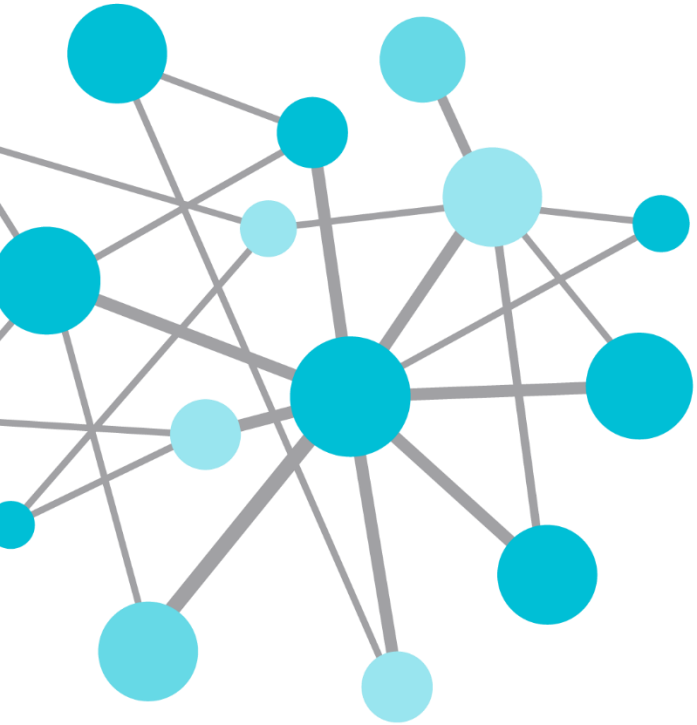


Standardizing on the PI System Infrastructure in Iberdrola Renewables' Business

Presented by **Elvira San Martín Marín**

Carles Viciano Chumillas

IBERDROLA

Agenda

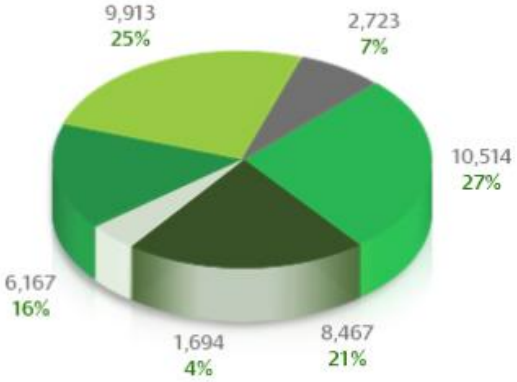
IBERDROLA OVERVIEW

- *IBERDROLA*
- *IBERDROLA RENEWABLES*
- *ORGANIZATION, SCOPE AND OBJETIVES*

CHALLENGE

- *PI SYSTEMS IN IBERDROLA RENEWABLES*
- *INICIAL SITUATION AND EVOLUTION*
- *WHAT IS THE PI COLLECTOR?*
- *PI COLLECTOR IN NUMBERS*
- *STANDARD*
- *GLOBAL INDICATORS, PROCESSES & TOOLS*
  - *EXAMPLE 1: Potential Generation*
  - *EXAMPLE 2: Global PI AF Infrastructure*
  - *EXAMPLE 3: Global Dashboard*

IBERDROLA



- Renewables 27%
- Hydroelectric 21%
- Cogeneration 4%
- Nuclear 16%
- Gas combined cycle 25%
- Coal 7%

Net Production
39 477 GWh

Installed Capacity
44 932 MW

61% of installed capacity is **CO2 Free**

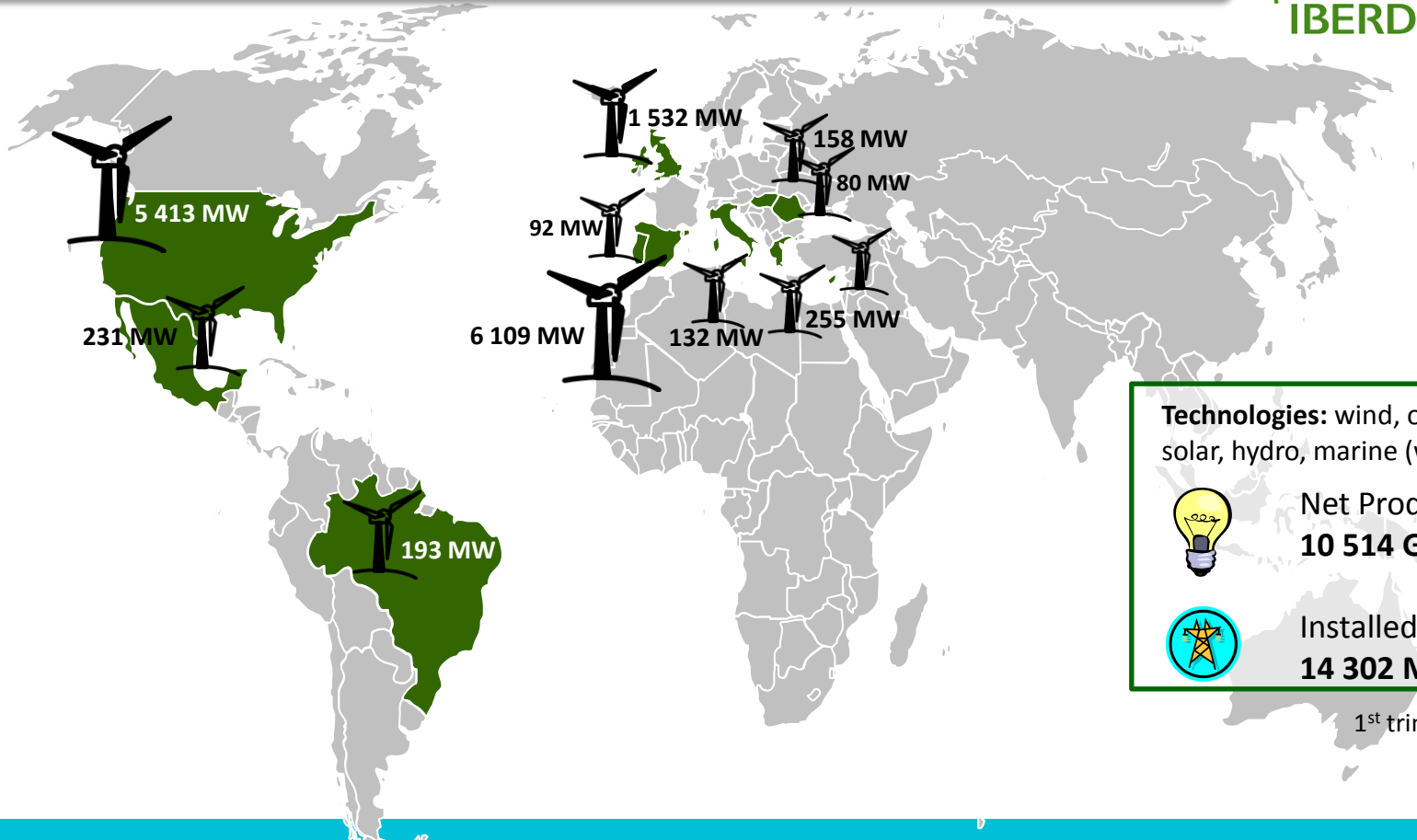
Supply points under management
28.5 Millions

