



RED
ELÉCTRICA
DE ESPAÑA



**Spanish most relevant SmartGrid
demonstration project.**
Mr. Asier Moltó Llovet

25th April 2012



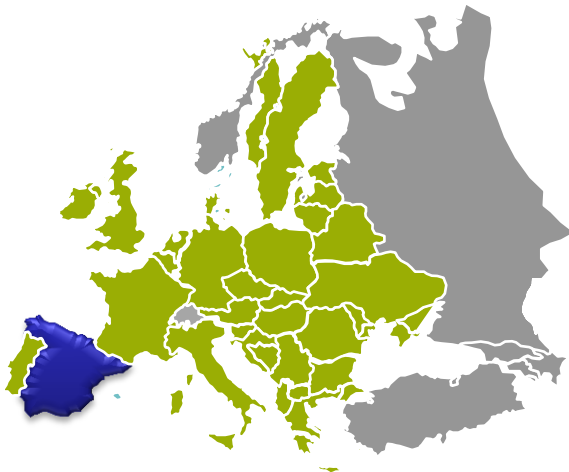


Overview of the presentation

- **Who is REE?**
- The challenge of the Demand Side Management
- Demand Response experiences
- Conclusion

Who is Red Eléctrica de España?

Red Eléctrica is the Spanish transmission system operator (TSO)



- Red Eléctrica was the first company in the world dedicated exclusively to power transmission and the operation of electrical systems. A pioneer in its field, the company occupies a position of leadership today in these activities.
- Red Eléctrica is the first European TSO establishing a Demand Side Management Department in coherence with its commitment of the development of a smarter electric grid adapted to the next decade challenges



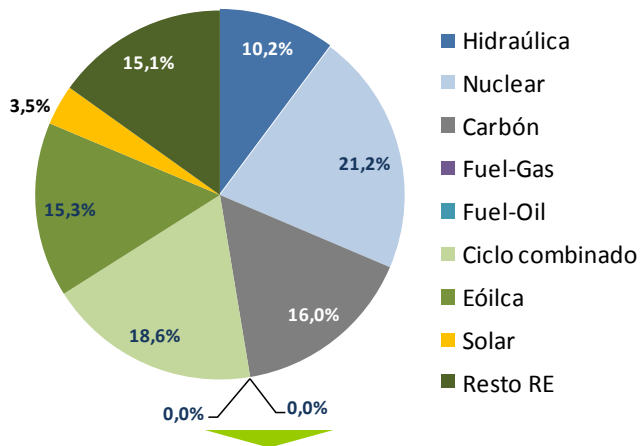
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Spanish energy context

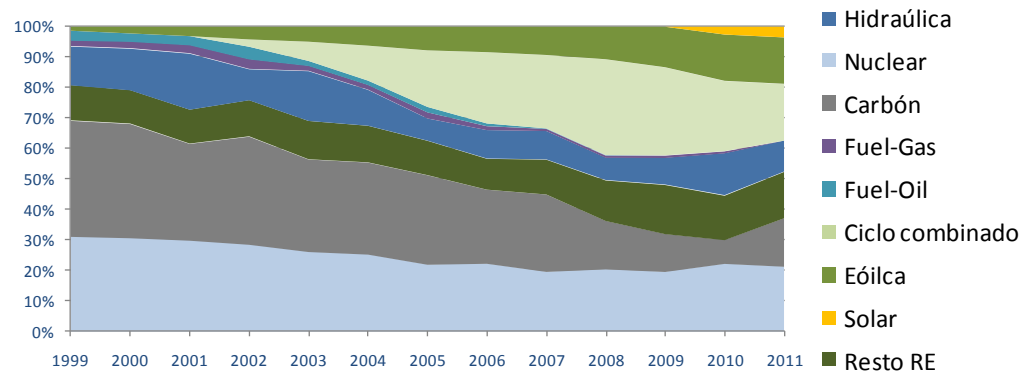
Spanish electric system is still dependant on fossil fuels, but presents a continuous introduction of energy coming from renewable sources.

2010 generation share



Combined cycles, nuclear and wind were the most used technologies in 2010.

