

## Innovation Theme 2 – Advanced Lifting, Transport and Component Handling (Including Portside Operations)

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### Context

Launch Academy is seeking pioneering technologies to improve the lifting, transport and management of components and tools used in offshore wind construction, installation and maintenance.

The first fixed-bottom offshore wind turbines in the UK were installed around 25 years ago, and the sector has expanded rapidly since, with 15.9 GW of offshore wind now operational and a development pipeline of approximately 95 GW across UK waters. Projects with bottom-fixed foundations continue to grow in size and complexity, driving demand for more efficient offshore lifting systems that can handle larger components and offer faster and safer offshore operations, increasingly in deeper waters.

As the industry evolves, floating wind has emerged to unlock deeper-water sites - particularly in the Celtic Sea and Scottish waters. Floating offshore wind introduces an additional layer of lifting, transport and component-management challenges, as much larger structures must be assembled and handled in shallow, space-constrained ports before tow-out and installation in more exposed offshore environments.

Launch Academy 6 invites UK companies to bring forward innovative technologies to address industry challenges by transforming the maintenance, assembly and construction of both bottom-fixed and floating offshore wind. Solutions in this area should deliver time, cost or safety benefits - for example by accelerating operations, reducing manual handling requirements or minimising downtime. Areas of specific interest include:

- UAV heavy lifting operations
- Floating wind assembly
- Major component exchange

### 1.1 UAV Heavy Lifting Operations

Unmanned aircraft vehicles (UAVs) are increasingly being utilised for lifting operations within the offshore wind energy industry, streamlining the transportation and delivery of tools and equipment to offshore assets whilst significantly reducing manual handling times and improving operational efficiency. They can offer time and financial benefits whilst reducing personal exposure to hazards for specific tasks, however, they also present hazards, with possible catastrophic effects, such as aerial collisions (other UAVs, crewed aircraft), uncontrolled descent (fatal to personnel below), and asset damage (structural damage to wind turbine generator).

Launch Academy seeks innovations in the way UAVs operators can provide a structured solution and business case to support planning and execution of heavy lifting operations for offshore transport & delivery of tools in accordance with relevant statutory requirements, aviation compliance, training and certification licences, safety management system (SMS) e.g. operational procedures, risk assessment

### 1.2 Floating Wind Assembly

Floating foundations, turbines and mooring systems are typically assembled quayside, and require heavy-lift capacity, precise manoeuvring and large laydown areas. Technologies that improve flexibility and efficiency or reduce space requirements of quay-side marshalling and assembly activities can relieve some of the port constraints and bring financial benefits to developers.

Once afloat, components/assemblies must be towed, stabilised and connected offshore, where weather windows, vessel availability and dynamic motions add complexity and cost. Major component installation and replacement on a floating platform in deep water provides a wholly different challenge to those in fixed foundation offshore wind. Unlike fixed structures, floating platforms are continuously influenced by waves, wind and vessel interactions, creating a dynamic environment that complicates stability, alignment and precision during heavy-lift or exchange operations.

Launch Academy seeks novel solutions for management and assembly of oversized components for floating offshore wind through the various stages of their lifecycle: storage, pre-assembly, tow-out, installation, maintenance and potential tow-back. This demands new logistics solutions, smarter handling equipment and more integrated planning to ensure safe, efficient and predictable operations. Solutions should ensure safe, predictable and efficient execution of lifting and handling operations.

### 1.3 Major Component Exchange

Installation and maintenance demands for offshore wind are becoming increasingly complex as turbine capacities exceed 15 MW and structures reach heights of ~150 m, with jacket foundations extending beyond 50 m water depths. This generates new challenges for construction and major component exchange for fixed-foundation offshore wind turbines and creates a growing need for advanced offshore lifting technologies, novel interface mechanisms, optimized handling systems, and vessel modifications.

Launch Academy seeks breakthrough solutions to optimize installation rate and offshore lifting operations. Solutions should address deeper-water operations, heavier components, and the need for safer, faster offshore execution. Approaches that reduce costs, streamline logistics, minimize weather downtime, or reimagine installation methodologies are strongly encouraged to support next-generation offshore wind deployment.