

# BWEA



Delivering the UK's wind, wave and tidal energy



## UK Offshore Wind: Charting the Right Course

Scenarios for offshore capital costs for the next five years



# Scenarios for offshore capital costs for the next five years

The offshore wind industry is an important source of future energy supply for the UK, although it is a sector which has yet to fully mature. Project roll-out in the UK has gathered pace with offshore wind build in 2009 expected to be similar to onshore wind build for the first time. Currently, the UK is also the largest global market for offshore wind. This progress has been accompanied by a sharp increase in capital costs which is a concern for continuation of that success story, with economic viability now a major barrier to deployment for offshore wind projects.

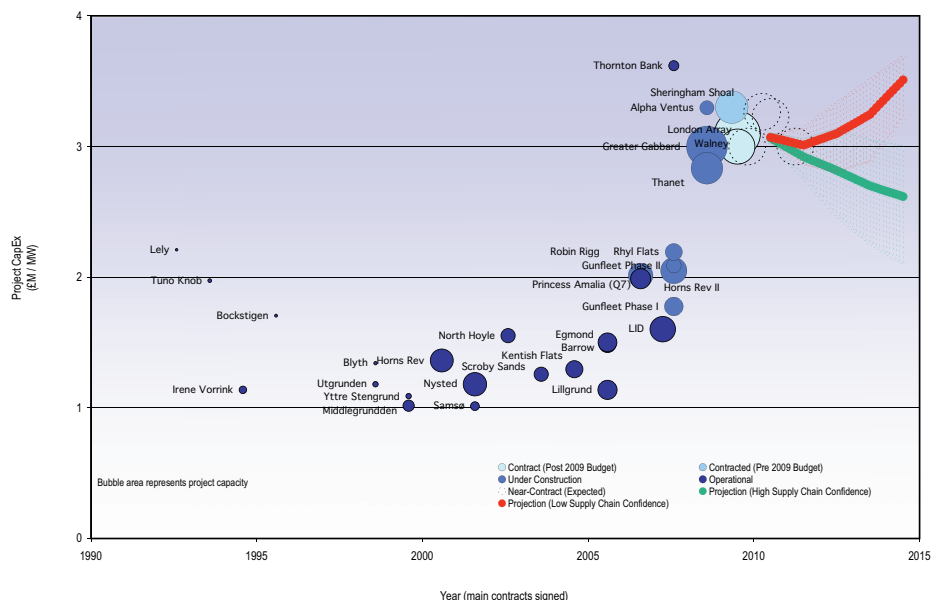
BWEA monitors the offshore wind sector closely and the work reported here has investigated cost trends for the industry, specifically:

- current capital costs levels and the drivers behind historical increases;
- anticipated capital costs for those projects likely to place major contracts by March 2011;
- scenario analysis leading to trends in capital costs extending out to 2015.

The work has been completed in consultation with the industry: project developers, key supply chain contractors and financiers.

The overall picture of capital costs of offshore wind projects, historically and under current market conditions is presented above.

Also shown above are future projections for high and low offshore wind supply chain confidence scenarios. Supply chain confidence is seen as a key factor in future costs and one which can be influenced by policy-makers and developers. In an otherwise neutral environment, projections show that good progress on this front will see capital costs reduced by 15-20% in 5 years time and on a strongly-reducing trajectory.



Historical, current and projected future capital costs for offshore wind projects

Other drivers of capital costs tend to be the result of global onshore wind business prosperity or the macro-economic situation, and so less amenable to influence. The confidence limits shown above on the 5 year cost trends reflect the potential impact of macro-economics and the influence of the onshore wind industry.

## Learning from the past

A review of the historical offshore wind capital costs reveals several important influences that have driven an upward spiralling trend from around 2005, which followed a period of relative stability from 2000 to 2004. Most important amongst these are those factors that have served to reduce supply chain competition, namely, the ongoing withdrawal of key contractors and products in combination with increasing demand pressure from industries competing for common supply capacity, in particular onshore wind. To reverse the upward capital cost trend in the long-term, a reversal in supply chain trends is important. Another factor that has had a strong historical influence is the relatively high early competition between suppliers (2000-2004) and

subsequent losses - as the true cost base and challenge of the technology was established and priced in to future contracts. More recently, currency and commodity markets have played an important role. Over 80% of UK offshore wind project capital value is imported, so the devaluation of sterling since 2007 has forced prices sharply up.

## A stable outlook from industry

Consulting key industry players (developers and contractors) gives a picture of current capital costs lying in a range centred on £3.1m per megawatt of capacity installed (for those projects recently contracted and likely to be contracted shortly). The consensus on future trends is for a slight rise in the next two years followed by a slight fall from current levels to 2015. As one expects in such a consultation exercise, dramatic changes are not foreseen and most consultees assume 'environmental' factors will persist at current levels. There was wide acknowledgement that capital cost reduction was needed for a healthy long-term industry. Attitudes towards the UK offshore wind sector are positive - in some cases very positive indeed.

