TRO10023

Planning Act 2008 and the Infrastructure Planning (Examination Procedure) Rules 2010

Application by Suffolk County Council for an Order Granting Development Consent for the proposed Lake Lothing Third Crossing

Written Representations by

Associated British Ports

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1 OVERVIEW

1.1 These Written Representations are submitted on behalf of Associated British Ports (ABP), the owner and operator of the Port of Lowestoft, and are designed to serve a twofold purpose:-

1.2 First, for the assistance of the ExA, they place the Applicant's proposals in the context of the Port of Lowestoft, a statutory port undertaking and its business – both existing and future.

1.3 Second, they are designed to explain why the Lake Lothing Third Crossing (LLTC) proposals as currently proposed by Suffolk County Council will cause "serious detriment" to ABP's statutory port undertaking, both in terms of existing and future operations.

1.4 It should be noted, at the outset, however, that ABP does not object to the principal of a third crossing of Lake Lothing.

1.5 ABP does, however, object to the location and form of the third crossing as currently being promoted by Suffolk County Council (SCC) on the basis that, in summary, the bascule bridge as proposed would:

(a) Bisect, at a low level, the Port of Lowestoft's Inner Harbour;

(b) Lead to the loss of operational berthing within the Port's Inner Harbour;

(c) Impede the operations of existing port operational tenants and occupiers;

(d) Introduce a dangerous safety hazard into the middle of an operational Port;

(e) Obstruct ABP's ability to perform and comply with its statutory duties; and

(f) Act to the serious detriment to the carrying on of the statutory undertaking, namely the Port of Lowestoft, within the terms of section 127 of the Planning Act 2008.

2 ASSOCIATED BRITISH PORTS

2.1 ***Owner and operator*** - ABP is the owner and operator of 21 Ports across England, Wales and Scotland. Together with its customers, it handled some 89 million tonnes of cargo in 2017, supported 119,000 jobs and contributed £7.5 billion to the UK economy.

2.2 The Port of Lowestoft is one of 11 ports within ABP's "Short Sea Ports" business – which extend to Troon in the north, to Plymouth in the west and to Lowestoft in the east - the Port of Lowestoft being in fact the UK's most easterly Port.

2.3 ABP's other business regions comprise the Port of Southampton, the Humber Ports and ABP's five South Wales ports.

2.4 ***Statutory undertaker*** - ABP operates the Port of Lowestoft in its capacity as both the owner and the statutory port undertaker. In this second capacity, it is able to undertake certain defined port related development within the 'statutory port estate' (cf Annex 3 below), whilst at the same time being obliged to comply with numerous prescribed statutory duties and fulfill various advisory obligations - as outlined below.

2.5 As well as being the owner and operator of the Port of Lowestoft, ABP is also the:

(a) **Statutory Harbour Authority ("SHA")** for the harbour area at Lowestoft, which extends from the Pier Heads in the Outer Harbour, inwards to Mutford Lock, including all of the tidal dock areas and Lake Lothing (up to the mean high-water spring tide level), as indicated on the plans attached as **Annex 1A and 1B**; and

(b) **Competent Harbour Authority ("CHA")** with respect to pilotage, which includes all the navigable waters within the Port and the seaward approaches.

Statutory Duties and Powers

2.6 As the owner and operator of the Port of Lowestoft and the SHA, ABP is required to comply with a myriad of statutory duties and fulfill a variety of functions ranging from the safety of navigation to protection of the environment and from issues of health and safety to regulation by bye-laws.

2.7 In addition to its general statutory duties and powers, ABP is also vested with a range of powers relating to the construction, maintenance and operation of the Port, many of which derive from the powers granted by the Harbours, Docks and Piers Clauses Act 1847, together with an array of historical local legislation specific to the Port.

2.8 With a view to assisting the ExA in terms of both understanding the statutory regime with which ABP is required to comply and in addition, understanding how the proposed LLTC will impede ABP's abilities to comply with and perform those

functions, a brief summary of those powers and duties is provided in the following paragraphs.

Transport Act 1981

2.9 The general duties and powers of ABP are set out in section 9 and Schedule 3 of the 1981 Act. Fundamentally, the Act requires ABP to have regard to the safety of operations when carrying out its duty to provide port facilities at its harbours.

2.10 Section 9 of the Act specifically provides as follows:

> *"**9 – General duties of Associated British Ports***
>
> *(1) it is the duty of Associated British Ports to provide port facilities at its harbours to such extent as it may think expedient.*
>
> *(2) Associated British Ports shall have due regard to efficiency, economy and safety of operation as respects the services and facilities provided by it and its subsidiaries.*
>
> *(3) In the performance of its functions, Associated British Ports shall have regard to the interests in general of its employees and the employees of its subsidiaries.*
>
> *(4) This section does not impose any form of duty or liability enforceable either directly or indirectly, by proceedings before any court."*

2.11 As the ExA will note, a recurrent theme in these Written Representations is that the mere fact of the construction and then the continuing operation of what is in effect a low level bridge in the middle of an operational port must impede ABP's ability to perform and comply with the general duties and obligations contained in section 9 of the 1981 Act.

Harbours, Docks and Piers Clauses Act 1847

2.12 Section 33 of the 1847 Act is a key provision in harbour legislation which applies to vessels seeking to use the harbour as well as to members of the public. It requires a harbour authority to keep their harbour, dock, and pier open for commercial users for the shipping and unshipping of goods, and the embarking and landing of passengers.

2.13 As such, ABP is under a statutory duty to keep its Port open to all and any vessels wishing to use its harbour. Section 33 provides as follows:

"Upon payment of the rates made payable by this and the special Act, and subject to the other provisions thereof, the harbour, dock, and pier shall be open to all persons for the shipping and unshipping of goods, and the embarking and landing of passengers."

2.14 In the light of this statutory obligation, it is self-evident that the construction of a bridge through the middle of the Inner Harbour, the opening of which is not in the control of the port operator, has the potential to cause ABP to breach its statutory duty under section 33.

2.15 In the context of this summary, the ExA's attention is also drawn to a number of additional powers and duties in the 1847 Act, including:

(a) ABP's power to appoint a Harbour Master (section 51); and

(b) The Harbour Master's wide range of statutory powers and duties contained in section 52 of the Act which provides as follows

*"**52. Powers of harbour, dock, or pier master.***

The harbour master may give directions for all or any of the following purposes; (that is to say,)

For regulating the time at which and the manner in which any vessel shall enter into, go out of, or lie in or at the harbour, dock, or pier, and within the prescribed limits, if any, and its position, mooring or unmooring, placing and removing, whilst therein:

For regulating the position in which any vessel shall take in or discharge its cargo or any part thereof, or shall take in or land its passengers, or shall take in or deliver ballast within or on the harbour, dock, or pier:

For regulating the manner in which any vessel entering the harbour or dock or coming to the pier shall be dismantled, as well for the safety of such vessel as for preventing injury to other vessels, and to the harbour, dock, or pier, and the moorings thereof:

For removing unserviceable vessels and other obstructions from the harbour, dock, or pier, and keeping the same clear:

For regulating the quantity of ballast or dead weight in the hold which each vessel in or at the harbour, dock, or pier shall have during the delivery of her cargo, or after having discharged the same:

Provided always, that nothing in this or the special Act contained shall authorize the harbour master to do or cause to be done any act in any way repugnant to or inconsistent with any law relating to the Customs, or any regulation of the Commissioners of her Majesty's [Customs and Excise]."

Dangerous Vessels Act 1985

2.16 Section 1 of the 1985 Act provides that a Harbour Master has a duty to give directions to prevent an accident, by prohibiting the entry of a vessel into the harbour if, in his opinion, its presence might pose a "*grave and imminent danger*" to the safety of a person or property, or where there is a risk it may prevent or seriously prejudice the use of the harbour by other vessels (from sinking or foundering), as a result of the condition of that vessel or the nature or condition of anything it contains.

2.17 Section 1 also empowers a Harbour Master to make a direction requiring a vessel to be removed from the harbour to prevent an accident. The Harbour Master has discretion as to when to exercise such directions, but must do so in a reasonable manner, as he thinks fit, having regard to all the circumstances and in particular the safety of any person or vessel inside or outside of the harbour (including the vessel in question). Section 1 of the Act applies to all vessels except for pleasure boats of 24 metres or less in length and vessels belonging to Her Majesty or in the service of the Crown.

2.18 The Applicant proposes to restrict and limit these powers in the context of the LLTC proposals – a restriction which would clearly impede the Harbour Master's ability to ensure the safety of navigation in the Port as well as the safety of users of the Port. This proposal by the Applicant is considered in more detail in Part 22 of these Written Representations, below.

2.19 The ExA will appreciate, however, that it is essential that the Harbour Master's powers in this respect are not impeded. The construction of a bridge in the middle of the Inner Harbour will, of itself, restrict the Harbour Master's ability to perform his duties – regardless of the limitation now additionally being proposed by the Applicant in the draft DCO.

2.20 In brief, the Harbour Master must be able to direct the removal of vessels quickly, efficiently, and without delay in emergency situations in order to prevent a serious accident from occurring which threatens to endanger life or property.

2.21 This is of particular relevance to ABP because any inaction by the Harbour Master in such circumstances could lead to liability for negligence.

The Dangerous Goods in Harbour Areas Regulations 2016

2.22 Under these Regulations, a Harbour Master has powers to give directions to persons having control of dangerous goods or cargoes within the harbour area where there is a risk to the health and safety from them.

2.23 Regulation 7 provides that a Harbour Master can, if taking into account all relevant circumstances, direct that dangerous goods or cargoes or any freight container, receptacle, vehicle, vessel, portable tank or other mode of transport containing dangerous goods or cargoes are either:

(a) prohibited from entering into the harbour area; or

(b) are removed from the harbour area.

2.24 The "*harbour area*" is defined widely in the Regulations to cover any harbour, port, haven, estuary, tidal or other river or inland waterway navigated by seagoing vessels.

2.25 It is vital to ABP's operations that the Harbour Master can direct a vessel containing dangerous goods or cargoes to be removed from the Port quickly and safely in emergency situations where there is a risk to the health and safety. As explained above, in respect of the Dangerous Vessels Act 1985, the Applicant's design of the proposed bascule bridge will result in an unacceptable risk to health and safety for people within and around the Inner Harbour, surrounding area and wider Port.

Merchant Shipping Act 1995

2.26 Where there is a wreck in, or in or near the approaches to, a harbour, which is or is likely to become a danger to navigation, the SHA may take possession of, remove or destroy it. The SHA may also light or buoy the wreck until it is raised, removed or destroyed.

2.27 The Applicant's proposed LLTC will, by cutting the Port's Inner Harbour in half, have the potential to restrict and limit ABP's ability to raise and remove or destroy a wreck which becomes a danger, by reason of the bridge height and constrained hours of opening.

Pilotage Act 1987

2.28 ABP is under a duty to evaluate and ensure the safety of ships approaching and navigating into the Inner Harbour at the Port, under the provisions of the 1987 Act. Section 2 provides that ABP, as the CHA, has a duty to keep the following factors under consideration:

(a) whether any and, if so, what pilotage services need to be provided to secure the safety of ships navigating in or in the approaches to its harbour; and

(b) whether in the interests of safety, pilotage should be compulsory for ships navigating in any part of that harbour or its approaches and, if so, for which ships and in which circumstances and what pilotage services need to be provided for those ships.

2.29 Each CHA must in performing the above functions have regard to the hazards involved in the carriage of dangerous goods or harmful substances by ship. The CHA must also ensure that it provides pilotage services, as considered necessary, having considered the requirement described above.

Health and Safety at Work etc. Act 1974

2.30 The very wide provisions of this Act apply to ABP in terms of the port undertaking. ABP as the operator of the Port and as an employer is under a general duty in accordance with the provisions of the Act to ensure that its staff and any persons accessing any Port premises are safe and can do so "*without risks to health*".

2.31 Section 3 of the Act provides that ABP not only has a duty of care towards its employees but also people accessing its premises. It must ensure that it conducts its undertaking "*in such a way as to ensure, so far as is reasonably practicable, that persons not in his employment who may be affected thereby are not thereby exposed to risks to their health or safety*".

2.32 Section 4 of the Act makes clear that the duty applies to "*the means of access thereto or egress therefrom or of any plant or substance in such premises to take such* measures *as it is reasonable for a person in his position to take to ensure, so far as is reasonably practicable, that the premises, all means of access thereto or egress therefrom available for use by persons using the premises, and any plant or substance in the premises or, as the case may be, provided for use there, is or are safe and without risks to health*."

2.33 The ExA should note that, in practical terms as applied to the Port and thereby ABP, the 1974 Act applies:

(a) on board a vessel when shore based workers are engaged in cargo handling or other tasks on board;

(b) to the Master and the vessel's crew when working with shore-based personnel on board ship;

(c) to the vessel's master who has duties in relation to the ship's crew who are put ashore to perform their own tasks (e.g. loading stores or carrying out maintenance work on the ship). Those duties also extend to plant and equipment (for example a forklift truck) which is under the master's control that is used ashore by the vessel's crew, or when used by shore based workers ashore or on board ship; and

(d) whatever size of vessel, where access between vessels is necessary, the access should generally be provided by the vessel lying outboard (except where there is a great disparity in freeboard in which case access should be provided by the vessel with the higher freeboard).

2.34 ABP is seriously concerned that it will not be able to comply with the requirements of this Act by reason of the design of the proposed LLTC, in terms of both its location and height and by reason of the practical operational constraints that the new bridge will self-evidently create, ABP's ability to perform and comply with its wide ranging duties will be severely limited and constrained.

2.35 This has the potential to lead to a consequential risk in terms of the health and safety of employees, tenants, occupiers, users and visitors to the Port – the legal liability and responsibility for which falls fully upon ABP.

Corporate Manslaughter and Corporate Homicide Act 2007

2.36 To underline the seriousness of the impact that will be caused by the construction and operation of the LLTC, the ExA should be aware that the provisions of the 2007 Act also apply to ABP. Section 1 of the Act provides that:

> *"an organisation to which this section applies is guilty of an offence if the way in which its activities are managed or organised–*
>
> (a) *causes a person's death, and*

(b) *amounts to a gross breach of a relevant duty of care owed by the organisation to the Deceased"*

2.37 An organisation is, however, only guilty of an offence "*if the way in which its activities are managed or organised by its senior management is a substantial element in the breach*".

2.38 ABP is understandably concerned that the introduction of the constraint of a two lane bridge through the middle of a Port must, of itself, limit ABP's ability to manage the Port – to its very serious detriment.

Advisory Guidance

2.39 In addition to ABP's general duties and statutory powers, ABP must also have regard to, and where relevant implement, the various marine and shipping safety codes and advisory guidance which are relevant to its operations at the Port, as detailed below.

The Port Marine Safety Code

2.40 The Port Marine Safety Code ("PMSC"), produced by the Department for Transport and the Maritime & Coastguard Agency (2016), applies to all UK Harbour Authorities and other marine facilities, berths and terminals.

2.41 The PMSC sets out a national standard for every aspect of port marine safety. It was developed to improve safety in the port marine environment and it provides a standard against which the policies and procedures and performance of organisations can be measured.

2.42 Whilst the PMSC is not mandatory, it is endorsed by the UK government and by the maritime business sector and there is, therefore, a "*strong expectation that all harbour authorities will comply*" with its provisions. Indeed, the ExA should be aware that non-compliance with the PMSC has been used to justify prosecution under Health & Safety legislation.

2.43 The PMSC requires that marine operations undertaken within a Port are safe and efficient so that when open for public use, users can do so "*without danger to their lives or property"*. The code explicitly states that "*the duty holder is accountable for safe and efficient* [marine] *operations*".

2.44 ABP, as the duty holder for the Port, must have regard to the safety of the Port's operations, promote the safe use and must have the ability to take such action as

is necessary for maintenance and operation of the Port and its facilities. The introduction of the constraints imposed by the LLTC will obstruct and impede ABP's ability to ensure that public use of the Port can take place safely and with without danger, as required by the PMSC.

2.45 Section 3 of the PMSC sets out the general duties and powers under the code, as follows:

> *"**General duties and powers:** For the purposes of the Code, the duty holder should ensure that the harbour authority or organisation discharges its responsibilities for:*
>
> ***Safe and efficient port marine operations:** Having regard to the efficiency, economy and safety of operation of the services and facilities provided as well as ensuring that appropriate resources are made available for discharging their marine safety obligations.*
>
> ***Open Port Duty:** Taking reasonable care, so long as the harbour or facility is open for public use, that all who may choose to navigate in it may do so without danger to their lives or property.*
>
> ***Conservancy duty:** Conserving the harbour or facility so that it is fit for use; this duty also includes providing users with adequate information about conditions in the harbour or facility…*
>
> ***Civil Contingencies duty:** Take account of the organisation's responsibilities under the Civil Contingencies Act 2004 including planning, preparing and coordinating responses to emergencies which threaten serious damage to human welfare, the environment or security.*
>
> ***Harbour authority powers:** Harbour authorities must be aware of their statutory powers and responsibilities under both primary and secondary legislation."*

2.46 Section 4 of the PMSC sets out the special duties and powers for duty holders which include:

> *"**Powers of Direction**: Powers to direct vessels are available and should be used where appropriate to support safe navigation.*

Regulation of dangerous vessels and substances: *Dangerous vessels and dangerous substances (including pollution) must be effectively managed.*

Pilotage: *A pilotage service must be provided if required in the interests of safety as determined by risk assessment."*

2.47 Paragraph 19 of the PMSC provides a cautionary tale in respect of non-compliance with the code. It reports that a successful prosecution was brought against a harbour authority for breach of section 3 of the Health and Safety at Work Act 1974 (discussed above) in which it was held that non-compliance with the fundamental elements of the code evidenced a failure to provide a safe system of work.

2.48 The guidance provided in sections 3 and 4 of the PMSC emphasises the need for CHA's to ensure safe navigation and safety of operations within their harbour and facilities, so that its use is without danger to lives or property. ABP's concern is that the LLTC will compromise the safe navigation of vessels within the Port, especially in the case of emergency situations where vessels are directed to leave the Port to avoid a serious or catastrophic accident.

Guide to Good Practice on Port Marine Operations

2.49 The Guide to Good Practice on Port Marine Operations ("PMSC Guide"), published by the Department for Transport's Maritime and Coastguard Agency in 2018, accompanies and should be read in conjunction with the PMSC. It provides clear guidance on how Harbour Authorities can demonstrate compliance with the PMSC.

2.50 Paragraph 8.5.2 of the PMSC Guide emphasises safety and that the following considerations must be taken into account in managing a harbour.

> *"8.5.2 Management of a harbour or facility begins in determining which activity is safe and where it can take place, having regard to the physical constraints and the variety of activities being undertaken. Effective tools need to be in place which will ensure as far as practicable, that these determinations are carried through in practice."*

International Ship and Port Facility Security (ISPS) Code

2.51 ABP is also bound to ensure that it is in compliance with the ISPS Code. This Code comprises a comprehensive set of measures designed to strengthen the security of ships and port facilities. It was developed in response of the perceived threats to ships and port facilities after the 9/11 terrorist attacks. The Code is implemented through the EU regulation on enhancing ship and port facility security (725/2004). It has two parts, Part A which is mandatory and Part B which is recommendatory. The EU regulation makes some of Part B of the ISPS Code mandatory.

2.52 The purpose of the Code is to provide a standardised, consistent framework for evaluating risk to the security of ships and port facilities. It enables governments to counteract changes in threat with changes in vulnerability for ships and port facilities by adopting the appropriate security levels and corresponding security measures.

2.53 The Code explains how maritime security is managed in the UK, how security measures are applied and how they should be complied with. It also provides guidance on how to deal with stowaways and deter acts of violence against merchant ships, such as piracy and armed robbery.

2.54 Government guidance on the ISPS Code refers to the Department for Transport's Marine Guidance Note (MGN) 440 (M) which aims to help ship owners, operators, masters and seafarers understand the risks posed by piracy, armed robbery and other acts of violence against merchant shipping. The Department for Transport's guidance note identifies steps to be taken to reduce the risk of such acts and advises on how to deal with and report them.

2.55 ABP's ability to comply with the ISPS Code must not be comprised and there is a serious concern that locating a bridge in the middle of an operational Port must, of itself, limit ABP's ability properly to perform and indeed be able to demonstrate its performance and compliance with the obligations imposed by the Code.

Health and Safety Executive (HSE) Guidance

2.56 ABP must also take into consideration the guidance provided by HSE in a number of relevant guidance documents in operating the Port, including the following:

(a) Safety in Docks: Approved Code of Practice and Guidance (L148);

(b) Health and Safety in Ports (SIP014) Guidance on safe access and egress in ports;

(c) Guidance on Safe Access to Fishing Vessels and Small Craft in Ports (SIP021);

(d) Managing health and safety in dockwork (HSG177);

(e) A quick guide to health and safety in ports (INDG446).

Conclusion

2.57 The ExA will appreciate that the above is very much only a summary of a very large number of statutes and advisory guidance which together are designed to regulate operations within a port.

2.58 The construction and operation of a low-level bascule bridge in the middle of an operational Port, which will be in the control of an external third party, must self-evidently act to the serious detriment of the statutory port undertaker.

2.59 It will impede ABP's ability to perform its statutory duties and powers and as a consequence, will potentially render ABP liable for any events, occurrences and incidents which arise as a result of the existence of the bridge which would not have arisen if the bridge had not existed.

3 THE PORT OF LOWESTOFT

3.1 The Port of Lowestoft is the most easterly port in the UK, located on the Suffolk coast to the south of the Port of Great Yarmouth and to the north of the Port of Felixstowe. **Annex 3** identifies the extent of the statutory port estate – the boundary of which defines the “statutory port estate” which ABP holds in its capacity as a statutory port undertaker.

3.2 The Lowestoft Port estate covers an area of approximately 63 hectares (155 acres), extending across both the landside and the water. It is served by Lake Lothing, the navigational channel of which is used 24 hours a day, seven days a week by a wide range of users – from commercial to leisure – and indeed in this latter context, it should be noted that Lowestoft acts as the as southern access to the Broads.

3.3 The Port accommodates vessels of up to 5,000 gross tonnes. In addition, its strategic location, looking across the North Sea, means that it is ideally placed to capitalise on major new growth markets in both offshore energy support activities and construction aggregates, whilst at the same time building on its traditional strengths in bulks, fisheries and general cargo.

3.4 Historically the Port was developed and grew in a seawards direction along Lake Lothing during the early 1800s, when in 1831 the Inner Harbour was constructed and Lake Lothing opened to the sea.

3.5 The Outer Harbour, purchased by Sir Morton Peto (whose company built Nelson's Column in London) was constructed in the mid to late 1800 in tandem with the construction of a railway linking Lowestoft with Norwich. The two harbours forming the Port are separated by an existing bascule bridge. The Outer Harbour is on the seaward side of the bridge and the Inner Harbour is on the western (inland) side.

3.6 Today, the Outer Harbour and the Inner Harbour are linked by a channel crossed by a bascule bridge which carries the conjoined A47/A12. The existing bascule bridge, when raised, can admit vessels into the Inner Harbour with a beam of up to 22m. The existing bascule bridge is monitored and operated by ABP, in accordance with existing operational procedures, as discussed at Part 4 below.

Port Operations

3.7 In terms of port operations, the Outer Harbour with its mix of existing activities is effectively full. It follows that any commercial flexibility that may be required to meet additional port-related development and sector growth will need to be accommodated in the Inner Harbour or it will be lost to a competitor port.

3.8 On a socio-economic level, for a town the size of Lowestoft, the Port plays a significant part. It currently supports 523 direct, indirect and induced full-time equivalent jobs, and it supports £30.9 million to £37.3 million gross value added ("GVA") annually across the local economy. In this context, the ExA's attention is drawn to the Socio-Economic Report prepared by Edge Economics, which is attached at **Annex 4**.

3.9 In this context it should be noted that the employment level at the Port in August 2018 reflects a historically low level of oil & gas sector contract work. Employment levels at the Port have inevitably fluctuated from year to year depending on the level of marine business. All ports are operating in a constantly fluctuating market, dependent on both national and international trade – as well as the vicissitude of

national and international politics. The ExA will appreciate, therefore, that the introduction of an operational impediment within the middle of the operational Inner Harbour will do nothing to assist the external commercial perception of the Port's utility.

3.10 That said, however, over the past 5 years the Port has seen a significant increase in commercial operations, (principally downstream of the proposed LLTC), the majority of these being linked to the offshore energy sector.

3.11 **The Outer Harbour –** Port operations in the Outer Harbour, which extends to some 18 hectares (44 acres) of port operational land, currently include:

(a) ***East Anglia One*** – the construction management, operation and maintenance ("O&M") base for the Scottish Power Renewables offshore wind farm;

(b) ***Greater Gabbard*** – The O&M base for the wind farm, owned by Innogy and Scottish and Southern Energy ("SSE") and operated by SSE;

(c) ***Sembmarine SLP Ltd*** - which offers extensive facilities for the construction of large top-side deck structures and jackets destined for oil and gas fields and wind farms primarily located in the North Sea;

(d) ***The Lowestoft Fishing Fleet*** – currently comprising some 13 inshore fishing vessels, each of around 10 m Length Overall ("LOA"); and

(e) ***Leisure*** – a large number of recreational craft moored in the Outer Harbour yacht marina operated by the Royal Norfolk and Suffolk Yacht Club.

3.12 **The Inner Harbour –** Port operations in the Inner Harbour, which extends to some 13.7 hectares (34 acres) of port operational land, the majority of which is situated on the northern bank of Lake Lothing and currently include:

(a) ***Offshore Energy Related Vessel Berths –*** quay areas (Town Quay and former Shell Base Quay) accommodating offshore renewable CTVs, wind farm project and survey and survey vessels;

(b) ***Cefas*** - The quayside base for the Centre for Environment, Fisheries and Aquaculture Science (Cefas), which is the Government's marine science advisor also based in Lowestoft, with their research vessel operating from Cefas Quay;

(c) ***Talismans*** – Predominantly for vessel repair and preparation for dry docking;

(d) ***Dudmans*** – A 14,000-tonne capacity silo and storage facility at Silo Quay operated by Dudman Lowestoft Ltd., which accommodates a range of materials, including grain and cement;

(e) ***Common User Quay*** – known as North Quay, the longest quay in the Inner Harbour at circa 650 metres. The North Quay Terminal allows mobile cranage to be used, together with 16,000 square metres of storage for forest products, steel and general cargo; and

(f) ***Ship repairs –*** The Inner Harbour enjoys the benefit of dry dock facilities, located between Town Quay and Cefas Quay.

3.13 In addition, the Inner Harbour facilitates the Lowestoft Haven Marina, which is located at School Road on the South Bank of Lake Lothing and comprises 2.4 hectares (6 acres) of land and accommodates 186 leisure craft.

The Inner Harbour

3.14 The new bridge, as currently proposed, would enter the port's statutory estate Port at a location approximately 850 metres from the existing bascule bridge, effectively bisecting the operational quayside owned by ABP and situated on the north side of Lake Lothing.

3.15 In terms of operational use and berthing, the Inner Harbour, as indicated on the plan attached as **Annex 1B,** is structured as follows:

TABLE 1: ABP Lowestoft, Inner Harbour Berth Use Table 2019

BERTH NAME	OWNER/ OPERATOR	PERMISSIBLE DREDGED DEPTH		QUAY LENGTH	PRIMARY USES
		OD METRES	ACD METRES		
TOWN QUAY 1	ABP	5.20	3.70	57m	Smaller windfarm vessel, tugs and survey support vessels
TOWN QUAY 2 & 3	ABP - PETERSONS	8.00	6.50	140m	Deep draft windfarm and survey/support vessels. Future operational base for Peterson Oil and Gas logistics base with berth priority.

DRY DOCK	SMS	N/A	N/A	70m	Dry dock facility for extensive ship repairs and hull cleaning/painting
CEFAS QUAY	DEFRA /P&O	7.50	6.00	124m	Government research vessel berth – long term lease with berth exclusivity for research vessel. Can be used for other vessels by request only.
TALISMAN'S QUAY/SILO EAST	ABP	5.20	3.70	78m	Common user berth tugs, ship repair and cargo operations
SILO QUAY (WEST)	ABP	5.50	4.00	152m	Use for silo operations – otherwise common user berth
NORTH QUAY 1-4	ABP	5.20	3.70	224m	Cargo operations and energy support vessel berthing – common user berth
NORTH QUAY 5	ABP	5.50	4.00	184m	Smaller windfarm vessel, tugs and survey support vessels – common user berth
NORTH QUAY 6 & 7 EAST	ABP	6.20	4.70	155m	Temporary logistics base for Peterson Oil and Gas related work. Then common user for deep draft windfarm and survey support vessels
NORTH QUAY 7 WEST	ABP	5.20	3.70	50m	Fendercare operations base for STS work – priority use
FORMER SHELL BASE	ABP	6.50	5.00	340m	Offshore construction support and potential O&M base for windfarms – common user berth
JELD WEN (NOT ABP)	FOR SALE /LEASE	7.10	5.60	242m	Privately owned
SOUTH QUAY (NOT ABP)	FOR SALE /LEASE	5.20	3.70		Privately owned/with heavy load facility for Sizewell

					transformers
SCHOOL ROAD	ABP	5.20	3.70	94m	School Road Marine – 140 berths

The Trading Importance of the Port

3.16 The Port serves the busy sea routes between the UK, Europe, Scandinavia and the Baltic States. It handles around 100,000 tonnes of cargo each year, including dry bulks, general and specialised cargoes. Whilst the cargo tonnage handled by the Port is relatively modest in national terms, this masks the importance of the Port as a strategic facility, especially to the offshore energy, agri-bulk and the fishing sectors, where little cargo is handled, as the following paragraphs explain.

3.17 Every indication at present, however, is that whilst the existing trades at the Port will continue to grow at a rate commensurate to what is for ports, always a fluctuating market dependent as it is on the vicissitudes of politics and world trade, the Port is witnessing a significant growth in the offshore wind energy market and the oil & gas market.

3.18 Today, the offshore wind related activity at the Port of Lowestoft supports 138 direct jobs and generates £11 million in GVA across the local economy. As a result of the recent growth in the wind sector, 40% of the current economic value of the Port is associated with renewables related activity. These numbers will grow rapidly, as the EA One O&M facility and construction support facility become active in 2019.

3.19 This increase in demand and economic activity at the Port underlines the point made above that ports *per se* operate in a fluctuating market. As a consequence, socio-economic reports such as that produced by Edge Economics in August 2018 will quickly fall out of date as the market changes – and thereby serves to understate the position.

3.20 The importance of the Port of Lowestoft in terms of the offshore wind sector was recognised by the Secretary of State ("SoS") in his Section 35 Direction of 22 March 2018 when, in conferring NSIP status on the Third Crossing project, he gave as one of his justifications for making the Direction was that the Project:

"Delivers the Port of Lowestoft's role in being the hub for the off-shore wind farms that area part of the East Anglia Array, a major energy supplier for the UK."

3.21 ABP is conscious that in seeking the section 35 Direction, the Applicant's failed to draw the Secretary of State's attention to the fact that the location of the bridge as proposed by Suffolk County Council would in fact act to the serious detriment of those very port operations that the Secretary of State seemingly wishes to protect and encourage, a point that ABP will be drawing to the attention of the SoS in its section 127 letter.

3.22 In this context, the ExA should also note that the critical part that the Port has to play in the context of the growing offshore wind market was recently highlighted by the Crown Estate's announcement of 15 November 2018 to the effect that East Anglia is to be one of the five regions to be taken forward for the Round 4 offshore wind leasing. As noted, Lowestoft's close proximity to the East Anglia wind farm region in the southern North Sea places it in a prime location to benefit from this future development potential.

3.23 In addition, the local authority, Waveney District Council, has itself acknowledged the importance of the Port in its emerging 2018 Local Plan, recognising, for example that the 'Growing potential to support the offshore energy sector' is a key economic issue for Waveney and that in this respect: –

"*The town significantly benefits from the Port of Lowestoft from which many offshore companies operate…."*

- and that the Port –

"is establishing itself as a renewables centre of excellence…" (Lowestoft specific settlement key issues).

3.24 Within the spatial strategy for the Lowestoft area provided within the emerging plan it is further highlighted that:

"*Lowestoft, along with Great Yarmouth will be important centres in the construction, operation and maintenance of offshore renewable projects*"

- as well as making clear that -

"The Port of Lowestoft will be an offshore renewables centre of excellence supporting the employment of a significant number of people."

3.25 As discussed below, it should be noted that the operations and maintenance functions of the offshore energy sector, many of which are already located at the Port and in future will have to be located in the Inner Harbour, are time critical operations. As such, any impediment which potentially introduces operational time constraints has the potential to impact critically on those operations.

4 EXISTING BASCULE BRIDGE

4.1 The channel linking the Outer and Inner Harbours is crossed by a bascule bridge, known as the A47 bascule bridge. This bridge carries the conjoined A47/A12.

4.2 The A47 bascule bridge has a clearance of 1.8 m above HAT under the bridge deck when in a closed position. In a raised position, vessels with a beam of up to 22 metres can enter the Inner Harbour.

4.3 The original A47 bascule bridge was constructed in the 1800's when Lake Lothing was opened to the sea. Construction of the existing bridge was authorised by *The London-Great Yarmouth Trunk Road (Lowestoft Inner Harbour Bridge Diversion) (No. 2) Order 1969 ("the Order")*. The new bridge was opened in 1972.

4.4 Historically, the bridge was owned by the Great Eastern Railway Company - the Company which first owned and operated the Port some two hundred years ago. Ownership eventually transferred to the Department for Transport and then Highways England. ABP has had control of the Bascule Bridge since 1987 and today undertakes mechanical and electrical maintenance and operates the bridge on behalf of Highways England from the immediately adjacent control tower.

4.5 Schedule 4 of the Order set out an operating procedure for the A47 Bascule Bridge, which states that:

> *"The bridge shall be open for the passage of vessels for such reasonable periods as may be required on every week day between the hours of 6 a.m. and 10 p.m., on Sundays in May to September inclusive between the hours of 6 a.m. and 6 p.m. and on Sundays in October to April inclusive between the hours of 6 a.m. to 2 p.m. At all other times the bridge shall be closed against vessels except in case of emergency or after prior arrangement with the Harbour Master to permit a vessel to pass the bridge on a particular tide."*

4.6 In other words, the Order has given the Port Harbour Master total discretion as to when to open the bridge - albeit in a context that, certainly during busy week-day

traffic periods, there will be a presumption that vehicular traffic and pedestrians will be able to pass over the bridge whenever possible.

4.7 With the knowledge of Highways England, the operating procedures for the A47 bascule bridge have evolved by custom and practice. The 2017 Bridge Operating Protocol, which is publicly available, provides in terms of bridge openings for commercial vessels that:

> *"4. The Lowestoft Harbour Bridge (between the Outer and Inner Harbours) will only be opened on demand for commercial shipping over 50 GRT."*

- it also provides that -

> *"4(A) Commercial shipping is discouraged from passage: 0815 - 0900 hours, 1230 - 1300 hours and 1700 - 1745 hours."*

4.8 The 2017 Bridge Operating Protocol also sets out specific opening times for small crafts and yachts, during weekdays, weekends and public holidays.

4.9 Although the Harbour Master has discretion to open the bridge during peak traffic periods, he tries to avoid this occurring as far as reasonably practicable.

4.10 Of particular significance in the context of the Applicant's proposals is the fact that during the last 12 months, the A47 bascule bridge has been opened only on limited occasions during the rush hour for commercial vessels, as the Harbour Master has responsibly exercised his control to minimise impact on vehicular traffic.

5 PORT OF LOWESTOFT MASTER PLAN

5.1 In July 2007, during the process of reviewing National Port Policy, the Government recommended that each major UK port should produce a Port Master Plan which would have a twofold objective. First, the Plan would facilitate coherent forward planning as far as the particular port itself was concerned and secondly, following consultation and liaison with the local planning authority, the evolving Plan would be able to play a part in the local development plan process.

5.2 In a market led industry where Government does not wish to dictate where development should occur – matters identified in the National Policy Statement for Ports and discussed further in section 6 of this representation – Port Master Plans

are seen as a way in which the 'market' can identify how individual ports may develop and grow.

5.3 Subsequent Master Plan guidance published in 2008 by the Department for Transport ("DFT") indicated that such plans should be produced by ports to:

(a) Clarify their strategic plans for the medium to long term;

(b) Assist local and regional planning bodies and transport network providers in preparing and revising their development strategies; and

(c) Inform port users, employees and local communities of expected development over the coming years.

5.4 The Government guidance recognises that ports are disparate and that Master Plans will be prepared at different times relative to other planning and decision cycles. Although ports operate in a dynamic commercial world, which requires operators such as ABP to constantly to evolve and adapt to the demands of a fluctuating market (matters highlighted within NPSfP – see Section 6 of this representation), master planning certainly has a part to play in terms of strategic planning over the medium to long term.

5.5 A Master Plan for the Port of Lowestoft, which sets out ABP's vision for development of the Port over the period of 2018 to 2038, has been in the process of preparation over the past 15 months. Unfortunately, its publication in draft form for public consultation has been delayed by the Applicant's proposals and the consequential detrimental impact that the third crossing, if constructed in the location currently proposed, will have on both existing and future port operations.

5.6 As at the time of the submission of these Written Representations (8 January), ABP hopes that it will possible for the draft version of the Master Plan, to receive ABP Board approval for publication in the next two months.

5.7 In brief, however, and to assist the ExA, the emerging Master Plan identifies the future commercial opportunities available to the Port, which primarily relate to the following:

(a) A significant future expansion of the offshore wind industry;

(b) Opportunities in the existing oil and gas industry, argri-bulks, aggregates sectors;

(c) Continued growth is its existing and traditional trading commodities; and

(d) Emerging opportunities in the fisheries sectors.

5.8 The emerging Master Plan also briefly considers the potential impact of the LLTC on the Port's future growth and its ability to seize commercial opportunities should they arise bearing in mind that the external perception of the Port – as well as the reality – will be that vessel movements will be seriously impeded/delayed by a second bridge across the middle of the Inner Harbour.

6 NATIONAL POLICY STATEMENT FOR PORTS

6.1 Within its case for the LLTC Scheme (APP-091 and APP-092) the Applicant sets out its assessment of the LLTC against those elements of the National Policy Statement for Ports ("NPSfP") which it considers to be relevant.

6.2 This assessment (largely contained within Appendix A of APP-092), however, concentrates on those paragraphs of the NPSfP which are found within sections 4 and 5 of that policy document, paragraphs which set out a series of assessment principles and impact areas which need to be considered by those making decisions on port and harbour facility development proposals.

6.3 What the Applicant has seemingly failed to give any detailed consideration to is that part of the NPSfP which sets out the Government policy for ports and the need for new port infrastructure – section 3 of the NPSfP. In ABP's opinion, a correct understanding of this aspect of the policy context is important in order to understand the context in which the Port of Lowestoft undertaking is carried out. Such an understanding is also necessary to enable an appropriate assessment of the impact of the LLTC scheme on the Port of Lowestoft to be undertaken – a matter which is returned to elsewhere within this Written Representation (for example, Section 21).

6.4 The NPSfP clearly needs to be read as a whole. However, set out below are some important aspects of section 3 of the NPSfP of relevance to the consideration of the effects of the LLTC scheme on the Port.

6.5 The NPSfP makes it very clear that ports – such as the Port - play an essential role in the UK economy (NPSfP, section 3.1). In terms of freight and bulk movements this section of the NPSfP recognises the essential role of ports by making clear that *"shipping will continue to provide the only effective way to move the vast majority of freight in and out of the UK, and the provision of sea port*

capacity will remain an essential element in ensuring sustainable growth in the UK economy" (NPSfP, paragraph 3.1.4).

6.6 The NPSfP also recognises the essential role that ports play in the provision of the nation's energy requirements. Amongst other things, ports are identified as having a *"vital role"* in the construction and servicing of offshore energy installations (NPSfP, paragraph 3.1.5).

6.7 Section 3.3 of the NPSfP sets out Government policy for ports. This *"fundamental policy"* is summarised as being to:

- *"encourage sustainable port development to cater for long-term forecast growth in volumes of imports and exports by sea with a competitive and efficient port industry capable of meeting the needs of importers and exporters cost effectively and in a timely manner, thus contributing to long-term economic growth and prosperity;*
- *allow judgments about when and where new developments might be proposed to be made on the basis of commercial factors by the port industry or port developers operating within a free market environment; and*
- *ensure all proposed developments satisfy the relevant legal, environmental and social constraints and objectives, including those in the relevant European Directives and corresponding national regulations"* (NPSfP, paragraph 3.3.1).

6.8 The second aspect of this policy reflects a long-standing principle that the ports industry is market led and that the market – rather than Government or any other external body – is best placed to decide where and when port capacity is to be provided.

6.9 In addition to the above fundamental policy, the NPSfP also sets out a series of outcomes new port infrastructure should seek to achieve in order to help meet the Government's policies on sustainable development (NPSfP, paragraphs 3.3.3 to 3.3.8).

6.10 Against the context of the Government's fundamental ports policy, the NPSfP then goes on to set out the Government's assessment of the need for new infrastructure. Paragraph 3.4.1 of the NPSfP helpfully summarises the position by explaining that:

> *"The total need for port infrastructure depends not only on overall demand for port capacity but also on the need to retain the flexibility that ensure port capacity is located where it is required,….., and on the need to ensure effective competition and resilience in port operations. …."*
>
> (NPSfP, paragraph 3.4.1).

6.11 In terms of the locational elements of this total need, the NPSfP further explains that capacity must be in the right place. Reflecting the 'market led' approach set out in its fundamental policy, the NPSfP makes it clear that the Government does not wish to dictate where port development should occur, but rather recognises that the market is the best mechanism for getting this right (NPSfP, paragraphs 3.4.11 and 3.4.12).

6.12 In terms of the competition elements of the total need, the NPSfP makes it clear that UK ports compete with each other and ports within Europe, and that such competition drives efficiency and lowers costs. NPSfP highlights that effective competition requires sufficient spare capacity to ensure real choices for port users. It is also made clear that ports need to operate at efficient levels, which is specifically highlighted as not being the same as operating at full physical capacity (NPSfP, paragraphs 3.4.13).

6.13 In terms of the resilience elements of the total need, the NPSfP makes it clear that spare capacity helps to assure the resilience of national infrastructure. It is made clear that the Government believe that resilience is provided most effectively as a by-product of a competitive ports sector (NPSfP, paragraph 3.4.15).

6.14 In reaching conclusions on the need for new infrastructure, the Government – for the reasons it sets out – makes it clear that excluding the possibility of providing additional capacity through port development would be an outcome strongly against the public interest (NPSfP, paragraph 3.4.16).

6.15 Section 3 of the NPSfP concludes by providing guidance to the decision maker on assessing the need for additional capacity. Amongst other things it is made clear that in respect of developments which support the development of offshore sources of renewable energy, the decision maker should accept the need for such developments.

Summary

6.16 In summary, the NPSfP makes clear that ports such as the Port of Lowestoft play a vital role in the UK economy, and that they operate within an industry that is market led where competition is encouraged, resilience is required and location is important.

7 LOCAL PLAN

7.1 Within its 'Case for the Scheme' (Document Reference: APP-091), the Applicant undertakes – in section 8 – an analysis of local policy and concludes that the LLTC scheme is 'in compliance with each of these documents' (paragraph 8.10.1).

7.2 ABP has considered the analysis which the Applicant has undertaken in respect of matters relating to the Port.

7.3 That said, whilst broadly agreeing with the Applicant's conclusions with regard to the extant Local Plan, it must be the case that the conclusions reached on the acceptability of the LLTC scheme in respect of such local policy matters relating to the Port depends upon the appropriateness of the impact assessment work that has been undertaken, and on which such policy conclusions are based. For the reasons which are summarised within these Written Representations, the Applicant's assessment of the impacts of the LLTC on the Port of Lowestoft is not, in ABP's opinion, appropriate, and any conclusions based upon the assessment that has been carried out cannot be relied upon.

7.4 Although the Applicant considers draft policies contained within the Final Draft Local Plan submitted for examination by Waveney District Council – see paragraphs 8.4.28 to 8.4.33 of APP-091 – this does not, for understandable reasons relating to timing of the submission, deal with the latest position in respect of this emerging plan.

7.5 In terms of this emerging Plan, ABP has been involved as necessary in the examination of the Plan. This has involved the submission of evidence to and appearing at relevant hearing sessions. At the time of writing, the Plan is still being examined but is at the stage where the District Council are consulting on proposed modifications to the plan which have arisen out of the examination process to date.

7.6 In terms of the Inner Harbour Port Area emerging policy (Policy WLP2.10) the District Council are proposing to modify the policy to now read as follows (relevant deletions shown crossed through and new text shown underlined).

> *"The Inner Harbour Port Area is defined on the Policies Map.*
>
> *Within the Inner Harbour Port Area land and buildings will be retained in port and other associated uses, with the exception of redevelopment or other land use changes required to accommodate the delivery and construction of the Lake Lothing Third Crossing in the form approved by a development consent order made under the Planning Act 2008. Proposals involving the redevelopment or change of use of existing premises, to uses not related to the port or the Lake Lothing Third Crossing as so approved will not be permitted.*
>
> *New development within the Inner Harbour Port Area should ensure that technology, equipment, and business practices are utilised in order to minimise noise and other amenity issues.*
>
> *New development on South Quay should include landscaping and public realm treatments which improve the appearance of this key gateway to the town centre.*
>
> *New development next to, or opposite, or in close proximity to the Inner Harbour Port Area should ensure potential conflicts are mitigated through the layout, use and environmental credentials of new buildings. Developers should liaise with businesses and port operators to ensure that potential conflicting uses are addressed prior to any application for planning permission. New development should not result in unreasonable restrictions being placed on the operations of* the port or existing businesses within the Inner Port Harbour Area."

7.7 The change to the first paragraph of the policy has been made to reflect the fact it is only a LLTC scheme that has been approved by a DCO – it thereby following that the scheme does not have a serious detrimental impact on the carrying on of the port undertaking - which is supported by this emerging policy and the emerging Plan as a whole. A scheme which does have a serious detrimental impact of the statutory port undertaking would not be supported.

7.8 A number of further modifications of relevance to the Port are being consulted on by the District Council – for example, ensuring that the Policies Map correctly

identifies the boundary of the Port, ensuring unreasonable restrictions are not placed on the operation of the Port as a result of the development of nearby sites and amending the boundaries of relevant development sites to ensure they do not include port land.

7.9 ABP is currently considering the modifications proposed by the District Council and what, if any, representations it will make by the end of the consultation period – 28 January 2019.

8 SERIOUS DETRIMENT

8.1 It is ABP's view that the LLTC proposal as currently being promoted by the Applicant cannot be authorised by the SoS, nor indeed recommended for approval by the ExA., because the scheme would cause "serious detriment" to the carrying on of the statutory port undertaking. As a consequence, the SoS is not in a position to certify the compulsory acquisition of part of the statutory port estate.

8.2 These Written Representations deal with the issue of "serious detriment" on a number of levels:-

(a) First in Part 9 below, the strict legal test of "serious detriment" as set out in section 127 of the Planning Act is discussed in the context of the LLTC proposals.

(b) Second, in Part 10, the serious detriment that will be caused by the LLTC scheme is explained in terms of the Applicant's proposed compulsory acquisition, both permanent and temporary.

(c) Sections 11 and 12 then describes the "serious detriment" that will be caused to the Port as a result of the LLTC Scheme in terms of navigational safety – pointing also to the Applicant's failure to undertake a navigation Risk Assessment of the project either before submission – or indeed to-date, during the course of the examination process.

(d) Section 14 looks at the related impacts that would be caused by the LLTC scheme in terms of the detrimental impact on both existing and future port operations.

(e) Finally, in the context of “serious detriment”, these Representations outline the mitigation that the Applicant will have to provide to reduce the serious detriment that will be caused by the scheme to manageable proportions.

9 THE STATUTORY TEST

Section 127 of the Planning Act

9.1 A pre-condition to the implementation of the LLTC scheme by the Applicant is the issue of a certificate by the SoS confirming that he is satisfied that the land which the Applicant wishes to acquire compulsorily can be so acquired without causing “serious detriment” to ABP’s statutory port undertaking.

9.2 It is ABP's firm view that the proposed LLTC scheme will in fact have a critically serious and detrimental impact upon the Port, in terms of both current and future operational viability.

9.3 This 'serious detriment' arises in the context of both the proposed line and height of the highway bridge through the middle of the Port’s Inner Harbour - a scheme the pre-requisite for which is the compulsory acquisition of part of the statutory port estate.

9.4 ABP has to date deliberately delayed submitting its representations as to serious detriment to the SoS - a step required by section 127(1) of the 2008 Act - in the hope that the Applicant would recognise the need for a mitigation package that will off-set the harm that will otherwise be caused to the Port.

9.5 Latest indications, however, are that the Applicant is not prepared to discuss a possible mitigation package and as a consequence of which, formal representations under section 127 (1) will be sent to the SoS before the scheduled resumption of the NSIP examination.

9.6 For the assistance of the ExA, Section 127 of the 2008 Act provides as follows:

> ***'127 Statutory undertakers' land***
>
> *(1) This section applies in relation to land ("statutory undertakers' land") if –*
>
> *(a) the land has been acquired by statutory undertakers for the purposes of their undertaking,*
>
> *(b) a representation has been made about an application for an order granting development consent before the completion of the examination of the application, and the representation has not been withdrawn, and*

(c) as a result of the representation the [Secretary of State] is satisfied that—

(i) the land is used for the purposes of carrying on the statutory undertakers' undertaking, or

(ii) an interest in the land is held for those purposes.

(2) An order granting development consent may include provision authorising the compulsory acquisition of statutory undertakers' land only to the extent that the Secretary of State—

(a) is satisfied of the matters set out in subsection (3), and

(b) issues a certificate to that effect.

(3) The matters are that the nature and situation of the land are such that—

(a) it can be purchased and not replaced without serious detriment to the carrying on of the undertaking, or

(b) If purchased it can be replaced by other land belonging to, or available for acquisition by, the undertakers without serious detriment to the carrying on of the undertaking.

(4) Subsections (2) and (3) do not apply in a case within subsection (5).

(5) An order granting development consent may include provision authorising the compulsory acquisition of a right over statutory undertakers' land by the creation of a new right over land only to the extent that the Secretary of State—

(a) is satisfied of the matters set out in subsection (6), and

(b) issues a certificate to that effect.

(6) The matters are that the nature and situation of the land are such that—

(a) the right can be purchased without serious detriment to the carrying on of the undertaking, or

(b) any detriment to the carrying on of the undertaking, in consequence of the acquisition of the right, can be made good by the undertakers by the use of other land belonging to or available for acquisition by them.

(7) If the Secretary of State issues a certificate under subsection (2) or (5), the Secretary of State must—

(a) publish in one or more local newspapers circulating in the locality in which the statutory undertakers' land is situated a notice in the prescribed form that the certificate has been given, F2...

(b) . . ."

9.7 Although ABP has taken a deliberately pro-active and collaborative approach with the Applicant in the context of the LLTC scheme, in order to assist them to understand the serious detriment caused by the LLTC and its impact on ABP's ability to carry out its statutory undertaking, in large part, ABP is concerned that the Applicant's application process has paid scant, if any, regard to the Port and the impact of the LLTC scheme on the Port, its operations, its statutory duties and obligations or its customers. In this context, the ExA's attention is drawn specifically to the contents of section 21 below, which outline the perceived deficiencies in the Applicant's environmental assessment of the scheme.

Statutory Undertaker's Land

9.8 Before discussing the section 127 legal test, the ExA will be aware that the test is only relevant if the land that a promoter of a DCO wishes to acquire is indeed land which *'has been acquired by Statutory Undertakers for the purposes of their undertaking*', in accordance with Section 127(1)(a) of the Act.

9.9 It is understood that this is not a point at dispute with the Applicant, but the following will be of assistance for the ExA in terms of confirming the legal status of ABP.

9.10 The ExA already have attached, as **Annex 3**, a plan of the Port that delineates the boundary of ABP's Statutory Port Estate.

9.11 The Port's Inner Harbour was originally built by the Lowestoft and Norwich Navigation Company and developed by the Norfolk Railway following the construction of the Norwich to Lowestoft railway. The first vestiges of the Inner Harbour were constructed in 1831, and the Outer Harbour was constructed in 1937.

9.12 In 1947, by virtue of the provisions of the Transport Act 1947, port ownership in the UK was to large extent regularised and ownership of and responsibility for ports was transferred from their then owners, by that time essentially railway companies, to the British Transport Commission.

9.13 Some fifteen years later, in 1962, ownership of those ports passed from the British Transport Commission to the British Transport Docks Board, a body constituted by the Transport Act 1962.

9.14 On 31 December 1982, the British Transport Docks Board was reconstituted under the name Associated British Ports pursuant to section 5(1) of the Transport Act 1981.

The Statutory Tests

9.15 ***Section 127 (3)(a) -*** The first statutory test is for the SoS to consider whether the land:–

> *"can be purchased and not replaced without serious detriment to the carrying on of the undertaking"*.

9.16 This requires the SoS to determine whether, if ABP is permanently deprived of the land and rights required for the construction of the LLTC and that land and those rights are not replaced, ABP's port undertaking, both current and future, will in any way be constrained or limited to a seriously detrimental extent.

9.17 There is no statutory definition of 'serious detriment'. Such precedent as does exist, however, points to serious detriment being an impact that is considered to be more than just trivial, but not necessarily severe. For the assistance of the ExA, the statutory test of 'serious detriment' test has been considered in a number of recent NSIP examinations:-

(a) In the ***Richborough Connection DCO*** application, the ExA considered that the term 'serious detriment' goes beyond just 'detriment', and that something would be 'serious' if it was 'important or significant' (Paragraph 9.9.101 of the Recommendation Report).

(b) In the ***Hinckley Point C Connection Project*** – which involved the construction of overhead power cables across the statutory estate of the Port of Bristol, the ExA acknowledged that the Bristol Port Company (statutory undertakers for the Port of Bristol) required inherent future flexibility to be able to develop its port estate and provide the necessary buildings and facilities upon it as it so wished, (Paragraph 8.5.275 of the Report to the SoS). Although the ExA recognised that the area affected by the proposed development was relatively small in comparison to the whole of the land available to the statutory undertaker, the particular location of the proposed overhead cables was likely to cause serious detriment to the carrying on of the undertaking. Further, the land affected represented an important part of the resources available to the Bristol Port Company and

there was a paramount need to retain the ability to use this land in a flexible manner (paragraph 8.5.276 of the Report to the SoS).

9.18 The “serious detriment” test extends principally, therefore, to the ability of the statutory undertaker to carry on its undertaking in the light of the both the loss of the land taken by compulsory acquisition and the consequences of that compulsory acquisition in terms of the undertaking going forward (i.e. the ExA considered not just current activities, but also the impact on future activities).

9.19 In the context of the section 127(3)(a) test, therefore, it is self-evident on the facts that serious detriment will arise as a result of the LLTC scheme for a variety of reasons, including the fact that:

(a) A significant area of land within the port estate, falling in the middle of the operational Inner Harbour, will be permanently deprived as a result of the LLTC, encompassing land side, quay, berthing and river-bed;

(b) The use of ABP's land and berth space for Port operations by ABP, its tenants and its customers will be disrupted during construction of the LLTC, which will consequently impact on the current operational viability of the Port;

(c) Once construction of the LLTC has been completed, the two lane bascule bridge constructed at a height of only 12 metres (11 metres above HAT to accommodate the anticipated required safety clearance) through the heart of the Inner Harbour must continue to disrupt in perpetuity ABP, its tenants and its customers;

(d) In particular, it will detrimentally impact the Port's future operational viability by virtue of the location, height, operational restrictions of the bridge; so that-

(e) As a result, ABP's ability to meet customer demand will be impaired by the perception of two bridges across the Port, leading to the risk that ABP:

(i) will be unable to retain its existing business; and/or

(ii) attract new business;

(f) ABP's ability to accommodate customers and key trades, particularly during times of peak traffic when the bascule bridge will not be opened for vessel movements, will be impaired, resulting in loss of business and/or delays to

vessels, with consequential long-term (or even permanent) damage to the Port's market reputation; with the consequence that-

(g) ABP's ability to compete for business will therefore be materially constrained;

(h) That loss of trade will adversely affect ABP's ability to maintain and invest in essential Port infrastructure in discharge of its statutory duties; and

(i) The Port's strategic significance for the UK will be seriously damaged and its economic contribution locally, regionally and nationally will be adversely affected.

9.20 Accordingly, on a perhaps overly simplistic level, it is difficult to conceive how the proposed compulsory acquisition and temporary use of an area of land located in the centre of the Port's Inner Harbour can ever be justified on the basis that it would not cause 'serious detriment to the port undertaking' without appropriate mitigation in place before the 'harm' is inflicted on the Port – something the Applicant has singularly failed to do in this instance.

9.21 ***Section 127(3)(b) -*** The second half of the statutory test requires the SoS to determine whether, if the land within the statutory port estate is to be compulsorily purchased:–

> "*it can be replaced by other land belonging to, or available for acquisition by, the undertakers without serious detriment to the carrying on of the undertaking".*

9.22 In summary, placing this statutory test in the context of the LLTC scheme and its impact on ABP's ability to carry on its statutory undertaking –

(a) first ABP does not have at its disposal alternative land that would replace the land lost to the LLTC scheme; and

(b) neither can it purchase alternative land to replace the land to be compulsorily acquired for the simple reason, as noted below, that there is no land available.

9.23 The practical consequence of the LLTC scheme as currently being promoted, is that the Port's statutory undertaking cannot be "carried on" unless the serious detriment which will self-evidently be caused by the scheme, is at least reduced – in the circumstances of the scheme it can never be totally eliminated in that one

does not sensibly attempt to build a low bridge, the opening of which is in the control of an external party, through the middle of an operational port – by an appropriate package of mitigation measures.

9.24 On a purely local level, the Port estate is, and always has been, physically constrained. The Port is effectively located within the centre of Lowestoft and is enclosed by the town both to the north and south. Lake Lothing itself forms a natural boundary, whereby the Port is constrained by Mutford Lock and the non-tidal Oulton Broad to the west and the North Sea to the east. To the north, the statutory port estate is bounded by commercial buildings, the Lowestoft main railway line – which will also serve the Port, and housing.

9.25 As such, the harsh reality in the context of this statutory test is that the Port, by reason of its geographical boundary constraints, does not have 'spare land' that it can simply surrender for a highway scheme. This land restriction of itself imposes an operational constraint on the Port in that it is critical for every operational port – worldwide – that if it is to be correctly positioned to meet the existing and future demands of a fluctuating international market, it must have land available within the port estate to enable it to meet customer demands – which can arise at short notice and at times, with no notice.

9.26 This reality is recognised in National Ports Policy, which, as had already been highlighted, makes clear that:–

> *"…Effective competition requires sufficient spare capacity to ensure real choices for port users. It also requires ports to operate at efficient levels, which is not the same as operation at full physical capacity."* (NPSfP, Paragraph 3.4.13)

9.27 The only land actually available to ABP at the Port for future expansion lies to the west of the proposed LLTC. This quay side and hinterland will effectively be constrained in terms of the access and use by large vessels that cannot enter under the new bascule bridge, due to the currently proposed operational restrictions and lack of an emergency berth.

9.28 Whilst the Applicants will argue that the LLTC scheme will not of itself lead to the effective sterilisation of port estate and consequential serious detriment to the undertaking, the Applicant has failed to recognise – despite numerous warnings from ABP over the past years – that vessels are increasing in size and vessel traffic is more often than not, time constrained. In terms of the off-shore wind

energy market – if a vessel is required to service a wind farm in the North Sea, has been boarded by some ten or twelve technicians – it cannot simply wait at berth until the County Council deigns the time convenient for the new bascule bridge to be lifted without imposing a severe additional cost burden on that operation.

