Offshore Wind Energy

Building for the future

FLYING FOCUS AERIAL PHOTOGRAPHY

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– Building for the future –

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Colophon

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Building for the future

Almost ten years ago, the first Dutch offshore windfarms were installed nearby IJmuiden. Since that time, the industry has grown enormously. Windfarms have arisen along the entire North Sea coast, growing ever larger in terms of turbine numbers as well as power output. Shipyards have been operating at full capacity to supply the specialist vessels needed for the installation and maintenance of these wind farms. Above all in England and Germany, huge farms have been created, the Netherlands has now started to catch up, for example this year's finalisation of the Luchterduinen farm. Next year the Gemini wind farm will also go into production, and there are plans for further new locations.

The German Bight is gradually reaching saturation point, with an almost continuous row of windfarms from the area north of Borkum, via Helgoland towards Esbjerg. Every day, dozens of fast crewtenders carry maintenance personnel out to the turbines and helicopters fly people to the transformer platforms. Alongside several farms, former cruise ships that have been converted into luxury accommodation vessels with a landing installation for crewtenders are moored. Instead of making the long journey to shore, maintenance personnel can now rest and recuperate on board after their shift on a turbine. All in all, the wind energy sector is a remarkably innovative sector that regularly calls upon us to create a photographic record of its activities. Ranging from the installation of turbines to cable vessels or crew tenders sailing in formation; we have seen it all through the eye of our camera lens!

In part two of our photo book 'Offshore Wind Energy', we are delighted to reveal the wealth of recent activities that have taken place beyond the horizon.

