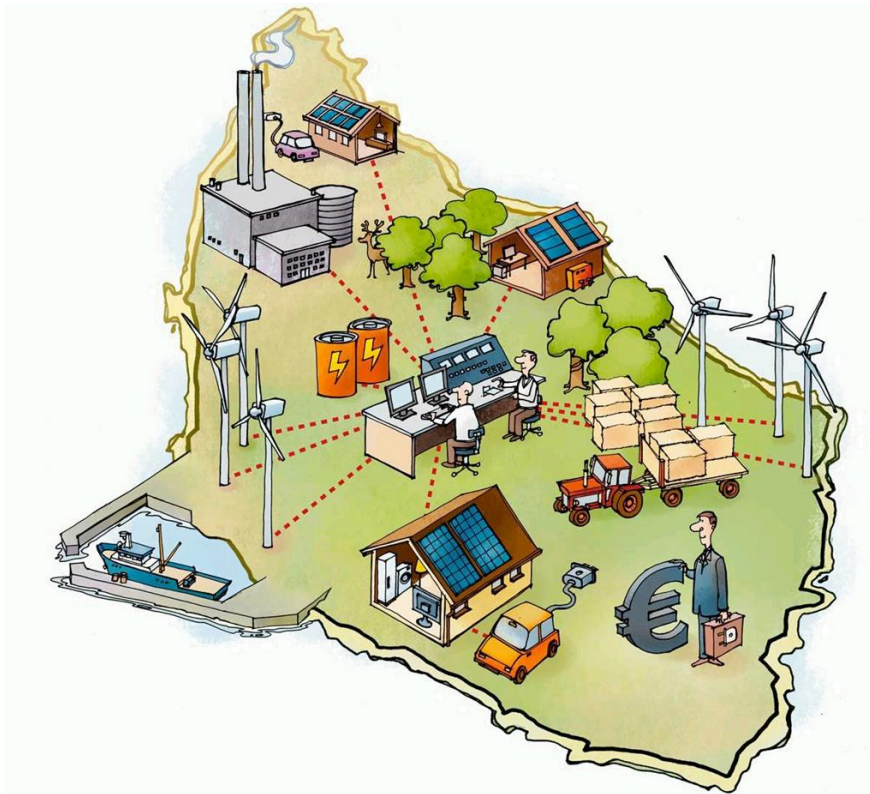


# EcoGrid EU

## A Prototype for European Smart Grids



Presentation at:  
Teknologisk Møteplass  
Oslo 4 October 11

Presentation by:  
Ove S. Grande, SINTEF ER

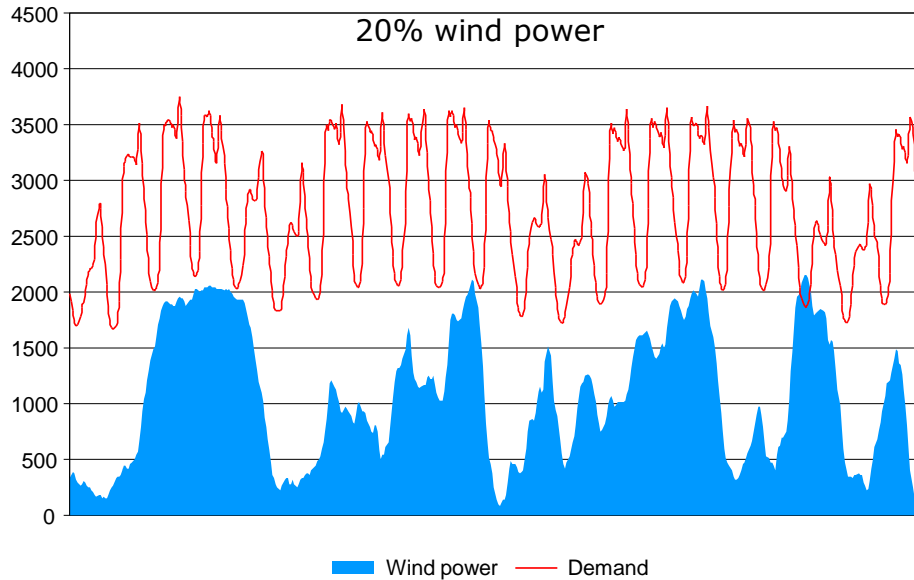
# Content

- Background - The Challenges of Tomorrow
- The Real-time Market Approach
- Bornholm – a Unique Demonstration Site
- Project organisation
- Impacts