9.29 As proposed by the Applicant in its draft DCO, the opening of the new bascule bridge will be strictly constrained by the Applicant's desire to give precedence to passing road traffic across the Port – a desire stimulated by its need to maximise the scheme's benefit cost ratio.

9.30 The port infrastructure of the kind in place at the Port of Lowestoft is extremely expensive to build and is almost entirely dependent on the suitability of location, options for which in the vicinity of the Port around Lowestoft are extremely limited. It would, therefore, be next to impossible today to replace or replicate the Port operational facilities that lie to the west of the proposed new bridge, or indeed underneath it, as discussed further in paragraph 16.1. Simply put, the land just does not exist.

9.31 As a consequence, the Port's business will be at best damaged or, at worst, lost.

10 COMPULSORY ACQUISITION AND PRACTICAL IMPACTS ON PORT OPERATIONS

Land and rights to be acquired

10.1 The proposed LLTC, if constructed, would cross through the middle of the Port's Inner Harbour on a series of piers. The Applicant is seeking:

(a) The permanent acquisition of approximately 3,084 square metres (of land) that falls under the bridge piers, both within the watercourse on the river bed and on ABP's Port landside and new waiting mooring;

(b) The permanent acquisition of 2,343 square metres or airspace and rights over the existing highway access to the Port and LLTC bridge deck;

(c) The permanent acquisition of 4,325 square metres of rights over Commercial Road which is the only highway access to the Port, together with additional rights around the highway and the new bridge; and

(d) The temporary possession and occupation of 40,396 square metres of land and water within ABP's statutory port estate for construction purposes.

10.2 In a Port with severely constrained port estate boundaries - yet a Port which is growing its existing operations whilst also looking to accommodate a substantial surge in the wind energy and oil and gas sectors – to the positive benefit of the UK economy and entirely in accordance with government policy – the compulsory acquisition of such a large part of the statutory port estate will self-evidently have a seriously detrimental impact upon ABP's ability to carry on the port undertaking.

10.3 In total, the construction and eventual operation of the LLTC will deprive ABP, either permanently or temporarily, of over 50,000m^2 of land with the statutory port estate.

10.4 A more detailed description of the impact of the proposal on the Port is given in the following paragraphs, divided between the construction and operational phases of the proposal.

Construction Phase

10.5 During the construction phase of the LLTC, the temporary land take required to construct the proposed LLTC is significantly greater than the footprint of the crossing itself, at 41,000m^2, – both on land and within Lake Lothing.

10.6 This is shown spatially on the Land Plans produced by the Applicant, in respect of which, sheet 3 of 5 covers the crossing of the Port and Lake Lothing.

10.7 As regards the land at the Port that will be acquired, and working from north to south, the main impacts on the Port during the construction phase are:

Footprint of the Crossing

10.8 The Applicant has indicated that it wishes to acquire the freehold of various plots of land within the Port to construct the proposed crossing – plots 2-23, 3-04 and 3-07 (the latter two being in Lake Lothing itself), in order to construct bridge piers and associated safety fenders.

10.9 In addition, the Applicant is seeking to acquire a mix of access rights and airspace rights essentially corresponding to the "footprint" of the proposal.

10.10 As regards that part of the LLTC proposal that crosses the Port (i.e. north of the quay edge), it is understood by ABP that this will become a compound where the erection of the bridge will take place, being "fed" from a further lay-down/fabrication compound to the east (plot 2-22, considered separately in this

representation). Thus the erection of the proposal will take place on plots 2-21, 2-23, 2-32, 2-33 and part of 2-34.

10.11 It is unclear to ABP what arrangements, if any, will be put in place to allow vehicles and pedestrians to continue to pass between what will, in effect, be a fenced-off construction site across the Port. A failure by the Applicant to give ABP adequate (and safe) access across this construction site will render that part of the Port to the west of the proposed work inaccessible.

10.12 ***Shed 3*** - The current main means of access to Shed 3 is by a door at the eastern end of the shed. The Applicant has failed to explain to ABP (or possibly taken into account) how HGVs will be able to manoeuvre into this shed during the construction phase of the works. As at January 2019, Shed 3 is in effect fully let and requires 24/7 access.

10.13 ***Closure of Lake Lothing*** - As regards that part of the LLTC that crosses Lake Lothing (i.e. south of the quay edge), during the construction phase of the proposed LLTC the Applicant envisages taking possession of a swathe of Lake Lothing over which construction works will take place – encompassing plots 3-903, 3-04, 3-05, 3-06, 3-07, 3-08, 3-34, 3-35, 3-36, 3-37 and 3-55.

10.14 ABP has been informed by the Applicant that it will, at times, be necessary to close the channel as a result of construction works taking place within these plots. The impact of so doing will be to deprive the Port and its customers of marine access in the vicinity and to the west of such works. This, coupled with the impact of the temporary possession of land within Lake Lothing, is considered in more detail below.

Temporary possession of Port land

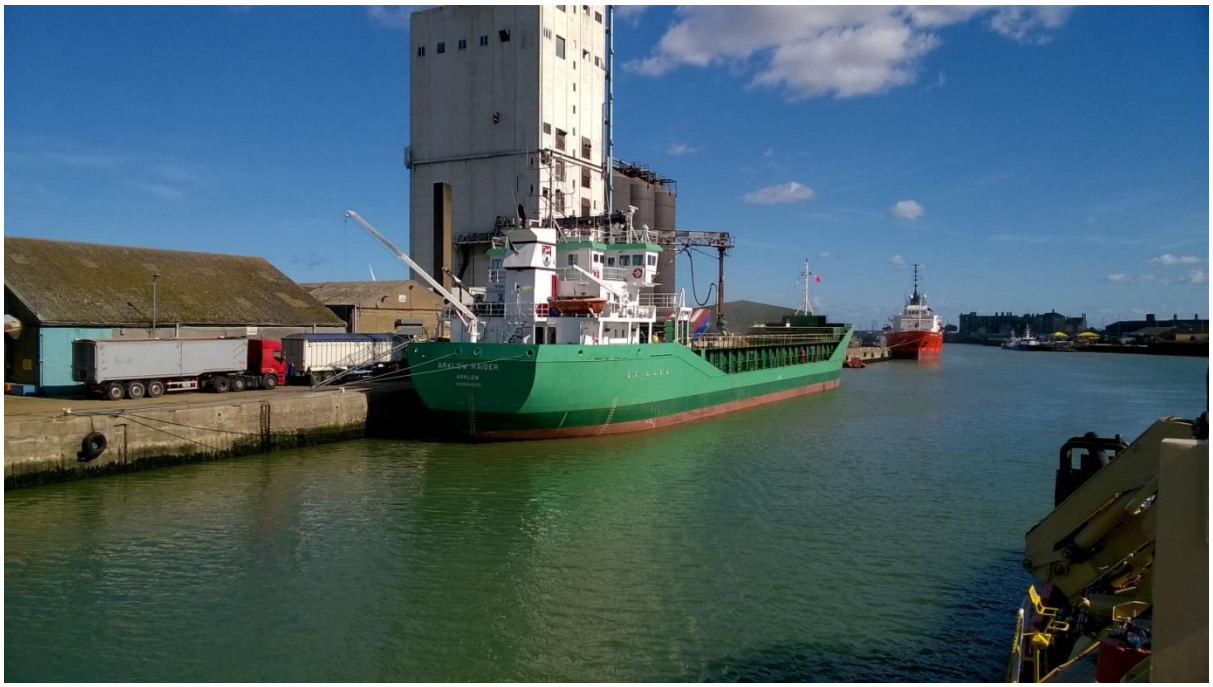
10.15 ***Dudmans*** - The LLTC scheme also envisages the use of an area of land between Shed 3 and the Dudmans (Lowestoft) Limited dry bulk silo loading facility ("Dudmans"). This is shown as plot 2-22 on the Land Plan sheet 3 of 5.

10.16 The Applicant proposes to use this area of land as a temporary construction compound for the receiving and storage of sections of bridge and other materials. This use appears to extend as far as the quay edge and will impact detrimentally on the port undertaking. ABP also notes that more of this land area and access routes will be needed to create the diversion route when Commercial Road is temporarily closed to allow bridge deck construction over the roadway, which is discussed in further detail below.

10.17 For example Plot 2-22 is regularly used for the marshalling of HGVs transporting dry bulk products (grains, barley, etc) to and from Dudmans' silo facility. Examples of this are shown in the photographs that appear as **Image 1 and Image 2** below. To deprive the Port of this facility to hold HGVs pending being weighed, loaded / unloaded and reweighed will have the impact of displacing stationary traffic onto Commercial Road which, at 8.5 metres width is not capable of providing safe holding spaces for up to 30 HGVs at a time. ABP is concerned that virtually all of the HGV holding areas form part of the land the Applicant is seeking to acquire.

IMAGE 1 - HGVs queueing to unload cargo destined for Dudmans – photographed 24 September 2018

IMAGE 2 – Arklow Trader grain vessel being loaded from Dudmans - photographed 24 September 2018



10.18 The Applicant has rather vaguely suggested that queueing Dudmans' traffic could be displaced to other (albeit unspecified) holding areas. The reality, however, is that there are none that are either adjacent to (or within line of sight of) Dudmans.

10.19 To be operationally viable, therefore, there will have to be a system put in place to "call off" HGVs from a remote holding area to Dudmans, although no proposals have been put forward by the Applicant for consideration by ABP/Dudmans.

10.20 Bearing in mind the impact that the scheme will have on the Port, such omissions point, in ABP's view, to the lack of consideration given by the Applicant to the practical impacts of the scheme. This is a point that has already been made on a number of occasions by ABP.

10.21 In terms of the issues arising in connection with the Dudmans facility, ABP has suggested instead that parts of the bridge construction compound could be relocated, by agreement, to other parts of the Port, thereby allowing bridge construction and HGV marshalling to co-exist for the duration of the construction works.

10.22 It is understood, however, that the Applicant is resistant to this suggestion. On that basis, the Port will be deprived of approximately 1.3 acres of prime quay side cargo storage land (used as such when the Dudmans' facility is not receiving/dispatching cargo by road).

Temporary possession of Lake Lothing

10.23 In essence, at its worst, the temporary possession of Lake Lothing as envisaged by the Applicant will deprive the Port of access to all berths that lie adjacent to plots 3-01, 3-03, 3-06, 3-10 and 3-33.

10.24 This is a combined length of some 420m, comprising North Quay berths 1 (part), 2, 3, 4E, 4W, 5 and 6 (part).

10.25 The actual impact, however, when overlaid on the Port's berthing configuration will be worse. It will effectively:

(a) render the whole of North Quay berth 1 inaccessible; and

(b) reduce the effective length of North Quay berth 6 from 100m to around 60m, thereby

(c) increasing the potential deprivation of direct access from 420m to approximately 455m during the construction phase of the proposed works.

10.26 In addition, however, the Port's berths to the west of the construction zone in Lake Lothing will be indirectly impacted and, at worst, will have no marine access – comprising a further approximately over 500m of quays (comprising North Quay 6 (remainder), 7E and 7W and the entirety of Shell Quay).

10.27 Whilst it is the case that the Applicant has indicated that they do not intend to take advantage of these rights in full, except during the installation of the opening bascule leaf of the proposed bridge (a process that will take a number of weeks if it proceeds to-plan), ABP is extremely concerned that insufficient safeguards exist within the dDCO to protect the Port against the possibility of a prolonged closure of Lake Lothing (in the event, for example, of crossing construction works not proceeding to plan).

Road access via Commercial Road

10.28 Commercial Road is the sole means of access to the Inner Harbour of the Port. It is a public highway until a point approximately 190m to the east of the proposed LLTC, whereupon it becomes a private highway serving the Port. The Applicant is

seeking to acquire permanent access rights along this part of Commercial Road during both the construction and operational phases (essentially plot 2-34 on the Land Plan).

10.29 ABP does not object to the Applicant acquiring such rights, provided that an equitable contribution to the upkeep of that stretch of road is made to ABP. For instance, ABP will require the Applicant to commit to providing a Transport Management Access Plan which deals with matters relating to the use of Commercial Road in relation to the LLTC scheme, such as sweeping, lighting, surfacing, security, damage to fencing, etc.

Closure of Commercial Road

10.30 During the construction phase it will be necessary for Commercial Road to be closed to traffic to allow for the installation of the LLTC approach road at height – comprising plots 2-32 and 2-20 on the Land Plan.

10.31 If the part of the Port to the west of the proposed LLTC is to remain functional for the duration of these works, it will be necessary for a diversionary route to be put in place – an indicative diversionary route is shown schematically in **Annex 5** - although it would appear that the greatest width available in places is 5.1 metres.

10.32 This will entail all traffic and pedestrians being routed to the dock edge to pass immediately to the south of Shed 3, then rejoining Commercial Road to the west of the Shed 3. This will also require a full Transport Management Access Plan, with suitable traffic controls, such as road markers, barriers, separate pedestrian and cycle routes, etc. Any diversionary route will also have to be assessed in the context of the Port's statutory security requirements.

10.33 As the ExA will note when they visit the Port, however, the available width is constrained – nominally around 9.5m between Shed 3 and the dock edge, but narrowing down to around 7.0m for a length of around 40m (at the location of a protruding awning). This part of the quay is also constructed using a “suspended deck” technique (the extent of this is clearly visible from the Google Earth image of this part of the Port) which serves to reduce the available corridor down to around 5.1m maximum, assuming all vehicles can pass safely under the protruding awning.

10.34 Given that the dDCO appears to place no temporal restriction of the length of time plot 2-20 may be taken temporarily, it is possible (but unknown at this stage) that the diversionary route may be in place for up to the duration of the proposed

crossing works. This will create serious practical difficulties for ABP as port operator and for ABP's tenants beyond this point, which will affect North Quay operations such a Peterson, JFMS with the Fendercare Operation, Sunny Campers and Caudwell Marine, plus users of the former Shell berth quay.

10.35 It is of some concern that no assessment has been made by the Applicant of the suitability of using this diversionary route from the perspective of:

(a) the safety of road users including pedestrians;

(b) the structural impacts on the quay's suspended deck;

(c) the interaction with the proposed temporary construction yard; nor

(d) the ability to access the entrance to 3 Shed and Dudmans,

which does again underline the somewhat superficial approach that has been taken by the Applicant to this project.

10.36 Indeed, the ExA should note that the Applicant has not reflected the requirement to make provision for a diversionary route within the Land Plans for the proposal.

10.37 As such, the Applicant does not actually have the ability to undertake such a diversionary route without ABP's agreement – something that ABP will not give until an assessment of its suitability for all users (pedestrians, cyclists and motor vehicles up to HGV) has been undertaken by the Applicant and shared with ABP for comment and, as necessary, revision. Such an assessment must also include swept path modelling of the passage of motor vehicles and consideration, as appropriate, of queueing lanes either side of what will inevitably need to be a single-lane bottleneck within the Port. In any event, land required to provide such access may not be available, by virtue of the operational requirements of the Port. If this occurs, it may be that the Applicant is unable to access the proposed slipway or construction compounds required to construct the LLTC.

Operational Phase

10.38 A number of the land use impacts of the proposal described during the construction phase of the proposal extend to the operational phase. The principal impacts are considered by ABP to be:

Permanent impact on 3 Shed

10.39 Plot 2-23 on the Land Plan shows the extent of land to be acquired freehold by the Applicant in the immediate vicinity of 3 Shed. It is understood by ABP that this plot is required for the construction of a bridge pier. As such it is feasible that the Applicant might seek – as would be entirely sensible and in any case, may even be required by ABP in terms of health & safety – to fence off this plot in order to protect it from unauthorised access.

10.40 Unless ABP is afforded the ability to manoeuvre HGVs over parts of this plot, however, it is difficult to see how access to 3 Shed can be gained by vehicles. As such, without modification of the Shed itself, it is likely that the utility of 3 Shed will be permanently impaired, to the overall detriment of the Port.

10.41 The County Council have indicated in discussions that they have carried out swept path analysis of an HGV manoeuvring into 3 Shed and the results indicate that access can be maintained. ABP has not had the opportunity to review this analysis, but remains wholly unconvinced as to the conclusion reached by the Applicant.

Permanent impact on Commercial Road

10.42 The construction of a highway of what is believed to be some 5.3 metres above Commercial Road also introduces a new permanent high restriction, which may impact on ABP's future operations. For example, this may impede access to the Port and/or the use of mobile harbour cranes and other vehicles which do not fit under the new height restriction.

10.43 Additionally, that part of Commercial Road overshadowed by the LLTC will require permanent lighting, security, barriers, etc, which will be required to be provided by the Applicant.

Permanent impact on berth availability

10.44 In their written questions, the ExA has specifically requested information (Written Questions 2.17, 3.4 and 4.1 issued on 17 December 2018) regarding the existing berth space within the port, the serious detriment that will arise to existing port operations and how the proposed compulsory acquisition will have a seriously detrimental impact on ABP’s day-to-day operations.

10.45 The practical reality is that 165m of quay length is rendered unusable as a result of the LLTC. This is clearly identified in the plan attached as **Annex 6**. The constraint

on berthing is considered further in the context of the statutory port security section, in section 19.

10.46 ABP will no longer be able to use the berth immediately to the west on the north side because the remaining length of useable quay (at around 19m) will be too short for commercial port operations.

10.47 The impact of the proposed crossing is, however, significantly wider than this and differs between the construction and operation of the proposed LLTC.

Construction

10.48 During the construction of the proposed LLTC, the Applicant has indicated a need to acquire temporary possession rights over approximately 420m of Lake Lothing, all of which is bounded to the north by the Port's berths. Thus the potential exists to deprive the Port of access to some or all of:

(a) The 420m of quay immediately to the north of Lake Lothing; as well as–

(b) A further approx. 500m of quays (comprising North Quay 6 (part), 7E and 7W and the entirety of Shell Quay) upstream of the westernmost limit of the temporary possession rights sought; and

(c) This impact arises because the temporary possession of land within Lake Lothing, as sought by the Applicant, has the potential to block or prevent the passage of shipping upstream of the proposed bridge for an undetermined length of time.

10.49 The Applicant has indicated a need to block the entire width of Lake Lothing whilst the LLTC bascule bridge is being put in place and commissioned, although no temporal restrictions to limit this to the minimum are included in the dDCO.

Operational

10.50 For the operational phase of the proposal, it is necessary to consider all the Port's berthing in the vicinity, and also further upstream, of the proposed LLTC in order to gain an overall view of the scale of detriment to the Port. This is explained in more detail in the following paragraphs.

10.51 The Inner Harbour comprises a number of distinct quayside areas, each with different characteristics, resulting from the sequential chronological development of the Port. In order to assess the full scale of the impact of the proposed LLTC on the Port, it is necessary to consider not only the quays that would be directly under

the crossing but also those downstream and upstream of the proposed LLTC. This is shown diagrammatically in **Annexures 1A and 1B**.

10.52 An analysis of the impacts appears in **Table 2** below (a simple red, amber, green analysis has been adopted) – the starting point of this analysis is the pronounced 'knuckle' at a point some 140m to the east of the proposed LLTC, that is clearly visible on aerial images of the Port (such as Google Earth). The knuckle protrudes some 5m and cannot practicably be straddled by vessels, hence it being selected as the starting point of this analysis.

Table 2: Impact of the LLTC on Berth Availability

Key:

	No impact
	Direct loss of berthing
	Indirect loss of berth utility

BERTH	NOMINAL LENGTH* / DEPTH (METRES)	IMPACT OF PROPOSED LLTC
1	60m long, 3.7m depth	Will become the only complete berth on North Quay to the east of the proposed LLTC. May be used by longer vessels (of up to approx. 100m LOA), by straddling berths 1 and 2.
2	60m, 3.7m	Around 10m permanently lost from western end (allowing for bollard spacing). When not used for longer vessels (up to approx. 100m LOA – as above), will be restricted to small commercial vessels up to c30m LOA.
3	60m, 3.7m	Permanently lost as a result of proposed LLTC
4E	45m, 3.7m	Around 25.5m permanently lost from eastern end, leaving an effective length of 19.5m. Of no practical use to the Port..
4W	95m, 3.7m	Upstream of proposed LLTC. Access to/from this berth will be restricted by proposed bridge opening restrictions, limiting its utility and commercial attractiveness.

5	95m, 4.0m	Upstream of proposed LLTC. Access to/from this berth will be restricted by proposed bridge opening restrictions, limiting its utility and commercial attractiveness.
6	100m, 4.7m	This is the deepest berth in North Quay – only Town Quay (at 6.2m) is a deeper common-user berth with sheet piled construction allowing heavy lift crane use, within the entire Port of Lowestoft. Upstream of proposed LLTC. Access to/from this berth will be restricted by proposed bridge opening restrictions, limiting its utility and commercial attractiveness.
7E	70m, 4.7m	This is the deepest berth in North Quay with sheet piled construction allowing heavy lift crane use, Upstream of proposed LLTC. Access to/from this berth will be restricted by proposed bridge opening restrictions, limiting its utility and commercial attractiveness.
7W	30m 3.7m	Upstream of proposed LLTC. Access to/from this berth will be restricted by proposed bridge opening restrictions, limiting its utility and commercial attractiveness.
'Shell Quay'	330m, Currently maintained at 3.7m, design depth can be taken to 5.0 metres below ACD	Upstream of proposed LLTC. Access to/from this berth will be restricted by proposed bridge opening restrictions, limiting its utility and commercial attractiveness.

*The current configuration of the Port does allow for flexible use of the berths within the Port.

10.53 In simple terms, when measured in whole berths, the berths shaded in red (berths 2,3, 4E) will be directly lost to the proposals as whole berths – as noted in the table, berth 2 will have impaired utility going forward.

10.54 In addition, the table shows the berths that will suffer an indirect loss of utility – being those shaded amber (berths 4W, 5, 6 7E, 7W and Shell Quay). This loss of utility derives from either the lack of an emergency berth to the east of the bridge restricting the ability to safely get vessels through what would become the "middle harbour" of the Port, or by virtue of the Applicant's intention to restrict the opening times of the proposed LLTC, so as to avoid bridge openings in the rush

hours (which will, of course, coincide with high water at certain times of the tide cycle).

11 THE PROPOSED NEW LLTC BRIDGE

11.1 In addition to the serious detriment to the Port undertaking caused by the compulsory acquisition of part of the port estate, the operational damage that the scheme will cause will be further exacerbated in practical operational terms by the construction of a second low level two-lane bridge through the operational Port. If approved, the LLTC will self-evidently cut the operational Inner Harbour in half.

11.2 The existing bascule bridge is a fact of circumstance. It simply bears witness to the historical growth of the Port, originally served solely by Lake Lothing, which was always going to have to gain access from the west to the sea in the east.

11.3 The practical reality that differentiates the existing bridge from the proposed LLTC is that ABP as the statutory port undertaker and SHA has operational control of the opening of the existing bascule bridge. This means that ABP can genuinely assure users of the Port that their passage to the sea will not be impeded by the bridge.

11.4 ABP would suggest that it is a statement of the obvious that in a scenario whereby potential commercial port users, faced with the option of taking space in a Port bisected by two bridges, one of which is not in the operational control of the port authority, will have little choice but to locate their future business elsewhere. As highlighted in Part 6 of these Written Representations in the context of the Government's policy for ports, the Port operates in a deliberately market led industry and one where competition is encouraged. The imposition of such a bridge disadvantages the Port in terms of it competing for business and trade.

11.5 To do otherwise would simply not be commercially sensible.

11.6 As currently proposed, the new bridge will present as an impediment to ABP's ability to attract new business which instead will look to alternative locations at other Ports, either on the east coast or indeed across the North Sea in mainland Europe.

11.7 In failing properly to assess the alternative routes for the crossing, the Applicant has rejected a western option for the bridge. Such an option – if appropriately designed and located – would in fact have been supported by ABP because it

would not have detrimentally impeded port operations. In addition, we query whether the environmental effects of the proposed LLTC were properly considered in the context of the western option, bearing in mind the recent decision in *Holohan (Brian Holohan and Others v An Bord Pleanala, (Case C-461/17*).

11.8 Instead, however, the Applicant has promoted a line for the bridge – in the face of very evident objection from the port operator – that cuts through the middle of the operational Inner Harbour. In addition, in so doing, the Applicant's proposal not only bisects the Port but, for the scheme to retain sufficient financial viability to justify the Government funding upon which the project depends – whilst contemplating an opening bridge, the Applicant also intends to retain total control of the periods when the bridge can be opened – in that the alternative would mean that the Applicant would have to re-calculate the benefit cost ratio ("BCR") test.

11.9 In terms of impact on the Port, the following should be noted:

(a) in a closed position, the proposed bascule bridge will have a maximum 12 metres Highest Astronomical Tide ("HAT") clearance under the bridge deck, which does not take into consideration the 'safety margin' required to be imposed for navigational safety reasons (likely to be 1m, thereby reducing the clearance to 11m at HAT);

(b) the navigable channel between the bridge piers and fenders that form part of the proposed bascule bridge will be reduced to 32 metres; and

(c) the maximum clearance under the LLTC will be further impacted by global sea level rise caused by climate change. It is widely accepted that, over the next 60 years, the sea-level at Lowestoft will have risen between 0.41m and 0.58m above 1990 levels (*UK Climate Impacts Programme (UKCP09) (Lowe et al., 2009*). Given that the existing bascule bridge has been operational for 57 years, it is inevitable that the impact of clearance under the LLTC bridge deck will be further detrimentally impacted by the accepted projections in sea-level rise.

Scheme of Operation

11.10 The Applicant intends to control the maintenance and operation of the LLTC, in accordance with a scheme of operation to be agreed with ABP. Critically, in terms of impact of the LLTC on Port operations, Article 40(2) of the draft DCO provides that:

> *"A scheme of operation … must provide that the opening of the new bridge to allow vessels to pass through Lowestoft Harbour cannot take place during peak traffic periods, such periods to be defined by the undertaker* [SCC].*"*

11.11 At a meeting between the Navigation Working Group ("NWG"), of which ABP is a part, on 18 December 2018, the Applicant provided the NWG with an annotated draft Scheme of Operation – which the Applicant will presumably be producing to the examination.

11.12 The ExA should be aware, however, that as currently drafted, the Scheme of Operation is not acceptable for a number of reasons.

11.13 The Applicant has imposed a prohibition on lifting the LLTC for any vessel during peak traffic hours, which it intends to be between the hours of 0800 to 0900 and 1700 to 1800, Monday to Friday. The Applicant is in effect prescribing extended windows of restriction for the existing bascule bridge for those vessels which need to transit Lake Lothing (i.e. that are located to the west of the LLTC) and will need both an LLTC bridge lift and an existing bascule bridge lift to leave the Port.

11.14 This "double-lift" is required because the current period for the discouragement of commercial vessel movements for the existing bascule bridge is 0815 to 0900 and 1700 to 1745 only – a smaller window then that envisaged by the Applicant for the LLTC. This will result in an unacceptable 'in-combination effect' for operators located to the west of the LLTC, who may in practice need to man their vessels and commence transit out of the Port some hours before they would otherwise need to, in order to clear both exclusion windows of the LLTC and the existing bascule bridge.

11.15 This additionally gives rise to the requirement for a number of vessels to 'clear' the LLTC opening window before the prohibition commences and then essentially 'mill about' in the middle Inner Harbour (i.e. between the LLTC and the existing bascule bridge), until those vessels are able to pass under the existing bascule bridge as part of the scheduled lift.

11.16 This would self-evidently create a navigational safety issue, especially for larger commercial vessels and strengthens the need for an emergency berth for vessels transiting through the Inner Harbour.

11.17 ABP is also of the firm view that the Scheme of Operation should not be a certificated document in the DCO. This is because it is a 'living document' which will require updating from time to time, as circumstances change. As currently

proposed, the Applicant envisages that any such changes would need to be submitted and approved by the Secretary of State, which is a lengthy process, and could detrimentally impact on ABP's operational capacity due to delay and cost.

11.18 Finally, ABP notes that the benefit cost ratio of the LLTC was calculated on the premise that the LLTC would remain closed during a large span of 'peak traffic hours', which ABP understood may have lasted up to 2 hours each morning and afternoon peak. It would appear that the Applicant has now considered reducing those hours, although ABP queries the impact that such a change will have on the benefit cost ratio of the LLTC.

12 NAVIGATIONAL SAFETY

Overview

12.1 From the perspective of ABP as SHA, one of the key exercises that has to be undertaken by a body that has responsibility for Port operations is an assessment of navigational risk.

12.2 A comprehensive Navigational Risk Assessment ("NRA") is a fundamental requirement for port operations if a port is to be able to comply with the Port Marine Safety Code ("PMSC") which is the UK's national framework for ensuring port risk is maintained as low as reasonably practicable ("ALARP"), together with the supporting Port Marine Safety Code's Guide to Good Practice ("PMSC Guide").

12.3 The PMSC requires a SHA to manage port marine operations safely and efficiently by:

- *"Taking reasonable care, so long as the harbour/facility is open for public use, that all who may choose to navigate in it may do so without danger to their lives or property.*

- *Conserve and promote the safe use of the harbour/facility and prevent loss or injury through the organisation's negligence.*

- *Have regard to efficiency, economy and safety of operation as respects the services and facilities provided.*

- *Take such action that is necessary or desirable for the maintenance, operation, improvement or conservancy of the harbour/facility". (DfT/MCA 2016)*

12.4 In respect of marine and navigational risk, the PMSC Guide points out that:

> *"Risks may be identified which are intolerable. Measures must be taken to eliminate these so far as is practicable. This generally requires whatever is technically possible in the light of current knowledge, which the person concerned had or ought to have had at the time. The cost, time and trouble involved are not to be taken into account in deciding what measures are possible to eliminate intolerable risk". (DfT/MCA, 2018)*

12.5 In brief, an NRA comprises data gathering; hazard identification; risk analysis (for both the construction and operational phases); existing risk controls and future risk controls.

12.6 ABP considers that the Scheme cannot be approved by the SoS until the navigational risks have been properly assessed by the SHA and a final NRA is approved and agreed by both parties (i.e. the Applicant and ABP).

12.7 Throughout the pre-application process the Applicant has, on a number of occasions, asked ABP to provide them with copies of its NRA for Port of Lowestoft. ABP's position, as is its consistent position whenever met by such a request from an external developing body, is that it is for the party proposing to introduce the hazard into the port to undertake a formal navigational risk assessment of the risks that will arise as a result of the proposal, and ABP as a statutory party with overall responsibility, will then undertake its own NRA, effectively assessing as part of the process, the Applicant's NRA. If an NRA is to be undertaken properly by an external body, it requires close co-operation and consultation with relevant SHA.

12.8 Once the Applicant's NRA is finalised, ABP can then undertake its own NRA of the Scheme. Until this is done, ABP considers that preliminary NRA ("pNRA") submitted with the LLTC application is inadequate, and hence defective, particularly as the Applicant produced the pNRA without ABP's formal input as SHA.

The Applicant's Preliminary NRA

12.9 Unbeknown to ABP at the time of the submission of the application, the Applicant, for reasons that are not yet understood, decided to prepare its own pNRA without consulting the SHA (ABP) and included the pNRA in the application documents (Document Reference APP-208).

12.10 It is relevant in this context to note that the Applicant provided the Navigation Working Group, of which ABP is a member, with an outline methodology for the pNRA some months prior to submission of the LLTC application documents. Significantly, the Applicant also advised that an NRA would not be prepared before the third Navigation Working Group meeting, which was held in December 2018 - some months after submission of the LLTC application.

12.11 Despite giving this indication, the Applicant then proceeded to prepare the pNRA without input from or even advising ABP that the preparation of the pNRA was underway.

12.12 It is understood that the Applicant believes that it adequately consulted with ABP prior to submitting the pNRA. ABP, however, is certainly of the view that neither it nor the Navigation Working Group was provided with sufficient detail of the pNRA to enable ABP to undertake a technical assessment of its potential compliance with the PMSC and the PMSC Guide.

12.13 Indeed, ABP was unaware that the Applicant had even produced the pNRA, as evidenced by the following:

(a) ABP's letter to the SoS on 24 July 2018, which criticised the application submission on the basis that it did not, as far as was understood based on communications with the Applicant, contain an NRA. The fact that the application submission did in fact include a pNRA no doubt assisted the SoS in concluding that the application could be validated. That said, it is ABP's view that the pNRA provided to date by the Applicant is inadequate; and

(b) ABP's Relevant Representations [RR-022] submitted to the SoS on 24 September 2018.

12.14 ABP considers that it is very unusual for a third party to produce a pNRA which assesses a given project's likely impact on port operations without first formally consulting the relevant SHA.

12.15 It is also ABP's view that the ExA will not be in a position, should they so wish, to approve the LLTC application if there is not in place a comprehensive and acceptable NRA – and as far as timescale is concerned, with the NSIP process under way, the Applicant may be in some difficulty in completing the exercise before the close of the examination.

ABP's concerns with the Applicant's Preliminary NRA

12.16 As far as the submitted pNRA is concerned, ABP has very serious concerns and reservations regarding its content and its evaluation and assessment scenarios which viewed in combination, lead to the conclusion that the assessment undertaken in the pNRA and the consequential judgments are incorrect and defective.

12.17 Although not a detailed analysis of the deficiencies of the pNRA, some of ABP's concerns with the pNRA include the following:

(a) Paragraph 2.1.3 states that the LLTC will improve access to the Lake area. The LLTC, however, will provide no tangible benefit to any part of Lake Lothing within the Port estate and there are no planning improvements to the existing and immediate road infrastructure to support this assertion. A defective core assertion colours the substance of the assessment that follows;

(b) Figure 2.2 states that the LLTC will have an 'infinite air draught when open', but this only relates to air draught in a vertical context and does not take into consideration any vessels with overhangs or listing that may be constrained by the proximity of the raised leaf to the channel edge;

(c) Section 3.2 of the pNRA, which sets out the 'consultation' undertaken with the Navigation Working Group, is worryingly inaccurate and misleading. It surprisingly omits to explain that the consultation process with the Navigation Working Group is incomplete and further meetings are scheduled to be held;

(d) Further, it fails to record that the Applicant advised that an NRA would not be prepared until the third Navigation Working Group meeting, which was held in December 2018 some months after submission of the LLTC application;

(e) Paragraph 3.4.1 – The data gathering for pNRA has failed to include any local incident reports, which have not been requested by the Applicant;

(f) Paragraph 4.5.13 fails to take into consideration the effects on under keel clearance of vessel squat, which is an increase in vessel draft caused by a vessel moving through shallow water;

(g) Paragraph 4.6.2 states that no bridge related incidents have been recorded within the Port of Lowestoft. ABP was not requested by the Applicant to provide any information as to such incident reports in relation to the existing bascule bridge. Such lack of consultation renders the pNRA more akin to a desk study, rather than a rigorous and robust NRA;

(h) Paragraph 5.1.1 – ABP Lowestoft does not have powers of General Direction;

(i) Paragraph 5.1.5 – This is not limited to Masters only, as under the Marine Navigation Act 2010 this also includes other suitable qualified and experienced Deck Officers;

(j) Paragraph 5.3.1 – The stated operational controls of the existing bascule bridge are incorrect;

(k) Paragraph 5.4.2 – The UK Hydrographic Office produces navigational charts, which incorporates information provided by ABP Lowestoft;

(l) Paragraph 6.1 – The risk assessment has failed to consider the potential effects on Business/Reputational Impacts. Further, the likelihood and severity measures adopted do not correlate with those provided by a standard MarNIS Risk Assessment Report;

(m) Paragraphs 7.2.1 and 7.3.2 – There is no detail as to how the monitoring will take place and who will be responsible for conducting it. It is imperative that the SHA is involved in any such process, as well as any additional mitigation measures that may be required as a result of such monitoring;

(n) Paragraphs 7.2.3 and 7.3.3 – It is a statutory requirement that the Trinity House Lighthouse Service issue consent for all Aids to Navigation, which must then be monitored by the SHA as the Local Lighthouse Authority;

(o) Paragraph 7.3.4 – This fails to mention any service level agreements for failure response and return to operation times;

(p) Appendix A – It should be noted that the likelihood and severity scoring does not align with that adopted by MarNIS and considered suitable for a port

environment. Additionally, the reference to Harbour Directions as an existing control is incorrect, as ABP Lowestoft does not have powers of General Direction. Relevantly, ABP Lowestoft does have powers of Harbour Directions, but these have not yet been enacted;

(q) In addition, the assessment fails to include the impact of the Lowestoft Harbour Bylaws as an existing control. Although ABP has not at this stage undertaken a detailed analysis of the scoring matrix, it is clear that it does not contain all assessment scenarios required for a robust assessment of navigational risk; and

(r) Generally, the pNRA fails to fully evaluate the mitigation required to offset navigational risk in any quantitative way.

12.18 In the light of the above – which is only a summary of some of ABP's key concerns - the preliminary Navigation Risk Assessment must be viewed as being of only very limited value.

12.19 It is also ABP's view that the ExA will not be in a position, even should they so wish, to approve the LLTC application if there is not in place a comprehensive and acceptable NRA.

12.20 It follows that, as far as timescale is concerned, with the NSIP process having now commenced, the Applicant may be in some difficulty in completing the exercise before the close of the examination.

13 VESSEL SIMULATION

13.1 In 2016, the Applicant engaged the Lowestoft College to undertake a number of Vessel Simulation modelling exercises of the LLTC, in order to:–

(a) establish the navigability through and adjacent to the Scheme bascule bridge;

(b) establish the suitability of the passage width beneath the Scheme bascule bridge;

(c) confirm the requirements for protection in the form of fenders;

(d) determine any aids to navigation that the Scheme bascule bridge may require; and

(e) establish the opening timings and interaction between the Scheme and existing bridges.

13.2 Three discrete vessel simulation exercises were undertaken in conjunction with ABP in November 2016, May 2017 and March 2018. During this time, ABP provided the Applicant with detailed written and oral feedback regarding the deficiencies with the accuracy of the simulation exercises and the modelling adopted. Relevantly, the first two simulation exercises were based on a twin leaf trunnion bascule bridge design, and only the third simulation modelling the current single leaf bridge design of the LLTC.

13.3 The results of the Vessel Simulation modelling are set out in the Vessel Simulation Report that is Appendix 15A to the Environmental Statement (Document Ref: APP-198).

13.4 ABP has a number of concerns with the vessel simulation exercise and the Vessel Simulation Report, which it has discussed with the Applicant on a number of occasions. These concerns include the following:

(a) As the design of the LLTC is not finalised, the Vessel Simulation exercise was based on the reference design only. As such, ABP considers that it is not possible to accurately model and/or simulate the effects of the proposed bridge design. In particular, the LLTC was not accurately modelled as:

(i) it was not possible to accurately assess the effects of wind upon vessel movements, due to deficiencies in the model and capabilities of Lowestoft College;

(ii) there is uncertainty regarding the cycle time of the bridge opening and closing; and

(iii) some larger vessel drafts modelled with azimuth propulsion systems were inaccurate, as they kept running aground even when there should have been sufficient under keel clearance. Consequently, tide height had to be adjusted to unrealistic levels to try to remove this defect, which eventually required the relevant simulations to be aborted. Overall, this compromised the ability to consider all vessel types required in realistic conditions.

(b) The Vessel Simulation did not have the capabilities to fully take into account wind sheltering, wind shear effects and meteorological effects (such as snow, ice, etc on the bascule leaf).

(c) Further, the adopted cycle time for the vessel simulation was 2 minutes and 40 seconds, however the Applicant acknowledges that this could change following the detailed design process.

(d) A series of recommendations made by the Applicant's consultants, Portia, are contained in the Stage 2 Navigation Consultant's Report, forming Appendix A to the Vessel Simulation Report. The recommendations set out in the include points such as use of a layby to the east of the LLTC, marks, lights and signals, leisure craft, timings and navigation. The recommendations also highlight the requirement that the Applicant undertake a formal risk assessment, particularly in terms of an emergency berth and for vessels with side projections (overhang) that could potentially contact the bridge structure or its leaf. Further, the report states that there may be occasions where navigational constraints require both bridges to be open to vessels (or at least closed to vehicles) at the same time. Given the important of these recommendations, ABP considers that this information should be contained within the main body of the Vessel Simulation Report.

(e) In addition, ABP is concerned that the Stage 3 Navigation Consultant's Report (Appendix B to the Vessel Simulation Report) omits any recommendations at all. Accordingly, there is some uncertainty as to whether the conclusions reached in this report are sound and whether or not it is defective.

13.5 Due to the deficiencies with the existing Vessel Simulation Report, it is imperative that the LLTC should be subject to further vessel simulation, to ensure that the final design of the scheme accurately simulates the effects of wind shear, wind sheltering, cycle times and meteorological impacts, as it is likely these factors will impact on the conclusions of the existing Vessel Simulation Report. Further, such final vessel simulation is required to inform the final NRA.

13.6 ABP understands that the Applicant now accepts these points and is intending to commission a further simulation exercise. ABP is, of course, prepared to engage fully and collaboratively in such an additional simulation exercise, although this does serve to emphasis ABP’s previously stated view that the application currently before the ExA is defective.

13.7 The ExA should be aware that, in addition, it has since been identified that at the vessel simulation exercise it was impossible to model the vessel in a ballast (unloaded) condition. In order to ensure robust and effective conclusions, it is imperative that vessels are modelled and assessed in both a loaded and ballast conditions, as the vessel condition will have consequential impacts on the air draught of a vessel and impact of wind and meteorological conditions. As such, full consultation with ABP marine personnel should be conducted to set the parameters for any future modelling exercises.

13.8 A copy of ABP's assessment of the of the Applicant's vessel simulation exercise is included as Appendix C to the Vessel Simulation Report (Document Ref: APP-198). This is currently being updated to address the vessel modelling point above (i.e. vessels modelled in a loaded condition only).

14 OPERATIONAL IMPACTS OF THE LLTC ON THE PORT - OFFSHORE WIND SECTOR

Overview

14.1 There are now over 30 operational offshore wind farms in the UK, with the majority of these located in the southern North Sea (in close proximity to Lowestoft) due to its wind driven environment and relatively shallow water. With a number of new projects under construction, the UK will achieve 10GW of offshore wind installed capacity by the end of 2020.

14.2 The Port has positioned itself as a renewable energy hub for offshore wind farm projects the operators of which can use the Port's existing facilities. Due to the Port's location in the southern North Sea near a number of planned, consented and built offshore wind farms, it is ideally placed to accommodate the growth in the offshore wind energy market, as well as building on its traditional strengths in the gas and oil, agri-bulks and aggregates sectors.

14.3 It is expected that investment in the offshore wind industry will materially grow at the Port over the next 10 to 15 years due to a number of factors, such as:

(a) the location of the Port in relation to the East Anglia zone; and

(b) the fact that the Port is a relatively 'ready to go' base for future renewable activities.

14.4 The primary concern of potential operators, as communicated to ABP by those operators, is the potential financial impact of consolidated shipping delays caused by the proposed LLTC over the 25-30 year lifespans of an offshore energy project, in an environment where Government targets are driving down the strike price for generating revenues. This is explained further in the following paragraphs.

14.5 Put simply, a five minute delay, caused by the existence of the proposed LLTC, to a vessel every day over the life of a scheme amounts to a financial risk the operators would not be prepared to consider when there are competitor ports that do not face such restrictions. As already highlighted, this is a significant risk in the context of the deliberately market led and competitive industry within which the Port operates.

14.6 ABP is currently in active albeit commercially confidential discussions with a number of operators who are likely to require space in the Port to service the offshore wind sector.

14.7 ABP is particularly concerned, therefore, that the construction of a second bridge through the middle of the Inner Harbour will impact negatively on the commercial perception of the Port and its ability to accommodate current and future business opportunities. In brief, ABP is concerned that the proposed bridge will:

(a) act as an impediment to future port development upstream of the proposed crossing point, due to the introduction of an impediment part-way along the inner part of the Port and the imposition of peak time restrictions; and

(b) ABP's inability to have full operational control the opening of the bridge; which will as a consequence -

(c) cause economic damage both to the Port as a result of the consequential loss of business and thereby the broader regional economy, at a time when the Port is undergoing a transformation arising from offshore wind construction and Operation and Maintenance ("O&M") activities. In this regard, the Port operates in a highly competitive environment – any factor (such as concerns over accessibility introduced by the proposed LLTC) that places the Port at a commercial disadvantage over competing ports will inevitably work to the detriment of the Port in what is currently an unusually fluctuating and unpredictable market.

Vessel Characteristics

14.8 Day-to-day operations for an offshore wind farm are most efficiently undertaken from a nearby port by using either Crew Transfer Vessels ("CTVs") or Service Operation Vessels ("SOVs"). The particular characteristic of each type of vessel is set out in further detail below:

(a) **CTVs** - Offshore wind farms have traditionally been serviced using CTVs that travel daily from a port operational base, and are around 24m in length. One dedicated berth is required per CTV, as they return to base daily. A CTV will travel at about 20 knots, which means for wind farms located more than around 40 nautical miles ("NM") away from a port, each technician will spend more than four unproductive hours a day in transit. This is costly in terms of human resources and there is a risk that the technicians will not be fit for work once they arrive, due to sea-sickness or alternatively, the sea could be too rough for safe turbine access. Accordingly, the practical operational limit of CTVs is around 40NM from a port operational base. Due to the type of operations carried out by CTVs and the amount of transit time required to service offshore wind farms, the vessel movements undertaken by CTVs are time critical. An essential consideration is the time it takes for a CTV to reach open sea from having departed its berth.

(b) **SOVs –** Wind farms that are located beyond the practical limit of CTVs (i.e. further than around 40NM from a port) utilise larger SOVs that are about 80m long and can accommodate 40 technicians. SOVs typically come to port once every fortnight for approximately 12 to 24 hours, which means that wind farm technicians live on board the SOV for the duration of their tour of duty. It is theoretically possible for multiple SOVs to share one berth, provided that the schedules align (which, in practice, rarely happens). Thus, many operators prefer to have a dedicated berth in order to mitigate the costs of port delays. SOVs are significantly more expensive to run than CTVs, due to higher charter rates and fuel consumption required to keep SOVs at their predetermined location.

Offshore Wind Industry Trends

14.9 The potential future demand of the offshore wind industry primarily relates to the following factors:

(a) **Turbine design** – The size of turbines used for wind farms are increasing – wind farms are currently using approx. 9.5 MW turbines, yet within a few years, up to 20 MW turbines are expected to be the norm. This means the cost of wind farm installation, operation, maintenance and servicing will decrease as fewer technicians per MW of installed capacity will be required to install and service larger turbines over the lifespan of the project.

(b) **Wind farm size, location and vessel strategy** – Wind farms are generally located within a few hours from shore. It is anticipated, however, that they will become larger and located further from shore as the industry matures. Generally, offshore wind farms located within around 40NM from a port operational base use CTVs for construction, maintenance and servicing, and those located more than around 40NM away utilise SOVs.

(c) **Market growth** – As a result of the offshore wind industry dramatically reducing energy production costs in recent years, the sector has received strong political support in the UK and the European competitor ports. As a result, the offshore wind sector will continue to grow in the North Sea. Due to its location and the available berth space in the Inner Harbour, Lowestoft is well positioned to be able to capitalize on this growth. Current industry and Government aspirations are for 30 GW of offshore wind generation capability by 2030, and it is projected that approximately 50% of this will be installed in the southern North Sea (EEEGR and 4C presentations to OWW 2018).

(d) **Supply chain maturity** – The offshore wind market comprises two distinct supply chains, namely the construction supply chain (i.e. component manufacture, project development and installation) and the O&M supply chain.

(e) The construction supply chain is close to maturity, which means most companies have ensured that they are optimally located to maximize opportunities.

(f) Conversely, the O&M supply chain is relatively immature, which means that many companies have yet to make a decision as to where to locate their operations base. As a result, the Port of Lowestoft will be of significant interest to companies looking to expand into the offshore sector that are not currently located in East Anglia when they are deciding where to locate their O&M bases.

Existing Vessel Berths at the Port

14.10 Existing demand at the Port for vessel berths for wind farm operations is evidenced by the current use of the Port. A number of offshore wind farm operations based out of Lowestoft currently use CTVs as follows:

(a) **East Anglia ONE (Scottish Power Renewables)** - Construction coordination and O&M base in Hamilton Dock, which utilises 6 CTV berths in the Outer Harbour.

(b) **Greater Gabbard (SSE)** – O&M base at Waveney Dock and grouting repairs at Trawl Dock, which uses 14 – 18 CTVs in the Outer Harbour (6 of these berths are directly related to the grouting repairs work).

(c) **Galloper (various partners)** – The former construction coordination base at Shell Quay, which used 8 – 10 CTVs in the Inner Harbour. Construction of the wind farm is nearly complete, and the O&M base will be based in Harwich. It is anticipated, however, that further use will be made of that facility during their summer maintenance campaigns, in the region of 2 – 4 CTVs, for vessels that exceed CTV capacity at Harwich.

14.11 Whilst the Outer Harbour is approaching functional capacity, the Inner Harbour has considerable capacity to accommodate CTV berths in the future, especially at the former Shell Quay which lies to the west of the proposed LLTC. ABP is concerned, however, that future wind energy customers will be unwilling to utilise berths which require passage under a second bridge, particularly for CTVs that are typically involved in time-critical wind operations. If bridge openings are required to allow the CTV to pass through, it adds both time and cost to each journey which, on a cumulative basis, will place the Port at a significant cost disadvantage compared to competitors.

14.12 With very little space availability in the Outer Harbour, this does mean that any additional offshore wind sector business that is still prepared to come to the Port of Lowestoft despite the very reals constraints now being posed by the LLTC scheme, will have to be located in the Inner Harbour – primarily at the East of England Energy Hub at the former Shell Quay as indicated on **Annex 1A**.

14.13 It is the case that the proposed bridge must undeniably detrimentally impact ABP's ability to secure business from the offshore wind sector, by virtue of the location, height, operational restrictions of the proposed bridge. To attempt to argue otherwise is to ignore the basic facts.

14.14 As already noted, the offshore wind sector business is time critical, and operators have advised ABP of a preference to be located in the Outer Harbour. The proposal for a second bridge – over which ABP would have no operational control (as proposed) – will increase exponentially this customer resistance to locating within the Inner Harbour to the west of the proposed LLTC – it literally becomes “a bridge too far” in commercial, financial and risk terms.

14.15 Accordingly, the operational restrictions of either bridge (which restricts vessel movements during times of peak traffic) results in an 'in-combination' effect, which is further discussed above. In practice, this means that ABP's ability to accommodate offshore wind business to the west of the LLTC will be impaired, resulting in loss of business and/or delays to vessels. This detrimental impact will, of course, be exacerbated if it is not possible for ABP to utilise the "double lift" concept, as noted above.

14.16 The offshore wind industry, in the UK sector alone, presents as an enormous opportunity in the southern North Sea with the potential for £22 billon of Capital Expenditure and O&M expenditure of £550 million by 2030 (source EEEGR and 4C presentations to OWW 2018).

14.17 HM Government is focussed on getting as much of this expenditure as possible to include UK content, to regenerate coastal towns, drive exports of skills and technology and increase employment. This can also be said to be a stated general economic development aim of the Suffolk County and Local District councils.

14.18 The Port of Lowestoft is well placed to benefit from this surge in activity and has already secured the construction support and O&M facilities for the Greater Gabbard and EAOne windfarms, as well as supporting construction on the Scroby Sands, Lincs and Galloper windfarms. Our commercially confidential discussions with windfarm developers, offshore energy service companies and an operator seeking an extension to an existing windfarm under a new Crown Estate initiative indicate:

(a) Their unwillingness to consider operating in a part of the Port separated from the sea by two bridges.

(b) Accepting that the Port’s Outer Harbour is already approaching capacity they would consider operating from behind one bridge but have expressed extreme nervousness or outright refusal to consider operating from behind a second bridge.

14.19 In addition, Table 2 (above) shows the berths that will suffer an indirect loss of utility – being those shaded amber (berths 4W, 5, 6 7E, 7W and Shell Quay). This loss of utility derives from either the lack of an emergency berth to the east of the bridge restricting the ability to safely get vessels through what would become the "middle harbour" of the Port, or by virtue of the Applicant's intention to restrict the opening times of the proposed LLTC, so as to avoid bridge openings in the rush hours (which will, of course, coincide with high water at certain times of the tide cycle).

Oil & Gas

14.20 ABP also notes that operators in other industries, such as oil & gas, have also indicated their unwillingness to consider operating in a port separated from the development area by two bridges.

CTV Report

14.21 ABPmer, (ABP's environmental consultancy which operates at arms-length from ABP) has undertaken an assessment of CTV characteristics, to assess the extent to which CTV usage within the Inner Harbour will be detrimentally impacted by the Scheme. In summary, the CTV Report concluded that:

(a) The new bridge will have a 12 metre HAT clearance, which means any vessel with an air draught larger than 11m (with a 1m safety margin) will require a bridge lift, depending on the state of tide.

(b) Windfarms are being built further offshore, which has resulted in an increase in the overall size of CTVs due to sea keeping characteristics in rougher offshore waters. Generally, increases in CTV length/beam will result in an increase in air draught.

(c) Current Port customers use CTVs that have air draughts in the 10 – 13m range. For example, a CTV with a 12m air draught, with a 1m ADC (safety margin), the LLTC bridge would need to be open 35% of the time, which increases to 84.7% of the time with an ADC of 2m.

(d) Given the upward trend in vessel size, in particular bearing in mind the likely increase in CTV carrying capacity to 24 technicians due to changes in licensing restrictions, it is anticipated that CTVs deployed in future offshore wind farms are likely to have air draughts of up to 15m, which means a

larger proportion of CTVs at the Port will require the bridge to open in the future.

14.22 Due to the number of current and future CTVs that would require the bridge to open to pass, ABP is of the view that the LLTC will act to the serious detriment of future wind farm operations located in the Inner Harbour.

BVG Report

14.23 ABP, in conjunction with BVG Associates, has undertaken an assessment of the potential future growth in the offshore wind sector at the Port (primarily based on the East Anglia wind farms) and consequently, the potential requirement for CTV berths and employment impacts.

14.24 BVG Associates are an independent renewable energy consultancy which focusses on wind, wave and tidal, and energy systems, established in 2006. Their expertise covers the business, economics and technology of renewable energy generation systems to a global client base, including customers in Europe, North America, South America, Asia and Australia. The majority of BVG Associates work is advising private clients investing in manufacturing, technology and renewable energy projects.

14.25 The methodology and assessment of the future UK demand that could be reasonably captured by the Port is set out in the draft BVG Report, which adopts a number of 'key assumptions' to predict the future offshore wind related demand at the Port. Although this is inevitably speculative, the assumptions are reasonable and proportionate and based on expert knowledge in the wind sector industry.

14.26 In summary, the draft BVG Report, a finalised copy of which will be provided to the ExA shortly, finds that:

(a) The Port is well located to benefit from the significant offshore wind developments that are likely to take place in the 2020s. Even for wind farms that may use other ports as their primary construction and operational bases (i.e. ports located closer to the more northerly East Anglican offshore wind farms), the Port would still be a logical location to base some activities involved in the construction, operation and decommissioning of offshore wind farms.

(b) The future demand for CTV berths is for just over 30 berths, but this figure may rise to 50 berths if, as can be reasonably anticipated, more wind farm

projects are developing and existing wind farms are repowered. The future demand for SOV berths is between 1 to 4 berths, depending on the mix of projects.

(c) Given the mix of projects, port configuration and existing tenancy agreements, this berthing demand can only be met by using both the Inner and Outer Harbours. There is little space remaining in the Outer Harbour of the Port for further offshore wind tenants, which means the Inner Harbour would need to be utilised for new wind farm customers or new commercial business.

(d) The demand for operations bases for the East Anglia wind farms would require around 40,000m^2 (4ha or 10 acres) of landside space at the Port in addition to the CTV berthing requirement. The potential area available in the Inner Harbour is about 10ha or 25 acres, which means the Port should be able to meet anticipated demand from the offshore wind industry, for both wind farm operations and supply chain activities.

(e) The future offshore wind demand would create 1,080 jobs at the Port by 2038, which are associated with offshore wind related activity.

(f) If the new bridge is constructed, new wind farm tenants located to the west of the new bridge will likely have increased response and transit times to wind farms, leading to lost revenue through greater turbine downtime and increased costs due to increased travel time. The reduced revenue and additional costs resulting from the longer transit time mean that the Port will be less attractive to most new offshore wind tenants.

14.27 The BVG Report concludes that the LLTC represents a potentially serious threat to the attractiveness of the Port for the off-shore wind sector.

14.28 Currently, the Port is well located to benefit from the significant offshore wind developments that are likely to take place in the 2020s and has the potential to create over 1,000 direct, indirect and induced jobs as a result.

14.29 The Port will continue to be a logical location to base some activities involved in the construction, operation and decommissioning of offshore wind farms. However both operational phase and servicing to wind farms at the Port would be affected by the proposed LLTC.

14.30 If the proposed LLTC results in all new offshore wind tenants in the Port having to be located to the west of the new bascule bridge this is likely to mean that Lowestoft is no longer attractive to most new offshore wind tenants. LLTC therefore represents a potentially serious threat to the attractiveness of the Port for the off-shore wind sector.

Nautilus Report

14.31 For the purposes of the current examination of the emerging Waveney Local Plan, (see section 6) Waveney District Council commissioned Nautilus Associates to prepare a report concerning *'An* Assessment *of Land Requirements to Support Offshore Engineering in Waveney*' (September 2018) ("the Nautilus Report"). A copy of the Nautilus is at **Annex 7**.

14.32 The Nautilus Report is an independent report that assesses the land requirements to support the offshore energy and engineering industries in the Lowestoft area, in order to provide updated market intelligence and evidence in support of the emerging Local Plan.

14.33 In short, the Nautilus Report concludes that the growth potential is such that there could be an argument that the majority of waterfront in the Inner Harbour in addition to the statutory port should be reserved for employment and port related land uses.

14.34 In terms of the offshore wind sector specifically, the Nautilus report confirms the accepted position that there will be major growth in the offshore wind sector in the local area (particularly in the next 10-20 years), and that Lowestoft is ideally located to serve the southern North Sea offshore energy sectors.

14.35 Relevant findings contained in the Nautilus Report include the following:

(a) Decommissioning of primarily gas fields off the East of England in the southern North Sea will be spread across 78 fields, with an anticipated spend of £489m in 2020 increasing to a total of £5.5bn in 2040. The 2009 BVG Report identifies that the oil and gas industry is able to deliver long term, high value jobs for the Lowestoft area and that the port may need to provide additional facilities in order to capture some of the decommissioning work that the southern North Sea will provide over the next 30-40 years (section 2.5.1, page 28). Offshore oil and gas decommissioning is identified as a priority for the area within the assessment (section 7, page 78).

(b) Southern North Sea is the most densely populated area for offshore wind projects, with more than 1,106 turbines currently operating and thousands more planned over the next decade. The East Anglian coastal region has an established offshore energy supply cluster and has strategically located ports with direct access to all planned wind farms (section 2.13, page 34).

(c) There are significant planned capital investments in the offshore wind sector in the East of England over the next few decades. In the short-term, around £2 billion by 2020, and around £5 billion by 2025. In the long-term, around £16 billion by 2030, around £23 billion by 2035, and over £30 billion by 2040 (section 2.2, and Figure 10, page 21).

(d) Offshore wind operations and maintenance, which is recognised as the largest part of the offshore wind farm lifecycle (on average, this equates to 40% of the lifecycle costs of a typical offshore wind farm), is one of the greatest potential opportunities for Lowestoft. The Nautilus Report estimates that the offshore wind and maintenance opportunities for Lowestoft are in the region of £309 million per year currently and will rise to £1.3 billion per year by 2025-2030 (section 2.13.1, page 36).

(e) As the UK's offshore gas basin and the world's largest offshore wind market is immediately off the East Anglian cost, there are significant new opportunities worth in excess of £10bn within close proximity to Lowestoft up to 2040 (section 3, page 37).

