Winds of change: Navigating risk in the offshore wind sector

November 2018
Introduction

Grant Thornton UK, in collaboration with Greensolver Peterson Offshore, is pleased to present the ‘Winds of change: Navigating risk in the offshore wind sector’ report.

The global offshore wind market is expected to deliver a several-fold increase in capacity on today’s levels by 2030, thanks to advancing technologies, reducing costs, access to low cost of capital, global climate change accords and additional jurisdictions embracing this developing sector. Of all the renewable technologies available, offshore wind has the best chance of supporting any significant energy baseload, given the scale at which it can be deployed.

Offshore wind continues to attract a sizeable proportion of renewable energy financing based on the sheer scale of the infrastructure undertaking. In 2017, offshore wind project financing totalled USD23 billion, with the majority of the transactions taking place in Europe or China. Several new markets are now embracing offshore wind as a next big step towards decarbonisation, in turn bringing new project opportunities. Costs in Europe have shrunk significantly through investment in infrastructure and grid expansion, making offshore wind cheaper than nuclear and pushing it towards cost parity with fossil fuel based power.

But what does this mean for stakeholders in an environment of increasing finance availability, decreasing government incentives and improving cost efficiencies? To investigate this further, we launched a survey to collect direct industry experience from the offshore wind community to find out how stakeholders in offshore wind projects can mitigate against the risks associated with these opportunities.

‘Winds of change: Navigating risk in the offshore wind sector’ presents the key themes identified by our survey respondents, including:

- **Winds of change** – Europe will continue to be at the forefront of investment and innovation in the offshore wind sector, but Asia Pacific (APAC) is closing the gap. In the five years to 2017, Europe attracted over 80% of total private finance in offshore wind projects and accounted for virtually all merger and acquisition (M&A) activity in the sector. However, respondents to our survey identified that over the next five years offshore wind investment is expected to shift from Europe to APAC and North America.

- **Investment rationale** – Government support remains critical for continued investment in offshore wind projects. One in five respondents identified the role of governments, either in providing incentives or as guarantors of regulatory stability, as one of the principal reasons for investing in offshore wind projects.

- **Looking to the horizon** – Size and scalability will become increasingly important to the development of wind farms, with 40% of respondents saying they will have the most significant impact on cost efficiencies. Turbine size has increased by almost a quarter and wind farm size by over a third since 2016.
Where the wind blows

Europe has historically been at the forefront of investment and innovation in the offshore wind sector. Europe attracted over 80% of private finance in offshore wind projects and accounted for virtually all M&A activity in the sector between 2013 and 2017. While respondents to our survey still identified the European offshore wind sector as the main beneficiary of investment, APAC – especially Taiwan, China and Japan – is closing the gap, followed by North America.

The initial drivers of growth in the European offshore wind sector were leadership in onshore technology, strong winds and shallow seas. In 2001, the Directive on Electricity Production from Renewable Energy Sources introduced European Union (EU) support. Since then, the EU regulatory framework has been supportive of Europe’s dominance as an offshore wind energy hub. The Renewable Energy Directive (RED), which runs until 2020, combined with national commitments, has led to the adoption of ambitious targets to increase the share of renewables in the energy mix. To meet these targets, member states – especially in Northern and Western Europe – have developed expertise across the offshore wind supply chain, as well as within the government agencies approving projects.

With the current National Renewable Energy Action Plans (NREAPs) coming to an end in 2020, it may be that fewer European projects get approval in the future. The UK has a strong project pipeline, with the new leasing rounds just announced by The Crown Estate Scotland. The offshore market in Europe will concentrate mainly in the UK, with 5.2 GW or 42% new grid-connected capacity expected in the period 2017-2020. Following the UK, another four countries will see offshore installations: Germany (3.5 GW), Belgium (1.4 GW), the Netherlands (1.3 GW) and Denmark (1.0 GW).

Emerging markets

APAC is experiencing a rapid surge in investment driven by generous government incentives, as in Taiwan, and ambitious national targets, as in China.

