A Look Back: One Year of AMS-FLOW

Ireland cannot achieve energy independence without floating wind farms but there is still no industry consensus on the most effective way to moor and anchor floating wind platforms.

Figuring out the best way to do this – and delivery the best value for the consumer – is the priority of the AMS-FLOW (Anchor and Mooring Selection for Floating Offshore Wind) project.

Over a successful first year of the 3 year project the team has brought together a multidisciplinary consortium of academic partners (ATU and UCC), SMEs (Dublin Offshore Technology Ltd and Exceedence Ltd), and industry experts (Wind Energy Ireland), fostering a collaborative environment that encourages new thinking.

Our aim is to develop cost-effective mooring and anchoring solutions for floating offshore wind by modelling wind-wave conditions, validating fibre ropes and load reduction devices, and optimising anchor designs through numerical and scaled physical testing. We will also assess the economic and environmental impacts of these technologies and deliver a high-level decision-making toolkit to guide early-stage project planning.

Put simply, we want to make sure that when designing floating wind farms the developer's project team has the tools to make the right choice to delivery the project safely, sustainably and affordably.

Project successes

Year 1 of AMS-FLOW has been marked by some significant successes. A key achievement in Work Package 3 (WP3) was UCC's interpretation of INFOMAR sub-bottom profiler data, which focused on mapping sediment thickness and distribution across potential areas for offshore development. Notably, the analysis of the North-West Area of Interest (AOI) is among the first to process newly released SEG-Y files, offering fresh insights into this previously underexplored region.

In WP2, Dublin Offshore Technology Ltd created a shared design basis for the project to guide the design specification. Platform technology descriptions and environmental conditions were developed to provide the basis for subsequent research activities.

The modelling approach, along with the design load cases and design conditions, was defined. Material selection and associated properties for the mooring design were specified, and the expected project design outputs were outlined. Both deliverables will be important in validating innovative mooring solutions—such as fibre/synthetic ropes and load reduction devices (LRD)—and in modelling emerging anchoring systems.

Challenges and reflections

Like any ambitious research initiative, AMS-FLOW encountered a few early challenges. A visa delay in recruiting a PhD student for WP1 temporarily delayed WP1's start, and a key task in WP3—sub-bottom profiling and sediment stratification—had to be reallocated from ATU to UCC.

Fortunately, this pivot proved highly beneficial, as Dr Arron Lim and Kevin Walsh at UCC delivered exceptional work, drawing on Dr Lim's renowned expertise in marine geoscience. On a personal note, navigating project overlaps at the start of 2024 while project managing AMS-FLOW and overseeing the technical delivery of WP3 and WP4 was testing. However, the support and collaboration from Dr John Bartlett, Mel Gavin and others within ATU have been invaluable in keeping the project on track.

Looking ahead – upcoming activity

The momentum continues to build for AMS-FLOW in our second year, with several exciting milestones on the horizon.

Upcoming activity includes UCC's WP1 presentation of early findings at IOWTC 2025 in Toulon, France. Dublin Offshore Technology is making impressive strides in refining their Load Reduction Device (LRD), a critical innovation for mooring system performance.

Meanwhile, baseline numerical modelling of emerging anchors will soon be complete, with centrifuge testing at ATU Sligo to follow in the autumn.

Additionally, Work Package 5, led by Exceedence Ltd., will begin delivering techno-economic assessments that will help shape future investment and policy decisions.

With these developments, AMS-FLOW is well-positioned to contribute to the future of offshore renewable energy in Ireland and beyond.

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