

THIS WEEK**Developers unwrap 335MW Christmas parcel in Scotland**

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Footprint on the move at 750MW Moray West off UK

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The next issue of reNEWS will be published on 10 January 2019. We wish all our readers a happy Christmas and a prosperous New Year.

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Hybrid training camp for turbine suppliers in Germany

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Siemens Gamesa emperor at 1GW Nero

Siemens Gamesa is to provide 4.5MW turbines to the 1GW Nero mega-farm in Romania.

The manufacturer beat a field of heavy-hitting competition to supply what will be a landmark onshore wind complex in the south-east of the country.

Project development vehicle Nero Renewables told reNEWS Siemens Gamesa's offer was "the most attractive and cost effective" following a tender originally launched in late 2017. The value of the deal was not disclosed.

The 4.5-145 hardware will feature hub heights of 127.5 metres and rotors of 145 metres. Nero said it will update project permits and optimise micro-siting to reflect the selection.

Turbines will be spread

across two 250MW clusters near Constanta and one 500MW site near Buzau.

Nero, short for Netherlands-Romania, is backed by a consortium of five European energy and consulting companies.

The group is hoping to export the wind farm's output from Romania via European integrated electricity market mechanisms.

Negotiations with possible equity partners and banks to secure finance are underway, as are talks with potential off-takers such as utilities and large corporations.

"We believe we will need approximately 18 months to financial close given the magnitude of the project," said chief executive Gauthier Van Weddingen.

UK offshore sector deal delay

A planned sector deal between the UK government and the offshore wind industry has been pushed into 2019.

Energy Minister Claire Perry said last month she expected the 30GW-by-2030 package to be concluded before the

festive period but Offshore Wind Industry Council co-chair Benj Skyes said discussions with Whitehall are still ongoing.

"We cannot comment on timings at this stage but we anticipate that the deal will be finalised soon," he added.

Fred Olsen to test the water for Harland and Wolff sale

Fred Olsen Energy will go to market early in the new year seeking expressions of interest for its Harland and Wolff fabrication yard in Northern Ireland.

The Norwegian big-hitter wants to assess market appetite for the Belfast asset as part of ongoing restructuring efforts designed to address financial difficulties with the Oslo parent, according to sources.

A full sale process could get underway later next year should serious suitors emerge.

Harland and Wolff could offer a bridgehead into the

UK offshore wind market and will be of interest to both international investors and established fabricators, said market experts.

Until a new owner is found it will be "business as usual" in Belfast, added a source familiar with the sales process.

The fabricator is in the last stages of assembling 18 jacket foundations for ScottishPower Renewables' 714MW East Anglia 1 wind farm off east England. Final load-out is scheduled for the spring.

Fred Olsen Energy booked a US\$94m operating loss in its most recent quarterly results.



LUCKY NUMBER: Innogy has completed construction of all 13 Senvion MM92 turbines at the Bad a Cheo wind farm in the far north of Scotland. Mechanical and electrical fit-out is ongoing with eight machines already commissioned.

The project in Caithness, pictured in the foreground alongside the operational Innogy-developed

Causeymire wind farm, is supported by a Contract for Difference.

In Wales, meanwhile, civil contractor Jones Bros has completed all 27 turbine foundations for Innogy's CfD-backed 96MW Clocaenog Forest project.

Vestas V105-3.45 machines are due to start arriving at the Denbighshire site from next month. Photo: Innogy

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PARALLEL PARKING: Deltawind has completed construction of its 102MW Krammer wind farm, featuring 34 Enercon E-115 3MW turbines with 180-metre tips, in the Dutch province of Zeeland

Photo: Jarek Matenczuk

Developers unwrap 335MW Christmas parcel in Scotland

International developers have filed festive-season applications for 335MW of new onshore wind farms with the Scottish government's planning division.

Canada's Boralex and UK partner Infinergy lodged proposals to build the 78.6MW Shepherd's Rig project in the south-west of the country.

The proposed site near Carsphairn in Dumfries and Galloway will feature 19 turbines with two at 125 metres and the remainder at 149.9 metres.

Candidate hardware features 117-metre rotors and capacity of 4.2MW for the taller machines and 105-metre rotors and 3.6MW power for the smaller duo. Shepherd's Rig will also feature a 6MW on-site battery storage facility.

The location on plantation forestry has elevations

ranging from 200 to 400 metres. The development started life with a 45-turbine layout.

In the north of Scotland, French utility EDF and local development partner Force 9 have filed to build the 48-machine Clash Gour mega-farm in Moray.

Three distinct turbine clusters are planned to the north, east and west of Statkraft's operational 67MW Berry Burn wind farm in Moray.

Hardware will feature varying tip heights between 130 and 176 metres and rotors between 120 and 152 metres.

A second scenario has been sketched out in which turbines are limited to 149.5 metres and rotors to 136 metres.

Capacity at the project could be 256MW based on a mix of "emerging onshore

wind technology" at 4.2MW, 5MW and 6MW. Currently available turbines would more likely result in top power of 225MW.

A 50MW energy storage facility is included in project infrastructure along with 36km of new access roads, three on-site substations and 11 borrow pits.

Statkraft recently took the wraps off a 42MW Berry Burn 2 extension while Vattenfall is planning the up to 150MW Ourack for a site to the immediate south.

Statkraft stretch

Statkraft of Norway is seeking to tweak consent for its 12-turbine Windy Rig wind farm in Dumfries and Galloway, Scotland.

Planners have been asked to sign off on 115-metre rotors, up from the original 100 metres, within the existing 125-metre tips at the site near Carsphairn.

"An increased generation capacity is now required to ensure the development is viable," said Statkraft agent Arcus in planning documents.

Windy Rig holds a grid connection offer for 42.8MW dated spring 2020. Specific capacities were not defined in the revised planning materials.

Statkraft acquired the wind farm as part of its assets deal with developer Element Power earlier this year.

IN BRIEF

■ Dutch developers Greenchoice and Windunie along with compatriot bank ABN Amro have acquired six turbines at the under-construction 23.5MW De Veerwijken wind farm in Overijssel. Ten Enercon E-103 2.35MW units are due online by end-2019. Terms of the deal with developer De Wieken were undisclosed. Raedthuys owns the remaining machines.

■ Etriplus has paused construction of its nine-turbine Greenport Venlo wind farm in the Netherlands following a legal challenge by local residents to consent granted by Limburg province. The Council of State is expected to rule in spring on the 40.5MW proposal.

■ Manufacturer Nordex is close to completing its 12MW Saint-Ambroix wind farm in the department of Loire-Atlantique, western France. The project's four N131/3000 turbines feature the country's longest blades at 65.5 metres within tips of 165 metres.

■ Irish investor NTR has entered the French wind market with the acquisition of the 8.8MW Bricqueville project from RES and the 10.2MW Saint-Pierre-de-Juillers from BayWa, paying a combined €35m.

■ Energiekontor has been given the green light by East Riding of Yorkshire Council to upgrade its nine-turbine Witherwick wind farm near Hull using its in-house Rotor Blade Extensions technology.

■ Juwi has shut down the 38.4MW Gau-Bickelheim project in Rhineland, Germany, after a blade fell from one of 16 Kenersys K110 turbines. No one was injured and investigations are ongoing.

■ Suzlon Group is to supply and install 50.4MW of 2.1MW turbines at an Atria Power wind farm in India.