Herman IJsseling, aerial photographer

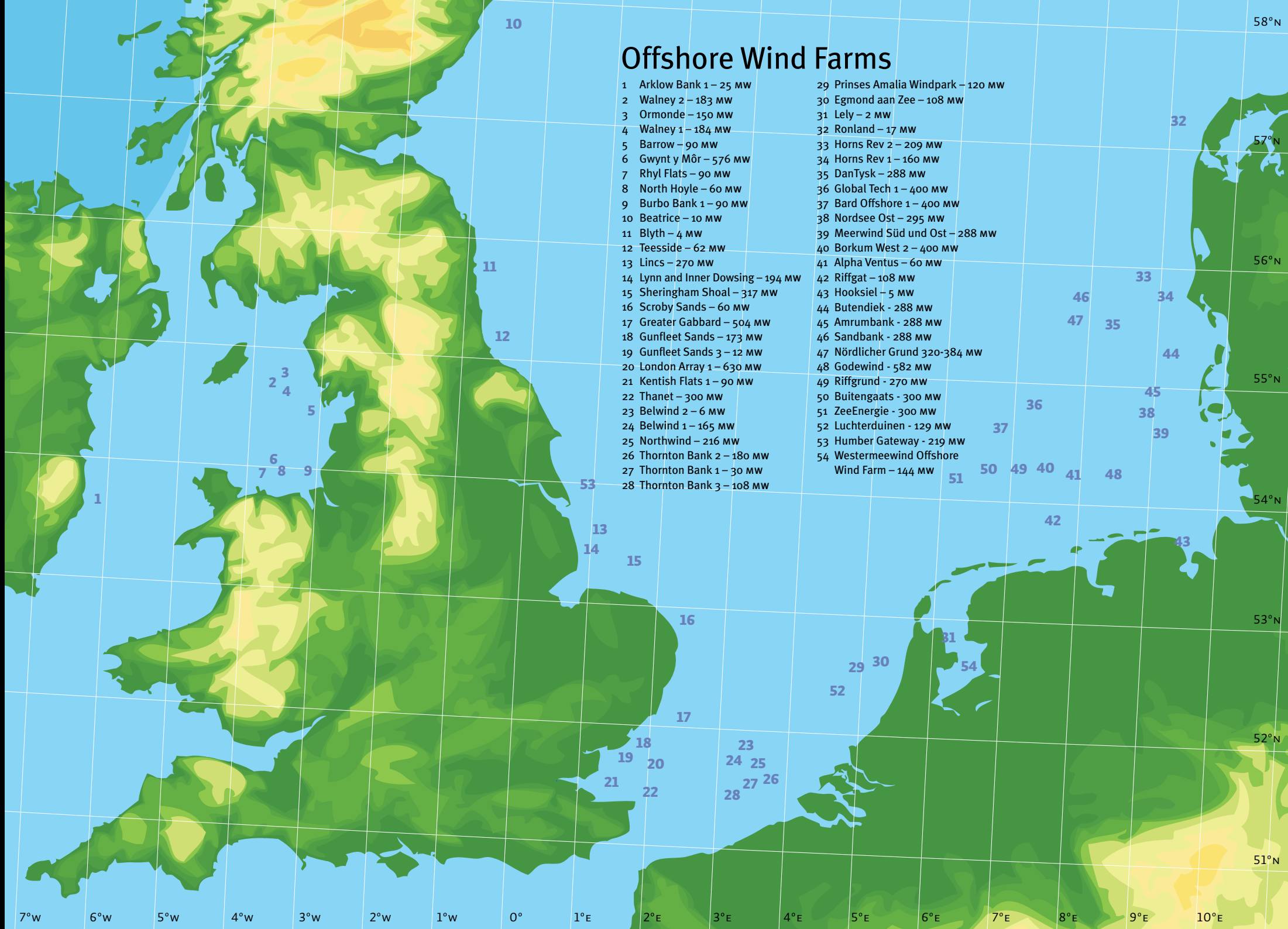
September 2015

More renewable energy from offshore wind

The construction of offshore wind farms in Western Europe is really booming. An impressive series of wind farms has been installed along the length of the German Bight and construction is set to continue in Dutch waters. In September 2015, for example the Luchterduinen Offshore Wind Park was completed, and work is well underway on Gemini.

Partly based on experience acquired in the oil and gas industry, Dutch contractors and shipping companies are playing a key role in the construction of offshore wind farms. Throughout the world, heavylift vessels, wind turbine installation vessels, cable layers, dredgers, fast crew suppliers, tugs and diving support and survey vessels operated by Dutch companies are hard at work. The commissioning of the wind turbine installation vessel Aeolus and the cable-laying vessel Nexus attracted particular attention. Both vessels were immediately deployed by contractor Van Oord, in the construction of wind farms off the Dutch coast.
Following on from the Egmond aan Zee Offshore Wind Farm (108 MW) in 2007 and the Princess Amalia Offshore Wind Farm (102 MW) in 2008, Luchterduinen (129 MW), the Netherlands' third offshore wind farm was officially opened on 21 September 2015. About 80 km north of the coast of the Province of Groningen, Van Oord is now hard at work completing the Gemini project that will produce 600 MW of energy, making it among the largest offshore wind farms in the world.
The first near-shore wind farm in the Netherlands, the 144 MW Westermeerwind Offshore Wind Farm, will be built in the IJsselmeer, along the dyke of the Noordoostpolder.
If it is left to the government, this will not be the last project to be undertaken. In a recently published information pack, contractors are informed about how they can respond to the tenders for the Borsele I and Borsele II projects. These wind farms, each with a capacity of 350 MW, will be built off the coast of the Province of Zeeland. Plans are also in preparation for Borsele III and Borsele IV. Through to 2019, the government intends to issue ever larger tender invitations so that by 2023, there will be offshore capacity for the generation of around 4,500 MW of renewable energy. This ties in with the government target, in the framework of the energy transition, to generate 16 percent of all renewable energy from offshore wind.
It looks then as if the Netherlands has started a catch-up race for the generation of renewable energy from offshore wind. The shallow North Sea with its regular supply of windy weather is the ideal location, a realisation that is also growing in English waters. Forewind Consortium for example, intends to build four and perhaps even six enormous wind farms, each with a capacity of 1.2 GW, on the Doggerbank. The service sector is poised to reap the profits from these latest developments !

