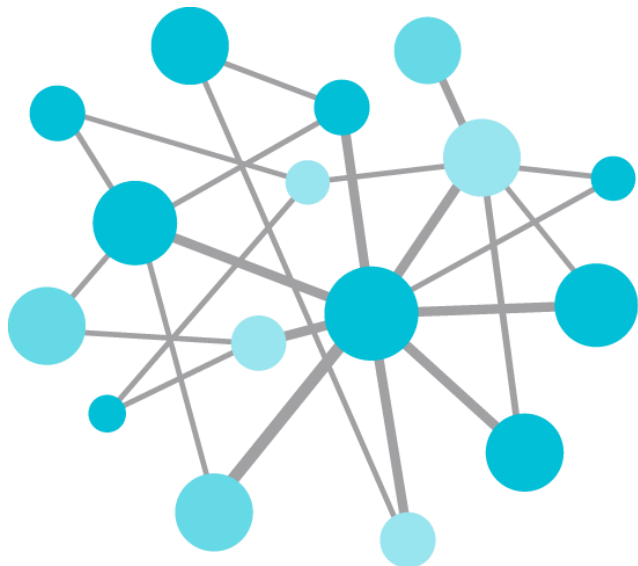


# Real time data awareness and advanced data processing at CECRE (Control Center for Renewable Energies)

Presented by **Juan Julián Peiró Peña**



**RED ELÉCTRICA**  
DE ESPAÑA



OSIsoft®

# INDUSTRY SEMINAR 2014

The **Power** of **Data**

**E M E A**

DECISION READY IN REAL-TIME

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- 3 CECRE: Control Center for Renewable Energies**
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# 1 Red Eléctrica de España (REE)

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## System Operation:

- ❑ *Operates the grid and coordinates its uses with the generation facilities in order to ensure the security and continuity of the electricity supply.*

