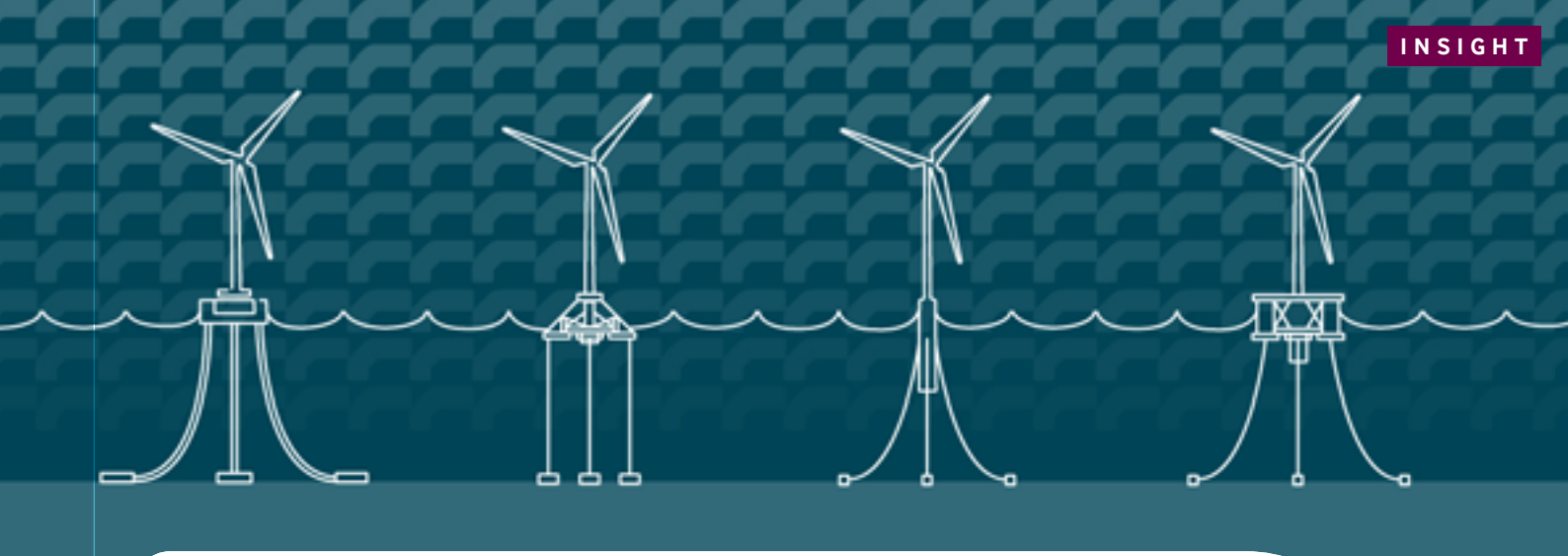

SPOTLIGHT: SITE INVESTIGATION SURVEYS & FLOATING OFFSHORE WIND

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What's involved in scoping a site for a floating offshore wind project and why? And what issues must the industry consider going forward? This article delves deeper.

Ewen Stewart is a Technical Director specialising in site surveys. We asked him what site investigation for floating wind projects will entail and what challenges the industry could encounter. With oil and gas developers increasingly involved in floating offshore wind due to the deeper water nature of the environments, Ewen, who has experience in both, talks about reasons for some of their similarities and differences in approach between the industries. Here's what we learned from our conversation...

Surveys protect against project risk

Floating offshore wind has some big differences from fixed, starting with the switch from shallow to deep-water environments. There's no foundation to sink into the seabed, but more points of contact with the seafloor and increased distance between wind farm and shoreline.

So where do geoscience surveys come in? Investigations like these are all about advising clients on how they can minimise risk. Geoscientists can make recommendations on what ground conditions to expect in the array and cable corridor, and how to assess the risk to cable and anchor points as well as informing other aspects of design and engineering. They investigate what geological conditions or possible hazards are present, ensuring the entire cable route and arrays are sufficiently sampled to reduce unknowns.

The analysis stage is crucial – and extensive

The duration of geophysical surveys for offshore wind farms is quite variable depending on their size and the weather conditions encountered during operations, but these generally take around one to two months. This is followed by geotechnical surveys of around two to three months. The acquisition of the data itself is quite a swift process; it's the analysis that can take time. The "measure twice, cut once" frame of mind is essential for design. It enables engineers to correctly identify what kinds of structures and fastenings will be suitable to keep turbines in place and performing efficiently in the harsh deep-water environment.

Site survey data: how much is too much?

