



Economic Impact of Low Carbon Energy on Welsh Ports

Economic Research Unit
Welsh Government

Final Report

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Executive Summary

DTZ was appointed by the Welsh Assembly Government's (now Welsh Government) Economic Research Unit in August 2010 to assess the economic impact of low carbon energy developments on Welsh ports. The objectives of this study are to:

- Produce a baseline assessment of the economic impact of ports in Wales
- Identify and review likely low carbon energy developments which may impact on Welsh ports (including projects outside Wales), in particular focusing on the offshore wind, onshore wind, wave, tidal, biomass, and nuclear sectors
- Assess the potential economic implications and opportunities for Welsh Ports over the period 2010 to 2030
- Identify and review barriers which may inhibit the realisation of economic benefits

There is a strong policy commitment to low carbon energy generation in Wales, and the low carbon energy sector has been identified as a core sector of increasing importance to Wales. A House of Commons Welsh Affairs Committee Inquiry into Ports in Wales (2009) identified Welsh ports as an 'underexploited resource' which could play a greater role in economic development, particularly through their potential role in relation to low carbon energy.

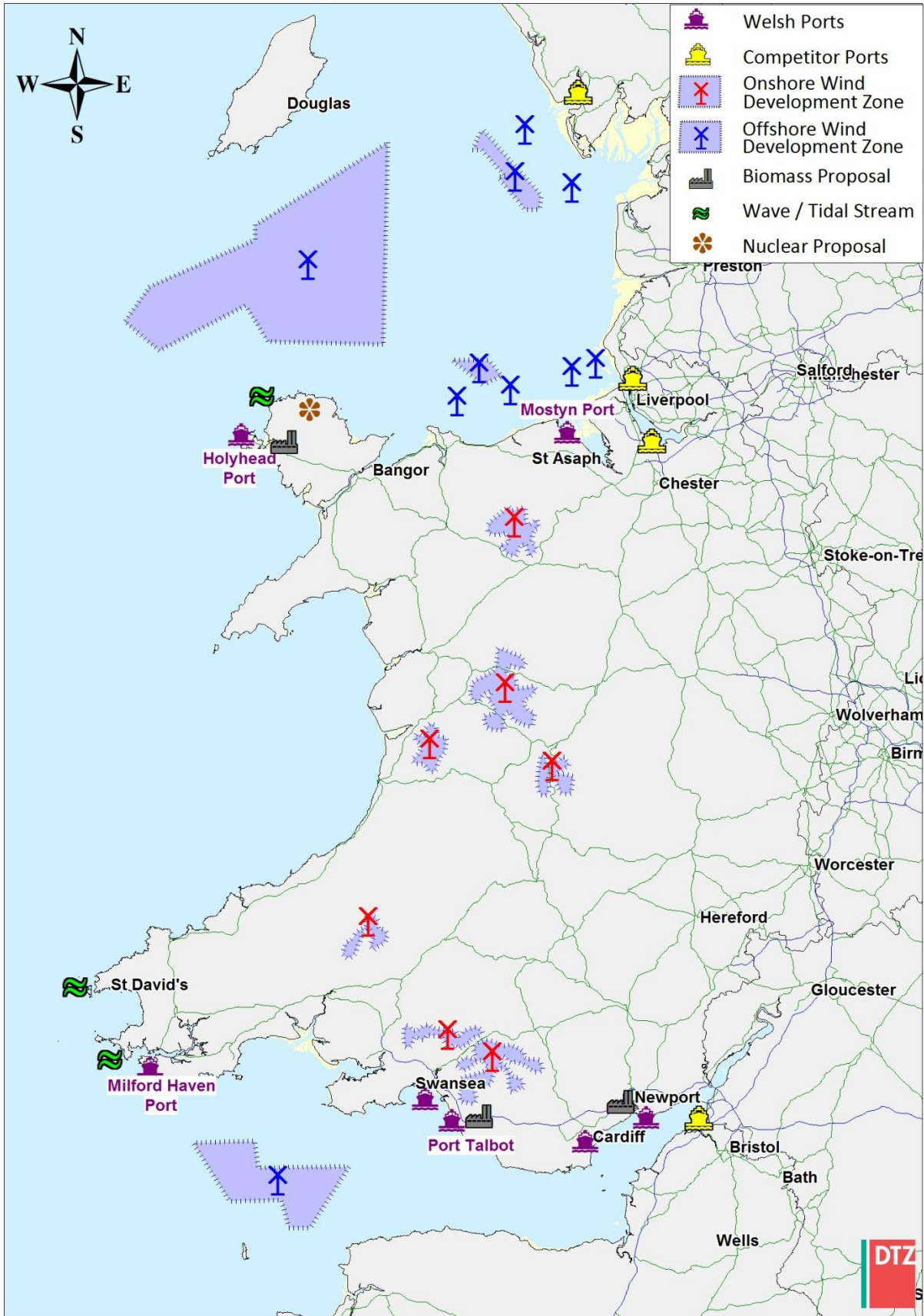
Baseline Review of Ports in Wales

There are a total of **14 ports in Wales** which currently handle commercial traffic. Collectively they handled a total of **54 million tonnes** of cargo in 2009, which amounted to 11% of all port traffic in Great Britain. The throughput of Welsh ports has fluctuated between 50-60 million tonnes per annum for the last decade. Milford Haven accounts for nearly three-quarters (74%) of all traffic, followed by Port Talbot (10%), Holyhead (5%), Newport (5%), and Cardiff (4%). Port traffic forecasts show that **overall traffic volumes in 2030 are expected to be in line with 2009, with zero growth overall in this period.**

Despite difficulties in assessing the economic contribution of ports, a range of estimates have been made for the total employment and economic benefit they generate. For example Oxford Economics (2009) suggest that UK ports directly support 132,000 jobs. In the absence of any corresponding assessment for ports in Wales, DTZ has estimated that **Welsh ports currently support at total of 18,400 jobs** (based on an existing study of ABP ports in South Wales, plus supplementary data in respect of remaining Welsh ports), which equates to around 14% of the total employment supported by UK ports.

The engagement of Welsh ports in the low carbon energy sector to date has been focused on a small number of ports (Mostyn, Port Talbot & Swansea). There is limited secondary information available to estimate the current level of economic impact which this activity generates, however DTZ has consulted with ports and low carbon energy project developers, and modelled economic impacts. The primary impact to date relates to the construction and operation of offshore wind projects out of the Port of Mostyn, which currently supports around 350 FTE jobs.