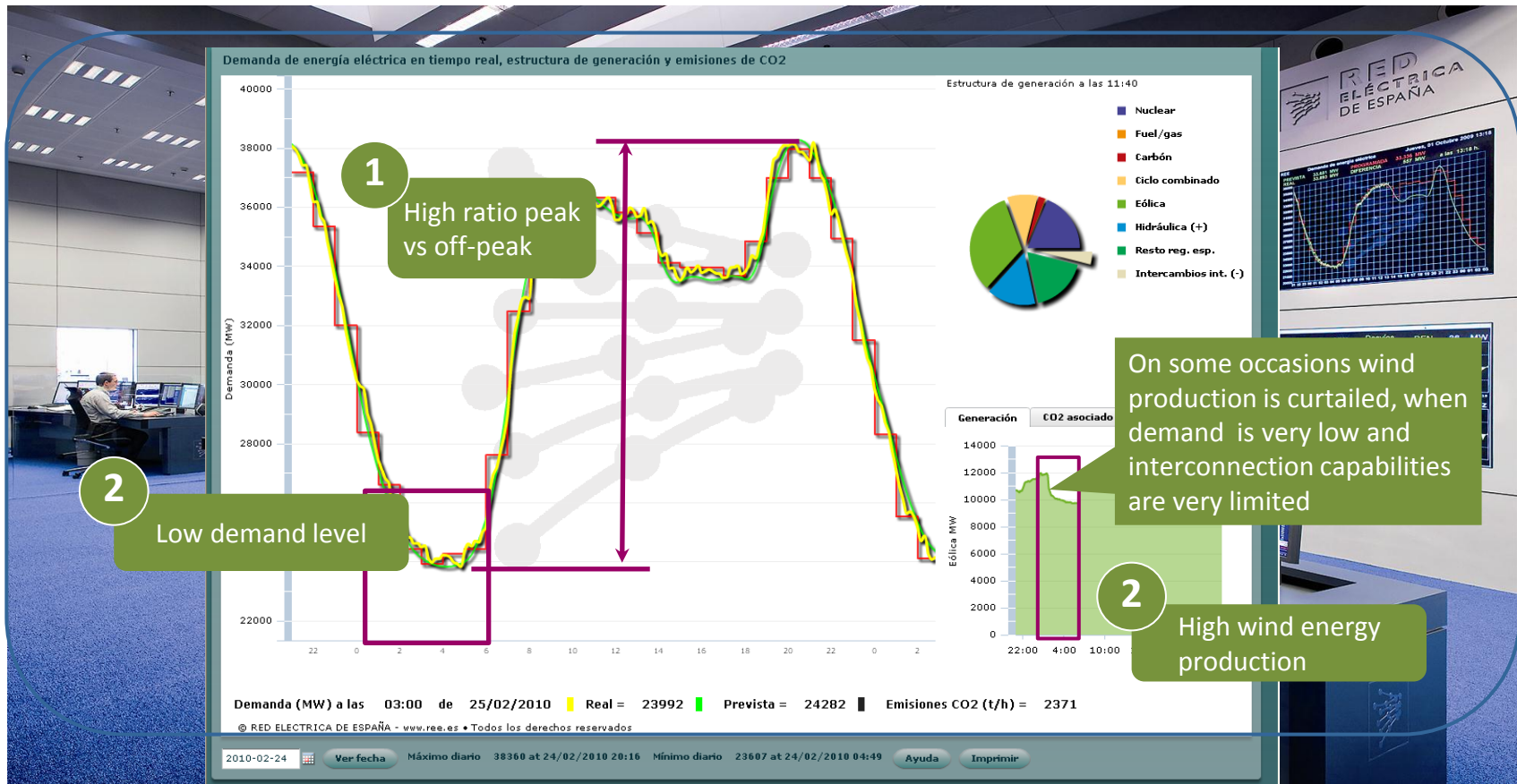
Spanish generation share evolution



In recent years has increased the participation of wind and combined cycles, basically at expense of production based in coal.