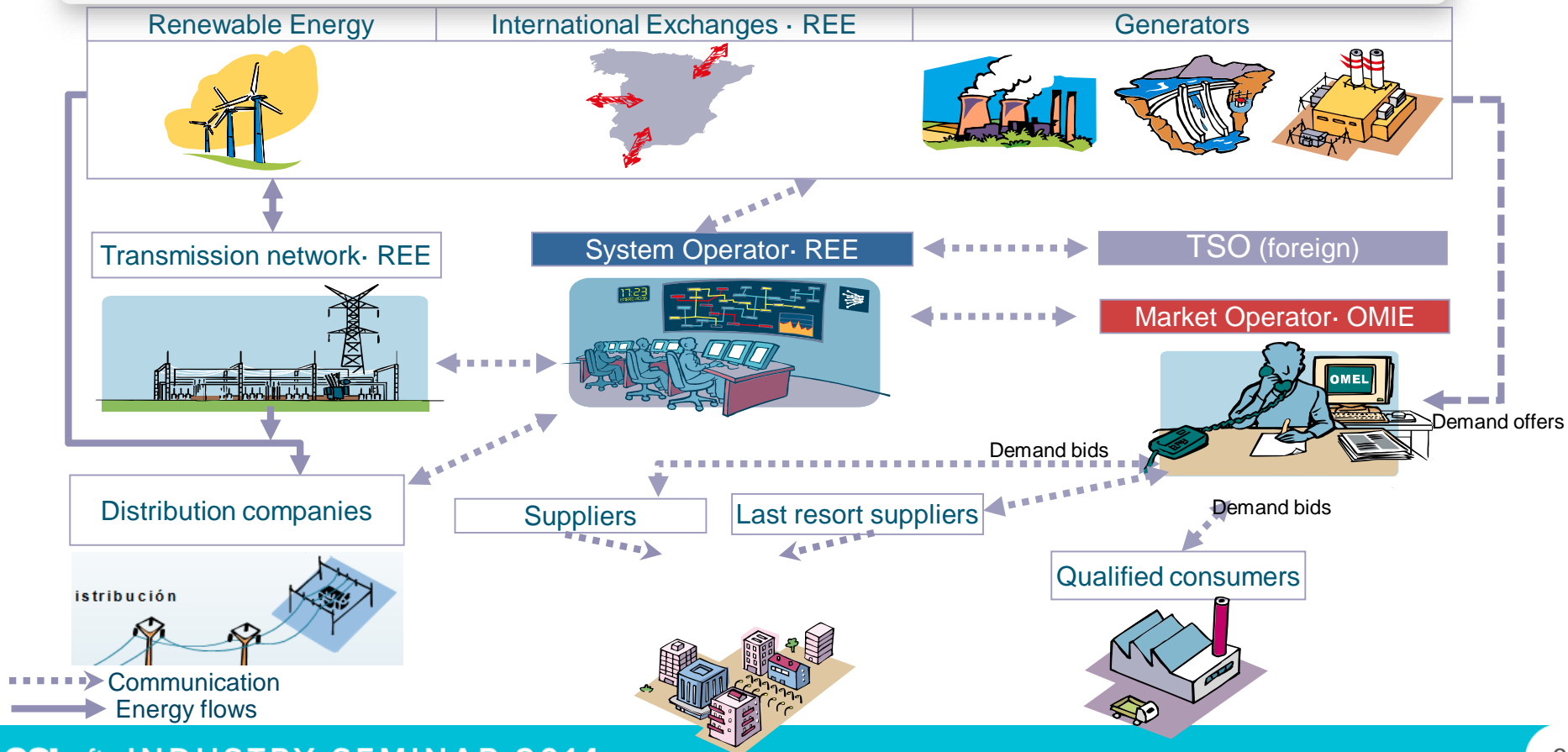


## Transmission (since 2007 as exclusive transmission company):

- ❑ *The development and the maintenance of the transmission facilities*
- ❑ *~ 41,000 km of lines and 78,000 MW of transforming capacity*



# 1 Red Eléctrica de España (REE)



## 2 CECOEL: Electrical Control Center

## 2 CECOEL: Real Time Data

EMS System

- *Every telemetry is linked point to point*
- **Observability:** 47 000 analog and 223 000 digital telemetries updated in less than 12 s
- **Controlability:** 40 000 remote control signals