The following summary map identifies the key commercial ports which we assess are likely to have a role in the low carbon energy sector, plus major renewable energy projects (including future developments) reviewed as part of this study.





Port Infrastructure Assessment

Low carbon energy projects often have significant port infrastructure requirements, hence port infrastructure will be fundamental to Welsh ports unlocking economic opportunities in this sector. The key criteria used to assess the suitability of ports for servicing the low carbon energy sector includes: marine access, navigation, port facilities, maximum ship size, road/rail transport links and land holdings.

DTZ has assessed all commercial ports in Wales, based on their current and planned infrastructure relative to the port infrastructure requirements for low carbon sectors. The following ports appear to have the greatest competitive advantage in exploiting the opportunities from low carbon energy sectors, although this does not preclude niche roles for other ports in Wales, for example in supporting the operations and maintenance (O&M) activities for offshore wind projects.

- **North Wales** - Holyhead and Mostyn
- **South Wales** - Milford Haven (including Pembroke Dock), Port Talbot, Newport, and Swansea

Our analysis highlights that there are several key competitor ports located in the geographical catchment of Wales relevant to the low carbon energy sector. All of these ports must be considered very serious competitors given their location, port specification, facilities and competitive intent to secure emerging opportunities from the low carbon energy sector:

- **Irish Sea & Morecombe Bay** - Belfast, Barrow-in-Furness, Liverpool, Birkenhead and Ellesmere Port
- **Severn Estuary** – Bristol and potentially North Devon ports

A clear spatial pattern is evident with different levels of competition in North and South Wales. For example, if one focuses on the offshore wind sector the following competitor analysis is informative:

- **North** – for the major offshore wind opportunities in the Irish Sea, there are only two ports on the North coast of Wales that are competitively placed to target this opportunity, with five serious competitors outside Wales.
- **South** – for the Atlantic Array there are four Welsh ports – all of which are better located than the main competitor port Bristol, and larger than other smaller competitors such as minor ports in North Devon.

Economic Impact of Low Carbon Energy

DTZ has reviewed the potential economic impact of low carbon energy projects on Welsh ports in the short term (2010-2015), medium term (2015-2020) and long term (2020-2030). DTZ constructed three scenarios (Optimistic, Moderate and Pessimistic) for the likely level of impact. It should be noted that the assessment considers only the impacts associated with Welsh ports, and not the wider low carbon sector in Wales.

