ANNEX D

Economic Potential of Offshore Wind Development at Newhaven Port

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1 INTRODUCTION

1.1 This paper explores the potential economic benefits to Newhaven and the Coastal South East subregion of offshore wind support facilities at Newhaven Port. It also sets out the possible economic impacts with regard to the wider South East region and the UK as a whole in terms of new jobs, business creation, sustainable economic growth and global competitiveness.

1.2 Recent announcements by the Crown Estate with regard to new offshore licenses along the South Coast mean that the time is right to explore opportunities for Newhaven and other UK ports to secure links with windfarm developers, in advance of the construction phase beginning.

1.3 Getting "a foot in the door" at this early stage could allow Newhaven (and the wider subregion) to position itself to take advantage of future job creation in the offshore wind sector, in particular through supply chain development opportunities.

1.4 This report therefore accumulates analysis by specialist energy consultants Douglas-Westwood, port consultants MDS Transmodal, and BBP Regeneration, to assess the potential for Newhaven and surrounding areas to capture benefits from future developments in offshore wind.

1.5 It begins with an overview of the policy and strategic context, and the current status of offshore wind, both in the UK and worldwide. This is then followed by an assessment of Newhaven Port and the role it could potentially play, and an in-depth analysis of the economic impact, focussing on new job creation through construction and operations and maintenance (O&M). Finally, a number of key conclusions and recommendations are offered to take this initiative forward.

2 BACKGROUND

2.1 This section presents to policy and strategic context for considering the potential role for Newhaven in the growth of offshore wind, along with an analysis of the current state of the industry.

Policy and Strategic Context

2.2 In 2008 the UK passed legislation which introduces the world's first long-term legally binding framework to tackle the dangers of climate change – the Climate Change Act. As part the overall effort to reduce the UK's carbon emissions the government also signed up to the EU's 2008 Renewable Energy Directive. This includes a target to produce 15% of all energy from renewable sources by 2020 and is equivalent to a seven-fold increase in UK renewable energy consumption from 2008 levels.

2.3 The Government's 'Renewable Energy Strategy', published in July 2009, establishes the balance of fuels and technologies that will be needed to achieve this ambitious goal. It sets out that more than 30% of our electricity, 12% of our heat and 10% of our transport energy will need to be generated by renewable energy. As the UK has substantial potential onshore and offshore wind resources, the strategy's preferred option is for two thirds of the UK's increase in renewable energy to come from new wind power infrastructure.

2.4 The strategy calls on central, regional and local governments and other public bodies to invest in the UK's renewables industries to:

- develop the wider renewable supply chain;
- support next-generation technology development and demonstration, including substantial new capital grant funding; and
- build up the necessary infrastructure to support a growing renewables manufacturing sector, such as work to stimulate investment in UK ports.

2.5 The Renewable Energy Strategy not only represents an opportunity for the UK economy as a whole, but also for coastal towns in the South East to secure new engineering, manufacturing and assembly work for the required wind turbines and benefit from some of the half a million jobs and over £100 billion of investment the renewable sector will generate.

2.6 The sector offers the opportunity then to drive aspects for the South East's economic and planning policy as the 2006 South East Regional Economic Strategy (RES) Implementation Plan includes the aim of creating a strong maritime economy through working with businesses that rely on the marine sector specifically, and the coastal setting more generally. Furthermore, policy SCT3 of the 2009 South East Plan (RSS) aims to develop the economic potential of a number of employment sites in the Sussex Coast, including Newhaven Eastside and Port.

2.7 SEEDA has recognised the role that the green technology sector can play in the region's economic recovery and future growth. In particular, its corporate plan 'refresh' has sought to address:

- The impacts of the economic downturn and a decline in business confidence
- Policy developments in light of
  - i The Sub National Review of Regeneration and Economic Development to give RDAs the responsibility of combing economic development and planning policy

ii An increasing focus on economic outputs stemming from the Government's Regeneration Framework

iii An increasing focus on the importance of the green economy and low carbon businesses, and

iv The government's new industrial policy New Industry: New Jobs to focus on areas where Britain has a competitive advantage and levels of expertise.

2.8 Whilst the objectives of the current RES (global competitiveness, smart growth, and sustainable prosperity) remain, SEEDA is restructuring its investment priorities and activities. Going forward the agency will be more focused on supporting business productivity and efficiency within the context of the low carbon economy. Furthermore, to capitalise on the impact of SEEDA's investment, it will join up existing programmes on research, development and deployment; innovation and clustering; inward investment and skills, and link them in a more purposeful way with place-based action planning.

2.9 The potential for Newhaven Port to support offshore wind growth would align strategically with the RES and this new focus. Specifically it constitutes a 'Transformational Action' to achieve 'Global Leadership in Environmental Technologies'. It could also help to alleviate deprivation across the Sussex Coast sub region by providing new higher value added jobs in emerging technology/green sectors.

2.10 The project could also contribute strategic added value by helping to achieve economies of scale in the renewable energy sector. Although there are already a significant number of businesses involved with environmental technologies operating in the South East, actions are needed in order for the region to reach critical mass in renewable energy. Investment in Newhaven would help to provide some impetus for further inward investment in the future.

2.11 SEEDA is already supporting high growth companies to innovate and to commercialise science based R&D in new markets and growth sectors, particularly environmental technologies. It has invested £3m in Vestas' R&D centre on the Isle of Wight, prototyping the next generation of offshore wind turbine blades. To capitalise on this investment, further support is needed to develop strong local and regional wind farm supply chains and O&M functions.

2.12 In January 2010, the results of the third round of the tender for licences to develop new wind farms in the UK's coastal development zones were announced. E.ON and Eneco were awarded contracts to develop new off-shore wind farms for the Hastings and Isle of Wight zones. This presents a unique opportunity for ports such as Newhaven, where there is sufficient land availability to provide a potential base for wind farm construction, O&M and future growth.

The Offshore Wind Market – Background and Current Status

2.13 Offshore wind activity worldwide is at an all time high. The next two years will see significant year-on-year growth in terms of capacity installed. However, the industry is struggling with the costs of development which have more than doubled in five years.

2.14 There is now over 1.5 GW of offshore wind capacity installed worldwide, with 334 MW installed in 2008. At the time of writing there is a further 1.5 GW under construction.

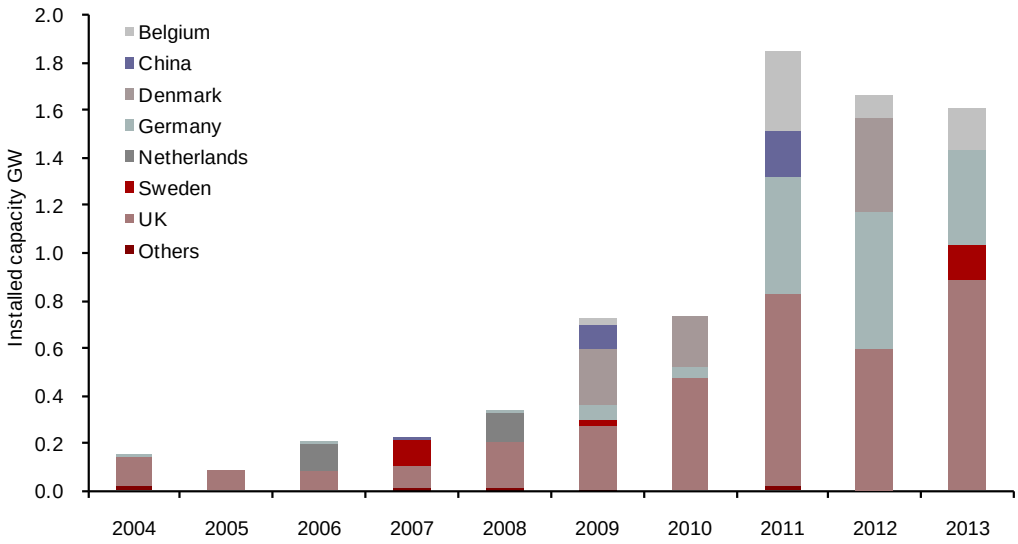
2.15 The majority of activity is still Europe-focused. The UK, Germany and Denmark will be the three most significant markets for offshore wind over the next five years. It is expected that 1,867 offshore wind turbines will be installed in Europe during the period 2009-2013.

2.16 Of great significance is the current construction of China's first commercial scale project. The 115 MW project is being built using a 'one lift' system similar to that used on Scotland's Beatrice demonstration project. It also marks the entrance of Sinovel as a supplier of turbines to the offshore wind industry.

2.17 Whilst activity is increasing however, it is at a lower rate than earlier market expectations. From 2011 rates of installation are expected to plateau for two years due to cost and financing problems that are being increasingly felt.

2.18 The past five years have been characterised by stop-start activity with few projects completed each year, and many projects being delayed. This characteristic has previously constrained levels of investment into offshore wind by the supply chain. Constraints have been felt in turbine supply, installation, vessels etc. With a more visible stream of activity, including significant levels of tendering for up to four years in advance we have seen response through the supply chain.