(f) Lowestoft has captured a significant pipeline of new investment in the town largely due to the growth of offshore wind projects and its supporting supply chain. The sub-region is now recognised globally as a leading centre for development, deployment, operations and maintenance with some of the world's largest offshore projects being delivered or developed off the region's coast (section 4.1, page 40).

(g) Sembmarine SLP's Fabrication Yard, forming part of the Port of Lowestoft, is the only large scale offshore fabrication in the East of England. These facilities could be developed into a major fabrication and construction hub servicing multiple offshore markets. There is capacity for these facilities to be used for fabrication of large offshore wind structures. (section 4.4, page 50).

(h) The Nautilus Report acknowledges that a number of existing Crew Transfer Vessels and Wind Farm Service Vessels may be able to pass under the new LLTC, but this is subject to their specification (principally the height of any antennae and communication systems) and tidal conditions within the port. Further, it is acknowledged that vessel design is evolving and offshore wind farms that are developed further offshore in deeper water will require larger vessels to accommodate larger numbers of personnel and equipment for operational efficiencies (section 5.2, page 59).

(i) The Port of Lowestoft is an ideal location to serve the southern North Sea offshore energy sectors, having c. 3,500m of quay and the ability to accommodate vessels up to 125m LOA with depths up to 6m. Some of this growth in the offshore wind sector could be accommodated at the former Shell Quay site (section 5.6, page 65).

(j) New manufacturing and fabrication methods for offshore wind farm foundations mean that the previous requirements for such facilities which made the Port of Lowestoft unsuitable (i.e. at least 150 metres of continuous quay space) no longer apply. This makes the Port of Lowestoft suitable for manufacturing and fabrication as well as operations and maintenance facilities. (section 6.1.1, page 67).

(k) In terms of future potential operation and maintenance bases for offshore wind farms, the Nautilus Report states that there remains strong evidence of potential occupier demand to develop such facilities, and there is a good case for such facilities to be developed on a speculative basis to encourage local expansion and inward investment with facilities being available and/or operational as soon as possible (section 6.3, page 74).

(l) The Port of Lowestoft is already home to the operational bases for Greater Gabbard and the East Anglia One Project. It is clear that future offshore wind projects will require similar operations bases over the coming decade, including East Anglia One North, Two and Three, and Lowestoft is the closest port to support these projects (section 6.3.1, page 74).

14.36 ABP notes, however, that the Nautilus Report indicates that the proposed LLTC would have an overall positive impact for the broad local area. ABP disagrees with Nautilus Report on this point and would highlight that whilst the Nautilus Report identifies several key areas for development in relation to the offshore wind sector within the Inner Harbour, it does not specifically address the impact of the LLTC on

the availability of these offshore wind sector opportunities within the Inner Harbour of the Port.

14.37 The ExA should note in this regard, however, that in discussions held with ABP (as part of a wider evidence gathering exercise with the industry) during the preparation of the Nautilus report, the author orally indicated that he was not a marine or shipping expert and had not considered in any great detail matters relating to the operation of the proposed bridge.

14.38 In the context of the above, it should be noted that in October 2018, ABP announced that they signed a new contract with trailblazing Norfolk boat builder, Goodchild Marine Services Limited, to construct a new state-of-the-art pilot boat for the Port.

Edge Economics Report

14.39 As a result of the key assumptions and conclusions set out the in BVG Report, Edge Economics have been instructed to undertake an assessment of the economic impacts of the Port in both 'With SCC Bridge' (i.e. the LLTC) and 'No Bridge' scenarios. A copy of the *'Port of Lowestoft: Economic Study Report'* and the separate annexure to that report prepared by Edge Economics are attached at **Annex 4A and 4B.**

14.40 Edge Economics Ltd provides economic services including economic impact assessment, feasibility and business case development, and specialises in the economics of infrastructure, innovation and technology. Edge Economics Ltd supports a wide range of clients including some of the UK's largest private sector companies, UK government and the European Commission. The practice was founded in 2013 by Tom Congrave, who has over 15 years' experience working as a professional economist, across the fields of economic development, regeneration and growth.

14.41 Relevantly, the Edge Economics Report concludes that:

(a) **No Bridge Scenario** - If the Port was able to accommodate the projected future demand in the offshore wind sector as a result of the LLTC not being built, it is estimated that by 2036, the Port could support 1,581 jobs (direct, indirect and induced) and contribute £122.2 million to £177.1 million of GVA annually to the local economy.

(b) **With SCC Bridge Scenario** – if the Port is unable to accommodate all of the projected future demand in the offshore wind sector as a result of the LLTC being built, then it is estimated that by 2036, the Port would support 876 jobs and contribute £60.9 million to £79.9 million of GVA annually to the local economy, demonstrating the level of detriment that would be caused to the Port by the proposed LLTC.

(c) **Overall Impact** – The LLTC scheme could adversely impact the economic potential of the Port to deliver long-term economic benefits to Lowestoft. A discounted cash flow ("DCF") analysis indicates that the total present value benefits over:

(i) an 18-year period are £706.3 million to £902.7 million under the 'With SCC Bridge' scenario, compared with £1,080.6 million to £1,495.6 million under the 'No Bridge' scenario.

(ii) A 60-year period are £1,208.4 million to £1,525.9 million under the 'With SCC Bridge' scenario, compared with £2,116.1 million to £2,964.0 million under the 'No Bridge' scenario.

14.42 Overall, the Edge Economics Report concludes that the implementation of the proposed LLTC could significantly adversely impact upon this economic potential for the Port to deliver long-term economic benefits to Lowestoft. It is estimated that the Port's future economic contribution in 2036 could be the considerably lower figure of 876 jobs if the proposed bridge is built out, compared to the 1,581 jobs which the Port could support if the bridge is not built out.

14.43 The Port's future economic contribution in 2036 could also be impacted by the proposed bridge, contributing in the range of £60.9 million to £79.9 million, instead of the significantly higher estimate of £122.2 million to £177.1 million of GVA annually (in 2017 prices) if the bridge is not built out. Further, the discounted cash flow analysis undertaken indicates significantly lower present value benefits over an 18-year period in the scenario where the bridge is built out (in the range of £706.3 million to £902.7 million in 2017 prices) compared to the scenario where the bridge is not built out (in the range of between £1.08 billion and £1.50 billion in 2017 prices).

East of England Energy Park at Shell Quay

14.44 ABP is current developing the East of England Energy Park ("EEEP"), at Shell Quay at the western end of the Inner Harbour. The development site was the

location of the former Shell Lowestoft base, which served the southern North Sea operations of Shell and was an important employer until its closure in 2004. The location of EEEP is ideal for the offshore wind sector, as it has large developable areas and quayside frontage suitable for CTV berthing. The relatively shallow water depths in this part of the harbour do not provide a constraint for CTVs and, depending on customer demand and requirements, finger pontoons may be installed to facilitate loading/ unloading operations (and, in any event, the berths at this part of the Port are capable of being deepened by approximately 1.3m to -5.0m ACD, should the need arise).

14.45 Although the precise configuration of landside and berthing infrastructure is still to be settled, ABP anticipates that the Energy Hub will be able to offer:

(a) Fuel bunkering;

(b) Crew facilities;

(c) Spare parts and component storage space;

(d) General dockside warehousing;

(e) Office space;

(f) Vessel battery charging; and

(g) R&D/ training/ teaching facilities for local stakeholders such as Cefas and East Coast College

14.46 In November 2018, ABP completed the first phase of a £300,000 demolition project to clear the 13-acre development site. The whole of the site is expected to be cleared of all structures by early 2019 and made ready for commercial use.

15 MITIGATION

15.1 In light of the serious detriment that the LLTC scheme will cause to the Port, ABP has made it clear to the Suffolk County Council, that whilst it does not object to the principle of a third crossing of Lake Lothing, if the County Council insists on promoting a line for the bridge that crosses through the middle of the Inner Harbour, then ABP has no choice but to object to the proposal.

15.2 That said, whilst the serious detriment created by the scheme can never be removed in its totality – in that on the facts alone, one is bound to question the

logic of driving a low bridge through the middle of an operational port (a port which plays its part and is an economic mainstay to the local and regional economy) – if the County Council were prepared to commit to the provision of certain mitigation measures, sufficient to reduce the serious detriment, then ABP may be prepared to reconsider its position.

15.3 As such, ABP has identified a range of measures which will to an extent mitigate at least some of the serious detriment that will be caused to the Port as a result of scheme. This mitigation comprises, in summary and amongst other things:

(a) **Emergency Berth** - The provision of an emergency berth on the eastern side of the proposed new bridge within the Inner Harbour, to offset the serious marine navigation risks that could arise as a result of a vessel becoming trapped between the two bridges, should one of them fail. Examples of this situation arising is if the bridge is stuck down or partially closed, or in certain circumstances, should the vessel itself fail. This is considered in more detail in Part 16 below.

(b) **Replacement Berthing** – Creation of new berthing space in the Outer Harbour, to compensate for the permanent loss of berthing (and hence utility) in the Inner Harbour as a result of the proposed LLTC.

(c) **Indemnity** - a full indemnity, backed by commercial insurance, bearing in mind that by constructing a low bridge through the middle of an operational Port, the County Council is proposing:

(i) to introduce a serious hazard into the Port to the detriment of the Statutory Harbour Authority and as a consequence, _

(ii) to impair significantly its ability to perform its statutory duties in the context of safety navigation, as well as introducing a risk of vessel strike to the new bridge and potential injury to users of the bridge/vessel crews as well as damage to the vessel.

Introduction and Principles to be Applied

15.4 The impact of the proposal on the Port of Lowestoft statutory undertaking can be summarised as:

(a) The direct physical loss, when measured in whole berths, of 165m of berthing in the immediate vicinity of the LLTC crossing.

(b) The indirect loss of utility affecting all berths – 720m of berthing in total – to the west (upstream) of the LLTC crossing, arising from the restrictive bridge opening regime sought by the Applicant.

(c) Operational matters impinging directly on certain statutory requirements placed on the Port, such as oil spill prevention and response, statutory Port security etc.

(d) The introduction of new risks into the Port, resulting from the existence of a public highway crossing the Port at height.

15.5 ABP has entered into discussions with the Applicant with the objective of reaching an agreement on how the Applicant intends to address these matters.

15.6 As at the date of these Written Representations, no such agreement has been reached.

15.7 In ABP's view the overall approach to be adopted is one of "equivalence" i.e. the provision of replacement assets and legal safeguards to offset the serious detriment that will be caused by the proposed LLTC. Equivalence will leave the Port neither better nor worse off as a result of the mitigation works.

15.8 The principles to be applied in relation to the LLTC proposal are the same as those recently applied in relation to a public highway crossing of another operational Port, being the Port of Newport in South Wales which is also owned and operated by ABP.

15.9 In this case, the Highway Authority, Welsh Government, was seeking to construct the M4 Relief Road over the middle of the Port of Newport at a height that would impede shipping and cargo handling operations (as well as introducing new risks into the port). In February 2018, ABP and Welsh Government entered into a settlement agreement to address comprehensively the impacts on the Port of Newport, allowing ABP to withdraw its objections to that proposal, including its objection under S16 Acquisition of Land Act, 1981 in relation to Serious Detriment.

15.10 Whilst the precise terms of that settlement agreement are confidential, ABP is seeking similar mitigation arrangements for the Port of Lowestoft, albeit tailored to the precise circumstances the Port finds itself in as a result of the LLTC proposal.

Physical Mitigation Requirements

15.11 This is designed to address, as far as possible, the impacts of items (a) and (b) above – items (c) and (d) being addressed separately.

15.12 In summary, if the detriment to the Port arising from the proposed LLTC is to be addressed, any mitigation package will have to deal with the direct and indirect impacts of the LLTC proposal on the Port which, as the preceding sections have demonstrated, amount to:

(a) Direct loss – 165m of berthing;

(b) Indirect loss – comprising the impairment to the utility of all 720m of berthing upstream of the proposed crossing; and in particular:

(c) Impairment to the functionality of North Quay 6 and 7 – length 170m, depth alongside 4.7m; and

(d) Impairment to accessibility to berthing for larger CTV vessels working to a fixed schedule west of the proposed LLTC.

15.13 Clearly also any mitigation must be located downstream of the proposed LLTC in order actually to mitigate the impacts and also must be capable of being accessed from the landside to allow for personnel access, cargo loading/unloading, ship re-provisioning and refuelling, all as required and in accordance with legal requirements/industry current practice.

15.14 In respect of such mitigation, it is generally accepted that equivalence:

(a) May result in new (replacement) assets being provided to mitigate for older assets being lost or impaired ("new for old"); and

(b) Entails the provision of replacement assets that meet current regulations in terms of building standards, storage and handling regulations etc, notwithstanding the existence of grandfathering provisions applying to assets being replaced.

16 MITIGATION - OUTER HARBOUR

Inner Harbour, downstream of proposed LLTC

16.1 ABP has reviewed the provision of berthing within the Inner Harbour downstream of the proposed LLTC and there are no realistic opportunities to create

replacement berthing within this part of the Port, due to the physical layout of the Port, current contractual obligations to customers and the nature of existing operations and space constraints.

Outer Harbour

16.2 As far as the Outer Harbour is concerned, in assessing the opportunities, the following principal factors have been considered:

(a) Current occupiers with contractual (e.g. landlord & tenant) positions within the Port (e.g. Sembmarine SLP), Greater Gabbard Windfarm O&M and East Anglia One Windfarm O&M facilities;

(b) The needs of the fishing fleet based at the Port.

(c) The generally harsher marine environment of the Outer Harbour, as compared to the Inner Harbour (in terms of wave action and swell); and

(d) Accessibility and the need for appropriate landside access.

16.3 Two primary opportunities, warranting further investigation, were identified in Trawl Dock and Waveney Dock. For the sake of completeness, the review identified very limited opportunities within Hamilton Dock given the extent of occupation by Scottish Power Renewables and the relocated fishing fleet. Similarly, whilst in principle, the Yacht Basin may present some potential opportunities to create commercial berthing, it was discounted at an early stage due to the impacts on the leisure sector and, in particular, the Royal Norfolk and Suffolk Yacht Club.

Trawl Dock

16.4 There is the potential to create additional berthing within Trawl Dock by the reconfiguration of marine access into the dock and the provision of access pontoons along the north side of the dock.

16.5 This would entail the repositioning of the entrance to Trawl Dock in order to create a calmer marine environment within the dock, to enable the construction of up to 13 smaller berths (given the somewhat constrained access, quay construction and reduced depths within this dock it is not possible to accommodate larger vessels).

16.6 The advantages and disadvantages of repurposing the dock include:

(a) **Advantages** - Potential to create up to 13 additional smaller berths with a combined length of approximately 210m.

(b) **Disadvantages**:

(i) This option will not address in full the serious detriment that will be caused to the Port (no replacement unrestricted deep berthing capability) and thus, in isolation, will not present as a solution.

(ii) Any additional berths created will be constrained by a lack of proximate landside facilities, berth depth and quay loading constraints. For example –

(A) It is not possible to create a deep berth to replace the capability of North Quay 6 and 7;

(B) It is likely to be a relatively expensive solution, with a relatively poor cost/benefit (as no replacement to North Quay 6 and 7);

(C) It is likely to be disruptive during construction with the need to temporarily rehouse existing users elsewhere in the Port;

(D) Additional consents are required (see below).

Waveney Dock

16.7 There is the potential to create additional berthing within Waveney Dock by constructing a new approximately 130m-long quay diagonally across the dock, suitable for berthing a vessel of approximately 100m LOA, from the peninsular between Hamilton and Waveney Docks – this is shown diagrammatically in **Annex 8.**

16.8 The new quay would also serve as a breakwater, the intention being to create marine conditions inside the breakwater that are similar (and equivalent) to those within Trawl Dock, thereby allowing for the creation of a number of replacement berths.

16.9 The advantages and disadvantages of this proposal are set out below.

(a) **Advantages**

(i) Ability to partially mitigate the “lost” North Quay 6 and 7 berths on the outward side of the new quay, with equivalent functionality – the usable length of berth being approximately 100m (less than the 165m permanent impairment).

(ii) Because this berth would be designated for larger ships, exposure to less-benign marine conditions is considered to be acceptable in marine safety terms with the provision of suitable fendering arrangements.

(iii) Ability to create a number of smaller berths in the sheltered area created by the new quay, comprising up to 5 additional smaller berths with a combined length of approximately 150m.

(iv) Satisfactory access to the berths thus created from the peninsular (in the case of the berths created in the sheltered area, access would probably be via an access ramp opening onto pontoon structures, due to the age of the existing quay wall).

(v) Likely to have a better cost/benefit ratio compared to other solutions.

(vi) Less disruptive to existing Port operations during construction.

(b) **Disadvantages** - Additional consents are required (see below).

Summary of Mitigation Options

16.10 In summary, based on the preliminary review undertaken thus far by ABP, the option of creating equivalent replacement berthing within Waveney Dock is considered to be the best option, given the need identified (subject to the basic level of information available).

16.11 This would create a replacement berth for deep-drafted vessels and 5 additional smaller berths with a combined length of approximately 150m (3 new CTV berths on the new quay, and 2 new CTV berths on Hamilton Dock) – whilst not fully mitigating the impacts of the LLTC proposal, the provision of such a mitigation package will at least allow the Port to respond positively to the emerging commercial opportunities that the Port needs to embrace to safeguard its future, and to contribute to the development of the local and regional economies.

16.12 Additional, more detailed, studies are required and will need to consider the following –

Consenting

16.13 The working assumption at this stage – to be confirmed – is that parliamentary powers exist under the historic Lowestoft dock Enabling Acts to construct works within the Outer Harbour. It is normal to have provisions that allow for the enlargement, alteration and improvement of the dock within the limits of deviation

of the Port. On the assumption that this is indeed the position, then it will not be necessary to seek a Harbour Revision Order to carry out the works.

16.14 It will, however, most probably be the case that the approval of plans and sections of the works would have to be obtained from the Marine Management Organisation (MMO), along with a MMO Marine Licence to carry out the works (including any dredging of the seabed, which will require a Capital Dredge Licence).

16.15 Given the nature of the works, it is considered likely that the project will be subject to Environmental Impact Assessment (EIA), inter alia, to establish the suitability of disposing of dredge arisings at sea, together with other relevant factors such as the impact on the public road network. Other topics of relevance may also be identified during EIA scoping for the project.

Design

16.16 The concept outlined in the preceding paragraphs would need to be confirmed during a more detailed preliminary design phase – as part of that it would most likely be necessary to establish ground conditions through intrusive ground investigation.

16.17 Wave modelling will also be required to validate the working assumptions at this stage regarding a reduction in wave action and swell within the sheltered breakwater area to acceptable levels. It will also be necessary to provide assurance there will be no worsening of conditions outside the protected area.

Marine safety

16.18 A navigation risk assessment would also be required to establish the viability of the concept, in light of the existing marine traffic through that part of the Outer Harbour.

Programme

16.19 It is normal for works of the nature described to take 12-15 months to be built, once consent has been granted (which may take a further up to approx. 12 months depending on the complexities of the EIA work required). Whilst it is acknowledged that this timeline may not be consistent with the timeline for the proposed LLTC, the Port would need sufficient assurance of commitment from SCC that the Port mitigation works will be funded and built by SCC and if, for any reason, the preferred proposal proves to be unachievable for any reason, that

SCC will commit to providing an alternative equivalent solution that safeguards the Port.

17 MITIGATION – RELATED ISSUES

17.1 The Port has a number of statutory obligations relating to the day-to-day operation of the Port that must be addressed by the Applicant to ensure equivalence for the Port. The principal matters are:

Oil Spill Prevention and Control

17.2 The Port has a statutory duty to respond to oil pollution incidents occurring within the Port's SHA area under the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998.

17.3 Compliance with the regulations is assessed and administered by the MCA Counter Pollution and Salvage Branch.

17.4 As part of this statutory duty the Port is required to risk assess and prepare for pollution events and maintain materials for a “Tier One" oil pollution response.

17.5 As part of the Port’s preparation for incident response it maintains a stock of materials which are approved by the MCA through the Statutory Oil Spill Contingency Plan.

17.6 This stock of materials includes a 150 metre length of 750 mm fence boom (Troilboom) kept on a hydraulically powered winch drum which is currently stored adjacent to the junction of the NQ 5/6 berths within the Inner Harbour (the Outer Harbour also has an 80m trailer-mounted boom).

17.7 This 150m boom can be used to fully enclose a large vessel suffering a pollution event anywhere within the Inner Harbour.

17.8 When towed through the water by the Port’s Harbour Launch assisted by the marina launch this boom can be readily deployed to most areas of the Inner Harbour which is used by the larger vessels calling at the port.

17.9 The LLTC structures during construction and in operation will include many more snagging points due to the introduction of fender sections, piles and bracing structures.

17.10 With the construction and operation of the LLTC the presence of large complex structures in the waterway will make safe towage of such a large boom by available marine craft extremely problematic – to the extent that ABP's statutory duty to respond effectively to an incident will be seriously compromised.

17.11 In order for ABP to discharge effectively its statutory duties relating to oil pollution incidents, ABP's current view is that the Applicant must provide two additional transporter booms of 75m length each, which can be joined with ABP's existing 80m trailer-mounted boom located in the Outer Harbour (that can be moved by road to the middle harbour). In the event of an oil pollution incident, the conjoined boom can be deployed in the middle harbour between the existing Bascule Bridge and the proposed LLTC structures.

17.12 With respect to the suspended quay structures present along part of North Quay, there are a number of additional complexities to take into account.

17.13 If an oil spill were to occur in the vicinity of a suspended quay, the most effective response would be to boom the main body of the vessel with the fence boom and supplement this with readily deployable absorbent materials and boom sections for the suspended quay areas at both ends of the vessel/main boom.

Statutory Port Security

17.14 This topic is considered separately in Section 19 below, but in brief, Ports are subject to comprehensive statutory security regulations, designed to protect the country, port users and shipping from the threat of terrorism and other unlawful activities. The position in the UK (and the rest of the EU) is governed by the International Ship and Port Facility Security Code. The UK has enacted The Ship and Port Facility (Security) Regulations 2004, (S.I.1495 of 2004) which brings the EU regulation 725/2004 into UK law.

17.15 Ports are therefore required by law to produce a Port Facility Security Plan ("PFSP") which is required to be approved by the DfT. Such plans are subject to audit and inspection by DfT and are required to be tested, and regularly reviewed and amended as the need arises.

17.16 The LLTC proposal seeks to build a public highway and opening bascule bridge across the Port and Statutory Harbour Authority area. The proposal therefore introduces a requirement for the Port to reassess its security resilience and capability to accept ISPS-compliant vessels.

17.17 Any resulting changes will have to be reflected in a revised PSFP, to be approved by DfT.

17.18 In terms of mitigation, in order to ensure that it is no worse off, ABP is seeking that the Applicant assumes legal responsibility for:

(a) The cost of providing in perpetuity any additional statutory security measures required as a result of the LLTC proposal; and

(b) Compensating ABP for any loss of business suffered as a result of having to decline shipping and/or restrict port-operational capability arising from the changes to the Port's statutory security designation as a result of the existence of the proposed LLTC.

Traffic Management Action Plan

17.19 During the construction period of the proposed bridge – which it is stated by the Applicant to be of up to three years duration – it is appropriate that the Applicant be required to put in place a Traffic Management Action Plan ("TMAP") in order to safeguard the movement of traffic within the Port at all times within the construction phase of the proposal. Central to this should be an obligation on the Applicant to acknowledge the primacy of the movement of port-related traffic over construction traffic (and works).

17.20 This is essential, given:

(a) The need for the proposed LLTC to cross Commercial Road, the Port's only access road, necessitating its closure for a period of time.

(b) The power that the Applicant is seeking to take temporary possession of land plot 2-20, a 75m stretch of Commercial Road, the impact of which will be to deprive road access to all parts of the Port to the west of this plot.

(c) The fact that no regard appears to have been given by the Applicant to the provision of alternative Port access at times when Commercial Road is closed.

The introduction of new risks into the Port

17.21 The introduction of new risks into the Port, resulting from the existence of a public highway crossing the Port at height, will have the effect of exposing the Port, and its owner ABP, to a new population of risks.

17.22 Whilst it is noted that an indemnity in favour of ABP has been included in the dDCO, ABP is seeking a more extensive Indemnity and Insurance Agreement from the Applicant to address the specific circumstances of a bridge crossing an operational port.

17.23 The Applicant has, to date, not accepted the need for such a stand-alone agreement. ABP is willing to enter into an insurance and indemnity agreement with the Applicant provided it incorporates the protection sought by ABP, as outline in Part 18 below - which was shared with the Applicant in early September 2018 and which is based on the protection provided to ABP for the M4 Relief Road scheme which crosses the Port of Newport, impacting on port operational areas in the same way as the LLTC proposal and, hence, provides a "tried and tested" precedent for the parties to follow.

17.24 Until such time as an over-arching indemnity and insurance agreement is put in place, it remains ABP's view that serious detriment will be caused to the Port by virtue of the potential additional liabilities the Port will become exposed to as a direct result of the proposal.

17.25 As far as ABP is aware, there are no other bridges that cross a statutory port or harbour that are of a comparable size and/or height to the proposed LLTC. Although the County Council has sought to provide us with a list of what they consider to be comparable bridges, following review of these examples, it is clear that none of these bridges are comparable to the LLTC scheme.

17.26 As such, it follows that if the County Council's LLTC scheme is approved, it will be introducing a serious hazard into the Port to the detriment of the Statutory Harbour Authority and its ability to perform its statutory duties in the context of safety navigation. Accordingly, it is imperative that the County Council provides ABP with an indemnity and insurance to offset the significant additional risk that it proposes to introduce to the Port.

17.27 Although it is noted that the draft Development Consent Order for the LLTC contains a limited indemnity for construction and maintenance purposes, it is not fit for purpose for the unique circumstances arising from the LLTC.

17.28 The ExA should be aware that ABP's requirement for a full indemnity from the Applicant is not negotiable and is supported by precedent. Further details as to the indemnity are provided in Section 20 below. A failure to provide an indemnity as sought by ABP will render any approved scheme susceptible to judicial review.

17.29 The ExA should note that ABP has taken a pro-active and collaborative approach with the County Council in the context of the LLTC scheme, in order to assist them to understand the serious detriment caused by the LLTC and to consider and assess the mitigation required to offset that serious detriment.

17.30 As at the date of these Written Representations, the Applicant has not agreed to provide any of the mitigation required to address the detrimental impacts of the LLTC. It is understood that the Applicant has been advised that any compensation can be met by way of the compensation code in the Upper Tribunal, no doubt in a considerable number of years hence, advice with which ABP does not agree.

Navigational Marks

17.31 Due to the introduction of a large hazard within the navigable channel of the Port, It is imperative that the Applicant install any permanent navigational marks and aids, such lights, buoys, signals, markers or other apparatus and/or undertake any other measures required by ABP and/or the Harbour Master as it may deem necessary in order to prevent any danger to navigation arising as a result of the construction or presence of the specified work.

17.32 This may also include any works ABP deems necessary to offset the impact of the reflection and/or glare of street lights on Masters of vessels transiting Lake Lothing.

17.33 Any such navigational marks must be consented by the Trinity House Lighthouse Service, and then monitored by ABP, as SHA and the Local Lighthouse Authority.

18 MITIGATION - EMERGENCY BERTH

18.1 The compulsory acquisition of land and the consequential construction of the bridge will create an unacceptable navigational safety risk arising from the possible failure of one, or both, of the bridges across the Port. By severing the Inner Harbour with a low bascule bridge, the timing of opening and closing of the bridge being under the control of the Applicant means that ABP's deep water berths (North Quay 6 and 7 berths), that are available for deep-drafted vessels and emergencies (for example, stricken vessels), will be located to the west of the proposed LLTC bridge.

18.2 If one or both of the bridges fail (i.e. getting stuck in the open, closed or partially open position) whilst a vessel is transiting through the Inner Harbour between the bridges, or indeed if the vessel encounters steering/engine difficulties between the bridges, there is currently no deep-water berth available on which the vessel could be safely moored whilst the necessary repairs to bride or vessel are undertaken.

18.3 This means that ABP will require an emergency berth to be constructed to the east of the LLTC, (i.e. between the existing bascule bridge carrying the A12/A47 and the proposed new LLTC), to cater both for deep draughted vessels that encounter difficulties through adverse weather conditions or failed engines, or indeed the failure of one or both bridges in times of emergency. This would provide a suitable and safe alternative quay for commercial vessels to berth at for a short period, and would offset the current navigational risk posed by the LLTC. ABP also notes that in the case of leisure vessels waiting for a bridge opening, the Applicant has accepted the need to provide a waiting pontoon and this is directly analogous for commercial ships that for whatever reason are not able to transit the LLTC bridge.

18.4 As well as being seriously detrimental to port operations, the lack of an emergency berth acts as a serious impediment to ABP's ability to fulfil its overriding statutory duties and obligations in relation to navigational safety.

18.5 ABP, therefore, requires an emergency berth be located on the south side of Lake Lothing, at a suitable point between the existing bascule bridge and the proposed Lake Lothing Third Crossing (LLTC). In ABP's view, the most suitable location is probably at the unused quay located adjacent to Belvedere Road, as shown in the attached sketch drawing, as attached as **Annex 9**, although this has not be subjected to a detailed assessment as to suitability. The following paragraphs explain ABP's position.

General location of the emergency berth

18.6 In general terms, to be of any utility, the emergency berth would need to be located between the existing bascule bridge and the proposed Lake Lothing Third Crossing (LLTC), in order to act as a safe refuge in the event of a failure of either bridge to open.

Functional requirement

18.7 The functional requirement for the emergency berth is that it should be able to accommodate the largest vessel that may get stranded between the two bridges – in practice such a situation is likely to arise for (1) an in-bound vessel intending to

transit to the west of the proposed LLTC, or (2) for an out-bound vessel, that has departed from a berth situated to the west of the proposed LLTC, which has successfully transited past the proposed LLTC and then been unable to proceed further due to a failure of the existing bascule bridge, leaving it trapped between the two bridges, unable to safely return to the berth it departed from.

18.8 In practice, therefore, in order to avoid detriment to the Port the emergency berth must be capable of accommodating the largest vessel that can currently use the Port's berths located to the west of the proposed LLTC. In practice, this is a vessel of the following dimensions:

(a) Length (defined as Length Overall, or LOA) up to 100m;

(b) Beam (width) of 20m – determined by the existing bascule bridge;

(c) Draught (depth under the water) of 5.0m. ABP notes that the current depth of North Quay 6/7, which are currently the deepest berths west of the LLTC scheme, is -4.7m ACD - although it should be noted that the Shell Quay was reconstructed by ABP in the early 2000's to enable dredging to -5.0, ACD; and

(d) Berthing pocket of -4.7m ACD to allow for clearance between the river bed and the vessel keel.

Lack of existing suitable ABP-owned berths

18.9 There are no ABP-owned berths within the Inner Harbour, located to the east of the proposed LLTC that present as a suitable emergency berth for the following reasons:

(a) Insufficient depth of water alongside the berth;

(b) Contractual commitments to other users;

(c) Intensive use by other Port traffic.

18.10 As a practical point, this strongly suggests that an emergency berth should be located within the current commercial Port operation along the north side of Lake Lothing. In any event, however, the creation of an emergency berth on the north side of Lake Lothing would deprive the Port of an existing berth which would be to the substantial commercial detriment of the Port statutory undertaking, because the emergency berth would have to be kept clear of all vessels in circumstances when it might be called upon.

18.11 In practice, this would have the following implications:

(a) The need to move any vessel(s) occupying the emergency berth to other berth(s), if indeed suitable alternative berthing is available, noting that:

(b) If no such berths were available then the incoming vessel would have to delay its arrival (or may divert to another Port, thus depriving the Port of that business); and

(c) Certain Port operations must happen on certain berths – for example, dry bulk handling operations must take place on the dry-bulks berth adjacent to the silo occupied by Dudmans (Lowestoft) Limited.

(d) Any cargo handling operations would have to cease for the duration of its use as an emergency berth.

(e) Any cargo in the process of being loaded will have to be moved to the new loading location, requiring additional personnel and equipment. Conversely, any cargo being unloaded may end up in a split location with a consequential knock-on in terms of cargo tracking, onwards transportation, security etc.

18.12 Overall, this is not a practical option in ABP's strong view and, in any event, would subject the Port to a financial burden in comparison to other ports in the region. This will be to the detriment of the Port of Lowestoft.

What length of quay will be required for this berth?

18.13 The length of quay required is approximately 125m, as shown in **Annex 9**. This will be sufficient to berth a vessel of length up to approximately 100m, allowing for mooring ropes at either extreme of the vessel, etc.

Technical requirements

18.14 The technical requirements for the emergency berth are:

(a) Creation of an approx. 125m emergency berth with an approx. 100m berth pocket (accommodating a vessel of up to approx. 100m LOA). ABP notes that in practice, the berth pocket will need to be longer (approx. 110/120m) to potentially address slope of harbour bed and give a measure of flexibility for the vessel to sit in the berth pocket);

(b) Depth alongside of -4.7m ACD, in effect, to replicate the affected berth to the west of the proposed LLTC, however constructed to be able to be dredged up to 5.0m, which is the deepest potential dredge depth of a berth to the west of the LLTC;

(c) Lighting along the emergency berth to meet Health & Safety requirements;

(d) Quay apron for ship gangways;

(e) Quayside lifesaving appliances and escape from water ladders;

(f) Access/egress for ships' crew, berthing personnel, etc; and

(g) Vehicular access for emergency services, etc.

18.15 The location of the emergency berth shown in **Annex 9** reflects the route of a buried gas pipeline as it is believed there will be insufficient depth to create a -4.7m ACD berth without impacting on the disused pipeline.

18.16 By way of additional information:

(a) The Belvedere Road site is not owned by ABP (the current owner is believed to be Sembmarine SLP). It is believed that the site may be available to purchase.

(b) Not all of the Belvedere Road site is needed to create the emergency berth – principally a 125m berth area and vehicular access to the berth.

(c) The condition of the quay is not known (although the "mirror image" quay on the north side, which is owned by ABP, suffered a partial collapse in 2012, indicating that the Belvedere Road quay may be close to the end of its working life.

(d) In any event, to achieve the necessary depths alongside, in order to act as an emergency berth, it is likely to require a new quay face plus associated dredging. Consents beyond those sought in the dDCO for the proposed LLTC would be required (marine licence etc.).

18.17 It is ABP's position that the Applicant must meet the costs of providing and maintaining the emergency berth, being a consequence of the scheme it is promoting.

19 MITIGATION – STATUTORY PORT SECURITY

19.1 This section sets out the Port security ("ISPS") implications for the Port arising from the LLTC. This information is based on the Port's Facility Security Plan ("PFSP"), augmented by conversations with the Department for Transport ("DfT"). The PFSP is an "Official – Sensitive" document, meaning that it can only be disseminated "..*on a strictly need to know (and personal) basis*." Accordingly, these representations intentionally do not (and cannot) go into any specific details of the Port's statutory security plans.

The general position relating to Statutory Port Security

19.2 Ports are subject to comprehensive statutory security regulations, designed to protect the country, port users and shipping from the threat of terrorism and other unlawful activities. The position in the UK (and the rest of the EU) is governed by the International Ship and Port Facility Security Code. The UK has enacted The Ship and Port Facility (Security) Regulations 2004, (S.I.1495 of 2004) which brings the EU regulation 725/2004 into UK law.

19.3 Ports are therefore required by law to produce a Port Facility Security Plan ("PFSP") which is required to be approved by the DfT. Such plans are subject to audit and inspection by DfT and are required to be tested, and regularly reviewed and amended as the need arises.

19.4 The principal thrust of ISPS is to ensure the security of the ship/shore interface at ports. The DfT proforma PFSP document lists out the following standard sections, to apply to all PFSPs:

(a) Section 1: Port Facility Details

(b) Section 2: Management of Security

(c) Section 3: Communication

(d) Section 4: Measures at Security Level 1

(e) Section 5: Measures at Security Level 2

(f) Section 6: Measures at Security Level 3

(g) Section 7: Miscellaneous information.

19.5 All UK ports normally operate at Security Level 1 (the lowest level of security). Were a port to operate at Security Level 2, this would require a more proactive and

intrusive level of security focusing in particular on identity verification, restricting access to key facilities (including ships), and more robust access control measures. Security Level 3 would likely place a port effectively in a state of 'lock-down', with enhanced levels of access control, patrolling, vigilance and search regimes.

Statutory Security at the Port of Lowestoft

19.6 The Port is categorised as an "Other Bulk Cargo" (OBC) port and its PFSP was last updated in April 2018. The Plan is for the commercial port areas that can accommodate or are directly related to the activities of ISPS vessels – the Plan also reflects the physical separation between the Inner and Outer Harbour areas.

19.7 The Port also has the ability to designate Temporary Restricted Areas which are required to be identified within the PFSP. These can be implemented during elevated security levels, or to accommodate ISPS-compliant commercial shipping (generally this applies to ships in excess of 500 gross tonnes, which are required to be ISPS compliant).

The LLTC Proposal

19.8 The LLTC proposal seeks to build a public highway and opening bascule bridge across the Port and Statutory Harbour Authority area (i.e. across areas which are capable of being designated as Temporary Restricted Areas). The proposal therefore introduces a requirement for the Port to reassess its security resilience and capability to accept ISPS-compliant vessels. Any resulting changes will have to be reflected in a revised PSFP, to be approved by DfT.

19.9 Based on the information provided thus far by the bridge Applicant:

Designated Restricted Areas

19.10 The existence of the proposed LLTC would establish the need for an area either side of the proposed LLTC that would have to be sterilised in Port statutory security terms, as a result of the Proposal – the sterilisation arises from the need to prevent any likelihood of an incursion into the Port's secure areas, irrespective of the Security Level. Having discussed the matter with DfT, it is ABP's view that an area of quay 50m either side of the footprint of the Proposal as it crosses the Port's North Quay will have to be sterilised in order to maintain the required standard of statutory security at the Port. This view has also been discussed and agreed by the DfT at a meeting at the Port on 22 August 2018.

19.11 Depending on the detailed design of the proposed LLTC and elevated road structures either side of it, it may be possible to review the extent of the area of sterilisation – however, any imbedded design features will have to address the risk of proscribed objects (e.g. firearms, drugs etc) being thrown from the proposed LLTC and/or approach roads into Designated Temporary Restricted Areas within the Port.

19.12 At the time of writing, the Applicant has suggested that the Network Rail compliant "H4a" bridge parapet will be sufficient to achieve an appropriate level of security where the proposed bridge crosses the Port, although no design details have been shared with ABP. Given that this standard is for a 1.5m high security boundary, ABP's view is that this will be insufficient to prevent the throwing of objects from the proposed bridge into adjacent areas of the Port, and that a taller fence is required.

19.13 This restriction would apply at all Security Levels. In broad terms, the sterilisation of an area 50m away from the bridge footprint equates to a direct loss of over 8% of ISPS vessel quay space within the Inner Harbour (calculated as the bridge footprint plus 50m in either direction = 125.5m, as a proportion of the total length of berthing within the Inner Harbour). In real terms, North Quay No.1 and 2 (part) berth would be restricted to smaller commercial ISPS vessels (less than around 70m LOA), because it will not be possible to establish a larger Temporary Restricted Area without breaking into the 50m sterilisation zone (taking into account ships' moorings).

19.14 This is shown diagrammatically in **Annex 10**, which in these circumstances this equates to a restriction of 223m of quay (15% of Inner Harbour quay space).

19.15 This loss will add to the serious detriment suffered by the Port as a result of the LLTC proposal.

Security Level 3

19.16 At Security Level 3, the entire length of the LLTC and approach roads may have to be closed to the public in order to secure Temporary Restricted Areas of the Port.

19.17 As the DfT guidance notes "At Security Level 3, specific security requirements may be placed on a port facility by Government. These requirements will depend on the specific intelligence obtained by, and available to, Government." This may therefore entail further unspecified security activity at the Port.

Monitoring of Designated Temporary Restricted Area

19.18 The position of the proposed LLTC, as well as the placement of bridge piers will have the effect of introducing new blind spots (in security terms) within the Port in the vicinity of the Proposal. It will therefore be necessary to undertake a review of security lighting and CCTV provision within this part of the Port in order to identify any upgrades required to continue to undertake the effective monitoring of affected Temporary Restricted Areas.

19.19 Such monitoring should include the proposed LLTC as well as the elevated approach road across the Port, in order to ensure that security breaches emanating from the existence of the LLTC are identified.

Need for Indemnification

19.20 From the foregoing it is clear that the LLTC proposal introduces a number of new security issues for the Port. As a matter of corporate policy, ABP will not accept any additional risk exposure resulting from the proposal – it will therefore require, in addition to any specific measures noted above, specific indemnity from Suffolk County Council in relation to any losses it suffers as a result of the construction, operation and/or existence of the LLTC crossing the middle of the Port's Designated Restricted Areas.

20 INDEMNITY

20.1 If the SoS eventually determines to authorise the construction of the LLTC, the introduction of a second bridge, of only 12 metres in height, which with a safety clearance will reduce the effective height at HAT to 11 metres (as currently proposed, but yet to be confirmed), will thereby introduce a consequential hazard into the middle of the operational port.

20.2 The new bridge will present as a safety hazard both to users of the port in terms of risk of vessel strike and injury to operators within the port estate and also to users of the bridge – both vehicular and non-motorised users.

20.3 Set out below is a summary of the additional indemnification requirements that ABP will require, possibly by way of a stand-alone Indemnity, to be given by the Applicant to ABP, should the proposed dDCO be approved.

20.4 The ExA should be aware that the points listed below are supplementary and additional to the provisions already negotiated with the Applicant and contained in the current version of the draft DCO (Document reference 3.1, dated June 2018) at Schedule 13, part 5 (p120) – "Protective provisions for the protection of the Harbour Authority".

20.5 This is because, whilst the indemnity provisions presently being offered by SCC may at first sight seem broad in nature, they are in fact narrow in actual application as far as the LLTC proposal is concerned and consequently, inadequate to meet the specific issues raised by this project.

20.6 This is because the currently offered indemnity provisions are based very much on established precedent. They are not designed, however, to deal with the specific nature of this application – which we would suggest is unique by reason of the fact that rather than just lead to potential changes in an affected party's practice or management of its business by reason of the implementation of the given project, the LLTC proposal will actually introduce an entirely alien hazard into the middle of an operational Port.

20.7 The indemnity provisions currently being offered by the Applicant in the dDCO simply reflect the fact that reliance on the Compensation Code does not address the impact on the carrying on by the statutory undertaker of its statutory undertaking in that a statutory undertaker may incur losses over and above the loss in value or disturbance to its property which normally falls within the remit of the Compensation Code.

20.8 In the circumstances of the LLTC proposal, ABP cannot be expected to be responsible for and to bear liability for the risks that will follow if the bridge is constructed and operated by the Applicant.

20.9 For that reason, ABP has no choice but to require the Applicant to enter in an Indemnity in the terms now sought and outlined below – which it should be noted, is based on very recent precedent in light of another similar project affecting an operational port.

Outline terms of the Indemnity

20.10 In brief, the Applicant will have to acknowledge that:

(a) The effect of the construction and operation of the LLTC will introduce risks to users of the LLTC as a result of the day to day operation of, and activities at, the Port;

(b) The construction and operation of the LLTC on and through the Port introduces a hazard as a result of which ABP could:

(i) suffer loss and damage (both direct and indirect and foreseeable and unforeseeable);

(ii) be served with claims made against it by third parties and/or by the undertaker; and

(iii) may incur liability to third parties and/or to the Applicant.

20.11 The Applicant will also be expected to accept a continuing obligation to keep under review in accordance with the principles of ALARP the risks posed by the LLTC and to identify and implement any further mitigation measures which may become appropriate if technology changes or the nature of the risks are re-assessed.

20.12 The Applicant must indemnity ABP in circumstances where:

(a) ABP suffers any form of loss or damage whatsoever without limitation or where any claims of whatsoever nature are made against ABP, or where ABP incurs any form of liability to the Applicant or to any third parties whatsoever without limitation; and

(b) ABP would not have suffered that loss or damage or such a claim would not have been made or such liability not incurred but for the construction or the existence or the location or the operation or use of the LLTC and whether the loss or damage or claim or liability was caused either directly or indirectly by the fact of and effects of the construction or the existence or location or the operation or use of the LLTC.

20.13 The Applicant is required to indemnify ABP, its Group Companies and their respective directors, officers and employees, against:

(a) any Losses incurred or suffered directly or indirectly as a result of any occurrence relating to or associated with the existence of the LLTC; or

(b) any Losses incurred or suffered directly or indirectly as a result of any occurrence which would not have been incurred or suffered but for the existence of the LLTC; or

(c) any Losses incurred or suffered in respect of claims or liabilities arising:

(d) in relation to the Port or the activities of Third Parties on or at the Port or port operations; and

(e) which claims or liabilities would not have been made but for the existence of the LLTC.

20.14 ABP accepts that it will be liable for such losses as may arise due to its negligence – subject to an agreed cap.

Insurance

20.15 The Applicant must, prior to the commencement of the LLTC Works, put in place and then maintain commercial insurance with a reputable insurer cover in a sum to be agreed.

Types of events or occurrences

20.16 For the assistance of the ExA, the types of events or occurrences which would be covered by the Indemnity – all of which are related to the existence/construction/operation of the LLTC, include -

(a) Collision or contact:

(i) between a vessel or vessels;

(ii) between vessels and the LLTC or its associated structures;

(iii) between cranes and other vehicles or equipment located or operating at the Port and the LLTC; and

(iv) involving a vehicle or vehicles and/or equipment using the LLTC causing a restriction or blockage of access to and/or from the Port.

(b) A vehicle or vehicles may crash whether accidentally or deliberately through the LLTC railings or barriers;

(c) An accident or collision or disruption resulting from the close vicinity of the LLTC to the Port and dust smoke or other emissions from cargo and other operations at the Port and the land forming part of the Port, including funnel

emissions from vessels and smoke, water vapour and other fumes from vessels and from dockyard premises.

(d) Stoppage or disruption or delay of road or rail or marine traffic to, from and within the Port and restrictions on access to and from the Port;

(e) An accident or emergency or other occurrence of any nature on or in the vicinity of the LLTC which affects the operation of the LLTC or vehicles using the LLTC or traffic or vessels in, or approaching, the Port;

(f) The collapse of the LLTC or part of the LLTC.

(g) The dropping of objects from the LLTC.

(h) Pollution in and around the Port due to floating debris, or leakage of cargo or other contaminant.

(i) Disruption of Port radio communications by eg, LLTC bridge structure, malicious act of radio interference on LLTC, effect of contractors' radios.

(j) Disturbance or difficulty occasioned by background lights, eg. crane warning lights, LLTC carriageway lighting disrupting or conflicting with navigation lights.

(k) Terrorism and malicious acts.

(l) Damage to the Port's railway lines passing under the Bridge and/or disruption to rail traffic on the Port's rail network.

(m) Lightning strike on the LLTC causing damage and/or electricity blackout.

Losses and damages

20.17 These will include -

(a) Direct, indirect and consequential financial loss, including loss of profit, loss of use, loss of reputation, loss arising from business interruption.

(b) Loss of or damage to vessels, vehicles, equipment, plant, machinery and port infrastructure (including loss or damage to cargo and cargo transhipment costs) and loss or damage to the LLTC and costs of repair and/or reinstatement, including the costs of repair or reinstatement of port facilities, and/or the LLTC.

(c) Loss caused by delay;

(d) Loss caused by pollution;

(e) Loss of life.

(f) Personal injury.

(g) Occupier's liability.

21 ADEQUACY OF THE ENVIRONMENTAL ASSESSMENT

21.1 Within this section of the representation we explain why the Environmental Impact Assessment (EIA) is inadequate in respect of its assessment of the effects of the LLTC on the Port of Lowestoft. Not only is this an important consideration in its own right, but it is clear from the application documentation that the Applicant considers that the conclusion of the Environmental Assessment assist in determining whether serious detriment is caused to the Port of Lowestoft undertaking.

The inadequacy of the assessment methodology used

21.2 In strictly formal terms, it is acknowledged that the Lake Lothing Third Crossing (LLTC) ES needs to be prepared in accordance with Directive 2011/902/EU, as implemented into UK law by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) (the 2009 Regulations). Although not explicitly identified in the 2009 Regulations it is clear from the 2011 Directive (see Article 5(1)) that EIA information should be provided in an appropriate form.

21.3 The Secretary of State's (SoS) LLTC Scoping Opinion (App 165) advised the applicant to consider the effect of the implementation of the revised Directive (EU Directive 2014/52/EU) in terms of the production and content of the ES (paragraph 3.4). The requirements of this revised Directive now having been brought into effect through the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 2017 Regulations).

21.4 The Applicant seeks to address this aspect of the Scoping Opinion within section 1.3 of its ES (App 136). Unfortunately, however, one aspect of the 2017 Regulations which the applicant has appeared to expressly fail to address in this section of the ES is the clear explicit requirement set out in Regulation 5(2) that the identification, description and assessment of significant effects must be undertaken in an appropriate manner.

21.5 Furthermore, irrespective of any such regulatory requirements, the SoS emphasised in the scoping opinion that the LLTC ES should be 'in line with best practice and case law' (APP 165, Appendix 1, paragraph A1.5). Best practice clearly has to include ensuring that the assessment is undertaken in an appropriate manner. For the reasons now explained, however, the assessment of the impacts of the proposed LLTC on the Port of Lowestoft has not been undertaken in an appropriate manner, neither can it be said that in this respect the ES is in line with best practice.

21.6 The assessment of the effects of the LLTC on the Port of Lowestoft is contained within Chapter 15: Private Assets of the ES (APP 136). Paragraph 15.3.1 of the ES explains that the assessment undertaken,

> *"adopts relevant aspects of the DMRB Volume 11, Section 3 Parts, 6 and 8 as well as IAN 125/15 which provide guidance on assessing the potential impact of a Scheme in relation to land use and community effects."*

21.7 ES Table 15-2 then sets out the 'Significance Criteria' that has been used in the Private Assets Assessment. This consists simply of four 'Impact Ratings' alongside a series of criteria used to determine each of these impact ratings.

21.8 This approach differs from usual assessment practice because no attempt has been made in the methodology to define: (i) the magnitude of the impact to be generated, or (ii) the sensitivity of the receptor receiving the impact. Failure to follow such an approach is not best practice and is inadequate, and such a conclusion is supported by the following points:

(a) The assessment methodology and approach set out in the DMRB – which the applicant indicates in its ES is appropriate for this road scheme proposal and sets the national standards for such developments (APP 136, paragraph 6.4.9) – makes it clear that the significance of an effect is formulated as a function of the receptor value and the magnitude of the impact. This is clearly set out within DMRB Volume 11, Section 2, Part 5 (HA 205/08) 'Assessment and Management of Environmental Effects' - a key aspect of the DMRB which the applicant fails to refer to in its assessment of the impacts on Private Assets.

(b) Failure to define the magnitude of an impact or the sensitivity of the receptor was an issue specifically identified by the SoS in the Scoping Opinion (APP 165, paragraph 3.14).

21.9 The inadequacy of the assessment methodology used results in some conclusions in terms of likely significant effects that are, at best, questionable. For example, the methodology used means that the assessment concludes that the demolition of two private garages would result in an overall 'Substantial Adverse' effect whereas the impact on the significant Port of Lowestoft is concluded to result in an overall 'Slight Adverse' effect (see Table 15-4 of the ES). Due to the methodology used, these two effects are directly comparable meaning that the effect on two privately owned garages is in overall terms concluded to be more significant than the effect on the Port.

21.10 If the appropriate methodology set out in DMRB Volume 11, Section 2, Part 5 (HA 205/08) were to be used the following conclusion would be reached in terms of effects on the Port. Relevant extracts of the appropriate methodology set out in DMRB are at **Annex 2**.

21.11 In terms of its value and sensitivity, having regard to the evidence relating to the Port and its future prospects provided elsewhere within this representation, ABP considers that the Port would be a receptor of 'High Value'. The DMRB gives typical descriptors for this value as 'High importance and rarity, national scale, and limited potential for substitution'. Leaving aside any other evidence, an analysis of both the Applicant's application for a section 35 direction from the SoS in respect of the LLTC and the SoS's response to that application would alone appear to support this conclusion.

21.12 In terms of the magnitude of the impact upon the Port of Lowestoft, ABP considers that – having regard to the evidence provided elsewhere in this representation - it can be argued that the impact is of 'major' magnitude. The DMRB gives typical criteria descriptors for this magnitude as ''Loss of resource and / or quality and integrity of resource; severe damage to key characteristics, features or elements'.

21.13 On the basis of the above, using the appropriate methodology set out in the DMRB would result in a conclusion being reached that the LLTC would have an adverse effect on the Port of Lowestoft of 'Large or Very Large' significance.

The incorrect application of the Applicant's own methodology

21.14 Leaving aside the preceding points about the appropriateness of the assessment methodology used, ABP also considers that the applicant has misapplied its own assessment methodology.

21.15 The Applicant's assessment concludes that the LLTC will have a 'Slight Adverse' effect on the Port of Lowestoft. The criteria given to define such an effect (given in Table 15-2 of the ES) is:

- *"Landtake that is not essential to existing or intended use;*
- *Activity that temporarily compromises or precludes use; and*
- *Loss of amenity that does not compromise use."*

21.16 From the evidence set out in this representation, these criteria cannot be said to be a reflective description of the impact of the LLTC Scheme on the Port of Lowestoft. The LLTC results in the removal of land and berth space that is essential to existing or intended use and permanently compromises activity and use. The effect of the LLTC on the Port is, in ABP's view, more aligned with the description given in respect of a 'Substantial Adverse' effect within Table 15-2 of the ES.

21.17 An inadequate understanding of the baseline environment in respect of the Port of Lowestoft – matters considered further in the following paragraphs – and an inadequate understanding of the type and extent of effects on the Port – matters also considered further in the following paragraphs – contribute, in ABP's view, to this incorrect identification of effect significance.

Failure to provide an adequate description of the baseline environment

21.18 In order for an assessment to be meaningful and adequate, it is necessary for an appropriate description of the environment likely to be affected to be given. In providing such a description it is, in ABP's view, necessary to not only describe the environment as it currently exists but to consider how the environment will involve over time in the absence of the project being promoted. ABP, for the reasons now explained, does not consider that the description of the baseline environment given in the LLTC ES in respect of the Port of Lowestoft is adequate.

Study Area

21.19 In order to define the baseline environment it is first necessary to identify the area within which the baseline is to be identified, i.e., the study area. In respect of the 'Private Assets' assessment within the LLTC ES, it is very unclear as to what the study area is. ES paragraph 15.1.3 simply states:

"The study area for the purposes of assessment of private assets is defined as the Order limits of the Scheme and adjacent land parcels (see Figure 5.1)."

21.20 It is not clear what the actual geographical extent is that is covered by 'adjacent land parcels'. ES Figure 5.1 does not assist in this regard. The reader of the ES cannot, therefore, be certain what the study area is and, therefore, cannot understand what the baseline environment is.

21.21 In respect of this point it is noted that at paragraph 3.13 of the scoping opinion it was stated:

"The SoS notes that many of the topic chapters in the Scoping Report do not specify *the study area that will be used for the assessments. The SoS recommends that the physical scope of the study areas should be identified under all the environmental topics and should be sufficiently robust in order to undertake the assessment. …… the scope should also cover the breadth of the topic area and the temporal scope, and these aspects should be described and justified."*

21.22 Specifically in respect of the assessment of Private Assets, the SoS's scoping opinion (paragraph 3.82) states:

"The baseline description lacks data sources and does not define the study area. Terms such as 'within the immediate vicinity' require explanation and justification. This limits the ability of the SoS to comment on the scope of the assessment as presented. Such information should be provided within the ES."

21.23 The Applicant has failed to address the points raised by the SoS in respect of defining the study area. The study area used has not been sufficiently well explained or justified. This, in turn, affects the adequacy of the baseline description and subsequent assessment.

Inadequate existing baseline description

21.24 As far as ABP can ascertain, the existing baseline environment description in respect of the Port of Lowestoft is limited to:

(a) Three short paragraphs in ES Chapter 4 (paragraphs 4.2.4 to 4.2.6);

(b) Two short entries within ES Table 15-3;

(c) Three paragraphs in ES Chapter 15 (paragraphs 15.4.4 to 15.4.6); and

(d) Some information within the Vessels Survey Report included as Appendix B to the Preliminary NRA.

21.25 The description provided is both limited and general in nature. In ABP's view this is not a sufficient baseline description for the purposes of assessing the impacts of the LLTC scheme on the Port.

Inadequate consideration of the evolution of the baseline

21.26 The 2017 Regulations now put into legislation the previous best practice requirement of describing the likely evolution of the baseline environment in the absence of the proposed development (Regulation 14(2)(f) and Schedule 4). Furthermore, in this regard it is noted that within the scoping opinion, the SoS, in any event, made clear that the scope of the study area "should also cover the …temporal scope and these aspects should be described and justified" (Scoping opinion, paragraph 3.13).

21.27 The only attempts to address this point within the Private Assets assessment appear to be at paragraph 15.5.2 and paragraph 15.5.13 of the ES.

21.28 Paragraph 15.5.2 simply states that any aspirations for future development, *"would need to be dealt with through local planning processes and these have been considered where the Applicant has been made aware that there are proposals to do so.*

21.29 Whilst this, in ABP's view is an inadequate attempt to address the issue, the approach that has been taken fails to have regard to the fact that the Port of Lowestoft – like all other ports in general – benefits from extensive permitted development rights that enable relevant development to take place within the Port without the need for an express grant of planning permission. There is, therefore the very real potential for development within the Port of Lowestoft to take place without it having to go through the 'local planning process'.

21.30 In paragraph 15.5.13, the Applicant tries to deal specifically with one potential development – the East of England Energy Hub – within the Port which ABP has identified could take place. This, however, appears to have been dismissed from further consideration on the basis that this is not a detailed development proposal.

21.31 ABP is surprised that the assessment does not appear to seek to grapple with the likely future evolution of the Port of Lowestoft. In this regard it is sufficient to

simply point out that future role which the Port of Lowestoft was considered likely to play in the delivery of offshore wind farms and also in the delivery of Sizewell C were aspects relied upon by the Applicant in seeking a section 35 direction from the SoS in respect of the LLTC.

21.32 A failure to consider the evolution of the baseline environment in respect of the Port of Lowestoft undermines the inadequacy of the assessment undertaken.

Failure to provide an adequate assessment

21.33 As explained in further detail throughout this written representation, the assessment of the LLTC which has been undertaken by the Applicant is considered by ABP to be inadequate in a number of regards. The detail of those concerns is not repeated here. Two further aspects, however, are now specifically identified.

Operational Assessment

21.34 At ES paragraph 15.5.19 it is acknowledged by the Applicant that a scheme of operation for the bridge is still to be developed. Although it is indicated in the same paragraph that an assumption made is that the bridge will not lift during the peak AM and PM period, the fact remains that in the absence of a scheme of operation the reader of the ES cannot be certain that the likely effects of the bridge during its operation have been correctly identified and assessed.

Failure to assess the LLTC project as defined in the draft DCO

21.35 The project for which consent is being sought is that which is set out in the draft DCO. Having considered the draft DCO as submitted there are a number of things which could happen through the powers granted by the DCO which ABP consider have not been considered in the environmental assessment. Such things include, for example, the ability – in perpetuity – to close or temporarily restrict the passage of vessels in Lake Lothing (Article 20) and a restriction on navigation within an area around the LLTC scheme (Article 41).

Summary

21.36 For the reasons summarised in the preceding paragraphs, ABP considers that the assessment of the effects of the LLTC scheme on the Port of Lowestoft contained within the ES is inadequate and the conclusions reached by the Applicant in this regard cannot be relied upon.

