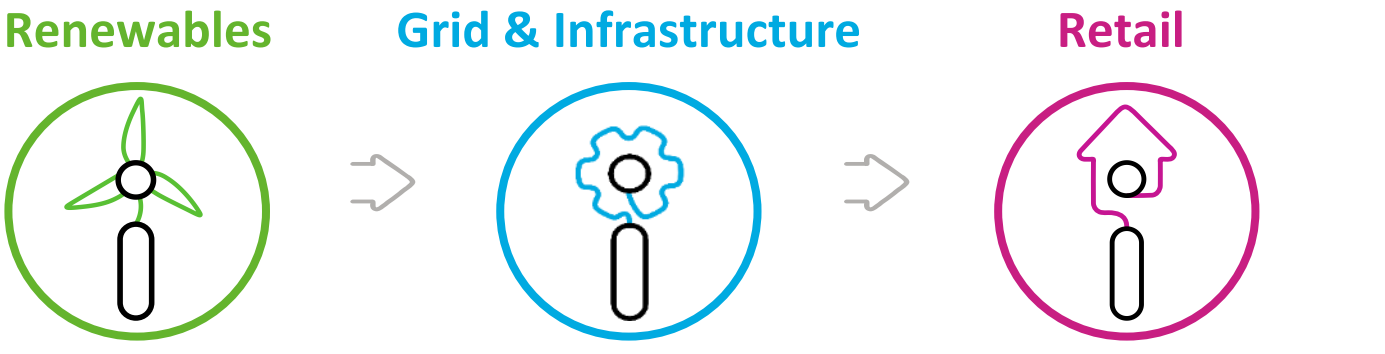
Development of the offshore wind supply chain – experience from Europe

Vladimir Nicolaas

innogy SE · September 2018

innogy is one of Europe's leading energy companies, with end-to-end operations in the electricity sector



Amongst top 5 largest offshore wind operators

No.1 distribution grid in Europe

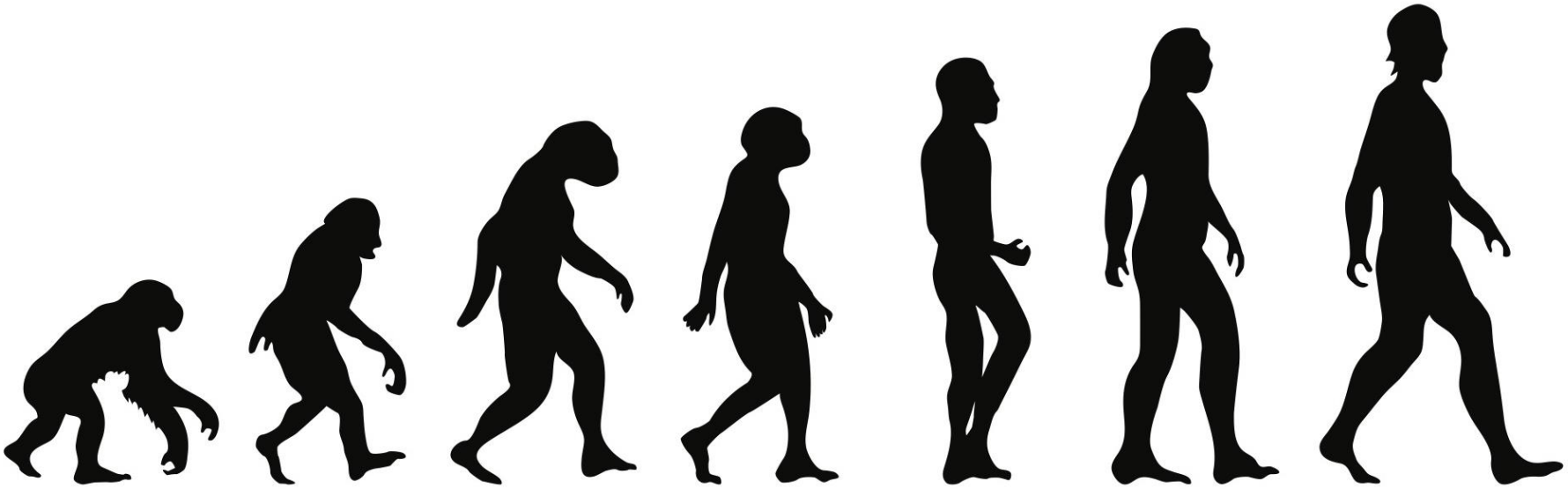
No.1 market position in 5 countries[1]

innogy key statistics (end 2017)[2]

- ✓ Business activities in 16 countries
- ✓ USD $22bn market capitalisation
- ✓ 23 million customers across Europe
- ✓ USD $52bn in revenues (2017)
- ✓ USD $5.2bn in adjusted EBITDA (2017)
- ✓ 42,393 employees
- ✓ USD $9bn planned net investments for 2018-2020

1 – Market positions based on volumes, on customer numbers | 2 – Exchange rate on 31 December 2017 of EUR:USD = 1.2006

Offshore wind has evolved . . .



