



TOWN AND COUNTRY PLANNING ACT 1990
PLANNING AND COMPULSORY PURCHASE ACT 2004

Rebuttal of Appellant's Proofs Evidence
on Energy Matters

Mr Tony Norton

CEng, MChemE, MBA, BSc (Hons)

on behalf of Dorset Council

Appeal by Powerfuel Portland Limited
against the refusal by Dorset Council of Planning Application
Ref. WP/20/00692/DCC for the construction of an energy
recovery facility with ancillary buildings and works including
administrative facilities, gatehouse and weighbridge, parking
and circulation areas, cable routes to ship berths and existing
off-site electrical sub-station, with site access through Portland
Port from Castletown,

at Portland Port, Castletown, Portland, Dorset, DT5 1PP

Planning Inspectorate References:	APP/D1265/W/23/3327692
Dorset Council References:	WP/20/00692/DCC
Date:	14th November 2023

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GLOSSARY

Term	Meaning
CCC	Climate Change Committee
CHP	Combined heat and power
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DESNZ	Department for energy security and net zero
DH	District heating
DHEC	District heating energy centre
EfW	Energy from waste
ERF	Energy recovery facility
ESCo	Energy services company
GHG	Greenhouse gas
GWh	Gigawatt hours (equal to 1,000 MWh)
kgCO _{2e} /kWh	Kilograms of carbon dioxide equivalent per kilowatt hour
IRR	Internal rate of return
kWh	Kilowatt hour
MW	Megawatt (MWe Megawatt electricity, MWth Megawatt thermal)
MWh	Megawatt hours (equal to 1,000 kWh) MWe Megawatt hour electricity, MWth Megawatt hour thermal)
RFA	Royal Fleet Auxiliary
SoC	State of charge
tCO _{2e}	Tonnes of carbon dioxide equivalent
tCO _{2e} /y	Tonnes of carbon dioxide equivalent per year

1. INTRODUCTION

- 1.1 My name is Tony Norton. I provided a proof of evidence on energy matters relating to the proposed Portland ERF on behalf of Dorset Council on 14th November 2023 (my Main Proof). My qualifications and experience are provided in Section 1 of my Main Proof.
- 1.2 My Main Proof sets out my view on those non-waste benefits of the Appeal proposal's location, relating to Shore Power and district heating.
- 1.3 This Rebuttal Proof considers arguments and information put forward by the Appellant in its proofs of evidence on these issues. I have not sought to rebut each point in the Appellant's evidence with which I disagree and the fact that I do not expressly rebut a point should not be taken as an indication that I accept it.
- 1.4 The sections below maintain the topic structure of my Main Proof considering in turn, Shore Power and district heating.

2. SHORE POWER

- 2.1 The Appellant highlights the potential benefits of the provision of Shore Power to cruise ships in particular.
- 2.2 The provision of Shore Power to cruise ships requires the delivery of electricity at a high rate (capacity) for short periods.
- 2.3 When two cruise ships are berthed at one time the capacity required can reach 22 MWe. However, Section 3 Figure 9 of my Main Proof shows that double berthing happened for only 119 hours in 2023 or 1.4% of the year.
- 2.4 The Portland cruise ship schedule for 2024 (see Appendix 1) shows 44 cruise ships in the port during the year with only three days on which two cruise ships are in the port at once. The timing of arrivals and departures gives a total double berthing time of 22 hours (0.03% of the year).
- 2.5 Management of vessel arrivals to avoid double berthing, or only providing Shore Power to a single cruise ship berth, would approximately halve the required capacity of cruise ship electricity provision.
- 2.6 As a result of Appellant designing Shore Power provision from the proposed ERF with a cruise ship double berthing capacity totalling 22 MWe it has requested Scottish and Southern Electricity Networks to cost for a 25 MVA (25 MWe) electricity grid upgrade [NR3] when, as highlighted above, this amount of capacity would only potentially be needed for very few hours in each year.
- 2.7 In Section 3.19 of my Main Proof I examine the potential for a 120MWh battery storage system supplied with 5 MWe of grid capacity and show that a much smaller amount of grid capacity can supply Shore Power. The use of batteries would mean that the grid would not need to be upgraded to the 25MWe proposed by the Appellant.
- 2.8 The Appellant does not provide evidence that the cost of, or timescale for, significantly lower capacity grid upgrade scenarios have been investigated.
- 2.9 The Appellant has confirmed that SSE is able to deliver the regional infrastructure on its network to provide an increase in supply of 25 MVA (25 MWe) from its Chickerell supply point 5 miles away within two years [PPF1 3.5.1 iv.]. However, upstream works by National grid may delay the availability of an

