

# Wind EUROPE

## CONFERENCE & EXHIBITION 2019

2-4 APRIL  
BILBAO

**DAY  
THREE**

## Vestas, SGRE and GE lose out to local players in 6GW China tender

**YUKI YU**

The big three Western turbine OEMs — Vestas, Siemens Gamesa Renewable Energy (SGRE) and GE — were left empty-handed after bidding for a share of the world's largest wind project, the 6GW Ulanqab facility in Inner Mongolia, China.

The gigawatts on offer at state power giant SPIC's tender — in which 14 turbine makers took part — were split between five Chinese OEMs. Shanghai Electric came out on top, securing 1.4GW, Goldwind and Ming Yang each took 1.3GW, while Dongfang Electric and CSIC Haizhuang picked up 1.1GW and 900MW, respectively.

The Ulanqab tender — one of the first held in China on a competitive, zero-subsidy basis — had explicitly called for “global top-15” turbine makers to bid, in what commentators



A wind farm in Inner Mongolia, China, where the 6GW Ulanqab project will be built

said was a significant signal of new openness to foreign manufacturers in the Chinese wind sector.

But a source at SPIC told *Recharge* that the subsidy-free nature of the project heaped significant cost

pressure on the developer, SPIC. The three Western OEMs were among the four most expensive bids, and despite expectations that efficiency and reliability could be factors in the

*CONTINUED on Page 3*

## Siemens Gamesa launches 5.8MW wind turbines

**BERND RADOWITZ**

Siemens Gamesa Renewable Energy (SGRE) has unveiled two 5.8MW turbines — part of a new 5.X platform that it says could conquer a 30-35% share or new orders in coming years.

“Today we are celebrating our second anniversary. I cannot imagine a better way to do it than by announcing the launch of this new platform — tangible proof of Siemens Gamesa's commitment to innovation and R&D,” said chief executive Markus Tacke at the product launch at the WindEurope show yesterday.

There will be two 5.8MW models available, the SG 5.8-170 with a

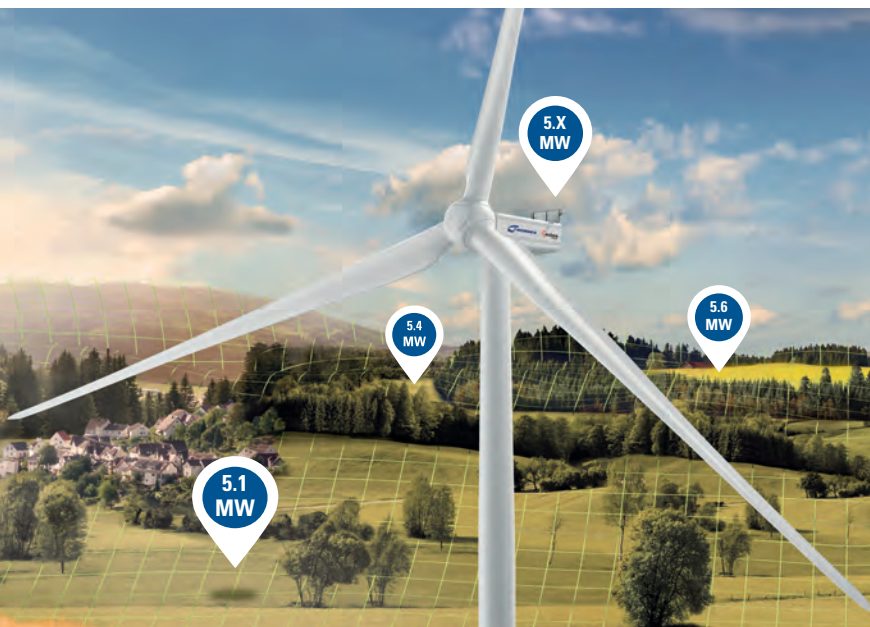
*CONTINUED on Page 3*

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*Benjamin Franklin*

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# MHI Vestas test plan spurs talk of next step-up in turbine size

BERND RADOWITZ

MHI Vestas plans to test a nacelle at Denmark's expanded Lindø Offshore Renewable Centre (LORC), chief executive Philippe Kavafyan revealed to *Recharge*, as the manufacturer kept industry commentators guessing over designs it has for a larger offshore machine or new platform.