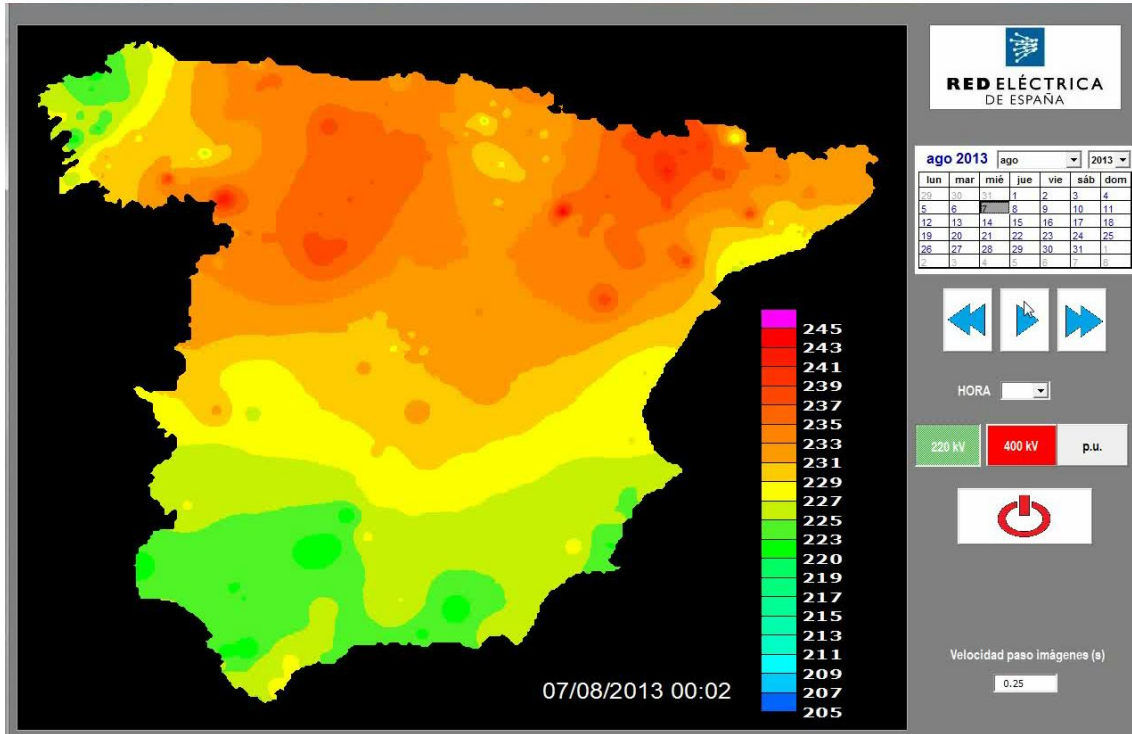


More than 2.5 billion data values every day

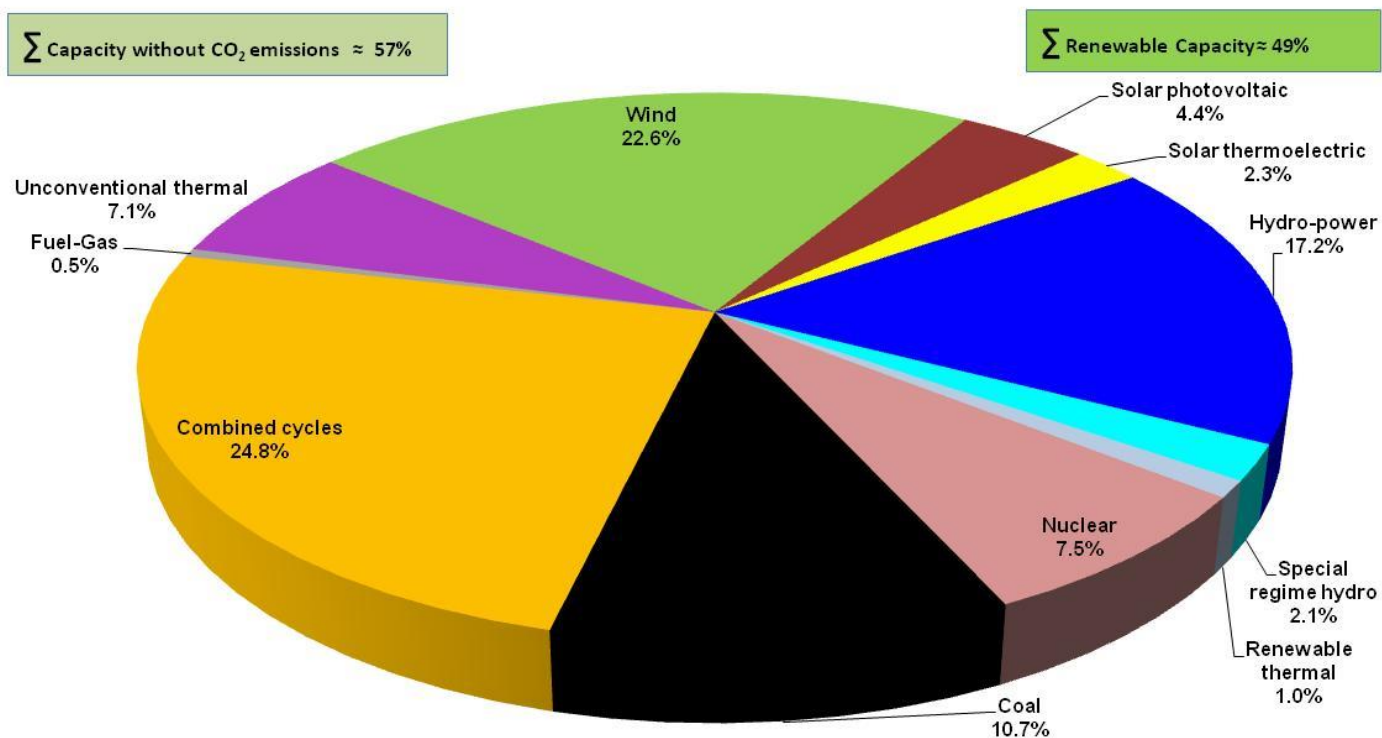
