

SMART GRIDS CREOS

World Standards Day
14/10/2015

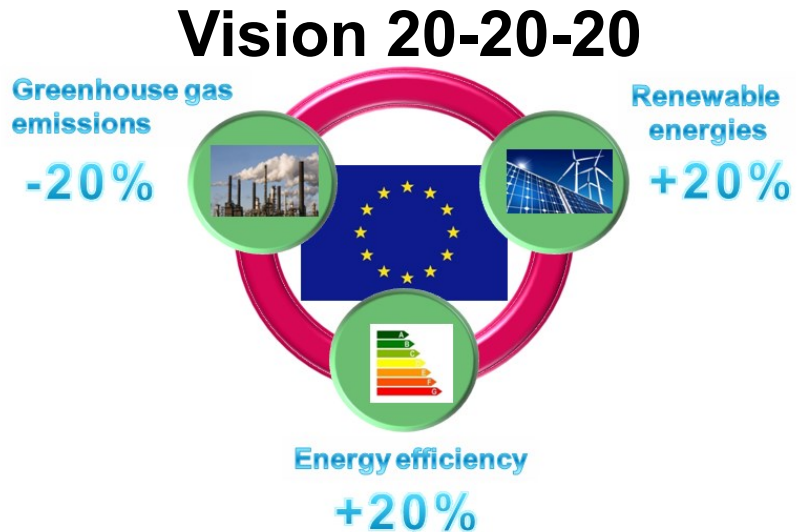
World Standards Day

Agenda:

- Introduction on SMART GRIDS
- CREOS's vision and activities on SMART GRIDS

Introduction on Smart Grids

Reasons for smart grids



2009/72&73/EC – Smart Meter
2012/27/EU – Energy efficiency
2014/94/EU – Electric vehicles
M490 – Smart Grids

Regulators' view:

Maximize the usage of the available infrastructure rather than replacing the cables by complete new ones leading to tremendous costs.

Introduction on Smart Grids

What is a Smart Grid?

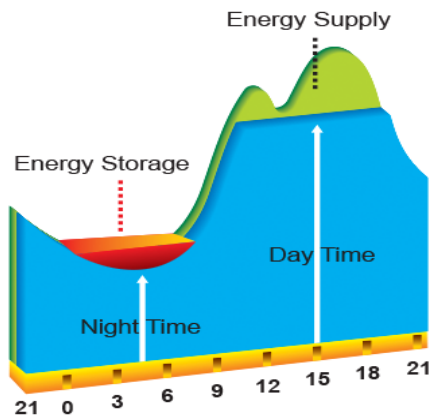
Distributed automation



Customer interaction



Peak shaving



Security & Reliability



Introduction on Smart Grids

What is a Smart Grid?

In simple terms:

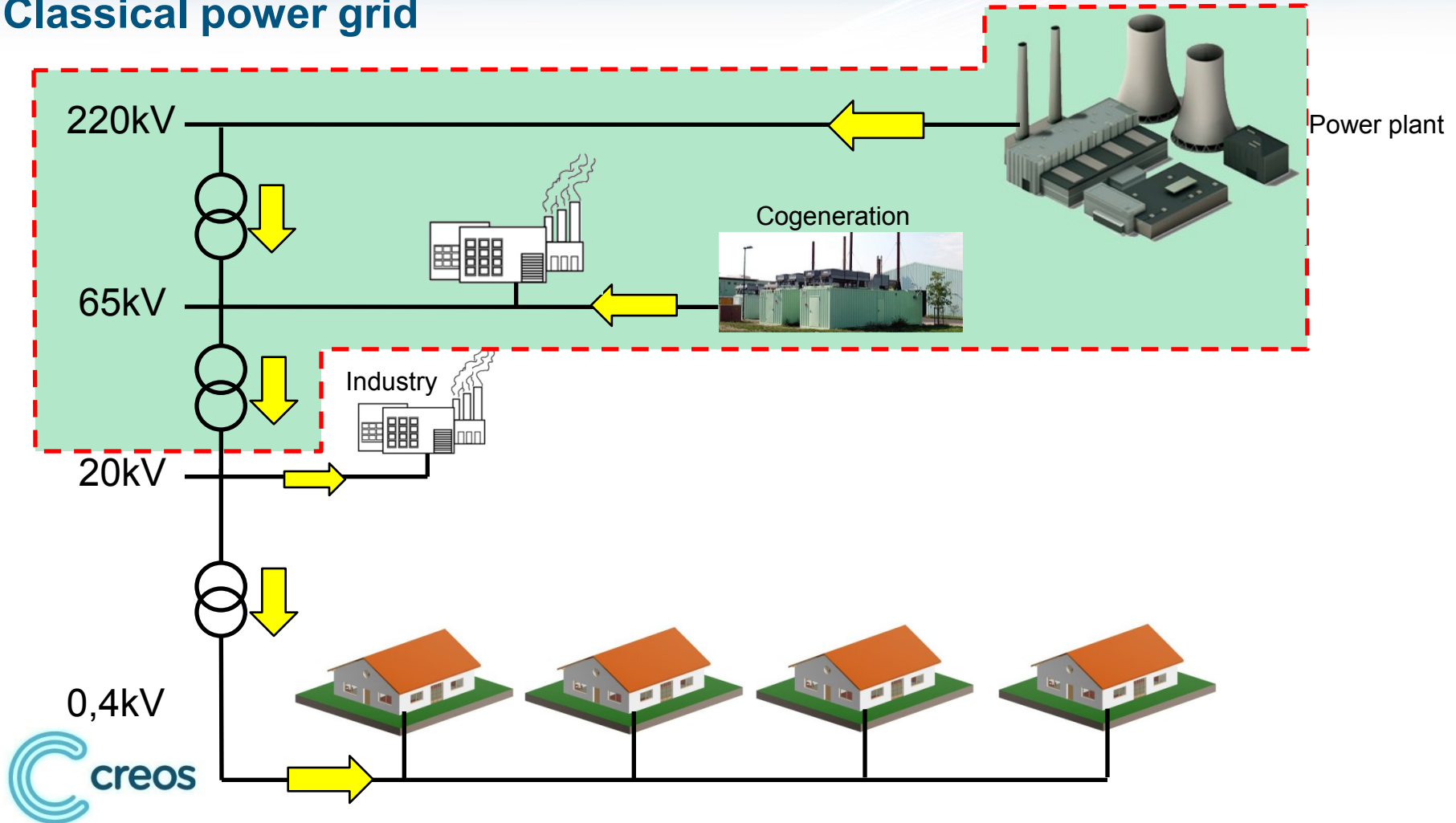
The Smart Grid is the interaction of all the previously mentioned elements.

IEEE P2030 definition:

“an automated, widely distributed energy delivery network characterized by a two-way flow of electricity