. . . evolution of the offshore wind farm

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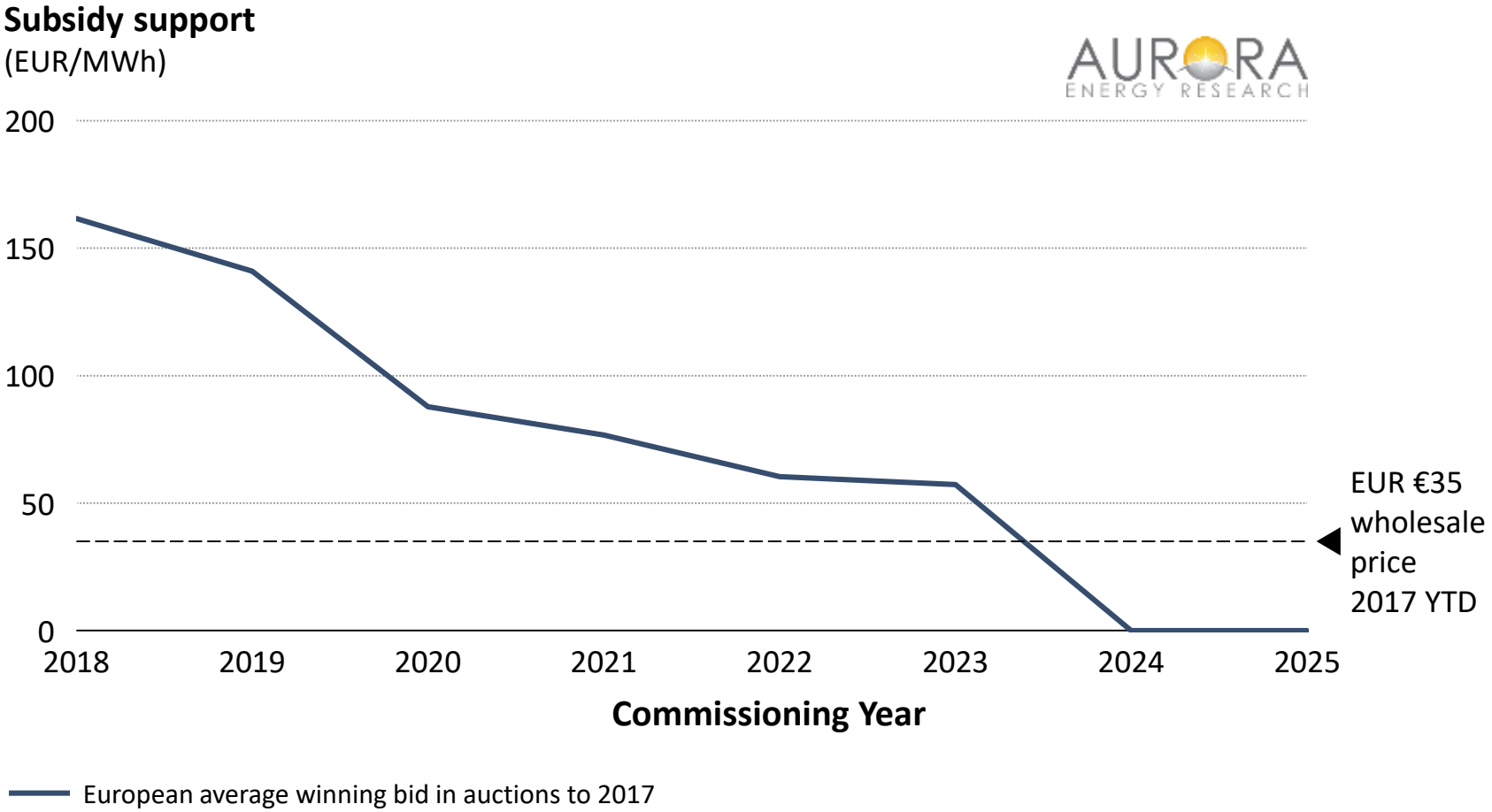
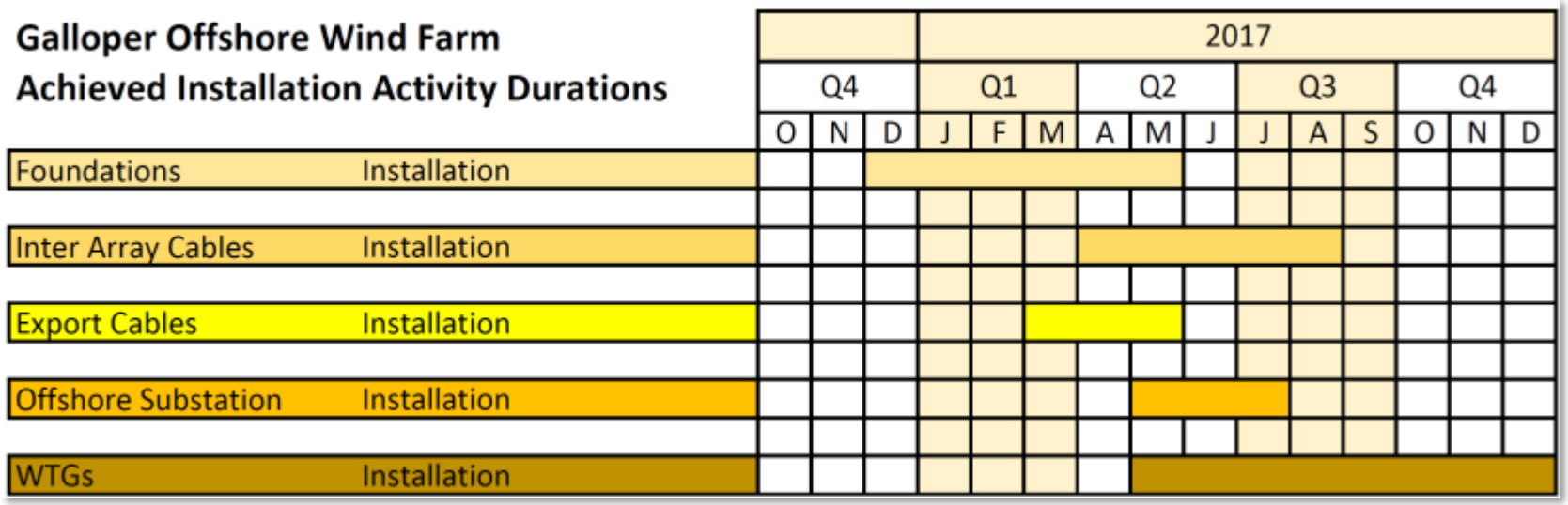
Project	North Hoyle	Rhyl Flats	Greater Gabbard	Thornton Bank	Gwynt y Mor	Nordsee Ost	Nordsee One	Galloper	Triton Knoll
(Expected) CoD	2004	2010	2012	2009-2013	2015	2015	2017	2018	2021
Capacity	60MW	90MW	504MW	325MW	576MW	295MW	332MW	353MW	860MW
Turbines	30 x 2.0MW	25 x 3.6MW	140 x 3.6MW	54 x 5-6.15MW	160 x 3.6MW	48 x 6.15MW	54 x 6.15MW	56 x 6.3MW	90 x 9.5MW
Water Depth	7-11m	10-15m	24-34m	12-30m	12-28m	22-26m	26-29m	27-36m	15-24m
Distance to shore	7km	8km	23km	28km	13km	60km	45km	30km	45km