■ Siemens Gamesa will supply four turbines to Falck's 10MW Carreastro wind project in Castilla y Leon, Spain.

■ Enel Green Power has exited the Uruguay market following the sale of its 50MW Melowind wind farm to investor Atlantica Yield for \$120m.

■ Spanish company Windar Renovables and local partner WRS Towers have opened a turbine tower manufacturing plant in Rostov, Russia.

■ Vestas has secured turbine orders totalling 373MW in Germany, India, Jordan and Italy. Projects range in size from 33MMW to 252MW with V117, V120 and V136 machines scheduled for delivery between 2019 and 2020.

■ Nordex is to supply AW132/3465 turbines for AES's 83MW Vientos Neuquinos wind farm in Argentina.

■ GE is to supply 1.7-103 turbines to the Actis-led 102MW Kipeto wind farm in Kenya.

■ Former GE Alstom executive Yves Rannou is joining Senvion as chief executive on 1 January, three months earlier than planned.

■ Falck is planning to up renewables capacity from 970MW to 1113MW next year and to 1430MW by 2021.

■ The Canadian province of Alberta has selected five wind farms totalling 763MW in a clean power tender.

■ French developer Quadran has started installation of eight Enercon 900kW turbines at its Montagne repowering project in Guadeloupe.

■ Blue Bear Energy is preparing to kick off public consultations on the around 16MW Goyerbrug wind farm in the Dutch province of Utrecht.

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Rough weather starts holidays early at 269MW German build

Monopile and transition piece installation work at Northland Power's 269MW Deutsche Bucht wind farm in the German North Sea is set to slip into next year.

Rough seas have hampered efforts at the site with 20 of the project's 31 traditional foundations completed at last count. Completion was originally scheduled for end-2018.

Seajacks jack-up Scylla installed the initial unit in early September for lead contractor Van Oord. Progress has been "a bit slower" than planned due to "bad-weather downtime", said a source.

Deutsche Bucht will also feature two novel Universal Foundation mono-bucket bases. Van Oord is due to

install those components separately in the second quarter of 2019.

All 33 foundations will all be in situ "within the planned construction schedule", said Northland.

MHI Vestas V164-8.4MW turbines remain on course for installation next summer.

EnBW is meanwhile hunting for three crew transfer vessels to service a pair of wind farms in the German Baltic Sea.

The combined contract for the 48MW Baltic 1 and 288MW Baltic 2 covers transport of tools and spare parts to the projects.

The vessels will also move workers and equipment between turbines, substations and other vessels. Tendering is set to wrap up in February.

Cherbourg yes to Haliade-X demo

Turbine manufacturer GE has been awarded a permit to deploy a Haliade-X 12MW offshore prototype at the French port of Cherbourg.

The Manche prefecture in Normandy granted the environmental authorisation after several weeks of public inquiry. Appeals can be lodged until the end of March.

The permit allows GE to install the unit, which will feature a 220-metre rotor, at the northern-most point of a reclaimed area designated

for renewables. GE is also running the rule over the Dutch port of Rotterdam, where the company said the prototype would be erected at monopile specialist Sif's factory in the Maasvlakte 2 industrial zone.

A GE spokesman said a final decision on the demo site has yet to be taken.

Commissioning of the prototype is planned for the second quarter of 2019 with testing set to continue to 2024.

IN BRIEF

■ Danish officials have narrowed the search for the country's next large-scale wind farm to two locations. Development rights will be offered starting next year for the 800MW project, which will be either north of Horns Rev in the North Sea or at Kriegers Flak in the Baltic

■ SSE has called on Dublin to make offshore wind a central plank of a new national energy plan. The utility-developer said the technology has the potential to be a "game-changer" for Ireland in a response to a consultation on the National Energy and Climate Plan 2021-2030.

■ The UK installed 2121MW of new offshore wind in 2018, almost double the previous record of 1154MW set in 2012, according to RenewableUK.

■ Developer EDPR has applied for approval to clear unexploded ordnance for its 950MW Moray East wind farm off northern Scotland.

■ Fabricators Sif and Smulders will produce 58 monopile foundations and transition pieces for Otary's 487MW Seamide wind farm off Belgium. Siemens Gamesa has selected Rebo Ostend terminal as the project's turbine construction base.

■ Siemens Gamesa and Aalborg University are leading the i4Offshore R&D initiative aiming to cut the cost of offshore wind via new technologies including a next-generation turbine.

■ Japanese investor Sumitomo has acquired a 29.5% interest in the Engie-led consortium developing the 496MW Noirmoutier and 496MW Treport wind farms off France. Engie retains 31% with EDPR on 29.5% and Caisse des Depots with 10%.

■ Nine companies and the US Business Network for Offshore Wind have set up the non-profit World Forum Offshore Wind group to support global growth of the sector.

■ New Jersey officials have denied funding to EDF Renewables for the 25MW Nautilus wind farm off Atlantic City on the grounds the project "does not demonstrate the economic and environmental benefits" required by state law.

■ Hans Henrik Jensen has been promoted to MHI Vestas chief sales officer, replacing Thomas Karst.

160MW Lillebaelt South near-shore project taking shape off Denmark

Danish developer Sonderborg Forsyning has filed an environmental impact assessment with authorities for its 160MW Lillebaelt South near-shore wind farm off the east coast of Jutland.

A series of turbine layouts has been mapped including scenarios involving 20 machines of 8MW or 40 units of 4MW.

Foundations would be either monopiles or gravity base structures placed at

least 4km from the coast at Nordborg in water depths of 7.5 to 25 metres.

Lillebaelt South is a so-called open-door project, a term for Danish developments not included in the government's official offshore wind auctions.

Compatriot European Energy has meanwhile won approval from Frederikshavn municipality to develop a five-turbine demonstrator 4.5km off north-east Jutland.



Fred Olsen eyes on global growth

Fred Olsen Windcarrier has acquired a 51% stake in jack-up Seafox 5 (pictured), in part to tailor the marine contractor's turbine installation offering to a growing global offshore wind market.

The vessel will initially be deployed next year at EnBW's 609MW Hohe See/Albatros project in the German North Sea.

Windcarrier chief executive Even Larsen said the acquisition was motivated in part by the challenges posed

by emerging markets in Asia and the US.

"If you do not have enough vessels to work in different markets it is hard to achieve high enough utilisation rates," he added.

The company is "prepared to further increase its vessel base" via newbuilds or acquisitions although there are presently no firm plans.

The remaining 49% stake in Seafox 5 is indirectly held by Singapore-based Keppel Offshore and Marine.

Photo: Fred Olsen Windcarrier

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Vestas gets handle on V136 blade issues at Finnish farm

Danish manufacturer Vestas has launched a blade repair campaign at EPV Energia's 117MW Metsala wind farm in Finland.

Roughly half of the project's 34 next-generation V136-3.45MW machines have

been shut down following the discovery of component problems in early autumn, it is understood.

Vestas confirmed it is currently investigating what it described as a "web dis-bonding issue" at the

wind farm, which went live in January in the western municipality of Kristinestad.

The problem occurs when internal strut systems designed to keep external glass-fibre sections together and help retain blade shape

under wind loads partly detach from the outer shell.

"Until further findings are available we cannot comment or speculate on the root cause of the issue," said a spokesman.

