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GE lines up pair of gigawatt-scale onshore deals in Middle East/Africa

BERND RADOWITZ

GE is in the frame for two onshore “mega deals” of more than 1GW in the Middle East and Africa (MEA) region, *Recharge* has learned.

“We’re looking at a couple of mega deals in the region,” Arungalai Anbarasu, product manager for wind at GE for Europe, Middle East and Africa (EMEA), told *Recharge* at WindEnergy Hamburg yesterday. “When we say a mega deal, it’s higher than 1GW. But we can’t announce anything until we have signed the contract.”

Anbarasu didn’t disclose the countries in which the industrial

giant expects to ink the deals, but mentioned Egypt as a place where there are many class II wind sites suitable for its 3.8MW 3.8-130 machine.

Coincidentally, Vestas is close to signing a 2GW turbine supply deal with the Egyptian government (see page 15).

The gigawatt-scale orders would further strengthen GE’s position in promising emerging wind markets. In May, the company signed a 1GW initiative with the Vietnamese government.

GE expects to greatly boost its share in the annual 3-3.5GW MEA market in which it only has a “very small share right now”, explained

Abraham Morales, GE’s marketing director for EMEA.

“We want to make sure that we are among the strongest top-tier OEMs there.

“The MEA region is one of our main priorities for growth.”

● Morales and Anbarasu also told *Recharge* that GE expects to double its onshore turbine market share in Germany, thanks to recent upgrades in its 3MW platform that aim to push down the levelised cost of energy and boost annual energy yields.

The US group grew its German market share to 7.3% last year from 4.9% in 2014, according to figures from consultancy Dewi. ☐

Mexico awards 1GW of wind in tender, but PV wins more

ALEXANDRE SPATUZZA

A total of about 1GW of wind was awarded in Mexico’s second clean-energy tender, which was announced on Wednesday night, but the sector was once again eclipsed by solar, which saw about 1.8GW allotted.

It was nevertheless a big improvement for the wind sector, which was only awarded about 400MW in the first tender earlier this year, compared to solar’s 1.7GW.

The second tender was “particularly hard-fought”, says Miguel Ángel Alonso, Acciona Energía’s Mexico director, with the average winning price across all technologies coming in at \$33.47 (€29.77) per MWh — 30% lower than in the first tender.

The ceiling price in the second tender was set at \$60/MWh.

Once again, there were many European developers attached to winning projects, including Acciona Energía, Enel Green Power, Engie and Iberdrola.

Acciona confirmed it will build a 180MW PV plant in Sonora state out of the second tender, while Enel revealed its local subsidiary will build a 93MW wind farm in Tamaulipas state.

Winning developers now face the challenge of getting their projects built and commissioned by the deadline in early 2019. ☐

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US wind market 'more interesting than Europe'



Vestas senior vice-president, Morten Dyrholm

KARL-ERIK STROMSTA

The US has overtaken Europe as “the most interesting place to do business” in the global wind market, according to Morten Dyrholm, Vestas’ senior vice-president for marketing, communications and public affairs.

“It used to be that in Europe we’d point fingers at the boom and bust [nature of the US wind production tax credit (PTC)], and say, ‘What a mess for renewables, compared to Europe with its long-term planning and targets,’” Dyrholm said yesterday at the WindEurope Summit.

“Now it’s completely the

other way around.” Today, Europe is “stagnating”, mired in discussions about market designs and the continent’s grids network, he explained. “We can’t really figure out where to go.”

By contrast, the US is a “spectacular success story and the PTC is delivering the long-term transparency and long-term visibility that drives investments”, Dyrholm said, referring to the multi-year extension the wind tax credit received in late 2015.

“In that sense, we look at the US as the most interesting place to do business.”

Dyrholm’s comments chime with a growing number of renewables executives who have expressed concerns about

the state and trajectory of the European market.

Enel Green Power chief executive Francesco Venturini this week told *Recharge* that Europe has “fallen behind in policy ambition and investment”, while WindEurope chief executive Giles Dickson slammed the EU’s “dysfunctional electricity market”.

Many Europeans are wrongly stuck in the belief that the US is a laggard when it comes to climate and energy policy, he added.

