

OSIsoft®  
**REGIONAL  
SEMINAR**  
The **Power** of **Data**

**THRIVING  
IN A  
WORLD OF  
CHANGE**



# Gaining and Sharing Insights Across the Enterprise from Anywhere

Presented by **Rami Antoun**



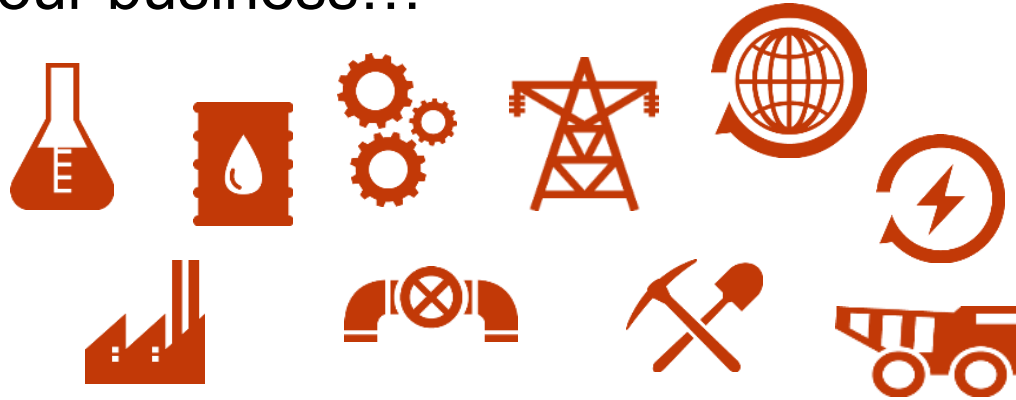
## Data-driven Decisions

A recent **study at MIT** showed that organizations **relying on data** to make decisions **performed** at rates 4-6 % **higher** than their peers.\*

*\*Erik Brynjolfsson,  
MIT Professor*

# Sharing Insights Across the Enterprise

Operational **insights** are discovered frequently throughout your business...



...but is everyone able to **share** their discoveries **quickly**, **easily** and **effectively**?

A hand in a dark suit sleeve reaches out to touch one of many glowing, rectangular digital screens that are floating in a dark space. The screens display various types of data visualizations, including bar charts, line graphs, and photographs of people. The hand is positioned in the lower-left foreground, with its index finger pointing towards a bright screen in the center. The background is dark, and the screens are illuminated with a blueish-white light, creating a sense of depth and technology.

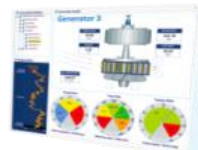
# Any Data, Anytime, Anywhere

## PI Visualization Suite

- Gives **every tool** at your fingertips
- To **fit your needs**
- And facilitate **enterprise-wide collaboration**



**PI ActiveView**



**PI BatchView**



**PI Coresight**



**PI WebParts**



**PI ProcessBook**



**PI Manual Logger**



**PI Visualization Suite**



**PI DataLink**



# The PI System Client Tools

- **PI Coresight** for ad hoc analysis and collaboration with mobility
- **PI ProcessBook** for display building and monitoring
- **PI DataLink** for analysis and reporting
- **PI WebParts** for enterprise-wide collaboration
- **PI Manual Logger** for manual data collection



# PI Manual Logger

Explore

Report

Monitor

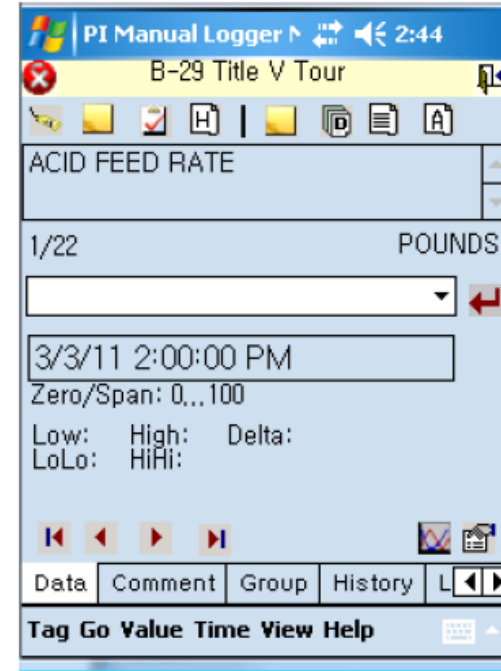
Collaborate

Share

Review

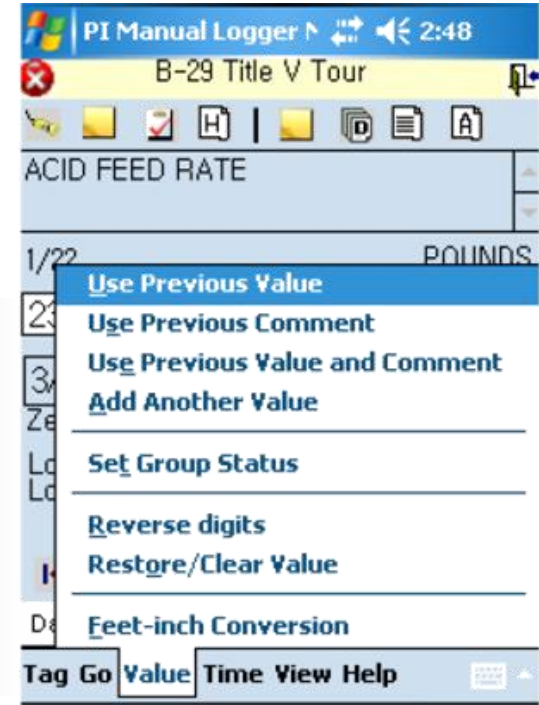
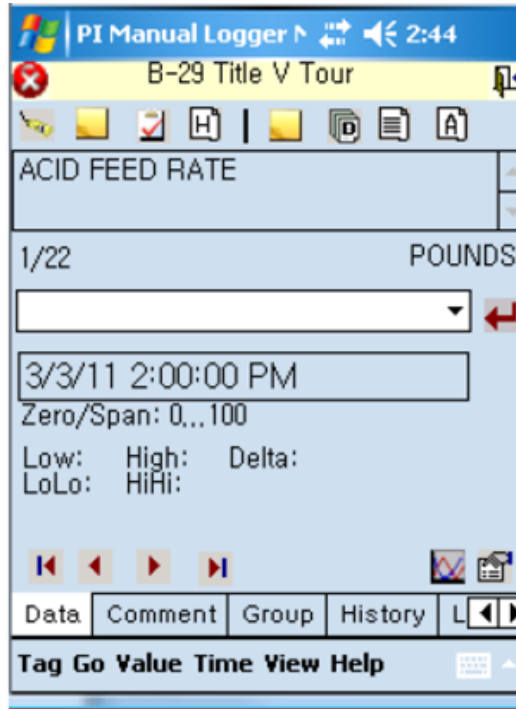
Collect

- **Manual entries** are oftentimes crucial
- **Centralized** configuration based on **tours** and **rounds**
- Available on computers and mobile devices (**Windows Mobile**)