Figure 1: Installed Capacity by Year Online



Source: Douglas-Westwood

Table 1: Installed Capacity by Year Online (MW)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	09-'13
Belgium						30		330	90	180	630
China				2		102		200			302
Denmark						235	212		400		847
Germany	5		3		5	60	48	490	576	400	1,574
Netherlands			108		120						0
Sweden				110		30				150	180
UK	120	90	90	100	194	270	473	805	595	880	3,023
Others	26			9	15	2		23			25
Grand Total	**151**	**90**	**201**	**221**	**334**	**730**	**733**	**1,848**	**1,661**	**1,610**	**6,581**

Source: Douglas-Westwood

2.19 Almost 6.6 GW of new offshore wind capacity is expected to be brought online in the 2009-2013 period. In 2009 we will see 730 MW completed and a similar level of activity will occur in 2010. From 2011 through to 2013, project completions increase markedly with rates increasing to over 1.8 GW in 2011, and then reducing slightly to around 1.6 GW in 2012 and 2013.

2.20 The UK will bring online almost twice the level of capacity as its closest rival Germany, with 3 GW forecast to 2013. The first five years of activity in Europe were fairly slow with just one or two projects brought online each year, however, the UK has been the most consistent market since 2003, with project completions every year. Significant market growth was seen in 2008, and 2009 has been an exceptional year with large numbers of projects currently under construction.

2.21 Looking to the longer-term, the UK has just announced details of the Round 3 licence winners. The sites will see up to 32 GW of new capacity installed at a cost in the region of £100 billion.

2.22 Annex A indicates offshore wind projects around the south coast of the UK.

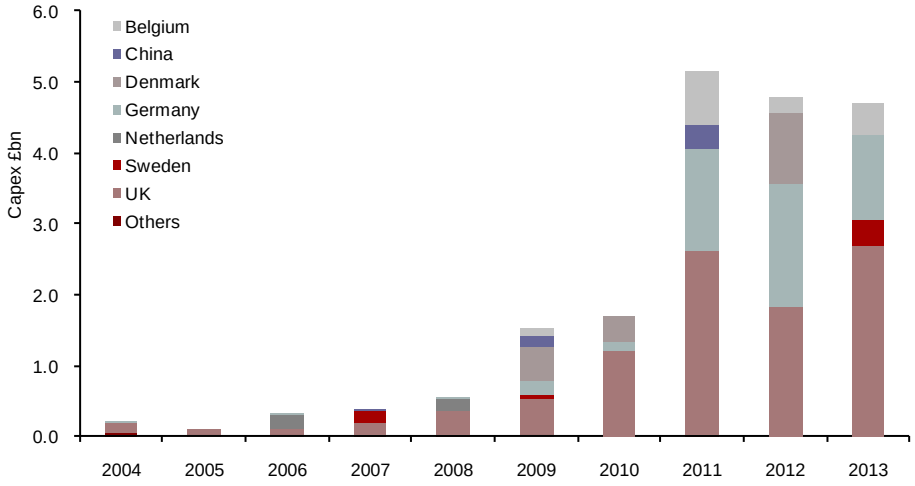
2.23 Germany has been slow to develop its first commercial projects, but development has been more difficult here in deeper waters, further from shore and with more bureaucratic application procedures. Recent legislation has aided development with a significant market mechanism now in place, grid connection procedures established and a booming domestic supply chain. Despite taking longer to develop projects, Germany has put much effort into building its supply chain which is now extremely strong. The Bremerhaven area in particular points the way to a successful future industry for Germany with market-leading companies clustered there.

2.24 Denmark is the third largest market, making a return to the industry it so famously lead initially. The completion of Horns Rev II and Nysted II in 2009 and 2010 respectively marks the first since 2003. A further major project at Anholt timetabled to come online in 2012 will add a total of almost 1 GW of new capacity for the period ahead. Government willing, Denmark has a strong future, with many sites available for development in relatively 'easy to build' locations.

2.25 China is currently building its first commercial offshore wind project, the 102 MW East Ocean Offshore Wind Farm. The Sinovel 3 MW turbines there are being installed in a one-lift method similar to that used on the Beatrice Demonstration project off Scotland. 2011 will see a second project coming online. We are seeing fast progress with sites off China, with both development and permitting timescales being very efficient.

2.26 Construction work will begin off the US and Canada at the end of the period although it will be after 2013 that we expect operation of projects such as Cape Wind (US) and Nai Kun (Canada).

Figure 2: Capital Expenditure by Year Online



Source: Douglas-Westwood

Table 2: Capital Expenditure by Year Online (£m)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	09-'13
Belgium						108		750	230	450	1,538
China				2		173		340			513
Denmark						465	353		1,000		1,818
Germany	14		8		17	200	145	1,470	1,728	1,200	4,743
Netherlands			175		158						0
Sweden				150		60				360	420
UK	155	105	123	185	340	514	1,210	2,581	1,834	2,703	8,842
Others	43			18	30	10		17			27
Grand Total	**212**	**105**	**306**	**355**	**545**	**1,531**	**1,708**	**5,158**	**4,792**	**4,713**	**17,902**

Source: Douglas-Westwood

2.27 The huge rise in expenditure is down to two main factors. Firstly, a sharp increase in offshore wind project activity, and secondly, considerable cost increases in the industry.

2.28 The offshore wind industry has gone against the convention of decreasing costs usually achieved through learning curves and supply chain improvements and has seen costs increase dramatically over the last five years. This is due to a combination of high demand, competition for manufacturing resources from the offshore wind sector, limitations in the supply chain, commodity price inflation and minimal competition in some areas.

2.29 Annual expenditure peaks at over £5 billion in 2011, a particularly busy year for the sector. Activity here has been driven largely by projects off the UK. Temporary increases in the number of Renewable Obligation Certificates (ROCs) allocated to offshore wind projects have spurred on projects. At this time we also see the first major commercial activity off Germany. Despite an enormous amount of planned capacity, the country has been slow to see market development but this is now changing.

2.30 Cost increases in the industry have been significant. From £1.1m/MW on the first UK projects in 2003, to over £3m/MW for projects reaching financial close today, the cost increases have caused much concern.

2.31 The largest market for the 2009-2013 period is the UK, where expenditure totalling some £8.8 billion is forecast. Behind the UK is Germany, where almost £4.7 billion is expected to be spent on projects coming online in the next five years. The next most significant markets are Denmark (£1.8bn and Belgium £1.5bn).

Market Issues – Costs/Financing

2.32 Concerns over cost have grown to new heights in the last year. Costs of offshore wind have risen from around £1.2m/MW on the first UK projects, through to over £2.5m/MW on projects under construction, with costs for projects under tender soaring to between £3-3.5m in some recent cases.

2.33 Turbine prices saw a significant hike during 2007 and 2008. This was in part driven by huge onshore wind demands as the industry had the best year yet, with massive growth rates seen. Offshore, prices were further increased by past turbine problems, but fundamentally by a shortage of competition amongst manufacturers. With just Siemens and Vestas supplying in the 3 MW turbine class, and demand high, prices responded accordingly. Whilst not yet commonly used, Repower is still the only significant supplier of 5 MW class turbines, with Multibrid just starting to scale up production.

2.34 Sharp commodity price increases also hit the industry, particularly steel and to some extent, copper. These have fallen recently.

2.35 The fall in Sterling has also hurt the UK industry. With the Pound falling sharply against the Euro, UK projects have been hit hard by import costs, effectively experiencing a 20% price hike.

2.36 Installation costs have also reached new highs. Offshore activity has not been higher, and the installation fleet is still relatively small – especially in terms of dedicated vessels.

2.37 The installation situation is now changing with a growing number of contractors entering the industry – we've seen the entrance of Seajacks and there are exciting new additions coming from Beluga Hochtief Offshore and Master Marine to name a few. It must be remembered, however, that many of these players have the ability to work in offshore oil & gas and will do so if day rates offer greater potential in that sector.

2.38 With regard to turbine costs we are seeing onshore turbine prices coming down this year and offshore a reduction is also expected. The financial crisis is having an impact on wind projects due to lower levels of lending and subsequently, demand for turbines is falling. Commodity prices have fallen from their peak and this will allow savings to be made, not just in the turbine component of projects.

2.39 On the other hand, we are seeing projects moving further offshore into deeper waters, which have cost implications for hardware, installation, logistics and operations & maintenance. Major cost-reduction is a long-term target, albeit one that must be addressed starting now. The emphasis needs to be on high quality development sites that can be built at reasonable cost.

2.40 Whether the costs have now peaked remains to be seen, but with turbine prices seeing downward pressure there is optimism that stabilisation is now starting to occur. The supply chain is increasing in capability and in most aspects there is more competition. However, the temporary increase in ROCs for offshore wind in the UK is creating increased demand within the supply chain which we expect to raise prices in the 2011-2013 period. Arguments in favour of further cost increases focus on more expensive future projects due to water depth.

2.41 Offshore wind projects to date have almost exclusively been built through balance sheet financing. The first significant exception to this is the Princess Amalia project (formerly known as Q7) off the Netherlands which was completed in 2008.

2.42 The role of utility companies in project development and ownership has become de-facto. Whilst there have been some notable successes in privately developed projects, particularly in the UK, the market is now almost fully utility driven. Utility involvement has grown due to the increasing capital required to move projects through development and utilities' own need to source energy from renewable resources.

2.43 This helped a lot of recent projects be built through the willingness of the utilities to fund construction through their balance sheets. However, due to the ongoing financial crisis the willingness (or ability) of

utilities to fund projects has vanished. The high costs being experience in the industry are a further turn-off. This has led to even the largest utility companies seeking project financing for their developments. The current financial climate means investors are naturally cautious and some projects found it difficult to attract investment.