22 **DRAFT DCO**

22.1 In addition to the serious detriment caused by the construction and operation of the LLTC, the DCO in its draft form confers powers which conflict with and override the statutory powers on which ABP relies to manage the safe and efficient operation of the Port. Without prejudice to its objection to the LTTC Scheme, ABP considers that the DCO should be amended to allow ABP to continue to discharge its statutory functions.

Article 3 – Disapplication of legislation – byelaws

22.2 The Applicant has sought to disapply a number of the Lowestoft Harbour Bylaws due to unavoidable 'breaches' during construction and maintenance of the LLTC. Although ABP recognises this may well be the case, specific exceptions can be made by ABP to meet the circumstances.

22.3 The byelaws contain a range of important provision relating to navigational safety, and compliance with these bylaws is a matter of safety for users of the port.

22.4 In particular, ABP is concerned by the Applicant's disapplication of Byelaw 36, which requires the Applicant to obtain a permit before diving in harbour waters. It is imperative that the Harbour Master is aware of any diving taking place within the port, to ensure that appropriate safeguards are put in place for the safety of the diver and users of the port. This is an important safety issue for the port and compliance with this bylaw is required in order for the Harbour Master to properly exercise his functions.

Articles 20, 21 and 41

22.5 ABP is concerned that the powers sought by the Applicant in the following provisions will impact on ABP's ability to comply with its statutory duties and obligations:

(a) Article 20 – Temporary suspension of Navigation with Lake Lothing in connection with authorised development.

(b) Article 21 – Removal of Vessels.

(c) Article 41 – Extinguishment of right of navigation within Lake Lothing in connection with authorised development.

22.6 In particular, Article 41 of the dDCO provides the Applicant with the power to extinguish all rights of navigation within an area around the LLTC bridge, which in effect, removes any rights of navigation in the event of an emergency situation occurring close to the bridge. As such, Article 41 is overly prescriptive.

22.7 It is imperative that the Harbour Master retains the right to authorise such navigation in the case of an emergency, pollution response or other exceptional circumstance, without the need to seek the permission of the Applicant.

22.8 This issue relates to not just vessels of ABP, but other vessels which the Harbour Master may require the ability to direct to use these waters if necessary, on the grounds of safety.

22.9 This is a power which the Harbour Master can be expected to exercise responsibility and with proper regarding to safety considerations. Without this power, the waters within the vicinity of the LLTC will cease to be part of the port.

22.10 The powers sought within Articles 20 and 21 of the dDCO are already vested in the SHA through various statutes. ABP considers that these powers should not be granted to the Applicant and that they should be exercised by the SHA at the request of the Applicant, with agreement to exercise not being unreasonably withheld.

22.11 In the very least, these powers must be subject to the formal agreement of the Harbour Master, as consultation with the harbour authority only is wholly inadequate.

Article 40 - Operation of the New Bridge

22.12 ABP considers that including the Scheme of Operation within the DCO is detrimental to the operation of the port and unnecessarily restrictive. A mechanism involving the harbour authority, the Highway Authority and the Navigation Working Group should be developed to allow variation of the Scheme of Operation on agreed basis, in order to permit timely variation if modification of the scheme is required. If the parties are unable reach agreement on any proposed variation to the Scheme of Modification, there should be a duty for the SoS to rule on any variation.

Article 44 Protection against dredging

22.13 As currently drafted this article prevents ABP dredging within the limits of dredging without the consent of the Applicant. ABP may need to dredge in this area in

order to maintain safe navigation in the harbor. It is unacceptable for the discharge of its statutory responsibilities to be subject to the veto of a third party.

Article 45 - Byelaws

22.14 To have two sets of byelaws controlling navigation within one SHA will lead to confusion, inconsistency and uncertainty unless the Harbour Authority is able to approve any new byelaws made by the Applicant.

22.15 The DCO should require the consent of ABP as harbour authority for any new byelaws.

22.16 As regards the byelaws contained in the DCO itself, these are overly restrictive and unacceptable.

22.17 It is also imperative that ABP is free to amend its own harbour byelaws without requiring the consent of another party, which would otherwise be an unacceptable fetter on the exercise of ABP's statutory duties and responsibilities. The Applicant will be able to object to the confirmation of any such byelaw when the matter is determined by the Secretary of State.

22.18 The management of navigation on an ongoing basis is the statutory function and responsibility of the Harbour Authority. As such, it must be both free to amend its harbour byelaws and have the right to approve byelaws made by others which perform this function.

Schedule 2 – Requirements, Requirement 11 – Preliminary Navigation Risk Assessment

22.19 This requirement is wholly unacceptable to ABP, as the LLTC scheme must be subject to a formal and properly undertaken Navigational Risk Assessment (NRA). This is not an exercise that has been undertaken by the Applicant to date.

22.20 As such, ABP is unable to confirm whether it will be able to comply with its statutory obligations, particular in terms of safety of navigation, and have proper control of the harbour.

Schedule 13, Part 5 - Protective Provisions for Harbour Authority

22.21 The protective provisions need to be supplemented in order to properly protect the responsibilities of the ABP as harbour authority:

(a) "Port land" is currently restricted to the water areas of the harbor. The protection for operational harbour land needs to be extended to the land areas of the harbour.

(b) In paragraph 57 the obligation on the Applicant to remedy any accumulation or erosion caused by the authorised development is not currently given any time limit. This should be discharged as soon as reasonably practicable.

(c) The indemnity in paragraph 6 should be extended to the maintenance of the authorised development as well as its construction or failure.

(d) In order to ensure the safety of shipping in the harbour the harbour authority should be able to require the Applicant to exhibit rights, lay down buoys and take such other steps for preventing danger to navigation in the vicinity of the authorised development as it may reasonably require.

23 FUNDING

Funding Statement

23.1 Suffolk County Council has secured funding for the current Scheme costs estimate of £91.73 million. As far as ABP can determine, those funds do not include funding for any mitigation measures/package of mitigation required for ABP and/or any compensation sum payable to ABP or others (only land acquisition).

23.2 Paragraph 3.1.1 makes clear that the costs estimate for the Scheme only includes: "*construction costs, preparation costs since 2015/16, supervision costs and land acquisition costs. This is an estimate of the anticipated outturn cost and therefore includes an allowance for inflation*."

23.3 Suffolk County Council has not secured/made provision for any further funds to pay for compensation/mitigation measures for ABP which may be necessary to make the Scheme work and to address serious detriment. The estimated Scheme costs would be considerably higher if such costs were taken into consideration.

23.4 The projected Scheme cost quoted - £91.73 million - is therefore no longer accurate for two reasons, each of which are considered further below.

(a) Suffolk County Council have made it clear that the likely cost of land acquisition necessary for the Scheme has increased by "up to £8 million"; and

(b) It appears that Suffolk County Council has failed to make any provision for the additional sums required to address serious detriment caused by the Port by the LLTC – the total of which may be a substantial number.

23.5 Paragraph 3.2.8 states that the recent report presented to the Council's Cabinet on 19 June 2018 reports that a "*more recent costs projection suggests that there is an upward pressure of up to £8m on the original Property Costs Estimate*". Suffolk County Council has not secured funding for this further £8 million, nor confirmed that it will underwrite it. A decision on funding for this further £8 million has been deferred until Autumn 2019 (see paragraph 3.2.9 below):

> *"3.2.9 The Cabinet acknowledged that the further funding of £8m would be made available if it is needed, but deferred any final decision on any additional funding* until *Autumn 2019, by which time the Applicant expects both to have awarded a stage 2 construction contract for the Scheme and to be able to make a more accurate cost projection, as part of its preparation of a FBC to be submitted to the DfT."*

23.6 There has been no provision for the further £8 million in the Council's budget (see the Cabinet report on 19 June 2018 - provided at Appendix C, paragraph 10).

23.7 The estimated Scheme costs is therefore in actuality up to £99.73 million rather than £91.73 million – but this point is not addressed in the Funding Statement, and the cost estimates remains shown as £91.7 million.

23.8 Critically, the figure of up to £99.73 million is also without taking into account any mitigation and/or compensation for severance and injurious affection of the retained land for ABP - which has not been accounted for, and will push the total up even further. Suffolk County Council has only secured funding for £91.73 million (as explained below).

23.9 The Scheme is being part funded by the Department of Transport (£73.39 million) and the remainder is payable by Suffolk County Council (£18.34 million). Suffolk County Council and New Anglia Local Enterprise Partnership have committed to together funding 20% of the total cost of the Scheme, which amounts to the remaining £18.34 million of the original £91.73 million estimate. (The 20% contribution is given "*on the understanding that no further increase in Government funding will be considered beyond the contribution requested*" i.e. on the basis of £91.73 million maximum - see the attached letter of intent dated 22 Dec 2015.)

23.10 Paragraph 3.2.7 states that, to fund the £18.34 million required, Suffolk County Council has earmarked £10 million from the Council's capital programme and the remaining £8.3 million will come from local contributions:

> *"3.2.7 …Accordingly £10m has been earmarked from the Council's capital programme, with the remaining £8.3m anticipated to come from local contributions. If such monies cannot be drawn down from other sources, the County Council would seek to borrow the monies or draw on its reserves if required to do so to deliver the Scheme."*

23.11 The position, however, does not appear to be transparent because:

(a) No information is given as to the origin of the £8.3million from local contributions; and

(b) Suffolk County Council's cabinet report in May 2016 (Appendix B) states that funding required for both the Scheme and the Ipswich Wet dock crossing require £10 million revenue and £10 million capital over three financial years. The report does not explicitly state that the funding must be distributed £10 million towards each project – which raises the issue of whether they could still allocate more to the Ipswich Wet dock crossing (as there is shortfall of £17.443 million between the two projects).

23.12 The report to Suffolk County Council's Cabinet (of 17 May 2016) states:

> "23. *At this point it is estimated that the funding required to develop the schemes to a point where final funding approval could be sought would total £10 million revenue and £10 million capital over the three financial years 2016/17, 2017/18, 2018/19. It is anticipated that construction of both schemes will commence in the 2019/20 financial year*.
>
> *"24. The estimated funding required in each financial year to cover work on both schemes is 2016/17: £3 million revenue, £3 million capital 2017/18: £5 million revenue, £4 million capital 2018/19: £2 million revenue, £3 million capital"*

23.13 It is likely that further funding will be provided from public finances according to Document 7.4 Outline Business Case, which states that:

- *"4.3 Budgets / Funding Cover*
- *4.3.1 Funding*

- *It is likely that the scheme will be funded entirely from public finances, and it is not clear at this stage whether any private financial contribution will be available."*

23.14 Paragraph 3.2.4 and 3.2.5 of the Funding Statement contained the following errors which are misleading.

(a) Para 3.2.4 – The amount of funding from the Department of Transport is incorrectly stated to be "capped at £75.39m". The funding is actually £2 million less - being "up to a maximum of £73.39 million" (as shown in the confirmation letter from the Department of Transport provided at Appendix A).

(b) Para 3.2.5 – Again this refers to the wrong figure of £75.39m. As a result of that miscalculation it erroneously states that the amount needed to meet the Scheme costs is £16.3 million (actually £18.34 million) and that the Council is providing "*a further £2m funding".*

23.15 This misleadingly gives the impression that the Council is providing an extra £2 million on top of what is needed to achieve £91.73 million - which would not appear to be the case – see para 3.2.5 below.

> "3.2.5 … Suffolk County Council's *cabinet has agreed to underwrite the shortfall of £18.3m, which comprises the additional £16.3m required to meet the estimated Scheme cost of £91.7m (alongside the £75.39m being provided by the DfT) and a further £2m funding towards the OBC costs."*

23.16 Suffolk County Council acknowledges that - "*negative impacts on port operations*" are a possible risk to the Scheme. (See paragraph 11 of the report for the Cabinet, June 2018 - provided at Appendix C). Its reports and the Funding Statement do not, however, include any mention of funding for mitigation or compensation.

23.17 Notably the release of monies from the Department for Transport is dependent upon them receiving confirmation: "*that Suffolk C.C. has the ability to cover all remaining funding required over and above the capped Departmental amount [£73.39 million] including any additional funding required as a result of the remaining legal and procurement processes*." (See Appendix A, letter of confirmation from the Department for Transport.)

23.18 As far as can be determined, it appears that Suffolk County Council will be seeking to rely on the commitment given by New Anglia Local Enterprise Partnership for Norfolk and Suffolk and Suffolk County Council that they commit to providing funding of 20% of the total cost of the Scheme which was confirmed in their respective letters of intent dated 22 and 23 December 2015 (provided by the Applicant at Document 7.4 - Appendix M – Letter of Intent).

23.19 The letter of intent from Anglia Local Enterprise Partnership (dated 23 December 2015) states that the - *"The local partners' commitment amounts to 20% of the total cost"* and this is supported by a letter from Suffolk County Council (dated 22 December 2015) which is a signed declaration by the Council's Section 151 Officer that the - "*Council has the intention and the means to deliver this scheme on the basis of its proposed funding contribution, on the understand that no further increase in Government funding will be considered beyond the contribution requested*" (i.e. 20% of the original scheme costs estimate of £91.73 million) and that declaration *"is made on the basis that the Council can only accept responsibility for that which is within our gift to deliver*".

23.20 Albeit that Suffolk County Council has underwritten to fund £18.34 million, it appears to ABP, on considering the Funding Statement that at present Suffolk County Council cannot demonstrate that it has the ability to fund the following amounts for the Scheme:

(a) further £8 million required for land acquisition – which is yet to be budgeted for;

(b) mitigation measures/package for ABP (or others affected) – not taken into account by the Council; and/or

(c) compensation for severance and injurious affection of the retained land – also not taken into account by the Council.

23.21 The guidance note produced by the Department for Communities and Local Government entitled 'Planning Act 2008: Application form guidance' (June 2013) requires that applications for development consent orders which involve the compulsory acquisition of land or an interest in land must be submitted with a funding statement which –

> "*must contain sufficient information to enable the Secretary of State to be satisfied that, if it were to grant the compulsory acquisition request, the proposed development is likely* to *be undertaken and not be prevented due*

to difficulties in sourcing and securing the necessary funding" (paragraph 26).

23.22 It appears to ABP that the Applicant has not provided sufficient information in its Funding Statement to enable the Secretary of State be satisfied that the Scheme would not be prevented due to difficulties in sourcing and securing the necessary funding for it.

23.23 Further guidance from DCLG's guidance note entitled - "*Planning Act 2008: Guidance related to procedures for the compulsory acquisition of land*" (September 2013) clarifies at paragraphs 17, that the: –

> *"timing of the availability of the funding is also likely to be a relevant factor*" for development consent order applications, and at paragraph 18, that "*Applicants should be able to demonstrate that adequate funding is likely to be available to enable the compulsory acquisition within the statutory period following the order being made, and that the resource implications of a possible acquisition resulting from a blight notice have been taken account of.*"

23.24 Again, it appears to ABP that the Applicant has not demonstrated that adequate funding is available for the Scheme.

23.25 On the basis of the above, ABP queries the conclusion of the Funding Statement (at paragraph 5.1.2) that - "*the requisite funding will be available to meet the resource implications of delivering the Scheme, including the costs of acquiring the land and rights necessary for constructing, operating and maintaining the Scheme".*

23.26 In short, the Applicant has not demonstrated that all the funding will be available.

24 CONCLUSION

24.1 These Written Representations have been designed:

(a) First to introduce the Port of Lowestoft, its operations and the part the Port hopes to be able to continue to play as a major contributor to the local economy; and

(b) Second, to confirm why the LLTC scheme as currently proposed by the Applicant, Suffolk County Council, will cause serious detriment to the carrying on of the statutory port undertaking.

24.2 It should be emphasised that ABP has made clear from the outset that it does not object to the principle of a third river crossing of Lake Lothing.

24.3 ABP has no choice, however, but to object to the LLTC proposal as now submitted by the Applicant in that:

(a) The Scheme, as currently formulated, will act to the serious detriment of ABP's ability to carry on its port undertaking; and

(b) The Applicant has failed to offer any measures of mitigation which may at least assist in reducing the serious detriment that will be caused by the Scheme – although it is accepted as a fact that the serious detriment cannot be eliminated altogether in that the detrimental impact caused by the construction of a bridge through the centre of an operational port, is of itself, neither a sensible nor practicable proposition.

24.4 ABP has made it clear, however, that should the Applicant be prepared to offer and legally commit to, a meaningful package of mitigation measures, then it would be prepared to reconsider its submitted objections.

24.5 ***Serious Detriment*** – as to the 'serious detriment' that will be caused by the LLTC scheme, ABP has in these Written Representations summarised its concerns, commencing with the legal test in Section 127 of the Planning Act 2008 under the following headings:

(a) Compulsory acquisition;

(b) Impact on berthing space and mooring flexibility;

(c) Impact during construction;

(d) Impact during operation;

(e) Impact on current operations;

(f) Impact on future business;

(g) Navigational safety; and

(h) Inability to comply with statutory duties and obligations.

24.6 ***Mitigation*** – in terms of mitigation, ABP has formulated a package of measures which are designed to reduce the serious detriment whilst maintaining 'equivalence'. These measures include:

(a) New quay space in the Outer Harbour;

(b) An emergency berth;

(c) Oil spill prevention and control;

(d) Traffic Management Action Plan;

(e) Port security; and

(f) Aids to Navigation.

24.7 ***Indemnity*** – the final element, related to but not part of the required mitigation package is the provision of a formal Indemnity to be given by Suffolk County Council to ABP.

24.8 Whilst the Applicant has included an Indemnity for ABP in the draft DCO, the terms of that indemnity do not in fact meet the requirement of what is in fact a unique proposition.

24.9 The indemnity proposed in the dDCO is in standard terms and is not designed to meet the unique circumstances that will be faced by ABP id the LLTC is constructed.

24.10 In effect, the indemnity included in the draft DCO does not encompass the very real risks that will arise in terms of potential loss of life, health and safety for berth users of the Port and users of the bridge.

24.11 Without an indemnity in the terms sought by ABP, should injury or damage arise as a consequence of the introduction of the bridge into the middle of an operational port, ABP as the statutory operator of the Port, will be liable. This is patently not acceptable.

24.12 The Applicant wishes to introduce the hazard and the consequent risk into the Port. The Applicant must, therefore, be prepared to bear any losses that arise as a consequence of the introduction of that hazard and risk.

24.13 As noted above, ABP's position in this respect is not negotiable.

Clyde & Co. LLP

on behalf of Associated British Ports

8 January 2019

ABP statutory area

Permanent acquisition of land = 3084m²

Permanent acquisition of airspace and rights over land = 2342m²

Permanent acquisition of rights over land = 4235m²

Temporary possession of land = 40396m²

Total area affected = 50057m²

Port Berth *(inc berth number and length)*

Remaining port area west of proposals *(not including slipway)* = 89115m²

Slipway = 1378m²

Allowance for ships' mooring lines

north

Shell Quay 330m

No. 7W 30m

No. 7E 70m

No. 6 100m

No. 5 95m

No. 4W 95m

No. 4E 45m

No. 3 60m

No. 2 60m

No. 1 60m

Normanston Park

Lake Lothing

LOWESTOFT

Port of Lowestoft

Inner Harbour

Brooke Business and Industrial Park

Riverside Business Park

Kirkley Ham

Sports Ground

Trinity House

Warehouse

Recreation Ground

Leathes' Ham

Annex 1A

Scale 1: 2000 @ A1

0 50 100 metres

ASSOCIATED BRITISH PORTS

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ABP statutory area

north

No. 4W
No. 4E
45m
No. 3
60m
No. 2
60m
No. 1
60m
Silo (West)
152m
Talisman's Quay / Silo East
78m
CEFAS Quay
124m
Town Quay 3
70m
Town Quay 2
70m
Town Quay 1
57m

Port of Lowestoft

Waveney Dock

Hamilton Dock

Trawl Basin

Inner Harbour

Outer Harbour

South Basin

Lowestoft South Roads

Annex 1B

Scale 1: 2000 @ A1

0 50 100 metres

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VOLUME 11 ENVIRONMENTAL ASSESSMENT
SECTION 2 ENVIRONMENTAL IMPACT ASSESSMENT

PART 5

HA 205/08

ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL EFFECTS

SUMMARY

This Advice Note provides guidance for determining the significance of environmental effects, including for cumulative effects, and for the management of those effects.

INSTRUCTIONS FOR USE

1. Remove Contents pages from Volume 11 and insert new Contents pages for Volume 11 dated August 2008.

2. Insert the new Advice Note HA 205/08 into Volume 11, Section 2.

3. Please archive this sheet as appropriate.

Note: A quarterly index with a full set of Volume Contents Pages is available separately from The Stationery Office Ltd.

DESIGN MANUAL FOR ROADS AND BRIDGES

HA 205/08
Volume 11, Section 2,
Part 5

THE HIGHWAYS AGENCY

SCOTTISH GOVERNMENT

WELSH ASSEMBLY GOVERNMENT
LLYWODRAETH CYNULLIAD CYMRU

THE DEPARTMENT FOR REGIONAL DEVELOPMENT
NORTHERN IRELAND

Assessment and Management of Environmental Effects

Summary: This Advice Note provides guidance for determining the significance of environmental effects, including for cumulative effects, and for the management of those effects.

REGISTRATION OF AMENDMENTS

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

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PART 5

HA 205/08

ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL EFFECTS

Contents

Chapter

1. Information Assembly

2. Determining Significance of Environmental Effects

3. Management of Environmental Effects

4. References

5. Enquiries

1. INFORMATION ASSEMBLY

1.1 The task of identifying and assessing environmental effects should commence at the early inception of the project. Increasingly the potential for significant effects will have been recognised in plans or programmes. Where a Strategic Environmental Assessment (SEA) or Assessment of Implications on European Sites (AIES) has supported plans or programmes (or strategies in Scotland and Wales) it may also inform the scope of project environmental impact assessment activities (refer to SECTION 2, Part 1, Chapter 3). This scope may also have been informed by consultation with stakeholders, including the public and statutory environmental bodies.

1.2 This first chapter sets out the approach to identifying the factors and information needed to undertake the assessment of environmental effects and includes the following:

I. Defining the project.

II. Defining the study area.

III. Defining assessment years and scenarios.

IV. Information assembly.

V. Project objectives and environmental impact assessment.

VI. Environmental impact assessment and design.

VII. Exploring alternatives.

VIII. Identifying the most appropriate design.

IX. Potential impacts.

X. Mitigation, enhancement and monitoring.

XI. Environmental performance.

XII. Reporting.

XIII. Uncertainty and validity of the assessment process.

I. DEFINING THE PROJECT

1.3 Correctly defining the project is essential. The Overseeing Organisation should ensure that the assessment matches the project that is the subject of the decision-making and legal procedures, and that this relationship is made clear in the reporting (refer to SECTION 2, Part 6). Where statutory Environmental Impact Assessment (EIA) is completed, and an Environmental Statement produced, the Statement should be made public in accordance with the EIA Regulations, whether or not a Public Inquiry is required. Consideration of the Environmental Statement by the Secretary of State or equivalent before proceeding with a project is a mandatory part of the statutory decision-making process.

1.4 Division of a large project into small projects to avoid mandatory EIA is not only unacceptable, but is likely to be illegal and subject to challenge. Furthermore, the creation of smaller projects for management and administrative reasons needs to ensure that for the purposes of meeting the requirements of EIA Regulations (refer to SECTION 2, Part 2, Chapter 1), the defined projects are autonomous, neither dependent on other projects nor necessitating new additional projects in order to function. Project changes during the lifetime of that project, need to be screened and reviewed, and reported appropriately, to identify whether changes are significant enough to require further assessment.

II. DEFINING THE STUDY AREA

1.5 The study area for the assessment should be defined on a case-by-case basis reflecting the project and the surrounding environment over which significant effects can reasonably be thought to have the potential to occur both from that project and in combination with other projects. For the assessment of cumulative effects, the spatial boundary of the receptor/resource with potential to be affected directly or indirectly will also need to be considered. The study area will be set for each individual topic and it is good practice for this to be identified at an early stage (refer to SECTION 2, Part 4).

1.6 Where practical, establishing a common boundary across the assessment topics is desirable. For most projects the study area will be in the immediate environs around the project. However, for others it is possible that sensitive receptors and resources may be located beyond the immediate environs of the project, if there are ways through which the receptors and resources may experience effects associated with the project.

Consultation with stakeholders, including the public and statutory environmental bodies, and identification of potential receptors/resources and potential significant effects should inform the definition of the study area.

III. DEFINING ASSESSMENT YEARS AND SCENARIOS

1.7 The objective of environmental impact assessment is to gain an appreciation of the significant environmental effects predicted to result from a project. This process is outlined below.

1.8 The process involves forecasting the effects by comparing a scenario with the project against one without the project over time.

1.9 The absence and presence of the proposed projects are referred to as the Do-Minimum and Do-Something scenarios respectively. The potential significant environmental effects need to be defined for the Do-Minimum and Do-Something scenarios in the baseline year and a future year, or series of future years depending on the topic.

1.10 Table 1.1 sets out the assessment for the Do-Minimum and Do-Something scenarios.

Assessment Scenarios	Baseline year	Year 15 (or worst in first fifteen years)
Existing condition	✗/✓	✗
Do-Minimum	✓	✓
Do-Something	✓	✓

Table 1.1 Assessment Scenarios and Assessment Years

1.11 If one were forecasting the effects of construction, the baseline year would be chosen to represent the conditions prior to construction starting. This would be compared with the conditions during construction.

1.12 For the assessment of effects arising from the operation of the project, (such as the effects of traffic on noise and air quality) the baseline would again be chosen to represent the situation prior to any effect, i.e., without the project and its traffic. This would then be compared with the conditions once the project is open to traffic.

1.13 Figure 1.1 shows an indicative assessment timeline for construction and operational effects.

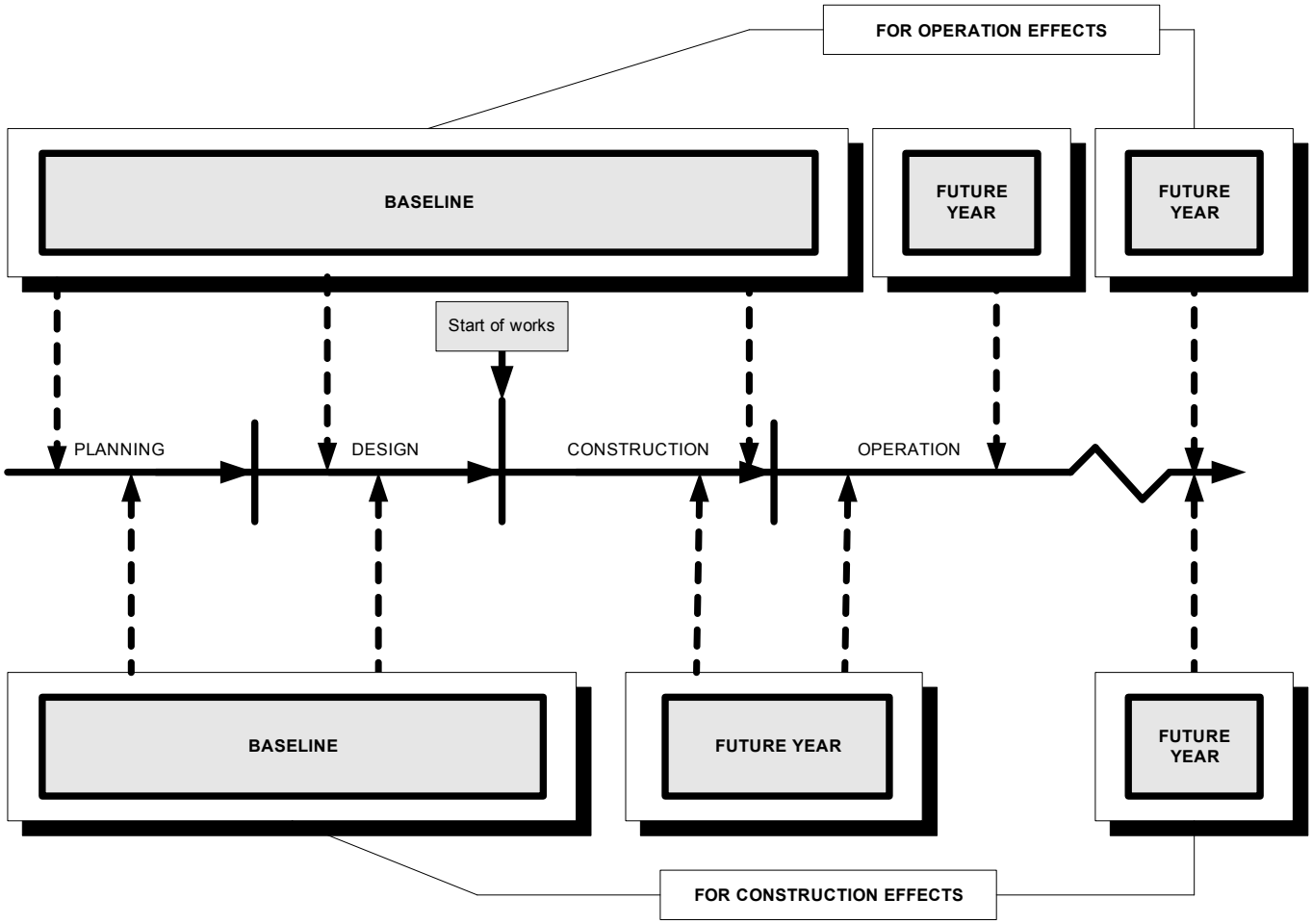

Figure 1.1 Assessment Scenarios

1.14 The topic chapters in SECTION 3 give specific guidance on baseline and future year choices for their topic. The future years are chosen to reflect any significant effects that may be predicted to arise and will be topic specific. For some topics, the worst year within the first 15 year period needs to be assessed. For others, particular target years may be assigned. Year 15 is typically the year chosen as it is likely that the mitigation measures will have achieved a significant effect by this time. For example, landscaping can typically take 15 years to deliver the mitigation of a significant effect.

1.15 To inform the likely baseline and future assessment years, each potentially affected receptor and resource should be scoped in accordance with the guidance set out in SECTION 2, Part 4. Where known, historic or current actions contributing to the state of the resource should be reviewed, indicating whether the effects are increasing or decreasing over time. Both Do-Minimum and Do-Something scenarios could be influenced by changes in legislation, land use and climate change, transport and community activities. Relevant legislation and regulation, standards and policies should therefore be identified and examined in an attempt to determine the various changes that are likely to occur regardless of the road project. These can inform the choice of assessment year(s).

IV. INFORMATION ASSEMBLY

1.16 There is a great deal of environmental information readily available to Designers from Government Organisations and agencies, academic and charitable organisations as well as the Overseeing Organisation. Data, survey and assessment needs should, therefore, be the subject of the scoping process as well as the overall project management process. It is important that the gathering of site environmental information does not lead to unnecessary anxiety amongst local people and the possible blighting of properties. However, increasingly projects will

have been identified in publicly available Transport Plans. Before the Designer undertakes a site visit, consideration should be given to the sensitivity of receptors and resources and the confidentiality of particular interests. Approval should also be sought from the Overseeing Organisation prior to approaching landowners and undertaking site visits.

1.17 Some environmental surveys should be undertaken at specific times of the year to ensure that appropriate data are obtained (see topic specific advice in SECTION 3). In order not to encounter delay, the Designer should determine the need for time sensitive surveys as early as possible in the option choice, planning, assessment and design process and then incorporate these into the project planning schedule unless impractical or unnecessary e.g., where the risk is small. Where justifiable constraints limit the scope of surveys these should be discussed with the relevant statutory environmental bodies to determine an appropriate approach and reported appropriately (refer to SECTION 2, Part 6).

1.18 Environmental data collated during the assessment process can help to populate asset databases and inform performance reporting and it should therefore be recorded, where it doesn't already exist, in line with the requirements of the Overseeing Organisation (e.g., in England, environmental data resulting from data collection should be recorded in EnvIS). Equally, data held by the Overseeing Organisation is likely to be a valuable source of data to inform the assessment process.

V. PROJECT OBJECTIVES AND ENVIRONMENTAL IMPACT ASSESSMENT

1.19 Whilst not a statutory requirement of the EIA Regulations it is useful to define the project's objectives in the early stages of a project. The objectives are the measures against which the success of the project can be judged. Project objectives can therefore be used as a benchmark against which the performance of a project can be measured (refer to SECTION 2, Part 5, Chapter 1, Section XI).

1.20 It is important to establish and understand if there is a hierarchy of objectives from national, even international, policy objectives through to the specific objectives for local areas and individual communities. For example, project objectives may be linked to objectives set out in any higher level plans or programmes (or strategies) as described via SEA reports or transport appraisal reports and plans. An awareness of conflicting objectives is needed and approaches followed to minimise the adverse risk of conflict.

1.21 The project objectives will contribute to the reporting of the extent to which:

- national, regional and local policies and strategic objectives are achieved;
- statutory obligations and project-specific objectives (including those confirmed in Public Inquiries) are achieved; and
- problems have been resolved.

1.22 The reporting of the environmental impact assessment process can therefore be used as a tool to demonstrate the effectiveness of the option choice, design and mitigation in relation to the project objectives at the time of assessment.

1.23 Objectives that are developed specifically for the project should be agreed in consultation with the Overseeing Organisation. Such objectives should be robust, be achievable in terms of affordability and value for money and measurable where appropriate, to ensure that they can be monitored and validated.

VI. ENVIRONMENTAL IMPACT ASSESSMENT AND DESIGN

1.24 One key requirement of environmental impact assessment is to ensure that there is a regular flow of information between the Designers and the topic area specialists. This is to ensure that the emerging findings of the assessment are conveyed and the feasibility of 'designing-out' potential significant adverse environmental effects is adequately considered and then carried out as an iterative process.

1.25 Avoiding, reducing and remedying significant adverse environmental effects through option choice and by inclusive design of mitigation measures is an integral part of the iterative design and planning of a project. Some mitigation may be incorporated as part of the design process for the project, for example, the selection of vertical and horizontal alignment or the location of junctions. The incorporation of other additional mitigation measures such as noise barriers or earth bunds can be separately identified to complement the chosen alignment to produce an efficient and cost-effective design.

1.26 During environmental impact assessment of a project, due regard should be given to effects that may

arise not just when the project is constructed or opened, but also in the longer term. Permanent and temporary, direct, indirect, secondary, cumulative, short, medium and long-term, positive and negative effects all need to be addressed via the design process (i.e., future effects of project implementation, operation and maintenance). Opportunity to incorporate environmental enhancement measures into the design should also be given due consideration.

1.27 In determining the most appropriate form of design solutions there should be no ambiguity. Only those measures which the Overseeing Organisation has power to control or implement and which are committed (refer to SECTION 2, Part 5, Chapter 1, Section X) should be assessed; any measures dependent upon agreement with third parties should be presented as such and not be construed as part of committed measures. Such mitigation by agreement should not feature in the assignment of effect significance unless it has been agreed to an extent that it is reasonably certain it can be secured.

1.28 Addressing the interaction of effects between the separate environmental topics requires integrated working practices with effective co-ordination between topic specialists throughout the assessment process.

1.29 It is possible that Environmental Reports prepared for plans and programmes (and strategies) under the SEA Regulations and the Assessment of Implications on European Sites process (where applicable) will impose requirements upon the design of projects. Indeed, it is possible that strategic mitigation measures may need to be delivered via individual projects. Consequently, the Designer needs to be aware of any such obligations placed on their project. The effectiveness of the project design in meeting the strategic measures defined in SEA Environmental Reports and implemented through projects may also be the subject of monitoring and auditing as part of the review reporting process defined by the SEA Regulations (refer to SECTION 2, Part 1, Chapter 3).

1.30 The assessment should reflect upon the extent to which land use and management change, and indeed how climate change, may alter future conditions. As a result of this, a new problem or opportunity may arise that does not exist under the current conditions. If dealt with as part of the assessment, cost effective solutions may be identified early when the problem is anticipated rather than left to become evident over time.

1.31 The effect of climate change is a key consideration in the assessment process. The headline changes in climate that the UK is expecting to experience as climate change manifests itself are:

a) more extreme and variable weather conditions;

b) increased fluvial flooding; and

c) changes in sea level.

1.32 There is likely to be a regional variation in the extent to which these changes occur, with the whole of the UK experiencing change, but with a greater regional emphasis on some aspects. Current UK climate change predictions, produced by the UK Climate Impacts Programme, look at 3 time frames, the 2020s, 2050s, and the 2080s, with the climatic changes becoming more pronounced the further away from the present we move. Until recently, the assumption has been that the aggregated weather observations of the past provided a good indication of current and future weather patterns. The pace of climate change is seriously challenging this presumption, and it is now important to consider the life and purpose of design features, and ensure that they continue to function under the increasing challenges of a changing climate.

1.33 Some environmental features may benefit under climate change, whilst others may deteriorate. It is down to the professional judgement (informed by relevant up to date studies, research and expert opinion where these are available) of the specialists to assess the effect of climate change, in the context of the assessment of the proposed works, on the elements under their examination, and determine the extent to which it requires a formal consideration. If climate change impacts are anticipated to increase the pressure on the element under examination, within the design life of the proposed project, then the latest UK climate change scenarios, published by the Met Office, should be considered as part of the assessment. In addition, the Designer should refer to the specific policy requirements of the Overseeing Organisation on climate change.

1.34 The separate topics areas in SECTION 3 each address climate change in greater detail.

VII. EXPLORING ALTERNATIVES

1.35 The formulation of alternatives needs to be driven by a regard to the project objectives rather than focussed on the narrow pursuit of one or two primary objectives. The aim of exploring alternatives is to ensure consideration of possible solutions that offer the best outcomes across the full range of objectives set by the Overseeing Organisation. The number and significance of adverse effects should, therefore, be minimised.

1.36 Transport projects are increasingly identified as a result of plans, programmes, strategies or studies in which an appraisal of alternatives has already been undertaken in the establishment of the project brief. Where a project contributes towards a higher-level plan, programme, strategy or study that has been the subject of, for example, a Multi-Modal Study, or Regional Spatial Strategy, then a wider range of alternatives may have previously been examined and reported in the public domain. Where this higher-level appraisal has considered alternatives, there is no requirement to duplicate the process. Therefore the consideration of alternatives should concentrate only on those alternative designs that emerge in pursuit of the project objectives.

1.37 Consequently, the Overseeing Organisation may need to consider the following types of alternatives including the "Do-Minimum" option:

a) **demand alternatives:** to meet the need through demand management techniques;

b) **activity alternatives:** such as provision of traffic calming instead of a new road;

c) **location alternatives:** selection of different corridors or access routes;

and as a sub-set of these main alternatives:

d) **delivery alternatives:** alternatives that reflect different means of delivering the desired end point in production terms, for example, a clear span bridge or one with piers and abutments in the river;

e) **scheduling alternatives:** programming the activities to avoid periods of enhanced environmental sensitivity. Alternative temporary land-take during construction should be considered;

f) **input alternatives:** use of different materials, lighting strategies or different designs; and

g) **mitigation alternatives:** a variety of solutions may be available to mitigate the adverse consequences of a proposal.

1.38 Not all alternatives need to be explored to an equal level of detail. Some alternatives will be examined in less detail than others, as a short study may reveal that they can be eliminated early in the process. Others may survive to a later stage in the project delivery process. The amount of investigation should be proportionate to the feasibility and benefits that an alternative may generate. An audit trail of such alternatives that have been examined, and the reason for not pursuing them, should be put in place.

1.39 To meet the requirements of the EIA Regulations (refer to SECTION 2, Part 2, Chapter 1), a summary of the main alternatives studied by the Overseeing Organisation that emerge in pursuit of the project objectives, the reason for the Overseeing Organisation's choice of project (taking into account potential significant environmental effects), and an indication of the main reasons for continuing with the project taking consideration of potential significant environmental effects, must be provided in the Environmental Statement. The main alternatives typically relate to 'Demand', 'Activity' or 'Location' alternatives e.g., those considered and presented at public consultation for a major project. It should be noted that consideration of alternatives for other assessment processes (e.g., Assessment of Implications on European Sites) might be different from the above.

VIII. IDENTIFYING THE MOST APPROPRIATE DESIGN

1.40 In determining the most appropriate design, the following considerations should be made:

a) the long-term effectiveness of the proposed design to secure the project objectives;

b) the ability for the design to incorporate measures to avoid, reduce or remedy significant adverse environmental effects;

c) the effect the design may have on other environmental receptors or resources;

d) the deliverability and practicality of the proposed design; and

e) the full cost of successful implementation including the practicalities of establishment and future management and maintenance costs.

1.41 The mitigation of significant adverse environmental effects should be dealt with as an iterative part of the option choice, planning and design stage. Failure to do so may result in: failure to deliver the project; and failure to avoid, reduce or remedy significant adverse environmental effects, particularly where land is not secured to allow delivery or future maintenance. Expensive solutions may also arise if the mitigation measures are implemented post construction. The following principles can be identified:

a) mitigation measures perform to an acceptable standard in safety, environmental, economic, social and community terms;

b) the mitigation measures can be fully implemented and all mitigation measures are agreed with the Overseeing Organisation. The implications for management and maintenance should be recognised by the Designer and the Overseeing Organisation (e.g., the provision of planting to form a visual screen entails a commitment to establishment maintenance in the early years and a long-term management obligation); and

c) the Overseeing Organisation should ensure that the design and mitigation measures do not unnecessarily restrict the flexibility during implementation to achieve the same or improved level of environmental performance by alternative means.

1.42 The iterative assessment and design processes should seek to incorporate measures to avoid or reduce the significant environmental effect following a hierarchical system, where avoidance is always the first mitigation measure to be considered:

a) Avoidance – consider and incorporate measures to prevent the effect (for example, consider alternative design options or phase the project to avoid environmentally sensitive periods).

b) Reduction – where avoidance is not possible, then methods to lessen the effect should be considered and incorporated into the project design. Consultation with the Overseeing Organisation will determine whether any remaining 'residual' effect is considered to be environmentally acceptable.

c) Remediation – where it is not possible to avoid or reduce a significant adverse effect, then measures to offset the effect should be considered.

1.43 The costs for environmentally sound project design and mitigation should be considered at all stages when the overall costs for funding of the project are calculated and planned, but the most cost effective and environmentally acceptable solutions will be delivered where potential environmental effects are given early consideration.

IX. IDENTIFYING POTENTIAL IMPACTS

1.44 In assessing the environmental effects of a project it is first necessary to identify the impacts that may arise as a result of project implementation. The EIA Regulations require the assessment to cover the likely significant effects arising from the permanent and temporary, direct, indirect, secondary, cumulative, short, medium and long-term, positive and negative impacts of a project.

1.45 While the majority of impacts potentially associated with road projects are well known, local circumstances may have the potential to generate unique or controversial situations. Through the process of establishing an appreciation of the problems and opportunities within the study area, an awareness of the likely impacts will emerge. These likely impacts should be identified and considered initially at the scoping stage, prior to identifying needs for further assessment.

1.46 All impacts, whether real or perceived by the community, are worthy of consideration during the environmental impact assessment process. However, the time and resource devoted to purely perceived impacts should be commensurate with that needed to secure understanding. Different impacts may overlap and the interaction of these impacts should be identified during the environmental impact assessment process.

a. Permanent and temporary impacts

1.47 Recognition should be made that permanent impacts will be more significant than those of a temporary nature. For example, the impact may only occur during a single phase of the project construction and be temporary. Alternatively, the impact may be long-term or irreversible and hence permanent. It is, therefore, important that the assessment distinguishes between permanent and temporary impacts.

1.48 Temporary impacts are those that are considered to be short or medium-term. Therefore, where the impact will be temporary, consideration should be given to the likely duration of the impact.

1.49 SECTION 3 provides further guidance on the analysis of permanent and temporary impacts associated with each environmental topic.

b. Direct, indirect and secondary impacts

1.50 The assessments should not just concentrate on the direct impacts that are generally very obvious, for example, the noise benefits of reduced traffic.

Assessments should also consider indirect impacts which occur in two basic forms:

i. impacts related to pressure as a result of project-induced change. For example, an environmental resource may experience increased pressures as the result of the implementation of a project. For example, the removal of hedgerows to make severed fields more viable; and

ii. those that alter the character, behaviour or functioning of the affected environment because of the knock-on impacts of the project over a wider area or timescale. For example, the removal of hedgerows above may lead to changes in soil retention.

1.51 Discovering indirect impacts early in the project delivery process helps determine whether to proceed or to modify the proposed design so that the long-term indirect consequences are consistent with the long-term needs and goals of the affected area as set out in adopted plans and programmes (and strategies).

1.52 SECTION 3 provides further guidance on the analysis of direct, indirect and secondary impacts associated with each environmental topic.

c. Cumulative impacts

1.53 The EIA Regulations require cumulative impacts to be considered in EIA. In addition, it is good practice to consider cumulative impacts in non-statutory environmental impact assessment.

1.54 Cumulative impacts result from multiple actions on receptors and resources and over time and are generally additive or interactive (synergistic) in nature. Cumulative impacts can also be considered as impacts resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the project[1]. Therefore, in setting the baseline scenario (refer to SECTION 2, Part 5, Chapter 1, Section III) it should be recognised that a cumulative assessment may be needed.

1.55 There are principally two types of cumulative impact in environmental impact assessment. These are:

i. cumulative impacts from a single project; and

ii. cumulative impacts from different projects (in combination with the project being assessed).

1.56 In the first type (i.e., cumulative impacts from a single project), the impact arises from the combined action of a number of different environmental topic-specific impacts upon a single receptor/resource.

1.57 In the second type (i.e., cumulative impacts from different projects, in combination with the project being assessed), the impact may arise from the combined action of a number of different projects, in combination with the project being assessed, on a single receptor/resource. This can include multiple impacts of the same or similar type from a number of projects upon the same receptor/resource.

1.58 For the purposes of this guidance, 'reasonably foreseeable' is interpreted to include other projects that are 'committed'. These should include (but not necessarily be limited to):

- Trunk road and motorway projects which have been confirmed (i.e., gone through the statutory processes).

- Development projects with valid planning permissions as granted by the Local Planning Authority, and for which formal EIA is a requirement or for which non-statutory environmental impact assessment has been undertaken.

1.59 In each case, other projects to be considered in the assessment of cumulative effects should be determined in consultation with the Local Planning Authority and other statutory bodies and confirmed with the Overseeing Organisation on a project-by-project basis.

1.60 SECTION 3 provides further guidance on the approach to identify and analyse the interrelationship between impacts associated with each environmental topic. It is important that there is good co-ordination of the sharing of results between topic areas to ensure a comprehensive identification and understanding of the interaction between impacts.

[1] *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interaction*, European Commission, May 1999.

X. MITIGATION, ENHANCEMENT AND MONITORING

1.61 Legislation provides the Overseeing Organisation with powers to:

> *"acquire land for the purpose of mitigating any adverse effect which the existence or use of a highway constructed or improved by them, or proposed to be constructed or improved by them, has or will have on the surroundings of the highway.*[2]*"*

1.62 Within these limitations and in accordance with the relevant legislation, the Designer should actively explore the feasibility and costs of delivering schemes that deliver across all the project's objectives and make effective contributions towards sustainable development.

1.63 Some measures may mitigate more than one effect. For example, planting can reduce visual effects for people and also benefit wildlife; balancing ponds may be designed with pollution control measures and deliver the required hydrological regime. Occasionally, measures can produce adverse as well as beneficial effects, e.g., an environmental barrier might severely increase visual effect or the excavation of balancing ponds may affect buried archaeological sites. It is important to manage measures to ensure that legal requirements are fulfilled and that the project objectives and anticipated benefits and commitments are achieved. Similarly, it may be necessary to monitor particular measures to ensure their successful implementation. These requirements should be covered by the standard Environmental Management System used for the project (refer to SECTION 2, Part 5, Chapter 3).

1.64 There are principally two types of mitigation; essential or desirable. Determining whether mitigation is essential or desirable relies on the professional judgement of the topic specialist. If mitigation is defined as essential, and it can be provided under the requirements and powers of the relevant legislation, then the Overseeing Organisation has statutory powers with which to deliver this. This type of mitigation can therefore be guaranteed and is taken into consideration during the assessment process. Desirable mitigation is a measure considered to be environmentally beneficial but that cannot usually be achieved using statutory powers. For example, desirable mitigation may require third party agreement. Unless this agreement is in place prior to the statutory processes, it cannot be guaranteed and therefore should not be considered when assigning significance. This is because, where a decision has been taken that the project can proceed given the reported level of environmental performance, then changes that undermine that decision may threaten the future integrity of the project, and this is more likely to arise where mitigation is purely desirable. The reporting and implementation of desirable mitigation should therefore be considered on a project-by-project basis, as agreed with the Overseeing Organisation. SECTION 2, Part 5, Chapter 1, Section VIII discusses the hierarchical approach for developing mitigation.

1.65 At each stage in the project planning process, the design and the mitigation measures should be agreed with the Overseeing Organisation. The mitigation and management commitments and requirements should also be reported appropriately in accordance with the requirements of the Environmental Management System (refer to SECTION 2, Part 5, Chapter 3). The Overseeing Organisation should ensure that appropriate skills are available to design and deliver the measures agreed during project assessment. Of crucial importance are those measures affecting and reducing the significance of adverse effects (i.e., essential mitigation). The likely effectiveness of these measures should be clearly evaluated and reported. The Overseeing Organisation should ensure that appropriate powers in accordance with relevant legislation are used to ensure that essential mitigation can be delivered. It is important that the Overseeing Organisation monitors its commitments to mitigate for adverse significant environmental effects and enhance the environment where required (for example, the duty to enhance biodiversity under Section 40 of the Natural Environment Rural Communities Act 2006). Follow-up management processes should be in place to ensure the delivery of essential features or controls takes place. In addition, the success of mitigation should be reported in accordance with the specific requirements of the Overseeing Organisation to inform continuous improvement of performance. The cost associated with the construction and establishment of measures should be included in the overall project cost, throughout the project planning and construction process.

1.66 Any commitments made earlier in the environmental assessment process should not be overlooked, particularly as these commitments and any associated measures may need to be reported to fulfil statutory obligations. Where they are no longer needed

[2] Highways Act 1980 (as amended), Part XII, Section 246.

to deliver an objective, then an audit trail should record this situation.

XI. ENVIRONMENTAL PERFORMANCE

1.67 In defining the design and mitigation solutions, rather than being overly prescriptive, the project objectives and level of environmental performance that the solution is to achieve should be specified early in the assessment process, preferably at the Scoping phase (refer to SECTION 2, Part 4).

1.68 Defining objectives specific to the project allows for the consideration of novel or innovative measures. On the other hand, there may be situations that require strict adherence to mitigation measures that are known to be successful. Due consideration of risk, failsafe and corrective measures to achieve the objective of the mitigation should be made when novel or innovative approaches are being considered. Particular care should be taken to ensure that the setting of a single performance objective does not then result in a secondary unforeseen adverse effect.

1.69 In consultation with the Overseeing Organisation, the Designer should explore alternative means of minimising mitigation costs and maintaining flexibility, whilst ensuring that the requirements of the project objectives are fulfilled and the level of environmental performance is not compromised. Where alternatives arise, these should be explored with the Overseeing Organisation to ensure there is no trade-off between maintaining flexibility and environmental performance. The level of environmental performance required may be appropriately documented as a commitment in an Environmental Management System (EMS) (refer to SECTION 2, Part 5, Chapter 3) in accordance with the specific requirements of the Overseeing Organisation. Ensuring that the proposed design and mitigation measures achieve their purpose and fulfil the project objectives is fundamental to minimise the significant adverse effects of any project and to meet any legal requirements.

1.70 Monitoring and validating of the project objectives should be undertaken to establish whether the project obligations have been met. The timescale for monitoring and validating should be agreed with the Overseeing Organisation.

1.71 Further guidance regarding project objectives is given in SECTION 2, Part 5, Chapter 1, Section V.

1.72 Environmental commitment data should be recorded as part of the process of reporting environmental impact assessments. Performance monitoring should be recorded in accordance with the requirements of the relevant Overseeing Organisation (for example, through EnvIS in England).

XII. REPORTING

1.73 SECTION 2, Part 6 provides guidance on the reporting of the environmental impact assessment process.

XIII. UNCERTAINTY AND VALIDITY OF THE ASSESSMENT PROCESS

1.74 The environmental impact assessment process should recognise that there may be some uncertainty attached to the prediction of environmental effects and this should be recognised in each of the SECTION 3 topic areas. The following are key sources of uncertainty:

- the validity of baseline data;
- the effect of the passage of time on the validity of data;
- future changes that could affect the conclusions of an assessment; and
- assumptions and predictions.

1.75 The sources of uncertainty and their implications should be clearly identified and documented, usually in qualitative terms, as the assessment progresses. Where it is meaningful to do so, the uncertainty should be expressed quantitatively, e.g., reflecting the error range associated with a particular prediction. The passage of time and environmental knowledge or change may alter uncertainty. There is, therefore, a link between uncertainty and validity in time.

1.76 One source of uncertainty is the time period or window between the various stages in project development or environmental impact assessment reporting. This influences the validity of the assessment since the data on which predictions are based may become out of date (e.g. through changes in the baseline environment). Similarly, where the environmental impact assessment places reliance upon data drawn from studies of plans or programmes (or strategies), or data gathered during a previous stage in the project delivery process, then the validity of this information should be confirmed. This may require the gathering of updated information through site visits and consultations.

1.77 Apart from considering the validity of the baseline data, the likely period over which the project and individual topic assessments would remain valid should also be considered. Retaining previously gathered data would improve the efficiency of subsequent assessments. In certain circumstances, and if agreed with the Overseeing Organisation, it may be cost effective to continue data collection during periods of inactivity, reviewing the data once the project is to be taken forward. Alternatively, continual data collection may be necessary in order to establish greater confidence in the baseline data.

1.78 Designers and the Overseeing Organisation need to be aware of the changes that may occur that question the validity of environmental data. They should consider the following variables:

i. the baseline environment changes, e.g., community expansion or species movement;

ii. the problem being addressed by the project changes and the project varies with consequentially different impacts arising;

iii. environmental values change e.g. new designations; and

iv. societal values change e.g. change of policy or legislation; new environmental design and mitigation possibilities emerge.

1.79 In some planning situations, typically urban situations, the environment may be subject to rapid change such that it is difficult to forecast the future situation. Consequently, some of the data, assumptions and predictions may become invalid. The environmental impact assessment should provide a commentary upon the likely period over which the data is envisaged to be valid and the degree of uncertainty attached to such data.

1.80 Projects emerging from plans and programmes (and strategies) may have been assessed at different levels of detail using data of potentially variable quality. Appropriate validation of the assessment from the plan or programme (or strategy) may be necessary at the commencement of the project development process since several years may elapse prior to the project development process commencing.

2. DETERMINING SIGNIFICANCE OF ENVIRONMENTAL EFFECTS

2.1 The purpose of environmental impact assessment is not to assess or characterise the environment for its own sake, but rather to influence design and option choice and ensure effort to mitigate effects is focussed on those more significant effects. The criterion for arriving at the assessment of environmental effects can be considered in a formulaic manner. In most cases the output of an environmental impact assessment will be to report on the significance of a particular effect.

2.2 The significance of the effect is formulated as a function of the receptor or resource environmental value (or sensitivity) and the magnitude of project impact (change). In other words, significance criteria are used to report the effect of the impact.

2.3 This second chapter sets out the approach to determining significance of environmental effects and includes the following:

I Assigning environmental value.

II Assigning magnitude of impact.

III Assigning significance.

IV Cumulative effects.

I ASSIGNING ENVIRONMENTAL VALUE

2.4 Typical SECTION 3 descriptors and criteria for the environmental value of an environmental resource are listed in Table 2.1. Note that not all of the SECTION 3 topics will use all the following value categories.

Value (sensitivity)	Typical descriptors
Very High	• Very high importance and rarity, international scale and very limited potential for substitution.
High	• High importance and rarity, national scale, and limited potential for substitution.
Medium	• High or medium importance and rarity, regional scale, limited potential for substitution.
Low (or Lower)	• Low or medium importance and rarity, local scale.
Negligible	• Very low importance and rarity, local scale.

Table 2.1 Environmental Value (or Sensitivity) and Typical Descriptors

II ASSIGNING MAGNITUDE OF IMPACT

2.5 Typical SECTION 3 descriptors and criteria which define the magnitude of an impact of a project are listed in Table 2.2.

Magnitude of impact	Typical criteria descriptors
Major	• Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	• Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Moderate	• Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	• Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Minor	• Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	• Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	• Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	• Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No change	• No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Table 2.2 Magnitude of Impact and Typical Descriptors

III ASSESSING SIGNIFICANCE

2.6 The approach to assigning significance of effect relies on reasoned argument, professional judgement and taking on board the advice and views of appropriate organisations. For some disciplines, predicted effects may be compared with quantitative thresholds and scales in determining significance. Assigning each effect to one of the five significance categories enables different topic issues to be placed upon the same scale, in order to assist the decision-making process at whatever stage the project is at within that process. These five significance categories are set out in the Table 2.3.

Significance category	Typical descriptors of effect
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table 2.3 Descriptors of the Significance of Effect Categories

2.7 It is important to note that significance categories are required for positive (beneficial) as well as negative (adverse) effects. The five significance categories give rise to eight potential outcomes. Applying the formula, the greater the environmental sensitivity or value of the receptor or resource, and the greater the magnitude of impact, the more significant the effect. The consequences of a highly valued environmental resource suffering a major detrimental impact would be a very significant adverse effect. The typical significance categories presented in Table 2.4 and within SECTION 3 topics have been prepared specifically for decision-making on projects and they may not necessarily be appropriate to other projects.

		MAGNITUDE OF IMPACT (DEGREE OF CHANGE)				
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
ENVIRONMENTAL VALUE (SENSITIVITY)	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Table 2.4 Arriving at the Significance of Effect Categories

2.8 Change can be either beneficial or adverse, and effects can also, therefore, be either beneficial or adverse. In some cases above the significance is shown as being one of two alternatives. In these cases a single description should be decided upon with reasoned judgement for that level of significance chosen.

2.9 The significance should be assigned after consideration of the effectiveness of the design and committed mitigation measures (in line with the Overseeing Organisation's requirements). That is, significance is assigned with mitigation in place allowing for the positive contribution of all mitigation that is deliverable and committed. In Scotland and Wales, the assignment of significance before the consideration of the effectiveness of the design and committed mitigation measures should also be undertaken, allowing for the case or reason for and the effectiveness of mitigation to be described.

2.10 At the early stages of project design, the details of mitigation are likely to be poorly defined. The significance assigned to effects by the Designer should be based upon the assumption that only standard mitigation practices should be put in place. Where other mitigation measures may be feasible or desirable to address the effects, then these should be noted but these should not influence the significance score that is assigned at this early stage. The uncertainty regarding their adoption needs to be made clear and subsequently resolved by the Overseeing Organisation at the later stages of the project assessment and design.

2.11 The SECTION 3 topics seek to ensure that the following questions, where relevant, should be considered in evaluating the significance of potential effects:

i. Which receptors/resources would be affected and in what way?

ii. Is the receptor/resource of a local, regional, national or international importance, sensitivity or value?

iii. Does the effect occur over the long or short term; is it permanent or temporary and increase or decrease with time?

iv. Is the change reversible or irreversible?

v. Are environmental and health standards (e.g., local air quality standards) being threatened?

vi. Are feasible mitigating measures available?

2.12 SECTION 3 guidance provides advice on the significance criteria for individual topics. If necessary the description of the criteria may be adjusted to reflect the specific effects that a project may generate but the overall criteria levels should not be adjusted. If changes are made, it is advisable to agree these with the Overseeing Organisation and in turn the statutory environmental bodies in advance of forecasting the actual significance criteria.