# The Wind Power Challenge

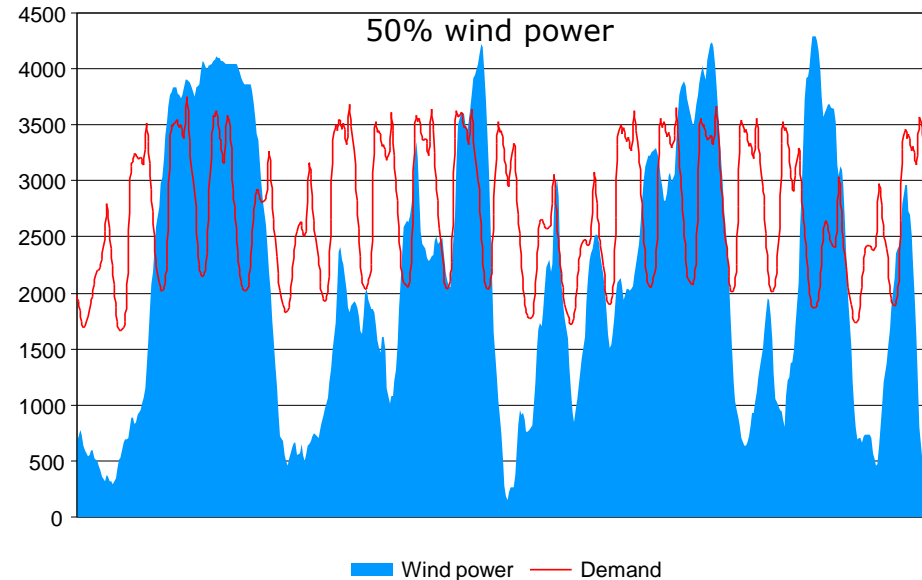
## An illustrative case from Denmark

**Today (2008)**



Wind power covers the entire demand for electricity  
in 200 hours (West DK)

**Tomorrow (2025)**



In the future wind power will exceed demand  
in more than 1,000 hours

***EcoGrid EU meets the increasing need for balancing services***

# EcoGrid EU in Brief

- ***A large scale demonstration of a real-time market place for distributed energy resources***
  - Project under EU's FP7-Energy-2010-2.1.1
  - Duration: March 2011- March 2015
  - Total budget: 21 million Euro (EU: 12,7 million Euro)
  - Demonstration > 50 % of budget
  - A demonstration of a *real* power system with more than 50 % renewable energy
  - EcoGrid EU was selected as one of two demonstration projects  
The other is Grid4EU, coordinator: ERDF, France

# EcoGrid EU Partners



**DENMARK**  
 Energinet.dk  
 (Initiator)  
 Østkraft  
 Center for Electric  
 Technology, DTU  
 Siemens  
 IBM  
 Landis+Gyr