# Case Study – Eastman Chemical

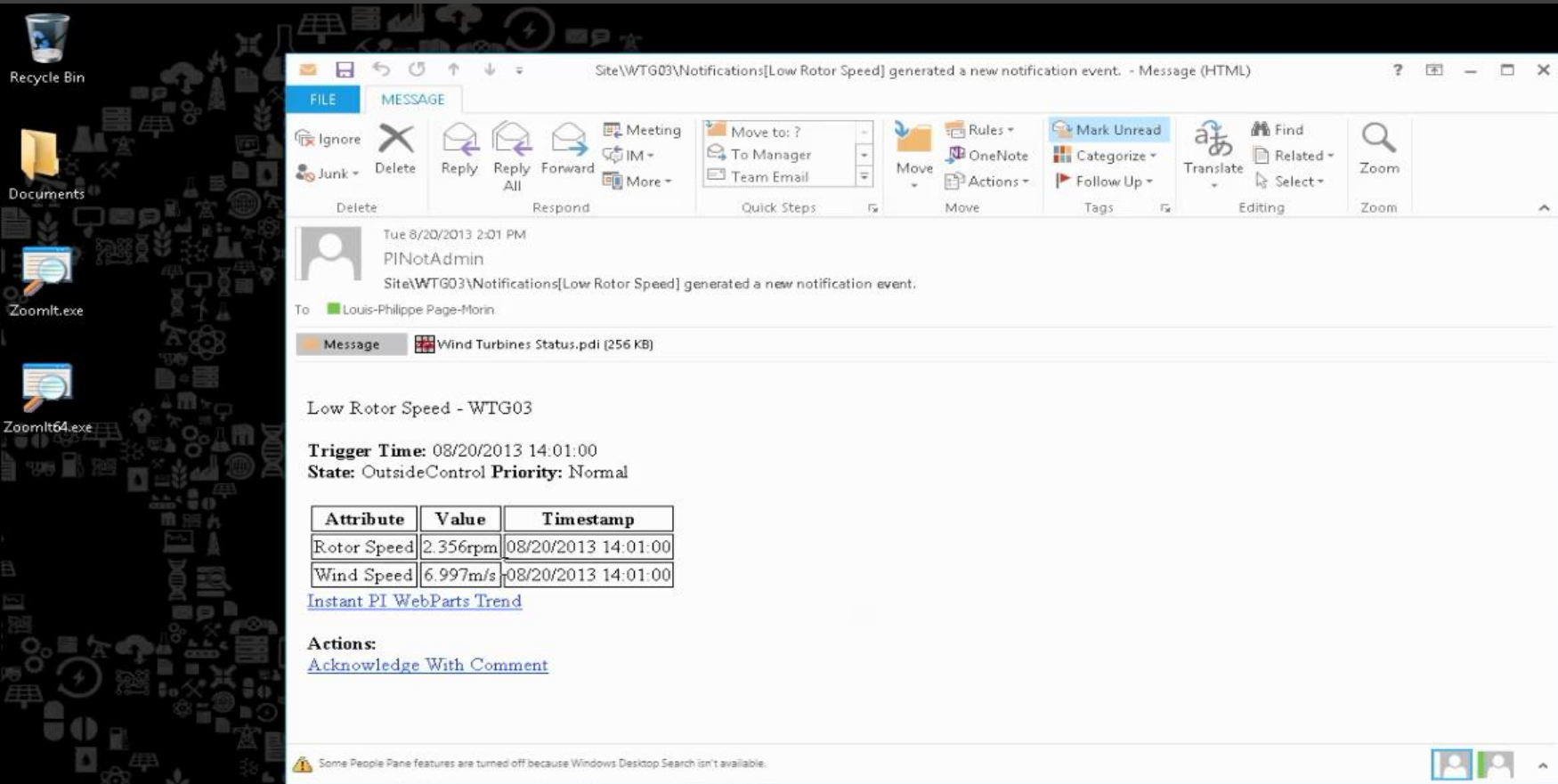




# DEMO



# PI Notifications and Visualization Tools



The screenshot shows a Windows desktop environment. The background is a dark grey surface covered with numerous small, light grey icons representing various fields of study: science (flasks, DNA helix, microscope), engineering (gears, lightbulb, circuit board), technology (computer monitor, smartphone, tablet), and general productivity (calendar, clock, notepad). On the left side of the desktop, there are larger icons for the Recycle Bin, Documents folder, and two instances of the ZoomIt application (ZoomIt.exe and ZoomIt64.exe). A Microsoft Outlook window is open in the center, displaying an HTML message. The window title is "Site\WTG03\Notifications[Low Rotor Speed] generated a new notification event. - Message (HTML)". The Outlook ribbon shows the "MESSAGE" tab with various action buttons like Ignore, Delete, Reply, Forward, Meeting, IM, etc. The message content is as follows:

Tue 8/20/2013 2:01 PM  
PINotAdmin  
Site\WTG03\Notifications[Low Rotor Speed] generated a new notification event.  
To: Louis-Philippe Page-Morin  
Message: Wind Turbines Status.pdi (256 KB)

Low Rotor Speed - WTG03

**Trigger Time:** 08/20/2013 14:01:00  
**State:** OutsideControl **Priority:** Normal

Attribute	Value	Timestamp
Rotor Speed	2.356rpm	08/20/2013 14:01:00
Wind Speed	6.997m/s	08/20/2013 14:01:00

[Instant PI WebParts Trend](#)

**Actions:**  
[Acknowledge With Comment](#)

At the bottom of the Outlook window, a small warning icon and text state: "Some People Pane features are turned off because Windows Desktop Search isn't available."



# DEMO

# PI WebParts

Explore

Report

Monitor

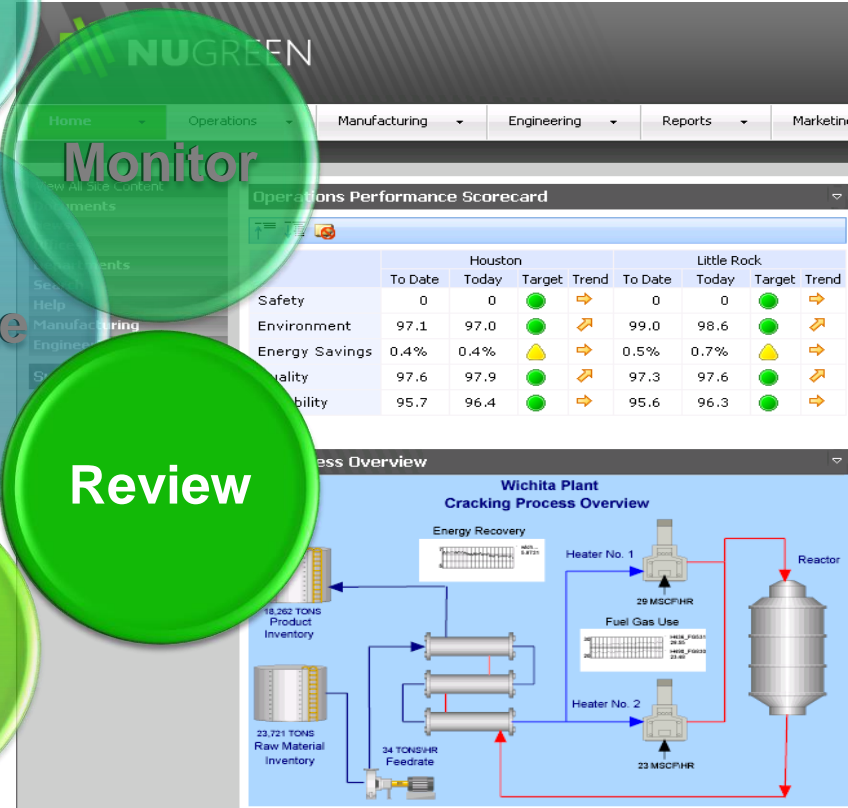
Collaborate

Share

Review

Collect

- Interactive web parts for **Microsoft SharePoint**
- Allow **real-time** visualization of operational data
- **Share** displays and reports to a wider audience







