Reducing the costs and LCOE of offshore wind in China

A guide to UK experience and expertise for Chinese developers, suppliers and design institutes

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A guide to UK expertise

Introduction

- China is developing a large offshore wind capacity, but is in the early stages
- Subsidy through FIT is low, so reducing cost of energy is key
- The UK has:
  - Experience of building a large offshore wind portfolio
  - Strong track-record in reducing the cost of wind energy
  - Plans in place to deliver further substantial reductions

- Overall costs in Europe are still higher than in China, so how can UK experience to help drive down costs of offshore wind energy for developers in China?

- Exploit UK innovation, industrialisation and knowledge transfer to drive down offshore wind costs focusing on three key areas:
  - Development stage consultancy
  - Turbine, foundation and cable installation
  - Offshore asset management

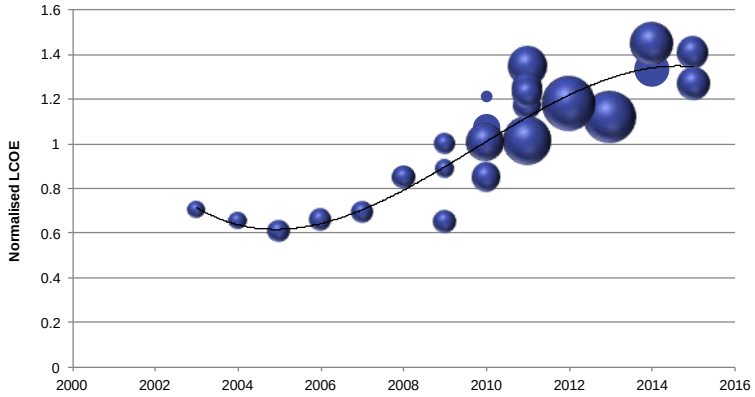
Contents

A guide to UK expertise

Introduction

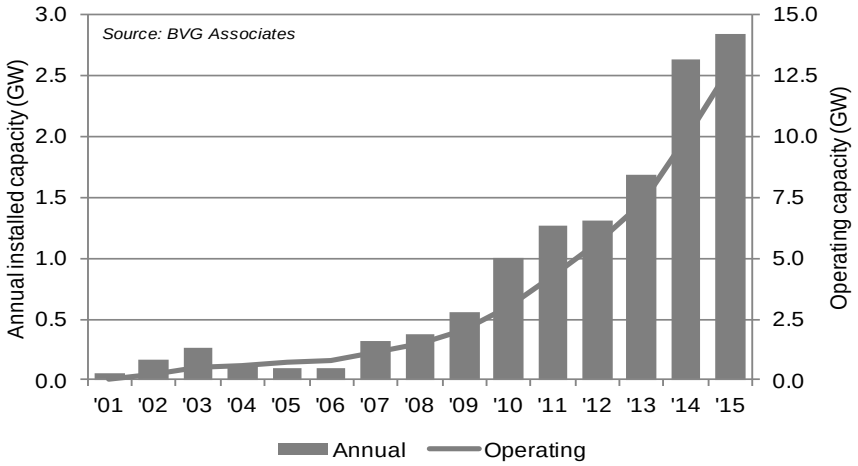
How UK experience and strengths can accelerate cost reduction in China

- Early experience in Europe offshore:
  - **Reported** CAPEX, planned OPEX costs and LCOE **increased**:
  - Projects moved further offshore
  - Suppliers had:
    - **Underestimated** time and cost of developing offshore
    - Not developed the special equipment and techniques needed
    - Pushed risk down the supply chain without managing it



- The UK has learned lessons while developing the biggest installed offshore wind capacity globally

- Experience is based on strong heritage in:
  - Offshore oil and gas
  - Shipping
  - Demonstration and testing
  - Electrical transmission systems
  - Asset management



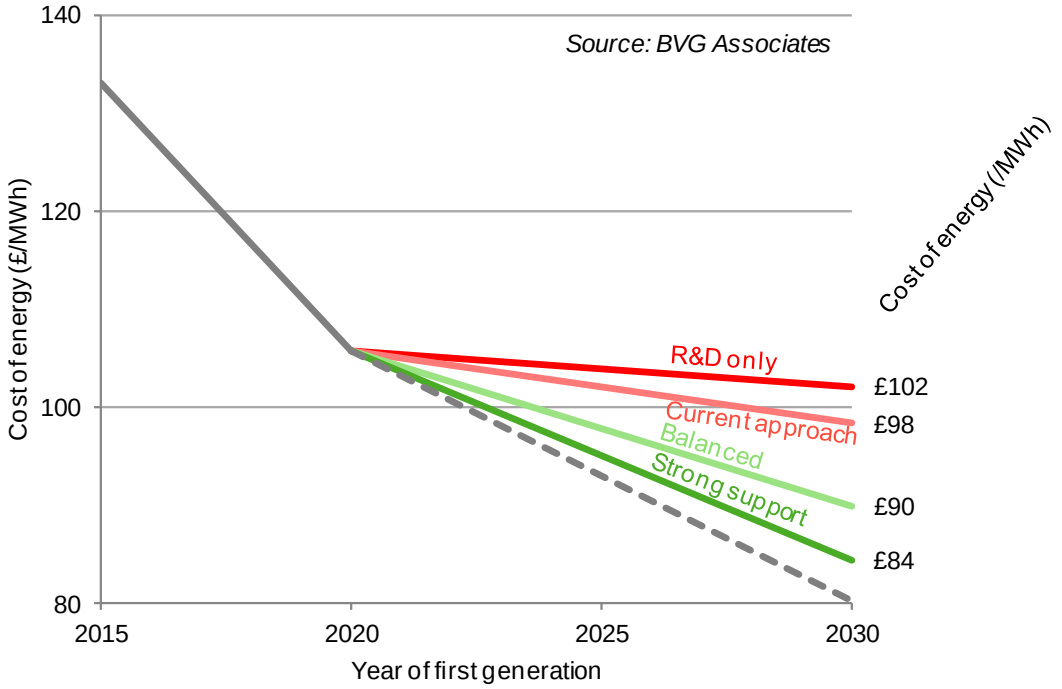
A guide to UK expertise

Introduction

How UK experience and strengths can accelerate cost reduction in China

- Offshore wind cost of energy is now on a strong downward trend in the UK, driven by learning in the supply chain, larger turbines and better offshore installation and operations

