BENEFITS OF PI PRODUCTS ON POWER GENERATION

Presented by **Álvaro Sanz de Acedo Pérez**

Agenda

AGENDA

1. ACCIONA ENERGY
   - A SINGLE PLATFORM TO CAPTURE FUTURE GROWTH
   - PRESENCY IN STRATEGIC MARKETS
   - CAPACITY
2. BUSSINESS CHALLENGE
   - DATA INTEGRATION
   - COMPANY NEEDS
   - PI SYSTEM ARCHITECTURE
3. BUSINESS CASE
   - NATIONAL CURTAILMENT
   - CURTAILMENT TOOL
4. RESULTS
5. BENEFITS
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6. NEXT STEPS
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ACCIONA ENERGY

A single platform to capture future growth

Skilled professionals
Led by a solid management team

Twenty years experience
A benchmark in the sector

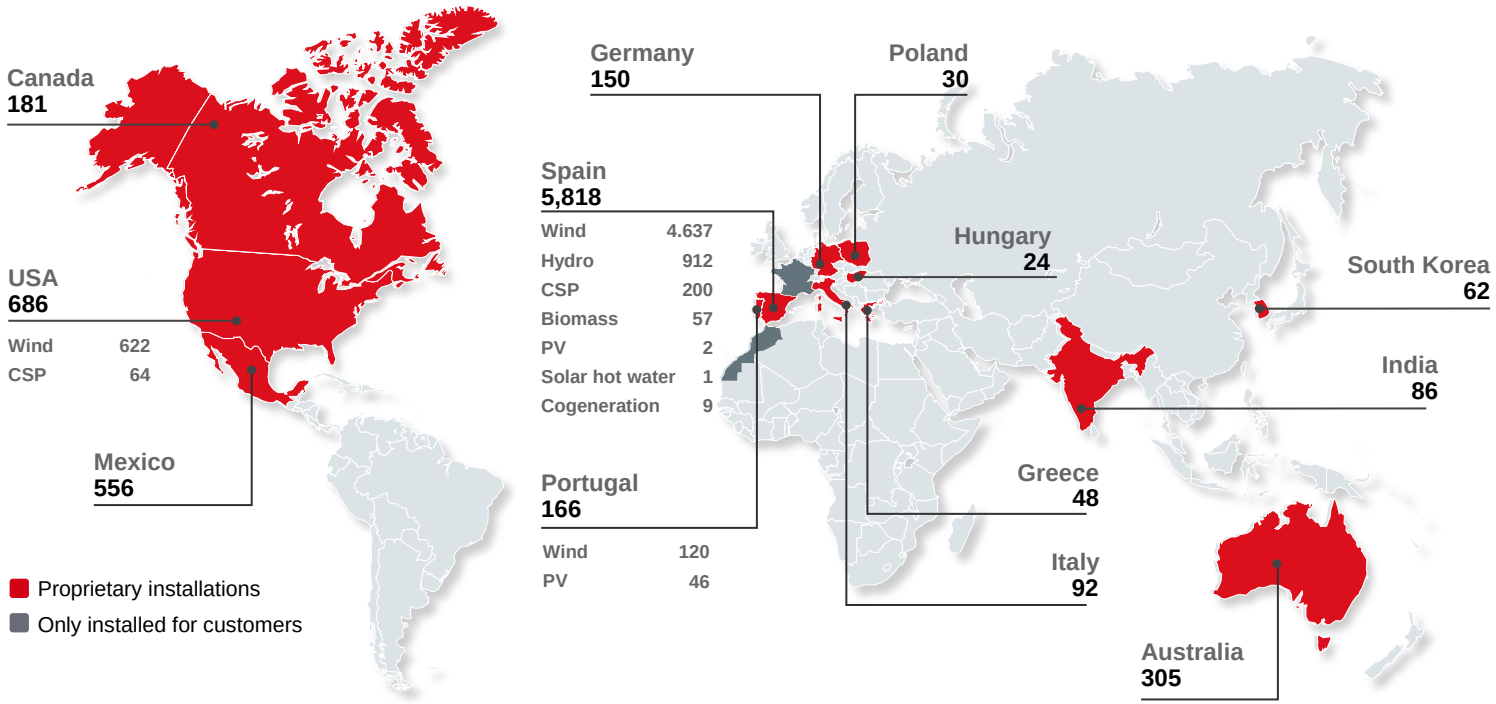
With a wide range of services
For a wide range of customers

