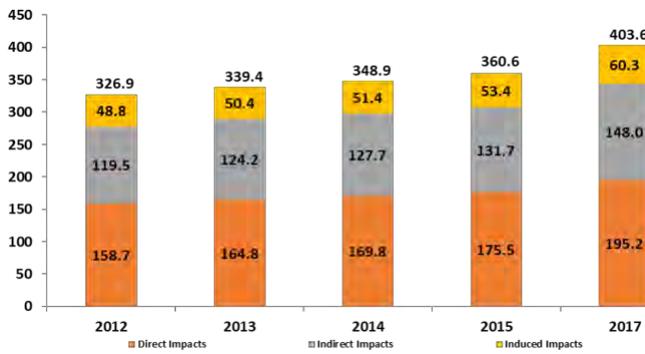
As shown in Figure ES-2, the total output of the industries affected by the direct, indirect and induced impacts of the European cruise industry has risen by 26 percent from €37.86 billion in 2012 to €47.86 billion in 2017. This increase in total output mirrors the growth in direct expenditures reported above.

Figure ES - 2: Total Output Generated by Cruise Industry Expenditures in Europe, 2012 – 2017 (Billions)



The total employment associated with the total output discussed above has increased by 23 percent from 326.9 thousand jobs in 2012 to 403.6 thousand jobs in 2017. Since 2012, the total employment impact has increased each year and has averaged 4.3 percent per year.

Figure ES - 3: Total Employment Generated by Cruise Industry Expenditures in Europe, 2012 – 2017 (1,000's)



1. An Overview of the Importance of the European Cruise Industry – Facts and Figures

The cruise industry in Europe⁴ is a dynamic source of economic activity providing economic benefits to virtually all industries and countries throughout Europe.

- Cruise tourism in Europe impacts all of the major aspects of the industry, including: ports of embarkation, ports-of-call, shipbuilding, ship maintenance, provisioning, sales and marketing and the staffing of cruise ships and administrative facilities. Positive economic conditions and an increase in European cruise capacity during 2017 have combined to result in an increase in passengers sourced from Europe,

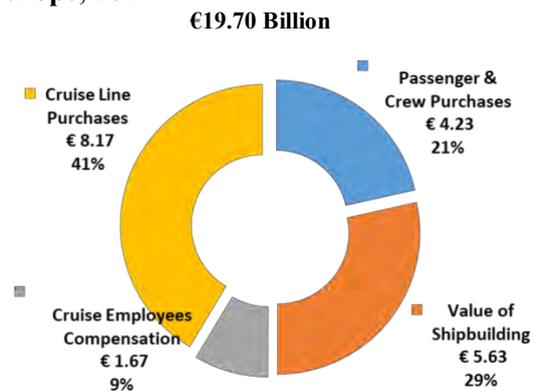
⁴ The European cruise industry is defined as those cruise-related activities that take place within Europe including cruise itineraries that visit European ports and destinations and also directly impact businesses and individuals located in Europe. It is broadly defined to include cruise lines and their employees; the direct suppliers to the cruise lines, such as wholesale distributors, stevedoring firms, and

passengers embarking on cruises at European ports and total passenger and crew visits in Europe during 2017.

- An estimated 6.96 million European residents booked cruises in 2017, a 7.8 percent increase over 2015.
- In 2017, Europeans represented 26 percent of all cruise passengers worldwide, down from 30 percent five years earlier. This share change is driven by the expansive growth in the Asia Pacific markets over that period.
- A total of 6.5 million passengers embarked on their cruises from a European port, a 6.1 percent increase over 2015. Around 85 percent are estimated to be European nationals.
- There were just over 34 million passenger visits to European ports during 2017, a 9.6 percent increase from 2015.
- Cruise lines visited a total of around 250 European port destinations including the Atlantic Isles.
- In addition, an estimated 16.8 million crew also arrived on board cruise ships calling at European ports during 2017, with approximately 6.7 million going ashore.

The cruise industry's direct spending made by the cruise lines⁵ and their passengers and crew throughout Europe in 2017 increased by 17 percent from 2015 to €19.7 billion.

Figure 1.1: Direct Cruise Industry Expenditures in Europe, 2017



- Cruise passengers and crew spent an estimated €4.23 billion in purchases during their port visits, ranging from accommodations to retail purchases of jewellery, clothing and other similar items. This represented a 10 percent increase over 2015 and is primarily attributable to the increases in the European passenger throughput. This follows a 5.6 percent increase in 2015 and a decline of 4.2 percent in 2014. For the second consecutive study, passenger and crew spending in Europe has reached new peaks.

financial and business service providers, such as insurers and consultants; shipyards; and cruise passengers.

⁵ Cruise lines are defined as those cruise companies that offer multi-day cruises in open waters. This definition thus excludes companies that offer river cruises.

- Europe is also the centre of and world leader in cruise ship construction and refurbishment. After three successive years of decline from 2009 through 2011, spending for new buildings and maintenance at European shipyards has now increased in each of study year since 2012. Shipbuilding totalled €5.6 billion in 2017, an increase of 22 percent over 2015. Since 2012, cruise industry expenditures at European shipyards have increased by approximately 46 percent and are finally above the 2008 peak of €5.2 billion.
- Included in the €19.7 billion of total direct expenditures is €1.67 billion in compensation paid to employees of the cruise industry that reside in Europe. The 2017 total employee compensation grew by 7.7 percent over 2015.
- Finally, the cruise lines also spent another €8.17 billion with European businesses to support their cruise and administrative operations, an increase of 18 percent from 2015.
- The spending by the cruise lines and their passengers and crew generated an estimated 403,621⁶ jobs throughout Europe through the direct, indirect and induced economic impacts. This is a 12 percent increase from 2015.
- In turn, the workers in these jobs produced an estimated €47.9 billion in total output and received €12.77 billion in total (direct, indirect and induced) compensation. The total output impact increased by 17 percent while the compensation impact rose by 16 percent from 2015.

Cruise New Building and Investment 2018-21

- The last two years have seen cruise ships being ordered in record numbers. As a result, over the period from 2018 to 2021, 68 cruise vessels have been scheduled for delivery for worldwide trading with capacity for 156,000 passengers of which 66 will be constructed in Europe and two in China. In addition, a further 33 ships with 94,000 berths are already on order for 2022-7 delivery. All but two of these are for construction in European yards. In addition to the usual pattern of construction in France, Germany, Italy and Finland, yards in Norway, Poland, Portugal, the Netherlands, Spain and Croatia will also benefit from this investment in new berths.
- Out of the 2018-21 total, as far as can be determined at present, 31 ships with 64,000 berths (41.0%) have been ordered by cruise lines primarily serving the European source market, representing an investment of €11.2 billion. Many of the others, particularly those serving North American markets, will also visit European destinations. This huge level of new investment underlines the cruise industry's continuing confidence

in the future of its business both in Europe and elsewhere in the world.

Table 1. 1: Global Cruise Ship Orders 2018-2021

Year Completed	Ships	Berths	Investment (Millions)
2018	15	33,665	€ 6,293
2019	22	42,147	€ 7,929
2020	17	40,314	€ 7,566
2021	14	40,263	€ 7,780
Total	68	156,389	€ 29,568

- 2017 saw a net increase of ten in the cruise ship order book with eight deliveries and 18 new orders. Although Europe continues to dominate the cruise shipbuilding market, the emergence of competition from China remains a possibility, although Japan appears to have been discouraged by its current experience from further competing in the market.

2. Cruise Industry Expenditures by Country

The cruise industry generated an estimated €19.7 billion in direct expenditures throughout Europe in 2017, up by 17 percent over 2015. These expenditures were derived from four major sources:

- cruise passengers;
- the construction and maintenance of cruise ships;
- cruise line purchases in support of their operations; and
- compensation of cruise line administrative staff and crew in Europe.

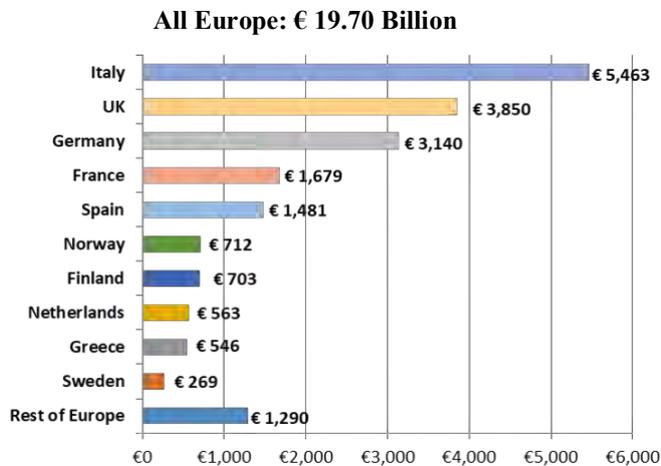
Furthermore, this spending impacted to some degree on each of the 32 European countries included in the analysis.

- The top ten countries accounted for 93 percent of the cruise industry's direct expenditures throughout Europe.
- Italy, as a leading centre for cruise ship construction in Europe and the largest cruise embarkation and destination market, benefited from €5.46 billion in direct cruise industry expenditures, a gain of 20 percent from €4.55 billion in 2015. About three-quarters of Italy's gain comes from its growth in shipbuilding.
- The UK is the second largest source market for cruise passengers in Europe with 1.93 million residents taking cruises during 2017. It also had the second highest level of direct expenditures with €3.85 billion, an increase of 18 percent over 2017. Across the UK, expenditures rose in each of the four major categories of direct spending. This growth was principally spurred by the 20 percent increase in cruise line spending - including employee compensation; and an increase of 13 percent in the combined spending of passengers and crew at ports across the UK.

⁶ These are full time equivalent jobs (FTEs).

- Germany ranked as the third highest country with €3.14 billion in direct cruise industry expenditures, up 6.6 percent from 2015. Expenditures were up in three of the four expense categories for Germany, with passenger and crew spending up 34 percent, cruise line purchases – including employee compensation – up 13 percent. These gains were somewhat tempered by a decrease of 6.1 percent in spending at German shipyards. Shipyard spending accounted for about 38 percent of all cruise industry expenditures in Germany.
- France and Spain round out the top five with €1.68 and €1.48 billion in direct expenditures, respectively. Total direct expenditures in France rose by 36 percent as a result of an 81 percent increase in spending for shipbuilding and refurbishment and a 7.5 percent increase in cruise line expenditures – including employee compensation in France
- Spurred by a 15 percent increase in the combined passenger and crew spending at Spanish ports, the total direct spending across Spain rose by 12 percent from 2015.

Figure 2.1: Cruise Industry Direct Expenditures by Country, 2017, Millions



The major centres for cruise shipbuilding, Germany, Italy, France, and Finland, were among the top ten countries for cruise industry direct spending. These four countries accounted for 72 percent of total industry expenditures in Europe and for approximately 87 percent of construction of cruise ships globally during 2017.

3. A Global Industry

The cruise industry has enjoyed dynamic growth over a period of nearly 40 years, driven initially by demand from North America and more recently by growing demand from Europe and the rest of the world, especially China and Australia. Table 3. 1 sets out international cruise sector growth between 2014 and 2017.

- Since 2007, the demand for cruising worldwide has increased from 15.9 million passengers to 26.75 million in 2017. This represents a 68 percent growth over the ten-year period, and an increase of 6.3 percent in the last year. Over a similar 10-year period, global, mainly land-based tourism, has risen by 47 percent to an estimated 1.32 billion tourists in 2017, up 6.7 percent from 2016.
- Although North American cruise passenger numbers have increased by 6.9 percent since 2014, the region's relative share of the total market has declined from 52 percent in 2014 to 48 percent in 2017. Over the same period, Europe has experienced an 8.9 percent growth in passengers, yet has seen its share decrease from 27 percent in 2014 to 26 percent in 2017. Asia has grown by approximately 140 percent since 2014 and now accounts for 15 percent to the market share.

Table 3. 1: International Demand for Cruises 2014 to 2017 (Million's)

Region	2014	2015	2016	2017
	Million passengers			
N. Am.	12.04	12.00	12.26	12.87
Europe ①	6.39	6.46	6.79	6.96
Asia	1.69	2.06	3.37	4.06
Australasia	0.99	1.13	1.37	1.44
RoW ②	2.24	1.42	1.37	1.43
Total	23.34	23.06	25.15	26.75
% NA	52%	52%	49%	48%

① Including Russia and Central and Eastern European countries outside the EU+3.

② Rest of the world, includes Mexico, South/Central America, Africa, Middle East, Other.

Source: CLIA (Updated)

A European Growth Industry (Thousand's)

European growth has slowed down in recent years, largely because of the uneven pattern of growth across the major countries. This can be seen from the more detailed figures for European growth over the 2015-2017 period, which are shown in Table 3. 2.

Table 3.2: Key European Cruise Market 2015-17

Source Market	2015		2016		2017		% Change 2015/17
	Group Total	Market Share	Group Total	Market Share	Group Total	Market Share	
Germany	1,813	28.1%	2,018	29.7%	2,189	31.5%	20.7%
UK ①	1,789	27.7%	1,960	28.9%	1,971	28.3%	10.2%
Italy	808	12.5%	751	11.1%	769	11.1%	-4.8%
Spain	466	7.2%	480	7.1%	510	7.3%	9.5%
France	612	9.5%	554	8.2%	504	7.2%	-17.7%
Other	969	15.0%	1,026	15.1%	1,015	14.6%	4.7%
Total	6,457	100.0%	6,789	100.0%	6,958	100	7.8%

① Including Ireland

Source: CLIA (Updated)

- In 2007 an estimated 4.1 million Europeans cruised, but by 2017 this figure had grown to 6.96 million, representing an increase of 70%.
- Over the same period, Europe as a source market for land-based tourism expanded by 38% to reach 671 million tourists.

The European Cruise Fleet

During 2017 there were 40 cruise lines⁷ domiciled in Europe which operated 137 cruise ships with a capacity of 163,959 lower berths, 10 percent over 2015. In addition, there were 23 cruise operators domiciled outside Europe participating in the European cruise market. These lines, predominately North American, deployed 75 vessels in the region with a capacity of 94,814 lower berths. This was a decrease of 5.5 percent from 2015.

There were at least 159 cruise ships active in the Mediterranean and 121 in Northern Europe during 2017⁸, some of which repositioned from the Mediterranean for the shorter Northern season. These ships ranged in size from the 4,500 passenger *MSC Meraviglia* to ships with a capacity of less than 100 passengers.

The Mediterranean

- In 2017 a total of 166 cruise ships were active in Mediterranean waters with a capacity of 215,697 lower berths with an average of 1,296 berths per ship.
- Collectively these ships carried a potential 3.44 million passengers on 2,577 cruises, offering a total capacity of 26.67 million passenger-nights, giving an average cruise length of 7.75 nights. A further

466,000 potential passengers cruised the Atlantic Isles.

- In 2017, North American operators deployed 57 ships with 75,196 lower berths in the Mediterranean, including some ships targeted at European markets. In comparison, European domiciled lines operated 101 vessels, which offered 134,127 lower berths.
- The market in the Mediterranean is expected to decline by a further 1% in 2018 as a result of further redeployments by European operators offset by increased capacity by North American-domiciled operators.

Northern Europe

- In 2017 a total of 121 cruise ships were active in Northern European waters with a capacity of 150,115 lower berths with an average of 1,240 berths per ship.
- Collectively these carried a potential of 1.92 million passengers on 1,365 cruises, offering a total capacity of 16.82 million passenger-nights, giving an average cruise length of 8.76 nights.
- The Northern European market has expanded by around 22 percent, compared with 2015 and is expected to achieve further growth of the order of 16 percent in 2018.
- In 2017, North American mainstream operators deployed 37 ships, with 52,690 lower berths in Northern Europe. European mainstream operators deployed 63 vessels with 92,951 lower berths. The balance was largely made up of niche market ships visiting the polar-regions.
- The Baltic Sea is the largest segment in the Northern Europe market, generating capacity of around 5.89 million passenger nights in 2017, increasing to 6.30 million in 2018.

4. European Cruise Ports

The European cruise industry is to a large extent destination-led and the Mediterranean and Northern European regions include many attractive destinations.

- Many of the leading ports are regarded as “must see” or “marquee” destinations that destination planners will wish to include in their itineraries.
- Other ports, some of which are also marquee ports in their own right, have advantages of strategic position, access to major hub airports and suitable bed-stock, enabling them to feature prominently as home ports.

Table 4. 1 summarises the position in 2017 for the leading European ports in respect of the embarkations,

⁷ Including two ships domiciled in other Mediterranean countries.

⁸ The figures for the Mediterranean and North European fleets cannot be compared with those given for the domiciled and non-domiciled fleets as ships move between markets both within Europe and

worldwide. Similarly the Mediterranean and North European fleets are not directly comparable. The Mediterranean total includes a few ships cruising to the Atlantic Isles only.

disembarkations and port-of-call visits at each port. Some data has been estimated, indicated by italics.

Table 4.1a: Leading Cruise Ports in 2017 – Thousands of Passengers

Port	Revenue Passengers, 2017			Total
	Embarking	Disembark	Port Call	
Mediterranean Top 12				
Barcelona	720	720	1,272	2,712
Civitavecchia	425	425	1,354	2,204
Palma	371	371	931	1,673
Majorca				
Marseille	207	208	1,072	1,487
Venice	613	613	201	1,428
Piraeus	166	166	723	1,056
Naples	56	57	814	927
Genoa	270	270	385	925
Savona	259	260	336	854
Las Palmas	<i>173</i>	<i>173</i>	<i>469</i>	815
Valletta	108	108	563	779
Dubrovnik	34	34	681	749
Northern Europe Top 12				
Southampton	<i>900</i>	<i>900</i>	<i>200</i>	<i>2,000</i>
Copenhagen	265	265	319	849
Hamburg	382	383	45	810
Rostock/ Warnemunde	195	195	252	642
Stockholm	88	88	445	621
St Petersburg	13	13	547	573
Bergen	25	25	509	559
Tallinn	0	0	543	543
Lisbon	29	30	462	521
Kiel	236	240	38	514
Helsinki	2	3	473	478
Cadiz	0	0	387	387

Table 4.1b – 2015 has been added for comparison purposes to Table 4.1a – 2017, above

Table 4.2b: Leading Cruise Ports in 2015 – Thousands of Passengers

Port	Revenue Passengers, 2015			Total
	Embarking	Disembark	Port Call	
Mediterranean Top 12				
Barcelona	685	679	1,176	2,540
Civitavecchia	434	434	1,404	2,272
Palma Majorca	274	274	1,175	1,722
Venice	682	682	218	1,582
Marseille	252	251	948	1,451
Naples	64	63	1,043	1,170
Las Palmas	233	233	591	<i>1,057</i>
Savona	324	323	335	982
Piraeus	142	142	696	980
Tenerife	37	44	852	933
Genoa	283	282	283	848
Dubrovnik	31	31	769	831
Northern Europe Top 12				
Southampton	828	827	95	<i>1,750</i>
Copenhagen	<i>185</i>	<i>185</i>	<i>310</i>	<i>680</i>
Stockholm	77	77	376	530
Hamburg	232	232	55	519
St Petersburg	0	0	515	515
Lisbon	21	21	470	512
Rostock/ Warnemunde	132	131	222	509
Tallinn	5	5	487	497
Kiel	209	214	35	458
Helsinki	0	0	437	437
Bergen	4	4	421	430
Cadiz	0	0	411	411

Estimates in italics.

Source: MedCruise, Cruise Europe and individual port data.

Major European Home Ports

The principal home ports in the Mediterranean and Northern Europe are shown in Table 4. 2 with passenger throughputs (or revenue passengers), where available for 2015-17.

Table 4. 3: Revenue Passengers - Major European Home Ports 2015-17

Home Port	Country	2015	2016	2017
Mediterranean				
Barcelona	Spain	2,540,302	2,683,594	2,712,247
Civitavecchia	Italy	2,271,652	2,339,676	2,204,336
Palma Majorca	Spain	1,721,906	1,627,373	1,673,210
Venice	Italy	1,582,481	1,605,660	1,427,812
Piraeus (Athens)	Greece	980,049	1,094,135	1,055,559
Genoa	Italy	848,227	1,017,368	925,188
Savona	Italy	982,226	910,244	854,443
Northern Europe				
Southampton	UK	<i>1,750,000</i>	<i>1,860,000</i>	<i>2,000,000</i>
Copenhagen	Denmark	680,000	740,000	849,000
Hamburg	Germany	519,453	722,015	810,000
Kiel	Germany	458,152	485,497	513,909
Amsterdam	Netherlands	281,941	331,532	383,000

Note: Where a port also handles port-of-call passengers, these are included in the totals shown in the above table.

Source: MedCruise, Cruise Europe and individual port data

Key European Ports-of-Call

The principal ports-of-call in the Mediterranean and Northern Europe are shown in the following table with passenger throughputs, where available, from 2015 to 2017.

Table 4.4: Major European Ports-of-Call 2015-17

Port-of-Call	Country	2015	2016	2017
Mediterranean				
Marseille	France	1,451,059	1,597,213	1,487,313
Tenerife Ports	Spain	933,154	884,173	964,337
Naples	Italy	1,169,571	1,306,151	927,458
Valetta	Malta	668,277	682,970	778,596
Dubrovnik	Croatia	830,684	831,730	748,918
Mykonos	Greece	649,914	722,517	699,304
Livorno	Italy	697,955	807,935	698,780
Côte d'Azur [ⓐ]	France	546,199	562,929	683,351
Corfu	Greece	647,346	748,914	679,681
Santorini	Greece	791,927	783,893	620,570
Katakolon	Greece	459,882	505,111	567,047
Kotor	Montenegro	442,029	536,644	541,017
Madeira	Portugal	580,348	522,483	540,593
Malaga	Spain	419,121	442,931	510,607
Palermo	Italy	546,884	510,078	459,224
La Spezia	Italy	667,446	507,531	454,954
Cagliari	Italy	263,247	255,873	424,305
Gibraltar	UK	344,140	404,005	404,995
Northern Europe				
Stockholm	Sweden	530,229	445,000	600,000
St Petersburg	Russia	515,041	487,648	581,422
Lisbon	Portugal	512,128	522,497	521,042
Rostock [ⓑ]	Germany	509,000	553,000	642,000
Tallinn	Estonia	496,669	509,730	542,844
Helsinki	Finland	436,500	410,800	478,000
Bergen	Norway	429,504	490,546	559,692
Cadiz	Spain	411,453	385,067	387,107
Geiranger	Norway	309,895	310,055	349,786
Stavanger	Norway	252,500	262,500	
Le Havre	France	224,367	332,515	386,833
Zeebrugge	Belgium	213,496	220,000	367,000
Oslo	Norway	199,000	235,000	
Flam	Norway	180,243	203,874	

[ⓐ] Mainly Nice, Villefranche and Cannes.

[ⓑ] Includes Warnemunde

Notes:

- Where a port also handles some home porting passengers, these are also included in the totals shown in the above table.
- Four of the five leading ports of call in Northern Europe are in the Baltic Sea.

Source: MedCruise, Cruise Europe and individual port data.

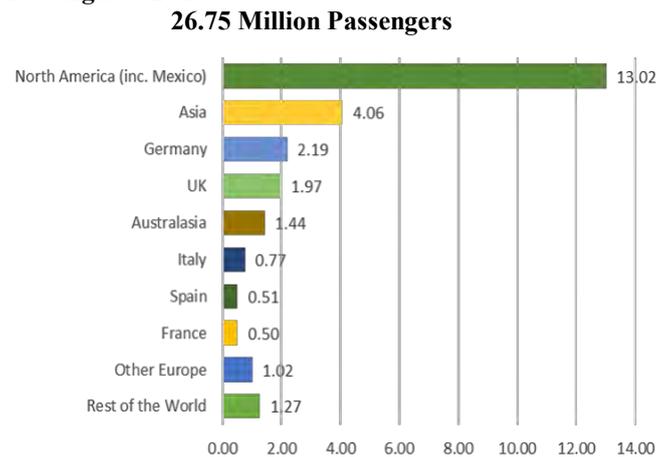
A feature of the tables in the above section, compared with previous reports is the absence of Turkish ports. The security situation in Turkey itself and in the Black Sea has led to a severe decline in throughputs in such previously popular ports as Istanbul and Kusadasi.

5. Cruise Passengers - Where do they come from and where do they go?

Source Markets

There were an estimated 26.75 million global cruise passengers in 2017 with the countries of Europe accounting for 26 percent of the total.

Figure 5.1: Global Source Markets by Cruise Passengers - 2017



During 2017 an estimated 6.96 million residents of the countries of Europe cruised. The top five source markets - Germany, UK, Italy, Spain and France - accounted for 85 percent of the market.

Table 5.1: European Cruise Passengers by Source Country, 2015 & 2017

Country	2015 Passengers (1,000's)	2017 Passengers (1,000's)	2017 Share of Total
Germany	1,813	2,189	31.5%
UK ¹	1,789	1,971	28.3%
Italy	808	769	11.1%
Spain	466	510	7.3%
France	612	504	7.2%
Switzerland	138	152	2.2%
Austria	113	130	1.9%
Netherlands	105	110	1.6%
Norway	103	104	1.5%
Belgium	65	72	1.0%
Sweden	80	64	0.9%
Portugal	36	49	0.7%
Denmark	36	45	0.6%
Other EU+3	-	155	2.2%
Other Europe	293	133	1.9%
Total	6,457	6,958	100.0%

¹ Includes Ireland

Source: CLIA

- The European market has grown by 70 percent over the last ten years but with economic growth moderating in recent years, European-sourced passengers have only increased by about 12 percent since 2012. Approximately 51 percent of Europeans cruised in the Mediterranean and Atlantic Isles in 2017, 25 percent in Northern Europe and the remaining 24 percent cruised outside Europe, primarily in the Caribbean.

Passenger Embarkations

An estimated 6.5 million cruise passengers embarked on their cruises from European ports in 2017.

- Italian ports, led by Venice, Civitavecchia, Savona and Genoa, were European market leaders with 1.8 million passenger embarkations in 2017.

- Spain was in second position with 1.45 million passenger embarkations during 2017. Barcelona and Palma were Spain's major embarkation ports.
- The United Kingdom was third behind Spain with 1.09 million embarkations. The principal embarkation ports for UK passengers were Southampton, Dover and Tilbury.
- The next four most important cruise embarkation countries were Germany, Denmark, France and Greece. Ports in Germany generated 880,000 passenger embarkations, followed by Denmark with 265,000, France with just under 239,000 and Greece with 228,000. The major embarkation ports in these countries were: Hamburg, Kiel and Rostock/Warnemunde in Germany, Copenhagen in Denmark, Marseille in France and Piraeus in Greece.

Table 5.2: Cruise Passengers by Country of Embarkation, 2015 & 2017

Country	2015 Passengers	2017 Passengers	2017 Share of Total
Italy	2,000,000	1,795,700	27.6%
Spain	1,282,000	1,445,800	22.3%
UK	1,060,000	1,094,000	16.8%
Germany	584,800	880,200	13.6%
Denmark	185,000	265,000	4.1%
France	309,600	239,000	3.7%
Greece	201,200	228,100	3.5%
Netherlands	86,000	124,000	1.9%
Malta	70,300	108,000	1.7%
Sweden	92,800	88,000	1.4%
Cyprus	33,000	35,700	0.5%
Croatia	31,400	34,400	0.5%
Portugal	24,400	32,022	0.5%
Other EU + 3	57,400	55,478	0.9%
EU+3	6,017,900	6,425,400	98.9%
Other Europe ¹	104,400	70,500	1.1%
Total	6,122,300	6,495,900	100.0%

¹ Montenegro, Russia, Ukraine, and Turkey (Europe only)
Source: G. P. Wild (International) Limited.

Port-of-Call Visits

There were an estimated 34.14 million cruise passenger visits across the European ports-of-call. The vast majority of these calls are at the Mediterranean and Baltic Sea ports. Including the Black Sea and Atlantic Isles the region as a whole includes around 260 ports visited by cruise ships. The top ten destination countries accounted for 83% of cruise passenger visits in 2017. The top three are in the Mediterranean⁹ and accounted for 51% of all European passenger visits while the Baltic ports accounted for another 10%.

- Led by Civitavecchia, Naples, and Livorno, Italian ports also hosted 6.8 million passenger visits in 2017 making Italy the largest cruise destination in Europe.

- With the inclusion of the Canary Islands, Spanish ports received nearly 6.7 million cruise passenger visits in 2015.
- Greece has maintained its ranking as the third most popular destination in Europe with 4.09 million passenger visits in 2017. Santorini, Piraeus, Mykonos, Corfu and Katakolon were the leading destination ports.
- With just over three million cruise passengers arriving at French ports in 2017, France moved ahead of Norway as the fourth largest cruise destination. The principal destination ports in France are: Marseille, the Cote d'Azur ports, Corsican ports and Le Havre.
- Norway was just behind in fifth place with three million visits and remained the leading destination in Northern Europe, led by Bergen, Geirangerfjord, Stavanger and Oslo.