Iberdrola Employees
28 201

1st trimester 2014

IBERDROLA RENEWABLES

IBERDROLA



Technologies: wind, offshore, solar, hydro, marine (waves)

Net Production
10 514 GWh

Installed Capacity
14 302 MW

1st trimester 2014

ORGANIZATION, SCOPE AND OBJETIVES

IBERDROLA

RENEWABLES

- Iberia & International Business
- US Business
- UK & Offshore Business
- Business Services

Technical Division

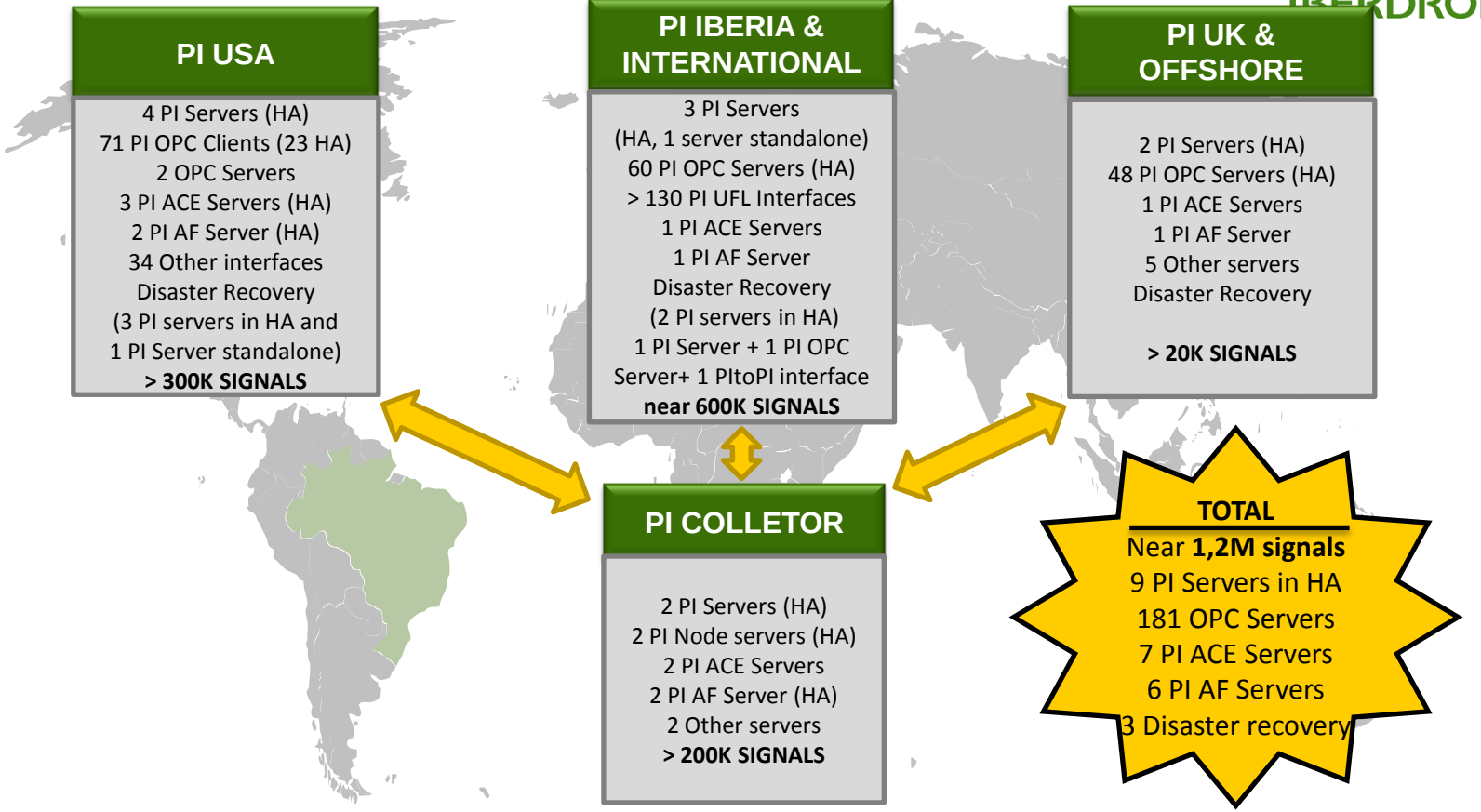
Performance Analysis & Operations Tools

- SIZE >14 000 MW
- DIVERSIFICATED > 10 000 WT
- Business Areas originally very differentiated
- Global Spread

Operation Approach	New view	Globalization
Global Tools Supporting Operations	→	Main Tools: DOMINA & Meteoflow
Standardization: Reporting & Indicators	→	Good practices are identified. Transversal communication between the areas in a common language
Share experiences and know-how		
Performance Analysis in a global way	→	Income ↑ Costs ↓

PI SYSTEMS IN IBERDROLA RENEWABLES

IBERDROLA



PI USA

4 PI Servers (HA)
71 PI OPC Clients (23 HA)
2 OPC Servers
3 PI ACE Servers (HA)
2 PI AF Server (HA)
34 Other interfaces
Disaster Recovery
(3 PI servers in HA and
1 PI Server standalone)
> 300K SIGNALS

PI IBERIA & INTERNATIONAL

3 PI Servers
(HA, 1 server standalone)
60 PI OPC Servers (HA)
> 130 PI UFL Interfaces
1 PI ACE Servers
1 PI AF Server
Disaster Recovery
(2 PI servers in HA)
1 PI Server + 1 PI OPC
Server+ 1 PItoPI interface
near 600K SIGNALS

PI UK & OFFSHORE

2 PI Servers (HA)
48 PI OPC Servers (HA)
1 PI ACE Servers
1 PI AF Server
5 Other servers
Disaster Recovery

> 20K SIGNALS

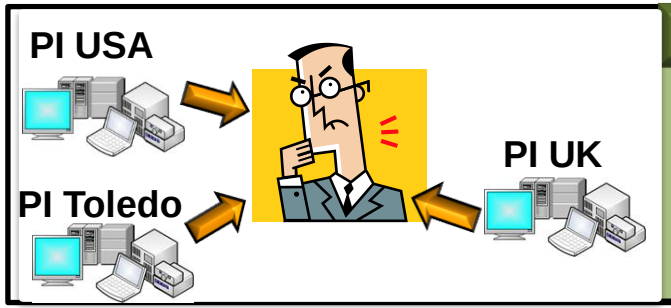
PI COLLETOR

2 PI Servers (HA)
2 PI Node servers (HA)
2 PI ACE Servers
2 PI AF Server (HA)
2 Other servers
> 200K SIGNALS

TOTAL
Near **1,2M signals**
9 PI Servers in HA
181 OPC Servers
7 PI ACE Servers
6 PI AF Servers
3 Disaster recovery