Only in renewables
In the main technologies

Worldwide
Operations in key markets

Throughout the value chain
Competitive advantage and maximum return

Presency in strategic markets



Data at 31.12.2011 in MW

8,212
Owned MW

7,329
Attributable MW

9,766
Total MW installed

CAPACITY

Power implanted by ACCIONA Energy (Data accumulated to 31/12/2011, in MW)			
	TOTAL (property + customers)	Property	Attributable
Renewables	9757.35	8202.40	7320.35
Wind power	8392.20	6920.53	6054.23
Hydraulic	911.89	911.89	911.89
Concentrating solar power (CSP)	265.00	264.00	264.00
Solar photovoltaic	115.37	48.26	32.51
Solar hot water	15.89	0.72	0.72
Biomass	57.00	57.00	57.00
Cogeneration	9.00	9.00	8.55
Total	**9766.35**	**8211.40**	**7328.90**

ACCIONA Energy's activity in biofuels		
Product	**Total Production (t.)**	**Attributable Production (t.)**
Total	303000	286500
Biodiesel	270000	270000
Bioethanol	33000	16500

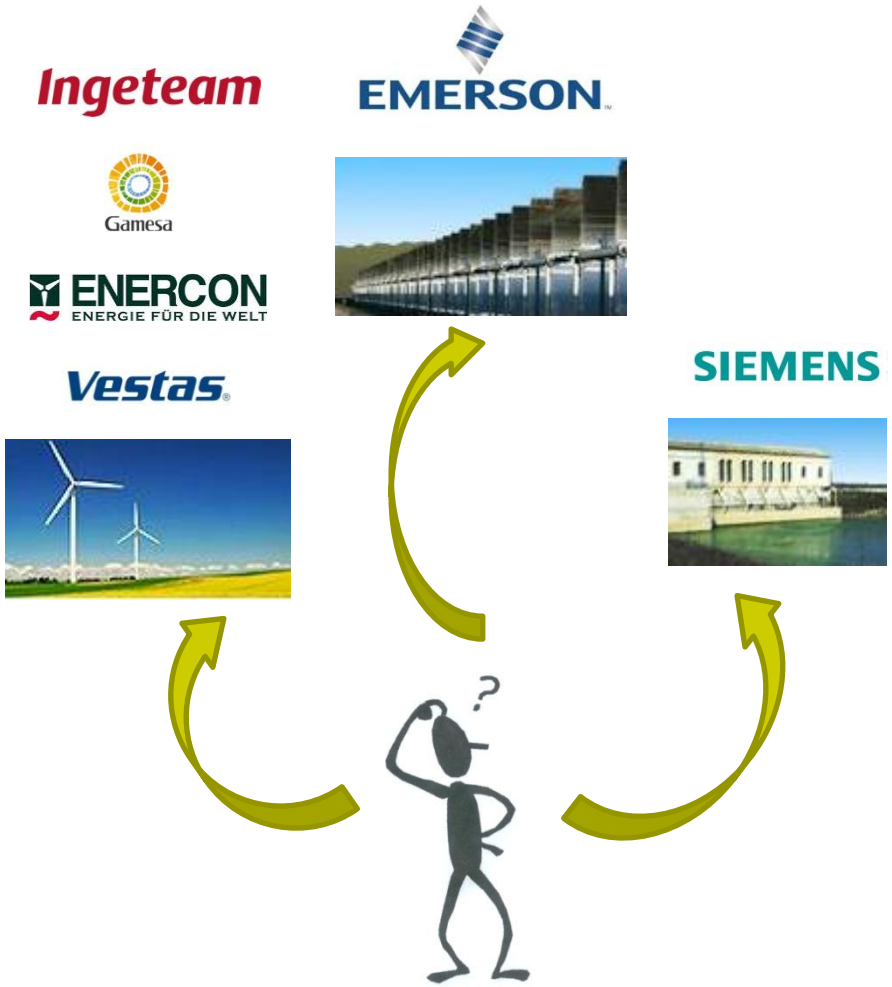
BUSSINESS CHALLENGE

DATA INTEGRATION

Different Technologies

Different vendors

Data access problems



COMPANY NEEDS

DATA INTEGRATION

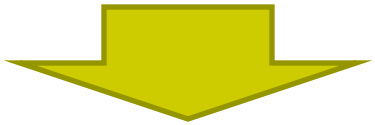
- DIFFERENT TECHNOLOGIES, VENDORS…
- JUST ONE TOOL

