

EWEA OFFSHORE COPENHAGEN 2015

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Offshore sales take Siemens to top spot

BERND RADOWITZ
DARIUS SNIECKUS
ANDREW LEE

SIEMENS has knocked Vestas off the top spot for the first time in MAKE Consulting's rankings of the world's top wind turbine manufacturers, thanks to its dominant offshore share.

Commenting on the annual *Global Wind Turbine OEM Market Share* study, MAKE partner Steen Broust Nielsen says: "Siemens jumped to the pole position in 2014 by maintaining a strong, well-diversified regional footprint, and, more importantly, by dominating the increasingly important offshore sector."

Globally, Siemens captured first or second position in 80% of the markets it engaged in, resulting in an

increase of 3.6 percentage points in its annual combined offshore and onshore market share, taking it from 7.2% to 10.8%.

Danish rival Vestas fell two places to third, with GE taking second spot in the MAKE rankings.

The consultancy — which produces one of the industry's most eagerly awaited OEM league tables — says Vestas' decline was "primarily because of a large volume of turbines delivered to the US market, which were not grid-connected in 2014".

"Nonetheless," MAKE adds, "the Danish turbine OEM maintains a commanding lead in global cumulative grid-connected capacity."

GE's leap from fifth in 2013 to runner-up last year reflected the continued importance of the Americas, with the connection of previously erected capacity in Brazil proving a boon to the US company.



Siemens was buoyed last year by its offshore installations

Photograph | Paul Langrock/Siemens

Goldwind fell from global number two to fifth on the MAKE list as Chinese rivals such as Ming Yang and United Power ate into its domestic sales.

"The growth of offshore in the short

to medium term is an all-European story with the overweight of installations in the coming years," says Nielsen, "but we expect from 2017,

Continued on page 2

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Boost for Senvion's big beast

BERND RADOWITZ

THE most powerful offshore wind turbine in serial production has been upgraded to boost energy yields by as much as 20%.

The prototype of the new Senvion 6.2M152 — a 6.2MW monster with a 152-metre-diameter rotor — has successfully completed its initial test phase at an onshore site at Langen-Neuenwalde, near Bremerhaven, northern Germany.

“We are making the most powerful turbine in series production to date [the 6.2M126] even more efficient,” says Senvion chief technology officer Russell Stoddart. “We know how to lower the power-generation costs while also ensuring increased yield.”

The 6.2M152 — which flies 74.5-metre SSP Technology blades — can increase energy yield by up to 20% at wind speeds of 9.5 metres per second compared with the 6.2M126, the company says.

Senvion's new model will be jockeying for position with established, like-sized rivals: Siemens' SWT-6.0-154 turbine, which is being installed at Dong's 210MW Westermost Rough wind farm in the UK North Sea; and Alstom's 6MW Haliade 150, which is spinning off Belgium at Belwind, in anticipation of 1.5GW of orders for French projects.

After a damaging lull in offshore



The prototype 6.2M152 being installed near Bremerhaven

orders, Senvion bounced back in February with the sale of 18 6.2M126 turbines to WPD's 111MW Nordergründe offshore project in the German North Sea. The manufacturer is also

waiting for German utility RWE and Canada's Northland Power to announce the results of a retendering of the 332MW Nordsee 1, for which Senvion had previously been pre-selected. ☐

Dong may follow E.ON's fossil-fuel spin-off

ANDREW LEE

OFFSHORE wind pacesetter Dong Energy confirmed it is “investigating different scenarios” after a report that it might spin off or sell its oil and gas exploration and production (E&P) operation.

Dong — the world's biggest offshore wind developer, with plans for 6.5GW by 2020 — has hired JP Morgan to help look at its options ahead of a potential initial public offering, as flagged up in early 2014 when Goldman Sachs and others invested DKr11bn (€1.48bn) in the Danish company.

Dong said yesterday: “The process is still at an exploratory stage and is not expected to be completed before the second half of 2015. At this point, different scenarios are being investigated, but no decisions have been made.”

E&P and wind sit alongside thermal power and the distribution and sales business in the company's portfolio. The oil and gas unit accounted for 52% of Dong's operating profit in 2014, with wind bringing in 37%.

Last year, German utility E.ON unveiled plans to split its renewables and conventional generation businesses into two companies.

Offshore sales take Siemens to top spot

From page 1

China — and Asia more generally — is set to lead the global growth in offshore wind in a significant way.”

MAKE's analysis is at odds with earlier preliminary rankings by FTI Consulting — which had Vestas top and Siemens second — as well as market analyst IHS.

MAKE's figures are based on grid-connected capacity, with the exception of China, which is analysed on the basis of installed capacity. By contrast, IHS calculates market shares according to turbine shipments, regardless of connection status. That methodology probably

explains the difference in the rankings (see tables, right).

“Competitors closed up on Siemens last year. This was due to a near halving of the vendor's offshore wind shipments, but also pick-up in activity by competitors,” IHS senior analyst Magnus Dale tells *Recharge*.