Paul Schaap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2 Walney 2 – 183 MW
3 Ormonde – 150 MW
4 Walney 1 – 184 MW
5 Barrow – 90 MW
6 Gwynt y Môr – 576 MW
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8 North Hoyle – 60 MW
9 Burbo Bank 1 – 90 MW
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February 6, 2015 – The wind turbine installation vessel *MPI Discovery* owned by MPI offshore working in the Amrumbank West Offshore Wind Farm situated in the German Exclusive Economic Zone on the Northsea 20 nautical miles north of Helgoland.

February 6, 2015 – Sistervessel *MPI Adventure* started working in the same area beginning 2015. They have been ordered to install 80 Siemens turbines of 150 meter high and 3,6 MW each.

March 13, 2013 – Windturbines in the Princess Amalia Offshore Wind Farm withstanding gusts of wind and a lot of rain when a thunderstorm is passing the area.

July 7, 2013 – MPI Adventure loading nacelles and gigantic rotors in Eemshaven to transport them for installation offshore.

May 5, 2014 – The crane vessel *Rambiz* owned by Scaldis Salvage & Marine Contractors seen here installing the 1.250 ton jacket of the substation for the Butendiek Offshore Wind Farm, situated west of the German isle of Sylt.

May 18, 2014 – The installation of the jacket was followed by the lifting and installation of the 2.260 ton topside for the Butendiek substation. Both jacket and topside were built by the Belgian steel construction company Iemants.

October 22, 2013 – The self-elevating platform JB-117 owned by Jack-Up Barge from Sliedrecht working next to the DolWin alpha HVDC platform, that was built by the Heerema Fabrication Group.

April 29, 2014 – Beginning 2014 the self-propelled jack-up vessel Seajacks Zaratan owned by Seajacks UK was executing installation work next to the DolWin alpha HVDC platform.

August 5, 2015 – The ocean going tugboats *Fairmount Expedition*, *Fairmount Sherpa* and *Fairmount Alpine* owned by Boskalis-daughter company Fairmount Marine towing the submersible DolWin Beta HVDC platform to the installation area north of Norderney, together with the *Union Sovereign* from Boskalis Offshore.

August 20, 2015 – The fallpipe rockdumping vessels *Rockpiper* and *Seahorse* of Boskalis offshore during rockdumping all around the recently installed DolWin beta HVDC platform. Diving support vessel EDT Protea is assisting the process.

April 22, 2014 – The self-propelled self-elevating accommodation vessel GMS Endeavour 6102 owned by Gulf Marine Services from Abu Dhabi standing next to the substation, built by the Strukton/ Hollandia joint venture for the DanTysk Offshore Wind Farm in the German Bight.

July 12, 2014 – The Heavy Lift Vessel *Jumbo Javelin*, owned by Jumbo from Schiedam busy installing a 31 metre high Transition Piece with a weight of 330 ton in the Butendiek Offshore Wind Farm, using an extra fly jib.

December 16, 2014 –
The *Tideway Rollingstone* owned by Tideway from Breda during scour protection work around the turbines in the Gwynt y Mor Offshore Wind Farm in Liverpool Bay.

January 24, 2015 – Also the fallpipe vessel *Seahorse* has been deployed for scour protection work in the Gwynt y Mor area.

June 24, 2015 – The offshore wind turbine maintenance vessels *MPI Sampson* and *MPI Dorethea* owned by MPI Workboats from Stokesley operating in the Thornton Bank Offshore Wind Farm near Ostend, Belgium. These high-speed multihull tenders have a capacity of 12 passengers and 3 crewmembers.

June 30, 2015 – The offshore wind turbine maintenance vessels *MPI Altisidora*, *MPI Snowball*, *MPI Napoleon* and *MPI Lucinda* owned by MPI Workboats sailing in formation near the Sheringham Shoal Offshore Wind Farm.

June 24, 2015 – The offshore wind turbine maintenance vessel *MPI Sancho Panza* working in the Thornton Bank Offshore Wind Farm. This was the first vessel of this type for Vroon's daughtercompany MPI Workboats.

September 30, 2014 – The Van Oord owned multipurpose offshore support vessel *Jan Steen* is equipped with a ROV for digging in the electrical cable from the Luchterduinen Offshore Wind Park to shore.

October 15, 2014 – To bring the cable from Luchterduinen Offshore Wind Farm onshore Van Oord chartered the cable-laying vessel *Ndurance*, owned by Boskalis.

