

DUDGEON

Offshore Wind Farm

Operated by Statoil

Summer 2016

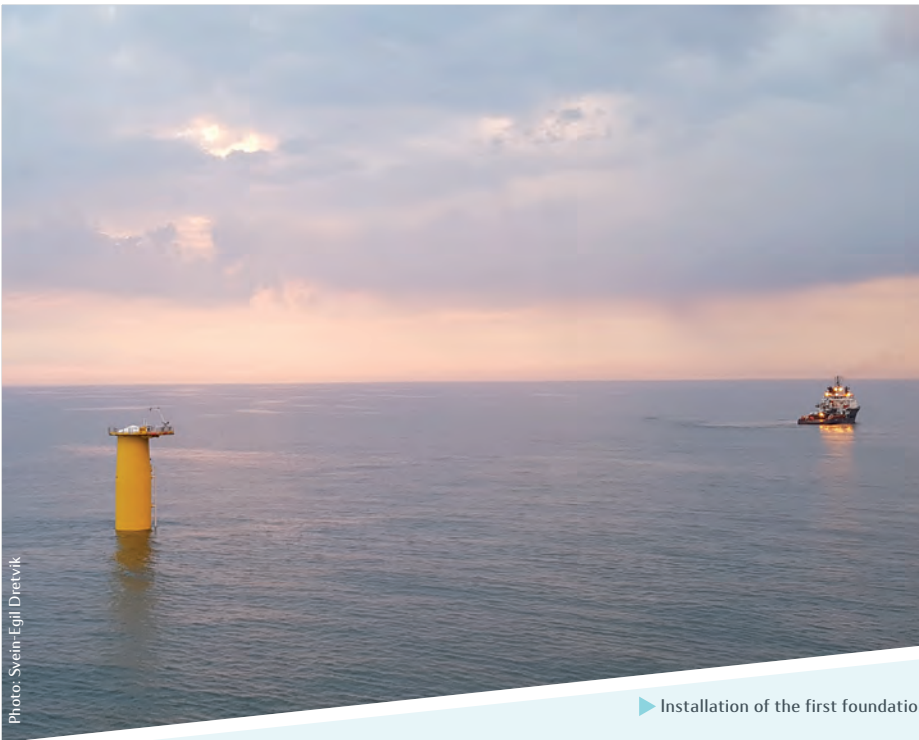


We aim to have all the infrastructure in place this year to be able to start installation of the towers, turbines and blades as planned early next year. ”

Olav Bernt-Haga

Project Director for the Dudgeon Offshore Wind Farm

Photo: Svein-Egil Dretvik



► Installation of the first foundation

Dudgeon construction proceeding according to plan

In March 2015 work commenced onshore building a new electricity substation and laying the longest underground cable for a UK offshore wind farm to date; in the same month this year offshore construction started, with the installation of the first monopile turbine foundation taking place on 22 March 2016.

The Dudgeon Offshore Wind Farm will consist of 67 wind turbine generators, the foundations for which are being brought to site from Vlissingen in The Netherlands

aboard the heavy lift vessel Oleg Strashnov. The installation of the foundations by this highly sophisticated vessel is heavily dependent upon offshore weather



Photo: Eva Sleire

► Foundations and TPs on the quayside in Vlissingen

conditions, but so far progress has been good with an average of three foundations being installed each week.

By the time the offshore construction work is fully complete in late 2017, there will have been over 4,000 vessel days worked out at sea ■

Project financing success

During May 2016, Dudgeon Offshore Wind Farm secured £1.3 billion of long term project finance to fund the capital requirements of the 402MW power plant currently under construction in the North Sea, 20 miles of the coast of Cromer in North Norfolk.

This is the first UK offshore wind project to obtain financing under the UK government's 'Contract for Difference'

(CfD) scheme. The project met its Milestone Requirement in May 2015.

"Closing such a significant phase of the project's development so swiftly illustrates the energy industry's confidence in the long term potential of offshore wind, and the increasing sophistication of finance models available to the sector," said Halfdan Brustad, Chairman of Dudgeon Offshore Wind Limited. *"It is also a testament to the project's commercial competitiveness, smooth execution and the growing investor appetite for utility scale renewable energy."*

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Building the Dudgeon Offshore Wind Farm...

Offshore, the Dudgeon Offshore Wind Farm will comprise 67 Siemens 6MW wind turbine generators and 1 offshore substation, and construction work on site 20 miles off the coast of Cromer in Norfolk has continued to gather momentum since the installation of the first monopile turbine foundation in March 2016.