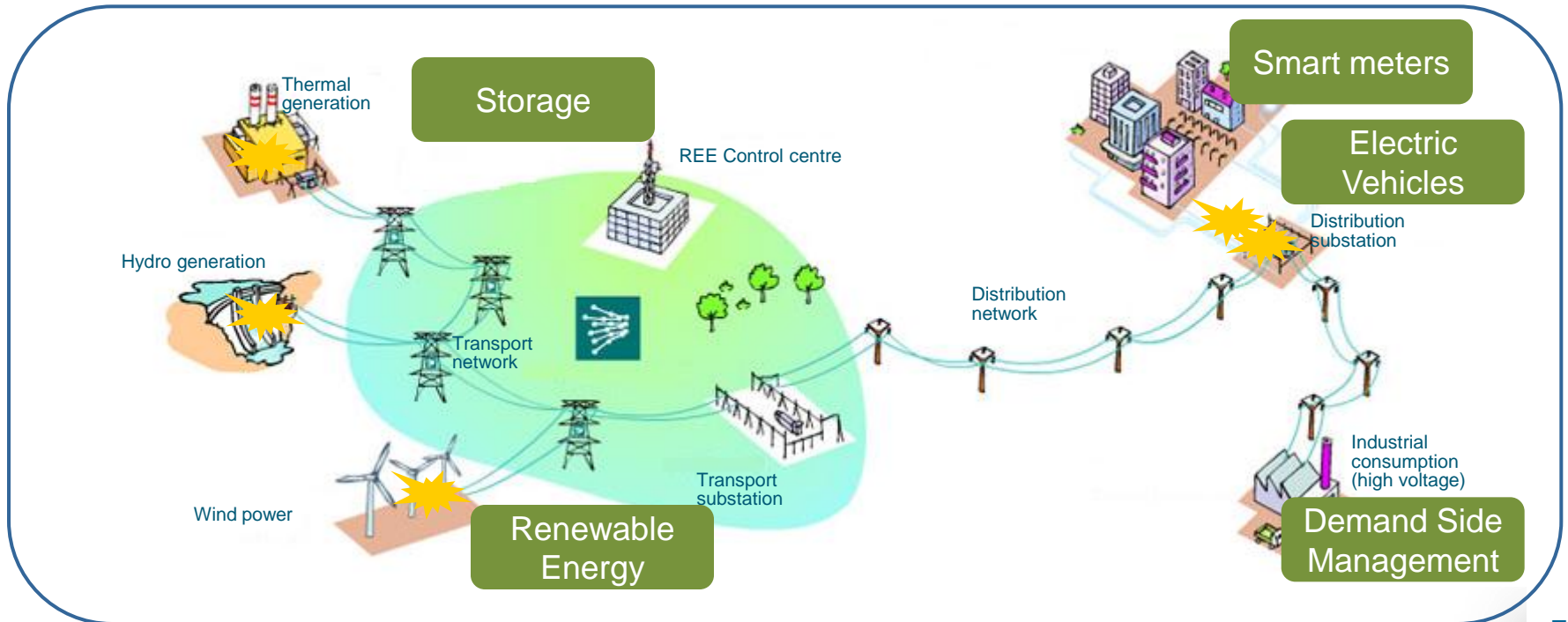
The challenge for the system operation

As a TSO, Red Eléctrica manages a daily load shape which presents high ratio peaks vs off-peak demands.



The future of the Electric System

“Smart Grid” is the process “to transform the functionality of the present electricity transmission and distribution grids so that they are able to provide a user-oriented service, enabling the achievement of the 20/20/20 targets and guaranteeing, in an electricity market environment, high security, quality and economic efficiency of electricity supply” (ENTSOE)





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SmartGrid R&D projects

This process requires projects dealing not only with the technology development but also with the deployment.

Demonstration projects



GAD Project: 30M€ to demonstrate Demand response services within residential sector



AGREGA Project: To develop DSM services through aggregation within medium industry sector



TWENTIES DEMO2 Project: To develop a VPP

Electric vehicle



VERDE Project: 40 M€ SEAT VE prototype and smart integration into the grid

DOMO
CELL

DOMOCELL Project: To develop a smart system for EV charge in public parking

Deployment projects



PRICE Project: Smartgrid project using smartmeters deployment in the Corredor del Henares area