**BELGIUM**  
 ELIA  
 EANDIS (+ORES)



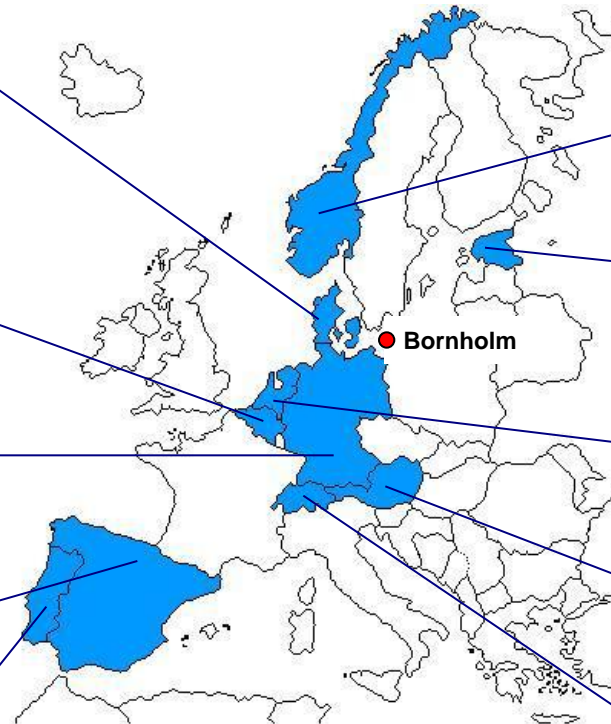
**GERMANY**  
 EnCT  
 Siemens AG\*



**SPAIN**  
 Tecnalia



**PORTUGAL**  
 EDPD



**NORWAY**  
 SINTEF ER  
 (Coordinator)



**ESTONIA**  
 Tallinn University of  
 Technology (TUT)



**THE NETHERLANDS**  
 ECN  
 TNO



**AUSTRIA**  
 Austrian Institute of  
 Technology (AIT)



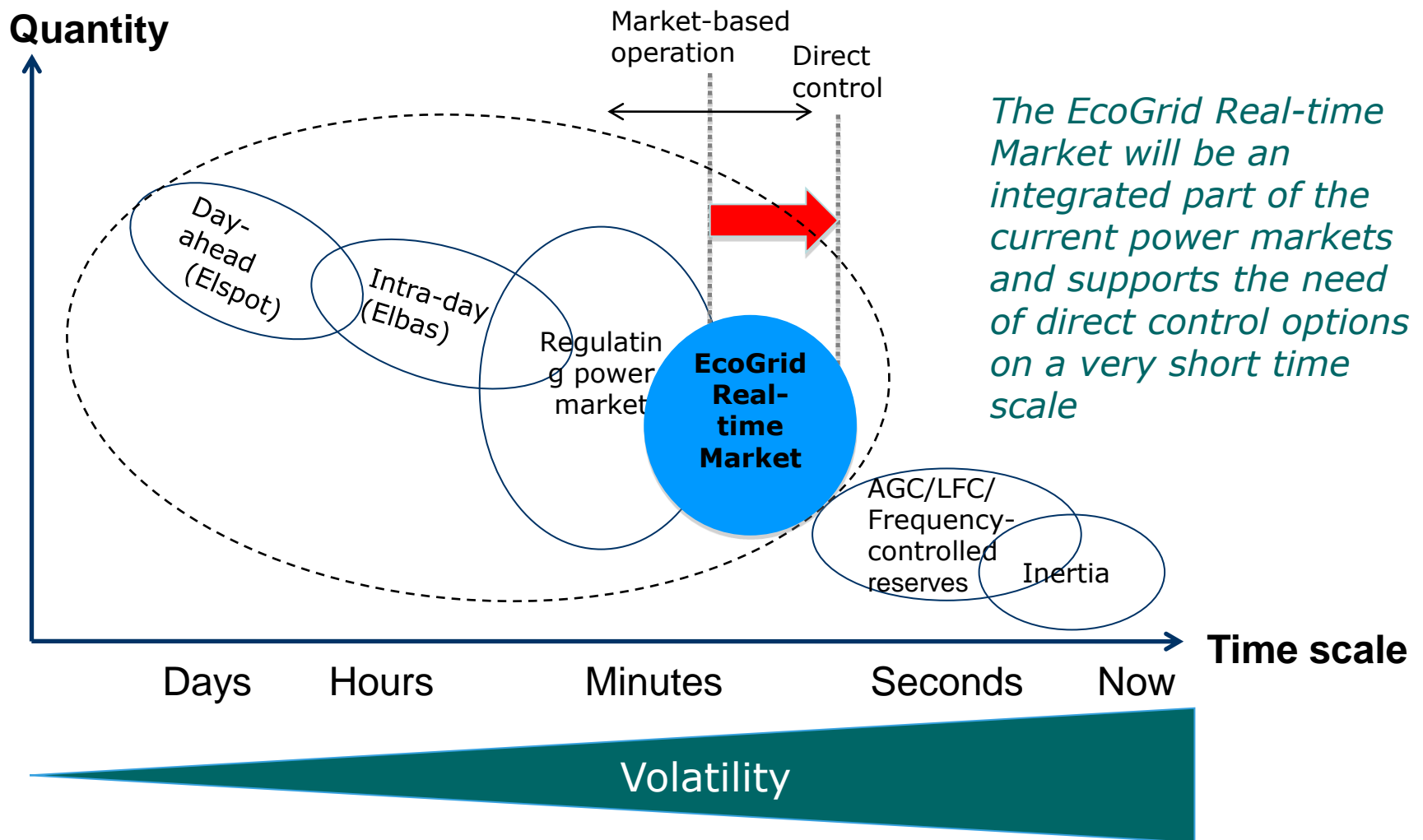
**SWITZERLAND**  
 IBM Zrl\*  
 Siemens, CH\*