The recent enthusiasm for offshore wind projects in Taiwan is the result of a combination of political, economic and technical considerations. Following the Fukushima nuclear meltdown in 2011, Taiwan pledged to make the island nuclear-free by 2025. To achieve this, the country plans to invest as much as NTD684 billion (USD22.7 billion) in wind energy, both on and offshore. It has developed a clear and stable regulatory framework with a 20-year feed-in tariff (FiT) structure for offshore wind, more generous than any found in Europe. Taiwan is also home to suitable wind and seabed conditions, making it a springboard to the vast APAC market for investors and developers looking to expand beyond European shores. Developers are busy adapting technologies to fit the specific conditions and standards applicable to the larger region, such as seismic risks, which do not apply to the European market. In the near future, European companies are likely to benefit most from the development of the Taiwanese market. For example, in September 2018 it was announced that a consortium of 20...
foreign and 10 local banks would provide a syndicated loan for up to NTD60 billion (USD1.2 billion) for the Yunlin wind farm, which is being developed by a company from Germany. China has become increasingly active in growing its offshore wind capacity and developing technological expertise at home. The country does not seek international financing or organise auctions for offshore projects, so it is difficult to quantify investment in the sector. However, after a slow start and a number of missed targets, China has substantially increased its capacity in recent years to become the third largest country in terms of total offshore wind installation globally, behind the UK and Germany.

China is also likely to become one of the sector’s largest innovators and suppliers. In 2013, the government gave the offshore wind industry priority status, but it was not until the Made in China 2025 plan was unveiled in 2015 that the sector gained the necessary impetus. Chinese companies are keen to learn from European veterans, one way to do this is through taking part in the development and running of large offshore projects in Europe, such as the UK’s Dudgeon wind farm, or investing in joint research between Chinese and European universities. As happened with the onshore wind sector, where China now manufactures and installs half of all turbines worldwide, the country is likely to define the future of offshore wind, both from the demand side and the supply side.

China is not alone in turning its attention and funding power towards Europe. In August 2018, two Japanese firms announced investment of GBP1.0 billion into a wind farm off Lincolnshire, with a German firm footing the remainder of the bill.

Under pressure from public opinion, the Japanese government has been looking to diversify its energy mix away from nuclear power without growing its dependence on imports. A new bill promoting offshore wind projects including a FiT mechanism was passed in May 2018, showing that offshore wind provides part of the answer for an island country with significant coastline and good wind conditions. Investment is expected to accelerate. Japan’s largest utility company, Tepco, which operated the Fukushima nuclear plant and suffered a heavy financial and reputational blow after its accident, announced in February 2018 that it would direct significant investment towards offshore wind.

Moreover, the commitment that the 2020 Tokyo Olympics will benefit from energy generated by floating turbines suggests investment will go to the most cutting-edge technology, especially as Japanese coastal waters tend to be deeper than European ones.
Winds of change: Navigating risk in the offshore wind sector

Promising growth
Later to the game but gathering momentum is the North American market. Canada has recently started paying more attention to the sector. In January 2018, the federal government launched a CAD200 million expression of interest for a renewable energy programme. It is unclear how much of this will be allocated to offshore wind, but the sector has climbed up the agenda. As of June 2018, a Danish-Canadian partnership has secured four projects on the Atlantic coast, representing an investment of CAD3.0 billion. On the West coast, Ørsted has secured exclusive rights to a project in British Columbia in partnership with a local company.

But it is in the United States that potential for growth looks most promising. The first offshore wind farm in the United States, built off the coast of Rhode Island, started operating in December 2016. It remains the sole live project in the country and generates a mere 30MW compared to Europe’s combined 16,000MW. But other East coast states such as New York and Massachusetts have recently awarded offshore wind contracts and made pledges towards increasing the share of electricity from the technology.

In fact, in June 2018, the Department of Energy announced USD18.5 million had been allocated to the New York State Research and Development Authority to advance the sector. The agency estimates that offshore wind could generate over 2,000GW in the country based on existing technology only. Gross potential is estimated at 10,800GW. The Trump administration, keen to ensure energy independence, has been relaxing permitting rules and surveying of suitable development areas along the Atlantic coast. As the country starts to embrace offshore wind, European developers are seeing an opportunity to enter a vast and rich market.

Indeed, projects usually involve European partners with a proven track record in the field. The United States lacks the experience and expertise that Europe has developed over the past two decades but, with collaboration across the Atlantic and costs falling faster than anticipated, analysts are confident that the country will catch up within a few years.

The 800MW Vineyard wind project awarded by Massachusetts in May 2018 went to a duo of American and Copenhagen developers. New York State’s Empire Wind project, expected to generate as much as 1.5GW, went to Norway’s Statoil. The world’s first floating wind farm (in Scotland) only a year old and the technology still in relative infancy, it is no surprise that Western states are more timid on offshore wind.