"A range of mitigating and corrective actions" are available to address the problem, he added.

The Danish manufacturer has yet to estimate how long the repair process will take, citing crane availability and weather conditions as swing factors.

Vestas also declined to say whether any other projects featuring V136 turbines are experiencing similar issues.

The model was launched in September 2015 and EPV placed what was the first firm order for the machines in December of that year for Metsala.

Full-scale production started last year.

France takes sting out of wind appeals

France has eased the onshore wind planning path by cutting the number of possible appeal avenues from three to two.

Legislation mandates an initial route for any challenge via the Administrative Court of Appeal with the Supreme Court acting as last resort.

The measures also place a limit on the time that new evidence can be introduced at court.

The changes are part of a 10-point plan presented early this year by government after months-long discussions with market participants.

Meanwhile, Boralex of Canada has commissioned the 10MW Noyers Bucamps, 20MW Hauts de Comble and 26MW Coteaux du Blaiseron wind farms in northern France and will complete the 10MW Le Pelon in the Deux Sevres region at the start of the new year. All four wind farms have 15-year power purchase agreements with EDF.

IN BRIEF

■ Greece has awarded capacity contracts totalling almost 160MW to nine wind farms and just under 62MW to 95 solar PV projects in the country's latest renewables auction. Wind prices ranged from €55 to €65.37 per megawatt-hour and solar came in at €63 to €68.99/MWh.

Wind facilities range in size from 4MW to 39.95MW and include EDPR's 15MW Aerorachi in northern Greece.

■ Senvion has won four turbine supply deals representing a combined 47MW from EDF Luminus and Eoly for the Sint Gillis Waas and Rebaix wind farms in Belgium, with CEZ for the Aschere-le-Marche project in France,

and with EKZ for the Marvila 2 plant in Portugal.

The German manufacturer will deliver a mix of 3.4M104, 3.4M114 and 3.4M122 machines.

■ Italian developer Enel has confirmed a 201MW order for 57 Siemens Gamesa turbines from the manufacturer's 3.X platform for the Kola wind farm in Murmansk, Russia, which is due to be commissioned in 2021.

■ Clean energy investor Glennmont Partners is to sell five wind farms in France totalling 59.5MW to Falck Renewables for €37m. The projects

started operations between 2006 and 2013 and the sale is expected to close in early 2019.

■ EDF Renewables has completed a repowering project at the Eckolstadt wind farm in Thuringia, Germany, replacing 11 vintage turbines with 10 modern units and raising capacity from 14.5MW to 34.5MW.

■ Statkraft is to supply electricity to Mercedes-Benz Cars factories in Germany from six community-owned wind farms with a combined capacity of 46MW.

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Fireworks at Triton

Innogy has secured consent from marine authorities to begin unexploded ordnance clearance for its 860MW Triton Knoll wind farm off Lincolnshire, east England.

The developer has identified 45 items for removal across the project and will begin with the near-shore export cable route from February.

Targets across the rest of the project will be detonated between April and December next year, according to filings with the Marine Management Organisation.

Seaway Heavy Lifting will install the first of 90 Sif-made monopile foundations for Triton in January 2020.

Innogy has meanwhile signed a memorandum of understanding with ports operator ABP to construct an operations and maintenance base for the project in Grimsby.

The facility is expected to be operational when Triton enters full operations in 2022.

IN BRIEF

■ DeepOcean has chartered Acta Marine walk-to-work vessel Orion to support its second array cable installation campaign at Orsted's 1.2GW Hornsea 1 wind farm off Yorkshire.

The ship will be used to provide accommodation as well as crew and cargo transfer services while Nexans and NKT-supplied wires are laid between April and June.

Seaway Offshore Cables has meanwhile started a separate array installation job covering just under half the wires at Hornsea 1. Seaway Aimery and support ship Seaway Moxie will be deployed through the first quarter of next year.

■ Dutch utility Eneco has agreed to purchase the output from Otary's 487MW Seamide wind farm off Belgium, which is expected to achieve first power in 2020.

■ Orsted is looking to carry out remedial export cable burial at its 573MW Race Bank wind farm off east England.

The Danish developer is seeking permission from the Marine

Management Organisation to rebury around 10km of lines via a combination of rock berm placement and trench back-filling.

■ Danish developer European Energy has ordered a crew transfer vessel from Valley Ship Solution to help serve the 21MW Sprogo wind farm off its home country.

■ Japanese utility Tokyo Electric is preparing to install a 2.4MW offshore turbine on a fixed-bottom foundation off the coast of Choshi with work set to wrap up early next year.

■ The European Commission has given state aid clearance to France's planned auction for development rights at the 500MW Dunkirk wind zone in the Channel. A winner is to be selected next year.

■ France-based Louis Dreyfus Armateurs has contracted Norwegian offshore crane provider TTS to supply a new service operations vessel to work on Orsted's 1400MW Hornsea 2 offshore wind farm off the east of England.

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Footprint on the move at Moray West

Moray West partners EDPR and Engie have proposed a revised boundary and dropped one of four turbine options for their planned 750MW wind farm off northern Scotland.

The developers have filed an addendum to Marine Scotland seeking to replace a large slice of acreage at the western edge of the Moray Firth site with an extended southern boundary.

The shift is designed to address concerns raised by Scottish Natural Heritage and others over seascape, landscape and visual impacts, according to supporting documents.

Technical and commercial assessments of the revised footprint are still being examined to see if it is

feasible, said the companies. Either the original or "supplementary development option" will be built should the wind farm secure consent.

In addition, one of four turbine layouts has been cut from the design envelope.

Dropping the option for 62 machines with 285-metre tips will "address concerns" relating to scale and the project's relationship with the under-construction 588MW Beatrice and Contract for Difference-backed 950MW Moray East, the partners said.

Two layouts featuring 85 units and one of 72 machines with 199, 230 and 265-metre tip heights remain in play.

The developers have also requested cutting the proposed original 50-year life of the project to 25 years.

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Europeans dig deep to win US lease sale

European heavyweights have emerged victorious from a marathon 32-round lease auction for federal acreage off Massachusetts.

The trio of winners put a combined \$405m on the table for three sites that have the potential to support 4GW-plus of offshore wind in the next decade.

Iberdrola-owned Avangrid and Copenhagen Infrastructure Partners consortium Vineyard Wind, an EDPR plus Shell alliance and Equinor each provisionally acquired the rights to develop separate 50,000-hectare

sites with bids of \$135m. Eight other companies took part in the auction, hosted by the Bureau of Ocean Management, with the record prices reflecting intense interest in the US market, according to industry insiders.

Twelve previous BOEM offshore wind lease sales have totalled a combined \$63m.

The result will also speed up development of a local supply chain even though construction is unlikely until the second half of the 2020s, added sources.

Vineyard said its bid is a long-term investment in a

zone where it is planning to bring a separate 800MW project online by 2021. There are no immediate development plans for the newly-acquired acreage, a spokesman added.

The EDPR-Shell joint venture, known as Mayflower Wind Energy, said its zone can support a 1.6GW wind farm.

A site assessment plan will get underway shortly alongside "formal development efforts" with operations possible "by the mid-2020s" subject to a final investment decision.

Equinor said the "attractive" Massachusetts lease area gives the company a "strong strategic position" in the US. It already holds a separate lease off New York where the 1GW-plus Empire Wind and Boardwalk Wind projects are being developed. Unsuccessful bidders included EDF, Innogy and WPD.

