Growing on Smart Data

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SIEMENS Gamesa
RENEWABLE ENERGY

Siemens Gamesa Renewable Energy Today

87 GW
Installed Global Capacity

25k
Employees

11 €B
Annual Revenue [2]

11.5 GW
Order Entry

23.2 €B
Order Book

True global, modern and scalable footprint

Advanced digital capabilities

Portfolio covering all requirements

- [1] *End of June 2018 (Q3 FY18)*
- [2] *End of FY'17*

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Siemens Gamesa Renewable Energy Today

Three business units with strong market position

- **74 GW** installed in 75 countries.
- **9,7 GW** promoted in 14 countries.
- The technology partner of choice for onshore wind power projects.

- **11,4 GW** installed all over the world since 1991.
- The most experienced offshore wind company with the most reliable product portfolio in the market.

- **55,4 GW** under service and maintenance.
- Helping customers achieve their business objectives by ensuring that turbines work at peak efficiency throghout their life cycle.

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fGamesa WindOne® Project - 2011

Company Challenges

Reduce **costs**

Increase **benefits**

Keep **customers in focus**

Unique **repository** for all the company

Extracting **more value** from existing assets

Knowledge tools for managing underperformance

Project Challenges

Huge amount of **information**

Change the way **maintenance** was done

Thousands of assets in remote locations

Personnel in many different **countries** & **cultures**

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fGamesa WindOne® Project

- Thousands of Wind Turbines in remote locations
- Billions of data generated

- SGRE Providing O&M Services

- Analysis
- Continous improvement

- Real Time
- Monitor & Operate

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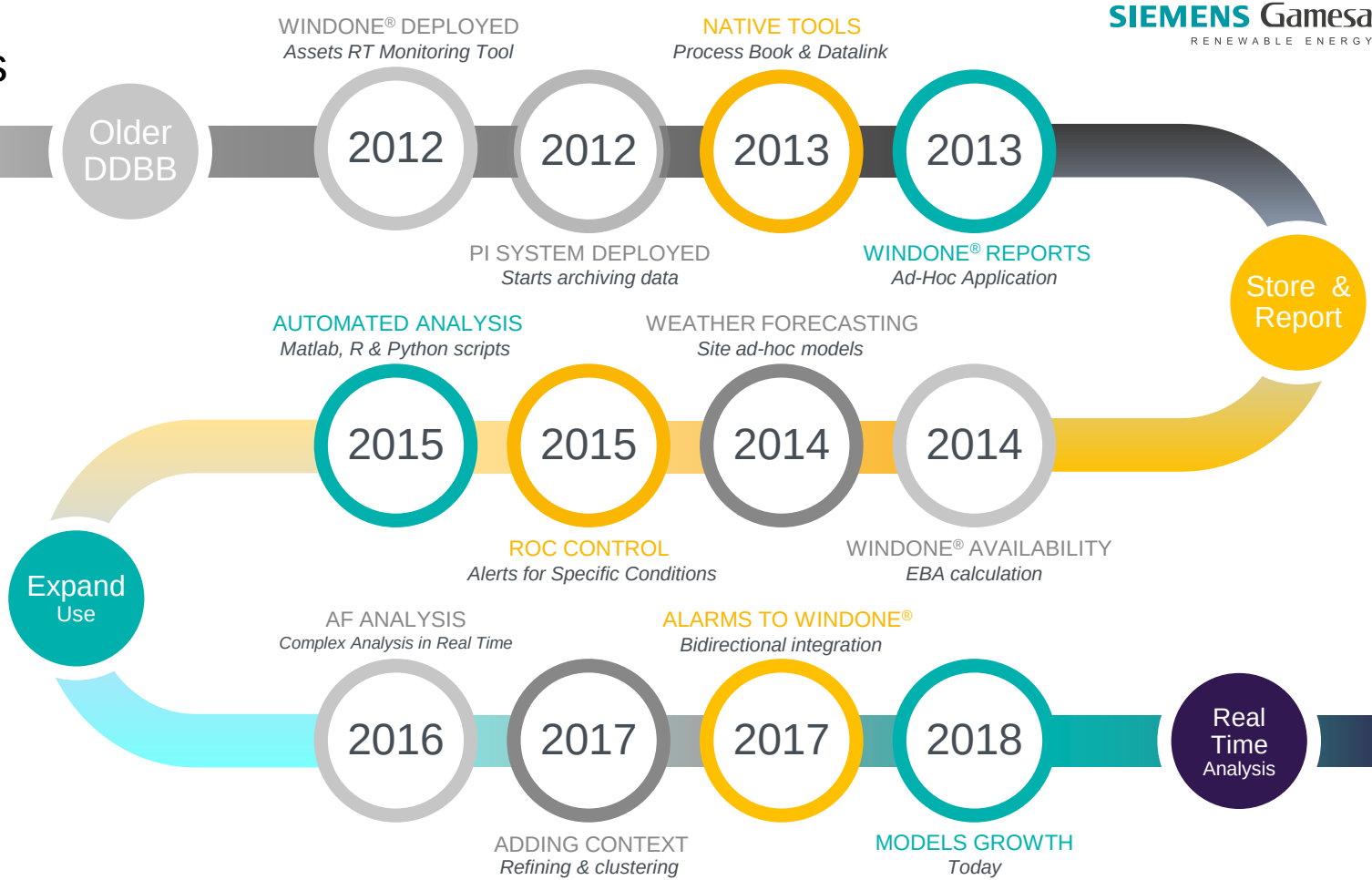
Milestones



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Facts about our PI System

>900
Wind Farms connected to WindOne®

>19k
Wind Turbines Integrated

3.2 MM
Active Tags with Real Time Acquisition

90k
Running Analysis

400
Direct Users

>2000
Indirect Users

Data from wind turbines, wind farms, SCADAs, regulators, met masts & substations

6 Different
applications using PI Data

** Figures as of September 2018.*

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General Architecture

Multi-OEM	Collector & Gateway	Central Systems	Enterprise Applications	Users
Gamesa	Windone®	Asset Framework Database	PI Analytics	Remote Operation Center
oOEM		Time Series Database	Windone® Reports	Field Technicians
		Alarms Database	Windone® Customers	Support teams
			Windone® Availability	General Users
			...	

