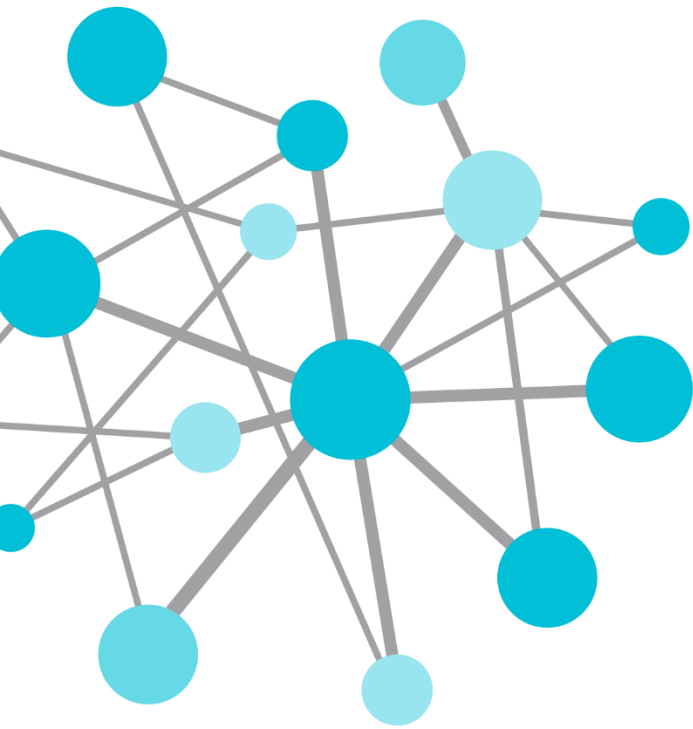
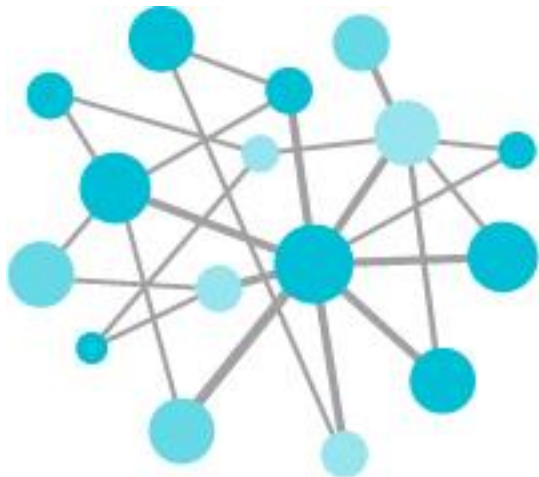




Information on the Spot with Power BI for Office 365 and the PI System

Presented by **Christian Leroux, EPM**



OSIsoft.

USERS 2014 CONFERENCE

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

DECISION READY IN REAL-TIME

Overview

- Real-time Insights
 - Microsoft Power BI
 - PI OData Service
- Demonstration
- Customer Stories
 - Ontario Wind Generation
 - Centrica Energy
 - Carnegie Mellon University