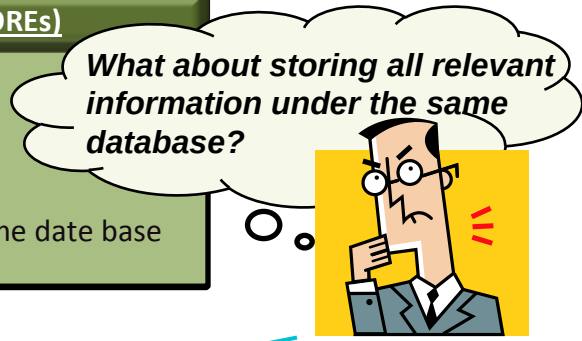
INITIAL SITUATION AND EVOLUTION

IBERDROLA



Three independent PI Servers (CORE's)

- Different PI System architectures
- Different standard
- Different purchase conditions
- Information is not stored under the same date base



Enterprise Agreement

- Normalize the architecture across the sites
- Fleet upgrades to latest versions of all PI System assets
- Develop High Availability and disaster recovery
- Ensure that maximum efficiency and reliability in the servers
- Training & guidance on best practices

Results

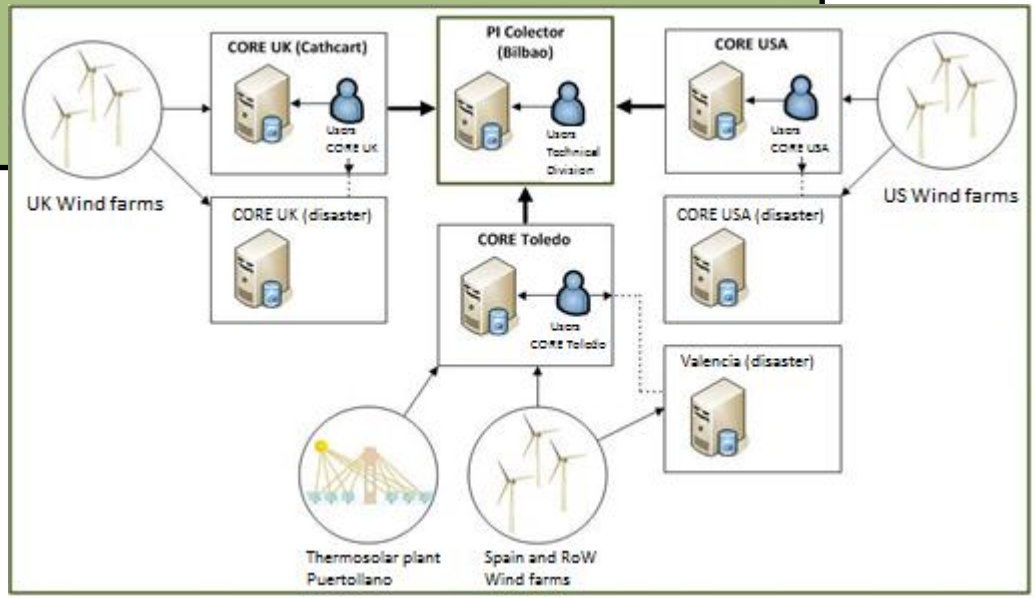
- PI Collector
- Global indicators calculations and tools developing are simple due to the standardization between PI System
- Relevant information is accessible and easy to find
- Taking advantage of our Know how
- Taking advantage of synergies
- Reinforce global use of PI System

WHAT IS THE PICOLLECTOR?

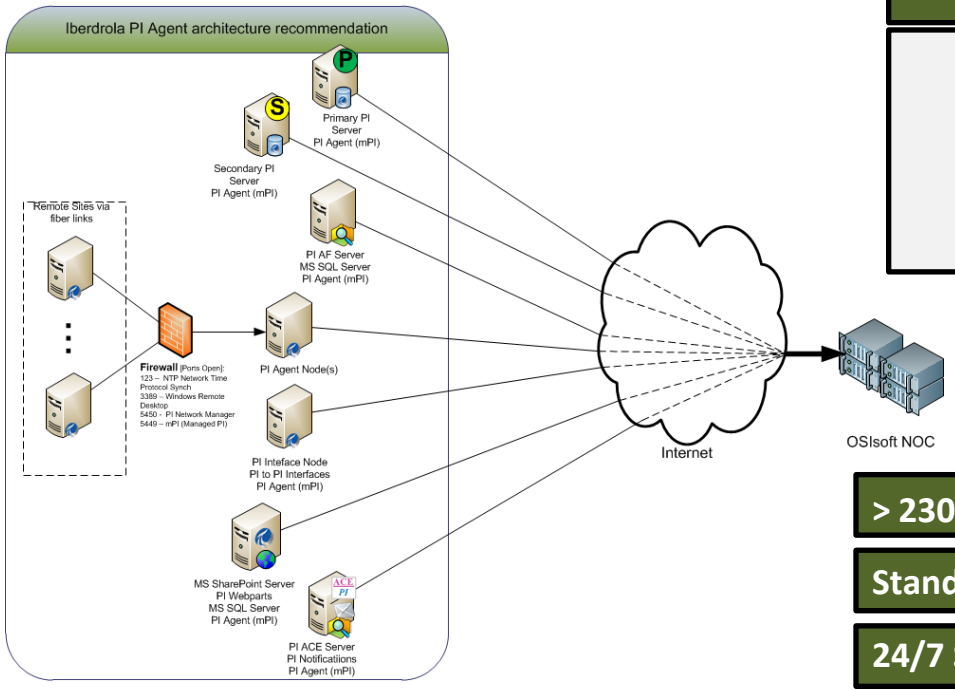
IBERDROLA

The PI COLLECTOR is born as the central PI System which is fed by Local PI Systems:

- Standardized information.
- Gathers the most relevant information independently from the country of the asset.
- Facilitates the calculation of global indicators.
- Orientated to Reporting and performance analysis.
- Feeds in-house tools.