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Use Cases

Success Stories

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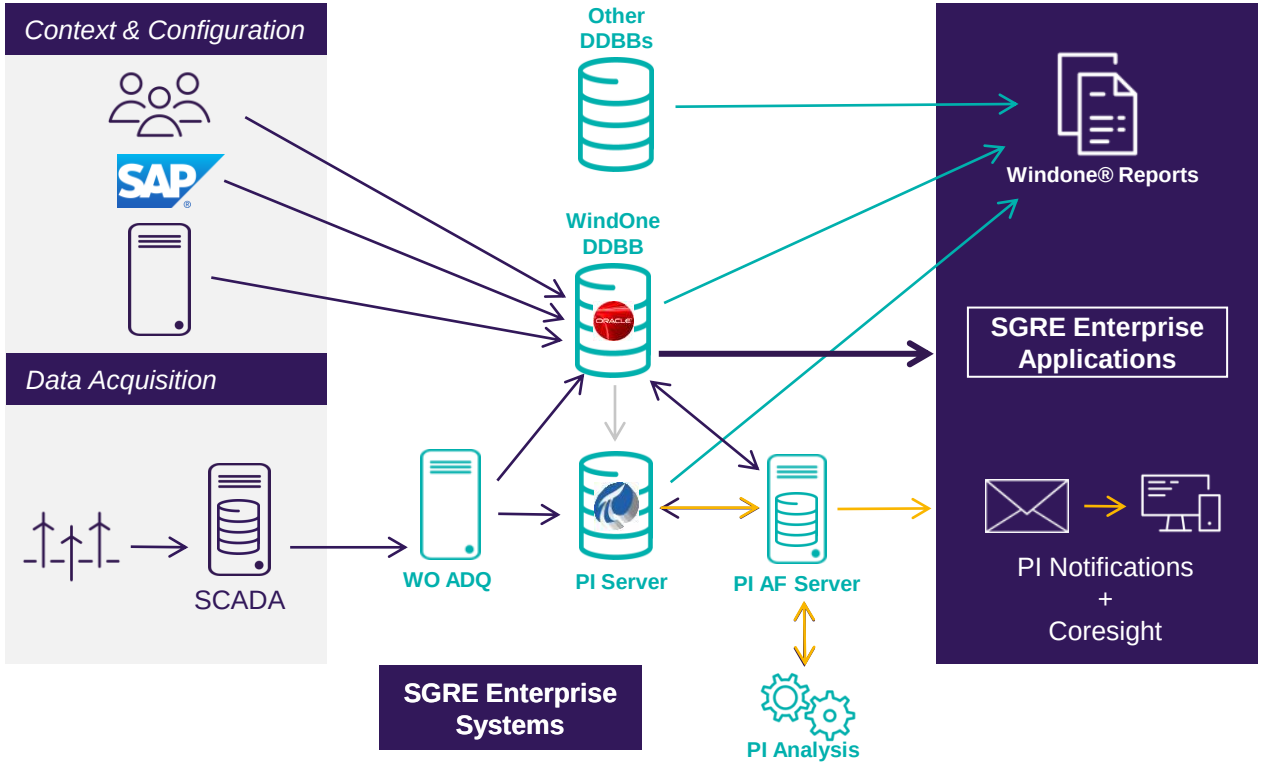
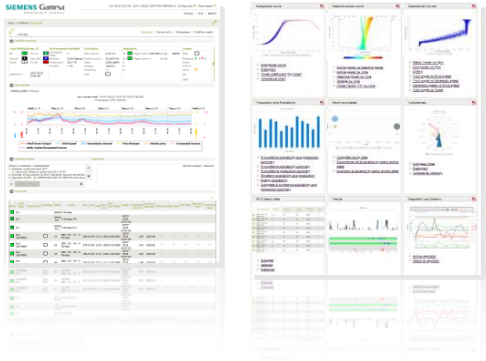
Particular use cases

Several examples on how the PI System has helped the company





Same system, different solutions for different use cases:

- WindOne® Reports
- Remote operation center solutions
- Advanced analytics

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WindOne® Reports Example

Challenge

- Predefined, easy-to-get and quick reports for all stake-holders within the company.
- Integrated with other company tools.

Solution

- Combine PI System data with other data sources to provide standard reports executed under the same assumptions.
- PI SDK, PI AF SDK.

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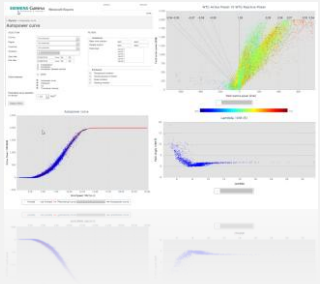

- > 30 reports and subreports.
- Assets health, behaviour and configuration, fleet analysis, wind farm reports.

Outputs

- Used by Support Teams, Field Technicians and many others.
- O&M personnel able to execute reports at “design engineers” level.