Microsoft Power BI

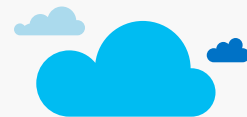
Excel as the BI tool
for everyone



1 Billion
Microsoft Office users

- Discover
- Analyze
- Visualize

Power BI for collaboration
& new experiences



Office 365 is Microsoft's fastest-
growing commercial product ever

- Share
- Ask
- Access

Scalable, Manageable, Trusted

Power BI - Analyzing data with Excel

Discover



Easily discover and access public and corporate data with **Power Query**

Analyze



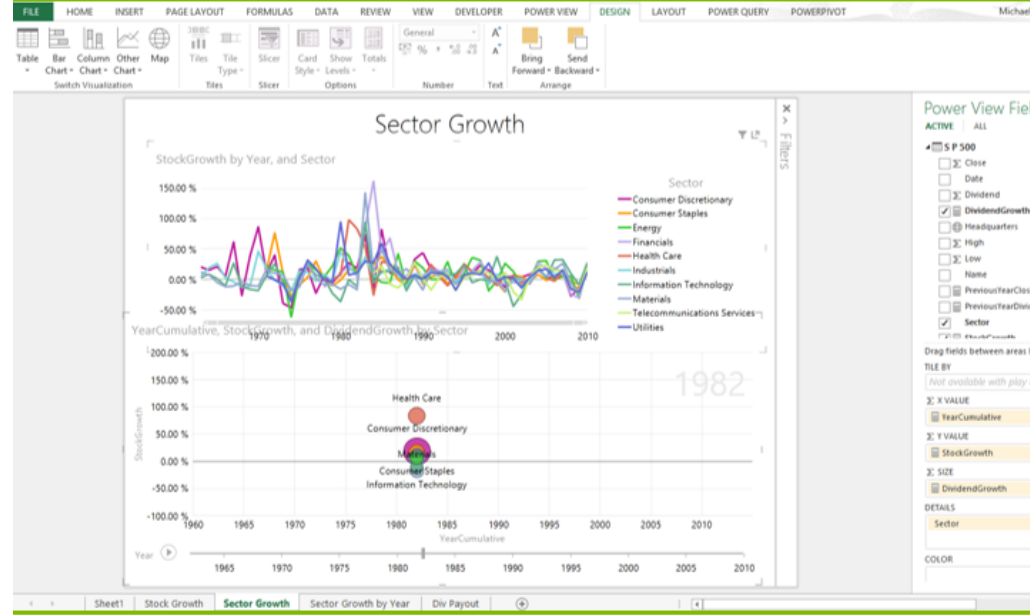
Model & analyze 100's of millions of rows lightning fast with **Power Pivot**

Visualize

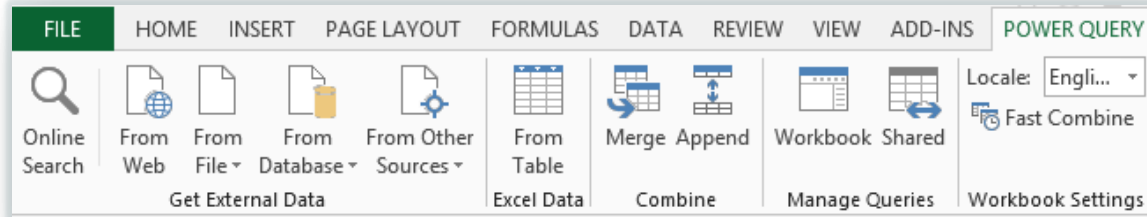


Explore and visualize data in new ways with **Power View** and **Power Map**

Explore your data with interactive visualization

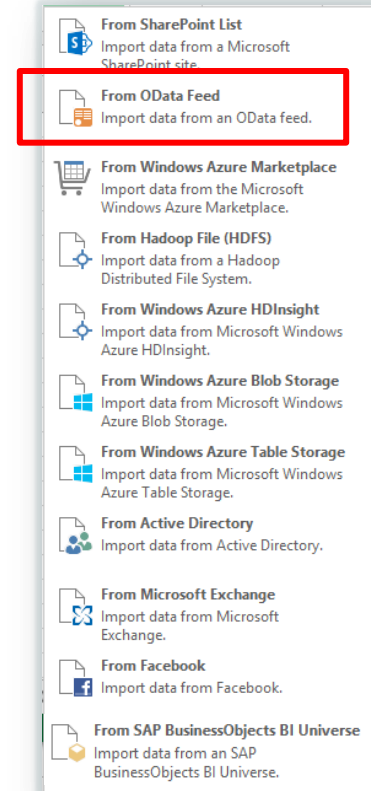


Power Query for Excel 2013

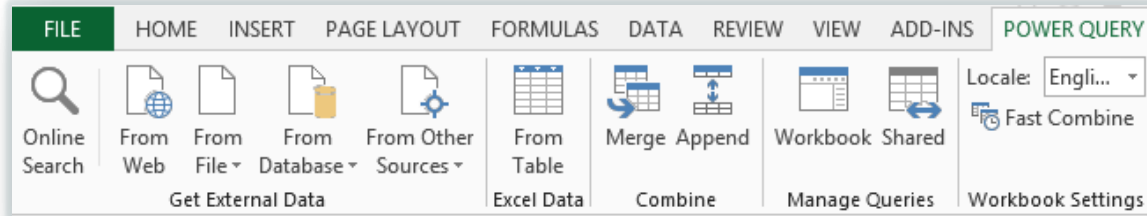


Free Add-In for Excel 2013

- Access to useful data sources;
 - Popular relational databases
 - Hadoop, SAP BusinessObjects, Microsoft Exchange, Facebook, etc.
 - OData Feeds, like the PI OData feature of the PI Web API.