- 23.000 telemetries available for retrieving using PI System



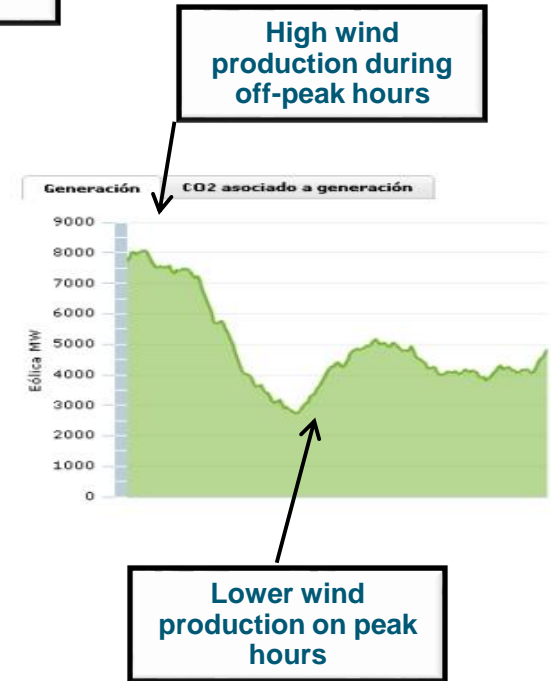
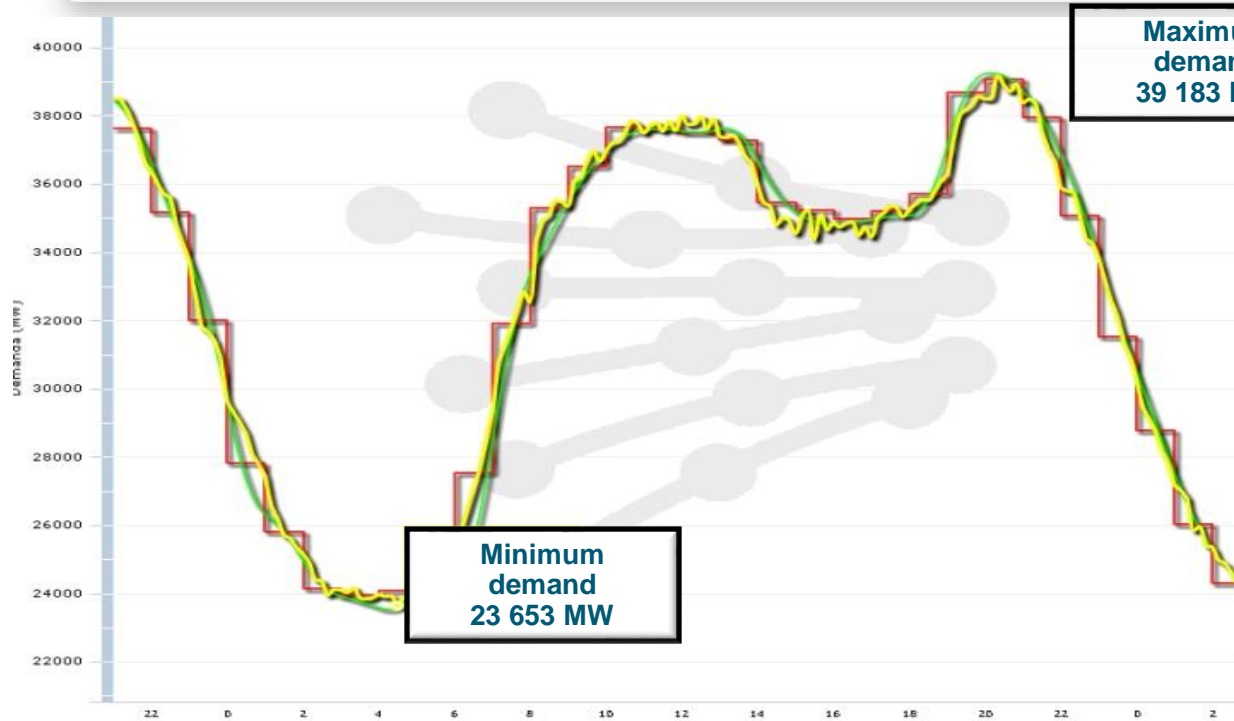
## 2 CECOEL: Voltage