“There’s a tremendous revolution that’s happening in the US. Carbon intensity is going down like nowhere else on the planet. Renewables are booming.” □

GE turbine towers to act as hydro reservoirs

KARL-ERIK STROMSTA

GE has been awarded the turbine-supply agreement for the groundbreaking Gaildorf project in Germany, which will directly link onshore wind turbines with a pumped-hydro storage facility for the first time.

Developed by a subsidiary of German construction firm Max Bögl, the Gaildorf project will see a natural lower water reservoir feeding smaller upper reservoirs 200 metres above — which will be built directly into the base of four

GE 3.4-137 turbines. The 3.4MW machines will be the tallest in the world, with a total tip height of 246.5 metres, including the 40-metre-tall above-ground reservoirs.

The hybrid plant, to be built in the Swabian-Franconian Forest in Baden-Württemberg state, will provide balancing power for fast-response stabilisation of the local grid, helping to integrate greater amounts of intermittent renewables.

During times of peak electricity demand and high prices, the

stored water will act as fuel for the hydro plant. When power prices are low, electricity will be used to pump the water uphill for later use.

“We’re committed to exploring innovative renewable energy technologies that have the potential to improve grid flexibility in Europe and around the world,” says Anne McEntee, chief executive of GE’s onshore wind business.

The 16MW pumped-storage plant will be supplied by German industrial company Voith. □

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Borssele 3&4 set for new price lows

BERND RADOWITZ

The Dutch government and wind industry executives expect prices at the 700MW Borssele 3&4 offshore wind tender, which closed yesterday, to fall even further than the record-low €72.70/MWh reached at the adjacent Borssele 1&2 area earlier this year.

A series of factors currently favour low offshore wind prices — low interest rates and steel prices, an overcapacity in the gas market and the steep learning curve in offshore wind, René Moor, programme manager for offshore wind at the Dutch economics ministry, told the WindEurope Summit yesterday.

Specific site conditions also help. “With more wind here [at Borssele 3&4, compared to 1&2], I actually expect a lower price,” he said.

Rob van der Hage, business manager for Dutch offshore at



The Egmond aan Zee wind farm in the Dutch North Sea

state-owned transmission system operator TenneT, said most of the competitors interested in Borssele 1&2 are also looking at Borssele 3&4 as they have more information now, such as knowing the bidding price at the earlier auction.

“That increases the likelihood that competitors are looking at decreasing their margin as much

as they can to at least reach this winning level,” he explained. “There is a likelihood that these price levels [at Borssele 3&4] will be similar or lower.”

Dong Energy, which won the Borssele 1&2 bid, and oil major Royal Dutch Shell are expected to have entered very competitive bids in the Borssele tender, according to industry sources. ☐

Cyber attacks on energy sector increase

CHRISTOPHER HOPSON

The power sector has seen a massive increase in cyber attacks over the past year, due to the increasing interconnection of the industry and emergence of smart grids, warns a new World Energy Council (WEC) report.

In a worst-case scenario, attacks could result in shutdowns of infrastructure, including renewables facilities, economic disruption, environmental damage and even loss of life, the report says.

“The energy sector must... assess cyber risks across the entire energy supply chain, improve the protection of energy systems and limit any possible domino effects that might be caused by failure in one element,” says Jeroen van der Veer, executive chair of the study. ☐

Photograph | Bloomberg/Getty

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Wind industry chiefs call for UK policy clarity

CHRISTOPHER HOPSON

Siemens has led a chorus of calls demanding the new UK government provide clarity on its future wind energy policy, in the wake of the country's surprise Brexit vote in last June's national referendum.

Michael Hannibal, chief of the offshore wind division at the German turbine maker, expressed concern that 5GW of offshore projects had "disappeared" from the UK market in the last year.

Hannibal said that Siemens had made a "bold move" in establishing its £350m (€405m) blade factory and turbine assembly facility in Hull, northeast England, but was dismayed by the lack of visibility in the UK market.

"We have stopped believing that politicians will ever put long-term energy plans in place," he said. "I sometimes ask if people knew



Michael Hannibal, Siemens Wind Power's offshore chief executive

what they voted for in the EU referendum.