LORC — on the Danish island of Fyn, close to MHI Vestas' nacelle factory — last month received Dkr50m (€6.7m) from the Danish government for an extension that will enable it to test turbines of up to 16MW.

"We are going to test something at the LORC facility — but we are not planning to test a 16MW," Kavafyan said in interview at the WindEurope conference yesterday.

"The precise characteristic of the testing [facility] is that it is up to 16MW," he added, declining to reveal further details of its plans.

MHI Vestas' current most powerful model is the 10MW version of its V164 offshore workhorse. The OEM so far has been tight-lipped about the possibility of bringing a larger turbine to the market, as its rival GE is doing with the 12MW Haliade-X.

Offshore turbine market leader Siemens Gamesa has said it is



MHI Vestas chief executive Philippe Kavafyan

working on a machine in the 12MW-plus class, although it hasn't revealed yet what the actual nameplate will be.

already has launched such a machine," Jacob Pedersen, chief financial analyst at Denmark's Sydbank, told *Recharge*.

"But if it is a turbine of about 15MW, then that would be a big leap, and it would be a new platform. Yet, it would cost a lot to develop that.

"From MHI Vestas's profit and loss statement, I cannot see how they could cover such a huge cost at the current stage."

The Danish-Japanese offshore OEM late last year said it will recruit 50 new employees at its Fyn nacelle plant. ☐

**■ If it is a turbine of about 15MW, then that would be a big leap, and it would be a new platform**

"It is difficult to assess what size they [MHI Vestas] will test at LORC. It doesn't make sense to bring a 12MW turbine to the market at this point, given GE

annually, respectively. This price cap for turbine maintenance is new in China, "putting a higher requirement on the OEMs to improve turbine quality control, while continue lowering turbine costs", a Chinese wind supply-chain source told *Recharge*.

Ulanqab was tendered in five sections, and winning just one would have represented a huge leap forward in the Chinese market for one of the big three

Western turbine makers.

Vestas, the best-performing OEM in China last year, installed 584MW in the country in 2018, a share of 2.8%, according to Bloomberg NEF figures.

Expectations of a potential foreign winner at Ulanqab were stoked earlier this year when Vestas and Siemens Gamesa both signed their first deals with SPIC, covering small deployments elsewhere. ☐

## Two-piece blades to be offered for 5.8MW model

*CONTINUED from Page 1* 170-metre rotor, which the company said will be the largest in the onshore sector, and the SG 5.8-155, with a 155-metre rotor.

The larger-rotor model will give a 32% increase in annual energy production (AEP) (at a wind speed of 8 metres per second [m/s]), when compared to manufacturer's SG 4.5-145 predecessor model, said SGRE. The smaller-rotor version will boost AEP by more than 20% (at a wind speed of 7m/s) when compared to the company's SG 4.5-145 model.

The new platform launch comes after rivals including GE, Enercon, Vestas and Nordex have each unveiled new turbines in the 5MW class amid a race in the industry to further push down the cost of wind energy.

SGRE's onshore wind chief executive, Mark Albenze, said he personally expects the 5MW class to take a 30-35% share of orders in the 2021-23 period.

Ever bigger turbines, and the long blades that they fly, can be difficult to transport, so SGRE is offering two design options for the 170-metre rotor — a one-piece blade and a segmented version, said onshore technology director Jose Antonio Malumbres.

The company plans to install prototypes of the SG 5.8-155 and SG 5.8-170 in mid-2020 and Q3 2020, respectively, with manufacturing scheduled to start in Q4 2020 and early 2021.

Albenze stressed that the new platform is the first "truly integrated Siemens Gamesa product" as it draws on proven technology from the two legacy companies — Siemens and Gamesa — and expertise from various regions.