- China can exploit UK experience to accelerate its reductions in LCOE by using:
  - Development stage consultancy, including structural design of substations and foundations
  - Turbine, foundation and cable installation equipment and expertise
  - Offshore asset management expertise

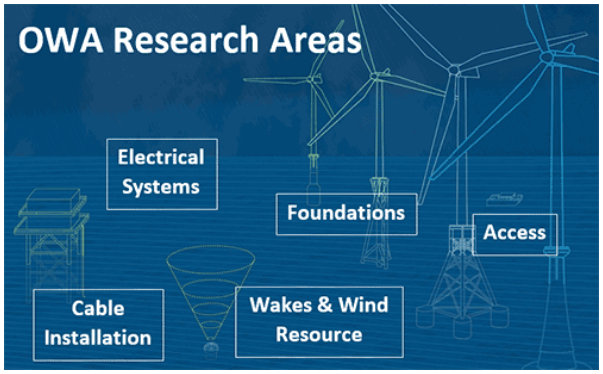


A guide to UK expertise

Introduction

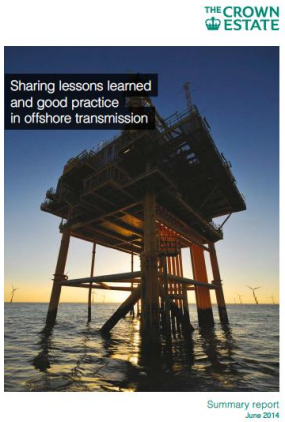
The growth of the UK supply chain

- The UK supply chain has grown over time through:
  - Involvement in Innovation
    - Research and development track record and strengths – such as the Offshore Wind Accelerator 2008-2016
  - Industrialisation
    - Many UK companies actively involved in early projects and have built up strong expertise
    - These companies have gone on to serve the wider European market and beyond
  - Knowledge transfer
    - Learning from projects delivered and synergies with oil and gas industry
    - SPARTA project shares operational and reliability across operators
    - Offshore Wind Programme Board collects and shares lessons learned across the offshore wind industry



SPARTA
System Performance, Availability and Reliability Trend Analysis

Offshore Wind Programme Board



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Key strengths and opportunities for the UK to support Chinese market

Development stage consultancy

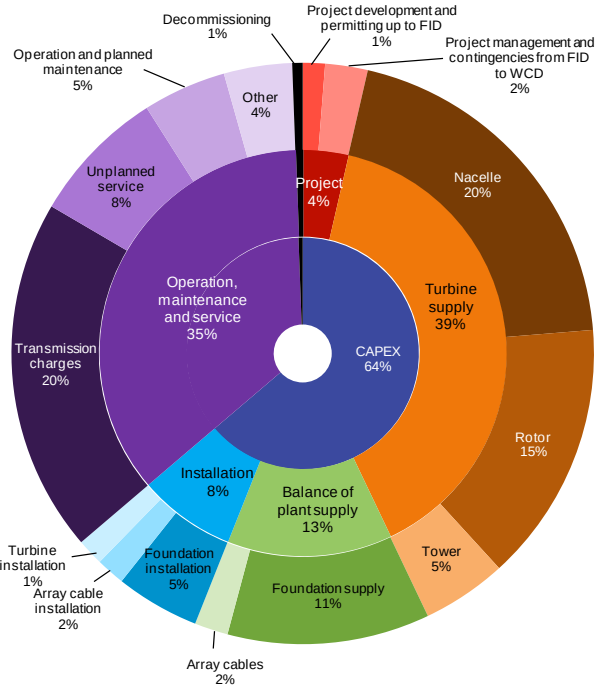
- Structural design of substations and foundations,
- Wind farm layout
- Wind resource assessment
- Wind farm surveys - environmental, geophysical and metocean
- Consenting
- Installation and operational planning
- Procurement

Turbine, foundation and cable installation

- Turbine transport to wind farm site
- Turbine installation and commissioning of turbines
- Foundation transport to the wind farm site
- Foundation installation, including piling
- Scour protection
- Transition piece installation and grouting.
- Transport and laying of array and export cables
- Cable pull-in and termination

Offshore asset management

- Operations management
- Wind turbine planned maintenance and unplanned service
- Balance of plant planned maintenance and unplanned service and
- Offshore logistics



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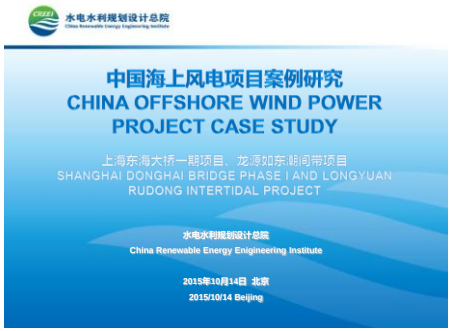
Comparing UK capability and Chinese market need

Key challenges for the Chinese market

- CREEI study October 2015 identified key challenges:
  - Domestic offshore wind power price mechanism needs to be clearer
  - Complicated domestic wind resource and construction conditions
  - Project development and management needs to improve
  - Technical criteria need to improve



- The UK has overcome many similar challenges:
  - Identified best power price mechanism (CfD)
  - Developed leading resource, site and environmental survey capabilities
  - Developed leading project management experience and tools
  - Delivered research in key areas to improve technology

借鉴英国先进经验，完善政策和服务体系

Borrow UK advanced experience and perfect policy and service systems

加强协调，加快项目开发进度

Enhance coordination and speed up project development

统筹加强资源与建设条件调查，形成滚动规划机制

Enhance resource and construction condition survey and form rolling plan mechanism