"If we are to continue to create jobs in the UK we need more predictability from the government in its policy making. For instance, there is a question as to how you could justify

establishing a tower factory in the UK when there is currently an oversupply of towers in Europe."

Michael Liebreich, chairman of Bloomberg New Energy Finance, said UK energy policy "has always been in disarray". However, he praised new energy secretary

Greg Clark for having a "good understanding of the issues surrounding climate change".

Anna Stanford, head of policy at developer RES, said the majority of the UK's wind companies had wanted the country to remain in the EU. "For us, the UK's 2020 renewable-energy targets have been very important and we also support stronger 2030 targets.

"The UK wind market has suffered from high levels of political interference. We need to reduce policy uncertainty as we have been getting mixed signals from the UK government."

Stanford added that the Contracts for Difference regime, which had been put together after a long period of consultation with the industry, still offered the best solution for the UK going forward, describing the UK's onshore wind scene as "unconscious but showing some sign of life".

Photograph | DPA/PA

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A rendering of GustoMSC's Tri-floater concept

Acciona enlists Sentient Science to reduce LCoE of its 7GW fleet

DARIUS SНИЕCKUS

Developer Acciona Energía has inked a deal with US industrial software firm Sentient Science to roll out the latter's DigitalClone technology for the pilot phase of a project that aims to reduce the levelised cost of energy (LCoE) across the Spanish company's 7GW wind fleet.

The Sentient Science system — which creates digital clones of each turbine model to predict risk of component failure based on operational data — will be used in turbine monitoring, testing, life-prediction and life-extension actions.

“This represents a big step forward in our ‘turbine for life’ programme to obtain the maximum performance from our turbines and be ever more competitive,” says Acciona Energía chief executive Rafael Mateo.

Sentient Science chief executive Ward Thomas adds: “Digitalisation of Acciona's fleet with DigitalClone Live will [help the developer] achieve business goals to have 50-year life machines through life-extension supply-chain actions.”

The deal envisages “a long-term collaboration” covering more than 6,000 wind turbines spread across more than 200 wind farms in 14 countries. ☐

GustoMSC to design floating foundation for Korean project

DARIUS SНИЕCKUS

Dutch offshore contractor GustoMSC has inked a breakthrough memorandum of understanding (MoU) with Halla Wind Energy and Korean Maritime Consultants (Komac) to design a first floating wind turbine for the Dongbu project off Jeju Island, South Korea.

The MoU provides a framework for co-operation between the three parties on a flagship

GustoMSC Tri-Floater, a three-column semisubmersible design, as part of a 100MW offshore wind farm that includes “positions for floating wind”.

“The GustoMSC Tri-Floater design was chosen by Halla Wind Energy for its favourable design, which is characterised by a three column, slender, robust and brace-less hull,” the three companies said in a statement at the signing of the MoU in Seoul, which was attended by Dutch Prime Minister Mark Rutte.

“This semi-submersible floating foundation can be customised for all types of offshore wind turbines.”

GustoMSC, which has been developing the Tri-Floater since 2002, will be responsible for the basic design of the foundation, while Komac will carry out detailed engineering. A manufacturer is “still to be chosen”.

Jeju aims to be powered 100% by renewable energy by 2030 through its ‘Carbon-Free Island’ initiative. ☐

Photograph | GustoMSC

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大成 DENTONS



German wind will slow as market pivots to Asia

BERND RADOWITZ

The growth of wind energy in Germany will slow down in the coming years, and globally will increasingly move to Asia and offshore, according to Commerzbank renewables specialist Günter Tallner.

Commerzbank is one of Europe's leading renewables financiers, with a €3.8bn portfolio in project financing that focuses on onshore wind and solar, but also includes offshore wind and bioenergy.

Growth drivers for renewables expansion continue to be a rising energy demand, climate change, insecurity about the supply of primary energy sources, as well as decreasing production costs for renewables, the bank says.

But the share of offshore in overall wind installations is likely to jump to a quarter in ten years, from around only 5% today,



A wind farm near Husum, Germany

Tallner says. The combined investment volume of already licensed offshore wind parks stands at around €100bn, Commerzbank calculates.