The new platform has a flexible power rating, he added. "We expect to build upon this modular design as we progress in the future." ☐

## Hopes dashed of great leap forward for foreign OEMs

*CONTINUED from Page 1* outcome, price looks to have been the decisive metric.

Shanghai Electric's low bid of less than 3,200 yuan (€424.23) per kW was 27% below the highest bid, which came from Vestas.

The bids also had to include a 20-year turbine service agreement and warranty, for which SPIC would pay a maximum of 25 yuan/kW and 10 yuan/kW

## ANDREW LEE

Wind and solar were the twin growth engines last year as renewables expanded to account for a third of the world's entire power capacity, according to new data from the International Renewable Energy Agency (Irena).

Wind and PV between them accounted for 84% of the 171GW of clean capacity added last year — an annual growth rate of 7.9% — as the world hit 2,351GW of renewables, says Irena's *Renewable Capacity Statistics 2019* report.

Solar capacity grew by 24% in 2018, with 94GW added — almost double the 49.1GW of wind, which itself managed a respectable 10% year-on-year increase.

Asia led the renewables charge in 2018, installing 61% of all new capacity (104.9GW), with Europe accounting for 13.8% (23.6GW) and North America 10.9% (18.7GW). China alone was responsible for 43.8% (75GW) of global renewables installations last year.

China added 20.3GW of wind in 2018 — more than Europe (11.4GW) and North America (7.8GW) combined — taking 41.3% of all new capacity. Asia as a whole installed 24.1GW — 49.2% of the total.

However, Asia's rapid clean



Wind and solar dominated new installations in 2018, according to Irena

## Renewables now account for a third of global installed power

energy expansion has been accompanied by 725GW of non-renewable — fossil-fuel and nuclear — capacity growth since 2010, according to Irena's analysis. Asia and the Middle East are the only regions where non-renewables increased, and are

“the main driving forces behind the persistent expansion in the use of fossil fuels for electricity generation”, says the body.

“Strong growth in 2018 continues the remarkable trend of the last five years, which reflects an ongoing shift towards

renewable power as the driver of global energy transformation,” said Irena director-general Adnan Amin said. “Renewable energy deployment needs to grow even faster, however, to ensure that we can achieve the global climate objectives.”

### TenneT to build pilot of artificial island wind hub

Dutch-German transmission system operator TenneT is to build a pilot artificial island in the North Sea as part of its plans to develop a “North Sea Wind Power Hub”, *Recharge* has learned

The hub would be a large manmade island that would host a converter station and potentially link multiple offshore wind farms to both the UK and the Netherlands, and could even include battery storage or green-hydrogen production.

Construction on the pilot would begin in the next three to five years, but TenneT is yet to decide what equipment it would test.

### Haliade-X design guru lands Poul la Cour prize

#### DARIUS SNIECKUS

The 2019 Poul la Cour Prize has been won by John T Olesen.

Olesen, chief engineer at GE Renewable Energy, was awarded the prize for his “unique and lasting contribution to the development of wind energy in Europe”.

Over a more than 35-year career in the European wind industry, Olesen, who joined pioneering turbine-maker Micon in 1983 and worked for NEG Micon and Vestas Wind Systems until 2011, is currently leading the design team responsible for GE's 12MW Haliade-X, the largest offshore wind turbine in development.

WindEurope deputy chief executive Malgosia Bartosik said:



John T Olesen being presented with the Poul la Cour Prize by WindEurope chief executive Giles Dickson

“As difficult as it was to select a winner, given the quality of the nominations, John is a thoroughly deserving one.

“He has worked tirelessly to push forward wind turbine technology. Throughout his career, John has played a seminal

role in enabling wind energy to go from niche technology to become a mainstream part of Europe's energy mix”.

The prize, awarded by WindEurope and Denmark's Poul la Cour Foundation, has been awarded 14 times since 1992.



