



Intelligent Cooperation in a Smart Grid Infrastructure (SG-INF)

Albena Mihovska and Pere Sabater

Contact: albena@es.aau.dk

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Proposal

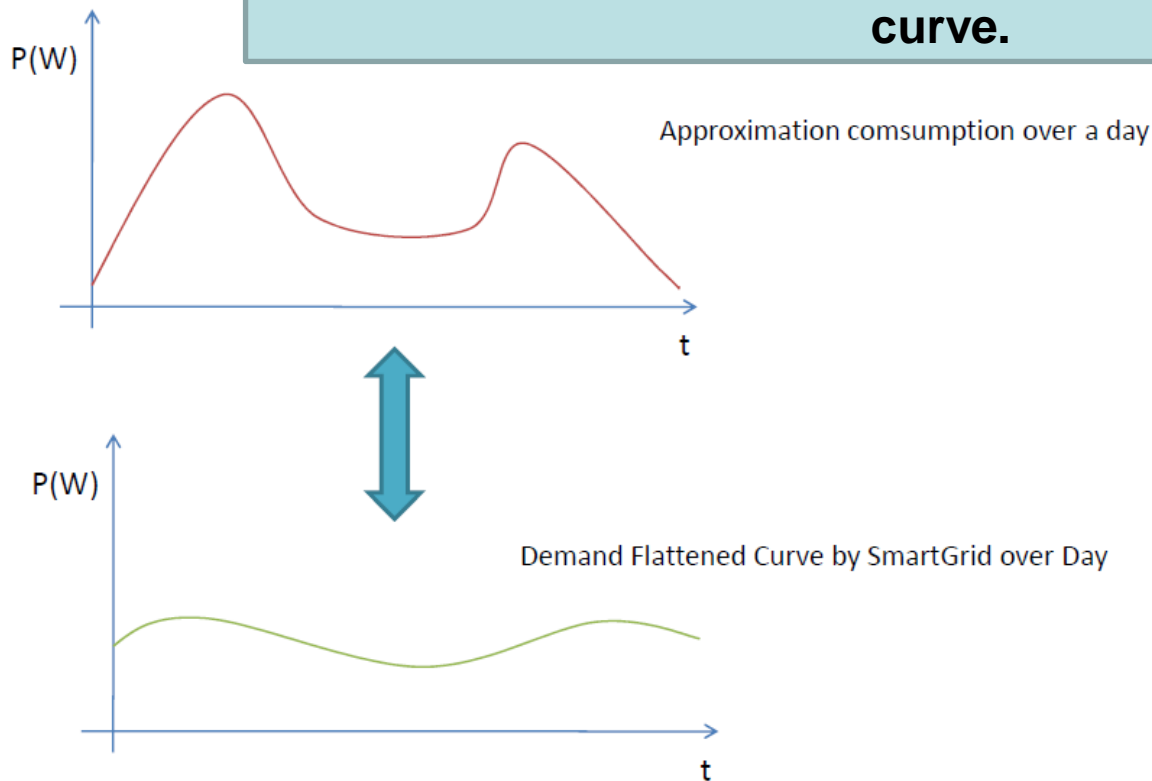
- ICT Call 11
 - Objective ICT-2013.6.1 Smart Energy Grids
- Expected Impact from Call:
 - Reduction of the percentage of energy lost during energy distribution
 - Reduction of the gap between energy produced and energy consumed
 - Increase of renewable energy sources and Combined Heat and Power-CHP connected to distribution grid
 - Reduction and shifting of peak loads

Vision

- Enable intelligent cooperation within integrated power and telecommunication grids across homes, buildings, industry and other businesses where the surplus of the renewable energy obtained by micro-generation from distributed sources (individual end users) can be accumulated together and regarded as a centralized generation plant towards a 100% renewable energy exploitation obtained from generation plants and distributed micro-generation.

Main Goal:

Flattened Demand Curve: enable quick adjustment of production and demand curves without any overloads on the power grid by optimizing the speed of renewable energy generation towards flattening of the production curve.



Main Objectives (1)

- Inject renewable energy into the power grid from distributed renewable energy installations (power grid acts as its own unlimited 'battery' source)
 - Store excess energy and use storage supplies to inject energy during peak consumption hours
 - Integrate the electric vehicle into the distributed renewable energy concept
 - Develop new business model that integrates the individual user into the process of energy trading