Industry push for BOEM to crank up auction clock

US offshore wind lobbyists are calling on BOEM to increase the frequency of lease auctions in the wake of the Massachusetts success.

National Ocean Industries Association president Randall Luthi told reNEWS there is too much time until the next round, which is expected in early 2020 for acreage in the New York Bight.

"NOIA calls on BOEM to develop an offshore wind leasing plan that schedules at least four 500MW lease sales annually with a target of an additional 20GW of offshore wind by 2034," Luthi said. "The spectacular sale results suggest that goal

could easily be met and even surpassed."

The last company to drop out in Massachusetts placed a bid of \$124m. "Someone else out there is willing to bid \$100 million. That is money left on the table," he added.

Liz Burdock, chief executive of Business Network for Offshore Wind, said money raised in the sale could be invested in port infrastructure and local companies seeking to become part of the supply chain.

"When you are getting over \$100m per lease it would be good to return some of that to the state that helped create the market."



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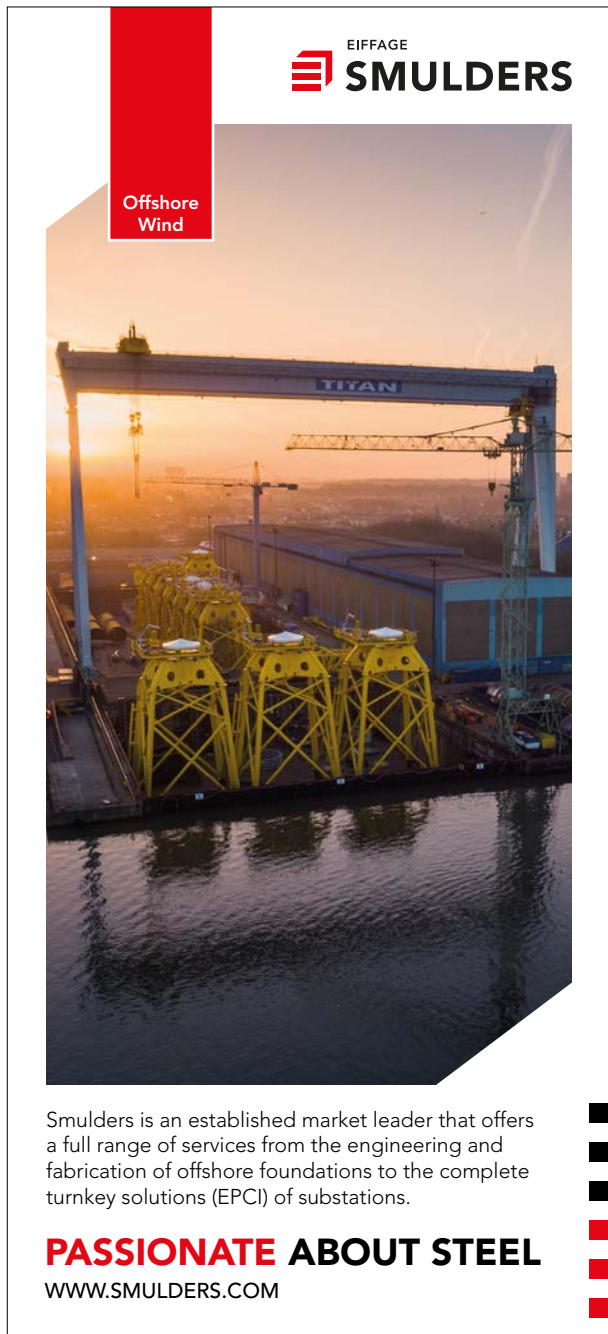
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IN BRIEF

- Copenhagen Infrastructure Partners and Avangrid Renewables have endorsed a transit corridor plan allowing safe access to fishing grounds south and east of Cape Cod near the developers' 800MW Vineyard wind project off Massachusetts.
- The Port of New Bedford in Massachusetts is to receive \$15.5m in funding from the federal Department of Transportation to improve its infrastructure and environment, including a new offshore wind staging site.
- Subsea 7 unit Seaway Offshore Cables has won a contract to supply and install array wiring at the 12MW Coastal Virginia wind farm. Orsted is to erect two Siemens Gamesa 6MW turbines for demo-owner Dominion Energy.
- The US House of Representatives has passed a Bill that could bring offshore wind farms to territories including Guam, Puerto Rico, American Samoa, Mariana and the US Virgin Islands. The legislation will now be considered by the Senate.

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Devon outfit hovers over assets at TEL

Devon marine contractor Keynvor Morlift is in line to acquire Welsh device developer Tidal Energy Ltd, it is understood.

Keynvor is expected to pay around £150,000 for the Cardiff company, which ceased trading in October 2016 following financial difficulties.

Official administrator Begbies Taylor is optimistic the deal will go through imminently despite the failure of two previous attempts. "There is a party we are engaged with and I am committed to trying to sort it. Fingers crossed there is some form of outcome to bring it to a close in the New Year," said partner Steve Wade.

Documents lodged with Companies House show the administrator recently received a deposit of £13,600 for the right to secure TEL.

It is unclear what Keynvor will do with TEL assets such as the 400kW Deltastream horizontal-axis turbine deployed on the Ramsey Sound seabed off Pembrokeshire in December 2015.

Retrieval of the unit is covered by a £600,000 decommissioning bond

previously lodged with the UK government by TEL.

Offshore Renewable Energy Catapult has previously expressed interest in conducting research on the machine, potentially as part of the nascent Marine Energy Engineering Centre of Excellence to be based in Pembroke Dock.

■ The new First Minister for Wales Mark Drakeford gave strong backing to marine energy in one of his first major interviews after winning the leadership election for Labour in the country.

The Welsh government will "build on the substantial investment we have already made in marine" as part of his ambitions for the sector to be the "cornerstone" of the country's economy by creating tens of thousands of jobs, he told the BBC.

"Right along the Welsh coast there are new ways of harvesting energy from the waves being trialled today. I want to make sure that as one of those becomes a breakthrough technology... the jobs that go alongside that are retained in Wales."



BACK-SPIN: Simec Atlantis Energy has redeployed its AR1500 1.5MW tidal turbine (pictured) at the MeyGen Phase 1A array in the Pentland Firth off northern Scotland following servicing at the Nigg yard in the Highlands. The developer has also re-installed a single Andritz Hydro Mk1 machine.

Photo: Simec Atlantis Energy

IN BRIEF

■ Dutch tidal developer Water2Energy has installed a 120kW vertical axis Darrieus-type turbine in a drainage channel at the Port of Antwerp in Belgium.

■ French tidal turbine developer Blue Shark Power System has signed an agreement with the Aetolia Acarnania region of Greece to support 30MW of projects.

■ Bombora Wave Power has appointed Applied Renewables Research of Northern Ireland to model extreme testing of its under-development mWave device to be installed off Pembrokeshire in 2020.

Cornish outfit Inyanga-Tech has won the marine engineering services contract to support design of the 1.5MW demonstration project.

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Mako to swim in Singapore

Australian tidal developer Mako has finalised plans for the Sentosa island demonstration project in Singapore developed in conjunction with Japanese shipping outfit Nippon Yusen and the Monohakobi Technology Institute of Tokyo.