2.44 The last two years have seen plenty of activity in acquisition of projects, with companies such as Vattenfall moving to expand their portfolio. We expect more movement through 2009 as some players look for ways out of projects where rate of return is below initial expectations, and others seek partners to share costs and risk on large developments. This extends to major players such as Centrica who is expected to soon announce partners for some of its very large UK portfolio.

2.45 Within the UK, the number of ROCs awarded per MWh of offshore wind generated was set to increase to 1.5 ROC/MWh from April. The Budget increased this to 2 ROC/MWh for the 2009/10 financial year, and this was to reduce to 1.75 ROC/MWh for 2010/11 before returning back to 1.5 ROC/MWh. This was designed to offer developers greater financial reward for their projects and help them get over current high costs.

2.46 It is enabling some projects to proceed that otherwise may have been delayed and has already been seen to have a positive effect on projects such as London Array. This boost is therefore going to stretch the supply chain and create opportunities for new entrants or expansion by existing players.

2.47 At the end of 2009 it was announced that the 2 ROC up-banding would continue through to 2014. This was done in light of the high costs seen in the industry and the necessity for the UK to accelerate offshore deployment. It is an extremely strong measure for the industry which will breing a great deal of comfort to Round 2 developers.

2.48 Whilst the increase will bring financial benefit to project owners, it also sends mixed signals to investors. Fluctuations of market mechanisms can increase uncertainty amongst investors who must assess the long term potential for a project.

3 THE ROLE OF NEWHAVEN PORT IN OFFSHORE WIND

3.1 The following analysis has been undertaken in order to highlight the range of opportunities for Newhaven and Shoreham Ports relating to offshore wind, and the requirements that an offshore wind farm could demand in terms of port-related uses.

Opportunities from Round 3 for Newhaven in relation to competing ports

About Round 3

3.2 On 10 December 2007, a Strategic Environmental Assessment (SEA) was announced to examine 25 GW of additional UK offshore wind energy generation capacity by 2020. In June 2008, The Crown Estate announced proposals for the third round of offshore windfarm leasing.

3.3 There are a number of new aspects to Round 3:

- **Zonal development.** The Crown Estate identified Zones for Round 3 offshore wind sites.
- **One company per development zone.** Partner Companies have been contracted through a competitive tender process to develop each Development Zone exclusively with The Crown Estate. This Partner may represent a consortium or single company.
- **Multiple sites per Zone.** The Crown Estate expects that there is potential for more than one wind farm site per zone.
- **Direct investment by The Crown Estate.** The Crown Estate will co-invest with the contracted partners in the development **programme up to the poin**t of achieving consents for wind farms.
- **Clear division of responsibilities.** There will be a clear delineation between The Crown Estate and the partner company activities and responsibilities. When specific sites have been identified, the partner will secure planning and other requisite consents for each site and arrange key contracts, including operational and financing contracts. The Crown Estate will provide the agreement for lease for each wind farm site, in addition to the supporting the development activities. In order to accelerate the process of Round 3, The Crown Estate will directly address barriers to delivery.
- **Site adjustment process.** The Crown Estate expects this process will offer flexibility to developers in defining site boundaries within a zone. The Crown Estate will work closely with zone partners to identify optimum sites and address zone-wide development issues required to secure consent. It will seek to reduce conflicts between the development activities and the interests of other stakeholders.
- **Managing project timelines.** The programme will allow partner companies to develop a schedule of sites within a zone. The Crown Estate is ideally positioned to improve programme efficiency by coordinating work streams across multiple projects seeking consent, and by commissioning early preparatory work before partners are selected.

3.4 Eighteen companies and consortia from at least nine countries submitted a total of 40 bids for the Round 3 licensing process. At least two each were filed for the nine indicative development zones.

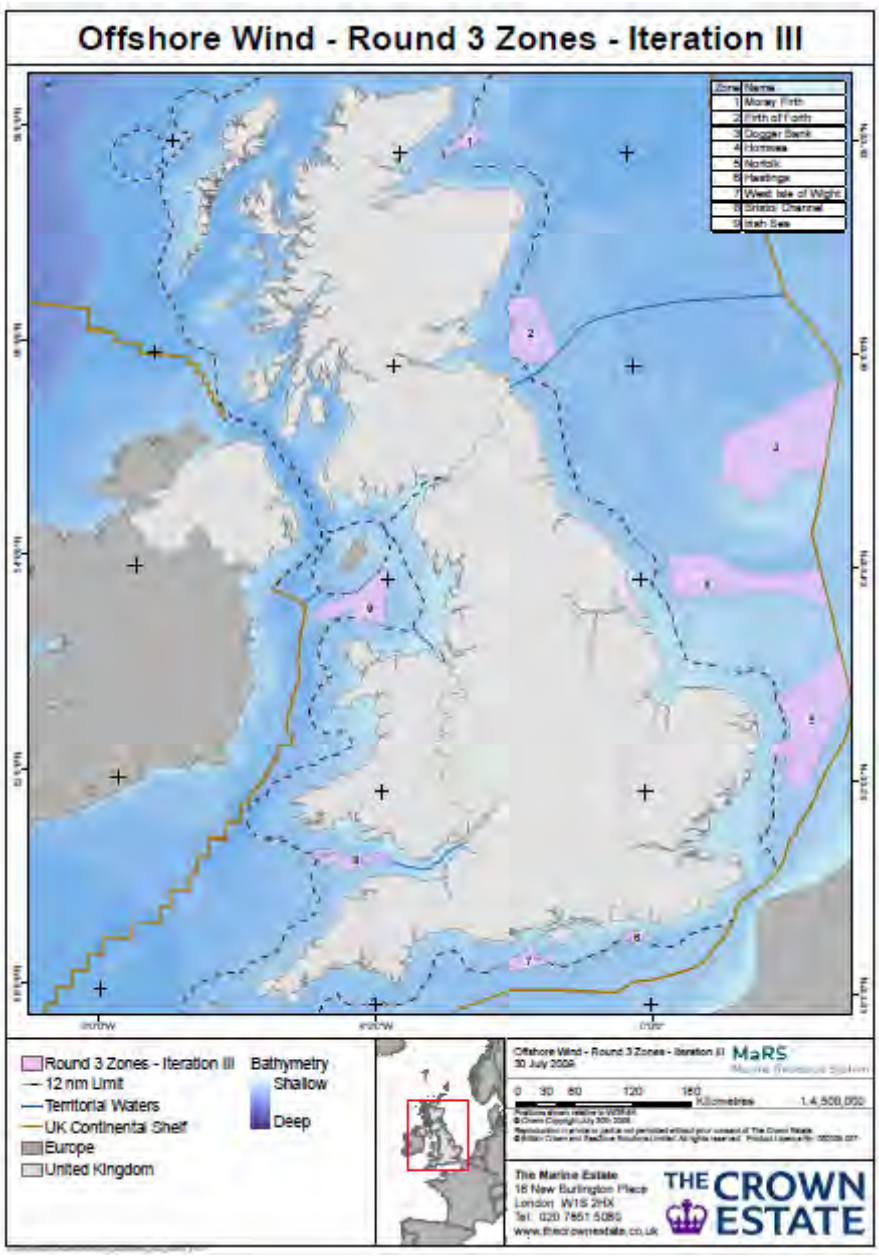
3.5 In September 2009 the first news of Round 3 winners emerged, and as expected major utilities took the majority of the zones. On 8th January 2010, awards for 32 GW of capacity were made when the winners of Round 3 were officially announced. They set out in the table below.

Table 3: Round 3 Developers

Zone number	Name	Developer	Capacity
1	Moray Firth Zone	Moray Offshore Renewables Ltd which is 75% owned by EDP Renovaveis and 25% owned by SeaEnergy Renewables	1.3 GW
2	Firth of Forth Zone	SeaGreen Wind Energy Ltd equally owned by SSE Renewables and Fluor	3.5 GW
3	Dogger Bank Zone	The Forewind Consortium equally owned by each of SSE Renewables, RWE Npower Renewables, Statoil and Statkraft	9 GW
4	Hornsea Zone	Siemens Project Ventures and Mainstream Renewable Power, a consortium equally owned by Mainstream Renewable Power and Siemens Project Ventures and involving Hochtief Construction	4 GW
5	Norfolk Bank Zone	East Anglia Offshore Wind Ltd equally owned by Scottish Power Renewables and Vattenfall Vindkraft	7.2 GW
6	Hastings Zone	Eon Climate and Renewables UK	0.6 GW
7	West of Isle of Wight Zone	Eneco New Energy	0.9 GW
8	Bristol Channel Zone	RWE Npower Renewables, the UK subsidiary of RWE Innogy	1.5 GW
9	Irish Sea Zone	Centrica Renewable Energy and involving RES Group	4.2 GW

3.6 The map below shows the location of each of the nine development zones.

Figure 3: Round 3 Development Zones



Source: The Crown Estate, as at January 2010

3.7 Despite the original announcement calling for completion of these projects by 2020, it is unlikely in Douglas-Westwood's opinion, that many will begin construction until around 2018. The zones give potential for enormous projects which are likely to be built in many phases over a long period.

3.8 Offshore wind projects are currently taking eight to nine years from conception to construction. The UK's Round 2 projects are seeing approval times following application submission of 18-30 months which is a big component of the long development period. Environmental surveys and increasing time spent in consultation with stakeholders is also increasing timelines. With contracting now more difficult, due to supply chain constraints and cost increases, the development phase of projects is lengthening.