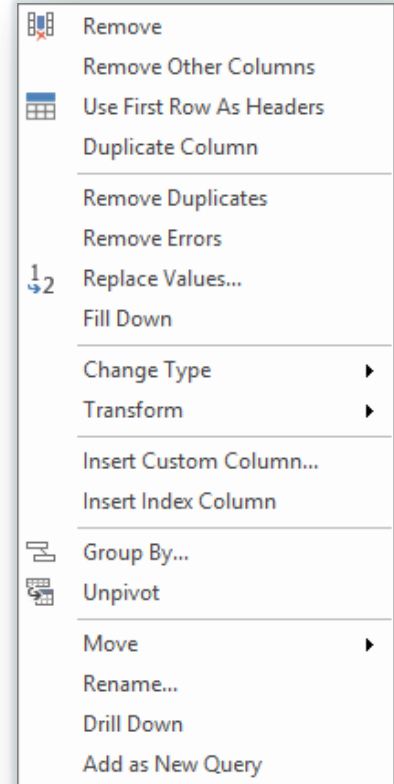


Power Query for Excel 2013



Free Add-In for Excel 2013

- Shape datasets for Power View analysis;
 - Remove columns and filter rows
 - Insert calculated columns
 - Reformat text and numeric data
 - Append and merge
- Author and share of scripted queries in Power BI for Office 365.



PI OData Service

CTP available on vCampus

- Connect to PI Asset Framework (PI AF) by URL.
- Easy navigation to PI AF attribute data by element template.
- Dataset types
 - Snapshot
 - Archive
 - Interpolated
 - Summaries

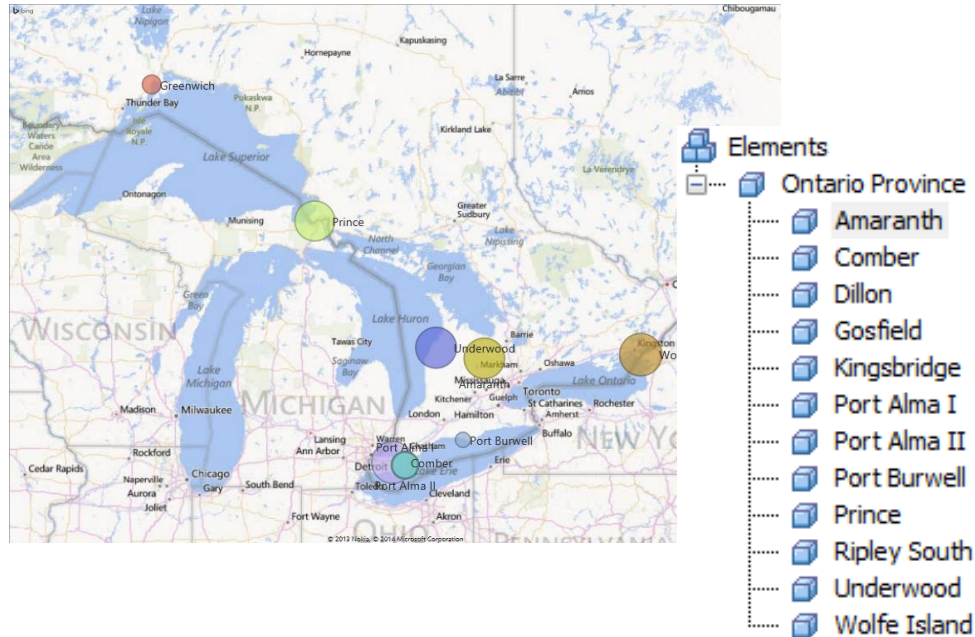
<http://localhost/PIOData/WindFarms/T>

The screenshot shows a web application interface. On the left, a table titled 'SiteInterpolations' displays data for various time intervals. The table has four columns: Time, GenerationPrediction, Generation, and Humidity. The data rows show values for 2/23/2014 from 12:00:00 AM to 8:00:00 AM. On the right, a 'Navigator' sidebar lists several data categories, with 'SiteInterpolations' currently selected and highlighted in green. Above the navigator is a checkbox for 'Select multiple items' and a URL field showing 'http://localhost/piodata/windfarms/t'. Below the table, a 'Columns [17]' section lists available attributes: StartTime, EndTime, TimeStep, SiteID, SiteName, Time, GenerationPrediction, Generation, Humidity, Latitude, Longitude, Temperature, WindDegrees, WindSpeed, WindDirection, Capacity, and Site.