Table 5.3: European Cruise Port of Call Visits by Country of Destination, 2015 & 2017

Country	2015 Passenger Visits	2017 Passenger Visits	Share of Total
Italy	6,800,000	6,795,500	19.9%
Spain	5,932,000	6,672,200	19.5%
Greece	4,176,500	4,090,000	12.0%
France	2,390,000	3,013,500	8.8%
Norway	2,508,000	3,004,000	8.8%
United Kingdom	1,017,000	1,415,000	4.1%
Portugal	1,278,300	1,260,200	3.7%
Croatia	1,141,600	1,090,400	3.2%
Sweden	518,900	590,900	1.7%
Malta	530,000	564,600	1.7%
Denmark	446,500	556,500	1.6%
Estonia	490,200	543,800	1.6%
Finland	449,500	496,800	1.5%
Gibraltar	343,500	405,000	1.2%
Belgium	233,000	395,500	1.2%
Germany	332,000	390,100	1.1%
Iceland	262,000	359,900	1.1%
Netherlands	319,000	330,300	1.0%
Ireland	232,000	262,000	0.8%
Poland	232,000	138,800	0.4%
Latvia	82,700	86,000	0.3%
Other EU ¹ + 3	81,800	203,600	0.6%
EU+3	29,796,500	32,664,600	95.7%
Other Europe ²	1,508,300	1,483,500	4.3%
Total	31,304,800	34,148,100	100.0%

¹ Bulgaria, Cyprus, Lithuania, Romania and Slovenia

² Montenegro, Russia, Ukraine, Turkey (Europe only)

6. Shipbuilding in Europe

Despite the long-term decline of merchant shipbuilding in Europe, the region has retained market share in a number of specialist sectors.

- The most important of these is cruise ship construction in which the European industry has been the world leader for nearly 50 years.

⁹ The majority of calls in Spain are at ports on their Mediterranean coast.

- Scheduled new ships at European shipyards have increased from 48 during the 4-year period of 2016-2019 to 66 over the 4-year period of 2018-2021. This represents a 38 percent gain in new ships.
- All but two of the oceanic cruise ships currently under construction through the end of 2021 are being built in European yards.
- The yards in Italy, Germany, France, and Finland are the most important suppliers to the market and currently account for 45 of the new ships due for delivery within Europe from 2018 to 2021.
- Germany and Italy are the current leaders with 60% of the European order book between them.
- Some diversification from the customary pattern is taking place with twenty mostly smaller ships under construction in Norway and other non-traditional countries.
- Although other non-European yards have the capacity and technology to build cruise ships, they may not have project management capability, aptitude or the desired balance of labour and skills required to deliver a cost effective result within a required budget in the contracted delivery time. However, Far Eastern yards have been studying the market diligently and the recent entry of China to the market is a significant milestone.
- The majority of cruise ships serving the European market are dry-docked in Europe, together with a number of North American ships summering in the region.
- European yards also undertake major conversions such as replacement of main engines and insertion of a mid-body to lengthen the ship.
- The outstanding reputation of European yards has meant that US cruise lines have continued to order ships in Europe despite the fluctuations of the US dollar against the euro.
- Europe offers an abundance of specialist skills and sophisticated technology in areas such as navigation and outfitting, which support European cruise ship construction and assist the yards in maintaining a competitive edge over their rivals in other parts of the world.
- The current allocation of the 2018-21 order book by European country of build is shown in Table 6.1

Table 6.1: Ocean-going Cruise Vessels – Scheduled European Newbuildings, 2018-2021

Country of Build	No	GT	Pax (LB)	Cost €M	Share of Cost
Italy	18	1,840.14	49,008	8,982	30.5%
Germany	14	1,963.22	47,358	8,819	30.0%
France	8	1,322.76	33,794	6,111	20.8%
Finland	5	770.800	21,164	3,077	10.5%
Norway	12	181.600	2,922	1,383	4.7%
Croatia	4	47,360	945	458	1.6%
Spain	2	48,000	596	356	1.2%
Poland	1	12,300	126	108	0.4%
Portugal	1	9,300	176	81	0.3%
Netherlands	1	5,739	100	65	0.2%
Total	66	6,201.23	156.18	29.44	100.0

Note: GT (Gross Tonnage), LB (Lower Berths), Pax (Passengers).

Total excludes two ships of non-European build (China).

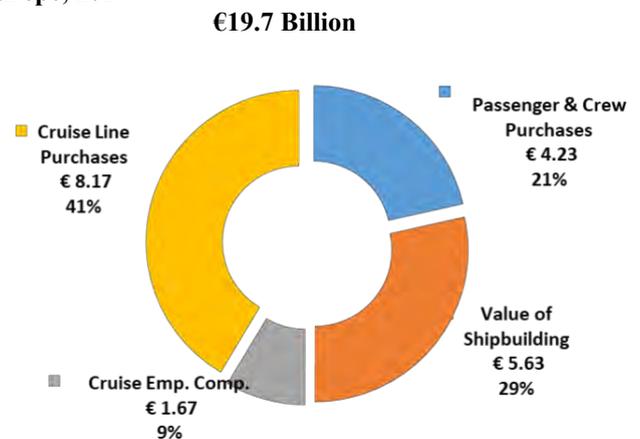
Source: G. P. Wild (International) Limited.

7. Direct Cruise Industry Expenditures in Europe: A Broadly Based Flow of Spending

Major Segments

Cruise tourism generated an estimated €19.7 billion in direct expenditures throughout Europe in 2017, an increase of 17 percent over 2015. As indicated in the following figure, these expenditures were broadly distributed across the four major source segments.

Figure 7.1: Direct Cruise Industry Expenditures in Europe, 2017



Shipbuilding

The global cruise industry spent €5.63 billion on shipbuilding in 2017; 29 percent of total cruise industry expenditures in Europe. This share is up from 27 percent of the total in 2015. After increasing by 13 percent in 2014 and 1.2 percent in 2015, expenditures for new construction and maintenance increased by 22 percent in 2017 over its 2015 levels.

- The continued increase in contracts placed with European yards over the past several years confirms Europe's continued pre-eminence in cruise shipbuilding over the remainder of the current decade and beyond.

Table 7. 1: Cruise Industry Expenditures for Newbuildings and Refurbishment (Millions), 2017

Country	Newbuildings	Refurbishment	Total
Italy	€ 1,623	€ 323	€ 1,945
Germany	€ 923	€ 268	€ 1,191
France	€ 900	€ 45	€ 945
Finland	€ 503	€ 52	€ 555
Other EU+3	€ 715	€ 277	€ 992
Total	€ 4,663	€ 965	€ 5,628

- About 83 percent of these expenditures relate to the work-in-progress for the construction of new cruise ships, with the remaining 17 percent covering conversion, refitting, refurbishment and maintenance of cruise ships.
- The four major shipbuilding countries in Europe saw significant variations in expenditures for new construction and maintenance in 2017. France and Italy saw expenditures increase by 81 percent and 54 percent, respectively. Expenditures in Finland rose by 9.8 percent. After a 23 percent decline in 2015, shipbuilding expenditures declined by an additional 6.7 percent in Germany in 2017.

Cruise Line Purchases

Cruise lines spent an additional €8.17 billion with European businesses in support of their cruise operations. This was 41% of the total direct cruise industry expenditures and an 18 percent increase from 2015. These purchases included a broad range of products and services and touched virtually every industry in Europe.

Among the major industries that benefited from the impact of direct cruise line spending were the following.

- Food and beverage manufacturers produced €807 million in provisions consumed on-board cruise ships by passengers and crew, an increase of 18 percent over 2015. This growth was primarily driven by the increase in passenger carryings throughout Europe as well as the increased costs of goods.
- Driven by a rise in fuel prices and increased shipyard newbuild and maintenance, the petrochemical industry received an estimated €901 million from cruise lines in 2017, a 14 percent increase from 2015. Petrochemical products include bunker fuels, lubricants, paint and cleaning supplies.
- Another €1.20 billion was spent for the manufacture of metals and machinery, including material handling equipment, engines, lighting equipment, communication equipment and computers. This represented a 21 percent increase over 2015.
- Spending for transportation and utilities totalled €1.95 billion and included spending for public utilities, travel agent commissions, port charges and ground transportation. This was a 17 percent increase from 2015 and was impacted by the increase in passenger visits throughout Europe as well as

additional support for cruise industry operations in the region.

Table 7. 2: Direct Cruise Lines Purchases by Industry (Millions), 2017 (Excluding Shipbuilding)

Industry	Purchases	Share of Total
Ag. Min., & Const.	€ 23	0.3%
Food & Beverage	€ 807	9.9%
Textiles & Apparel	€ 222	2.7%
Paper & Printing	€ 232	2.8%
Petroleum & Chemicals	€ 901	11.0%
Stone & Glass	€ 32	0.4%
Metals	€ 254	3.1%
Machinery	€ 946	11.6%
Other Manufacturing	€ 484	5.9%
Wholesale Trade	€ 135	1.6%
Transportation & Utilities	€ 1,954	23.9%
Financial & Bus. Svcs.	€ 1,676	20.5%
Personal Serv. & Gov't	€ 499	6.1%
Total	€ 8,165	100.0%

Note: In this and subsequent tables in the economic impact sections, the totals may differ from the sum of the components due to rounding.

- The cruise industry also spent an estimated €1.68 billion on financial and business services including: advertising, engineering and other professional services, computer programming and support services and direct mail and market research. This was an increase of 18 percent over 2015.

Cruise Passengers and Crew

Passengers and crew spent €4.23 billion at ports-of-embarkation and ports-of-call in 2017, accounting for 21 percent of total cruise industry expenditures. This was a 10 percent increase over 2015.

- The 6.5 million cruise tourists that embarked on cruises from European ports spent an estimated €1.89 billion on airfares, port fees, accommodation, excursions, food and beverages amongst others at the embarkation ports, 7.4 percent more than in 2015.
- European airfares accounted for approximately 72 percent of these expenditures by embarking passengers.
- The 34.10 million passenger visits at European ports-of-call generated an additional €2.17 billion in expenditures for tours, food and beverage, merchandise and other similar expenditures. This is an increase of 12.4 percent from 2015.
- An estimated 16.81 million crew members arrived at port cities during cruise calls. Of these an estimated 6.7 million disembarked and made purchases totalling an estimated €164.7 million, or €24.50 per crew visit.

Compensation of Cruise Line Employees

European cruise lines spent €1.67 billion on compensation for employees who resided in Europe during 2017, an 8 percent increase over 2015. These expenditures accounted for 8.5 percent of total cruise industry direct expenditures. The cruise lines employed an estimated 69,072 residents of Europe in their administrative offices and as crew on board their ships.

Table 7.3: Cruise Line Compensation Shares by Country, 2017 - Country of Residence of Employees

Country	Share of Total
UK	40%
Italy	33%
Germany	7.7%
Norway	6.8%
Spain	2.3%
France	2.2%
Portugal	2.0%
Ireland	1.1%
Ukraine	0.9%
Netherlands	0.8%
Romania	0.7%
Bulgaria	0.5%
Rest of EU+3	4.5%

Direct Expenditures by Country

As indicated in Table 7.4, businesses throughout Europe were directly impacted by the cruise industry.

- The three countries of Italy, the UK and Germany accounted for 63 percent of the direct expenditures of the cruise industry. Combined these three countries experienced an increase of 16 percent in direct expenditures from 2015. These countries participated in all segments of the industry:
 - Serving as major source and destination markets for cruise passengers,
 - Maintaining headquarters facilities and providing crew,
 - Providing shipbuilding and/or repair services, and
 - Provisioning and fuelling of cruise ships.

Table 7.4: Direct Cruise Industry Expenditures by Country, 2017 - Millions

Country	Direct Spending	Share of Total
Italy	€ 5,463	27.7%
UK	€ 3,850	19.5%
Germany	€ 3,140	15.9%
Spain	€ 1,481	7.5%
France	€ 1,679	8.5%
Finland	€ 703	3.6%
Norway	€ 712	3.6%
Greece	€ 546	2.8%
Netherlands	€ 563	2.9%
Sweden	€ 269	1.4%
Top 10	€ 18,408	93.5%
Portugal	€ 258	1.3%
Denmark	€ 253	1.3%
Croatia	€ 110	0.6%
Malta	€ 111	0.6%
Gibraltar	€ 72	0.4%
Next 5	804	4.1%
Rest of the EU+3	€ 485	2.5%
Total	€ 19,698	100.0%

Direct expenditures among the top five countries was up 17 percent from 2015 – from €13.32 billion to €15.61 billion.

- France led the way with a 36 percent increase in direct expenditures –and accounted for nearly 11 percent of the total direct expenditures among the top 5 countries. Spending increased in the shipbuilding and passenger and crew spending categories. Shipbuilding led the way with an 81 percent increase. Spending by cruise lines, including the compensation of their employees residing in France was up by 7.5 percent.
- Italy experienced a 20 percent growth in direct expenditures over 2015. These gains were driven by a 54 percent gain in shipbuilding and repair – representing nearly 75 percent of the total gains Italy experienced since 2015. Cruise line purchases for goods and services, including employee compensation rose by 11 percent. Passenger and crew spending across Italy’s ports was down by 2.1 percent over 2015. This is due to an overall decrease in all passenger types – sourced, embarks and port of call.
- Direct expenditures in the UK rose by 18 percent during 2017 over 2015. Spending by passengers and crew at UK port cities increased by more than 13 percent as a result of a 3.2 percent increase in embarking passengers and more than a 50 percent increase in port of call visits. Spending by at UK shipyards was up slightly at 2.1 percent. Cruise lines spending for goods and services in support of cruises, including resident employee compensation was up by 20 percent over the 2015 levels.
- Overall, Spain experienced a 12 percent increase in direct cruise industry expenditures in 2017 over

2015. Gains were seen across all four major expenditure categories, including a 15 percent increase in the combined passenger and crew spending at cruise destinations in Spain. Cruise line purchases at Spanish ports, including employee compensation were up 5.6 percent from two years earlier, and ship repair and maintenance increased by 6.4 percent.

- Germany experienced smaller gains in direct cruise sector expenditures with an overall gain of 6.6 percent. The growth in Germany occurred across three of four of the major categories of spending. The growth was led by a 34 percent increase in the combined spending of passengers and crew members. Cruise lines spending for goods and services in support of cruises, including resident employee compensation was up by 13 percent over the 2015 levels. These gains were somewhat tempered by a 6.7 percent decrease in shipbuilding and repair expenditures in Germany from 2015 to 2017.

The remaining five countries in the top ten experienced an aggregate gain of 14.0 percent in total direct expenditures. This was the net result of gains in the four countries of the Netherlands (21%), Norway (19%), Finland (12%), and Greece (12%). Sweden was the only country of the top 10 to experience a decrease in direct expenditures (0.7%).

- The Netherlands' growth of 21 percent resulted from gains in three of the four major categories of direct expenditures: passenger and crew spending, cruise line employment compensation, and cruise line purchases. These gains were driven primarily by a 44% increase in embark passengers and a 15% increase in port-of-call passengers. Aggregate spending by cruise lines in support of cruise operations, increased by nearly 30%.
- Norway's 19 percent increase in direct expenditures was primarily the result of a 19.3 percent increase in passenger and crew spending at the country's ports – driven by a 20 percent increase in passengers and crew. Spending for ship maintenance also rose. Aggregate spending by cruise lines in support of cruise operations also rose by 22 percent.
- Direct expenditures in Finland rose by 12 percent during 2017. Finland's growth was primarily driven by the 9.8 percent increase in spending for shipbuilding and maintenance. In addition, passenger and crew spending at Finland's cruise destinations increased by 13 percent. Aggregate spending by cruise lines in support of cruise operations also rose by 23 percent.
- Greece saw its direct expenditures increase by 12 percent in 2017 over 2015. This was primarily concentrated in spending by cruise lines in support of their cruise operations. Passenger and crew spending grew 1.1 percent due to a 13 percent

increase in embark passengers which was offset by a 2.1 percent decrease in port-of-call passengers. This resulted in an overall decrease of 1.4 percent in total passengers.

- Direct expenditures in Sweden during 2017 was down by about 1 percent. This drop was primarily driven by decreases in both embarking and source passengers and their associated spending. Source passengers were down 25 percent, while embarks were down 5.2 percent over 2015. An increase in transit passengers, and their associated spending, somewhat offset this decrease in spending.
- The next five countries had direct cruise industry spending of between €72 million and €258 million. These five countries were primarily impacted as passenger destination markets and experienced an aggregate increase in direct expenditures of 14 percent since 2015. Direct spending totalled €804 million during 2017 across these five countries.

The remaining countries all had direct cruise industry expenditures of under €70 million. These countries were primarily impacted as either source markets, destination markets or as sources for crew. Some nations that had more significant impacts include the following:

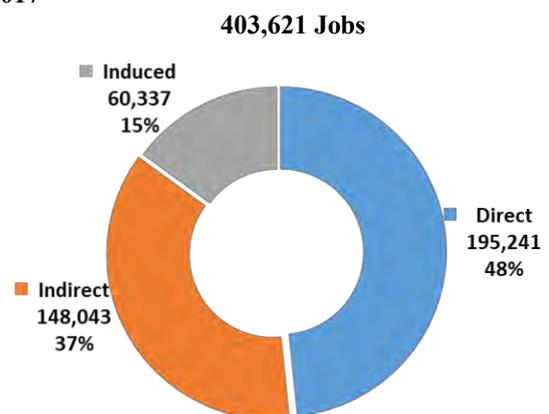
- Passenger Source Markets: Austria, Cyprus and Switzerland.
- Passenger Destination Markets: Belgium, Cyprus, Estonia, Iceland, Ireland.
- Crew: Bulgaria, Hungary, Ireland, Poland, and Romania.

8. The Economic Benefits of Cruise Tourism

Employment Impacts

The €19.70 billion in direct cruise tourism expenditures throughout Europe in 2017 generated an estimated 403,621 jobs (direct, indirect and induced), up by 12 percent from 2015.

Figure 8. 1: Total Employment Impact in Europe, 2017



Direct Employment Impacts

The direct cruise tourism expenditures directly generated an estimated 195,241 jobs. These included employees of the cruise lines, direct suppliers to the cruise lines and employees of establishments providing goods and services to passengers.

The direct economic impacts of the cruise industry are derived from a broad range of activities including:

- Port services and cruise industry employment;
- Transportation of cruise passengers from their place of residence to the ports of embarkation;
- Travel agent commissions;
- Spending for tours and pre- and post-cruise stays in European port cities;
- Passenger spending for retail goods in European port cities; and
- Purchases of services and supplies by the cruise lines from European businesses.

The direct jobs generated by the cruise industry are located on cruise ships, in headquarters of cruise lines, at travel agencies that sell cruises, at manufacturing plants that provide goods consumed on cruise ships, at shipyards, advertising agencies and at hotels that are used by passengers for pre- and post-cruise stays.

As indicated in Table 8. 1, the direct employment impacts are broadly based and include the following:

- Cruise lines directly employed an estimated 69,072 European residents in their administrative offices and on-board cruise ships. They accounted for 35 percent of the direct employment impacts.
- European manufacturers employed an estimated 52,536 workers, 27 percent of the direct jobs. The total number of manufacturing jobs generated by cruise industry expenditures increased by 18 percent from 2015.
 - European shipyards employed an estimated 32,097 workers on the construction and repair of cruise ships. As a result of the 22 percent increase in the expenditures for ship construction and repair from 2015, employment at European shipyards increased by 18 percent.

Table 8.1: Direct Cruise Industry Employment by Industry, 2017

Industry	Direct Jobs	Share of Total
Agr., Mining & Constr.	244	0.1%
Manufacturing	52,536	26.9%
Food & Beverages	3,227	1.7%
Textiles & Apparel	2,198	1.1%
Paper & Printing	1,438	0.7%
Petroleum & Chemicals	1,324	0.7%
Stone, Clay & Glass	198	0.1%
Metals	2,796	1.4%
Machinery	5,509	2.8%
Electrical Machinery	1,390	0.7%
Shipbuilding	32,097	16.4%
Other Manufacturing	2,359	1.2%
Wholesale & Retail Trade	12,554	6.4%
Hospitality	7,287	3.7%
Transportation & Utilities	26,470	13.6%
Air Transport	6,543	3.4%
Transport Services	17,401	8.9%
Other Transport & Utilities	2,526	1.3%
Financial & Business Svcs.	15,794	8.1%
Finance, Ins. & Real Estate	1,346	0.7%
Business Services	14,448	7.4%
Personal Services & Govt	11,284	5.8%
Subtotal	126,169	64.6%
Cruise Line Employees*	69,072	35.4%
Grand Total	195,241	100.0%

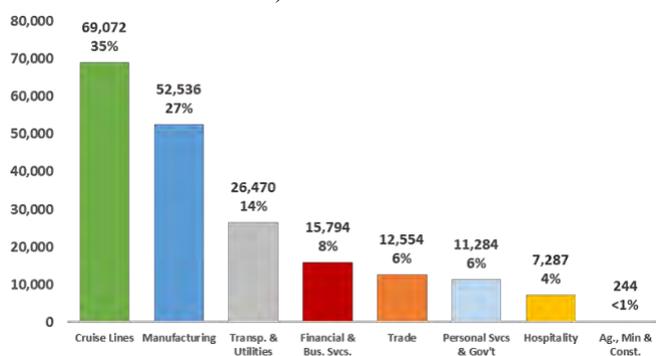
* European Nationals

- An estimated 3,227 jobs were generated in the food and beverage industry to produce food and beverage items consumed on cruise ships.
- Nearly 9,700 workers were employed in the metals, machinery and electrical machinery industries to produce structural metal products and equipment used in offices and on cruise ships. This was an increase of 21 percent over 2015.
- The wholesale and retail trade sector employed an estimated 12,554 workers to provide goods to the cruise lines and their passengers. Employment in this sector rose by 19 percent from 2015.
- The Transportation and Utilities sector employed 26,470 workers, 14 percent of the total and a 14 percent increase over 2015. These included air transportation workers dependent on air travel by passengers and crew, truck drivers who deliver goods to cruise ships, travel agents who sell cruises and tour operators that provide onshore excursions.
- Financial and business service providers employed nearly 15,800 persons, including insurance agents, financial advisors, computer programmers, engineers, management consultants, lawyers and accountants. They accounted for 8.1 percent of the total direct employment impacts and rose by 13 percent over 2015.
- Nearly 7,300 workers were employed in the hospitality industry (hotels, restaurants and amusement enterprises) as a direct result of passenger and crew

spending during their cruise vacations. This was an increase of 9.9 percent from 2015 and accounted for 3.7 percent of the direct jobs.

- Finally, 11,284 jobs were generated in the personal services, & government sectors, an increase of 17 percent from 2015. These include photographers, health care employees and social service providers, among others.

Figure 8.2: Direct Employment by Sector, 2017
195,241 Jobs



Total Employment Impacts

As indicated in Table 8.2 an estimated 403,621 total jobs, comprising direct, indirect and induced employment, were generated throughout Europe by the cruise industry in 2017, an increase of 12 percent over 2015.

- European manufacturers employed nearly 98,100 workers, 24 percent of the total jobs, as a result of the total economic impact of the cruise industry. This is an increase of 15 percent from 2015 which is directly related to the increase in cruise ship construction and increased passenger carryings.
 - Transportation equipment industry employed an estimated 38,705 workers, the majority (80%+) of which were employed working on the construction and maintenance of cruise ships and other vessels.
 - Nearly 13,000 jobs were generated in the food, textiles and apparel industries as result of cruise line, passenger and household demand for food, clothing and related products.
 - Nearly 28,400 workers were employed in the metal and machinery industries primarily as a result of direct and indirect demand from the shipbuilding industry.
- As noted previously, cruise lines directly employed 69,072 European residents in their administrative offices and on-board cruise ships. They accounted for 17 percent of the total employment impacts.
- Financial and Business Services accounted for 19 percent of the total employment impacts with 77,090 jobs. While the total impacts measured in this section were spread throughout all components of this sector, the impacts were most heavily concentrated in the area of business services.

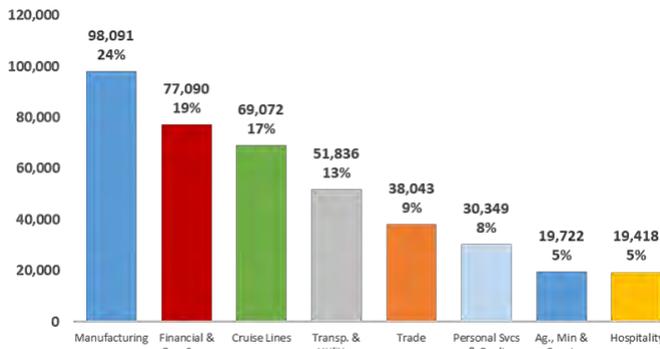
- Combined, the Trade and Hospitality sectors accounted for 14 percent of the total employment impacts, which amounted to 57,461 total jobs. The trade jobs were primarily among wholesale trade establishments, while the hospitality jobs were concentrated in hotels and eating and drinking outlets.

Table 8.2: Total Employment by Industry, 2017

Industry	Total Jobs	Share of Total
Agr., Mining & Constr.	19,722	4.9%
Manufacturing	98,091	24.3%
Food & Beverage	6,814	1.7%
Textiles & Apparel	6,146	1.5%
Paper & Printing	5,398	1.3%
Petroleum & Chemicals	4,948	1.2%
Stone & Glass	1,616	0.4%
Metals	14,004	3.5%
Machinery	9,018	2.2%
Electrical Machinery	5,340	1.3%
Transportation Equipment [1]	38,705	9.6%
Other Manufacturing	6,102	1.5%
Wholesale & Retail Trade	38,043	9.4%
Hospitality	19,418	4.8%
Transportation & Utilities	51,836	12.8%
Air Transport	7,410	1.8%
Transport Services	25,100	6.2%
Other Transport	12,358	3.1%
Communications & Utilities	6,968	1.7%
Financial & Business Svcs.	77,090	19.1%
Finance, Ins. & Real Estate	11,775	2.9%
Business Services	65,315	16.2%
Personal Services & Govt	30,349	7.5%
Subtotal	334,549	82.9%
Cruise Line Employees	69,072	17.1%
Grand Total	403,621	100.0%

- Transportation and Utility services accounted for 13 percent of the total employment impacts with just over 51,800 jobs. This reflects the direct demand generated by the cruise industry and the strong business to business and consumer goods and services dependency on the transportation sectors.
- Just over 19,700 total jobs, amounting to 4.9 percent of the total employment impacts were generated in the Agriculture, Mining and Construction segments. Nearly two-thirds of these were in the Agriculture sector
- The Personal Services and Government sector accounted for 7.5 percent of the total employment impacts with nearly 30,500 total jobs. These jobs were concentrated in the education, medical care and social services industries.

Figure 8. 3: Total Employment by Sector, 2017
403,621 Jobs



Total Employment by Country

As indicated in Table 8. 3, the European cruise industry was responsible for generating employment in each of the EU+3 countries. The employment impacts were, however, concentrated in 10 countries, accounting for 89 percent of the industry's total job creation. The next five countries each had total employment impacts in excess of 3,000 jobs and accounted for 6.1 percent of total job creation. The remaining countries accounted for 5.1 percent of total employment impacts generated by the industry.

The Top Ten

The three countries of Italy, the UK and Germany accounted for 63 percent of the direct expenditures of the cruise industry and the 62 percent of the total employment impacts. These three countries experienced a combined increase of 16 percent in direct expenditures and a 12 percent increase in total employment from 2015.

- Italy accounted for about 30 percent of the total employment impacts with 119,052 jobs. This share was up slightly from 29 percent in 2015, but it represented a 16 percent increase in the total employment impact.
 - As Europe's largest cruise destination market, the transportation and utilities, trade, and hospitality industries accounted for a combined 27 percent of the total employment impacts.
 - The manufacturing sector accounted for 28 percent of the total impact with these jobs concentrated in the shipbuilding and metals industries.
 - The cruise lines directly employed an estimated 14,910 Italian residents as crew and administrative staff, 13 percent of the total employment impacts.
- The United Kingdom accounted for 20 percent of the total employment impacts with an estimated 82,410 jobs, an increase of over 11 percent since 2015.
 - As Europe's second largest cruise passenger source market, the transportation and utilities, trade, and hospitality industries accounted for a combined 22 percent of the total employment impacts.

- The Financial and Business Services sector accounted for 22 percent of the total impact. These jobs were primarily in the advertising, professional consulting and insurance industries.
- The cruise lines directly employed an estimated 17,180 UK residents as crew and administrative staff, which accounted for 21 percent of the total employment impacts.

