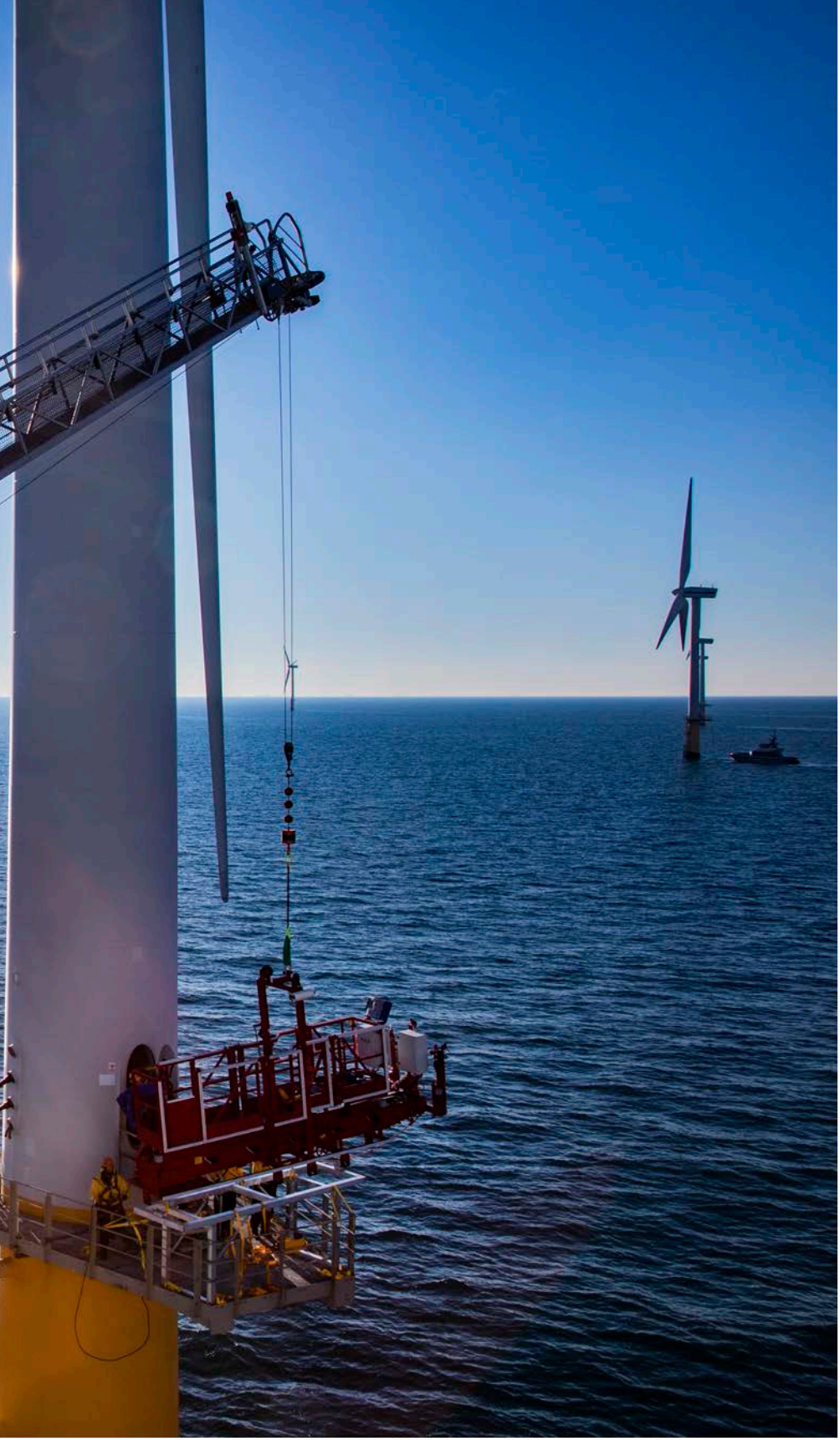
Accessing the floating wind frontier

The company's E1000 system can transfer both personnel and cargo in rough sea states. Photo: Van der Kloet

'Floating wind', the new buzzword of the offshore energy sector, is said to revolutionise the global energy infrastructure. Floating turbines open up new potential sites for exploitation, further offshore, in deeper seas, where stronger and more consistent winds mean better yields. Only four floating wind farms have been built so far, but this relatively new technology is gaining considerable attention from investors and governments as a means to push the global energy transition forward.