Still, Siemens retained its lead in the global offshore market, with more than one third of all shipments. “But competition was tight as vendors like MHI-Vestas Offshore Wind, Areva and Senvion also saw substantial shipment volumes last year,” Dale says, adding that significant traction for

MHI-Vestas' V164-8.0 machine brings Vestas back into the game.

Siemens has an ace up its sleeve this year. The German offshore market is booming, with 2GW in grid-connections expected off its North Sea and Baltic Sea coasts in 2016. Siemens commanded an overwhelming 89% in its home market in 2014.

But other regions will soon make their mark in offshore wind. In particular, China will shape the market in the short and medium term, IHS believes. Last year, the Chinese market produced less than 150MW in shipments, of a 1.8GW global market. ☐

Top 10 turbine OEMs in 2014

- 1 Siemens
- 2 GE
- 3 Vestas
- 4 Goldwind
- 5 Enercon
- 6 United Power
- 7 Gamesa
- 8 Ming Yang
- 9 Envision
- 10 XEMC

Source: MAKE Consulting

- 1 Vestas
- 2 Siemens
- 3 Goldwind
- 4 GE
- 5 Enercon
- 6 Suzlon
- 7 United Power
- 8 Gamesa
- 9 Ming Yang
- 10 Envision

Source: IHS

Photograph | Senvion

CHRISTOPHER HOPSON

THE offshore wind industry must shed 26% of its capital and operating costs to become “highly competitive” with gas, coal and nuclear by 2023, according to a study commissioned by EWEA.

The Ernst & Young study, *Offshore Wind in Europe: Walking the Tightrope to Success*, highlights four “key actions” to reduce costs:

- Deploying larger turbines to increase energy capture (a 9% saving);
- Encouraging greater competition (7%);
- Commissioning new projects (7%); and
- Tackling supply-chain challenges (3%).

The report expects the sector to have nearly reduced the levelised cost of energy to €100 per MWh by 2020, by which time cumulative installed capacity in European waters is expected to have tripled to 23.5GW. The cost could be reduced to €90/MWh by 2030, so long as a continual stream of new projects come on line, the study adds.

Photograph | Ulrich Wirrwa/Stiemens



Offshore's four steps to match fossil fuels

Commenting on the report, EWEA chief executive Thomas Becker says: “As much as we need politicians to come on board, it’s also up to the industry to deliver on our commitments. It’s no secret that cost reduction is a great challenge that we face in the

offshore business; but as we continue to work together, innovate and compete, the sector will face down its trials in the years ahead.”

The study points out that there is no policy framework in place to meet the EU’s targets of 27% renewables and a 40% cut in

greenhouse gas emissions by 2030. But if the suggested actions in the report are followed, it says, offshore wind could reach almost 65GW by 2030 — more than 25% of European power generation. ☑

JOINT DECLARATION FOR A UNITED INDUSTRY: Pages 14-15



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Industry closing in on cost targets

DARIUS SNIECKUS

THE cost of offshore wind power off Britain has dropped by almost 11% since 2011, putting it on track to reach the government's target of hitting £100 (€138) per MWh by the end of the decade, according to UK industry body the Offshore Renewable Energy (ORE) Catapult.

Figures in its *Cost Reduction Monitoring Framework (CRMF)* study, produced with UK seabed landlord the Crown Estate, show the levelised cost of energy (LCoE) from offshore wind has been whittled down from £136/MWh three years ago to £121 for projects moving to construction between 2012 and 2014.

The fall in LCoE is attributed in large part to developers' early uptake of 6MW turbines to replace standard 3MW machines.

"Larger turbines are central to cost-reduction," says Chris Hill, ORE Catapult's innovation, engineering and programme director. "But there are other elements that are influencing projects' LCoE too — extended utilisation of monopiles, the XLs, is another example.

"The industry's original cost projection suggested we would have moved on to more expensive jackets and gravity base foundations, but better engineering and site selection have meant we can continue to use larger monopiles for many more projects in the near term."

O&M — calculated to make up 20-25% of an offshore project's total cost — is an area where there is "real potential" to cut



O&M is one area where costs could be cut further, according to the ORE Catapult report; below: Chris Hill

expenditure. "O&M can be reduced by several percentage points. However, again it comes back to the bigger turbines that are being installed — fewer individual operations to erect generating units, economies of scale, greater efficiencies and operational strategies," says Andy Lewin, senior project manager at ORE Catapult.

Publication of the CRMF numbers came as the UK announced Contracts for Difference (CfD) support for the 714MW East Anglia Zone 1 and 450MW Nearth na Gaoithe wind farms.

"The [CRMF]

and today's auction results are welcome evidence of the progress on cost reduction being made by the offshore wind industry," says energy minister Matthew Hancock. "We've created the right conditions for significant levels of investment and are now seeing costs come down towards the target of £100/MWh — and with the potential to go further still."