Table 8. 3: Total Employment by Country, 2017

Country	Total Jobs	Share of Total
Italy	119,052	29.5%
UK	82,410	20.4%
Germany	48,490	12.0%
Spain	31,233	7.7%
France	19,973	4.9%
Norway	16,831	4.2%
Finland	10,756	2.7%
Greece	10,721	2.7%
Portugal	9,984	2.5%
Netherlands	8,992	2.2%
Top 10	358,442	88.8%
Romania	7,363	1.8%
Poland	5,039	1.2%
Bulgaria	4,846	1.2%
Croatia	3,988	1.0%
Sweden	3,385	0.8%
Next 5	24,620	6.1%
Rest of EU+3	20,559	5.1%
Total	403,621	100%

- Germany accounted for 12 percent of the total employment impacts with an estimated 48,490 jobs, an increase of 6.2 percent from 2015. Germany saw its overall share of European employment decrease from about 13 percent in 2015. This relative decline resulted from the impact of the 6.7 percent decline in cruise industry spending at German shipyards.
 - Manufacturing, with 12,836 impacted jobs, accounted for 26 percent of the total employment impact.
 - As Europe's largest cruise passenger source market, Germany's transportation (excluding cruise line employees), trade, and hospitality industries accounted for a combined 21 percent of the total employment impacts.
 - The cruise lines directly employed an estimated 4,690 German residents as crew and administrative staff, which accounted for 9.7 percent of the total employment impacts.

The remaining seven countries in the top ten tended to be impacted in two or three primary segments.

- Spain, as a major source and destination market with some headquarters had 31,233 jobs, an increase of 9.3 percent over 2015. Cruise line employees accounted for about 4.0 percent of its total employment impact, while the transportation and

utilities, trade, and hospitality industries accounted for 37 percent of the impact.

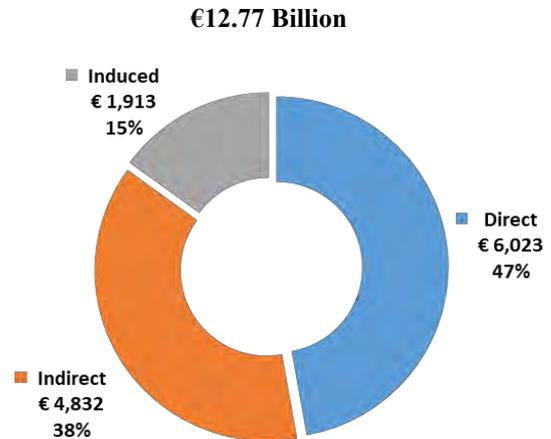
- France is a shipbuilding centre and a source and destination market. It had a total employment impact of 19,973 jobs, an increase of 21 percent from 2015. The manufacturing sector accounted for 28 percent of the total. The transportation and utilities, trade, and hospitality industries accounted for 33 percent of the total employment impact.
- Norway provides ship maintenance services, crew, and is a destination market. Norway had a total employment impact of 16,831, up 14 percent from 2015. Manufacturing jobs, including shipbuilding, accounted for 19 percent of the total employment impact in Norway, cruise line employees accounted for 27 percent and the ground transportation and trade industries accounted for 23 percent.
- Finland features primarily as a shipbuilding centre and a port of call, receiving nearly 500,000 in-transit passengers in 2017. Its employment impact in excess of 10,700 jobs increased by nearly 14 percent over 2015. The employment impact was concentrated in the manufacturing and financial and business services sectors, which accounted for 72 percent of the total jobs.
- Greece is primarily a destination market with some ship repair services and had a total employment impact 10,721 jobs, an increase of 7.4 percent from 2015. Approximately 59 percent of these jobs were in the transportation and trade sectors and 11 percent in manufacturing.
- Portugal is a source for crew and ship repair services and is also a cruise destination market. It had a total employment impact of just under 10,000 jobs, an increase of 3.7 percent from 2015. Employees of the cruise lines accounted for 39 percent of the total impact and the transportation and utilities, trade and hospitality sectors accounted for 25 percent.
- The Netherlands is primarily a source market for cruise industry purchases and ship maintenance, however, embarking passengers rose by 44 percent to 124,000 and transit passengers were up by nearly 16 percent to just over 330,000 passengers. Purchases by cruise lines amounted to 71 percent of the direct expenditures with shipbuilding accounting for another 17 percent. The total employment impact during 2017 was nearly 9,000 jobs, up 19 percent from 2015. The manufacturing sector was responsible for 27 percent of the total employment impacts while the transportation, trade and hospitality sectors accounted for 28 percent.

The remaining countries were primarily impacted as source markets, destination markets or as sources for crew. As a result, most of the jobs generated in these countries were either as crew or in the transportation, trade and hospitality sectors.

Compensation Impacts

The cruise industry is also responsible for the generation of significant income throughout Europe. The 403,621 total jobs generated by cruise tourism also generated €12.77 billion in total compensation, which is comprised of direct, indirect and induced impacts.

Figure 8. 4: Total Compensation Impact in Europe, 2017



Direct Compensation Impacts

The cruise tourism expenditures directly generated €6.02 billion in compensation throughout Europe during 2017, an increase of 15 percent from 2015. This compensation included income received by employees of the cruise lines, direct suppliers to the cruise lines and the employees of establishments providing goods and services to cruise passengers.

The distribution of compensation among the major industries in Europe is similar to but not identical to the employment distribution. The differences are due to the wage differentials among the impacted industries and the countries in which the jobs are generated.

As indicated in Table 8.4 the direct compensation impacts are broadly based and include the following.

- The 69,072 European residents directly employed by the cruise lines received €1.67 billion in compensation. They accounted for about 28 percent of the direct compensation impacts.

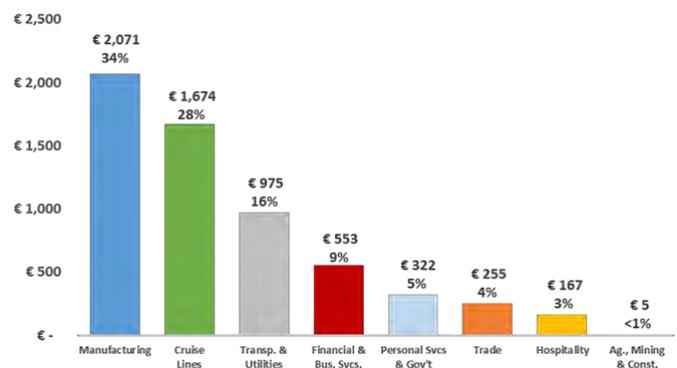
Table 8.4: Direct Cruise Industry Compensation by Industry, 2017

Industry	Direct Compensation Millions	Share of Total
Agr., Mining & Constr.	€ 5	0.09%
Manufacturing	€ 2,071	34.38%
Food & Beverage	€ 105	1.74%
Textiles & Apparel	€ 53	0.87%
Paper & Printing	€ 59	0.98%
Petroleum & Chemicals	€ 79	1.32%
Stone & Glass	€ 7	0.12%
Metals	€ 80	1.33%
Machinery	€ 176	2.93%
Electrical Machinery	€ 58	0.96%
Shipbuilding	€ 1,367	22.69%
Other Manufacturing	€ 87	1.44%
Wholesale & Retail Trade	€ 255	4.24%
Hospitality	€ 167	2.78%
Transportation & Utilities	€ 975	16.19%
Air Transport	€ 336	5.57%
Transport Services	€ 573	9.51%
Other Transport & Utilities	€ 67	1.11%
Financial & Business Svcs.	€ 553	9.18%
Finance, Ins. & Real Estate	€ 96	1.60%
Business Services	€ 457	7.58%
Personal Services & Govt	€ 322	5.34%
Subtotal	€ 4,349	72.21%
Cruise Line Employees	€ 1,674	27.79%
Grand Total	€ 6,023	100.00%

- The 52,536 European manufacturing employees dependent on cruise-related spending earned an estimated €2.07 billion in compensation, amounting to 34 percent of the total direct compensation.
 - Employees of European shipyards engaged in the construction and maintenance of cruise ships received an estimated €1.37 billion in compensation in 2017, an increase of nearly 19 percent over 2015.
 - Employees in the food and beverages industry earned €105 million, an increase of 19 percent from 2015, from the production of provisions consumed by cruise passengers and crew.
 - Workers directly employed in the metals and machinery industries earned €314 million producing a broad range of equipment used on cruise ships and in administrative offices, an increase of 17 percent from 2015.
- It was estimated that the 12,554 wholesale and retail trade sector employees directly employed as a result of cruise industry experienced a 22 percent increase in direct compensation. Direct compensation increased from €210 million in 2015 to €255 million in 2017.
- It was also estimated that the 26,470 workers directly employed in Transportation & Utilities sector earned €975 million, 16 percent of the total direct compensation impacts and an increase of 15 percent from 2015.

- The 15,794 persons calculated to be employed in the Financial and Business Services sector were paid €553 million, which amounted to 9.2 percent of the direct compensation impacts and an increase of 17 percent over 2015.
- The 7,287 workers that were employed in the hospitality sector as a direct result of passenger spending on their cruise vacations made €167 million in compensation and accounted for 2.8 percent of the total.
- In the Personal Services and Government sectors, it was estimated that the 11,284 directly generated jobs earned €322 million in compensation, 5.3 percent of the total direct compensation impacts.

**Figure 8.5: Direct Compensation by Sector, 2017
€6.02 Billion**



Total Compensation Impacts

As indicated in Table 8.5 an estimated €12.77 billion in total compensation, which combines the sums derived from direct, indirect and induced compensation, was earned by workers throughout Europe as a result of the European cruise industry in 2017, a 16 percent increase from 2015.

- The 98,091 European manufacturing jobs generated by the European cruise industry produced nearly €3.8 billion in total compensation. Manufacturing accounted for 30 percent of the total compensation impacts.
 - The 38,705 workers estimated to be employed in the manufacturing of transportation equipment earned an estimated €1.64 billion in 2017. Approximately 83 percent of these earnings were paid to workers in the shipbuilding and repair industry.
 - The 12,960 employees from the food, textiles and apparel industries earned €400 million in compensation as a result of cruise line, passenger and household demand for these products.
 - The nearly 28,400 workers employed in the metal and machinery industries primarily as a result of the direct and indirect demand from shipbuilding received €1,037 million in remuneration.

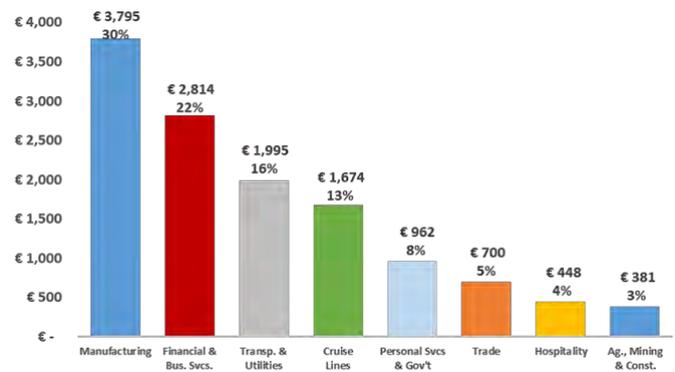
- A sum of €1.67 billion was paid in compensation to European residents that were directly employed by the cruise lines in 2017, 14 percent of total compensation impacts.
- Financial and Business Services were estimated to employ 77,090 workers due to the economic activities of the European cruise industry. These workers made €2.8 billion in remuneration and accounted for 22 percent of the total compensation impacts.
- Combined, the Trade and Hospitality sectors accounted for 9.0 percent of the total compensation impacts with €1.15 billion in earnings.
- The nearly 52,000 jobs created in the Transportation and Utilities sector as a result of the direct, indirect and induced impacts of the European cruise industry received just under €2.0 billion in employee compensation, amounting to 16 percent of the total impacts.

Table 8. 5: Total Compensation by Industry, 2017

Industry	Total Compensation Millions	Share of Total
Agr., Mining & Constr.	€ 381	2.98%
Manufacturing	€ 3,795	29.72%
Food & Beverage	€ 234	1.83%
Textiles & Apparel	€ 166	1.30%
Paper & Printing	€ 199	1.56%
Petroleum & Chemicals	€ 262	2.05%
Stone & Glass	€ 61	0.48%
Metals	€ 473	3.70%
Machinery	€ 326	2.55%
Electrical Machinery	€ 238	1.86%
Transportation Equipment[1]	€ 1,643	12.86%
Other Manufacturing	€ 194	1.52%
Wholesale & Retail Trade	€ 700	5.48%
Hospitality	€ 448	3.51%
Transportation & Utilities	€ 1,995	15.62%
Air Transport	€ 384	3.01%
Transport Services	€ 855	6.70%
Other Transport	€ 440	3.44%
Communications & Utilities	€ 316	2.47%
Financial & Business Svcs.	€ 2,814	22.04%
Finance, Ins. & Real Estate	€ 802	6.28%
Business Services	€ 2,011	15.75%
Personal Services & Govt	€ 962	7.54%
Subtotal	€ 11,095	86.20%
Cruise Line Employees	€ 1,674	13.80%
Grand Total	€ 12,769	100.00%

- The approximately 19,700 total jobs generated in the Agriculture, Mining and Construction industries benefitted from €381 million in compensation, 3.0 percent of the total.
- The Personal Services and Government sector accounted for 7.5 percent of total compensation impacts with €962 million in earnings. This was earned by the 30,349 workers that were employed as a result of the total impacts of the cruise industry in Europe.

**Figure 8.6: Total Compensation by Sector, 2017
€12.77 Billion**



Total Compensation by Country

Although the European cruise industry was responsible for generating compensation in each of the EU+3 countries, the majority of these impacts were concentrated in 10 countries, accounting for 95 percent of the industry's income creation. The next five countries each had total compensation impacts exceeding €35 million and accounted for another 3.1 percent of the total. The remaining 17 countries accounted for 1.9 percent of the total compensation impacts with less than €31 million each.

The Top Ten

The three countries of Italy, UK and Germany accounted for more than two-thirds of the cruise industry's total compensation impact in Europe.

- Italy accounted for 29 percent of the total compensation impacts with €3.69 billion in earnings, an increase of 18 percent over 2015.
- Manufacturing was responsible for 32 percent of the total impact with compensation totalling €1.19 billion and concentrated in shipbuilding and metals.
- As Europe's largest cruise destination market, the transportation and utilities, trade, and hospitality industries together amounted to 24 percent of the total compensation impacts and accounted for €876 million in earnings.
- The 14,910 workers calculated to be directly employed by the cruise lines earned €548 million, 15 percent of the total compensation impacts.
- The United Kingdom accounted for 25 percent of the total compensation impacts with €3.16 billion in earned income:
 - Manufacturing, with €791 million in total compensation accounted for 25 percent of the total compensation impacts. Manufacturing jobs were concentrated mainly in the machinery and food and tobacco industries.

- Financial and Business Services, with €759 million, were responsible for 24 percent of the total compensation impacts, concentrated in the advertising, professional consulting and insurance industries.
- As Europe's second largest source market, the transportation and utilities, trade and hospitality industries accounted for €625 million in compensation, amounting to 20 percent of the total compensation impacts.
- The 17,180 workers estimated to be directly employed by the cruise lines earned €675 million, which accounted for 21 percent of the total compensation impacts.

Table 8.6: Total Compensation by Country, 2017

Country	Total Compensation Millions	Share of Total
Italy	€ 3,686	28.9%
UK	€ 3,159	24.7%
Germany	€ 1,804	14.1%
Spain	€ 959	7.5%
France	€ 925	7.2%
Norway	€ 567	4.4%
Finland	€ 405	3.2%
Netherlands	€ 270	2.1%
Greece	€ 204	1.6%
Portugal	€ 148	1.2%
Top 10	€ 12,127	95.0%
Sweden	€ 141	1.1%
Denmark	€ 121	0.9%
Croatia	€ 60	0.5%
Switzerland	€ 41	0.3%
Malta	€ 38	0.3%
Next 5	€ 400	3.1%
Rest of EU+3	€ 242	1.9%
Total	€ 12,769	100.0%

- Germany accounted for 14 percent of the total compensation impacts with earnings amounting to just over €1.80 billion:
 - Manufacturing amounted to 36 percent of the total impact with €652 million in employee compensation. This reflects Germany's shipbuilding status, with jobs concentrated mainly in the shipbuilding and metals industries.
 - As Europe's largest cruise passenger source market, Germany's transportation and utilities, trade and hospitality industries accounted for a combined 20 percent of the total compensation impacts with €357 million in earnings.
 - The 4,690 workers directly employed by the cruise lines earned €127 million, 7.0 percent of total compensation impacts.
- The remaining seven countries in the top ten tended to be impacted in two or three primary segments:

- Spain, as a major source and destination market with some headquarters operations, had a total compensation impact of €959 million, accounting for 7.5 percent of the European total. Cruise line employees were responsible for 3.9 percent of the impact and the transportation and utilities, trade, and hospitality industries for 37 percent.
- France is a shipbuilding centre and a source and destination market. It had a total compensation impact of €925 million in earnings. The manufacturing sector accounted for about 37 percent, while the transportation and utilities, trade, and hospitality industries amounted to 29 percent of the total compensation impact.
- Norway provides ship maintenance services, crew, and is also a destination market. Norway had a total compensation impact of €567, up 19 percent from 2015. Manufacturing jobs, including shipbuilding, accounted for 25 percent of the total compensation impact in Norway, cruise line employees accounted for 20 percent and the ground transportation and trade industries accounted for 22 percent.
- Finland features primarily as a shipbuilding centre. Its compensation impact of €405 million was concentrated in the manufacturing and business services sectors, which accounted for 72 percent of the total impact.
- The Netherlands primarily provides support services and provisioning for cruise ships. It had a total compensation impact of €270 million in earnings, 2.1 percent of the total European impact. Manufacturing accounted for 41 percent and the Financial and Business Services sector for 20 percent.
- Greece is primarily a destination market with some ship repair services and had a total compensation impact of €204 million, 1.6 percent of the European total. The transportation and utilities and trade sectors accounted for a combined 60 percent of the compensation. An additional 15 percent comes from manufacturing.
- Portugal is a source for crew and ship repair services and is also a cruise destination market. It had a total compensation impact of €148, an increase of 9.6 percent from 2015. Employees of the cruise lines accounted for 23 percent of the total compensation impact in Portugal while the transportation, trade and hospitality sectors accounted for 37 percent.

The remaining countries were primarily impacted as source markets, destination markets or as sources for crew. As a result, most of the compensation generated in these countries was either as cruise line compensation or earnings in the transportation, trade and hospitality sectors.

Contributors and Sources of Information

The authors acknowledge the contribution made by individual cruise lines and shipbuilding members of Euroyards in providing the financial information underpinning the report.

The following are the other principal sources of information used in the report:

Port statistics published by Cruise Europe, MedCruise, Cruises in the Atlantic Islands, Cruise Norway, Cruise Baltic, Cruise Britain and individual port authorities;

CLIA statistical reports;

Cruise market analysis published in the International Cruise Market Monitor.

Glossary of Specialist Terms and Abbreviations

Term or Abbreviation	Definition
CLIA	Cruise Lines International Association, global trade association (representation in North and South America, Europe, Asia and Australasia) representing the interests of cruise lines, travel agents, port authorities and destinations, and various industry business partners.
CLIA Europe (ex ECC)	Established in 2014 from the European Cruise Council to promote the interests of cruise operators in Europe and represent their interests with the EU institutions in all matters of shipping policy and ship operations.
CLIA UK and Ireland (ex-PSA)	Established in 2014 out of the former Passenger Shipping Association. It is the national CLIA association in the UK and Irish market.
Compensation (Remuneration)	Compensation (remuneration, income) is the sum of wage and salary payments, benefits, including health and life insurance, retirement payments and any other non-cash payments; includes all income to workers paid by employers.
Cruise Europe	Organisation representing the interests of cruise ports located mainly in Northern European waters. Other organisations such as Cruise Baltic, Cruise Britain and Cruise Norway represent specific countries or smaller regions.
EU	European Union. Comprising 29 Member States (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Gibraltar, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.) The UK is expected to withdraw from the union in 2019.
EU+3	The EU countries listed above plus Iceland, Norway and Switzerland
Euroyards	Organisation representing leading European shipyards, including those building the majority of cruise ships currently on order.
Full time equivalents (FTEs)	Employment (jobs, workers) figures are expressed as full-time equivalent employment, a computed statistic representing the number of full-time employees that could have been

Term or Abbreviation	Definition
	employed if the hours worked by part-time employees had been worked by a full-time employee. Thus, FTE is always less than the sum of full-time and part-time employees.
Home Port	Port at which a cruise ship is based, normally for a series of cruises. May also be referred to as a base-port, embarkation port or turn around port.
International cruising	This normally refers to cruises on ships that visit ports in more than one country and are also marketed internationally. Other non-international cruising such as coastal and riverine is excluded from the scope of the current study.
Lower Berths	Used to measure the normal capacity of a ship when two beds in each cabin are occupied.
MedCruise	Organisation representing the interests of cruise ports located in the Mediterranean and adjacent waters.
Northern Europe	As defined by Cruise Europe, this region comprises cruise destinations in: the Baltic; Iceland, Norway and Faeroes; Europe West Coast (as far as Lisbon); and United Kingdom and Ireland. The Baltic is the largest sector.
OECD	Organisation for Economic Co-operation and Development, international organisation of 34 countries to promote policies that will improve the economic and social well-being of people around the world.
Pax	Abbreviation for passengers.
Pax-nights	Number of passengers in lower berths multiplied by the number of nights a ship is occupied during a cruise. May also be referred to as bed-days or pax-days.
Port-of-Call	Port at which a cruise ship calls during the course of a cruise. Also sometimes referred to as a transit port or destination port.



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APPENDIX SE8: METHODOLOGY FOR GEOGRAPHICAL DISTRIBUTION OF SOCIOECONOMIC IMPACTS

In this assessment I have applied the 'Place Based Analysis' as set out in Appendix A2 of the HM Treasury Green Book (2022). This explains that:

Place based effects should be adjusted for:

- substitution where firms substitute one type of labour for another to benefit from an intervention but do not increase employment or output.
- leakage which is the extent to which effects “leak out” of a target area into others. For an intervention designed to increase employment in a particular area, leakage could take the form of increased employment in neighbouring areas.
- displacement which is the extent to which an increase in economic activity or other desired outcome is offset by reductions in economic activity or other desired outcome in the area under consideration or in areas close by. For example, where a supported business takes market share from an unsupported business.

Where appropriate, employment multipliers can be applied following the adjustment for leakage, displacement and substitution. I have applied 'non-tradeable' multipliers, which the Green Book defines as measuring the effect deliverable within the assessment area.

Appropriate economic multipliers are based on professional judgement informed by various studies, particularly:

- HCA (now Homes England (HE)). (January 2014). Additionality Guide Fourth Edition.
- BIS. (October 2009). BIS Occasional Paper No. 1: Research to Improve the Assessment of Additionality.

APPENDIX SE9: HM GOVERNMENT POWERING UP BRITAIN



HM Government



POWERING UP BRITAIN

March 2023



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ISBN 978-1-5286-4017-6

E02888039 03/23

Printed on paper containing 40% recycled fibre content minimum

Printed in the UK by HH Global on behalf of the Controller of His Majesty's Stationery Office

Ministerial Foreword

From the coalfields that powered our Industrial Revolution, to the North Sea oil that helped fuel our growth during the final quarter of the 20th century, Britain has profited from access to cheap, abundant energy.

Yet a global pandemic, Putin's brutal war in Ukraine, and Britain's continued reliance on imported oil and gas have pushed up energy prices to unprecedented levels over the past year. The Government has stepped in this winter to pay half of the typical household's bills over winter and around half of wholesale energy costs for some businesses. And we've radically increased electricity generation from renewables like wind and solar. But much bigger challenges remain. How do we secure the reliable, affordable energy that we need to power Britain's future? How do we wean ourselves off the polluting sources of energy that are destroying our planet? And how do we make sure that families in this country can never be held hostage again by someone like Putin who uses energy as a tool of aggression?



We certainly won't find the answers to those questions by looking backwards. Russian gas, just like Vladimir Putin himself, belongs in the past. Instead, this is the moment we commit to a different future. One that breaks with the fossil fuels that powered our past two centuries. One that will meet Britain's long-term energy needs. One that will get bills down so they stay down, and deliver among the cheapest wholesale energy prices in Europe by 2035. One that will help us become a net zero economy by 2050, ending our contribution to global warming. And one that will boost economic growth, using Britain's unique assets and talents to drive the energy transition.

This document – Powering Up Britain – is the Government's blueprint for the future of energy in this country. By bringing together our Energy Security Plan, and Net Zero Growth Plan, it explains how we will diversify, decarbonise and domesticate energy production by investing in renewables and nuclear, to power Britain from Britain. It sets out the extraordinary opportunities opening up in technologies like Carbon Capture, Usage and Storage, Floating Offshore Wind Manufacturing, and hydrogen, which will not only help us reach net zero, but also consolidate Britain's position as a global leader in green energy. And it details how we will use that leadership to influence energy decarbonisation internationally.

The creation of a new Department for Energy Security and Net Zero in February was a clear statement of intent by this Prime Minister and this Government. Today, I am proud to be publishing the new Department's manifesto for the future. By setting Britain on course to greater energy independence, it will deliver energy security. By bringing down bills and keeping them down, it will deliver consumer security. By embracing renewables and nuclear power, it will deliver climate security. And by creating new green industries, it will deliver economic security.

A handwritten signature in black ink, appearing to read 'Grant Shapps', written in a cursive style.

Rt Hon Grant Shapps MP

Secretary of State for Energy Security and Net Zero

Introduction

One of the foundation stones of thriving economies is access to cheap, abundant and reliable energy. We rely on it to power our homes, our infrastructure, and industry. Affordable and plentiful energy also makes businesses more competitive, generating growth, jobs and prosperity. And it keeps the cost of living down.

When Putin invaded Ukraine in February 2022, it exposed mainland Europe's over-dependence on Russian gas. Despite the UK having very little direct exposure to Russian gas, we have all seen the consequence of his war in our bills. Since the end of February 2022, average wholesale gas and electricity prices have been over three times higher than their average over the preceding four years. Economies have slowed or contracted, inflation has risen, and household energy bills have soared across much of the western world.

As a nation we have stood firmly by the side of Ukraine and will continue to do so. We also stood firmly on the side of families across the UK paying around half of the average household's energy bills over winter and around half of wholesale energy costs for some businesses. However, our collective battle against Putin relies on us transitioning ourselves away from his expensive oil and gas and providing British energy for British homes.

That is why energy security is one of this Government's greatest priorities – and why the Prime Minister created the new Department for Energy Security and Net Zero in February.

After decades of reliance on imported fossil fuels, the new department's mission is to replace them with cheaper, cleaner, domestic sources of energy. We will be powered by renewables including wind and solar, hydrogen, power with carbon capture, usage and storage (CCUS) and new nuclear plants - while recognising the vital role that UK oil and gas will play in the transition. This will make us much more energy independent, to protect us from volatile international energy markets, while underpinning our clean energy transition, so the UK becomes a net zero economy by 2050. It will also help us make sure the UK has among the cheapest wholesale electricity prices in Europe by 2035.

Energy security and net zero are two sides of the same coin. We already have the right strategic approach, and we need to double down on delivery. The energy transition in line with net zero is one of the greatest economic opportunities for this country and we are committed to ensuring that the UK takes advantage of its early mover status. Rapid deployment of low carbon electricity will enable a systemic transformation across the economy working with technologies across the system to deliver cheaper, more secure energy. Further, global action to mitigate climate change is essential to long term

prosperity – the overall costs and risks of global warming are estimated to be equivalent to losing between 5% and 20% of global GDP each year.¹

The Government has set out a clear and consistent set of strategic objectives and a long-term policy framework. From the *Energy White Paper* in 2020 through the *Net Zero Strategy* in 2021 and in last year's *British Energy Security Strategy*. Our policies are backed by targeted government funding which, together with the policies set out in this package of documents, will leverage around £100 billion of private investment over the period to 2030, and our ambitions will support up to 480,000 jobs in 2030.

We are in a strong position to drive the energy transition ourselves. Between 1990 and 2021, we have cut our emissions by 48%, decarbonising faster than any other G7 country, whilst growing the economy by 65%. We are already in the top three countries within Europe over the past 5 years for clean energy investment in a transition that will see an opportunity worth £1 trillion for British businesses in low carbon products and services by 2030.^{2,3} Much of the technology is being developed here, and we have a strong and supportive business environment.

This paper sets out how the government will enhance our country's energy security, seize the economic opportunities of the transition, and deliver on our net zero commitments. To meet this ambition, the Department for Energy Security and Net Zero will deliver:

1. **Energy security:** setting the UK on a path to greater energy independence.
2. **Consumer security:** bringing bills down, and keeping them affordable, and making wholesale electricity prices among the cheapest in Europe.
3. **Climate security:** supporting industry to move away from expensive and dirty fossil fuels.
4. **Economic security:** playing our part in reducing inflation and boosting growth, delivering high skilled jobs for the future.

Achieving these objectives will support us to meet the **Prime Minister's priorities**, in particular to **halve inflation** and get our **economy growing**, to build a strong, stable and prosperous future, thereby **reducing debt** in the medium term, for our country.

Powering Up Britain – Delivering Energy Security and Net Zero

We are taking bold action to achieve our energy security and net zero objectives.