加强关键技术研究，降低工程投资成本

Strengthen key technology research and reduce project investment cost

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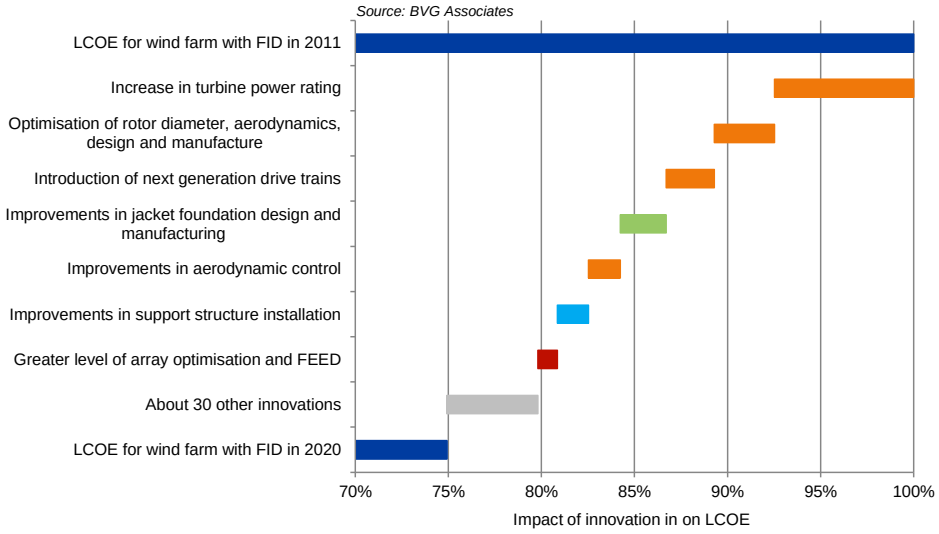
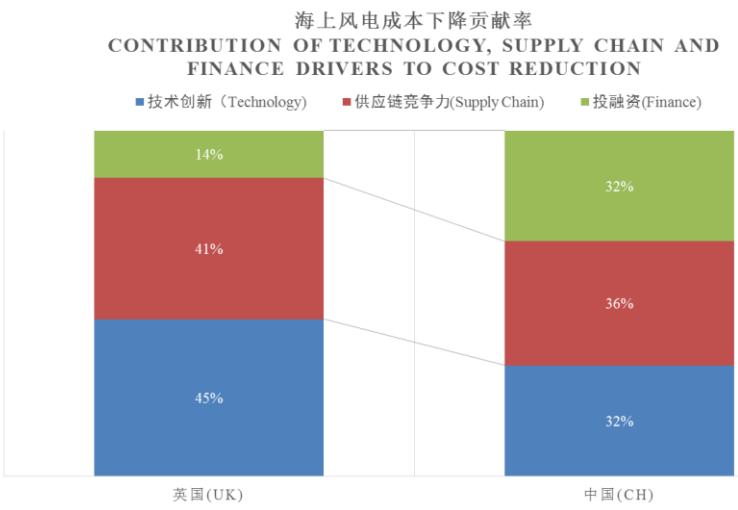
Opportunities to reduce the cost of offshore wind energy in China

CNREC study identified sources of required cost reduction

- Finance cost improvements have a bigger role to play than in UK
- Finance cost improvements are linked to technology and supply chain improvements:
  - As technology and supply chain improvements are delivered,
  - Risk and uncertainty reduce, and
  - Finance providers see the sector as maturing and worthwhile
- The UK is on-track to deliver **at least** 25% LCOE reduction between 2011 and 2015





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Opportunities to reduce the cost of offshore wind energy in China

China can deliver maximum LCOE reduction by blending skills of domestic and UK suppliers

Wind farm element	LCOE reduction priority	Role for domestic suppliers	Role for UK suppliers to deliver maximum additional LCOE reduction
Project development	M	Deliver consented projects. Increase use of best available tools and equipment	Consultancy on wind farm design, resource characterisation, ground and metocean surveys, EIA, structural design of foundations
Turbine supply	H	Develop and deliver turbines with high reliability and energy production	Consultancy on product development, test and validation, and turbine procurement
Foundation supply	M	Manufacture to specification and supply on time	Foundation design and analysis and verification
Installation	H	Supply and operation of vessels for foundation, turbine and cable installation	Supply and operation of specialist vessels. Installation management consultancy. Training of installation workers.
Array cables and electrical transmission system	H	Electrical system component development and supply.	Offshore substation structural design Array cable design, supply and protection
Operations, maintenance and service (OMS)	H	Supply and management of workers, spares and transport to monitor the wind farm and undertake OMS activities.	OMS strategy consultancy. OMS planning, monitoring, project management. Training of OMS technicians. Vessel design
Cost of capital	H	Provide debt and equity finance, engage with developer to understand how he is managing risk.	Consultancy on product development, validation, risk mitigation, adoption of best practice and communicating this to stakeholders.

A guide to UK expertise

Focus on key subsectors

Development stage consultancy (including structural design of substations and foundations)

Consultants used in all stages of offshore wind farm development.

Wind farm development includes:

- Agreement for lease
- Wind farm design (including structural design of substations and foundations, wind farm layout, wind resource assessment and yield optimisation)
- Wind farm surveys (including bird, fish, marine mammal, seabed, geophysical and geotechnical, visual, onshore)
- Stakeholder engagement and consenting, and
- Procurement and FID.

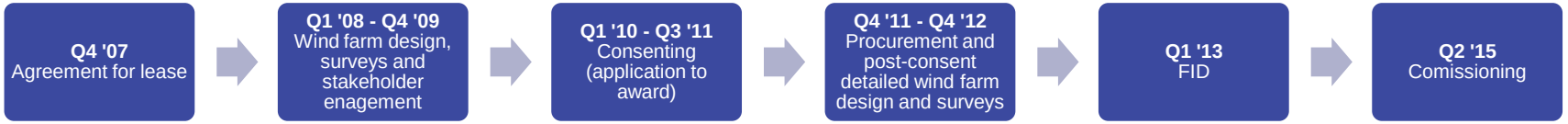


Figure: Typical development time line for an offshore wind farm commissioned in 2015.