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A Big Brown bat

# Novel bat-deterrent method ‘boosts AEP’

**DARIUS SNieckus**

Annual energy production (AEP) from wind farms in bat-infested regions could see a significant boost while greatly reducing the number of creatures killed in turbine-rotor collisions, to judge by tests of an innovative deterrent technology being pioneered by US outfit NRG Systems.

Results from trials at EDF Renewables’ 175MW Pilot Hill development in Illinois, where a spread of 15 ultrasonic acoustic systems were installed on turbines last year, showed an overall improvement in AEP of almost 2% and a reduction in bat fatalities of an average of 67%.

“Our goal with this trial was to gauge the efficacy of combining curtailment with NRG’s system to reduce bat mortality at wind turbines. The results of this trial are very encouraging and suggest that this approach to minimising bat impacts is a compelling one

for the wind industry,” said EDF’s director of environmental strategy Michael Azeka.

Testing of NRG’s system — which generates ultrasonic waves out to the blade tips that “jams” the bats’ echolocation frequency and so prompts them to forage in airspace outside the wind farm site — was conducted at the 103-turbine development over three months, with a five-metre-per-second cut-in speed (ie, the wind speed required to start the rotor spinning) applied at the deterrent-equipped turbines.

The trials led to a “significant reduction” in kills of silver-haired bats (72%), hoary bats (71%), big brown bats (94%), and eastern red bats (58%), as the creatures prefer not to fly in strong winds.

Currently, cut-in wind speed is the most widely used method for curbing bat mortality at

wind farms but generally results in a significant loss of energy production when curtailment is implemented.

“The Pilot Hill trial is especially encouraging because it suggests that we can minimise bat impacts while increasing the amount of energy produced at wind plants

**// We can minimise bat impacts while increasing the amount of energy produced at wind plants struggling with this crucial issue**

struggling with this crucial issue,” said Brogan Morton, senior product manager at NRG Systems. “This is a win for all parties involved, including developers and conservationists.”

The Pilot Hill tests were preceded by a two-year study at the Los Vientos wind farm in Texas, which saw an overall

reduction in bat fatalities of 54%.

“We added some additional bat deterrent units and used a slightly different configuration to help get more ultrasound into the rotors’ swept areas to see if more ultrasound — that was louder and went further — would lead to a greater reduction in bat fatalities.

“[Using this system to improve AEP] goes a long way as it far outstrips what curtailment alone can do — at least from an economic standpoint. It has made a lot of developers hopeful there is now a tool that will

allow them to avoid curtailing [power production] where it doesn’t make sense, while meeting environmental impact objectives.”

The NRG system is currently being rolled out in North America, with the company planning to run trials of the technology in Europe later this year. ■



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HIGHLIGHTS OF THE DAY

THURSDAY 4 APRIL

 #windeurope2019



→ Individual session tickets are available at the registration desk!

## Programme overview



09:00 - 10:15	<b>Investing in people: delivering a just energy transition for all Europeans</b>	Level 4	Auditorium 1
10:15 - 10:45	<b>Poster awards ceremony</b>	Level 3	Poster area
10:45 - 12:00	<b>Digitalisation - beyond wind</b>	Level 4	Auditorium 1
	<b>Innovative solutions for installation and operations</b>	Level 4	Auditorium 2
	<b>The market outlook in Europe</b>	Level 3	Luxua 1
12:00 - 13:00	<b>Lunch</b>	Exhibition Hall 3	
13:00 - 14:15	<b>Digitalisation: creating value in O&amp;M</b>	Level 4	Auditorium 1
	<b>Drivetrain monitoring: beyond SCADA</b>	Level 4	Auditorium 2
	<b>Repowering and lifetime extension: getting the right framework</b>	Level 3	Luxua 1
14:15 - 15:00	<b>Poster viewing</b>	Level 3	Poster area
15:00 - 16:15	<b>Tomorrow's wind farms: smart, collaborative, secure!</b>	Level 4	Auditorium 1
	<b>Becoming circular: turbine components recycling</b>	Level 4	Auditorium 2
	<b>Maintaining the competitiveness of the European supply chain</b>	Level 3	Luxua 1

See the programme online:

[windeurope.org/confex2019/conference/programme/](http://windeurope.org/confex2019/conference/programme/)

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## HIGHLIGHTS OF THE DAY

THURSDAY 4 APRIL

 #windeurope2019

## Social events

Poster session  
and awards

10:15 – 10:45

Poster Area – Luxua, Level 3

Join us to celebrate this year's poster award winner and enjoy some morning refreshments.