This package sets out how we will deliver our plans, including by:

Delivering Great British Nuclear (GBN): We are matching the global competition and scaling-up our nuclear programme by having launched GBN, responsible for driving delivery of new nuclear projects, backed with the funding it needs. The organisation will be initially led by an interim Chair and CEO and will be based in or around the Greater Manchester area. This body will support our ambition to ramp up nuclear capacity in the UK to up to 24GW by 2050. The first priority of GBN is to launch a competitive process to select the best Small Modular Reactor technologies.

Making a world-leading commitment to Carbon Capture, Usage and Storage: We are announcing the eight projects to progress to negotiations to form the first two CCUS clusters, in the North East and North West, and that we will launch a process to enable expansion of those Track-1 clusters later this year. We are also launching the process for confirming the next clusters for deployment in Track-2.

Delivering a Hydrogen economy: Our 2030 hydrogen production ambition could generate enough clean electricity to power all of London for a year. We are announcing a suite of developments that get that ambition underway: confirming the first winning projects from the £240 million Net Zero Hydrogen Fund, naming the two CCUS-enabled hydrogen projects moving forward on the Track-1 clusters, publishing a shortlist of 20 projects we intend to enter due diligence with for the first electrolytic hydrogen allocation round; and announcing our intention to open two further hydrogen funding rounds in 2023.

Accelerating deployment of renewables: Our goal is to develop up to 50GW of offshore wind by 2030 and to quintuple our solar power by 2035. We are opening the latest allocation round of the UK's world leading Contracts for Difference (CfD) scheme to incentivise investment in renewable energy. UK levy funded support for renewable power since 2010 has totalled around £80 billion.⁴ The UK is a world leader in offshore wind and floating turbines represent the next frontier. We are launching £160 million of funding for pilots of the Floating Offshore Wind Manufacturing Investment Scheme to build UK port infrastructure to further reduce the cost of offshore wind.

Reducing our reliance on fossil fuels to heat our buildings: The Government has an ambition to phase out all new and replacement natural gas boilers by 2035 at the latest and will further consider the recommendation from the *Independent Review of Net Zero* in relation to this. People's homes will be heated by British electricity, not imported gas. The Heat Pump Investment Accelerator will mean heat pumps are manufactured in the UK at a scale never seen before. We want to make it as cheap to buy and run a heat pump as a

gas boiler by extending the Boiler Upgrade Scheme by three years, and by rebalancing the costs of electricity and gas.

Reducing household bills by increasing energy efficiency: We are confirming plans for our new Energy Company Obligation scheme the Great British Insulation Scheme, extending help to a wider group of households. This will mean that around 300,000 of the country's least energy efficient homes could save £300-£400 each year as part of a £1 billion energy efficiency programme by March 2026. This will form part of our work to meet our 15% demand reduction target by 2030 which will not only help lower bills, but also support our net zero objectives.

Decarbonising transport: We are signalling our long-term plans for decarbonising road and air travel - continuing to provide strong market signals and incentives to drive supply chain development. We have published a final consultation on the Zero Emission Vehicle mandate: requiring that from 2024 an increasing percentage of manufacturers' new car and van sales are zero emission. We are announcing more than £350 million investment in electric vehicle charging infrastructure. We are also consulting on a long-term trajectory for Sustainable Aviation Fuel uptake in the UK through a mandate to be introduced from 2025.

Speeding up planning and networks: Alongside this document we have published a revised set of energy national policy statements for consultation, covering overarching energy, renewables, electricity networks, gas generation, and pipelines. On 23 February 2023 the Government published our Nationally Significant Infrastructure Project (NSIP) Action Plan, which sets out how the government will reform the consenting process to ensure the planning system can deliver for the future, to meet the demands of a greater number and complexity of cases and deliver against government's ambitions. The Electricity Networks Commissioner, Nick Winser, has been tasked to advise government on what more can be done to accelerate grid delivery, and will present recommendations to Ministers in June. We will respond with an action plan this year.

Mobilising private investment: Our updated 2023 *Green Finance Strategy*, will strengthen the UK's position at the forefront of the growing global green finance market while supporting the investment needed to meet our targets. This includes maximising the impact of the UK's public financing institutions, for example through the UK Infrastructure Bank with its £22 billion of financial capital. It also sets out our pathway for the UK to become the world's first Net Zero Aligned Financial Centre – equipping the market with the information and tools necessary to meet this goal.

Building on our COP26 Presidency: The UK will continue to lead internationally, building on our COP26 Presidency. Two of the documents we are publishing today – the 2030 Strategic Framework for International Climate and Nature Action and the HMG International Climate Finance Strategy – show what this leadership will look like in practice. We are delivering on our promises – including our £11.6 billion contribution to the

\$100 billion global climate finance goal. Our international work delivers on the UK's domestic agenda – improving energy security by accelerating the energy transition, bringing down costs of new technologies for our own net zero plans, and opening up huge economic opportunities for trade and investment.

Taking advantage of the energy transition

Investment is the key to delivering our energy security, carbon targets and seizing the economic benefits – the jobs, exports, and productivity gains – of the transition.

We need investment at scale across a range of sectors to rapidly rollout existing technologies and bring through transformative new ones. Established technologies, such as offshore wind turbines, need to be deployed at pace to meet our ambitions for decarbonising power and delivering wholesale UK electricity prices that rank among the cheapest in Europe by 2035. Meanwhile, a significant proportion of technologies we will need for 2050 are currently at the demonstration or prototype phase.⁵

The UK has demonstrated green and growth go hand in hand. Thanks to the Climate Change Act (2008) and Environment Act (2021), we have a strong legal framework for reaching net zero emissions by 2050, and we are doing the same for energy security through the Energy Bill, providing a clear signal to industry and investors. Over the last decade, the UK has developed a tremendous record for attracting investment into green industries through a range of financing mechanisms, and we are determined to build on this. Between the first CfD renewable allocation round in 2015, and the fourth in 2022, the per unit price of offshore wind fell by almost 70%.⁶ We have delivered the second highest amount of recorded low-carbon investment cumulatively across Europe over the last 5 years.⁷

Further, as the Prime Minister set out at COP27, 'there can be no solution to climate change without protecting and restoring nature'. In January this year, we set out our vision in the Environmental Improvement Plan, providing a blueprint not just to halt the decline of nature in our country, but to reverse it.

Government policy and funding commitments are already leading to real outcomes. Government committed £30 billion of domestic investment for the green industrial revolution at Spending Review 2021, £6 billion for energy efficiency for 2025-8 at the Autumn Statement 2022, and up to £20 billion for CCUS at Spring Budget 2023. This is supported by investments from across the UK's public financing institutions - the UK Infrastructure Bank (UKIB), British Business Bank (BBB), and UK Research and Innovation (UKRI) – as outlined in our refreshed 2023 *Green Finance Strategy*. The UKIB alone has £22 billion of financial capacity and a central mission to tackle climate change and promote economic growth across the UK, with clean energy expected to be the largest sector in its portfolio.⁸ Since November 2020, over 80,000 green jobs are currently being

supported or are in the pipeline across the UK economy as a result of new government policies and spending.⁹

Our vision for a transition to a green and sustainable future will provide new opportunities to grow and level up the UK economy and support hundreds of thousands of green jobs. The low carbon transition should be fair and affordable and not negatively impact businesses. In fact, world leading hydrogen hubs in places like Teesside, are bringing back investment to areas that experienced significant decline during the 20th century. Through our North Sea Transition Deal, we're helping to decarbonise oil and gas and protecting thousands of existing jobs. If we don't support the economy wide net zero transition, not only will we miss our carbon targets, but we will miss out on the opportunities green growth presents to business and consumers.

Securing UK investment in the race to develop green industries

Many countries have now recognised the economic benefits the transition will bring. Through our COP26 presidency, we encouraged an increase in net zero pledges from countries covering 30% to more than 90% of global GDP.¹⁰ Since the publication of the *British Energy Security Strategy* and *Net Zero Strategy* we have seen others follow the UK's lead in increasing their ambition on clean energy and supporting the net zero transition. The US has taken decisive action through the Inflation Reduction Act, and the EU has set out its plans to grow green industries through the Green Deal Industrial Plan.

The UK welcomes this increased global ambition on climate change. Alongside our partners and allies, we remain convinced that a multilateral approach is necessary to tackle climate change. All economies will need to take decisive steps to reduce global emissions. Increased investment in net zero technologies globally will unlock innovation and drive costs down, as well as create opportunities for UK exports. We will continue to work with partners to ensure that the clean transition does not come at the expense of our trusted global supply chains and the rules-based international system. We do not wish to participate in a discriminatory subsidy race, which will be harmful to many nations' intentions to transition. Our focus is on responding to investor and industry calls to provide the long-term certainty, strategic de-risking, and confidence that they need to invest in the technologies and infrastructure necessary to deliver our energy security and net zero objectives.

We will continue to stay at the forefront of the economic transformation to net zero and retain our edge to unlock further opportunities to invest in and grow green industries in the UK. This plan delivers both policy and funding measures to cement the UK as a prime destination for long-term investment, growing our green industrial base and unlocking export opportunities for British businesses. The measures in the 2023 *Green Finance Strategy*, along with measures announced at Spring Budget 2023, include reforms

to the pensions and insurance sector that will leverage the UK's deep capital markets to invest in the net zero transition and green industries in the UK. For example, through our package of reforms to Solvency II, we will support insurers to increase investment in long-term productive assets, including innovative green assets and renewable energy infrastructure.

The UK continues to be well placed to secure the economic benefits of the transition. The UK is among the most exciting countries in the world for green industries with one-in-six of all Foreign Direct Investment (FDI) backed cleantech projects in Europe in 2020.¹¹ This plan will see us build on our strengths and our comprehensive track record across a range of sectors:

- **Offshore wind** – We currently have the world's largest operational offshore wind farm project, Hornsea 2, and the second, third and fourth largest operational offshore wind farm projects in the world. Our innovative policy instruments like the CfD scheme make the UK a world leader in offshore wind.
- **Nuclear** – Nuclear energy has been used reliably and safely in the UK for over 60 years and we have extensive experience of the full nuclear life cycle, from front-end design through to decommissioning. One of the world's most advanced nuclear technologies is being developed here in the UK, with up to £210 million awarded to Rolls-Royce SMR Ltd in November 2021 to develop further their design for one of the world's first Small Modular Reactors (SMRs). We are matching the global competition and scaling-up our nuclear programme by having launched GBN, responsible for driving delivery of new nuclear projects, backed with the funding it needs.
- **CCUS** – The UK has one of the greatest CO₂ storage potentials of any country in the world, the UK Continental Shelf, with potential storage capacity estimated at 78 billion tonnes providing substantial opportunities for growth through international trade.¹² The Government will provide up to £20 billion of funding for early deployment of CCUS to unlock private investment and jobs. Government is making an ambitious series of announcements on CCUS, following the £20 billion funding announced at Spring Budget 2023, including announcing the eight projects to progress to negotiations to form the first two CCUS clusters, in the North East and North West. These projects are not the extent of our ambition. Later this year we will set out a process to launch the next expansion of Track-1, and we have now launched Track-2. A major CO₂ storage licensing round was launched last year, and we are developing a longer-term vision to set out how CCUS will support net zero.

- **Hydrogen** – The UK’s natural assets and technical expertise means we can be an early mover in both electrolytic ‘green’ hydrogen and CCUS-enabled ‘blue’ hydrogen production. There are over 200 companies working on hydrogen and fuel cell technologies in the UK, and we consistently feature in the top ten countries globally for hydrogen technology patent rates. We are announcing a shortlist of projects for due diligence and confirming further details on electrolytic hydrogen allocation rounds.
- **Electric Vehicle uptake and infrastructure** – In 2022, the UK had the second highest battery electric car sales in Europe, bringing the total number of plug-in vehicles on UK roads to over one million licensed, of which around 60% are battery electric.¹³ Charging infrastructure is also speeding ahead: public charging devices have more than tripled from 10,300 devices in January 2019 to over 38,700 in March 2023. We are building on that by publishing a final consultation on an ambitious Zero Emission Vehicle mandate, requiring an increasing percentage of new car and van sales to be zero emission.
- **Green Finance** – Behind every new net zero investment, sits a team of financial, legal, data and accountancy experts, presenting a huge opportunity for the UK financial sector and professional services. The UK’s financial sector already leads in green project financing and investment analytics. We set out how we will capture this opportunity in the *2023 Green Finance Strategy*.
- **Research and Tech sector** – The UK is a leading science superpower. We are widely recognised as global leaders in cutting edge areas like the most promising fusion energy technologies, and boast a world-class research base, with three of the top 10 universities globally.¹⁴ This means we are one of the best places to conceive, develop and deliver green technologies, putting us in a strong position to capitalise on the opportunities of a net zero economy.

There are significant opportunities for UK industry the whole way through the supply chain. We want UK companies to continue playing a key role in green supply chains, from nuclear to CCUS and electric vehicles. For example, nuclear power station Hinkley Point C has spent over £4.1 billion with suppliers in the Southwest to date and EDF anticipate that 64% of the construction value of the project will be spent with UK firms, with over 22,000 people nationwide currently working on the project.¹⁵

We are supporting the development and growth of resilient UK supply chains and targeting public funding strategically for key industries. Our Floating Offshore Wind Investment Scheme will provide up to £160 million to kick start investment in port infrastructure projects, supporting the growth of wind power manufacturing in the UK. To secure the economic opportunities of the transition to clean heat, £30 million will be provided through the Heat Pump Investment Accelerator, leveraging up to £270 million of private investment into manufacturing and associated supply chains.

The Government has already committed to supporting the automotive sector in its transition to electric vehicles with over £800m capital funding made available at the last spending review. We want the UK to be one of the best locations in the world to manufacture electric vehicles, with an end-to-end zero emission vehicle supply chain. Our ambitious ZEV mandate will put UK manufacturers at the forefront of the electric revolution, supported by delivery of charging infrastructure that government is funding in partnership with industry to boost demand and by our capital allowances reforms to boost investment with the introduction of full expensing for 3 years. In addition, the Automotive Transformation Fund and the long-term Advanced Propulsion Centre R&D programme are supporting the development and commercialisation of cutting-edge automotive technologies. In the coming months, after engagement with industry, the Government will build on these interventions to take decisive action to ensure future investment in zero emission vehicle manufacturing.

We are also supporting UK industry to increase their exports. The global transition to net zero creates a major market opportunity with exports within low carbon and renewable energy industries growing significantly faster than exports from the broader economy. In 2021, it is estimated exports from these sectors increased by 67% from 2020, compared to total exports which increased by 6%.¹⁶ In 2021-2022 alone, the economic impact of the new loans, insurance and guarantees provided by UKEF across the whole economy was up to £4.3 billion of UK Gross Value Added (GVA) and an estimated up to 72,000 UK jobs – 40,000 directly employed by exporters and a further 32,000 jobs supported indirectly through the UK supply chain. We are increasing UK Export Finance's maximum exposure limit from £50 billion to £60 billion. This provides additional capacity for UKEF to support exporters, including in green industries, to win contracts, fulfil orders and get paid.

To secure the investment we need, we use a range of different levers from tax to regulation through planning reform, targeted spending and international collaboration. These will play to the unique strengths of the UK. We are delivering:

- **A strong and supportive business environment:** the government is committed to making the UK the best place in the world to start and grow a business and we are ensuring the UK's tax system is one of the most competitive of the world's major economies. At Spring Budget 2023, we announced reforms to capital allowances which give the UK the joint most generous capital allowance regime in the OECD. We introduced full expensing for three years to support business investment, with a commitment to make the reform permanent when the fiscal conditions allow, and increased tax reliefs for R&D intensive Small and Medium Enterprises (SMEs). Together, these ensure the UK business tax system is one of the most competitive of the world's major economies.
- **Long-term policy certainty and agile and smart regulation to drive investment:** we are setting a clear policy framework on energy security and net zero, so

businesses can plan and invest with confidence. Smart and agile regulation, including the Zero Emission Vehicles mandate, the consultation on the Sustainable Aviation Fuels mandate as well as in areas such as building efficiency and heat pumps, will help drive demand for new products and services and accelerate innovation and investment. Sir Patrick Vallance's Pro-Innovation Regulation of Technologies Review on green industries demonstrates we can move quickly to ensure regulation supports innovation and investment. Government will break down the barriers to deployment, to allow projects and investment to happen more quickly.

- **Revenue models, financing mechanisms and market frameworks:** in emerging sectors we are establishing clear market frameworks (including through the Energy Bill), so the private sector can invest with confidence. This includes revenue models that give investors more certainty about the returns they will make: from CfDs and business models for hydrogen, through to the Nuclear Regulated Asset Base (RAB) model and models for CCUS. To complement this, our green finance policy framework seeks to ensure sufficient private capital is available to finance our net zero objectives.
- **Targeted public investment:** Public spending has a role to play where industry and households cannot, for instance making our schools and hospitals greener through the Public Sector Decarbonisation Scheme (PSDS). Further, in areas where investors face greater risk due to the novelty or scale of a project, government can co-invest alongside the private sector to ensure good projects happen. Government does this directly, for example through the Advanced Fuels Fund, or through our major public finance institutions, including the £22 billion UKIB. We have set out the role of these institutions in detail in our updated 2023 *Green Finance Strategy*. We also continue to provide significant public investment in research and innovation, with £4.2 billion in net zero research and innovation over the period from 2022-25.

Our international approach

We are securing energy supplies by ensuring that where the UK is dependent on imports those imports are built on diversified sources of supply and relationships with strong, trusted partners and allies. We are working with the EU and bilaterally with our connected countries on winter preparedness and energy security, involving our respective system operators and regulators. Beyond the EU we work with strong trusted partners and allies including through our Strategic Energy Dialogues to help tackle national and global energy challenges.

It is essential that we work internationally to drive the global transition to clean technologies. This will bring down emissions, protect and restore nature, improve energy security, and realise the huge economic and growth opportunities for the UK.

Complementing our domestic plans and our successful COP26 Presidency, we are therefore also publishing:

- the *2030 Strategic Framework for International Climate and Nature Action* – setting out the role the UK will play in driving progress against six global climate and nature challenges.
- the *International Climate Finance Strategy* – outlining how the UK’s high-profile commitment to spend £11.6 billion on ICF in 2021/22-2025/26 is being spent and is delivering results. The strategy also shows how we are delivering on the ICF sub-targets we have announced publicly, on nature, adaptation, and innovation.

As we increase our efforts to decarbonise domestically, we must ensure production, and the associated greenhouse gas emissions, do not shift to other countries with lower carbon pricing and climate regulation. We are therefore launching a consultation on potential policy measures to address future carbon leakage risk, including a UK Carbon Border Adjustment Mechanism and product standards, which could be deployed from the mid-2020s onwards.

Powering Up Britain – Energy Security Plan

Putin’s invasion exposed mainland Europe’s over-dependence on Russian gas, with implications for affordability and security. The UK cannot ever afford to be at the mercy of a malign actor like this. The *British Energy Security Strategy* was clear that the long-term solution is to address our underlying vulnerability to international fossil fuel prices by reducing our dependence on imported oil and gas.

Our vision is to power the UK through affordable, home-grown, clean energy:

- ensuring Britain has among the cheapest wholesale electricity prices in Europe by 2035;
- moving towards energy independence through a potential doubling of Britain’s electricity generation capacity by the late 2030s;
- maximising the vital production of UK oil and gas as the North Sea basin declines; and
- capturing global early mover advantages and capitalising on the decarbonisation needs of the more than 90% of the global economy that are now signed up to net zero targets.

To succeed in achieving our vision to power the UK through affordable, home-grown, clean energy, we must both manage the short terms risks and act for the

long term. For Britain, a future in which we are more energy independent, more energy secure, means:

- reducing energy demand and increasing the overall share of domestic energy production, building on our ambitions set out in the *Net Zero Strategy* and *British Energy Security Strategy*;
- ensuring that where the UK still needs to import energy, including through interconnectors, that those imports are built on strong relationships with trusted partners and allies and diversified sources of supply, which will also provide access to long term export markets to support our growing clean energy industries;
- building in resilience and mitigations to ensure that if there are disruptions to imports, consumers still have a reliable supply of energy.

***Powering Up Britain – Energy Security Plan* sets out the steps by which the Government will enhance our country’s energy security following the publication of the British Energy Security Strategy in April 2022.** This plan:

- **Sets out the actions taken to secure energy supplies this winter** and the next steps in ensuring resilience of our gas supplies;
- **Demonstrates the actions we are taking to ensure more home-grown energy**, by driving investment in renewables, CCUS, and nuclear;
- **Sets out our approach to reforming energy retail and electricity markets** to support businesses and households.

Powering Up Britain - the Net Zero Growth Plan

The transition to net zero will require action across the whole economy fuelled by rapid deployment of low carbon electricity. To thrive, the UK will need to support the growth of new sectors and help others adapt.

The path to net zero outlined in the *Net Zero Strategy* is still the right one; developments in the last 18-months have only reinforced that view. The UK has already made huge progress in decarbonising the economy and decoupling emissions from economic growth. The *Independent Review of Net Zero*, led by the Rt Hon Chris Skidmore MP, concluded that the transition to net zero is the economic opportunity of the 21st century, driving investment, jobs and creating significant opportunity across the UK. The Review was unequivocal in its assessment that the plan set out in the *Net Zero Strategy* was the right one, whilst providing recommendations to strengthen delivery. The Climate Change Committee’s 2022 Progress Report to Parliament further confirms our approach.

In the *Net Zero Growth Plan*, we are bolstering our delivery. This plan:

- **Responds to the expert recommendations made in the Independent Review of Net Zero**, which explored how we can achieve net zero in the most pro-growth, pro-business way;
- **Demonstrates the actions we will take to ensure the UK remains a leader in the net zero transition**, by ensuring we drive investment into key green industries like offshore wind, CCUS, and nuclear;
- **Strengthens delivery with a focus on the action we can take today to keep us on track to meet our carbon budgets**, acting as our annual update against the *Net Zero Strategy*, both on a national and local level;
- **Meets our statutory obligations under the Climate Change Act (2008) to:**
 - Respond to the Climate Change Committee's (CCC) *2022 Progress Report to Parliament*; and
 - Provide a Carbon Budget Delivery Update that sets out a package of policies and proposals that will enable us to meet carbon budgets.

Delivering our plans

In these plans we set out our ambitious policies which will ensure we can deliver energy security, increase the UK's international economic competitiveness, while delivering net zero. There are two sides of this: the *Powering Up Britain - Energy Security Plan* is focused on changing decades of reliance on imported fossil fuels, by reducing demand and boosting home grown energy, giving energy resilience the priority it deserves. The *Net Zero Growth Plan* focuses on our long-term decarbonisation trajectory and how it can improve the UK's competitiveness, deliver an industrial renaissance and level up the whole of the United Kingdom. These documents are complementary and should be read together. While comprehensive, they will continue to evolve and be flexible to adapt to changing circumstances.

Together they provide the long-term certainty, business models and frameworks and targeted investment that will accelerate delivery of our departmental objectives.

We are acting across all parts of the energy system and economy:

1. Providing a secure, abundant and clean energy supply
 - Power generation
 - New clean energy systems and infrastructure
 - Networks and enablers

2. Reducing demand by increasing energy efficiency for homes and businesses
3. Supporting the rest of the economy through the transition

The following pages outline some of the announcements being made to bolster our delivery of cheap, clean and plentiful energy.

1. Providing a clean, secure energy supply

We have an ambition to fully decarbonise the power system by 2035, subject to security of supply, and we will also need to grow and develop energy sources beyond the power sector. Moving to a power system that relies primarily on low carbon technologies is a crucial step towards delivering, cheaper, cleaner, domestic energy and addressing our underlying vulnerability to international fossil fuel prices. In 2021, the share of generation from renewables reached 40%, including from bioenergy, wind and solar, and 15% from nuclear.¹⁷ Already we have nearly reached 14GW of offshore wind installed; reached 14GW of solar installed; announced up to £20 billion for CCUS at Spring Budget 2023; announced the £120 million Future Nuclear Enabling Fund and will announce a shortlist of applications soon; announced Great British Nuclear to progress new nuclear; invested approximately £700 million to take a 50% stake in Sizewell C in November 2022, and a further £100 million to support project development in January 2023.

Next Steps:

Power Generation

Launch of Great British Nuclear (GBN) & the Small Modular Reactor (SMR) selection process	Nuclear is the critical baseload of the future energy system and we are setting out an ambitious programme for increasing generation to match global competition. The Government is committed to a programme of new nuclear projects beyond Sizewell C, giving industry and investors the confidence, they need to deliver projects at speed. With this aim in mind, the Government has launched Great British Nuclear (GBN) which will be funded to lead delivery of our programme of new nuclear projects. GBN will operate through British Nuclear Fuels Limited. The first priority for GBN is to launch a competitive process to select the best SMR technologies. This will commence in April with market engagement as the first phase. The second phase – the down-selection process - will be launched in the summer, with an ambition to assess and decide on the leading technologies by Autumn. We will co-fund the selected technologies through their development and will work with successful bidders on ensuring the right financing and site arrangements are in place, in line with our commitment to take two Final Investment Decisions next parliament. The Government has also launched the Future Nuclear Enabling Fund of up
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	to £120 million to provide targeted support for new nuclear to address barriers to entry and will announce a shortlist of applications to begin pre-grant award due-diligence soon.
Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS)	The UK is a world leader in offshore wind deployment and floating wind represents the next frontier in this green growth story. Floating turbines, which can be deployed in deeper waters than conventional turbines, will boost energy capacity even further by allowing wind farms to be situated in new areas around the UK coastline where wind strengths are highest. We are launching the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS), which will provide up to £160 million to kick start investment in port infrastructure projects needed to deliver our floating offshore wind ambitions. This will give investors the confidence to back this emerging sector, which will make a vital contribution to the UK's energy security and net zero targets.
Solar	Solar has huge potential to help us decarbonise the power sector. We have ambitions for a fivefold increase in solar by 2035, up to 70GW, enough to power around 20 million homes. We need to maximise deployment of both ground and rooftop solar to achieve our overall target. Ground-mount solar is one of the cheapest forms of electricity generation and is readily deployable at scale. Government seeks large scale solar deployment across the UK, looking for development mainly on brownfield, industrial and low/medium grade agricultural land. The Government will therefore not be making changes to categories of agricultural land in ways that might constrain solar deployment. Government is seeking widespread deployment of rooftop solar in commercial, industrial and domestic properties across the UK. To support our solar ambitions, we are accepting the recommendation from the <i>Independent Review of Net Zero</i> to set up a taskforce to deliver on this ambition.

