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## World's first offshore wind turbine jacket foundation with suction buckets installed

*The SBJ turbin base (consisting of foundation caissons/buckets, jacket, transition part and tower) lifted on board the vessel Pacific Orca at the yard in Ålborg, Danmark, ready for transport and installation at the field.*

Date: 8/28/2014. International cooperation on new offshore wind Technology. DONG Energy successfully installed the world's first offshore wind turbine foundation based on the Suction Bucket Jacket (SBJ) technology.

The installation took place during 26th August at 25 meters water depth in

the Borkum Riffgrund 1 offshore wind farm, 37 km off the German island Borkum.

Until now, most offshore wind turbines are founded on monopiles. DONG Energy has installed the first jacket with suction buckets as a proof-of-concept full-scale prototype, to be tested and monitored over several years. The SBJ technology, previously used for offshore oil and gas platform foundations, has several economic as well as environmental advantages.

Ramboll has performed the design of both primary and secondary steel for the wind turbine foundation and buckets, working in close cooperation with the Norwegian Geotechnical Institute (NGI), who has delivered the geotechnical design. The cooperation between DONG Energy and the two experienced consultants has focused on establishing foundation loads and corresponding soil stiffnesses, which are mutually dependent. This is carried out to assess the short and longterm global interaction between jacket and soil, and to determine the local soil/bucket interaction to ensure that the strong suction pressure for installation can be safely applied.

NGI performed laboratory tests of the soils to provide necessary data for structural and geotechnical analyses for the design of the SBJ foundation. Furthermore, NGI has also designed and successfully installed instrumentation for overall monitoring of the prototype, which includes more than 100 instruments, more than 7 km of cables and a data collection system. The British based Carbon Trust Offshore Wind Accelerator program including DONG Energy and the five other developers Statoil, Statkraft, E.ON, Scottish Power and Mainstream supports the prototype with MNOK 60.

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The Norwegian Geotechnical Institute (NGI) is a leading international centre for research and consulting within the geosciences. NGI develops optimum solutions for society, and offers expertise on the behaviour of soil, rock and snow and their interaction with the natural and built environment.

NGI works within the markets Offshore energy; Building, construction and transportation; Natural hazards, and Environmental Engineering.

NGI is a private foundation with office and laboratory in Oslo, branch office in Trondheim, and daughter companies in Houston, Texas, USA, and Perth, Western Australia. NGI was established in 1953.

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