The company is to install two Mako.7 turbines under the boardwalk between the Singapore mainland and the

island of Sentosa by mid-2019 for a two-year run. Maximum power rating will be 5kW in two metres per second flows.

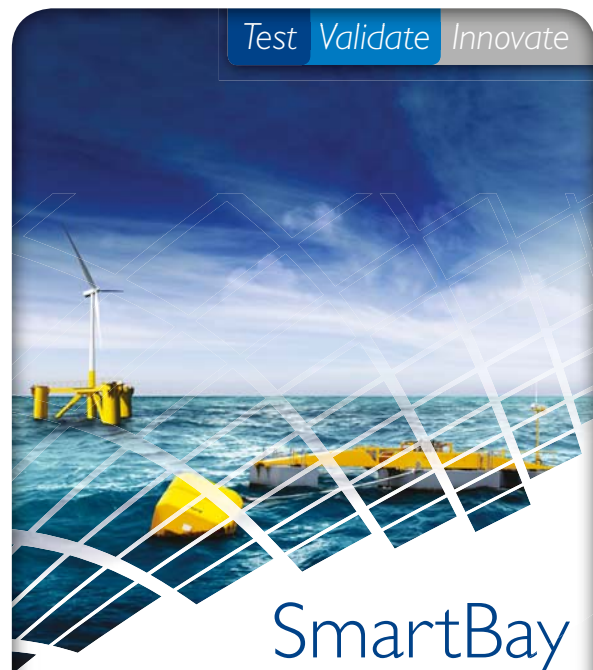
"There may be opportunities for deployment of turbines in the surrounding waters but our main objective is to demonstrate the predictability of tidal energy and the reliability of the Mako.7 to potential customers," said the developer.

March of the Wello Penguins

Finnish wave developer Wello has launched its second 1MW Penguin device at the Netaman shipyard in Estonian capital Tallinn.

The machine is due to be installed at the European Marine Energy Centre's Billa Croo test site off the Orkney

mainland from February. Wello, along with fellow device developers CorPower, Laminaria and Ocean Energy, have meanwhile been lined up to participate in the EMEC-led SEA Wave project to address environmental concerns.



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Hybrid training camp for turbine suppliers

Wind-storage demos to offer taste of decentralised energy systems in Germany, writes Sara Verbruggen

German turbine manufacturers are stepping up development of wind-storage hybrid projects to gain expertise in clean energy optimisation with a view to export opportunities worldwide.

Pilot schemes in the north of the country are aimed at moving onshore wind farm integration with storage from the R&D stage to commercial reality.

Enercon is to start installing a 4MW battery storage system at a 64MW wind farm near Haren in Lower Saxony next year.

The hybrid plant, which is due to be operational in 2020, will also incorporate a 2MW electrolyser.

Haren is expected to demonstrate how a hybrid system can optimise use of

wind energy to balance the local grid network and convert power to gas for long-term storage.

Lithium-ion batteries will be placed close to the turbines and connected to the grid via a single converter.

Instead of turning off turbines to avoid overloading the grid, output can be directed to recharge the battery, which injects the power again at times when there is an electricity shortage in the local medium voltage network.

For long-term storage, generation is converted to hydrogen and injected into the natural gas grid.

Enercon will operate the wind-storage plant, which will be owned by a special purpose vehicle named BW Burgerwindpark Fehndorf-Lindloh that is supported by around 100 local stakeholders as well as the turbine maker's partner Agrowea. Backers are seeking state or EU funding.

Enercon head of sustainable energy systems Jens Winkler said he hopes Haren will help convince policymakers of the value of hybrids.

"Germany's energy market does not currently support developers to install so-called hybrid plants or integrate wind with energy storage.

"The importance of doing

this pilot is to show how regions with high levels of local wind production can make use of surplus generation as opposed to curtailing output and as an alternative to building expensive transmission lines to take more power to the biggest load centres."

Market players are further disincentivised from developing hybrid projects as they are paid for power that is not exported to the grid, said Vestas new business development manager for Germany Marco Sieg.

"The interest in wind-plus-storage projects is very high but under current conditions you can make a business case for building standalone storage to bid into the primary control reserve market or you can make a business case by building a wind farm but you cannot make a business case for combining the two."

Nordex, meanwhile, teamed up with Swedish developer Vattenfall this year to build the Curslack wind-storage hybrid power plant on the outskirts of Hamburg.

The project completed last month consists of Nordex turbines coupled with 720kW/792kWh BMW batteries to optimise the

12.6MW Curslack wind farm's output and avoid curtailment in the event of grid overload.

The scheme was co-developed with the Centre for Renewable Energies and Energy Efficiency (CC4E) at Hamburg University of Applied Sciences.

Scandinavian company Vattenfall built and connected the lithium-ion storage system to four N117/2400 turbines and a single N117/3000 machine.

Over the next two years the hybrid plant will provide 'virtual' or 'synthetic' inertia, able to respond to signals at sub-second speeds to help balance the grid.

The partners will test how fast the system can respond to simulated grid signals, said CC4E project manager Mike Blicher.

"The project will include the development of self-learning algorithms to improve the speed of response to frequency changes based on input of different data sources, including forecasting and historic data," he added.

The scheme will show how decentralised energy systems may look in Germany in 10 to 20 years from now.

"The data and knowledge gained from doing them will also inform lawmakers how to regulate

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EYE ON THE PLUSES: Nordex's Curslack wind-storage hybrid project near Hamburg

Photo: Daniel Reinhardt & Vattenfall

09


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08 the market to enable these new commercial models.” Nordex head of storage and hybrids Francisco Javier Ramirez said Curslack will “lay the groundwork” as the turbine fabricator looks to add hybrid power plants to its business offering. “Merging wind with energy storage allows the plant to provide different grid services, such as virtual inertia, frequency regulation, reactive power, time-shifting as well as price arbitrage.” Nordex wants to have the tools and know-how to develop software controls that operate and manage hybrid plants to optimise integration between wind, storage and the grid. “As these services and markets do not yet exist on a large scale it is about preparing for the future, also with an eye to export opportunities in regions that are more developed in these areas, for example Australia and North America,” said Ramirez. ■

Offshore power-to-X solutions ‘need Berlin government support’

German trade body BWO has called for targeted government backing to help offshore wind developers couple electricity generation with sectors such as transport and heating, writes *Hans-Dieter Sohn*.

BWO director Uwe Knickrehm said he believes ‘power-to-X’ solutions are vital if the nation is to hit its target of 80% renewables in the energy mix by 2050.

Policy-makers should raise 2030 installed capacity goals for offshore wind from 15GW to 20GW, scrap double charges of storage facilities, and map out a market design for project supports, he added.

“For the foreseeable future, power-to-X facilities will need a support mechanism due to their (energy conversion) losses,” said Knickrehm, speaking at the recent

Power-to-X & Offshore Wind conference in Berlin.

Earlier this month, Shell, Siemens and TenneT called on Berlin to tender for extra offshore wind power capacity tied to hydrogen production.

The three companies commissioned a study produced by consultancy group E-Bridge, which found 900MW of power-to-gas projects driven by offshore wind could be built between 2026 and 2030.

Orsted has also made noises recently about maximising the potential for German offshore wind by incorporating power-to-gas solutions.

TenneT executive Lex Hartman said new tenders for wind farms should be combined with storage facilities.