3.9 Measures being introduced into Round 3 are encouraging for confidence in the offshore wind sector. With The Crown Estate sharing some development cost this should ensure fewer projects stall during the planning stage. It will also help independent developers that have been somewhat eclipsed by major utilities in the sector. This is important because the UK has shown the ability of small developers to bring a project through to financial close before it is sold to a new owner as an asset.

Hastings Development Zone

3.10 The Hastings zone is located off the West Sussex coastline. The area is 270.2 sq km, equivalent to 54,000 football pitches. It is over 13km from the coast at its closest point and nearly 26km at its farthest point. The shallowest parts of the zone at around 19m are of a similar depth to the London Array project awaiting construction in the Thames Estuary. The deeper areas of up to 62m are more likely to be avoided, so not all of the zone will used to locate wind turbines.

3.11 E.ON Climate and Renewables UK have now signed an exclusive Zone Development Agreement with the Crown Estate, to take the proposals through the planning and consenting phase and eventually develop the Hastings zone. E.ON were early pioneers in offshore wind with the country's first offshore wind project at Blyth and one of the first commercial scale projects at Scroby Sands off Great Yarmouth. Since then E.ON have constructed the 180 MW Robin Rigg project which is going through the latter stages of commissioning.

3.12 This year, E.ON along with consortium partners, agreed to construct the first phase of the largest offshore wind farm in the UK, the 1,000 MW London Array project, which the company plans to have operational by the end of 2012.

Port Uses

3.13 The principle uses of a port in relation to offshore wind are:

- **Storage and assembly** - The servicing ports are likely to be required to lay down a stock of towers and rotors to ensure smooth operations for the installation vessels. Assembly of the blades and rotor arrangement can take place on shore with the nacelle, hub and two blades fitted together and then transported to the site in a 'bunny ear' configuration

- **Quay side access & specification** - Vessels engaged in wind farm construction will vary in length from around 50 metres (barges) up to 130 metres for the largest jack-up installation vessel. A further 10-20m will be required for mooring lines at each end of the vessel. A hard quayside is required, with load bearing capacity sufficient to take the load of craneage and heaviest weight being transferred on or off a vessel

- **Volume of Shipping** - The number of vessel movements generated in a typical installation of 100 turbines excluding foundations is estimated to be approximately 143 heavy transports over 2 seasons; equivalent to around 72 vessel movements in a six-month period. Additional allowance also needs to be made for deliveries of turbines, cables and equipment by ship. The total number of vessel movements generated by the construction of 175 wind turbines is therefore estimated at around 332 vessels over two seasons

- **Operations and maintenance (O&M**) - Once a wind farm installation operation is complete there will be an ongoing need for servicing and maintenance of the facility. During the operating life of a wind farm (20-25 years) there will be a need for onshore monitoring and servicing. Personnel requirements would be between eight and ten engineers. Office accommodation will be required to house the remote sensoring equipment connected to the turbines to monitor outputs and performance.

3.14 More generally, if Newhaven or Shoreham Ports is to be in the frame for servicing the Hastings Zone, they will need to be able to provide:

- Berthing, dispatch and manoeuvring facilities for large offshore wind construction vessels
- 24-hour access
- Loading capability for all plant modules (foundations, nacelles, rotor, blades, towers, cable reels, etc.)
- Sufficient quayside for multiple vessels for both delivery of components and construction vessel load-out
- Areas for interim storage and pre-assembly of plants and plant modules
- Covered storage areas
- Reliable and efficient transport connections, onshore and offshore
- Good shipping possibilities to and from European countries
- Proximity to road and rail networks, and to an airport with direct European connections
- Offshore wind experience, project management experience of local port and logistic service providers
- Qualified local staff
- Existing local companies in the supply chain / capable of providing support

3.15 If Newhaven and Shoreham are going to play a key role in supporting offshore wind, they will need to complete investment in port upgrade in advance – as to properly position themselves as real prospects for windfarm operational activities.

3.16 Newhaven port authority (NPP) has shown an interest in the investment required but they may require support from SEEDA and others in the region to secure funding and to ensure that investment work is carried out in a timely manner.

3.17 In terms of a Newhaven operation – there are currently significant areas of unused land within the port and therefore it is unlikely that there would be a difficulty in allocating a sufficient area for an offshore construction facility. However – it would need to be confirmed with NPP that they were capable of meeting the requirements for ground load bearing capacity, as well as quayside length / load bearing.

3.18 NPP have already expressed an interest in the work required to make the port 'wind farm ready.' However, the required level of investment is not clear at present and it needs to be understood whether the Port is willing / able to make the necessary commitment to secure the expected business.

3.19 Given the proximity of Newhaven and Shoreham Ports to Zone 6, it could well be in the interest of the finally selected wind farm operator to invest in the necessary port upgrades and this would need to be

explored at the time. There may also be an opportunity for the public sector to support the operation, on the strength of the benefits which could accrue to the local area, although this would require careful consideration in the context of State Aid. Experience suggests that there are other Ports which have the ability to provide the same type of facilities, nonetheless, the details of these possibilities require further investigation.

Windfarm Requirements

3.20 There is a growing network of Ports in the UK which have been used for offshore windfarm construction purposes. These comprise the following :

Mostyn	North Hoyle, completed 2003 Burbo Bank, 2007 Rhyl Flats, 2008
Lowestoft	Scroby Sands, 2004
Belfast	Barrow, 2006
Felixstowe	Kentish Flats, 2005
Nigg, Cromarty Firth	Beatrice Demonstration, 2006
Belfast & Mostyn	Robin Rigg, 2008
Barrow	Walney (under construction)
Great Yarmouth	Greater Gabbard (under construction)

Source: DECC: UK Ports for the Offshore Wind Industry, February, 2009

3.21 The following provides some guidance as to the services that will need to be provided during the different stages of the windfarm construction process. This is broken down into a number of distinct components:

- Foundations & transition pieces
- Cabling
- Towers
- Nacelles
- Rotor blades.

3.22 The foundations for the turbine can be of three types: a steel monopile, a gravity base foundation, or a tripod foundation. Choice of foundation is dependent on seabed conditions; however the most common method currently in use is the monopile.

3.23 The monopiles can be over 50 metres in length with a diameter of 4.5-6.0 metres and weigh around 400 tonnes. On the North Hoyle Bank wind farm 30 monopiles were installed over a four-month period i.e. around two per week. It can be assumed that any port servicing such an operation would need to have space available to lay down around 4 weeks worth of monopiles (i.e. 8) to ensure no delays are experienced.

3.24 In addition, a clear quayside area of around 150 metres in length and 25 metres across (3,750 square metres) would be required to allow clear access to the ship's side.

3.25 Transition pieces would be wider in diameter than the monopiles (approx. 8 metres) and around 10-15 metres in length. These could be fitted at a faster rate than the monopiles so it is likely that a larger quantity (around 30) would need to be stored at the local port to adequately service the operation.

3.26 The area therefore required for this preliminary part of the operation is 2 hectares (5 acres) as set out below.

	Square Metres Required
Monopiles	8,400
Transition pieces	8,000
Ship working apron	3,750
Total Area (sq m)	**20,150**
Acres	5.0
Hectares	2.0

3.27 Once the monopiles and transition pieces have been erected the above areas should be clear for the cabling, rotor and tower installations, although it would be prudent to allow for some areas of overlap.

3.28 The towers will be over 75 metres in length and are likely to be made up of three interlocking pieces of around 25 metres in length each with an overall weight of around 180 tonnes.

3.29 On previous windfarm installations erection of the towers and rotor arrangements has taken around a day for each one. The servicing port is likely to be required to lay down around 2 weeks (14 days) worth of towers and rotors to ensure smooth operations for the installation vessels.

3.30 Assembly of the blades and rotor arrangement can take place on shore with the nacelle, hub and two blades fitted together and then transported to the site in a 'bunny ear' configuration. In addition to this a lay-down and storage area for blades and rotor arrangements will be required. For 14 turbines - 42 blades will require storing, together with nacelles and ancillary equipment. The land area required for the above components would be as follows –

	Square Metres Required
Tower storage	11,760
Working/assembly area	3,600
Blade storage	12,600
Nacelles/ancillary equipment	4,000
Ship working apron	3,750
Total Area (sq m)	**35,710**
Acres	8.8
Hectares	3.6

3.31 In conclusion, total land area requirements can be estimated at around a minimum of 6 hectares. This is on the basis that the operation will be planned in stages but with an allowance for some overlap between the foundation stage and the installation and erection of the turbines.

3.32 A study commissioned by DECC in early 2009, reported on the capabilities of UK port facilities to support wind farm construction in consideration of Government renewable energy targets. This concluded that to allow flexibility in terms of providing more storage accommodation to facilitate a higher rate of installation – the land area to be set aside within a port operation may need to be up to 8 hectares - based on handling of 100 turbines a year.

3.33 The study also recommended:

- 200-300m length of quayside with high load-bearing capacity and adjacent access

- Water access to accommodate vessels up to 140m length, 45m beam and 6m draft with no tidal or other access restrictions
- Overhead clearance to sea of 100m minimum (to allow vertical shipment of towers; and
- Where ports were likely to face greater restrictions as a result of the weather – then an additional lay down area of up to 30 hectares may be required.

3.34 From the range of ports already used for offshore construction purposes – the following is useful guidance in terms of the operational and land area requirements.

3.35 **Port Mostyn** - In 2007 during construction of the Burbo Offshore Wind Farm, Siemens leased a 45,000 square-metre area (4.5 hectares) in the Port of Mostyn, located in North Wales. The 65 m high steel towers of the wind turbines were assembled upright and all internal and electrical systems were tested before they were loaded onto the installation vessel.