\*Open to all registered participants



## Spanish wine at AEE stand

12:00

AEE stand 1-E20

Join AEE for a taste of Spanish wine and Iberian ham while chatting about the Spanish wind industry.

Euskadi/Basque Country  
Stand Reception

13:00

Basque Pavilion, Hall 1

Network over refreshments at the Basque Country stand.

See the programme online:

[windeurope.org/confex2019/networking/#social-events](http://windeurope.org/confex2019/networking/#social-events)

## Side events

09:00 - 11:45	Wind energy in Africa – Perspective for Mozambique, Kenya and Nigeria	Level 5 Room 5
09:00 - 13:00	Accelerating wind turbine circularity 2 <sup>nd</sup> workshop edition	Level 1 Atrium 1
09:00 - 13:00	Workshop on FHP wind curtailment mitigation solution	Level 5 Room 2
13:00 - 15:00	ETIPWind Workshop	Level 5 Room 1A

See the programme online:

[windeurope.org/confex2019/networking/#side-events](http://windeurope.org/confex2019/networking/#side-events)

## Exhibition halls

## HALL 1

Thought Leaders  
Forum

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9:45-15:45

Offshore wind  
technology, markets  
and finance

See the programme online:

[windeurope.org/thoughtleaders](http://windeurope.org/thoughtleaders)