In onshore wind, the bank sees a shift in growth from Europe to

Asia, and in the short and medium term also to North America.

The bank sees the global onshore market receding to 53.2GW in 2025 from 59.1GW in 2015, and the offshore market

exploding to 14.3GW in 2025 from only 3.3GW last year.

But while Europe is expected to keep about the same annual volume of 3GW in 2025, that of Asia/Pacific will soar to 10.8GW in 2025 from 300MW in 2015, Commerzbank believes. The numbers are based on the bank's own research and figures from analyst MAKE Consulting.

In the German market, annual growth in wind energy is expected to slow down to 5% in the ten years up to 2025, well below the average 9% growth rate in the previous ten years.

The introduction of tenders in Germany from next year will lead to heightened competition, Commerzbank believes.

Nevertheless, wind projects in established markets such as Germany remain a very sought-after asset class, helped by low interest rates and predictable cash flows. □

Photograph | DPA/PA

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As a Partner of the 8th Hamburg Climate Week, the world's leading wind energy expo is also open to non-trade visitors on 30 September. Anyone who wants to get an impression of the innovative power and career opportunities of this industry can visit the expo halls on the Recruiting Day from 9.00 to

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Johanna Kettmann, Talent Supply Project Manager Wind Company: Kelly Services

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Wirtschaftsberatung AG Geschäftsstelle Hamburg

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Monique Schack, Senior Recruits, Siemens HR, Siemens AG

13.40 – 13.55

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Lars Poslednik, Director Sales & Business Development,
CONVENT ENERGY GMBH

14.00 – 14.15

Kelly Services – Wind ist unser Business

Thorsten Grösch, Consultant Kelly Engineering Resources,
Kelly Services

14.20 – 14.35

European Wind Energy Market

Linda Gaffel, Coordinator of EWEM, TU Delft

14.40 – 14.55

Where do you see yourself?

Jan-Philipp Heineck, Recruitment Coordinator, AECOM

15.00 – 15.15

Recruiting for Offshore Renewables Projects at Jan De Nul Group

Eline Vandenbroeck, Recruiter, Jan De Nul Group



Recruiting Day Forum 2016

The Recruiting Day Forum between Halls B1 and B2 shows the importance of WindEnergy Hamburg as a unique international recruitment exchange for the wind industry. Anyone interested can contact potential employers such as Siemens, Nordex, Enercon, Kelly or Windigo, or speak to HR advisors or to the representatives of universities and educational organizations. HR officers will also be present at many other stands in all exhibition halls on the Recruiting Day, ready for interviews. Get in touch with potential employers directly!

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- WEAS Technik GmbH, Stand R12
- Windigo GmbH, Stand R04
- Wind Energy Technology Institute (WETI), Stand R10

You can find more companies taking part in the Job Route throughout the halls!

Juwi boss: expect consolidation among developers



Juwi chief executive Michael Class

BERND RADOWITZ

The chief executive of developer Juwi expects consolidation in the wind development sector as the environment for new projects gets tougher, especially in the company's home market of Germany. The reasons include regulatory changes, dwindling political support and strict environmental protection hurdles, Michael Class tells *Recharge*.

"Currently the project market for wind projects in Germany is a sellers' market. We have more investors asking for projects than are on the market," Class says.

"The low cost of money and the few stable investment opportunities make wind projects relatively attractive to institutional investors like pension funds and insurance."

But as Germany will, from next year, grant licenses for new wind parks only through tenders, and initially cap those

at 2.8GW annually, there will be a consolidation among project developers after 2017-18, Class believes.

Germany last year added 3.54GW of onshore and 2.38GW of offshore wind. "It will become tighter in the market from 2018 on."

While companies used to be able to develop wind projects within three years, they now often need about five years due to a more difficult political environment and heightened public resistance to wind parks in Europe's largest renewables market.

"The reason for that is also clear: we have a higher density of wind parks. So they are more visible for people. The Fukushima effect, as politicians call it, is running out. With the reduced political will to support renewable energies, it gets harder to realise wind projects."