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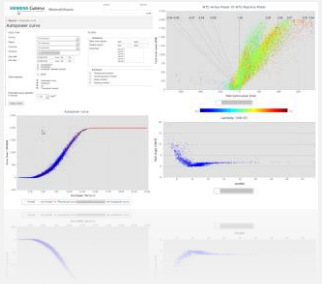

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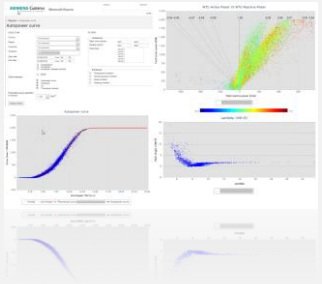

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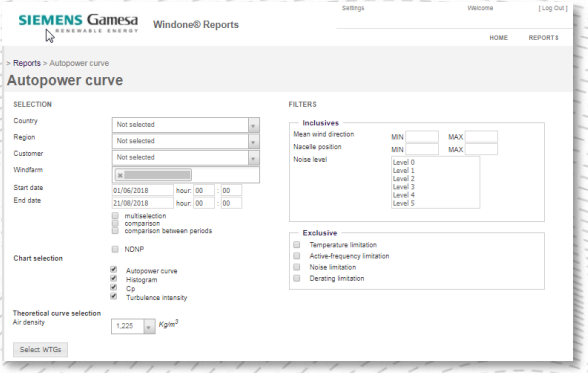

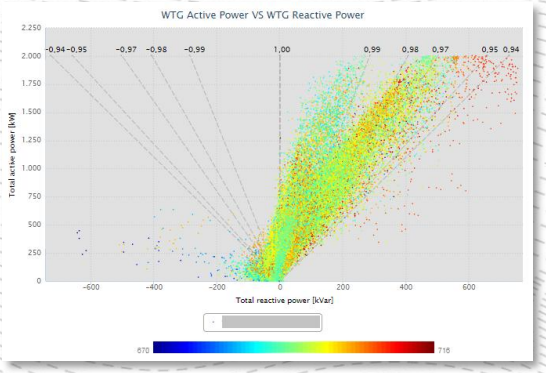

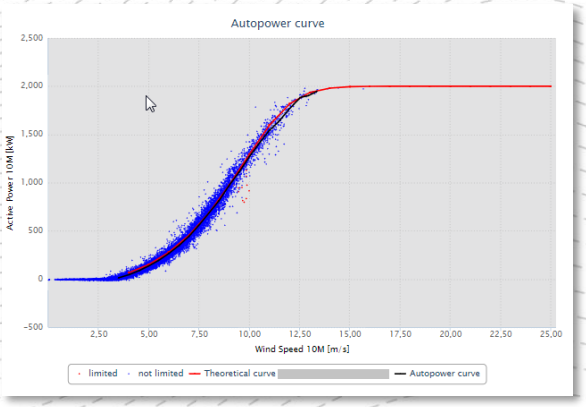

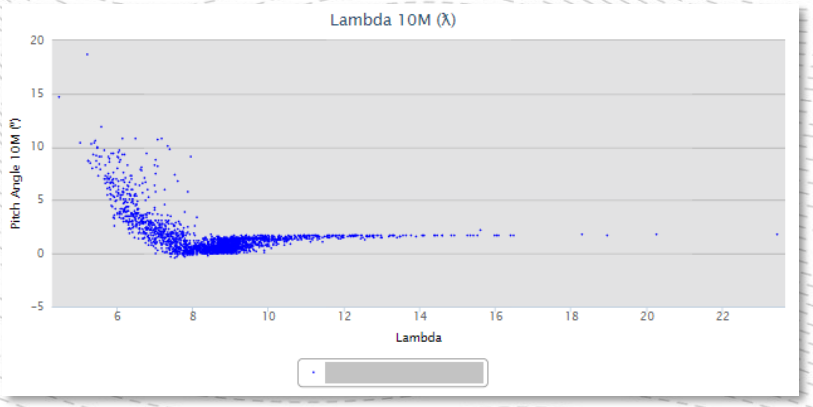

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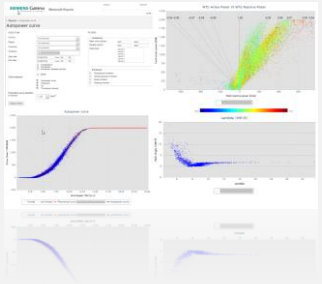

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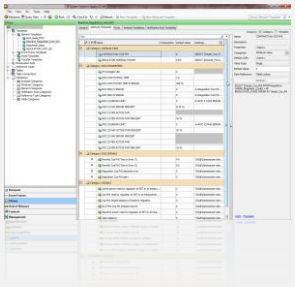
Remote Operation Center Example

Challenge

- Grid Operator requirements.
- Operate & maintain Wind Farms, apply setpoints.
- Internal requirements.

Solution



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- Expression analysis & Event Frames used.

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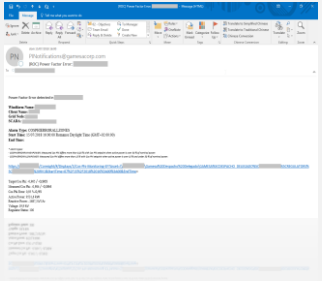

- ROC operators get a notification either if there is near gets out of range (+security margin) or the quality indicator gets too low.

Outputs

- ROC operators check the situation at the Wind farm and then decide the best course of action.