PI COLLECTOR IN NUMBERS



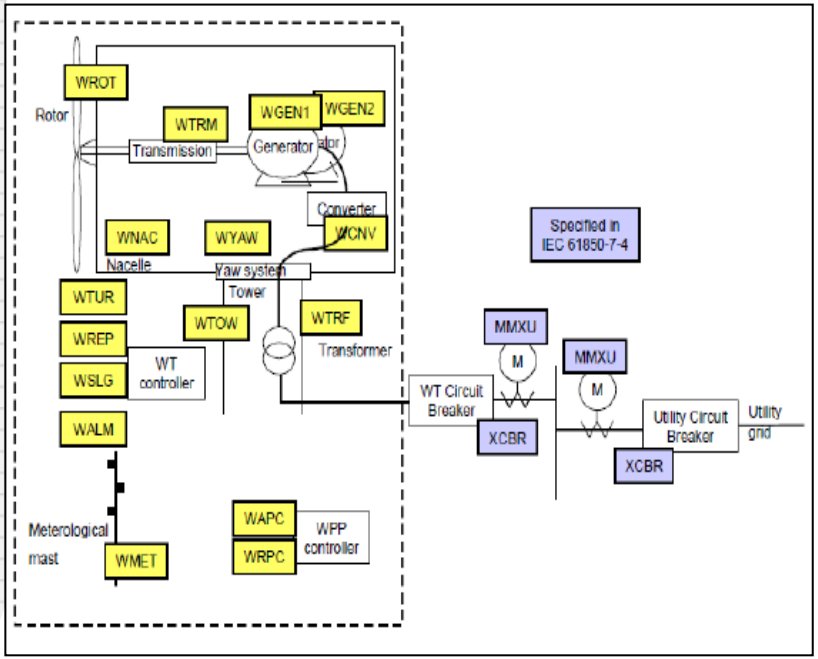
10 Servers	
PI Server in HA	2 x PI ACE server
PI Node in HA	2 x PI AF server
PI WebParts	2 x PI AF server
Development PI Server	

- **> 230 000 signals** from assets all around the world.
- **Standardization** for all the Business Areas.
- **24/7 Support**.
- Updated software to the latest release.

IBERDROLA

Standard

- *Due to the globalization from the company in the different Business Areas, the definition of a standard which unify criteria and allow to evaluate the assets in a same way has become necessary.*
- *Based on the **IEC 61400-25 and 61850**.*
- *The standard makes easier the indicator analysis, lets the unification of evaluation criteria and improves the efficiency when evaluating the assets of IBR.*
- *Facilitates the automatic tools development for manage the assets.*



STANDARD

IBERDROLA

Standardization

Indicators calculations for a globalized fleet.	Compare apples with apples
Implementation from all the asset on the in-house tools	The different location is no longer a problem
Allows the creation of scorecards	Global picture of the Business
Facilitates the creation of PI AF hierarchy	All the relevant information in one place
Single PI System	Increases the efficiency

GLOBAL INDICATORS, PROCESSES & TOOLS

IBERDROLA

Some examples:

- Global PI AF Infrastructure
- Actual Production, Potential Generation, Effective Forecast…
- Global Dashboard

Main characteristics

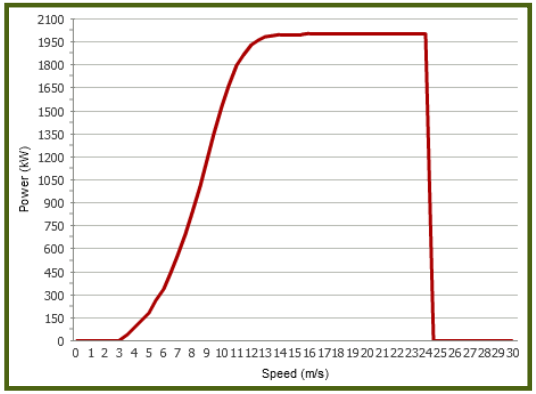
- Calculated on **Real Time**.
- For more than **14 000 MW**.
- Accessible **worldwide**.
- **Standard** indicators for all the assets.
- Used by all the Business Areas.

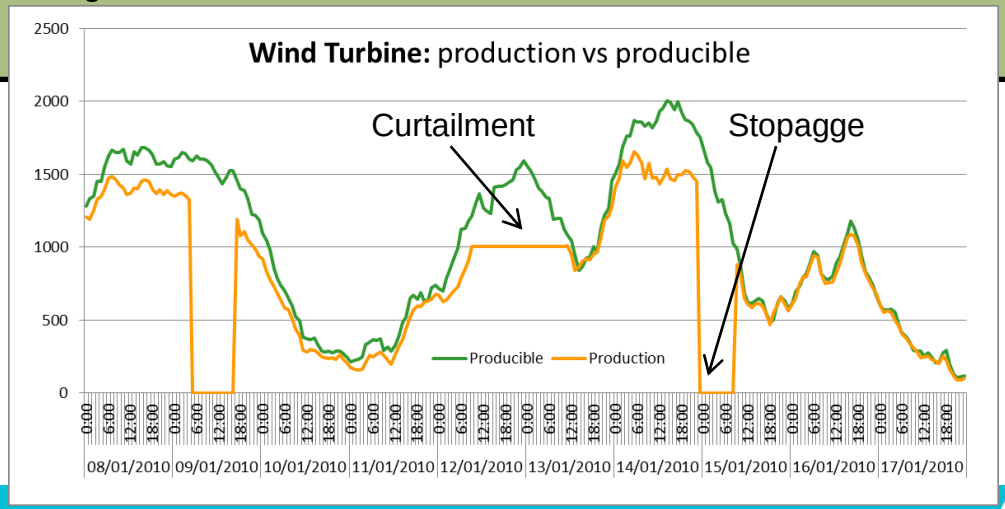
EXAMPLE 1: Potential Generation

IBERDROLA

Potential generation:

- It is the indicator which calculates the **potential generation energy which can be produced in a facility at a 100% availability.**
- It is calculated in a **10 minute basis in real time**.
- The WTG wind speed and the power curve are the base to calculate real time potential generation.
- Every time there is better wind speed data (communication failures recoveries, etc.), it is updated.
- It is calculated at both wind farm level and wind turbine generator level.
- PI AF helps this calculation to improve efficiency.