November 11, 2014 - The multipurpose support vessel *Zwerver III* is also chartered by Van Oord for all kind of work in the Luchterduinen Offshore Wind Farm. The 35 metre long vessel is owned by HVS Dredging Support from Harlingen.

October 15, 2014 – The brandnew wind turbine transport and installation vessel *Aeolus* owned by Van Oord was responsible for the entire installation of all the monopiles in the Luchterduinen Offshore Wind Farm.

October 15, 2014 – For secure positioning of the monopiles in the Luchterduinen project the *Aeolus* is equipped with a pile gripper. In the crane the pile driving hammer is visible.

April 18, 2015 – The wind turbine support and installation vessel *Aeolus* on its way from Esbjerg to the Luchterduinen Offshore Wind Farm loaded with 8 towers, 8 nacelles and 24 blades for installing and assembling 8 wind turbines.

April 9, 2015 – The 139 metre long *Aeolus* is equipped with a large crane with a lifting capacity of 900 ton to lift towers, nacelles and blades. The vessel can work in water down to 55 metre of depth.

July 11, 2015 – Left from the platform the 6.000 dwt heavy-cargo vessel *Abis Duisburg* owned by Abis Shipping from Harlingen dumping stones with a mobile crane. On the right the multipurpose support vessel Zwerver III during subsea operations.

August 24, 2014 – The multipurpose subsea service vessel *Normand Pioneer*, managed by Solstad Offshore, working close to the transformerplatform in de Westermost Rough Offshore Wind Farm situated approximately 15 nautical miles north of Spurn Head at the river Humber estuary.

August 24, 2014 – Installation work carried out by MPI Offshore's wind turbine transport and installation vessel *MPI Adventure* in the Westermost Rough Offshore Wind Farm.

February 11, 2014 – The self-elevating wind turbine installation vessel *Vidar* operated by Hochtief Solutions from Hamburg installing the nacelle and rotor on one of the wind turbines in the Global Tech 1 Offshore Wind Farm.

February 11, 2014 – In the beginning of 2014 the self-elevating wind turbine installation vessel *Brave Tern* owned by Fred. Olsen Windcarrier was operating in the Global Tech 1 Offshore Wind Park for the installation of wind turbines.

July 12, 2014 – Seaway Heavy Lifting's monohull crane vessel *Stanislav Yudin* surrounded by an airbubble curtain to reduce underwater noise levels to protect submarine life during installation work in the Global Tech 1 Offshore Wind Farm.

October 22, 2013 – The self-elevating wind turbine installation vessel *Innovation* operated by HGO Infra Sea Solutions just before starting to use her 1.500-tons Liebherr crane to install the first out of three turbine foundations in the Global Tech 1 Offshore Wind Farm.

May 15, 2015 – The subsea construction vessel *Havila Phoenix* owned by Havila Shipping from Fosnaavaag in Norway was chartered by DeepOcean UK for subsea works in the Global Tech 1 Offshore Wind Farm.

May 15, 2015 – The Global Tech 1 substation was designed by Overdick and built by Keppel Verolme and is standing on 4 suction piles from SPT Offshore in water of 40 metre depth in the German Bight, 55 nautical miles north of Borkum.

May 15, 2015 – Installation work in the Global Tech 1 Offshore Wind Farm. In front of the turbine the Norwegian multipurpose offshore vessel *Reef Despina* owned by Reef Subsea and behind the turbine the self-elevating wind turbine installation vessel *Seajacks Hydra* owned by Seajacks UK.

November 5, 2014 – The diving support vessel *VOS Sympathy* owned by Vroon Offshore Services from Den Helder was also deployed during installation work in 2014 in the Global Tech 1 area.

February 11, 2014 – The multipurpose field and ROV support vessel *Siem Stork*, owned by Siem Offshore from Kristiansand and chartered by diving contractor N-Sea, executing subsea work near a wind turbine foundation in the Global Tech 1 Offshore Wind Farm.

April 29, 2014 – The BW-0 substation is situated 25 Nautical miles north of the German island Borkum in the Borkum West Offshore Wind Farm. The farm includes 80 turbines.