IV DETERMINING SIGNIFICANCE OF CUMULATIVE EFFECTS

2.13 When considered in isolation, the environmental effects of any single project upon any single receptor/resource may not be significant. However, when individual effects are considered in combination, the resulting cumulative effect may be significant. The focus in assigning significance to cumulative effects should be determined by the extent to which the impacts can be accommodated by the receptor/resource. Thresholds (limits beyond which cumulative change becomes a concern) and indicative levels of acceptable performance of a receptor/resource may also aid the assessment process.

2.14 The following factors should be considered in determining the significance of cumulative effects:

- Which receptors/resources are affected?
- How will the activity or activities affect the condition of the receptor/resource?
- What are the probabilities of such effects occurring?
- What ability does the receptor/resource have to absorb further effects before change becomes irreversible?

2.15 It is useful to standardise significance criteria for cumulative effects. The 5 categories below could be used as a framework for determining significance of cumulative effects:

Significance	Effect
Severe	Effects that the decision-maker must take into account as the receptor/resource is irretrievably compromised.
Major	Effects that may become key decision-making issue.
Moderate	Effects that are unlikely to become issues on whether the project design should be selected, but where future work may be needed to improve on current performance.
Minor	Effects that are locally significant.
Not Significant	Effects that are beyond the current forecasting ability or are within the ability of the resource to absorb such change.

Table 2.6 Determining Significance of Cumulative Effects

2.16 It should be noted that the assessment of air quality and other assessment processes, for example Assessment of Implications on European Sites, might have different requirements for the consideration of cumulative effects.

3. MANAGEMENT OF ENVIRONMENTAL EFFECTS

Introduction

3.1 Advice on good environmental design, mitigation measures associated with specific environmental topics and on the implementation and management of environmental issues in projects is given in DMRB Volume 10 (or its updates), in SECTION 3 and in guidance specific to the relevant Overseeing Organisation. This chapter advises on how a project's likely significant environmental effects, as identified by the environmental impact assessment process, should be managed in order to mitigate adverse project consequences and to proactively protect the environment.

The Environmental Management Process

3.2 In order to maintain a project's long-term environmental performance and delivery of its objectives it is essential that a link is built between the project design and assessment process and the environmental management process. A structured and formalised approach will allow environmental planning, implementation, review and reporting to work as one. Environmental Management Systems (EMS), such as those specified in the ISO 14000 series of standards and the Eco-Management and Audit Scheme (EMAS), cover such a structured approach. For England, cross reference should be made to DMRB's guidance for EnvIS, which sets out environmental management information requirements for EnvIS (a Geographical Information System (GIS) based Environmental Information System which houses environmental asset and management information). Reference should be made to the specific requirements for EMS of each of the Overseeing Organisations.

3.3 The environmental management process addresses the how, when, who, where and what of integrating environmental mitigation measures and management throughout an existing or proposed operation or activity. It encompasses all the elements that are sometimes addressed separately in option choice, consultation, design, mitigation, monitoring and action plans. The function of the environmental management process is, therefore, to:

i. assist in the identification of significant environmental effects;

ii. assist in the co-ordination of the option choice, design and implementation of measures;

iii. ensure awareness of the project's commitments to design, mitigation, enhancement and monitoring measures made in project design and reporting;

iv. provide a checklist of measures;

v. measure environmental performance; and

vi. provide the basis for monitoring and auditing the delivery of environmental measures.

3.4 The environmental management process may typically be divided into four main stages:

i. Planning and Design: covering activities related to:

   – feasibility;

   – outline design;

   – detailed design.

ii. Construction: covering activities:

   – prior to construction (e.g. site preparation);

   – during construction (e.g. works);

   – during establishment (e.g. site reinstatement).

iii. Handover: covering:

   – the transfer of scheme-specific environmental information from new-build to network management agents.

iv. Operation and Maintenance: covering environmental management in the course of network:

   – operation;

   – maintenance.

3.5 The environmental management process is complementary to the activities undertaken during the environmental impact assessment process and collates all appropriate and relevant information that should exist within the project Designer's teams. To support the delivery of project mitigation, a suitable environmental management process should accompany all environmental impact assessments. This process should fulfil the specific requirements of the Overseeing Organisation.

4. REFERENCES

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Statutory Instrument 1988 No. 1241 The Highways (Assessment of Environmental Effects) Regulations 1988, *The Stationery Office Limited*, ISBN 011087241X.

Statutory Instrument 1993 No. 3160 The Roads (Northern Ireland) Order 1993, *The Stationery Office Limited*, ISBN 0110342895.

Statutory Instrument 1994 No. 1002 The Highways (Assessment of Environmental Effects) Regulations 1994, *The Stationery Office Limited*, ISBN 0110440021.

Statutory Instrument 1994 No. 2716 The Conservation (Natural Habitats, &c.) Regulations 1994, *The Stationery Office Limited*, ISBN 0110457161.

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European Commission (2007): Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC.

5. ENQUIRIES

All technical enquiries or comments on this Advice Note should be sent in writing as appropriate to:

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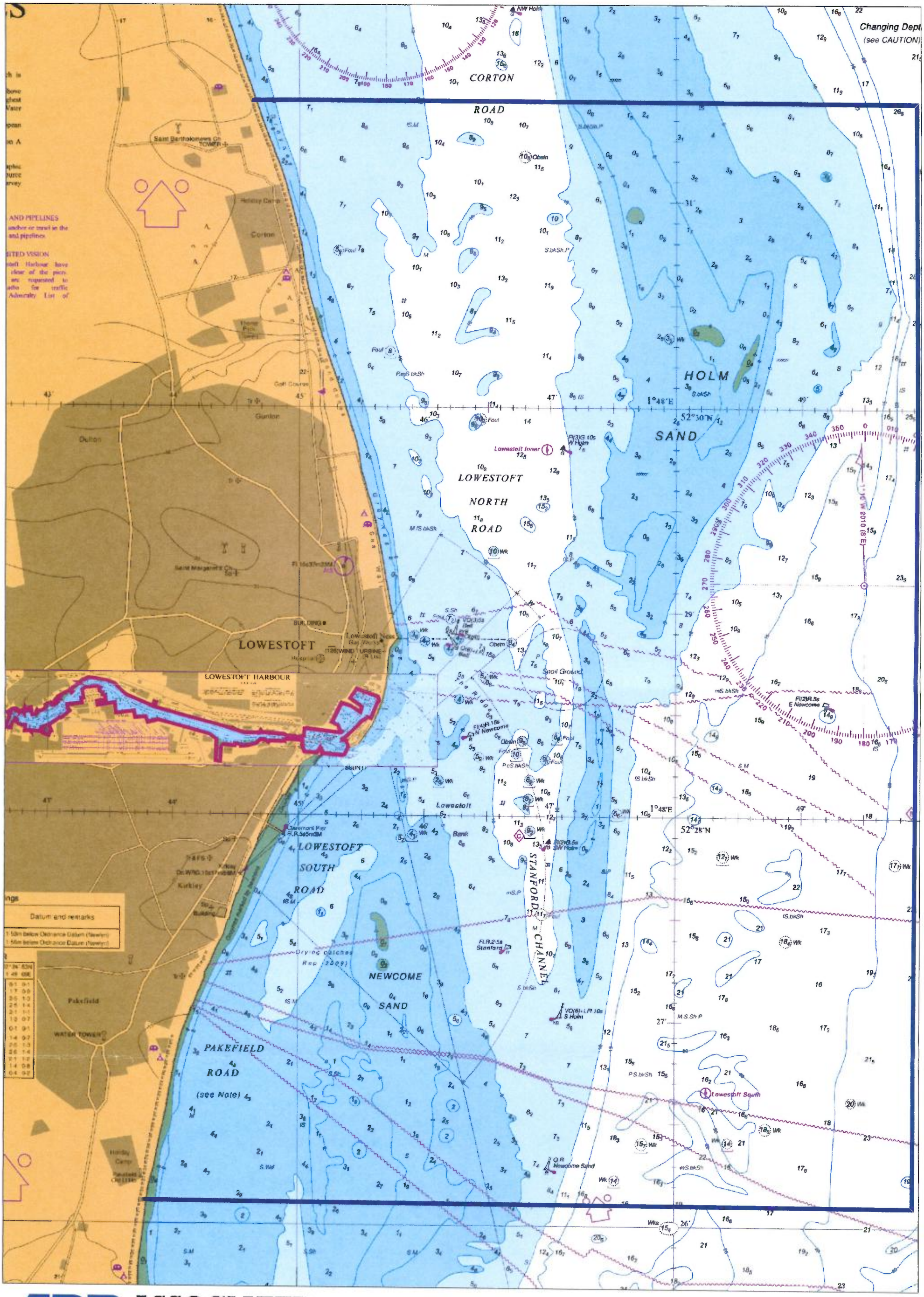
Plan 1



ASSOCIATED BRITISH PORTS

Limit of SHA (Port Limit)
Limit of CHA (Pilotage Limit)
CHA = SHA unless shown otherwise

Revision 2 - 1st September 2010

Lowestoft (1:75,000)

Associated British Ports

Port of Lowestoft: Economic Study

Report

Draft | 11th August 2018

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Executive Summary

i. Situated directly opposite major continental ports, the Port of Lowestoft (Port) serves the busy sea routes between the UK, Europe, Scandinavia, and the Baltic States. The Port is linked by A-roads to the M11 and M1 and has quayside rail links. Nearby, Norwich Airport is linked to destinations in the UK and Europe.

ii. The Port is home to the Operation and Maintenance Base for Greater Gabbard Offshore wind farm. Part of the Port also offers extensive facilities for the construction of large topside-deck structures and jackets destined for the North Sea and other oil and gas fields and wind farms. The Port is home to a substantial fleet of offshore standby/support vessels.

iii. In total, the Port currently (as at August 2018) supports 523 direct, indirect and induced FTE (full- time equivalent) jobs at the local level. The current economic impact of the Port (as at August 2018) is substantial when quantified as gross value added (GVA); the Port supports in the range of £30.9 million to £37.3 million of GVA annually[1]. The order of 35% to 47% of the current GVA contribution of the Port (as at August 2018) is associated with offshore wind related activity (for the lower and upper ranges of GVA per job applied respectively). The recent developments in offshore wind are of strong significance to the offshore supply chain, given the challenges and uncertainties in the oil & gas sector.

iv. Looking to the future, the Port has a central role to play in economic prosperity in Lowestoft and the wider region. Ports play a critical role in enabling industry to trade and do business – by providing key economic infrastructure that allows business to take place. In acting as effective enablers ports must respond to the changing needs of industry and ensure that their needs are sufficiently met.

v. The Port is no different in this context. The future growth of the offshore wind industry is the primary driver of changing activity at the Port. The Port has positioned itself as a renewable energy hub with offshore wind farm projects utilising port infrastructure for their operations. The role of the Port in the expansion of the offshore energy industry is particularly important in enabling sustainable growth and economic prosperity for the local area.

vi. In the future, there is potential for the Port to act as an enabler for securing further economic benefits of offshore wind developments for Lowestoft. The Port is a relatively 'ready to go' base for future offshore wind activity, making it well placed to attract further activity. This activity has the potential to deliver long-term economic benefits to the local economy; it includes significant long-term operations and maintenance activity and the potential future repowering of turbines. By accommodating projected future demand, it is estimated that the Port could support 1,581 direct, indirect and induced full-time equivalent (FTE) jobs and contribute in the range of £122.2 million to £177.1 million of GVA annually (in 2017 prices) to the Lowestoft economy by 2036.

vii. The implementation of the proposed Lake Lothing Third Crossing could significantly adversely impact upon this economic potential for the Port. It is estimated that the Port's future economic contribution in 2036 could be a significantly lower figure than without the proposed bridge; 876 direct, indirect and induced FTE jobs compared with 1,581 direct, indirect and induced FTE jobs, and contributing in the range of

[1] Range reflects lower and upper estimates of offshore wind GVA contribution.

£60.9 million to £79.9 million of GVA annually instead of £122.2 million to £177.1 million of GVA annually (in 2017 prices).

viii. A discounted cash flow (DCF) analysis indicates that the total present value benefits over an 18-year period are in the range of £706.3 million to £902.7 million under the 'With SCC bridge' scenario where the proposed Lake Lothing Third Crossing is implemented, compared with between £1.08 billion and £1.50 billion under the 'No bridge' scenario where it is not implemented.

1 Introduction

1.1 Background

1. Situated directly opposite major continental ports, the Port serves the busy sea routes between the UK, Europe, Scandinavia, and the Baltic States. The Port is linked by A-roads to the M11 and M1 and has quayside rail links. Nearby, Norwich Airport is linked to destinations in the UK and Europe.

2. The Port is home to the Operation and Maintenance Base for Greater Gabbard Offshore wind farm. Part of the Port offers extensive facilities for the construction of large topside-deck structures and jackets destined for the North Sea and other oil and gas fields and wind farms. The Port is home to a substantial fleet of offshore standby/support vessels.

3. Two developments provide important context to the study: (i) the development of a new Port Master Plan and (ii) the proposed Lake Lothing Third Crossing. The Port Master Plan will set out the strategic development of the Port in the future. The Port Master Plan is being prepared in accordance with Department for Transport (DfT) guidance on Port Master Plans[2]. The proposed Lake Lothing Third Crossing project involves the construction of a new highway crossing of Lake Lothing, Lowestoft, connecting Riverside Road to the south of Lake Lothing with Peto Way to the north of Lake Lothing. The Planning Inspectorate received an application for the project on 13 July 2018.

4. ABP commissioned Edge Economics to undertake an overarching economic impact analysis, considering both the current and potential future economic value of the Port. The analysis undertaken is informed by a study of the offshore wind sector undertaken for ABP by specialist renewable energy consultants, BVG Associates[3].

1.2 Economic impact study objectives

5. The primary objective of the study is to establish up to date evidence on the economic influence of the Port. There are two aspects to this objective:

    1. To understand the current economic value of the Port at the present day (as at August 2018); and
    2. To understand the potential future economic value of the Port over the Port Master Plan period (up to 2036) under different scenarios with respect to the proposed Lake Lothing Third Crossing.

6. This report is structured as follows:

    - Section 2 outlines the methodology applied in this study;
    - Section 3 presents the analysis of the current economic value of the Port;
    - Section 4 presents the analysis of the potential future economic value of the Port; and
    - Section 5 summarises the key conclusions.

[2] 'Guidance on the Preparation of Port Master Plans' DfT (December 2008).
[3] 'Offshore wind opportunities in the Port of Lowestoft: An independent report for Associated British Ports' BVG Associates (July 2018).

2 Methodology

2.1 Overview

7. The study focuses on the economic impacts of the Port on the local economy.

8. The economic impact assessment utilises a broad range of primary and secondary data sources. Information provided by ABP and its tenants has been important in ensuring the best possible evidence base and methodological rigour for the analysis.

2.2 Methodology

9. The methodology applied for this study has been tailored to capture, as robustly as possible, the scale and significance of the economic impacts of the Port.

Time period

10. The analysis considers both the current economic value of the Port (as at August 2018) and potential future economic value of the Port over the Port Master Plan period to 2036. A discounted cash flow (DCF) analysis is also undertaken which considers impacts further ahead to 2078 (for the purposes of comparison with material published as part of the Outline Business Case for the Lake Lothing Third Crossing).

Scenarios

11. A scenario-based approach is applied to explore the potential future economic value of the Port. Two scenarios are tested:

    1. "No SCC bridge" - where the proposed Lake Lothing Third Crossing is not implemented; and

    2. "With SCC bridge" - where the proposed Lake Lothing Third Crossing is implemented,.

12. ABP has defined the scenarios to be tested and BVG Associates has undertaken an analysis of associated employment impacts in the offshore wind related sector. Our analysis takes the form of a ‘what if’ type of economic impact modelling using this information.

Analysis of port activities

13. Impacts are reported using the following groupings of port activities for the Port:

    1. Offshore wind related activity; and

    2. Other activity.

14. Reporting using these groupings is appropriate for two reasons. First, it enables the analysis to account for significant differences in the economic characteristics of port activities at the Port. (The characteristics of the offshore wind related sector are distinct from those of other activities at the Port.) Second, it reflects the changing role of the Port to accommodate significant future growth in offshore wind related activity.

15. Whilst further growth in offshore wind related activity is the primary opportunity for planned growth at the Port, it is noted that other areas of potential future opportunity

exist. These include future opportunities in agribulks and aggregates[4] (the latter linked to major infrastructure projects such as HS2, Sizewell C construction and ongoing roads programme). The potential economic value of these opportunities is not monetised within the economic analysis undertaken, the focus is on the development of offshore wind related activity.

16. An analysis of offshore wind related activity has been undertaken by BVG Associates. Edge Economics has undertaken an analysis of other activity. The overall picture of economic value presented in this report is developed drawing on analysis undertaken by both parties. A summary of the methodology applied to the study of the two groups of activity is set out below.

Offshore wind related activity

17. BVG Associates undertook an analysis of offshore wind related activity at the Port. Edge Economics liaised with BVG Associates to incorporate their impact estimates into an overall picture of jobs and GVA impacts across the Port.

18. BVG Associates produced a study on the demand for berths in Lowestoft at the Port arising from wind sector activity along with associated employment estimates[5]. The study also considered to what extent the proposed Lake Lothing Third Crossing could affect growth of the offshore wind industry in Lowestoft.

19. The BVG Associates analysis considers the following employment impacts:

- **Direct** – those working for the wind farm owner or the large contractors, such as a turbine manufacturer;
- **Indirect** – those working elsewhere in the supply chain; and
- **Induced** – those created from the expenditure of direct and indirect workers.

20. The estimate of current direct employment (as at August 2018) is informed by primary research at the Port and data collected from tenants by ABP.

21. Indirect employment is estimated on the basis of BVG Associates's specialist knowledge of the supply chain in the offshore wind related sector. The BVG Associates analysis assumes that for every job created at the Port, a further 0.1 of an indirect job is created elsewhere in the town. The BVG Associates analysis assumes that for every direct and indirect job, a further 0.05 of a induced job is created in the town. BVG Associates note that these assumptions are consistent with Government guidance[6].

22. The BVG Associates study also considers the potential future economic value of offshore wind activity at the Port. The analysis is based upon the anticipated changes at the Port as detailed in the Port Master Plan[7].

23. In broad terms, the BVG Associates analysis considers:

1. The future UK demand for vessel berths;

[4] As identified in the draft Port of Lowestoft Master Plan.
[5] 'Offshore wind opportunities in the Port of Lowestoft: An independent report for Associated British Ports' BVG Associates (July 2018).
[6] Additionality Guide. Fourth Edition, Homes and Communities Agency, 2014. Available online at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf
[7] 'Port of Lowestoft: Port Master Plan' ABP (July 2018).

2. The future UK demand that could reasonably be captured by the Port; and

3. The number of jobs associated with the current and future demand captured by the Port.

24. Further detail on BVG Associates' methodology is provided in BVG's report.

25. Edge Economics used the employment estimates from the BVG Associates work to estimate associated GVA under both the 'No SCC Bridge' and the 'With SCC Bridge' scenarios.

26. The GVA equivalent of the aggregate jobs estimates is estimated using a range in average GVA per job of £79,525 to £126,000. This reflects the range of different values for GVA per job established in empirical research. Accordingly, the economic analysis takes a prudent approach, considering the range of different potential outcomes for GVA. The values applied are based on evidence for the offshore wind sector established in research published by BIS and the New Anglia LEP[8].

27. It is well established that jobs in the offshore wind related sector are characterised by a higher GVA per job than the average for the whole economy. The latest Office of National Statistics (ONS) productivity statistics indicate a whole economy figure of £53,191 for the UK and £50,333 for the East of England region[9].

Other activity

28. Edge Economics undertook an analysis of other activity at the Port.

29. The work involved a desk-based exercise utilising ABP data, port land use plans and other publicly available datasets. A site visit to the Port was undertaken in July 2018. ABP contacted tenants to obtain current employment levels (as at August 2018) and provided this data to Edge Economics.

30. The focus of the analysis is on employment and GVA impacts.

31. The analysis considers the following impacts:

- **Direct** – the direct employment associated with the Port, including employment based on or from (e.g. offshore) the Port Estate or within close proximity (circa 100m);
- **Indirect** – the supply chain impacts of the expenditures of the Port and port related activities; and
- **Induced** – the follow-on economic impacts of the expenditures of those directly employed in port related sectors.

32. Together, the estimates of these impacts provide a comprehensive picture of the scale and breadth of the Port's economic influence.

33. The estimate of current direct employment (as at August 2018) is informed by primary research at the Port and data collected from tenants by ABP. Indirect and induced employment is estimated using local level multipliers of 1.11 for indirect

[8] Figure of £79,525 based on BIS research on offshore wind, 'The size and performance of the UK low carbon economy' (March 2015). BIS figure of £72,993 for 2013 expressed in 2017 prices using HM Treasury inflation adjustment. Figure of £126,000 based New Anglia LEP research, 'Economic Strategy Evidence Base Report' (December 2017), for the energy sector in Norfolk and Suffolk.
[9] 'Labour Productivity: Q 2018' ONS (published July 2018). Figure of £53,191 for all industries in 2016.

effects and 1.11 for induced effects (equivalent to a composite multiplier of 1.23), based on experience in economic analysis of the ports sector.

34. The composite multiplier applied (1.23) is considered conservative since port related activities typically generate stronger economic multiplier effects than other sectors in the economy. This is evidenced by input-output tables published by the Scottish Government which provide estimated type II multipliers (composite multipliers) by business activity at the national level[10]:

Figure 1: Multiplier effects of port related activities vs. other sectors

	Type II employment multiplier
Primary port related sectors	
Water transport	2.1
Oil & Gas extraction, metal ores and other	1.8
Fishing	1.7
Repairs and maintenance	1.8
Other sectors	
Business support activities	1.3
Agriculture	1.4
Retail excluding vehicles	1.3

Source: Scottish Multiplier Statistics.

35. These indicate that primary port related activities such as water transport (2.1), oil & gas extraction (1.8), fishing (1.7) and repairs and maintenance (1.8) have higher employment multipliers than other sectors such business support activities (1.3), agriculture (1.4) and retail excluding vehicles (1.3).

36. The GVA equivalent of the total jobs figure is estimated using an average GVA per job of £51,642. This is based on the latest ONS productivity statistics for the transportation and storage sector in the East of England[11]. This figure is considered conservative since some of the activities at the Port are in higher value added sectors (such as oil and gas).

37. The analysis of future impacts considers the potential future economic value of the Port over the Port Master Plan period to 2036. This applies the same economic impact framework as the estimate of the current economic value. The analysis is based upon the anticipated changes at the Port as detailed in the Port Master Plan[12]. It considers the type of growth envisaged and the relationship to customers and employment.

Discounted cash flow (DCF) analysis

[10] 'Scottish Multiplier statistics', Type II employment multipliers for 2015, see https://www.gov.scot/Topics/Statistics/Browse/Economy/Input-Output/Mulitipliers

[11] 'Labour Productivity: Q 2018' ONS (published July 2018). Figure of £49,850 for 2016 expressed in 2017 prices using HM Treasury inflation adjustment.

[12] 'Port of Lowestoft: Port Master Plan' ABP (July 2018).

38. To provide a picture of aggregate impacts over time, a discounted cash flow (DCF) analysis of GVA under each of the scenarios is provided. This DCF value represents a lump sum in today's value of the GVA arising from the Port over a set period.

39. The DCF is provided over two timeframes; using an 18-year and 60-year appraisal period.

40. The 18-year appraisal period reflects the timeframe for the Port Master Plan to 2036. It is also consistent with the time period of the Local Plan. The analysis for the 18-year period is expressed in 2017 prices.

41. The analysis over a 60-year appraisal period has been provided in addition in order to provide figures that can be compared with the appraisal presented in the Third Crossing Outline Business Case[13]. This reflects a typical transport type appraisal and is therefore expressed in 2010 prices[14].

2.3 Key assumptions

42. The analysis applies the following key assumptions:

- The spatial scale of analysis is the local area (Lowestoft);
- The current economic value estimated refers to the value as at August 2018;
- The analysis is based on current macroeconomic conditions (as at August 2018) and does not factor in changes that may arise as a consequence of the UK leaving the EU. For example, some sources suggest that the UK fishing sector may experience higher levels of growth should the UK leave the EU – this is not factored into the analysis. Similarly, barriers to cross channel and international trade are not included;
- The analysis of future impacts does not include additional economic activity associated with opportunities in other areas (e.g. agribulks and aggregates) or major projects except for offshore wind related activity. For example, the economic impacts of the proposed Sizewell C project[15] are not included;
- GAV figures are expressed in 2017 prices unless otherwise stated;
- The BVG Associates analysis of offshore wind related employment impacts assumes current levels of automation going forward;
- The DCF analysis applies a 3.5% discount rate in years 1-30 and 3.0% in years 31-60 (in alignment with DfT and HM Treasury Green Book guidance); and
- The DCF analysis of GVA impacts assumes annual productivity growth (growth in GVA per job) of 0.5% for both offshore wind related activity and other activity at the Port. This reflects the potential for greater labour productivity through increased automation and use of technology.

[13] 'Outline Business Case: Lake Lothing Third Crossing' Mouchel for Suffolk County Council and New Anglia LEP (December 2015).
[14] 2017 values have been expressed in 2010 values using the GDP deflator values from the WebTAG Databook, DfT (June 2018 v.1.10.1).
[15] EDF Energy's proposals for a new nuclear power station on the Suffolk coast.

3 The Current Economic Value of the Port

3.1 Overview

43. This section examines the current (as at August 2018) economic contribution of the Port to the local economy.

44. As outlined in the methodology section, we consider economic activity at the Port using two groupings: (i) offshore wind related activity and (ii) other activity.

45. The analysis presents two key metrics, employment and GVA.

3.2 Creating and supporting jobs

46. The overriding economic contribution that the Port provides to the local economy is the creation of jobs. These comprise of direct employment at both ABP and tenants across the Port Estate plus indirect and induced employment across the local economy.

Offshore wind related activity

47. The recent developments in renewables are of strong significance to the offshore wind supply chain, given the challenges and uncertainties in the oil & gas sector.

48. Lowestoft's location, central on the East Anglia Coast, makes it an attractive site for wind farm operators. Existing demand is evidenced by current and recent activities taking place in both the Outer Harbour (Greater Gabbard) and Inner Harbour (for Galloper). ABP report that the Outer Harbour is almost at capacity.

49. In total, offshore wind related activity at the Port currently (as at August 2018) supports around 138 jobs (of which 119 are direct, 12 indirect and 7 induced).

Other activity

50. The large range of operators and tenant businesses working on the Port Estate support a substantial number of embedded business-to-business supply chains within the local economy.

51. ABP directly employ the equivalent of 24 full time equivalent (FTE) jobs as at August 2018. The majority of these posts are in the marine business area that includes bridge operator, coxswain, deckhand and pilot roles. The posts cover a broad range of occupations and associated skills levels. Given that many of the manual posts are skilled rather than un-skilled posts, overall the Port has a relatively high proportion of skilled jobs.

52. In addition to ABP staff, ABP's tenants' operate businesses across a range of business areas across the Port Estate. These support an estimated 289 FTE jobs as at August 2018.

53. Historically, employment levels at the Port have fluctuated from year to year. In particular, these fluctuations have been driven by changes in contract work associated with the oil & gas sector. The employment level at the Port in August 2018 reflects a historically low level of contract work associated with the oil & gas sector.

54. In total, other activity at the Port currently (as at August 2018) supports 385 FTE jobs (of which 313 are direct, 34 indirect and 38 induced).

55.

Summary

56. **The Port currently (as at August 2018) supports 523 direct, indirect and induced full time equivalent jobs at the local level.**

Figure 2: Employment impact (current – August 2018), Port of Lowestoft

	Direct	Indirect	Induced	Total
Offshore wind related activity	119	12	7	**138**
Other activity	313	34	38	**385**
Total	**432**	**46**	**45**	**523**

Source: Edge and BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

3.3 Generating economic value

57. Economic value at the Port is generated through physically enabling firms in the region to trade and industries to import and export raw materials and finished products to international markets. The role of the Port in serving the needs of the offshore wind related sector is particularly important.

58. The nature of the activities supported by the Port is such that the associated jobs have a relatively high average GVA per job compared with the economy average.

59. **The Port currently (as at August 2018) supports in the range of £30.9 million to £37.3 million in GVA across the local economy.**

Figure 3: GVA impact (current – August 2018), Port of Lowestoft

	GVA to local economy (£m)	
	Lower range	Upper range
Offshore wind related activity	11.0	17.4
Other activity	19.9	19.9
Total	**30.9**	**37.3**

Source: Edge using BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

3.4 How estimates relate to other work

The estimate of the current economic value of the Port is based on the methodology outlined and relates to the economic impacts to the Lowestoft economy at August 2018. Arup undertook a national economic impact study of ABP's 21 UK ports in 2014/15. The 2014/15 study was undertaken at a national level with the sole purpose of establishing the broad magnitude of ABP's total contribution to the UK economy. The study was not a bottom-up assessment of each individual ABP port. Accordingly, the findings which were below the national level should be treated in this context. Nonetheless, the study did generate an estimate of the economic impact

of the Port to the East of England regional economy (approximately 1,200 jobs and £79 million in GVA).

4 The Potential to Drive Future Economic Growth

4.1 Overview

60. This section examines the potential future economic contribution of the Port to the local economy.

61. As outlined in the methodology section, we consider economic activity at the Port using two groupings: (i) offshore wind related activity and (ii) other activity. The potential to further grow offshore wind activity at the Port is a particular focus for growth. This is evidenced in the Port Master Plan and BVG Associates study.

62. Two scenarios are tested:

- Scenario 1 – No bridge
- Scenario 2 – With SCC bridge

63. The analysis presents two key metrics; employment and GVA.

4.2 Broad growth outlook

64. Looking to the future, the Port has a central role to play in economic prosperity in Lowestoft and the wider region. Ports play a critical role in enabling industry to trade and do business – by providing key economic infrastructure that allows business to take place. In acting as effective enablers ports must respond to the changing needs of industry and ensure that their needs are sufficiently met.

65. The Port is no different in this context. The needs of industry in Lowestoft and wider East Anglia have changed considerably over past years. The future growth of the offshore wind industry is the primary driver of change in activity at the Port. The Port has positioned itself as a renewable energy hub with offshore wind farm projects utilising port infrastructure for their operations. The role of the Port in the expansion of the offshore energy industry is particularly important in enabling sustainable growth and economic prosperity for the local area.

66. In the future, there is further potential for the Port to act as an enabler for securing further economic benefits of renewables developments for Lowestoft. The Port is a relatively 'ready to go' base for future renewables activity, making it well placed to attract further activity. This activity has the potential to deliver long-term economic benefits to the local economy; it includes significant long-term operations and maintenance activity and the potential future repowering of turbines.

4.3 Scenario 1 (No bridge)

Description

67. This scenario assumes that the proposed Lake Lothing Third Crossing is not built and that port use continues. Under this scenario, the Port is able to fully accommodate forecast future offshore wind related demand (as per the projections in the BVG Associates analysis).

Key assumptions

General

- East Anglia ONE North and East Anglia TWO (Scottish Power Renewables projects) adopt a Crew Transfer Vessel (CTV) servicing model

Outer Harbour

- Fishing and oil & gas activity remain in place

Inner Harbour

- Existing users including Dudmans and CEFAS remain in place
- An aggregate handling facility is reinstated, potentially including a conveyor to the rail head
- The former Shell site is redeveloped for future offshore wind industry use

Results

68. Under this scenario, employment associated with offshore wind related activity is expected to grow significantly over the period to 2036 (as evidenced by the BVG Associates analysis). Offshore wind related employment is expected to increase from 138 jobs to 1,080 jobs; an increase of more than seven-fold. The strong economic multiplier effects associated with this activity, driving growth in supply chain employment, contribute toward this expansion.

69. The average level of employment associated with other activity at the Port is expected to remain broadly unchanged over the period to 2036 with the exception of oil & gas activity. As noted earlier, the level of employment at the Port in August 2018 reflects a historically low level of oil & gas sector contract work. Assuming a continuation at such a low level to 2036 would therefore be overly pessimistic. Accordingly, from 2020 onwards an average level of employment in oil & gas activity is assumed based on observed historic employment. Direct ABP employment and employment in other activity (excluding oil & gas) is expected to remain unchanged from 2018 levels with increased activity levels being accommodated through growth in productivity per worker..

70. The proportion of total employment associated with offshore wind related activity is expected to increase from around 26% in 2018 to the order of 68% in 2036. The proportion of total GVA associated with offshore wind related activity is expected to increase from around 35% in 2018 to the order of 77% in 2036 using the lower range of GVA, and increase from 47% to 84% using the upper range of GVA.

71. **In total, it is estimated that the Port could support 1,581 direct, indirect and induced FTE jobs and contribute in the range of £122.2 million to £177.1 million of GVA annually to the Lowestoft economy by 2036.**

Figure 4: Employment and GVA impact (Future Scenario 1), Port of Lowestoft

Employment	**2018**		**2036**	
Offshore wind related activity	138		1,080	
Other activity	385		501	
Total	**523**		**1,581**	
GVA, annual (undiscounted) £m	**2018**		**2036**	
	Lower range	**Upper range**	**Lower range**	**Upper range**
Offshore wind related activity	11.0	17.4	93.9	148.8
Other activity	19.9	19.9	28.3	28.3
Total	**30.9**	**37.3**	**122.2**	**177.1**

Source: Edge and BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

4.4 Scenario 2 (With SCC bridge)

Description

72. This scenario assumes that the proposed Lake Lothing Third Crossing is built in the central location and that port use continues. Under this scenario, offshore wind related activities at the Port are constrained (as per the BVG Associates analysis).

Key assumptions

Outer Harbour

- Fishing and oil & gas activity remain in place

Inner Harbour

- Crew Transfer Vessel (CTV) operators for offshore wind will be unwilling to berth to the west of the proposed bridge
- The former Shell Base is no longer seen as being an acceptable construction coordination/O&M facility in the future
- The bridge creates sterilisation of approx 180-200m of quay which could potentially be used for Crew Transfer Vessel (CTV) berthing

Results

73. Under this scenario, employment associated with offshore wind related activity over the period to 2036 is expected to grow at a reduced rate to the 'No bridge' scenario (as per the BVG Associates analysis). Offshore wind related employment is expected to increase from 138 jobs to 375 jobs; an increase of almost three-fold.

74. As with the 'No bridge' scenario, the average level of employment associated with other activity at the Port is expected to remain broadly unchanged over the period to 2036 with the exception of oil & gas activity. As noted earlier, the level of employment at the Port in August 2018 reflects a historically low level of oil & gas sector contract work. Assuming a continuation at such a low level to 2036 would therefore be overly pessimistic. Accordingly, from 2020 onwards an average level of employment in oil & gas activity is assumed based on observed historic employment. Direct ABP employment and employment in other activity (excluding oil & gas) is expected to remain unchanged from 2018 levels with increased activity levels being accommodated through growth in productivity per worker.

75. The proportion of total employment associated with offshore wind related activity is expected to increase from around 26% in 2018 to 43% in 2036. The proportion of total GVA associated with offshore wind related activity is expected to increase from 35% in 2018 to 54% in 2036 using the lower range of GVA, and increase from 47% to 65% using the upper range of GVA.

76. **It is estimated that the Port's future economic contribution in 2036 could be 876 jobs and contribute in the range of £60.9 million to £79.9 million of GVA annually.**

Figure 5: Employment and GVA impact (Future Scenario 2), Port of Lowestoft

Employment	**2018**		**2036**	
Offshore wind related activity	138		375	
Other activity	385		501	
Total	**523**		**876**	
GVA, annual (undiscounted) £m	**2018**		**2036**	
	Lower range	**Upper range**	**Lower range**	**Upper range**
Offshore wind related activity	11.0	17.4	32.6	51.6
Other activity	19.9	19.9	28.3	28.3
Total	**30.9**	**37.3**	**60.9**	**79.9**

Source: Edge and BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

4.5 Discounted cash flow analysis

77. A discounted cash flow (DCF) analysis indicates that the total present value benefits over an 18-year period (in 2017 prices) are in the range £706.3 million to £902.7 million under the 'With SCC bridge' scenario compared with between £1.08 billion and £1.50 billion under the 'No bridge' scenario.

78. Over a 60-year period (in 2010 prices), the total present value benefits are in the range of £1.21 billion to £1.53 billion under the 'With SCC bridge' scenario compared with between £2.12 billion and £2.96 billion under the 'No bridge' scenario.

Figure 6: Present Value GVA impact, Port of Lowestoft

	PV GVA Benefits, £m			
	18-year (2017 prices)		**60-year (2010 prices)**	
	Lower range	**Upper range**	**Lower range**	**Upper range**
Scenario 1 - No Bridge				
Offshore wind related activity	710.4	1,125.5	1,450.9	2,298.8
Other activity	370.2	370.2	665.2	665.2
	1,080.6	**1,495.7**	**2,116.1**	**2,964.0**
Scenario 2 – With SCC Bridge				
Offshore wind related activity	336.1	532.5	543.2	860.7
Other activity	370.2	370.2	665.2	665.2
	706.3	**902.7**	**1,208.4**	**1,525.9**

Source: Edge using BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

4.6 Summary

79. A summary table of all results is provided below.

Figure 7: Summary of economic impacts, Port of Lowestoft

	Employment		Annual GVA (undiscounted)		PV GVA Benefits	
	2018	**2036**	**2018**	**2036**	**18-year (2017 prices)**	**60-year (2010 prices)**
Scenario 1 - No Bridge						
Offshore wind related activity	138	1,080	11.0 – 17.4	93.9 – 148.8	710.4 – 1,125.5	1,450.9 – 2,298.8
Other activity	385	501	19.9	28.3	370.2	665.2
	523	**1,581**	**30.9 – 37.3**	**122.2 - 177.1**	**1,080.6 - 1,495.7**	**2,116.1 - 2,964.0**
Scenario 2 - With SCC Bridge						
Offshore wind related activity	138	375	11.0 – 17.4	32.6 – 51.6	336.1 – 532.5	543.2 – 860.7
Other activity	385	501	19.9	28.3	370.2	665.2
	523	**876**	**30.9 – 37.3**	**60.9 – 79.9**	**706.3 – 902.7**	**1,208.4 – 1,525.9**

Source: Edge using BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

5 Conclusions

80. In total, the Port currently (as at August 2018) supports 523 direct, indirect and induced FTE (full- time equivalent) jobs at the local level. The current economic impact (as at August 2018) of the Port is substantial when quantified as gross value added (GVA); the Port supports in the range of £30.9 million to £37.3 million of GVA annually.

81. The order of 35% to 47% of the current GVA contribution (as at August 2018) of the Port is associated with offshore wind related activity (for the lower and upper ranges of GVA applied respectively).

82. By accommodating projected future demand, it is estimated that the Port could support 1,581 direct, indirect and induced FTE (full-time equivalent) jobs and contribute in the range of £122.2 million to £177.1 million of GVA annually (in 2017 prices) to the Lowestoft economy by 2036.

83. The implementation of the proposed Lake Lothing Third Crossing could adversely impact upon the economic potential of the Port to deliver long-term economic benefits to Lowestoft. It is estimated that the Port's future economic contribution in 2036 could be a lower figure than under the 'No bridge' scenario; 876 jobs and in the range of £60.9 million to £79.9 million of GVA annually (in 2017 prices).

84. A discounted cash flow (DCF) analysis indicates that the total present value benefits over an 18-year period are in the range of £706.3 million to £902.7 million under the 'With SCC bridge' scenario compared with between £1.08 billion and £1.50 billion under the 'no bridge' scenario.

Addendum – Lowestoft Economic Study (Internal)

This addendum note provides additional information to the main economic report for the purposes of internal ABP reference. Where appropriate it is cross-referenced with sections of the main report.

1.1 Section 2.2 (methodology)

Offshore wind activity

In respect of average GVA per job in the offshore wind sector, the following two sources are used to calculate the range presented:

- BIS research on offshore wind, 'The size and performance of the UK low carbon economy' (March 2015). The figure of £79,525 for 2018 is based on the BIS figure of £72,993 for 2013 expressed in 2017 prices using HM Treasury inflation adjustment; and
- New Anglia LEP research, 'Economic Strategy Evidence Base Report' (December 2017), for the energy sector in Norfolk and Suffolk. The figure of £126,000 for 2018 is based on this analysis.

In our view, the BIS research is the more robust of these two sources. It was produced by Central Government and is frequently cited. The New Anglia LEP research has the benefit of being more local and recent (and indicates a higher GVA per job which is positive for the Port's economic contribution). It is based on a less extensive study than the BIS research and includes broader energy activities (not just offshore wind) however.

Other activity

The Scottish Type II multipliers referred to in order to demonstrate that port related activities typically have higher economic multiplier effects than other sectors are a recognised source of multipliers and frequently cited. The relative strength of multipliers across these sectors is expected to be representative of the case in England and indeed Lowestoft.

The average GVA per job of £51,642 applied to other activity at the Port is considered to be a reasonable proxy for the GVA associated with port employment. This figure is considered conservative since some of the activities at the Port are in higher value added sectors (such as oil and gas). To determine precise GVA for the Port would require comprehensive financial data across the firms on the Port Estate. This data was not available nor could it be sourced within the time and resources available for the study.

1.2 Section 3.2 (current economic value - jobs)

Offshore wind related activity

In total, offshore wind related activity at the Port currently (at August 2018) supports around 138 jobs (of which 119 are direct, 12 indirect and 7 induced).

Figure A1: Offshore wind related activity - Employment impact (August 2018)

Jobs	Figure	Method
Direct	119	Based on study research of activity at the Port at August 2018, drawing on data provided by ABP through consultation with tenants.
Indirect	12	BVG Associates estimate - Assumes that for every job created at the Port, a further 0.1 of an indirect is created elsewhere in the town. BVG Associates note that this assumption is consistent with Government guidance[1]. Calculation: 0.10 x 119 = 12
Induced	7	BVG Associates estimate - Assumes that for every direct and indirect job, a further 0.05 of an induced job is created in the town. BVG Associates note that this assumption is consistent with Government guidance[2]. Calculation: 0.05 x 131 = 7
Total	**138**	

Source: Edge and BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

[1] 'Additionality Guide', Fourth Edition, Homes and Communities Agency, 2014.
[2] 'Additionality Guide', Fourth Edition, Homes and Communities Agency, 2014.

Other activity

In total, other activity at the Port currently (at August 2018) supports 385 FTE jobs (of which 313 are direct, 34 indirect and 38 induced).

Figure A2: Other activity - Employment impact (August 2018)

Jobs	Figure	Method
Direct - ABP	24	Based on study research of activity at the Port at August 2018, drawing on data provided by ABP.
Direct - Tenants	289	Based on study research of activity at the Port at August 2018, drawing on data provided by ABP through consultation with tenants.
Total direct	**313**	
Indirect	34	Based on applying a multiplier of 1.11. Taken together with induced effects, this is equivalent to a composite multiplier (including both indirect and induced effects) of 1.23. This is in line with the sub-regional composite multiplier across all observations cited in BIS/CEA guidance[3]. Calculation: 0.11 x 313 = 34
Induced	38	Based on applying a multiplier of 1.11. Based on applying a multiplier of 1.11. Taken together with indirect effects, this is equivalent to a composite multiplier (including both indirect and induced effects) of 1.23. This is in line with the sub-regional composite multiplier across all observations cited in BIS/CEA guidance[4]. Calculation: 0.11 x 347 = 38
Total jobs	**385**	Note – above figures include rounding

Source: Edge (2018).

Note: Figures include rounding.

Employment levels at Sembmarine SLP (which accounts for a significant proportion of activity at the Port) fluctuate from year to year depending on the level of contract work secured by the firm.

The employment level at the Port in August 2018 reflects a historically low employment figure at Sembmarine SLP (60 jobs). Available data points for employment at the firm are: 2018 - 60 jobs, 2016 - 100 jobs and 2014 - 300 jobs.

1.3 Section 3.3 (current economic value - GVA)

The Port of Lowestoft currently (at August 2018) supports in the range of £30.9 million to £37.3 million in GVA across the local economy.

[3] Referred to in HCA guidance: 'Additionality Guide', Fourth Edition, Homes and Communities Agency, 2014.
[4] Referred to in HCA guidance: 'Additionality Guide', Fourth Edition, Homes and Communities Agency, 2014.

The estimated GVA figure is based on the applying average GVA per job figures to the employment numbers. The lower and upper bounds of the range reflect the application of an average GVA per job figure for offshore wind related activity of £79,525 (lower) and £126,000 (upper) in 2018. The methodology section of the main report provides the evidence base for these figures.

1.4 Section 3.4 (how estimates relate to other work)

The basis of the estimate of the current (at August 2018) economic impact of the Port presented differs from the 2014 Arup study in the following ways:

1. It is based on the current position at the Port in August 2018. The Arup study, while published in 2014, relates to the year 2012;
2. It is based on a detailed bottom-up assessment of the Port of Lowestoft. The Arup study applied a different methodology;
3. It refers to impacts on the Lowestoft economy. The Arup study refers to impacts on the regional economy. The geographical extent of economic multipliers is therefore different; and
4. It is undertaken at time of historically low employment levels in the oil and gas sector (Sembmarine SLP). The Arup study was undertaken at a time when Sembmarine employment levels were more buoyant. See Section 1.2 above.

1.5 Section 4.3 (Future growth, Scenario 1 – 'No bridge')

Results

Sembmarine SLP employment

The employment level at the Port in August 2018 reflects a historically low employment figure at Sembmarine SLP (60 jobs). Available data points for employment at the firm are:

2018 - 60 jobs
2016 - 100 jobs
2014 - 300 jobs

The economic analysis assumes a return to an ‘average’ level of employment from 2020 onwards. The analysis applies the average of the above 3 data points (153 jobs) to Sembmarine SLP employment from 2020 onwards. Without this assumption, it is judged that the future growth estimates would be overly pessimistic.

This assumption explains the difference in 'other activity' employment between 2018 and 2036 jobs (385 and 501 jobs respectively) presented in Figure 4 of the main report. The difference (116 jobs) comprises of a difference in direct jobs of 93 (153 – 60) and application of multiplier effects.

Figure A3: Other activity - Employment impact (Future Scenario 1)

Year	Jobs figure	Method
2018	385	Based on study research of activity at the Port at August 2018, drawing on data provided by ABP through consultation with tenants.
2036	501	As per 2018 figure, with additional 116 jobs (comprising 94 jobs and 22 jobs through multiplier effects) due to return to an 'average' employment level at Sembmarine SLP from 2020 onwards.

Source: Edge (2018).

Note: Figures include rounding.

Calculations

In total, it is estimated that the Port could support 1,580 direct, indirect and induced FTE (full-time equivalent) jobs by 2036. A breakdown of this estimate is provided below.

Figure A4: Total Employment impact at 2036 (Future Scenario 1)

	Jobs
Offshore wind related activity	
Direct	819
Indirect	210
Induced	51
Sub total	**1,080**
Other activity	
Direct	406
Indirect	45
Induced	50
Sub total	**501**
Total	**1,581**

Source: Edge and BVG offshore wind employment analysis (2018).

Note: Figures include rounding.

In Figure 4 of the main report, between 2018 and 2036 offshore jobs increase from 138 to 1,080 jobs. This is based on employment forecasts provided by BVG Associates (and justification is provided within their report).

The estimated GVA figures are based on the applying average GVA per job figures to the employment numbers. The lower and upper bounds of the range reflect the application of an average GVA per job figure for offshore wind related activity:

Figure A5: Average GVA per job applied at 2018 and 2036 (Future Scenario 1)

	Average GVA per job	
	2018	**2036**
Offshore wind related activity		
Lower bound	£79,525	£86,995
Upper bound	£126,000	£137,835
Other activity	£51,642	£56,493

Source: Edge (2018).

Note: Figures include rounding.

Growth in GVA per job between 2018 and 2036 is based on productivity growth of 0.5% per annum.

The methodology section of the main report provides the evidence base for these figures.

1.6 Section 4.4 (Future growth, Scenario 2 – 'With SCC bridge')

Results

Assumption – Sembmarine SLP employment

See explanation provided under Section 1.5 above.

Calculations

In Figure 5 of the main report, between 2018 and 2036 offshore jobs increase from 138 to 375 jobs. This is based on employment forecasts provided by BVG Associates (and justification provided within their report).

The estimated GVA figures are based on the applying average GVA per job figures to the employment numbers. The lower and upper bounds of the range reflect the application of an average GVA per job figure for offshore wind related activity (as per Section 1.5 above).

1.7 Section 4.5 (DCF analysis)

Over a 60-year period, there is a difference in the total present value benefits between the 'No bridge' and 'With SCC bridge' of the order of £900 million using the lower range estimate and £1.4 billion using the upper range estimate (see Figure 6).

This compares with a difference of £114.6m in the estimated benefits of the 'central bridge' and 'western bridge' options in the Outline Business Case for the Lake Lothing Third Crossing[5].

[5] 'Outline Business Case: Lake Lothing Third Crossing' Mouchel for Suffolk County Council and New Anglia LEP (December 2015), page 67, table 2-3. As notes in the OBC, economic costs and benefits for the preferred scheme in the economic case are different from the figures in table 2-3 which are based on similar levels of detail for each option, as appropriate for comparing the different options.

1.8 Comment on land assessment published by Waveney since the economic study

Since the economic study was undertaken, an assessment of land requirements to support offshore engineering in Waveney has been published[6].

The assessment provides:

a) A high-level overview and summary of the economic opportunity from offshore wind, other renewables, oil and gas and the wider offshore engineering sector in the southern North Sea based on existing knowledge and research; and

b) An assessment of the likely waterfront land requirements in addition to the land within the Port of Lowestoft, and the likely land/premises requirements in PowerPark, in order to realise Lowestoft's potential in securing the maximum realistic amount of the above economic opportunity.

The geographic area considered is set out in two broad study areas:

PowerPark – comprising 24.7 hectares of existing port, industrial and warehousing land to the area south of Ness Point and east of Battery Green Road and includes Hamilton Dock, Waveney Dock, along with parts of Trawl Dock and the Outer Harbour.

Waterfront land – the area of land north and south of the Lake Lothing, west of Station Square, following Commercial Road North of the inner Harbour, and land south of Lake Lothing following the A12, Waveney Drive onto Victoria Road. This area includes the Riverside Road Enterprise Zone area, former Jeld-Wen factory site, Brooke Peninsula, and the West End of Lake Lothing.

The report has researched major capital investments in energy infrastructure, ports and transport related projects in the short term to 2025 and the longer term to 2040. The headline results are:

- £10.8bn planned capital investments in major energy and infrastructure projects in the East to 2025;
- A total of £59.4bn investments planned in regional projects in the longer term to 2040;
- A further £497bn investment across the UK to 2040; and
- An additional £846bn investments across NW Europe up to 2040.

The most significant short-term investments are in offshore wind (£4.9bn), transport (2.1bn), ports infrastructure (£1.5bn) and oil and gas decommissioning (£1.3bn). In the long-term the most significant investments are in offshore wind (£30.2bn), nuclear (£10.3bn), transport (6.7bn), oil and gas decommissioning (5.5bn), and ports infrastructure (3.6bn).

The assessment includes a SWOT analysis, based on the research and drawing inputs from industry and stakeholder consultations. One of the key messages coming out of this process is that:

[6] 'An Assessment of Land Requirements to Support Offshore Engineering in Waveney' Nautilus Associates for Waveney District Council (September 2018).

"it was felt by many that there is a general lack of suitable employment land supply for offshore energy and engineering sectors in Lowestoft, and a very limited range of sites with suitable quayside access"

[page 5]

A key conclusion coming out of the study is:

*"**Based on our research and consultation, there is significant and growing demand for a variety of new and additional facilities including high-spec office accommodation, a range of engineering workshops and fabrication facilities, warehousing and storage, and shared access waterfront for loading/unloading goods.***

The Council should make all endeavours to ensure there is adequate provision of employment land for B1, B2 and B8 uses for the offshore energy and engineering supply chain, with good access to quay side facilities, potentially on a shared basis.

The 2009 Demand and Need Study is seen as outdated with more recent studies having been commissioned, which for a variety of reasons surrounding commercial sensitivities were not made publicly available to support the Local Plan evidence base.

The capital investment forecasts provided highlight the sheer volume and scale of projected investment in energy, engineering and infrastructure projects which could be accessed by businesses and supply chains operating from Lowestoft, building on the success of the existing businesses in capturing major contracts.

With more than £10bn of major projects forecast in/offshore the East of England, growing to £487bn across the UK by 2040, the supply chain opportunities for businesses across Lowestoft will be substantial and in line with more recent growth and success in securing investment from existing offshore energy projects."

[page 77]

Overall, the report highlights the substantial economic opportunity for Lowestoft in coming years associated with planned offshore energy investment. The Port is identified as a key component of enabling this growth.

Annex 5

KEY

Suspended Quay - Not suitable for HGV's

Diversionary Route - Minimum width 5.1m

Indicative Alignment of Bridge

Permanent acquisition of land

Permanent acquisition of airspace and rights over land

Permanent acquisition of rights over land

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Entrance to Shed 3

ABP statutory area

Permanent acquisition of land = 3084m²

Permanent acquisition of airspace and rights over land = 2342m²

Permanent acquisition of rights over land = 4235m²

Temporary possession of land = 40396m²

Total area affected = 50057m²

Port Berth *(inc berth number and length)*

Remaining port area west of proposals *(not including slipway)* = 89115m²

Slipway = 1378m²

Allowance for ships' mooring lines

Security fence

north

+ 2.7m

L Twr

WB

No. 4W
95m

No. 4E
45m

19m

10m

72m

33m

25.5m

33.5m

No. 3
60m

10m

No. 2
60m

54m

No. 1
60m

165m

CH

MLW

Und

MP

MP

Wharf

Annex 6

Scale 1: 500 @ A2

0 5 10 20 25 metres

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An Assessment of Land Requirements to Support Offshore Engineering in Waveney

A Report to Waveney District Council

September 2018

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Client:	Waveney District Council
Client contact:	Sam Hubbard
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Date:	SEPTEMBER 2018

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Executive Summary

Nautilus Associates Limited have been commissioned by Waveney District Council (WDC) to undertake an assessment of potential land requirements to support the offshore energy and engineering sectors.

The Council are undertaking Local Plan Review to cover the period to 2036. This report provides updated market intelligence in support of the Local Plan. The assessment provides:

a) a high-level overview and summary of the economic opportunity from offshore wind, other renewables, oil and gas and the wider offshore engineering sector in the southern North Sea based on existing knowledge and research.

b) an assessment of the likely waterfront land requirements in addition to the land within the Port of Lowestoft, and the likely land/premises requirements in PowerPark, in order to realise Lowestoft's potential in securing the maximum realistic amount of the above economic opportunity.

The geographic area this report considers is set out in two broad study areas:

PowerPark – comprising 24.7 hectares of existing port, industrial and warehousing land to the area south of Ness Point and east of Battery Green Road and includes Hamilton Dock, Waveney Dock, along with parts of Trawl Dock and the Outer Harbour.

Waterfront land – the area of land north and south of the Lake Lothing, west of Station Square, following Commercial Road North of the inner Harbour, and land south of Lake Lothing following the A12, Waveney Drive onto Victoria Road. This area includes the Riverside Road Enterprise Zone area, former Jeld-Wen factory site, Brooke Peninsula, and the West End of Lake Lothing.

Market Opportunities

The report has researched major capital investments in energy infrastructure, ports and transport related projects in the short term to 2025 and the longer term to 2040. The headline results are:

- **£10.8bn planned capital investments in major energy and infrastructure projects in the East to 2025**
- **A total of £59.4bn investments planned in regional projects in the longer term to 2040**
- **A further £497bn investment across the UK to 2040**
- **An additional £846bn investments across NW Europe up to 2040**

The most significant short-term investments are in offshore wind (£4.9bn), transport (2.1bn), ports infrastructure (£1.5bn) and oil and gas decommissioning (£1.3bn).

In the long-term the most significant investments are in offshore wind (£30.2bn), nuclear (£10.3bn), transport (6.7bn), oil and gas decommissioning (5.5bn), and ports infrastructure (3.6bn).

Capital investment opportunities have been identified across a wider geographic area in terms of the accessible market for businesses and supply chains based in, and operating, from Lowestoft. The town has deep experience in developing and delivering products and services to UK-wide and global offshore engineering markets. Mapping these opportunities will help to shape longer-term employment land requirements, building on the area's existing supply chain strengths.

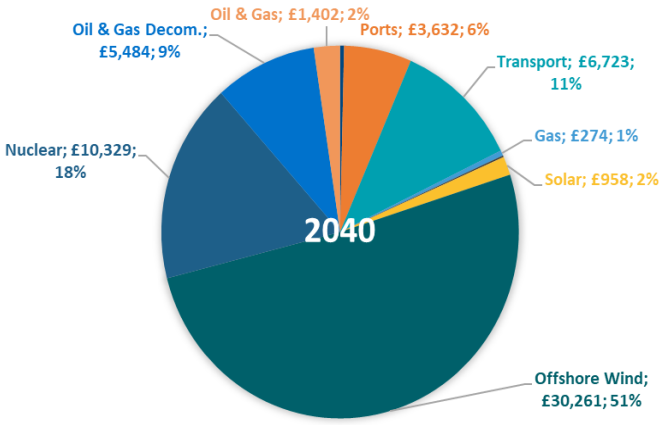

Figure 1: CAPEX forecast for projects in the East of England to 2040.

Offshore Wind Operations and Maintenance (O&M) Forecasts

Offshore wind O&M is one of the greatest potential opportunities to drive investment and supply chain growth in Lowestoft. O&M is recognised as the largest part of the offshore wind farm lifecycle that the UK can develop world-leading capabilities in, building on deep expertise and experience in servicing offshore oil and gas projects.

An O&M facility is primarily designed to support the lifetime operation and maintenance of an offshore wind farm(s) to minimise any disruption to energy generation and maximise output. The life span of the current generation of offshore wind farms is typically in the region of 25-30 years.

Building on the capital investment forecasts, the report provides an assessment of potential growth for operations & maintenance. Assuming an estimate of £75,000 per megawatt (MW) per year, this suggests a potential O&M opportunity for existing operational projects off the East of England coast in the region of **£309 million per year** rising to more than **£1.3 billion per year** when the current portfolio of consented offshore wind projects is installed and commissioned by 2025-30.

SWOT Analysis

Based on the research and drawing inputs from industry and stakeholder consultations, a number of key points were identified in developing the SWOT analysis.

With both the UK's offshore gas basin and the world's largest offshore wind market is immediately off the East Anglian coast, it is clear that Lowestoft has many existing strengths across the offshore energy and engineering sectors, which offers significant opportunities available to the businesses to invest, grow, and capture new growth opportunities.

As the historic UK headquarters for Cefas, this presents a significant opportunity to grow the marine sciences cluster of expertise and the related local supply chain. The new £16m Cefas campus, including new fish laboratories, could play a key role in supporting the future fishing industries.

Based on consultation feedback, it was felt that there has been a general lack of focus in promoting Lowestoft and developing land and infrastructure to support the offshore energy and engineering sectors in Lowestoft, compared to areas such as the Beacon Park Enterprise Zone in Gorleston.

Overall, it was felt by many that there is general lack of suitable employment land supply for the offshore energy and engineering sectors in Lowestoft, and a very limited range of sites with suitable quayside access. Consultees expressed a degree of frustration in relation to delays in developing major potential sites such as PowerPark, Jeld-Wen and land off Commercial Road.

Poor utilisation of the town's fabrication facilities and general lack of large-scale fabrication work was highlighted, including the need to ensure major facilities were able to secure major contracts, with local businesses benefitting from related supply chain opportunities.

PowerPark Land Requirements

PowerPark comprises areas of existing port, industrial and warehousing land to the area south of Ness Point and east of Battery Green Road and includes Hamilton Dock, Waveney Dock, along with parts of Trawl Dock and the Outer Harbour.

The vision behind the PowerPark area of Lowestoft to create a dynamic hub for the offshore energy sectors has, to date, not yet been fully achieved.