As shown in the following figures, the number of jobs supported by low carbon energy in Welsh ports is forecast to increase from the current figure of around 350 jobs to between **1,000 – 3,000 jobs by 2020**. On this basis, low carbon energy could support up to **14% of port employment by 2020**. The average employment in ports over the period 2010-2020 supported by the low carbon sector is forecast to be between 1,000 and 2,500 jobs. In all scenarios, there will be a **rapid increase in the number of jobs by 2012** (to between 1,640 and 2,450 jobs) due to the expected construction of major biomass plants at Port Talbot and Anglesey, the sizeable Gwynt Y Mor offshore wind project, and the Skerries tidal stream project.

Figure 1: Total Employment Impact in Welsh Ports – All Low Carbon Energy Technologies

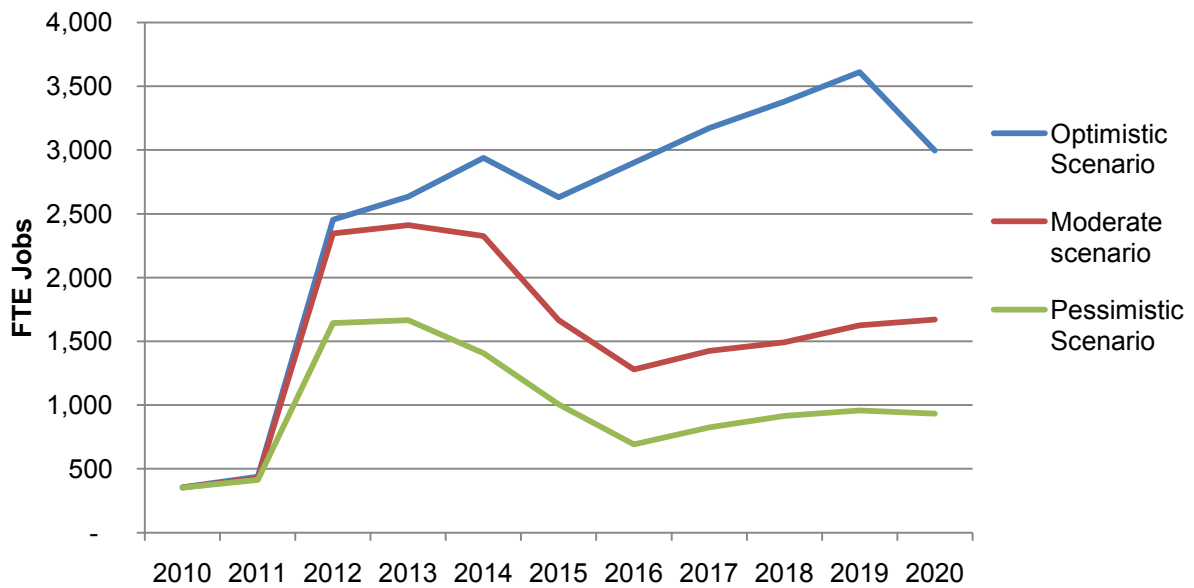
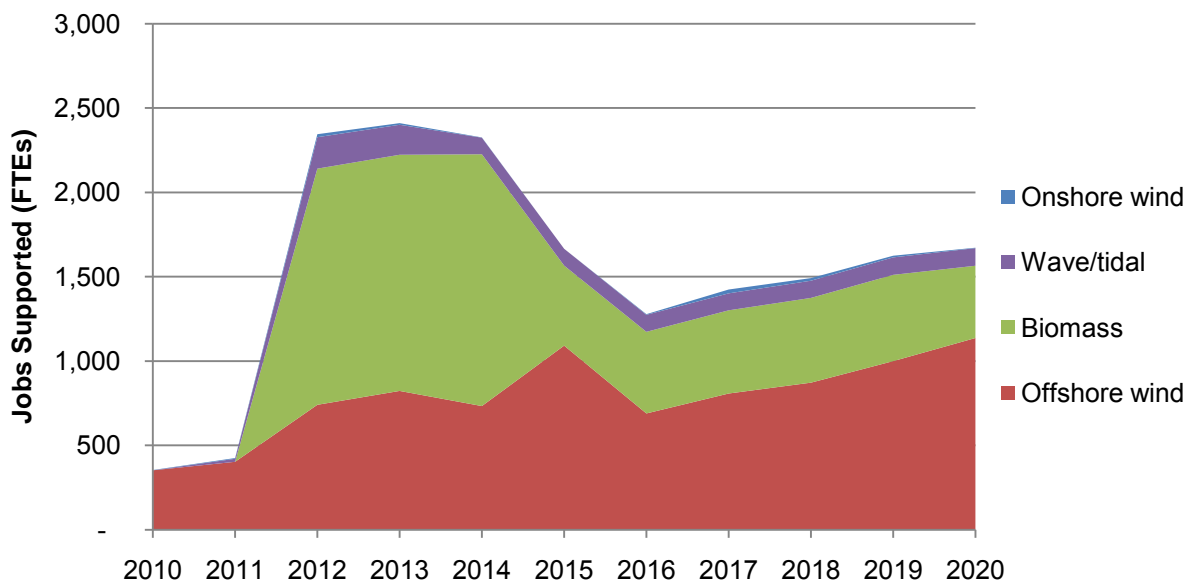