August 27, 2013 – The topside of the substation of the Borkum West Offshore Wind Farm hanging in the crane just before the installation on the jacket by the crane vessel *Rambiz* owned by Scaldis Salvage & Marine Contractors.

February 11, 2014 – The Borkum West substation 30 nautical miles north of Borkum early morning, two hours after sunrise.

August 25, 2014 – The *Pacific Orca* owned by Swire Pacific Offshore installing a three-legged jacket with suction piles from SPT Offshore northwest of Borkum. Pacific Orca is one of the world's biggest wind turbine installation vessels.

October 22, 2013 – The *MPI Adventure* owned by MPI Offhore during installation of nacelles and rotors in the Borkum West Offshore Wind Farm.

Datum – A busy day in the Borkum West Offshore Wind Farm. Upfront the purpose-built ROV support vessel *Fugro Symphony* owned by Fugro Subsea Services. In the background the wind turbine installation vessel *Sea Installer* from A2SEA.

November 5, 2014 – The wind turbine installation vessel *Sea Installer* owned by A2SEA from Fredericia in Danmark standing on her four 83 metre long legs next to one of the turbines in the Borkum West area.

May 15, 2015 – Equipped with two heave compensated cranes and an Ampelmann W2W system the 157 metre long multipurpose construction vessel *Aker Wayfarer* owned by Aker Solutions from Lysaker in Norway on its way to the Borkum West Offshore Wind Farm.

August 5, 2015 – The wind farm support and crew transfer vessel *Church Bay* of Holyhead Towing's subsidiary Turbine Transfers Limited just transferred personnel on one of the Borkum West wind turbines.

August 20, 2015 – The wind turbine installation vessel *Sea Challenger* was delivered in 2014 to A2SEA from Fredericia in Danmark. Here the jack-up vessel is using her 900 ton crane to install a nacelle on a tower in the Godewind Offshore Wind Farm.

August 20, 2015 – The 24 metre long crewtender *Ocean Wind 8* of Hartlepool owned by Windcrew Workboats uit Blyth (UK) next to one of the two Godewind substations from Dong Energy, transferring people and supplies.

September 27, 2013 – SeaZip Offshore Service from Harlingen started in 2013 with a charter service with the Damen Fast Crew Suppliers 2610 Twin Axe catamarans *Seazip 1* and *Seazip 2* for the offshore wind sector. Both vessels were photographed sailing next to the Bard Offshore Wind Farm.

September 27, 2013 – In 2013 the former cruise ferry *Regina Baltica* from Riga served as a floating hotel during the installation phase of the Bard Offshore Wind Farm. The fast crew tender *Seazip 1* was chartered to shuttle between the *Regina Baltica* and the windturbines.

October 6, 2013 – The High-speed craft *Liz-V* owned by Stemat Marine Services from Rotterdam sailing next to the German Meerwind Offshore Wind Farm. The vessel from 2013 is able to sail at 30 knots with a maximum of 24 passengers.

April 10, 2014 – The German engineering company Overdick from Hamburg designed the jack-up barge *Thor* for Hochtief Solutions. On the photo *Thor* is standing next to the transformerplatform Meerwind sud/Ost in the German Bight close to Helgoland.

December 1, 2013 – A lot of activity during the process of installing the HelWin alpha HVDC platform. Left the self-elevating accommodation platform GMS Endeavour 6102 owned by Gulf Marine Services and on the right the self-elevating jack-up platform Seafox 7 from Workfox.

February 6, 2015 – The self-elevating accommodation vessel *GMS Endeavour* 6102 standing next to the HVDC converter platforms HelWin bèta and HelWin alpha 20 nautical miles north of Helgoland.

April 22, 2014 – With a lot of diving equipment on deck the diving support vessel *VOS Shine* owned by Vroon Offshore Services from Den Helder is working subsea in the Nordsee Ost Offshore Wind Farm.

April 10, 2014 – The *Stemat Spirit* owned by Stemat Marine Services from Rotterdam photographed during cable laying in the Nordsee Ost Offshore Wind Farm. The vessel is equipped with a 4.400 tons cable carrousel with a diameter of 24 metre.

