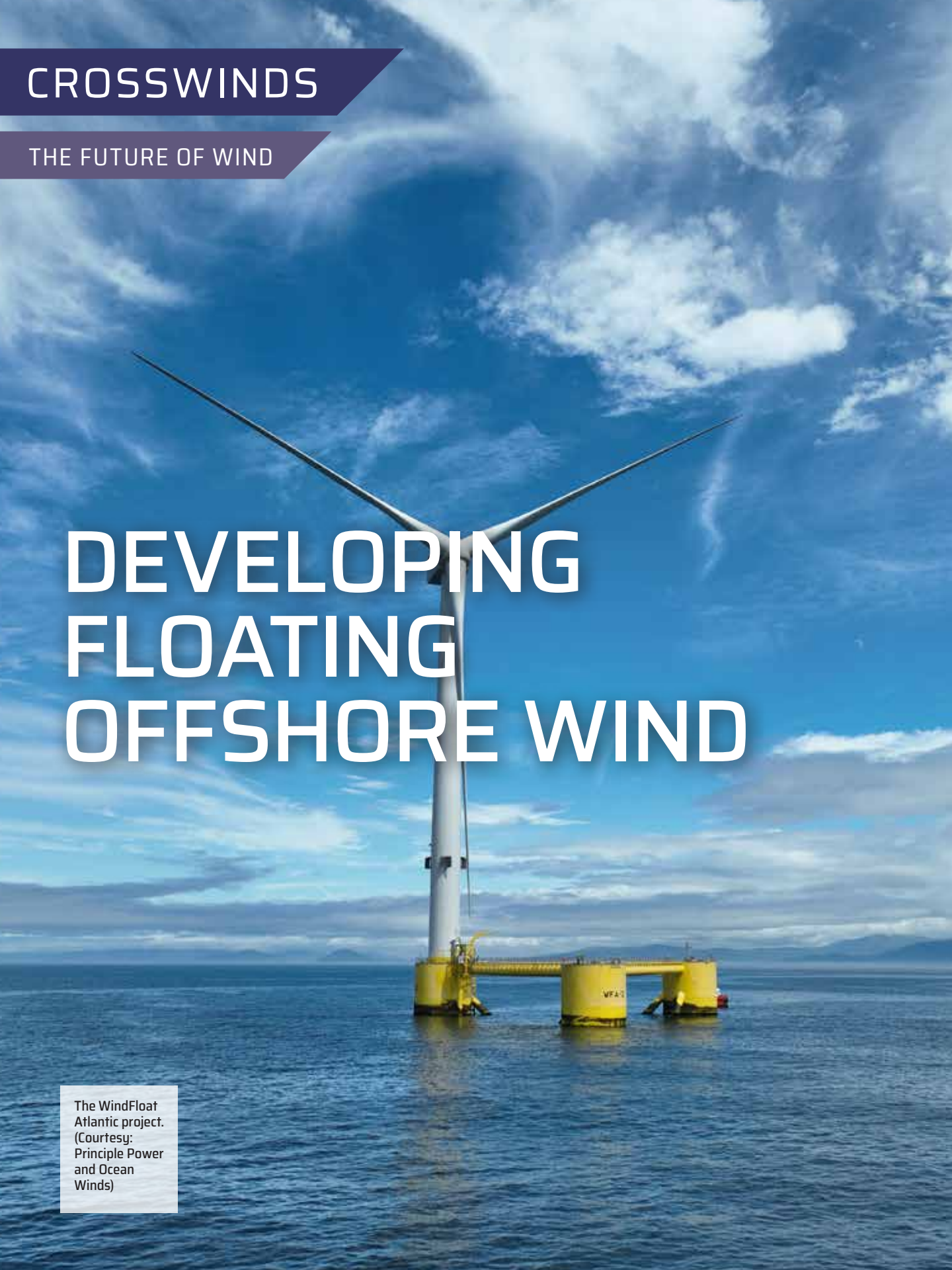
DEVELOPING FLOATING OFFSHORE WIND



The WindFloat Atlantic project. (Courtesy: Principle Power and Ocean Winds)

Case Study: Principle Power and Shoreline Wind collaborate to unlock floating offshore wind opportunities globally.