Due to increased difficulties in planning and building wind

farms, developers need more time, money and expertise, Class says.

As one of the larger players in Europe, Juwi itself is well prepared for consolidation among developers, Class says. He adds that the company will offer smaller partners co-operation in the form of future joint ventures, in which Juwi could shine due to its competence in getting project licences, while smaller partners could contribute with their closeness to regional politics.

After being bought by regional German utility MVV in 2014, Juwi continues to consolidate and expects a "significantly better" net profit this year than last. In 2015, the developer had posted a €2.3m (\$2.6m) net profit, compared to a €112m net loss in the year earlier.

Beyond Germany, Juwi also has a 250MW wind development pipeline in South Africa, but at an early development stage. The company is currently in a bidding process for a series of

solar projects between 65MW and 85MW, Class said.

Juwi still has a 3GW German wind development pipeline, even after selling 375MW in projects to the renewables unit of trading firm BayWa.

Class expects his company to eventually reach a "net output of working projects" of only 500-700MW from its pipeline due to the current complex consenting environment.

"There are still a lot of projects in this pipeline in a very early stage and you never know whether you have a bird problem there, or a grid connection issue there, political acceptance, distance to housing," he explains.

"There is always a kind of dying rate included in these project pipelines."

The company also offers solar EPC services overseas, and is increasingly active in the O&M market, servicing 1.2GW in wind and 600MW in solar plants globally. □

Ethiopia ‘to open up wind sector to IPPs’

BRIAN PUBLICOVER

Large-scale private ownership of Ethiopian wind assets is expected by the end of the decade, industry experts told the WindEurope Summit yesterday.

The East African nation's government currently owns all of the country's 324MW of installed wind capacity, including the 153MW Adama 2 project, which was recently completed by developer HydroChina International Engineering.

However, the May launch of Ethiopia's first tenders for 1.2GW of planned wind capacity, on top of ongoing power sector reforms, could open the door to independent power producer (IPP) involvement, said Deo Onyango, regional executive of Sub-Saharan Africa for GE Renewable Energy.

A template for IPP power-purchase agreements was



The Adana 2 project in Ethiopia, built by a Chinese company with Goldwind turbines, but owned by the Ethiopian government

established by Ethiopian Electric Power last year, when it agreed to buy up to 500MW of electricity from the foreign-owned Corbetti geothermal project in central

Ethiopia. The US government is also advising Addis Ababa on IPP frameworks through its Power Africa programme, Onyango points out.

The Ethiopian government — which aims to bring roughly 3GW of new wind projects on line by 2037 — is said to have become more open to private investment in its power sector as it is unable to take on more debt to build generating capacity.

A number of challenges — including grid and transmission constraints, as well as limited access to financing — mean that the path to private ownership of Ethiopian wind assets is still far from assured.

Nonetheless, Onyango says the Ministry of Water, Irrigation and Electricity's first round of tenders for 550MW of wind capacity in May represents a major shift.

“Bringing in IPPs is huge,” agrees Steve Sawyer, secretary general of the Global Wind Energy Council (GWEC). “It could transform international investors' attitude to the whole of East Africa, if it actually happens.”

Photograph | Goldwind

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Vestas close to sealing 2.2GW MoU with Egypt

CHRISTOPHER HOPSON

Vestas has confirmed it is close to securing a landmark agreement with the Egyptian government that could see it supplying 2.2GW of wind turbines to the North African country.

“Once we get this memorandum of understanding (MoU) signed with the government it initiates a new phase in the closer co-operation with the Egyptian authorities which we believe could lead to multiple turbine orders with the potential of up to 2.2GW,” spokesman Michael Zarin tells *Recharge*.

Vestas chief executive Anders Runevad has recently visited Egypt to advance negotiations with an MoU expected to be signed imminently.

“In the MoU I am quite certain there will be lots of discussion about creating ‘local value’, which



Vestas turbines at the Zafarana wind farm in Egypt

can be done in different ways such as building supply chains and providing training for local workers.”

Reuters reported that Denmark’s energy minister, Lars Lilleholt, also visited Egypt with

the intention of helping to seal the deal. “The Danish energy ministry is providing us with a great deal of political support for the co-operation with the Egyptian government,” Zarin adds.