3.36 **Felixstowe** - The Kentish Flats wind farm was serviced from Felixstowe. A berth and an area of around 3.6 hectares were made available at the No 1 roro berth. This area along with the dock basin area is identified for extensive redevelopment as part of the Felixstowe south expansion scheme and is unlikely to be available for future use as a general cargo berth.

3.37 **Barrow** - Associated British Ports (ABP) has joined forces with DONG Energy Ltd in handling essential components for more than 100 wind turbines as part of the construction of the Walney Offshore Windfarm off the Cumbrian coast. The agreement gives DONG Energy access to 18 acres (approx 7.3 hectares) of land at ABP's Port of Barrow, which will be used for the import, storage and onward transit of the deep-sea piles and transition pieces. It is anticipated that construction work on the wind farm will begin in March 2010.

3.38 **Lowestoft** - was the selected port for the receipt and despatch of 30 wind turbines for the Scroby Sands wind farm. An area of around 3.0 hectares was made available on North Pier in Waveney Dock for the operation.

3.39 In 2009 The Port of Lowestoft became the operations centre for the Greater Gabbard Offshore Windfarm which, when completed, will be the world's largest offshore windfarm, consisting of 140 offshore wind turbines and two offshore substations. The turbines will be located 15 miles off the Suffolk coast, and Lowestoft's Outer Harbour is being used to house the necessary operational support facilities.

3.40 Port owner ABP is carrying out significant investment in the construction of facilities next to the Waveney Dock. The port will also play host to a fleet of high-speed offshore catamarans, capable of reaching the windfarm in approximately one hour. An existing warehouse at the Waveney Fish Market is also being converted for office use to house GGOW's onshore operational centre.

Competing Ports

3.41 Newhaven faces competition from other ports in the UK and on the continent. The construction and Operation & Maintenance (O&M) phases of a project have different drivers for port choice.

3.42 The use of national ports is not a given. The Barrow project was constructed out of Belfast rather than Barrow in Furness. The Lynn & Inner Dowsing projects had the turbines brought to site from Esbjerg in Denmark and the foundations from Vlissingen in the Netherlands. The Thanet project is currently using Dunkerque, France as the main construction port.

Construction Logistics

3.43 Construction logistics and costs affect where projects are built from. Given the current high-cost environment project developers are finding it more efficient to use a port closer to the turbine and foundation manufacturing location. This is a trend we believe will increase.

3.44 The location of the major manufacturing contractors impacts on the construction port decision. There has been an increasing trend for turbines and foundations to be shipped straight to the construction site from the manufacturing location.

Construction Opportunities

3.45 The Hastings project is the key opportunity for Newhaven. The Isle of Wight project could potentially be build from Newhaven although it is felt that ports such as Portsmouth would be more likely to win the work. These are the only two UK prospects in the next 10 years. There are not yet any public plans for development post Round 3 and any potential 'Round 4' activity would be unlikely until after 2025.

3.46 There are a number of French projects proposed which Newhaven could target. These are, however, some way off realisation. French legislation and market mechanisms are not supportive of offshore wind at the current time. Ports such as Le Havre would offer competition to Newhaven.

3.47 Construction jobs are not long term and can be seasonal. Without a visible project pipeline long term benefit from offshore wind construction is minimal.

3.48 Overall, there is a risk that UK ports will not be used for construction phases.

O&M Logistics

3.49 For the O&M phase, proximity to the project is of great importance. Fast access to the project is crucial. Being located nearer to the project allows much faster personnel transfer. Increased transfer times mean a smaller percentage of maintenance personnel's working days are spend on the turbine.

3.50 Access is the other main factor and the port must offer round-the-clock availability (with no tidal restrictions). Other factors such as local skills, amenities etc. are of lesser importance. Conflicting port activities must be considered.

3.51 Choice of O&M port is a decision made by the turbine manufacturer in conjunction with the project developer. The turbine manufacturer provides initial O&M as part of its initial warranty period (now usually two years) on the turbines. Because the project developer/owner may subcontract the O&M after this initial period it is involved in the decision making.

O&M Opportunities

3.52 Given its location, Newhaven would represent a sound choice for operations and maintenance activities for the Round 3 Hastings offshore wind farm. The Round 3 Isle of Wight wind farm is located too far away for Newhaven to have a realistic chance of providing the main O&M services.

3.53 At this time, the Hastings project is the only O&M opportunity identifiable for Newhaven. The Economic Impact Assessment section of this report assesses what specific opportunities there are for Newhaven and the sub-region.

3.54 O&M offers long-term high-income jobs. Existing projects show that the majority of these jobs go to local people.

3.55 Newhaven must be able to offer sufficient quayside for personnel transfer vessels and supply vessels. A quay length of 50m would be adequate. Depending on project characteristics, multiple quay spaces may be required. Large offshore installation vessels of around 120m do not need to be accommodated but this would be advantageous as they are sometimes used for major repair works. Other facility requirements are warehousing (with easy quay access), offices, car parking and small workshop space.

3.56 Daily maintenance visits to the wind farm are made, usually by small crew boats. These personnel transfer vessels will typically carry 12 technicians to the site. The better weather between April and October sees more scheduled maintenance, with the project operator using this period for any major

works. Over a third of all planned maintenance trips are not undertaken due to bad weather conditions ('weather days').

3.57 The Economic Impact Assessment section of this report assesses what specific opportunities there are for Newhaven and the sub-region.

4 ECONOMIC IMPACT ASSESSMENT

Socio-economic profile of Newhaven

4.1 Newhaven is located in the Lewes District of East Sussex. The town has a strategic location on the South Coast of England, at the mouth of the River Ouse, and has been historically an important cross Channel port, with a commercial vehicle and car ferry service to Dieppe in Normandy.

4.2 Newhaven is a town of approximately 11,200 people located in the Lewes District of East Sussex[1]. The town is situated on the South Coast of England at the mouth of the River Ouse and has historically been an important cross -Channel port, with a commercial vehicle and car ferry service to Dieppe in Normandy. In addition to the commercial ferry service, Newhaven handles other port traffic (principally aggregates, scrap and industrially-based cargoes) and there is also a small marina.

4.3 However, despite its strategic location, Newhaven requires investment to support its regeneration and economic development. A study is currently underway, led by Newhaven Strategic Network (NSN) - a partnership of Newhaven Town Council, Lewes District Council, East Sussex County Council and SEEDA, to create a 'Physical Development Vision for Newhaven'. This work will assist the authorities in making strategic decisions about where to direct future investment to achieve the greatest outcomes.

4.4 In recent decades the harbour has suffered from a lack of maintenance and general decline. Surveys have indicated that some ferry users perceived Newhaven to be 'dirty', 'not interesting or attractive', and consequently overall visits and spend by ferry-travellers in the town centre is low[2]. There has also been a deterioration in the traditional port-related industrial areas, where dated premises, vacancies, lack of upkeep and low value uses have served to accelerate the decline in property assets.

4.5 As well as commercial and industrial issues, and despite some new development in recent years, there are still some serious housing issues facing local people – such as a poor physical environment in some residential areas and a shortage of low cost housing, particularly for first-time buyers. None of the affordable housing units completed in Lewes District between 2006 and 2009 were within Newhaven.

4.6 The two wards that make up the town – Newhaven Denton/Meeching and Newhaven Valley, are amongst some of the most deprived in East Sussex. The 2007 Index of Multiple Deprivation (IMD) shows that all of Newhaven's eight Super Output Areas fall within the 32% most deprived in the country, with the worst performing SOA in the top 5% most deprived nationally. Average household income for the residents of Newhaven is significantly lower than that of the region, county and district, at just 82% of average household income for the South East[3].

4.7 In one of the two wards (Newhaven Valley), nearly 1 in 5 people of working age are in receipt of at least one of the key income-related benefits, including Job Seekers Allowance, incapacity benefit, and lone parent income support[4]. Furthermore, whereas 9.8% of children in Lewes District were in receipt of free school meals, the proportion is 16.7% in Newhaven.

4.8 In 2008, there were 5,149 people employed in Newhaven, working in 561 workplaces. The majority of these jobs are in the manufacturing sector, which accounts for 31% of all employment in Newhaven, compared to England where manufacturing constitutes only 10% of employment. Other large employment sectors in Newhaven include the wholesale/retail/distribution sector (23% of Newhaven's

[1] Census, 2001

[2] DTZ Newhaven Strategic Network Report, 2004

[3] East Sussex Figures, 2009

[4] Nomis/ONS, 2009

employment). The economy is also characterised by the dominance of small and medium sized businesses, with 82% of workplaces employing fewer than 10 employees in 2008, and only 4% employing over 50 employees[5].

4.9 Reflecting wider national trends however, employment in manufacturing has fallen by 21% in Newhaven between 2006 and 2008. Over the same period, sectors which have experienced growth include construction (a 50% increase) and banking, finance and insurance (a 30% increase).

4.10 Given the nature of the local economy, the recession has had a greater impact on Newhaven than in the relatively affluent district of Lewes. By December 2009, 4.8% of the resident working age population in Newhaven were claiming Job Seekers Allowance, compared to 3% for Lewes District and 4.1% across England. This represents a 70% increase in unemployment in the town since December 2006.