HISTORIAN NEEDS

- ELEVATED AMOUNT OF DATA
- REAL TIME DATA
- ACCIONABLE INFORMATION

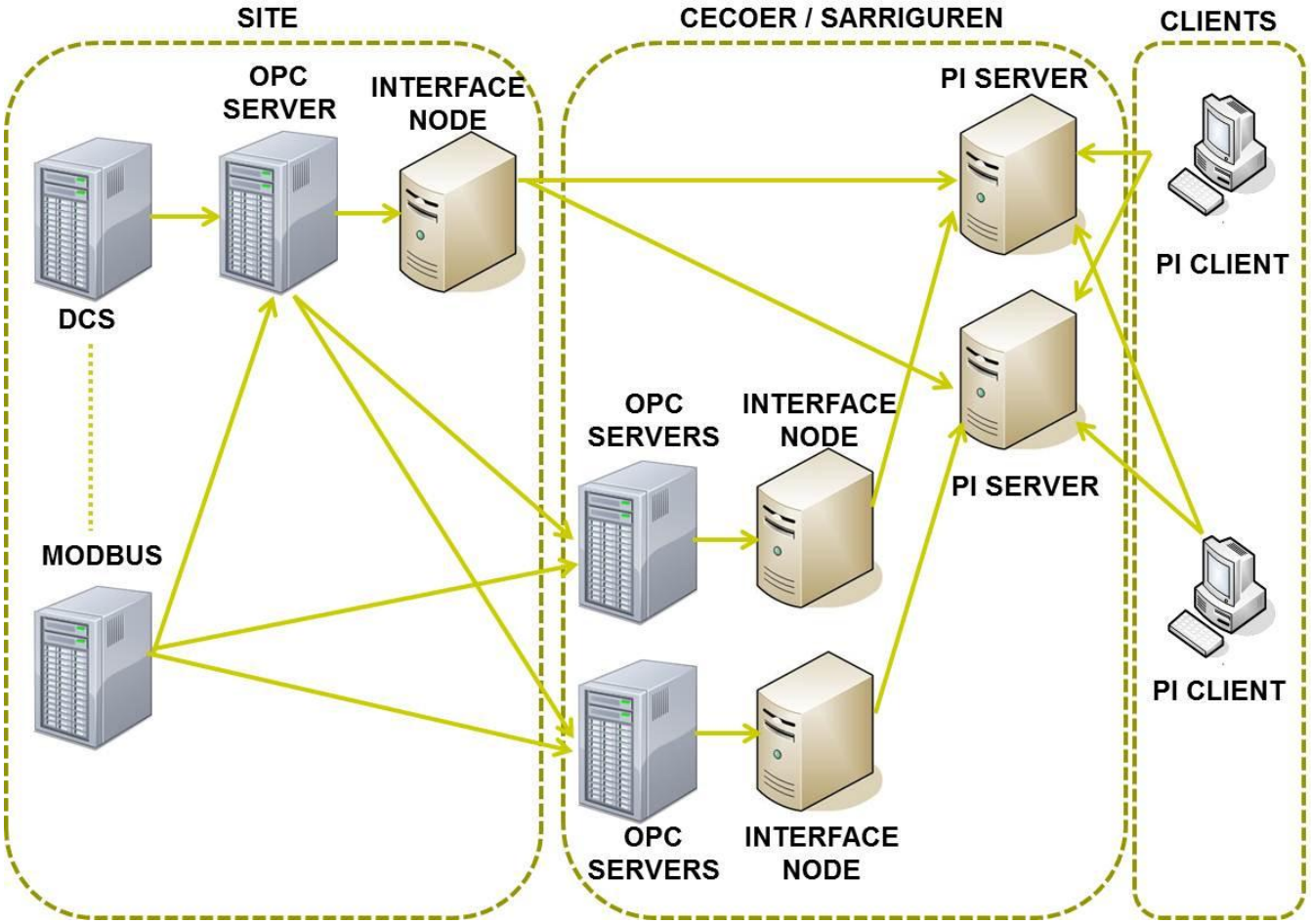
ANALYSING / REPORTING TOOL

- ASSET MONITORING
- REPORTING
- ROOT CAUSE INVESTIGATION