The report nonetheless cautions that it is far from a job done. "Continued innovation and cost reduction depends on the scale of growth planned for the sector [and] while progress has been

made in the face of a reduced deployment outlook, it is not safe to assume that the supply chain will continue to invest in the required technology innovations if the size of the market is not sufficient," say the authors.

ORE Catapult chief executive Andrew Jamieson notes: "Our CRMF report not only demonstrates excellent progress made in just a few years in making offshore wind a more cost-competitive, sustainable, secure source of energy, but also illustrates the technology innovations and efficiencies required to deliver the targeted £100/MWh.

"Significant challenges lie ahead for the entire industry, and continued progress will require ever greater collaboration between industry, government and academia."

The CRMF report, for which data and analysis were provided by Deloitte and DNV GL, was commissioned last year by the UK's Offshore Wind Programme Board at the request of industry leaders and government.

Among the report's recommendations are: "clarity" on the government's ambitions for the build-out and future scale of offshore wind generation; support to speed development of new technologies for deep-water projects; and more focus on standardisation of key wind farm components, such as substations.

"Speak to anyone in the industry and they will tell you 'clarity' is what is needed beyond 2020," states Hill. □



Photography | Siemens | ORE Catapult

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MPs call for seven years of CfD visibility

**CHRISTOPHER HOPSON
ANDREW LEE**

A PARLIAMENTARY committee wants the next British government to urgently clarify the long-term pool of money available to support renewables, giving investors at least seven years' visibility.

The House of Commons Energy and Climate Change Committee, headed by Conservative Member of Parliament Tim Yeo, says uncertainty over the future size of the Levy Control Framework (LCF) — the overarching funding mechanism for renewables support — risks creating a “difficult landscape for investors”.

The framework guides the funds available under the new Contracts for Difference (CfD) support mechanism for renewables, which announced the results of its first auction last month.

The issue was raised by industry representatives with the committee during its inquiry into



the Electricity Market Reform (EMR) process.

The committee's report on EMR cites developers' fears that the current LCF pool, which runs until 2021, could already be largely taken up by projects awarded early CfDs, and that the arrangements beyond that date are unknown in the run-up to the national election in May.

The report urges the current government to offer more guidance on the funds available under the framework, and it wants the next administration to clarify the future of the LCF beyond 2020-21 as soon as possible after the 7 May election.

“Rolling forward projections of LCF funds should be published annually thereafter, so that

investors are always able to look at least seven years ahead to make their investment decisions,” it adds.

Committee members also raised concerns that the UK's mechanism for back-up power supplies is skewing the market in favour of fossil-fuel capacity, and voiced reservations about the role of network operator National Grid in the process. ☒

Photograph | Lawrence OP



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[siemens.com/energy/sov-story](https://www.siemens.com/energy/sov-story)

ANDREW LEE

VATTENFALL remains strongly committed to the UK offshore wind sector and is looking at options to add to its portfolio there, the Swedish utility's sector head in the country, tells *Recharge*.

Andy Paine, Vattenfall UK's head of offshore wind development, spoke days after the company revealed it will sell its 50% share in the East Anglia One (EA1) offshore wind project to partner Iberdrola.

Paine says the project schedule of EA1 — which was last month awarded Contracts for Difference (CfD) support for 714MW in the UK's first competitive renewables auction — “wasn't quite right” for Vattenfall.

The day after EA1 received its CfD and the Swedish company announced its exit, it emerged that Vattenfall had won the concession to build the 400MW Horns Rev 3 wind farm in Danish waters. Both projects are due to enter service by 2020.

Paine insists that the two events shouldn't be seen as indicating any shift of focus from one part of Europe to another.

“As a business we always look at our portfolio and optimise it against the level of commitment we can make.”

He says the group remains fully engaged in future development plans with Iberdrola for the 7.2GW East Anglia zone, including the EA3 project, which is next on the agenda for the partners.

As well as planning the next step at East Anglia, Vattenfall is currently building the 50MW Kentish Flats Extension project in southern England and trying to advance the European Offshore Wind Deployment Centre (EOWDC) in Aberdeen Bay, Scotland, despite the best efforts of US tycoon Donald Trump.

Paine says Vattenfall is “looking at options to develop our portfolio” in the UK, where it already operates 540MW offshore at projects such as Thanet and Ormonde, as well as running a significant onshore wind business.

“We have a number of opportunities we are pursuing. A key part of that will be the later projects in East Anglia.”

Paine hails the awarding of the

The DanTysk wind farm off Germany, which is 51%-owned by Vattenfall



Vattenfall ‘committed’ to UK offshore despite East Anglia One exit

CfD to EA1 as a “tremendous signal that the East Anglia zone is the place for large-scale Round 3 projects to happen”.

The attraction of supply-chain partners to the region and the synergies in areas such as O&M should create a virtuous circle that helps fuel cost reduction for later projects in the zone, he says.

EA1 won its CfD with a price of £119.89 (€165) per MWh, taking it “down the cost-reduction curve” towards the UK industry's target of £100/MWh by 2020.

Paine believes that goal is achievable. “Costs are coming

down, probably faster than we thought in the industry,” he says.