4.11 As well as the immediate opportunity to capitalise the growth of investment in renewable energy infrastructure and the development of wind farms within the region to aid recovery, the holistic regeneration of Newhaven, including areas around the Port, can help to address some of the wider structural problems in the town.

4.12 The level skills and training amongst the population of Newhaven and along much of the Sussex Coast is relatively low compared to wider county and region statistics. The development of new industrial sectors associated with offshore wind technologies may help to drive up local incomes and skills levels as new economic and employment opportunities are made available.

4.13 Educational attainment across all ages is low in Newhaven. At the time of the 2001 census, 33% of Newhaven's resident population had no qualifications. Skills levels in Newhaven are lower than the district, regional and national averages with a greater proportion with level 1 qualifications (21.6% in 2001) and a lower proportion of the population with higher level (graduate) qualifications (10.7%). The future workforce is also likely to be less skilled than the wider district and region. 44.6% of pupils achieved 5+ A*-C GCSE grades in 2008, compared to 62.5% in East Sussex[7].

4.14 Of those living in Newhaven, there is not a large proportion of people who work in high level jobs, with only 18% employed as managers or professionals (compared with 30% in the region and 26% nationally). A significant number (25%) of people in Newhaven are employed in elementary or operative roles, while 15% have a skilled trade - once again underlying the strong manufacturing sector in the area[8].

4.15 As noted later in this report, the local skills base is not a strong deciding factor in the selection of ports for offshore wind construction or O&M phases. Location decisions tend to be more focused on the type of port and the associated physical requirements. As such, it is more likely that the renewable energy sector will offer an opportunity to tackle local skills issues rather than the low skills base constituting a barrier to investment.

4.16 Furthermore, as the O&M phases of offshore wind farm development are likely to create higher income jobs, there is also the opportunity to make a wider positive contribution to the sub-regional economy and diversify the local employment base. Currently, a proportion of the population commutes away from Newhaven to access higher level jobs, while many others commute in from outside the area to work in Newhaven's large manufacturing sector.

[5] Annual Business Inquiry data, 2008

[6] Nomis/ONS, 2009

[7] East Sussex in Figures, 2009

[8] Census, 2001

4.17 Going forward there is the opportunity to create a more balanced local employment offer to reduce the need to commute, whilst at the same time retaining a degree of employment in elementary / operative roles to avoid excluding those members of the community who will find it difficult to advance to higher level occupations.

Short, Medium and Long Term Offshore Wind Growth

4.18 In the short term (2010-2015), no opportunities are likely to exist for Newhaven. The port must, however, have positioned itself strongly and be in discussions with the winning developer of the Hastings zone, E.ON.

4.19 In the medium term (2016-2020), construction of project(s) in the Hastings zone and initial operation will have begun. And in the long term (2020-2040), there are opportunities associated with the operation of the Hastings zone project(s). There is also potential associated with the construction and operation of potential Round 4 projects (not yet announced). For example, the originally proposed Round 3 indicative sites included one zone off New Romney. It did not receive sufficient interest from bidders to proceed to one of the final zones. It could potentially move forward in future Rounds.

Timing

4.20 Being one of the smaller Round 3 projects at 600 MW, Hastings could be amongst the first to be built. If this is the case construction could begin around 2017. Given current tendering activity, major contractors would be invited to tender around 2013. It is important that Newhaven have a strong business case for offshore wind work by this time if it is to target the construction phase. The O&M decision is usually made 18-24 months before first electricity generation but ports will be shortlisted in advance of this.

4.21 The Isle of Wight project is likely to have a slightly later timescale as the winning bid for the site was 900 MW.

Other Supply Chain Opportunities

Background

4.22 Supply chain development to a significant level is something that needs addressing at a national scale. Despite currently having the world's largest offshore wind market, UK efforts to establish an industry against competition in Denmark and Germany in particular, has been virtually a failure.

4.23 Apart from some key competencies through specific companies there are no areas of particular strength in the UK. Manufacturing capacity is extremely low and this is the highest value aspect of the industry.

4.24 Part of the difficulty has come about due to the UK's lack of pursuit of **onshore** wind. The UK had a chance to be a leader in onshore wind but lack of decision saw the industry develop on the continent, particularly in Denmark and Germany. With **offshore** wind still in its infancy it has not fully developed its own supply chain separate to the onshore sector.

4.25 Due to the interdependency of offshore wind on other industries and supply chains, many project developers and owners would like to see a dedicated supply chain for offshore wind components, in order to "ride out" fluctuations in demand from other markets and allow a smoother delivery process for key components and services. The major constraint on this taking place is the relative infancy of offshore wind which has meant that other more stable and established markets, including onshore wind, have remained a more attractive proposition to suppliers.

4.26 A decoupling of the supply chain is a likely development to allow the offshore wind market to continue its momentum of growth and to reduce any potential bottlenecks; and dedication to offshore wind is also likely to foster improvements in design and efficiency by tailoring the supply characteristics to the needs of offshore wind developers. Other improvements of a decoupled supply chain will also include increasing competitive pressures amongst suppliers as well as developing improved learning rates and capacity improvements which should all serve to reduce offshore wind capital costs.

UK development areas

4.27 At a regional level, there are ongoing efforts to attempt supply chain stimulation and investment. Geographical areas of particular activity are the North East, the East of England, the North West and Aberdeen. Of these, the North East has the greatest potential for establishment of manufacturing. The East of England has a superb location but lacks strong port facilities and manufacturing capability. Aberdeen, as 'capital' of the North Sea oil industry arguably has very high potential, but its displacement from market will make it challenging.

4.28 For the UK to succeed in the industry, its greatest potential lies with specific offshore wind technology and services. The strength of the onshore wind industry on the continent requires the UK to move into areas of lesser competition. This is supported by the relatively small potential of the onshore wind market in the UK – offshore is becoming dominant and should be focussed on.

What can Newhaven offer?

4.29 Newhaven should initially focus on development of the port and aggressive marketing of it. It has a very strong case for winning the O&M phase of the Hastings project and has the capability to act as the construction port for the project. The determination of that location is dependent on other factors apart from proximity to the project. We would recommend immediate dialogue with the winning developer(s) of the project following announcement (currently scheduled for January 2010).

4.30 If the port does win the construction work it should be recognised that whilst it will result in several years of strong activity, the potential for future work is not guaranteed. O&M activity represents a long-term (20 years plus) and predictable revenue stream for the port. This long-term activity also offers the greatest potential for diversification and establishment of supporting businesses in the area.

Local and Sub-Regional Employment Opportunities

4.31 As noted above, whilst Newhaven has the capability to be used for windfarm construction, it is unlikely as proximity is not the key concern during this phase, with ports close to the manufacturer often being used. If Newhaven were to be selected for the construction work, this would be short term in nature and requiring a range of skills. Some of the occupations require specialist skills which are likely (at least initially) to be imported from overseas. It is likely however that there would be scope for an increase in local employment across a range of functions.

4.32 There is real opportunity for Newhaven to win the O&M phases of the Hastings project, creating higher income jobs, the majority of which may go to local people.

Base, Medium and High Case Economic Outputs

Relevant projects

4.33 The winners of Round 3 were announced on 8th January 2010. There are two zones relevant to Newhaven.

4.34 The **Hastings zone** was won by E.ON Climate and Renewables UK. They were successful with a bid for a 600 MW project. A known competing bid for the zone was from wpd offshore GmbH and Clipper Windpower who submitted a bid to develop a 1,350 MW project in the zone. They stated that they would use Clipper's under-development 10 MW turbine.

4.35 As the smallest of the R3 zones it is reasonable to expect that Hastings will be amongst the first projects built. This arguably makes it likely that smaller more proven turbines will be used in the 3-6 MW range, which depending on chosen size, could see between 100-200 turbines installed.

4.36 The **West of Isle of Wight zone** was won by Eneco New Energy as a 900 MW development. As previously discussed, this project is too far away for Newhaven to offer an O&M service to it. Newhaven could be used as the construction port but other nearer locations might prove more favourable. The work could be

undertaken by a large number of south coast ports. We again would expect the project to use around 150-180 5-6 MW turbines.

Direct Economic Benefits

4.37 The following assumptions have been made:

- We have used £3m/MW for capital costs. This represents some cost reduction from current costs but meeting this level will be essential for projects to be viable.
- We have used a figure of £79k/MW/year for O&M costs.
- We estimate that 30% of all O&M phase costs are attributable to the port or services operated from it e.g. personnel costs, harbour rates, etc.
- For the construction phase, we have assumed the port achieves 1% of total capital cost. This figure was used in DECC's 'Ports for Offshore Wind' report. We have split this value across a four year construction period for each of the projects. The figure is conservative and could increase dependent on the range of services performed. Total port costs are in some cases as high as 2.5% but the majority of these costs are spent on non-locally provided services and equipment.

Table 4: Direct Economic Benefit – Hastings: Construction and O&M (£m)

Hastings (600 MW)	Construction and Operations & Maintenance										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
O&M					15.8	15.8	15.8	15.8	15.8	15.8	15.8
Construction		4.5	4.5	4.5	4.5						
Total	0.0	4.5	4.5	4.5	20.3	15.8	15.8	15.8	15.8	15.8	15.8

Table5: Direct Economic Benefit – Isle of Wight: Construction (£m)

Isle of Wight (900 MW)	Construction										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Construction			3.8	3.8	3.8	3.8					
Total	0	0	3.8	3.8	3.8	3.8	0	0	0	0	0

Source: Douglas Westwood

Direct Economic Benefit Scenarios

4.38 The three scenarios for direct economic benefit and employment have been developed based on possible roles for Newhaven in the two main projects relevant to it, Hastings and Isle of Wight.