\* Third Party

# Roles of the Partners



# The Scope of a Real-time Market



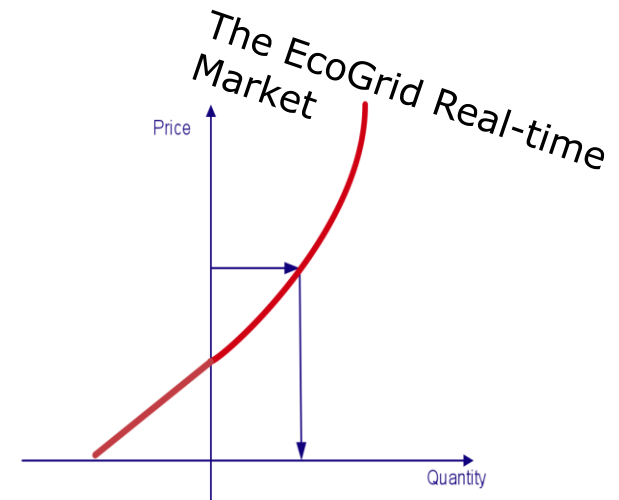
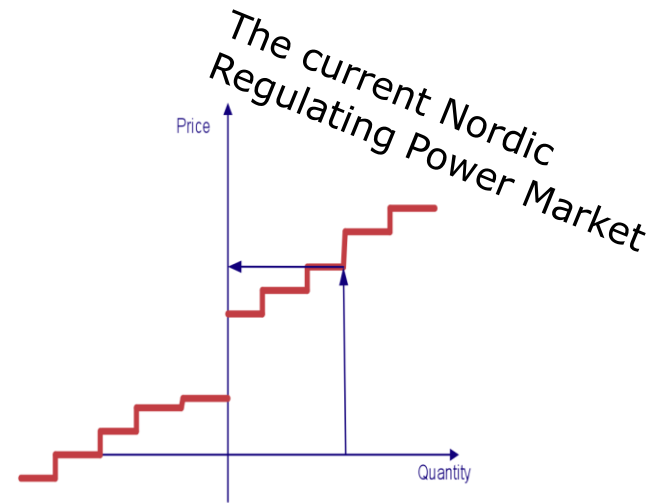
# An Additional Source of Regulation Capacity