New clean energy systems and infrastructure

Carbon Capture Usage and Storage (CCUS)	<p>CCUS can capture CO2 from power generation, hydrogen production, and industrial processes – storing deep underground utilising decommissioned oil wells or using it. CCUS is also vital to unleash scale up of key greenhouse gas removal technologies (GGRs), like direct air carbon capture and storage and bioenergy with carbon capture and storage, to balance residual emissions from hard to abate sectors. Government is making an ambitious series of announcements on CCUS, following the up to £20 billion funding announced at Spring Budget.</p> <p>First, we are announcing the initial eight Track-1 capture projects with which we are entering into negotiations, with the full expectation of expanding the Track-1 clusters and project list in future.</p> <p>Second, we will launch later this year a process to bring in further projects within the Track-1 clusters by 2030. This will select additional projects to connect into the HyNet and East Coast Clusters – including the Humber and their associated stores as they become viable, and we will engage the sector shortly on how to deliver this.</p> <p>Third, we will work to identify if any of these additional projects could be potential alternatives to any of the initial Track-1 projects, if any are unable to agree contracts within the criteria and timelines required. The Government will continuously monitor the value for money offered by the Track-1 shortlist, to ensure only the best and most cost-effective capture projects reach Final Investment Decision.</p> <p>Fourth, we remain committed to our ambition of 20-30mtpa of carbon storage and four operational CCUS clusters by 2030, which is why we are announcing today the launch of the Track-2 cluster process. Our initial view is that Acorn and Viking are the leading contenders for Track-2 T&S Systems.</p> <p>Fifth, to meet our sector aims and Net Zero target we are committed to further development of Industrial Carbon Capture, Waste, CCUS-enabled Hydrogen, Power CCUS, and engineered GGRs. As part of this, we will work closely with electricity generators currently using biomass to facilitate their transition to power BECCS, subject to value for money, taking account of energy security on the road to net zero.</p>
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	<p>We expect this announcement to crowd-in billions of pounds of additional private capital as our private partners also commit to the programme, putting us on track to deliver up to 50,000 jobs and bringing investment to our industrial heartlands.</p>
<p>Hydrogen</p>	<p>Hydrogen is a potential energy solution for harder to electrify areas like parts of industry, heavier transport such as aviation and shipping, and potentially heating buildings, as well as the important role it can play in the power sector. Our ambition to have up to 10GW of low carbon hydrogen production capacity by 2030 could generate enough clean electricity to power all of London for a year. Today, we are confirming the first winning projects from the £240 million Net Zero Hydrogen Fund. We are announcing a shortlist of projects for due diligence in the first electrolytic hydrogen allocation round, through which we intend to support up to 250MW of new electrolytic hydrogen production capacity, subject to affordability and value for money. Successful projects in this round will be funded by government until the hydrogen levy is in place. Further, we are announcing our intention to launch a second electrolytic allocation round later this year, through which we intend to support up to 750MW capacity, and to publish a hydrogen production delivery roadmap by the end of the year. The first and second allocation rounds are intended to support our ambition of up to 1 GW of electrolytic hydrogen in operation or construction by the end of 2025. We are also naming the CCUS-enabled hydrogen projects moving forward on the Track-1 clusters, intended to support our ambition for up to 1GW of CCUS-enabled hydrogen in operation or construction by the end of 2025. To bring forward hydrogen transport and storage infrastructure business models, we are also aiming to introduce legislative powers when parliamentary time allows, which will be crucial to designing these new business models by 2025. These actions are key to potentially unlocking up to £11 billion in private investment by 2030, accelerating the UK hydrogen economy to bolster energy security and potentially supporting over 12,000 jobs by 2030.</p>

Networks and enablers

<p>Grid</p>	<p>Power generators connect to consumers through the grid, which includes the high-voltage transmission lines and lower voltage distribution lines, which ensures that all areas of Britain always have enough power. We need to expand the grid at an unprecedented scale and pace to deliver more clean power and increase our energy security. <i>Powering Up Britain - Energy Security Plan</i> sets out plans to accelerate the delivery of strategic transmission upgrades by at least three years, with an ambition to cut delivery times in half. The Electricity Networks Commissioner has been tasked to advise government on what more can be done to accelerate grid delivery, and will present recommendations to Ministers in June. We will respond with an action plan this year. Alongside the focus on accelerating investment in the grid, we are working with industry and Ofgem to reform the grid connections process, at both transmission and distribution levels, which is delaying both generation and demand projects in parts of the country. We will publish a connections action plan in the summer.</p>
<p>Planning</p>	<p>An effective planning system is needed to support both large scale nationally significant infrastructure like offshore wind, nuclear power and CCUS, and support local decisions on renewable and low carbon energy. That is why in order to support our net zero and energy security goals the government is committed to ensuring faster, fairer and more effective planning regimes, including through changes to the National Planning Policy Framework - generally for local plan-making and decisions, the energy National Policy Statements - specifically for nationally significant decisions, and Electricity Act planning. The Government are publishing five revised energy NPS covering Renewables, Oil and Gas Pipelines, Electricity Networks and Gas Generation, and an overarching Energy Statement for consultation. This includes a new requirement for offshore wind to be considered as “critical national infrastructure”. Recognising that onshore wind is an efficient, cheap and widely supported technology, Government has consulted on changes to planning policy in England for onshore wind to deliver a localist approach that provides local authorities more flexibility to respond to the views of their local communities. We will respond to the NPPF consultation in due course.</p>

Electricity Market Reform	Markets underpin the efficient operation of the system and send key signals for long term investment. We will need to reform market frameworks to deliver our 2035 ambitions. The Review of Electricity Market Arrangements (REMA) programme will consult further this Autumn on reforms for the electricity market to ensure it remains fit both for today and future generations.
UK Emissions Trading Scheme (UK ETS)	Since 2021, the UK ETS has placed the power of the market at the heart of the UK's net zero strategy. The Independent Review of Net Zero sets out an enhanced role for the UK ETS as a foundation for a thriving, decarbonised economy through 2050 and beyond. It shows how, with a long-term commitment to an expanded market, we can unlock investment in UK infrastructure; catalyse innovation in the UK's world-leading science and technology; and support UK businesses with the most cost-effective and flexible means to deliver net zero. Government accepts the recommendation that we set out a long-term pathway for the UK ETS. We will work with the ETS Authority to set out one this year.

2. Addressing demand by increasing efficiency for homes and businesses

The low carbon energy system depends on overall energy demands reducing significantly, and increasing efficiency will help with cutting bills. This means homes or businesses becoming far more efficient, through adoption of clean heat technologies, better energy management, and investment in energy efficiency measures. We have already made significant progress, most recently announcing ambition to cut final energy demand from buildings and industry by 15% by 2030 and by launching an Energy Efficiency Taskforce, chaired by Alison Rose, CEO of NatWest, to support energy security and decarbonise buildings and industry. We have also funded ‘help to heat’ schemes to reduce energy bills and improve energy efficiency; and launched the £450 million Boiler Upgrade Scheme which has already seen over 14,000 voucher applications since it opened on 23 May 2022.¹⁸

Next steps:

Energy Efficiency	We will introduce a new Energy Company Obligation scheme – the Great British Insulation Scheme – to deliver £1 billion additional investment by March 2026 in energy efficiency upgrades, such as loft and cavity wall insulation. Supporting around 300,000 of the country’s least energy efficient homes to save around £300-£400 each year, it will extend help to a wider group of people living in the least efficient homes in the lower Council tax bands as well as boosting help for those on the lowest incomes. We plan to lay legislation by the summer to take it forward. We remain committed to improving energy efficiency performance across different buildings. We are planning to consult by the end of this year on how to improve the energy efficiency of owner-occupied homes. We will publish a summary of responses to the consultation on improving the energy performance of privately rented homes and respond to the consultation on improving home energy performance through lenders. We are also putting in place measures to reduce demand from large businesses and improve the efficiency of industrial processes through announcing extensions to the Industrial Energy Transformation Fund and Climate Change Agreement schemes as well as piloting an energy advice service for SMEs.
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Heat Networks	Heat networks are vital to making net zero a reality in the UK. In high density urban areas, they are often the lowest cost, low carbon heating option. This is because they offer a communal solution that can provide heat to a range of homes and businesses by capturing or generating heat locally. We are continuing to grow and decarbonise the UK heat network market through the Green Heat Network Fund and the Heat Network Efficiency Scheme. We can now confirm that capital support will be extended to 2028 to facilitate the continued growth of low carbon heat networks, including £220 million for the Heat Network Transformation Programme over 2025/6 and 2026/7.
Clean Heat	Heat pumps are an important part of the future of heating as they are significantly more efficient than traditional boilers, use cleaner energy, and should reduce bills relative to fossil fuel heating. We want to support the manufacturing of heat pumps here in the UK, so we are launching a £30 million Heat Pump Investment Accelerator to leverage up to £270 million of private investment to boost UK manufacturing and supply chain and support our commitment to install over 600,000 heat pumps p.a. by 2028. Alongside this, we intend to implement the Clean Heat Market Mechanism in 2024 to incentivise heating system manufacturers to deploy heat pumps as a proportion of fossil fuel boiler sales. We want to continue to support households with this transition and therefore will be extending the Boiler Upgrade Scheme until to 2028, and we will enhance the current marketing campaign to increase consumer awareness and take-up. The Government has an ambition to phase out all new and replacement natural gas boilers by 2035 at the latest and will further consider the <i>Independent Review of Net Zero Review's</i> recommendation in relation to this.
Fuel price rebalancing	We know that, in the long run, green products are more efficient and cheaper. However, current distortions in electricity and gas prices do not always make this the case. We want to make it easier for consumers to make the switch to green products by rebalancing prices between electricity and gas to remove these distortions. We accept the Skidmore Review recommendation that Government should commit to outlining a clear approach to gas vs. electricity 'rebalancing' by the end of 2023/4 and should make significant progress affecting relative prices by the end of 2024. Rebalancing will generate the clear short-term price signal necessary to shift both households and businesses to lower-carbon, more energy efficient technologies like heat pumps. This is vital to meet Government's existing decarbonisation commitments, including our goal of 600,000 heat pumps installed per year by 2028.

3. Supporting the rest of the economy through the transition

The rest of the economy will need to transition to net zero. A low carbon power sector can support buildings, industry, transport and agriculture to decarbonise with increased electrification. Parts of these same sectors may be harder to electrify and therefore need different solutions to decarbonise. So far, we have completed a technical consultation on the Zero Emission Vehicle mandate, including engagement with 400+ stakeholders; published our *Jet Zero Strategy*; allocated £150 million in support to industry through the Industrial Energy Transformation Fund (IETF) since summer 2020 and more.

Next steps:

Increased support for industry through the IETF	The IETF is designed to help businesses with high energy use to cut their energy bills and carbon emissions through investing in energy efficiency and low carbon technologies We are announcing a £185 million uplift for Phase 3 of the IETF, bringing the total allocation to the IETF to £500m across all phases. We intend to open Phase 3 of the IETF for new applications in early 2024, continuing to provide grant funding to support industry in delivering energy efficiency and GHG emissions improvements.
A consultation on carbon leakage	As we increase our efforts to decarbonise domestically, we must ensure production, and the associated greenhouse gas emissions, do not shift to other countries with lower carbon pricing and climate regulation. We are launching a consultation on potential policy measures to address future carbon leakage risk, including a UK Carbon Border Adjustment Mechanism and product standards, which could be deployed from the mid-2020s onwards.
Zero Emission Vehicles	The transition to zero emission cars and vans is leading the way in our effort to decarbonise transport, and we are already making excellent progress towards our phase out commitments. Between 2030 and 2035, new cars and vans will only be able to be sold if they offer significant zero emission capability. We have published a final consultation on an ambitious Zero Emission Vehicle mandate, requiring an increasing percentage of new car and van sales to be zero emission, to support delivery of all new vehicles being zero emission by 2040.
Sustainable Aviation Fuels (SAF)	Our journey towards zero emission flights will include kick-starting the commercialisation of SAF in the UK. We are making excellent progress towards this goal and go even further, announcing a consultation

	setting out full details of the SAF mandate policy with target trajectories and incentives; a second application window for the up to £165 million Advanced Fuels Fund; and grant awards to Airbus to scale-up research on ultra-low emissions and hydrogen aircraft.
Natural Resources, Waste and F-gasses	We have set out 25 measures that are in the agriculture net zero pathway, many of which have already been developed and introduced through the Environmental Land Management schemes, Farming Investment Fund, and Farming Innovation Programme.
2023 Green Finance Strategy	To support the transition to a clean and secure future, we will need to align private sector financial flows with clean, environmentally sustainable and resilient growth, and strengthen the competitiveness of the UK financial sector. We are publishing our <i>2023 Green Finance Strategy</i> , which sets out how we catalyse our world-leading financial services sector to deliver on our ambitious commitments. Alongside this we are also publishing our Nature Markets Framework which sets out government's approach to supporting and accelerating growth in nature markets, a key mechanism to help deliver our joint nature and climate goals.
Supporting Green Skills	The growth of green industries will lead to new jobs, which may require new skills. To support this transformation and help people take advantage of the opportunities the transition will bring, we will produce a Net Zero and Nature Workforce Action Plan in 2024. We are starting with a set of initial actions from the Net Zero Power and Networks pilot working group, followed by a suite of comprehensive actions for these sectors by Summer 2023, which can be used as a template for the other sectoral assessments. Industry have also committed to work with DfE to propose new Skills Bootcamps in FY 2023-24 aimed at addressing immediate workforce skills needs in key low carbon sectors. By the end of 2023, we will have at least 35 different bootcamp courses across England supporting greener construction, transport, and green energy and industry sectors. Further, government will work with partners to ensure that net zero and green careers are considered in all relevant current and proposed careers campaigns across government and industry.

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- ⁴ The figure is presented in 2022 prices as the sum of Renewables Obligation (RO), Feed-In-Tariffs (FiTs) and Contracts for Difference (CfD) levy funding since 2010. Historic data to Financial Year 2021/22 has been compiled from past OBR Economic and Fiscal Outlook (EFO) publications and Ofgem's 2021/22 published Annual Report on the FiTs scheme. For 2022/23, the OBR forecast for CfD and RO payments from the March 2023 OBR EFO publication has been applied. No published forecast for 2022/23 is available for the FiTs scheme and so this has not been included.
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- ¹⁴ Times Higher Education (2023), 'World University Ranking 2023', <https://www.timeshighereducation.com/world-university-rankings/2023/world-ranking>

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APPENDIX SE10: HM GOVERNMENT BRITISH ENERGY SECURITY STRATEGY



HM Government

British Energy Security Strategy

Secure, clean and affordable
British energy for the long term

April 2022

Hinkley Point C, Somerset



HM Government

British Energy Security Strategy

Secure, clean and affordable British energy for the long term

April 2022



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Foreword from the Prime Minister



For most of the industrial age, the UK was what we now call “energy independent”.

The great coal fields of the North, the Midlands and South Wales heated our homes, fed the voracious boilers of Megawatt Valley and created vast volumes of town gas for municipalities across the country.

In time they were joined by a steady flow of oil and natural gas extracted from deep below the waters of the North Sea.

Yet as the years passed we drifted into dependence on foreign sources.

Sometimes this was through deliberate planning; more often it was the by-product of policy fudges, decision-dodging and short-term thinking.

But whatever the cause, the result today is all too obvious to anyone who receives an energy bill.

Global energy costs have been rising for some time as demand soars and factories roar back into life after Covid; Putin’s invasion of Ukraine pushed them still higher and, ultimately, it is the consumer who ends up paying the price.

This government is already stepping in to help, with over £9 billion of help for families struggling with their bills.

But if we’re going to get prices down and keep them there for the long term, we need a flow of energy that is affordable, clean and above all, secure. We need a power supply that’s made in Britain, for Britain – and that’s what this plan is all about.

We’re not going to try and turn back the clock to the days when we choked our streets and our atmosphere with filthy fumes and ever-rising levels of climate-imperilling carbon dioxide.

Instead, we’re going to take advantage of Britain’s inexhaustible resources of wind and – yes – sunshine.

We’re going to produce vastly more hydrogen, which is easy to store, ready to go whenever we need it, and is a low carbon superfuel of the future.

We're embracing the safe, clean, affordable new generation of nuclear reactors, taking the UK back to pre-eminence in a field where we once led the world.

We're making homes and businesses more efficient, so you need to use less energy in the first place.

We're going to work with industry to slash our way through needless and repetitive red tape so that all this can happen much more quickly. Energy companies tell me they can get an offshore wind turbine upright and generating in less than 24 hours, but that it can take as much as 10 years to secure the licences and permissions required to do so.

And as even the most evangelistic environmentalist would concede that we can't simply pull the plug on all fossil fuels overnight without the lights going out all over Europe, we're going to make better use of the oil and gas in our own backyard by giving the energy fields of the North Sea a new lease of life.

For years, governments have dodged the big decisions on energy, but not this one.

We've got the ambition, we've got the vision – and, with this plan, we're going to bring clean, affordable, secure power to the people for generations to come.

A handwritten signature in black ink, appearing to be 'Boris Johnson', with a long horizontal line extending to the right.

The Rt Hon Boris Johnson MP

Prime Minister

Introduction

Energy is the lifeblood of the global economy. From heating our homes to powering our factories, everything we do depends on a reliable flow of affordable energy.

So as the global economy reopened in the aftermath of the pandemic, the sudden surge in demand for everything from new cars to foreign holidays drove a massive spike in demand for oil and gas, dramatically increasing the price of these essential fuels.

This has been compounded by Russia's abhorrent and illegal invasion of Ukraine. As we are part of a global market, the price we pay for gas is set internationally. And President Putin has used this against us by restricting the supply of Russian gas to the European market, further pushing up prices. The vital sanctions imposed by the UK and its allies to support the Ukrainian people will also inevitably have an adverse effect on all economies.

As a result of all these factors, European gas prices soared by more than 200 per cent last year and coal prices increased by more than 100 per cent. This record rise in global energy prices has led to an unavoidable increase in the cost of living in the UK, as we use gas both to generate electricity, and to heat the majority of our 28 million homes.

The Government's immediate priority has been to provide financial assistance to families and businesses struggling with higher energy bills. But when the UK is spending the equivalent of over £1,200 per person this year, just to service the national debt, we cannot afford merely to rely on taxpayer funding to assist with paying ever higher bills; we need to bring down the bills themselves.

The first step is to improve energy efficiency, reducing the amount of energy that households and businesses need. We have already saved households on the lowest incomes around £300 a year on bills through energy efficiency measures – and we are investing over £6 billion on decarbonising the nation's homes and buildings.

But the long-term solution is to address our underlying vulnerability to international oil and gas prices by reducing our dependence on imported oil and gas.

Even as we reduce imports, we will continue to need gas to heat our homes and oil to fill up our tanks for many years to come – so the cleanest and most secure way to do this is to source more of it domestically with a second lease of life for our North Sea. Net zero is a smooth transition, not an immediate extinction, for oil and gas.

Accelerating the transition away from oil and gas then depends critically on how quickly we can roll out new renewables. The Government's Ten Point Plan for a Green Industrial Revolution, together with the Net Zero Strategy and this Energy Strategy, is driving an unprecedented £100 billion of private sector investment by 2030 into new British industries

including Offshore Wind, and supporting around 480,000 clean jobs by the end of the decade.

The growing proportion of our electricity coming from renewables reduces our exposure to volatile fossil fuel markets. Indeed, without the renewables we are putting on the grid today, and the green levies that support them, energy bills would be higher than they are now. But now we need to be bolder in removing the red tape that holds back new clean energy developments and exploit the potential of all renewable technologies.

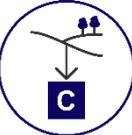
Most critically, when we have seen how quickly dependence on foreign energy can hurt British families and businesses, we need to build a British energy system that is much more self-sufficient. This requires power that can be relied on, even when the sun is not shining, or the wind is not blowing. So, this government will reverse decades of myopia, and make the big call to lead again in a technology the UK was the first to pioneer, by investing massively in nuclear power.

Investing in the North Sea, expanding our renewable capacity, and leading in nuclear power will also enable the UK to produce more hydrogen. We will seize this opportunity so that we are not wholly dependent on other countries for this vital superfuel which has vast potential applications – from industrial production to net zero aviation.

All of these steps will accelerate our progress towards Net Zero, which is fundamental to energy security. By 2030, 95 per cent of British electricity could be low-carbon; and by 2035, we will have decarbonised our electricity system, subject to security of supply. This is a transition which reduces our dependence on imported oil and gas and delivers a radical long-term shift in our energy with cleaner, cheaper power, lower energy bills and thousands of high wage, high skilled new jobs.

We are delivering on the 10 Point Plan, having already generated 68,000 green jobs and £22 billion in private investment, so now we are raising our ambition.

10 Point Plan	Delivery highlights so far
 <p>Advancing offshore wind</p>	<ul style="list-style-type: none"> • Over £1.6 billion invested, securing 3,600 jobs • 11GW already generated, and another 12GW in the pipeline • Up to £320 million in government support for fixed bottom and floating wind ports and infrastructure • Additional government support for other low-cost renewables technologies
 <p>Driving the growth of low carbon hydrogen</p>	<ul style="list-style-type: none"> • £7.5 million awarded to ITM's Gigastack Project, an early mover in the market, with potential to support up to 2,000 jobs over time • Preparing to allocate up to £100 million of revenue support to initial electrolytic projects • Launching £240 million Net Zero Hydrogen Fund later in April • Developed indicative Heads of Terms for hydrogen business model contract
 <p>Delivering new and advanced nuclear power</p>	<ul style="list-style-type: none"> • Committed to provide up to £1.7 billion of direct government funding to enable one nuclear project to FID this Parliament • Investing £100 million into Sizewell C to help develop this project • Investing £210 million to develop Small Modular Reactors with Rolls Royce • Announced a £120 million Future Nuclear Enabling Fund to progress new nuclear
 <p>Accelerating the shift to Zero Emission Vehicles</p>	<ul style="list-style-type: none"> • £4 billion of investment has flowed into the UK zero emission vehicle sector • Building two new gigafactories, in Sunderland and Blyth • 30,425 public charge-points in the UK with 100 new rapid chargers were added to the UK network every month during 2021
 <p>Green public transport, cycling and walking</p>	<ul style="list-style-type: none"> • 1,678 zero emission buses funded • Launched Active Travel England, increased cycling by 75%
 <p>Jet zero and green ships</p>	<ul style="list-style-type: none"> • Consulted on introduction of a UK Sustainable Aviation Fuel (SAF) mandate, requiring jet fuel suppliers to blend an increasing proportion of SAF into aviation fuel from 2025 • Allocated £23 million as part of the Clean Maritime Demonstration Competition

10 Point Plan	Delivery highlights so far
 <p>Greener buildings</p>	<ul style="list-style-type: none"> • Cut VAT for insulation and heat pumps • 46% of English homes at EPC C or above, up from 9% in 2008, and 2,300 social housing homes in the process of being improved • Over 60,000 heat pumps installations estimated by industry, now offering households grants of £5,000 towards an air source heat pump so they are cost competitive compared to a gas boiler
 <p>Investing in CCUS</p>	<ul style="list-style-type: none"> • Committed £1 billion in public investment to decarbonise our industrial clusters • Announced the first 2 clusters in Teesside, the Humber and Merseyside • Launched phase 2 of the Industrial Energy Transformation Fund, allocating £60 million to decarbonisation technologies, with a further £100 million delivered in May and October this year
 <p>Protecting our natural environment</p>	<ul style="list-style-type: none"> • Additional £124 million provided at Spending Review 2021 to the Nature for Climate Fund to support tree planting and peat restoration, going beyond 2019 Manifesto Commitment of £640 million • 13,290 hectares of trees planted across the UK in 2020/21 • Launched three new Community Forests, in Cumbria, Devon and the North-East • £5.2 billion invested in six year programme of flood defences
 <p>Green finance and innovation</p>	<ul style="list-style-type: none"> • £615 million allocated from Net Zero Innovation Portfolio allocated • Set the JET world record, with 59 megajoules of heat energy in a single fusion 'shot' that lasted 5 seconds

Immediate support on energy bills



The government has acted quickly to provide immediate relief to British families and businesses facing steep increases in their energy bills.

Help for families

A **£9.1 billion package of support** including a £150 non-repayable Council Tax rebate for the majority of households in England from April, with comparable provision in the devolved administrations, and a £200 reduction in energy bills from October for all households in Great Britain through the **Energy Bills Support Scheme**, to be recovered through energy bills and will spread the cost of the energy price shock over 5 years from 2023.

The **Warm Home Discount** will increase to £150 in October and extend its coverage to assist three million people.

The Government is investing a further £500 million in a **Household Support Fund** for local authorities to use in supporting the most vulnerable with food and utility bills.

Totalling £22 billion worth of support for cost of living, further measures include:

- the first cut in **fuel duty** for over a decade;
- an increase in the **National Living Wage** equivalent to a £1,000 a year increase in gross earnings for full time workers;
- and a cut to the **Universal Credit taper and increase to Universal Credit work allowances** worth around £1,000 for 1.7 million families on average.

Help for industry

The Government recognises that UK industrial electricity prices are higher than those of other countries and will act to address this. We will extend the Energy Intensive Industries (EII) Compensation Scheme for a further three years and intend to increase the aid intensity to up to 100 per cent (1.5 per cent of GVA).

We have increased the overall budget limit for the scheme accordingly, but as is the case under the current scheme, if there is a risk of budget over-spend, we may choose to reduce the aid intensity.

We will also consider other measures to support business including increasing the renewable obligation exemption to 100 per cent.

Energy efficiency



Over 90 per cent of our homes are heated by fossil fuels, accounting for a third of UK total gas use. The price spikes in the gas market mean households are particularly exposed to these changes and facing energy bills upwards of £2,000. The majority of our homes are energy inefficient. Improving the efficiency of our homes could reduce our heating bills by around 20 per cent and reduce our dependency on foreign gas. By 2025, around 700,000 homes will be upgraded, and by 2050 all our buildings will be energy efficient with low carbon heating.

At the end of the First World War, Britain was a nation in which almost 80 per cent of people rented their homes. Fast-forward to now, and around 70 per cent of people own their own home, with most built prior to the 1973 oil shock which precipitated an improvement in insulation standards.

Our homes are our castles – people want choices regarding how they improve them. But internationally, some countries are faring better than the UK as their homes are less dependent on gas and better insulated.

We want to continue making UK homes more comfortable and cheaper to run. Every therm of gas saved grows our energy security and brings jobs to the UK.

On cost, there are many measures for reducing energy bills including cavity wall insulation, which typically costs between £1000-£3000. Measures that improve the efficiency of our homes, on average, reduce bills by £300. On aesthetics, upgrades can retain and enhance building's character with measures being easy to install and beautiful in design.

On choice, this is not being imposed on people and is a gradual transition following the grain of behaviour. The British people are no-nonsense pragmatists who can make decisions based on the information.

We have gone further than any government in setting out an **ambitious strategy** by:

- Publishing the landmark Heat and Buildings Strategy with an accompanying £3.9 billion of support.
- This includes nearly £1.8 billion targeted at low-income households through the Home Upgrade Grant and the Social Housing Decarbonisation Fund. This builds on more than £1.2 billion we have already invested this Parliament to support low-income households to install energy efficiency measures.
- Combined, this funding will improve up to 500,000 homes, saving households hundreds of pounds per year on their energy bills and reduce our reliance on gas. It also included more than £1.4 billion to upgrade public sector buildings. This brings capital spending on buildings decarbonisation over the lifetime of Parliament to £6.6 billion.
- Expanding the Energy Company Obligation to £1 billion per year from 2022-2026, helping 113,000 low-income households annually to improve their energy efficiency.
- Setting a 2035 date by which we intend to phase out the sale of new and replacement gas boilers.
- Introducing a package of measures to increase deployment of heat pumps to 600,000 installations per year by 2028, and expanding heat networks through the Green Heat Networks Fund and designating heat network zones.

We will **cut the cost for consumers** who want to make improvements by:

- **Zero-rating VAT for the next five years** on the installation of energy saving materials, including insulation and low carbon heating, saving between £1000-£2000 on the cost of an air source heat pump.
- **Launching the £450 million Boiler Upgrade Scheme** this month. Thanks to government support, heat pumps are now priced much more competitively compared to gas boilers. We want as many people as possible who want one this year to be able to have one installed, **so will continue to keep uptake of the scheme under review.**
- **'Rebalancing' the costs placed on energy bills** away from electricity to incentivise electrification across the economy and accelerate consumers and industry's shift away from volatile global commodity markets over the decade. This will also ensure heat pumps are comparatively cheap to run over time. We will publish our proposals on how to do so in 2022, considering overall system impacts and limiting the impact on bills, particularly for low-income consumers.

We will help to send **clear signals**:

Through the market

- We are **looking to facilitate low-cost finance from retail lenders** to drive investment in energy efficiency measures. There are currently around 40 green mortgage products available to consumers wanting to make green home improvements. We will double innovation funding for the development and piloting of new green finance products for consumers from £10 million to £20 million and introduce a scheme under which lenders will work to improve the energy performance of the properties against which they lend. We will also work with the UK Infrastructure Bank as it considers investment opportunities, including those that would improve the energy efficiency of our buildings.
- **Better labelling and product standards** so consumers can purchase more efficient products including for heating, lighting, washing and cooking. For example, LED lightbulbs are now the norm and Energy Saving Trust estimate that consumers save £2-3 per lightbulb each year, with little effort. We are bringing in new minimum standards and labelling requirements for a range of energy-using products and will formally consult on draft regulations in early 2023.
- **Expanding heat pump manufacturing**: We will run a Heat Pump Investment Accelerator Competition in 2022 worth up to £30 million to make British heat pumps, which reduce demand for gas.

Through government channels

- Research suggests the government is the trusted source of advice so we will work with trusted voices to scale up our information offer to help households understand energy saving measures. By summer we will launch a comprehensive Energy Advice Service on GOV.UK, which will help consumers navigate what can be unknown territory to improve the energy performance of their homes. We will launch additional support for homeowners through telephone support and specific local area advice for energy consumers.
- Establishing a dedicated energy advice offering for smaller businesses to provide trusted advice on improving industrial energy efficiency and decarbonisation.

Through frameworks

- Setting clear energy performance standards varying by building type, phased in over the long-term. More details will be announced in May.
- Reviewing the practical planning barriers that households can face when installing energy efficiency measures such as improved glazing, including in conservation areas and listed buildings. This will be completed by the end of 2022 and ensure protection of local amenity and heritage, whilst making it easier to improve energy efficiency.

Oil and gas



Currently around half of our demand for gas is met through domestic supplies. In meeting net zero by 2050 we may still use a quarter of the gas that we use now. So to reduce our reliance on imported fossil fuels, we must fully utilise our great North Sea reserve, use the empty caverns for CO₂ Storage, bring through hydrogen to use as an alternative to natural gas and use our offshore expertise to support our offshore wind sector. As a result of our plans, the North Sea will still be a foundation of our energy security but we will have reduced our gas consumption by over 40 per cent by 2030.

The North Sea emerged as an important oil-producing area in the 1970s and 1980s, with the UK Continental Shelf currently home to around 290 offshore installations, over 10,000 km of pipelines, 15 onshore terminals and over 2,500 wells.

Gas is currently the glue that holds our electricity system together and it will be an important transition fuel. We are taking a balanced approach to this unique subterranean asset. There is no contradiction between our commitment to net zero and our commitment to a strong and evolving North Sea industry. Indeed, one depends on the other.

On decarbonisation, the flexibility of gas has underpinned our world-leading rollout of offshore wind and UK gas has a lower carbon footprint well under half that of most imported gas.