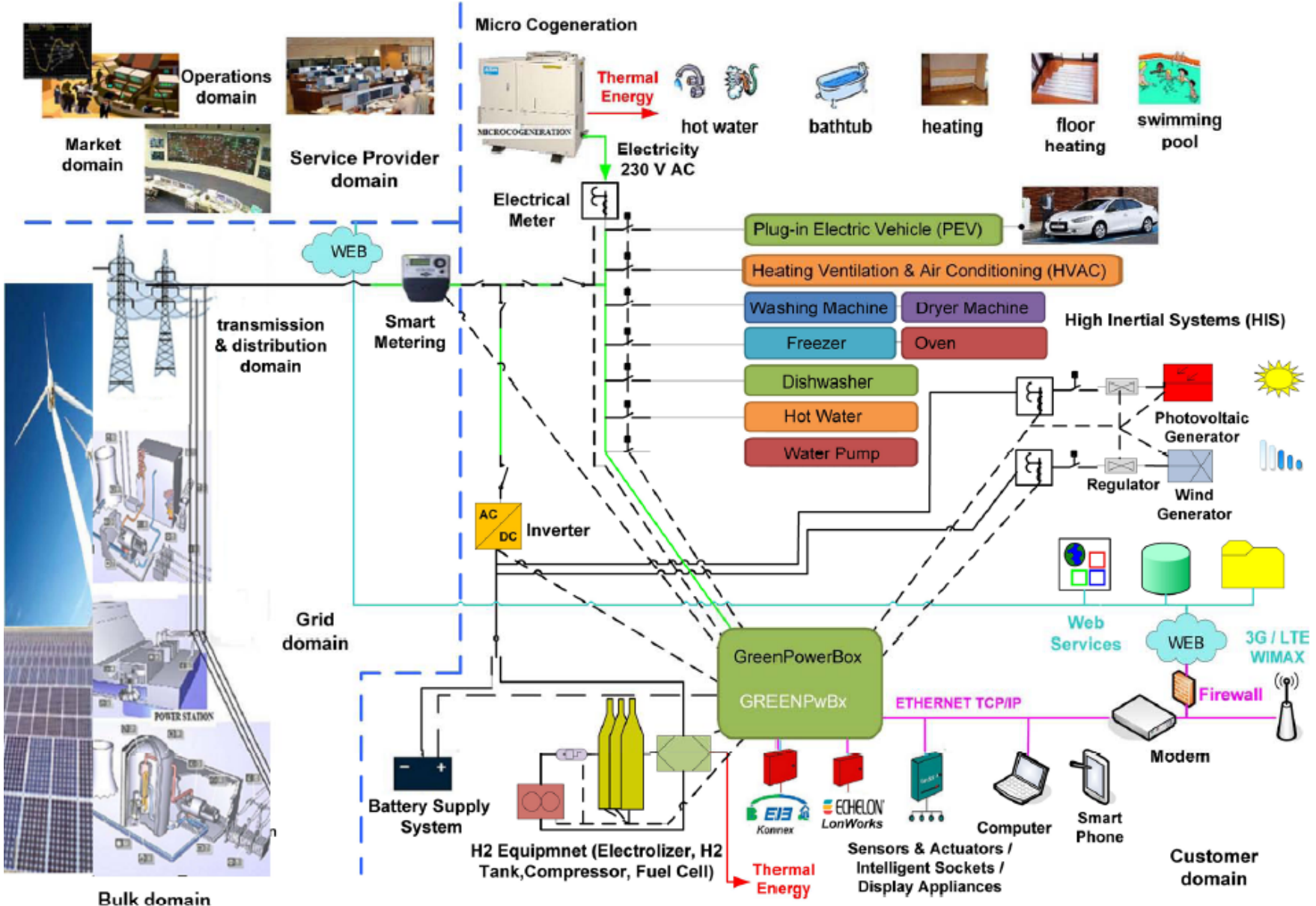
Specific Objectives (1)

- Design an automatic and autonomous online electric system where decisions are taken based on the current load of the power grid
- Enable communication between end user and rest of network
- Design and integrate a geographically distributed data processing/server control architecture (CPD) for the processing of information based on the estimated production curve input

Main Elements

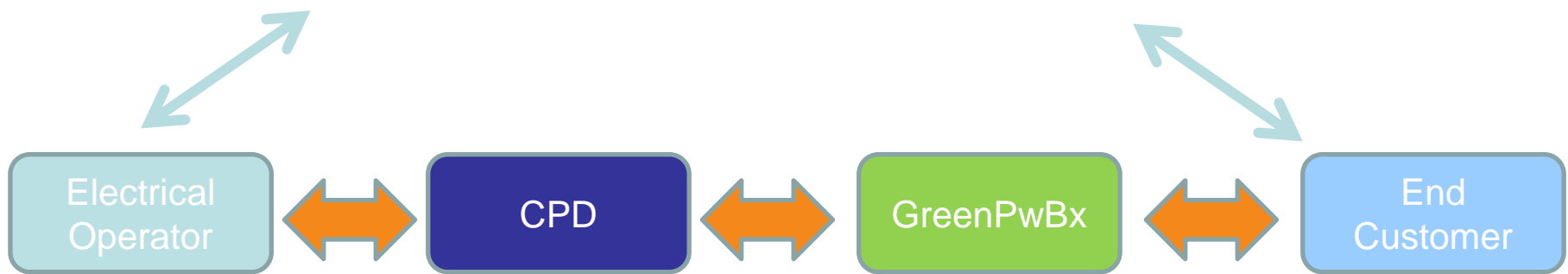
- Smart metering in real time
- Smart scheduling in real time
- Control of distributed micro generation
- Energy trading

SG-INF Concept



Example of SG-INF Interactions

How much energy are we injecting from the power grid?
How much energy are we extracting from the power grid?



Expected Impact

- Reduction of the percentage of energy loss during energy distribution:
 - peak consumption is lower than actual situation peak consumption
- Distributed power grid by the macro/micro installations of renewable energy sources. Length between generation and consumption point decreases rapidly
- Flattened curve ensures constant speed of operation