Perspective

Advantage-OW Framework

RCG's offshore wind technology and innovation catalyst

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RCG'S ADVANTAGE-OW FRAMEWORK

RCG proprietary framework for assessing new technologies and innovation in offshore wind helps clients quickly and effectively understand the risks and opportunities of a given technology. Leveraging RCG's cross-cutting expertise in the sector, clients receive world-class, objective advice to inform decision making.

Background - Competition driving innovation

The offshore wind industry's continued downward cost curve is one of the great success stories in worldwide renewable energy development. Its emergence as a reliable and cost-efficient energy generation technology has led to uptake in new markets as well as a change in approach from those early adopter markets to help keep a downward pressure on costs. The general trend with governments worldwide is to turn to auction mechanisms as a way to either portion up the seabed, provide access to offtake agreements or both. In light of this new world and increased competition, offshore wind developers need to find the edge to submit a winning bid and technology and innovation is coming into its own as a way of securing this edge.

> *"Innovation strategy is an essential tool for technology development and growth.*

This is a trend of recent auctions, confirmed with Crosswind's successful award of Hollandse Kust Noord in the Netherlands, where innovation will be front and centre in the development of a commercial offshore wind farm. Cost isn't the only area where innovation helps developers win, but other levers can be pulled depending on the criteria of different auctions. For example, innovation can help with local content requirements which are becoming increasingly common, or it can help prove to regulators a commitment to the market and a potential trajectory for the industry in its region.

Technology Readiness Levels (TRL) are recognised as a planning tool for innovation management.[1] Technology Readiness Levels were originally developed by NASA, later used by US-DOD, US-DOE, ESA; now adopted by the European Union for technology funding. However, adaptation is needed to ensure proper decision-making processes when using any Technology Readiness Level scale. The difficulty is turning this approach into a practical tool in a competitive market.

[1] Innovate-to-Market workflow: https://thinkrcg.com/innovate-to-market-workflow/

The need - Challenges in technology assessment

So how do developers go about securing the edge in auctions through innovation and how does a business find and assess which technologies it may want to rely upon now or in the future to achieve the commitments it might make in a bid? This can come into focus at the time of preparing a bid into a competitive auction, to help shape a bid or appeal to particular criteria in that auction. Or it can come earlier as part of a lifecycle development approach, allowing innovation to be assessed at an early stage in development and monitored and refined through to financial investment decision (FID) and beyond.

“Agile methods can be applied to accelerate technology development.

Whichever stage a project or portfolio is at, the challenge becomes how to objectively assess the risk/reward balance that an innovative technology might provide. Innovation is inherently risky, but often the rewards far outweigh the risks. Ultimately, the rewards are more likely to be achieved (and likely to be larger) if the risks are known at the outset and managed through development. Assessment of innovation is currently not standardised and can be highly subjective depending on the expertise of the assessor, which may introduce errors or overlooked risks that lead to issues later down the line. An efficient and robust assessment methodology for innovative technology that can be applied at any stage of project development has the potential to provide developers with a competitive edge and allow them to adopt the most promising technologies.

Our solution - RCG’s Advantage-OW Framework

Why?

RCG saw an opportunity to help the industry better understand and assess innovation and technology and created the Advantage-OW framework to assess the potential of a given technology:

- Technology Readiness Level (TRL) – Assessment of the technology and commercial readiness level for the required application.
- Technical – Technical assessment including engineering and logistical improvements or challenges.
- Environmental - How the environment might be impacted by the innovation.
- Supply Chain – Reviewing the supply chain required to deliver the technology.
- Codes – Standards, regulations, and legal implications.
- Health, Safety, Environment (HSE) – Potential HSE improvements or additional HSE risks associated with this new technology.

- Organisation – Research into the organisation behind the technology and their track record.
- Outlook – Future trends in different markets that affect the potential for deployment of this technology.
- Levelised cost of energy (LCoE) – The confidence in LCoE predictions.

The framework not only encourages offshore wind developers to start thinking about innovation more systematically at the outset of project development, but it also provides a repeatable way of assessing innovation that can be used across a portfolio of projects and helps communicate often technically complex matters, distilling them into an informative but understandable format to help make decisions. In equal measure, the framework can be leveraged by investors to scope out potential investment opportunities quickly and effectively or can be utilised by public sector bodies looking to maximise return on rate-payers' money by investing in the most promising innovations to achieve their objectives.