“We will need energy storage. The grid alone will



HYDROGEN BALLOON: Orsted is among stakeholders to look into tapping power-to-gas potential at German offshore wind farms such as its Borkum Riffgrund 2

Photo: Orsted/Matthias Ibeler

not be sufficient,” he added. “I am convinced that hydrogen will prevail but we should not rule out other developments.”

However, a power-to-hydrogen test field off Warnemunde in the German Baltic Sea is unlikely to be implemented before 2025 “at the earliest”, German Offshore Wind Foundation

board member Jorgen Thiele told reNEWS.

Under earlier plans, the test field was targeted for operations by 2023. Unclear grid connection schedules and a mismatch with funding schemes backed by the energy ministry are among the issues to be resolved, it is understood. ■

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5GW pipeline gets the green light in China

Local authorities in southern Guangdong province, China, have approved six offshore wind farms totalling 5GW.

China Three Gorges is developing the Yangjiang Qingzhou 5, 6 and 7 projects, each totalling 1GW, due online between 2024 and 2026.

Guangdong Yudean has secured approval for the 400MW Yangjiang Qingzhou 1 and 600MW Yangjiang Qingzhou 2 wind farms. The former is scheduled to go live by 2023 and the latter by 2024.

China General Nuclear Power has been given the go-ahead for the 1GW Yangjiang Fanshi 2, due online in 2025.

Development ball rolling for \$12bn project off Vietnam

Singapore-based developer Enterprize Energy is targeting construction of a 600MW first-phase wind farm off Vietnam starting in 2022.

Permitting for the wider 3.4GW Ke Ga complex in an area some 20km off Binh Thuan province in the south of the country will kick off in January.

Enterprize chairman Ian

Hatton said securing the paperwork necessary to make the project "bankable by Western standards" will likely take 18 months.

Requirements include a site exclusivity agreement, environmental approvals and feed-in tariff.

The overall Ke Ga development, comprising a further four 600MW phases and a final 400MW array, is budgeted at \$11.9bn excluding export grid connections and onshore substations.

"There will be continuous deployment between 2022 and 2027. Each phase will probably be financed separately but consented as one," added Hatton.

Enterprize has penned an initial agreement with MHI Vestas for the supply of 340 turbines, adding it is "probable" that V164-10.0MW machines will feature in the first instance.

State-owned oil and gas company PetroVietnam is to supply foundations. Jackets are thought likely to feature in water depths between 20 and 45 metres and fabrication will take place the port city of Vung Tau.

"There has to be a technical assessment and it comes down to cost but PetroVietnam has made serial numbers of jackets and other components for the oil and gas industry for decades," said Hatton.

PetroVietnam is also in line to fabricate the offshore substations and could install the foundations.

Hatton said he expects the project to benefit from a feed-in tariff "in the ballpark" of \$98 per megawatt-hour.

Formal negotiations with state power utility Vietnam Electricity are scheduled to start early next year.

Watchdog puts Taipei on notice over 'generous' FiT

Criticism of Taiwan's offshore wind roll-out from a government watchdog could impact future policy for the sector, writes Andrew Silver from Taipei.

Monitoring agency Control Yuan said feed-in tariff rates set by the Ministry of Economic Affairs are too high and the selection process in tenders could be open to challenge.

The local supply chain is also not yet equipped to meet the needs of offshore wind development plans, according to an agency report.

The government has two months to issue a detailed response. An initial statement from Taipei said its approach has been "consistent". Final

decisions on a third offshore wind auction are expected in January.

Taiwan utility Taipower has meanwhile signed a power purchase agreement with German developer WPD for the 640MW Yunlin wind farm off the island's west coast.

The 20-year deal will lock in the 2018 feed-in tariff rate of NT\$5849 per megawatt-hour for the 80-turbine project.

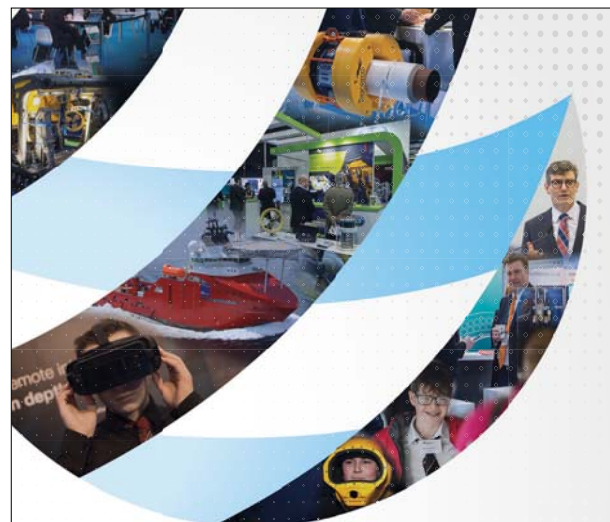
The wind farm is set to feature Siemens Gamesa 8MW turbines and is due online in 2020.

Taipower has also agreed a power deal at the 2018 rate with Swancor and Macquarie for the 376MW Formosa 2 project off Miaoli.



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Waterford council on war path over blades

Waterford County Council is to start enforcement proceedings against BlackRock over a breach of planning conditions at its 32.4MW Barranafaddock wind farm.

The local authority "intends to serve a warning letter" to the project owner after national planning body An Bord Pleanala ruled nine of 12 GE 2.85MW turbines feature blade lengths not covered by existing consents.

Hardware in question comprises 51.5-metre blades, up from the permitted 45-metre configuration,

although all machines remain within the 125-metre tip height ceiling.

The warning will request that BlackRock "carries out the development in accordance with its planning permission", said a spokesman for the council.

"The developer has four weeks to respond to the warning letter. The council has to wait the statutory period before it can decide what form further action will take."

BlackRock declined to comment but told ABP the local authority signed off on

the turbines during pre-construction compliance in December 2013.

The units also meet consent conditions covering shadow flicker and noise, the owner said.

Barranafaddock near Ballyduff was built by Cork developer Element Power.

"Element Power Ireland complied in full with all planning conditions set down by the local authority at the time," said Statkraft, which recently acquired the company's Irish onshore wind business.

The wind farm, which has been operational since 2015, was bought by investor BlackRock in 2016.

IN BRIEF

■ Statkraft will shortly file a planning application for the 12-turbine Drehid wind farm in Kildare. The Nordic giant is eyeing hardware with 169-metre tips at the project, which was originally included as part of the rejected 47-turbine Maignhe mega-farm.

■ A Galetech-led consortium has started consultations with national planners for a 110kV substation at the proposed 35MW Pinewood wind farm in Laois. The group, which includes Belgian developer Storm Windpower and GE, is awaiting a decision on the 11-turbine element.

■ Independent developer Richard Walshe has applied to local planners to build the three-turbine Huntstown wind farm in County Donegal.

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Buying spree at Greencoat

Greencoat has acquired two operational wind farms in Tyrone, Northern Ireland.

The investment company paid the Irish Infrastructure Fund, jointly managed by AMP Capital and Irish Life, £87m for the 18.4MW Church Hill and 32.2MW Crighshane.

Viridian Group held a minority stake in the projects, which went live in 2012.

In the Republic, Greencoat has separately agreed to acquire two wind farms totalling 45MW in a deal worth €88m. The company will this month close the acquisition from BlackRock of the 36MW Monaincha in County Tipperary and 9.2MW Garranereagh in County Cork.