The Egyptian government first

confirmed it was in talks with Vestas in April.

A number of major renewables companies have signed deals to invest in Egypt in recent months, including China’s TBEA SunOasis and Saudi Arabia’s ACWA Power.

Last summer, Siemens signed a deal with the Egyptian government that will see it build €8bn worth of energy infrastructure in the country, including 2GW of wind capacity and a rotor blade factory for turbines. Siemens also plans to open a blade plant in Morocco next year after winning a concession in the country.

Egypt hopes to generate 20% of its power from renewable sources by 2022, massively increasing the role of wind, solar and hydropower. The government is attempting to modernise its power system, which is currently dominated by fossil-fuel generation. □

Photograph | Danish Wind Industry Association



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Eno launches 4MW machines

BERND RADOWITZ

German wind turbine manufacturer Eno Energy has joined the ranks of companies introducing 4MW turbines, after unveiling upgraded machines at WindEnergy Hamburg.

From mid-2017, Eno will offer its 114 and its 126 models in a 4MW version for IEC IIA wind locations. The manufacturer, based in Rostock, northern Germany, currently only supplies those machines as 3.5MW turbines.

The upgraded models will have an up to 7% higher energy yield than their 3.5MW cousins.

“After the completion of the 0-series of the Eno 114 3.5MW and an evaluation of all measurements, it quickly became clear to our development division that there are still yield reserves in the machine that could be used



An Eno technician at work

relatively soon,” says Robin Ahrens, head for development at Eno Energy.

Eno’s much larger rivals, Gamesa and Enercon, already

offer 4MW turbines.

Eno is also widening its range of turbine towers and will increase its offer of steel towers for the Eno 126 with a 97-metre version. □

Siemens signs 200-turbine onshore deal

BERND RADOWITZ

Siemens signed a framework agreement at WindEnergy Hamburg yesterday for the supply of at least 200 of its direct-drive onshore turbines with wind developer Ventotec that will likely boost the industrial giant’s hitherto low market share in Germany.

As the company’s direct drive machines all have more than 3MW in capacity, the deal represents an order volume of well more than 600MW, spread out over the next eight years.

Siemens will supply at least 35 units per year to Ventotec, which plans to use the machines for around 40 new wind farms to be built in eastern Germany. The deal comes with a 20-year service agreement. □

Photograph | Eno Energy

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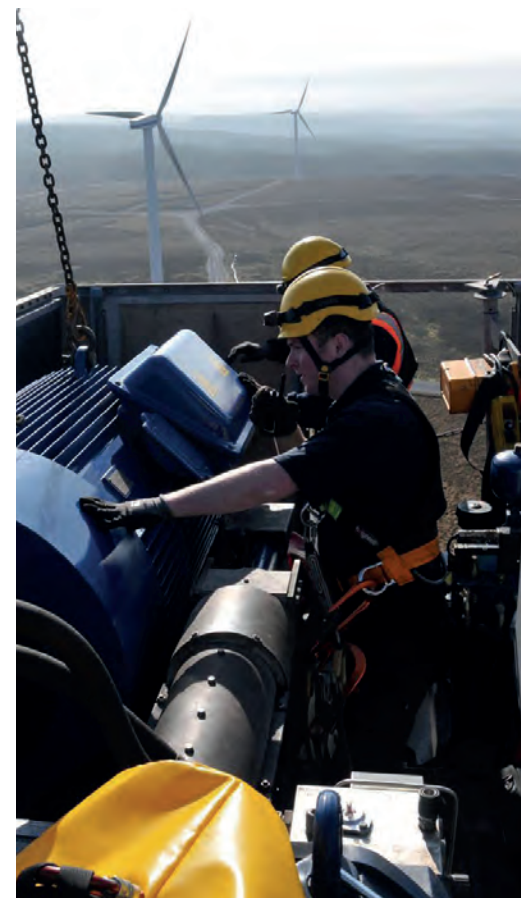
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A2Sea's *Sea Installer* installs the first 8MW turbine — Vestas' V164-8.0MW — offshore at the Burbo Bank Extension; inset: Jens Frederik Hansen

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A2Sea boss eyes 10MW giants

BERND RADOWITZ

Offshore contractor A2Sea is preparing to build a new generation of installation vessels to carry machines larger than 8MW, A2Sea chief executive Jens Frederik Hansen tells *Recharge*. “At some time around 2022, I guess we will be looking at

said jack-up vessels in the next decade will need to be able to lift up to 1,500 tonnes and have a free deck space of up to 6,000 square metres.