And he claims the UK remains an attractive place for offshore wind development, despite fears

|| The project schedule of East Anglia One wasn't quite right for Vattenfall

among some in the industry that the CfD process — which awarded the offshore sector a total of 1.16GW in the first round — will constrict opportunities.

“It's all a matter of getting your costs down,” Paine says. “If your project is cheaper in cost than the

next projects you stand a better chance in the auction. That's a position everyone in the sector has signed off on.”

More widely, Paine says Vattenfall's offshore wind team is upbeat about the prospect for renewables development under Magnus Hall, who was named chief executive of the state-controlled group in May last year. Hall — and the Swedish government — have said Vattenfall will move decisively in the direction of clean energy, with a new dedicated business area set up to drive forward its wind activities.

“There's no question about our commitment to this sector [offshore wind] and we see the UK as a key part of that,” Paine says. ■

Photograph | Vattenfall

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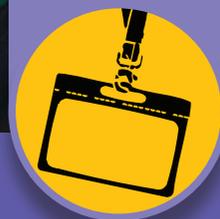
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HAPPENING TODAY

Conference sessions: Top picks

HARDtalk with a united industry: Will you deliver?

11:45-13:15 (Auditorium: A10, A11, A12)
The host of the BBC's HARDtalk programme, journalist Stephen Sackur, will exercise his "hard talk" questioning in this session as he challenges a panel of industry leaders on how they will deliver on cost reduction. Find out more about a joint declaration for a united industry to achieve cost reduction, what is needed from policy-makers and what the societal and economic benefits are.

Turbine technology: Fixed to the seabed

14:30 - 16:00 (Room A10)
The fascinating topic of offshore wind turbine substructures — from fixed-bottom to floating. Learn how foundations will look for ever-larger turbines at increased water depth, some of their design drivers, and the impact that this will have on cost reduction.

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10-12 March
Choose from a series of thematic boat tours and visit the Middelgrunden offshore wind farm. For more information, visit www.ewe.org/offshore2015 or enquire at the registration desks.

Opening reception

From 18:30
(Danish Pavilion in Hall E, followed by a party in Hall B)
Join your fellow participants to celebrate the end of a successful first day and experience the business value of social networking over drinks and a light dinner.

Tuesday 10 March



SIDE EVENTS

Speakers' corner

10-12 March (Located in Hall A)
Hear first-hand from companies on their latest activities

Opportunities in UK offshore wind

10:00-12:00 (Meeting room 16)
Learn how you can supply to the UK's 258MW Burbo Extension offshore project

EERA-DTOC: New design tool for offshore clusters

14:30-16:30 (Meeting room 7)
Hear about the latest research in offshore wind farm cluster planning

Offshore HSE training: Room for improvement?

15:30-17:00 (Meeting room 20)
Join a discussion on current developments in offshore HSE training

Niedersachsen: Invest in the German Coast

16:00-17:00 (Room 5: Press Conference Room)
Niedersachsen's Minister for Economic Affairs shares what Germany's coast has to offer

DON'T MISS TOMORROW

Supply-chain panel debate

9:00-10:45 (Auditorium: A10, A11)
Join industry thought leaders as they gather to set the agenda for the future of offshore wind. Hear from Latvian Minister for Economics and chair of the European Union Energy Council, Dana Reizniece-Ozola, and Irish Minister for Skills, Research and Innovation, Damien English, before the discussion begins.

Boat Tours

Falck Safety Services will be leading tomorrow morning's boat tour to the Middelgrunden offshore wind farm with a discussion of lessons learned and ways to improve offshore health and safety. The group will leave the Bella Center at 9:15. For more information, enquire at the registration desks.

Joy and concern after two offshore projects win CfDs

ANDREW LEE

TWO offshore wind projects totalling 1.16GW were among 2GW of capacity offered Contracts for Difference (CfDs) under the UK's first competitive auctions for renewable-energy support.

The offshore projects offered CfDs were the 714MW East Anglia One (EA1), being developed by Iberdrola and Vattenfall off England's east coast, and the 448MW Neart na Gaoithe planned in Scottish waters by developer Mainstream Renewable Power (MRP).

The CfD auctions mark a new era for renewables support in the UK and will replace the existing Renewables Obligation mechanism, which starts phasing out next year.

The offshore projects came in at £119.89 (€164.70) per MWh for EA1 and £114.39 in the case of Neart na Gaoithe, against an administrative strike price of £140/MWh.

Immediately after securing the CfD, Iberdrola announced that it will buy the outstanding 50% stake in EA1 from Vattenfall and continue as sole developer of the project. Iberdrola's UK unit,

ScottishPower Renewables (SPR), says it may still expand the project up to its full consented size of 1.2GW by bidding for more support in future CfD rounds.

SPR says it "has been able to bid at a price that is lower than anything previously seen in large-scale offshore wind thanks to the engineering, procurement and operational efficiencies that have been introduced in to the project".

