OFFSHORE WIND: EUROPE'S EUR 90 BILLION FUNDING REQUIREMENT

White Paper - 19 July 2005

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With good onshore locations becoming hard to find, Europe's wind industry has its sights set offshore.

New Energy Finance estimates that Europe's offshore wind plans will require at least EUR 90.8bn (USD 115bn) between now and 2030. Of this only EUR 2.7bn (USD 3.4bn) has so far been secured. A staggering EUR 88.7bn (USD 112bn) still remains to be found.

New Energy Finance believes that European governments need to streamline permitting processes and contribute to connection costs if they want to hit their targets for offshore wind capacity.

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Across Europe, over 54GW of offshore wind is currently proposed or in planning. The most ambitious countries are Germany, the UK and the Netherlands, targeting 25GW, 9.1GW and 6GW respectively (see Figure 1).

So far, however, only 0.6GW of offshore wind has been installed in Europe, a mere 1.1% of the total planned (see Figure 2). Financing has been secured and construction begun on another 1.0GW. Existing projects range in size from the experimental 1.0MW, to the not inconsiderable 165.5MW Danish Nysted project. The most active developers so far have been the European utilities, Elsam, Centrica, E.ON, RWE npower and Energi E2.

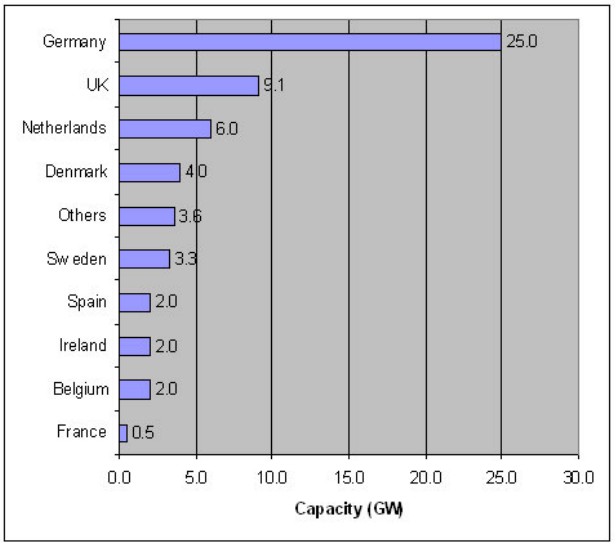

Fig 1: Worldwide offshore wind targets. Government plans and/or capacity additions announced by developers (GW)

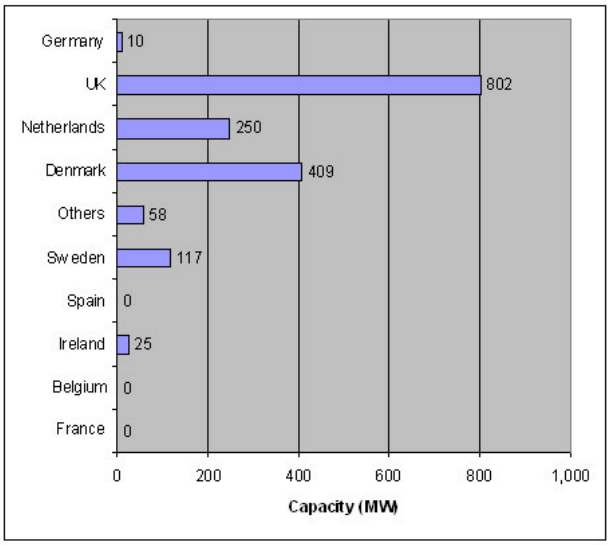

Fig 2: Worldwide offshore wind projects in progress: projects with financing secured, currently in construction or already commissioned (MW)

Note: "Others" includes USA, China, Canada, Russia

So where is the bottleneck? An analysis of projects under development and national targets reveals that specific sites have been identified for 32.5GW (59%) of the proposed developments. Of those sites which have already been identified, and in some cases for which permits awarded, no less than 29.7GW (92%) have yet to secure financing. That translates into an immediate funding requirement of EUR 49.4bn (USD 62.4bn) (see Figure 3).