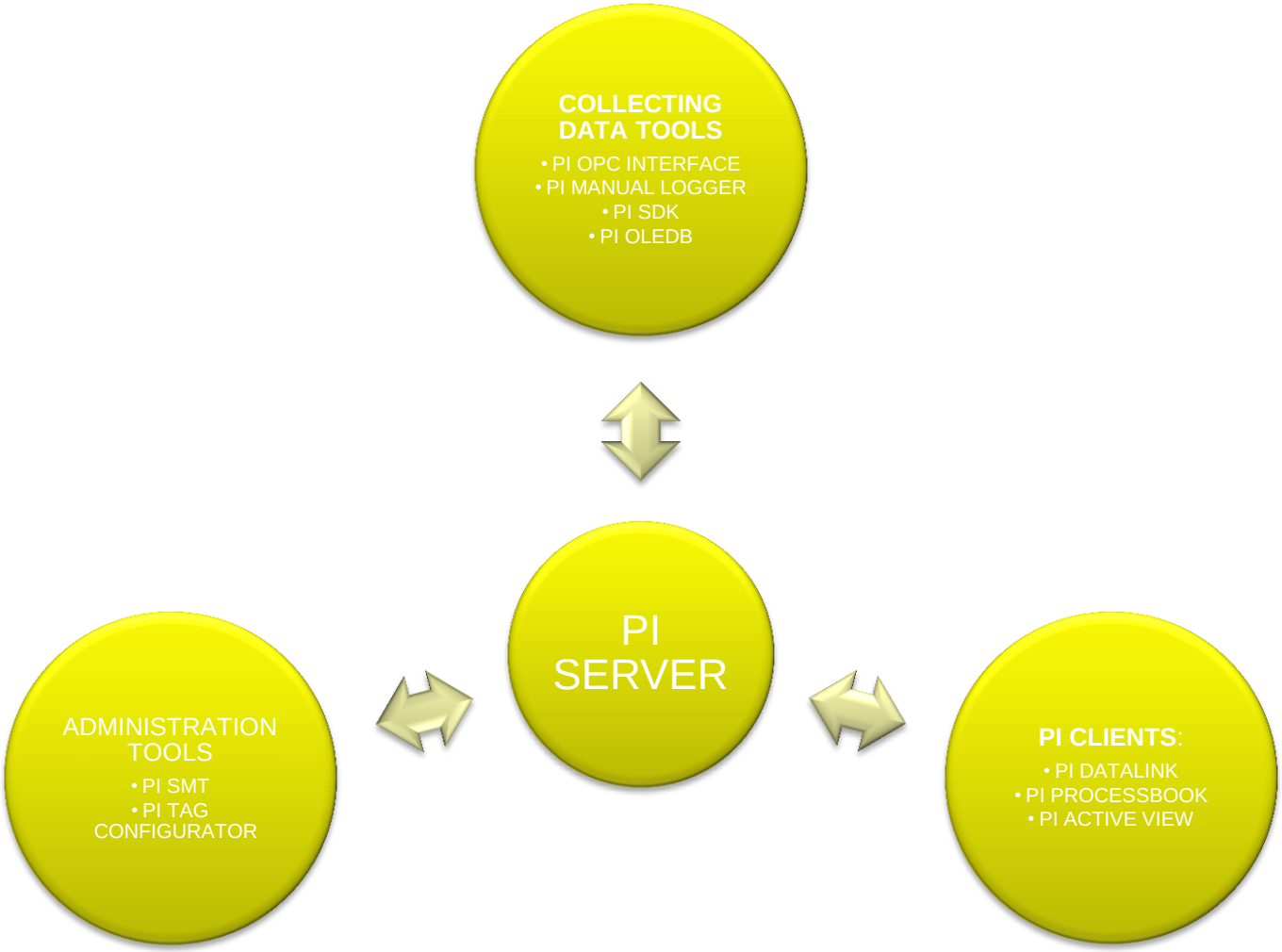
PI SYSTEM

PI SYSTEM ARCHITECTURE



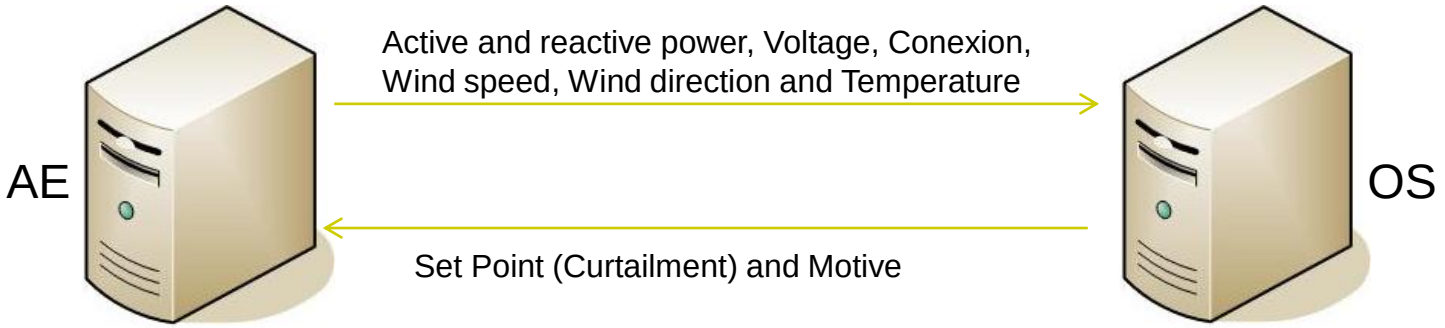
- Two PI Servers
- Centralised and distributed Interface nodes
- OPC communication
- PI OPC interface

