Challenge description	Challenge owner
1. - Transfer to sea methodologies Installation: Transfer to sea is a key operation when setting large project execution plans. The process is constrained by floating wind structures weight and shape in combination with port facilities conditions. Transfer to sea can create a bottleneck when executing a large-scale project. This shall be performed in a safe and smooth manner. The solution to this challenge needs to improve the load out methodologies for large and heavy structures, minimize the cost of load out operation, increase safety and mitigate risks.	Iberdrola (Spain)
2. Support and Monitoring of Commissioning and Maintenance Activity Commissioning and Maintenance Activities for Offshore Substations: Commissioning and Maintenance activities for offshore wind farms consume excessively high time and costs and have a significant impact both for the acceptance and delivery of offshore substations and for the management of these wind farms in their service phase. The companies responsible for the "Commissioning" of the offshore substations (previous to substation delivery), as well as the companies responsible for the "Maintenance" (after substation delivery) of offshore wind farms, are interested in finding solutions to minimize the performance duration of those activities and its cost. It is required to provide solutions that, considering the advantages of the use of digital technologies, can have a significant impact on the development of offshore substation commissioning and maintenance activities, improving time and cost.	Navantia (Spain)
3. Multi-task versatile UAV system to support underwater offshore O&M activities within an Offshore Wind Farm Operation & Maintenance: Offshore Wind Farms require inspection, security surveillance, rescue support and corrective and preventive maintenance for Wind Turbines, Wind Turbines Substructure, Offshore Substation, Inter Array and Export Cables. The maintenance program for an Offshore Wind Farm is complex and requires many visits and actions from the O&M team during the entire duration of the project, being underwater activities specially challenging. A solution is required to improve and optimize all these offshore underwater activities by minimizing the technician and manned vessels engagement needs, thus reducing the human intervention risks, and minimizing the overall carbon footprint.	Ocean Winds (Poland)
4. Offshore Wind Planning Optimizer considering RT production forecasting Offshore digitalisation: In relation to the development of next generation digital methodologies to enhance performance, increase grid stability and security of supply through real-time data-supported decision making, internal tools to forecast the production of the CO's individual turbines more accurately has been developed. A need to transfer this knowledge to the asset management and operations teams has been identified to turn production forecasts into actionable results in the form of an optimized planning of the operation and maintenance activities. The solution needed is the development of an Offshore Wind Planning Optimization tool considering real-time production forecasting inputs and continuous environmental condition inputs.	Otary (Belgium)

5. Birds anti-rest effect solution Environment: Main concerns regarding Offshore Wind Turbines projects are their impact on biodiversity. The capacity of wind farms developers to answer and bring guarantees to certify the control of the collision risk is crucial. Facilities are likely to generate attractivity for some species who could rest on floats and could represent an additional collision risk with the wind turbine blades increasing the species mortality. The need would be to limit the float attractivity for birds as rest effect. Today, some solutions have been developed (anti-rest cables…) but do not present effective results. A slow and easily applicable solution with the floats structures would enable the support of the sector virtuously. The objective is to develop an anti-rest solution to integrate or add to the floats to limit their attractivity for the species.	Qair (France)
6. Cargo drone approach to the nacelle Drone approach to nacelle: Delivery of spare parts to offshore wind turbines using unmanned aircraft (drones) is an emerging technology with many challenges. The benefits are faster delivery, more flexible delivery, higher safety and lower cost. Of the many challenges, one that remains largely unsolved is the actual delivery of packages from the aircraft to the heli hoist on the nacelle. Ideally, there should be no custom changes to the heli hoist to facilitate the delivery, and therefore the drone cannot land. Instead, the package must be hoisted down. This requires fairly good navigation and guidance on the part of the drone relative to the heli hoist. The challenge is to find the best approach for delivering larger packages (5 to 50 kg) from the aircraft to the heli hoist using a winch on the drone. This would include some dedicated test flight with existing equipment and commercially available sensors to determine the approach. CO proposes use of scanning lidars for this.	Vattenfall (Denmark)
7. Control system development for floating Vertical Axis Wind Turbine (VAWT) Control system: Controlling a floating wind turbine poses significant challenges, as the foundation is moving and the environment (wind, waves, sea current, tide) will influence the measurements used for control of the turbine. A well-designed control system is not only a safety issue, but directly influences the unit cost and LCOE of the produced electricity. For a vertical-axis floating turbine the challenge is enhanced, as little prior research and development has been performed. The challenge is to develop a controller for a floating VAWT. The controller should be able to control the turbine at windspeeds from 1 to 25 m/s. At higher wind speeds the turbine closes down. The controller is to be implemented as a function in the software “DeepLines Wind”, which is being used to simulate the complete behaviour of the wind turbine.	SeaTwirl (Sweden)
8. Improved data collection for the purpose of customs reporting Data collection: During continuous execution of wind turbine main component exchange campaigns, it has been discovered through data collection process and invoice creation, how manual and slow the collection of data for customs reporting purposes is. The challenge lies within the very time-consuming and manual process taking place, to correctly report to customs authorities when goods are being shipped across borders. The solution to this need is to address how to collect the required data for customs import/export purposes, of the goods which are returning from an offshore wind farm back to the CO’s warehouses in a quicker and smarter way.	Ørsted (Denmark)