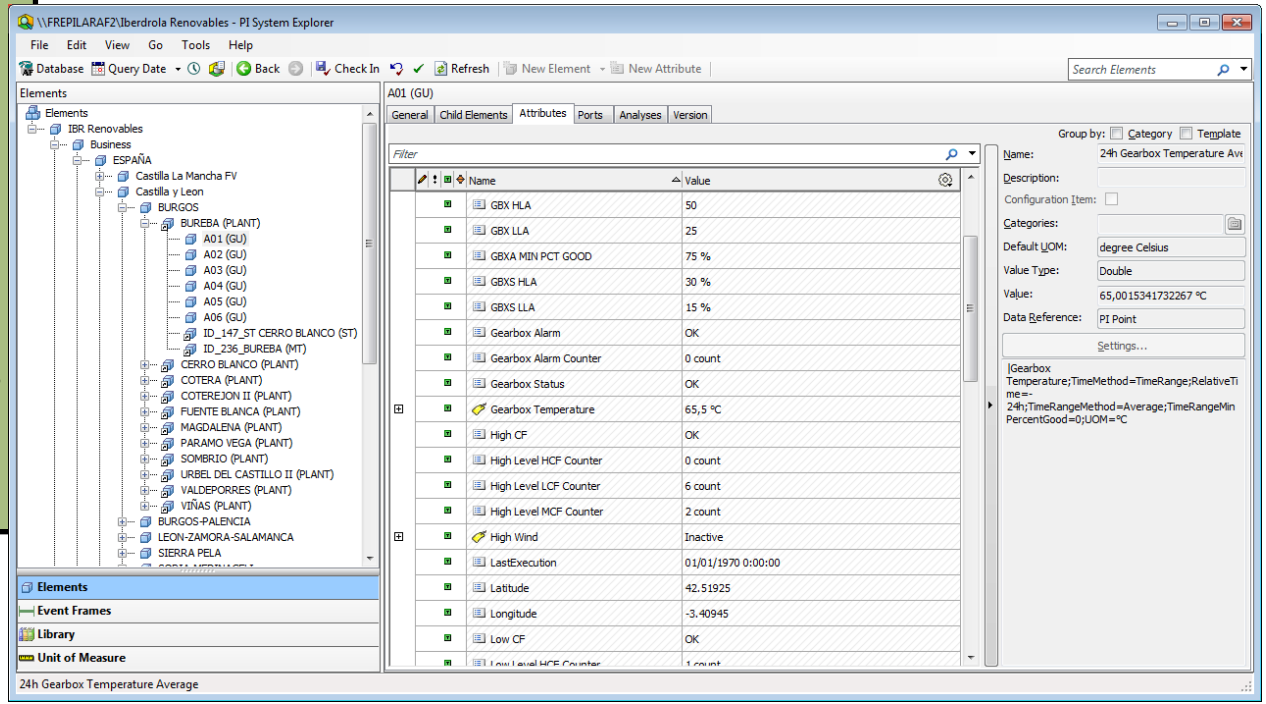


EXAMPLE 2: Global PI AF Infrastructure

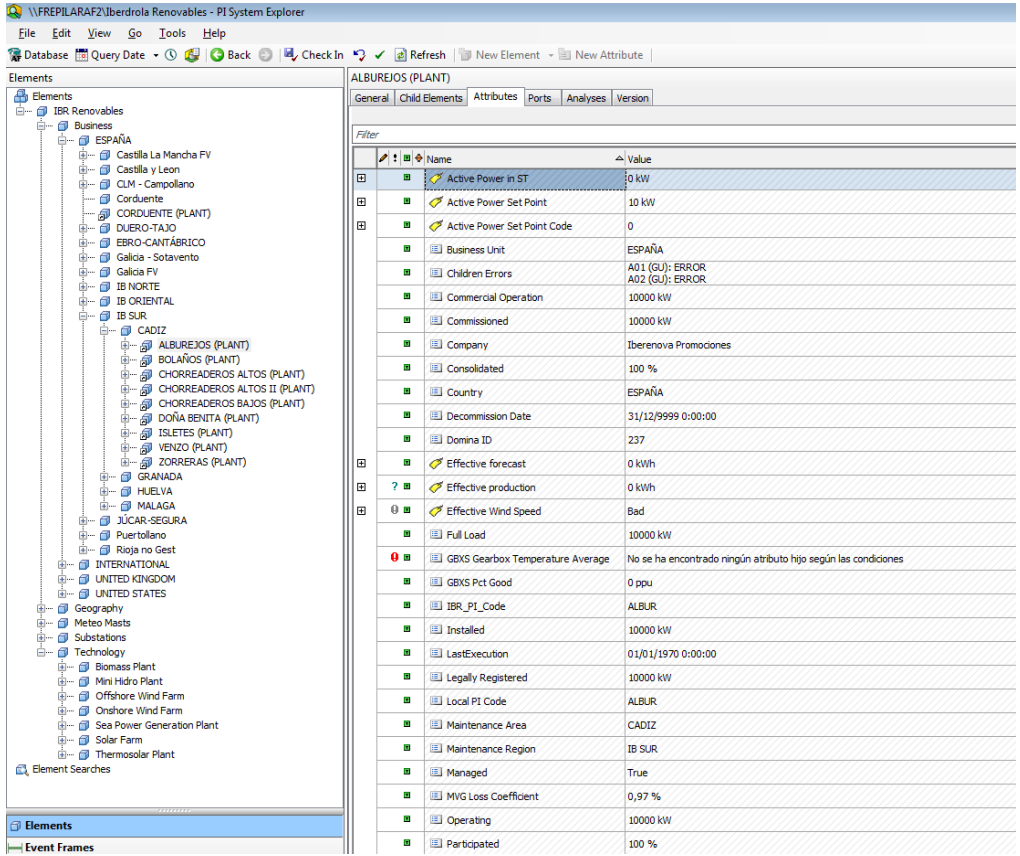
IBERDROLA

PI AF has allowed us to:

- Gather **relevant information** from the assets in one **single place**.
- Have all the fleet organized hierarchically.
- **Improve the performance** from the indicators calculation.
- Use **new tools** to take more advantage from the PI System data.
- **Standardize** the organization and data requirements from our assets.