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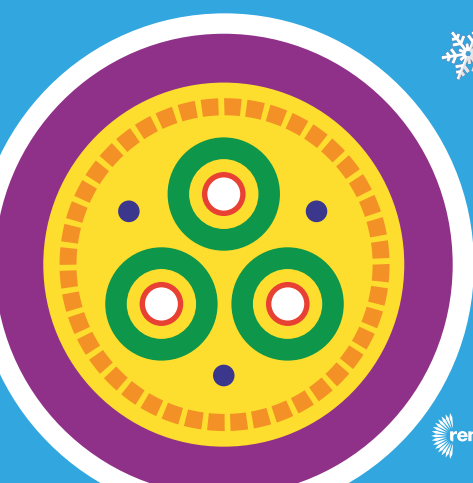
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Developers on trail of 90MW payday at ABP

Semi-state developers have started consultations with An Bord Pleanala for separate 90MW wind farms in the midlands and west of Ireland.

Bord na Mona has opened talks with the national planning authority for the Derrinlough project on the Clongawny and Drinagh bogs in west County Offaly.

Discussions, which are due to wrap up in April, are expected to lead to a full planning application in the summer under the strategic infrastructure process.

The peat company-cum-developer has yet to nail down final turbine numbers although the wind farm will be "similar in scale and height" to its Derryadd project in Longford. The latter proposal is based on around 24 units with 185-metre tips.

Forestry specialist Coillte has meanwhile started consultations with ABP for a project of between 20 and 25 turbines at Carrownagowan in County Clare.

The developer said the wind farm has the potential to hit around 90MW and will also complete the pre-application process in April.

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Minesto eyeing grants for Welsh tidal project

Swedish tidal kite developer Minesto has applied for fresh Welsh European Funding Office cash to help map an up to 80MW array off Anglesey.

The company is seeking an undisclosed amount from WEFO's €100.4m pot for wave and tidal for development of a project dubbed '100x80', it

is understood. The title refers to a levelised cost of electricity of €100 per megawatt-hour via installation of the 80MW array.

Funding scheduled to be signed off by March would back a feasibility study into the Holyhead Deep development and assist the

design of a next-generation, up to 1MW tidal kite. The project would also allow Minesto to continue testing of its existing 500kW machine off Anglesey, a source said.

Learnings from an extended period of continuous operation would feed into the design of the new device.

Minesto is targeting a total mass of between 10 and 15 tonnes per megawatt in a bid to reduce both capital and operational expenditure.

The company has meanwhile stepped up site development for its ocean current demonstration project off Keelung island in Taiwan consisting of a single device of around 100kW.

Micro-siting investigations in conjunction with National Taiwan Ocean University are underway ahead of deployment due by the end of 2019.

Marine and offshore wind call on Paris to aim higher

French marine and offshore wind companies have called on politicians to increase ambitions in the country's upcoming energy roadmap.

Nine market participants asked in an open letter for the government to facilitate installation by 2030 of 10GW of fixed offshore wind and 3GW of floating wind.

They also suggested Paris should include tidal and river current projects with a total capacity into the hundreds of

megawatts. The draft French energy roadmap currently cites targets of 5GW of fixed and floating wind, and zero tidal tenders, over the next 10 years. Final measures are due to be adopted next year.

The letter said: "Marine renewables and offshore wind are the future of France's energy and industrial policy.

"It is more than necessary to markedly increase the roadmap's marine renewable and offshore wind goals."

IN BRIEF

■ The European Investment Bank is providing €84m towards a €1.2bn renewable energy fund established by Irish developer NTR that will back wind, solar and energy storage projects across Europe.

The EIB has elsewhere approved finance totalling €335m for wind and solar projects in Spain that will contribute to the country's 20% by 2020 renewable energy target.

■ The European Bank for Reconstruction and Development has approved a five-year energy strategy targeting clean, secure and affordable supplies with renewables central to the plan. EBRD confirmed it will no longer finance coal mining or coal-fired electricity generation.

■ UK fund FIM Solar Distribution has acquired the 5MW Carditch Drove PV array in Somerset from Spanish developer Solaer. FIM said it expects to complete at least two further deals in early 2019 to push its UK solar portfolio to nine projects.

■ Middle East energy companies Akkar Sal and Lebanon Wind Power

are seeking turnkey contractors to build a pair of wind farms totalling 140MW in north Lebanon. Pre-qualification closed last week.

■ Tractebel subsidiary Lahmeyer International has acquired Deutsche Offshore Consult as part of plans to strengthen its position in the offshore wind sector.

■ UK asset manager Octopus is to supply Shell Energy Europe with electricity from a 70.5MW portfolio of unsubsidised Italian solar assets under a five-year power purchase agreement.

■ The cost of electricity produced by large-scale solar plants in the UK is set to fall to £40 per megawatt-hour by 2030 from between £50 and £60/MWh in 2019, according to new analysis by the Solar Trade Association.

■ Crown Estate Scotland paid £9m in royalties to Holyrood from renewables and other sources during its first year of operation, according to the devolved organisation's first annual report.

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US offshore now prime real estate

Any doubts about the US offshore market were blown away last week by the combined \$405m that leading developers committed to secure three federal wind zones off Massachusetts. The \$135m per zone, more than three times the previous record for a US offshore site, won areas that were left uncontested when originally auctioned in 2015.

Equinor, Shell plus EDPR venture Mayflower and Iberdrola-CIP tie-up Vineyard triumphed after 32 rounds from a pool of 11 active bidders. The high-profile winners, and their powerful balance sheets, are a far cry from the more specialist developers that once led the charge in the country.

The financial muscle being deployed is a reflection that circumstances have changed both inside and outside the US. Most importantly, individual states are finally

providing a route to market as part of policies designed to boost economic growth and diversify energy supplies, building on the earlier efforts of federal officials.

Globally, reduced opportunities in established geographies, increased competition among developers and the continuing need for scale have made emerging markets far more attractive than just a few years ago. Cost reductions and greater experience of adapting offshore technology to varying site conditions have also contributed to mitigating risks and boosting confidence outside of traditional hunting grounds.

The momentum is unlikely to abate in the short term. Any company looking to participate in future US auctions should ensure they have very deep pockets.

Bah humbug, Ofgem

Ofgem has never been a big fan of the 'if you build it they will come' philosophy, particularly when it comes to islands wind, but in the case of the planned Orkney interconnector the UK energy regulator needs to think again.

Demands that the generation threshold required to justify a 220kV subsea line be almost doubled to 135MW, from the previously outlined 70MW, are short-sighted and could scupper the northern cluster's long-held aspiration for a link to the mainland.

The energy profile of Orkney is in many ways unique, comprising a mix of standard supply requirements, a range of innovative renewables technologies, next-generation grid challenges and sometimes experimental tie-

ups across the electricity, heat and transport sectors.

There is little doubt the planned connection to mainland Scotland will encourage increased deployment of all varieties across the islands, to the wider benefit of the entire UK energy market, and that the initial 70MW will quickly accelerate both to and beyond the proposed revised target.

Perhaps less poetically, and as transmission provider SSEN pointed out this week, Ofgem's ruling also appears to represent an outlier position in terms of standard practice as deployed elsewhere in the UK. It is high time the grid Grinch changed its ways when it comes to Scotland's islands.