EA1 will see up to 100 turbines deployed in the North Sea at a cost of about £2bn, supplying power for about 500,000 homes.

SPR plans to start construction in 2017, with the first turbines installed by 2019 and full operations the following year.

SPR chief executive Keith Anderson says: "It signals a major industry breakthrough in efforts to reduce the costs of offshore wind. ScottishPower Renewables has been leading efforts to drive down costs for many years, and we delivered considerable efficiencies in the recent construction of West of Duddon Sands."

Vattenfall says it will continue to work with Iberdrola on other

The 389MW West of Duddon Sands project, co-owned by ScottishPower Renewables and Dong Energy

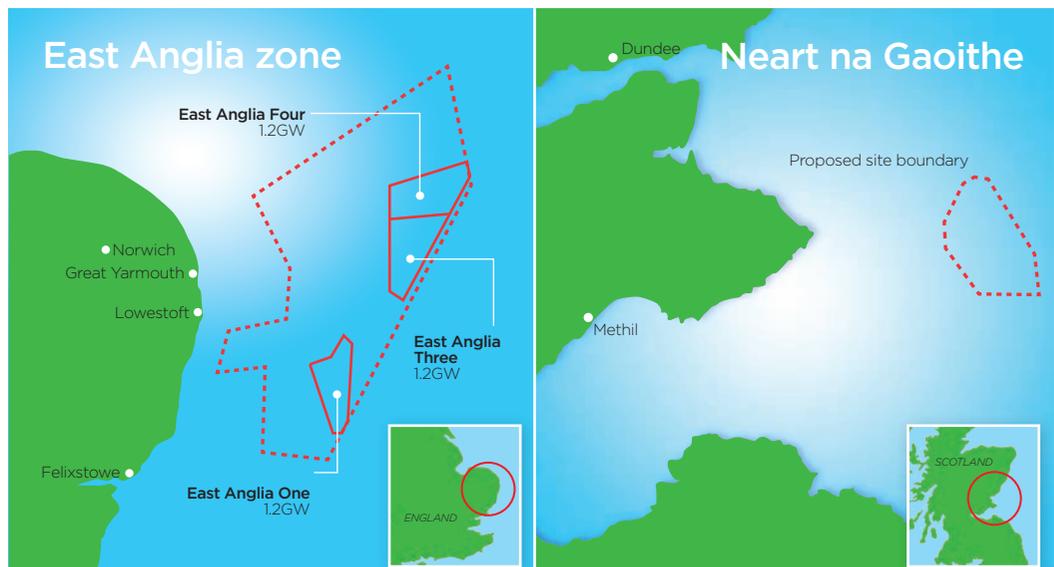


projects in the UK's giant 7.2GW East Anglia zone.

Neart na Gaoithe's CfD success meant Scotland avoided an offshore wind lock-out.

MRP expects to make a final investment decision on the project in the first quarter of 2016, with the wind farm operational by 2020.

MRP — which plans to use Siemens 6MW turbines at the project in the Firth of Forth — says: "What's unique about this



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project is that it will be the first time a UK offshore wind farm of this scale will be built using project finance alone.”

There had been fears in Scotland that the country might miss out entirely on a share of offshore wind support in the first round.

But while MRP celebrated, there was no CfD for the 1.1GW planned by Moray Offshore Renewables, a joint venture between Portugal’s EDP Renováveis and Repsol of Spain, or for the 784MW Inch Cape, also planned by the Iberian duo.

Scotland’s government immediately voiced fears that the CfD process would be unable to give the Scottish sector the momentum it needs.

“It is now clear that the future budget for offshore wind is unlikely to support Scottish ambitions to develop an industry,” said a government statement. “Only one Scottish offshore wind farm received a contract, while two major offshore wind farms were refused — leaving

uncertainty over their future development.

“The UK government must act immediately to provide confidence to the offshore wind industry, ensuring there



RenewableUK's Maria McCaffery

is sufficient budget allocated to auctions to deliver the large-scale deployment and cost reduction that we have seen in onshore wind.”

That call for visibility is echoed by industry body RenewableUK,

which says the “highly competitive prices” achieved in the auction showed the cost-reduction progress being made by offshore wind as it chases its 2020 goal of £100/MWh.

RenewableUK chief executive Maria McCaffery says: “It is vital that the new government [to be elected in May] moves quickly to clarify process around the next awards [in the autumn].

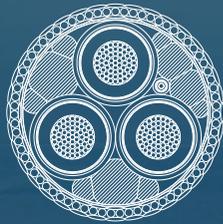
“A level of certainty about both immediate future allocation rounds, but also the long-term vision of decarbonised electricity, and the support needed for it, will ensure projects keep coming forward, at the right price.”

The developers offered 15-year contracts under the first CfD round must now sign final agreements with the UK’s Low Carbon Contracts Company, which administers the system for the government.