June 3, 2014 – The Damen Fast Crew Supplier 2610 *Seazip 1* of Seazip Offshore Service from Harlingen moored next to a wind turbine jacket in the Nordsee Ost Offshore Wind Farm.

April 22, 2014 – The crane vessel *Oleg Strashnov* owned by Seaway Heavy Lifting lifting the 6.500 ton jacket of the SylWin alpha platform from the submerged transportbarge to install it on the seabed. The platform is designed by Overdick.

July 12, 2014 – Using the float-over method the 14.000 ton topside of the SylWin alpha converter platform owned by Siemens is going to be installed on the jacket. Seaway Heavy Lifting hired Dockwise for this job.

July 19, 2014 – Mammoet is using strandjacks for lifting the 14.000 topside of the SylWin alpha converter platform to the right height. In the foreground the *Oleg Strashnov* owned by Seaway Heavy Lifting.

July 15, 2014 – On board of the crane vessel *Oleg Strashnov* owned by Seaway Heavy Lifting preparations are made for installing a module on the SylWin alpha converter platform.

July 31, 2014 – The SylWin alpha HVDC platform, built for Siemens, nearly finished. Engineering company Overdick had conducted the overall design, structural design as well as the transport and installation engineering.

July 12, 2014 – A lot of activity near the just installed BorWin beta converter platform. The self-elevating platform JB-117 owned by Jack-Up Barge is standing next to the transformerplatform. On the foreground the cable-laying vessel *Giulio Verne* van Prysmian P.

September 27, 2013 – The fast crew tender *Seazip 1* from 2013 owned by SeaZip Offshore Services transferring people and supplies to a wind turbine in the Bard Offshore Wind Farm in the German Bight.

May 7, 2015 – Several vessels and jack-up barges are chartered for installing the cables from the Dutch coast near Eemshaven to the Gemini Offshore Wind Farm. On the foreground the trailing suction hopperdredger *Volvox Olympia* owned by Van Oord and in the background the innovative jack-up barge *Wavewalker 1*.

May 7, 2015 – The route for the two electrical cables to the Gemini Project is clearly visible in the shallow waters of the Waddenzee. On the foreground the crane barge Stemat 88, on the right the trencher Nessie 2 chartered for digging in the cables. In the background the innovative jack-up barge Wavewalker 1.

June 23, 2015 – With lowtide the route for the cables from Eemshaven to Gemini is clearly visible. On the foreground the cranebarge Stemat 88.

May 15, 2015 – The first project for the brandnew *Nexus* handed over by Damen shipyards to owner Van Oord in 2015 was laying the cables for the Gemini Project. On deck is the 5.000 ton carrousel situated with a capacity of 40 km cable.

August 2, 2015 – The 161 metre long windfarm installation vessel *Pacific Osprey* van Swire Pacific Offshore installing one of the monopiles for the Gemini Offshore Wind Farm. The crane is lifting the monopile in the gripper for precise positioning.

August 2, 2015 - The Damen Fast Crew Supplier 2008 *Offshore Waddenzee* owned by Acta Marine from Den Helder is chartered by Van Oord for crew transfers in the Gemini Offshore Wind Park.

August 2, 2015 – The heavy-lift vessel *Rambiz* owned by Scaldis Salvage & Marine Contractors lifting the first of two 1.400 ton jackets for the two offshore high-voltage stations of the Gemini project to install it on the seabed.

August 20, 2015 – 18 days later the crane vessel *Rambiz* was photographed just before the installation of the two offshore high-voltage stations of each 1.000 ton. The lifting capacity of *Rambiz* is 3.300 ton.

August 15, 2015 – The ultra shallow draft support vessel *Coastal Chariot* owned by Acta Marine from Den Helder operating in the Gemini area with diving equipment from Bluestream Offshore on deck.

August 15, 2015 – The *HAM-602* owned by Van Oord was modified for the infield cable-laying in the Gemini Offshore Wind Park.