Time	GenerationPrediction	Generation	Humidity
2/23/2014 12:00:00 AM	93.036072	14.408216	92
2/23/2014 1:00:00 AM	90.036072	14.143168	92
2/23/2014 2:00:00 AM	74.036072	13.878119	92
2/23/2014 3:00:00 AM	55.536076	13.613071	92
2/23/2014 4:00:00 AM	39.036076	13.348023	92
2/23/2014 5:00:00 AM	26.036074	13.082975	94
2/23/2014 6:00:00 AM	13.022457	12.817926	94
2/23/2014 7:00:00 AM	8.022457	12.552878	94
2/23/2014 8:00:00 AM	9.522457	12.28783	94

Columns [17]
StartTime, EndTime, TimeStep, SiteID, SiteName, Time, GenerationPrediction, Generation, Humidity, Latitude, Longitude, Temperature, WindDegrees, WindSpeed, WindDirection, Capacity, Site

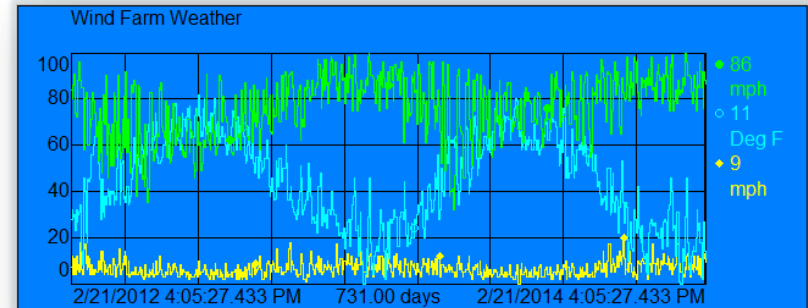
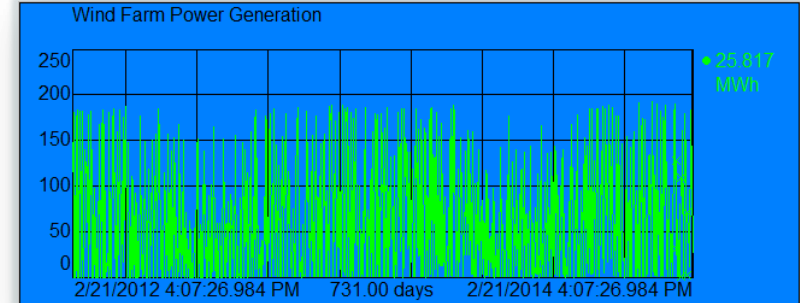
Example - “Ontario Wind Generation”



Data Sources:

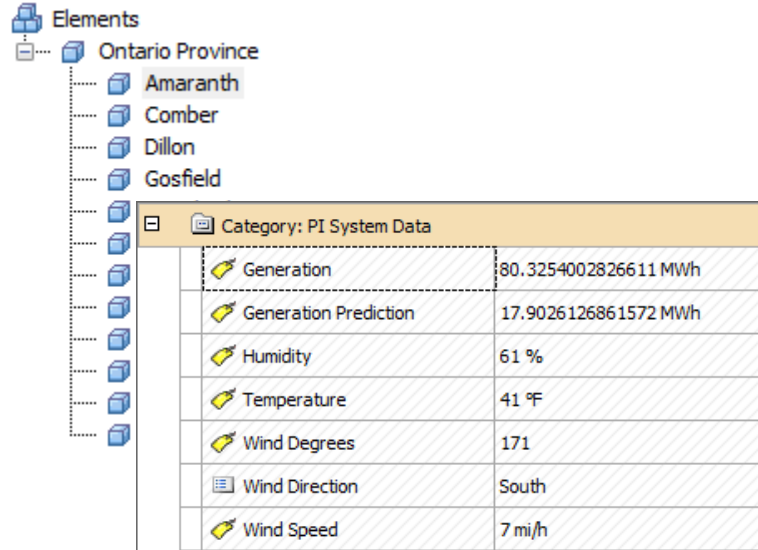
Ontario Power Generation: www.ieso.ca

Weather Underground: www.wunderground.com

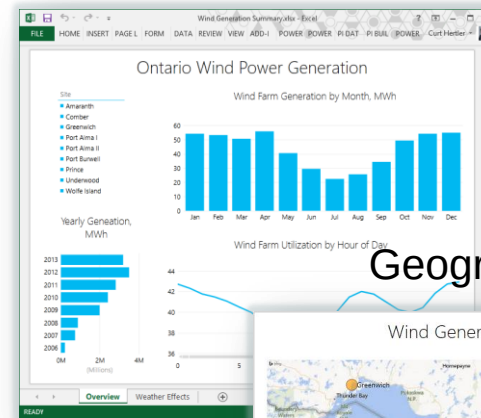


Power View in Excel 2013

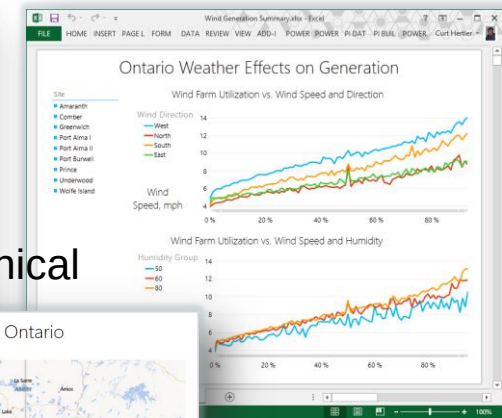
PI AF



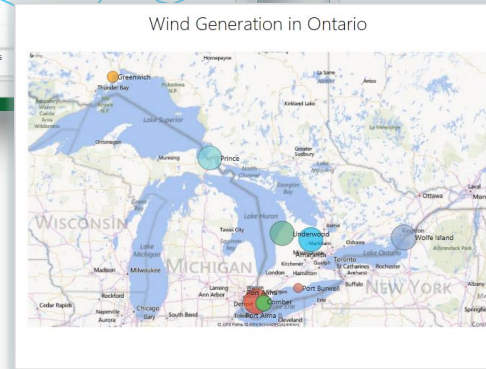
Overview



Weather Effects



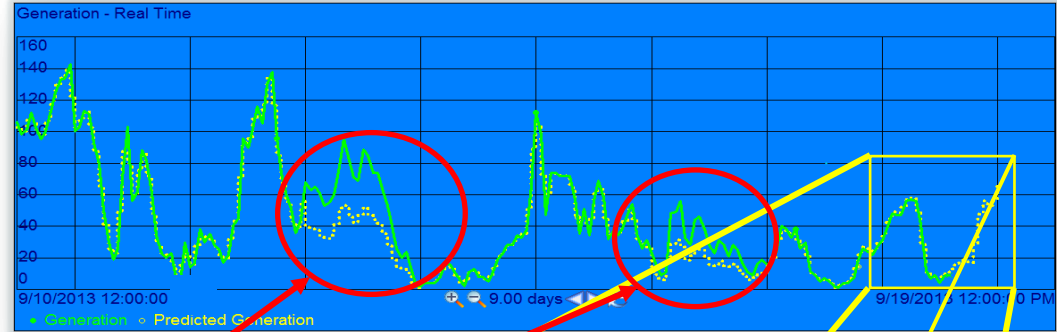
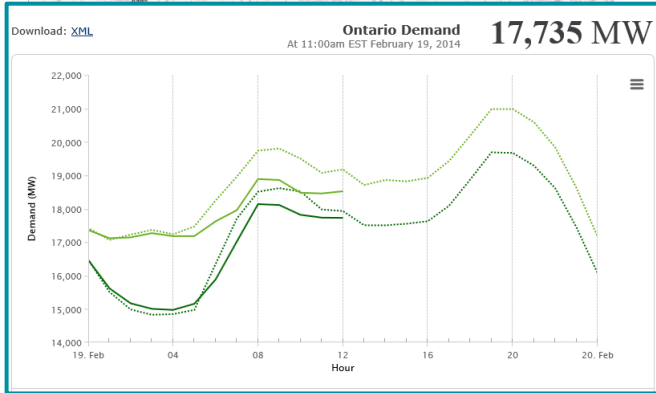
Geographical