Figure 2: Total Employment Impact in Welsh Ports by technology (Moderate Scenario)



In all scenarios, the majority of the impact to 2020 will be related to the **Offshore Wind and Biomass sectors, which together account for 90%+ of the total employment** impact across all low carbon sectors. The Onshore wind sector will support a very small number of jobs in ports (notwithstanding that there will be significant impacts at onshore wind development sites). In terms of the Wave/Tidal sector, the impact will be modest in the short to medium term, but is likely to increase in importance significantly in the longer term. Regional analysis suggests that around three quarters of the total impact related to offshore wind will be in North Wales, whilst two-thirds of the total impact related to Biomass will be in South Wales.

In the medium term (2015-2020), the scenarios diverge considerably. In the Optimistic Scenario, it is estimated that Low Carbon sectors could support an average of over 3,100 FTEs in the period 2015-2020, as it is assumed that Welsh ports continue to be utilised for major offshore wind projects, and there is a continuing stream of new biomass projects. By contrast, in the Moderate Scenario, low carbon energy projects would support 1,500 FTEs on average over the period 2015-2020, whilst in the pessimistic scenario this would be further reduced to 900 FTEs.

The scenario analysis demonstrates that the economic outcomes could vary significantly depending on the following factors:

- The extent to which **limitations and barriers** (such as planning/environmental issues, financing, logistics, supply chain, capacity etc) cause development projects to be delayed, scaled back or even cancelled.
- The **choice of port** for construction and operations and maintenance activities (Offshore Wind and Wave/Tidal) and the location of biomass projects.

In the longer term (2020-2030), there is considerable uncertainty around the level of employment which could be supported by low carbon energy projects, but this assessment has highlighted the following key trends:

- **Offshore Wind** will continue to support jobs associated with operations and maintenance activities on current and future projects (540-1,200 FTEs depending on the scenario chosen). There may also be some further construction activity in the long term associated with known projects (if they are delayed beyond 2020), and potentially additional projects beyond the current Crown Estate Round 3 licensing process.
- **Wave / Tidal** - It is expected that the roll-out of commercial scale wave and tidal stream devices would take place from 2020 onwards – although there is uncertainty around the likely level of deployment. Welsh ports will be well-placed to capture economic activity related to deployment, operations and maintenance, and potentially also the manufacture of marine energy devices. If Wales can capture a significant share of manufacturing activity related to marine energy, then this could potentially support several thousand jobs at port sites in Wales; however there is significant uncertainty around this.
- **Biomass** – in the long term, there will be a requirement to operate biomass plants and import biomass materials through Welsh ports. Depending on the level of deployment to 2020, this could support between 230 and 440 FTEs. It is also possible that there will be further deployment of biomass capacity at port sites in the long term, which would support additional construction and operational jobs.
- **Onshore Wind** – It is expected that much of the onshore wind capacity in Wales would be deployed by 2020. Hence the impact of onshore wind on ports post 2020 would be very small.