On longevity, estimates suggest 7.9 billion barrels of oil reserves and resources remain under our seas, and 560 billion cubic metres of gas.

On profits, the industry is set to invest billions in the development of nascent clean technologies, such as hydrogen and carbon capture.

We will send clear signals on the **role of gas** in the transition by:

- The North Sea Transition Authority plans to launch **another licensing round in the autumn**, taking into account the **forthcoming climate compatibility checkpoint** and **the need for energy security**. This will mean more domestic gas on the grid sooner.
- Establishing **Gas and Oil New Project Regulatory Accelerators** to provide dedicated, named project support to facilitate the rapid development of projects – which could take years off the development of the most complex new opportunities.
- Reducing the emissions of our offshore oil and gas further, by driving rapid industry investment in **electrifying offshore production**, to ensure our gas remains the low-carbon choice.
- Remaining open-minded about our onshore reserves. We have commissioned an **impartial report on the geological science of shale gas and the modelling of seismic activity by the British Geological Survey**, reviewing any scientific updates that the government ought to consider. The pause continues to remain in place unless new evidence emerges. Any exploration or development of shale gas would need to meet rigorous safety and environmental protection, both above ground and sub-surface.

We will ensure a new lease of life for the North Sea in **low-carbon technologies** by:

- Delivering on our **£1 billion commitment to four Carbon Capture Usage and Storage (CCUS) clusters by 2030**, with the first two sites selected in the North East and North West currently proceeding through Track 1, with the Scottish Cluster in reserve.
- The industrial clusters will be the starting point for a new carbon capture industry with a sizeable export potential, helping to create industrial ‘SuperPlaces’ in the UK.
- Publishing **delivery roadmaps for CCUS and hydrogen** to provide clear signals to industry to invest this month.

Renewables



Accelerating the transition from fossil fuels depends critically on how quickly we can roll out new renewables. Our *Ten Point Plan for a Green Industrial Revolution* has already put the UK at the forefront of many renewable technologies, delivering £40 billion of private investment in under two years. By the end of 2023 we are set to increase our capacity by a further 15 per cent. But now we must go further and faster, building on our global leadership in offshore wind.

Offshore wind

Our island's resources, with its shallow seabeds and high winds offers us unique advantages that have made us global leaders in offshore wind and pioneers of floating wind. With smarter planning we can maintain high environmental standards while increasing the pace of deployment by 25 per cent. Our ambition is to deliver up to 50GW by 2030, including up to 5GW of innovative floating wind.

Our history of North Sea oil and gas expertise enables us rapidly to deploy our rich expertise in sub-sea technology and maximise our natural assets. Already, just off the coast of Aberdeenshire, we have built the world's first floating offshore wind farms. There will be huge benefits in the Irish and Celtic Sea. And by 2030 we will have more than enough wind capacity to power every home in Britain.

We will be the Saudi Arabia of wind power, with the ambition that by 2030 over half our renewable generation capacity will be wind, with the added benefit of high skilled jobs abounding these shores. But the development and deployment of offshore wind farms still takes up to 13 years.

On planning, these projects tend to have public support, and ultimately benefit the environment because they help reduce the damage to habitats that is caused by climate change.

On cost, the unit cost of offshore wind power has fallen by around two thirds. The Contracts for Difference (CfD) scheme has shared the risks of investing in new technologies to boost UK renewables and bring in billions of pounds of private investment.

On jobs, our technological leadership is delivering high skilled, high wage British jobs. Our increased ambition means we expect the sector will grow to support around 90,000 jobs by 2030.

We will cut the process time by over half by:

- Reducing consent time from up to **four years down to one year**.
- Strengthening the Renewable **National Policy Statements to reflect the importance of energy security** and net zero.
- **Making environmental considerations at a more strategic level**, allowing us to speed up the process while improving the marine environment.
- Introducing **strategic compensation environmental measures**, including for projects already in the system, to offset environmental effects and reduce delays to projects
- **Reviewing the way in which the Habitats Regulations Assessments are carried out** for all projects making applications from late 2023 to maintain valued protection for wildlife, whilst reducing reams of paperwork.
- Implementing **a new Offshore Wind Environmental Improvement Package** including an industry-funded **Marine Recovery Fund and nature-based design standards** to accelerate deployment whilst enhancing the marine environment.
- Working with the **Offshore Wind Acceleration Task Force**; a group of industry experts brought together to work with Government, Ofgem and National Grid on further cutting the timeline.
- **Establishing a fast-track consenting route for priority cases where quality standards are met**, by amending Planning Act 2008 so that the relevant Secretary of State can set shorter examination timescales.

We will ensure the UK remains a **world leader** by:

- Offering clear investable signals through **annual auctions**, with the next round a year earlier in March 2023, helping to keep costs down through competition.
- Consulting on changes to the 2024 CfD auction, Allocation Round 6, that incentivise renewables to locate and operate in a way that minimises overall system costs.
- Aiming to bring forward up to **5GW of floating offshore wind by 2030**, which opens up some of the windiest spots. This is backed by investing up to £160 million in ports and supply chains and £31 million in Research & Development (R&D) funding.

Onshore wind

Onshore wind is one of the cheapest forms of renewable power. The UK already has over 14GW of onshore wind, with a strong pipeline of future projects in Scotland. We will improve national network infrastructure and, in England, support a number of new projects with strong local backing.

The Government is serious about delivering cheaper, cleaner, more secure power, so we need to consider all options. That is why we included onshore wind in the latest Contracts for Difference auction round and will include it in future rounds.

In Scotland, which has its own planning system, we will work with the Scottish Government to ensure communities and landscape issues are considered for future projects.

In Wales, we will support the work underway by the Welsh Government, Ofgem, and networks to improve grid connections.

In the more densely populated England, the Government recognises the range of views on onshore wind. Our plans will prioritise putting local communities in control. We will not introduce wholesale changes to current planning regulations for onshore wind but will consult this year on developing local partnerships for a limited number of supportive communities who wish to host new onshore wind infrastructure in return for benefits, including lower energy bills. The consultation will consider how clear support can be demonstrated by local communities, local authorities and MPs.

We will also look at arrangements to support the repowering of existing onshore wind sites when they require updating or replacement. With advances in technology this process can enhance capacity and provide new opportunities for communities to benefit.

Solar and other technologies

With the sun providing enough daily energy to power the world 10,000 times over, solar power is a globally abundant resource. There is currently 14GW of solar capacity in the UK split between large scale projects to smaller scale rooftop solar. The cost of solar has fallen by around 85 per cent over the past decade, and can be installed in just one day on a domestic roof. We expect a five-fold increase in deployment by 2035.

For ground-mounted solar, we will **consult on amending planning rules** to strengthen policy in favour of development on non-protected land, while ensuring communities continue to have a say and environmental protections remain in place.

We will continue supporting the effective use of land by encouraging large scale projects to locate on previously developed, or lower value land, where possible, and ensure projects are designed to avoid, mitigate, and where necessary, compensate for the impacts of using greenfield sites.

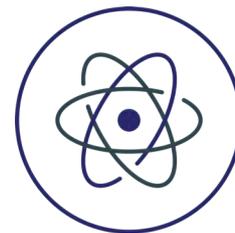
We will also support solar that is co-located with other functions (e.g. agriculture, onshore wind generation, or storage) to maximise the efficiency of land use. We have also included solar in the latest Contracts for Difference auction round and will include it in future rounds.

For rooftop solar, we will bring down bills and increase jobs by radically simplifying planning processes with a consultation on relevant permitted development rights and will consider the best way to make use of public sector rooftops.

We have already **removed VAT on solar panels** installed in residential accommodation in Great Britain. We are looking at **facilitating low-cost finance** from retail lenders to drive rooftop deployment and energy efficiency measures. And we will design performance standards to make installation of renewables, including solar PV, the presumption in new homes and buildings.

As an island nation surrounded by water, we will also aggressively explore **renewable opportunities** afforded by our geography and geology, including tidal and geothermal. And we are actively exploring the potential for **international projects** to provide clean, affordable and secure power, for example by expanding the Contracts for Difference scheme.

Nuclear



Low-carbon nuclear supplies 15 per cent of our electric lifeblood as a steady source of generation to complement intermittent renewables. Nuclear is the only form of reliable, low carbon electricity generation which has been proven at scale and returns more than a hundred times as much power as a solar site of the same size. We can only secure a big enough baseload of reliable power for our island by drawing on nuclear. Our aim is to lead the world once again in a technology we pioneered so that by 2050, up to a quarter of our power consumed in Great Britain is from nuclear.

When Her Majesty The Queen opened the world's first nuclear power station at Calder Hall in Cumbria in 1956, she described being present at the making of history. The UK had indeed led the world as the first country to split the atom, and the first to pioneer this new form of power.

But since then, we have fallen behind other countries. Five of our six existing plants will be offline within the decade, and we currently have only one new project in construction. By comparison, France currently has nine times more nuclear capacity than the UK. For decades successive governments have failed to make the necessary investments in British nuclear.

Today the UK is making the big call to reverse decades of under-investment. We will kickstart a nuclear reaction to recover our global leadership in civil nuclear power and drive down costs by building at scale over the next thirty years.

On safety grounds, the UK applies the highest global nuclear safety standards, including for the safe long-term disposal of all nuclear waste.

On cost, the UK is making the responsible decision to invest in this country's future and ultimately lower costs through setting up a long-term nuclear programme.

On jobs, each large-scale nuclear power plant could support up to around 10,000 jobs at peak construction.

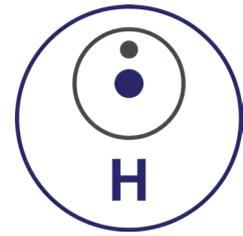
We will ensure the UK is one of the best places in the world to **invest** in nuclear by:

- Increasing our plans for deployment of civil nuclear to up to **24GW by 2050 – three times more than now** and representing **up to 25% of our projected electricity demand**.
- Within this overall ambition, we intend to take **one project to FID this Parliament and two projects to FID in the next Parliament, including Small Modular Reactors**, subject to value for money and relevant approvals. This is not a cap on ambition, but a challenge to the industry to come forward and compete for projects and aim to come online this decade.
- Depending on the pipeline of projects, **these ambitions could see our nuclear sector progressing up to 8 more reactors across the next series of projects**, so we improve our track record to **deliver the equivalent of one reactor a year, rather than one a decade**.
- This will all sit alongside our existing investment of **over £2 billion this Parliament in new nuclear**, including £100 million to support the development of Sizewell C, and £210 million to bring through small modular reactors.

We will radically change how we **deliver** new nuclear projects by:

- **Launching the £120 million Future Nuclear Enabling Fund in April**, first announced in the Comprehensive Spending Review.
- **Setting up the Great British Nuclear Vehicle this year**, tasked with helping projects through every stage of the development process and developing a resilient pipeline of new builds. **We will work with industry to scope the functions of this entity starting straightaway** – building on UK industrial strengths and expertise.
- Backing Great British Nuclear **with funding to support projects to get investment ready** and through the construction phase. We expect to **initiate the selection process in 2023 for further UK projects**, with the intention that government will enter negotiations with the most credible projects to **enable a potential government award of support as soon as possible, including (but not limited to) the Wylfa site**. As part of this, HMG will consider the role UK government financing can play in supporting new projects. Final contracts and construction would commence when any outstanding conditions are satisfied and projects are sufficiently mature. Any projects would be subject to a value for money assessment, all relevant approvals and future spending reviews.
- The UK has eight designated nuclear sites: Hinkley, Sizewell, Heysham, Hartlepool, Bradwell, Wylfa, Oldbury and Moorside. **To facilitate our ambitious deployment plans we will also develop an overall siting strategy for the long term**.
- Without impacting the robust safety, security and environmental protections offered by UK regulatory regime, Government will work with the regulators to understand the potential for any **streamlining or removing of duplication from the consenting and licensing of new nuclear power stations**, including possibly new harmonisation on international regulation.
- **We will also collaborate with other countries** to accelerate work on advanced nuclear technologies, including both Small Modular Reactors and Advanced Modular Reactors (AMRs).

Hydrogen



We have virtually no low-carbon hydrogen in our system today – but technology is making this a near-term reality with vast potential applications. By investing in the North Sea, renewables and nuclear through this Plan, the UK is well-placed to exploit all forms of low carbon hydrogen production. Our drive on renewables makes green hydrogen especially valuable for flexibility and as a storage solution. Excess renewable electricity used to produce hydrogen can be stored over time and used to power the grid when needed. We will double our UK ambition for hydrogen production to up to 10GW by 2030, with at least half of this from electrolytic hydrogen.

Hydrogen has many uses, for example, the first car to use a hydrogen fuel cell was invented by General Motors in 1966. It was a key component in town gas that powered UK homes before the discovery of North Sea gas. When produced cleanly, hydrogen is one of the greenest forms of energy we have – which is why we plan to blend up to 20 per cent hydrogen into the natural gas grid and will take a final decision by the end of next year.

Hydrogen is the most abundant chemical element in the universe, but needs releasing from water, hydrocarbons, or other organic matter before we can use it. The UK will look to be a leader in developing a domestic source of this superfuel, in this ever-increasing internationally competitive space. And we fully support hydrogen as a relatively frictionless way to decarbonise our lives in the near-term.

Hydrogen can be produced in many different ways. Sometimes colours are used to describe this process.

“**Blue**” hydrogen splits natural gas into hydrogen and carbon dioxide, with the carbon captured and stored.

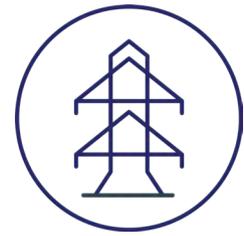
“**Green**” hydrogen uses electrolysis, passing electricity through water to separate out the hydrogen and oxygen.

“**Pink**” hydrogen also uses electrolysis, but with energy from a nuclear power plant.

We will offer clear **long-term signals** alongside **immediate support** by:

- Doubling our ambition to **up to 10GW of low carbon hydrogen production capacity by 2030**, subject to affordability and value for money, with at **least half of this coming from electrolytic hydrogen**. By efficiently using our surplus renewable power to make hydrogen, we will reduce electricity system costs.
- **Aiming to run annual allocation rounds for electrolytic hydrogen**, moving to price competitive allocation by 2025 as soon as legislation and market conditions allow, so that up to **1GW of electrolytic hydrogen is in construction or operational by 2025**.
- **Designing, by 2025, new business models for hydrogen transport and storage infrastructure**, which will be essential to grow the hydrogen economy.
- Levelling the playing field by setting up a **hydrogen certification scheme by 2025**, to demonstrate high-grade British hydrogen for export and ensure any imported hydrogen meets the same high standards that UK companies expect.

Networks, storage and flexibility



Accelerating our domestic supply of clean and affordable electricity also requires accelerating the connecting network infrastructure to support it. Within this decade, our modern system will prioritise two key features: anticipating need because planning ahead minimises cost and public disruption; and hyper-flexibility in matching supply and demand so that minimal energy is wasted. This more efficient, locally-responsive system could bring down costs by up to £10 billion a year by 2050.

Flexibility has always been the valuable heart of our system, ensuring power can flow quickly from where it's produced to where it's needed. In 2021, the onshore electricity network had approximately 18,000 km of high voltage transmission cables, and approximately 800,000 km of lower voltage distribution lines, enough to stretch around the world 20 times. Networks are a complex system that have been slow in their transformation. We aim to halve the time it takes to get this infrastructure built so we can double the pace.

On costs, building ahead of need, where good value for money, may mean paying more in the short term for an asset that isn't efficiently utilised immediately but is the cheapest option over the long term and reduces the need for repeated disruptive works to continually upgrade the system.

On uncertainty, whilst there are many future decisions yet to be taken, and a need for an agile approach to network infrastructure, we do know that electricity demand is highly likely to double by 2050.

On competition, price signals can harness the power of responsive demand to minimise wasted energy and deliver far more efficient distribution of power than a state-planned system ever could.

We will ensure **lower total costs** by offering clear signals on future need by:

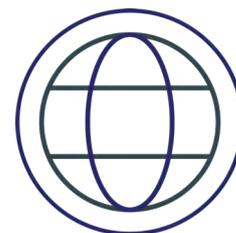
- **Establishing the Future System Operator** as soon as practicable to drive our overall transition and oversee the UK energy system.
- Publishing a **strategic framework** this year with Ofgem for how networks will deliver net zero.
- **Appointing an Electricity Networks Commissioner** to advise Government on policies and regulatory changes to accelerate progress on network infrastructure.
- **Setting out a blueprint for the whole system by the end of 2022 in the Holistic Network Design (HND) and Centralised Strategic Network Plan (CSNP)**. The HND will identify strategic infrastructure needed to deliver offshore wind by 2030. Certain infrastructure identified in the HND and CSNP will be exempt from the introduction of onshore network competition.
- **Updating the National Policy Statements to recognise these blueprints** in the planning system, increasing certainty for the planning inspectorate, developers and other stakeholders, and speeding up delivery.
- **Ensuring Ofgem expedites its approvals process** to build networks in anticipation of major new sources of generation and demand. Government will set out the importance of strategic network investment in its forthcoming Strategy and Policy Statement for Ofgem.
- Working with developers and the supply chain, we will increase **pipeline visibility and certainty** to help accelerate procurement timelines. And we will work with Ofgem to speed up connections to the local distribution networks.
- **Dramatically reduce timelines for delivering strategic onshore transmission network infrastructure by around three years**. We will work with Ofgem, network operators and the supply chain to find further savings, for example in the procurement, manufacture and construction stages. **Overall, we aspire to halve the end-to-end process by the mid-2020s**.
- **Ensuring that local communities can benefit** from development of onshore infrastructure in their area, we will consult on community benefit options. We will launch an Offshore Coordination Support Scheme which will de-risk delivery of well-advanced offshore wind projects.

We will ensure a more **flexible**, efficient system for both generators and users by:

- Encouraging all forms of flexibility with sufficient large-scale, long-duration electricity storage to balance the overall system by developing appropriate policy to enable investment.
- Ensuring consideration is given to the **siting of hydrogen electrolysers** to best use surplus low carbon electricity and reduce network constraints.
- Undertaking a comprehensive **Review of Electricity Market Arrangements (REMA)** in Great Britain, with high-level options for reform set out this summer.
- Ensuring we have a retail market fit for purpose. We will **join REMA up with our ongoing retail review** to ensure that consumers fully benefit from the next phase of our energy revolution, setting out plans before the next price cap period.

- Smartening up the system with more **flexible pricing**, through Time of Use tariffs and battery storage through Electric Vehicles.
- Ensure all new homes are designed so that **smart meters can be fitted from the outset**, in advance of the Future Homes and Buildings Standards by 2024.

International delivery



It is crucial we work with international partners to maintain stable energy markets and prices. This will help protect UK consumers and reduce the use of fossil fuels globally. Similar to our domestic strategy, we have a dual approach to reduce global reliance on Russian fossil fuels whilst pivoting towards clean, affordable energy.

To reduce global reliance on Russian fossil fuels, the UK is:

- Committing to **phase out the use of Russian oil and coal by the end of 2022, and end imports of Russian liquified natural gas as soon as possible thereafter**. The US has made similar commitments.
- **Building international support to reduce Russian energy revenues**. Internationally coordinated action, e.g., through the G7 and International Energy Agency is key to support stable markets and to help secure the critical minerals we all need to successfully move to clean energy.
- Building on our important **partnerships with non-Russian OPEC countries, and the US**, to promote market stability through the availability of alternative supplies of oil and gas.
- **Hosting the first UK-Qatar Strategic Energy Dialogue** in May to further deepen our existing energy collaboration.
- **Working closely with the US on gas**, particularly on how we can leverage UK LNG infrastructure to support European supply.
- Driving our work with European partners for more **efficient trading across our electricity interconnectors**, lowering costs for UK and EU consumers.
- **Providing a key EU entry point for non-Russian supplies of gas**. We are examining our infrastructure to ensure gas flows efficiently between the UK, Europe and the global market through our interconnectors and LNG terminals and promote gas infrastructure to be hydrogen-ready.

To support other countries to make the same transition to clean, affordable, secure energy, the UK is:

- Leading the **Clean Green Initiative**, launched by the Prime Minister at COP26.
- Committing to **double our International Climate Finance to £11.6 billion** over five years.
- Collaborating with partners to reduce reliance on fossil fuels, from the Powering Past Coal Alliance, the Green Grids Initiative, to nuclear. The UK has decades of experience in uranium enrichment and fuel fabrication to support alternatives to Russian fuel. We are working with like-minded partners at the IAEA and other fora to form an alliance that shapes international regulations to drive SMR deployment. Our North Seas collaboration will accelerate the development of offshore windfarms with links to continental power grids, unleashing hundreds of gigawatts of clean energy into North Seas countries' electricity systems.

Energy plan objectives and key measures

 Oil & Gas Low carbon UK gas, and zero Russian imports						
Key measures	End 2022 ambition	2023 ambition	2024 ambition	2025 ambition	2030 ambition	2050 ambition
<ul style="list-style-type: none"> • Regulatory Accelerators for new oil & gas • Planned new oil & gas licensing, mindful of delivered Climate Checkpoint & energy security • Review of the science on shale gas • Clean electricity for offshore platforms • CCUS clusters to futureproof North Sea • Phase out Russian oil and coal by end 2022 and Russian LNG gas imports as soon as possible thereafter 	<ul style="list-style-type: none"> • Climate Checkpoint launched • Planned new licensing round for oil & gas • Oil & Gas New Project Regulatory Accelerators • 0% Russian oil and coal 	<ul style="list-style-type: none"> • Potential new projects merge from licensing round 			<ul style="list-style-type: none"> • Domestic gas production remains a core part of UK energy security • Large scale electrification to provide clean power to offshore platforms • 20-30MT CCUS target • Over 40% reduction in gas consumption 	<ul style="list-style-type: none"> • Net zero compatible oil and gas sector, supplying the UK economy



Nuclear

Deliver Great British nuclear with high ambition, expertise and backed to support projects

Key measures	End 2022 ambition	2023 ambition	2024 ambition	2025 ambition	2030 ambition	2050 ambition
<ul style="list-style-type: none"> Up to 8 reactors progressed across the next series of projects Reaching up to 24GW by 2050 (up to 25% of demand) Starting scoping out the Great British Nuclear Development Vehicle next month 	<ul style="list-style-type: none"> Great British Nuclear (GBN) Vehicle being set up Future Nuclear Enabling Fund funding awarded 	<ul style="list-style-type: none"> Initiate the selection process for further nuclear projects 	<ul style="list-style-type: none"> By 2024, FID on one nuclear project (i.e. this parliament) 		<ul style="list-style-type: none"> Up to 8 new reactors progressed across the next series of projects 	<ul style="list-style-type: none"> Up to 24GW nuclear installed (up to 25% of total GB demand)



Solar

Ramp up deployment, on both roofs and ground

Key measures	End 2022 ambition	2023 ambition	2024 ambition	2025 ambition	2030 ambition	2050 ambition
<ul style="list-style-type: none"> Consult on amending planning rules to strengthen policy in favour of solar development Consult on reviewing permitted development rights to support solar deployment Explore low-cost finance options with retail lenders to help households install rooftop solar Design performance standards to further encourage renewables, including solar PV, in new homes and buildings 	<ul style="list-style-type: none"> Publish updated planning documents to support solar deployment Bring the Part L Homes Standards interim uplift into force, enabling solar deployment as a route to compliance 	<ul style="list-style-type: none"> Contracts for Difference auction 	<ul style="list-style-type: none"> Enable improvements in network infrastructure and connectivity; streamline network charging rules Contracts for Difference auction 	<ul style="list-style-type: none"> Future Home Standard and Future Buildings Standard in force, further uplifting energy performance in new homes and buildings Contracts for Difference auction 	<ul style="list-style-type: none"> This could be up to 70GW of solar by 2035 	<ul style="list-style-type: none"> A low-cost, net zero consistent electricity system, most likely to be composed predominantly of wind and solar generation



Wind

Cheaper power for local areas by cutting planning and delivering better connections

Key measures	End 2022 ambition	2023 ambition	2024 ambition	2025 ambition	2030 ambition	2050 ambition
<ul style="list-style-type: none"> • Halving planning and regulation time for new offshore wind projects • Consult on developing partnerships for a number of onshore wind projects for supportive communities, with associated benefits for local population • Improving community benefits for areas with strategic network infrastructure • By next year, have blueprint for strategic network infrastructure • Networks Commissioner and Future System Operator to help plan ahead • Launch an Offshore Coordination Support Scheme 	<ul style="list-style-type: none"> • Publish Electricity Networks Strategic Framework • Publish Holistic Network Design, identifying critical reinforcements required to support wind ambition and helping to speed up delivery timelines including planning and regulatory approvals • Improving Community Benefits consultations for strategic network infrastructure and onshore projects for supportive communities • Launch an Offshore Coordination Support Scheme • Updated English planning policy to support repowering 	<ul style="list-style-type: none"> • Contracts for Difference auction • Amend National Policy Statements • Introduce environment strategic compensation measures • Amend Habitat Regulations Assessment • Introduce Offshore Wind Environmental Improvement Package • Establish a fast track consenting route for priority cases where quality standards are met 	<ul style="list-style-type: none"> • Contracts for Difference auction • Develop appropriate policy to enable investment in long-duration energy storage • Future System Operator established 	<ul style="list-style-type: none"> • Contracts for Difference auction 	<ul style="list-style-type: none"> • Up to 50GW offshore • Including up to 5GW floating offshore wind capacity 	<ul style="list-style-type: none"> • A low-cost, net zero consistent electricity system, most likely to be composed predominantly of wind and solar generation



Hydrogen

Boost our commitment to green H₂, accelerating our H₂ economy

Key measures	End 2022 ambition	2023 ambition	2024 ambition	2025 ambition	2030 ambition	2050 ambition
<ul style="list-style-type: none"> • Double our ambition to up to 10GW hydrogen production capacity, at least 50% from electrolytic projects • Aim to run annual allocation rounds for the hydrogen business model, moving to price-competitive allocation by 2025 as soon as legislation and market conditions allow • Aim that up to 1GW of electrolytic hydrogen is in operation or construction by 2025, alongside our existing commitment up to 1GW of CCUS-enabled hydrogen • Design Transport & Storage business models by 2025 	<ul style="list-style-type: none"> • Complete final hydrogen business model • Net Zero Hydrogen Fund open and funding allocated • Launch UK Low Carbon Hydrogen Standard 	<ul style="list-style-type: none"> • Decision on blending up to 20% hydrogen into natural gas grid • Award first business model contracts to electrolytic and CCUS-enabled hydrogen projects • Hydrogen heating neighbourhood trial begins 	<ul style="list-style-type: none"> • Allocate second round of business model contracts to electrolytic hydrogen projects 	<ul style="list-style-type: none"> • Up to 1GW electrolytic ‘green’ hydrogen and up to 1GW of CCUS-enabled ‘blue’ operational or in construction by 2025 • Hydrogen Transport & Storage business models designed • Hydrogen heating village trial begins and plan for town pilot • Hydrogen certification scheme set up 	<ul style="list-style-type: none"> • Up to 10GW low carbon hydrogen production capacity, double previous 5GW ambition • Hydrogen Transport & Storage business models in place 	<ul style="list-style-type: none"> • There could be 240-500TWh low carbon hydrogen supply by 2050



Demand

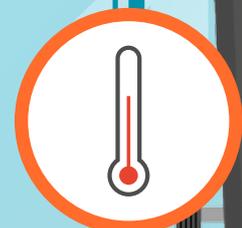
Accelerate energy efficiency deployment and phase out fossil fuel use

Key measures	End 2022 ambition	2023 ambition	2024 ambition	2025 ambition	2030 ambition	2050 ambition
<ul style="list-style-type: none"> • VAT cut for insulation & heat pumps • Facilitating low-cost finance from retail lenders to catalyse green finance market • Heat Pump Investment Accelerator of up to £30m • Better labelling and product standards so consumers can purchase more efficient products including for heating, lighting, and cooking • Setting clear energy performance standards varying by building type • Launching our new national digital support tool on GOV.UK Energy Advice Service to help consumers improve the energy performance of their homes • Establishing a dedicated energy advice offering for smaller businesses • Extend the EII Compensation Scheme for a further three years, and intend to increase the aid intensity to up to 100% (1.5% of GVA) • Consider other measures to support business including increasing the renewable obligation exemption to 100% 	<ul style="list-style-type: none"> • Continue to deliver energy efficiency upgrades through existing public sector, social housing and supplier-led schemes • Launch the Boiler Upgrade Scheme and the Green Heat Network Fund • Upgrade around 2,000 social homes in 2022 through the Social Housing Decarbonisation Fund demonstrator • Begin ECO4 which will upgrade 450,000 homes over four years • Publish proposals to rebalance energy costs 		<ul style="list-style-type: none"> • Consulted on phasing out fossil fuel heating off the gas grid from this date • Ensure all new homes are designed so that smart meters can be fitted from the outset, in advance of the Future Homes and Buildings Standards • Launch Clean Heat Market Mechanism 	<ul style="list-style-type: none"> • Ensuring all new buildings in England are ready for Net Zero from 2025 • Begin designating heat network zones 	<ul style="list-style-type: none"> • 600,000 heat pump installations per year by 2028 • As many fuel poor homes as reasonably practicable to Band C by 2030 • As many homes to reach EPC B and C as possible by 2035 	<ul style="list-style-type: none"> • All heating systems used in 2050 are compatible with Net Zero with an ambition to end the installation of gas boilers by 2035 at the latest

APPENDIX SE11: POLICY CONNECT NO TIME TO WASTE

NO TIME TO WASTE

RESOURCES, RECOVERY, & THE ROAD TO NET-ZERO



“Until we reach a point where we no longer produce residual waste, we need to be managing it in the most efficient way.”