In total, 27 projects, including onshore wind, PV, bioenergy and energy-from-waste schemes, were awarded contracts worth more than £315m. □

Photography | Iberdrola | RenewableUK

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DARIUS SNIECKUS

THREE of the biggest players on the European offshore wind stage — Danish developer-utility Dong and turbine makers MHI-Vestas and Siemens — have taken the extraordinary step of putting their names to a document intended to unify the sector at a critical point in its history. Top of their *Joint Declaration for a United Industry*: cost reduction.

Screwing down the cost of technology, construction and operation of wind farms to a levelised cost of energy (LCoE) under €100 (\$116) per MWh — at deeper-water, far-from-shore projects — would put fresh winds in the sails of a sector that is closing in on grid parity with conventional fuels.

Cost-reduction comes in many guises. Dong's executive vice-president for wind, Samuel Leupold, acknowledges the important contributions coming from technology development, project financing and O&M, but thinks the industry should first be taking aim at a far more fundamental target — location.

"We keep preaching internally that site selection is key — finding more suitable development sites to drive costs down," says Leupold. "There is no doubt that many sites being built out in the past were not ideal in terms of wind speeds and seabed conditions, and too small in terms of economies of scale.

"In this regard, our industry has to become normal: like all other power-generation technologies, if you build a gas-fired power plant or a hydropower dam in the wrong place, it will not be cost-competitive."

Leupold points to the 4.2GW Celtic Array project, which Dong handed back to the UK government last summer after coming to the conclusion that seafloor geology would have made much of the giant Irish Sea wind zone uneconomic by forcing the developer to opt for a high-cost one-off foundation design.

He adds that developers must move beyond thinking about 200-250MW projects and scale up their ambitions to "minimum 600MW" projects in order to capitalise on economies of "building big".



Three wise men with the knowledge to cut costs

"It is still the governments that are determining where and what size the development zones are. We need to turn that around so the industry, which has the specialists, has a greater influence to say which are the most suitable sites," says Leupold.

Larger-scope development zones, he stresses, will call for bigger "integrator" developers such as Dong, which has a risk-absorbing offshore asset base of some 6.5GW planned by the end of the decade.



Siemens' Michael Hannibal

"At Dong we have the advantage of doing it [developing offshore wind farms] as the integrator controlling a multi-contract approach with the overview over all the interfaces — and this is how we believe we can really minimise the risk.

"Ultimately, the industry will need to see this from more players to do this risk absorption. You would expect to see more of this from contractors as well as larger developers and consortia."

The turbine is the heart of



Dong's Samuel Leupold

every offshore wind farm — but not in the way that it is onshore. And this resonates in the cost-reduction formula. The larger-rotor machines designed for the maritime wilds off Europe are something of a double-edged sword: higher nameplate capacity helps "tremendously" in bringing down the CoE by boosting output with fewer units and less interarray cabling, but introduces new risk for being not-yet-field-proven technology — "so on balance," queries Leupold, "is this bringing down LCoE, yes or no?"

Moreover, as MHI-Vestas chief executive Jens Tommerup underlines, "unlike onshore wind, the cost of the wind turbine is a proportionally smaller cost of the total CoE of an offshore wind-power plant".

"One concrete area where MHI-Vestas is focusing on to reduce the CoE is building a bigger turbine; massively increasing the amount of energy captured from the wind and hence increasing power output while maintaining a high level of reliability and



Siemens SWT-6.0-120 turbines being installed by A2Sea at Gunfleet Sands 3

serviceability,” says Tommerup. “But it is extremely important that CoE reduction is considered from a holistic approach. We are committed to building powerful partnerships across the industry in order to drive down the cost of offshore wind — through partnerships with our customers, suppliers, financiers and policymakers.”

As a company “born out of collaboration and partnership”, MHI-Vestas has been formed with expectation of “consolidation of the industry moving towards fewer but stronger players, [which] will significantly increase competition and continue to drive down CoE”, says Tommerup.

The “advanced partnership” deal struck in 2012 by Dong and MHI-Vestas has been central to speeding

the 8MW V164 machine to market — the utility was looking over the OEM’s shoulder through testing of the proto-turbine at the Danish national test centre at Østerild, and late last year placed a lead-off order for 32 units for its 258MW Burbo Bank Extension project off western England.

“That discussion [with the OEM], getting it started early and achieving a holistic approach in trading off executive risk with developing innovative technology that can drive cost down to find the optimal balance between the two, was central to moving this project forward,” says Leupold.

Dong also has a similar relationship with Siemens and its 6MW SWT-6.0-154 machine.

“MHI-Vestas and Siemens know that just as we cannot live with one turbine supplier, nor can they live with only one customer,” adds Leupold. “It is important in the industry that you trust your partner but you need competition because this leads to innovation and further cost reduction.”

For the European offshore sector to flourish to full industrialisation, Siemens Wind Power chief executive Michael Hannibal

As turbines get larger, it is not enough just to build the components larger

concur that partnerships “could not be more important — because we need a sustainable market, and that means partnering with customers and our suppliers to jointly get it there”.