SmartCity Malaga & Barcelona:
ENDESA Smartmeters
deployment

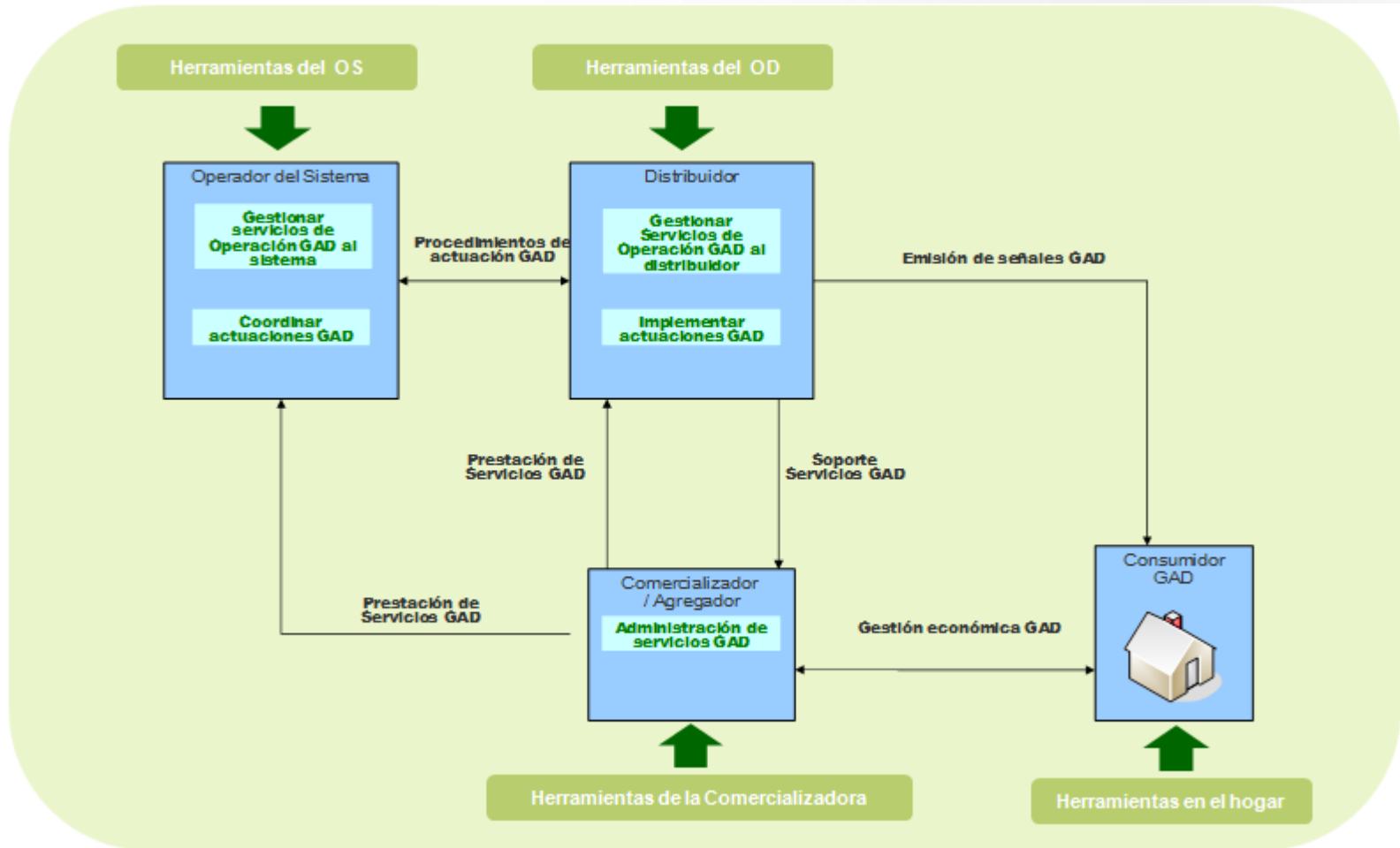


Player's role

From a TSO perspective, the main challenge is to ensure that system operation needs are taken into account.