Many UK companies have significant experience providing consultancy during the development of an offshore wind farm

Many of the companies have broad experience across parallel sectors, for example oil and gas.

Many of the companies have experience offshore wind projects in UK, Europe and beyond.

Offshore meteorological mast for wind resource assessment.

A guide to UK expertise

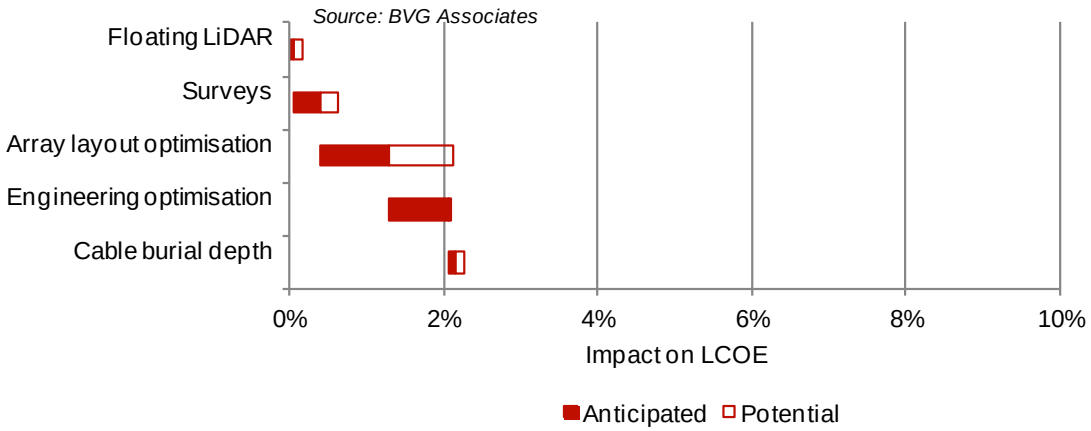
Focus on key subsectors

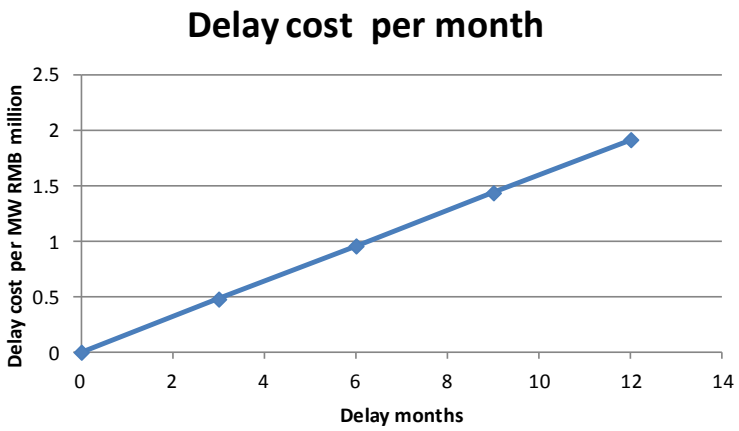
Development stage consultancy (including structural design of substations and foundations)

- LCOE reduction can be delivered through the development stage:
  - Higher energy capture
    - Better layout design
    - Transmission system optimisation
  - Capital cost reduction
    - Better foundation, substation and electrical system design
  - Installation cost reduction
    - Better installation planning
  - Finance cost reduction (risk reduction)
    - Better wind resource estimate
    - Better surveys of site conditions
    - Better environmental surveys
    - Greater certainty on cost and consenting

- Development stage improvements can still deliver >2% LCOE reduction in Europe - potential in China likely to be much higher

- Extra borrowing costs mean that a 12-month delay in start of operation is equal to a 10% reduction in capital cost





A guide to UK expertise

Focus on key subsectors

Development stage consultancy (including structural design of substations and foundations)

Company	Description	Year of first activity and flagship projects	Relevance to reduction in LCOE	Website
ARUP	Engineering design studies Due diligence	2010 Round 1, Round 2 and Round 3 projects	Installation cost and risk reduction Consenting risk and delay reduction	
ATKINS	Wind farm design	2007 Dogger Bank Zone Hornsea Project One	Higher energy capture Capital cost reduction Installation cost and risk reduction	www.atkinsglobal.com/en-gb
BIBBY OFFSHORE	Cable route surveys	2012 Firth of Forth Zone Inch Cape	Installation cost and risk reduction	www.bibbyoffshore.com/ www.bibbyhydromap.com/
Calecore	Seabed and geotechnical surveys	2009 Moray Firth Zone	Installation cost and risk reduction	www.calecore.com/home/
DNV·GL	Wind farm optimisation	2000 Burbo Bank Thanet	Higher energy capture Energy uncertainty reduction	www.dnvgl.com/
Environmentally Sustainable Systems	Wildlife surveys	2001 Greater Gabbard Navitus Bay	Consenting risk and delay reduction	www.ess-ecology.com/
GARDLINE GROUP	Wildlife surveys, seabed surveys and geotechnical surveys	2001 Dogger Bank Zone East Anglia Zone	Installation cost and risk reduction Consenting risk and delay reduction	www.gardline.com/
HiDef AERIAL SURVEYING	Wildlife surveys	2008 Dogger Bank Zone Isle of Man	Consenting risk and delay reduction	-
HR Wallingford	Coastal processes surveys	Lynn and Inner Dowsing	Consenting risk and delay reduction	www.hrwallingford.com/
hydrosphere	Data instrumentation	2003 Greater Gabbard Sheringham Shoal	Higher energy capture	www.hydrosphere.co.uk/

A guide to UK expertise

Focus on key subsectors

Development stage consultancy (including structural design of substations and foundations)