Professor Margaret Bates

July 2020

This report follows a six month-long inquiry and was written by Oliver Feaver, Policy Manager, Sustainability at Policy Connect.

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2030

THE ROAD TO RECOVERY

WE COULD BE ON TRACK FOR RECYCLING TARGETS AND ALSO:

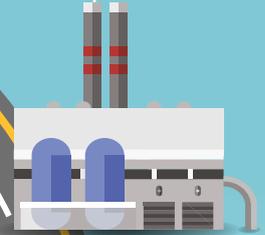
UNLOCK BILLIONS OF INVESTMENT AND GREEN JOBS

AFFORD 10 NEW RECYCLING FACILITIES EACH YEAR FROM MONEY SPENT SHIPPING WASTE ABROAD

GENERATE EFW HEAT EQUIVALENT TO HALF A MILLION HOMES



JET-ZERO: SUSTAINABLE TRANSPORT AND AVIATION FUELS



AVOID 4 MILLION TONNES OF CO₂ IN 2030 BY DISPLACING LANDFILL



WHAT MUST WE DO?

1. Keep driving up recycling
2. Get plastics out of the residual waste stream
3. Stop sending waste abroad and use it for UK heat/energy
4. Reduce landfill reliance
5. Keep reviewing waste treatment capacity and requirements
6. Allow sufficient Efw investment
7. Collaborate to seize the Efw heat opportunity

Foreword

For us as parliamentarians, this inquiry brings home the fact that half of the waste we produce in the UK is not recyclable. Instead, it ends up largely in landfill or being sent overseas, or even being fly-tipped on our precious green spaces. This aspect of waste management would shock many citizens, but the reality is that we will continue to produce large volumes of non-recyclable waste for years to come. It is an urgent issue that we must manage as a nation, in the most resource efficient way, whilst also considering both net-zero and the post-COVID 'Build Back Better' agenda.

This report from Policy Connect comes at a key time for waste management and public health, when the need for safe and effective removal of our waste has never been more important. As the UK embarks on our Build Back Better movement, we must no longer simply bury or export the problem. Instead, we should, as other European economies do, treat residual waste as a valuable resource to produce lower carbon heat and energy, alongside a focus on achieving our important recycling targets and investing in innovative recycling technology. Energy from Waste (EfW) is not the perfect long-term solution for residual waste. But accompanied by a drive to increase heat use and to decarbonise EfW further, it is the best available technology, and is an essential part of the transition ahead of us.

The recommendations in this report build upon the direction of travel set by the Government's 2018 Resource and Waste Strategy, to put the UK at the forefront of global resource efficiency and to increase utilisation of the heat generated from waste. The report concludes that the appropriate location of plants is the key to unlocking greater heat use, and proposes cross-governmental, local authority, and industry collaboration to determine future locations and potential heat off-takers.

Energy from Waste can support low-carbon domestic heating, energy-intensive industries, aviation, and more. At the same time, it could attract important investment into communities and create jobs across the country as we recover from the economic shock of COVID-19. To help to provide certainty for the infrastructure investment needed, the Government should clearly set out the future role of EfW, and provide a stable, long-term, and ambitious policy framework.

This report addresses these difficult issues head on, and has involved partners across sectors; those who manage our waste; carry out research into new and innovative methods; and from the energy and construction sectors. Given our shared desire to maximise resource efficiency and value for the UK, the research conducted here aspires to provide practical recommendations for productively incorporating residual waste management into the UK's move to net-zero and a circular economy.





The Rt Hon Robert Goodwill MP
Conservative, Scarborough and Whitby,
Former Minister at Defra



Alex Sobel MP
Labour, Leeds North West, Chair of the
All-Party Parliamentary Net Zero Group



Lord Teverson
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EU Energy and Environment Committee



Lord Duncan of Springbank
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Kerry McCarthy MP
Labour, Bristol East, Shadow Minister
for Green Transport



Mark Pawsey MP
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The Rt Hon the Lord Smith
Cross bench, Former Chair
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Labour, Putney

Recommendations

Waste policy

Residual waste treatment

page 11

The Government should release a policy statement outlining the future role of EfW as the best available residual waste treatment, as well as its role in helping to decarbonise other sectors.

Managing our own waste

page 15

The UK should stop sending its waste abroad. Rather than paying other countries to recover energy from our waste and buying energy back, the UK should deal with our own waste and recover more of our energy and heat needs.

Waste projections

page 16

Defra should produce a waste and resources roadmap, outlining the targeted and managed transition to a circular economy and net-zero ambitions.

Climate and the environment

Decarbonising EfW

page 12

The Government should support the development and integration of Carbon Capture and Storage technology into EfW facilities, in anticipation of a future carbon tax.

Recycling and waste prevention

page 17

Defra should continue to drive up recycling rates, including supporting innovation and technology development; and eliminating plastics from the residual waste stream should be prioritised.

Waste and public awareness

page 20

The Government should drive a national public education campaign around personal responsibility and waste management, and its links to climate change. This should engage authorities and encourage communication of the end-process of residents' waste.

Waste heat

A role for waste heat

page 22

BEIS' upcoming Heat and Buildings Strategy should recognise a clear role for EfW heat to provide accessible low carbon heat, as a key early element on the road towards heat sector decarbonisation.

Addressing the heat challenge

page 23

The Government should implement a package of aligned and complementary measures drawn from the menu in this report, to address identified barriers to the EfW heat challenge.

Finding the right location

page 24

The Government should establish or actively participate in a cross-sectoral forum to consider the appropriate location of EfW infrastructure, prioritising finding potential heat customers.

Planning and nearby development

page 30

The Government should revise the National Planning Policy Framework's presumption in favour of sustainable development to include proposed developments using EfW heat.

Executive Summary

This inquiry, supported by the broad membership of the Sustainable Resource Forum, takes as its start point that waste management must be a key consideration as the UK's focus shifts to net-zero carbon by 2050 and to addressing the long-term impacts of COVID-19. As we set out below, there are good reasons why resource management and improving resource efficiency has been a central theme throughout a wealth of recent legislation. Our inquiry concludes that EfW has an important role to play in the transition ahead of us: both as the lowest carbon solution for managing residual waste, but also by providing low carbon heat and supporting other sectors' decarbonisation efforts. It also recognises that the UK can do more to further decarbonise EfW, by getting fossil-based plastics out of the residual waste stream, and with government support to explore new carbon capture and storage technology (CCS).

Our investigations consider the three options for managing residual waste: sending it to EfW, burying it in landfill or shipping it abroad, and firmly conclude that EfW is the best available option. By sending the waste to EfW, it is pushed up the waste hierarchy, diverted away from environmentally damaging landfill, and can support the UK's heat and power needs. At the same time, it helps to maintain a clean and hygienic waste service; something the public has come to expect; the need for which has been reinforced during the COVID crisis. The inquiry proposes that the UK should move towards a Scandinavian style approach to residual waste, viewing it as a valuable resource to generate heat, to ensure that landfill reliance is driven down to as low as is feasible.

The UK is currently introducing an ambitious range of measures to address resource challenges and encourage recycling. It is not yet clear exactly what impact these will have on future levels of waste arisings, but stakeholders are clear that continuing to drive recycling and waste prevention should be central to future innovation across the sector. There is also a need for greater public awareness of the links between personal waste responsibility and climate change.

Calculations show that even if the UK does meet its 2035 recycling targets, there will continue to be large volumes of residual waste produced long into the future. The UK should therefore frequently reassess projections for future waste volumes, to account for the impact of new measures and externalities, and to allow necessary investment into EfW capacity. This will enable maximum use of low carbon waste heat generated by EfW to support housing, industry, and other sectors.

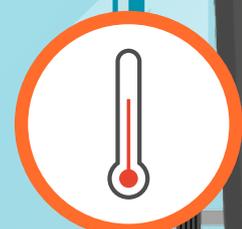
The inquiry concluded that there is no time to waste. The UK is disproportionately lagging behind much of Europe in harnessing EfW heat, with less than a quarter of plants connected to heat networks. We found that there are currently a number of barriers preventing this on a larger scale, but that the primary challenge is finding the right sites for plants, located near to a potential heat off take. Our firm conclusion is that Government needs to play a greater role to realise this opportunity, working collaboratively with industries and local government to determine suitable sites and potential heat customers.

This inquiry has found that when integrated into communities, and with the addition of local heat supply, EfW has the potential to offer significant community value across the country. Whether this is by attracting local investment, creating new skilled jobs, or by providing low carbon heating to help address fuel poverty, EfW can play a critical role as the UK builds back better from the impact of COVID-19 on our society and economy.

This inquiry, which covers EfW in England, received contributions from 50 organisations, through parliamentary roundtables, interviews, and written submissions. The following chapters examine the future role of EfW, the opportunities for EfW in tackling the UK's long-term challenges, increasing resource efficiency through heat utilisation, and maximising community value.

CHAPTER ONE

ENERGY FROM WASTE AND THE CLIMATE AGENDA



Energy from waste and the climate agenda

In recent years, the climate agenda and focus of government has shifted significantly, and public concern for the environment has never been greater.¹ The UK has committed to net-zero carbon emissions by 2050, and adopted ambitions to reach a circular economy.² There now needs to be a focus on how every sector and industry adapts to this, where previously many had assumed they could fall outside of the scope of the less ambitious Paris Agreement.³

Resource and waste management policy is critical to this agenda, and has been a central theme throughout a wealth of new legislation:

- The **Industrial Strategy** (2017) outlined that the Government is “*committed to moving towards a more circular economy – to raising productivity by using resources more efficiently*”.⁴
- The **Clean Growth Strategy** (2017) aims to achieve decarbonisation objectives for each sector (in accordance with the Climate Change Act) at low cost to UK taxpayers, consumers and businesses while maximising social and economic benefits for the UK.⁵
- The **Resources and Waste Strategy** (2018) outlined how England will preserve material resources by minimising waste, promote resource efficiency and move towards a circular economy in England.⁶
- The **25 Year Environment Plan** (2018) outlined ambitions to improve the environment via the Environment Bill. The Plan strives to use natural resources more sustainably and efficiently, minimise waste and pollution, and mitigate and adapt to climate change (aligned with the Clean Growth Strategy).⁷
- The **Environment Bill** (2020) gives provision for targets, plans and policies for improving the natural environment and around waste and resource efficiency.⁸

Energy from Waste (EfW) has an important role to play in this transition, and this report outlines the future of this suite of technologies. EfW is the lowest carbon solution for managing residual waste, by diverting landfill and generating useable electricity and heat. Every tonne of waste diverted from landfill to EfW saves 200kg of CO₂, while generating low carbon energy and heat.⁹

EfW technology

Within the wider framing of EfW, there are different technologies for certain waste streams. For example, anaerobic digestion is the preferred technology for managing residual food waste, whilst combustion EfW is used for mixed residual waste. Additionally, Advanced Thermal Treatments (ATT) including gasification and pyrolysis are being increasingly explored with financial support through Contracts for Difference (CfDs). However, this inquiry found limited support or evidence of ATT being currently proven on a large, sustainable scale. EfW can therefore be taken to refer to available and proven combustion technologies.

Wider decarbonisation

The question is how could we be using waste: could we use it to decarbonise really difficult sectors? To get there you need strong, stable policy support. That doesn't mean subsidies but it means a long-term vision.

Mark Sommerfeld, Renewable Energy Association

EfW is primarily a waste management tool. Whilst often considered a transitional technology until a point where residual waste ceases to arise, there are additional roles that existing and emerging EfW technologies can play. These roles should be utilised fully to contribute to the decarbonisation efforts for often-difficult sectors, and the broader UK climate agenda.

The Government's Clean Growth Strategy praises the resources and waste sector for its decarbonisation efforts, which has seen a 69% reduction in carbon emissions since 1990. The Strategy highlighted, however, the lack of progress achieved by other sectors. The Strategy stresses the need to replicate similar progress, in particular across the transport, industry, and domestic heating sectors.¹⁰

Heating

Significantly, the EfW process generates vast quantities of heat, which can and should be utilised as far as possible. Decarbonising domestic and industrial heating is already proving to be one of the most challenging aspects of the drive towards net-zero.⁵

EfW also presents a significant opportunity to provide heat to non-domestic buildings. By 2050, non-domestic buildings are projected to represent 53% of heat network demand, despite the fact that they will only account for 28% of the UK's general heat requirements.¹¹ As a high temperature process, EfW heat is ideally placed to serve lower efficiency buildings and industrial plants with high heat demand.

In 2018, the Government identified at least 0.2tWh of accessible EfW waste heat, which alone would double the proportion of UK heat provided through heat networks if utilised. Chapter two of this report explores the opportunities and challenges of EfW heat.

Helping other sectors

In addition to heat, EfW technology can present opportunities in other often difficult-to-decarbonise sectors. There are emerging technologies utilising residual waste and unique EfW processes to produce alternative products; syngas for transport fuels, jet fuel, or chemicals manufacturing such as naphtha.

Due to a general lack of clarity, it is unclear exactly how government perceive the future role of EfW, and where the priorities are for the different technologies. This was demonstrated through varying levels of government subsidy support for different outputs over a number of years, with EfW transport fuels currently receiving the greatest level of financial support through the Renewable Transport Fuel Obligation.

Net-zero is this big thing we need to talk about. How does waste management contribute to the transition to net-zero carbon by 2050?

Roundtable participant

The Government should provide clarity on the future role of EfW both in terms of residual waste management and also the decarbonisation agenda, to help stimulate the market and investment accordingly.

RECOMMENDATION: RESIDUAL WASTE TREATMENT

The Government should release a policy statement outlining the future role of EfW as the best available residual waste treatment as well as its role in helping to decarbonise other sectors.

Carbon footprint

This inquiry has found EfW to be the lowest carbon option for managing residual waste, avoiding 200kg of CO₂ for every tonne of waste diverted away from landfill.⁹ There are still carbon emissions released during the process, however, with 10.7Mt reported in 2018.¹² Whilst this figure does not offset for the heat and electricity generation, it is still key to drive down these levels in line with reaching net-zero by 2050. This can be categorised into controlling two factors: what is being inputted - the feedstock; and what is being released - the emissions. A two-pronged approach to tackle both of these factors will be most effective.

Eliminating plastics from the residual waste stream

In order to drive EfW decarbonisation, the level of fossil carbon in the waste must be minimised, and the biogenic (renewable) component must make up the majority of residual waste. At present biogenic content makes up around two thirds of residual waste.⁴³ Burning fossil-based plastics is the most environmentally damaging material commonly treated by EfW, and removing plastics from the residual waste stream will be key to decarbonising EfW further.

The Environment Bill provides powers to introduce new measures higher up the supply chain, including new extended producer responsibility (EPR) measures, alongside an incoming deposit return scheme (DRS), as well as a drive towards a refill/reuse society.⁸ These measures will target the removal of plastics, which will help to eradicate this issue and the environmental impact of our resources and waste arisings. However, if these measures do not achieve this, introducing a future carbon tax would be another effective way to drive down the levels of plastic* ending up in the residual waste stream, in turn driving decarbonisation of the waste stream.

Emissions

There are similarly emerging technologies to help capture and reduce the carbon impact of EfW emissions. Carbon Capture and Storage (CCS) technology is increasingly being trialled for different industries across the world. Recently a number of EfW plants across Europe have incorporated CCS both during the design and retrospectively.

Other innovative processes are utilising accelerated carbonation technology (ACT) during the flue gas treatment, to turn air pollution control residues (APCr) into aggregate construction products. This utilises waste CO₂ and is typically carbon-negative, representing another form of CCS.¹³

RECOMMENDATION: DECARBONISING EFW

The Government should support the development and integration of Carbon Capture and Storage technology into EfW facilities, in anticipation of a future carbon tax.

CASE STUDY

Fortum Oslo Varme

Location: Oslo, Norway

Input: 400,000 tonnes per year

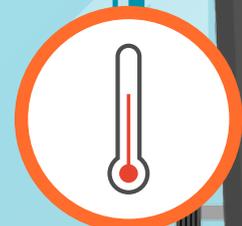
Output: District heating and cooling to Oslo, electricity

Interest: Klemetsrud is building and integrating full scale CCS. A pilot demonstrated the possibility to capture 90% of all CO₂ in the flue gas.



CHAPTER TWO

THE ROAD TO RECOVERY



The road to recovery

The majority of current waste legislation has derived from the European Union. The UK's departure from the European Union has presented the opportunity for the governments of the UK to be in full control of their waste policies, although details of the exact future relationship arrangements with the EU are not yet known.¹⁴ Waste policy spans different levels of government within the UK. The UK Government has full responsibility for waste and resources across England, whilst the Northern Irish, Scottish, and Welsh Governments largely oversee their respective waste in most areas including managing municipal waste.¹⁴ This inquiry references both England and the UK throughout, although is directly aimed at England's waste policy. The themes and technologies are nevertheless relevant and applicable to each devolved nation.

The Resources and Waste Strategy (RWS) set out the UK Government's ambitions for the future of the sector. Whilst largely focusing on recycling and reuse, there were new details on residual waste. The main aim was to drive up the efficiency of Energy from Waste plants, to ensure that they reach **R1 Recovery status**. The simplest way to drive greater efficiency of EfW plants is to ensure heat generated by the process is being utilised rather than released into the atmosphere as waste heat.

The EU Waste Framework Directive (*Directive 2008/98/EC on waste*) developed the concept of the waste hierarchy, alongside the concepts of EPR and the polluter pays principle.¹⁵

The hierarchy ranks five steps for waste management according to their environmental impact.¹⁶ Whilst this is an EU Directive, the UK Government has reaffirmed that residual waste will continue to be treated in accordance with the hierarchy outside of the EU.¹⁷

The Waste Framework Directive (Article 3) also provides specific definitions of each step. EfW plants can typically be classified as either disposal or recovery, depending on their efficiency and output. The Directive distinguishes between disposal and recovery for EfW plants as the following:¹⁸

Recovery means any operation the principal result of which is waste serving a useful purpose by replacing other materials that would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. [Article 3(15)]

Disposal means any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. [Article 3(19)]

It is vital to ensure EfW plants reach recovery status, in order to drive residual waste up to the highest possible level of the hierarchy. This is determined using the R1 Energy Efficiency Formula, which calculates the efficiency at which the energy generated by EfW is utilised. Some plants in the UK reach recovery status by solely generating electricity. If waste heat is utilised through district heating or another offtake, the R1 measure will be significantly higher than through electricity generation alone. As of January 2019, 28 out of the total 47 existing EfW plants in the UK were R1 Recovery accredited.¹⁹



Projections and capacity

Various factors will significantly affect future residual waste arisings, and as a result it is difficult to project volumes and required capacity. The Resources and Waste Strategy (RWS) presented Defra modelling, which projected residual waste arisings through to 2035. This modelling showed there to be an appropriate EfW treatment capacity, but also made a number of assumptions, as follows.

RDF exports

Exporting waste in the form of refuse derived fuel (RDF) for disposal abroad is prohibited.²⁰ However, RDF can be exported for recovery depending on the country's regulations, and the UK exported 3,137,266 tonnes in 2018²¹. The RWS modelling assumed RDF exports would be maintained at a similar level. However, since it was published, a number of European countries including the Netherlands and Sweden have introduced RDF export taxes.^{22,23} Initial trends are already beginning to emerge of the levels of RDF exports reducing, with Environment Agency data for 2019 reflecting a fall to 2,714,225 tonnes.²⁴ It remains unclear exactly how this will affect UK export levels, but it appears unlikely that the volumes exported will remain stable as the RWS suggested.

Additionally, £280 million is being spent by the UK each year to export waste for other countries to recover energy from; often the same countries that the UK then imports energy from.²⁵ In our 2019 Plastic Packaging Plan, Policy Connect called for an end to plastic waste exports for recycling by 2030. The Government has followed this advice, committing in their 2019 Manifesto to an end to plastic exports, albeit only to non-OECD countries.²⁶ Whilst this is positive progress, export destinations must be judged on domestic environmental regulations for waste rather than economic status, to ensure exports are managed at the highest environmental standards. We now additionally believe that the UK should no longer be exporting RDF waste and should instead prioritise ensuring EfW is more acceptable through greater heat offtake.

RECOMMENDATION: MANAGING OUR OWN WASTE

The UK should stop sending its waste abroad. Rather than paying other countries to recover energy from our waste and buying energy back, the UK should deal with our own waste and recover more of our energy and heat needs.

Recycling targets

The RWS reaffirmed a recycling target for England of 65% municipal solid waste recycling by 2035, in line with the EU's Circular Economy Package.^{6,27} Government projections for residual waste arisings assume that this will be met, however there is mounting expectation that these targets will be missed. DS Smith and Central Saint Martins' report *Tipping Point* shows the UK set to miss both short-term and long-term recycling targets, only expecting to meet 65% recycling by 2048.²⁸

This inquiry heard a broad spectrum of views relating to if and when the UK would achieve the 65% target recycling rate. Regardless of exactly when 65% is met, this will leave a baseline of 35% residual waste. The volume of waste that 35% represents is likely to continue growing as population increases. Sufficient EfW capacity is key to avoiding reliance on landfill into the future.

Landfill reliance

Finally, the model in the Resources and Waste Strategy assumed that even by 2035, there will continue to be a reliance on landfill, to dispose of 10% of residual waste. Whilst we recognise there are a few materials where landfill is necessary, this target can be more ambitious, and landfill still accounting for 10% of residual waste is too high. Since publication of the RWS, the Committee on Climate Change have recommended a more ambitious target for an end to landfill of biodegradable waste by 2025; a decade sooner than the RWS previously outlined and modelled towards.²⁹

“The Government may meet or even exceed their waste targets, or they might miss them. In the meantime, what I would expect is for Government to continually check how they are doing and progressing, and readjust.”

Roundtable participant

This inquiry found a broad spectrum of varying views on future treatment capacities; if and when waste management targets will be met; and how much landfill and exports will be relied upon. Whilst there was not a clear consensus around this, the lack of clarity in itself is notable, and therefore future planning has become difficult due to uncertainty. We note that whilst over-capacity should be avoided, the greater risk is continued landfill due to insufficient capacity. Additional EfW capacity will be required if we are to be sufficiently ambitious on driving down landfill and ending RDF exports. The risk of insufficient feedstock for future EfW lies with the private investors; and market dynamics can be expected to avoid this.

RECOMMENDATION: WASTE PROJECTIONS

Defra should produce a waste and resources roadmap, outlining the targeted and managed transition to a circular economy and net-zero ambitions.

This should include five-yearly reassessments of residual waste volumes, treatment capacities, and regional requirements, beginning from 2025. The roadmap should include an aim to drive down landfill reliance to as near zero as feasible, and account for externalities such as foreign RDF export taxes.

A circular economy

The inquiry found evidence and justification as to how EfW can be compatible with, and a servant to circular economy ambitions. The EU action plan for the Circular Economy regards one as where:

“The value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised” and where “waste and resource use are minimised, and when a product reaches the end of its life, it is used again to create further value.”²⁷

Naturally, the priority and focus of a circular economy is waste minimisation and redesign. However, a uniformly and totally waste-free society is not realistic. The latter part of this definition therefore poses a clear role for EfW in providing a valorisation service; complying with the waste hierarchy by displacing landfill, and as the best available and proven technology to recover maximum value from end of life waste.

There is an additional recovery of materials from incineration bottom ash (IBA), representing around 20% of the feedstock volume.³⁰ This is typically in the form of aggregate used for construction materials, or through removal of metals for recovery (including ferrous and non-ferrous metals). This reduces the pressure for additional virgin materials, and keeps materials in a closed loop. There is also an advantage of further carbon savings, given that secondary production (recovery) is typically less energy intensive than primary production such as mining. This is particularly the case with certain scrap metal recovery, producing up to 90% fewer carbon emissions than primary production.³¹

The needs of the future

It is critical to all conversations about waste arisings and management, that reduce is the highest and most desirable step in the waste hierarchy. Whilst achieving the most appropriate waste stream and treatment is the main focus, it should be noted this inquiry frequently heard that waste minimisation must be the Government's driving factor, and that more emphasis on this is required.

All waste streams must be approached holistically, and treated at the highest possible level of the waste hierarchy in accordance with the material type and value. In addition to reducing and reusing where possible, recycling rates must be maximised if the UK is to meet its target for 65% recycling of municipal solid waste by 2035.⁶ The UK is being rightly ambitious on recycling, and it should continue to drive higher levels of recycling. Emerging technologies including chemical recycling can play a role in assisting this drive, by separating out recyclable materials found in the residual stream.

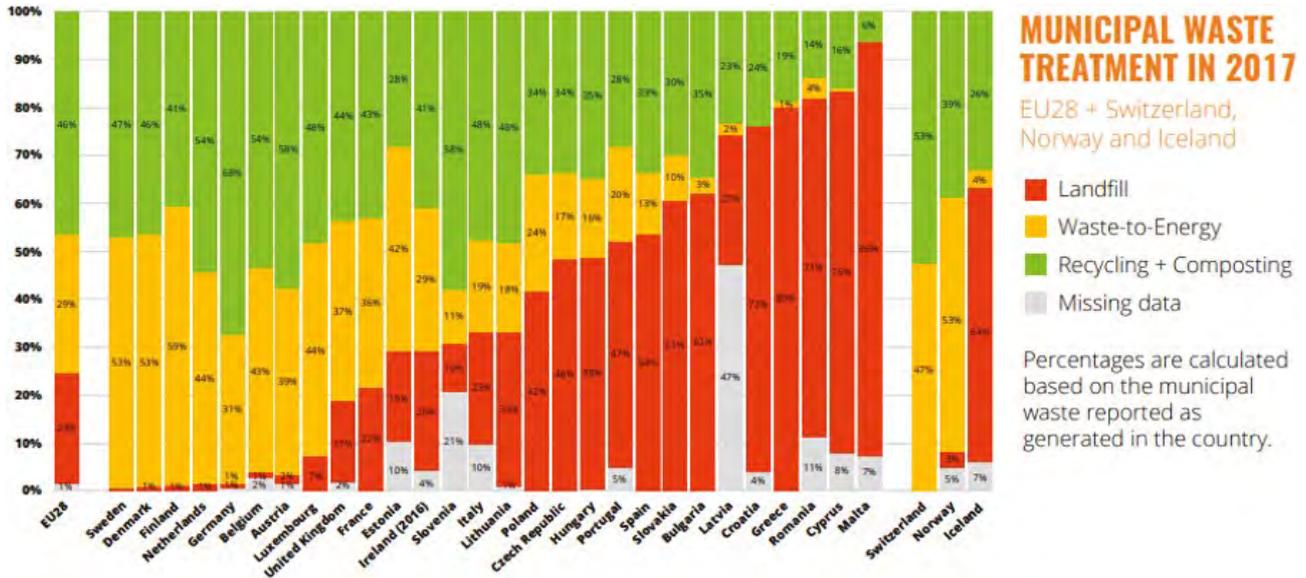
RECOMMENDATION: RECYCLING AND WASTE PREVENTION

The Government should drive a national public education campaign around personal responsibility and waste management, and its links to climate change. This should engage authorities and encourage communication of the end-process of residents' waste.

Equally, in aiming to reduce the volume of residual waste arisings, minimisation and recycling efforts need to be backed up by the necessary infrastructure being put in place. The implications of not doing so are evident in Scotland. The Scottish government introduced a target in 2012 for a ban on biogenic material going to landfill, to be effective from 2021.³² However, as a result of insufficient alternative waste treatment capacity, there were reports of increased RDF exports, and the ban's inception date has since been extended.³³

EfW and recycling rates

There are often claims that EfW inhibits recycling rates, however this inquiry found no evidence to support this. Conversely, countries with higher reliance on EfW than landfill, often provide evidence that EfW goes hand in hand with the best recycling performances. The below graph visualises the proportion of waste sent to either landfill, EfW, or recycled, by European countries in 2017.³⁴ In contrast to claims that EfW hampers recycling, the below shows that the countries with the highest and above average recycling rates, are the ones with more EfW and less landfill.