There's a risk that floating wind's first wave of commercial projects will be 'over-spec'd' (surveyed and designed according to overly strict parameters) and therefore over-engineered in comparison to shallow-water wind farms. Projects will want to reduce risk and satisfy evolving regulations, but the upshot is increased project costs.

There's also the question of repeat visits to reacquire data. Some projects do this again and again – even when there's a "best in class" dataset already available. Others acquire very dense geophysical data, but the more you gather, the more you have to analyse. Instead, the aim should be to acquire data in the most efficient way possible. The right consultant should optimise planning and management of this – it should be cost-effective, while getting to the answers and evidence you need.

Are other energy industries doing it better?

How floating offshore wind projects acquire data will make a big difference. There's a lot of variation in approach, and even within a particular region, there can be a lack of continuity.

You could make comparisons with the oil and gas sector, which has more streamlined data acquisition processes, but Ewen says, "That's true now, but it wasn't 30 years ago. That industry learned the 'hard way' and floating wind is doing the same thing now."

Oil and gas works on the licence block or multi-client (MC) model. For the MC model, survey companies acquire data for vast areas, selling to clients who express an interest if the data is likely to be relevant to them. The licence block can also be sold on, allowing the developer to recoup some of their costs. Floating offshore wind, meanwhile, is currently entirely proprietary or government-backed, while the MC model hasn't been applied in fixed offshore wind (to date) due to differences in leasing processes and how developers operate. However, it is being considered, for example for wind resource data. How floating offshore wind's processes evolve – and the direction data gathering takes – will be telling.

Government involvement and support for floating wind site surveys

So who takes control of site data and what difference does this make? The Irish sector is one example of the development model, in which the developer acquires the data and covers the cost.

In a bid to improve the process, some governments are taking full or partial control of data acquisition. The UK government is doing this in the Celtic Sea and will interpret the data before releasing the initial ground model (created to help identify suitable development areas and cable corridors). The Dutch government is covering the costs of top-class geophysical and geotechnical campaigns – at many millions of Euros – and will also release the data to developers. This approach removes some of the expense but also some of the planning, management, wait times and other hurdles prior to development, essentially de-risking the project prior to the leasing process.

Read more about RPS work in the Celtic Sea:
- **As a member of the Celtic Sea Cluster**
- **Navigating the complex regulatory regime of the Irish and Celtic Seas**

Find out more about desktop studies in this case study

"Good things come in small packages"

Previously, we've written in **this article** about how, in floating offshore wind, less contact with the seabed is sometimes wrongly assumed to mean less environmental impact. When it comes to design, it's also not just a question of where the anchor goes. Instead, highly detailed seabed and subsea surveys will be needed to truly understand project requirements. This limits the type of approach where a survey company acquires large swathes of data in one go. Floating offshore wind will need to think of surveying in terms of much smaller parcels – which will yield more focussed and relevant information.

Changing the proposed location of a wind farm is challenging, so micrositing (investigating and defining a specific area for development) must be effective. This is another difference from oil and gas, where directional drilling – drilling non-vertically – means certain geohazards or features can be avoided. The exact site proposed for an oil and gas project isn't "set in stone" in the same way.

Coming from oil and gas, however, developers will have to be ready to take "a different attitude to data". They will need more detail, and in some cases, they will also be required to share that data to help the industry develop.

"Here again," Ewen adds, "the challenge of how to 'spec' or scope studies correctly is really important, but this is an aspect where RPS has the right kind of experience to support our clients."

Drawing on a range of energy industry experience

Ewen gained 20 years' experience on oil and gas projects before working in renewables. He sees many new entrants into technical roles looking to specialise in renewables, but points out the value of geoscience skills learnt elsewhere. These could also be set to decline as senior oil and gas consultants retire. For example, he points to the link between geophysicists or geologists and engineers:

"Engineers put the steel in the earth, but the geoscientists tell them what's there to begin with. You have to be able to communicate well – almost in a different language as the engineering side is so different from imaging or subsurface imaging. That type of communication is an integral part of working in the oil and gas sector."

For Ewen, experience across a range of industries – with a broad skillset that not many companies can compare with – is one of the reasons RPS stands out. "We carry out site investigation, data QC and analysis, but also **environmental assessment, metocean studies, UXO**, and more. We set the tone for quality and experience, so we can walk the client right the way through the asset development."

For more information about RPS support for site surveys, contact Ewen Stewart, Technical Director.

Read more about floating offshore wind at RPS:
Consenting
Deal advisory
Marine mammals
Floating offshore wind – the opportunity