OrbisEnergy

At the heart of PowerPark is OrbisEnergy, the region's flagship hub for the offshore renewable energy industry, opened in 2008.

Figure 2: OrbisEnergy, Wilde Street, Lowestoft

Over the past ten years, OrbisEnergy has supported more than 180 tenant businesses. Those tenants have created more than 1,100 new jobs with many retained in the local area following graduation from the OrbisEnergy facilities into new or alternative follow-on accommodation. The growth of OrbisEnergy and its many tenant spin-outs has been a major catalyst for investment in the local area.

Research undertaken strongly supports demand for 'move-on' or expansion accommodation from existing OrbisEnergy tenants and users, all of whom are either offshore wind developers, operators or supply chain businesses, virtual tenants, and prospective new tenants (i.e. those for whom the existing OrbisEnergy accommodation is unsuitable for one reason or another).

Consideration should be given to working in partnership with OrbisEnergy to develop and refine options for expansion based on strong demand from new and existing tenant companies.

From our research there is clear and growing demand for good quality flexible space which could offer a mixture of office and workshop and/or storage type space. While the amount of space potential occupiers may require varies, there appears to be a cluster of demand and a corresponding shortage of supply around the 1,500-5,000 sq. ft. size (140-465 m2) units. Though the level of demand is strong and likely to continue to grow in the medium to longer term, under the limits of this commission, it is not quantified. Nevertheless, an overall development of approximately 15,000-25,000 sq. ft. (with the potential to extend) comprising these smaller units could offer critical mass, flexibility and cost efficiency benefits.

With the PowerPark Local Development Order now expired, consideration should be given to its renewal and/or revision to help drive investment interest and promote the area as a prime development location.

The potential to create new business, community and education facilities are at Ness Point, through the conversion of the Gasomoter, should be considered as a key project linked to the Community Seafront Strategy and investing in new amenities to support Ness Point as a visitor destination.

Sembmarine SLP Fabrication Yard

Sembmarine SLP has been a major employer in Lowestoft for many years, having had various owners over its 40 years. During this time, it has delivered a number of major offshore structures to the UK oil and gas and offshore wind industries from its Lowestoft port facilities.

The Sembmarine SLP facilities remain the only large scale offshore fabrication in the East of England region. It is well-positioned to secure work across offshore wind foundations fabrication, offshore wind substation, oil and gas decommissioning, and new nuclear construction. The facilities and capabilities available could be developed into a major fabrication and construction hub servicing multiple offshore markets.

Fisheries Industry

PowerPark is currently home to the fishing industry in Lowestoft including 4 main user groups (Fishermen; Auctioneers/Agents; Merchants; and Packing & Consumables suppliers). The report details their current spatial requirements and demonstrates that these are adequately provided for currently within their existing premises.

Figure 3: Lowestoft Fish Market

In the context of the UK's exit from the European Union, future growth of the fishing industry locally may present a significant opportunity. Through consultation with the fishing industry, it is suggested that the economic value of future fishing could increase to **£168m (quayside value),** increasing to **>£670 million** when processed, or four times the current value, producing a **net additional c.77,600 tons** of fish caught. At the time of writing, there is no certainty as to the specific future requirements for a renewed regional fishing industry.

However, through the Renaissance of East Anglian Fisheries (REAF) consortium, a bid for funding has been made to commission a detailed research report on the potential for a renewed UK fishing industry with Lowestoft as the regional hub.

Ness Point

As Britain's most easterly point, Ness Point is a regular destination albeit with no visitor facilities at the present time. It is also home to the 2.75MW 'Gulliver' wind turbine.

Gulliver is an offshore prototype installed in 2005 and is an operational turbine owned and operated by Thrive Renewables. The turbine's design life is c.20 years. In partnership with Thrive, consideration should be given to options for repowering and asset life extension, or upgrading with a potential option to develop the turbine as an 'innovation platform' for test and demonstration of new technologies and maintenance solutions.

Early stage concepts from the OrbisEnergy team to redevelop the former Gasomoter on Gas Works road into a new community space, including a visitor's and education centre, have also been considered in this report which could have a positive impact on Ness Point as a visitor destination.

Waterfront Land Requirements

The Waterfront area considered in this report comprises land immediately to the north and south of the Inner Harbour & Lake Lothing, extending from the west side of the bascule bridge through to the western end of Lake Lothing.

The area currently comprises a mixture of industrial, office and retail premises, interspersed with some areas of older residential development. However, there are also large parcels of land which comprise unused brownfield sites, many of which incorporate poorly maintained or derelict buildings/structures, and underutilised sites.

The area incorporates the Riverside Road Enterprise Zone (EZ); former Jeld-Wen factory site and adjacent playing fields; County Wildlife Site; Brooke Peninsula; Brooke Business Park; former Sanyo factory site; Haven Marina; SCA Recycling site; Witham Paints site.

The quayside areas to the north of the Inner Harbour and Lake Lothing are currently used much more frequently for the mooring of larger service operation vessels (SOV's), transportation vessels, crew transfer vessels (CTV's) etc.

The development of the Third River Crossing (TRC) is recognised as a major milestone for the continued growth of Lowestoft's economy and will have an overall positive impact on the mobility of people, goods, and services across the town.

Riverside Road Enterprise Zone

The Riverside Road EZ has been successful in developing new facilities, including Essex and Suffolk Water and the joint-Council offices. Access to the EZ site will change with the construction of the TRC, which will remove part of the eastern aspects of EZ site for development, with the new proposed access road off Waveney Drive and through part of the former Jeld-Wen site.

The remaining land on the Riverside Road Enterprise Zone, together with the significant development potential on the former Jeld-Wen factory site for new employment land, offers a major opportunity to develop shared quayside facilities with feeder sites encouraging a wider range of investment opportunities for new and existing offshore and marine engineering businesses to cluster.

Kirkley Ham Inlet

The c.45m wide Kirkley Ham quayside inlet located between Lings car dealership to the west and land occupied by the Asda supermarket to the east is currently an unused area of quay which could offer notable benefits for the mooring of offshore SOV's, CTV's and associated vessels.

Figure 4: Aerial view of Kirkley Ham inlet

Quay heading land ownership and available vessel mooring facilities (mooring bollards etc.) available in this area would need investigation to determine the feasibility of Kirkley Ham being re-used for vessel mooring purposes.

Jeld-Wen Factory Site

The former Jeld-Wen factory site and adjacent playing fields, located within the Lake Lothing area of Lowestoft, covers an area of 14.2 hectares. This currently unused waterfront site offers significant development opportunities for the local area, particularly due to its notable quay heading and yard areas to the south of Lake Lothing. The close proximity of the northern section of the Jeld-Wen site to the existing Enterprise Zone, and potential for inclusion within an Enterprise Zone extension, makes this land parcel even more attractive for employment use.


Figure 5: Riverside Road Enterprise Zone area and Jeld-Wen site with artist's impression of the Lake Lothing Third Crossing

It is a desirable waterfront site for development for offshore energy and engineering businesses, particularly those operating vessels, or relying on vessels for transportation of personnel or equipment.

The Jeld-Wen site was selected as a temporary facility for the load-out for 140 tonne onshore fabricated offshore modules onto transport vessels, fabricated by a local engineering company in 2014.


Figure 6: View of Jeld-Wen quay being used in 2014 for offshore assembly and load-out using mobile crane on the quayside

This site was selected at the time due to it being one of very few quayside areas available in the town suitable for this use. The site was successfully used for the load-out operation, emphasising the value of this quay for offshore engineering usage.

The existing buildings on the Jeld-Wen site are unlikely to be suitable for re-use or renovation for new businesses. Demolition of the existing building stock on this site is therefore the most likely way

forward to make way for development of new industrial facilities and offices to better suit the needs of the offshore engineering and associated businesses.

ABP Lowestoft - Shell Quay / Commercial Road

Shell Quay takes its name from the former Shell Base on Commercial Road which contains a mix of offices, workshops, quayside facilities, and warehousing, much of which has been underutilised or vacant. A demolition order is in place to clear the site and open it up for new investment.

ABP have developed an outline vision in partnership with London-based architects Chetwoods to transform the 13-acre site with direct quay access. The visuals of the site are at concept only stage and not based on demand and need research, nor informed master-planning.

Car Parking

Existing public parking facilities are inadequate and not appropriate for the offshore energy and engineering supply businesses due to nature, frequency and type of vehicles in use. Research has identified clear demand for flexible secure vehicle parking. For offshore workers operating on port land, it has been suggested that a Park & Ride scheme or shuttle bus be considered.

Offshore Energy & Engineering Land Requirements

Research has identified a growing demand from a variety of offshore energy sector focused businesses many with a marine and/or engineering focus who would like to invest in or expand their facilities in Lowestoft with a view of entering or developing their positions in the offshore energy and engineering supply chain.

This is expected to grow at a significant rate in the coming years and will be a vital area of occupier demand for space across the town. Projected growth in the offshore projects supports the need for access to the types of facilities and port infrastructure which Lowestoft could provide.

The extent and speed at which demand for space may increase in Lowestoft will be closely related to the locational decisions and operational models adopted by those involved in the development and operation of these offshore projects and those of their supply chain.

Manufacturing and Fabrication Supply Chain Requirements

Lowestoft has a rich history in designing and delivering a range of offshore foundations for global oil and gas projects, as well as bespoke innovative offshore wind substation foundations such as the Dudgeon offshore wind substation, using new suction bucket technology for the first time.

Offshore wind turbines have typically used monopile foundations but are moving toward alternative designs such as jacket foundations, which are more suitable for deeper water projects such as East Anglia One project.

Earlier assessments suggested that the opportunity for jacket fabrication in Lowestoft was limited due to the large lay down/storage areas foundation fabrication requires e.g. 10-15 Ha (23-34 acres) with at least 150 metres of continuous quay space. This is no longer the case.

The production and logistics models for larger volume foundation fabrication contracts has also evolved, now adopting a multi-port, multi-yard strategy e.g. multiple (often smaller) fabrication yards producing smaller volumes which are barged to a central marshalling port elsewhere prior to installation. This model opens a new range of potential fabrication opportunities to explore.

There is expected to be rapid growth in other areas of offshore engineering and marine fabrication sectors, namely demand for offshore substations and accommodation platforms/modules not only for projected offshore windfarm development but from across other segments of the energy sectors.

Decommissioning of existing oil and gas platforms are now being awarded with strong growth forecast over the next decade. Similar facilities will be required for the potential refurbishment and/or end-of-life disposal of offshore topsides and foundations.

Such options could be accommodated with the Sembmarine SLP yard facilities, with additional new supply chain facilities potentially created further within the inner harbour with quayside access**.**

Offshore Wind O&M Facilities

All earlier research reports commissioned over the past decade have highlighted offshore wind O&M as one of the greatest potential opportunities to drive investment and supply chain growth in Lowestoft.

Based on our research, there remains strong evidence of potential occupier demand to develop a range of O&M facilities and capabilities, with shared quay access. There is a good case for such facilities to be developed on a speculative basis to encourage local expansion and inward investment with facilities being available and/or operational as soon as possible.

Figure 7: Opened September 2015, Windcat Workboat's 15,000 sq ft (1,377sq m) quay side site at the port of Lowestoft

The following indicative examples are based on genuine inward investment enquiries and businesses own growth aspirations:

1. **Fabrication and activities in support of windfarm support crew and ship mobilisation**
2. **Offshore wind workboat servicing, manufacturing and support services**
3. **Fabrication work for mixed oil, gas and offshore renewables sectors**
4. **Design, supply and maintenance of electrical equipment for oil, gas and offshore wind sectors**

All of these examples are highly relevant for potential development in areas of the PowerPark, but more crucially on land at the Riverside Ride Enterprise Zone and the former Jeld-Wen Factory site with quay frontage that can be brought into use.

The facilities outlined above, and variants of same, could also be developed in other port areas such as Shell Quay and land off Commercial Road owned by ABP, and land off Belvedere Road currently occupied by Sembmarine SLP.

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Abbreviations

AAP	Area Action Plan
ABP	Associated British Ports
BOE	Barrels of Oil Equivalent
CCS	Carbon Capture and Storage
CEFAS	Centre for the Environment, Fisheries, and Aquaculture Science
CFD	Contract for Difference
CTV	Crew Transfer Vessel
CV	Capital Value
DEFRA	Department for the Environment, Food, and Rural Affairs
EEDA	East of England Development Agency
EEEGR	East of England Energy Group
GVA	Gross Value Added
GW	Gigawatts
ICT	Information and Communication Technology
LOA	Length Overall
LDO	Local Development Order
LEP	Local Enterprise Partnership
LER	Local Equipment Room
LQ	Living Quarters
MW	Megawatts
O&M	Operations and Maintenance
OEM	Original Equipment Manufacturer
SQFT	Square Feet
SQM	Square Metres
TRC	Lake Lothing Third River Crossing
UNCLOS	United Nations Convention on the Law of the Sea
WDC	Waveney District Council
WFSV	Wind Farm Service Vessel

1 Introduction and Background

Nautilus Associates Limited (Nautilus) have been commissioned by Waveney District Council (WDC) to undertake an assessment of land requirements to support the offshore energy and engineering industries in the Lowestoft port and coastal area known as the 'PowerPark'.

The Council has long recognised the potential for the growth in offshore engineering activities, particularly the growth of offshore wind.

The Lowestoft Lake Lothing and Outer Harbour Area Action Plan (part of the Waveney Local Plan) was adopted in 2012 and provides a positive vision on how the waterfront areas of Lake Lothing and the Outer Harbour could be regenerated to help capitalise on the growth of offshore related activities.

The plan included the identification of a 'PowerPark', comprising the Outer Harbour and the industrial estate to the north as a focus for offshore related businesses. The plan was supported by evidence including a PowerPark Demand and Need Study (2009) which helped inform the overall potential and the best mix of uses for the site. The plan also identifies the potential of land on the south-side of Lake Lothing (outside of the port) to potentially accommodate offshore related industries in addition to the PowerPark.

Following the adoption of the Area Action Plan some sites around Lowestoft were designated as Enterprise Zones to help support the burgeoning offshore energy and engineering industries.

The East Suffolk Business Plan (2015) affirms the Council's commitment to supporting the growth of the offshore sector. East Suffolk Economic Growth Plan, (2018-2023) builds on this and identifies the sector as a key sector in East Suffolk which the Council will help support.

The study provides an evidence-based and up-to-date assessment of the growth potential of offshore renewable energy, oil and gas, and other offshore engineering activity in the town and across the wider region.

Specifically, the assessment provides:

- a high-level overview and summary of the economic opportunity from offshore wind, other renewables, oil and gas and the wider offshore engineering sector in the southern North Sea based on existing knowledge and research.
- an assessment of the likely waterfront land requirements in addition to the land within the Port of Lowestoft, and the likely land/premises requirements in PowerPark, in order to realise Lowestoft's potential in securing the maximum realistic amount of the above economic opportunity.

1.1 Study Area

The geographic area this report considers are set out in two broad study areas:

a) **PowerPark** – comprising 24.7 hectares of existing port, industrial and warehousing land to the area south of Ness Point and east of Battery Green Road and includes Hamilton Dock, Waveney Dock, along with parts of Trawl Dock and the Outer Harbour.

b) **Waterfront land** – the area of land north and south of the Lake Lothing, west of Station Square, following Commercial Road North of the inner Harbour, and land south of the Lake Lothing following the A12, Waveney Drive onto Victoria Road. This area includes the Riverside Road Enterprise Zone area, former Jeld-Wen factory site, Brooke Peninsula, and the West End of Lake Lothing.

Figure 8 below shows the two shaded study areas.

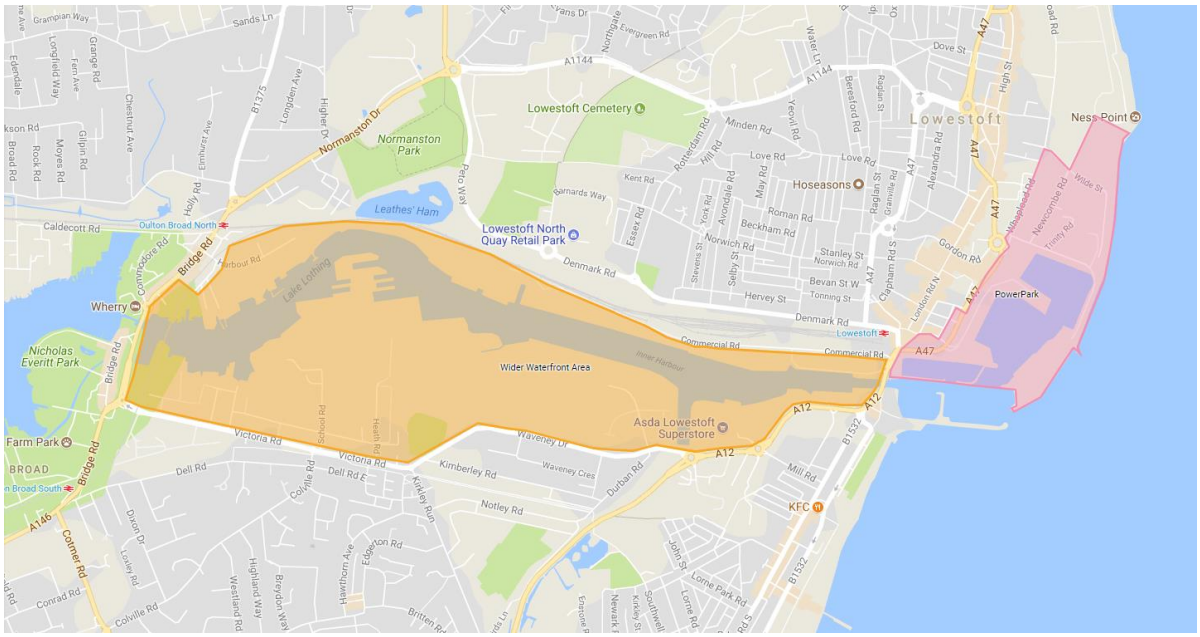


Figure 8: Study Areas

Whilst this report does not provide specific assessments for individual sites, it does provide an overview of the potential opportunities most suitable for future growth aligned to the Waveney Local Plan Site Allocations, focussing on:

- WLP2.2 – PowerPark
- WLP2.4 – Kirkley Waterfront and Sustainable Urban Neighbourhood

The report assumes the development and delivery of the Lake Lothing Third Crossing, as set out in the Waveney Local Plan. All commentary on potential developments and indicative land requirements have been developed on that basis.

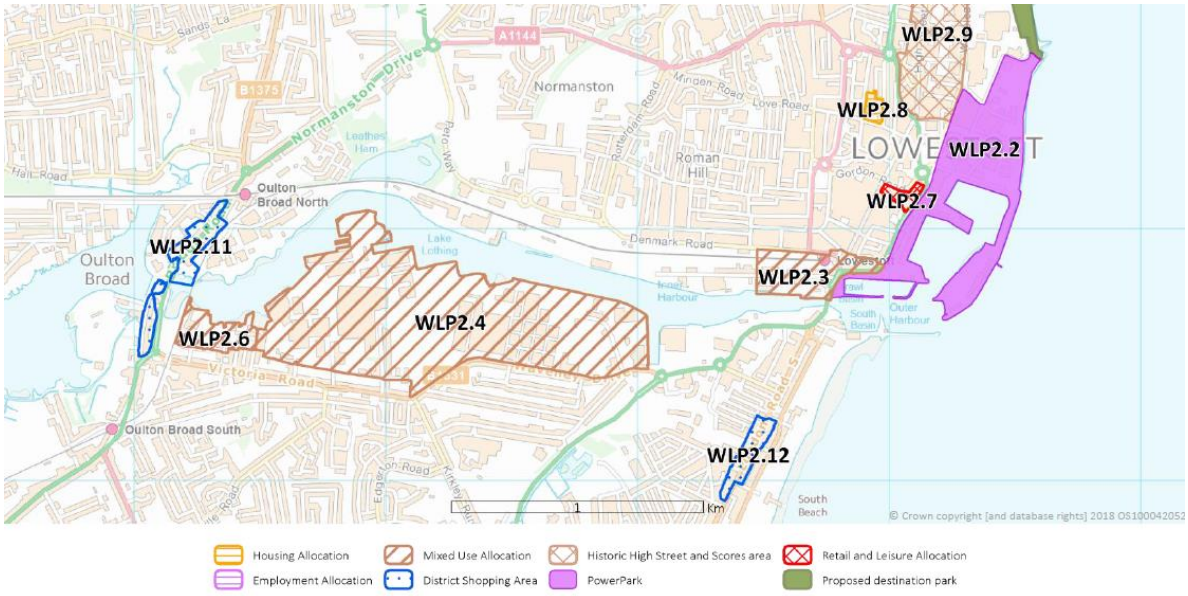


Figure 9: Waveney Local Plan Site Allocations [Source: Waveney Local Plan, 2018]

1.2 Draft Local Plan

The Council is well progressed with its Local Plan Review to cover the period to 2036. The Local Plan review will bring the District's planning framework up to date and in line with national planning policy.

The new Local Plan will set out the expected growth within the Waveney District geography, where this will be accommodated/located and how it will be delivered. The Plan will replace the Area Action Plan. However, it rolls forward many of the proposals within the Area Action Plan and maintains the regeneration focus on central Lowestoft.

The final draft plan has now been submitted to the Secretary of State for examination. Part of the examination will explore the need for new employment land to meet projected jobs growth.

1.2.1 Employment Land Needs Assumptions

The Draft Local Plan is supported by a high-level assessment of future needs for jobs and employment land. The Employment Land Needs Assessment (2016) provides an objective assessment of need for new industrial and office space over the period 2011-2031. The assessment includes an analysis of the likely benefits of offshore wind to Waveney and the implications for jobs and employment land.

The Employment Land Needs Assessment Update (July 2017) provides a quantitative update to the above study using latest economic forecasts from the East of England Forecasting Model and Experian.

Both the Employment Land Needs Assessment and its update recognise a significant potential increase in employment levels and demand for employment land within Waveney arising from the construction and ongoing maintenance of offshore wind developments off the region's coast.

The latest assessment models a forecast growth of 5,000 new jobs being created within Waveney district within the plan period to 2036. It recommends that the Local Plan should ensure sufficient employment land is made available to support this projected growth in employment, and to attract the significant opportunities from the offshore wind sector into the district and its major towns. It Is recommended that an appropriate employment land requirement for inclusion in the local plan is 43 hectares (106 acres) of new employment land for B-class uses in the district. The local plan has allowed

a greater allocation of employment land than this recommendation to provide some choice and flexibility and in case some sites do not come forward.

1.2.2 Priorities and Objectives within the Local Plan

Strategic priorities and objectives outlined in the Waveney District Draft Local Plan include:

- To achieve sustained and resilient economic growth in towns and rural areas in order to support 5,000 new jobs in the District;
- To improve the quality and provision of all types of infrastructure including in roads, railways and flood defences;
- To deliver up to 8,223 homes to meet the district current and future housing requirements, 56% of which will be located within the Lowestoft area;
- To deliver up to 53.6 hectares (133 acres) of new employment land, 60% of which will be located in the Lowestoft area.

The recognition of the huge potential for growth in Waveney associated with offshore wind farms is continued in the Area Action Plan which references the presence of traditional fishing and manufacturing sectors within Lowestoft alongside the growing supply chain expertise in offshore wind. The local plan articulates the town of Lowestoft as a growing 'centre of excellence' in renewables, home to key offshore wind developers and operators and the construction and operational bases of Greater Gabbard, Galloper and East Anglia ONE offshore wind farms.

The draft Local Plan further references the benefits to Lowestoft of its close proximity and strong links to Great Yarmouth which also offers considerable expertise to the offshore renewables sector. Within the plan period, it is the vision that Lowestoft, along with nearby Great Yarmouth, will be important centres in the construction, operation and maintenance of offshore renewable projects into the future. The Port of Lowestoft will be supported to maintain its position as a leading offshore renewable centre of excellence supporting the employment of a significant number of people.

1.2.3 Provisions for PowerPark

The Local Plan highlights the PowerPark as a key location for development in the town. It highlights that the area will continue to receive support and promotion as a cluster for the offshore renewables, engineering and oil and gas sectors.

In addition, the Local Plan includes a relocation strategy to support existing businesses operating in the area that are not in the energy sector to relocate to other areas within the town. Additional employment land allocated in north Lowestoft could accommodate businesses wishing to relocate.

1.2.4 Provisions for Waterfront Land

The waterfront land study area is also recognised in the Local Plan. Kirkley Waterfront and Sustainable Urban Neighbourhood area has an allocation to deliver 1,400 new homes, community facilities, new employment premises and better public access to the waterfront. This includes 7.5 hectares of land for employment and port related development.

The third crossing over Lake Lothing, planned to be in place by 2022, is referenced as representing a key capital investment project in the town to help alleviate traffic congestion in the town and improve connectivity and helping deliver regeneration sites into the future.

1.3 Economic and Policy Context

1.3.1 National Policy

The national policy framework which has an impact and influence on the land requirements and allocation of the offshore engineering sectors locally is split into three core government strategies summarised below; the UK Industrial Strategy, and the governments Clean Growth Strategy and Environment Plan which fall beneath this.

Industrial Strategy

The UK governments Industrial Strategy sets out the national approach to boost productivity, grow businesses and create jobs with investments in skills, industries and infrastructure. It indicates this will be achieved through:

1. Strengthening productivity through five foundations:
    - **Ideas**: encouraging the UK to be the world's most innovative economy
    - **People**: ensuring good jobs and greater earning power for all
    - **Infrastructure**: driving a major upgrade to the UK's infrastructure
    - **Business environment**: guaranteeing the best place to start and grow a business
    - **Places**: creating prosperous communities across the UK
2. Building partnerships with industry and addressing barriers to growth through 'Sector Deals'
3. Building on our established and emerging strengths to tackle 'Grand Challenges' including AI and data, the ageing society, clean growth, and future of mobility.

Within this strategy the government outlines plans to develop an ambitious Sector Deal for offshore wind, aiming to help drive 10GW of new capacity in the 2020s, with the opportunity for additional deployment into the longer-term.

Clean Growth Strategy

The UKs Clean Growth Strategy sets out an ambitious blueprint for Britain's low carbon future identifying a comprehensive set of policies and proposals that aim to accelerate the pace of 'clean growth', i.e. deliver increased economic growth and decreased emissions.

In the context of the UK's legal requirements under the Climate Change Act, the UK's approach to reducing emissions has 2 guiding objectives:

1. To meet our domestic commitments at the lowest possible net cost to UK taxpayers, consumers and businesses; and,
2. To maximise the social and economic benefits for the UK from this transition.

Within the Clean Growth Strategy, initiatives are outlined to reduce national greenhouse gas emissions in a number of areas including through improving business/industrial and residential energy efficiency, accelerating the shift to low carbon transport and delivering clean smart and flexible power. This includes proposals to reduce UK emissions from energy production, phasing out the use of unabated coal to produce electricity by 2025, deliver new nuclear power projects, and supporting future developments of renewable technologies including Offshore Wind.

To complement and support these ambitious objectives the clean growth strategy pledges government funds to deliver this evolution in UK energy generation to drive innovation and nurture low carbon technologies. For the first time, this strategy outlines targeted investment across the

energy system. The UK government, in partnership with the Research Councils and Innovate UK, also expects to invest £467m to support development and innovation within the nuclear sector and a further £177m to further reduce the cost of renewables, including innovation in offshore wind turbine technology.

The strategy also announces up to £557 million for further Pot 2 Contract for Difference (CfD) auctions, with the next auction planned for spring 2019, where it is anticipated a number of offshore wind projects will compete for CfD support.

Environment Plan

In January 2018 DEFRA published its 25-year Environment Plan, setting out how the UK government intends to work alongside businesses and communities to improve the environment within a generation. The Plan looks forward to delivering a Green Brexit and sets out ambitious proposals on reforming agriculture and fisheries management and achieving the highest standards in environmental status for UK land, rivers and seas.

By adopting the Plan the UK government hopes to achieve:

1. Cleaner air
2. Clean and plentiful water
3. Thriving plants and wildlife
4. A reduced risk of harm from environmental hazards such as flooding and drought.
5. Using resources from nature more sustainably and efficiently.
6. Enhanced beauty heritage and engagement with the natural environment.

The Plan seeks to implement a sustainable fisheries policy as the Government looks to take advantage of the opportunities offered by leaving the EU to bring a world-class fisheries management system that is based on the principle of maximum sustainable yield and helps to restore and protect the marine ecosystem.

1.3.2 New Anglia Economic Strategy

The New Anglia Local Enterprise Partnership published the Norfolk and Suffolk Economic Strategy in 2017 articulating stretching but achievable ambitions and priority actions to deliver increased economic growth, job creation, increased wages and new housing across the LEP geography by 2036.

The strategy recognises and highlights the regions diverse economy and existing specialisms in clean energy, ports and logistics, advanced manufacturing, ICT, life sciences and biotechnology. In it New Anglia set out their ambition to become a leader in clean growth and a centre for the UK's clean energy sector, referencing the existing supply chain in offshore renewables, oil and gas, and nuclear new build, sector support organisations such as OrbisEnergy, Hethel Engineering Centre, the East of England Energy Group (EEEGR), and home grown research providers such as the Centre for Environment, Fisheries and Aquaculture Science (CEFAS).

The strategy identifies nine key sectors in which Norfolk and Suffolk have competitive advantage including **Energy** and **Advanced Manufacturing and Engineering** (incorporating a strong and diverse supply chain working across numerous sectors including energy, agritech, aerospace and aviation, transport and automotive, and life sciences). The evidence base behind the strategy indicates that within Norfolk and Suffolk these high priority growth sectors offer a combined GVA of £6.1bn, employs over 90,000 employees, and supports over 6,000 businesses.

The Economic Strategy offers support to businesses growing within these priority sectors, and support to the continued development and growth of the established local clusters in the industries locally.

1.3.3 Suffolk Growth Strategy

The Suffolk Growth Strategy (Suffolk County Council, 2013) sets out the following four aims:

1. Suffolk needs a prosperous and vibrant economy which inspires people to succeed
2. Suffolk needs a high quality, responsive education and training system
3. Suffolk wants to be exemplar in tackling climate change
4. Suffolk needs all people to be kept safe from harm, to be able to live healthy lifestyles and to be valued.

The Strategy identifies key sectors that are forecast to grow strongly over the next decade and are highlighted as needed to ensure ongoing investment and support to grow. These sectors align with the New Anglia key sectors and include, but are not limited to, offshore renewables, ICT, food drink and agriculture, creative industries and biotechnology.

1.3.4 East Suffolk Economic Growth Plan

This Economic Growth Plan sets out how the East Suffolk Council (Suffolk Coastal and Waveney District Councils) and its partners will create the best environment for businesses to start up, flourish and grow to facilitate economic growth in the plan period to 2023. It will achieve this through maximising the competitive advantage in key sectors such as energy, ICT, tourism and logistics.

Promoting economic growth is one of the central pillars of the East Suffolk Business Plan. The Plan identifies four economic assets and opportunities that are "amongst the most significant anywhere in the UK", one of which is offshore and renewable energy. In addition, the Councils aim to support the local fishing sector to advance opportunities. The Growth Plan identified that Brexit impacts could generate new opportunities in primary industry, notably fishing, potentially resulting in a resurgence.

The East Suffolk Economic Growth Plan recognises the potential of the key sectors with high-growth potential including energy, manufacturing and engineering, marine, ports and logistics. Lowestoft is recognised as a key economic geography that could support new jobs growth. The Growth Plan has clear priorities including encouraging established businesses to invest and grow and attracting inward investment. East Suffolk Council has also committed to supporting the energy sector by:

- continuing to ensure appropriate land and premises provision in and near Lowestoft to enable the offshore energy sector – and its supply chain – to thrive;
- working with New Anglia LEP to promote and advance the 'East of England Energy Coast', recognising the role, contribution and potential of East Suffolk's specialisms in renewables, nuclear and gas.

2 The Market Opportunity

2.1 Overview

In this section we have mapped the future market opportunity in the offshore engineering and neighbouring sectors by mapping large scale capital investments planned in energy infrastructure, ports and transport related projects in the immediate future to 2025 and the longer term to 2040.

Over the past decade, Lowestoft has captured a significant pipeline of new investment in the town largely due to investment in offshore renewables and supporting supply chain infrastructure. The sub-region is now recognised globally as a leading centre for the development, deployment, operations and maintenance of offshore renewables, in particular offshore wind, with some of the world's largest offshore projects being delivered or developed off the region's coast. The Norfolk and Suffolk coastal region's ability to support this market is largely derived from the last 50 year's offshore energy industries, with an established offshore supply cluster.

2.1.1 Methodology

We have undertaken a detailed assessment identifying all significant energy/engineering infrastructure development projects out to 2040. Prospects have been categorised geographically as:

1. Projects in/offshore Suffolk and East of England with a capital value (CV) >£5m
2. Projects in/offshore the UK with CV > £25m
3. Projects in NW Europe with CV > £75m

Our assessment further categorises these capital investments by industrial sector identifying projects in the following sub-sectors of offshore engineering and neighbouring or competing industries:

- Upstream oil & gas
- Oil & gas decommissioning
- Other fossil fuels
- Carbon, capture & storage (CCS)
- Nuclear
- Offshore wind
- Onshore wind
- Other power generation
  - Wave and tidal
  - Solar
  - Biomass
  - Gas
- Transport
- Ports
- Power transmission & storage

We have researched opportunities across a wider geographic area in terms of the accessible market for businesses and supply chains based in, and operating, from Lowestoft. The town has deep experience in developing and delivering products and services to UK-wide and global offshore engineering markets including offshore oil & gas, offshore wind, commercial and leisure marine, and nuclear engineering sectors. Mapping these opportunities will help to shape longer-term employment land requirements, building on the area's existing supply chain strengths.

In collaboration with 4C Offshore, **we have identified 1,176 projects, totalling £1,402bn of capital investments across NW Europe[1], the UK and the East of England[2] region.**

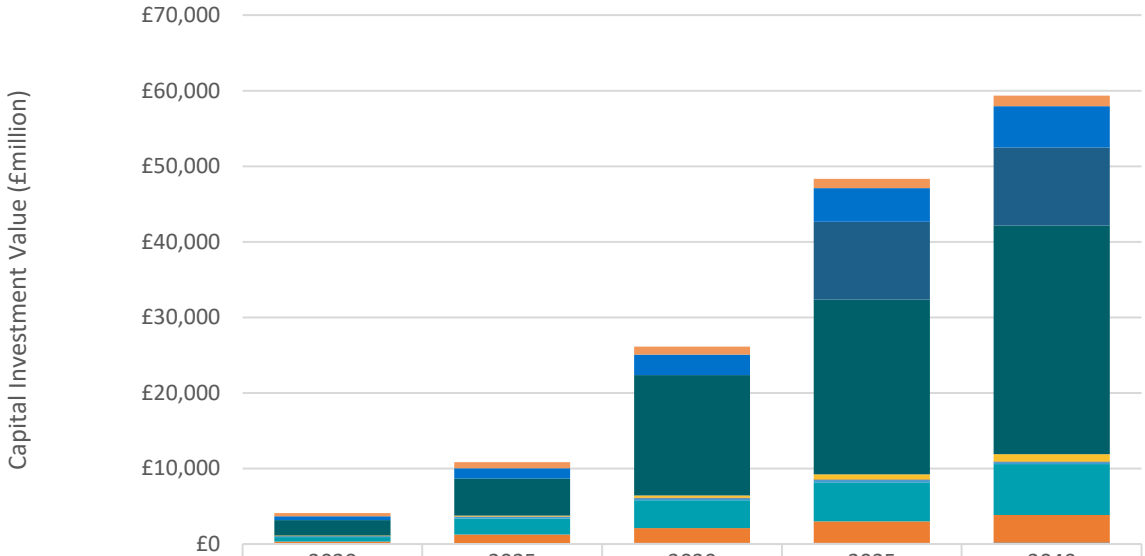
[1] NW Europe is defined as UK, Ireland, Germany, France, Belgium, Netherlands, Denmark, Norway & Sweden.
[2] East of England is defined as Norfolk, Suffolk, Essex, Cambridgeshire, Hertfordshire & Bedfordshire

The headline results are:

- **£10.8 bn planned capital investments in major energy and infrastructure projects in the East of England to 2025**
- **A total of £59.4bn investments planned in regional projects in the longer term to 2040**
- **A further £497bn investment in England and across the UK to 2040**
- **And a further £846bn investments across NW Europe up to 2040**

2.2 East of England Market Opportunity

In the East of England there is some £10.8 billion investment planned in energy, engineering and infrastructure projects in the short term to 2025, increasing to more than £59.4bn by 2040, as shown in Figure 10.



	2020	2025	2030	2035	2040
Oil & Gas	£429	£782	£1,051	£1,257	£1,402
Oil & Gas Decom.	£489	£1,349	£2,711	£4,412	£5,484
OtherFossil	£0	£0	£0	£0	£0
CCS	£0	£0	£0	£0	£0
Nuclear	£0	£0	£0	£10,329	£10,329
Offshore Wind	£2,059	£4,932	£15,945	£23,103	£30,261
Onshore Wind	£0	£0	£0	£0	£0
WaveAndTidal	£0	£0	£0	£0	£0
Solar	£58	£142	£276	£703	£958
Biomass	£36	£42	£80	£83	£83
Gas	£91	£182	£274	£274	£274
Transport	£611	£2,139	£3,667	£5,195	£6,723
Ports	£330	£1,156	£1,981	£2,807	£3,632
Power Transmission	£0	£94	£141	£179	£216

Figure 10 Projected Capital Investments (cumulative) in the East of England in the Short, Medium and Long term to 2040

The most significant short-term investments to 2025 are in offshore wind (£4.9bn), transport (£2.1bn), ports infrastructure (£1.5bn) and oil and gas decommissioning (£1.3bn). See Figure 11.

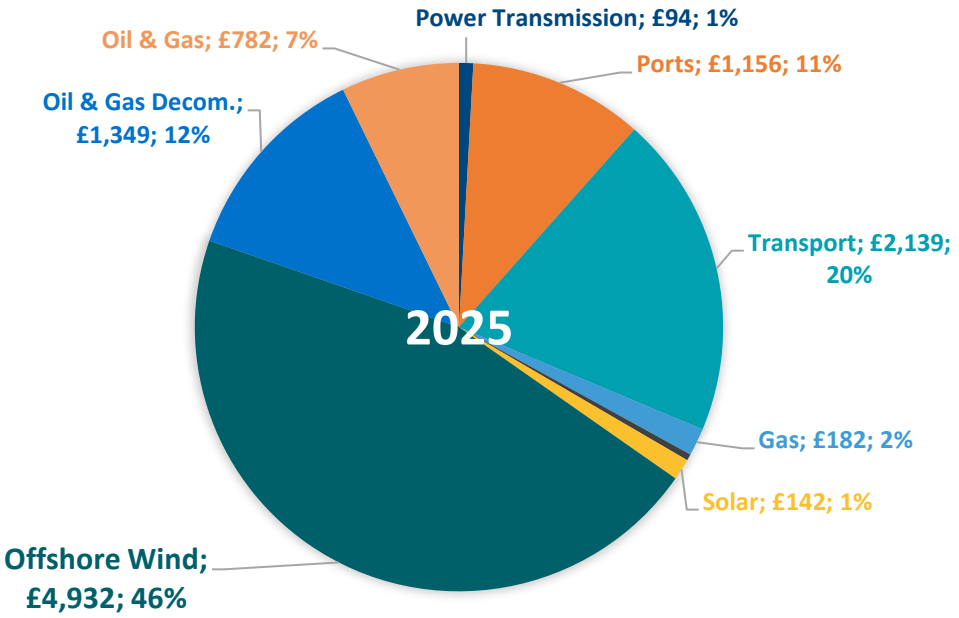


Figure 11 CAPEX for projects in the East of England (over £5m) in the short-term to 2025

Looking into the longer-term to 2040, the order of the sector's capital expenditure in the East of England is unchanged apart from the introduction of the nuclear new builds at Sizewell and Bradwell. The nuclear expenditure becomes very apparent with a total spend of one third of that of the offshore wind industry.

In the long-term the most significant investments are in offshore wind (£30.2bn), nuclear (£10.3bn), transport (£6.7bn), oil and gas decommissioning (£5.5bn), and ports infrastructure (£3.6bn). See Figure 12.

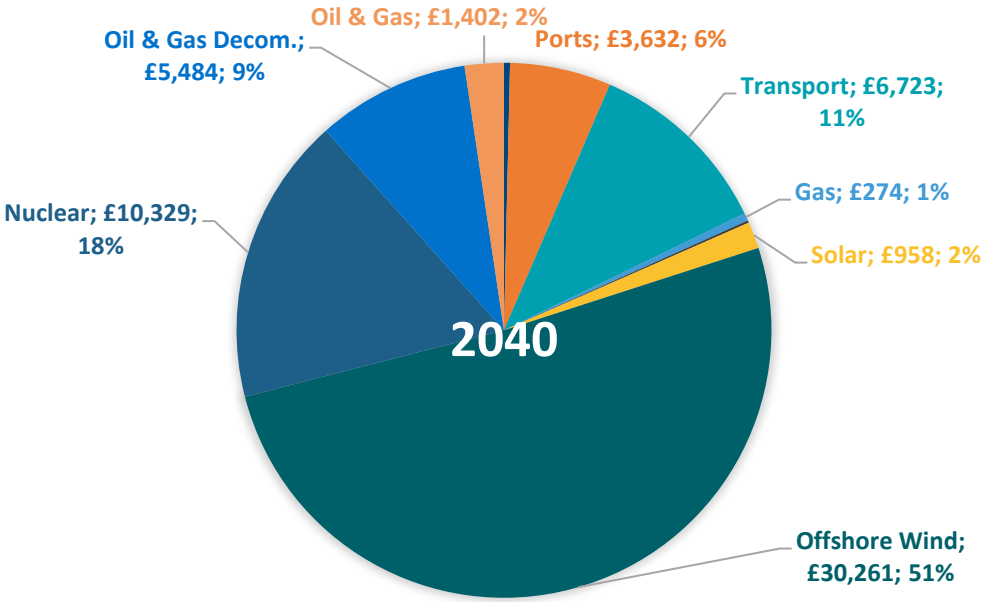


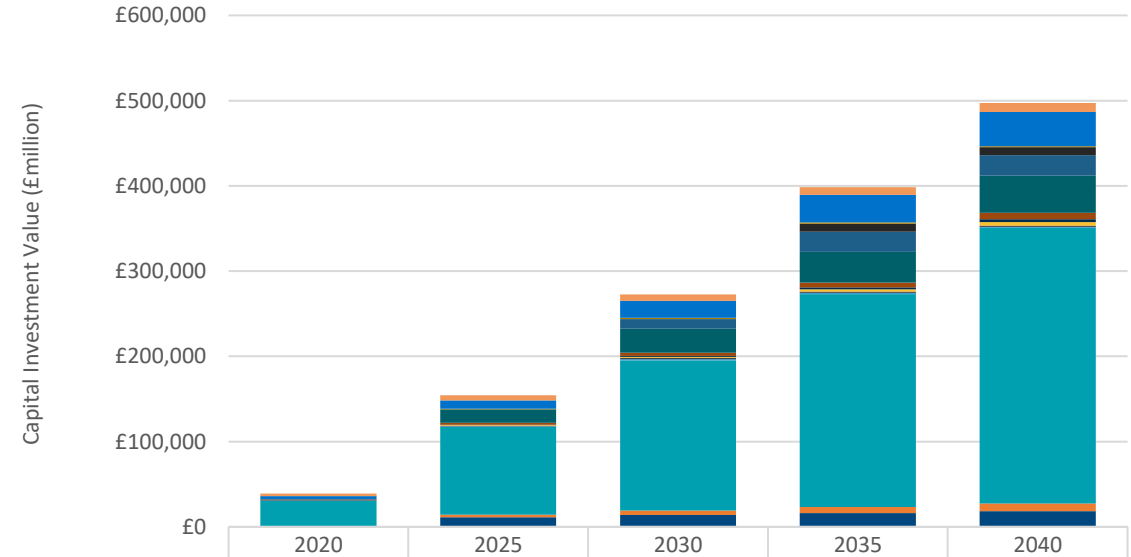
Figure 12 CAPEX for projects in the East of England (over £5m) in the long-term to 2040

In addition, whilst the oil and gas sector is maturing it still contributes significantly in the region and is anticipated to invest a similar amount by 2040 as solar, gas powered generation, power transmission and biomass infrastructure capital expenditure put together.

2.3 UK Market Opportunity

In addition to the significant market opportunity in the East of England, our assessment has modelled a further £497bn investment in England and across the UK to 2040. The following figures **do not** include the East of England forecasts as set out in Section 2.1. These have been separated to ensure clarity of the specific market opportunity available to the region.

Looking nationally at capital investment projects with a capital value of over £25m, £154bn investment is planned in the short-term to 2025, growing to almost £497bn in the longer-term to 2040.



	2020	2025	2030	2035	2040
Oil & Gas	£3,146	£5,734	£7,708	£9,219	£10,281
Oil & Gas Decom.	£3,584	£9,890	£19,883	£32,357	£40,214
OtherFossil	£0	£600	£1,200	£1,200	£1,200
CCS	£0	£0	£0	£9,500	£9,500
Nuclear	£0	£0	£11,400	£23,871	£23,871
Offshore Wind	£0	£16,002	£28,030	£35,848	£43,666
Onshore Wind	£666	£2,331	£3,996	£5,661	£7,326
WaveAndTidal	£49	£262	£1,102	£2,082	£3,482
Solar	£243	£592	£1,151	£2,936	£3,999
Biomass	£665	£765	£1,458	£1,516	£1,516
Gas	£478	£955	£1,433	£1,433	£1,433
Transport	£29,380	£102,830	£176,279	£249,729	£323,179
Ports	£825	£2,887	£4,949	£7,011	£9,073
Power Transmission	£94	£11,379	£14,066	£16,216	£18,365

Figure 13: Projected Capital Investments (cumulative) across the UK (over £25m) in the Short, Medium and Long term to 2040

From the UK perspective, the most significant areas for investment will again include transport, oil and gas decommissioning and offshore wind.

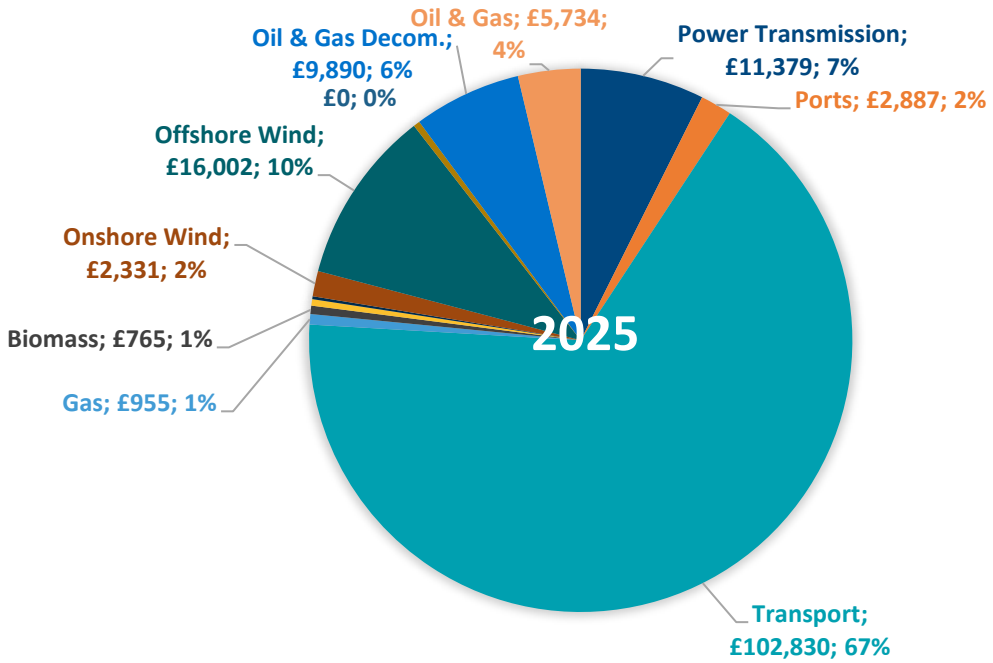


Figure 14 CAPEX for projects in the United Kingdom (over £25m) in the long-term to 2025

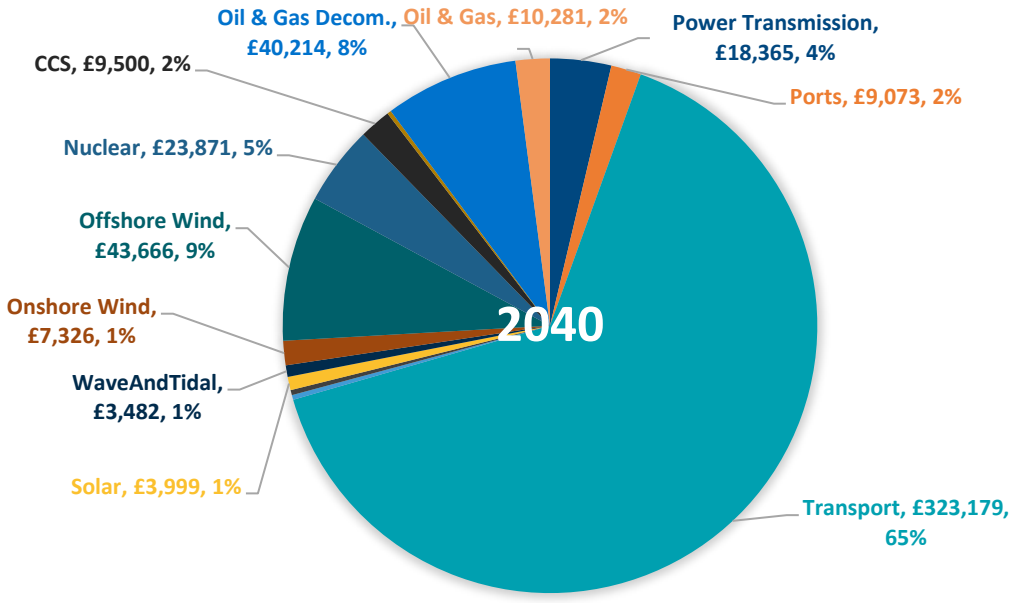


Figure 15: CAPEX for projects (cumulative) in the United Kingdom (over £25m) in the long-term to 2040

2.4 North West Europe Market Opportunity

Finally, in addition to the market opportunity offered in the East of England and across the UK, our assessment has identified a further £846bn investment in capital projects in North West Europe to 2040. Mirroring the trends across the UK significant investments are projected in transport and offshore wind sectors, power transmission and port infrastructure are also important sectors for investment.

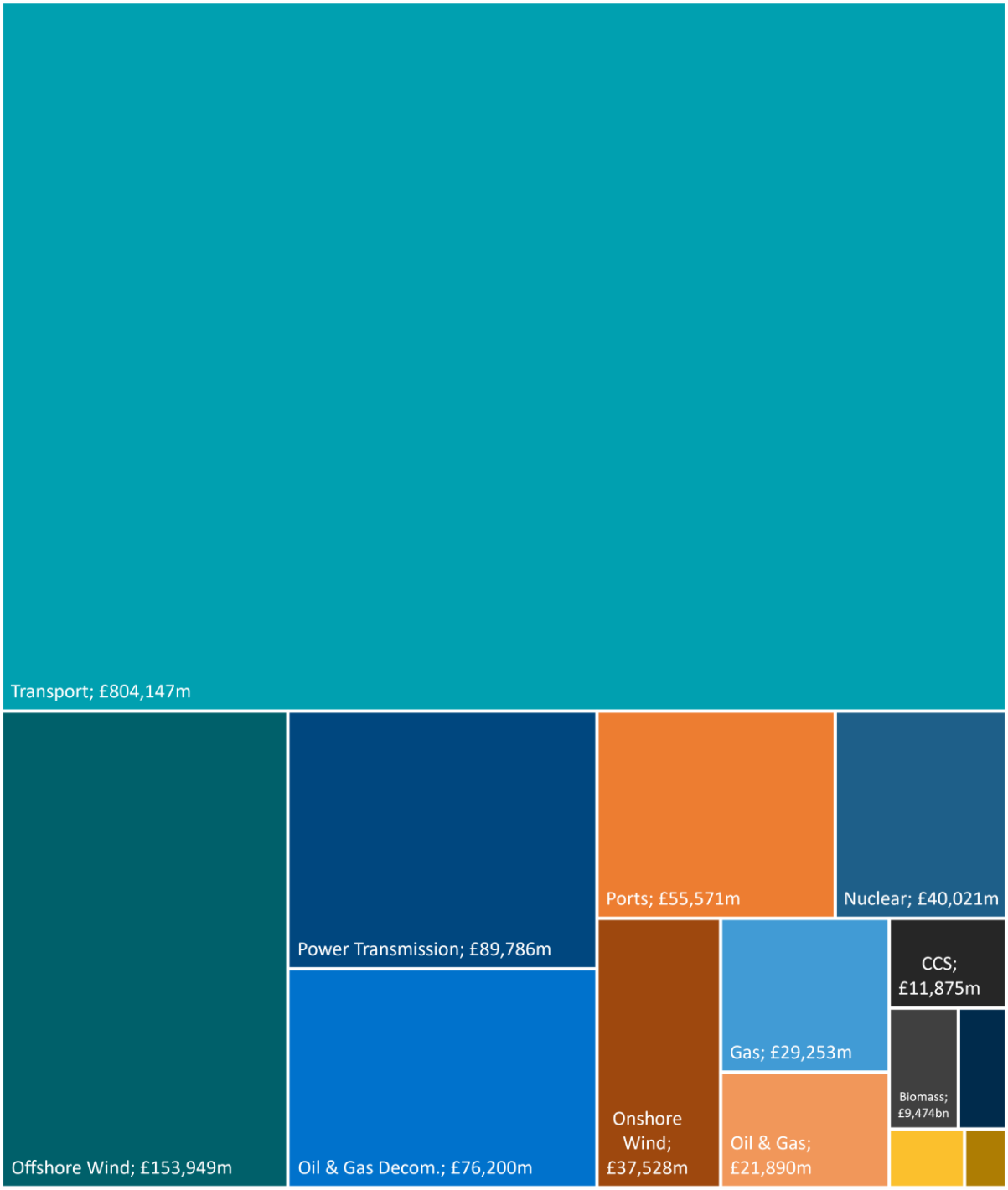


Figure 16 Projected CAPEX in projects across North-West Europe (over £75m) to 2040

Having identified the market opportunity for capital investment projects in the East of England and across wider geographies across the UK and North West Europe, this chapter identifies trends in the modelled investments within each sector examined.

2.5 Sector Profile: Upstream Oil and Gas

Offshore activity has been a mainstay of the East of England economy for the past fifty years and has provided a vital lifeline in recent recessions, particularly for areas around the east coast of the region, including Lowestoft and Great Yarmouth. In 2016/17, oil and gas provided some 76 per cent of the UK's total primary energy, with production from the UK's Continental Shelf (UKCS) satisfying 60 per cent of the country's primary energy demand.

UK Government projections suggest that approximately 66 per cent of the UK's energy mix will be met by the oil and gas industry by 2035.

Figure 17: Breagh A Offshore Gas Platform in the SNS

Owing to its proximity to sizeable gas fields in the North Sea (see Figure 18), the East of England is an established hub for the offshore gas industry and a large base for major and international businesses. With a strong local workforce and vast relevant experience, the region has maintained its reputation as a national centre for offshore activity.

The SNS currently plays host to over 150 offshore gas assets. While the North Sea is now regarded by many as a mature province on a slow decline this has opened up other opportunities in areas such as advanced oil and gas recovery techniques and decommissioning.

Based on field data published by Government it is clear that overall SNS gas production is declining significantly, however, a significant number of gas discoveries in the SNS could be commercially viable.

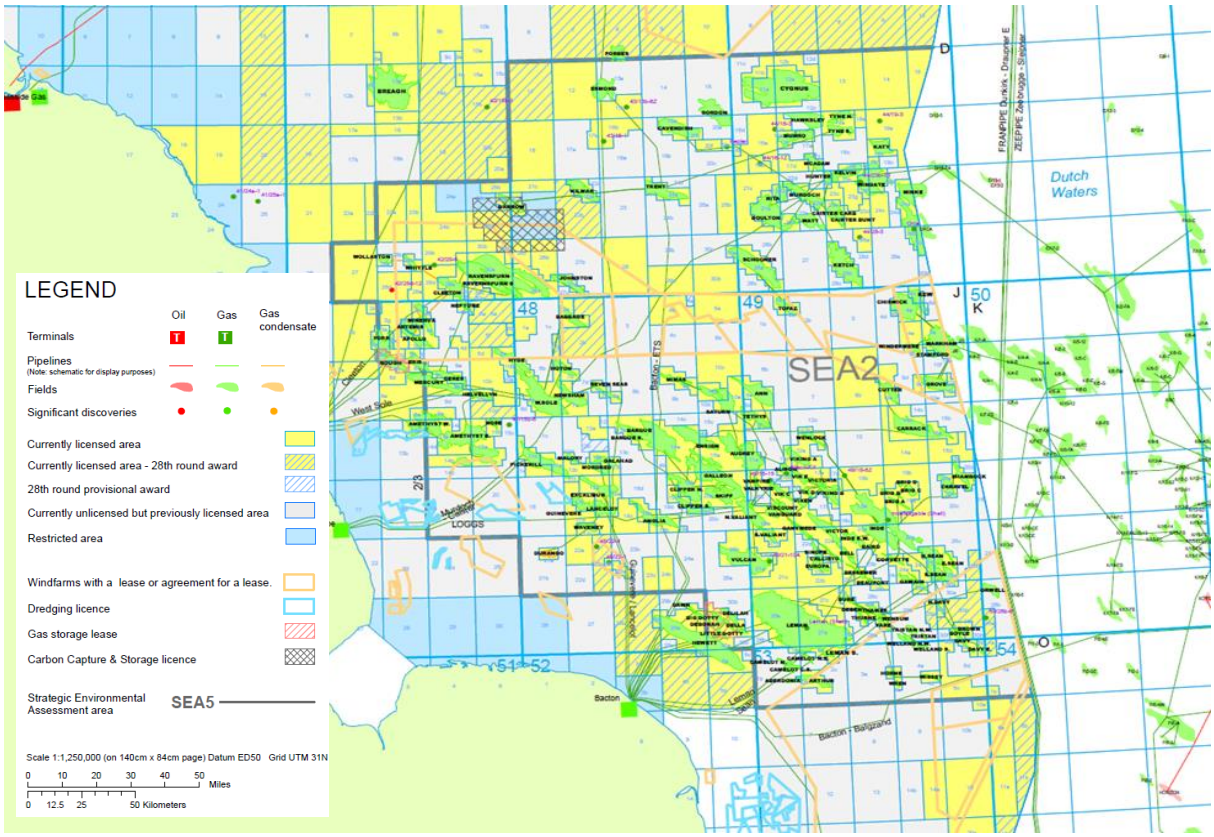


Figure 18: SNS gas fields - *Source: BEIS*

The SNS, being the least expensive region of the UK to operate at £13/boe, has seen relatively little cost growth over the last decade. This has been principally driven by the need to control costs to maintain profit margins as the gas producing region has not enjoyed the same high revenues as other areas of the UKCS that are rich in liquids. But the lower market value of gas, in comparison to oil, set against rising costs is a particular problem for companies operating in the SNS[3]. These factors make it hard for the SNS, which is exclusively gas production, to compete for new investment.

However, oil and gas is a global industry with companies manufacturing, providing personnel and supporting projects across the world. Companies locating and growing within Lowestoft could be well placed to support both the anticipated investment in the UK Continental Shelf and the global markets for oil and gas exploration, production, storage and decommissioning.

The capital investment forecasts for oil and gas projects are based on known oil and gas fields currently undergoing development.