Company	Description	Year of first activity and flagship projects	Relevance to reduction in LCOE	Website
Fisher	Marine engineering and support	Dogger Bank Zone Galloper	Installation cost and risk reduction	www.james-fisher.com/
jee	Installation engineering	2006 Humber Gateway London Array	Capital cost reduction Installation cost and risk reduction	www.jee.co.uk/
Mott MacDonald	Wind farm design Construction monitoring	2006 Northwind Princess Amalia	Higher energy capture Capital cost reduction Installation cost and risk reduction	www.mottmac.com/power/wind-power-generation/offshore-wind
natural power	Wind farm design and data instrumentation	1996 Moray Firth Zone Robin Rigg	Higher energy capture Capital cost reduction Installation cost and risk reduction	www.naturalpower.com/
oldbaum	Wind farm design and data instrumentation	2003 Inch Cape	Higher energy capture Capital cost reduction Installation cost and risk reduction	www.oldbaumservices.co.uk/
RAD TECH	Data instrumentation	2001 Rhyl Flats East Anglia Zone	Higher energy capture	www.rad-tech.co.uk/
res	Wind farm design and project management	2002 Dogger Bank Zone West of Duddon Sands	Higher energy capture Capital cost reduction Installation cost and risk reduction	www.res-offshore.com/
SeaRoc	Data instrumentation	2002 Dogger Bank Zone Hornsea Zone	Higher energy capture	www.searoc.com/
sgurr energy A Wood Group Business	Data instrumentation and technical advisor	2002 Dudgeon Westermost Rough	Higher energy capture Operational cost and risk reduction	www.sgurrenergy.com/

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ATKINS

Development stage consultancy (including structural design of substations and foundations)

Atkins overview

- A world renowned design, engineering and project management consultancy.
- Working with DONG Energy on detailed design engineering of offshore substation platforms (OSPs).
- 2013 - contract for standardised detailed design engineering for five OSPs across three UK wind farms.
- 2015 - contract for standardised detailed design engineering for three further OSPs for Hornsea Project One.

Project details

UK offshore wind farm	Total potential capacity (MW)	Location	Year of turbine installation[1]	Number of OSP[2]
Burbo Bank Extension	258	Irish Sea	2016	1
Race Bank	580	North Sea	*2017*	2
Walney Extension	660	Irish Sea	*2017*	2
Hornsea Project One	1,200	North Sea	*2018*	3

[1]*Anticipated year in italics*

[2]*Offshore substation platforms contracted to Atkins for detailed engineering design*

Reducing cost of energy and lessons learned

- OSPs typically account for 7% of undiscounted capital and operational costs.[3]
- Standardised design of multiple OSPs enables cost savings during fabrication.
- Lessons learned on the standardisation of the first five OSPs is being applied to Hornsea Project One OSPs.
- Atkins can use the same approach to support Chinese developers.

Benefits to the project or wider industry

- The client, is progressing to a standardised wind farm and aims to reduce the costs of offshore wind energy by 35% – 40% for projects reaching final investment decision in 2020. Atkins work will support this cost reduction.
- Atkins has 40 years of experience from parallel sectors, such as oil and gas, and significant experience in European offshore wind. It directly applies lessons learned associated with offshore structures.

Offshore substation platform with heli-deck

[3]*Based on a 500MW offshore wind farm using 6MW turbines and jacket foundations using a combination of real project and modelled data*

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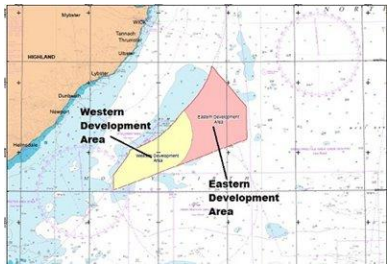
Development stage consultancy (including structural design of substations and foundations)

Sgurr Energy overview

- An engineering and technical advisory consultancy that has assessed over 160GW of renewable energy developments.
- For Moray Offshore Renewables (MORL), undertook concept engineering for the O&M of a multi-gigawatt offshore wind development
- Worked in close collaboration Wood Group Kenny for plant design and access, and with other work package leaders

Project details

- Moray Firth is a UK Round 3 zone.
- Located in Scottish North Sea.
- The zone has consent approved with a total potential capacity of 1,116MW across three projects.



Reducing cost of energy and lessons learned

- Identified and recommended technical and commercial strategies to best perform preventive and corrective maintenance over the operating life of the project.
- By considering O&M at the early stages of project development, maintenance strategies were developed to give cost benefits across the entire operating life of the assets.
- Opportunities for optimisation in OPEX were identified, and which are expected to lead to reduced downtime and increased reliability

Benefits to the project or wider industry

- "Their expertise was indispensable in defining strategies and costs for our O&M work package. …their support and flexibility was essential in maintaining our decision making process."
  Guilherme Mello portugal
  Civil & Mechanical Engineering Manager - MORL
- Sgurr Energy has experience of working on over 160GW of renewable energy developments.
- SgurrEnergy has created a number of O&M strategies that contribute to reducing LCOE. Each site is unique, presenting its own challenges and SgurrEnergy's involvement in some of the biggest global offshore wind projects allows the transfer of knowledge across projects.

A guide to UK expertise

Focus on key subsectors

Turbine, foundation and cable installation

Installation vessels can operate equally efficiently anywhere in the world.

UK companies have a wealth of experience across turbine, foundation and cable installation activities.

Turbine installation

Transport to wind farm site, installation and commissioning of turbines

Vessels used for installation have been specifically designed for the offshore wind industry and in all cases these are self-propelled.

MPI Offshore and Seajacks specialise in the sector, operating several purpose-built vessels.

Over 500 turbines operating in UK offshore wind projects by the end of 2015 installed by MPI Offshore or Seajacks.

Foundation installation

Transport to the wind farm site and installation, including piling, scour protection, transition piece installation and grouting.

