Platform for Microgrid Design and Operation

Johan Windahl[1] Håkan Runvik[1] Stéphane Velut[1]

[1]Modelon, Sweden, {johan.windahl,hakan.runvik,stephane.velut}@modelon.com

This paper describes the development and requirement specification of a platform for design and operation of microgrids.

The goal is to have a platform based on open standards that can be used to efficiently solve current and future engineering problems for distributed energy sources and storage systems. By basing it on a unified architecture, collaboration and efficient work flows are enabled.

In this work we investigate the requirements on the model and on the tool side. We also demonstrate how an energy storage system can be designed to reduce the maximum peak power and how it can be operated in the most economic efficient way, taking into consideration constraints and limitations of the system.

This work is based on Modelon's web-based modeling and simulation platform and its Modelica library Microgrid.

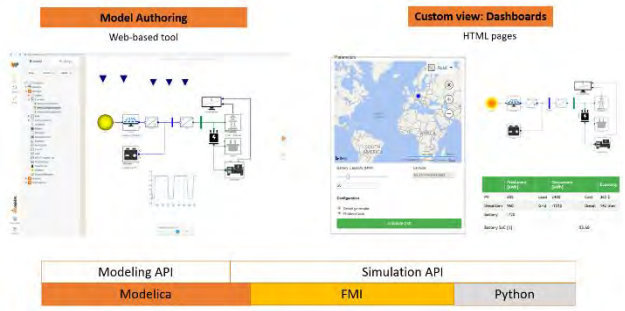

Figure 1 Microgrid models in an architecture overview of Modelon's web-based modeling and simulation platform.

Keywords: simulation, optimization, peak shaving, battery storage, energy management, economic dispatch