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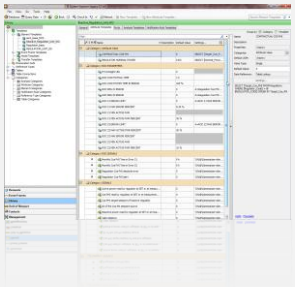

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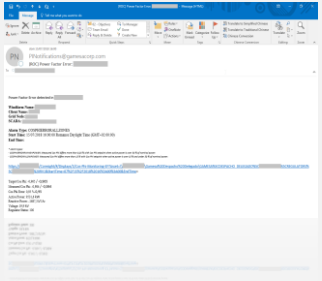

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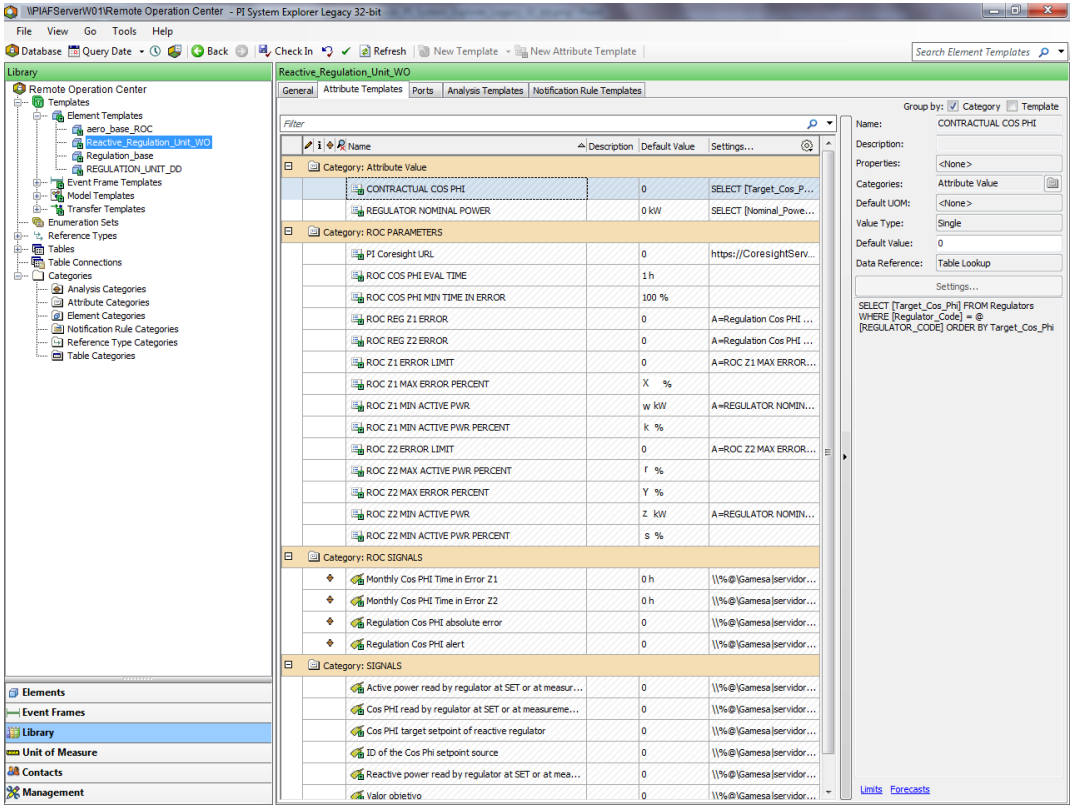

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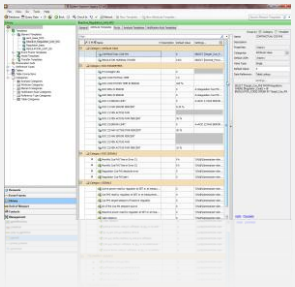

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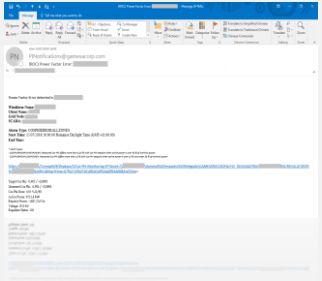

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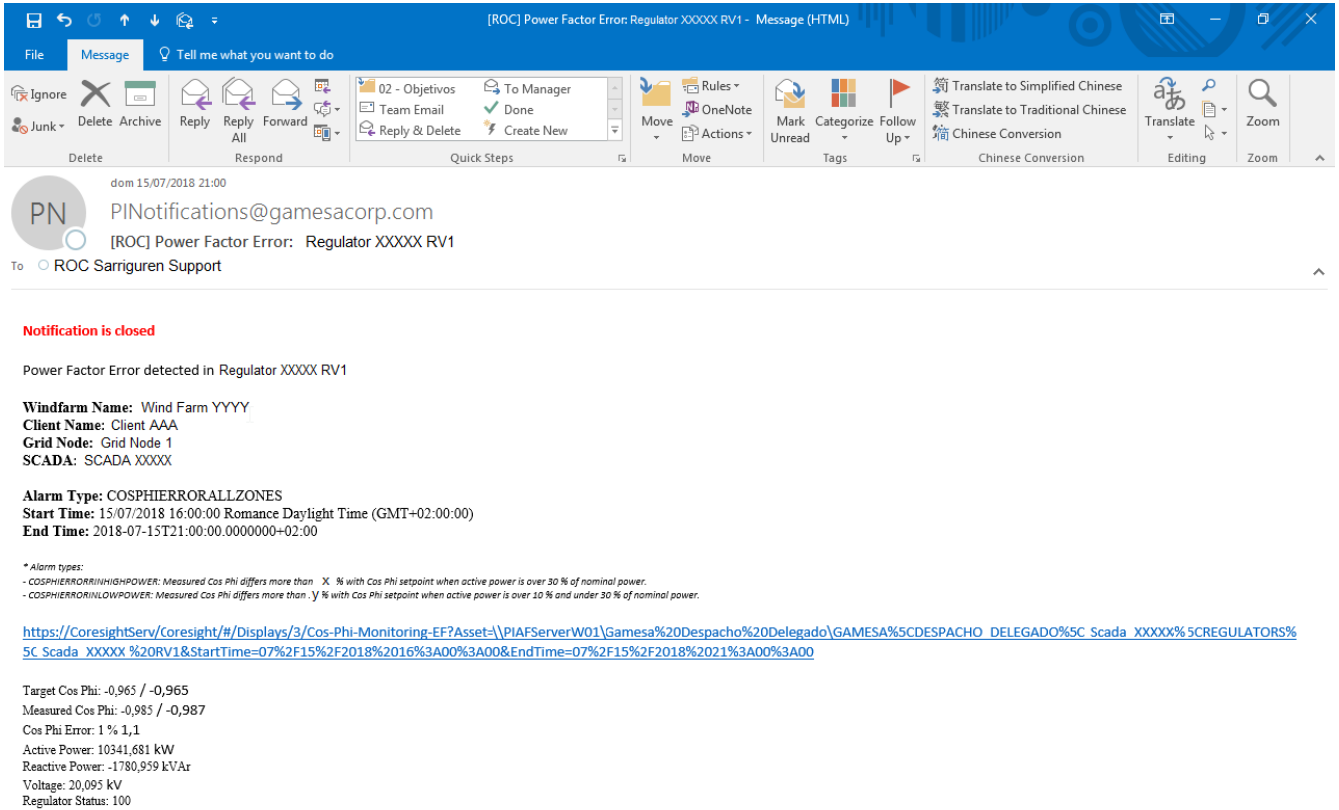

