



# SIKA AT WORK

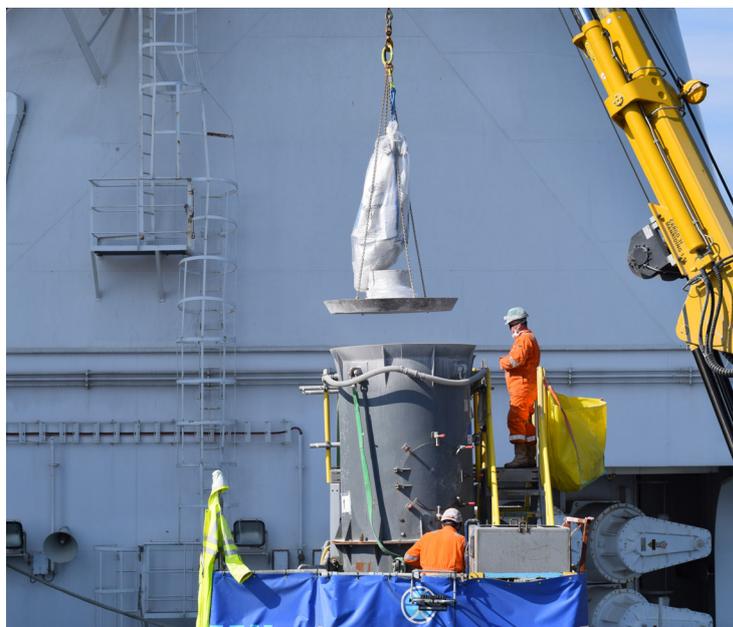
## GODE WIND I & II WIND FARM, NORTH SEA, GERMANY

OFFSHORE & MARINE CONSTRUCTION  
RENEWABLE ENERGY

BUILDING TRUST



# GODE WIND I & II WIND FARM NORTH SEA, GERMANY



## PROJECT DESCRIPTION

Gode Wind I and II offshore wind farms were constructed by DONG Energy in the German sector of the North Sea. Gode Wind I (330 MW) and Gode Wind II (252 MW) comprise a total of 97 Siemens turbines, each with a capacity of 6.0 MW, resulting in a combined output of 582 MW. This project represents DONG Energy's largest investment to date. The wind farms will generate CO<sub>2</sub>-free electricity sufficient to meet the annual energy needs of approximately 600,000 German households.

In early 2015, following a thorough evaluation and testing process in compliance with German single case approval (ZiE) requirements, SikaGrout®-9500 grout was selected for the grouting works.

Project name: Gode I & II Offshore Wind Farm  
Location: North Sea, Germany  
Year: 2015  
Application: Monopile foundations  
Product: SikaGrout®-9500

## PROJECT REQUIREMENTS

SikaGrout®-9500 was chosen for the grouting of XL monopile foundations due to its outstanding mechanical performance and installation efficiency. The foundation installation contract was carried out by Belgium-based contractor GeoSea. A total of 97 XL monopiles required specialized grouting with ultra-high-strength material to fill the annular gaps between the XL monopiles and the transition pieces.

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## SIKA SOLUTIONS

After installing the XL monopile foundations into the seabed, transition pieces were positioned over the monopiles and lined out for the vertical section of the turbines to be installed. Fixed grout lines, fabricated on the transition pieces, allowed for connection of flexible hoses to the access platform. These flexible hoses then extended to the turbine deck to allow the grouting contractor to connect grout hoses via a flexible boom arm from the vessel.

More than 61 tons of SikaGrout®-9500 were pumped into the XL monopile transition piece connections using the grouting contractor's specialized equipment, which has been proven to double grout output rates compared to other high-strength grout mixers on the market. As the first material

to receive type approval certification from DNV GL under DNV-OS-C502 for use at temperatures as low as 0°C, SikaGrout®-9500 enabled grouting operations to be completed within shorter but more frequent weather windows. The installation of all 97 foundations, including the grouting process, was successfully completed approximately 1.5 months ahead of schedule.

## PROJECT PARTICIPANTS

Main contractor:	GeoSea
Applicator/ Contractor:	FoundOcean Ltd.

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## HIGHLIGHTS

- The high-efficiency mixing and delivery system, which leveraged the grouting contractor's full-pack high-output mixing equipment, delivered a new record for the fastest foundation installation using SikaGrout®-9500 in big bags. Over 48 hours of actual grouting time were saved on the grouting works, saving many more hours of valuable vessel time.
- The rapid early strength development of SikaGrout®-9500 minimized weather window requirements for installation, enhancing overall project efficiency while delivering substantial cost savings and improved performance.

## QUICK FACTS

<b>Turbine manufacturer:</b>	DONG Energy A/S
<b>Amount of material used:</b>	5,918 tons
<b>Number of turbines:</b>	97 x Siemens SWT-6.0-154
<b>Windfarm total capacity:</b>	582 MW
<b>Homes equivalent:</b>	600,000
<b>CO<sub>2</sub> reduced per year:</b>	833,065 tons
<b>Blade diameter:</b>	Approximately 154 m
<b>Area of wind farm:</b>	70 km <sup>2</sup>
<b>Foundation type:</b>	Grounded monopile foundation
<b>Typical water depth:</b>	28 - 34 m

Any product name or reference reflects the Sika product name at the time of creation of this document and may differ from the product name or reference during past events.

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