Sandbox

EDIT LINKS

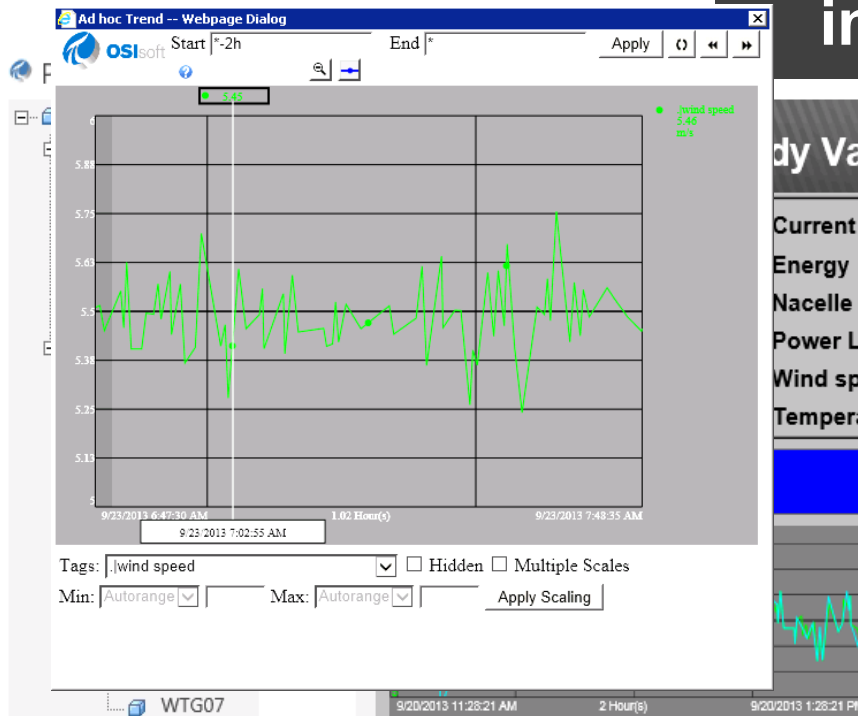
## NuGreen Energy

Home

Documents

Site Contents

EDIT LINKS



# PI ProcessBook Displays in Microsoft SharePoint

dy Valley WTG01

PI Coresight Display

Current L1 358.05 kA  
Energy 903.44 kWh  
Nacelle Position 358.75 °  
Power Load 59.62  
Wind speed 5.40 m/s  
Temperature 14.86 °C



