

Solar@Sea III

Publieke samenvatting / Public summary

Aanleiding

The Solar@Sea II project has developed a novel floating solar technology based on inflatable lightweight flexible material. The materials and mooring concept was chosen aiming at a low-cost, high yield solution. In the sheltered environment of the Oostvoornse Meer the consortium was able to gain experience with the electrical and mechanical installation of the system and with the dynamic behaviour of the floaters in wind and small waves. The project delivered a full scale demonstrator of two units installed in the Oostvoornse lake. This positive experience provides the basis for the follow-up of new more advanced tests on the North Sea offshore The Hague. This project will reduce a number of knowledge gaps, develop and test new technologies needed to fully exploit flexible floating PV technology in offshore conditions, supporting the claim of being high yield, cost-effective, and reliable. The topics covered are: flexible floater technology, shared mooring, innovative installation and decommissioning methods, novel monitoring system, numerical and experimental design tools, biofouling monitoring and control, PV panel yield and lifetime assessment.

Doelstelling

This project will address missing key technologies and knowledge bits needed to enable large scale deployment of lightweight flexible floater types for offshore PV arrays. These cover floater, mooring, installation and decommissioning methods, biofouling development and control, hydro-structural monitoring, PV yield and improved design tools. The goals of this project will be achieved

Projectinformatie / Project information

Projectnummer / Project number

HER+21-03064942

Subsidiebedrag / Grant amount

€ 2.455.273,00

Algemene informatie / General information

Penvoerder / Secretariat

Stichting Maritiem Research Instituut
Nederland

Volg Topsector Energie op X / Follow Topsector Energie on X

@TSEnergie

through the development of an offshore pilot and its deployment on a site with high wave exposure in the North Sea. This pilot will be used as a base to test innovative technologies and gaining knowledge through practical experience and extensive monitoring. At the end of this project, lightweight flexible floater types for offshore PV arrays will reach TRL7 for open sea conditions.

Korte omschrijving

- developing and deploying an offshore monitoring system and moored scaled basin tests; - providing a functional design for the floater, the engineering and hardware for the mooring system and the installation strategy and guidelines. - update the two existing floaters and deliver two new floaters. - designing an appropriate antifouling strategy for the floaters at the North Sea, carry out exposure tests with suitable coatings and/or cleaning tools and monitoring biofouling growth on the exposed structure. - research the durability of the PV modules; this will provide yield predictions as input for LCOE analysis. Carry out structural modelling of the floaters, monitoring requirements and sensors for strain measurements on the floater and floater-PV interface; material tests for longevity and strength through accelerated lifetime laboratory tests. - installation and decommissioning of the offshore pilot

Resultaat

The Solar@Sea III project will set the base needed for future large scale deployment of lightweight flexible floater types for offshore PV arrays. This pilot will reduce a number of knowledge gaps, develop and test new technologies needed to fully exploit this technology in offshore conditions and provide necessary parameters to refine LCOE calculations, needed to define business cases for future large scale deployments. The main results of this project are listed below: - Hydro-mechanic design tools for large flexible structures made suitable for offshore deployments - Shared mooring technology for floating PV arrays developed and tested - Performance of flexible floater technology assessed in offshore conditions - Innovative

installation and decommissioning method for flexible floating PV arrays developed and tested - Monitoring biofouling development in offshore conditions and control strategy defined and tested. - Novel monitoring system with digital twin approach developed and applied - Yield and lifetime of flexible PV panels assessed for offshore deployments This knowledge will be disseminated in the form of peer-reviewed paper(s).

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

Voor meer informatie over de Topsector Energie, ga naar www.topsectorenergie.nl.

Voor meer informatie over de TSE / Energie-Innovatie regelingen die RVO aanbiedt, ga naar www.rvo.nl/tse.