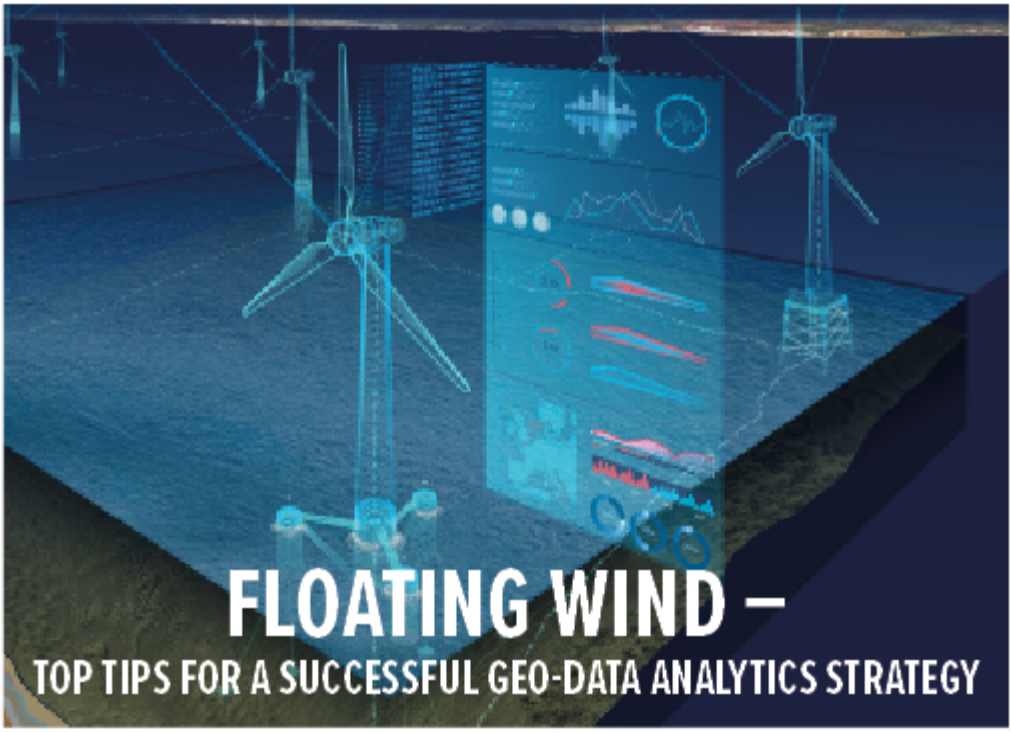

FLOATING WIND – TOP TIPS FOR A SUCCESSFUL GEO-DATA ANALYTICS STRATEGY

Floating wind is an emerging technology that promises to bridge the ever-growing demand for clean energy, with access to terawatts of predictable wind energy that blows unobstructed over vast swathes of the oceans

Yet, the complex interactions between the environment, a floating hull moored to the sea and a giant wind tower atop presents a multiphysics engineering problem like none other. A deliberately defined 'data-driven' strategy, as underpinned by the following core principles, will enable effective design-build-operate-improve iterations in floating wind.

- **Physics based** – Wind drives waves, waves drive motions, motions drive structural fatigue. The interplay and sequence of physical parameters should auto-define data hierarchy and scope

- **Cost-effective data acquisition** – Sensors are cheap, but open-source data can be cheaper. Static datasets (such as seabed data) can be built from digitising legacy data, and keeping sensors dry (not underwater) is a good idea to avoid maintenance issues

- **Data economies of scale** – Integrated packages with multiple sensors in a 'black-box' can be helpful in reducing deployment cost and importantly save future grief with stitching together disparate datasets

- **Fit-for-purpose data orchestrated framework** – Key nuances to consider are edge capability for bandwidth economy, application programming interfaces for third party data, and scalability of end uses – would a mooring sensor need to be augmented with remotely operated vehicle inspection data-lake in the future?

- **No-code mindset** – End users can distil powerful insights if enabled with drag-and-drop user interfaces. For perspective, a structural engineer is more literate with columns of data than a programmer can be about hydrodynamics

- **Data variance and knowledge transfer** – The same features are represented differently with sensor make and type, season, or even geography. This can be problematic for automated routines such as machine learning and industrialised quality control algorithms. Leveraging knowledge transferring models are the secret to manage this effectively

CONCLUSION

The floating wind industry is currently at ramp-up stage, and design concepts are being validated with demonstrator projects. Gathering data from these demonstrators will be worth its weight in gold to standardise and de-risk the thousands of turbines that will float in the oceans in coming decades.

Aproop Dheeraj Ponnada
Solution Owner, Floating Wind
Fugro