Status



99.97



Sandbox

EDIT LINKS

NuGreen Energy

# PI DataLink Reports in Microsoft SharePoint

Home

Documents

Site Contents

EDIT LINKS

Excel Web Access - Wind Turbines Daily Report\_RS2013\_DLES

FILE

OPEN IN EXCEL

DATA

FIND

A

B

C

D

E

F

G

H

1

2

3

4

5

6

8

9

10

11

12


13

14

15

16

17



Wind Turbines Daily Report

From

September 22, 2013

To

September 23, 2013

Wind Farm

Windy Valley

Wind Turbine

WTG01

Turbine

Environmental Conditions

Model

1.5s

Wind Speed

5.53

m/s

Nominal Power

1.5

MW

Outside Temperature

Energy

Rotor Speed

Nacelle Position

Current L1

Previous Values

kWh


rpm


°


kA


Wind Speed


Outside Temperature




















905.73




17.50




163.34




360.14




5.42




14.98




905.29




17.50




164.28




360.05




5.50




15.03




905.70




17.51




144.69




360.13




5.45




15.09




906.06




17.51




161.13




360.17




5.40




15.14




907.02




17.52




225.30




360.37




5.56




15.20




905.36




17.50




158.31




360.07




5.38




15.24




906.21




17.51




138.86



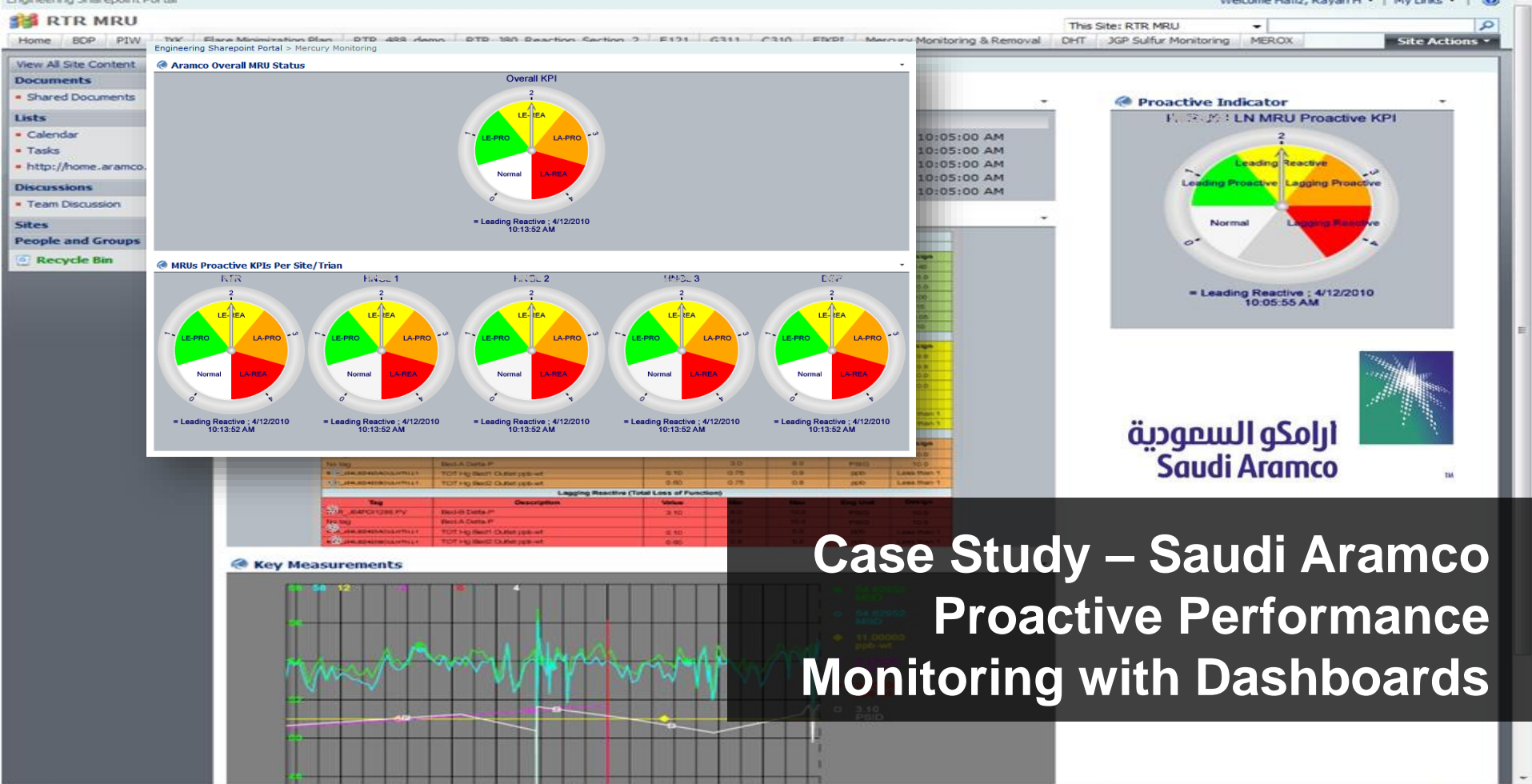
360.22



5.50



15.23



# Case Study – Saudi Aramco Proactive Performance Monitoring with Dashboards

أرامكو السعودية  
Saudi Aramco

# PI ProcessBook

Explore

Report

Monitor

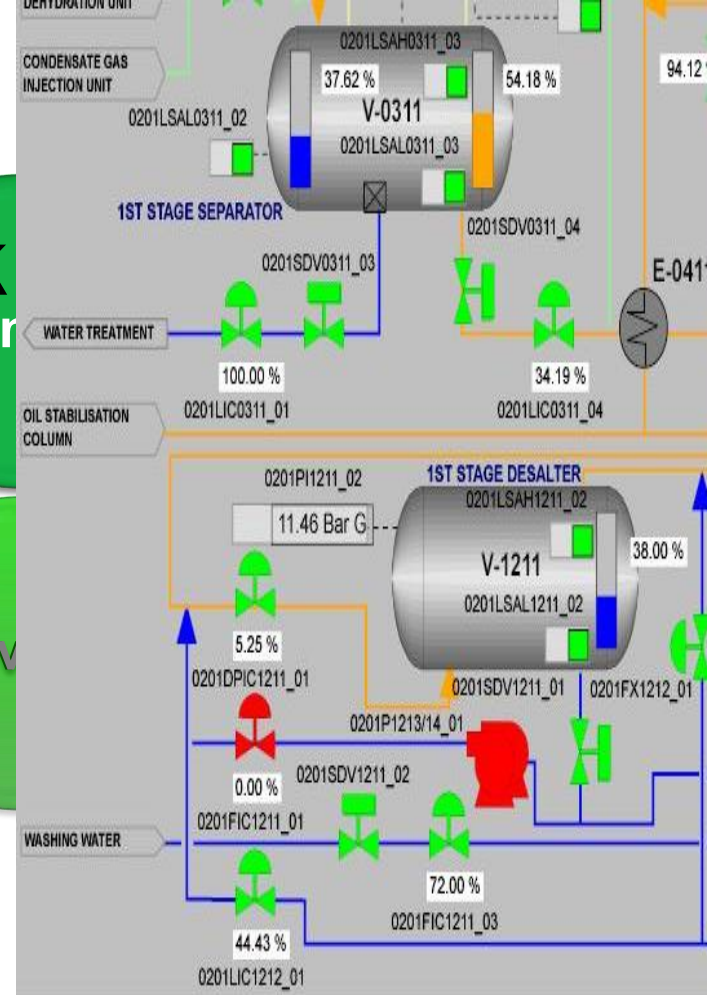
Collaborate

Review

Share

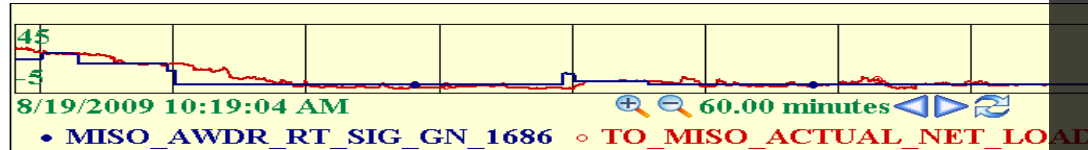
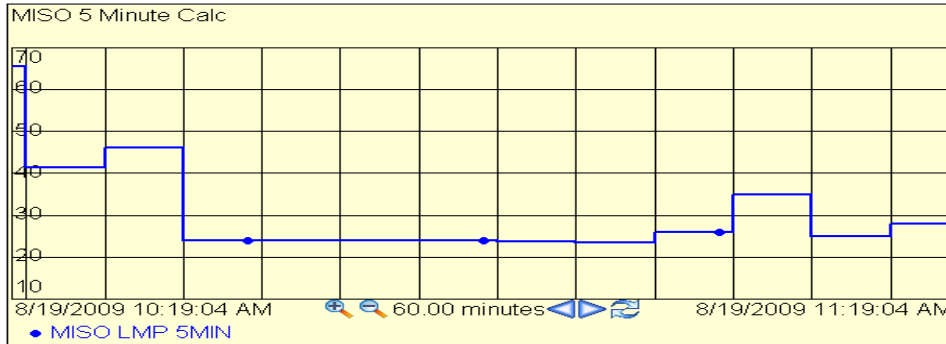
Collect

- Display of **real-time and historical data**
  - Process representation
  - **Trend** with traces
  - Context management with PIAF
- Allow for **process monitoring** and review of problematic events



# Demand Response Overview

	Real Energy	Regulation	Spin Reserve
Cleared	19	18	00
Deployed	19	00	00



Regulation Setpoint

Actual Meter

TOTAL POT LINE LOAD: **455.39 MW**

OCB 1500	<div></div>	91.3
OCB 1502	<div></div>	90.8
OCB 1503	<div></div>	92.8
OCB 1504	<div></div>	90.4
GCS 3805	<div></div>	00.0
GCS 3806	<div></div>	90.0
GCS 3800	<div></div>	00.0

Current Average Price **28.50 dollars**  
 5-MIN LMP Price **28.05 dollars**  
 Last Hour LMP Price **31.75 dollars**

**Case Study – Alcoa  
 Demand/Response and  
 Adaptation**

Homepage

Energy Flow

WPP Switchyard

Generation Trends

Warrick Overview

Pot Line Trends

Dispatch Status



# PI DataLink

- Allows **summary calculations** and **filtering** of the data
- Enhances PI System Data with access to **Microsoft Excel reporting** features

	A	B	C	D
1	Début	5/27/2010 13:40		
2	Fin	5/28/2010 13:40		
3				
4	Date	BA:CONC.1	BA:LEVEL.1	BA:TEMP.1
5	27-May-10 13:51:28	43.80355835	0.69	5.41
6	27-May-10 13:51:58	0	0.00	0.00
7	27-May-10 14:07:28	5.801473618	12.40	10.64
8	27-May-10 14:19:58	18.39671898	21.03	20.03
9	27-May-10 14:45:58	25.30208397	39.79	45.05
10	27-May-10 14:55:28	40.00126648	33.46	28.58
11	27-May-10 15:12:28	42.83501053	0.65	0.83
12	27-May-10 15:12:58	0	0.00	0.89
13	27-May-10 15:27:28	5.907530308	10.27	10.69
14	27-May-10 15:42:28	20.59512711	22.60	20.78
15	27-May-10 16:06:58	27.59270096	37.20	42.05
16	27-May-10 16:13:28	39.76164246	35.06	27.03
17	27-May-10 16:33:28	43.08703995	0.53	0.92
18	27-May-10 16:33:58	0	0.60	0.98
19	27-May-10 16:50:58	6.635637283	13.87	13.76
20	27-May-10 17:06:58	19.4419651	24.95	20.57
21	27-May-10 17:26:58	25.28218265	27.14	21.21

D7

**CRITICAL CONTROL POINT PERFORMANCE**

Filter: Month / Year Date From: 01/07/2010 Date To: 31/07/2010 31 day period Data Last Updated: 21/09/2010 12:40

District/Locality CCP	% Hours Recorded	Critical Limit - % Good			Target Limit - % Good			# Alarms	Critical Alarms		Target Alarms		Last Refresh
		In Band	Low	High	In Band	Low	High		Low	High	Low	High	
<b>SWR</b>													
<b>▼ Bunbury</b>													
<b>Australind</b>													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	G 85.9	G 96.6	G 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7		G 98.7	G 0		G 0			21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
<b>Boyanup</b>													
Chlorine_Residual_Inlet	R 31.1	O 98.2	O 99.5	O 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7		R 98.7	G 0		G 0			21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
<b>Collie</b>													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	G 85.9	G 96.6	G 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7			G 0					21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	O 88.7		N/A			G 0	G 0				21/09/2010 12:40
<b>Darkan</b>													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7			G 0					21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
<b>► Busselton</b>													
<b>▼ Mandurah</b>													
<b>Dwellingup</b>													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7		G 98.7	G 0		G 0			21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
<b>Mandurah</b>													
Chlorine_Residual_Inlet	R 31.1	O 98.2	O 99.5	O 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7		G 98.7	G 0		G 0			21/09/2010 12:40

