Opti-Shade: the optimal system configuration in case of shadow

Publieke samenvatting / Public summary

Aanleiding

Solar systems on roofs with string inverters have a low performance in case of shadow. Power optimizers and micro inverters increase the performance, but are often not cost effective due to the high investment cost. The question is whether systems can be developed with high performance in case of shadow at low cost.

Doelstelling

The purpose of the project is the development of a (BIPV) power optimizer/inverter system which is shadow insensitive at low investment cost. These systems have low electricity production cost (€/kWh) at high specific yield (kWh/m²). The expected lifetime is longer since “HOTSPOTS” in the PV modules with shadow are avoided. More PV modules can be placed on a roof with better aesthetics because no account has to be taken with shadow objects like exhaust pipes and dormers.

Korte omschrijving

The basis of the project is to apply only power optimizers on the PV modules with shadow (selective deployment of power optimizers), resulting in a system with high performance at low investment cost compared with standard systems with power optimizers (high cost) or without power optimizers (low performance). According to most power optimizer manufactures, selective deployment of power optimizers is technically not possible. Therefore, first a market research is done on possible power optimizer brands for selective

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deployments (ECN, AERspire, RE-Source). Solned has contacts with a Chinese power optimizer manufacturer and supplies this power optimizer for the tests. A special power optimizer for selective deployment is developed by Heliox. A selection of the power optimizers is tested in the laboratory and by outdoor test with an inverter (ECN). From these results, a field test is done for the determination of the yearly yield of the most favorable configuration compared with reference systems (SEAC). Finally, the market survey will be updated with the results of the tests (RE-Source, ECN) and the results are disseminated.

Resultaat

The project will answer the following questions: 1 Is selective deployment of power optimizer possible? 2 Is the cost of the optimizers countervailed by the higher performance of the system? 3 Are HOTSPOTS avoided for a longer lifetime and safer system? 4 Is it possible to check the performance of the system by only monitoring the PV modules with power optimizers in comparison with the total performance of the system?

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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