Modelling of Scour at Submerged Structures Offshore

Publieke samenvatting / Public summary

Aanleiding

Offshore wind energy generation is one of the most promising methods to ensure a rapid transition towards a sustainable energy supply and to reduce dependency on fossil fuels. As with most renewable energy sources, demand and supply of energy do not necessarily always match: one cannot increase wind intensity on demand, and peak energy demands may not necessarily align with storm winds. Therefore, significant attention is paid to various energy storage options. One of those options is the Ocean Battery. The Ocean Battery is a CES award winning pumped hydro storage system at the seabed that provides an eco-friendly utility scale energy storage system (more information can be found at: https://oceangrazer.com/).

Doelstelling

Utilizing the Ocean Battery on a wind farm scale comes with various challenges. Firstly, relatively little is known about the behavior of fully submerged obstacles on the seabed. An example to illustrate this is rock berms that are used to protect underwater cables or pipelines: there is not much known about the magnitude of scour that can occur around these objects under various offshore conditions, and little data is available. The ocean battery might be considered as a (flexible) berm, thus obtaining detailed knowledge on the response of the seabed due to this structure is vital for its success. To minimize risk of offshore implementation and to increase the chances of a successful offshore pilot therefore first insight into

Projectinformatie / Project information

Projectnummer / Project number
TKITOE_WOZ_2210_Deltares_3S-O
Subsidiebedrag / Grant amount
€ 124.915,00

Algemene informatie / General information

Penvoerder / Secretariat
Deltares

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the behavior of a (flexible) berm on the seabed is required.

Korte omschrijving

Assessing the behavior of the seabed around a submerged structure is not a trivial task. This type of research is typically done using experimental facilities, and an ever-present challenge with this type of work is how to interpret the (schematized) conditions on laboratory scale towards prototype scale. Within the proposed research it will be attempted to generate more insight into upscaling of experimental results to field scale for a realistic offshore hydrodynamic climate through a combination of laboratory work and numerical modelling work.

Resultaat

The results of this work will enhance understanding of the interaction of fully submerged structures in the offshore environment with the seabed.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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