PI SYSTEM ARCHITECTURE

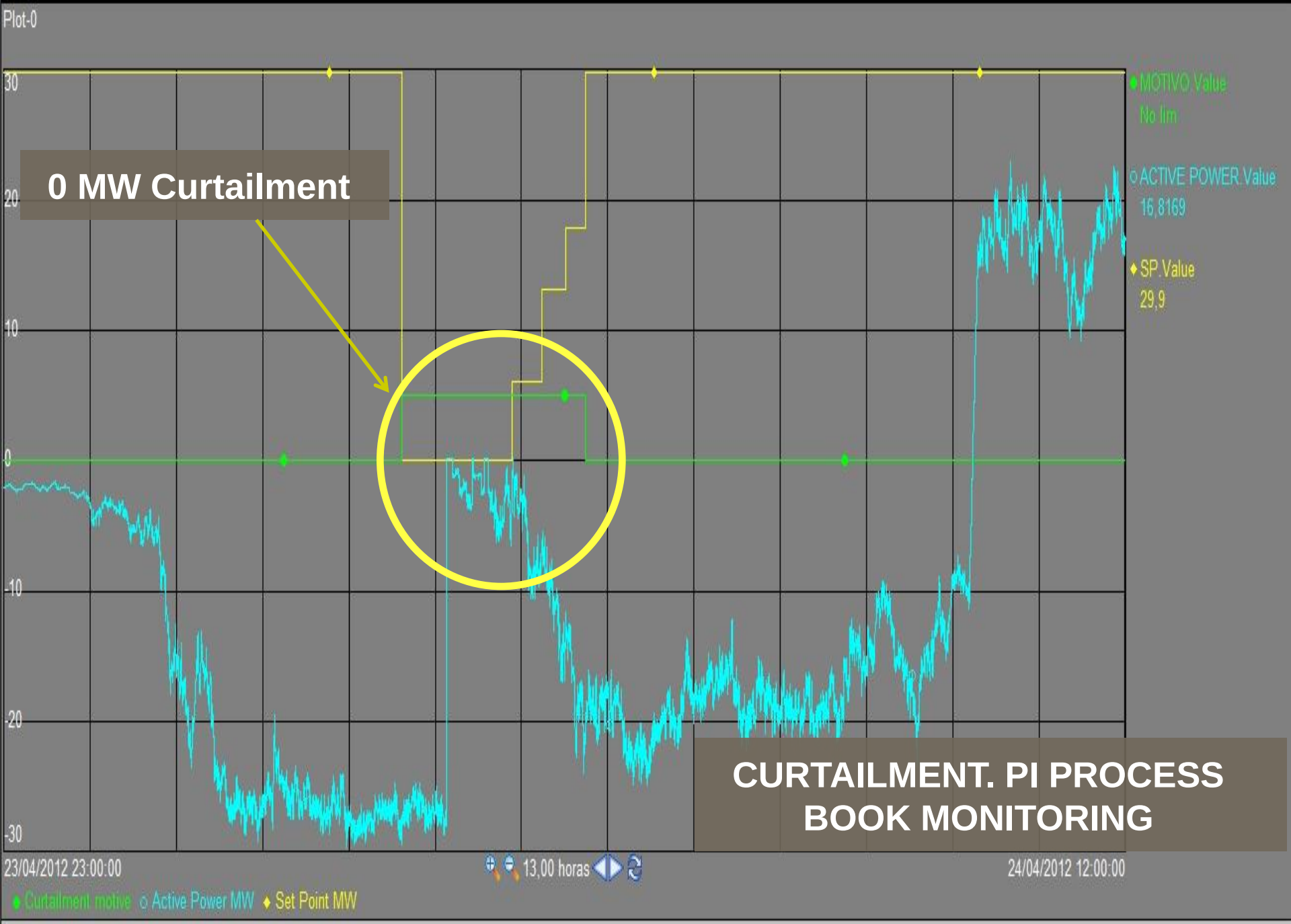


BUSINESS CASE

NATIONAL CURTAILMENT

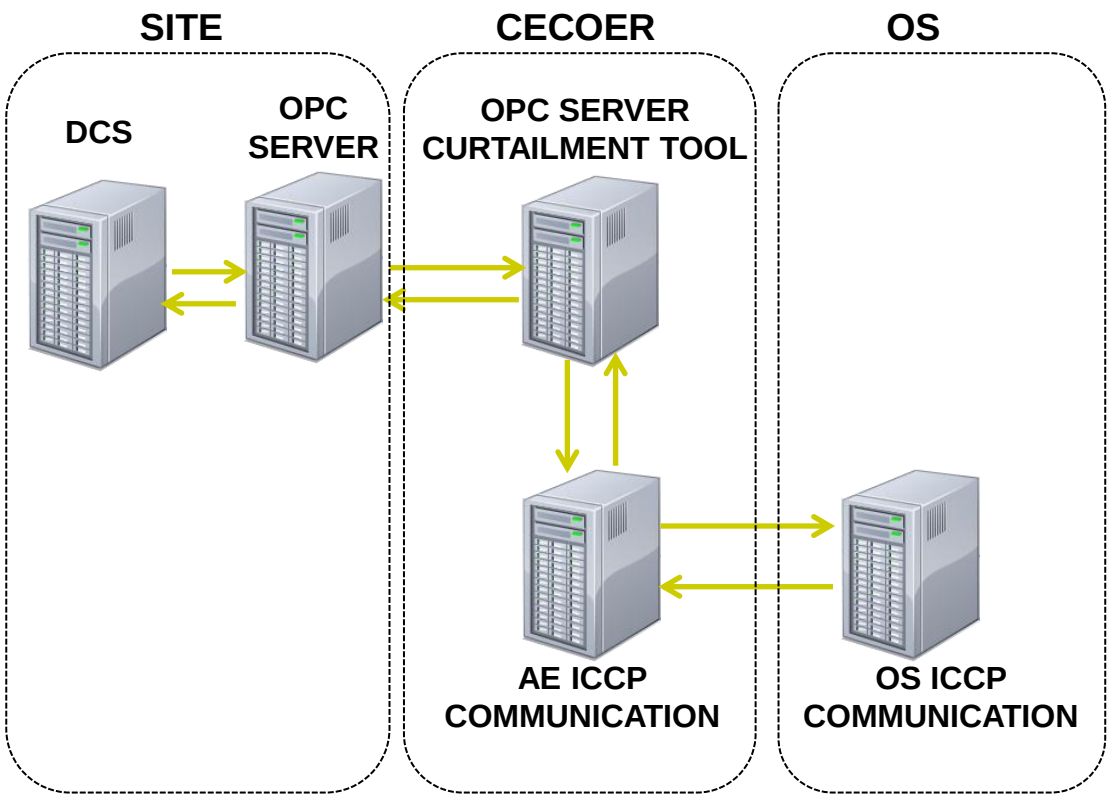