## HALL 3

Safety, Skills  
& Training ZoneIn association  
with

10:45-16:00

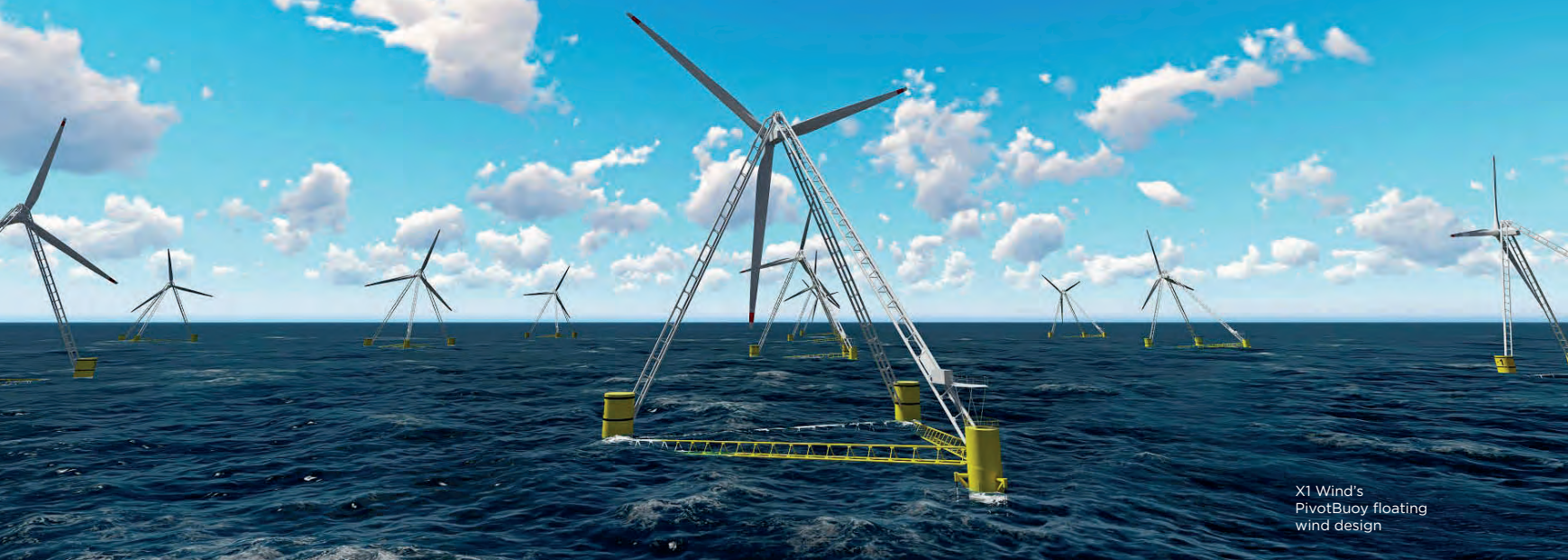
Skills Workshop

See the programme online:

[windeurope.org/trainingzone](http://windeurope.org/trainingzone)



# ‘Market-changing’ floating wind design lands EU funding



X1 Wind's PivotBuoy floating wind design

## DARIUS SNieckus

Spanish floating wind technology outfit X1 Wind has reeled in €4m to bring its innovative PivotBuoy design to market, with the ambition of helping to catapult the nascent sector into worldwide industrialisation.

The funding, from the EU Commission's Horizon 2020 programme, will underwrite plans to test a 1:3 scale version of the technology in 40-50 metres of water off the Canary Islands in 2020.

The prototype, which will be topped with an adapted 225kW Vestas turbine, combines a tension-leg platform and so-called single point mooring system, to allow the unit to “weathervane” with the prevailing wind, to better harness the resource.

X1 Wind calculates the PivotBuoy concept, which could be 80% lighter than some first-generation floating wind designs and moored in water depths of up to 1,500 metres, could pave the way towards cost reductions of some 50%, translating to a €50/MWh cost of energy on

commercial-scale wind farms.

“In the past decade, a number of prototypes have successfully proven floating wind is technically feasible, but costs need to be reduced by at least 50%,” said X1 Wind chief Alex Raventos.

“Technology disruption is required to achieve large-scale competitive floating offshore wind. We plan to demonstrate the advantages of our innovative PivotBuoy system.”

Raventos told *Recharge* that X1 Wind's “redesign of the structural design of existing solutions takes advantage of being floating, drastically cutting the steel weight and minimising active systems [and to allow for] scale up to even to larger rotors [using] a downwind configuration”.

X1 Wind will head up a nine-partner consortium, which includes EDP, ESM, WavEC, IntecSeA, the Danish Technical University, DNV GL and Degima, for the three-year trial at Plocan,

the Oceanic Platform of the Canary Islands test site.

“The floating wind industry is accelerating fast with the UK, France, Portugal and Norway leading the way and other countries like the US, Japan and Spain catching up,” said Raventos.

“We are already seeing significant cost reduction when scaling up to 8-10MW rotors as well as with serial production of platforms. We expect to bring

**X1 Wind calculates the PivotBuoy concept could pave the way towards floating wind cost reductions of some 50%**

another step-change to make floating offshore wind competitive against current energy technologies.”

The world's first commercial-scale floating wind farm, Equinor's 30MW Hywind, was brought on line in late 2017 off the Scottish coast. Four separate

24MW array projects are to be built off France with installation foreseen in 2020-21, following green-lighting by the EU earlier this year.

Portugal also has an array project, the 24MW WindFloat Atlantic, under construction.

And back in the UK, the 2MW scout turbine for the 50MW Kincardine array, off Scotland, was moored last year.

Ireland is the latest to join the floating wind build-out, with a first unit destined for switch-on in 2022.

Latest calculations from WindEurope suggest some 350MW of floating wind capacity will be switched on in Europe by 2021 via a raft of projects off the UK, France, Portugal and Norway.

From a single industrial-scale prototype in 2009, floating wind has progressed at a clip toward commercialisation.

