

Reduced Grid Connections

Publieke samenvatting / Public summary

Aanleiding

The Dutch electrical grid is significantly congested. Materially extending the grid is expensive and will take considerable time. Consequently, grid connection costs are increasing rapidly, and additional capacity is severely limited. As such it represents an important hurdle to introducing additional renewable energy sources into the Dutch energy system, jeopardizing our societal ambitions in the energy transition.

Doelstelling

Currently, bringing offshore wind energy to an onshore electrolyser plant requires a grid connection equal to the peak power of the energy source as all impacts of the intermittent nature need to be managed by the grid. However, most if not all the issues introduced by the intermittency can be mitigated by more closely connecting the renewable energy source to a controllable load such as an electrolyser and introducing the appropriate control and necessary (short-term) storage. Developing the control and associated hardware would allow us to introduce large scale renewable energy coupled to e.g., an electrolyser plant without putting a large hold on the grid. The project aims to develop and demonstrate solutions that will work with a much-reduced grid connection to bring renewable energy into our energy system. This would facilitate much larger and faster development of these projects and as a result accelerate the energy transition.

Korte omschrijving

A first line-up of equipment will be built at ETCA

Projectinformatie / Project information

Projectnummer / Project number

TKITOETKI2023REDCOM

Subsidiebedrag / Grant amount

€ 2.539.089,00

Algemene informatie / General information

Penvoerder / Secretariat

Shell

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(Shell Amsterdam) using state-of-the-art equipment utilizing our solar panels, 50-kW electrolyser, short-term storage and high-frequency converter developed by ProDrive. As part of this project Prodrive will adapt their firmware to allow for the high-frequency control required by this application. Tennet together with TUE will explore technical solutions for fault-ride-through mitigation and passive and active filtering of the “noise” on the connection to arrive at a solution acceptable to the grid-provider. TU Delft will explore new topologies to improve upon the original line-up and help mitigate its shortcomings. Both Shell and Prodrive will investigate the scale-up of the 50-kW solution to MW+-level which is the building block for commercial GW+ scale electrolyser plants.

Resultaat

We will demonstrate a working line-up with a grid connection of less than 10% of peak power at the 50 kW-level (using solar panels and a 50-kW electrolyser) that is ready to scale up to MW-level and is acceptable to future grid codes. The approach we are following in our project (close collaborative TRL accelerator), in our choice of partners as well as scalable implementation in our energy transition campus will lead to a much-reduced time to bring projects from the idea-phase to implementation and lends itself for replication.

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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