OPTIMIZE DEVELOPMENT AND O&M OF OFFSHORE WIND FARMS WITH AUTONOMOUS SOLUTIONS

RWE is one of the largest power producers in the UK, accounting for around 15% of all electricity generated amounting to over 10 GW pro rata - enough to power over 10 million UK homes. RWE is also the one of the largest renewables generators in the UK with a diverse operational portfolio of technologies including onshore wind, offshore wind, hydro and biomass and employing around 2,600 people. Overall, and including its committed investments in projects already under construction, RWE expects to invest up to £15 billion in new green technologies and infrastructure in the UK by 2030.

Sofia Offshore Wind Farm is 100% owned by RWE and is now under construction, onshore in Teesside and offshore on Dogger Bank in the central North Sea. RWE is actively exploring offshore wind related innovations with the potential to support not only Sofia, but other projects across the organisation's existing portfolio, and within its future development pipeline.

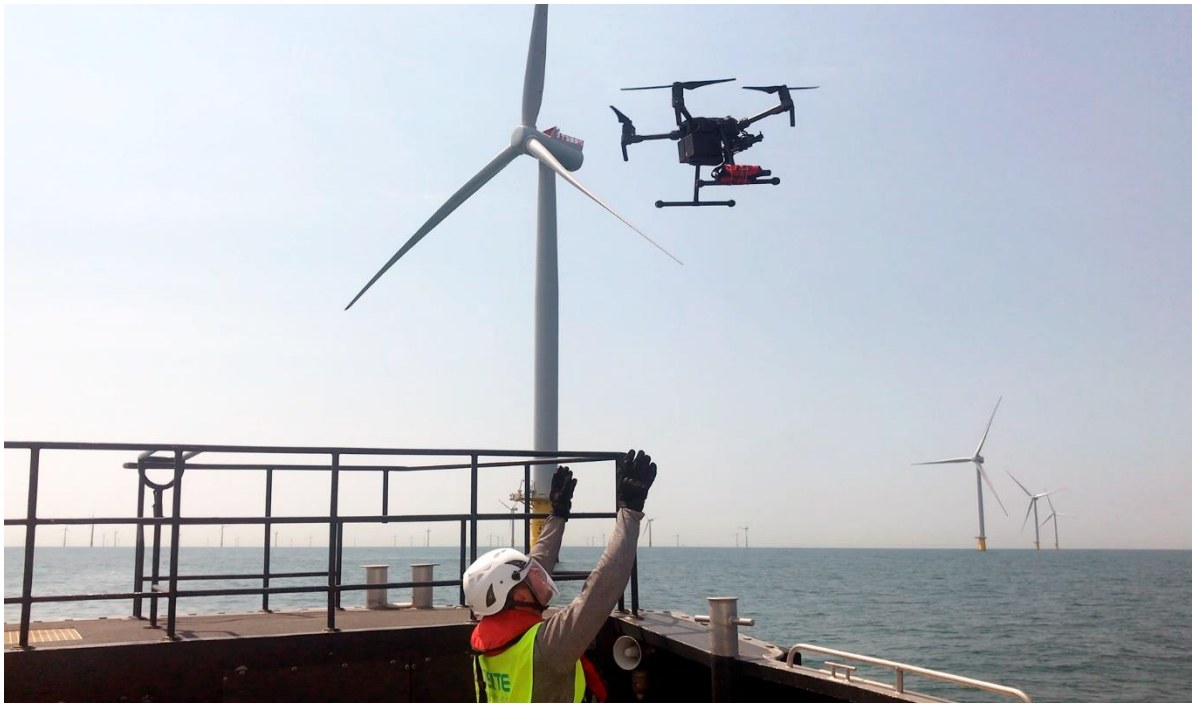

Figure 1: Drone inspection at an RWE wind farm (Credit: RWE)

Challenge Background

RWE has recently announced the Growing Green strategy with a plan to invest 50 billion euros to achieve 50 GW of capacity by 2030. Offshore wind will play a major role in those ambitions with an aim of 8 GW of offshore wind capacity in 2030. Continuous improvement is one of the key values of RWE, and there is a promising potential in making operations and maintenance activities more efficient and with lower carbon emissions, while ensuring safety at the same time. We believe autonomous technologies will play a fundamental role in this development and we are therefore looking for autonomous solutions for multiple use cases and the best way to integrate them into wind farm site investigations, construction and O&M.

Solution Requirements	
Functional Requirements	We are interested in solutions that correspond to the application of autonomous technologies for (but not limited to) the following use cases: Bathymetric studies, cable burial depth monitoring and scour protection surveying Structural inspections Blade inspections / repair Environmental monitoring & sampling Drones for cargo transport - shore to OWF (offshore wind farm), SOV (service operation vessel) to turbine, CTV (crew transfer vessel) to turbine, and SOV to CTV. The solutions may include an adaptation of existing autonomous technologies (from industries other than offshore wind) for additional use-cases and better optimized operations. Beyond that, we are also looking for ideas / solutions to successfully and sustainably combine the technologies for the mentioned use cases to develop an integrated, cost-efficient and safe O&M concept. Moreover, we are interested in solutions that particularly consider the application of the technologies in far offshore windfarms such as Sofia, where distances from shore exceed 150km.
Technical Characteristics	The scope of the challenge is set wide purposefully and we are open for submissions addressing any of the themes mentioned above, both as technologies and as use concepts. The main requirements for the solutions are for it to be: • safe – the technology should not pose any risks to people and operation of the wind farm • easily integrated into OWF - possible to integrate on a large scale into future windfarms, and preferably the ability to be retrofit into operational OWFs All solutions should pose no harm to the environment and put a high importance on sustainability. The technology or concept should ideally: • have low carbon footprint • include end-of life concept with a focus on recyclability or material reuse
Operating Conditions	Technologies should be prepared for harsh offshore conditions i.e. corrosive environment, high waves and strong winds, and therefore

	require minimal maintenance. If these conditions are not suitable for the operation, clear weather limits need to be defined.

Market Opportunity

Offshore wind industry is rapidly expanding. It is necessary we put focus on 1) sustainability of those developments and 2) ensuring constant reduction of HSE risks. Autonomous technologies can help address both of these points, leading to reduced carbon emissions and safer and cheaper operations. When autonomous technologies become cost-competitive, there will be a large opportunity to include them in offshore wind farms development, construction and operations.

Eligibility and Further Information

Eligibility	Entrants to this competition must be: • Established businesses, start-ups, SMEs (Small-Medium Enterprises) or individual entrepreneurs • UK based or have the intention to set up a UK base • Minimum of TRL (Technology Readiness Level) Four. See link for further detail on the TRL scale https://enspire.science/trl-scale-horizon-2020-erc-explained/
Assessment	Applications will be assessed on: • Applicability to the challenge • Innovativeness of the solution • Coherence of proposed business model and company vision • Feasibility and economic viability, including ability of the team to progress the solution • Development potential • Maturity of the solution • Ability to launch product and ease of implementation
IP & Commercial Route	• Existing background IP associated with a potential solution will remain with Launch Academy Applicant(s)/Participant(s). Where any new IP generation is envisaged during the Launch Academy programme, it will be subject to the mutual IP agreement of the Launch Academy Participant(s) and Launch Academy Sponsors if it is jointly developed. If new IP is developed solely by the Participant then it will remain with the Participant. • Where necessary, a non-disclosure agreement (NDA) may be signed to uphold confidentiality in the engagement between the Launch Academy Participant(s) and Launch Academy Sponsors. • ORE Catapult do not take any share of IP ownership or enter commercial ventures through the Launch Academy programme.