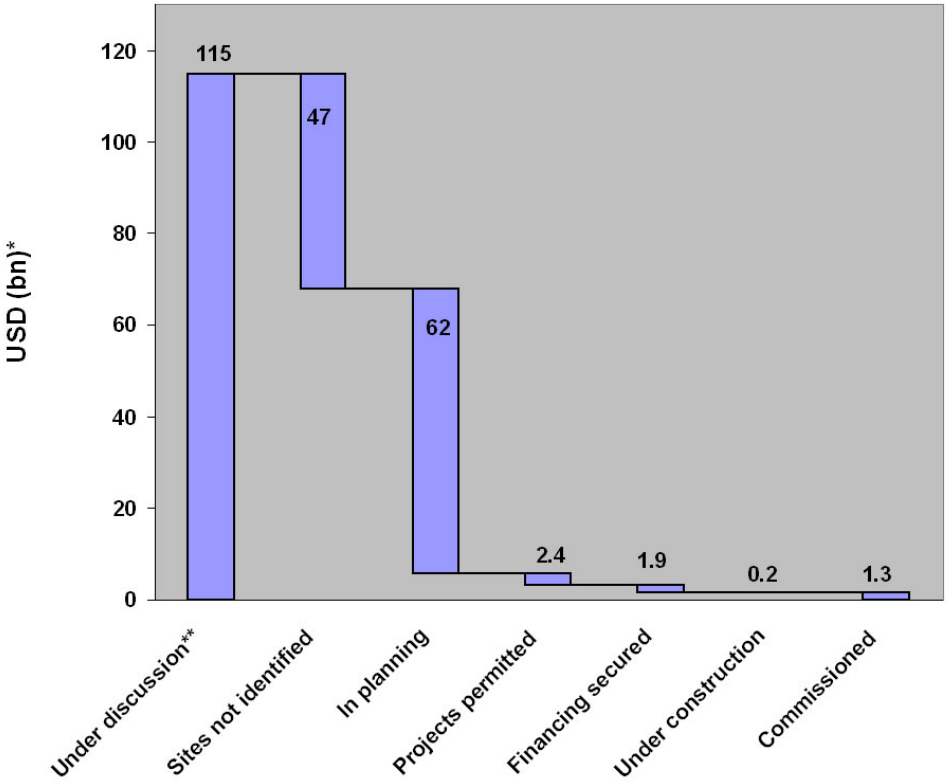

Figure 3. Financing requirement for European offshore wind, by stage of development. * Assumes average USD 2.1m per MW capital costs; ** Under discussion = higher of national target or sum of developer proposals

One of the reasons for the difficulties experienced by as-yet-unfunded projects is that offshore permitting is a lengthy process involving multiple authorities - industry sources claim as many as 14 different agencies can be involved in a single project. Streamlining of procedures is being actively tackled by British, Danish, Swedish governments. Another concern is that the offshore services companies required to erect towers and lay cables may have insufficient capacity for the huge volume of work ahead.

The real problem, however, according to Ian Temperton of Climate Change Capital, is that as they stand, the projects are just not financially viable: "If the projects make economic sense the funding is available", he says. "There is no shortage of experience amongst the major lenders and equity providers in financing onshore wind." This experience is already being transferred to offshore wind, with various banks working with the utilities to fund the UK's Round One projects.

The main reason why the economics look unattractive lies in the continuing doubt over the cost of offshore wind. Two years ago, most industry experts were estimating the capital cost for offshore wind at USD 1.6 to 1.9m per MW. Recent research by Garrad Hassan, the world's leading consultant on wind farm economics, shows that while costs for existing offshore projects have been in the range of USD 1.4 to 1.6m per MW, costs for projects currently in planning will be higher - perhaps as much as USD 2.1 to 2.6m per MW, according to Colin

Morgan, Offshore Senior Engineer. He cites increases in prices on the supply and contract side of the developments, and also the increased connection costs for less favourable sites.

Here at New Energy Finance, we believe that experience and economies of scale will mitigate these drivers of increased costs for offshore wind development, so for the purposes of our analysis we chose a unit cost at the low end of Garrad Hassan's range - USD 2.1m per MW (see Table 1). This is also the average figure for the 26 projects which we analysed, for which costs have been made public.

	Onshore (USD)	**Offshore (USD)**	**Difference**
Turbines	550k (55%)	950k (45%)	**+72%**
Foundations & towers	220k (22%)	460k (22%)	**+110%**
Grid & electrical connections	150k (15%)	530k (25%)	**+250%**
Other costs	8k (8%)	170k (8%)	**+110%**
Total	**1.0m (100%)**	**2.1m (100%)**	**+110%**

Note: Excludes capital cost of O&M contract. Source: New Energy Finance estimates.

Table 1. Typical costs per MW, offshore versus onshore

So far, only Denmark and the UK have managed to install more than 100MW of offshore capacity. In Denmark, a national committee established specific potential areas to be developed by utilities by 2008, and encouraged them by instituting a minimum feed-in tariff for electricity transmitted to the grid.

In the UK, 124.0MW of the Round 1 projects have been commissioned and financing has been secured for a further 588MW, all backed by the major utilities. The Government ensured the success of these developments by offering capital grants to cover part of their costs. Mark Draper, now of Ocean Power technologies but formerly responsible for developing Scroby Sands, said: "Government capital grants were essential for the returns on Round One to hit the required hurdle rate".

These capital grants are not available for Round Two projects, many of which have inherently higher costs due to their locations, severely limiting their attractiveness. Scottish Power, E.ON and other winners of the Round Two franchises have run the numbers, and are now telling the Government that as things stand there will be no progress.