Municipal waste treatment in 2017. CEWEP graph based on Eurostat figures, 2019

Parts of the UK have replicated this trend albeit at a more localised scale. Buckinghamshire achieves well above average recycling rates (57% in 2014/15, compared to a national average of 43.7%), and this is alongside a move to EfW reliance for their residual waste, and the associated cost savings.^{35,36}

Supporting recycling

Small amounts of potentially recyclable waste end up in residual waste streams. This problem often derives from mismanagement of waste at the producer and consumer level, and punitive measures on residual treatment infrastructure will not resolve this. As outlined in chapter one, a future carbon tax would be a more effective method to drive down plastics in the residual stream. Additional measures aimed at the production and design level in adherence with the polluter pays principle, alongside clarity and education for consumers are also key to avoiding this, and EPR reforms coming into effect from 2023 should help to address this.

There is also the opportunity for EfW to contribute to recycling and waste sorting infrastructure. EfW plants can be co-located alongside recycling or waste sorting facilities. This enables heat and energy generated by the EfW to be directly exported to power the energy intensive recycling processes. This would simultaneously improve EfW efficiency, and source easily available energy to enable recycling. Examples of this are already occurring in the UK, with new plants set to power co-located recycling plants.³⁷

Resource efficiency

Resource efficiency is also a consideration when managing materials. Recycling a material is more desirable than sending it for recovery. There comes a point however, for example after a plastic has been recycled several times, where either more value can be recovered through effective recovery than another round of recycling, or where the material is no longer capable of being recycled without additional virgin materials. This demonstrates why flexibility and availability of both processes is key to maximising efficiency.

Incineration Tax

There is speculation that the Government could in the future introduce an incineration tax. Whilst this is not explicitly government policy, ministers have repeatedly stated that if long-term ambitions to maximise recycling are not met, an incineration tax may be considered.³⁸ This inquiry heard repeatedly that this would be detrimental primarily to local authorities' ability to manage residual waste, and that importantly such as step would not tackle the production of the waste higher up the supply chain. If the Government do in future proceed with this, they should provide clarity and demonstrate how this would be effective in achieving their aim. As part of this, they must calculate and reimburse the associated costs to local authorities, to avoid discouraging investment into necessary future infrastructure, and they should also consider the impact on heat decarbonisation ambitions.

As discussed in chapter one and recommendation two, there may be more appropriate measures that would drive the decarbonisation of the waste sector, including alternate taxes.

Public awareness

Over recent years, public awareness of appropriate waste management has risen up the agenda.³⁹ In particular, the popularity of BBC's Blue Planet II series at the end of 2017, which highlighted the impact of marine plastic pollution. This increased public consciousness of materials was termed the *Blue Planet effect*, prompting retailers to introduce ambitious bans and targets on plastic packaging.⁴⁰ Despite this shift in public attitudes, this inquiry heard from several waste companies that they have seen little or no change to the volumes and materials composition of waste received in recent years. This is backed up in polling, showing that despite the growing concerns, individuals do not broadly intend to take responsibility for solutions.³⁹ Government should do more to turn attitudinal shifts into actions. Education around this should be driven at a national level to avoid regional variance. This should aim to improve understanding of both waste hierarchy/materials impacts, as well as the appropriate treatment infrastructure required.

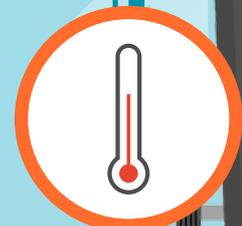
The UK public has come to expect clean, waste-free streets, and the COVID-19 crisis has similarly reinforced the importance of safe management and appropriate disposal of waste. This basic but fundamental function of EfW should not be overlooked. There is also a level of disconnect between producing waste and requiring infrastructure to manage it, often leading to an 'out of sight, out of mind' approach on an individual level. To address this, the public education campaign should involve and engage local authorities. Councils are best placed to inform residents in a hard-hitting way how their waste is disposed, and some may wish to go further and communicate the specific end destination/site. Local authorities could achieve this by simply printing the relevant information onto their waste bins. Certain local authorities have already taken up this suggestion, but encouragement for all councils to do so would ensure a level playing field of information across the country.

RECOMMENDATION: WASTE AND PUBLIC AWARENESS

The Government should drive a national public education campaign around personal responsibility and waste management, and its links to climate change. This should engage authorities and encourage communication of the end-process of residents' waste.

CHAPTER THREE

FROM WASTE TO HEAT



From waste to heat

It is important to distinguish the EfW heat challenges from the wider heat network question. Heat networks appear a long-term ambition for the UK, as part of the net-zero heat decarbonisation strategy alongside debates around hydrogen and electrification. The timescales for addressing these two questions are also different, and EfW heat must be addressed sooner, as proposed plants that will be built over the next few years may well form some of the last generation of plants. Therefore, if the EfW heat challenge is not tackled now, this opportunity will pass.

It seems we need to use fairly blunt instruments in the short term if we want this to happen. We need to do things that will have an immediate effect rather than a long term strategic effect.

Roundtable participant

Resource efficiency

EfW facilities can ideally operate in CHP mode and connect to a heat network, to export the heat generated during the process directly to a suitable external heat demand. The previous Department for Energy and Climate Change compiled a list of these technologies.⁴¹ Heat networks allow low carbon heat to be exported in the form of hot water or steam, and the length and total distance exported to can vary significantly. Similarly, the networks can serve different types of off taker, from entire communities to industrial parks.

As outlined in chapter one, the Government has ambitions for greater efficiency of EfW plants, to help ensure R1 recovery status is achieved. The most resource efficient method of extracting value from waste through EfW is to directly utilise this heat. This is because less energy is lost through heat export than through electricity generation. The Z Ratio or Z-factor calculation determines this, by comparing heat export and reduction of electricity generation for CHP plants. A high result demonstrates greater efficiency through heat supply.⁴²

EfW heat displaces virgin energy - usually gas - by using wasted heat from a partly renewable source.⁴³ If communities do not harness this heat, it will continue to be produced by EfW plants but will instead be lost into the atmosphere as waste heat. Before thinking about generating new sources of low-carbon heat, it would be more resource efficient to harness existing heat already produced. Using EfW generated heat should be the first action taken by Government.

Decarbonising heat

As outlined in Chapter One, the Clean Growth Strategy outlines the need to decarbonise certain sectors in particular – including domestic heating, business, and industry. This inquiry found that EfW heat could play a role in the decarbonisation of all of these: decarbonising domestic heating through connecting to district heat networks, decarbonising industry through co-location and direct heat offtake, and helping more innovative and energy-intensive technologies emerging such as data centres and cooling systems. Similarly, the Committee on Climate Change's central scenario for the fifth carbon budget assumes heat networks will need to serve at least 18% of buildings heat demand by 2050.⁴⁴ Heat networks currently serve 2% of the UK's heat, and this inquiry heard that utilising the EfW heat already marked as "accessible" by Government would double this figure to 4%, which would be a great early win.

“From a strategic point of view, the UK needs to decarbonise heat. We will soon cease to use natural gas, but we do not yet have strategy. Now is a good time to incorporate EfW into a heat decarbonisation plan.”

Roundtable participant

RECOMMENDATION: A ROLE FOR WASTE HEAT

BEIS' upcoming Heat and Buildings Strategy should recognise a clear role for EfW heat to provide accessible low carbon heat, as a key early element on the road towards heat sector decarbonisation.

UK and abroad

EfW plants connected to integrated district heat networks are commonplace across much of Europe today, including in most large cities in Scandinavia. Naturally, the climate in the more northerly European countries lends them to requiring efficient heating systems. A common theme across northern European countries is also supportive policy towards CHP, including capital support (grants/tax relief) and power export support.⁴⁵ However, climate is not the sole explanation for better integration of EfW in Europe, particularly when countries such as the Netherlands, which has a similar climate to the UK, has effectively incorporated EfW into society. An extensive heat network grid across much of Europe additionally links to historical acceptance of the systems in these countries, as well as the fossil fuel price shock during the 1970s.⁴⁶

The UK is a long way behind the rest of Europe when it comes to utilising EfW heat. Instead UK policy has historically favoured the adoption of gas network supplies for heat, and was until recently the world's largest market for boilers.⁴⁶ Most modern EfW plants are built CHP-enabled (Combined Heat and Power), in anticipation of finding a heat customer.⁴⁷ However, as of 2018, of the 40 EfW facilities in the UK only eight were actually operating in CHP mode.⁶

Despite this lack of progress, this inquiry found the waste sector to be almost unanimously supportive of the Government's EfW heat ambitions, and would welcome the opportunity to export their heat. Similarly, it was noted that when the EfW debate shifts away from emotional arguments around waste, and towards the opportunities and practicalities of heat, it becomes a much more constructive conversation.

There are however currently a number of barriers and challenges that are preventing heat offtake from being viable in many cases. In order to realise these ambitions, the Government needs to provide support to help address these barriers. These include the following measures, which should be regarded as an options menu (for example 5 and 7 overlap slightly):

1. **Statutory undertaker powers** should be extended to the heat network infrastructure. A contentious aspect of connecting EfW to a heat off-taker is often the need for a pipe to cross beneath a road or small piece of land. Without powers, landowners can refuse or demand a significantly high price to do so, to the extent that the connection ceases to be viable. Statutory undertaker powers would enable essential pipe connections to be made, in line with powers awarded to other utilities and infrastructure sectors.
2. **Permitted development rights** should be extended to EfW pipe work connections, as is being consulted on in Scotland.⁴⁸ This would create a more level playing field in terms of the planning system, enabling EfW heat networks to compete with traditional heat sources (gas and electricity).

3. **Building regulations** should be reformed, so that rather than penalising waste heat loss from a pipe, where the alternative is to waste all the heat; successfully exported heat is instead incentivised. Additionally, SAP methodology; Defra's life cycle analysis data on carbon emissions, should be updated. This should holistically view EfW and EfW heat networks together.
4. **Zoning** should be explored, as a solution to identifying demand and reducing risk. Zoning would enable regions to be identified according to their requirements and opportunities. This concept would typically be a wider programme incorporating a multitude of different sectors and interests across the energy industry, amongst which EfW would be a consideration. Alternatively, a smaller scale programme could focus solely on EfW, considering heat customers and demand, infrastructure relating for transporting waste, waste volumes etc., but finding heat customers must be the priority.
5. **Concession zones** are being increasingly used in European cities to develop and expand new heat networks, requiring developments within a certain radius of a plant/network to connect to the heat network, unless an alternate low-carbon heat source is used .
6. **A waste-heat incentive** to continue to provide an element of financial support for the development of low carbon heat infrastructure, and to reduce/underwrite some of the commercial risk. The 2020 Budget included announcements of an extension to the Renewable Heat Incentive, as well as investment in a new Green Heat Networks Scheme to follow on from the success of the Heat Networks Investment Project (HNIP). These are promising commitments, and more details on these measures will be welcome.
7. **A local planning requirement** should be introduced, obligating a feasibility assessment of any new development to either install a new heat network, or to connect to an existing heat network importing EfW heat. MHCLG should additionally consult with industry and developers to determine and set a challenging threshold for the number of houses in any new development, above which a heat network connection would be required.

RECOMMENDATION: ADDRESSING THE HEAT CHALLENGE

The Government should implement a package of aligned and complementary measures drawn from the menu in this report, to address identified barriers to the EfW heat challenge.

Location

This inquiry found that the most significant challenge and barrier to EfW heat use is location. The specific spatial location of a plant largely determines the feasibility of finding and connecting to a heat customer.⁵⁰ Location includes the proximity to potential heat off-takers, the length of any connection required, the surrounding land, and the local authority planning requirements.

Plant locations appear to be driven by suitable land availability to developers, focusing on land price and planning characteristics rather than a broader holistic approach. As a result, a disproportionate number of plants are located in Northern England where land values are typically lower.

Similarly, a large number of existing EfW plants in the UK are located rurally, away from housing or industrial developments.⁵⁰ This has largely been driven by local opposition to planning applications, which has led to these isolated locations and often-derelict former industrial land becoming the sites of least resistance. Whilst this community engagement is important in the planning stages and determining of the new plant locations, this historical opposition has meant there are now numerous sites in the UK where heat connections have not been viable, unless there are new development near to the sites in the future.

This contrasts with much of Europe, where this inquiry heard that it is commonplace for municipal authorities to influence waste and energy planning, to the extent that locations of EfWs and connection to heat networks are delivered. Given the RWS ambitions for greater use of EfW heat, the Government should help determine locations of future plants, and finding a suitable heat customer should be the priority.

RECOMMENDATION: FINDING THE RIGHT LOCATION

The Government should establish or actively participate in a cross-sectoral forum to consider the appropriate location of EfW infrastructure, prioritising finding potential heat customers.

This forum would aim to replicate the success of the Offshore Wind Industry Council. It would enable Government, industry, local authorities, and residents to approach opportunities and challenges collaboratively, considering aspects like regional resource requirements, waste volumes, heat demand, community engagement, transport, and local planning requirements. This would help avoid the lack of local planning coordination and emphasis on local authority boundaries, as well as the current high levels of spending on planning processes.

Given the need to engage across central and local government it would make sense for this to be a cross-sectoral board that sits within government machinery, such as the National Infrastructure Commission. Alternatively, the future role of the UK Resources Council (currently being established for the waste and resources sector as part of the Government's sector deal programme) could be extended to incorporate this forum.

Wider heat network development

The challenges for the development of EfW heat networks typically fall within two categories. Some of these challenges and barriers are directly related to EfW infrastructure and land, and these have been discussed.

Certain other challenges are more broadly relating to the UK's development of heat networks and a heat grid. During the course of this inquiry, a range of other major challenges were raised that can only be addressed as part of a wider development of heat network technology, markets, and frameworks. These are complex issues which require further discussion and investigation. Nevertheless these are still of relevance to EfW, and should serve to further facilitate the viability of EfW heat as Government addresses these, as well as stabilising any difficulties that arise in the short term. Below is a brief summary of some of the key challenges:

Commercial risk

From planning and construction stages, to contract writing, and throughout the operation there is the factor of waste-heat risk. This relates to the lack of standardised contracts, dependence of the parties on continued operation, the limited lifespan of CHP plants, and fixed heat prices. Some of this risk is likely to be reduced by contract standardisation and demonstration, and incentives from regulators (BEIS/Ofgem) could underwrite and further reduce this.

Consumer protection

There are a range of considerations relating to consumer protections and challenges posed by heat networks which are addressed in different ways. This can relate to the natural monopoly and difficulty in switching suppliers, regulating the operator, bill composition and more. Regulations will likely be needed to guarantee consumer rights, for example giving the right for new operators to take over a network if standards are not met. A recent Energy Technologies Institute report identified regulating monopoly capital and consumer protections as the greatest barrier to heat network implementation in the UK.⁴⁶

Development of a heat grid

The UK is developing heat grid infrastructure at a much slower rate than abroad. Only 2% of the UK's heat demand is currently served from heat networks, and the majority of these are in London. Large regions of England, including Yorkshire, have almost no current use of heat networks although a number of applications are beginning to be developed.⁵¹ At the time of this inquiry, BEIS is consulting and developing a heat network market framework.⁵²

Backup heat

Heat networks are typically powered by a main primary source (EfW or other CHP plants). These facilities inevitably need to be switched offline for a small part of the time each year, for maintenance and in line with their Environmental Permit conditions. Heat network customers will therefore require a backup source to provide heating during these downtime periods, or alternatively heat networks need to be built to facilitate multisource, enabling alternate heat sources to feed-in. This would promote the close location of a number of linked heat sources, and again this would require co-ordination and planning.

Thermal storage

This is providing a flexible solution to simultaneous heat and electricity generation, as well as intermittent heat demand. By storing heat during low demand periods, CHP plants are able to continue to generate and meet ongoing electricity demand, and the stored heat can then be released at a later point as required.⁵¹ Thermal storage also has a role to play in providing continued heat during periods where generation is paused for maintenance or refurbishment. Further technological development and demonstration is required in this area, although strides are being made.

CHAPTER FOUR

UNLEASHING SOCIAL POTENTIAL



Unleashing social potential

This inquiry found that EfW facilities could offer a range of social benefits for the surrounding communities, if they are well-integrated. However, this community value can only be unlocked by ensuring plants are as efficient, well-regulated, and engaged with the community as possible.

Misconceptions

The greatest barrier to EfW planning permission is often opposition from small numbers of local residents. Engaging and communicating with the local communities throughout planning stages is critical in ensuring plants are well integrated. Recommendation eight would enable local authorities and resident groups to be part of the wider-scale discussions in determining the most appropriate locations for future plants.

Defra addressed a number of the common concerns and misconceptions around EfW in their 2014 *guide to the debate* publication.⁵³ The understanding of the purpose of EfW amongst the public appears to have broadly improved over recent years, and the main ongoing issue tends to be related to the location; a case of “why here?”. Despite this, certain campaigns continue to oppose plants; building emotional cases that largely rely on inaccurate grounds:

Health and air quality

The most common concern is around the potential health and air quality implications of EfW plants, through emissions and particulates released into the atmosphere. There is a historical misconception that EfW emissions contain significant levels of pollutants, which are harmful to the health of the local community.

EfW emissions are closely regulated by the plant’s Environmental Permit. This permit is awarded by the regulating authority which is either the Local Authority in the case of small facilities, or in most cases the Environment Agency. The authority then regulates the plant in accordance with the Environmental Permitting (England and Wales) Regulations 2010.⁵⁴ EfWs are required to submit strict Air Quality Assessments, to demonstrate that the plant meets emission limit values as set out in the Directive 2000/76/EC on the incineration of waste (Waste Incineration Directive).⁵⁵

Public Health England commissioned research from the Small Area Health Statistics Unit (SAHSU) at Imperial College London, looking into the health impact of EfW plants. Three papers were published between 2018 and 2019. These found no evidence of an increased risk of infant mortality for children living close to *Municipal Waste Incinerators*, and a causal association between an increased risk of congenital anomalies and close proximity to MWIs was not established.⁵³ The current PHE risk assessment and guidance is:

“Modern, well run and regulated municipal waste incinerators are not a significant risk to public health.

While it is not possible to rule out adverse health effects from these incinerators completely, any potential effect for people living close by is likely to be very small”

What is less well communicated is the balance of health risks. Nearby communities connected to district heating avoid the need for a natural gas boiler in the home, removing potential health risks associated with burning gas.⁵⁶ Health questions around EfW appear more frequently than any possible impacts of boilers, or nearby roads etc. despite no increased evidence. For example based on data from BEIS’ National Air Emissions Inventory, bonfire night alone contributed 10 x more dioxin emissions in 2016 than all EfW plants throughout the year.⁵⁷

The EfW operators have to play a role in this, through being as transparent and open with their emissions data as possible in order to build public confidence. It is becoming increasingly common for facilities to publish a live emissions tracker on their website for the public to view, as well as monthly reports.

It has become commonplace to dismiss EfW as dangerous and associate it with claims of health risks, despite no evidence to support this. What is less frequently recognised is the basic but fundamental service in maintaining hygiene that EfW first and foremost provides. Preventing waste build-up in the streets, reducing the spread of diseases, and the safe disposal of medical and hazardous waste would often be overlooked, but in a post-COVID-19 world will likely become more important and of greater public interest than ever.

Other concerns

Recycling

There is a continued perception often from local opponents to EfW that the process is detrimental and hampers efforts to increase recycling. Chapter two outlines why this inquiry found no evidence to support this, and in fact shows that areas with EfW often have the highest recycling performance.

Traffic

The other common ground of opposition is around traffic movements generated by waste imports. In addition to stack emissions from EfW outlined in the previous health section, Environmental Permits also assess fugitive emissions generated, which includes traffic fumes as part of the operation.⁵⁴

There are also EfW plants across the county where waste is being transported to the plants via different means, such as on rail or water as seen on the Thames with tugs transporting 1,000,000 tonnes each year to the Cory Riverside plant.⁵⁸ These are all considerations linked determined to the plant location, which should be assessed holistically in line with recommendation seven.

Social value

Social or community value can be difficult to measure and ascertain. Certain community benefits are tangible and easily measured, often being required in planning applications through s.106 obligations.⁵⁹ However, others are less so, and it becomes increasingly difficult to consider these appropriately alongside more directly measurable factors. Despite this, many of these benefits remain invaluable to the strength, cohesion, and future proofing of communities. More effort should be made to recognise the contributions EfW could make to future sustainable communities.

Housing and new homes

The most significant source of social value is understood to stem from heat utilisation. When an EfW connects to a heat network and supports local communities, there are numerous benefits. Primarily, this is through improved efficiency and cost savings. EfW heat is in itself a by-product of waste management, in contrast with other sources of energy/electricity generation. As a result, this presents an opportunity to export the heat at a more affordable price.

You've got to meet people where they are, and they want to see real examples. Is there somewhere people can go and visit to see how they are getting heat offtake into their home? They need to see something tangible that reassures them that they can get on board.

Roundtable participant

MHCLG are currently consulting on the new Future Homes Standard, ahead of its implementation by 2025. This will aim to amend building regulations, to future-proof homes with low-carbon heating and greater energy efficiency.⁶⁰ It will ban gas-grid boiler installations, and replace these* with more efficient heat systems.⁶¹

The National Planning Policy Framework currently contains a presumption in favour of sustainable development.⁶² This presumption should be extended so that it applies to new developments nearby to EfW plants, which intend to source low-carbon heat from the EfW plant. This would simultaneously help to access existing low-carbon heat, drive greater efficiency of both EfW and of domestic heating, and contribute to the Government's 'Build Build Build' agenda.

RECOMMENDATION: PLANNING AND NEARBY DEVELOPMENT

The Government should revise the National Planning Policy Framework's presumption in favour of sustainable development to include proposed developments using EfW heat.

It is additionally worth considering the contribution that this affordable heat can have towards addressing fuel poverty.⁶³ BEIS' most recent figures for 2017 showed that more than 10% of households in England were experiencing fuel poverty.⁶⁴ Within this, rural areas typically experience the highest prevalence of fuel poverty.⁶⁵ As outlined in chapter two, a number of existing EfWs are located in remote rural locations. This planning presumption could help facilitate developments that both improve efficiency of EfW, and help address fuel poverty particularly within rural areas. Additionally, building developments near to existing EfW removes the community opposition, and likely enhances the community buy in to maximise social value.

Public services

Another opportunity is for local authorities or other public bodies to provide the initial heat load (anchor load) for a district heating scheme, thus supporting the development of the rest of the heat network and minimising investor risk. This heat load would be in the form of buildings and could therefore provide the basis for community infrastructure; either the main council buildings, or other energy intensive community facilities such as schools, hospitals, and swimming pools.

Employment

An EfW facility creates a range of skilled jobs, whether these are plant operators, engineers, drivers, managers, educators and tour guides or others. As is historically often the case with large industrial employers, the local communities can develop close links with the facility, through long-term employment often spanning multiple generations. Market analysis shows potential for the creation of both direct and indirect jobs for regions, with plants typically creating around 50 permanent skilled jobs, as well as hundreds of further jobs during the construction phase.⁶⁶

The Department for International Trade is increasingly exploring opportunities to create jobs and capabilities in the UK to produce the necessary infrastructure for heat networks. In addition to the job creation, achieving this would both improve sustainability and avoid paying excess amounts to import products from abroad.

Education

Increasingly, EfW plants are integrating educational facilities into developments, as well as offering tours to develop greater public understanding of waste management. These facilities become a valuable resource for local schools and communities, and this practice should be encouraged as much as possible.

Investment

It is worth considering the potential investment awarded from EfW and district heat networks, at both a local and national level. As well as creating local jobs, new EfW plants are likely to bring about investment to the locality more broadly. Whether this is by levelling up transport infrastructure, developing community spaces or gardens, facilitating local education, or powering new sustainable communities, these are all elements that will only arise as a result of the EfW.

Developing the EfW heat market has additionally become increasingly important for Government at the scale of attracting foreign direct investment into the UK, as well as helping UK companies to export overseas. This potential investment presents an opportunity for EfW and heat networks to contribute to the economic recovery from the COVID-19 crisis. If done efficiently and in line with this inquiry's recommendations, this could also play a role as part of the much-discussed *green recovery*.

Supporting local industry

As outlined in chapter one, co-locating an EfW near to an industrial park and exporting heat/energy to power the industrial processes, provides an opportunity to also help reduce the carbon impact of the industry. This future proofing of communities and existing infrastructure is key both to net-zero, but also to keeping the public on board and maintaining community ties.



Methodology

This project drew upon a wealth of research and reports from a large number of organisations, as well as primary data collected through one-to-one interviews and roundtable discussions with experts from industry, academia, government and NGOs.

A total of 16 interviews were undertaken between December 2019 and February 2020. Three parliamentary roundtables were held in January and February 2020 to discuss issues in more detail. 16 further written submissions were additionally received. A full list of contributors is outlined below.

The views in this report are those of the author and Policy Connect. Whilst these were informed by the listed contributors, they do not necessarily reflect the opinions of these organisations.

Roundtable A

Residual waste, a circular economy, and the future role of EfW. 14th January 2020

Chair: Lord Teverson

Roundtable B

EfW heat opportunities and challenges. 28th January 2020

Chair: Deidre Brock MP

Roundtable C

EfW and the community. 11th February 2020

Chair: Alex Sobel MP

Contributors:

Amey

Association of Decentralised Energy

Barratt Developments

BBIA

Built Environment Communications Group

Bywaters

Cadent Gas

Citizens Advice

Chartered Institute of Wastes Management

Confederation of European Waste-to-Energy Plants

Cory Energy

Countryside Properties

Department for Business, Energy & Industrial Strategy

Department for International Trade

East London Waste Authority

Environmental Services Association

Extinction Rebellion

FCC Environment

Foresight Group

Greenpeace

Grundon

Homes England

Inspiring Sustainability

Keith Riley

Knowledge Transfer Network

Local Authority Recycling Advisory Committee

Lincolnshire County Council

Local Government Association

MVV Environment

National Association of Waste Disposal Officers

North London Waste Authority

OCO Technology

On Pack Recycling Label

Orsted

Renewable Energy Association

Suez

Tolvik

University of Birmingham, Energy Research Accelerator

University of Leeds (Resource Recovery from Waste Programme)

University of Northampton

University College London (Current Student)

Vattenfall

Velocys

Veolia

Viridor

Wales & West Utilities

Western Riverside Waste Authority

WRAP

About this report

This report is the culmination of a six-month inquiry into the future role of Energy from Waste in the UK. The project was carried out by the Sustainability team at Policy Connect, and was supported by industry stakeholders as members of the Sustainable Resource Forum.



sustainableresource
Forum

The evidence gathered was from roundtables, interviews, and written submissions. The transcripts were then analysed using thematic analysis to identify themes, which were then developed through desk research and interviews to form the report and its recommendations.

The Sustainability Team

The All-Party Parliamentary Sustainable Resource Group (APSRG), The Sustainable Resource Forum, All-Party Parliamentary Climate Change Group (APPCCG), Carbon Connect, and the Westminster Sustainable Business Forum (WSBF) make up the Sustainability team at Policy Connect.

Policy Connect

Policy Connect is a membership-based, not-for-profit, cross-party think tank. We bring together parliamentarians and government in collaboration with academia, business and civil society to inform, influence and improve UK public policy through debate, research and innovative thinking, so as to improve peoples' lives.



We lead and manage an extensive network of parliamentary groups, research commissions, forums and campaigns. We are a London living wage employer and a Member of Social Enterprise UK, and have been operating since 1995. Our work focuses on key policy areas including: health & accessibility; education & skills; industry, technology & innovation; and sustainability. We shape policy in Westminster through meetings, events, research and impact work.

Acknowledgements

We would like to thank all the different organisations and individuals who contributed to this inquiry. We would also like to thank Oona Muirhead CBE (Business Adviser, Policy Connect), Claudia Jaksch (Head of Sustainability, Policy Connect), Jonathan Shaw (CEO, Policy Connect), Susannah James (Media & Communications Manager, Policy Connect), Sarah Selley (Former Civil Service secondee), Robert Hunt (Board Member, Policy Connect), and Tom Howard-Vyse.

Special thanks also to Professor Margaret Bates for her academic advice and support throughout.

Appendix 1: Assumptions and figures used to calculate the level of potential

“Generate enough EfW heat equivalent to the needs of **half a million homes** if we can address the heat challenge”

- Using a central scenario for waste projections, with 24.5 million tonnes of residual waste in 2030, and 60% combined recycling rate
- Modelled as if EfW continues to increase its share of the residual waste market at a similar rate, and receives 80% of residual waste arising in 2030
- Modelled as if 70% of available EfW capacity were able to export heat in 2030
- Calculates the amount of heat generated per tonne of waste input, across the ten EfW plants in the UK exporting heat in 2018 - 450kWh_{th}/t – and extrapolated across the projected 2030 EfW capacity exporting heat
- Assumed an average household heat consumption of 12,300kWh_{th} per year

“Afford to build **10 high spec plastic recycling facilities** each year with the money currently spent on shipping RDF abroad”

- Based on a current national spend of around £280 million per year on RDF exports
- Assumed a cost of high specification plastic reprocessing facility of around £29 million

“Avoid **4 million tonnes of CO₂** in 2030 by displacing landfill”

- Based on 200kg of CO₂ saved for every tonne of waste diverted from landfill to EfW
- Applied to central 2030 scenario, assuming 80% of this waste goes to EfW
- The CO₂ savings are likely to be higher once offsetting from heat utilisation is factored in

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