# Case Study – Water Corporation of Western Australia

## Critical Control Point Performance

# PI DataLink 2013 & Microsoft Excel 2013

- **PI DataLink 2013**
  - **PI AF** support with the new **PI System Search** engine
- **Microsoft Excel 2013**
  - Business Intelligence (BI) tools are integrated
  - Microsoft **PowerPivot**
  - Microsoft **Power View**

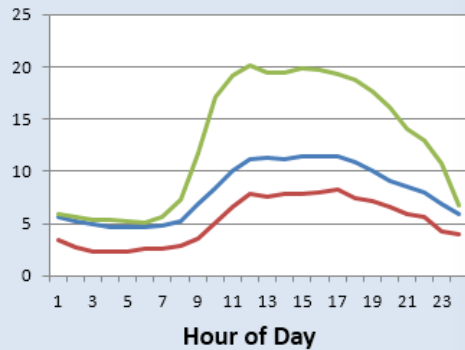


# Demand Profiling and Grid Analysis



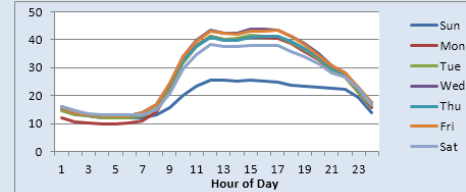
Substation

Feeder Distribution, kWh

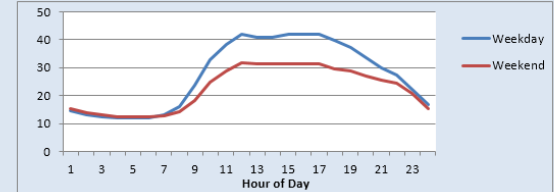


Feeder and Pole Transformer Analysis

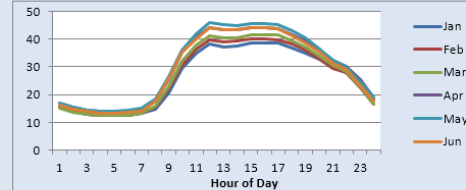
Weekday Profiles, kWh



Weekday \ Weekend Profiles, kWh



Monthly Profiles, kWh



Pole Loads at Peak (9 am - 4 pm), kWh

	Jan	Feb	Mar	Apr	May	Jun
	KWH	KWH	KWH	KWH	KWH	KWH
PT0398	4.4	4.5	5.0	5.3	5.5	5.5
PT1324	3.5	3.6	3.5	4.0	4.1	4.2
PT2235	3.4	3.9	4.1	4.5	4.7	3.1
PT4537	2.8	3.2	3.3	3.7	3.8	3.7
PT7465	3.1	3.2	3.5	3.8	3.9	4.0
PT7745	3.2	3.2	3.1	3.3	3.6	4.3
PT8356	10.6	11.0	11.0	11.7	12.1	11.7
PT8461	3.3	3.3	3.6	3.8	3.8	3.5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

3 **Feeder Circuit** ▼

5 FD1209

6 FD2349

FD4602

## 10 Pol-Turf ▼

PT0398

PT1324

14 PT2235

15 PT4537

17	PT7465
----	--------

PT7745

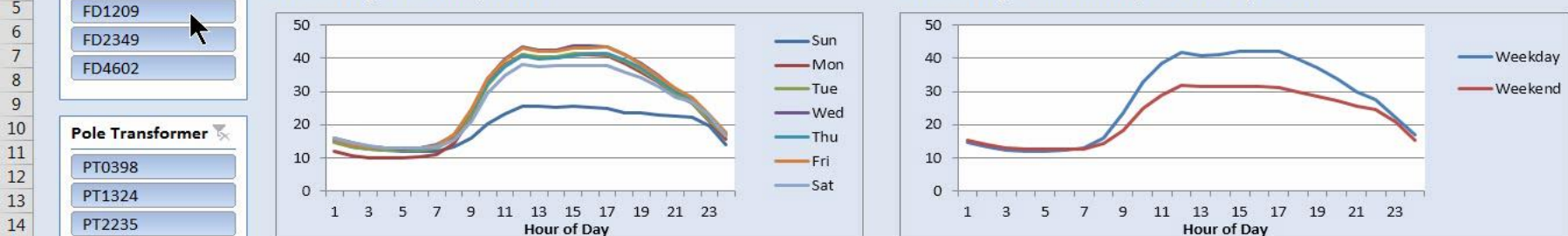
20	PT8356
----	--------

21	PT8461
----	--------

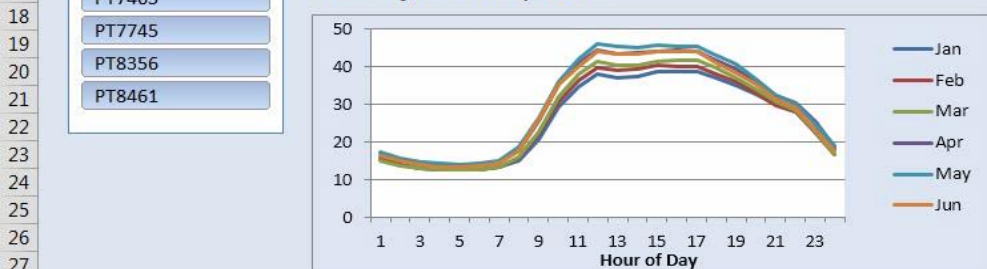
22

[illegible]

Feeder Circuit	W	M	T	F	S	L	W	M	T	F	S	L	W	M	T	F	S	L
----------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



15 PT4537

[illegible]

	Jan	Feb	Mar	Apr	May	Jun
	KWH	KWH	KWH	KWH	KWH	KWH
PT0398	4.4	4.5	5.0	5.3	5.5	5.5
PT1324	3.5	3.6	3.5	4.0	4.1	4.2
PT2235	3.4	3.9	4.1	4.5	4.7	3.1
PT4537	2.8	3.2	3.3	3.7	3.8	3.7
PT7465	3.1	3.2	3.5	3.8	3.9	4.0
PT7745	3.2	3.2	3.1	3.3	3.6	4.3
PT8356	10.6	11.0	11.0	11.7	12.1	11.7
PT8461	3.3	3.3	3.6	3.8	3.8	3.5



# PI Coresight Explore

- **Modern** Web based visualization tool
- Facilitates **ad hoc analysis**
- **Instantaneous learning**
- Software with a **fast release cycle** to fit your needs
- **No client-side installation**