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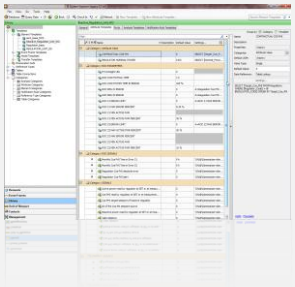

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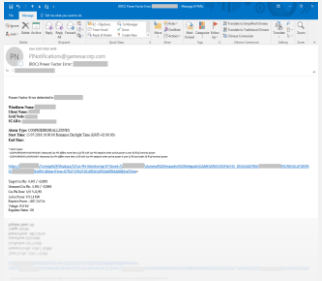

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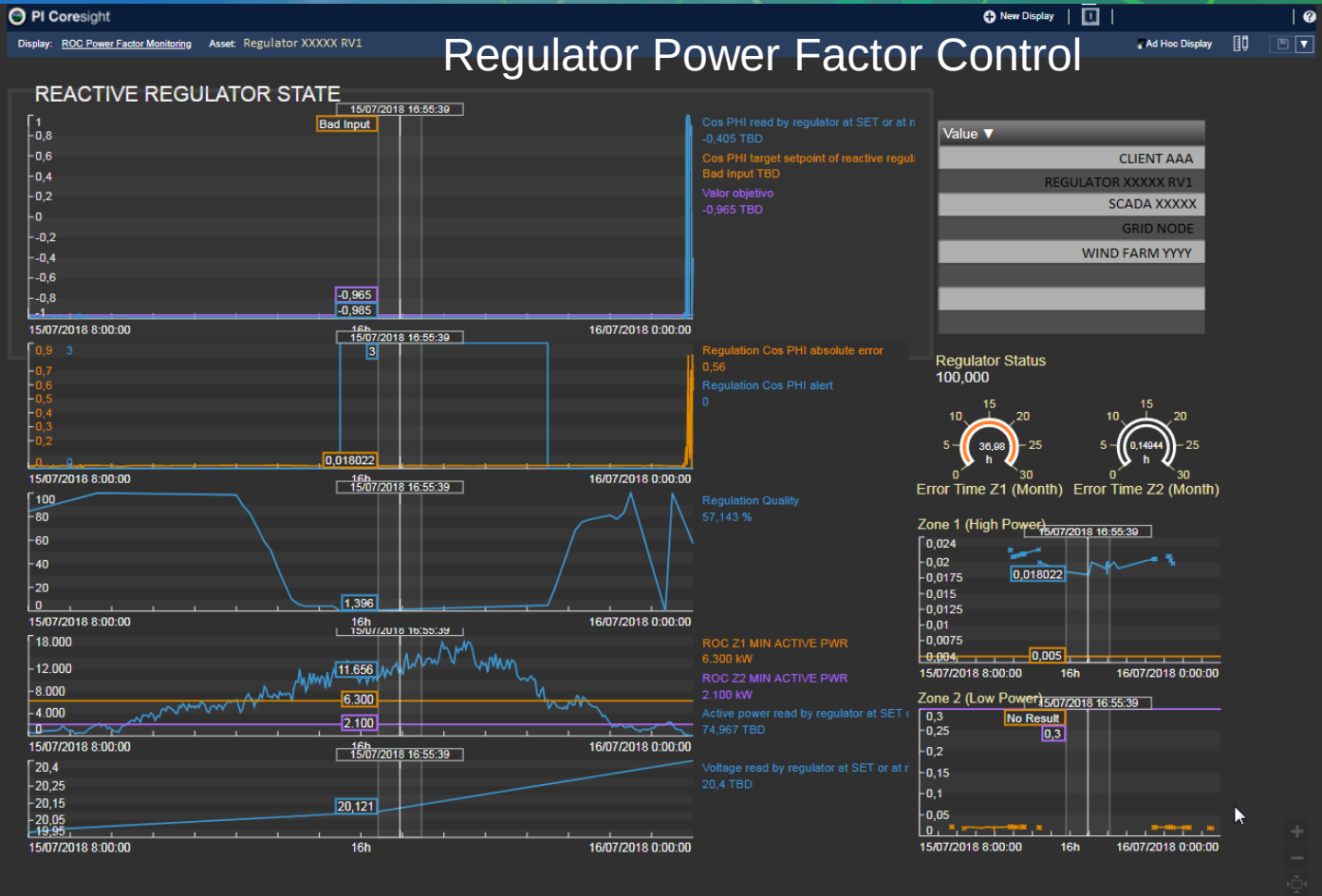

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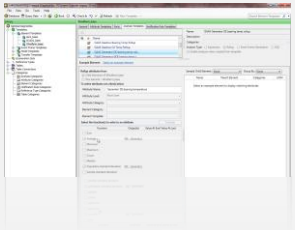
Advanced Analytics Example

Challenge

- Assets health & performance monitoring.
- Detect / Predict hidden faults.
- Improve maintenance.
- Avoid major incidents.