## The current balancing market:

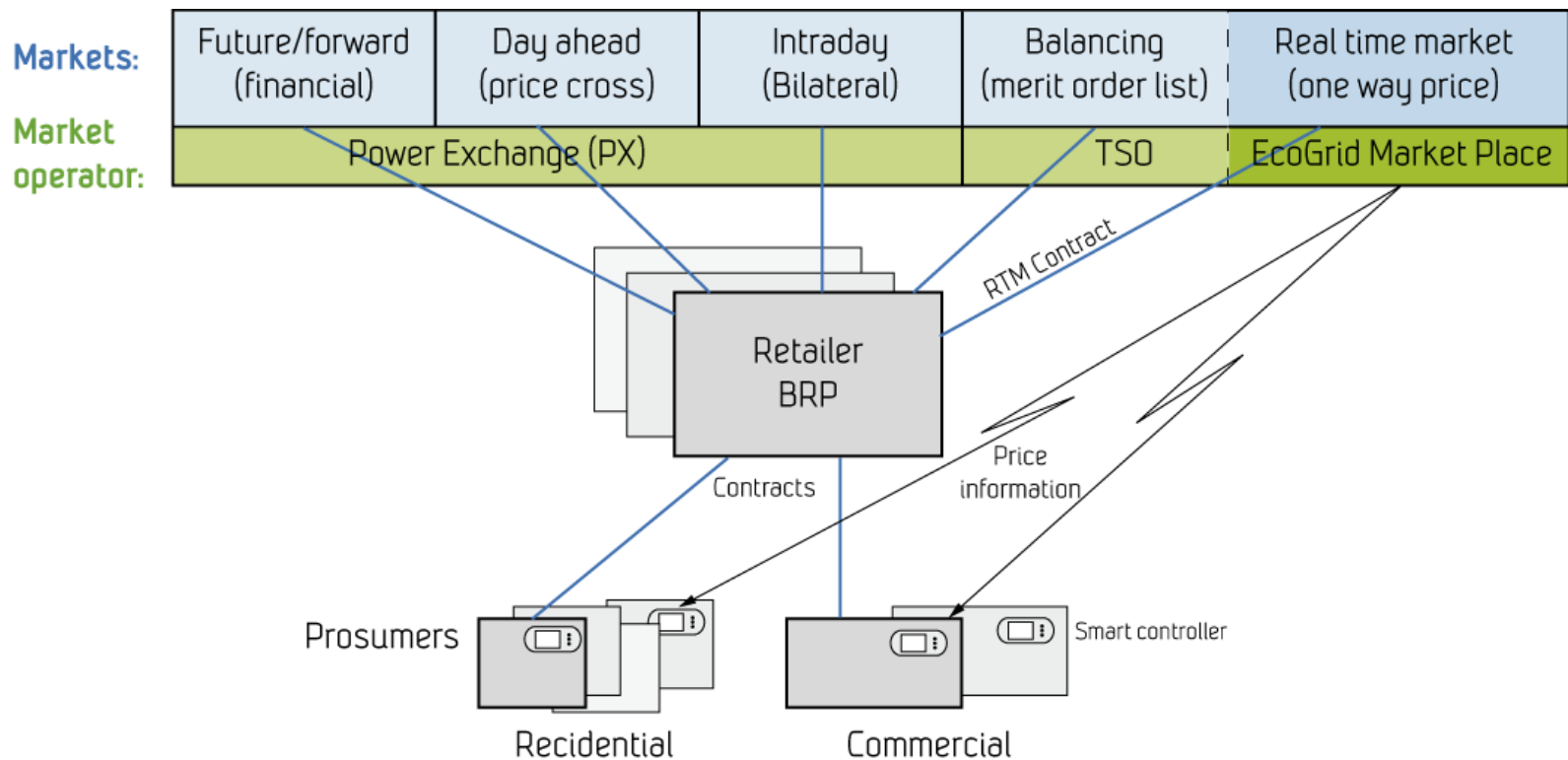
- Merit order list of regulation objects
- Include only large producers, large consumers and aggregated smaller units (minimum 10 MW)
- 15 minutes response requirement

## The new real-time market:

- No restriction on the size of units (MW)
- 5 minutes price intervals
- Response dependent of the accumulated price elasticity



# Example of business model



# End-user Involvement

- Response to real time price only, every 5 minutes
- Automation necessary
- Customer segmentation
- Customer recruitment challenges:
  - Information and understanding of the potential benefits of participation (economical/energy savings/security/environment)
  - Acceptance of technology and automation
  - Contractual issues

# 2000 Participating Customers in the Demonstration



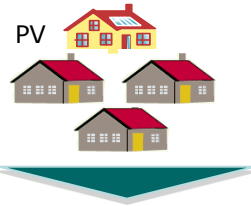
## “The reference group”

- 200 households with a smart meter
- No access to specific information or “smart” equipment



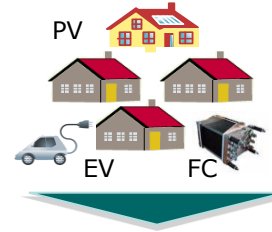
## “The self-helped”

- 400-500 households with a smart meter
- Receiving market price information/prognosis
- Must move their energy consumption by themselves



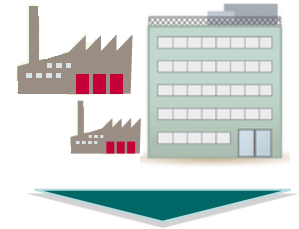
## “The semi-advanced”