PI Data Access

Example - “Improving Predicted Generation”

Future Data coming in PI System 2015



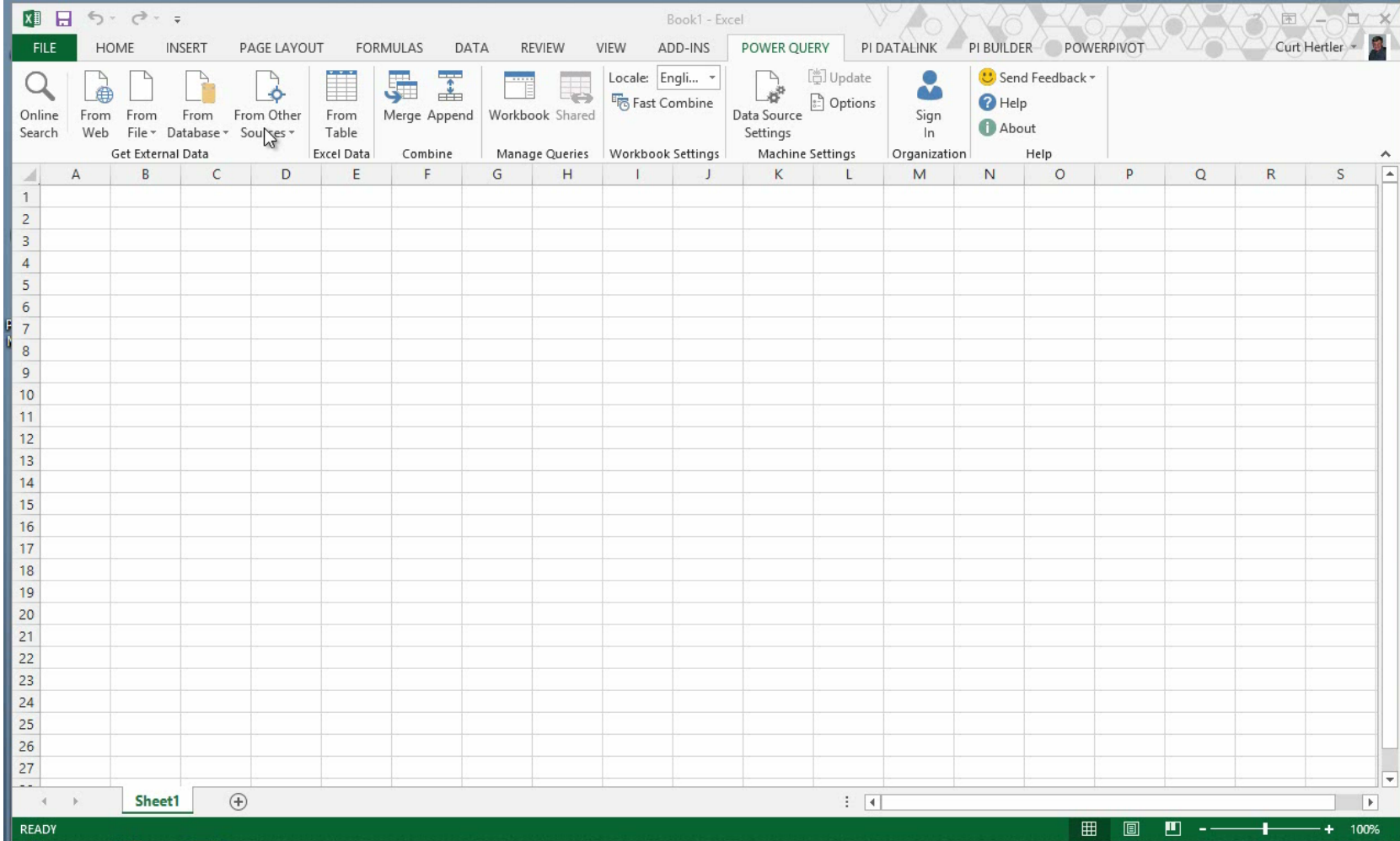
Prediction
Errors

Weather Effects ?