Over 400 foundations for turbines operating in UK offshore wind projects by the end of 2015 installed by MPI Offshore or Seajacks.

Cable installation

Transport and laying of array and export cables

Cable pulling and termination

UK companies have significant experience in cable installation activities, such as cable pull in, cable termination, supply of ROVs and cable ploughs.

SMD cable plough

Seajacks' Zaratan, operational since 2012

A guide to UK expertise

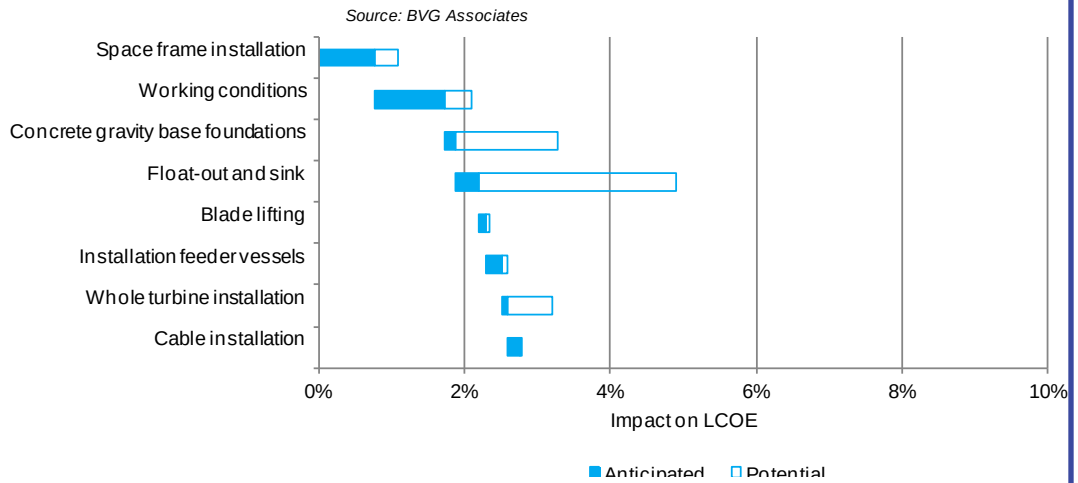
Focus on key subsectors

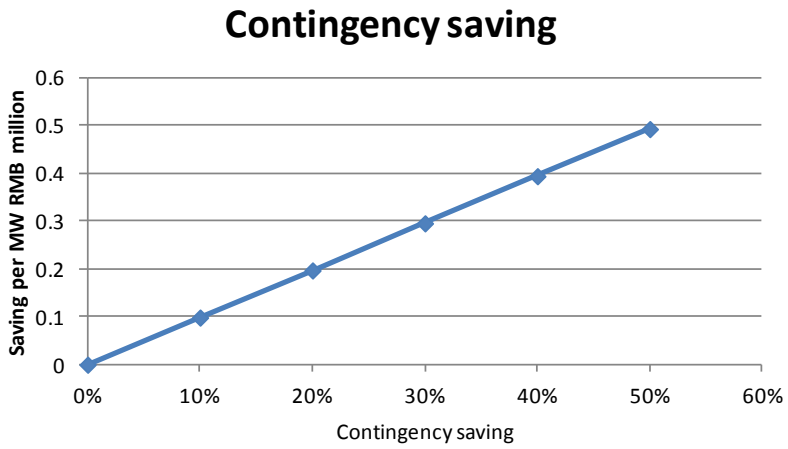
Turbine, foundation and cable installation

- LCOE reduction can be delivered through the installation stage:
  - Installation cost reduction
    - Better installation planning
    - Optimised installation management (avoid wasted time and mistakes)
    - Optimised vessel, lifting and sea fastening
    - Faster installation of turbine, foundation, substations and cables
  - Finance cost reduction (risk reduction)
    - Greater certainty on site conditions
    - Greater certainty on cost and installation time

- Installation stage improvements can still deliver >3% LCOE reduction in Europe - potential in China likely to be much higher

- Installation contingency can account for 40% of installation costs – significant scope for reduction





A guide to UK expertise

Focus on key subsectors

Turbine, foundation and cable installation

Company	Description	Year of first activity and flagship projects	Relevance to reduction in LCOE	Website
ACTEON	Foundation installation (Piling and grouting)	2004 Lynn and Inner Dowsing Humber Gateway (Via MENK)	Foundation installation cost reduction	http://acteon.com/
DEEPOCEAN	Cable installation	2011 Race Bank Walney Extension	Cable installation cost reduction	www.deepoceangroup.com/
CWIND	Turbine and cable installation (Cable pull-in)	2009 Gwynt y Môr Westermost Rough	Turbine and cable installation cost reduction	http://cwind247.com/
ECOSSE Subsea Systems	Cable installation (Cable trenching)	2012 Humber Gateway Westermost Rough	Cable installation cost reduction	www.ecosse-subsea.co.uk/
FOUNDOCEAN	Foundation installation (Grouting)	2010 Gwynt y Môr West of Duddon Sands	Foundation installation cost reduction	www.foundocean.com/
Global Marine Systems	Cable installation	2000 Blyth Kentish Flats	Cable installation cost reduction	www.globalmarinesystems.com/
JDR	Array cable design, supply, installation and support	2002 London Array Greater Gabbard	Array cable cost / performance optimisation	www.jdrglobal.com/renewables/
mpi OFFSHORE	Turbine and foundation installation	2001 Humber Gateway London Array	Turbine and foundation installation cost reduction	www.mpi-offshore.com/
ode A DORIS Group Company	Installation project management	2000 Ormonde Scroby Sands	Installation cost reduction	www.ode-ltd.co.uk/
seajacks	Turbine and foundation installation	2009 Sheringham Shoal Walney	Turbine and foundation installation cost reduction	www.seajacks.com/

A guide to UK expertise

Focus on key subsectors

Turbine, foundation and cable installation

Company	Description	Year of first activity and flagship projects	Relevance to reduction in LCOE	Website
SMD	Cable installation (Cable ploughs and ROVs)	2003 Blyth	Cable installation cost reduction	www.smdoffshore.co.uk/
Tekmar	Cable installation (cable protection)	2008 Burbo Bank Extension Gwynt y Môr	Cable installation cost reduction	www.tekmar.co.uk/

A guide to UK expertise

Integrated Service Provider

CWind overview

- Extensive experience in managing service packages in the wind sector, understanding the demands placed on people and vessels by offshore work.
- Worked on 29 offshore wind farms in the UK, Germany and the Netherlands
- To date supported 7478MW in construction, 1800MW in O&M
- Provided **crew transfer, temporary power & corrosion protection** at London Array, Gwynt y Môr and EnBW Baltic 2 OWFs.