and information, capable of monitoring and responding to changes in everything from power plants to customer preferences to individual appliances.”

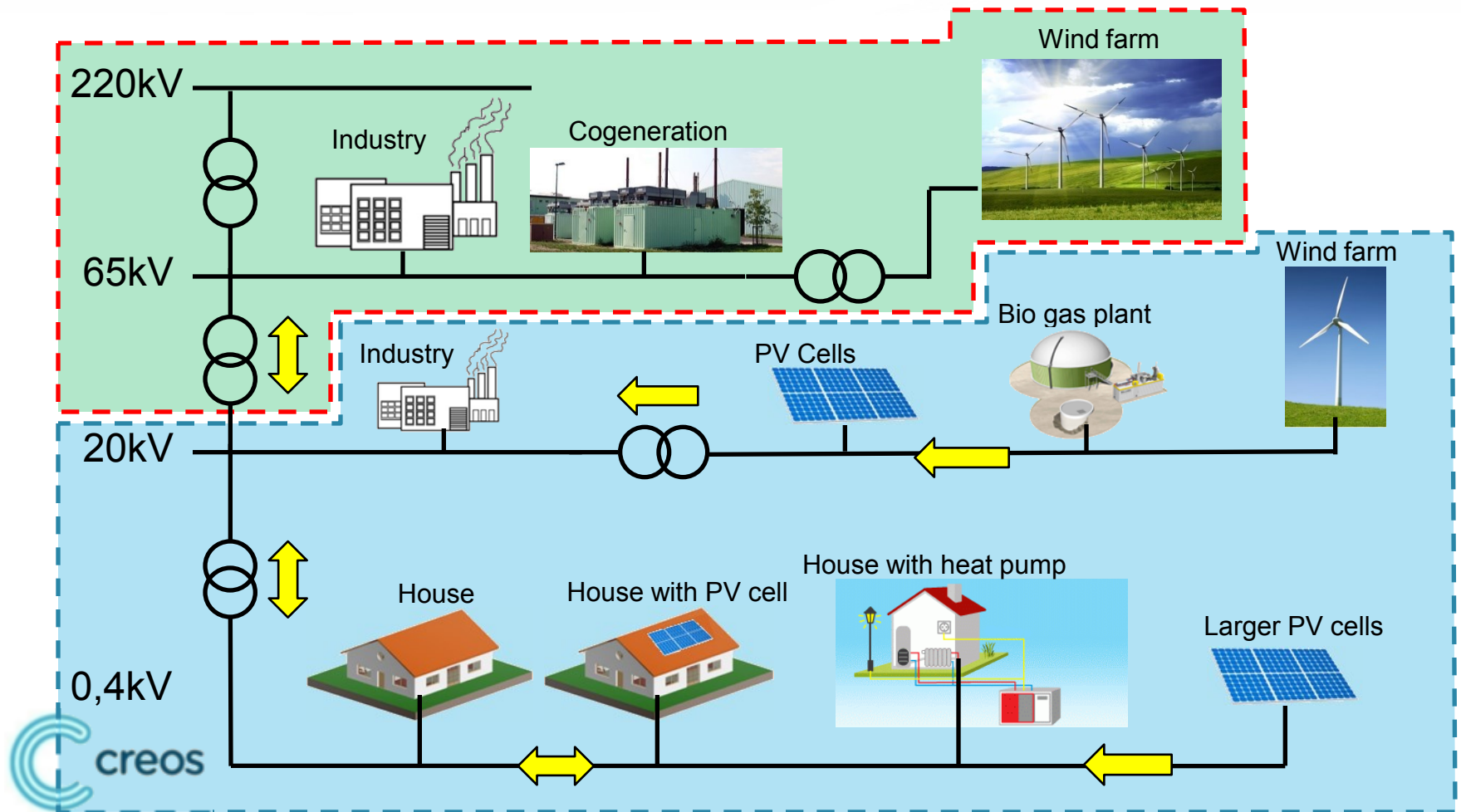
Creos's vision and activities on Smart Grids