“Among the learnings we made on the SWT-6.0-154 was that you



MHI-Vestas
Jens Tommerup

need to engage with your suppliers as early as possible so that they know exactly what to supply and when to ramp up production. As turbines get larger, it is no longer enough just to build the components larger. You need an

even closer and more aligned view together with your suppliers.”

The 6MW turbine, in operation off the UK at Dong’s Gunfleet Sands 3 and Westermost Rough,

is cited as a fruit of this partner-driven cost-reduction tactic, with the machine being upscaled as a 7MW-plus model, as a “lever” to trim costs by boosting CoE.

“This way, you take a fully bankable product and with some minor tweaking get more AEP

[annual energy production] for the future,” says Hannibal.

Winning the argument with Europe’s governments as to the long-term potential economics of offshore wind is important and by no means guaranteed.

“Nations bordering the North Sea would have access to a constant and reliable energy source that will enable them to meet their respective carbon targets,” says Tommerup.

“And they have an industry that is committed to and has in fact historically been very successful in cost reduction.

“All we need in return are stable, long-term policies that enable the sector to grow at the scale necessary in the offshore industry to drive down the cost of energy to under €100/MWh.” □



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Prime Minister
Stefan Löfven

“ A staggering 2.34GW of offshore projects have been consented

Sweden plans to unblock frozen projects

BERND RADOWITZ

SWEDEN is getting serious about setting up a viable support system for offshore wind that could unblock gigawatts of already licensed projects in the Baltic Sea as early as next year.

After overcoming a budget crisis in December via a compromise with the main conservative opposition, Prime Minister Stefan Löfven's Social Democrat-Green minority government has given the Swedish Energy Agency the task of coming up with a viable proposal for a support system by June.

The government would then present a proposal in parliament about six months later, Lise Nordin, Green Party energy spokeswoman and Member of Parliament, tells *Recharge*.

“The parties and government need time to look into and weigh up the pros and cons in the material presented by the energy agency,” Nordin says. “The most ambitious timetable for starting a new support system would probably be around summer 2016.”

Sweden has 212MW of offshore

wind up and running, but developments have been stalled for years as the current renewables support system, based on green certificates, is insufficient to justify the elevated construction costs of offshore wind.

The energy agency is analysing different types of support systems that would comply with EU state aid rules, says programme manager Maria Stenkvist.

The Green Party favours a tender-based system similar to that in neighbouring Denmark, while the state already provides grid access for offshore wind parks.

A staggering 2.34GW of offshore projects have been consented but not built due to the weak support system, Stenkvist adds. Another 5.7GW are in the application process, and a further 1.4GW in

early-stage development.

A viable support system for offshore wind will fit in well with the new strategic direction at Sweden's huge state-owned utility Vattenfall, which already has vast expertise in offshore and last month won a competitive tender for the 400MW Horns Rev 3 project off Denmark.

Vattenfall has a licence to build the 600MW Kriegers Flak 2 project in Swedish waters, while German developer WPD says it is ready to build the 265MW Storgrundet wind farm in the Bay of Bothnia.

“We have the wind, we have the areas. There are a lot of projects in the pipeline in Sweden,” says Hans Ohlsson, WPD Offshore's managing director for Sweden, adding that if Sweden were to get serious about phasing out nuclear power as well, offshore wind would come just in time.

Ohlsson warns, however, that current permits are running out in coming years — another issue that needs to be addressed by Stockholm. ☐



Green Party
energy
spokeswoman,
Lise Nordin

Dong eyes markets outside Europe

KARL-ERIK STROMSTA
CONCERNED that major European offshore wind markets may shrink or become increasingly unattractive after 2020, industry leader Dong Energy is quietly evaluating new markets.

For all its spectacular growth over the past decade, the offshore wind market remains highly concentrated in a handful of Western European countries. For a company like Dong, which expects offshore wind to remain significant to its business for decades to come, that concentration presents a worrying level of risk.

“In Europe, in general, we face a lot of uncertainty on how it goes post-2020,” Matthias Bausenwein, Dong’s head of market development for wind

power, tells *Recharge* in Tokyo. “There is growing uncertainty in the established markets, which makes it necessary to look beyond [them].”

Across Europe, offshore wind developers will increasingly be subjected to auction systems. Several important European markets, like France and the Netherlands, have medium-term targets for offshore wind but nothing in place for the long term. In all markets, offshore wind will face stiff competition from gas-fired plants and other renewables, including PV. Add to the mix the intense political pressure the European offshore wind sector will be under to reduce its costs, and projects may be less profitable in the future.

Given Dong’s central role in the global offshore wind market —



Installation of a suction bucket foundation at Dong’s Borkum Riffgrund project in the German North Sea

the company owns one third of the world’s operating capacity — Bausenwein’s comments serve as both a warning for the European market and a vote of confidence in nascent markets such as Japan and the US.

Pressed by *Recharge* to specify which new markets Dong is looking at, Bausenwein declines to comment. “I wouldn’t say we are far

enough [along] to disclose these.”

However, he says Dong will look primarily at three factors when deciding whether a market is worthy of investment — its attractiveness; accessibility; and its “cultural fit” with the Danish company.