IN THE FRAME



ODDE JOB: Danish developer European Energy has completed the sale of the 25.2MW Nojsomheds Odde wind farm in its home country to Swiss investment outfit SUSI Partners. Commissioning of nine Vestas V117-3.6MW turbines at the beginning of this year opened the taps on a feed-in tariff premium of 25 ore per megawatt-hour.

Banks rings changes at 88MW Lethans site

Banks Group is exploring a revised layout for its consented 88MW Lethans wind farm near New Cumnock in East Ayrshire.

The County Durham company is scoping a range of changes to the 22-turbine, Section 36 project in a bid to maximise economics with super-size hardware.

Tips under a proposed variation application would be extended to a mix of 220, 200, 176 and 156-metre units from the current 176, 152, 149.9 and 136-metre configuration.

Rotors in all cases would be set at 150 metres, up from the originally-consented 117 metres, suggesting top power of around 100MW. Under revised plans the consent would also be extended by five years to 30 years.

As part of the redesign Banks is seeking permission to drop four turbines should Buccleuch's adjacent 28MW Glenmuckloch wind farm be constructed and change the wind resource profile.

The company is also seeking the separate option to micro-site Lethans

machines by up to 275 metres in order to maximise output and minimise visual and landscape impacts.

"Two scenarios are presented as Banks wishes to keep flexibility within the consent due to factors outwith its control. This includes neighbouring developments, routes to market and manufacturer warranty for the turbines," said the company.

■ UK developer North British Wind and US partner Invenergy have secured consent for the 62.7MW Pencloe project in East Ayrshire.

Scottish ministers approved 19 turbines of up to 125 metres near New Cumnock following a public inquiry and a positive recommendation from officials.

The application was submitted to planners in 2015 but the local authority objected on the grounds of visual, landscape and aviation impacts.

NBW and Invenergy have partnered on a number of Scottish wind farms, including

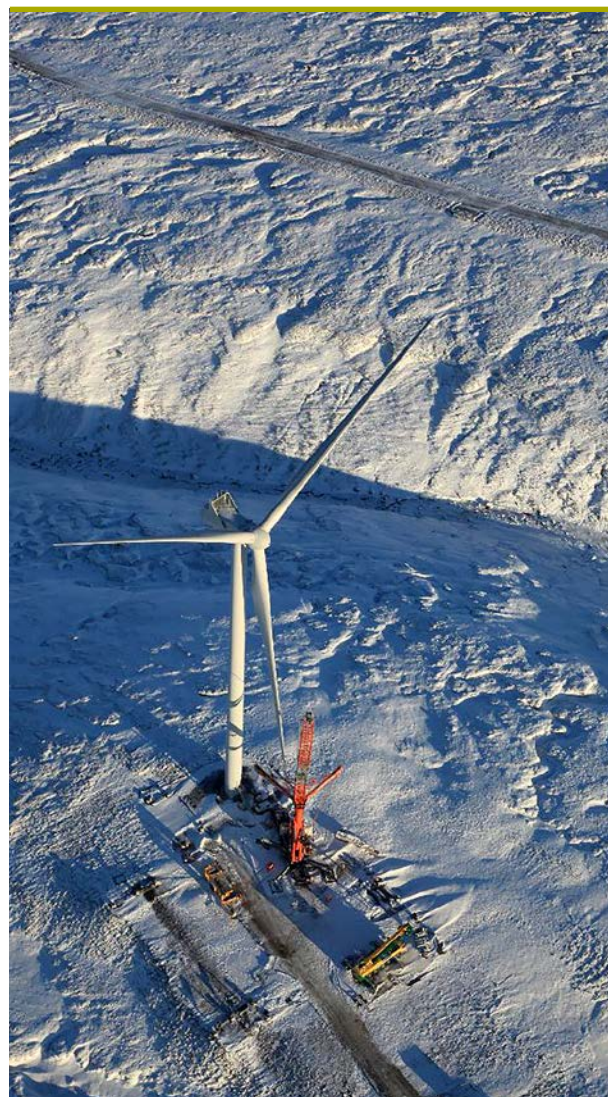
the 42.7MW Margree, which remains under consideration by Dumfries and Galloway officials.

■ Muirhall Energy has won approval on appeal for the 22.4MW Priestgill wind farm near Abington in South Lanarkshire.

Scottish officials overturned local authority rejection of the seven-turbine project, which will feature tips of up to 145 metres and hardware of around 3.2MW.

Priestgill is part of a portfolio of development assets acquired by Muirhall from AES in 2015 and includes a 1MW battery storage system. The project is close to SSE's operational 523MW Clyde complex.

■ English developer Dickens Hydro Resources has revised a planned series of hydro projects in Glen Etive. The seven sites near Fort William will now cumulatively total 6.5MW, rather than 7.2MW, and are designed to have a reduced visual and landscape impact.



COOL RUNNING: SSE has officially completed the 228W Stronelairg wind farm (pictured) in the Scottish Highlands "ahead of schedule and on budget".

The £350m project south of the Great Glen near Fort Augustus has been fully commissioned with all 66 Vestas 3.45MW turbines now feeding the grid.

RJ McLeod led on civil engineering at the upland site in the Monadhliath mountains near the 100MW Glendoe hydro project.

Stronelairg is the final SSE wind farm to be accredited under the Renewables Obligation and pushes the company's onshore portfolio to 2.1GW.

The developer is working

towards the sale of a 50% stake in the project alongside the nearby and already-operational 94MW Dunmaglass.

"The potential sale is in line with SSE's strategy to create value from developing and operating assets as well as owning them," it said.

Wholesale director Martin Pibworth said "the skill and professionalism of the teams that designed, developed and built the wind farm" helped to overcome challenges including altitude and weather.

The utility is currently exploring a 40-turbine extension to the project. Scoping for what is being called the Cloiche wind farm is underway.

Photo: SSE

NEWS ROUND-UP

■ Actis and Mainstream joint venture Lekela has broken ground on the 158.7MW Taiba N'Diaye wind farm in Senegal, west Africa, which will feature 46 Vestas V126-3.45MW turbines when it goes live in 2020.

■ Siemens Gamesa is to supply 4.5-145 turbines rated at 4.2MW for Enel Green Power's 249MW Parque Amistad 3&4 wind farms in Mexico.

■ Nexans and Tesmec have won a €12m turnkey contract for cabling at Goldwind's 530MW Stockyard Hill wind farm in the Australian state of Victoria.

■ US developer Terra-Gen is to sell 100MW of electricity from the Coachella Hills wind farm in California to Shell Energy North America under a long-term power purchase agreement. The project will repower the existing Coachella Flats and Painted Hills facilities and is expected to be completed in December 2020.

■ Senvion has confirmed a turnkey order for 3.6M140 turbines at the 86MW second stage of Nexif Energy's Lincoln Gap wind farm in South Australia. The machines will be installed and operating by mid-2020, the German manufacturer said.

■ Enel Green Power has started construction of the 244MW Dolores wind farm in Nuevo Leon, Mexico, with operations scheduled to start in 2020. The company has meanwhile flicked the switch at its 185MW Hill Topper in the US state of Illinois.

■ US utility Georgia Power has opened a procurement round for renewables projects totalling 540MW, including wind, solar and biomass. Interested parties are invited to review terms of the request for proposals and submit ideas by 15 January.

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