## 2 CECOEL: Installed Generation Capacity May 2014 - 100 GW

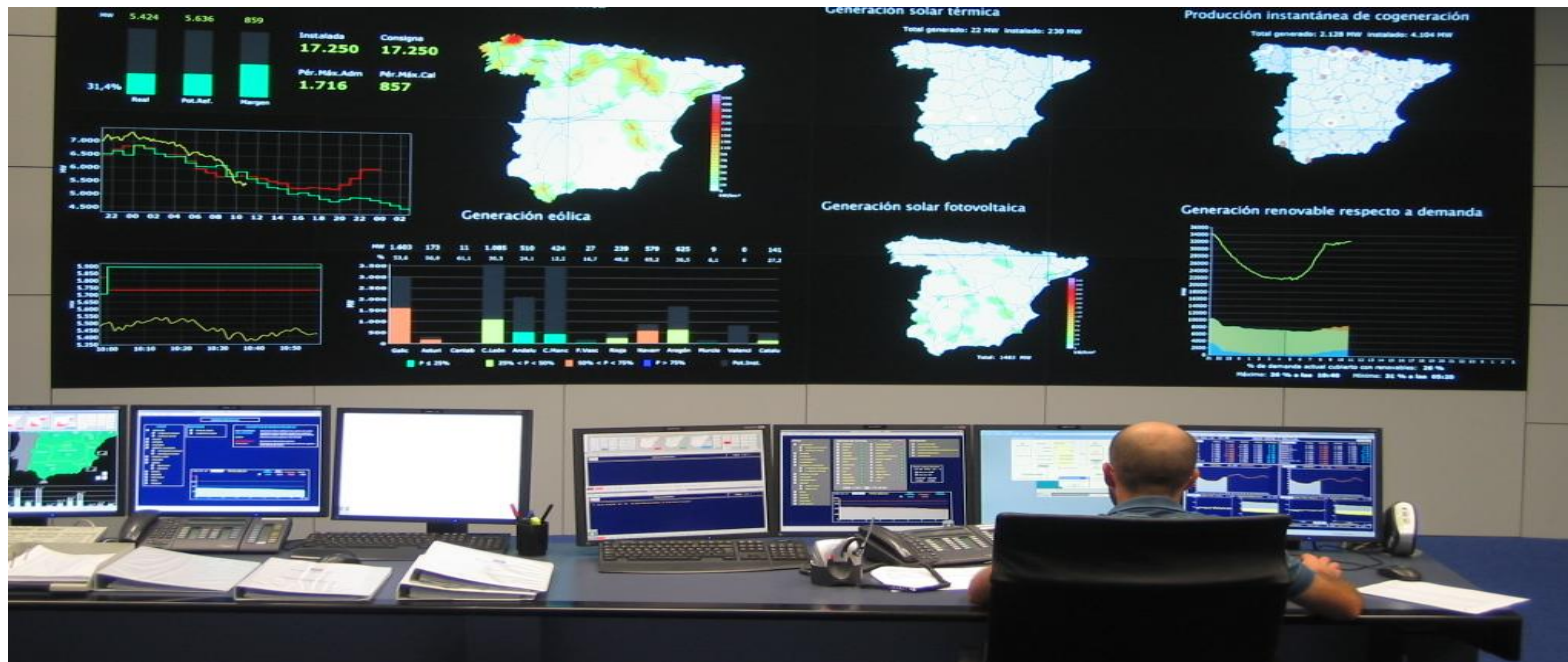


## 2 CECOEL: Demand Coverage

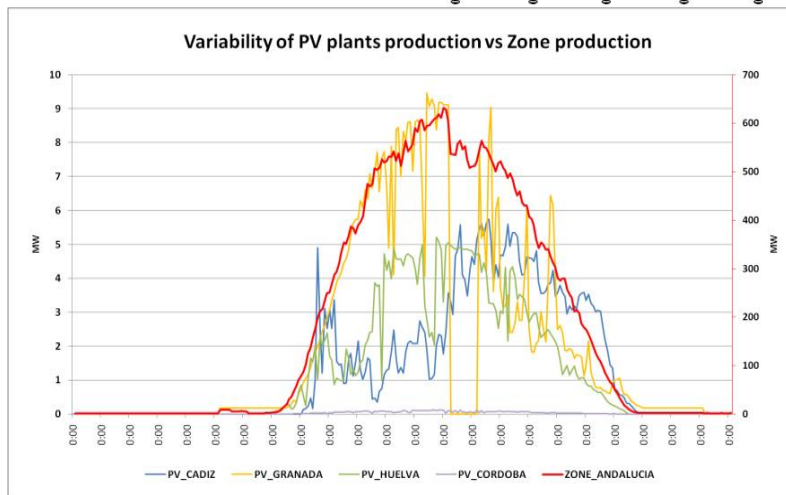
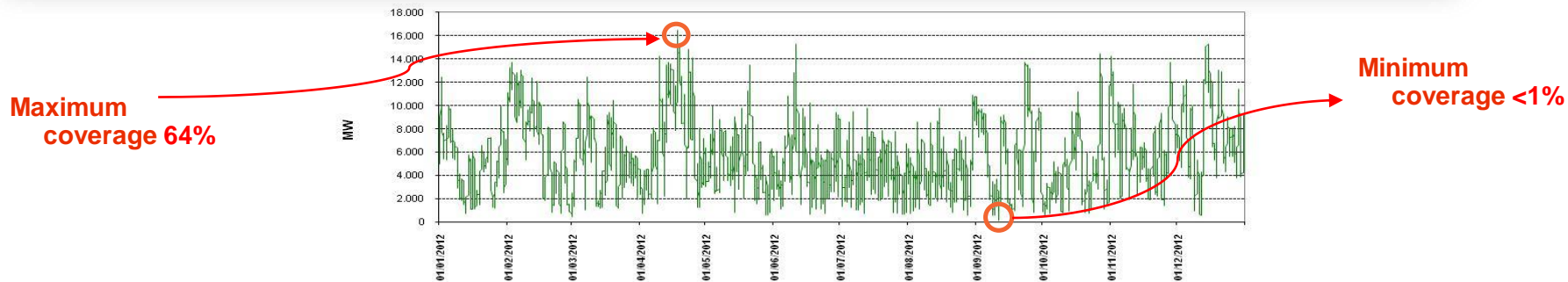


### 3 CECRE: Control Center for Renewable Energies

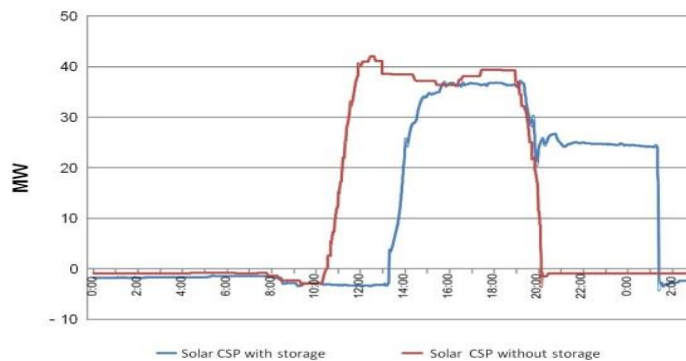
### 3 CECRE: Control Center for Renewable Energies