Solution



- Expression analysis & event frames analizing RT WTG signals.
- Raising alarms if conditions trigger model thresholds.

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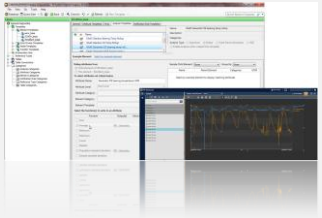
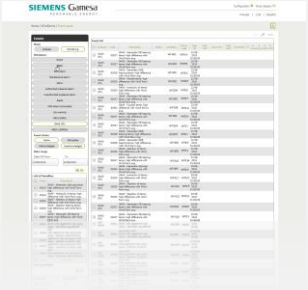


- Definition & Parametrization.
- Check asset condition vs model.
- Alarm included in Alarms DDBB

Outputs



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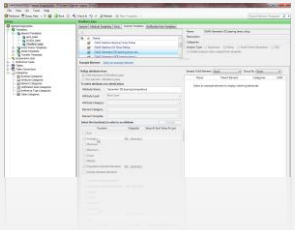

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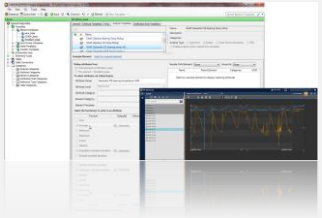

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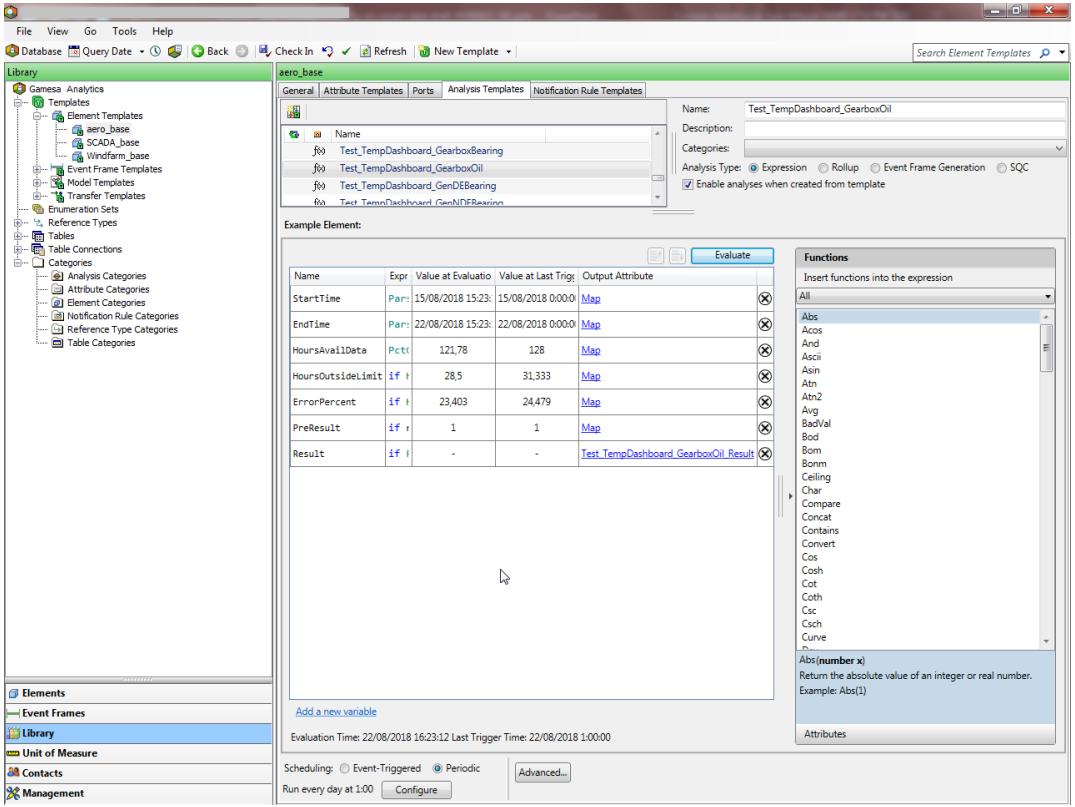
Wind Farm's 3σ quality check



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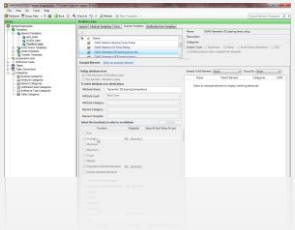

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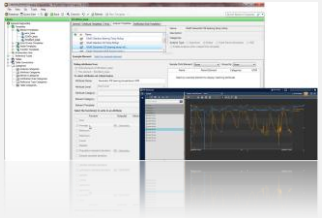