Which jurisdictions are likely to receive the highest levels of investment in offshore wind over the next five years?

<table>
<thead>
<tr>
<th>Region</th>
<th>Country</th>
<th>Share</th>
</tr>
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<tbody>
<tr>
<td>Europe</td>
<td>UK</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Germany</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Netherlands</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Europe others</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Denmark</td>
<td>5%</td>
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<tr>
<td>APAC</td>
<td>Taiwan</td>
<td>13%</td>
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<tr>
<td></td>
<td>China</td>
<td>10%</td>
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<tr>
<td></td>
<td>Japan</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>APAC others</td>
<td>1%</td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td>14%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>2%</td>
</tr>
</tbody>
</table>

Europe

- UK 20%
- Germany 11%
- Netherlands 11%
- Europe others 6%
- Denmark 5%

APAC

- Taiwan 13%
- China 10%
- Japan 7%
- APAC others 1%

North America 14%

Other 2%
Investment rationale

As with most renewable energy technologies, the offshore wind sector has developed and grown as a result of access to government incentives. As the findings from our survey suggest, governments continue to play an important part in the investment decision process. One in five respondents identified the role of governments as one of the principal reasons for investing in offshore wind projects, either in providing incentives or as guarantors of regulatory stability.29

The evolution of the sector is demonstrated by 30%30 of respondents identifying either the level of returns or the predictability of returns as a principal reason for investing in offshore wind. A further 24%31 were influenced by the scale of investment, which is not available in other areas of financial markets, demonstrated by some of the largest pension funds in the world investing in offshore wind.32

What are the principal reasons for investing in offshore wind?

Staying ahead of competition – 9%
Size of projects – 8%
Acquiring technology/know how – 7%
Other – 5%
Synergies – 5%

Scale of investment – 16%
Stability/predictability of returns – 15%
Levels of returns – 15%
Stability/predictability of regulatory framework – 10%
Government backing/initiatives – 10%
Other – 24%
Financing structures

Returns and scale of investment go somewhat hand in hand. Due to technological improvements and economies of scale, offshore wind is considered to be the largest investment opportunity in the power sector. Financial markets have supported the growth in offshore wind, with strong liquidity in both equity and debt reflected in improvements in pricing and tenure in a low interest rate environment. In particular, we have observed a convergence in the cost of capital for offshore wind to that of onshore wind in the UK. This is largely as a result of the scale of offshore wind projects providing an attractive home for the abundance of capital in the market.

When it comes to investment, our respondents identified project finance (23%), non/limited recourse finance (21%) and corporate finance (19%) as the most preferred financing methods for the construction phase of offshore wind projects. Of course, these methods are not mutually exclusive and are very often used alongside each other. The financing method for each project will depend on the sponsors and their risk appetite, size and the availability of capital.

What are the most preferred financing methods for the construction phase of offshore wind projects?

- Project finance – 23%
- Non/Limited recourse finance – 21%
- Corporate finance – 19%
- Capital market financing – 15%
- Bond financing – 14%
- Other – 7%

Insight

In general, financing offshore wind is no different than any other infrastructure project. Yet, when you combine extreme weather and water with anything, it always gets more complex. However, what we have seen over the past few years is that investors have come to understand the risks and how to manage them. When we talk about financing projects, we need to speak about the movement from revenues relying on a more stable FiT type income stream to ones that have more volatility (i.e. merchant exposure). This has resulted in developers having to rely on more equity and less debt as a source of financing. Some recent tender winners rely on 100% equity finance. And there is no shortage of capital; hence many funds are moving to new technologies and geographies in order to find yield and deploy capital.
Government incentives

Governmental support remains critical for continued investment in offshore wind projects. Both contracts for difference (CfD) and FiTs appear to be the preferred forms of government incentives. Governments in the largest and most advanced European offshore wind markets, such as the Netherlands and the UK, have successfully used these, or equivalent incentives, to award increasingly large projects in the North and Baltic seas. Newer overseas players have started attracting large investments by providing similar incentives, such as a very attractive FiT, in Taiwan and Vietnam. In particular, the Taiwanese FiT is fixed for 20 years and so eliminates any merchant risk the project is exposed to over a 20-year life.

Which government incentives are the most attractive when making offshore wind investment decisions?