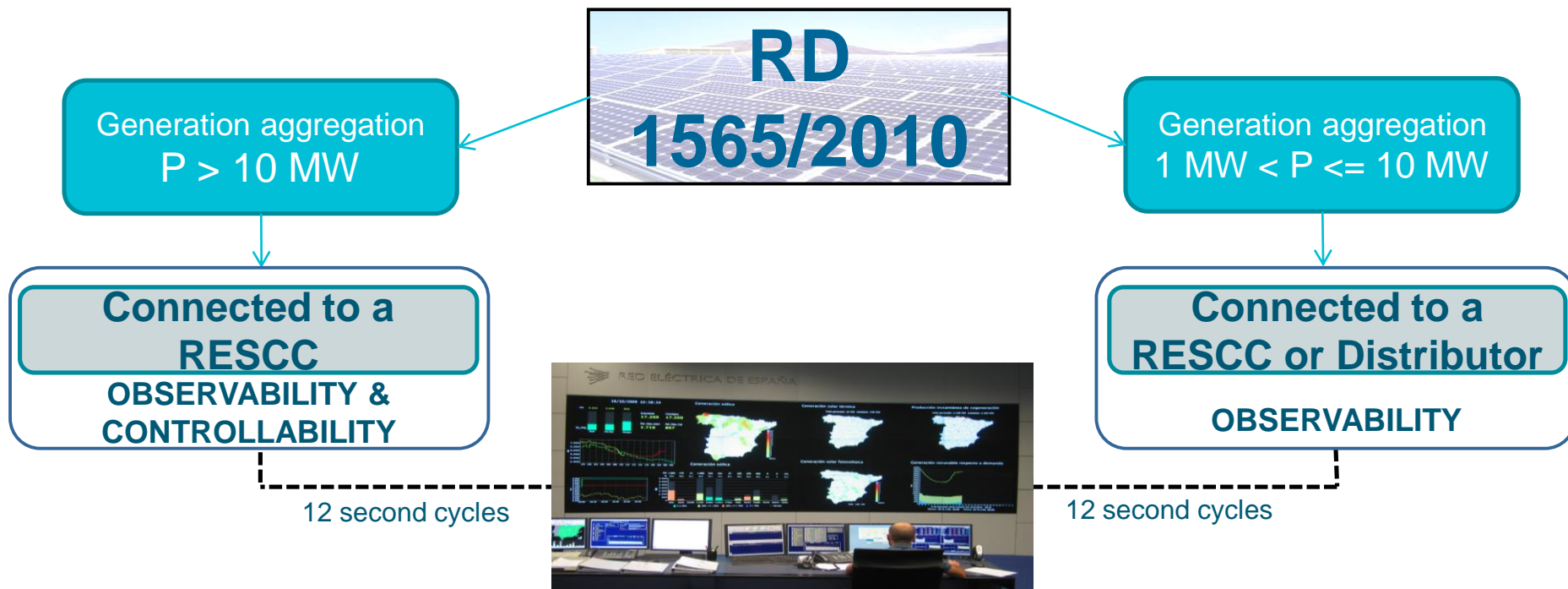
### 3 CECRE: Variability



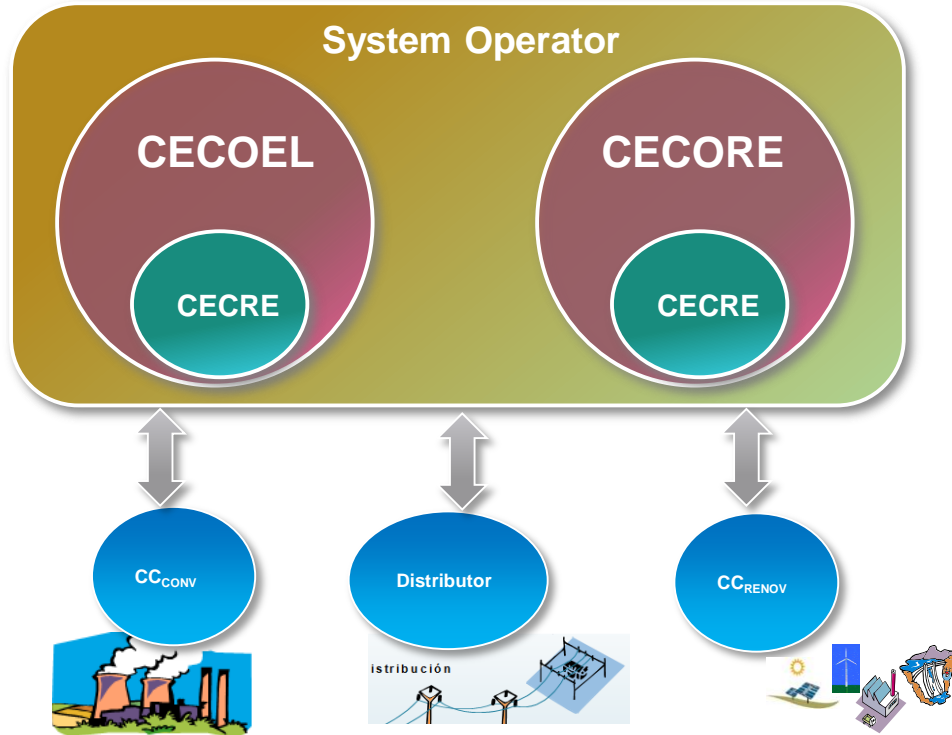
#### CSP power plants:



### 3 CECRE: Regulation



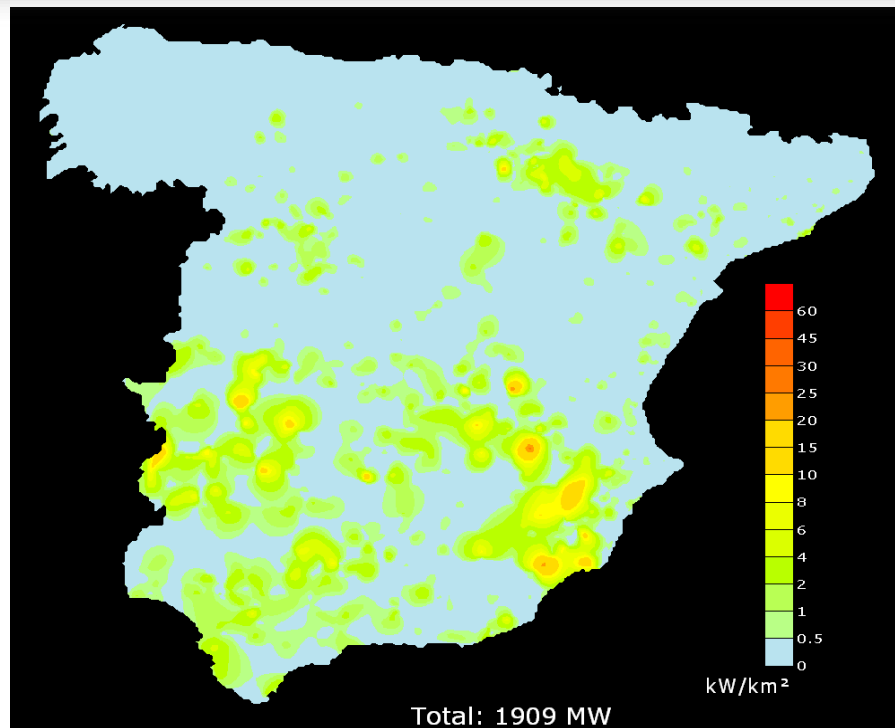
### 3 CECRE: Control Center for Renewable Energies



- 3 000 generation installations
- 37 generation control centers
- 350 distribution operators
- Communication is needed in case of emergency, outages or maintenance