E X A M P L E 2: Global OU AF Infrastructure



PI Tags

Asset general information

PI ACE Tags

Alarms

Asset general information

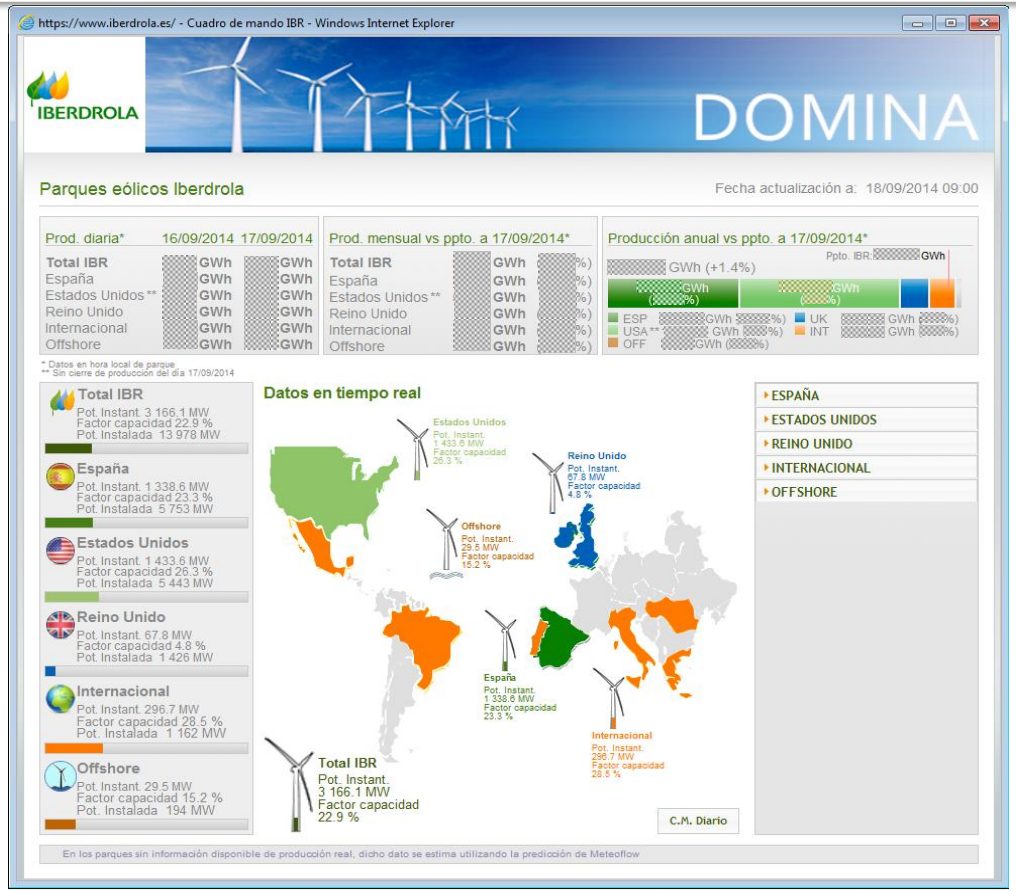
EXAMPLE 3: Global Dashboard

IBERDROLA

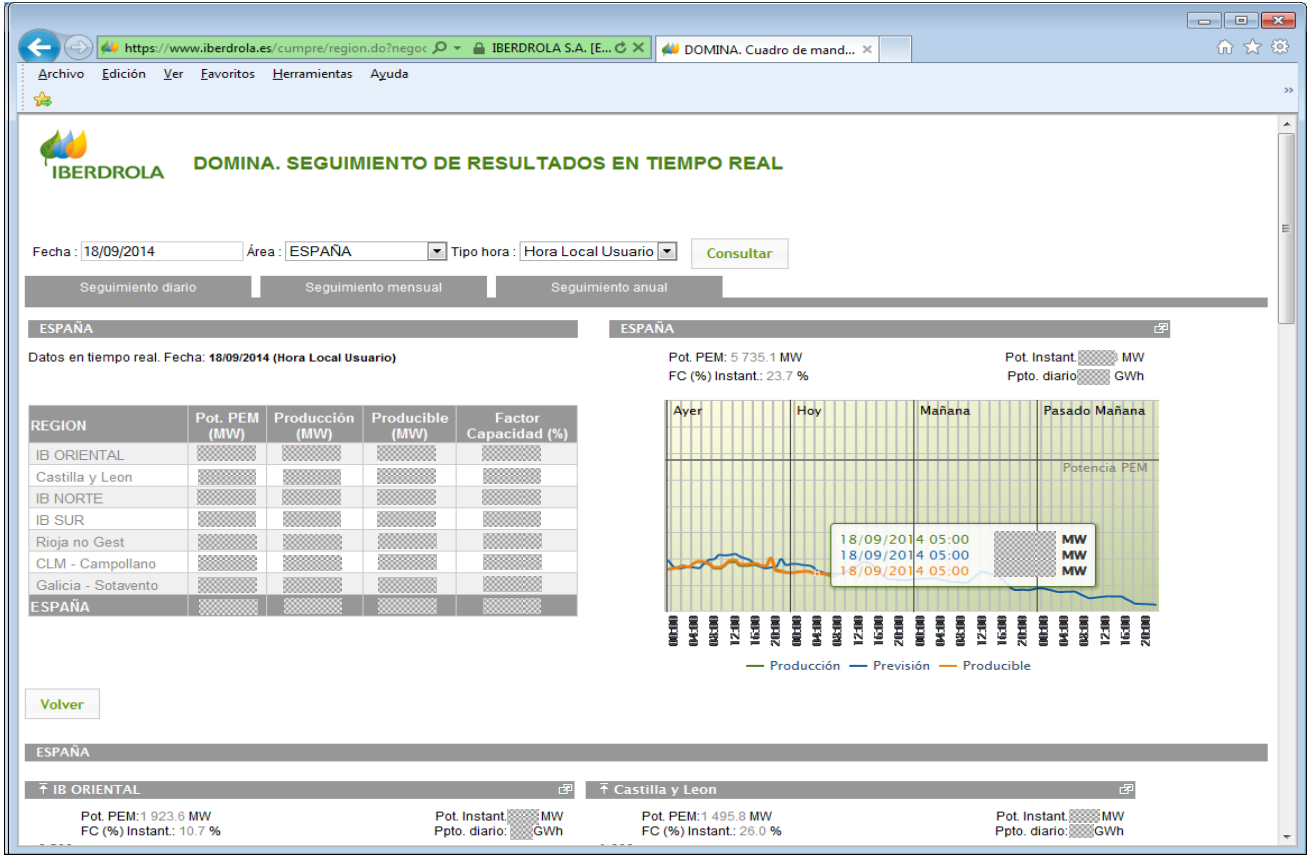
Global Dashboard:

- A web based tool **developed in-house which gives the big picture of the Business.**
- **Gathers the most relevant KPIs and assets information**.
- Facilities well organized.
- **Flexible tool**. The displayed data can vary depending on the user needs.
- **Historical data available.**
- Easy to use.
- Nice design.