Lowestoft is well placed to support this ongoing investment due to the concentration of offshore service companies located in the town and across Suffolk; and because of the proximity to the Bacton Terminal and the gas fields of the Southern North Sea (SNS), with the potential for offshore gas storage and gas interconnection to Belgium.

[3] Gas has historically traded at around 20% the value of oil. Divergence has also been seen over the last four years,

In this report it is assumed that the bulk of expenditure relates to offshore oil and gas production. Non-conventional (fracking) onshore oil and gas reserves are only found in the UK, France, Sweden, Denmark and The Netherlands according to DNV.GL. It is assumed that there is no significant non-conventional growth justified by the declining costs of renewables.

2.5.1 Oil & Gas Decommissioning

Decommissioning of primarily gas fields off the East of England in the Southern North Sea will be spread across 78 fields with an anticipated spend of £489m in 2020 increasing to a total of £5.5bn in 2040.

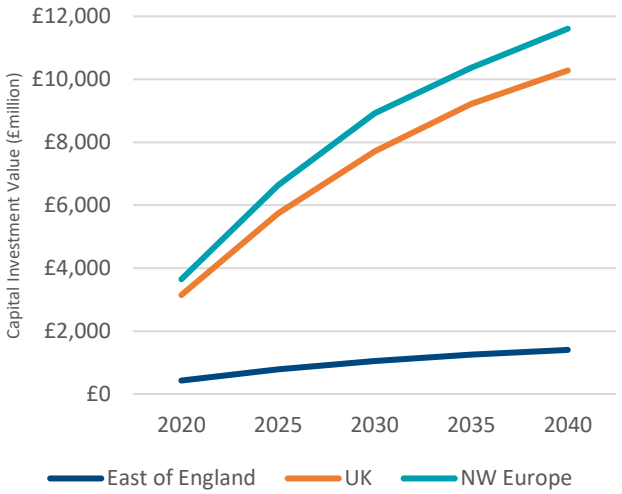


Figure 19: Projected capital investments (cumulative) in upstream oil and gas projects to 2040

The 2009 BVG report identifies that the oil and gas industry is able to deliver long term, high value jobs for the Lowestoft area and that the port may need to provide additional facilities in order to capture some of the decommissioning work that the SNS will provide over the next 30-40 years. The physical facilities and supply chain requirements for oil & gas fabrication and decommissioning work are broadly comparable, requiring large lay down facilities with good waterfront access capable of heavy lift vessels to load/off-load large pieces of equipment e.g. topsides and removed foundations.

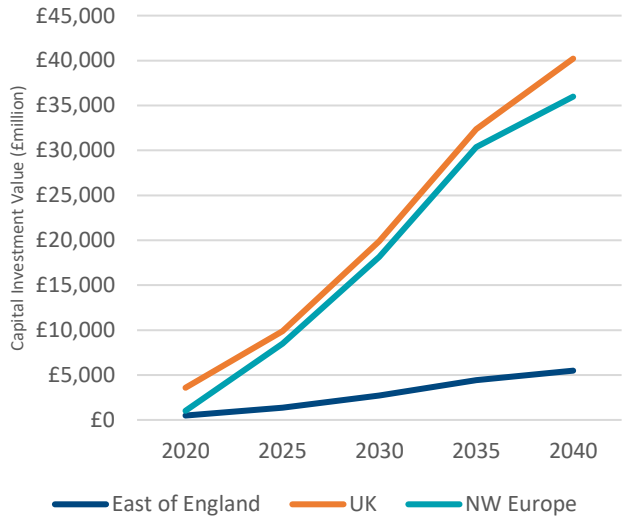


Figure 20: Projected capital investments (cumulative) in oil and gas decommissioning projects to 2040

2.5.2 Other Fossil Fuels

Coal plants in UK are closing and there are no new coal plants anticipated. The capacity for oil-fired auto-generation (for industry self-consumption) is unknown and so no investment is assumed in East of England or UK.

There are one or two potential new coal plants in Germany but there are no confirmed new builds in the whole of NW Europe.

2.6 Sector Profile: Carbon Capture & Storage

CCS has been slow to take off throughout Europe. There are few projects in the pipeline, but various EU governments are seeking to encourage development of this technology and so, potentially, more projects will be announced and progressed over the next few decades.

In October 2017, the UK government announced its new approach to carbon capture, usage and storage in the Clean Growth Strategy with the aim of deployment at scale during the 2030's subject to costs coming down sufficiently. Whilst there is anticipated investment in CCS of £9.5bn bn in the UK up to 2035, there are no projects planned in the East of England.

The Suffolk coast, adjacent to the Southern North Sea basin, potentially has considerable storage capacity for CO_2 and, therefore, offers significant long-term potential for CCS businesses to operate in the area, delivering CO_2 to offshore storage sites. CCS business opportunities for the region may include re-use of the Bacton Terminal and associated pipelines (Bacton terminal has eight pipelines tying back to it from 74 fields) or the development of a CCS hub around the Thames Gateway.

The 2009 BVG Demand & Need report proposes that the PowerPark could offer the CCS sector an operational base for developing the technology and innovation and techniques required to utilise the SNS gas fields with a long term view of providing operations and maintenance and service support from business already operating within the oil, gas and marine sectors.

Lowestoft is currently well endowed with technical expertise, which is relevant to developing CCS, however the market is still very young with projects still in the research and development phases and technologies at an early stage of commercialisation. The offshore oil and gas, power generation, renewable energy and specialist technical expertise that already exists in the area offers a strong platform on which to build.

Given the stagnation and delay in developing CCS and related technologies, the prospects for Lowestoft are considered as medium to long term, with other sectors potentially offering stronger and shorter-term investment opportunities.

The opportunities for Lowestoft in the short term would be limited. However, CCS should feature in the medium to longer term development plan as companies locate in the area and expand the indigenous capability of the local supply chain.

2.7 Sector Profile: Nuclear

Nuclear power offers a low carbon electricity source and is likely to remain an important component of the overall national electricity supply for the foreseeable future if low carbon targets are to be achieved.

The region has both the proven expertise and new identified key sites and projects to continue a formative role in this key energy sector. From Sizewell A currently being decommissioned, Sizewell B as a current operating facility and the proposed new reactors at Sizewell C and Bradwell B which forms part of the Government's new civil nuclear build programme.

Figure 21: Sizewell B Power Station, Suffolk

The UK currently has 15 reactors with a total generating capacity of 10 gigawatts of electricity (GWe). All but Sizewell B are scheduled to be retired by 2035.

The capital expenditure of £10.3bn in the East of England will impact in approximately 2035 with the building of the two new plants at Sizewell and at Bradwell (neither Sizewell nor Bradwell have government approval yet). This is equivalent to 20% of the entire capital expenditure on new build nuclear plants in NW Europe and 28% of planned build capacity.

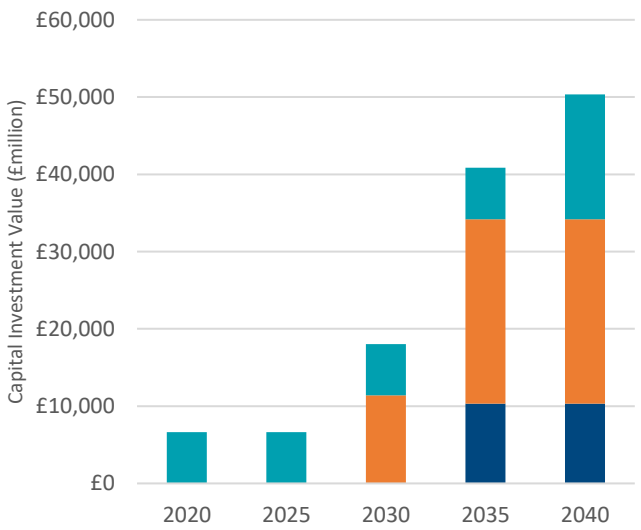


Figure 22: Projected capital investments (cumulative) in nuclear projects to 2040

The overall potential for regional companies to contribute to and benefit from the nuclear industry is significant, regionally, nationally and globally.

The supply chain opportunities within the nuclear sector in Suffolk will be primarily for manufacturing the non-nuclear components of a new reactor, as the UK currently lacks the capability to build equipment such as the reactor pressure vessel. Such non-nuclear components include the transformers, switchgear (circuit breakers between the generator and the transformer), concrete, steel, pipes and cabling.

The knowledge and skills base necessary for new nuclear build and operation have to be maintained and re-invigorated, through investment in the communities surrounding the site as well as in universities and colleges teaching relevant courses. There is potential for investment in the coastal

defence technologies that will be required to shore up coastal nuclear sites and ensure that they remain safe from flooding, erosion and inundation over the life time of a plant (up to 10 years for consent and building, approx. 60 years operation, and 20 years decommissioning) - a long term economic opportunity for the whole of Suffolk and the wider region.

Lowestoft and Waveney are well within commuting distance of the proposed development at Sizewell which could provide significant employment opportunities for the local community.

2.8 Sector Profile: Onshore Wind

Onshore wind is one of the most mature renewable energy technologies and will continue to be important in meeting the UK's renewable energy targets. The region has both existing generating sites and potential sites that may have suitable resource for onshore wind, particularly in coastal locations.

Onshore wind power provides an increasingly economic source of energy, with significant worldwide growth for the last ten years. The industry has been made viable through economic subsidies which have enabled development to take place. For some countries, onshore wind power is both a key energy source and a major industry in its own right.

Earlier demand and need research identified that Lowestoft, in particular the PowerPark, would be unlikely to attract the onshore wind sector as the region has little operational onshore wind, while the supply chain is largely based in mainland Europe.

Research suggests that there is limited potential for onshore wind supply chain development in relation to import (and potential export) of wind farm hardware into the region and beyond. This will not necessarily require the creation of any new facilities.

Whilst Lowestoft has and continues to attract companies that are active in both the onshore and offshore wind industries, it is likely to be the offshore wind projects that will be the prime focus.

There is no planned capital expenditure for onshore wind projects in the East of England over £5m. By 2040 there is forecasted spend of £7.3 bn total in UK. There is an additional £27.6 bn in planning stages.

2.9 Sector Profile: Other Power Generation

2.9.1 Wave and Tidal

Wave and Tidal technologies remain at an early research and development stage, with limited options for larger scale deployment. Therefore, there are currently no marine projects in Europe of any significance or size at this early stage of the industry's growth. For the capital that is spent in the forecast, due to economies of scale required for cost reduction, it is envisaged that majority of projects will exceed £75m.

Across the UK, there are forecast projects totalling an estimate £3.4bn up to 2040, although no specific projects to be located off the East of England at this stage.

The 2009 BVG Report suggested that a wave and tidal research centre would deliver the highest value in long-term employment, with the smallest land footprint.

The report highlighted that the nearest tidal resource for R&D is located off the Norfolk and North Suffolk coast which has more benign marine conditions for early stage testing, complimentary to prototype testing at EMEC in Orkney and Wavehub off the South West coast.

We conclude that Wave and Tidal technology opportunities remain a significant area whereby Lowestoft and wider Suffolk are well placed to support the ongoing research, development, prototyping and deployment of wave and tidal devices with its shallow water environments suitable for testing and a range of port side locations for easy deployment.

2.9.2 Solar

Large solar projects (>95MW) are relatively rare and so it is likely that a small percentage, say 3%, will be over that threshold. Of the 24 projects in the East of England the largest is at Ockendon of 46 MW. The majority are much smaller (i.e. under 10 MW). £58m will be spent in the East of England up to 2020 increasing to a total of £958m by 2040, with the majority of expenditure between 2030 and 2035.

2.9.3 Biomass

Biomass (also referred to as Bio-Energy) has potential to contribute to electricity, heat and transport energy needs. Biomass can be burnt for both heat and electricity. Biogas can be produced from landfill and anaerobic digestion and can either be cleaned and delivered in the gas network or burnt for electricity or heat. Biofuels may play a part in low carbon transport.

Norfolk and Suffolk have large food, agricultural and waste resources that put it in a good position to develop this sector, both for its own regional energy needs and to exploit its proximity to the large energy demand of London.

In the UK 70% of existing biomass projects are greater than £75m and 66% of future projects are over that threshold. When available coal powered plants are converted to biomass plants the demand for dedicated biomass powered plants will diminish.

Planning permission has been granted for the construction of 2 biomass plants in Norfolk and Suffolk (Chalk Lane Business Park at Snetterton and Ellough Biodiesel which are included in the total expenditure of £80m before 2030.)

Research highlights the strong and diverse agricultural and industrial heritage within the region that supports the development of biomass. It concludes that opportunities for Lowestoft within the biomass energy sector would be limited to storage and import/export activities and that there is no comparative advantage to the areas overall in accommodating elements of this sector.

2.9.4 Gas power generation

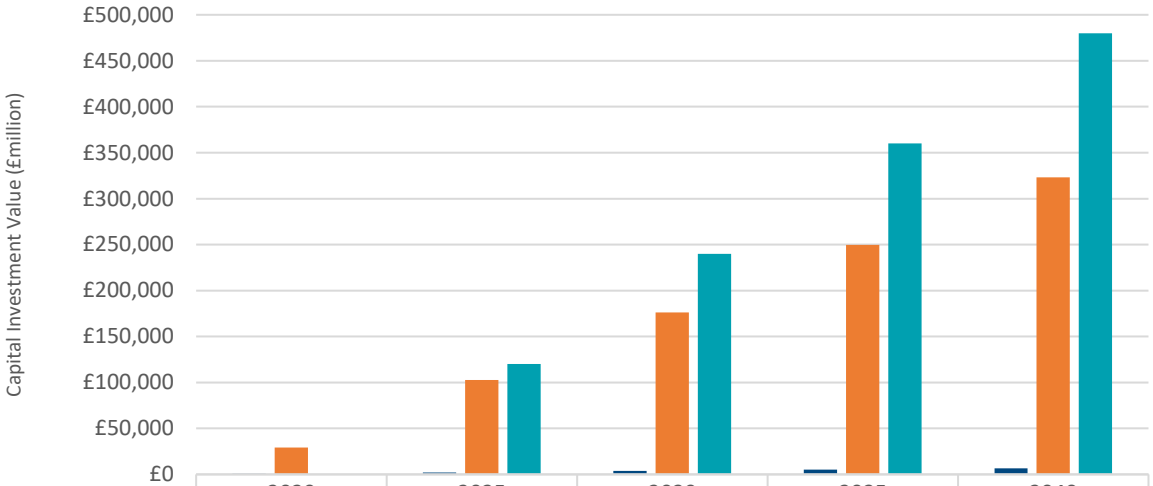
The capital expenditure across the East of England will increase from £182m up to 2025, to £274m in 2040 with no further spend expected after that. This includes 17 projects across the region including both landfill gas and gas and diesel plants.

2.10 Sector Profile: Transport

The main investment on transport infrastructure in the East of England will be the Oxford to Cambridge Expressway, and the three river crossings – Upper Orwell, Great Yarmouth third and Lake Lothing third crossing.

Overall, the sector will see a capital spend of £2.1bn by 2025 increasing to £6.7bn in 2040. The total spend in UK on infrastructure projects and maintenance by 2040 is £323bn.

This research includes major transport infrastructure projects by the DfT, smaller projects from Highways England and those over the £5m threshold for Scotland, Wales and Northern Ireland.



	2020	2025	2030	2035	2040
East of England	£611	£2,139	£3,667	£5,195	£6,723
UK	£29,380	£102,830	£176,279	£249,729	£323,179
NW Europe	£48	£120,048	£240,048	£360,048	£480,048

Figure 23 Projected capital investments (cumulative) in transport projects to 2040

2.11 Sector Profile: Ports

In Q2 2018 Moffat Nichol identified £1.8bn of port infrastructure projects reportedly expected to be delivered by 2020. Although given the early status of many projects, this is considered to be an overestimate. This would correspond to £900m of annual investment making the UK the largest market. It is assumed that only two-thirds will proceed in the timeframe, i.e. an annual investment of £600m of which a projected £330m (increasing to £3.6bn by 2040) will be invested in the development of Sheerness, Felixstowe and the Great Yarmouth Outer Harbour.

2.12 Sector Profile: Power Transmission & Storage

UK projects information is derived from National Grid's Network Option Assessments (NOA) which outlines 10-year investments to the end of 2027. UK investments will be worth £3.2bn according to National Grid NOA. This has been divided pro-rata across the UK projects (except where costs are known). Investments have been assumed to continue at 80% of the same rate from 2030 to 2040. It is expected that the rate of significant infrastructure projects will decrease as electricity market integration exceeds 15%.

There are 3 projects planned for the East of England (Burwell, Tilbury and Wymondley) with capital expenditure of £94m up to 2025.

2.13 Sector Profile: Offshore Wind

The UK is currently the world's largest market for the development and deployment of offshore wind. The Southern North Sea is the most densely populated area for offshore wind projects with more than 1,106 turbines currently operating and thousands more planned over the coming decade.

The wider European offshore wind market is a rapidly growing area with Germany, Denmark and France planning for significant developments in offshore renewable energy generation.

This being said East Anglia sits at the heart of the world's largest market for offshore wind in the UK North Sea. Specifically, the East Anglian coastal region's ability to support this market is largely derived from the last 50 years' offshore gas, maritime and ports & logistics industries, with an established offshore energy supply cluster.

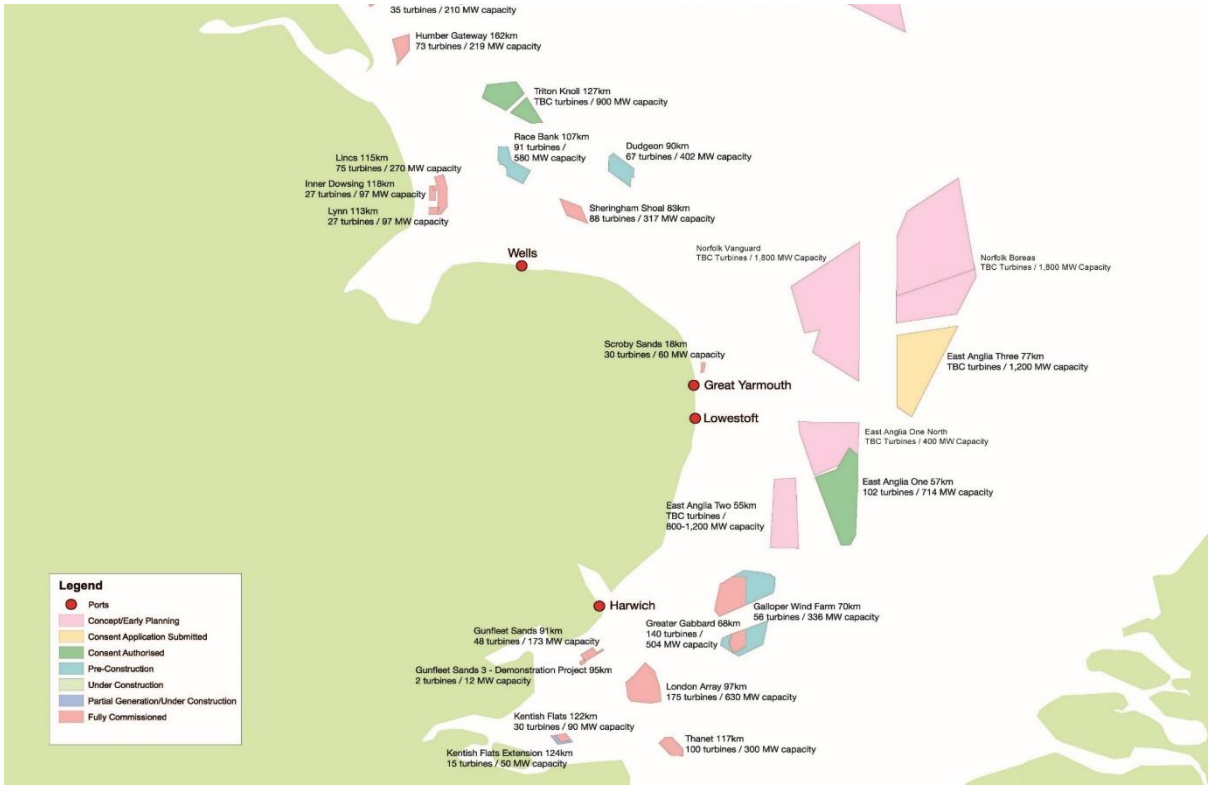


Figure 24: SNS Offshore Wind farms - Source: Nautilus/4C Offshore

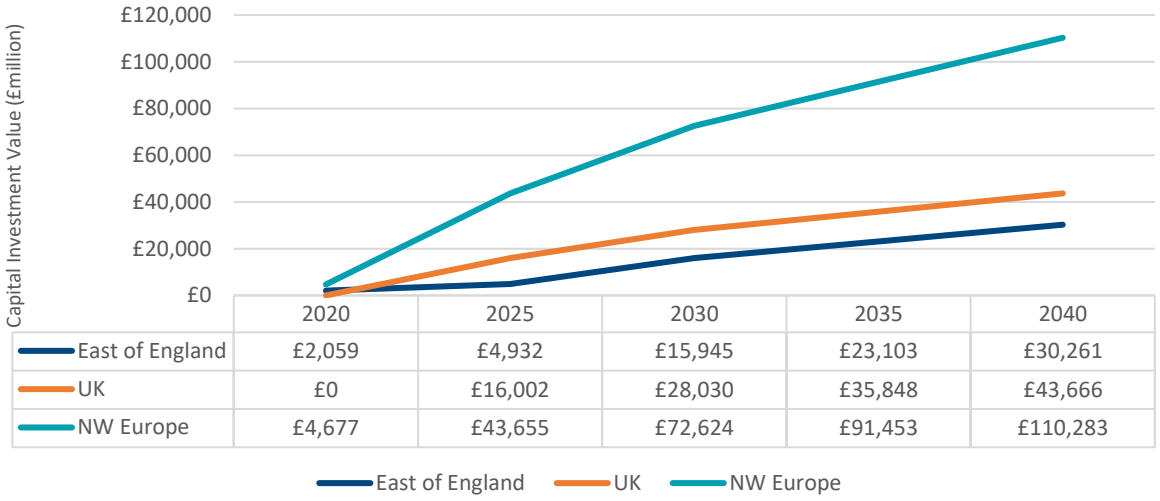
The East Anglian coast has unrivalled and strategically located ports offering direct access to all planned Round One, Two and Three wind farms sites. Proximity to the physical market is a key consideration of any wind farm developer and of the supply chain. Figure 24 shows the status of offshore wind development off the East Anglian coast.

The East of England has recently welcomed announcements from Scottish Power Renewables who have established their construction and operation base for the 714MW East Anglia ONE offshore wind farm at Lowestoft. Lowestoft was recently used as the construction base for Innogy's 340MW Galloper offshore wind farm, off the Suffolk coast.

Up to 2020, forecast investment in offshore wind in the East of England is in £2bn with the construction of Triton Knoll due to start early in 2019. Before 2030, a further 5 projects (East Anglia ONE North, TWO and THREE, Norfolk Vanguard and Norfolk Boreas) are anticipated taking the capital

expenditure up to £16bn. Over the same period the total forecasted spend in the rest of UK is £28bn and £72.6bn in the rest of NW Europe. The Netherlands are planning a further £26bn investment, Germany £17.5bn and France £13.2bn.

Growth of offshore wind in UK up to 2030 is based on political certainties, however, growth is assumed to be slow for the period 2030 - 2040 to 65% of the growth seen in the previous decade. In addition, the UK's share of the total European market is projected to decline significantly due to the strong predicted growth in NW Europe.



	2020	2025	2030	2035	2040
East of England	£2,059	£4,932	£15,945	£23,103	£30,261
UK	£0	£16,002	£28,030	£35,848	£43,666
NW Europe	£4,677	£43,655	£72,624	£91,453	£110,283

Figure 25 Projected capital investments (cumulative) in offshore wind projects to 2040

2.13.1 Offshore Wind Operation & Maintenance

Offshore Wind Operations & Maintenance has been a significant local and regional opportunity identified through all recent research studies on the future growth of Lowestoft, Waveney and the wider region. We have provided an assessment on potential growth for operations & maintenance, building on the earlier capital investment forecasts.

Most offshore wind turbines have a design life of 20-25 years. During which they will be subject to regular and routine maintenance checks to maximise efficiency. Typically, this involves two visits per year, together with remote monitoring systems which feedback to a central control team.

Operations and Maintenance (O&M) is a crucial aspect of the offshore wind industry and will ensure that a number of jobs are created which will remain in place throughout the life of the wind farm. Planned maintenance covers all preventative maintenance work, including inspections to determine whether any such work is required. A comprehensive inspection and maintenance plan would normally be implemented to help prolong asset life and achieve a return on the investment.

Opportunities to develop on existing O&M facilities in Lowestoft are significant given the number of offshore wind projects being developed in close proximity to Lowestoft. Sections 6.2 and 6.3 provides a more in-depth assessment of potential facilities for consideration.

At present, there are some 1,106 operational offshore turbines across 16 projects off the coast of the East of England. Whilst there are a wide variety of views on the forecasting models for operations and maintenance in offshore wind, all offshore wind operators are focussing on improving reliability and reducing the overall operational costs.

Based on existing research, the estimated O&M costs for a typical offshore wind turbine ranges from £60,000 /MW/year (E&Y, 2009) to £87,500 /MW/year (BVG Associates, 2012). These figures do not include leases paid to the Crown Estate, Transmission Network Use of System charges or operational insurance premiums.

Comparing these figures with a Round 2 Offshore Wind farm off the East Anglian coast, which cannot be identified for commercial sensitivities, we have modelled their O&M spend over a 2-year period between 2016 and 2017.

The total O&M spend in 2016 was £45m and in 2017 was £39m, representing an average figure of £77,380 /MW/year based on the most recent spend. **Suppliers within a 30-mile range of their chosen port base accounted for more than 51% of all O&M spend.**

Assuming a conservative forecast estimate of £75,000 /MW/year, this suggests that the current installed capacity for offshore wind farms off the East of England (not including East Anglia One currently under construction at the time of writing), the majority of which could be serviced in part or full by Lowestoft-based suppliers, could be in the region of **£309 million per year** rising to more than **£1.3 billion per year** when the current portfolio of consented offshore wind projects is installed and commissioned by 2025-30.

Industry analysts are suggesting that an average of 40 per cent of the typical lifecycle costs of offshore windfarm developments will come from O&M requirements. Based on UK government projections for offshore wind deployment, the O&M costs for more than 5,500 turbines could be worth £2 billion per annum by 2025.

Figure 26: Dudgeon Offshore Wind Farm / Offshore Substation (front right) designed and fabricated at Sembmarine SLP yard in Lowestoft

3 SWOT Analysis

Based on our initial research and drawing inputs from industry and stakeholder consultations undertaken through this study, we have compiled a summary SWOT analysis, identifying the key strengths, weaknesses, opportunities and potential threats to Lowestoft's sustainable growth across offshore energy and engineering sectors.

The SWOT analysis is summarised in Figure 27 overleaf which is further explained in the following chapters in terms of an assessment of potential land requirements.

It is clear that Lowestoft has many existing strengths across the offshore energy and engineering sectors, which offers significant opportunities available to the businesses to invest, grow, and capture new growth opportunities. The town has a rich heritage in fishing and offshore energy and with some of the closest proximity to the Southern North Sea markets for offshore renewables and oil and gas.

With both the UK's offshore gas basin and the world's largest offshore wind market is immediately off the East Anglian coast, there are significant new opportunities worth in excess of £10bn with close proximity to Lowestoft up to 2040. Add in the wider opportunities across the UK and beyond and this increases to in excess of £487bn over the same period.

As the historic UK headquarters for Cefas, this presents a significant opportunity to grow the marine sciences cluster of expertise and the related local supply chain. The new £16m Cefas campus, including new fish laboratories, could play a key role in supporting the future fishing industries.

OrbisEnergy is recognised by consultees as having made a significant impact on Lowestoft and its recent ability to secure major developers and supply chain businesses in the local area. The role OrbisEnergy provides in clustering the offshore renewable energy supply chain, and mapping future innovation and technology trends, should not underestimated. The hub's role has been a major catalyst for investment in the town and should form a core element in supporting future investment across offshore energy and engineering sectors.

Skills and access to talent was discussed across elements of the SWOT analysis. Consultees felt that a huge amount of investment has and is going in to support skills development in energy and engineering, however, overall progress has been slow with industry needs not being met by local suppliers. The £10m investment in the new Energy Skills Centre at East Coast College was highlighted as a major potential asset once developed, as is the recently announced Offshore Wind Skills Centre being delivered by 3Sun, Greater Gabbard Offshore Wind Ltd., and part-funded by New Anglia LEP.

Feedback from industry stakeholders suggests that the biggest potential threat for Lowestoft is the risk of sole dependency on offshore wind related activity. Lowestoft has a diverse array of expertise and experience across a wide range of offshore energy and engineering projects which should be the focus for future growth across offshore oil & gas, decommissioning, offshore wind, and new nuclear.

The UK's departure from the European Union was cited as both an opportunity and a threat, largely driven by current uncertainty on the future relationship for trade and exports. The fishing and seafood processing sector could see major growth post-Brexit.

Lowestoft has traditionally had a close relationship with the neighbouring port town of Great Yarmouth, offering some advantages to promote a combined offer to global markets. It was felt that Lowestoft lacks a defined 'unique selling point/proposition' and clear identity for the town as a centre of excellence in offshore engineering and renewables, with a potential threat of competition from other regional port towns and cities such as Harwich, Grimsby, and Hull.

Based on consultation feedback, it was felt that there has been a general lack of focus in promoting Lowestoft and developing land and infrastructure to support the offshore energy and engineering sectors in Lowestoft, compared to areas such as the Beacon Park Enterprise Zone in Gorleston. Delays in bringing forward development at PowerPark and the Jeld-Wen sites in recent years have reinforced this view with some businesses.

Overall, it was felt by many that there is general lack of suitable employment land supply for the offshore energy and engineering sectors in Lowestoft, and a very limited range of sites with suitable quayside access. Much of the vacant units and sites were felt to be unsuitable in their current form, requiring sites to cleared to enable development of suitable workshops, storage, and office space.

Consultees expressed a degree of frustration in relation to delays in developing major potential sites such as PowerPark, Jeld-Wen and land off Commercial Road.

Poor utilisation of the town's fabrication facilities and general lack of large-scale fabrication work was highlighted by some, who felt that more support was needed to ensure major facilities such as the Sembmarine SLP yard were able to secure major contracts, with local businesses benefitting from related supply chain opportunities. One consultee suggested that they would be interested in exploring investment options to developed the existing yard into a multi-purpose fabrication and offshore supply base servicing multiple markets.

The potential market opportunities, as set in Section 2, that could be available to businesses based in or operating from Lowestoft were unanimously agreed as being one of the single biggest economic opportunities available over the coming decades, which has the potential to provide a major jobs boost to the town.

Some concern was cited around the region losing equally significant opportunities when the oil and gas industry was developed in the 1970's and 80's which saw Aberdeen emerge as the UK's oil and gas capital on the basis of significant government investment in infrastructure to support the sector. Consultees felt that much more should be done to ensure that Lowestoft and the wider region captures "more than our fair share" of contracts awarded.

All consultees recognised the potential growth in fishing when the UK leaves the European Union and the potential for new innovation and technology to be introduced, and potential alignment with existing offshore and marine based engineering supply chains.

CURRENT/INTERNAL

Strengths

- Rich heritage in fishing and offshore engineering sectors
- Proximity to market for offshore wind, oil & gas, decommissioning and nuclear
- Existing well recognised supply chain expertise in offshore engineering (Diverse local expertise)
- National recognition as a Centre for Offshore Renewable Engineering (CORE)
- Home to CEFAS: scientific authority in sustainable fishing
- Home to OrbisEnergy: a hub for offshore renewables and engineering
- Significant recent growth in offshore wind supply chain
- Enterprise Zone allocations
- Strong network of sector representative bodies inc. EEEGR, TechEast, Chambers
- Supportive public and economic growth bodies inc. SCC, NALEP, WDC
- Industry skills provision by East Coast College
- Political leaders taking an active interest in fishing and offshore engineering growth

Opportunities

- Third crossing development over Lake Lothing by 2022
- Brexit: leaving CFP creating new growth opportunities for local fishing industry (moving towards a fairer allocation of fishing opportunities, and strengthened trade with export markets)
- Create vision for a new UK Fisheries 'Centre of Excellence'
- Offshore Engineering supply chain growth from major capital investment prospects secured
- Business growth, new local jobs, and inward investment
- Opportunities to unlock development on PowerPark and Jeld-Wen sites
- Renew and potentially expand PowerPark LDO
- New £10m Energy Skills Centre at East Coast College, Lowestoft Campus
- Schools in Lowestoft will be supported by the industry backed STEM Hub to better integrate education and employers & coordinating STEM initiatives
- Future R&D opportunities in wave and tidal sectors

Weaknesses

- Poor transport connectivity inc. pinch points such as Bascule Bridge
- Poor Broadband and digital infrastructure
- No local USP despite recognised expertise
- PowerPark Local Development Order expired March '17
- Poor utilisation of existing fabrication yard facilities
- Limited helicopter access for offshore operations
- Identified gap in the market for suitable space for the energy and advanced manufacturing sectors
- Shortage of suitable and affordable business premises in general, with significant costs of relocation & expansion identified and limited move-on space
- Shortage of suitable employment land supply for offshore sector in Lowestoft
- Limited range of sites with quayside access
- High levels of local deprivation, low skills & qualifications, high unemployment
- Weak skills profile in North Suffolk, retaining young talented people is difficult with low wages and higher productivity

Threats

- Declining trends in employment, productivity and key labour market indicators in recent years
- Sole dependency on offshore wind for economic growth
- Competition from other ports and local areas of expertise displacing local opportunity e.g. Gt Yarmouth, Harwich, Felixstowe, Humber region, and other European countries
- Comparative availability of employment land in Gt Yarmouth (risk of displacement of businesses and employment opportunities)
- Waveney lacks the critical mass of office occupiers to compete for office based activity/firms
- Local flood risks holding back infrastructure investment
- Brexit: uncertainty in future EU relationship
- Enterprise Zone allocations timing out
- Uncertain future government commitments to energy sector projects and investments

FUTURE/EXTERNAL

Figure 27: Summary SWOT Analysis

4 PowerPark Land Requirements

4.1 Overview

PowerPark in Lowestoft comprises 24.7 hectares of existing port, industrial and warehousing land to the area south of Ness Point and east of Battery Green Road and includes Hamilton Dock, Waveney Dock, along with parts of Trawl Dock and the Outer Harbour.

The area currently comprises a mixture of industrial, office and retail wholesale premises. Much of the estate is poorly maintained with an ageing building stock and high ratio of vacant units.

The outer harbour docks area lies to the south of Hamilton Road. Much of this area is in the ownership of ABP. The area is currently used by a mixture of users including the offshore wind industry, the fishing industry, Sembmarine SLP and for yacht berthing.

Figure 28: PowerPark, Lowestoft

The OrbisEnergy centre, a prominent facility on PowerPark, provides incubation and managed office space for businesses working across the offshore renewable energy sector. Now in its tenth year of operation, the centre was designed as an exemplary flood resilient building at the heart of the estate with frontage to the North Sea. Adjacent to the OrbisEnergy Centre is the Gulliver demonstrator wind turbine, which at 126 metres from turbine base to blade tip, presents a significant local landmark and generates 2.75MW of power.

It was anticipated that the site, when fully developed, would build on the region's heritage of marine engineering and offshore support and play home to a significant proportion of the supply chain for offshore renewables. Unfortunately, there have been delays in implementing development.

Despite this, Lowestoft has captured a significant pipeline of new investment in the town largely due to the growth of offshore wind projects and its supporting supply chain. The sub-region is now recognised globally as a leading centre for the development, deployment, operations and maintenance with some of the world's largest offshore projects being delivered or developed off the region's coast.

4.2 Previous Land Needs Assessment

In 2009, BVG Associates suggested the following should be available to satisfy the requirements of the energy sector:

- 300m (in 50m sections) of non-continuous quay length available by 2020. 40-60m pontoons need to be placed at various locations close to available quay.
- 7,000m2 of flexible, secure and bonded warehouse space.
- Flexible, secure and private office spaces with separate and private meeting facilities and high-speed internet facilities to accommodate 1,000 people.
- 3000m2 of light marine engineering workshops with access to compressed air and the ability to drain industrial oils.
- 30,000m2 of flexible, fenced, secure and CCTV monitored outdoor storage space.
- Wet and dry storage rooms with secure storage of personal effects for 270 people. This is separate to office space.
- Skills and training facilities – subject to on-going research. Parking spaces for a mix of private, light and occasional heavy commercial vehicles.
- The ability to easily move heavy loads around within the PowerPark by forklift or truck. External traffic, road and street furniture amendments are minimal due to the existing complex local traffic network.

In 2010, Roche Surveyors provided an assessment of property related issues which arose from the 2009 BVG report, providing insights into the specific spatial requirements. The study concluded that:

- Offshore renewable energy will continue to be a major source of employment in the East of England, with up to 1,000 new direct jobs likely to flow from Round 3 Offshore Wind developments, with the town geographically best placed to benefit.
- The principal source of employment is likely to be in operations and maintenance, with the wind farm construction likely to end in 2020 and the life span of the turbines in the region of 25 years, there is potential economic benefit to the town until 2045 at least.
- The outer harbour and Lake Lothing provide excellent waterside opportunities, in physical terms, for businesses looking to operate and service offshore wind assets. There are sufficient and suitable opportunities with the quay headings available and there is land which can be developed for the initial stages. The location of Lowestoft makes it the closest operational harbour to the position of the East Anglia Offshore Wind projects.
- The availability of waterside accommodation, suitable for commercial use, provides the town with a unique selling point. Table 1 below shows the summary of land that could be required for PowerPark as reported by Roche Surveyors in 2010:

Property Demand Summary			
Property Type	**Up to 2013**	**2013 – 2017**	**2017 onwards**
Warehouses	1000 m^2	5000 m^2	1,000 m^2
Workshops	1000 m^2	2000 m^2	Limited
Offices	2000 m^2	6000 m^2	500 m^2
Storage Yard	7,500 m^2	20,000 m^2	2,500 m^2
Training and F.E.	3,700 m^2	n/a	n/a
Total Land Requirement	**24,500 m^2 (6.05 acres)**	**43,000 m^2 (10.625 acres)**	**8000 m (1.977 acres)**

Table 1: PowerPark Property Demand Summary [Source: Roche Surveyors, 2010)

In 2012, Nautilus were commissioned to undertake an outline feasibility assessment for potential expansion and development of grow-on space for OrbisEnergy; and to consider potential opportunities for the PowerPark development and providing a framework for an initial implementation strategy for the PowerPark in Lowestoft.

The Nautilus report concluded that there was significant forecast growth in offshore renewable energy, and in particular, offshore wind. The proximity of the PowerPark to port-side facilities at Lowestoft potentially offers offshore supply companies with the ability for larger scale fabrication an attractive proposition for investment.

The 2012 report identified strong demand within the PowerPark for the following activities/facilities:

- OrbisEnergy grow-on accommodation. Serviced, flexible, affordable units with a mixture of office and workshop and/or storage type space, from c.1,500 sq. ft. with ability to grow.
- Offshore Wind O&M facilities.
- Offshore Oil & Gas, and Offshore Wind supply chain/servicing facilities inc. workshops, warehousing, and offices.
- Wave and Tidal facilities for test and demonstration.

From these options, several outline specifications were developed with indicative development costs for facilities to accommodate such uses. The report was completed in September 2012 and was not made available in the public domain due to commercial sensitivities.

The report concluded that PowerPark remains a strategically important site for development to support the offshore energy and engineering sectors due to its proximity to the rapidly growing market, its port facilities, and existing cluster of leading businesses.

Figure 29 shows a recent oil and gas fabrication project delivered from the Sembmarine SLP yard for Maersk's Culzean field, whilst Figure 30 shows the current high-level site overview for PowerPark.

Figure 29: Sembmarine SLP Platform Bridge for the Maersk Culzean Oil & Gas Field off Scotland [Source: Sembmarine SLP]

Figure 30: PowerPark site overview [Source: Waveney District Council]

4.3 OrbisEnergy

Based at heart of PowerPark is OrbisEnergy, the region's flagship hub for the offshore renewable energy industry. It is a state-of-the-art innovation and incubation centre that sits on Britain's most easterly location at Ness Point in Lowestoft.

Figure 31: OrbisEnergy, Wilde Street, Lowestoft

OrbisEnergy's prime objective is to maximise the supply chain opportunities associated with the rapid development of offshore renewables in the North Sea, and to help small and medium sized enterprises take advantage of the many opportunities the growing sector offers.

OrbisEnergy was opened in late-2008 and the 35,000 square foot building is nearing full occupancy, with a pipeline of interested businesses, reflecting the momentum gaining in the sector. It has rapidly become a global centre of excellence securing major offshore developers to the region including Scottish Power Renewables, Innogy, Scottish and Southern Energy, and Vattenfall.

The core range of services currently offered by OrbisEnergy include:

- Fully serviced and flexible tenancy options for a range of high-spec offices from 19 to 100sqm and complete virtual office solutions;
- Conferencing, Meeting and Hot-desk facilities;
- Access to industry experts providing a range of supply chain development and business improvement support;
- Engagement with national and international innovation, R&D, technology acceleration and funding programmes;
- Networking opportunities between tenant companies and wider industry networks.

OrbisEnergy is currently home to 72 tenant businesses (as at August 2018), all of whom work within the offshore renewable energy sector, employing more than 110 people on site at any time. The centre is owned by Suffolk County Council and managed in partnership by Nwes and Nautilus Associates.

Over the past ten years, OrbisEnergy has supported more than 180 tenant businesses. Those tenants have created more than 1,100 new jobs with many retained in the local area following graduation from the OrbisEnergy facilities into new or alternative follow-on accommodation. Such businesses include 3Sun Group, Seajacks, Windcat Workboats, James Fisher Marine Services, and more.

OrbisEnergy has helped to facilitate more than £7 billion of new regional investment in businesses, projects, infrastructure and buildings. The centre has designed a range of collaborative supply chain programmes including innovation funding support, where the centre has directly invested >£5m in 176 small business-led innovation projects, developing new ideas and technologies.

The innovation hub continues to play a major role in bringing together the offshore energy and engineering supply chain, and acts as a major catalyst for inward investment, regional innovation, supporting skills and training, and supply chain development.

OrbisEnergy is the UK HQ to some leading names in the offshore renewables industry, including Fred. Olsen Windcarrier, Global Wind Service, and 4C Offshore, and is often used to support training and development for clients such as Siemens.

4.3.1 Future OrbisEnergy expansion options

As at August 2018, OrbisEnergy is 97% occupied with a growing list of new enquiries for offices and workspace to support regional offshore projects. There is also currently limited high-quality flexible office and workspace available in Lowestoft with close proximity to marine and port facilities.

Discussions and research undertaken strongly supports demand for 'move-on' or expansion accommodation from existing OrbisEnergy tenants and users, all of whom are either offshore wind developers, operators or supply chain businesses, virtual tenants, and prospective new tenants for OrbisEnergy (i.e. those for whom the existing OrbisEnergy accommodation is unsuitable for one reason or another).

OrbisEnergy, at present, is not able to offer access to all such facilities to support the purposes of technology development, demonstration and testing, or workshops and storage. With little or no such facilities available in the local area (other than under normal commercial conditions which many SMEs are not able to meet) there may be business needs being missed.

Demand from existing and potential new OrbisEnergy tenants for growing additional facilities and space is, as one would expect, varied in form and nature in the type of accommodation and service required. Notwithstanding, our research has identified some common needs and demands for OrbisEnergy follow-on facilities. These can be categorised as:

- Graduation units, 'serviced' small flexible, affordable units from 1,500 sq. ft. with mixture of office and workshop/storage space;
- Larger units, workshop/storage space, 5,000-15,000 sq. ft. workshop/storage space;
- Additional office space (say similar specification to existing OrbisEnergy space).

Failure to provide such accommodation, which is currently in short supply, may lead to leakage of growing energy sector companies out with the PowerPark and the broader area.

Figure 32: High-spec Office Space at OrbisEnergy

A number of options for expanding the OrbisEnergy facilities have been considered in recent years. In 2014, the OrbisEnergy management team developed outline options for the physical expansion of the facilities within the parameters of its existing site. The proposed extension could provide an additional 10,000 – 12,000 sq. ft. of office space. Options were also developed for a new Warehousing facilities, additional Car Parking, and a new combined visitor's centre/café.

These options were not progressed at the time due to funding and resource constraints, however, this should be reviewed considering updated demand. These outline requirements for additional office accommodation and warehousing have been summarised below.

Office Accommodation

Accommodation would notionally comprise a total net area 10,000 sq. ft. over 3 storeys with clean lettable lab / office space across three floors split into lettable units' c200 – 1000 sq. ft. This would be an extension to the North side of the building. The activities undertaken in the facilities may include general office; research and development; prototyping; product development.

Key Requirements:

- Flexible accommodation offering office / lab space for a range of energy related occupiers. Split into serviced units between 200 and 1000 sq. ft. with 'demountable' partitioning.
- Notional total Net Internal Area of 10,000 sq. ft. 3-storey accommodation with potential to expand and split into 20 units with ancillary facilities.

- Ability to accommodate specified specialist activities and provide appropriate separation and any protection needed to comply with the relevant legislation.
- Site area c0.12acre minimum – assuming 70% site coverage.
- Estimated GTN ratio of 75%.
- Service facilities and parking for minimum 130 additional people at any one time.
- Benefits of links with OrbisEnergy and full access to a full suite of facilities and sector and business support services provided by OrbisEnergy.

Warehousing Facility

Accommodation would notionally comprise a total net area c13,850 sq. ft. split into 4 high quality flexible workshop units c1,700-3,450 sq. ft. on a single site with associated car parking and ancillary facilities. The activities undertaken in the facilities may include supply chain work; research and development; prototyping; product development.

Key requirements:

- Notional total Net Internal Area of c13,850sq. ft. single storey accommodation split into 4 adjoining workshop / workspace units on a single site with associated car parking, hard-standing and ancillary facilities.
- Flexible workshop type accommodation for a range of offshore wind related occupiers including possible R&D uses, with external yard. Split into units of around 3,450 sq. ft.
- Service facilities and parking for minimum of 20 people at any one time.
- Site area c0.44acre – assuming notional 85% site coverage.
- Ability to accommodate specified specialist activities and provide appropriate separation and any protection needed to comply with the relevant legislation.
- Eaves height – 5.0m to accommodate large loads and / or 2 stories of accommodation with adoption of a mezzanine floor.
- Loading – heavy industrial loading bearing capacity minimum 50T to support heavy lifting gear and for the storage of heavy equipment.
- Service and Utilities – capability to accommodate heavy industry 75kV power, industrial capacity water supply, waste disposal and sewage to include appropriate oil separation.
- Benefits of links with OrbisEnergy and full access to full suite of facilities and sector and business support services provided by OrbisEnergy.

4.3.2 Future Office Space Requirements

From our research there is clear and growing demand for good quality flexible space which could offer a mixture of office and workshop and/or storage type space. While the amount of space potential occupiers may require varies, there appears to be a cluster of demand and a corresponding shortage of supply around the 1,500-5,000 sq. ft. size (140-465 m2) units. Though the level of demand is strong and likely to continue to grow in the medium to longer term, under the limits of this commission, it is not quantified. Nevertheless, an overall development of approximately 15,000-25,000 sq. ft. (with the potential to extend) comprising these smaller units could offer critical mass, flexibility and cost efficiency benefits.

Demand for smaller commercial office/warehouse units has increased in recent times. Research confirms there is a limited supply of good quality, well located, flexible office/workshop units of this size currently available in the Lowestoft area. The limited amount of this type of accommodation

which has become available recently has experienced strong take-up, with some of that demand coming directly from existing and potential OrbisEnergy tenants.

The level of demand is now at a level where this 'shortage' of small units, would justify consideration of new speculative development.

Potential occupiers view the services and facilities OrbisEnergy offers (including the brand) as unique attractions that provide an added value and which they would be willing to pay a premium for. Occupier demand is for facilities to be available on a flexible, fully-serviced, easy in-easy-out basis.

There currently is no such accommodation available in the sub-region which addresses (or could address) these occupier requirements in a way which is directly comparable to that offered by OrbisEnergy or graduation space offered to generate added value to users.

There is a high demand for such facilities now and this is likely to grow. There is a case for such facilities to be developed and in operation as soon as is possible.

Notional Specification for Accommodation

Accommodation may notionally comprise 25,000 sq. ft. (2323 m2 with the potential to extend) total net area split into 10 high quality flexible office/workshop units of c.1,500-5,000 sq. ft. (140-465 m2) each on a single site with associated car parking and ancillary facilities. The activities undertaken in may include supply chain work associated with any of the energy sectors identified in Sections 2 & 6.

Key requirements:

- Notional total Net Internal Area of 25,000 sq. ft. (2323 m2) single storey accommodation split into 10 adjoining workshop/workspace units on a single site with associated car parking (with a minimum of 80 car parking spaces), hard-standing and ancillary facilities.
- Flexible workshop type accommodation for a range of offshore wind related occupiers including possible R&D uses, with external yard. Split into serviced units between 1,500 and 5,000 sq.ft. (140-465 m2) with 'demountable' partitioning.
- Site area c.1 acre (0.4 Ha) - assuming notional 50% site coverage.
- Ability to accommodate specified specialist activities and provide appropriate separation and any protection needed to comply with the relevant legislation.
- Eaves height - 5.0m to accommodate large loads and/or 2 stories of accommodation with adoption of a mezzanine floor.
- Roller shutter doors.
- Loading – heavy loading bearing capacity to support lifting gear and storage of equipment.
- Services and Utilities –capability to accommodate heavy industry power supply, industrial capacity water supply, waste disposal and sewage to include appropriate oil separation.
- Ability to accommodate larger items such as fabrications, cranes and a test rigs on site.
- Benefits of links with OrbisEnergy and full access to full suite of facilities with sector and business support services provided by OrbisEnergy

Based on our research and consultation, there remains strong and growing demand for additional facilities broadly as set out by OrbisEnergy. Consideration should be given to the expansion of OrbisEnergy and also the potential development of additional office space within the PowerPark area. Availability of land to support car parking will be a key consideration.

4.4 Sembmarine SLP Fabrication Yard

Sembmarine SLP has been a major employer in Lowestoft for many years, having had various owners over its 40 years. During this time, it has delivered a number of major offshore structures to the UK oil and gas and offshore wind industries from its Lowestoft port facilities.

The company is now a subsidiary of Sembmarine (SMOE Pte Ltd, of Singapore). The organisation has the capability and capacity to design and fabricate large structures for use within the offshore industries worldwide.

The Lowestoft Hamilton Yard's geographical location allows direct access to the North Sea, whilst the harbour benefits from a low tidal range that significantly assists load-out operations. The Belvedere Road South Quay yard is equipped with a roll-on-roll-off (RoRo) load-out facility and is also suited for decommissioning activity.

Examples of projects delivered include: BP Norway, Valhall, 180 person accommodation module (4,288 tonnes), three local equipment room (LER) modules (905 tonnes) a power from shore module (1,226 tonnes); ConocoPhillips UK, Katy MFP (472 tonne jacket, 373 tonne topsides), which established shore communications within hours of installation; Nexen Petroleum Golden Eagle Area development project, which included a 140 person living quarters (LQ) module (2,000 tonnes), a 550 tonne bridge and 220 tonne flare module.

More recently, SLP have delivered the Offshore Wind Substation Topside and Jacket, an 1,800-tonne high voltage electrical substation topside, and a 1,500 tonne jacket substructure with suction piles. The contract utilised more than 50 local suppliers in their design and fabrication.

Figure 33: Offshore Wind Substation Foundation being loaded out from Sembmarine SLP Yard

The Sembmarine SLP capabilities are summarised below.

Capabilities and Capacities	
Total Area (m^2)	55,000 m^2 – Hamilton Dock 12,350 m^2 – Belvedere Road, South Quay
Fabrication Area Covered (m^2)	• Fabrication area – 2,640 m2 • Paint shop – 1,539 m2 • Two pipe workshops, plate cutting shop, saw shop
Assembly and Erection Area (m^2)	25,300 m^2 – Hamilton Dock 12,350 m^2 – Belvedere Road, South Quay
Cranage – Lifting Capacity and Hook Height (Tonnes and Metres)	1 x 350 tonnes (mobile) 2 x 150 tonnes (mobile) 1 x 45 tonnes (mobile) 4 x 10 tonnes (Gantry Cranes)
Load-Out Capacity (Tonnes)	• 2 x 6,000 tonnes capacity load-out quays (largest recent load-out 4,300 tonnes) • Nominal ground bearing pressure – 10 tonnes/m2 to 35 tonnes/m2
Minimum Water Depth (Metres)	4.5 metres lowest astronomical tide
Maximum Water Depth (Metres	6.95 metres mean high water springs
Dry Dock Capacity	Not applicable
Other e.g. Licenses, Permissions, Ware house and Storage Size, Engineering, Electrical and Joiners Workshop Size etc.	• 5,659 m_2 of covered storage • Harbour entrance 44.7 metres x 6 metres deep • Offices available for clients site personnel • Fabrication tonnage for last five years – 13,600 tonnes • Type of fabrication offered (standards or specifications available): - Structural – EEMUA 158/DNV OS-C401 - Pipework – American National Standards Institute ANSI-B-31.3 (piping for refinery)/Pressure Equipment Directive PED 97.23ec – Si 1999;2001 - Other – Electrical Installation, IEE Regulations 17th Edition/ATEX (Atmosphères Explosibles) Directive

Figure 34: Sembmarine SLP Capabilities [Source: UK Fabricators Directory 2016, Oil and Gas UK]

There are now numerous examples of supply chain collaboration where smaller ports are delivering fabrication contracts, such as offshore wind turbine foundations, in smaller volumes and transporting finished items to a centralised marshalling port elsewhere prior to load-out and installation. Such opportunities should be developed in collaboration with SLP.

Decommissioning remains a major potential market for Lowestoft's only major fabrication yard which should be encouraged. A closer partnership with Sembmarine SLP could help to align their own plans with wider potential investment in the PowerPark area.

The Sembmarine SLP facilities are well-positioned to secure work across offshore wind foundations fabrication, offshore wind substation, oil and gas decommissioning, and new nuclear construction. The facilities and capabilities available could be developed into a major fabrication and construction hub servicing multiple offshore markets.

4.5 Fisheries Industry

A key consideration for future spatial requirements is the existing and future growth potential of Lowestoft's fisheries industry. In 2015, WDC commissioned Nautilus to research and report on the physical spatial requirements of the existing fishing industry in the town. The report, at that time, considered the suitability and capacity of various sites in the outer harbour and waterside locations in the town to physically accommodate these current requirements.

Since that report, we have seen some significant political changes, notably the UK's decision to leave the European Union in the June 2016 referendum. After leaving the EU, the UK will become an independent coastal state under international law, through the UN Convention on the Law of the Sea (UNCLOS) and will have the right to control and manage access to fish in UK waters out to 200 nautical miles or the median line.

In the short term (next two years), UK fisheries policy will align with the agreement reached with the EU in March 2018 on an implementation period. This will serve as an interim step to any future relationship with the EU. The 'Sustainable Fisheries for Future Generations' White Paper published by Defra in July 2018, suggests that, from 2020, the UK will be negotiating access and fishing opportunities for 2021 as an independent coastal state. This presents a significant potential opportunity for Lowestoft and the wider East Anglian region, which may influence future needs.

This section summarises the spatial requirements of the existing fishing fleet and existing fishing industry which is located within Outer Harbour of Lowestoft port. The baseline requirements remain as reported in 2015 and have been tested with fishing industry representatives.

Fishing for Leave, an independent campaign for the fishing industry, suggests that the economic value of future fishing could increase to £168m (quayside value), increasing to >£670 million when processed, or four times the current value, producing a net additional c.77,600 tons of fish caught as set out in Table 2. This is not accounting for other quota species which are also taken in lesser quantities, and does not take account of non-quota species such as red mullet or squid etc.

Species	Current Tons	Post-Brexit potential Tons	Post-Brexit potential value (£m)	% increase
Sole (East Channel)	655	2,555	£20.0	390%
Sole (North Sea)	672	6,518	£51.1	970%
Plaice (Channel)	3,103	8,406	£9.0	271%
Plaice (North Sea)	29,815	48,000	£52.8	161%
Skate (North Sea)	1,070	1,798	£2.3	168%
Skate (East Channel)	191	1,016	£1.3	532%
Herring (Sou N.Sea/E.Channel)	5,108	48,906	£29.0	957%
Cod (East Channel)	160	1,264	£2.6	790%
	40,774	**118,463**	**£168.1**	**291%**

Table 2: Potential Economic Value for Fishing in South East/East England. [Source: Fishing for Leave]

Whilst there is some uncertainty over realistic future growth forecasts now, more detailed feasibility studies are being commissioned by WDC to build a more comprehensive understanding of the potential future growth of the fishing and seafood industries.

4.5.1 Structure of the Lowestoft Fishing Industry

As outlined in the 2015 assessment, the fishing industry in Lowestoft includes 4 main functions or spatial user groups:

- **Fishermen**: 13 fishermen working out of Lowestoft at the time of reporting
- **Auctioneers/Agents**: Operating out of one central Fish Market
- **Merchants**: 4 fish merchants currently operate from individual premises within Lowestoft
- **Packaging and Consumables Suppliers**

4.5.2 Spatial Requirements on the Lowestoft Fishing Industry

The section below details our existing understanding of the key spatial requirements of each fishing supply chain user group.

4.5.2.1 Existing Fishermen

Storage Space/Baits Sheds: 12 of the 13 existing fishermen indicated a workspace of approx. 24 sqm (6m x 4m) would accommodate the requirements of 2 fishermen who would utilise this space on a shared basis. The workspace could be accommodated in a shipping container type construction (standard shipping container is 6m x 2.5m).

These workspaces must accommodate the following:

- a work bench area
- electricity and lighting
- water supply (could be provided on a shared basis)
- refrigeration facilities (approx. 12 sqm per workspace shared by 2 fisherman)

1 fisherman indicated a requirement for larger workspace facilities of 90 sqm to include:

- 2-3 work bench areas
- electricity and lighting
- a water supply
- refrigeration facilities approx. 27 sqm
- Hardstanding area approx. 27 sqm

Shared Quay Space: Primarily used for loading and unloading of fishing vessels, refuelling of fishing vessels and landing fish catch. Approx. 32m of quay heading is currently required, with drop quay and quay side craneage (with minimum loading capacity of 60 kg) enabling two boats to use the area simultaneously. The area needs to be of adequate width (approx. 4 meters) to allow loading and unloading of fishing equipment, landing fish and refuelling fishing boats.

Additional shared quay space is required to check and repair fishing nets. An area of say 45 sqm (3m x 15m) close to the mooring is currently adequate to serve this purpose.

Ice Making Facilities: Ice-making and boxing facilities are needed close to landing quay facilities.

Mooring Space: Currently mooring capacity requirement is for 12 x 10m fishing vessels requiring 12m mooring space each. An additional larger 11m fishing vessel requires 13m mooring space. The mooring space requires a shared direct quay frontage of a minimum of 2 meters wide to allow for some loading and unloading at the mooring area.

This current requirement equates to circa 90 linear metres of quay wall (assuming that the fishing boats can be double moored).

Fuelling Facilities: Fishing vessels may re-fuel directly from fuel suppliers who deliver directly to them, or via on site storage facilities within the port area. Associated spatial requirements include:

- on site storage facility for refuelling (min. area of 25 sq. m) with access for tanker lorry delivery vehicles
- access for direct fuel deliveries to fishing boats via 20 T fixed delivery lorries.

Car parking: A minimum of 13 car parking spaces are currently required (1 per fisherman).