In addition to the quantitative impacts identified above, the assessment also highlighted the following qualitative and wider economic impacts:

Impact	Description
Supply Chain	Low carbon energy projects are anticipated to generate significant opportunities for Welsh suppliers (including companies at port sites and elsewhere). The range of supply chain opportunities is extremely diverse. This assessment has highlighted that Welsh firms are well-placed to engage in this market – with 100 firms across Wales expressing an interest in offshore wind supply chain opportunities.
Skills	There is expected to be significant growth in the number of low carbon jobs in Wales (at port sites and elsewhere), which will create demand for workers with a range of particular skills. Given that this is an emerging industry, these skills may not be in sufficient supply, potentially creating skills gaps and upward wage pressure within low carbon sectors; although it is possible that increased demand could be met through the transfer of skills from other sectors and/or retraining. Welsh staff already engaged in low carbon industries are becoming more skilled over time, moving up the value chain of activities, and exporting their services to the rest of the UK.
Other sectors	Ports tend to be space constrained, and have a defined maximum capacity at any point in time; and low carbon energy uses such as offshore wind construction and biomass plants can occupy a significant amount of space. However, it is not always the case that low carbon energy activities come at the expense of other activities. The levels of traffic in Welsh ports (particularly dry bulk traffic) have been static or in decline in recent years, therefore low carbon activity could provide a much needed new source of business rather than displacing other activity.
Research and Development	R&D impacts could arise as a result of the location of low carbon energy developments at port sites, and knowledge exchange between ports, project developers and Universities. This is most likely to occur in sectors where the technology is less well developed, such as marine energy. There are already a number of R&D centres in low carbon sectors in Wales, the largest of which is the Low Carbon Research Institute – led by the Welsh School of Architecture at Cardiff University.
Inward Investment	The development of a low carbon sector in Wales could potentially boost the profile of Wales and encourage inward investment from foreign firms to service this growing market.
Social	Possible impacts include: <ul style="list-style-type: none"> • Impacts on tourism and leisure • Noise (particularly during construction) • Congestion (both onshore road traffic, and offshore shipping traffic)
Environmental	Possible impacts include: <ul style="list-style-type: none"> • Marine ecology, ornithology, and seabed habitats • Onshore ecology and environment • Landscape/seascape and visual environment • Physical environment – effects on sediment transport, water quality, waves and tides, scour effects, hydrology, and flood risk

Barriers and Mitigation Options

The following table sets out the factors which could act as potential barriers to the realisation of economic benefits from low carbon energy – identified through consultation with ports, renewable energy developers and other stakeholders as part of this study. Based on these identified barriers, DTZ has suggested a selection of possible mitigation options available to the public sector in Wales, and a possible prioritisation in terms of potential impact. However, further work will be required to assess the suitability of any such policies.

Potential Barriers	Potential Public Sector Response / Mitigation Options	Priority / Potential Impact
Barriers related to ports		
Market Awareness and Engagement of Welsh Ports	High engagement amongst larger ports. Need to engage smaller ports more fully to ensure they understand opportunities	Medium
Port Infrastructure and Capacity Constraints	Targeted support to ports to invest in the necessary infrastructure to compete in low carbon markets.	High
Uncertainty of which ports will be used	Requires ongoing engagement with developers of major projects.	Medium
Planning Restrictions and Environmental Issues	Complete SEA and leasing round for Marine renewables. Work with project developers to ensure that environmental impacts are mitigated as far as possible.	High
Barriers related to low carbon sectors more generally		
Availability of Skills / risk of skills gaps	Further research required to identify specific skills demand, skills gaps, and education provision inside/outside Wales.	Medium
Financing and Viability of Low Carbon Energy Projects	Work with developers to better understand the risks to major development projects.	Medium
	Targeted investment in R&D on technologies which can improve the viability of low carbon projects.	High
Power Network Infrastructure and Capacity Constraints	National Grid already working to ensure sufficient network infrastructure and capacity. Project developers must engage with National Grid at the earliest opportunity to ensure that capacity will be available.	High
Land-side infrastructure requirements	Targeted investment to increase the usage of Welsh ports by onshore wind sector (overall impact on Welsh jobs would however be minimal).	Low
Supply Chain Bottlenecks (particularly offshore wind)	Support to major project developers and supply chain firms Mapping of supply chain capabilities? (as has been done in SW) Use of the Sell2Wales system as a meeting-point for project developers and suppliers?	Medium



Overall, our analysis demonstrates that there is a need for a holistic approach to the low carbon energy sector in Wales to ensure that economic benefits are maximised. Most importantly, this needs suitable dialogue between project developers, ports, supply chain companies, and R&D providers on an ongoing basis. Public sector support (Welsh Government, Local Authorities and other relevant parties) integrated across the following domains, is also of importance:

- Ports
- Planning (e.g. Including SEA)
- Land-based infrastructure (transport, grid connectivity, sites)
- Skills
- Supply chain
- Financial support
- Inward Investment
- R&D and demonstration projects