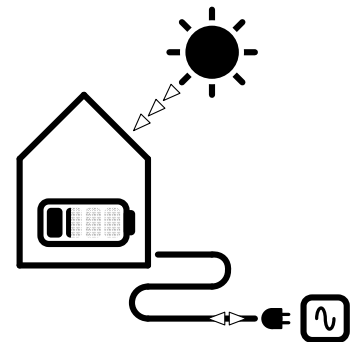


Decongestion of the Distribution Network by Decentralized Storage (D³O)

The market for small-scale renewable decentralized energy generation was until recently dominated by photo-voltaic panels (PV). Recently the subsidy was sharply reduced and from 2013 even additional distribution costs are charged on the current installations. These actions result in a reduced confidence of the end customer in the financial benefits of PV, which means that many producers and installers are currently seeing black snow. However, it is undeniable that with the current inverter technologies currently in use, the distribution network is still necessary to provide high-quality and continuous voltage.

At the moment, there is plenty of research being carried out at the various inverter manufacturers in order to better match supply and demand through inverter / battery combinations. Such systems are currently market-ready and are being offered commercially. In addition to supply and demand, these systems can better coordinate with each other - which means a decongestion of the current distribution network - and also guarantee an uninterrupted supply in the event of a short breakdown of the distribution network.



The proposed research assumes a win-win situation for both the end customer, the distribution system operators (DSO) and the installers of solar panels. If the pricing for distribution costs is done via a smart meter, such a system can lead to a reduction in distribution costs. For DSO this means a strain on the network, as a result of which new investments are postponed or even redundant. In addition, this can also lead to an accelerated roll-out of smart meters for DSO that is partly funded by the end customer. As PV energy becomes commercially attractive again, this also means a re-ignition of the PV sector.

Within this project, the emphasis in the short term is on the concrete and practical validation of the above proposed solution by building a demonstrator. An ambitious test set-up has been developed within Lemcko that has led to a freely programmable, real-life, residential distribution network. This test set-up is used to monitor both the residential customer and the distribution network and therefore it is perfect for integrating inverter / battery combinations in the network, validating the proposed solutions and thus convincing the end customer and the DSO person of such innovative inverters.

Since battery installations are already provided for in such installations, this construction also has the option of guaranteeing a certain continuity in the event of a power supply interruption. These possibilities, and their technical implications, are also further explored within this project.

This demonstrator will be further expanded to introduce installers to these new inverters through workshops and hands-on sessions. Based on targeted design tools, the installer is able to correctly choose an optimal inverter / battery combination. The practical implementation is taught on the developed platform.