4.5.2.2 Fish Market

Standard Warehousing/Fish Market Building: The existing Lowestoft Fish Market building, originally designed and built for this purpose, measures approx. 560 sqm. The building is currently utilised to 75% of its capacity, indicating some space available for growth of the fishing catch. The existing fish market include:

- auction floor space (440 sqm)
- ice making and cold store facilities (approx. 71 sqm)
- box store (approx. 21 sqm)
- full height roller shutter doors enabling easy quayside access
- access door directly from the unloading quay into the cold store
- adjoining toilet block (approx. 22 sqm)
- good water and electricity supplies
- internal drainage channels across the operational areas of the building

Currently the fish market building is located adjacent to the quayside where fish are landed from fishing vessels. This quayside hardstanding/unloading area is covered and is in the region of 116 sq. m.

Figure 35: Lowestoft Fish Market

Loading and Unloading Areas: loading and unloading areas are adjacent to the fish market building to move fish stock into and out of the fish market. Currently approx. 116 sqm roadside space is available and utilised. This is in addition to quayside loading and unloading areas noted above under fishermen's requirements.

Car parking: A minimum of 20 visitors parking spaces (approx. 350 sqm) required for cars and vans of visitors attending the auctions. Access and parking for large fixed 30T 'Quayside' Lorry (approx. 50 sqm) also required.

4.5.2.3 Auctioneers/Agents requirements

The auctioneers currently occupy space of approx. 46 sqm which was considered adequate in 2015. The auctioneers' spatial requirements include:

- approx. 43. sqm office and changing room space with water and electricity supplies.
- facilities in close proximity to the fish market.
- Car parking for c.3 cars – approximately 38 sqm.
- CCTV control and monitoring facilities (for the fish markets area)

4.5.2.4 Fish Merchants

Fish merchant's workspace: At the time of reporting (2015) the 4 x fish merchants operating in the town occupied independent workspaces or facilities fitted out to relevant industry standards. Two of these fish merchants' premises are located close to the other fishing related supply chain areas at Hamilton Dock. The remaining two, whose current premises include public access with shop frontage are located elsewhere in the outer harbour. These requirements are summarised below.

Merchant 1 spatial and facilities requirement:

- Building area of approx. 192 sqm (24m x 8m)
- Full height roller shutter 3.3m wide
- Facilities to load directly onto lorries and vans from the warehouse (currently Inc. a 77m loading bay area)
- Water and electricity supply
- Working areas within the building include: fish processing area approx. 90 sqm (with chiller, sinks and work benches); 62 sqm of refrigerator/chiller space; and office space of approx. 14.5 sqm
- Welfare facilities at approx. 24 sqm comprising toilet and kitchen/rest area.

Figure 36 - Loading bay area at Fish Merchant's premises

Merchant 2 spatial and facilities requirement:

- Building area of approx. 165 sqm (10m x 16.5m)
- 2.4m x 2.5m roller shutter doors
- Facilities to load onto vans and bring pallets in/out of the building
- Public access and shop frontage are needed
- Water and electricity supply
- Working areas within the building include: fish processing area approx. 73.5 sqm (with sinks), drainage and work benches, Freezer/chiller area 33 sqm of; and office space of approx. 17.6 sqm
- Welfare facilities at approx. 12 sqm

Figure 37 - Processing area within Fish Merchants premises

Merchant 3:

- Building area of approximately 303 sqm (18.3m x 16.6m)
- 29 sqm refrigerated space
- Public access with shop frontage
- 2 roller shutter doors (current ones are 2.3m x 2.6m)
- facilities for loading onto vans
- Water and electricity supply
- Working areas within the building include fish processing area approx. 182 sqm with sinks, drainage and work benches, Freezer/chiller area 25 sqm of; office space of approx. 51 sqm NIA; fish smoked in 39 sqm;
- Welfare facilities at approx. 16 sqm

Figure 38 - Smoker in one of Merchants workspaces

Merchant 4:

- Building of approximately 131 sqm (6.55m x 20.0m)
- 3.1m X 2.4m roller shutter door,
- Facilities to load onto small transit size vans.
- Water and electricity supply
- Working areas within the building include: fish processing area approx. 90 sqm NIA with sink Inc. approx. 15 sqm of refrigerated area within this area; office space of approx. 12 sqm;
- Welfare facilities at approx. 28 sqm comprising toilet and kitchen/rest area.

4.5.3 Packaging and Consumable Suppliers

The existing packaging consumables supplier to the fishing fleet is currently co-located with other fishing industry interests in the port area. In summary their spatial requirements are (based on their existing facilities):

Storage space: This storage space is currently spread across three closely co-located buildings providing a combine space of approx. 244sqm.

Office and Welfare Facilities: Space of approximately 21sqm is currently used.


Figure 39 - Existing storage facilities

Car Parking: A hardstanding area for 3 cars and 12 delivery vans is required. There is currently in the region of 80sqm of parking and hardstanding to satisfy this requirement. Access for receiving deliveries from articulated lorries is also required.

4.5.4 Renaissance of East Anglia Fisheries

Following the referendum result on the UK's membership of the EU the Renaissance of East Anglian Fisheries (REAF) group was established, chaired by Peter Aldous MP. The aim of the group is to explore the long-term strategy for the fishing industry based in East Anglia and explore what potential growth opportunities there may be following the UK's withdrawal from the EU and the Common Fisheries Policy. The ultimate aim of the group is to re-establish Lowestoft as major regional fishing hub in the context of a significantly growing domestic fishing sector.

REAF has evolved since its inception in 2017 and its current focus is to carry out a strategic review of East Anglia's current fishing industry, capacity, infrastructure and supply chain in order to determine what potential benefits may exist following the UK's withdrawal from the Common Fisheries Policy and what investment/ policy changes would be required to maximise those benefits.

In order to facilitate this research, a bid for funding from the EMFF has been made by WDC on behalf of REAF. If successful, this funding will be used to commission a report focusing on the above elements and setting out a strategy for the regional fishing industry with Lowestoft as the regional hub.

At the time of writing, there is no certainty as to the specific future requirements for a renewed regional fishing industry.

4.6 Ness Point

4.6.1 Gulliver Wind Turbine

The Gulliver wind turbine is an offshore class demonstration NEC Micon NM92 wind turbine built by Vestas and developed by SLP Energy. It remains an operational 2.75MW turbine, connected to the local network and supplies enough power for 2,100 homes.

Thrive Renewables, formerly Triodos Renewables, are the current owner operator for the Gulliver wind turbine which has become a landmark feature for Lowestoft.

Gulliver was an offshore prototype installed in 2005 with a typical design life of 20 years. Whilst Gulliver remains an operational turbine generating power, we would suggest that early discussions should be undertaken with Thrive to understand longer terms plans and options for repowering and asset life extension, upgrading, or decommissioning in the longer term.

One option could be that Gulliver be in part developed into an 'innovation platform' a similar way as the Offshore Renewable Energy Catapult's 7MW Demonstration Wind Turbine at Fife, Scotland which is available as a test and demonstration facility to companies developing innovative products and solutions. This would support the broader aims of PowerPark as a hub for offshore renewable energy innovation.

Figure 40: Gulliver wind turbine at Ness Point, Lowestoft

4.6.2 Former Gasometer, Gas Works Road

Early stage concepts have been developed by the team at OrbisEnergy to redevelop the former Gasomoter on Gas Works road into a new community space, including a visitor's and education centre.

The gasometer is no longer operational and remains in the ownership of National Grid. Subject to investigation, the site could be converted into an iconic community space, potentially over 3 storeys.

Figure 41: Gasomoter (now disused) on Gas Works Road.

A feasibility study and specification will be required but it is assumed at this time to be a c20,000 sq. ft. facility overall providing:

- Offshore wind farm visitor's centre facilities at c6,000 sq. ft.
- Café facility with 50 covers & associated kitchens at c7,500 sq. ft.
- Ness Point & East of England Park flexible community facility, inc. public facilities and toilets at c1,500 sq. ft.
- Commercial meeting room and venue hire facilities c5,000 sq. ft.
- Outdoor area associated to the café.
- Public and visitor parking facilities, potentially with access via OrbisEnergy's existing parking facilities to provide overflow parking as required to service any potential expansion.

The concept for a shared Offshore Wind Visitors and/or Education centre has been previously tested with regional operators, all of whom would be supportive based on the success of the E.ON Scroby Sands Visitors Centre in Great Yarmouth, which attracts some 40,000 visitors each year.

Such a facility could be an integral part of the Council's plans to invest at Ness Point, with a new visitor centre / café facility linked to current work around the East of England Park.

5 Waterfront Land Requirements

5.1 Overview

The Waterfront area in Lowestoft under consideration comprises the land immediately to the north and south of the Inner Harbour & Lake Lothing, extending from the west side of the existing bascule bridge through to the western end of Lake Lothing. These land areas are broadly bounded to the north by Commercial Road and to the south by the A12 and Waveney Drive and to the west by Victoria Road.

To the south of Lake Lothing a significant 59.8 hectares of this area is currently allocated for mixed use development under the 2012 Area Action Plan. The area is referred to as the Kirkley Waterfront and Sustainable Urban Neighbourhood and incorporates Riverside Road Enterprise Zone; former Jeld-Wen factory site and adjacent playing fields; County Wildlife Site; Brooke Peninsula; Brooke Business Park; former Sanyo factory site; Haven Marina; SCA Recycling site; Witham Paints sites.

The area currently comprises a mixture of industrial, office and retail premises, interspersed with some areas of older residential development. However, there are also large parcels of land which comprise unused brownfield sites, many of which incorporate poorly maintained or derelict buildings/structures, and underutilised sites.

The majority of the land to the north of Lake Lothing is owned by ABP, including the substantial Shell Quay area off Commercial Road, with many areas being leased to private companies.

The quayside areas to the south of the Inner Harbour and Lake Lothing area adjacent to Riverside Road Enterprise Zone and the former Jeld-Wen factory site are currently unused. However, the eastern end of the Jeld-Wen factory site and its associated quay heading has been sporadically used for lifting-out of onshore fabricated offshore structures onto transportation vessels.

The quayside areas to the north of the Inner Harbour and Lake Lothing are currently used much more frequently for the mooring of larger service operation vessels (SOV's), transportation vessels, crew transfer vessels (CTV's) etc.

Figure 42: Waterfront Land Study Area, (based on Kirkley Waterfront and Sustainable Urban Neighbourhood (WLP2.4))

5.2 Lake Lothing Third River Crossing

Following publication of the Area Action Plan in 2012 the preferred route and funding sources for Lowestoft's long awaited Third River Crossing (TRC) have been finalised. This comprises a significant milestone for the town but will also have ramifications on the allocation of land use within the Waterfront area.

Figure 43: Artist's Impression of the Lake Lothing Third Crossing [image courtesy of Suffolk County Council]

The land areas affected by the TRC are predominantly the Riverside Road EZ and Former Jeld-Wen factory site. In essence the new TRC southern access road will dissect the existing Riverside Road Enterprise Zone area and remove the existing access road to the site. This will require a new access road to be constructed for the Enterprise Zone, with the currently proposed route being off Waveney Drive through the western end of the former Jeld-Wen factory site.

Figure 43 provides an artist's impression aerial view showing the southern road access for the TRC extending through the Riverside Road Enterprise Zone. Figure 44 shows a similar artists impression aerial view on the new Enterprise Zone access road extending through the former Jeld-Wen factory site.

The new TRC will offer significant improvements to the area with regard to transport routes and traffic congestion relief. During the construction phase of the TRC there will be a requirement to coordinate marine based activity and the passage of offshore vessels in the Lake Lothing area, in order to avoid any working areas and dredging works etc.

Once the TRC is built the clearance between the waterline and underside of the bridge deck (air-gap) will become an important factor with regard to the ease of passage of ships and other offshore vessels operating in and accessing the Lake Lothing area. Currently the proposed clearance dimension being mentioned is in the region of 12m.

A number of existing Crew Transfer Vessels (CTVs) and Wind Farm Services Vessels (WFSVs) may be able to pass under the proposed 12m airgap, subject to their specification (principally the height of any antennae and communication systems) and tidal conditions within the inner harbour. Vessel design is evolving based on new technologies and changing needs of the offshore energy and engineering sectors, for example with offshore wind farms being developed further offshore in deeper

waters requiring vessels to accommodate larger numbers of personnel and equipment for operational efficiencies. Similarly, in oil and gas the sector is exploring a shift from helicopter access to marine vessel access for personnel and equipment supply to improve safety and operations.

5.3 Riverside Road Business Park (inc. Enterprise Zone)

The Riverside Road Business Park is part of the Lowestoft-Great Yarmouth Enterprise Zone, one of 24 such zones created in England since 2011 in order to stimulate growth by providing a portfolio of strategic sites, with concessions offered to businesses locating there. These incentives include business rates relief, simplified planning regulations and central government support for the provision of super-fast broadband. Business rates growth within the zone for at least 25 years is retained by the LEP to support economic priorities. The zone crosses the boundary between Norfolk and Suffolk.

Figure 44: Riverside Road Enterprise Zone, with artist's impression of Lake Lothing Third Crossing [image courtesy of Suffolk County Council]

The Enterprise Zone includes five sites in Lowestoft, totalling over 70 hectares, designated for activities related to energy, offshore engineering, and ports and logistics. Of particular relevance to the proposed scheme is the Riverside Road Business Park site, comprising a 4.5-hectare brownfield site south of Lowestoft Inner Harbour (Lake Lothing), shown in Figure 45.

Based on information sourced from New Anglia LEP, the Great Yarmouth & Lowestoft Enterprise Zone, which has an energy sector focus, has delivered 1,694 Jobs, 773 construction jobs, 50 businesses, £44m private investment, £178m public investment, 18.3 hectares of land developed and 52,223 sqm of floor-space, as at May 2018. It is estimated that by 2021 the zone could create an additional 1,266 new jobs (708 on WDC sites), 204 construction jobs (85 on WDC sites), attracting 30 new businesses (20 on WDC sites), and leveraging £10m of private investment (£4m on WDC sites).

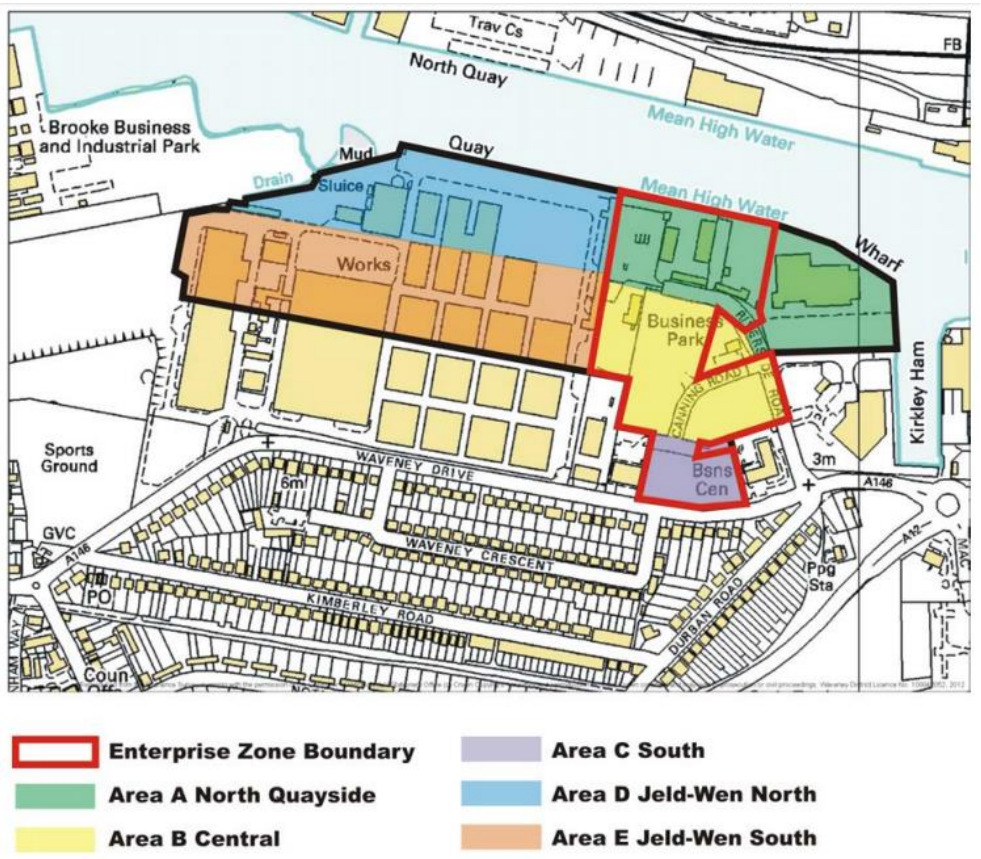


Figure 45: Image identifying the Riverside Road Business Park including Enterprise Zone boundary (based on Great Yarmouth and Lowestoft Enterprise Zone Local Development Order Reference: EZ/LOW/RR-01)

The Riverside Road land has been allocated for B1 (light industrial / business), B2 (general industrial), or B8 (storage and distribution use). A Local Development Order was in place which permitted these uses without need for planning permission, subject to certain constraints on the land. The LDO expired in March 2017. The land forms part of the wider mixed-use allocation known as Kirkley Waterfront.

As noted in Section 4.1, construction of the TRC will have implications on the current Riverside Road Enterprise Zone land, and usage. The new southern TRC approach road will effectively dissect this area, requiring new access roads to be constructed for the remaining section of Riverside Enterprise Zone, and the Nexen Lift Trucks site to the east of the TRC.

The proposed new access road route into the Riverside Road Enterprise Zone does offer a major opportunity to extend the existing Riverside Road Business Park. To further increase the employment land allocation in this area it would appear logical to further extend the Business Park's western boundary to the western side of the new access road. This would encourage development of additional employment premises either side of the new Riverside Road access road.

With a view to attracting offshore engineering related businesses to the area, the opportunity could be taken to extend the Business Park to incorporate the northern element of the former Jeld-Wen factory site, including the existing quay headings. The south-western section of the former Jeld-Wen factory site fronting Waveney Drive could then sensibly be allocated for residential development, which generally agrees with the Area Action Plan proposals for this area.

The remaining land on the Riverside Road Enterprise Zone, together with the significant development potential on the former Jeld-Wen factory site for new employment land, offers a major opportunity to develop shared quayside facilities with feeder sites encouraging a wider range of investment opportunities for new and existing offshore and marine engineering businesses to cluster.

With new access roads and associated infrastructure to support the TRC, urgent consideration should be given to more detailed site master-planning to ensure the wider area maximises it development potential to support the growing economic opportunities available.

5.4 Kirkley Ham Inlet

The c.45m wide Kirkley Ham quayside inlet is located between Lings car dealership to the west and land occupied by the Asda supermarket to the east. This inlet is currently an unused area of quay which could offer notable benefits for the mooring of offshore SOV's, CTV's and associated vessels during the TRC construction phase, and beyond.

Figure 46: Aerial view of Kirkley Ham inlet [image courtesy of Google Maps]

The inlet would require dredging to allow access by larger vessels due to it having silted-up over time. However, the achievable water depth for mooring of vessels would be dependent on the quay wall sheet pile depths in this area. The quay wall in this area was partially re-piled in the late 1990's by the East of England Development Agency (EEDA) to encourage and facilitate redevelopment of this area.

Quay heading land ownership and available vessel mooring facilities (mooring bollards etc.) available in this area would need investigation to determine the feasibility of Kirkley Ham being re-used for vessel mooring purposes.

5.5 Jeld-Wen Factory Site

The former Jeld-Wen factory site and adjacent playing fields, located within the Lake Lothing area of Lowestoft, covers an area of 14.2 hectares. The American owned timber company closed its joinery factory in June 2010 and since then this waterfront site has remained vacant.

Figure 47: Artist's impression of Jeld-Wen Factory Site with proposed new Access Road

Planning applications have been granted for the development of the neighbouring Brooke Peninsula site, including the former Jeld-Wen playing fields. WDC has also developed a Hybrid Application for the Former Sanyo site on School Road, Lowestoft.

This currently unused waterfront site offers significant development opportunities for the local area, particularly due to its notable quay heading and yard areas to the south of Lake Lothing. With a view to encouraging employment growth in the area from the offshore engineering sector, it would be extremely short-sighted to lose this significant quayside and vessel mooring facility to residential or leisure redevelopment use. The close proximity of the northern section of the Jeld-Wen site to the existing Enterprise Zone makes this land parcel even more attractive for employment use. It is clearly a desirable waterfront site for development for offshore wind, renewables, oil and gas and wider offshore engineering sector businesses, particularly those operating vessels, or relying on vessels for transportation of personnel or equipment.

Taking account of the proposals to develop the neighbouring Brooke Peninsula and Sanyo sites for residential and associated uses, it would seem sensible for the western and southern sections of the Jeld-Wen site to also be allocated for similar residential development. This would also be in line with the general principles and land use zoning proposed in the Area Action Plan.

Historically the Jeld-Wen quay heading areas were used for mooring, loading and unloading of larger timber transport vessels. In 2013 an engineering assessment was commissioned by a local steel fabrication company to assess suitability of temporarily re-using the eastern end of the Jeld-Wen quay for load-out of 140 tonne onshore fabricated offshore modules onto transport vessels. **This site was selected at the time due to it being one of very few quayside areas available in the town suitable for this use.**

Figure 48: View of Jeld-Wen quay being used in 2014 for offshore skid frame assembly prior to load-out using a 1000Te mobile crane on the quayside [image courtesy of Technicus Consulting]

The engineering study considered condition of both the quay slab and quay wall in this area with regard to load capacity and associated crane stability. In general, the sheet-piled quay walls were found to be in reasonable condition, despite remaining unused for vessel mooring and un-maintained since closure of the factory. **The study made recommendations which allowed the Jeld-Wen quay to be successfully used for this load-out operation, emphasising the value of this quay for offshore engineering usage.**

The existing buildings on the Jeld-Wen site are unlikely to be suitable for re-use or renovation for new businesses as they were constructed to suit the specific timber processing, treatment, storage, and joinery business operations of Jeld-Wen. Demolition of the existing building stock on this site is therefore the most likely way forward to make way for development of new industrial facilities and offices to better suit the needs of the offshore engineering and associated businesses.

Based on the market assessment in Section 2 and the SWOT analysis and discussions with key organisations in the offshore energy, engineering, and fishing sectors there is an argument that the majority of the waterfront in the inner harbour in addition to the statutory port land should be reserved for employment and port related land uses, including the entire Jeld Wen Factory site.

This would ensure Lowestoft is able to maximise the potential in securing investment in connection with the growth of offshore sector. However, in reality given the surrounding existing and permitted land uses the planning authority will clearly need to balance the use of land to deliver wider objectives for the town and therefore at the very least waterfront land in the Riverside Road Area and Jeld Wen Factory site should be reserved for employment. The 7.5 hectares referred to in Policy WLP2.4 therefore seems a reasonable approach to take.

5.6 ABP Lowestoft – Shell Quay / Commercial Road

Shell Quay, accessible off Commercial Road, is the site of the former Shell UK headquarters on containing a mix of offices, workshops, ancillary quayside facilities, and warehousing, much of which has been underutilised or vacant since Shell moved its UK offices to the Netherlands in 2005.

The site is not part of the specific study areas of PowerPark or Waterfront land as per the WLP2.4 site allocation. However, the site is immediately opposite the Riverside Road Enterprise Zone and former Jeld-Wen factory site on the North side of the river and offers potential development on statutory port land which has previously supported the offshore energy and engineering sectors.

Lowestoft Port is an ideal location to serve the Southern North Sea offshore energy sectors having c.3,500m of quay with the ability to accommodate vessels up to 125m LOA with depths up to 6m.

Most recently the office buildings have been used to support the installation and early operation of the Galloper Offshore Wind Farm with some small office units let to other offshore engineering related tenants. Part of the Galloper operations on this site included installation of a temporary vessel refuelling facility to support the operation of up to 16 no. CTV's.

Following the completion of the Galloper wind farm construction project, the entire site has been vacated (including decommissioning of the vessel refuelling facility) with demolition due to commence to clear all buildings in the near future. ABP are currently considering site investment options to create new facilities, subject to established demand and need.

ABP have developed an outline vision in partnership with London-based architects Chetwoods to transform the 13-acre development site with direct quay access, as set out in Figure 49.

Figure 49: ABP Lowestoft's Outline Vision for Shell Quay/Commercial Road, Lowestoft [Source: ABP]

Following discussions with ABP, the artist's impression is a concept only and not based on any robust demand and need research, nor any informed master-planning at this stage. ABP have commissioned BVG Associates to provide updated offshore wind sector intelligence to support their representation to the draft Local Plan. Following consultation with ABP's consultant team, it appears that there is broad agreement that offshore wind is a significant growth opportunity for Lowestoft.

6 Offshore Energy & Engineering Land Requirements

Research has identified a growing demand from a variety of offshore energy sector focused businesses many with a marine and/or engineering focus who would like to invest in or expand their facilities in Lowestoft with a view of entering or developing their positions in the offshore energy and engineering supply chain. This is expected to grow at a significant rate in the coming years and will be a vital area of occupier demand for space across the town.

The timescales for this commission have not allowed for a detailed demand and need study including full market engagement. However, we have drawn from earlier published research together with detailed consultations with a sample of industry stakeholders.

It is clear from both our research and consultations that there is likely to be a strong growth in the demand for space over the next 10-20 years from offshore energy and engineering related businesses across Lowestoft. Projected growth in the offshore projects supports the need for access to the types of facilities and port infrastructure which Lowestoft could provide.

While the predicted industry demand for port side facilities will be significant it is almost impossible to accurately predict how much manufacturing and fabrication will be achieved within the UK let alone Lowestoft at this time. This due to the complex nature of the industry and the relationship between developers and key suppliers for turbines, substations, foundations etc; and changing Government policy, including Brexit, which is creating uncertainty for longer term investments post-2020.

The extent and speed at which demand for space may increase in Lowestoft will be closely related to the locational decisions and operational models adopted by those involved in the development and operation of these offshore projects and those of their supply chain.

Whilst the specific spatial requirements for each business will vary, a key common factor is that the majority will require regular, occasional access to a shared quayside frontage.

How much accommodation will be needed and when will depend upon a number of other factors, which are unknown at the present time, but would include:

- The position of both national and local economies.
- The competitive advantages (or otherwise) of competing locations such as Great Yarmouth, Ipswich and Harwich in the East of England or ports on the west coast of Holland and Germany.
- The continued growth of renewable energy and the continued importance of the southern North Sea.
- Contracts being awarded to operators who choose to locate within the Lowestoft location and the general sub-region.
- Availability of sites for the inward investment which this opportunity presents.

Types of accommodation required include office, warehouse and lay-down/storage space but will be determined by the companies who wish to operate in the area. The wider the range of options in terms of tenure and building size, the more opportunity there is to “capture” the business requirements of the offshore energy and engineering sectors.

The issue of timing requires consideration. Now there is limited available space with good waterfront access in Lowestoft, which could be capable of being developed within say 6-9 months. The relocation of any existing business from their existing locations could take 12 -18 months to procure if new accommodation must be constructed to receive any relocating businesses and suitable premises are not otherwise available.

There have been limited Demand and Need studies delivered in Lowestoft over recent years, other than those developed for the PowerPark, including expansion of the OrbisEnergy facilities.

There is known demand for some specific facilities now. Other businesses consider Lowestoft a suitable location for installation and commissioning primarily for offshore wind projects off the East Anglia coast, but most ideally suited to support Operational and Maintenance activity of the same.

6.1 Manufacturing and Fabrication Supply Chain Requirements

6.1.1 Foundation / Sub-structure Manufacturing

Potential for foundation and sub-structure manufacturing is based on the existing supply chain expertise and track record in developing marine sub-structures.

Lowestoft has a rich history in designing and delivering a range of offshore foundations for global oil and gas projects, as well as bespoke innovative offshore wind substation foundations such as the Dudgeon offshore wind substation, using new suction bucket technology for the first time.

Offshore wind turbines have typically used monopile foundations but are moving toward alternative designs such as jacket foundations, which are more suitable for deeper water projects such as East Anglia One project.

Earlier assessments suggested that the opportunity for Lowestoft was limited due to the large lay down/storage areas foundation fabrication requires e.g. 10-15 Ha (23-34 acres) with at least 150 metres of continuous quay space. This is no longer the case.

New and innovative foundation concepts are being designed as offshore turbine designs evolve, often using off-site construction and fabrication techniques. Recent inward investment enquiries handled by OrbisEnergy suggest interest from a novel foundation manufacturer using modular construction which could be accommodated at varying locations within the inner and outer harbours, with quayside access.

As set out in Section 4.4, the production and logistics models for larger volume foundation fabrication contracts has also evolved, now adopting a multi-port, multi-yard strategy e.g. multiple (often smaller) fabrication yards producing smaller volumes which are barged to a central marshalling port elsewhere prior to installation. This model opens a new range of potential fabrication opportunities to explore.

Figure 50: Offshore Power Generation Module, fabricated by Sembmarine SLP for Maerk's Culzean Oil & Gas project.

6.1.2 Substations / Topsides

There is expected to be rapid growth in other areas of offshore engineering and marine fabrication sectors, namely demand for offshore substations and accommodation platforms/modules not only for projected offshore windfarm development but from across other segments of the energy sectors e.g. oil and gas. Lowestoft and the PowerPark have an established track record in production in this area, albeit not the scale on which future demand is forecast.

Indicative requirements are:

- 15,000 m2 (c.160,500 sq ft) main production hall
- Storage space to support accommodation and facilities including car parking.
- c3 Ha (7 acres) minimum - assuming 50% site coverage near to quayside.
- 10m high eaves for main building with very heavy cranage.
- Heavy load bearing capacity and heavy industrial power supply.

Decommissioning of existing oil and gas platforms are now being awarded with strong growth forecast over the next decade. Similar facilities will be required for the potential refurbishment and/or end-of-life disposal of offshore topsides and foundations.

Such options could be accommodated with the Sembmarine SLP yard facilities, with additional new supply chain facilities potentially created further within the inner harbour with quayside access.

6.2 Offshore Wind Farm Operations & Maintenance Facilities

All earlier research reports commissioned over the past decade have highlighted offshore wind O&M as one of the greatest potential opportunities to drive investment and supply chain growth in Lowestoft. Subsequent reports commissioned by Renewable UK, the Crown Estate, and the Offshore Renewable Energy Catapult support O&M as the largest portion of the offshore wind farm lifecycle that the UK can develop world-leading capabilities in, building on the country's deep expertise in servicing offshore oil and gas projects. This is particularly relevant for Lowestoft.

Given this potential, we have provided a more detailed insight into the typical supply chain and facilities requirements for offshore wind O&M.

Figure 51: Scottish Power Renewables' East Anglia One Operations Base - currently under construction in Lowestoft

An O&M facility is primarily designed to support the lifetime operation and maintenance of an offshore wind farm(s) to minimise any disruption to energy generation and maximise output. The life span of the current generation of offshore wind farms is typically in the region of 25-30 years.

The operations side of the O&M function is largely a management role currently undertaken by the developers/operators themselves and involves monitoring the performance of the wind farm, organising maintenance schedules and supplier interaction. This often includes the siting of a control room and marine coordination suite for live monitoring of actual generation, performance and security of the wind farm site.

The maintenance element of the O&M function involves routine and non-routine inspection, service and repair of the Wind Turbine Generators and associated equipment.

There is currently no typical or preferred O&M facility. However, based on offshore wind projects delivered to date the closest proximity port to the wind farm site has often been the O&M port of choice in order to minimise offshore service vessel fuel costs and travel times. Each facility is tailored to the port location, distance to wind farm and the size of the project. Much will also depend on the type of infrastructure and facilities already available at the chosen port.

Generally, a number of factors are taken into consideration when identifying a suitable port location for an offshore wind farm O&M facility. These include, but are not limited to the following:

- **Proximity to wind farm/size of wind farm** - the closer an O&M facility is to the wind farm the better to minimise travel distance and operational cost. As wind farms move into deeper water further offshore, there will be an increasing requirement for land-based facilities supported by an offshore accommodation hub, or Service Operations Vessel (SOV), to accommodate workers during planned maintenance periods. Establishing O&M support facilities in overseas ports for wind farms located further away from the east coast shoreline, principally in Netherlands and Belgium, could become more attractive for wind farm operators. It is therefore important that the facilities on offer in Lowestoft port are made as attractive as possible.
- **24/7 quayside access required** – While most O&M facilities currently operate within a 12-hour daily working window it is essential that 24-hour access is available to facilitate 24-hour operations as required.
- **Speed restrictions** – the location of an O&M facility within a port environment and travel distance through the port are key considerations. An O&M facility located deep within a large port may prove less attractive when compared to a smaller port further away and not subject to the same speed restrictions.

  This presents major potential opportunities for Lowestoft-based service companies to supply offshore wind projects further away from the Port of Lowestoft, but where the steaming or transit time is faster than other more local ports.
- **Conflicting traffic** – a busy port can impact dramatically on the ability of an O&M operator to respond to an emergency meaning that a quieter port with less conflicting traffic is the preferred choice.
- **Tidal constraints** – can impact on travel time and quayside access.
- **Flexibility of the port owner** – the ability of a port owner to work closely with the developer is vital particularly since the facility is likely to remain operational for at least 20-25 years.
- **Local, skilled workforce** – while a developer and the associated turbine manufacturer will provide the specific training required to operate and maintain a wind farm development, a local, skilled workforce is essential to support the wider supply chain.
- **Turbine manufacturer requirements** – manufacturers will often have their own preferred specification list for an O&M facility which needs to be considered. They also provide a dedicated maintenance team who will work as part of the team during the initial warranty period – usually five years.

- **Provision of a helicopter service** – for larger, more remote wind farms, transport to and from the site may be supported by a dedicated helicopter service. Transportation by sea is also greatly reliant on stable weather conditions which can restrict access to the wind farm by up to 50% in any given year. A helicopter service will greatly increase the ability to access the wind farm in poor weather conditions. It is likely that most operators will require a dedicated helicopter facility on the same site as the O&M building to minimise transfer times for maintenance crew and equipment.

The Greater Gabbard Offshore Wind farm located off Suffolk, with its operations base at Lowestoft, was one of the UK's first projects to charter its own helicopter co-located with the main operational control building. The model and learning developed by SSE as owner/operator of the wind farm has been something that many other offshore wind farm operators are considering. This includes East Anglia One currently under construction off the Suffolk coast.

The typical supply chain for an O&M facility includes:

- **Specialist consultants/architect/planning teams** - required to deliver the project build from concept to completion.
- **Turbine manufacturer** - typically there will be a five-year warranty period for the wind farm and the manufacturer, often referred to as the OEM (Original Equipment Manufacturer), will provide a dedicated maintenance team to work with the developer/operator during this period. After this period, and as the market matures, there will be new opportunities for specialist offshore maintenance companies to step into this role.
- **Vessel charter** - the operator will require a dedicated crew as part of this charter to run the vessels during the contract period. This crew will form part of the overall operations team.
- **Helicopter charter** - as with the vessel charter, a dedicated crew should be provided to work with the operations team.
- **Security and facilities management** - providing a support service to the efficient running of the O&M facility.
- **Survey teams** - regular substructure/foundation surveys will be required and will be out with the scope of the turbine manufacturer's warranty. This will require specialist underwater survey teams and temporary vessel charters.
- **Training** - provision of training is essential in the local area. O&M teams are usually derived from a local workforce and will require a period of training for this specialist sector, e.g., training of engineers for winching onto the top of a nacelle from a helicopter.

Figure 52 below shows the outline site layout for the Greater Gabbard Offshore Wind Farm operations base at Waveney Dock within the Outer Harbour area. This example is a demonstration of the various supply chain elements coming together. Note this does not include the berths for CTVs and Wind Farm Service Vessels, often accommodating between 8 no. to 12 no. vessels during a normal season.

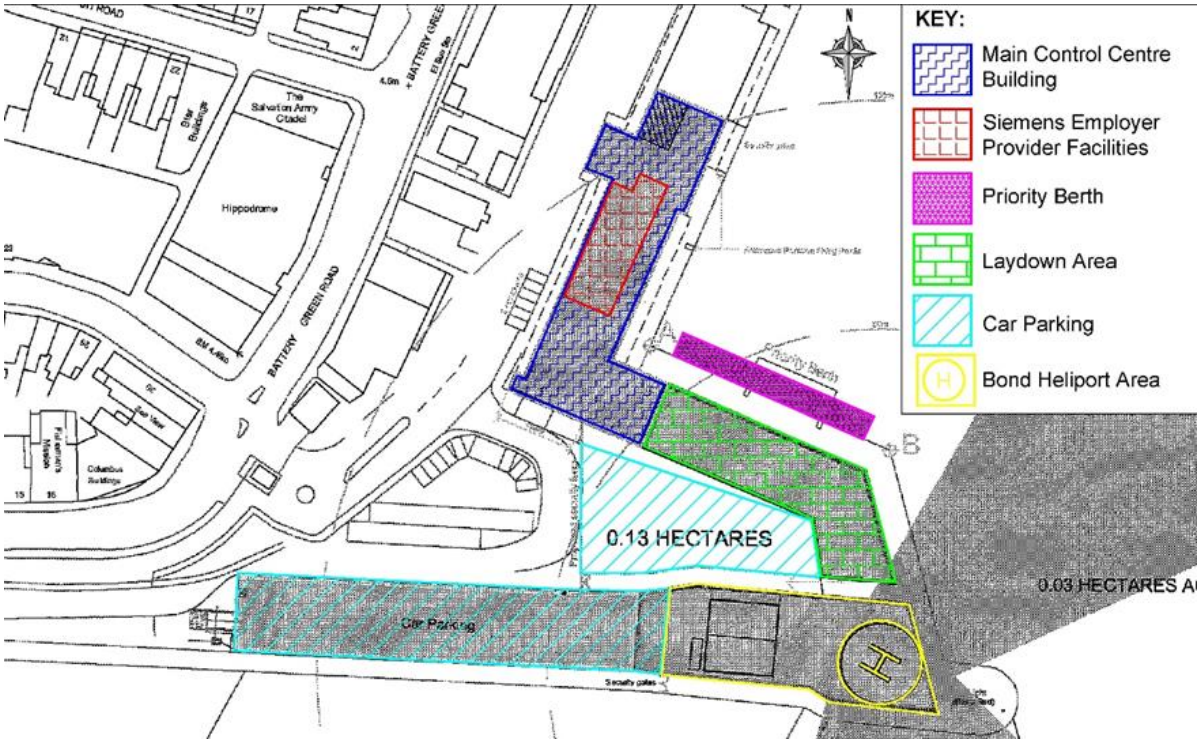


Figure 52: Outline Site Plan for Great Gabbard Operations Base at Waveney Dock. Not to Scale. [Source: WDC]

The larger an offshore wind farm, the larger the team required to service the turbines, substation(s) and on-going operations which could lead to a larger O&M facility and increased vessel and helicopter support requirements.

As wind farms increase in size, as is the current market trend, developers will continue to use a number of different turbine models or manufacturers to construct the offshore wind projects. This will add to the complexity of any O&M function potentially with individual engineering teams responsible for each turbine type, particularly during any warranty period. This could vastly increase the size of an O&M facility and therefore the demand for space and dedicated quayside access.

However, greater efficiencies can be derived as wind farms increase in size and additional factors must be considered such as distance from shore, where an offshore accommodation facility may be necessary, reducing the need for a large onshore facility.

Large scale repairs e.g. a large component exchange or blade repair, will require an alternative approach to day-to-day O&M. Whilst each individual wind farm will require a dedicated day-to-day O&M land-based hub, large scale repairs could be contained within one or two key locations and will service a number of wind farms. The lay down space requirements are likely to be more significant and may need direct access to deep water quays with an ability to manoeuvre large pieces of equipment onto barges and jack-up vessels.

As wind farms are being developed in deeper water and further offshore, and therefore further away from their O&M port, operators are developing alternative approaches to routine inspection and maintenance campaigns. This includes supply chain clustering and developing greater collaboration between operators and wind farm owners.

Based on consultation with regional offshore wind operators, developers and supply chain companies, there is significant potential to consider the development of shared O&M facilities such as:

- **Crew Facilities** with shared facilities including changing facilities, showers, secure lockers, PPE exchange etc.
- **Crew Transfer Facilities** with shared assets such as Helicopter services, Crew Transfer Vessel (CTV) berths for multiple operators/projects, fuel bunkering and ancillary supplies.
- **Briefing Rooms.** Offshore teams require daily briefings prior to boarding the vessel, either helicopter or CTV. This often includes Health & Safety, weather, works itinerary, and any required 'toolbox talks' to support their offshore inspection and maintenance works.
- **Vessel Maintenance.** Having access to a shared facility for inspection, repair and maintenance to the vessel or workboat is highly desirable. This could include boat-lifting capabilities as well as any specialist disciplines such as marine coating, painting, marine electronics and communication systems.
- **Car Parking** with potential lift-sharing incentives to reduce the overall parking requirement close to port side facilities.

Figure 53: Greater Gabbard Offshore Wind Farm - Operated and Maintained from Lowestoft

6.3 Indicative O&M Supply Chain Requirements:

Based on our research, there remains strong evidence of potential occupier demand to develop such facilities, with shared quay access. There is a good case for such facilities to be developed on a speculative basis to encourage local expansion and inward investment with facilities being available and/or operational as soon as possible.

The overall level of employment land available with shared quayside access will drive inward investment and jobs growth, and it there important to retain as much land with quayside access designated as employment land. This should include any adjacent or 'feeder' plots, which could encourage supply chain clustering.

6.3.1 O&M Operations Base

As set out earlier, Lowestoft is the home to the existing offshore wind operation base for Greater Gabbard, with the new operations base currently under construction for the East Anglia One project.

Beyond these two facilities supporting their respective projects, it is clear that future offshore wind projects will require similar operations bases. This include the East Anglia One North, Two, and Three projects being developed by Scottish Power Renewables over the coming decade with Lowestoft the closest the port to support these projects in addition to East Anglia One.

A number of factors are considered by windfarm developers and operators when considering a suitable port location for an O&M facility, as identified in Section 6.2 above. There is no consistent set of key requirements for such activities. Requirements and the facilities needed will vary depending on the business and operational models of the parties involved and the nature and location of the offshore assets being serviced. As windfarms increase in size developers may use a number of different turbines and foundation type within an array. This may increase the complexity of O&M functions and demand for space and quay access.

For the purpose of this report a notional specification of requirements are noted below for illustrative purposes and these are based on O&M facilities elsewhere:

- Blocks of 50m of non-consecutive quay side space. Ideally three – so 150m in 50m blocks. Not all blocks will be required at once.
- 40,000 sq.ft. (3716 m2) warehouse as close as possible to quayside space. Warehouse ideally has 6m plus roof height with shelving units to handle 1t weights.
- Office space for 60 people say 15,000 sq.ft. (1,200 m2) with high speed data connection, meeting space, marine control centre and logistics control room.
- Engineering workshops for light use say 20,000 sq.ft. (1858 m2) Workshop requires compressed air and drainage to handle light / medium oil recycling.
- Open Area c.100,000 sq.ft. (9290 m2) for high turnover of crates. Note: Different turbine manufacturers prefer to be separate from each other, with secure private space.
- Parking.
- Staff area including: Changing rooms, storage/locker rooms, dry rooms and wet rooms
- Notional Site area c.6 acre minimum.
- 60m pontoon and marine lift facilities (small mobile cranes) to load 1,000kg weights quickly and easily from quay to vessels.
- Road or land based systems to move 1 unit quickly and easily around site with forklifts.

With construction of Round 3 offshore wind farms now taking place, and with forecast growth in the development of new offshore wind projects followed by their lifetime operations, there is an urgent need to consider how best to accommodate any future offshore wind operations bases.

As can be evidenced by the Greater Gabbard Offshore Wind Farm operators, SSE plc, their operations bases support around 100 full time staff. The East Anglia One project is suggesting a similar number of full time employees once the project moves into its operational phase.

6.3.2 O&M Supply Chain

The types of activities involved the O&M Supply Chain have been set out in Section 6.2 above, and include marine engineering; fabrication; painting; supply chain services and supplies. Some of the firm requirements from potential occupiers identified through this work are summarised below. Specific spatial requirements vary but all identified so far require access to a shared quayside frontage.

The following indicative examples are based on genuine inward investment enquiries and businesses own growth aspirations which has informed our research and been supported by our industry consultation.

1. **Fabrication and activities in support of windfarm support crew and ship mobilisation**
   - c.20,000 sq.ft. workshop with 15% office content with potential to extend to 50,000 sq.ft.
   - Preferably a single unit but would consider space split sites.
   - C.20 employees.
   - Site area c.1-acre minimum - secure yard space required, assume 50% site coverage.
   - Quayside access needed on a shared basis with draft depth to accommodate OSV's (say c.5m, 70m length and 28-35m beam).
   - Eaves height c.5m to enable lorry and forklift truck to access workshop space, roller shutter door.
2. **Offshore wind workboat servicing, manufacturing and support services**
   - C.50,000sq. ft. workshop space with 10% office content
   - 100t loading bearing capacity and industrial power supply, good overhead carnage facilities with say 20t and 7t hooks.
   - C.30 employees.
   - Say Site area c2 acre minimum - secure yard space required, assume 60% site coverage.
   - Quayside access needed on a shared basis with 4m draft depth.
   - Eaves height c.5m to enable lorry and forklift truck to access workshop space, roller shutter door.

Figure 54: Opened September 2015, Windcat Workboat's new 15,000 sq ft (1,377sq m) quay side site at the port of Lowestoft where it services and maintains its fleet of 39 boats.

3. Fabrication work for mixed oil, gas and offshore renewables sectors

- 7,500 sq. ft. workshop space with outside workspace with potential to expand.
- C.25 employees.
- Site area c0.5acre minimum - secure yard space required, assuming 40% site coverage.
- Quayside access needed on a shared basis with 4.5m draft depth.
- Eaves height c.5m to enable lorry/forklift truck to access workshop space, roller shutter door.

4. Design, supply and maintenance of electrical equipment for oil, gas and offshore wind sectors

- C.9,000sq. ft. space comprising 7,000 sq.ft. warehouse space and 2,000 sq.ft. of office type accommodation with outside space on a single site
- potential for requirements to double in next 5 years
- c.25 employees.
- Site area c.0.4 acre if allowing for potential expansion
- Eaves height c.5m to enable lorry/forklift truck to access workshop space, roller shutter door.

There currently is strong evidence of occupier demand for such facilities in the PowerPark and outer harbour area, if shared quay access could be offered. While requirements continually evolve and change, and occupier demand needs to be monitored, there is a good case for facilities such as those identified above to be developed and operational as soon as possible.

All of these examples are highly relevant for potential development in areas of the PowerPark, but more crucially on land at the Riverside Ride Enterprise Zone and the former Jeld-Wen Factory site with quay frontage that can be brought into use.

The facilities outlined above, and variants of same, could also be developed in other port areas such as Shell Quay and land off Commercial Road owned by ABP, and land off Belvedere Road currently occupied by Sembmarine SLP.

7 Conclusions

Nowhere in the UK has a broader energy mix or provides as much business potential as the East of England coastline. The area's offshore gas business is still growing after 50 years. The area sits at the heart of the world's largest market for offshore wind. Nuclear power facilities are being decommissioned and new sites being developed. With emerging plans for the storage of gas and captured carbon in the Southern North Sea, the East of England has an energy investment programme estimated at billions.

The scope and scale of planned developments in the region's energy sector, means that companies across Lowestoft and the wider region are presented with a host of new business opportunities. The benefits could be vast, promoting economic growth, creating thousands of new jobs and securing many existing positions in high value low carbon sectors.

In order to secure a place for the UK as a global centre for clean growth technologies and low carbon industries, Lowestoft and wider Suffolk must focus on clean energy sectors, such as offshore wind, marine energy, nuclear power, carbon capture and storage, and other renewable technologies, where there are clear competitive advantages.

The Council has long recognised the potential for the growth in offshore engineering activities, particularly the growth of offshore wind, and has broadly supported business growth and inward investment. There have also been a number of delays in developing strategic sites such as PowerPark and waterfront land including the former Jeld-Wen site.

Based on our research and consultation, there is significant and growing demand for a variety of new and additional facilities including high-spec office accommodation, a range of engineering workshops and fabrication facilities, warehousing and storage, and shared access waterfront for loading/unloading goods.

The Council should make all endeavours to ensure there is adequate provision of employment land for B1, B2 and B8 uses for the offshore energy and engineering supply chain, with good access to quay side facilities, potentially on a shared basis.

The 2009 Demand and Need Study is seen as outdated with more recent studies having been commissioned, which for a variety of reasons surrounding commercial sensitivities were not made publicly available to support the Local Plan evidence base.

The capital investment forecasts provided highlight the sheer volume and scale of projected investment in energy, engineering and infrastructure projects which could be accessed by businesses and supply chains operating from Lowestoft, building on the success of the existing businesses in capturing major contracts.

With more than £10bn of major projects forecast in/offshore the East of England, growing to £487bn across the UK by 2040, the supply chain opportunities for businesses across Lowestoft will be substantial and in line with more recent growth and success in securing investment from existing offshore energy projects.

Based on our review and assessment of the energy industry, future developments, and their relevance to PowerPark and Waterfront Land areas, the following priorities emerge strongly.

- **Offshore oil and gas services sectors**
- **Offshore oil and gas decommissioning**
- **Offshore Wind Manufacturing, Assembly, Installation and Operations & Maintenance**
- **Carbon Capture and Storage *longer term***
- **Marine Renewables R&D (Wave and Tidal) *longer term***

The report highlights the potential of offshore wind operations and maintenance, estimated at more than £1.3 billion per annum by 2025. With evidence to suggest that around half of the offshore wind O&M spend could be within a 30-mile radius of the chosen port, the opportunities for Lowestoft, Great Yarmouth and the wider local economy are significant.

The oil and gas sector in Lowestoft, and Great Yarmouth, continues to see signs of positive growth following the recent global downturn, and although it is largely serviced based, there are some notable exceptions supporting larger scale engineering and fabrication e.g. Sembmarine SLP, Stowen Group, AFS Ltd.

Lowestoft is currently well endowed with technical expertise which is relevant to developing a strong decommissioning and CCS capability. Decommissioning projects are emerging now and growing over the coming years, which presents a sizeable potential market, however the CCS market is still young with projects still in the research and development phases and technologies at an early stage of commercialisation. The opportunities for PowerPark to support decommissioning are in the short to medium term, whilst CCS should feature in the medium to longer term development plan.

7.1 PowerPark

The vision behind the PowerPark area of Lowestoft to create a dynamic hub for the offshore energy sectors has, to date, not yet been fully achieved. The growth of OrbisEnergy and its many tenant spin-outs has been a major catalyst for investment in the local area.

The proximity of the PowerPark to port-side facilities at Lowestoft and in particular in potentially supplying companies with the ability for larger scale fabrication would be an attractive proposition for smaller to medium engineering-based businesses.

New facilities have been proposed and modelled since the original 2009 report, many of which have been summarised through research undertaken for this report.

The potential to develop new speculative facilities to encourage investment should be considered in the same way the development of OrbisEnergy was considered a strategic investment to drive demand, to which there is clear evidence of success.

Consideration should be given to working in partnership with OrbisEnergy to develop and refine options for expansion and to secure investment to bring this forward, based on strong demand from new and existing tenant companies.

With the PowerPark Local Development Order now expired, consideration should be given to its renewal and/or revision to help drive investment interest and promote the area as a prime

development location. This could include some provision made available under the Council's existing Local Discretionary Rate Relief policy to incentivise new businesses locating onto the PowerPark.

Recent examples of supply chain collaboration where multiple ports are delivering fabrication contracts, such as offshore wind turbine foundations, in smaller volumes and transporting finished items to a centralised marshalling port elsewhere prior to load-out and installation, highlight new opportunities for Lowestoft's fabrication supply chain.

The Sembmarine SLP facilities remain well-positioned to secure work across offshore wind foundations fabrication, offshore wind substation, oil and gas decommissioning, and new nuclear construction. The facilities and capabilities available could be developed into a major fabrication and construction hub servicing multiple offshore markets.

The potential to create new business, community and education facilities are Ness Point, through the conversion of the Gasomoter, should be considered as a key project linked to the Community Seafront Strategy and investing in new amenities to support Ness Point as a visitor destination.

It is widely accepted that there could be significant growth in the local fishing and seafood sectors following the UK's departure from the European Union, however, this cannot be easily quantified during the current negotiations nor be translated into potential land use requirements. Funding has been bid for to allow a more in-depth study into the sector's growth potential.

7.2 Waterfront Land

The development of the Third River Crossing is recognised as a major milestone for the continued growth of Lowestoft's economy and will have an overall positive impact on the mobility of people, goods, and services across the town.

The Riverside Road Enterprise Zone has been successful in developing new facilities, including Essex and Suffolk Water and the joint-Council offices. Access to the EZ will change with the construction of the TRC, with the new proposed access road off Waveney Drive and through part of the former Jeld-Wen site.

An option to further increase the employment land allocation on the EZ would be to extend the Enterprise Zone western boundary to the western side of the new access road. This would encourage development of additional employment premises either side of the new access road. With a view to attracting offshore engineering related businesses to the area, the opportunity could be taken to extend the Enterprise Zone area to incorporate the northern element of the former Jeld-Wen factory site, including the existing quay headings.

The close proximity Jeld-Wen site's northern section to the existing Enterprise Zone makes this land an attractive for employment use. It is clearly a desirable waterfront site for development for offshore energy and engineering sector businesses, particularly those operating vessels, or relying on vessels for transportation of personnel or equipment.

The site has been used by a local steel fabrication company for load-out of a 140 tonne onshore fabricated offshore module onto transport vessels. **This site was selected at the time due to it being one of very few quayside areas available in the town suitable for this use.**

Engineering studies at the time made recommendations which allowed the Jeld-Wen quay to be successfully used for this load-out operation, emphasising the value of this quay for offshore engineering usage.

The remaining land on the Riverside Road Enterprise Zone, together with the significant development potential on the former Jeld-Wen factory site for new employment land, offers a major opportunity to develop shared quayside facilities with feeder sites encouraging a wider range of investment opportunities for new and existing offshore and marine engineering businesses to cluster.

While the predicted industry demand for port side facilities will be significant it is almost impossible to accurately predict how much manufacturing and fabrication will be achieved within the UK let alone Lowestoft at this time.

Whilst the specific spatial requirements for each business will vary, a key common factor is that the majority will require regular, occasional access to a shared quayside frontage.

This creates the potential, based on recent discussions, that the site together with Shell Quay opposite, could be developed as a leading 'Centre of Excellence' for Operations, Maintenance in Offshore Renewable Energy, providing an operational hub for vessels, helicopters, equipment, personnel and other services operating from new facilities on the site.

This could compliment other major investments across Lowestoft, including:

- the new £10m Energy Skills Centre at the Lowestoft campus of East Coast College;
- OrbisEnergy and PowerPark as the supply chain hub for offshore renewable energy; and
- the £16m redevelopment of the Cefas site at Pakefield, Lowestoft, creating a new Marine Science campus with expansion potential.

It should also be noted that the R/V Cefas Endeavour, with its home port at Lowestoft, could also offer new opportunities for quay-side facilities, subject to longer-term growth plans following the completion of their new HQ in Lowestoft.

Based on the market assessment in Section 2 and the SWOT analysis and discussions with key organisations in the offshore energy, engineering, and fishing sectors there could be an argument that the majority of the waterfront in the inner harbour in addition to the statutory port land should be reserved for employment and port related land uses, including the entire Jeld Wen Factory site.

This would ensure Lowestoft is able to maximise the potential in securing investment in connection with the growth of offshore sector. However, in reality given the surrounding existing and permitted land uses the planning authority will clearly need to balance the use of land to deliver wider objectives for the town and therefore at the very least waterfront land in the Riverside Road Area and Jeld Wen Factory site should be reserved for employment.

7.3 Offshore Energy and Engineering

Research has identified a growing demand from a variety of offshore energy sector focused businesses many with a marine and/or engineering focus who would like to invest in or expand their facilities in Lowestoft with a view of entering or developing their positions in the offshore energy and engineering supply chain. This is expected to grow at a significant rate in the coming years and will be a vital area of occupier demand for space across the town.

All earlier research reports commissioned over the past decade have highlighted offshore wind O&M as one of the greatest potential opportunities to drive investment and supply chain growth in Lowestoft. The town is home to the existing offshore wind operations base for Greater Gabbard, with the new operations base currently under construction for the East Anglia One project.

Beyond these two facilities, it is clear that future offshore wind projects will require similar operations bases. This include the East Anglia One North, Two, and Three projects being developed by Scottish Power Renewables over the coming decade with Lowestoft the closest the port to support these projects in addition to East Anglia One.

With construction of Round 3 offshore wind farms now taking place, and with forecast growth in the development of new offshore wind projects followed by their lifetime operations, there is an urgent need to consider how best to accommodate any future offshore wind operations bases.

There currently is strong evidence of occupier demand for a range of offshore wind O&M facilities that could be developed if they could offer shared quay access. While requirements continually evolve and change, and occupier demand needs to be monitored, there is a good case for facilities such as those identified above to be developed and operational as soon as possible.

The examples highlighted in this report are highly relevant for potential development in areas of the PowerPark, but more crucially on land at the Riverside Ride Enterprise Zone and the former Jeld-Wen Factory site with quay frontage that can be brought into use.

Decommissioning of existing oil and gas platforms are now being awarded with strong growth forecast over the next decade. Similar facilities will be required for the potential refurbishment and/or end-of-life disposal of offshore topsides and foundations.

Such options could be accommodated with the Sembmarine SLP yard facilities, with additional new supply chain facilities potentially created further within the inner harbour with quayside access.

7.4 Car Parking

Car parking has been identified as a key area for future consideration. Existing public parking facilities are inadequate and not appropriate for the offshore energy and engineering supply businesses due to nature, frequency and type of vehicles in use.

Vehicular parking on the PowerPark has become limited and a known constraint for some tenants. Development land, in some cases, is being used as temporary car parking such as the land next to the Ness Point wind turbine acting as the car park for tenants at Hamilton House on Battery Green Road.

With the scale of potential developments on PowerPark and on waterfront land, there is an urgent requirement for parking consideration.

Based on research and consultation undertaken through this study, there is clear demand for flexible secure vehicle parking. For offshore workers operating on port land, it has been suggested that a Park & Ride scheme or shuttle bus be considered.

Annex 8

- Pontoon 1x 60m x 2.5m & 1 x 90 x 2.5m
- Access ramp
- Piles
- Dredged box 100m x 20m
- Berth / breakwater 130m x 15m
- CTV berths 30m
- Area leased to SSE

Scale 1: 2000 @ A3

0 50 100 metres

ASSOCIATED BRITISH PORTS

Adams Hendry
Sheridan House, 40-43 Jewry Street, SO23 8RY
T 01962 877414 www.adamshendry.co.uk

Emergency berth (125m)

Annex 9

Site area = 7984m² (not needed to create emergency berth)

Quay apron = 1680m²

Possible access routes to emergency berth

Length of water's edge = 175m

Approximate route of gas main

Scale 1: 2000 @ A3

0 50 100 metres

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ABP statutory area

Permanent acquisition of land = 3084m²

Permanent acquisition of airspace and rights over land = 2342m²

Permanent acquisition of rights over land = 4235m²

Temporary possession of land = 40396m²

Total area affected = 50057m²

Port Berth *(inc berth number and length)*

Remaining port area west of proposals *(not including slipway)* = 89115m²

Allowance for ships' mooring lines

Security fence

north

+ 2.7m

L Twr

50m

125.5m

25.5m

50m

10m

77.5m

10m

No. 4W
95m

No. 4E
45m

No. 3
60m

No. 2
60m

No. 1
60m

223m

WB

MLW

Und

CH

MP

MP

Wharf

Annex 10

Scale 1: 500 @ A2

0 5 10 20 25 metres

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