*"We take confidence from the ongoing commitment the UK Government shows in developing the offshore wind industry",*  
**DONG Energy**

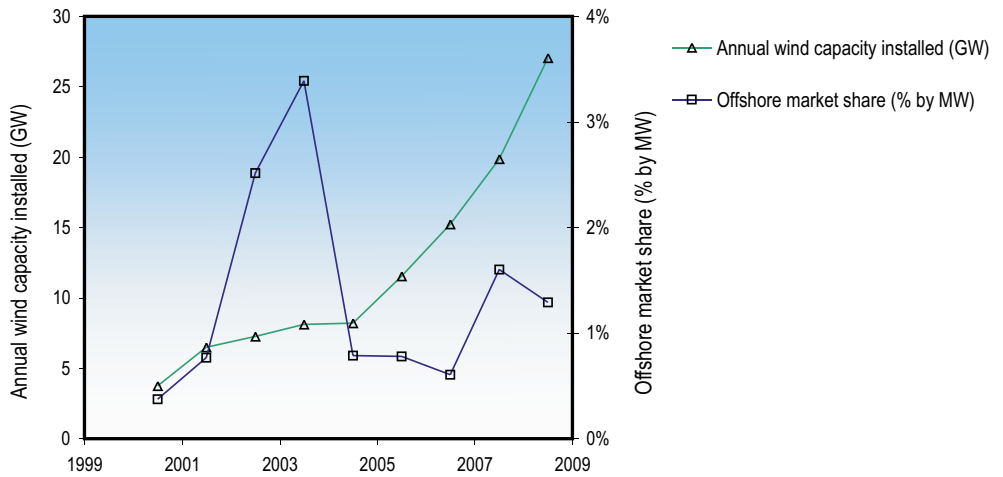
The 2009 Budget proposal for enhanced off-take revenues for pending projects has been mostly well-received with some reservations being expressed on the impact for investor confidence and certainty.

*"Positive movements by the Government through the ROC increase in response to a recent decrease in economic viability of UK projects compared to the rest of Europe. This allowed key projects to progress and more importantly sent the signal that the government is serious about offshore wind and will support growth in the industry",*  
**Wind turbine supplier**

Consultees also shared their views on the functioning of the market. Developers have responded to the market signal of increasing prices for wind turbines and installation vessels, for example through long-term agreements. Contractors are sending the message that this does not go far enough if the corner is to be turned on capital costs and capacity is to be developed to service Round 3 projects.

**Turbine Market - critical mass**

The current global offshore wind installation rate is just under 1 GW per annum, over half in the UK, and growing fast. Discussions with wind turbine suppliers identified that they view offshore sales of around 1 GW per annum as the level which would make them consider the offshore business to be close to mature. At this level on a national basis, suppliers may also start to



justify inward investment. As there are 3-4 turbine suppliers active in the market, that would suggest annual deployment rate of circa 5 GW being required across European offshore markets for maturity in the turbine supply element.

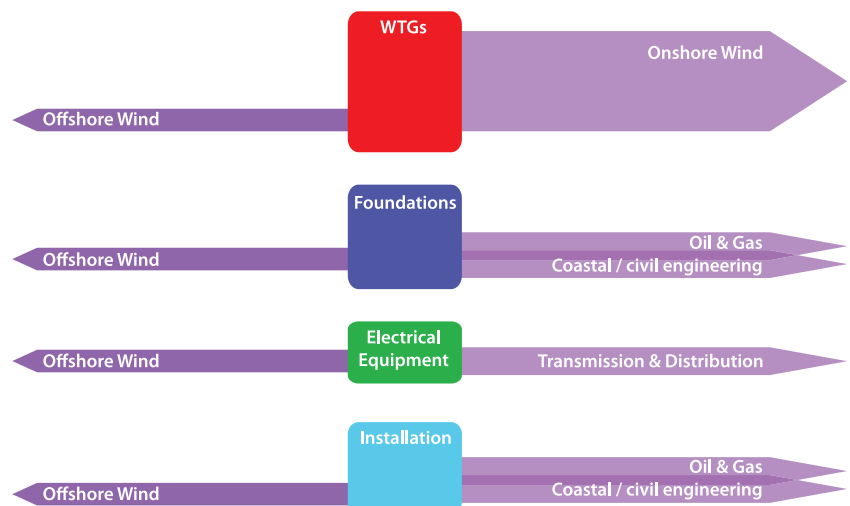
**Boosting confidence to extract a decoupled supply chain**

The offshore wind supply chain is maturing slowly and the extent to which confidence can develop or be accelerated has a substantial impact on overall capital costs with a 5 year horizon, or more importantly, the trajectory which capital costs will be following by 2015. If sufficient confidence is instilled for incumbent and new-entrant suppliers and contractors, a dedicated supply chain could be created for offshore wind for the first time.