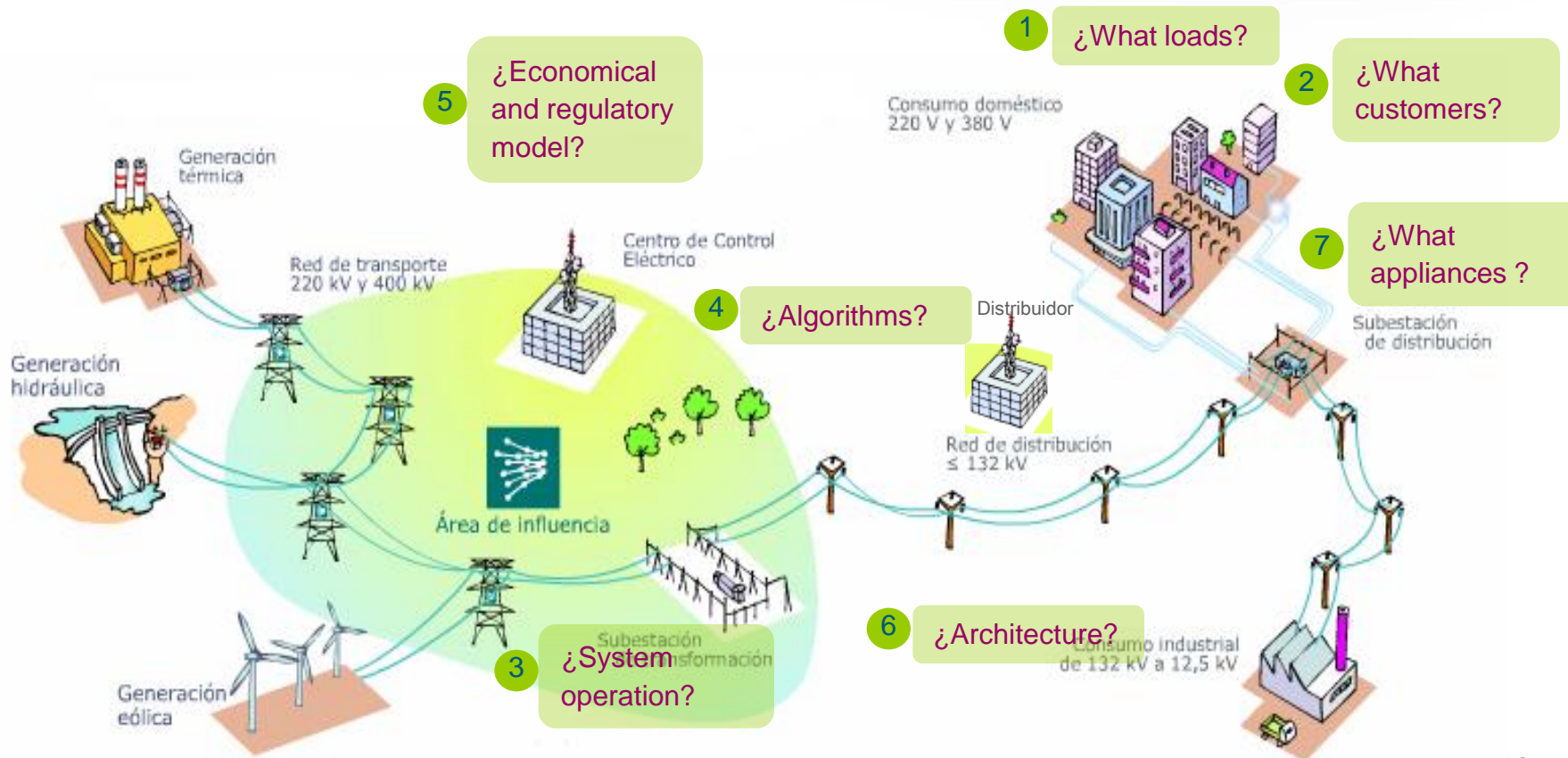


GAD Project



GAD project

Targets

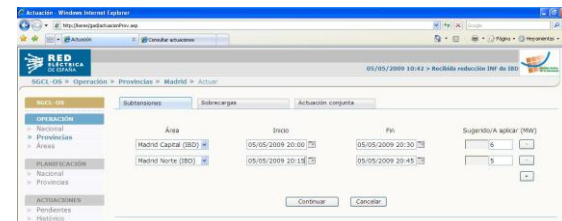
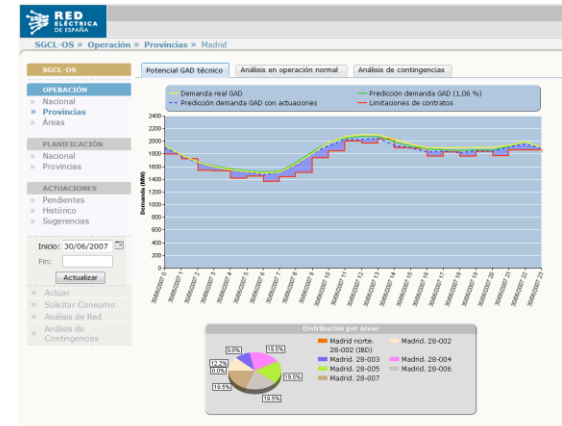
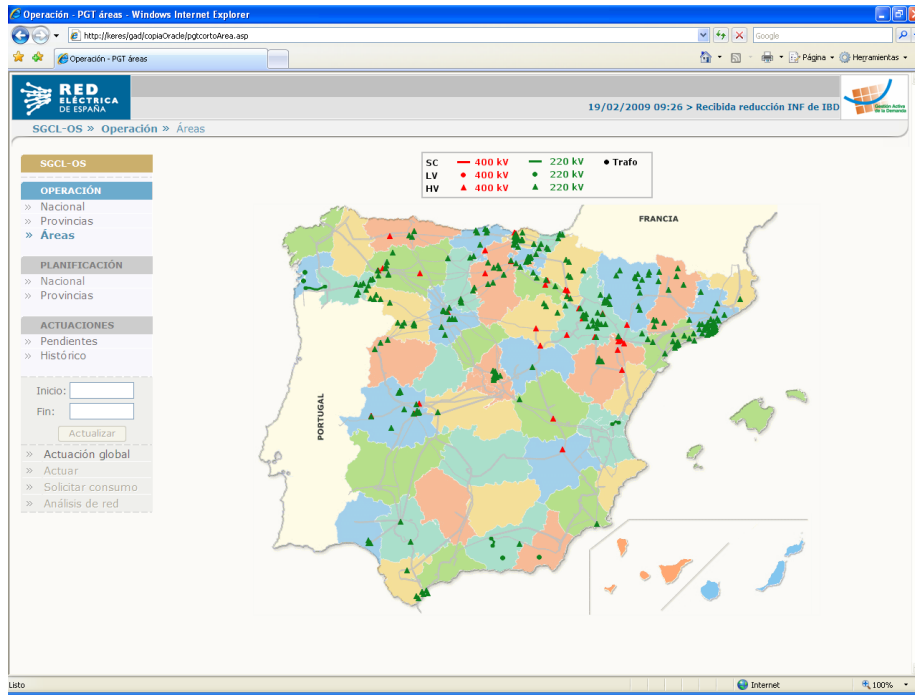