- Contracts for difference/Auction system – 22%
- Feed-in tariffs – 21%
- Guaranteed access to the grid – 16%
- Green certificates – 16%
- Tax credits – 14%
- Exemptions (e.g., climate change levy exemptions in the UK) – 10%

Insight

Up until not so long ago, the focus was always on government support levels required to ensure the returns from offshore wind projects were adequate. That is somewhat still the case but it’s changing fast. As has already been the case with solar, subsidy-free offshore wind is getting more and more attention; especially after contracts in Germany and the Netherlands were recently signed without any government support. However, the industry acknowledges that these are one-off cases, at least for now, and won’t be commissioned for several years. The typical drivers are responsible for the movement towards no longer requiring government support: reducing capital costs, rising capacity factors and access to low cost financing.
As many as 39% of our respondents indicated that a phasing out of government incentives or a shift in political priorities away from offshore or renewables would have a negative impact on investment.

As such, government incentives remain crucial to the development of offshore wind projects in both established and emerging offshore wind hubs. This holds true despite costs having fallen dramatically in recent years. Fierce competition in some of the most mature markets has seen zero-subsidy bids, as in Germany and the Netherlands in 2017, winning large government auctions. Such subsidy-free projects, however, currently remain the exception. Government backing does not only provide a financial incentive but also valuable non-cash inducements, such as grid connection and a form of risk-sharing. It will take time for technology to adapt to new and challenging topography and geographical standardisation, and the significant additional economies of scale associated with the technological evolution will remain elusive in the immediate future. For this reason, government incentives will likely remain the norm for innovative projects in higher-risk locations for some time.

**Which factors are most likely to discourage and/or slow down investment in offshore wind?**

- Phasing out of government incentives: 22%
- Shift in political priorities towards other solutions: 17%
- Predictability of revenue: 10%
- Rising interest rates: 9%
- Limited pipeline of available sites: 9%
- Volatility of oil and/or steel prices: 8%
- Limited experience in the market: 6%
- Technical/construction risks: 5%
- Environmental impact: 5%
- Other: 5%
- Local communities involvement: 4%
Disputes

Beyond the economic and political dynamics that have encouraged the development of offshore wind, Europe has established a set of standards and institutions, such as the Energy Charter Treaty (ECT), that provide predictability to investors through tried and tested dispute resolution mechanisms and a wealth of published awards. The long lifecycle of offshore wind farms and the relative youth of most projects mean that fewer disputes have arisen compared with more mature renewables such as solar energy. Only 22% of our respondents have been involved in an offshore wind dispute. A recent report on disputes in the construction sector noted that the top three causes of disputes were: failure to properly administer the contract, poorly drafted or incomplete/unsubstantiated claims and employer/contractor/subcontractor failing to understand and/or comply with its contractual obligations. These are all issues that are likely to arise in the construction of offshore wind assets.

In what areas do you expect offshore wind disputes to arise in the future?

- Performance/availability: 23%
- Maintenance and replacement: 19%
- Project design and construction: 16%
- Regulation: 13%
- Contract design and management: 11%
- Other: 10%
- Offshore Transmission Owner cost: 8%
Performance, maintenance and project design/construction are the three areas where respondents expect disputes to arise in future, in addition to regulatory changes, which have been the cause of many solar claims. This could have a material impact on costs, especially as liability and liquidated damages is already the most contentious area when drafting investment contracts.

When drafting offshore wind investment contracts, which areas are the most contentious?

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall liability and liquidated damages</td>
<td>26%</td>
</tr>
<tr>
<td>Other</td>
<td>20%</td>
</tr>
<tr>
<td>Governing laws and regulations</td>
<td>15%</td>
</tr>
<tr>
<td>Performance/availability guarantees</td>
<td>13%</td>
</tr>
<tr>
<td>Offshore Transmission Owner cost recovery</td>
<td>8%</td>
</tr>
<tr>
<td>Risk allocation for weather and sea conditions</td>
<td>8%</td>
</tr>
<tr>
<td>Standards and warranties in relation to plant performance</td>
<td>6%</td>
</tr>
<tr>
<td>Dispute resolution clause</td>
<td>4%</td>
</tr>
</tbody>
</table>

The only significant offshore wind case in the public arena is MT Højgaard A/S v E.ON Climate & Renewables UK Robin Rigg East Limited and another. This arose from the failure of foundation structures at the Robin Rigg offshore wind farm in the Solway Firth, which were designed and installed by MT Højgaard A/S.
Insight

MT Højgaard A/S (Respondent) v E.ON Climate & Renewables UK Robin Rigg East Limited and another (Appellants)

The Supreme Court upheld an appeal in the MT Højgaard litigation restoring the Technology and Construction Court’s original decision and finding the contractor liable to comply with a fitness for purpose type obligation contained in a technical schedule despite obligations elsewhere in the contract to exercise reasonable skill and care, and to comply with an international standard.