Situated in rougher seas, the provision of safe and efficient offshore access to personnel and cargo will be crucial if floating wind farms are ever to become commercially viable. Ampelmann has become well known in the global offshore energy sector, for its motion compensated systems and services that deliver reliable and consistent offshore access. With over 650 projects already completed, the company's systems have put Walk to Work (W2W) firmly on the map of the global offshore energy infrastructure. Now turning its gaze towards the floating wind sector, Ampelmann expects an increased demand for its systems as the floating wind sector grows.

The future of floating wind

Throughout Europe, Asia and the Americas, floating wind is expected to grow explosively in the coming years, as it promises to sustain the increasingly ambitious green energy targets of governments and businesses alike. Particularly where space for both onshore and bottom-fixed wind turbines is scarce, these turbines have the potential to broaden the horizon of the offshore wind sector.

In Europe, new wind markets will emerge across the region. Along with the North Sea, the Atlantic and the Mediterranean will become focal points of Europe's floating wind agenda that will see Ireland, Portugal, Spain, Greece and Italy as important centers of growth.

While Europe is leading the charge, the first large-scale projects have already been announced in East Asia and the USA. China, Japan and South Korea have earmarked floating wind as an important part of their ambitious plans to achieve carbon neutrality by 2050.

As a relative newcomer to the offshore wind sector, the US is also expected to invest heavily in the new technology. On top of California's and Oregon's combined state targets of 6GW, the Biden-Harris administration has announced the aim of reaching 15GW of floating wind by 2035, with the deliberate goal of reducing the costs of floating wind energy.

Challenges and opportunities

Despite these ambitious global targets, the sector is both technologically and commercially in its infancy and there are some significant challenges and obstacles still to be overcome. The construction, operation and maintenance of floating turbines can lead to unforeseen expenses that impact the cost of the turbine's lifecycle. Irrespective of the turbine design, be it semi-submersible, Spar, tension leg platform (TLP), or other novel designs, floating wind farms are difficult to access from both the air and the sea, leading to tight operational windows that make offshore access costly and inefficient. Traditional access methodologies might struggle with the rough and unpredictable metocean conditions in deeper waters, further away from servicing ports, which are exacerbated by the difficulties of accessing the floaters from moving vessels.

Motion compensated gangways have much to offer to the nascent floating wind sector. As one of the pioneers of W2W, Ampelmann has been designing and building gangway systems for over fifteen years. Its signature gangway is based on a hexapod that enables the system to compensate for motions in all six degrees of freedom. By providing stable access points between vessels and floaters, these systems increase the accessibility of offshore installations and structures in rough sea states.

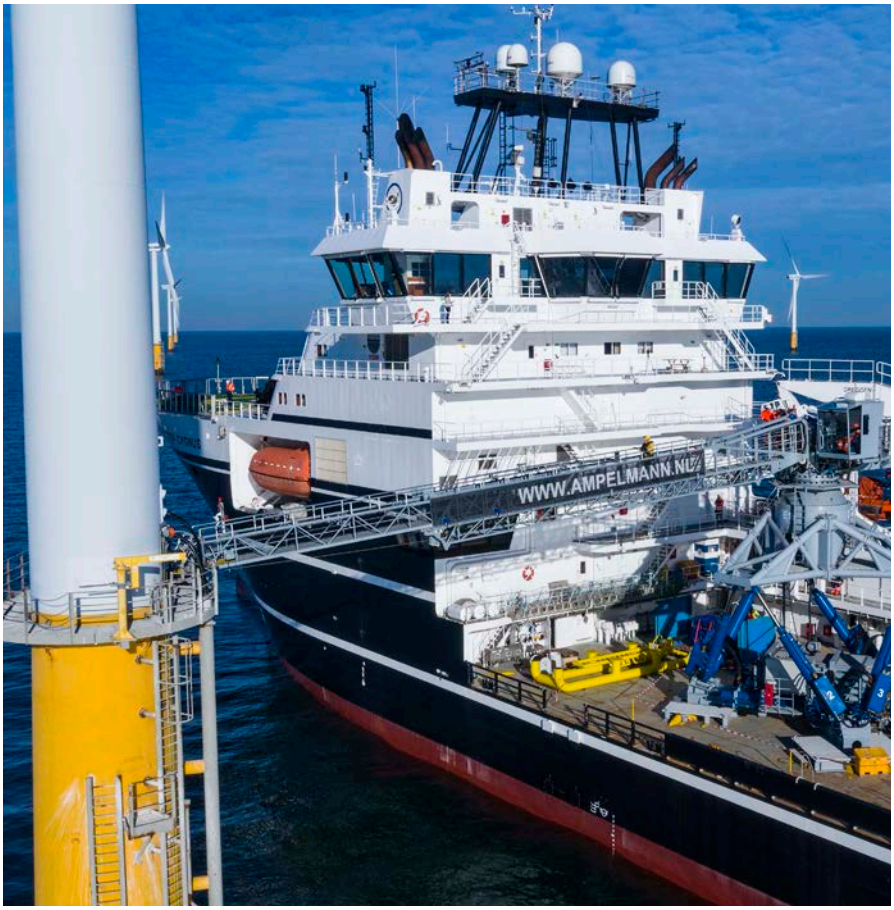
The result is improved workability, efficiency and safety even during adverse weather conditions. With more uptime, offshore operations can continue throughout the year, reducing operational costs without straining the global vessel market.