- 700 semi automated households with a smart meter
- Installation of 1-2 reactive appliances responding to market price signals/prognosis
- All houses have installed heat pumps or electric heating



## “The advanced”

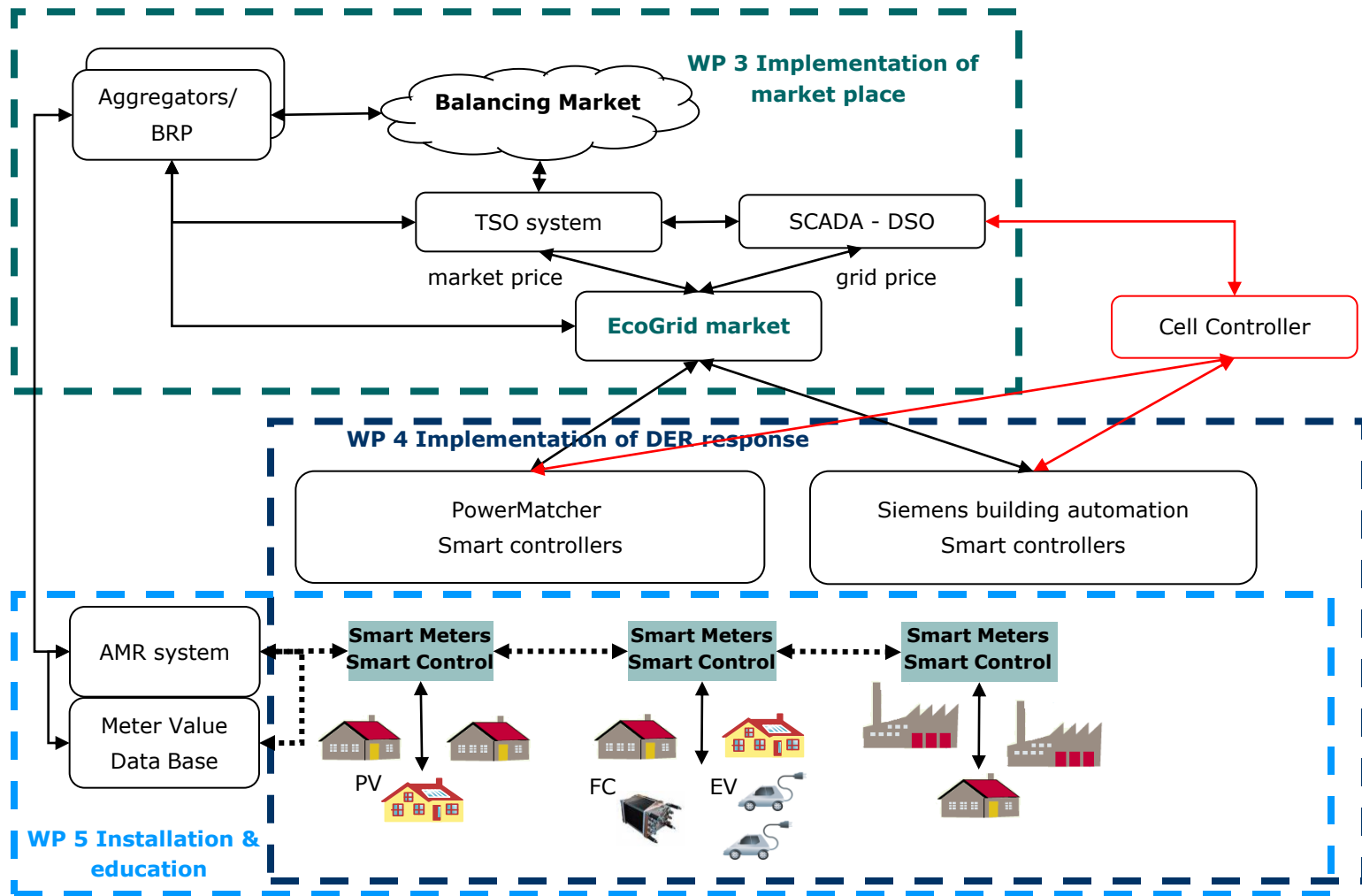
- 500 fully automated households with a smart meter
- Installation of multiple connected appliances, all of which are responsive to price signals