Many analyst forecasts, including those of UK low-carbon business development body Carbon Trust, point to a fleet as large as 15GW by 2030. ☐





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## KARL-ERIK STROMSTA

The political whirlwind sparked by the Green New Deal (GND) is moving in ways that neither Republicans nor Democrats seem to fully understand — or be able to control — exposing vulnerabilities on both sides on the issue of climate change.

One thing that is clear is the GND has struck a nerve on climate change like nothing else for many years in national American politics. Partly as a result, the US renewables industry may soon have the opportunity to shift to offence in Washington DC — after several years in a defensive crouch.

Put forward last month by two liberal Democrats, the GND calls for a paradigm-shifting build-out of renewables, alongside various other progressive demands. It's a non-binding resolution with no chance of becoming law, intended to be a conversation starter more than anything else.

But its impact has been deep. One effect has been making the gulf between Democrats and Republicans on climate change appear wider than ever. For evidence, look to the gleeful vote the Republican-controlled Senate last week on the GND — a vote that was pure political theatre, designed to embarrass moderate Democrats.

Many in the renewables business would have preferred to see the GND's call for decarbonisation put forward on its own terms, rather than being yoked to what many see as unrelated issues — such as healthcare — a broadening that creates both political allies and enemies.

The GND has “moved the conversation” on climate in an important way, says Sarah Webster, vice-president for government relations at Pattern Energy.

“But it runs the risk of alienating people on the other side of the aisle — it already has alienated them — because of the politics around it, and the linkage of clean energy to a larger political agenda.”

Republicans see an immediate opportunity to make political hay



out of the GND, but they are in danger of overplaying their hand. It may be tempting to take a swing at the GND, but knocking it down begs the obvious follow-up: So *what's your plan?*

The lack of an answer is a problem for Republicans, a reality acknowledged even within their own ranks.

“They’ll have their little vote... but what’s next?” asks Heather

Reams, a Republican and the executive director of Citizens for Responsible Energy Solutions, a group focused on persuading conservative lawmakers to support clean energy.

“We can’t hear crickets — then it starts becoming a political liability,” she adds.

It’s worth noting that the Democrats have not been particularly aggressive on climate change since they failed to pass a cap-and-trade system under the Obama administration. The issue played little role during the Democratic presidential debates in 2016.

But it’s a different world today. “This is an issue that’s going to be hardwired into the DNA of every Democratic presidential candidate,” says Morgan Gray, legislative director for Senator



Campaigners in favour of the Green New Deal marching in New York City



# ANALYSIS: Green New Deal is changing the climate for US renewables

Democrat  
Congresswoman  
Alexandria Ocasio-  
Cortez at the  
announcement  
of the Green New  
Deal legislation

Ed Markey of Massachusetts, co-sponsor of the GND alongside media-genic freshman Congresswoman Alexandria Ocasio-Cortez.

Ironically, by veering so hard to

■ The GND may open fertile ground in the political centre for a compromise on energy and climate change

the left, the GND may open fertile ground in the political centre for a compromise on energy and climate change under a future president.

Republicans in competitive

districts — of the sort that will be key to the 2020 presidential election — increasingly see political advantage in taking a moderate stance on climate, says Alex Flint, formerly a member of President Trump's transition team, and now executive director of the Alliance for Market Solutions, a conservative group that supports a revenue-neutral carbon tax.

"It's becoming a politically attractive issue for a lot of Republicans running in those districts," Flint says.

In recent years, the climate issue has held many Republicans back from openly supporting renewables. But if the politics of climate change begin to shift at the national level, then the conversation will turn to solutions



US President Donald Trump shows his love of the black stuff at a rally in West Virginia

— and few fruits hang lower than renewable energy.

Pattern Energy's Webster says: "I don't know how many times I've been in conservative [Capitol] Hill offices — say with members of Texas' [congressional] delegation — and behind closed doors they say, 'We really love you. My constituents love you.'"

Such Republicans have been reluctant to openly support renewables. But that could change very quickly over the next few years.