With over 200 successful wind projects already completed for European and Asian contractors, and its first US project about to commence, the company's gangways see frequent use in the global offshore wind sector. Nevertheless, floating wind also shares many similarities with conditions in Oil & Gas (O&G).

For decades, floating platforms such as semi-submersibles, Spars, FPSO's and single point moored buoys (SPM) have been a mainstay of the development of deep-water oil and gas fields. Together with support vessels, such as platform supply vessels (PSV) and semi-submersible heavy lift ships (HLS), these offshore structures and platforms, like floating wind turbines, require efficient access solutions to safely conduct offshore operations and enable consistent access throughout the year.

Since its foundation in 2008, Ampelmann's systems have been active in this sector and its specially trained operators are well versed in the intricacies of floating-to-floating access. Ampelmann's A- and E-types, as well as the A300 and the E1000, which can also lift cargo alongside transferring personnel, already see frequent use in both sectors. This includes ship-to-ship and floating-to-floating work scopes.

The company has a wide range of gangway systems that can operate in different climatic conditions and are suitable for work on both smaller and larger vessels. Because of their hexapod, these systems can compensate for high sea states and offer a flexible alternative to conventional offshore access solutions.



Ampelmann gangway systems make offshore access safe, efficient and reliable. Photo: Van der Kloet

Systems and services

In late 2022, one of Ampelmann's E1000 systems was mobilised on a major floating wind farm off the coast in Norway. In spite of the harsh North Sea conditions, the gangway was able to continue to perform throughout the winter, providing consistent support to crew and cargo operations. Having already transferred over 2,500 people and 80,000kg of cargo, a second E1000 was mobilised in early 2023 and began its tour of duty alongside the first system to support operations on the wind farm.

As one of the most powerful systems in Ampelmann's portfolio, the E1000 is the ideal access solution for the floating wind sector. Because it can withstand waves up to 4.5m H_s, the system provides consistent offshore access for personnel and cargo in the rough and variable sea states that are prevalent during the construction, maintenance and operation of deepwater floating wind farms.

The gangway can also convert into a crane with a hoisting capacity of one metric tonne, ideal for lifting equipment, spare parts, winches and generators. With hundreds of successful landings already made, the gangway has the proven capacity to work effectively on floating wind farms.

Alongside its systems, Ampelmann provides its customers with a robust service package to increase uptime and ensure the highest productivity rates during offshore operations. This includes specially trained operators and a 24/7 hotline to the Operations Control Centre (OCC). The company also provides its customers with Ampelmann Insights, a data tracking tool that enables its clients to closely monitor and optimise their projects.

This digital platform offers workability forecasts to assist with efficient planning of offshore operations. Digital services such as these can be particularly helpful for projects on floating wind farms where the variable nature of maritime conditions requires meticulous operational planning.

Expectations for the future

The emergence of floating wind will alter the existing limits of the renewable energy sector, opening up new frontiers across the world and expanding prospective sites for the harvesting of wind power. Floating wind turbines are set to become an essential component of the international effort to reduce carbon emissions and provide global citizens and businesses with green and clean sources of energy.

But with new opportunities come new challenges.

The divergent motions of floaters and vessels require clever solutions to enable the effective servicing of wind farms far out at sea, in deep waters with rough weather conditions. The provision of efficient offshore access to personnel and cargo will be crucial if floating wind farms are ever to make the transition to commercialisation.

Ampelmann is prepared for the growth of floating wind. Its high-tech gangways and innovative approach to offshore access have helped to redefine the safety and efficiency standards in the global offshore energy sector.

As the floating frontier expands, the company wishes to offer its expertise as an offshore access provider to this exciting new market. Having delivered three successful projects, the company's systems have been proven to have the capacity to work effectively on floating wind scopes and its trained operators and services have much to offer to the industry as it develops.

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