Reductions in levelised cost of energy

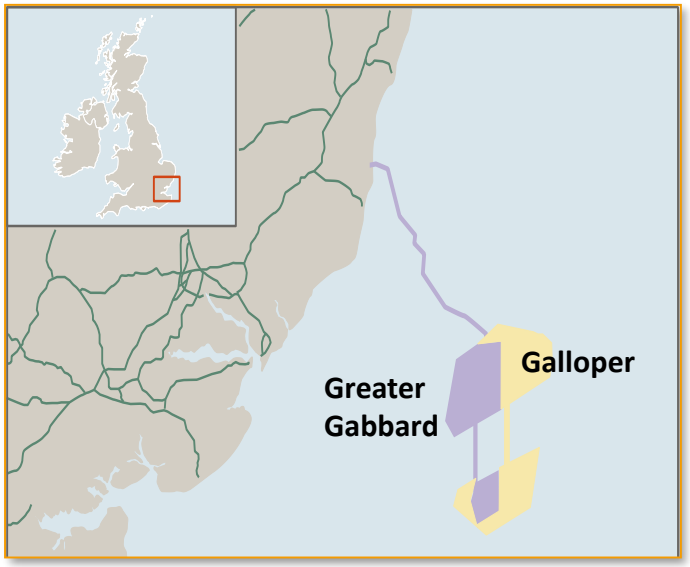


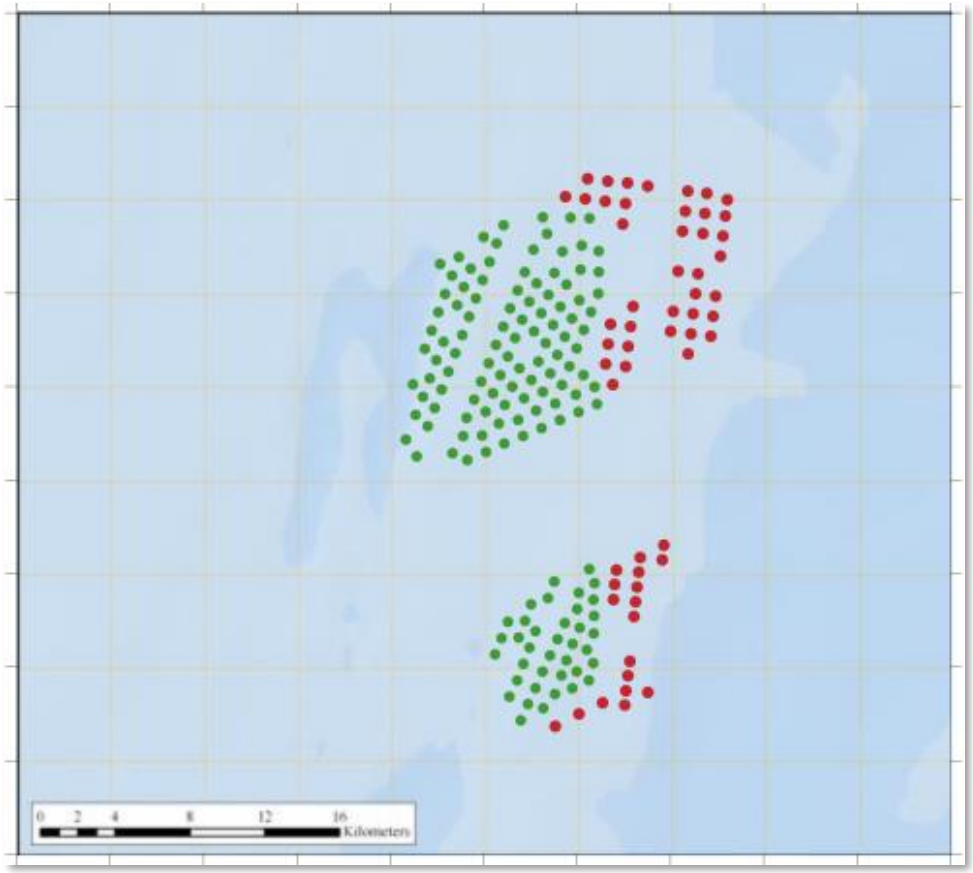
Building in record time

Galloper Offshore Wind Farm
Achieved Installation Activity Durations



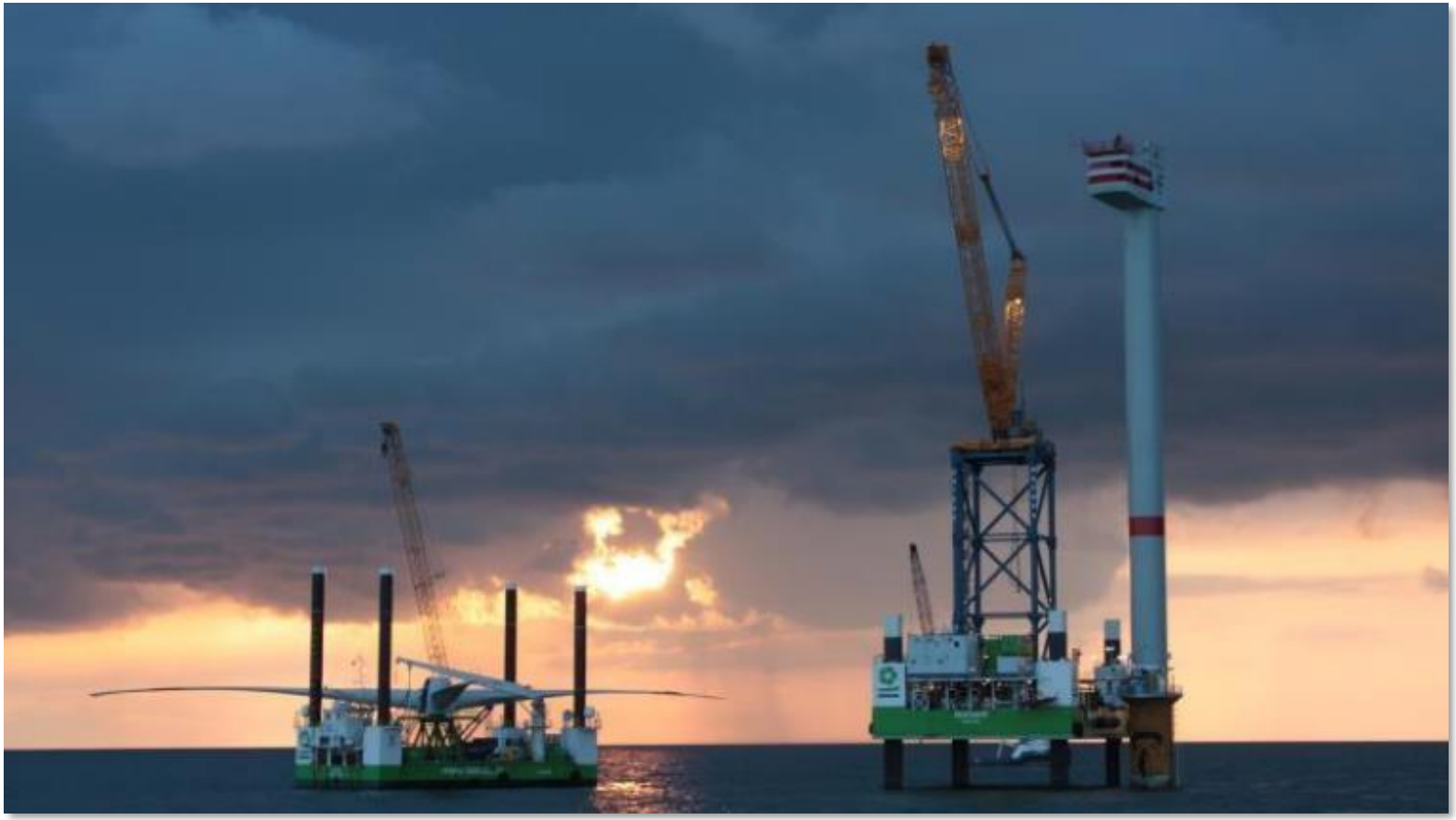
1: Wind turbine generator scale effect





2: The right design

3: The right tools



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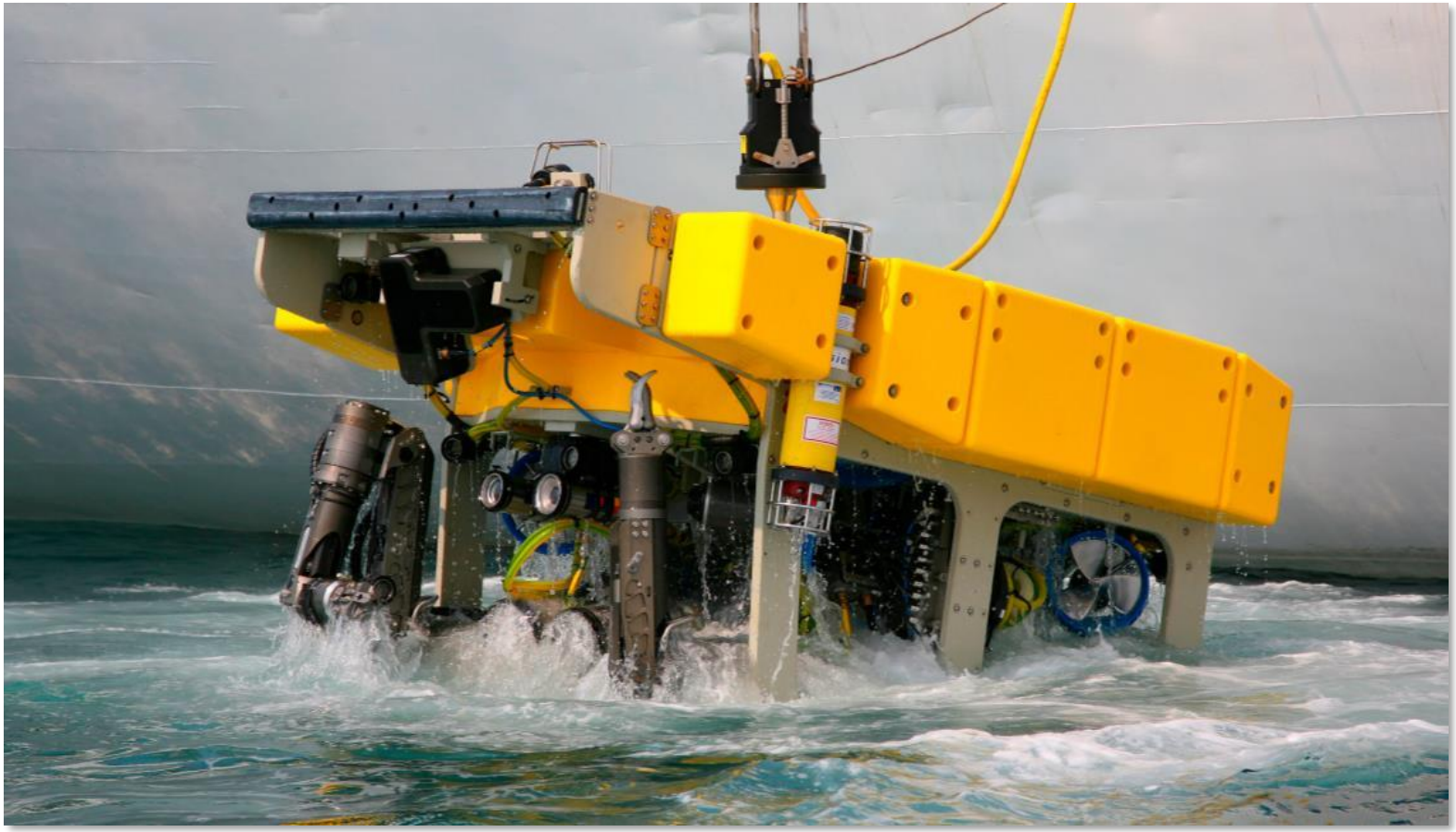

4: Supply chain investment

Friday, October 26, 2018 | greatyarmouthmercury.co.uk

NEWS

■ Groundbreaking ceremony using a six handle shovel at the Outer Harbour. Construction at Peel Ports Great Yarmouth has begun to enhance port infrastructure, as part of works for the offshore Galloper and East Anglia One wind farms. Picture: JAMES BASS PHOTOGRAPHY

Town will be the leading port for offshore energy industry

Anne Edwards
anne.edwards@archant.co.uk