How?

The framework utilises RCG's breadth and depth of experience and expertise in offshore wind to provide a holistic overview of a given technology, with experts drawn in from across the business to provide analysis and insights specific to their skillset.

RCG takes the time to understand the client's needs and baseline for the assessment at the outset, as well as the ultimate objectives the client has in deploying a new technology assessment, whether that be cost reduction, HSE improvements or environmental mitigation.

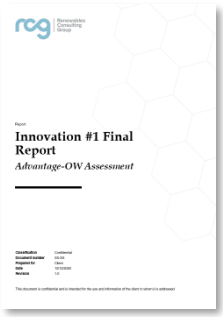
Clients can bring a technology they are interested in to RCG or ask for a technology scan prior to kick-off. Each of the Advantage-OW framework pillars (as listed above) is then assessed to provide a complete understanding of the risks or opportunities that may be inherent when applying the technology to a project or a portfolio of projects. The analysis can be shaped to the client's needs with higher level analysis possible for a greater number of technologies, through to in-depth analysis utilising RCG's proprietary Levelised Cost of Energy tool and advanced risk assessment.

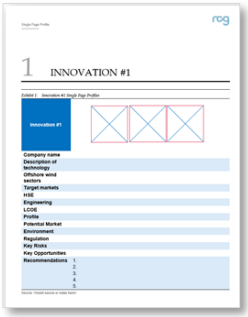
What?

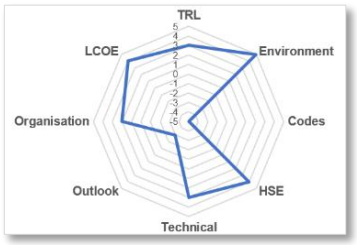
RCG provides the client with a suite of deliverables for an in-depth understanding as well as summaries and graphics to help communicate the outcomes to their business. This includes:

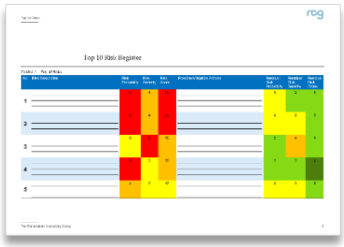
- Technical report – presenting the results of the assessment from the RCG team of experts and providing the necessary technical detail and justification for the assessment scores.

- Profile – RCG's one-page proforma allows clients to compare and contrast technologies and get to the heart of a technology's use case in five minutes.
- Radar diagram risk scores – RCG provides opportunity and risk scores for each of the Advantage-OW framework's pillars, utilising radar diagrams to help visualise these scores.
- Risk registers – The top risks and opportunities are detailed in a "Probability × Impact" risk register, utilising a 1-5 matrix scoring to present the scale of the risk or opportunity.









RCG's experience as a developer and as a technology assessor helps translate what can often be confusing and detailed material into a concise and easy to understand format.

Conclusions

The Advantage-OW framework can be applied not only by offshore wind developers in assessing technologies for projects or portfolios, but also prospective technology investors to scope out future investments, and public sector bodies requiring a robust and transparent framework to assess funding opportunities in offshore wind.

To discuss how RCG can help you to maximise the benefits from new technology and innovations in offshore wind, contact us directly.

ABOUT THE AUTHOR

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Michael Stephenson is an Associate Director in RCG's London office. He has substantial experience in the wind industry, both onshore and offshore and has worked across multiple stages of the project life cycle, including research and development, planning, and construction.

Mr Stephenson is a certified project manager with a proven track record of managing real-world projects. He has an in-depth knowledge of multiple facets of onshore and offshore wind, with a unique skill set acquired from experience across multiple stages of project development working both as client and consultant.

Mr Stephenson has a deep technical understanding of offshore wind through management of research and development (R&D) studies related to offshore wind technology both desk-based and in the field. He has also utilised this understanding to provide public and private entities with new market intelligence, including helping design their own R&D and innovation programmes to accelerate cost reduction in offshore wind.

The Renewables Consulting Group

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