GAD Project. Loads and appliances



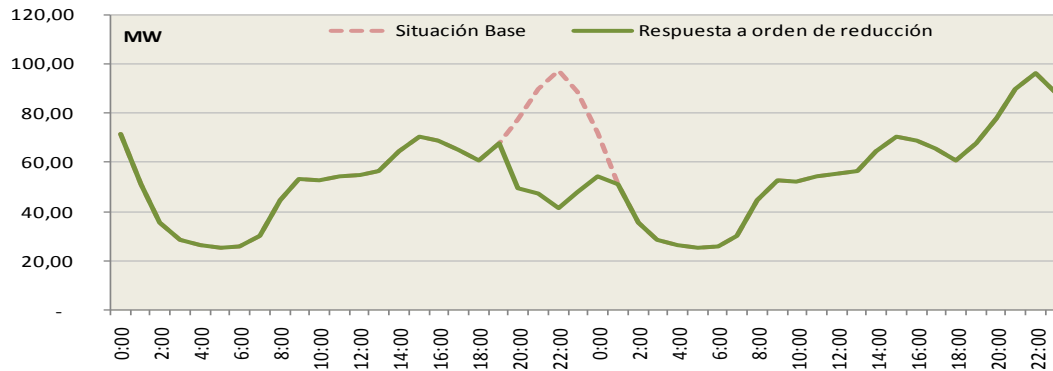
Management tools

New tools for demand management (GAD project)

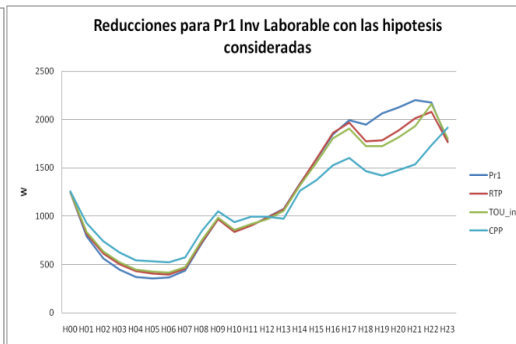
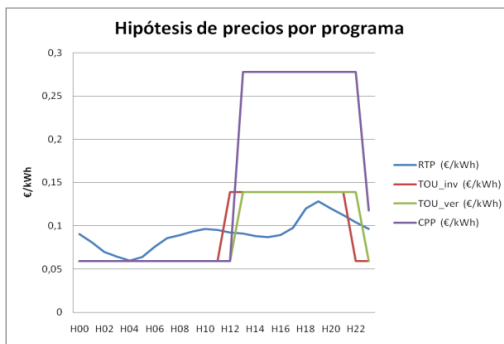