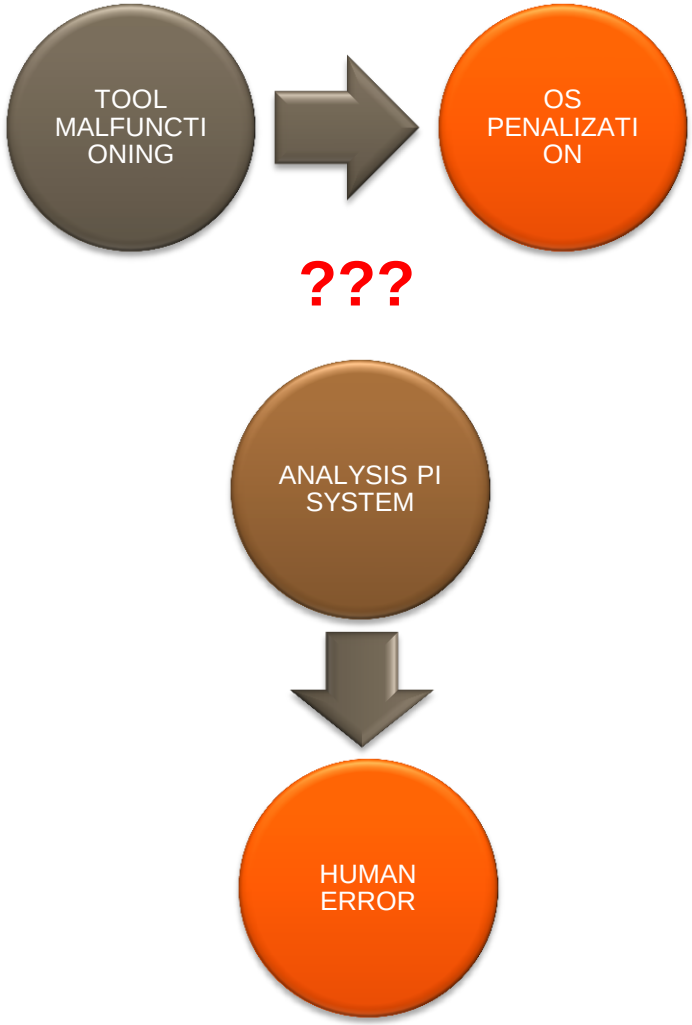
- Active power monitoring (PI Process Book Display+APIs SDK)-> Warning
- Problem fixed -> **Avoid future power losses**