“We are, in general, monitoring all offshore markets,” he says. “I think this is our obligation.”

Photograph | Dong Energy

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At the leading edge of blade protection



BladeShield gives five times greater protection, Blade Dynamics claims

DARIUS SНИЕCKUS

ULTRA-LONG wind turbine blade pioneer Blade Dynamics has outlined details of its new erosion-prevention solution, BladeShield.

The technology — based on a polymer membrane moulded into the blade's leading edge to retain an “aerodynamically accurate” aerofoil — has been shown in third-party tests to provide five-times greater resistance to damage from salt water, ultraviolet light and rain corrosion than conventional protection tapes.

“This technology has great potential to reduce wasteful O&M on blades,” says Blade Dynamics

head of sales and marketing Theo Botha. “Leading-edge decay with current technology is a very costly problem. High resistance to erosion, coupled with the airfoil accuracy that moulding the material into the blade brings, can achieve a 2-3% increase in average AEP [annual energy production], which is a huge step forward for the industry.”

Current liquid and precast tape protection solutions are improving, notes Botha, but they share the limitations of all “additive” solutions, which create thick, protective coatings that “actually reduce power output” by

Going long

Blade Dynamics is building a record-breaking 100-metre blade called the D100 — a slimline, modular model scoped for the coming 10MW-plus turbine designs. It is underwritten by £15.5m (\$24.9m) in funding from UK government/industry R&D body the Energy Technologies Institute's Very Long Blade project.

changing the aerofoil shape and affecting the surface roughness.

Protective tapes have been calculated to reduce AEP by up to 1.5% and liquid coatings by 0.7%, judged against a “clean” aerofoil.

As turbine rotors grow larger and blade tip speeds accelerate, “the impact forces that blade erosion materials have to withstand increases even faster”, Botha says.

BladeShield is currently only available built into Blade Dynamics' own blades, although variations are being developed that can be retrofitted on to other models and also used for *in situ* blade repairs. ☒

Photograph | Blade Dynamics

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The SOVs will add three hours of productive working time to a standard 12-hour shift

Siemens puts giant service vessel to work

DARIUS SNIECKUS

THE flagship of a fleet of giant service offshore vessels (SOVs) being built to take on O&M duties for Siemens at European wind farms has started its maiden assignment at Dong's Westermost Rough off northeast England.

The 90-metre-long "mothership", launched from the Havyard shipyard in Norway, is at the heart of Siemens' answer to cutting the cost of operating offshore wind farms at maximum output.

The company calculates that it will be able to slash weather-related downtime from the current 40-45% to 10-15% with the SOVs.

"We expect to take a big proportion of our weather downtime out of the equation with the SOVs, both in travel and once on site [where they can station-keep in 2.5-metre waves]," says Siemens Wind Power chief operating officer Torben Bang.

Using remote diagnostics hand in hand with the SOVs — which will have docked "daughter craft" that can shoot off to individual turbines to carry out repairs — Siemens aims to carve 20-30% out of current O&M cost projections for



Torben Bang says the new vessels will be used in conjunction with Siemens' remote monitoring services

wind farms more than 70km off the coast.

The vessel, with spare-parts storage, workshops and accommodation for 40 people, will be able to sail to projects through high waves and force 6 winds, with technicians "walking to work" onto turbines using a hydraulic gangway.

"It is clear that the O&M side of the future cost of energy from offshore wind is and will continue to be a very important element," says Bang. "The bigger turbines we are now seeing used are contributing to a lower cost of energy in terms of capex and electrical infrastructure, but also to opex [operation expenditure] — if we maintain them well to

increase energy production.

"We would like to do more with our remote capabilities [monitoring from onshore diagnostic service bases] but also to prepare for the more complex O&M that these new, far-offshore wind farms will need."

Four of the new vessels will enter service for Siemens this year and next. Two will be built by Ulstein Verft Norway and chartered from ship owner Bernhard Schulte; and another pair will come from Denmark's Esvagt.

The first SOV will take up its maiden full-scope service job at the 288MW Baltic 2 wind farm off Germany in late spring or early summer, with the second vessel

headed to the nearby 288MW Butendiek project.

"We have projects now on the 'boundary' of far offshore where O&M personnel are transported 2.5 hours each way," says Bang. "With the next projects that are more than 100km offshore, this commute is not sustainable."

With the new SOVs, personnel will be able to stay offshore for four weeks, adding three hours of productive working time to each 12-hour shift, whereas five hours has previously been eaten up by transport to and from the site.

Vattenfall recently signed up for Siemens' combined service concept for its German North Sea Sandbank and DanTysk projects, with one of the new vessels expected to take up position between the two wind farms.

An SOV is also in the frame for Gemini, the Netherlands' largest offshore wind development.

"The size of the wind farm, the distance from shore and the roughness of the sea — these all come together in logistics considerations," says Bang. "With certain projects, the SOV can meet all these challenges in one." □

Photography | Havyard | Ole Mortensen