Construction works have begin to enhance port infrastructure at Peel Ports Great Yarmouth for several high profile offshore wind projects.

A multi-million pound co investment has been agreed to support the construction of primary infrastructure and ground works for the Galloper

"Development work will ensure facilities at Yarmouth are some of the best anwhere for delivering large-scale offshore windfarms

Charlie Jordan, ScottishPower Renewables

Peel Ports Great Yarmouth will provide a further boost to investment and jobs creation the projects will bring to the region.

Port director Richard Goffin believes this latest investment in port-side facilities will consolidate Yarmouth's position as a leading offshore energy port facility in the UK.

Mr Lewis said: "It's fantastic Siemens chose Peel Ports Great Yarmouth as their preferred port

And Charlie Jordan of ScottishPower Renewables Project said: "Peel Ports Great Yarmouth will be integral to the successful delivery of East Anglia ONE, which will be one of the largest offshore windfarms to go in to construction anywhere in the world.

"This development work will ensure the facilities at Yarmouth are some of the best anywhere for delivering large-scale offshore

5: Industry Collaboration

Offshore Renewables Joint Industry Programme (ORJIP) - reduce consenting risks

Offshore Wind Industry Council (OWIC) - strategic review of east coast port facilities to maximise potential to accelerate economic growth

The Offshore Wind Programme Board (OWPB) - drive cost reduction by assessing risks and barriers and implement solutions in partnership

Offshore Wind Accelerator (OWA) - improve the economics of offshore wind farms in UK waters through developing innovative technologies that can be deployed

Thank you!
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SCIROCCO