Report

Collaborate

Share

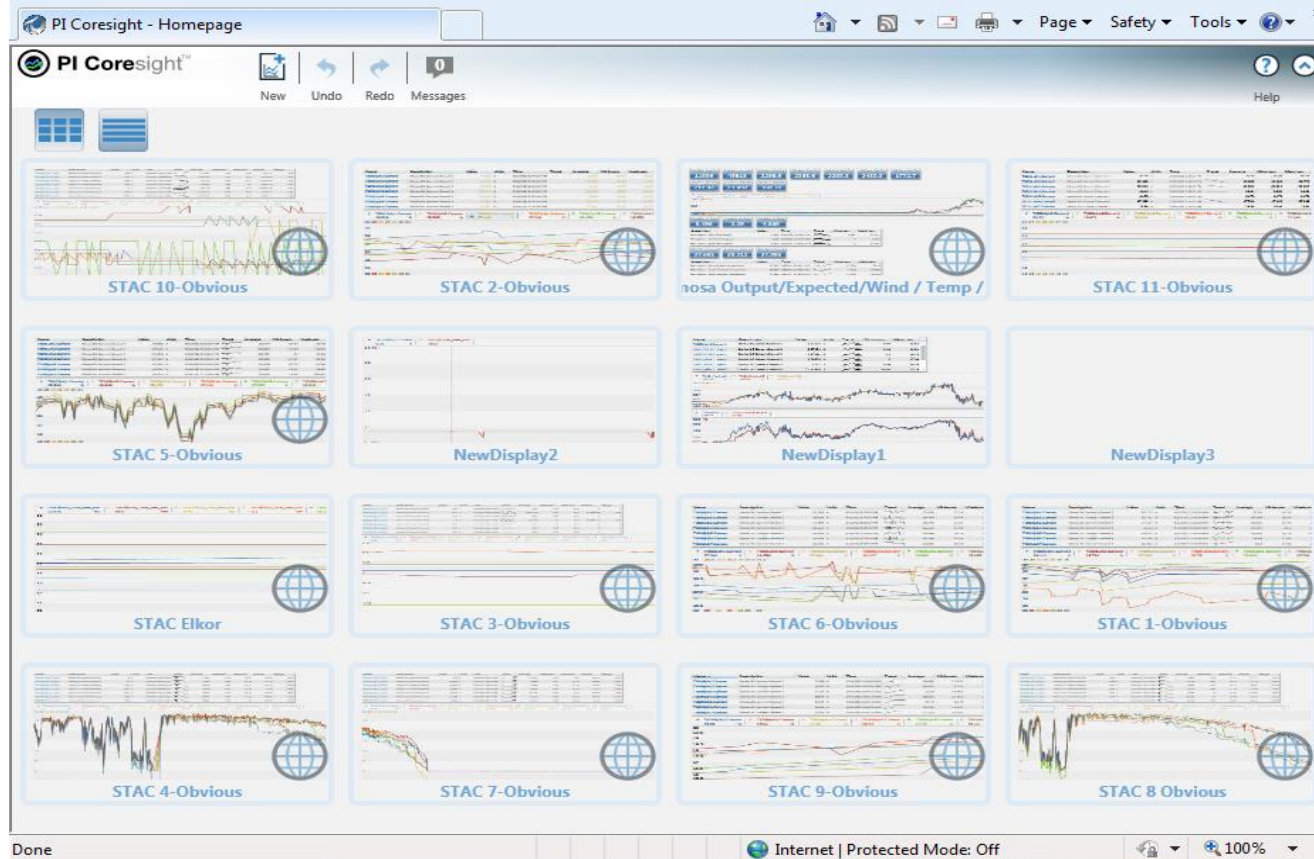
Collect



# Benefits of PI Coresight at AMONIX™

POWERING THE FUTURE NOW™

- **Minimal learning curve**
- **Rapid trend analysis**
- **Leveraging PI AF structure and data**



# Visualization and Mobility



Your needs are evolving:

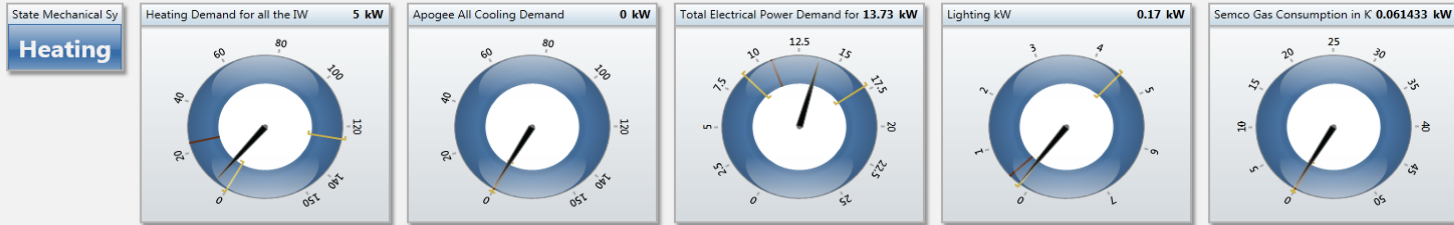
- **Remote** access
- Access at **any time**
- **Self-service** usage

# Mobility and the PI System

- Mobile **PI Coresight** application for the **iPad** and the **iPhone** now available!
  - Native application
  - Free download on the Apple App Store™
  - Test it now with **sample data**

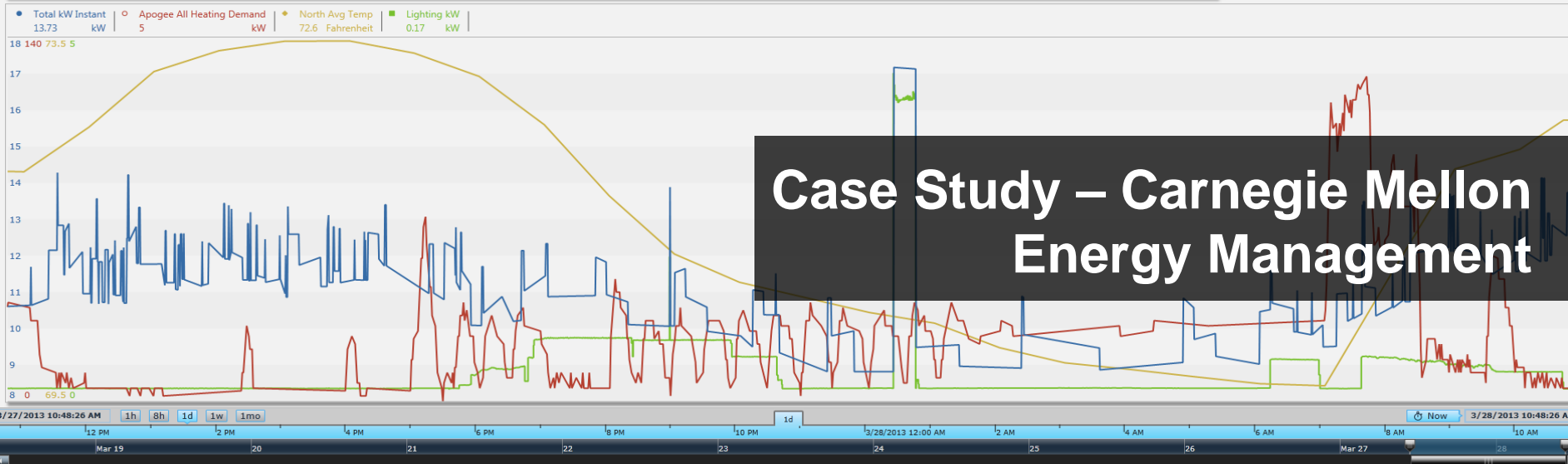






Name	Description	Value	Units	Trend	Average	Minimum	Maximum	StdDev	Range
Apogee All Heating Demand	Heating Demand for all the IW	5	kW		23.64	0	125	21.44	125
Total kW Instant	Total Electrical Power Demand for all IW	13.73	kW		10.77	8.812	17.18	1.402	8.365