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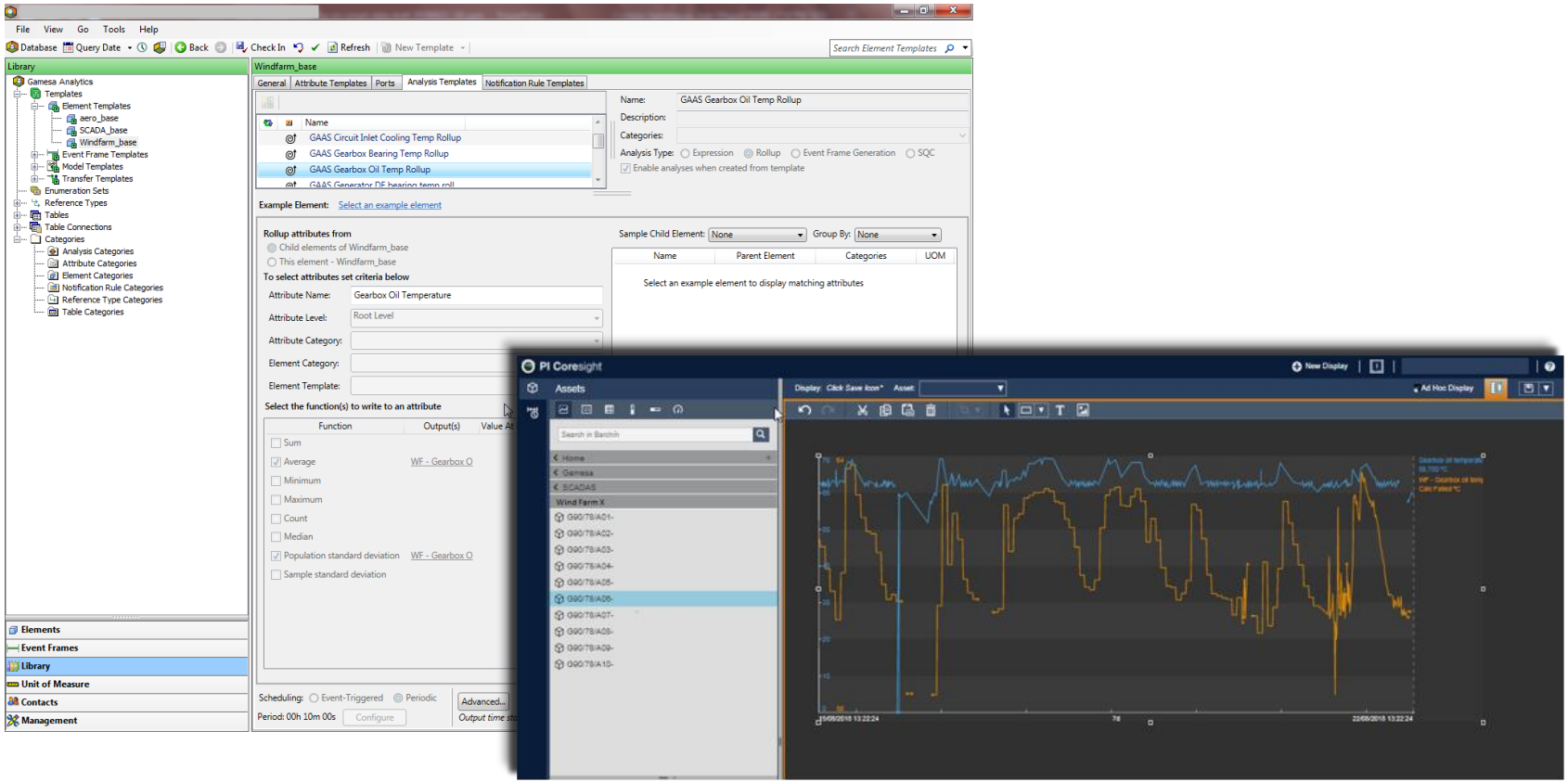

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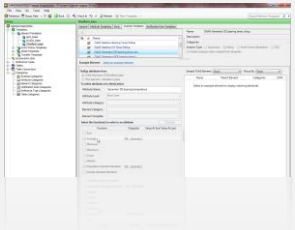

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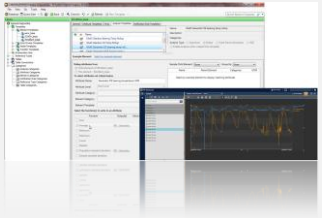