Although the installer is jointly owned by Dong Energy and Siemens, which has said it plans to build 10MW-plus turbines, neither Siemens nor any other turbine manufacturer has disclosed information on its future machines.

“It’s still early days for the commercial use of the next generation of turbines. It will be in the early

2020s. We have time to both define and deliver our new best product.”

Looking into the nearer future, Hansen says there is no bottleneck of available vessels for 7-8MW turbines in the coming years — even considering the construction start of new projects off the Dutch, French

and possibly Belgian coasts.

“We are seeing projects already being procured for 2017, 18, and 19. There are contracts with vessels available, so I don’t see any problems there,” he says. “France is still talking about installing turbines, but that will only be in 2019 or 20, and I think there will be vessels for that as well.”

Vying for a share of the market outside Europe, A2Sea has sub-chartered the *M/V Torben* from a Chinese company (the vessel previously had been used by RWE in Europe) for the installation of the 8MW Formosa 1 pilot project in the Taiwan Strait, using two Siemens 4MW turbines.

“These are basically demonstration turbines. We are also looking into how we can make it possible to participate in the extensions coming in 2019 and forward,” Hansen says.

Project owner Swancor plans to boost the demonstrator to a 128MW wind farm. Last year, the Taiwan government raised its offshore wind installation target

At some time around 2022, we will be looking at turbines of 10MW or larger

turbines of 10MW or larger. That is what we are excited to see the requirements for,” he says.

“I think we will need new ships for these. But it depends on the lifting heights and weights, which we don’t know yet. A detailed assessment will have to take place.”

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Bernd Radowitz asks Global Wind Energy Council secretary-general Steve Sawyer about the new hotspots in the global wind industry

Wind power in emerging markets is diversifying and moving towards new hotspots. Which ones in particular are of interest to GWEC? We went through a prioritisation process last autumn. As things appeared to be moving in Argentina, in the run-up to the election there, we put a bet that the right guy [current president Mauricio Macri] would win and that we would have an opportunity — and we have. So that's where most of our effort is focused at the moment. But at the same time, the next two down the list...are Iran and Vietnam.

Iran, because it's a country at a turning point, rejoining the global community and recognising what its economists have been telling it for a long time: that it needs to diversify its energy supply, it needs to conserve its oil, it has to prolong the income that it can generate from oil for as long as possible, with the idea that it would need a transition away from it.

Iran is close to Europe; it could potentially interconnect with lots of other countries. It has a tremendous wind resource and a very large, well-educated technological class. So it would be a perfect place. And its capital city is choking in horrible pollution and smog.

Of course there are [remaining]



The next big emerging wind markets

difficulties with Iran and its neighbours, and Iran and the West.

What prospects do you see for wind in Iran for the next couple of years? Well, I'm hoping [to see] the first couple of commercial projects. They have a small indigenous [turbine OEM] industry. But I know Gamesa, Vestas, Siemens [and] GE have been going in to try to get contracts to move forward

with large, modern machines.

Everybody I've seen from Iran in the last five years or so, they're desperate for me to help them figure out how to get parts. Due to the US-led sanctions, they've been prevented from getting parts for their existing machines, never mind putting in new ones.

And what about Vietnam?

Vietnam is a large, rapidly growing economy [with a] long coastline, lots of good wind

resources. They desperately need the power. Their ability to exploit their hydro is coming to an end.

Vietnam is difficult, as it would be in Iran or anywhere else, in terms of dealing with a transition away from a centrally planned economy, where everything about the power sector is owned by the government. There is an effort to change that in Vietnam, although it is not universally supported. Between each party congress, it goes back and forth. ☐

Photography | Jason Bickley/WindEurope

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