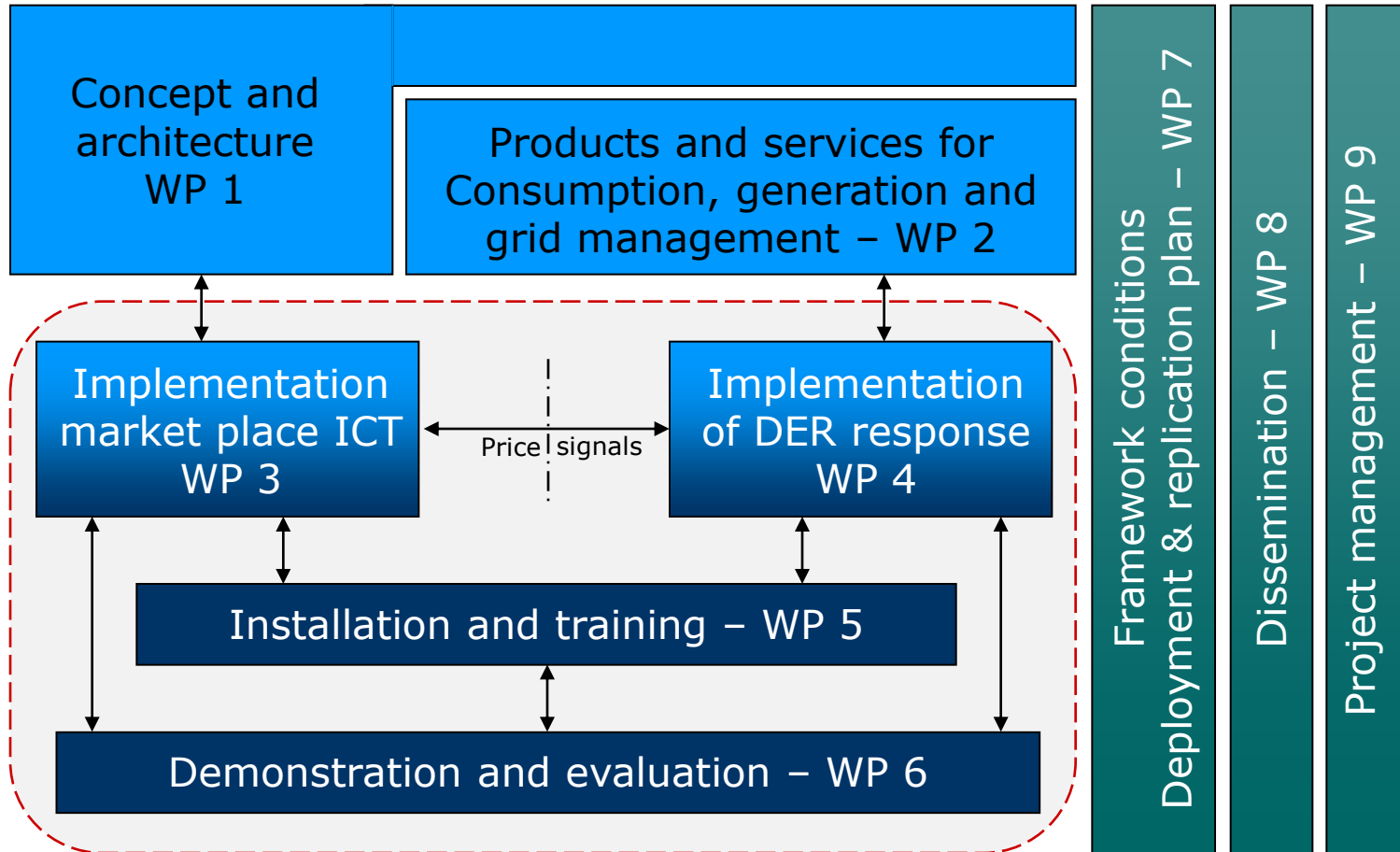
## “The smart businesses”

- 100 commercial/public customers with a smart meter
- Including small business units and the public customers
- Approx. 4 connected smart appliances

# Technology Involved



# Organisation of EcoGrid EU



## Bornholm - a unique test site

Thank you  
for your Attention