upgrade until 2037. However there is still the possibility that lower capacity upgrades may be deliverable in a two-year timeframe.

- 2.10 Lower capacity grid upgrades may have the potential to significantly reduce grid upgrade costs and take place well ahead of the 2037 date identified for the 25MWe upgrade.
- 2.11 Without any assessment of this potential, the Appellant's assertion that there are no short-term alternative energy sources to the ERF to provide shore power [PPF1 8.2.4] and that power cannot be delivered practicably or viably by means of a local grid connection [PPF1 2.3.10] (combined with battery storage) is not in my view made out.
- 2.12 Furthermore, the provision of Shore Power is subject to commercial arrangements between the provider and the offtaker. The Appellant acknowledges [PPF2 NR1 point 6.] that the economic feasibility of shore power is a complex decision for both ports and shipping companies. In Section 3.2 of my Main Proof I note that even when Shore Power is available cruise ships choose not to use it. I cite recent research that suggests that in Southampton only one in ten cruise ships have used shore power since it became available in 2022. Of the vessels that did, Shore Power was used only for an average of five hours per visit despite typically spending twelve hours in port with vessel operators choosing to generate power onboard rather than connect to shore power. There are no guarantees that even if Shore Power is available at Portland and vessels are equipped to take it that Shore Power will be used.
- 2.13 This commercial uncertainty should, in my view, be taken into account in assessing the weight to be given to the benefits of Shore Power included in the updated Carbon Assessment.

3. DISTRICT HEATING

- 3.1 In Section 4 of my Main Proof, I assess the northern and southern legs of the heat network identified in the Appellant's district heating reports [CD 1.7 & 2.7].
- 3.2 I discount the 1,000 m long northern leg heat loads and highlight that the 120m elevation of the prisons served by the southern leg would, in any event, mean that the two legs would need to be hydraulically separated. Hydraulic separation would make straight forward expansion of the southern route to the northern route (as described in the district heating paper [CD 2.7 para 5.10]) impractical. Two separate networks would be needed, further reducing the potential economic viability of the northern leg. It is not therefore, as the Appellant claims [PPF1 3.5.1 v.], entirely rational that once the southern leg is in place the heat network would extend to the northern leg, because hydraulic separation would mean that the marginal cost would not reduce significantly.
- 3.3 The Appellant states that the district heating network (northern and southern leg) would require between circa 2.6 MWth and 11 MWth to be extracted from the steam turbine [PPF1 2.3.6]. In my Main Proof I use load duration curves to describe the estimated heat load from the southern leg in more detail, based on load duration curves for Exeter's historic prison. This leads to a peak load for the southern leg alone of 14.6 MWth and identifies an ERF design heat extraction capacity of 4MWth with heat extraction continuing below 2.6 MWth.
- 3.4 The delivery of a district heating network will require equipment to extract the heat from the steam provided by the ERF and return the condensate to the ERF together with the back-up boilers, pumping and other equipment. This equipment will need to be housed in a district heating energy centre (DHEC) located adjacent to the proposed ERF as set out in Section 4.20 of my Main Proof.
- 3.5 The Appeal proposal does not include a district heating network, which would require a separate planning application [PPF1 2.3.15]. A planning application for district heat would need to include the DHEC in addition to the pipework referred to by the Appellant [PPF1 2.3.14 & 2.3.15]. It is incorrect to suggest that the pipework is the only planning consideration.

