



**EUROPEAN
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Belgium's offshore winds show their might

The bright sunshine on the morning of the trip to visit Thornton Bank offshore wind farm boded well. However during the 90 minute drive from Brussels to the port of Ostend, Belgium, clouds gathered ominously overhead. Upon arrival at C-Power's visitor centre, journalists who had signed up to the press visit of the wind farm, organised by the European Wind Energy Association (EWEA), were greeted with the disappointing news that the waves of the North Sea were now over the safety limit of 1.5 metres. The trip would have to be put on hold: even the technicians working out at sea that morning had been forced to return to dry land.

It was a pertinent demonstration of the ability of the weather to make or break a day's planned work on an offshore wind farm. Filip Martens, the CEO of C-Power, which owns the farm, explained to the visitors that each operation has a 36-hour weather window and, "on average, the site can be accessed 87% of the year."

Not only is work on the farm highly weather-dependent, but an extra layer of complication is added by the fact that in many ways Thornton Bank is – figuratively if not literally – breaking new ground.

"Thornton Bank is the first offshore wind farm ever to use 5 MW wind turbines 30 km from land", explained Martens. "These powerful turbines mean that when Phase II is finished, the farm will have a total capacity of 300 MW and be in operation 97% of the time."

The finished wind farm will produce 1 TWh of power, enough for 600,000 inhabitants. It will also avoid a good deal of carbon dioxide – 450,000 tonnes.

"The carbon dioxide the project will avoid is the equivalent of 90,000 hectares of forest", explained Martens. "If you imagine a 15 km-wide band of forest running the full length of Belgium's 60 km coastline, that's the size I mean".

However, despite all the benefits the fully operational farm will bring, the barriers to be faced go further than merely negotiating the weather on a daily basis.

Firstly, the siting of the wind farm in the North Sea meant finding a suitable spot amidst the power and telephonic cabling already in place. The chosen location has the Belgium – Great Britain gas pipeline running through it, so the farm is being put up on either side of it.

In terms of the electricity network, offshore wind farms, unlike any other form of power generating

technology, are currently required to pay for their own grid connection. C-Power has therefore had to fund the cable connecting Thornton Bank to the shore, which represents some 25% of the overall cost of Phase I of the project. The fact that the wind farm operators have to give day-ahead power forecasts to the grid operators for their production on a 15-minute basis is also a challenge given the variability of the wind. An intraday system, whereby forecasts are much shorter, is widely recommended by the wind industry, as it would allow far greater accuracy.

One issue that slows down offshore wind developments is the lengthy administrative permit processes for project proposals.

"The project is given a 20-year life span. That means that after 20 years of operation, we need to remove all evidence of the project and the area of the sea needs to be exactly as it was when we found it. In order to do this, we need to set aside €37 million at the start of the project", explains Martens. "No other power producers have to do this."

Some of the administrative burden on European wind farm developers should be eased with the passing of the 2009 Renewable Energy Directive, which aims to reduce the red tape involved.

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Installing an offshore wind farm is a complicated and complex process. Yet offshore wind is Europe's largest domestic energy source, and as well as being free from greenhouse gases, it replaces costly fuel imports. Moreover, the sector has the potential to become a new, multi-billion euro industry, creating thousands of new jobs, and securing Europe as the world leader in offshore wind energy technology.

Examples like that of Thornton Bank show that although there are many financial and administrative obstacles that developers still frequently have to face, offshore wind can bring immense benefits and is key to a sustainable, clean, high tech but low risk energy future.

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