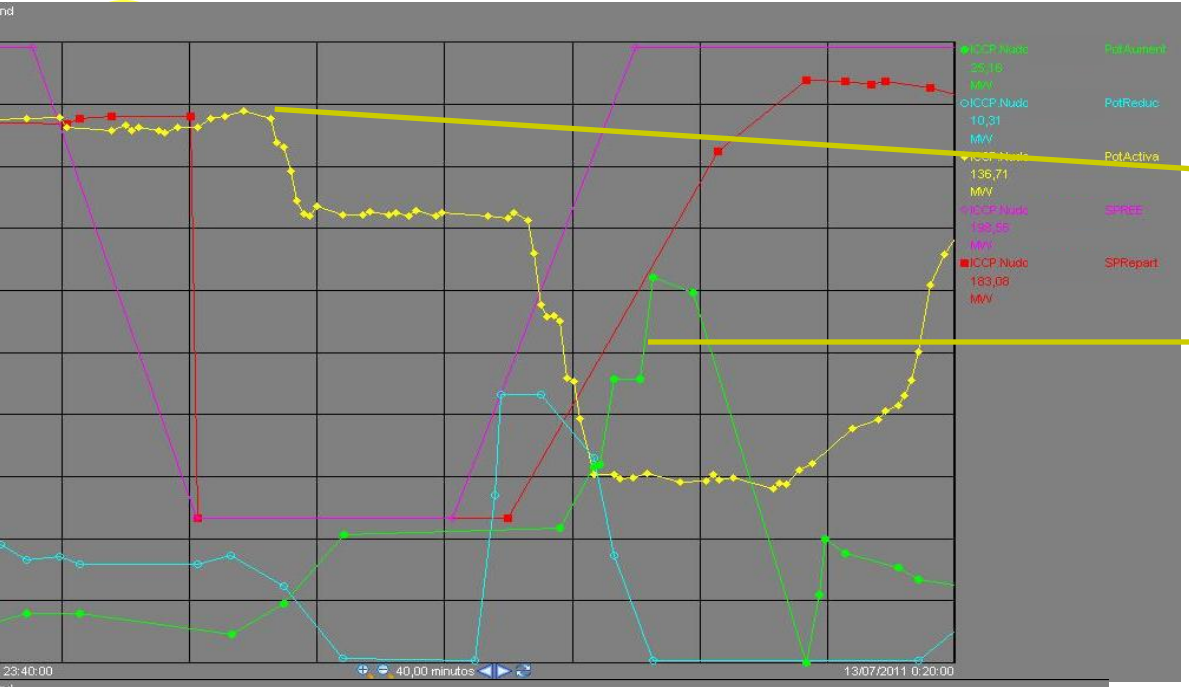


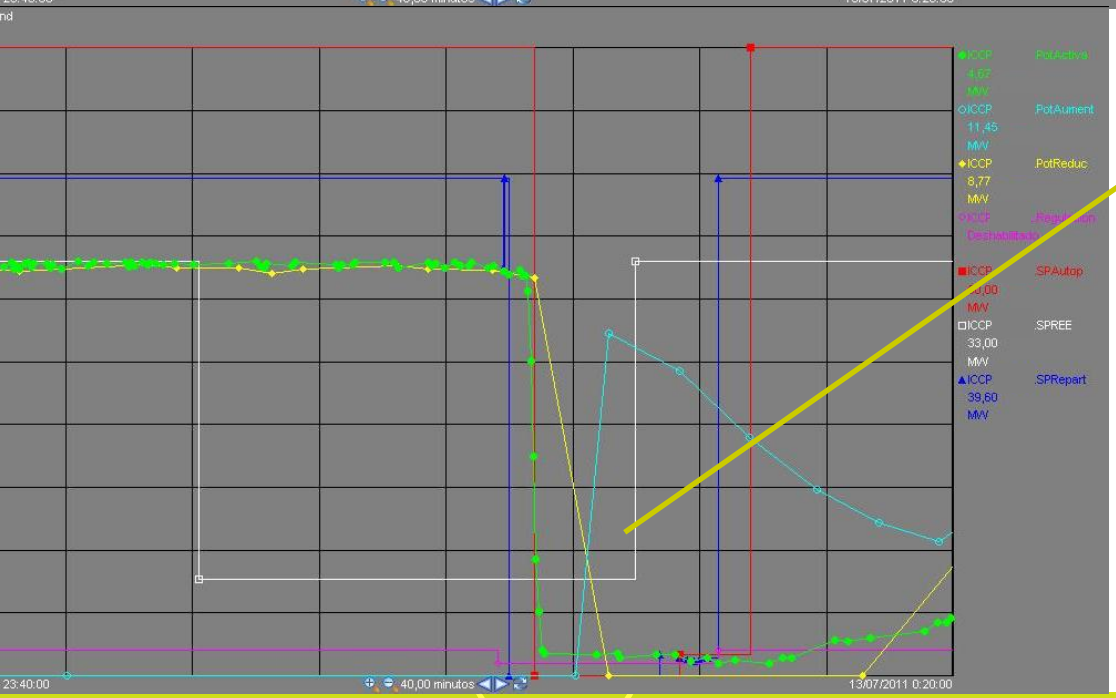
CURTAILMENT. PI PROCESS BOOK MONITORING

CURTAILMENT TOOL









Curtailment Sent

Tool actuation delayed

Tool activation

CURTAILMENT. PI PROCESSBOOK MONITORING

RESULTS

RESULTS

- Data homogeneization, data integration
- Different origins -> One system
- Easy to scalate
- Big potencial, enhancing PI system functionality
- Allows programmimng based on SDK APIs
- Decission making
- Reliability
- Different department needs covered(CECOER, Production, Engeneering…)

BENEFITS

TANGIBLE BENEFITS

- Maximize asset production
- Optimize set point tracking during curtailments
- Realtime VS Meter production surveillance (10% deviation allowed)

INTANGIBLE BENEFITS

- Quick access to the information
- Data integration (DCS, Oracle, other systems)
- Decission making
- Reporting tool
- Analysing tool
- System reliability
- Less storage required
- One version of the truth

NEXT STEPS

NEXT STEPS

- Reorganising PI Servers
  - PI Server 1 (Wind Power, Hydraulic, Biodiesel)
  - PI Server 2 (Concentrating Solar Power, Biomass)
- Updating to PI 2010
- Asset Framework implementation (PI AF)
- Interface control tool
- Increase PI System functionallity, basing other applications or other processes on PI
  - Expected energy calculation based on PI AF or PI ACE
  - Forecast on PI System
  - Reports automation

CONCLUSION

CONCLUSION

DATA INTEGRATION

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DATA HOMOGENEIZATION

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HIGHER CONTROL

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HIGHER BENEFITS

CONTACT INFORMATION

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THANK YOU

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