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The NETfficient Handbook: Aggregated Energy Storage for Smarter Communities

Grid Integration of Distributed Energy Storage Using an Aggregation Platform

NETfficient
Storage for Life

Andrea Immendörfer (Lead author)

The NETfficient Handbook

Steinbeis-Edition

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Glossary

2LEV	Second-Life Vehicle Batteries
A	Ampere
AMM	Acquisition Management Module
BMS	Battery Management System
BTM	Behind-the-meter
CMMS	Computerised Maintenance Management System
DER	Distributed Energy Resources
DDO	Design-Decide-Operate
DMS	Distribution Management System
DSO	Distribution System Operator
EEX	European Energy Exchange
EMG	Energy Management Gateway
EMP	(NETfficient's) Energy Management Platform
EPEX	European Power Exchange
EV	Electric vehicle
ESS	Energy Storage System
FOMS	Forecast-based optimal Management System
FTM	Front-of-the-meter
HESS	Hybrid Energy Management System
HV	High voltage
iNMS	Intelligent Node Management System
LFP	Lithium iron phosphate
LV	Low voltage
MPPT	Maximum Power Point Tracking
MV	Medium voltage
PV	Photovoltaic
TSO	Transmission System Operator
UPS	Uninterruptible power supplies
VPP	Virtual power plant
WAN	Wide area network

1 Introduction to NETfficient

NETfficient is a visionary project, bringing together 13 partners from seven countries to implement a pilot for a future-proofed energy system on the German island of Borkum.

This pilot is designed to tackle some of the most pressing energy challenges:

- to promote a mostly renewables-based energy supply
- to improve exploitation of existing renewable energy
- to deal with time-shift between availability of renewable resources and demand peaks.

Energy storage and smart energy management are considered to be the missing link in meeting these challenges and in empowering citizens and businesses to become active prosumers, thus involving them in the energy value chain and ultimately, to attain a better living and working environment. One main objective of the project is to develop and test different applications for energy storage systems in a real environment. Central to this endeavour is the development of an Energy Management Platform, which can be used by utilities to manage the energy from renewables and storage devices. This means that clean and sustainable energy, which exceeds the immediate demand, will be stored in the island's electric grid when it is available, to be distributed at a later point in time, when there is demand for it.

The real-life demonstration on Borkum is driven by five different applications for storage, covering a wide range of functionalities in the low voltage and medium voltage grid.

The NETfficient-Handbook presents key results from the project with particular emphasis on integration of small-scale storage technologies into the grid, by connecting them to a management platform. This publication is complementary to the dissemination material already available on the project website