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Vibropiling – a cost efficient and environmentally friendly method to install offshore wind turbine foundations

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Abstract

For prospective offshore wind projects a new foundation installation method is proposed: The complete vibropiling of monopiles. The method significantly improves the cost efficiency compared to traditional impulse piling (hammering), as it enables shorter installation times and minimizes the need for noise mitigation.

To install vibrated piles on a commercial scale, the acceptance of the method from the approving authorities is required, especially as strict noise emission regulations for foundation installation exist in Germany. The project therefore aims to demonstrate to the project partners and certification bodies, that vibrodriving of piles in comparison to hammered piles provides an equivalent soil stiffness and load bearing capacity, has lower noise levels, causes lower levels of fatigue and stress to the piles, does not compromise pile weld integrity, and is faster as well as more cost effective. In a test field in Northern Germany, three piles have been vibrated into the ground close to the shore under real operating site conditions. The method itself and the load bearing characteristics of the piles were investigated and tested to prepare the commercial application of this innovative pile installation.

Besides RWE/ innogy, the "Vibro" joint industry consortium consists of a broad variety of partners: The Carbon Trust (OWA), who contributes to the funding of this project and various partners from power industry, offshore construction, and suppliers participate.