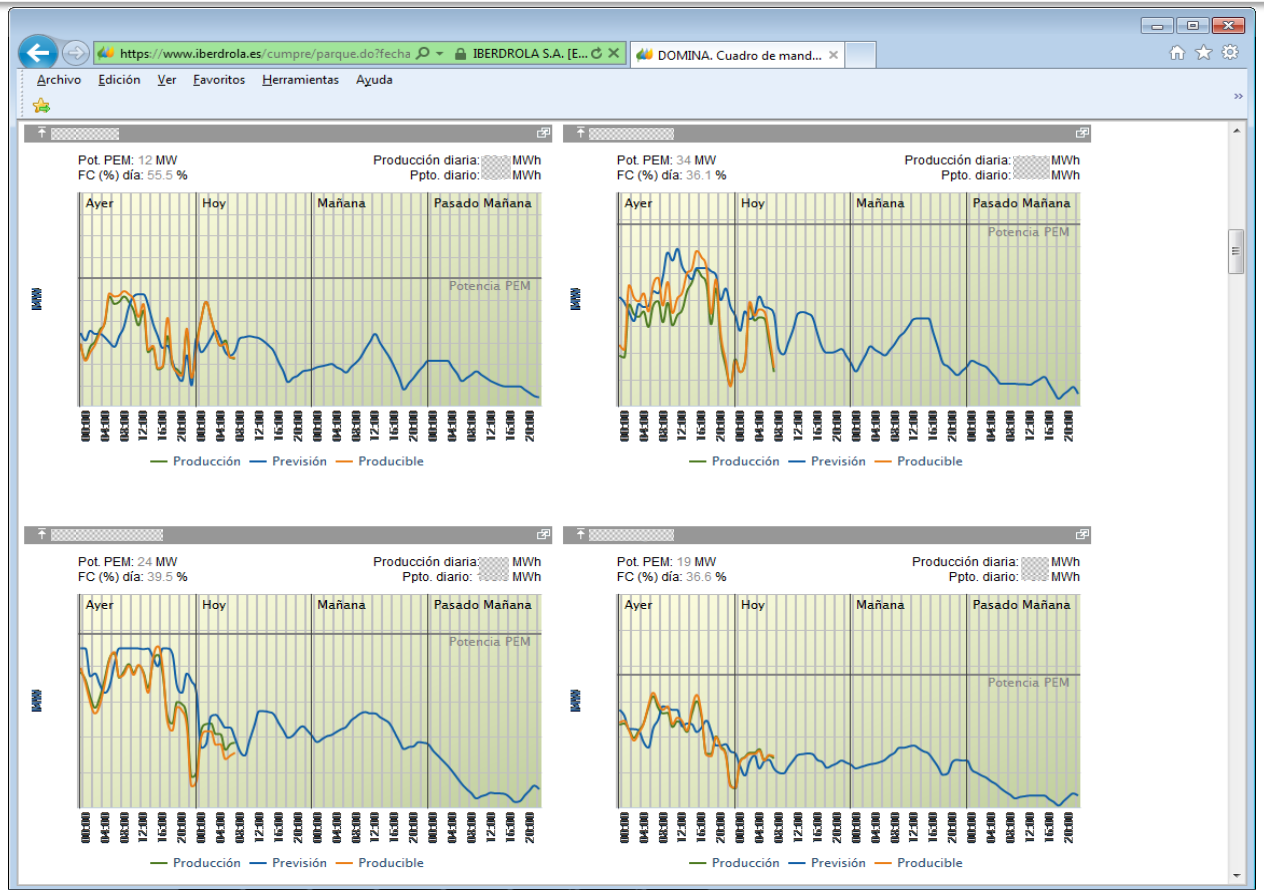
EXAMPLE 3: Global Dashboard



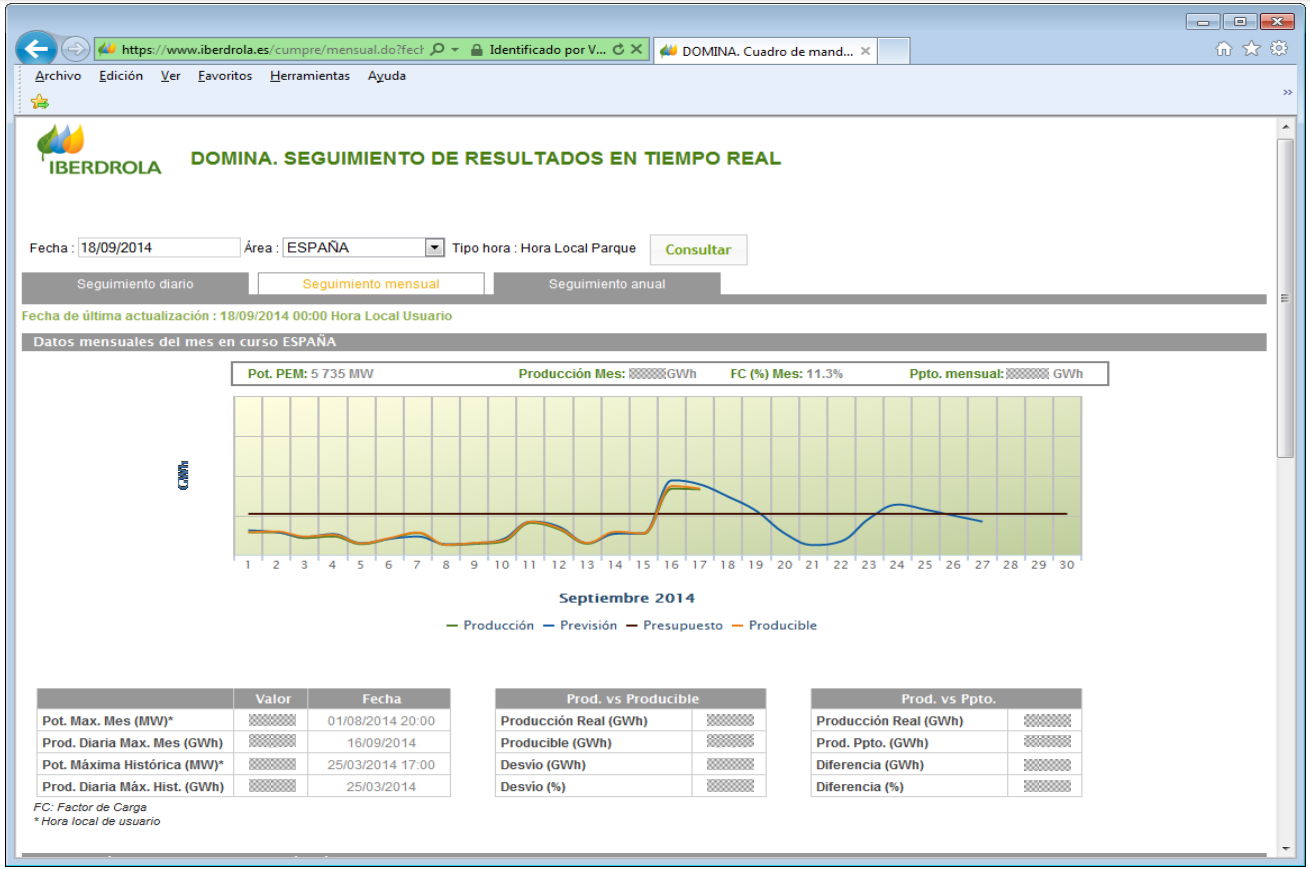
EXAMPLE 3: Global Dashboard



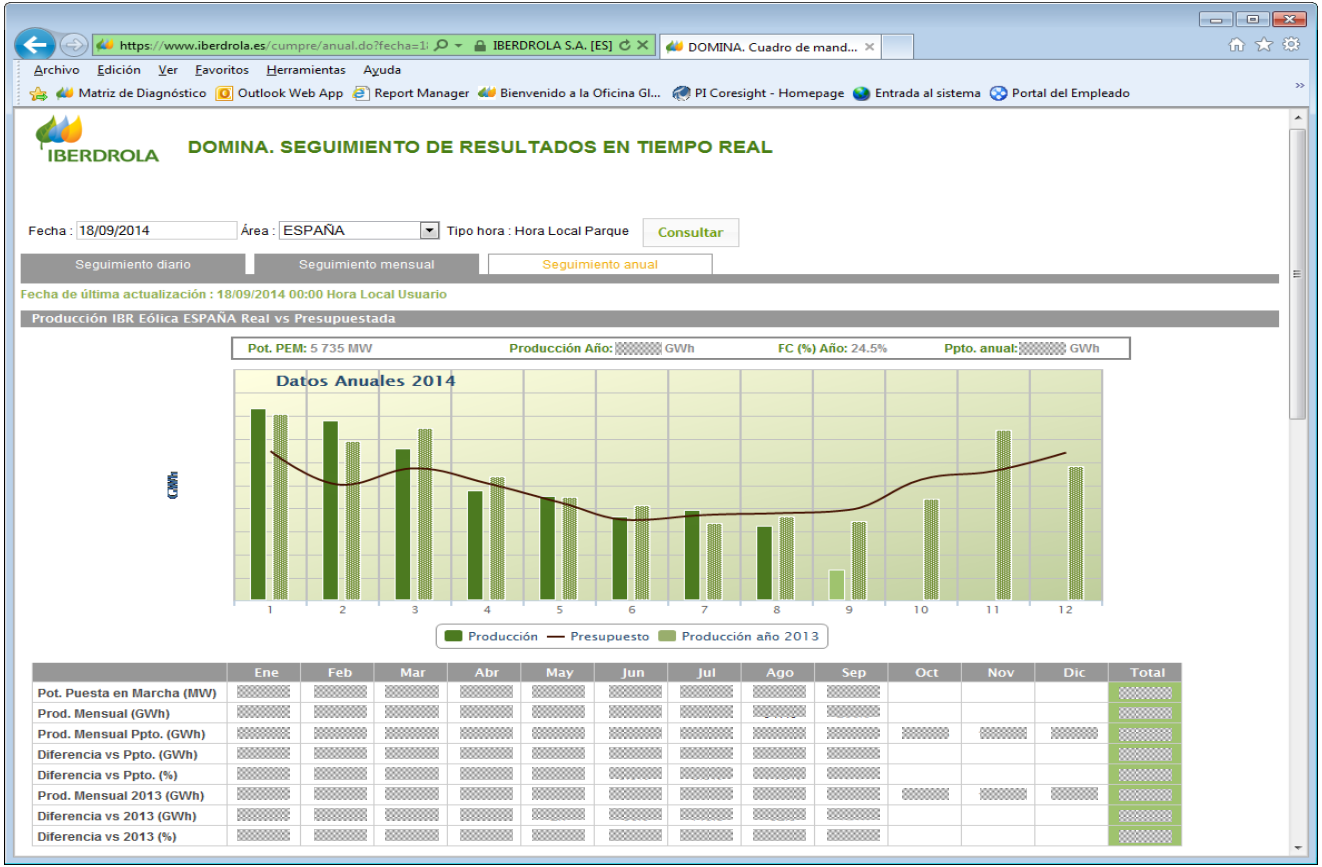
EXAMPLE 3: Global Dashboard



EXAMPLE 3: Global Dashboard



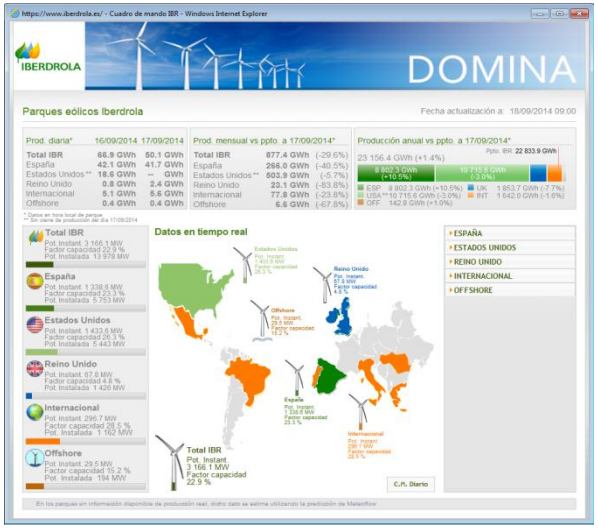
EXAMPLE 3: Global Dashboard



PI System standardization in the Iberdrola Renewables Business

"…standardization and the PI COLLECTOR approach have allowed us to deliver worldwide consistent best practice in the way we operate. We now have the necessary tools to keep on redefining excellence and to continuously improve…"

IBERDROLA



Business Challenge

- Huge fleet
- Assets all around the globe and different organizations.
- Standard procedures needed.
- Benchmark between countries.
- Need to potentiate the know-how and synergies.