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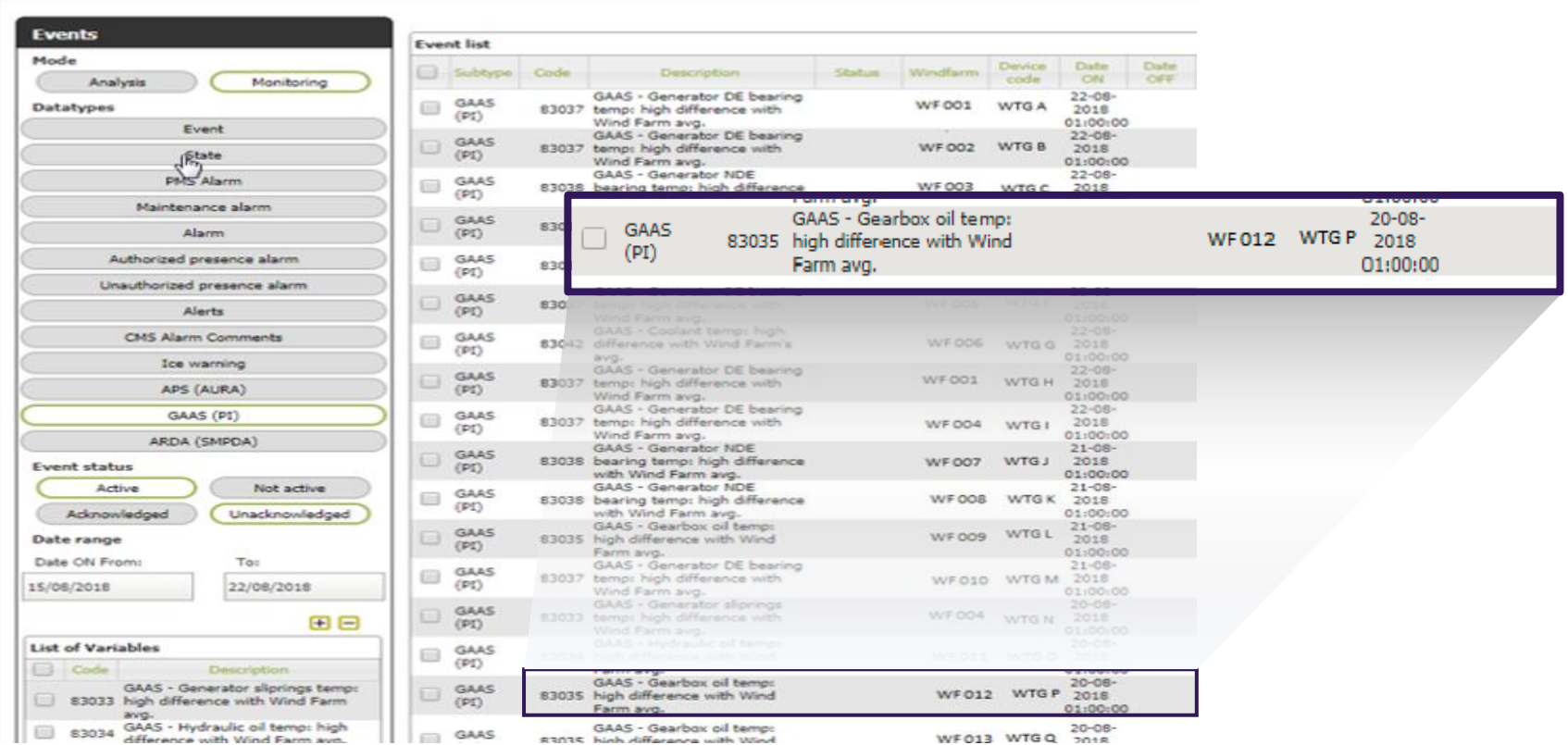

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Particular use cases

Several examples on how the PI System has helped the company

Challenge

Improve O&M services

Solution

Use PI System capabilities jointly with other enterprise systems.

- WindOne Reports: web application.
- PI EF + Notifications + Coresight for Remote Operation Center
- PI Analysis + Alarm generation + Enterprise Systems

Results

What benefits were achieved/measured?

- Anticipation to problems.
- Standard reporting.
- Effective operation & maintenance of a huge fleet of WTGs.
- Reduce cost of O&M.
- Increased performance of support teams, better time-to-solution ratio.

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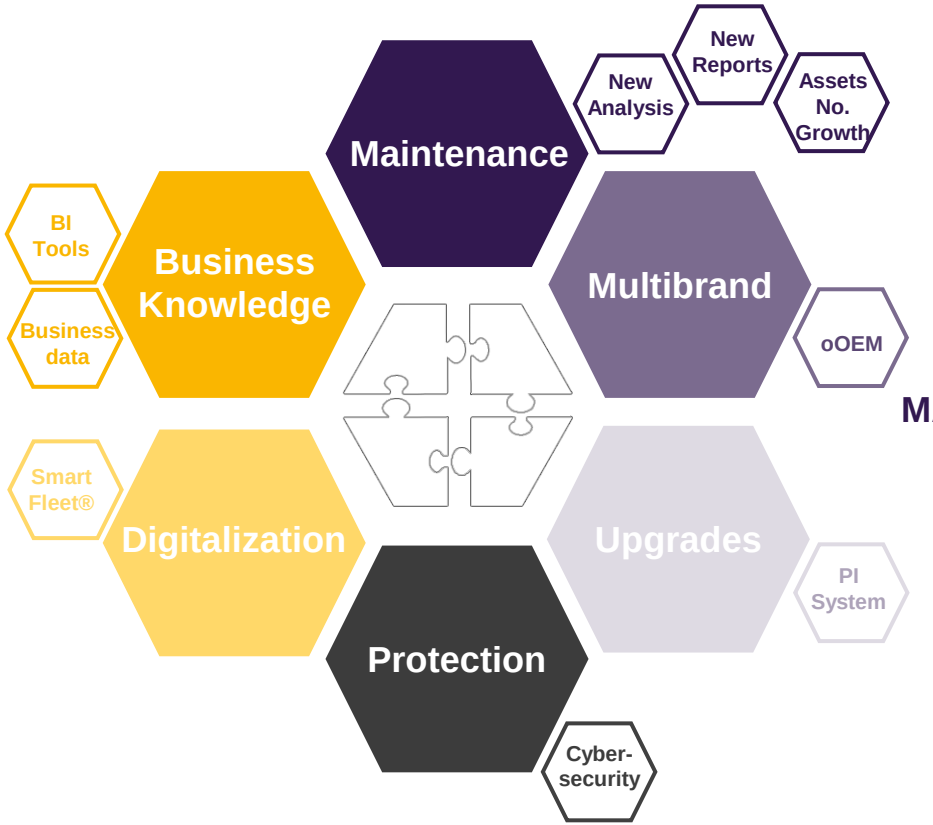
The Future



CONTROL YOUR COST

MAXIMIZE YOUR REVENUE

MITIGATE YOUR RISKS

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We are

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Chief Engineer

Siemens Gamesa Renewable Energy

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Suescun, Edurne

Service Product Manager

Siemens Gamesa Renewable Energy

Maria.Suescun@siemensgamesa.com

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Questions?

Please wait for the **microphone**

State your **name & company**

Please rate this session in the mobile app!

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