Innovation Theme 3 – Technologies to Speed Up Offshore Wind Construction and Reduce Environmental Impact

Context

Launch Academy is seeking novel physical technologies that can streamline offshore wind construction, reduce environmental impacts and improve the flow of components from port to site.

There is a need for the UK offshore wind sector to accelerate construction timelines, both to meet national deployment ambitions and reduce offshore wind development costs. Progress is constrained by weather-related delays, complex marine operations, slow procedures and downtime to avoid environmental impact, and the need to uphold stringent safety and environmental standards. Physical constraints of assembling ever-larger turbines, the need for specialised vessels and equipment, and the increasing complexity of offshore construction sequences also impact on the rate of construction as projects move into deeper waters and harsher environments. Breakthroughs may come from new construction methodologies, novel installation hardware, alternative foundation or assembly concepts, or physical technologies that enable faster, more resilient and more predictable offshore execution.

Launch Academy 6 invites UK companies to bring forward innovative technologies to address industry challenges by reducing downtime, streamlining critical offshore construction and installation activities, and accelerating offshore wind build-out. Areas of specific interest include:

- Rapid-change technologies
- Subsea environmental protection
- Floating wind deployment optimisation
- Deep-water installation

3.1 Rapid-Change Technologies

Offshore wind developers need new technologies that can dramatically speed up the installation, replacement and change-out of components across both bottom-fixed and floating wind farms. Current approaches often rely on complex offshore lifts, long weather windows and specialist vessels, creating costly delays and extended downtime.

Launch Academy seeks hardware-based innovations that enable faster, safer and more predictable component handling and exchange - such as quick-connect interfaces, modular or plug-and-play assemblies, rapid-deployment tooling, or systems that simplify offshore mating and demating operations. Solutions that reduce offshore lift requirements, minimise vessel time, or allow more work to be completed quayside are particularly valuable. Successful innovations will help developers shorten

maintenance cycles, improve availability and reduce construction and O&M costs across the UK's growing offshore wind fleet.

3.2 Subsea environmental protection

There is a growing need for hardware that can reduce subsea environmental impacts during offshore wind construction and installation activities such as piling, foundation installation, anchoring and cable laying operations. Opportunities include advanced noise-abatement systems, alternative low-noise installation methods, low-impact foundation or anchoring designs, and equipment that reduces or captures sediment plumes.

Launch Academy seeks novel hardware-based solutions that limit underwater noise, minimise seabed disturbance and reduce interactions with marine wildlife. Innovations from marine conservation, subsea engineering, dredging, seismic mitigation or environmental monitoring may offer valuable crossover potential. Successful solutions will help developers to deliver projects more efficiently while upholding high environmental standards.

3.3 Floating Wind Deployment Optimisation

As floating offshore wind scales up, developers need reliable technologies that enable space-efficient wet-storage and reliable tow-out of floating foundations and assembled turbine units. Current approaches often require large port footprints, long weather windows and complex marine coordination, creating bottlenecks that slow deployment.

Launch Academy seeks innovative hardware and systems that support safe, stable and space-efficient wet-storage of multiple units, as well as tools that streamline tow-out, station-keeping and handover to installation vessels. Opportunities include modular mooring arrays, dynamic positioning aids, temporary stabilisation systems, and equipment that reduces tug requirements or expands workable weather limits. Effective solutions will help developers accelerate construction schedules, reduce marine operations costs and improve predictability across the floating wind deployment chain.

3.4 Deep-Water Installation Novel Installation Solutions for Deep-Water Fixed-Bottom Offshore Wind

As offshore wind projects extend beyond 50–60 m depths, foundation sizes increase, seabed conditions become more variable, and installation windows narrow, creating significant constraints for conventional methods. At greater depths, jackets become taller and more flexible, making it harder to maintain alignment and achieve the tolerances required for secure pile-to-jacket or jacket-to-transition-piece connections. Grouted and mechanical connection systems face higher loads, more complex dynamic behaviour and greater sensitivity to installation accuracy. Deeper sediments, uneven bearing capacity or stronger currents complicate pile driving, penetration prediction and

foundation stability. These challenges collectively extend installation durations, increase uncertainty and raise costs, underscoring the need for new concepts and technologies tailored specifically to deep-water fixed-bottom construction.

Launch Academy seeks innovative approaches that address the specific construction and installation barriers associated with deploying fixed-bottom offshore wind turbines in deep-water environments. We invite solutions that rethink how deep-water foundations and turbine structures are assembled offshore, offering streamlined offshore workflows or unlocking new deep-water construction methodologies that will support future large-scale deployment.