Shell recently announced that the consortium developing the 1.0GW London Array project had submitted consents and planning applications, but according to industry sources development plans are heavily dependent on renewed government support. Meanwhile a Shell/Nuon joint venture has signed final contracts for the development of a 108MW Dutch offshore project with government support amounting to 13.5% of capital costs.

In the UK, one particular problem lies in the structure of the Renewable Obligation Certificate (ROC) system. If overall national targets for renewable power are met, the value of a ROC drops to zero. The more the target is undershot, the more valuable the ROC. It must have seemed fiendishly clever when it was first dreamed up, but it has turned the financing of UK offshore wind into a vast game of chicken, with rewards to developers being more dependent on the actions others than on the quality of their projects.

Germany, meanwhile, which is looking to build 25GW by 2030, has established a fixed-rate feed-in tariff, as it did for onshore wind. This is serving to attract a number of independent developers, with Energiekontor, Plambeck Neue Energien, Enova, Geo mbH and Winkra Energie leading the way. Many German wind developers, however, have weak balance sheets after the shake-out in the onshore wind sector, and it is not yet clear where the bulk of the funding will come from. Given the lack of growth in Germany's onshore wind sector, any failure of the offshore sector to take off would have a dramatic effect on the wind industry there (see Figure 4).

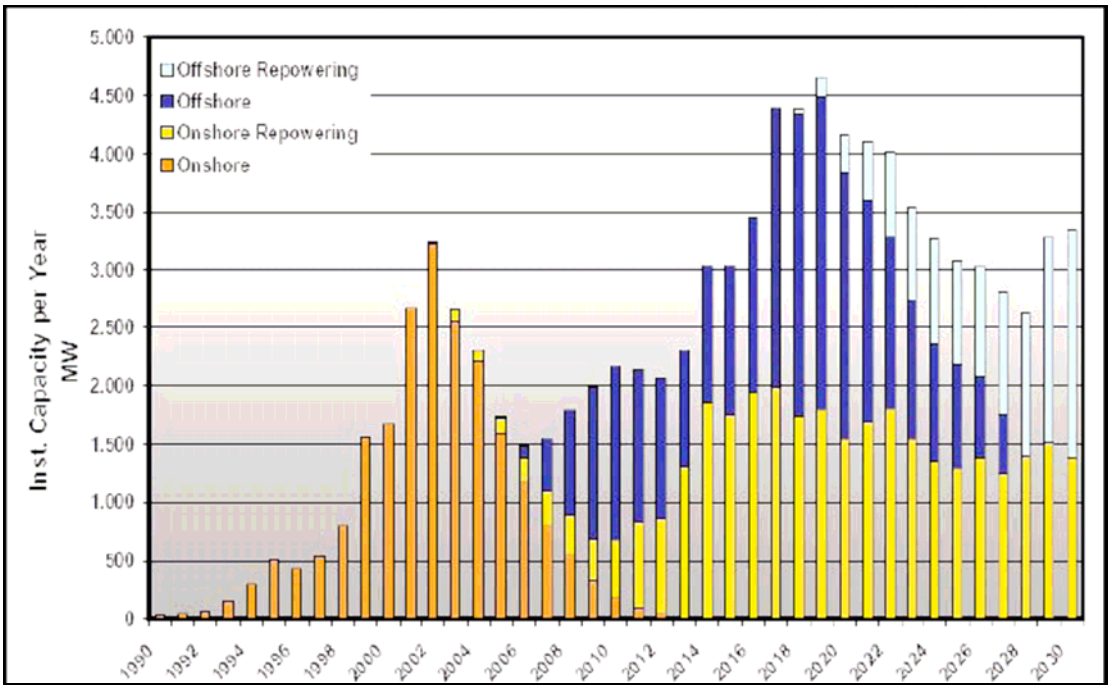

Figure 4. German onshore and offshore wind forecast to 2030 (Source DEWI)

Essentially, then, the reason for the bottleneck in offshore wind development is that the projects which are being proposed are uneconomic. High costs in the early projects were acceptable - they were ground-breaking projects, governments provided extra support and contractors were willing to charge less for the chance to position themselves for further developments. Now that these experimental projects are up and running, however, and the true cost of offshore wind is better understood, the question is how and when will the main bulk of Europe's offshore projects be financed?

New Energy Finance believes that European governments need to address two problems in order to get Europe's offshore wind plans back on track: the cumbersome permitting process, and the cost of grid connections. All the other barriers (technology risk, construction delays, and availability of capital) can then be overcome by industrial and financial players within current frameworks. Europe's chances of hitting its emission reductions targets hang in the balance.

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London, 19 July 2005

New Energy Finance is a specialist provider of financial information, research and analysis to investors in clean energy. This white paper is a version of an article that first appeared in the New Energy Finance Briefing. For more information, please contact info@newenergyfinance.com.