- **The high case** assumes that Newhaven is home to construction and O&M activity for the Hastings project and is the base for construction for the Isle of Wight project.
- **The medium case** assumes that Newhaven is home to construction and O&M activity for the Hastings project only.
- **The low case** assumes that Newhaven is home to the O&M activity for the Hastings project and has no role in its construction, or in any other project.

Table 6: Direct Economic Benefit – Scenarios for Newhaven (£m)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
High case	0.0	4.5	8.3	8.3	24.0	19.5	15.8	15.8	15.8	15.8	15.8
Medium case	0.0	4.5	4.5	4.5	20.3	15.8	15.8	15.8	15.8	15.8	15.8
Low case	0.0	0.0	0.0	0.0	15.8	15.8	15.8	15.8	15.8	15.8	15.8

Source: Douglas Westwood

4.39 In summary, the direct economic benefit to the Newhaven area, in terms of expenditure on port related windfarm support activities, could range from: in the "high case" £4.5m as early as 2016, peaking at £24m in 2019 when the Hasting zone becomes operational, £19.5m in 2020 and then £15.8m per annum thereafter; in the "medium case" also £4.5m pa from 2016-18, then £20.3m in 2019 and £15.8m from 2020 onwards; and finally the "low case" providing local port-related expenditure of £15.8m pa from 2019.

4.40 In all cases this would be a significant boon to local GVA, of anywhere from £4.5 to £24m in a particular year. Furthermore, this does not factor in job creation which is discussed below.

Direct Job Creation

4.41 The tables below show estimated direct employment for construction and/or O&M activity for the projects Newhaven would initially target. This shows the short-term nature of construction activity in comparison to the O&M phase.

4.42 The following assumptions have been made in this analysis:

- Based on current industry practice, one personnel transfer vessel is required for each 25 turbines during the O&M phase. Each of these vessels will transport 12 personnel to the site and is manned by two or more crew.
- Additional onshore staff for the turbine manufacturer, wind farm owner and port are required. Based on current projects the number of onshore personnel is approximately 40% that of the offshore personnel.
- It should be noted that in the construction phase, the manufacturers of the major components are likely to use a high percentage of their own experienced personnel from abroad.

Table 7: Direct Jobs – Hastings: Construction and O&M

Hastings (600 MW)	Construction and Operations & Maintenance										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Offshore O&M Personnel					70	70	70	70	70	70	70
Commissioning				70	70						
Onshore staff - construction		30	60	60	30						
Onshore staff - O&M					28	28	28	28	28	28	28
Total	0	30	60	130	198	98	98	98	98	98	98

Table 8: Direct Jobs – Hastings: O&M

Hastings (600 MW)	Operations & Maintenance										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Offshore O&M Personnel					70	70	70	70	70	70	70
Commissioning				70	70						
Onshore staff - construction											
Onshore staff - O&M					28	28	28	28	28	28	28
Total	0	0	0	70	168	98	98	98	98	98	98

Table 9: Direct Jobs: Isle of Wight: Construction

Isle of Wight (900 MW)	Construction										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Offshore O&M Personnel											
Commissioning					70	70					
Onshore staff - construction			45	90	90	45					
Onshore staff - O&M											
Total	0	0	45	90	160	115	0	0	0	0	0

Source: Douglas Westwood

Scenarios – Direct Job Creation

4.43 The three scenarios have been developed based on possible roles for Newhaven in the two main projects relevant to it, Hastings and Isle of Wight.

4.44 The high case, medium case and low case scenarios are as outlined in the table below.

Table 10: Direct Jobs - Scenarios for Newhaven

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
High case	0	30	105	220	358	213	98	98	98	98	98
Medium case	0	30	60	130	198	98	98	98	98	98	98
Low case	0	0	0	70	168	98	98	98	98	98	98

Source: Douglas Westwood

4.45 The analysis shows that the high case scenario has the potential to generate a peak of 358 jobs during the later construction and early O&M phases, tailing off to an estimated 98 jobs over the longer term. The analysis highlights the short term nature of employment opportunities during the construction phases, and suggests that the greatest opportunity for Newhaven in the O&M phases. In addition, it is recognised that a significant proportion of construction employment will be imported with limited opportunities for local people.

4.46 In order to maximise the proportion of jobs to be taken up by local people, it is essential that they be well placed in terms of skills development. As discussed above, Newhaven's resident population is currently relatively low qualified compared with district, national and regional averages. However it has the advantage of having a high proportion of its workforce active in skilled trades or elementary/operative roles, and these individuals should have a greater chance of being able to obtain the skills required for windfarm construction and O&M.

5 CONCLUSIONS AND RECOMMENDATIONS

Summary

Background and policy/strategic context

5.1 UK renewable energy targets are driven in part by an aim to produce 15% of all energy from renewable sources by 2020 - equivalent to a seven-fold increase in UK renewable energy consumption from 2008 levels. The Government's 'Renewable Energy Strategy', published in July 2009, establishes the balance of fuels and technologies that will be needed to achieve this ambitious goal. It sets out that more than 30% of our electricity will need to be generated by renewable energy. As the UK has substantial potential offshore wind resources, the preferred option is for two thirds of the UK's increase in renewable energy to come from new wind power infrastructure.

5.2 Central, regional and local governments and other public bodies are asked to invest in the UK's renewables industries to develop the renewable supply chain, support next-generation technology development and demonstration, and build up the necessary infrastructure to support a growing renewables manufacturing sector, such as work to stimulate investment in UK ports.

5.3 SEEDA is becoming increasingly focused on supporting business productivity and efficiency for the low carbon economy. To capitalise on the impact of SEEDA's investment, it will join up existing programmes on research, development and deployment; innovation and clustering; inward investment and skills. The potential for Newhaven Port to support offshore wind growth would align strategically with RES objectives. Specifically it constitutes a 'Transformational Action' to achieve 'Global Leadership in Environmental Technologies'. It could also help to alleviate deprivation across the Sussex Coast sub region by providing new higher value added jobs in emerging green sectors.

5.4 The project could also contribute strategic added value by helping to achieve economies of scale in the renewable energy sector. Although there are already a significant number of businesses involved with environmental technologies operating in the South East, actions are needed in order for the region to reach critical mass in renewable energy.

5.5 In January 2010, the results of the third round of the tender for licences to develop new wind farms in the UK's coastal development zones were announced, amounting to awards for a total of 32 GW of capacity. E.ON and Eneco were awarded contracts to develop new off-shore wind farms for the relatively small Hastings (0.6 GW) and Isle of Wight (0.9 GW) zones. This presents a unique opportunity for ports such as Newhaven, where there is sufficient land availability to provide a potential base for wind farm construction, O&M and future growth.

5.6 The Hastings zone is located off the West Sussex coastline. The area is 270.2 sq km, and is over 13km from the coast at its closest point and nearly 26km at its farthest point. The shallowest parts of the zone at around 19m are of a similar depth to the London Array project awaiting construction in the Thames Estuary. The deeper areas of up to 62m are more likely to be avoided, so not all of the zone will used to locate wind turbines. E.ON Climate and Renewables UK have now signed an exclusive Zone Development Agreement with the Crown Estate, to take the proposals through the planning and consenting phase and eventually develop the Hastings zone. E.ON were early pioneers in offshore wind with the country's first offshore wind project at Blyth.

5.7 Worldwide, offshore wind activity is at an all time high. The next two years will see significant year-on-year growth in terms of capacity installed. However, the industry is struggling with the costs of development which have more than doubled in five years. There is now over 1.5 GW of offshore wind capacity installed worldwide, with 334 MW installed in 2008. Almost 6.6 GW of new offshore wind capacity is expected to be brought online in the 2009-2013 period. From 2011 to 2013, project completions will increase markedly with rates increasing to over 1.8 GW in 2011, and then reducing slightly to around 1.6 GW in 2012 and 2013.

5.8 The UK will bring online almost twice the level of capacity as its closest rival Germany, with 3 GW forecast to 2013. The largest market for the 2009-2013 period is the UK, where expenditure totalling some £8.8 billion is forecast. However, it is unlikely that many of the Round 3 projects will begin construction until around 2018. The zones give potential for projects which are likely to be built in many phases over a long period.

5.9 Offshore wind projects are currently taking eight to nine years from conception to construction. The UK's Round 2 projects are seeing approval times following application submission of 18-30 months which is a big component of the long development period. With contracting now more difficult, due to supply chain constraints and cost increases, the development phase of projects is lengthening. Measures being introduced into Round 3 are encouraging for confidence in the offshore wind sector. With the Crown Estate sharing some development cost this should ensure fewer projects stall during the planning stage.

5.10 The principle uses of a port in relation to offshore wind are: Storage and assembly; quay side access & specification; volume of shipping; and operations and maintenance (O&M). More generally, if Newhaven or Shoreham Ports are to be in the frame for servicing the Hastings Zone, they will need to be able to provide a number of services/facilities including: berthing, dispatch and manoeuvring facilities for large vessels; 24-hour access; sufficient quayside for multiple vessels; areas for interim storage and pre-assembly; covered storage areas; proximity to road and rail networks; and qualified local staff.