By MICHAEL BJERRUM

The global renewable energy landscape is rapidly evolving, with offshore wind energy emerging as a key component in achieving global sustainability goals. As the transition to cleaner energy intensifies, the need for scalable, innovative solutions in offshore wind technology becomes more pressing. Europe has been the early mover. Today, 20 percent of energy produced across the continent comes from wind. That statistic is far higher across early moving countries such as Denmark (56 percent), Ireland (36 percent), Germany (30 percent), and the U.K. (29 percent). The IEA expects wind to be the No. 1 source of power in Europe by 2027.

The rest of the world is now waking up to the opportunity. Offshore wind is expected to be one of the fastest growing segments in renewables globally — almost tripling its capacity in 2023 to 2028 to more than 150 GW, according to EIA. That said, geographies are not the same. Deep water coastlines found in the Asia Pacific region, among other parts of world, make offshore wind opportunities problematic. Innovation such as floating offshore wind (FOW) have been revolutionary to get over this problem, but proving the use case of FOW has been a story of collaboration. The case study of two businesses, Principle Power and Shoreline Wind, above many others, has proven FOW is a credible offshore wind technology and is ready to scale.

PIONEERING FLOATING WIND

Since 2007, Principle Power has pioneered the development of floating wind technology. In 2016, Principle Power selected Shoreline's simulation solutions, recognizing that planning commercial scale wind farms requires the ability to accurately represent the many inherent complexities and dependencies that go into the logistics to build and operate projects in different geographies.

Principle Power was already equipped with five years of operational data from the first pilot project WindFloat 1 off the coast of Portugal, as well as the processes and method statements for projects such as WindFloat Atlantic. Shoreline brought its expertise acquired from providing advanced simulations for traditional (fixed) offshore wind from around the world and had already developed a solution (Shoreline Design) that could simulate the design, construction, and ongoing operations and maintenance of offshore wind projects.

Together, Shoreline and Principle Power collaborated to extend Shoreline's Construction Design™ and Operations Design™ software to be able to realistically simulate the operations required to deliver utility-scale floating wind projects.

The Kincardine Offshore Wind Farm project. (Courtesy: Principle Power)

PLANNING OPERATIONS

Principle Power uses Shoreline's simulations, in combination with internal databases, to help developers plan operations for many different projects across the world, including the 30-MW Fukushima Forward project in Japan, the 1.2-GW Korea Floating Wind project in Korea, and several projects in Taiwan. The analysis and simulation of each project helped to identify requirements and bottlenecks for robust planning and are used to optimize costs and performance. They can also stress test project execution plans to understand the potential impact of sensitivity scenarios and mitigating contingency plans. The results, which are based on real-world experience, help to build confidence in scaling up floating offshore wind projects to commercial scale in new markets around the world.

"Combining our real-world data from deployment and operations of floating offshore wind projects with Shoreline's advanced simulation technology helps us deliver feasible execution and O&M planning to our clients," said Inês Serras Pereira, LCoE and Business Intelligence Lead at Principle Power. "By accounting for the complex interdependencies between quayside and offshore operations, and considering the inherent variability of weather offshore, we ensure that we provide best case schedules for commercial-scale projects that are deliverable. This provides an excellent starting point for optimization and contingency planning, helping our clients to prioritize the most cost and revenue effective approaches throughout the lifetime of wind projects."

Ocean Winds contracted Shoreline Computerized Maintenance Management System (CMMS) solution (CMMS) for its deployment at WindFloat Atlantic, where Principle Power is providing platform inspection, maintenance, and repair services.

Thanks to its contract through WindFloat Atlantic, Shoreline and Principle Power will continue to collaborate to make sure that the simulation capabilities keep pace with the many developments in floating offshore wind such as the in-situ repair that was recently completed at Kincardine.

The collaboration between Principle Power and Shoreline Wind represents a significant milestone in the development of floating offshore wind technology. By combining their respective strengths, the two companies have unlocked the vast potential of floating wind, a technology that promises to revolutionize the renewable energy sector. As floating offshore wind continues to evolve, the Principle Power and Shoreline Wind collaboration serves as a powerful example of how strategic partnerships can drive innovation and accelerate the deployment of renewable energy solutions on a global scale.

ABOUT THE AUTHOR

Michael Bjerrum is co-founder of Shoreline Wind. He has an engineering background and 26 years of global commercial management experience in different energy sectors. Bjerrum entered the offshore wind business in 2008 and has held a number of different management and board positions within the offshore wind industry prior to co-founding Shoreline Wind in 2015.