*"Meeting 2020 targets relies on supply chain companies making huge investment decisions now. That requires a stable industry with a long term future. We welcome recent statements that the Government will take a more strategic approach, especially to grid, and hope to work with them to deliver the UK's targets."*

**Siemens Transmission and Distribution Ltd**

The heavy inter-dependency on other sectors, exemplified by the figure below, continues to be a major capital cost issue. The offshore wind industry has so far ridden on the back of other sectors, and so has been subject to the conditions in those markets.



The analysis presented in this report suggests that measures to accelerate de-coupling of the supply chain have the potential to increase competitive pressures and also to improve the likelihood that industry maturation effects (scale, learning and innovation) will feed through to project capital costs. However, even if effective action is taken by Government and industry now, the benefits are not likely to have a deflationary impact on capital costs until 4-6 years from now due to the substantial lead time required to establish new facilities. The formulation of actions to instigate this shift in the supply base is outside the scope of this study, although it is suggested that a combination of market pull (long-term frame-orders and strong policies) in combination with substantial direct support for new facilities, such as grants and soft-loans will be required. If implemented successfully, these measures have the potential to re-invigorate the industry with real commercial competition driving down contract prices, pushing forward innovation and removing the 'risk-premium' which is currently throttling the sector.

### Increasing UK content - a high priority

The very high euro-content of offshore wind projects has exposed the industry to massive currency risk and since mid-2007 the precipitous decline in the value of sterling against the euro has had a direct impact on capital costs for UK projects, in the order of 15-20%.

Increasing UK produced content in the value chain has the potential to avoid a repeat of this in the future, whilst generating UK jobs and tax revenues. In addition, the supply chain de-coupling discussed above would be bolstered significantly by such development of domestic supply base, with the potential for the UK plc to become a specialist in offshore wind. This would serve the needs of the domestic market with the potential for substantial future export revenues. This can only happen if developers and government successfully instil the long-term confidence and support required for investment in dedicated supply chain capacity.

*“There is a tremendous opportunity coming to the UK manufacturing industry creating thousands of jobs. In some areas industry is further advanced than Government realise. With minimal additional investment we have an opportunity to have sectors of the UK leading in this new industry due to the experience and skills gained from the oil and gas sector. We could create an industry that will last for 20 to 30 years.”*

**Burntisland Fabrications Ltd**

Success for UK manufacture relies on the UK providing the base demand for the critical 'mass' mentioned above, and not an erratic component of the wider European demand. However, it is important to recognise that the UK cannot 'go it alone' as contractors require a strong and stable political climate in more than one national market before significant investment decision can be sanctioned. In this respect, a successful UK offshore wind industry is inextricably linked to similar success in other EU markets, despite the additional short-term pressure on the supply chain that this will incur.

### Underlying drivers - macro economics and onshore wind

The interactions between the onshore wind market and offshore supply chain against the uncertain macro economic backdrop is found to be central when considering the outlook for offshore wind capital costs. The analysis in this report yields the uncomfortable finding that a prolonged recession and / or the cooling of the global onshore wind market results in a favourable projection of offshore wind capital costs. The UK offshore wind business cannot significantly influence macro economics or indeed the onshore wind market. However, the response of the fragile and contingent offshore wind supply chain to both of these 'environmental' factors can be influenced.

In absence of extreme movements in these factors, capital cost is not expected to alter dramatically over the next 5 years. However, the offshore wind business remains at the mercy of the economic climate, the value of sterling and the pressure put upon it by onshore wind demand. These uncontrollable environmental factors can have just as large an impact on offshore wind capital costs as the measures outlined above.

### Delivering Round 3

With a longer timeframe, significant investment decisions need to be made to ensure the capacity exists to deliver Round 3 projects, as well as the capacity planned for other North Sea states. In that context, one perspective is that a steady level of capital costs for the next 5 years is acceptable, provided it delivers, by 2015, a better-resourced and more efficient industry.



This is an extract from the main report which can be viewed at [www.bwea.com](http://www.bwea.com)

Garrad Hassan is the world's leading renewable energy consultancy serving the wind, wave, tidal and solar sectors. Headquartered in the UK, with offices across the globe, it offers a full range of engineering consultancy, industry advice, specialist software and training – dedicated to renewables. This report has been led by the company's Offshore Wind Department - a multi-disciplinary team focused on contributing to offshore wind project development.

BWEA is the trade and professional body for the UK wind and marine renewables industries. Formed in 1978, and with over 470 corporate members, BWEA is the leading renewable energy trade association in the UK. Wind has been the world's fastest growing renewable energy source for the last seven years, and this trend is expected to continue with falling costs of wind energy and the urgent international need to tackle CO<sub>2</sub> emissions to prevent climate change.



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