

Flexible Meshed DC Grid

Publieke samenvatting / Public summary

Aanleiding

The energy transition challenges the energy infrastructure. Most of the new energy resources connected to the low voltage grid use DC internally. DC distribution grids can enhance the capacity of existing infrastructure. Most electricity grids in urban areas are built in a meshed topology however they are only operated radially for control and protection reasons. If DC grids would be operated in a meshed topology additional power capacity and flexibility can be enabled.

Doelstelling

The objective of this project is to develop the necessary network technology for the efficient operation of bipolar meshed DC distribution grids with bidirectional power flow and flexible demand. This enables a more cost-efficient way of distributing electric energy. The ongoing RVO DEI project OVLXXL has indicated a number of challenges regarding meshed grids and bidirectional flow. Therefore this project aims at developing the missing network components. This technology can facilitate EV charging in public lighting grids, but it is aimed at developing general technology that can be applied to many use cases, for example also DC microgrids for rural electrification in South Asia or Africa.

Korte omschrijving

The activities in this project include: - Research and development of solid state protection devices with protection strategy for meshed DC distribution grids with bidirectional power flow by DC Opportunities R&D. - Development of power flow control converter

Projectinformatie / Project information

Projectnummer / Project number

TEUE418010

Subsidiebedrag / Grant amount

€ 665.606,00

Algemene informatie / General information

Penvoerder / Secretariat

Stichting Gelijkspanning Nederland

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for meshed DC distribution grids that can actively compensate voltage drop and control current flowing from both ends of a distribution cable with very high efficiency by DC Opportunities R&D. - Analysis of congestion management and flexible demand-side scheduling problems for these DC distribution grids and devices including dynamic overloading of lines, uncertainty regarding generation, and fairness regarding multiple users by the algorithmics group at Delft University of Technology. - An evaluation and demonstration on the facilities of The Green Village in Delft.

Resultaat

The expected results include: - Prototypes of solid state protection devices for DC distribution grids with bidirectional power flow. - Prototypes of power flow control converters for meshed DC grids. - Scientific papers explaining the novel converter techniques and the power flow and scheduling algorithms. - Demonstration of the technology also in relation to other developments in the field of DC-technology and innovation at The Green Village.

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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