Some results for REE

For REE, GAD services may become a very relevant operational tool helping to improve efficiency of spanish electric system



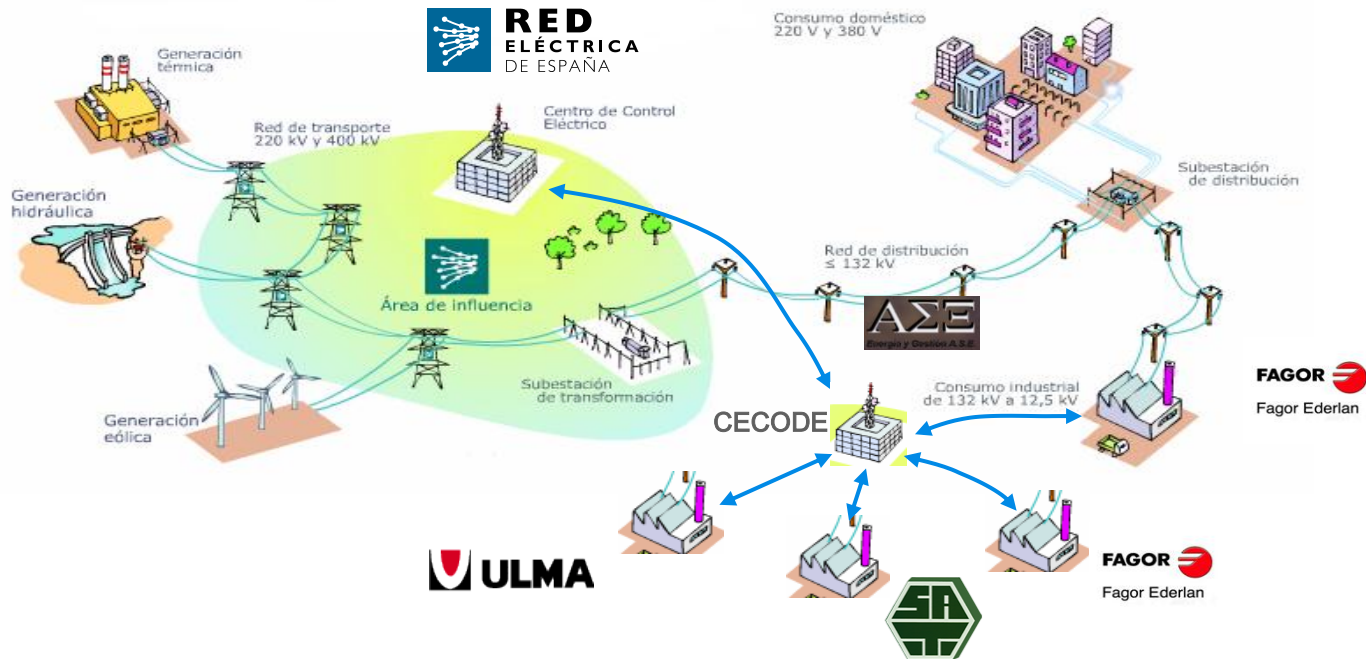
Response to technical signals



Response to price signals

AGREGA Project

To demonstrate that medium industry can provide a DSM service through aggregation



VERDE Project.

VERDE project is oriented to develop an electric car as well as its smart integration into the electric system



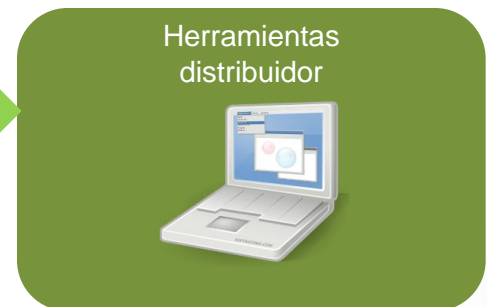
Vehículo

Infraestructura

Herramientas OS



Herramientas distribuidor



Deployment projects



PRICE Project: Smartgrid project using smartmeters deployment in the Corredor del Henares area