Following this, parties should consider making clear in their general contract conditions whether, and how, technical schedules are to affect overall obligations to design and workmanship. Contractors may wish, for example, to include paramountcy provisions, which state that nothing in any of the schedules to the contract is to impose a design obligation of a greater standard than reasonable skill and care.37

The potential for disputes needs to be carefully considered when drafting offshore wind contracts. It is easier to resolve disputes during the drafting stage than after an event has occurred, and so reducing the need for formal dispute proceedings. This is supported by the results of the survey with 37% of respondents preferring to resolve disputes via negotiation. Interestingly, 22% prefer to resolve any formal disputes via arbitration rather than litigation (8%), which is reflective of the international nature of offshore wind investment and projects.

What is the preferred dispute resolution mechanism when drafting offshore wind contracts?

![Dispute Resolution Mechanism Chart]

Decommissioning

Later on in a project’s lifecycle, over a third of respondents say that costs of repair and maintenance are the key financial factors when considering whether to decommission a turbine or wind farm. Close to one in five respondents still identifies the end of subsidies as a reason to abandon a project and start decommissioning.
What are the key financial reasons to take into account for decommissioning?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of repairs and maintenance</td>
<td>35%</td>
</tr>
<tr>
<td>Variations in the price of electricity</td>
<td>25%</td>
</tr>
<tr>
<td>No longer profitable as government initiatives run out</td>
<td>19%</td>
</tr>
<tr>
<td>Variations in the prices of gas</td>
<td>9%</td>
</tr>
<tr>
<td>Variations in the price of oil</td>
<td>6%</td>
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<tr>
<td>Other</td>
<td>6%</td>
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Planning for the future when only a handful of wind farms have gone through the entire lifecycle still proves a difficult exercise. Despite some significant technological advances and wind farms delivering beyond expectations in recent years, the sector is still focused on innovation and optimising efficiency. In 2006, the UK government estimated decommissioning costs at £40,000/MW. In 2017-18, the Dutch government required a €120,000/MW bank guarantee to plan for decommissioning costs for the Borssele wind farm auctions. In response to our survey, 93% of respondents said that decommissioning would cost between €0.0/MW and €200,000/MW (which could be an accurate representation of the top end of decommissioning costs) but is a significant range on which to base investment decisions.

Offshore wind operators, however, have several options at their disposal when considering the future of a wind farm. Unlike in the oil and gas sector, which is more heavily regulated and depends on the availability and accessibility of a finite amount of fossil fuel in a given location, offshore wind farms can be repowered or refurbished. This is already common practice in the onshore wind market, with over 150 onshore wind turbines repowered with larger ones in 2017 in Europe alone. By updating existing turbines and platforms, operators and investors have the possibility not only to increase the lifetime of a project, but also to increase energy production and efficiency.

What would you consider an adequate estimate of decommissioning costs (€000’s/MV)?

- 0 – 100: 43%
- 101 – 200: 50%
- ≥ 201: 7%

Insight

As well as traditional Financial Due Diligence (FDD) and Operational Due Diligence (ODD), there is an increased use of integrity due diligence (IDD) investigations into prospective business partners and customers. IDD can help parties understand an organisation’s history, track record and the reputations of its principals.

IDD can highlight red flags for financial crime and provide information regarding track records in other relationships, business ventures and political relationships. In emerging markets, IDD can highlight hidden influencers (such as hidden shareholders or political figures), reveal macro risks inherent in a region or specific sector, legislation changes and underlying ownership structures. It can also identify undisclosed business interests, material misrepresentations or omissions, or conflicts of interest.
Looking to the horizon

The ability to build larger turbines and scale up projects will become increasingly important to the development of wind farms, with over 40% of respondents saying this will have the most significant impact on cost efficiencies.

Which structural factors are most likely to impact the cost of offshore wind farms?