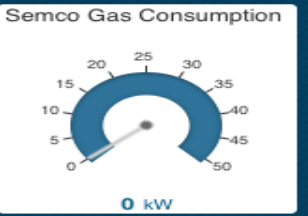
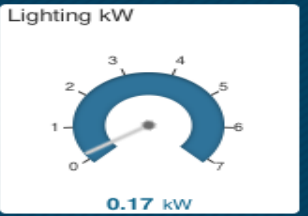
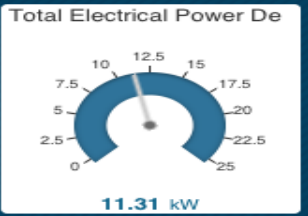
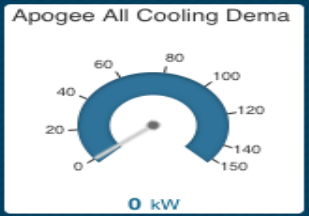
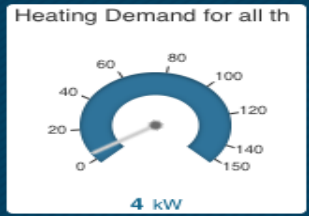
Name	Description	Value	Units	Trend	Average	Minimum	Maximum	StdDev	Range
North Avg Temp	North Average Temperature	72.6	Fahrenheit		71.5	69.7	73.5	1.34	3.79
North IW/North Avg Ill	North Average Illuminance	857.8	Lux		336.3	0	1,469	461.7	1,469





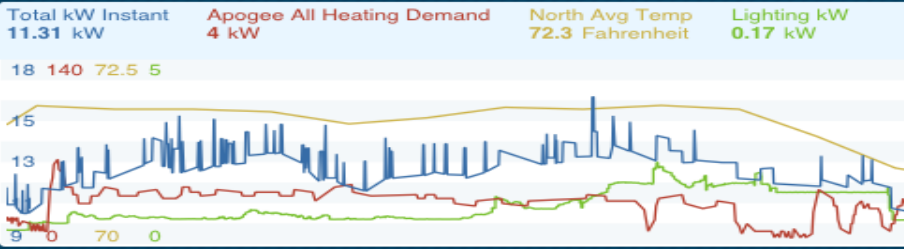
State Mechanical System

# Heating



Name ▲	Description	Value	Units	Trend	Average	Minimum	Maximum
Apogee All Heating Demand	Heating Demand for all the IW	4	kW		28.82	2	124
Total kW Instant	Total Electrical Power Demand for all IW	11.31	kW		11.38	9.497	17.95

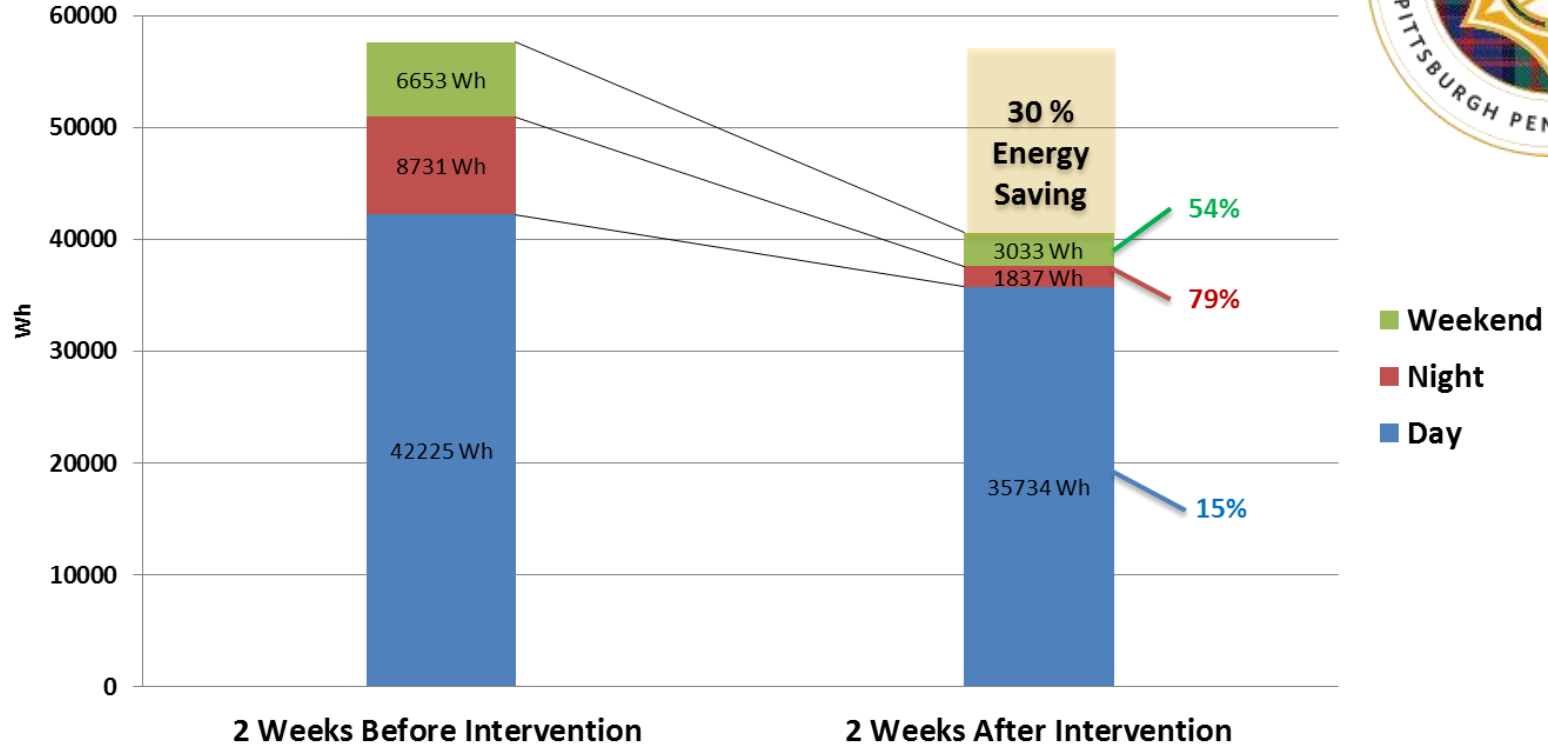
Description ▼	Value	Units	Trend	Average	Minimum	Maximum	StdDev
North Average Temperature	72.3	Fahrenheit		71.2	70.1	72.3	0.622
Daylight Level Apogee	1,418	Lux		22.36	1.500	226.57	



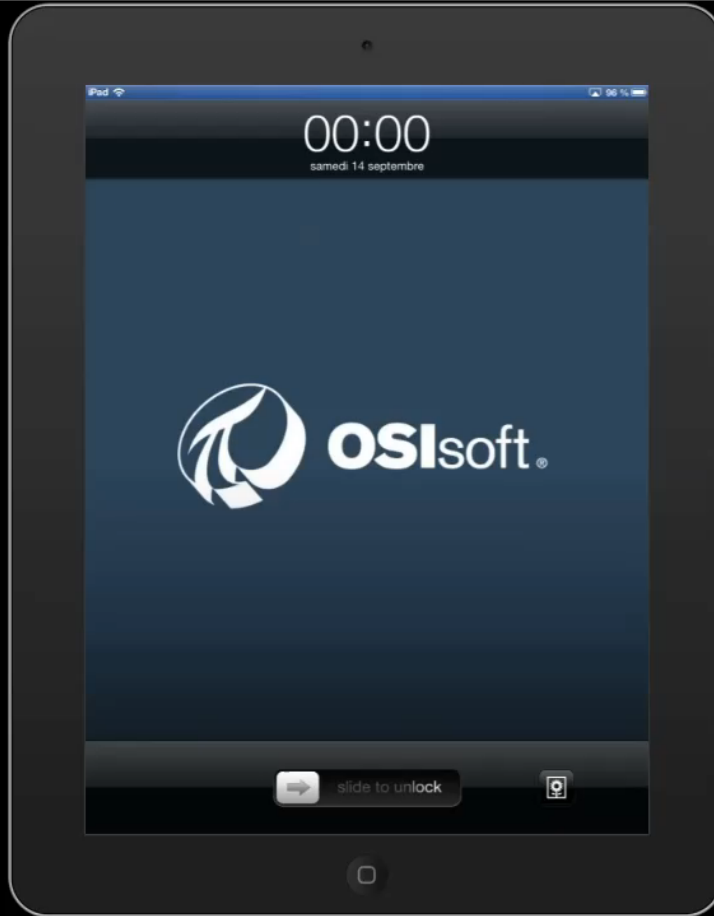
## Case Study – Carnegie Mellon Energy Management

# Case Study – Energy Management

## Energy Savings (CFA n=7)



# Support for iPad and iPhone



# Support the Devices you Use

How can you tell now what every team member  
will use...

tomorrow...

next week...