Project details

Offshore wind farm	Total potential capacity (MW)	Location	Year of turbine installation	Number of Turbines
London Array OWF	630	North Sea, UK	2012	175
Gwynt y Môr OWF	576	Irish Sea, UK	2013	160
EnBW Baltic 2 OWF	288	BalticSea, Germany	2014/15	80

Reducing cost of energy and lessons learned

- Integrated packages reduce costs, risk & interfaces.
- Fuel-efficient vessels save up to half in fuel, (£500 per vessel per day[1)]. CWind vessels are suitable for Chinese offshore wind farms.
- Early planning of temporary power requirements can create significant cost-savings. Offshore management and communication systems important to use weather windows for maximum savings.
- Lessons learnt from extensive exposure to the European Offshore wind market, can be applied to Chinese offshore wind farms on a consultancy, training or service basis.

Benefits to the projects or wider industry

- Clients benefited from combining vessels and equipment with technician and project management services for tailored cost-effective package solutions.
- CWind works closely with the client to enable most effective project.
- Cost savings through combining tasks where possible, using multi-skilled technicians and packaging up works.

[1]Based on a 22m resin-infused catamaran (MPC 22) against a comparable aluminium vessel

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Turbine, foundation and cable installation

Seajacks

- Operates self-propelled jack-up vessels for offshore solutions around the world
- Installed 22% of all UK offshore wind turbines
- Main installation contractor for the Meerwind project.
- 2012- Installed:
  - 80 SWT-3.6MW turbines
  - 80 monopile foundations and transition pieces
  - Managed scour protection, noise mitigation and grouting

Project details

- North Sea
- 80 turbines
- Capacity of 288MW
- Year of turbine installation 2013
- All turbines operational

Seajacks Zaratan loading monopile foundations

Reducing cost of energy and lessons learned

- Seajacks was able to use two mid-sized vessels (Seajacks Zaratan and Seajacks Leviathan) working in tandem.
- Seajacks Zaratan managed to load, transport and install 3 monopiles in an industry leading 36 hours.
- Vessel modifications for the project increased efficiency of handling loads on and around deck.
- Innovative tools developed to lay scour protection more efficiently

Benefits to the project or wider industry

- "Benchmark for future North Sea projects"
  German Authorities
- "The better the equipment, the greater the efficiency. Seajacks is a good partner and we make a well-coordinated team able to install very quickly"
  Managing Director, WindMW
- The challenging experience at Meerwind has provided Seajacks with vital experience for future projects.

A guide to UK expertise

Focus on key subsectors

Offshore asset management

Takes place through operational phase of wind farm

Includes maintenance and service of the assets.

Many activities require specialist technicians and equipment, including:

- Operations management (for example use of systems to store and analyse condition monitoring data to respond to failures)
- Wind turbine planned maintenance and unplanned service (for example rope access for blade inspection)
- Balance of plant planned maintenance and unplanned service (for example maintenance of scour protection and foundation grouting), and
- Offshore logistics (for example, crew transfer vessels for technician transfer)

By the end of 2015, the UK had over 5GW of offshore wind capacity installed, requiring asset management on over 1,450 turbines and foundations and 2,500km of array and export cable.

All UK projects are managed from UK ports using UK suppliers, who have built up particular expertise to supply this sector.

CWind's Sword crew transfer vessel

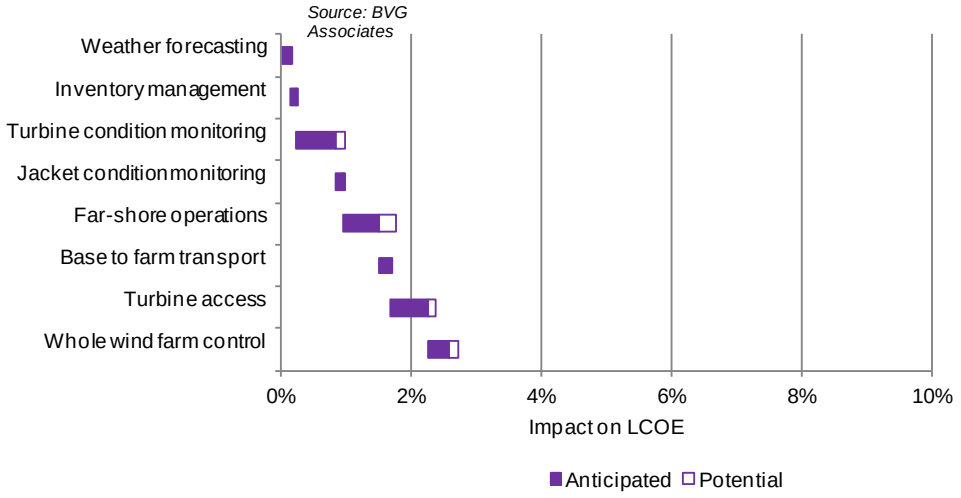
3Sun Group wind turbine maintenance and inspection

