# Microgrid Technology Research and Demonstration

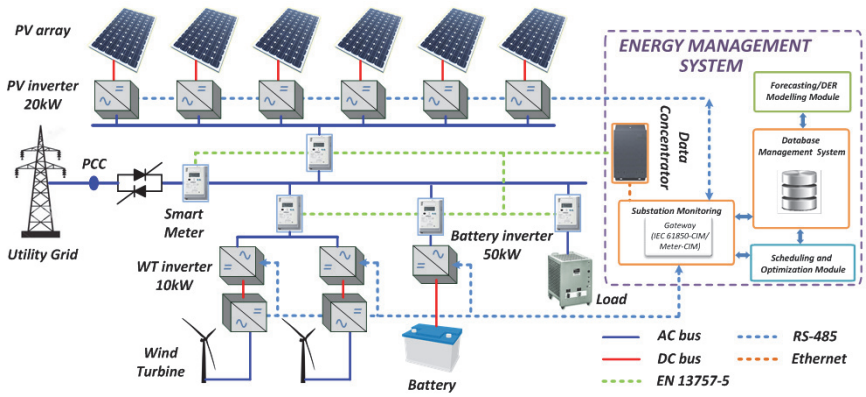
*A Chinese-Danish Collaboration*

www.meter.et.aau.dk

## PROJECT DESCRIPTION

The objective of this project is to develop a demonstrative, research-oriented platform, which aims to ease the integration of Distributed Generation (DG) units, hierarchical and multilevel control strategies, and multiple microgrid configurations.

Smart metering is an important milestone in this project. Smart meters are the main part of Advanced Metering Infrastructure (AMI) and are usually able to provide detailed and real-time information on customers' energy consumption, harmonics, unbalances, voltage variations and interruptions.




**Implementation of Hybrid Microgrid in Shanghai**

## MICROGRID IMPLEMENTATION IN SHANGHAI

The electrical energy generated in the demonstration site can be either consumed locally or injected to the main grid.

The total capacity of demonstration is 200kW:

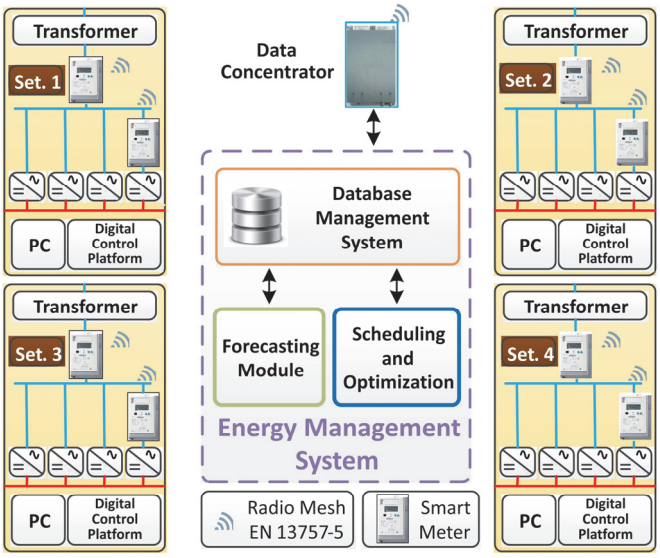
- 130kW PV system
- 20kW Wind turbine system
- 50kW Energy storage system.

The DG units are managed by an advanced Energy Management System (EMS).

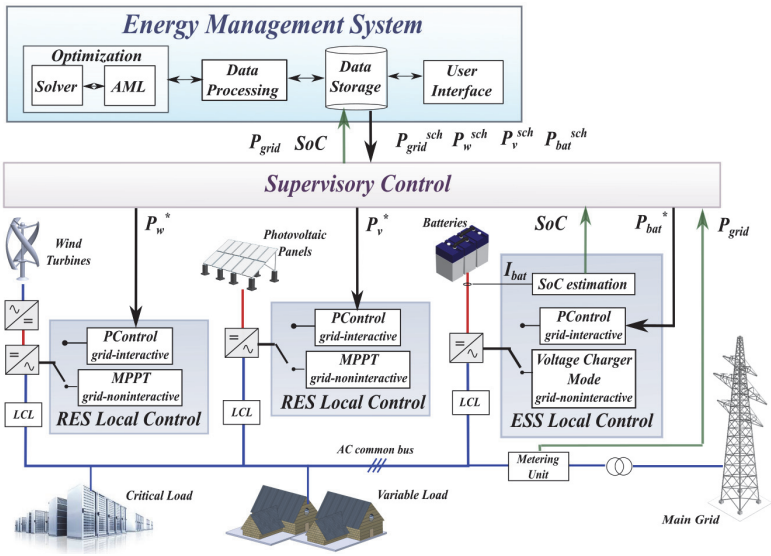
130 kW Rooftop PV installation

Two 10kW Wind Turbines

Batteries, Power Electronics and Control




**AMI and EMS in AAU Microgrid Lab**




**Integration of EMS with MG controllers**

## SMART METERING IN AAU LAB

- The system is formed by several smart meters installed in 6 lab setups, a data concentrator, a database system, and a user interface developed in LabVIEW.
- An EMS is deployed to perform energy optimization tasks by using the information provided by the AMI.
- Parameters such as active and reactive powers, THD, unbalance factor, sags and swells are measured by the meters.