During May 2016 the offshore substation jacket arrived on site from UK manufacturers Sembmarine SLP in Lowestoft. This large 4-legged structure has now been successfully attached to the seabed using suction buckets, the first time that this technology has been used at a UK offshore wind farm.

The wind turbines will be connected to the offshore substation by a network of inter-array cables, which are currently being laid on the seabed in readiness for the arrival and lift of the impressive 4 deck substation topside during August 2016.

The two 24 mile long submarine export cables which will carry the electricity from the wind farm to landfall at Weybourne on the North Norfolk coast were laid earlier this year, and these are now connected to the Dudgeon onshore electricity cable at a purpose designed transition joint bay constructed on land close to the coast.



► The offshore substation jacket secured in position



► Export cable ducting pull-out at Weybourne

Despite the very wet weather conditions that Norfolk has experienced during the first half of 2016, the Dudgeon **Onshore** electricity cable and substation construction works have made strong headway.

The installation of the 30 mile long underground cable from Weybourne in North Norfolk to Necton in the Breckland district of Norfolk, complete with the construction of its 56 associated cable joint bays, has continued to present many challenges, not least crossing the River Stiffkey, which was fuller and faster flowing than usual due to the unseasonably heavy rainfall. However a carefully planned 'dam and pump-over' programme proved entirely successful, and the river banks have now been successfully re-profiled.

By mid-July there were some sections along the cable corridor where sub soil reinstatement was ready to commence. Accordingly, a team of local North Norfolk specialist contractors was appointed to undertake this important process, and it is anticipated that further sectors will shortly become available for reinstatement following the successful completion of cable testing.

Work continues at Necton where Siemens Transmission and Distribution is building the Dudgeon onshore electricity substation adjacent to a new National Grid substation; together these two facilities will enable the electricity generated by the Dudgeon Offshore Wind Farm to be transmitted into the National Grid electricity distribution network.

The majority of the construction work here has been completed, and the main activities

now being undertaken are associated with cable connections and interfaces, and by the Autumn 2016 testing and commissioning will be underway.

The Autumn months will also see the commencement of site landscaping activities which, over the coming years, are expected to mature to provide local residents with effective site screening.



► Substation construction continuing at Necton

The huge amount of meticulously planned construction now taking place offshore and onshore is expected to ensure that the Dudgeon Offshore Wind Farm will be able to transmit electricity from its first fully commissioned wind turbine generator during the first quarter of 2017.



► A joint bay being constructed



► Installing the onshore cable under the River Stiffkey

...and in Great Yarmouth

Since July 2015 a former warehouse on the south bank of Great Yarmouth's river harbour has undergone significant change to become the Statoil UK Wind Energy Centre. It is from here that the Dudgeon Offshore Wind Farm O&M base is now operating, having moved from its adjacent temporary office accommodation in July 2016.

Operations Manager Rune Ronvik is very pleased with the new facility, saying: "The two storey facility, which has been integrated into the existing framework of the warehouse, provides office space for our workforce as well as a dedicated 24/7 control centre. The remainder of the warehouse is being used as a logistical store for spare parts which can be transported to the wind farm when needed."

He added: "Once the wind farm is fully operational in late 2017, the building will comfortably accommodate all of the permanent staff working onshore managing the wind farm."



► River harbour quayside at the Statoil UK Wind Energy Centre

Four successful recruitment campaigns have already been undertaken, and when the Dudgeon Offshore Wind Farm is fully operational next year there will be 25 Statoil UK wind operations personnel working onshore in Great Yarmouth, 23 working offshore from Great Yarmouth and 2 working in London and Oslo. In addition Siemens will have 21 of its own employees working offshore, and there will be 3 security and administration support contractors working at the Dudgeon O&M base onshore.

The Dudgeon O&M base has been operational since March 2016 when offshore construction commenced, and engineers and technicians now regularly travel to the wind farm site, located 20 miles off the coastal town of



► The Statoil UK Wind Energy Centre

Cromer in North Norfolk. In order to provide easy access to the crew transfer vessels (CTVs) which transport them to site, pontoons have been installed into the River Yare alongside the O&M base quay.

As the offshore construction process continues to gather momentum over the coming months, the CTV *MPI Napoleon* will be joined by the *MPI Snowball* and the *Rix Leopard* during the late summer months of 2016 ■

UK Wind Energy Centre opening and vessel Baptism Event

It is anticipated that around 100 guests will attend the Formal Opening of the new Statoil UK Wind Energy Centre on South Denes Road in Great Yarmouth on Friday 9th September 2016.