A guide to UK expertise

Focus on key subsectors

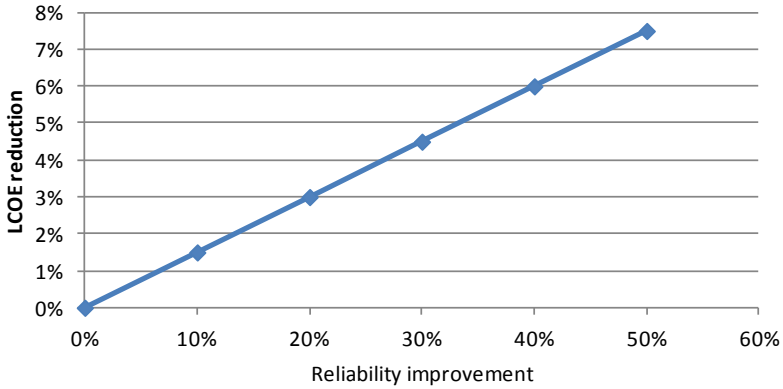
Offshore asset management

- LCOE reduction can be delivered through the operational stage:
  - Condition monitoring
    - Avoid unnecessary work
    - Avoid major failures and downtime
    - Schedule work efficiently
  - Logistics
    - Planning of work
    - Transport of technicians and equipment



- Operational stage improvements can still deliver >3% LCOE reduction in Europe - potential in China likely to be much higher

- Perfect turbine reliability would deliver 15% LCOE savings through reduced cost and increased energy production – asset management can help deliver some of this



A guide to UK expertise

Focus on key subsectors

Offshore asset management

Company	Description	Year of first activity and flagship projects	Relevance to reduction in LCOE	Website
3sun GROUP	Blade maintenance	2007 Greater Gabbard London Array	Operational cost reduction Higher energy capture	www.3sungroup.com/
babcock	Operation and maintenance Helicopter logistics	2011 Greater Gabbard	Operational cost reduction Higher energy capture	www.babcockinternational.com/ www.bondaviationgroup.com/case-history/offshore-wind-farm-support
BIBBY OFFSHORE	Operations and maintenance support Decommissioning	2012 Firth of Forth Zone Inch Cape	Operational cost and risk reduction	www.bibbyoffshore.com/ www.bibbyhydromap.com/
Briggs	Operations and maintenance support	2010 Dong framework for UK & N Europe array cable maintenance	Operational cost and risk reduction	www.briggsmarine.com/marine/renewable-energy/offshore-wind/
CWIND	Offshore logistics	2009 London Array Westermost Rough	Operational cost reduction	http://cwind247.com/
DNV·GL	Performance analysis	2000 Burbo Bank Thanet	Operational cost reduction Increased reliability	www.dnvgl.com/
Global Marine Systems	Cable maintenance	2000 Barrow	Operational cost reduction	www.globalmarinesystems.com/
Renewable Advice	Blade maintenance	2008	Operational cost reduction Higher energy capture	www.renewableadvice.com/
natural power	Performance analysis and site services	1996 Robin Rigg	Operational cost reduction Increased reliability	www.naturalpower.com/
Romax TECHNOLOGY	Performance analysis and condition monitoring	2006 Lincs Lynn and Inner Dowsing	Operational cost reduction Increased reliability	www.romaxtech.com/

A guide to UK expertise

Focus on key subsectors

Offshore asset management

Company	Description	Year of first activity and flagship projects	Relevance to reduction in LCOE	Website
sgurr energy A Wood Group Business	Operation and maintenance consultancy	2002 Dudgeon Westermost Rough	Operational cost reduction Increased reliability	www.sgurrenergy.com/
WINDCAT WORKBOATS	Offshore logistics	2004 London Array West of Duddon Sands	Operational cost reduction	www.windcatworkboats.com/

A guide to UK expertise

Offshore wind training provider

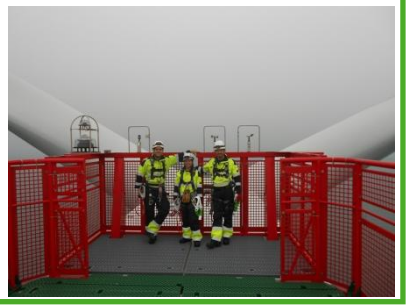
National Wind Farms Training Centres

- First offshore wind training provider to receive GWO accreditation in the UK
- Delivers courses accredited by Renewable UK (RUK) and the Global Wind Organisation (GWO)
- Delivers bespoke courses to offshore wind market players and individuals
- 1642 trained from January 2013 – January 2015
- 18 different courses offered including GWO Working at Height & Rescue, Fire Awareness, Advanced rescue, Sea Survival, First Aid, Wind Farm Medic and PPE inspections
- Training centres on the east and west coast of the UK

Project details

Project Overview – Sheringham Shoal

- Capacity: 317MW
- Turbines: 88 3.6MW Siemens SWT-3.6-107
- Fully commissioned
- Clients: Scira Offshore/Statkraft
- Services: SHEQ review and training



Reducing cost of energy and lessons learned

- NWFTC went offshore with client to review and amend, the whole working at height, rescue, access and egress procedures
- Ensured best practice compliance and the safety of their teams
- Photos and videos used to review success and suitability of changes
- Delivering better qualified, more efficient workers to the UK offshore wind sector
- Lessons learnt can be applied to Chinese offshore wind farms on a consultancy, training and service basis.

Benefits to the project or wider industry

- Clients benefited from the development of a SHEQ (safety, health, environment, and quality assurance) review and bespoke training service
- Enabled O & M teams to work effectively in a safe environment.
- Clear step by step procedure and instructional video delivered as training aids in the induction process at the wind farm

Thank you

BVG Associates Ltd
The Blackthorn Centre
Purton Road
Cricklade, Swindon
SN6 6HY UK
tel +44(0)1793 752 308

BVG Associates Ltd
The Boathouse
Silversands
Aberdour, Fife
KY3 0TZ UK
tel +44(0)1383 870 014

BVG Associates LLC
Green Garage
Second Avenue
Detroit, MI
48201 USA
tel +1 (313) 462 0673

info@bvgassociates.co.uk
@bvgassociates
www.bvgassociates.co.uk