Predicted Wind speed – turbine velocity
Wind direction - geography
Temperature - mechanical
Humidity - air density



DEMO



BI Sites - Quickly create collaborative BI sites

Office 365 Outlook Calendar People Newsfeed OneDrive Sites Tasks Power BI Admin

OSIsoft, LLC Team Site

Power BI

Ask with Power BI Q&A

Featured reports

Big Horn Basin Substation
Monthly Totals
Hourly Feeder Distribution, kWh
Demand Profile
Prabal Acharya | Updated: May 13 2014 3:26 PM

Hawaii - Predictive Analysis
Volume by Date, Month
Prabal Acharya | Updated: May 9 2014 2:42 PM

Redmond Campus Energy Map
Main Campus North Campus West Campus
Redmond CityScale
Dave Doll | Updated: Mar 11 2014 1:10 PM

Energy Usage Index
Energy Use Index by Category and KPI Description
KEYNOTE CityScale San Diego (A)
Dave Doll | Updated: Mar 18 2014 11:22 AM

Energy Use per LEED
Energy Use per LEED
Pittsburgh Building Information
David Doll | Updated: May 13 2014 1:06 PM

Featured questions

Show substation energy by age group.

What is the total bbf by time, site and product as line chart?

Show KWH by Pole Transformer

show KWH by month by pole transformer on map

Documents

Airport

Golden Gate

Special

CityNext

MSFT Puget Sound Campus

CMU

Power and Utilities

Savemill Production
Savemill Production
Curt Hartler | Mar 27 2014 8:17 AM

Compressor Performance
Compressor Performance
Curt Hartler | Jan 7 2014 9:21 AM

Gas Well Production
Gas Well Production
Curt Hartler | Apr 10 2014 11:56 AM

Operation to Plan
Operation to Plan
Curt Hartler | Sep 5 2013 11:50 AM

Operating Event Benchmarking Summary
Operating Event Benchmarking Summary
Curt Hartler | Jun 10 2014 5:50 AM

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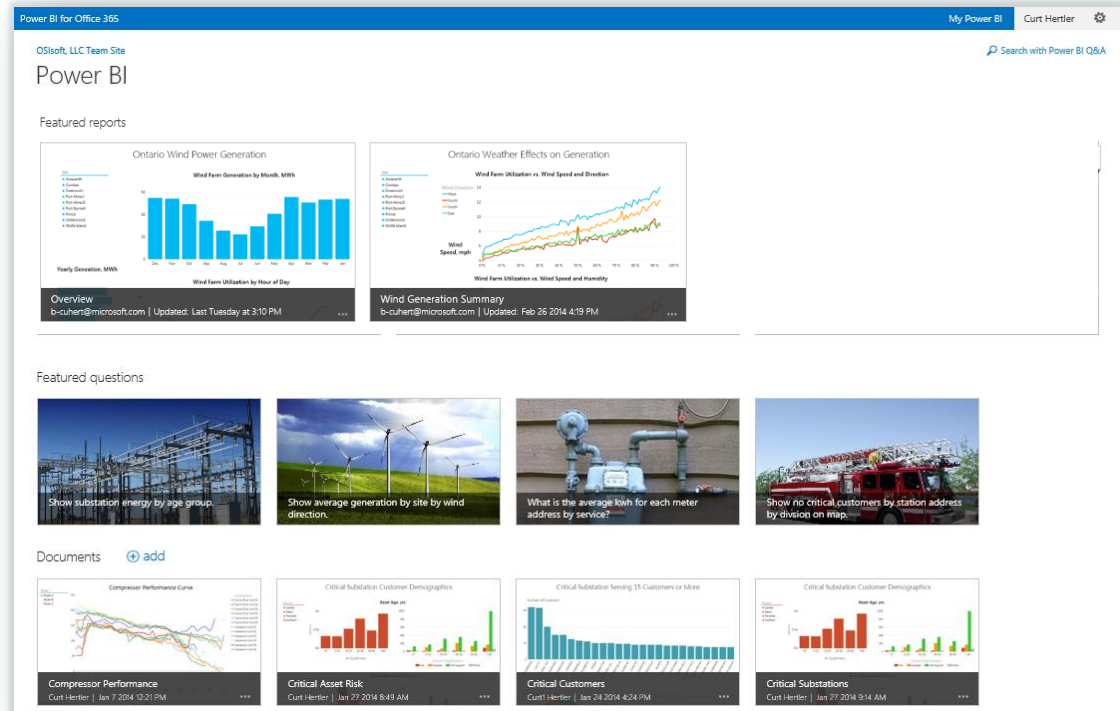
© Copyright 2014 OSIsoft, LLC.