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- 3.6 Section 4.23 of my Main Proof considers the viability of the southern leg district heating system based on evidence from a detailed feasibility study to extract heat from the Exeter ERF and supply it to a heat network. The economics returned a low internal rate of return suggesting that the southern leg is not a viable investment for an Energy Services Company. Therefore, I do not agree with the Appellant's assertion that there is no reason why a heat network could not be delivered, nor do I anticipate that, without an investor, commercial terms could be agreed between the parties [PPF1 2.3.15].

Appendix 1 - 2024 Portland Port cruise ship schedule¹


cruisetimetable.com
the cruise planning website
19 November 2023

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port schedule year

Portland, England Cruise Ship Schedule For 2024

Day	Cruise Line	Ship	Times	Passengers
February				
Mon 19		AIDAsol	a 1000 d 1800	2174
April				
Fri 5		Renaissance	a 0700 d 1700	1358
Mon 22		Regal Princess	a 0700 d 1900	3560
Wed 24		ms Rotterdam	a 0900 d 1700	2668
May				
Tue 7		Norwegian Pearl	a 1330 d 2130	2394
Fri 10		Renaissance	a 0700 d 1800	1358
Mon 13		Celebrity Apex	a 1000 d 1700	2910
Fri 17		Caribbean Princess	a 0700 d 1900	3140
Tue 28		Regal Princess	a 0700 d 1900	3560
Thu 30		AIDAsol	a 0800 d 2000	2174
June				
Sat 1		Renaissance	a 0700 d 1600	1358
Sun 9		Regal Princess	a 0700 d 1900	3560
Mon 10		Mein Schiff 3	a 0700 d 1900	2506
Tue 11		Artania	a 0800 d 1800	1122
Thu 13		Renaissance	a 0900 d 1700	1358
Mon 17		Spirit Of Adventure	a 0800 d 1700	999
Thu 20		Seven Seas Splendor	a 1200 d 2200	750
July				
Wed 3		Regal Princess	a 0700 d 1900	3560

¹ <https://www.cruisetimetable.com/portland-england-cruise-ship-schedule-2024.html>
 Accessed 19/11/2023

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		Seven Seas Mariner	a 1100 d 2100	708
Thu 4		AIDAsol	a 0800 d 2000	2174
Sun 14		Seabourn Sojourn	a 0530 d 1900	450
Thu 25		Island Princess	a 0700 d 1900	1974
Sat 27		Caribbean Princess	a 0700 d 1900	3140
August				
Fri 2		Nautica	a 0900 d 1700	690
Tue 6		AIDAsol	a 0800 d 2000	2174
		Norwegian Dawn	a 0700 d 1700	2340
Fri 23		Norwegian Dawn	a 1100 d 1630	2340
Tue 27		Mein Schiff 3	a 0700 d 1900	2506
Wed 28		Renaissance	a 0800 d 1700	1358
Fri 30		Norwegian Dawn	a 1300 d 2100	2340
September				
Sun 8		Seabourn Sojourn	a 0530 d 1900	450
Mon 9		ms Nieuw Statendam	a 0700 d 2200	2666
Wed 11		Caribbean Princess	a 0700 d 1900	3140
Fri 13		Disney Dream	a 1030 d 2000	2600
Tue 17		AIDAsol	a 0800 d 2000	2174
Tue 24		Sun Princess	a 0700 d 1900	4300
Fri 27		MSC Virtuosa	a 1200 d 2000	4888
October				
Thu 3		Amera	a 0800 d 2100	834
Tue 15		ms Rotterdam	a 0700 d 1700	2668
		MSC Virtuosa	a 1200 d 2000	4888
Sun 20		Artania	a 0800 d 1700	1122
November				
Tue 5		Sirena	a 0900 d 1900	684
Tue 19		AIDamar	a 0800 d 1930	2194
December				
Tue 10		AIDamar	a 0900 d 1900	2194

Legend 0->2999 passengers 3000->5999 6000->8999 9000->11999 12000->