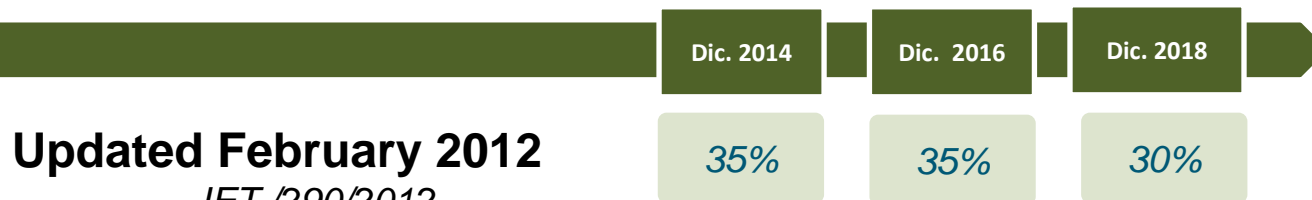
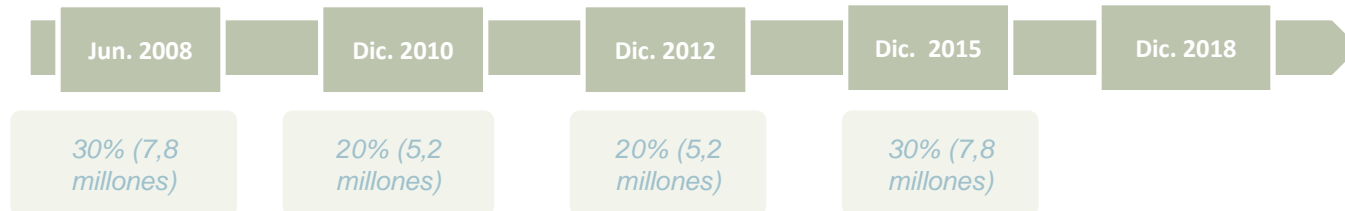
SmartCity Malaga & Barcelona:
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Towards the future grid...

The National Meters Substitution Plan implies the substitution of current meters for smart meters with remote management and measurement.

11 years– From 2008 to December 2018



This plan means the substitution of 26 M meters

PRICE project

This project has 4 areas: **RED** (monitoring and automation), **GEN** (in house energy efficiency), **GDI** (Distributed generation) and **GDE** (DSM)



PRICE project

The project involve 500.000 inhabitants with 200.000 meters and 1500 distribution grid substation (50% IBDL y 50% GNF)





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Conclusion

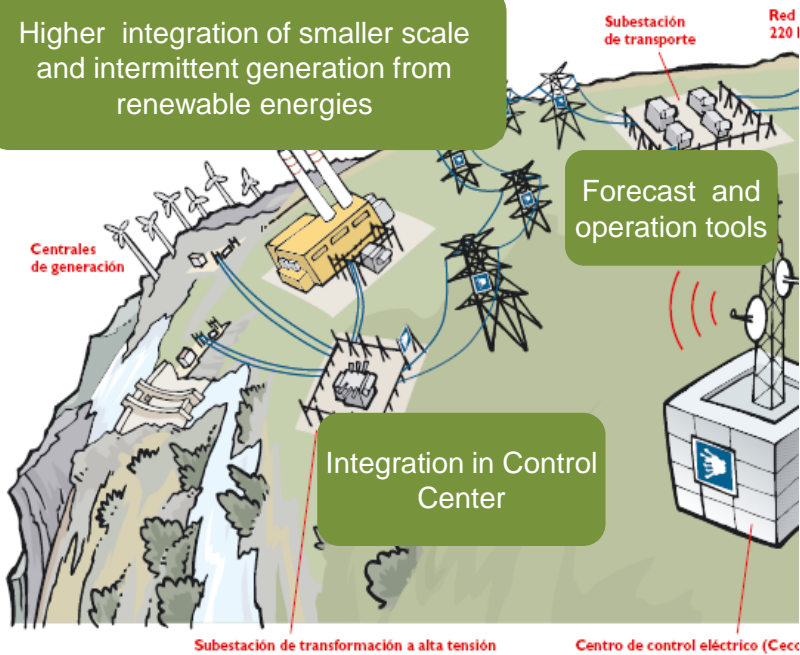
Demand side management will have a key role in the future system operation

Electricity offer

Higher integration of smaller scale and intermittent generation from renewable energies

Forecast and operation tools

Integration in Control Center



Electricity Demand

Industrial Demand Management

Storage

Information

Electric vehicle