Classical power grid



Creos's vision and activities on Smart Grids

Future electricity grid – Smart Grid



Creos's vision and activities on Smart Grids

Creos' strategy

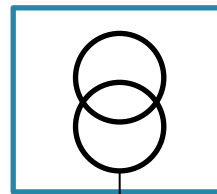
1. The foundation of all activities is to have a reliable and secure communication network:
 - Deployment of a private TETRA network (voice + data)
 - Extension of the fiber optical network from HV to the MV/LV stations
 - Deployment of smart meters communicating via power line
2. Installing more actors in the field:
 - Switches, Smart Meters, voltage regulators, $\cos(\varphi)$,...
3. Connecting these actors to the communication network:
 - To be able to control and act from remote
4. More and more automation and distribution of intelligence:
 - Take autonomously the right decision based on the detected grid situation

Creos's vision and activities on Smart Grids

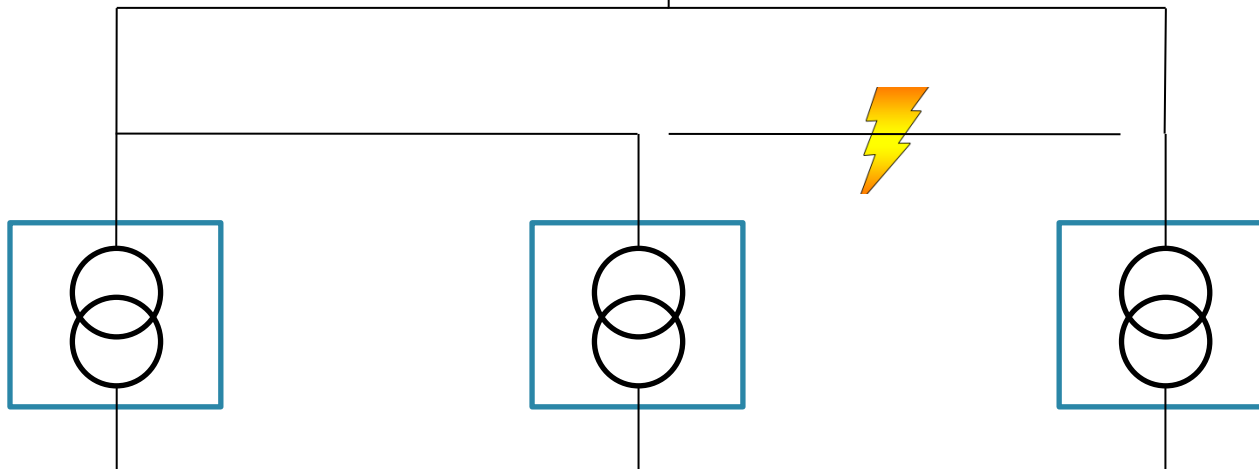
Smart Grid vision - Examples

Self-healing network MV network

HV grid



MV grid



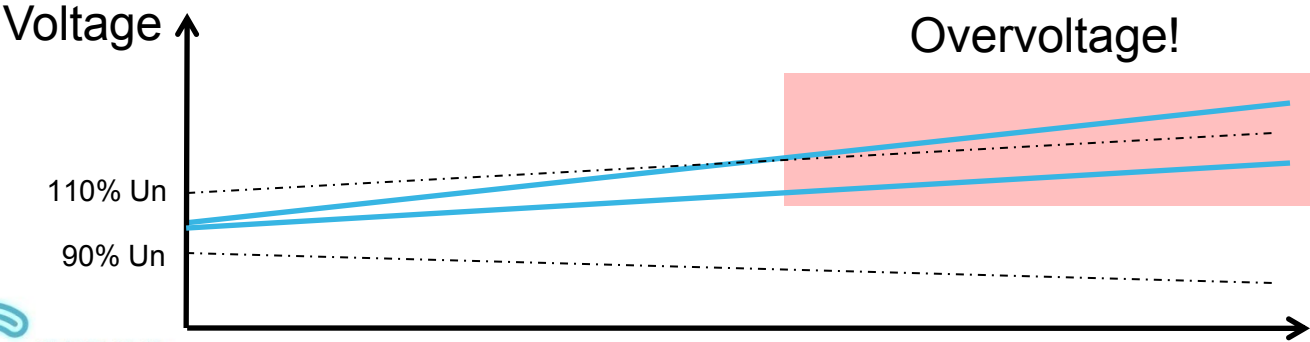
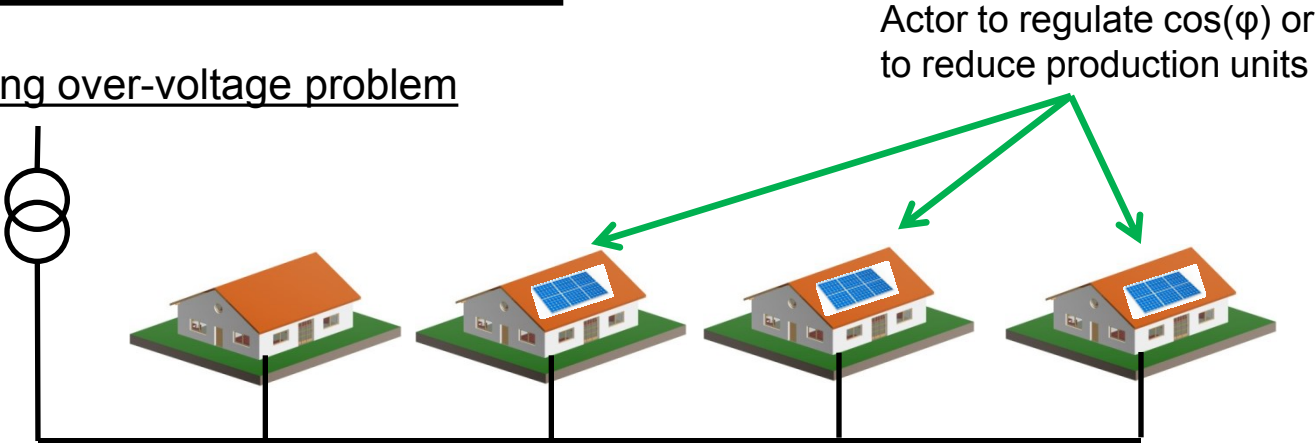
LV grid



Creos's vision and activities on Smart Grids

Smart Grid vision - Examples

Self healing over-voltage problem



Creos' vision and activities on Smart Grids

Creos' activities

1. Currently Creos is rolling out the communication networks (TETRA and F.O) and from next year on the Smart Meters.
2. In parallel Creos is working together with the Interdisciplinary Centre for Security, Reliability and Trust (SnT) of the University of Luxembourg on projects to:
 - Secure the communication networks
 - Detect abnormal behaviors or consumptions based on the data collected from smart meters
 - Cluster the customers and perform load predictions
 - Increase the reliability of the electricity grid while performing actions on the different actors in the grid