It would not be a stretch for Republicans to suddenly embrace the enormous success of wind development in states like Texas and Oklahoma. In fact, it may only be a matter of time. Many of their financial backers, including big utilities, have already started doing so.

Since Trump's election, the renewables industry has astutely adopted a lay-low strategy at the federal level — springing into action to defend the tax credits when they were under threat

in 2017, but otherwise focusing on quietly taking maximum advantage of the subsidies while they last, and preparing for the post-subsidy world of the 2020s.

But the day is coming when the renewables industry will have to throw its weight behind what sort of federal policy it would like to

■ It's becoming a politically attractive issue for a lot of Republicans

see in the 2020s — a carbon tax? A cap-and-dividend system? A technology-neutral tax credit for zero-carbon energy sources?

The great pendulum of American politics is swinging back in the other direction. For all the controversy around the GND, a grand political consensus on renewable energy may be closer at hand than many realise. ☐



Green New Deal co-sponsors Senator Ed Markey and Ocasio-Cortez greet each other outside the US Capitol



Andrew Jamieson is chief executive of the UK R&D centre Offshore Renewable Energy Catapult

#### ANDREW JAMIESON

Offshore Renewable Energy Catapult, the UK's leading technology innovation and research centre for offshore wind, has officially opened a £2m (€2.3m) joint UK-China offshore wind R&D facility in Yantai City, Shandong province.

The TUS-ORE Catapult Research Centre (TORC) will bring important benefits to both countries.

China's rapidly-growing offshore wind market — predicted to become the world's largest by 2030 — is opening up a whole new wave of opportunities for UK businesses to engage and compete on a global scale.

Few in Europe will have heard of Yantai City, but the conurbation and Shandong province have come to symbolise the ambition and growth of the Chinese offshore wind market. Almost 100 million people live in the province, which is set to become the home of one of China's largest offshore wind farms — the 300MW Huadian Shandong Jimo demonstration project.

The Chinese Government is investing \$100bn in wind power projects by 2020 and aiming to install 5GW of offshore wind in the South China Sea, with a further 10GW in planning.

This unprecedented growth presents huge potential for UK businesses to export their products and services to China, and for the market there to adopt novel technologies that can not only speed up the rate of deployment, but also keep costs down.

That's why we've chosen to partner with China's Tsinghua University Science Park, or TusPark, which offers incubation services to high-tech supply chain companies, and establish TORC in Yantai City's growing commercial district. The new facility will act as a leading renewable-energy technology research and development incubation centre, with unique links into both the UK and China to support the growth of their respective offshore wind industries and providing opportunities for stronger UK and Chinese academic collaborations.

TusPark's business incubation model is a proven cross-sector success story. It has expanded its support model to the UK, opening incubation centres in Newcastle and Cambridge and supporting giants such as BP and Microsoft. The Catapult's model



The building in Yantai City where TORC is being set up

## Why ORE Catapult has built a joint-venture R&D centre in China

of working with academia and businesses both large and small to support technology development is a great fit with the TusPark approach, making them an ideal partner.

China's ambitious growth targets means they are very willing to adopt new, innovative technologies, possibly

financial matters, building a presence in China as part of the incubation journey, and potentially seeing Chinese investment in their business. It is truly fascinating to see how the TusPark incubation model creates an innovation buzz by building a cluster of like-minded businesses with expert support, advice and guidance to hand.

There are lessons to be learned for the UK from China's proven supply-chain incubation model. More UK-based demonstrator sites would provide the platform for companies to prove new technologies in a real-

world offshore wind environment, rather than trying to sell them to established, full-scale commercial wind farms.

What will success look like? For me, it will be a burgeoning Chinese offshore wind market — underpinned by the best new products and services the UK supply chain has to offer. ■

**China is very willing to adopt new, innovative technologies, possibly faster than the European market**

faster than the European market has traditionally been able to do.

Through TORC, UK businesses developing new technologies can explore opportunities to export their products and services to the Chinese market in a number of ways: for example, by accessing expert advice and guidance on technology, legal and



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