

Shared Anchors for Floating Offshore Wind

Why floating offshore Wind Energy?

An enormous amount of offshore wind energy is needed to accommodate the future demand for renewable energy. From a global perspective, relatively few countries can access shallow waters, where the traditional bottom-fixed foundation solutions are applicable. Consequently, to make offshore wind energy accessible globally, floating offshore wind is now considered as a viable solution. A floating offshore wind turbine is installed on a floater, which is a floating vessel. To secure station keeping of the floating offshore wind turbine, the floater is attached to mooring lines fastened to the seabed by an anchor. This is the same principle as the anchors for a naval vessel.

Anchors for floating offshore wind turbines

Several anchor concepts exist for anchoring floating wind turbines. One of the most applicable solutions is the suction anchor concept. This concept consists of a hollow steel cylinder that is closed at one end. It reminds of a bucket turned upside down and placed on the seabed. The suction anchor is then installed into the seabed by pumping out water from inside the anchor, which will force the anchor into the seabed.

Why are shared anchors of interest?

Each floating offshore wind turbine is typically connected to a minimum of 3, but potentially up to 6 or more anchors. Considering the high number of anchors per floating wind turbine, and the fact that an entire wind farm will consist of numerous wind turbines, a significant number of anchors are required. However, if the mooring system can be designed in a way that multiple wind turbines can be connected to the same anchor, the number of needed anchors could be potentially reduced, and consequently, the environmental impact.

Who will perform the research?

The project will be conducted as an industrial PhD project in a collaboration between Aarhus University and COWI. The PhD project will focus on advanced computer simulations. Aarhus University will contribute with academic supervisors and vast experience in advanced computer simulations.

This project aims to improve the design practice for shared (and non-shared) anchors for floating wind structures and to provide the industry with state-of-the-art knowledge on how to design shared anchors for floating offshore wind turbines.