**especially** next year!



# Collect Data with Different Devices

PI Manual Logger

TOURS

Back

Apr 09 2013 - 12:34:14 pm  
1 / 8 tags

**Pump P250 Temp**  
South Reflux Pump \ Pump1

**Instructions**  
Use the vibration probe to measure the Temperature for Pump P250.

**Value**  
190  
Limits violated: Hi(185)  
H:185 L:155  
Previous value: 184 - Apr 09 2013 - 12:34:14 pm  
> more values

**Timestamp**  
Apr 09 2013 - 12:34:14 pm

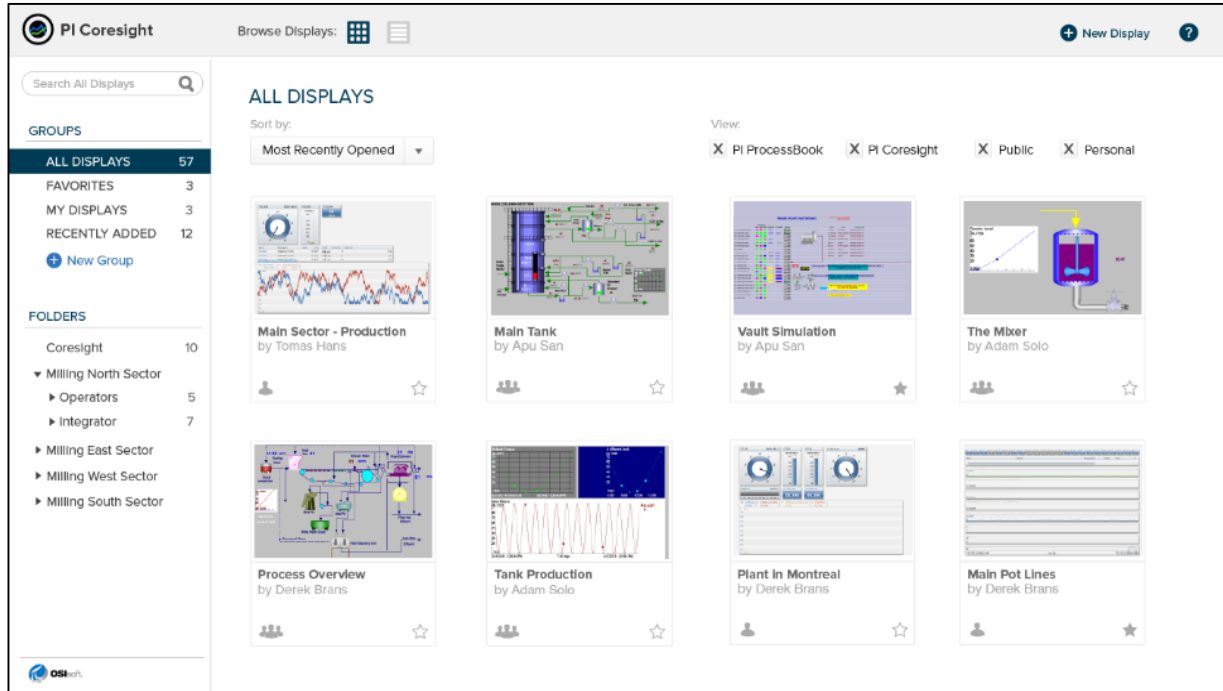
**Comment**

Next / Prev All Missing

- Browser interface is device agnostic
- Simplified screen
- Android phone & tablet
- iPhone and iPad
- Any modern browser (HTML5 support)



# View PI ProcessBook Content on Different Devices



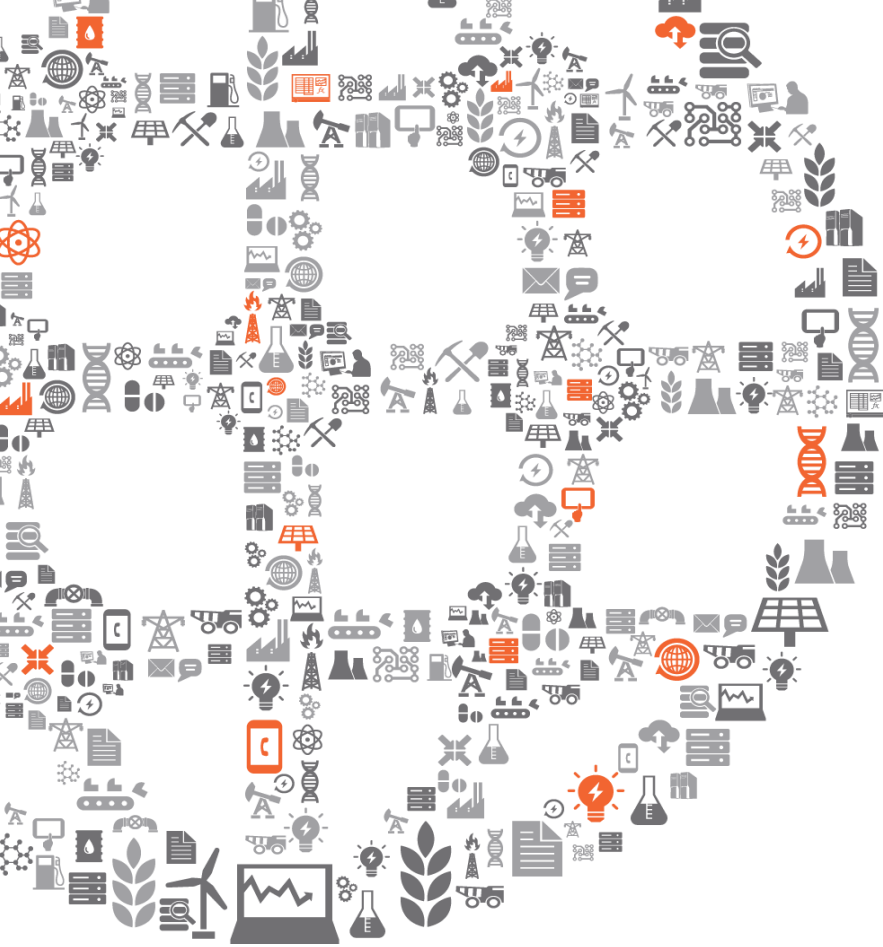
- **Browse PI ProcessBook displays** the same way as PI Coresight
- Any modern browser (**HTML5** support)



# PI Visualization Suite Benefits

- Access to the data in the format you want **reduces the time to insight**
- Access to the data when and where you want **facilitates collaboration and sharing of insights**
- **All** visualization tools to **any** user gives **the right tool** for the job **at the right time**





# Questions

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



State your  
**name &  
company**



# Operational Insights Enterprise Wide





# THANK

# YOU

Brought to you by



# Rami Antoun

[rantoun@osisoft.com](mailto:rantoun@osisoft.com)

Field Service Engineer  
OSIsoft, LLC