



Pioneering performance in the North Sea: The offshore wind farm Global Tech I

(status quo March 2014)

Global Tech I is one of the first offshore wind farms being built in the German North Sea. The wind farm's array consists of 80 AREVA Wind turbines each with a capacity of 5 megawatts and so has a total installed capacity of 400 megawatts. This will realistically provide electricity generated by environmentally friendly wind energy of more than 1.4 billion kilowatt hours per year. Global Tech I will occupy an area of roughly 41 square kilometres located approximately 180 kilometres from Bremerhaven and 138 kilometres northwest of Emden. The wind farm is being built in the German Exclusive Economic Zone (EEZ) and not within any marine protection zone. Germany's Federal Maritime and Hydrographic Agency (BSH) granted its approval for the 80 wind power turbines and the associated transformer station in 2006. Construction began in August 2012. Once Global Tech I is fully operational it will supply sufficient environmentally-friendly electricity to power an equivalent of 445,000 households with an average power demand of 3,130 kilowatt hours per year.

Global Tech I Offshore Wind GmbH is the project company that will build and operate the offshore wind farm Global Tech I. The company's shareholders are mainly the three energy suppliers Stadtwerke München GmbH, HSE AG (Darmstadt) and Axpo International S.A. which are holding together a stake of almost 75 per cent.

Status quo (31.3.2014)

The wind farm is presently under construction and it is estimated to be complete in summer 2014. Until now 28 towers and nacelles and six rotor stars have been erected. With regards to the innerfield cabling the second phase with the cable burial has already started. Once Global Tech I is connected to the converter station BorWin beta, presently expected by end of 2014, it will be fully operational and will supply sufficient environmentally friendly electricity to power an equivalent of 445,000 households with an average power demand of 3,130 kilowatt hours per year.

Facts

Area	41 square kilometres
Location	180 kilometres northwest of Bremerhaven, German Exclusive Economic Zone (EEZ), North Sea
Sea depth	up to 40 metres
Number of turbines	80 turbines of 5-megawatt (type: AREVA M5000)
Installed capacity	400 megawatts
Expected wind energy production	1,4 billion kilowatt hours per year, equivalent of 445,000 households with an average consumption of 3,130 kilowatt hours annually
Wind turbines	Manufacturer: AREVA Wind GmbH
Tripod foundations	<p>Manufacturer:</p> <ul style="list-style-type: none"> - 40 tripods: ARGE Tripod Global Tech 1 (consortium of WeserWind GmbH and Erndtebrücker Eisenwerk GmbH & Co. KG) - 10 tripods: Nordseewerke GmbH - 20 tripods: WeserWind GmbH - 10 tripods: Iemants N.V. and Eiffage Construction Métallique S.A.S. <p>Tripod dimensions: 60 metres height, weighing 900 metric tonnes</p>
Erection of tripod foundations	HOCHTIEF Solutions AG with the heavy-lift jack-up vessel INNOVATION
Installation of towers and nacelles	<p>Fred. Olsen Windcarrier with the two crane vessels Brave Tern and Bold Tern. Near shore logistics is realised by BLG Logistics.</p> <p>Transshipment on installation vessels at the offshore terminal ABC Peninsular of BLG at Bremerhaven</p>
Rotor blade assembly and Installation, logistic services	<p>AREVA Wind</p> <p>Using: jack-up vessel Vidar of HOCHTIEF Solutions</p> <p>Transshipment on installation vessel at JadeWeserPort in Wihlemshaven</p>

Transformer station

Manufacturer: Consortium of Alstom Grid GmbH and Keppel Verolme B. V.

The transformer station will be permanently manned to run the wind farm efficiently. Up to 38 service and installation engineers will work in shift around the clock to assure smooth operations

Infield Cabling

Manufacturer: Consortium of Norddeutsche Seekabelwerke GmbH and Prysmian PowerLink Services Ltd.

Grid connection via BorWin beta

responsibility is with the grid operator TenneT

Weight of components (rounded)

Nacelle	235 tonnes
Tower section S3	180 tonnes
Tower section S2	90 tonnes
Tower section S1	90 tonnes
Hub	64 tonnes
Blade (3-blade rotor)	17 tonnes x 3

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