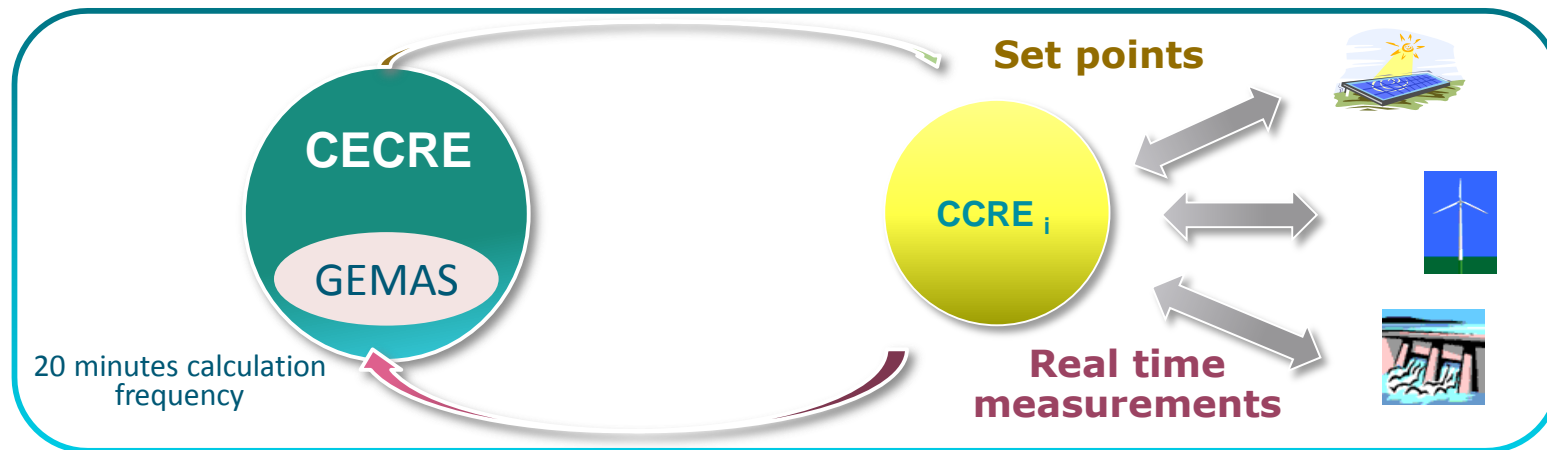
### 3 CECRE: Observability



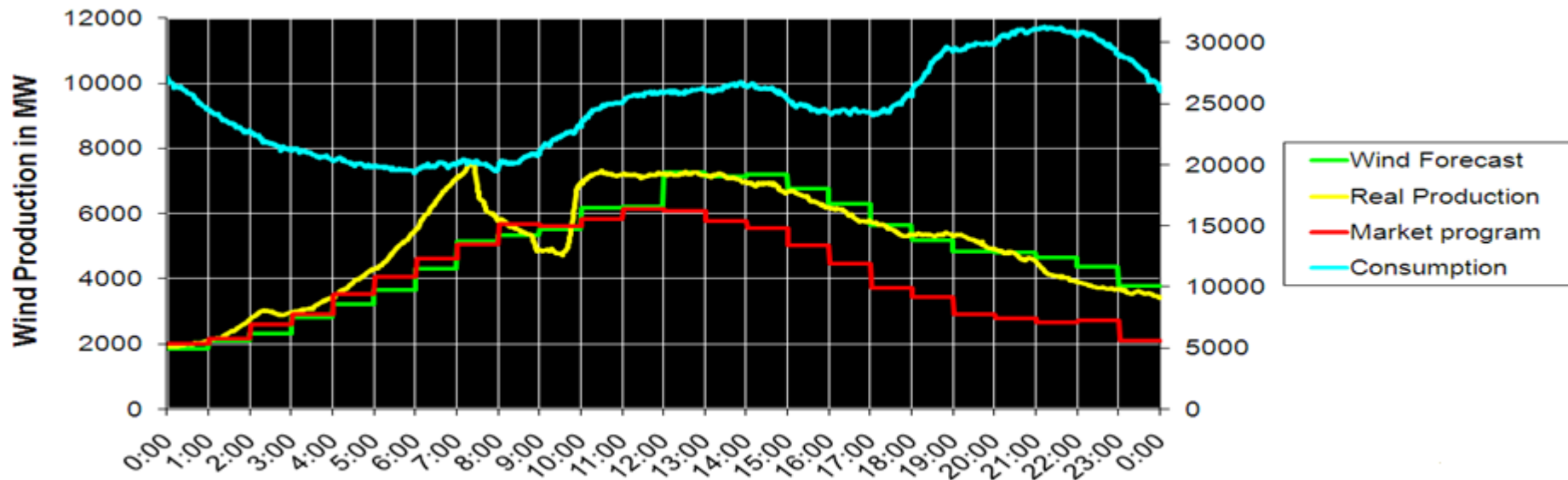
#### Real Time Photovoltaic Generation

### 3 CECRE: Controllability

## SECURITY ANALYSIS USING A REAL TIME WIND SCENARIO



### 3 CECRE: Controllability



## 4 Outline & Conclusions

## 4 Outline & Conclusions

- ◆ Real time data awareness: 2.5 billion telemetries every day.

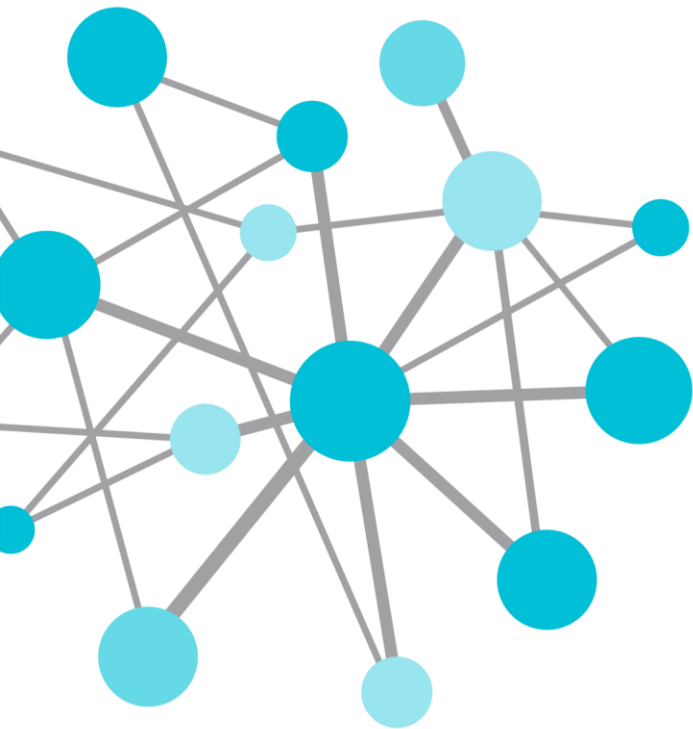
PI System is a powerful tool for:

- ◆ Retrieving both real time and historical data values.
- ◆ Monitoring at the electrical control center.
- ◆ Advanced data processing: PI System supports standard programming languages.

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THANK  
YOU

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