According to some estimates, turbine size has increased by almost a quarter and wind farm size by over a third since 2016. Increase in size outpaced anything governments expected and the trend seems to be accelerating. In the 10 years from 2007 to 2017, turbine size more than doubled to 8MW. Just over a year later, the first double-digit megawatt turbine was launched. Increasing energy production capacity through size means building wider blades and higher turbines to catch more and steadier wind, producing more energy more reliably. It is also easier to increase turbine size for offshore wind farms, which are barely visible from shore and therefore less likely to attract public ire, than for their onshore counterparts. In September 2018, a Danish-Japanese joint venture launched V164-10MW, the world’s first double-digit megawatt wind turbine, while America’s GE is working on a 12MW turbine. Such technical advances are the key to the immense, and yet largely untapped, Asian market.

Our findings show that financial and technical considerations are tightly linked and influence the whole lifecycle of offshore wind projects, from the pre-investment stage, to the construction and operation of the facility, through to decommissioning. Technological advances are also an important consideration. Almost a fifth of our respondents identified floating foundations as a key challenge for the future of offshore wind.
What would you consider the key challenges for the future of offshore wind?

- Cost reduction: 26%
- Floating foundations: 19%
- Supply chain constraints: 16%
- Connection to national grids (OFTO interface): 10%
- Lack of experience due to relative low maturity of the industry: 7%
- Environmental impacts: 6%
- Weather conditions affect both energy generation and ability to run and maintain the turbines: 5%
- Other: 3%

Floating turbines make offshore development possible in waters previously inaccessible to wind farms with traditional foundations, opening up vast swathes of seas and oceans to the sector. A year ago, the world’s first floating wind farm became operational in Scotland and has been reported to exceed expected power generation. Since then, the technology has encouraged other governments to get involved. China has identified floating turbines as part of the answer to meet its ambitious targets and growing demand, while Norway and Japan have the most advanced plans to develop their own floating wind farms. Taiwan is also an ideal entry point for developers to access the rest of APAC, where conditions are more challenging and floating turbines have the potential to unlock investment in other promising markets.

Floating turbines also allow for more flexibility in strategically locating and operating wind farms: a site performing below expectations could be relocated to a more suitable, and therefore more profitable location, arguably quicker than building a new farm from scratch. It is also an area where building bigger should be easier. Unlike traditional turbines, which are anchored into the seabed, floating ones can be built and maintained in port before being transported to site, making logistics simpler and costs lower. The world’s second floating wind farm, off the coast of Portugal, will operate the largest floating turbines ever and will be located far out to sea to benefit from stronger and more reliable wind.46
Finally, new technologies and innovation could have a considerable impact on returns. Key among them is energy storage, as the attractiveness of offshore wind projects is closely linked to the price of electricity. When electricity becomes cheaper relative to offshore wind, the energy produced by the turbines can be stored and released once the market is more favourable. Following the success of a number of large-scale energy storage projects in 2017, this year has seen the announcement of significant investment in the sector, including USD10 billion by 2020 from EDF France, a large utility and the launch and listing of specialised funds. Such injection of funds in research and development will further decrease the costs associated with storage until it becomes ubiquitous to how the world plans, supplies and consumes electricity.
Conclusion

In a time of increasing focus on the finite level of carbon resources and a need to reduce human impact on the environment, offshore wind offers the greatest investment opportunity to deliver the power required in a sustainable manner with an ever increasing rate of technological change.

We hope this report will provide insights for all offshore wind stakeholders on the areas of change and consistency in offshore wind, coupled with the benefits and risk of investing in offshore wind.

About Grant Thornton’s research

This report is based on responses to an online survey Grant Thornton UK conducted during July and August 2018. 114 respondents from energy corporates, law firms and private equity firms, in 13 countries, shared their views about offshore wind development and investment. These respondents represented a broad cohort of market experts, who have collectively worked on various offshore wind projects.

Following completion of the online survey, Grant Thornton UK convened a roundtable dinner and one-to-one discussions with respondents and additional industry experts to debate and analyse the preliminary research findings. Insights and observations from those discussions are also included in this report.

We would like to thank all the contributors to our research for their time and insights, in particular:

Alex Harrison  Gerry Beausang  Neil Keenan
Charles Yates  Guy Winter  Nick Pincott
Charlotte McAuslan  Lisa Mazzucotelli  Richard Power
Gavin Blake  Mike Read  Robert Speht
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Robert has 20 years’ experience in renewable energy giving him a broad background across various renewables technologies, but especially wind, offshore wind and solar and across the full life cycle of projects from development, through construction and in operations. With experience in 10 offshore wind farm projects across Northern Europe he has a very good understanding of the issues facing the industry together and where the sector will be headed in the future.
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