August 2, 2015 – The heavy-cargo vessel *Abis Dublin* owned by Abis Shipping from Harlingen is modified to save as a floating hotel with extra accomodation on deck. One of the crewtenders in the Gemini area is the Malltreath Bay owned by Turbine Transfers from Holyhead.

August 5, 2015 – Equipped with diving gear from Bluestream Offshore the brandnew survey vessel *Geo Focus* owned by Geo Plus was deployed to search for ammunition from the second world war in the Gemini Project area.

June 2, 2015 – The self-propelled jack-up vessel *Seajacks Zaratan* owned by Seajacks UK is struggling with the waves of westerly galeforce winds in the shippinglane north of Terschelling. Her groundspeed is only between 1 and 2 knots.

May 1, 2015 – The fast crew suppliers *Offshore Wielingen* and *Offshore Waddenzee* photographed in their new colours of their new owner Acta Marine from Den Helder near the Princess Amalia Offshore Wind Farm near IJmuiden.

February 11, 2014 – Tideway's fallpipe vessel *Flintstone* dumping rocks in the Borkum West Offshore Wind Park. On the background *Pacific Orca* preparing the installation of a turbine foundation.

April 22, 2014 – The impressive ROV support and construction vessel *Deep Cygnus* owned by Helix Canyon Offshore from Houston working in the Borkum West Offshore Wind Farm, installing infield cables.

July 12, 2014 – The fast crew tender *Seacat Defender* is transferring people working in the SylWin Wind Park to the accomodation vessel *Wind Ambition* owned by C-bed Floating Hotels from The Netherlands.

June 24, 2015 – The multihull crew tender *Windcat 8* sailing at high speed through the waves near the Thornton Bank Offshore Wind Farm.The vessel is one of the almost 40 fast crew transfer vessels operated by Windcat Workboats from IJmuiden.

May 7, 2015 – Close to the shore of the Noordoostpolder in the Dutch IJsselmeer the Westermeerwind Offshore Wind Park is developed. A cranebarge owned by Mammoet is installing parts of one of the 48 turbines to be built.

July 12, 2014 – Besides wind turbine and installation vessels A2SEA from Danmark also operates Small Waterplane Area Twin Hull (SWATH) type crew transfer vessels, like the *Sea Hurricane* photographed in the SylWin area.

June 8, 2015 – The hull of the 108 metre long wind farm support vessel *Acta Orion* underway from Stettin in Poland to Harlingen behind the Danish tugboat Westsund. Owner Acta Marine from Den Helder will operate the vessel in the Gemini Project, after completion and delivery by CIG Shipbuilding.

July 31, 2015 – Vessels from the D-class from Abis Shipping from Harlingen are very much suitable for the transportation of wind turbine parts, like on this photo the 6.000 ton dwt *Abis Dundee* with a deckload of rotorblades.

June 23, 2015 – The diving support vessel *Noordhoek Pathfinder* owned by N-Sea from Zierikzee was deployed for cable installation work in the summer of 2015. The route of the cable from one of the Wind Farms in the German Bight was close to the German isle of Borkum.

January 27, 2015 – In the beginning of 2015 the multipurpose survey vessel *Octans* operated by SeaZip Offshore Service from Harlingen was deployed for research of the seabed on the future location of the Borsele Offshore Wind Park.

September 3, 2013 – Four monopiles and four transition pieces underway from Vlissingen to the DanTysk Offshore Wind Farm in the German Bight behind the tugboat *Ginger* owned by Iskes Towage & Salvage from IJmuiden.

August 20, 2015 – Early morning fogpatches floating low and slow in the Borkum West Offshore Wind Farm, before dissolving when the sun is warming up the atmosphere.

January 27, 2015 – The low wintersun shining through the clouds over parts of the Northwind Offshore Wind Farm near the Belgian coast.

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Flying Focus

Flying Focus' maritime aerial photographer Herman IJsseling regularly flies into the fascinating world of the offshore wind industry and witnesses the building of several offshore windfarms on the Northsea and Irish Sea. This most recent selection of photos is a visualisation of this world, still unknown to a lot of people onshore. With this second photobook in this series Herman IJsseling covers most recent aspects of this immense industry, from the transport up to the installation offshore.

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