The opening ceremony will be performed by Councillor Graham Plant, Leader of Great Yarmouth Borough Council at 11:45 hours, and will be followed by the Baptism of the new ESVAGT Service Operation



► The new ESVAGT SOV

Vessel (SOV); this will be used to facilitate both the construction and the maintenance of The Dudgeon Offshore Wind Farm over the next five years.

Luncheon will then be served in a marquee erected on the quayside for the occasion, and all the guests will also have the opportunity to be shown around this new vessel ■

Statoil sponsors the 2016 Great Yarmouth Maritime Festival



The Maritime Festival is one of the annual highlights of the Great Yarmouth tourism calendar, attracting around 28,000 visitors during the two day event. This year it takes place on Saturday 10th and Sunday 11th September and Statoil is one of the Festival sponsors.

The Dudgeon Offshore Wind Farm, which is being constructed and will be operated by Statoil, will have a large display stand and information desk in the Sponsors 'Marquee', and the Dudgeon team is looking forward to welcoming visitors to the stand and answering their questions about offshore wind energy.

The new ESVAGT SOV vessel will also be moored up alongside the historic South Quay, and the crew will be conducting guided tours of the vessel on both days of the Maritime Festival ■

The Dudgeon Team:

An interview with Martin Goff Landowner Manager

As Landowner Manager Martin Goff is responsible for the relationships with all the Norfolk landowners, and their tenant farmers, across whose land the onshore electricity cable for the Dudgeon Offshore Wind Farm is being buried from landfall at Weybourne to the substation at Necton.



▶ Martin Goff

The work and day to day landowner liaison is being undertaken by Dudgeon's subcontractor Carillion plc. From the very beginning both Dudgeon and Carillion recognised that this 30 mile onshore cable installation was going to be a major civil engineering challenge.

"Apart from the engineering complexities associated with what is the longest onshore cable installation associated with a UK offshore wind farm, one of the biggest issues has been the poor weather," said Martin Goff.

"Low overnight temperatures in March and April last year delayed the start of the Great Crested Newt monitoring programme, and then the unprecedented levels of rainfall



▶ Land re-in statement underway near the North Norfolk coast

through summer, autumn and winter 2015 meant that all too often ground conditions were unsuitable for Carillion to work along long stretches of the cable corridor."

He continued: *"Considering the weather conditions and the duration of the works, the landowners have been very patient and understanding for which we are all very grateful. With the cable laying completed, Carillion now intends to use the drier summer months to continue re-instating sub soil and top soil, and where necessary install post-construction drainage, for as many landowners as possible. Specialist contractors in Norfolk have been appointed to undertake this work but, again, progress will be highly weather dependent."*

"However, completing all the reinstatement and drainage works this summer will be a tough challenge, and we intend to hold discussions on this with individual landowners, and their land agents, to aid their 2016/2017 cropping plans. I would like to reassure landowners that should there be delays in completing the reinstatement of their land, we are committed to mitigating the impacts of such delays." ■

Dudgeon in the Community

The Dudgeon Community Fund has now been established and is being administered by the Norfolk Community Foundation. During 2016 it aims to support a wide range of charitable, voluntary and community activities in communities that are being directly impacted by the onshore construction activities associated with the infrastructure and operations base of the Dudgeon Offshore Wind Farm. The fund also supports projects that improve community infrastructure in these communities. Applications can be accepted from parish councils, charities, voluntary and community groups and schools. Churches may apply but only for projects that focus on community activities.

Applications for a grant from the Dudgeon Community Fund can be made by visiting: www.norfolkfoundation.com ■



▶ Work on the cable corridor at Great Ryburgh

About the Owners

Dudgeon Offshore Wind Farm is owned by two Norwegian companies, Statoil and Statkraft, and Masdar of Abu Dhabi.

Statoil is an international energy company headquartered in Norway, with 21,000 employees and operations in 36 countries. Building on 40 years of experience from oil and gas production, the company is committed to accommodating the world's energy needs responsibly, applying technology and creating innovative business solutions.

Masdar is Abu Dhabi's renewable energy company advancing the development, commercialisation and deployment of clean energy technologies and solutions. The company serves as a link between today's fossil fuel economy and the energy economy of the future.

Statkraft is a leading company in hydropower internationally and Europe's largest generator of renewable energy. The Group produces hydropower, wind power, gas-fired power and district heating and is a global player in energy market operations. Statkraft has 3600 employees in more than 20 countries ■

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