Solution

- Standardization across sites
- Creation of PI COLLECTOR
- Enterprise Agreement
- Ensure maximum efficiency and reliability

Results and Benefits

- Reliable indicators and processes at real time
- Web scorecard
- Improve in forecast accuracy
- Increase in efficiency

Elvira San Martín

- esmartin@iberdrola.es
- **Asset Performance Analysis & Commercial Operations Tools**
- IBERDROLA RENOVABLES

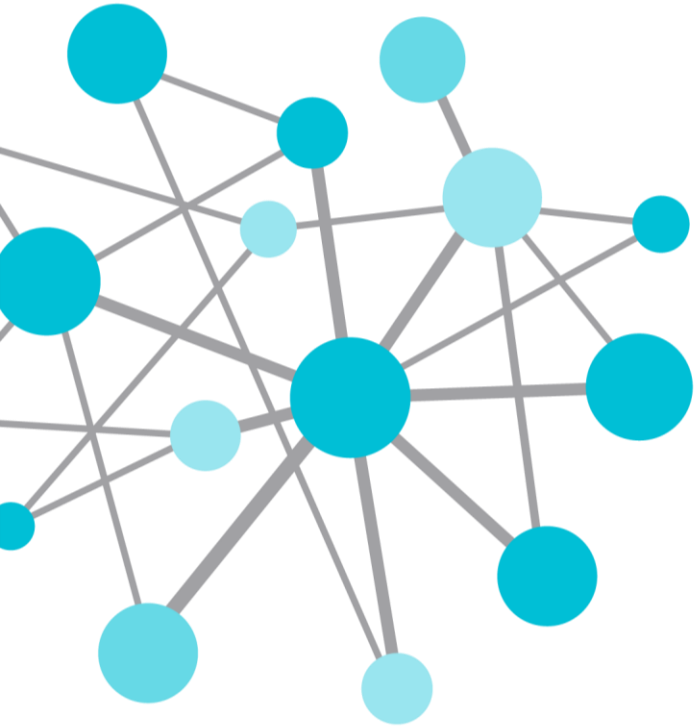
Carles Viciano

- cvciano@iberdrola.es
- **Asset Performance Analysis & Commercial Operations Tools**
- IBERDROLA RENOVABLES

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**



THANK YOU

Brought to you by OSIsoft.

Please don’t forget to…

Complete the online survey for this session

eventmobi.com/emeauc14

Share with your friends

#UC2014