5.11 At Newhaven Port there are currently significant areas of unused land and therefore it is unlikely that there would be a difficulty in allocating a sufficient area for an offshore construction facility. However it would need to be confirmed with NPP that they were capable of meeting the requirements for ground load bearing capacity, as well as quayside length / load bearing. Given the proximity of Newhaven and Shoreham Ports to Zone 6, it could well be in the interest of the finally selected wind farm operator to invest in the necessary port upgrades and this would need to be explored at the time.

5.12 However, Newhaven faces competition from other ports in the UK and on the continent. The construction and O&M phases of a project have different drivers for port choice. The use of national ports is also not a given. For example, the Thanet project is currently using Dunkerque, France as the main construction port.

Construction and O&M Opportunities

5.13 Construction logistics and costs affect where projects are built from. Given the current high-cost environment project developers are finding it more efficient to use a port closer to the turbine and foundation manufacturing location. This is a trend that is likely to increase. The location of the major manufacturing contractors impacts on the construction port decision. There has been an increasing trend for turbines and foundations to be shipped straight to the construction site from the manufacturing location.

5.14 The Hastings project is the key opportunity for Newhaven. The Isle of Wight project could potentially be built from Newhaven although it is felt that ports such as Portsmouth would be more likely to win the work. These are the only two UK prospects in the next 10 years. There are however a number of French projects proposed which Newhaven could target, but these are some way off realisation. French legislation and market mechanisms are not supportive of offshore wind at the current time. Furthermore, ports such as Le Havre would offer competition to Newhaven.

5.15 Construction jobs are not long term and can be seasonal. Without a visible project pipeline, long term benefit from offshore wind construction is minimal. Overall, there is a risk that UK ports will not be used for construction phases.

5.16 For the O&M phase, proximity to the project is of great importance. Fast access to the project is crucial. Being located nearer to the project allows much faster personnel transfer. Increased transfer times mean a smaller percentage of maintenance personnel's working days are spend on the turbine. Access is the other main factor and the port must offer round-the-clock availability (with no tidal restrictions). Other

factors such as local skills, amenities etc. are of lesser importance. Conflicting port activities must also be considered.

5.17 Choice of O&M port is a decision made by the turbine manufacturer in conjunction with the project developer. The turbine manufacturer provides initial O&M as part of its initial warranty period (now usually two years) on the turbines. Given its location, Newhaven would represent a sound choice for O&M activities for the Hastings offshore wind farm. The Isle of Wight project is located too far away for Newhaven to have a realistic chance of providing the main O&M services. O&M offers long-term, high-income jobs. Existing projects show that the majority of these jobs go to local people.

5.18 For the O&M phase, Newhaven must be able to offer sufficient quayside for personnel transfer vessels and supply vessels. A quay length of 50m would be adequate. Depending on project characteristics, multiple quay spaces may be required. Large offshore installation vessels of around 120m do not need to be accommodated but this would be advantageous as they are sometimes used for major repair works. Other facility requirements are warehousing (with easy quay access), offices, car parking and small workshop space. Daily maintenance visits to the wind farm are made, usually by small crew boats.

Economic Impact

5.19 Given the nature of the local economy, the recession has had a greater impact on Newhaven than in the relatively affluent district of Lewes. By December 2009, 4.8% of the resident working age population in Newhaven were claiming Job Seekers Allowance, compared to 3% for Lewes District and 4.1% across England. This represents a 70% increase in unemployment in the town since December 200[9]. As well as the immediate opportunity to capitalise on investment in renewable energy infrastructure, the holistic regeneration of Newhaven, including areas around the Port, can help to address some of the wider structural problems in the town.

5.20 The level skills and training amongst the population of Newhaven and along much of the Sussex Coast is relatively low compared to wider county and region statistics. Currently, a proportion of the population commutes away from Newhaven to access higher level jobs, while many others commute in from outside the area to work in Newhaven's large manufacturing sector.

5.21 In the medium term (2016-2020), construction of project(s) in the Hastings zone and initial operation will have begun. And in the long term (2020-2040), there are opportunities associated with the operation of the Hastings zone project(s). Being one of the smaller Round 3 projects at 600 MW, Hastings could be amongst the first to be built and construction could begin around 2017. Given current tendering activity, major contractors would be invited to tender around 2013. It is important that Newhaven have a strong business case for offshore wind work by this time if it is to target the construction phase. The O&M decision is usually made 18-24 months before first electricity generation but ports will be shortlisted in advance of this.

5.22 Supply chain development to a significant level is something that needs addressing at a national scale. Despite currently having the world's largest offshore wind market, UK efforts to establish an industry against competition in Denmark and Germany in particular, has been virtually a failure. Apart from some key competencies through specific companies there are no areas of particular strength in the UK. Manufacturing capacity is extremely low and this is the highest value aspect of the industry.

5.23 Due to the interdependency of offshore wind on other industries and supply chains, many project developers and owners would like to see a dedicated supply chain for offshore wind components, in order to "ride out" fluctuations in demand from other markets and allow a smoother delivery process for key components and services. The major constraint on this taking place is the relative infancy of offshore wind which has meant that other more stable and established markets, including onshore wind, have remained a more attractive proposition to suppliers.

5.24 Three scenarios for direct economic benefit and employment have been developed based on possible roles for Newhaven in the two main projects relevant to it, Hastings and Isle of Wight. The **high case** assumes that Newhaven is home to construction and O&M activity for the Hastings project and is the base for construction for the Isle of Wight project. The **medium case** assumes that Newhaven is home to construction and O&M activity for the Hastings project only. The **low case** assumes that Newhaven is home to the O&M activity for the Hastings project and has no role in its construction, or in any other project.

5.25 The direct economic benefit to the Newhaven area, in terms of expenditure on port related windfarm support activities, could range from:

- in the "high case" £4.5m as early as 2016, peaking at £24m in 2019 when the Hasting zone becomes operational, £19.5m in 2020 and then £15.8m per annum thereafter;
- in the "medium case" also £4.5m pa from 2016-18, then £20.3m in 2019 and £15.8m from 2020 onwards;
- the "low case" providing local port-related expenditure of £15.8m pa from 2019.

5.26 In all cases this would be a significant boon to local GVA, of anywhere from £4.5 to £24m in a particular year, not including job creation. The analysis shows that the high case scenario has the potential to generate a peak of 358 jobs during the later construction and early O&M phases, tailing off to an 98 jobs over the longer term. This highlights the short term nature of employment opportunities during the construction phases.

Recommendations and Interventions

5.27 In order to maximise the proportion of jobs to be taken up by local people, it is essential that they be well placed in terms of skills development. As discussed above, Newhaven's resident population is currently relatively low qualified compared with district, national and regional averages. However it has the advantage of having a high proportion of its workforce active in skilled trades or elementary/operative roles, and these individuals should have a greater chance of being able to obtain the skills required for windfarm construction and O&M, including jobs such as the manufacturing of components, onsite turbine assembly, and maintenance/repair.

5.28 Furthermore, as the O&M phases of offshore wind farm development are likely to create higher income jobs, there is also the opportunity to make a wider positive contribution to the sub-regional economy and diversify the local employment base.

5.29 Going forward there is the opportunity to create a more balanced local employment offer, whilst at the same time retaining a degree of employment in elementary / operative roles to avoid excluding those members of the community who will find it difficult to advance to higher level occupations.

5.30 The local skills base is not a strong deciding factor in the selection of ports for offshore wind construction or O&M phases. Location decisions tend to be focused on the type of port and the associated physical requirements. As such, it is likely that growth in the sector will offer an opportunity to tackle local skills issues.

5.31 The development of new industrial sectors associated with offshore wind technologies may help to drive up local incomes and skills levels as new economic and employment opportunities are made available.

5.32 Newhaven should initially focus on development of the port and aggressive marketing of it. It has a very strong case for winning the O&M phase of the Hastings project and has the capability to act as the construction port for the project. The determination of that location is dependent on other factors apart from proximity to the project. We would recommend immediate dialogue with the winning developer, E.ON.

5.33 If the port does win the construction work it should be recognised that whilst it will result in several years of strong activity, the potential for future work is not guaranteed. O&M activity represents a long-term (20 years plus) and predictable revenue stream for the port. This long-term activity also offers the greatest potential for diversification and establishment of supporting businesses in the area. There is real opportunity for Newhaven to win the O&M phases of the Hastings project, creating higher income jobs, the majority of which may go to local people.

5.34 By contrast, if Newhaven were to be selected for the construction work, this would be short term in nature and requiring a range of skills. Some of the occupations require specialist skills which are likely (at least initially) to be imported from overseas. It is likely however that there would be scope for an increase in local employment across a range of functions.

5.35 The greatest opportunity for Newhaven is in the O&M phases, whereas it is recognised that a significant proportion of construction employment will be imported with limited opportunities for local people.

5.36 In summary, a number of actions are required to take full advantage of any wind farm opportunities that may arise. These include:

- NPP and the South East England Development Agency (SEEDA) jointly initiating dialogue with the winning developer, E.ON, as well as the selected turbine manufacturer.
- East Sussex County Council, SEEDA, Lewes District Council and other partners focussing on strategies to help to ensure that local residents are equipped with the necessary skills to participate in this labour market, thus maximising the proportion of jobs to be taken up by local people
- Encouraging good working relationships with the Port authorities and local/regional stakeholders
- Positioning Newhaven for longer term economic benefits through R&D, component manufacturing, and other supply chain opportunities
- Developing a strong business case for offshore wind work immediately if it is to target the construction phase
- Exploring longer term research and development (R&D) links with local universities

ANNEX A: Offshore Wind Projects