14

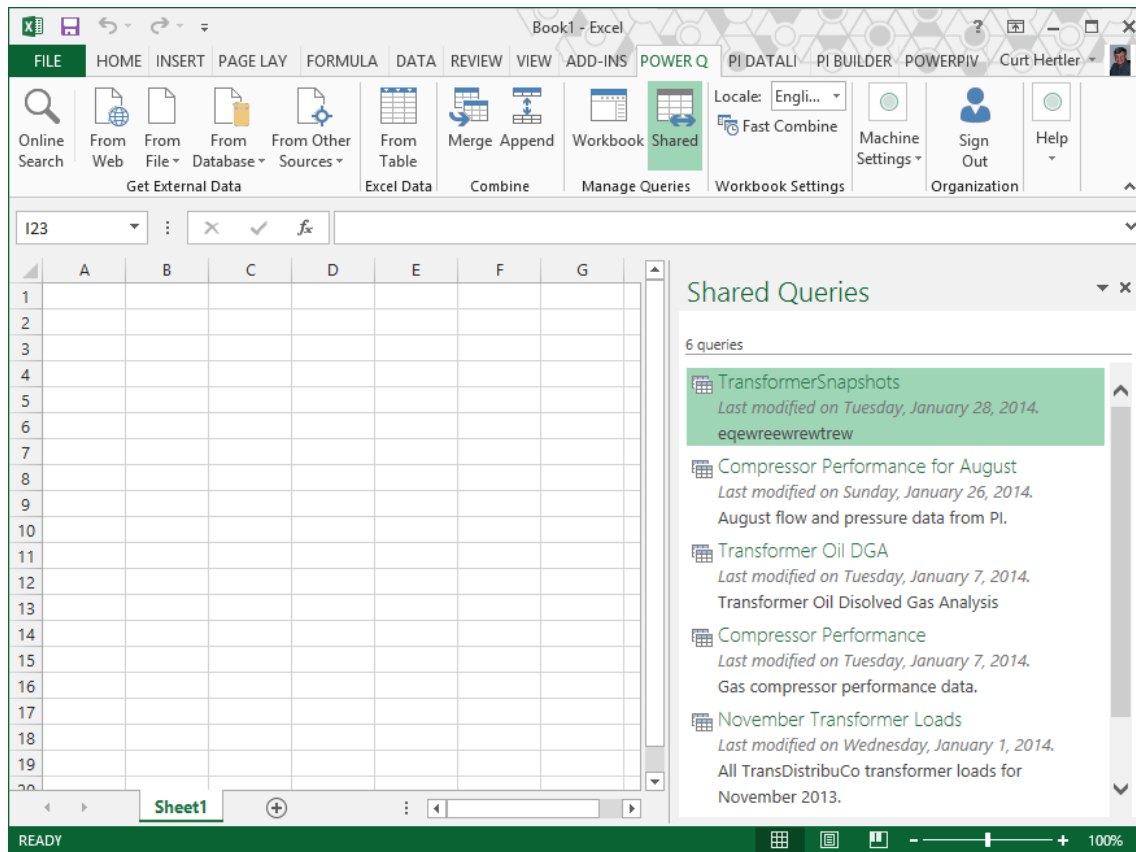
Power BI for Office 365

BI functionality for Office 365

- Natural language queries
Power BI Q&A
- Query sharing
 - Power Query for Excel 2013
 - PI Web API – OData Feature
- Mobile data analysis
Power BI App
- Scheduled data refresh



Sharing Queries in My Power BI





DEMO

Book1 - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ADD-INS POWER QUERY PI DATALINK PI BUILDER POWERPIVOT Curt Hertler

Online Search From Web From File From Database From Other Sources From Table Merge Append Workbook Shared Local: Engli... Fast Combine Data Source Settings Update Options Sign Out Send Feedback Help About

Get External Data Excel Data Combine Manage Queries Workbook Settings Machine Settings Organization Help

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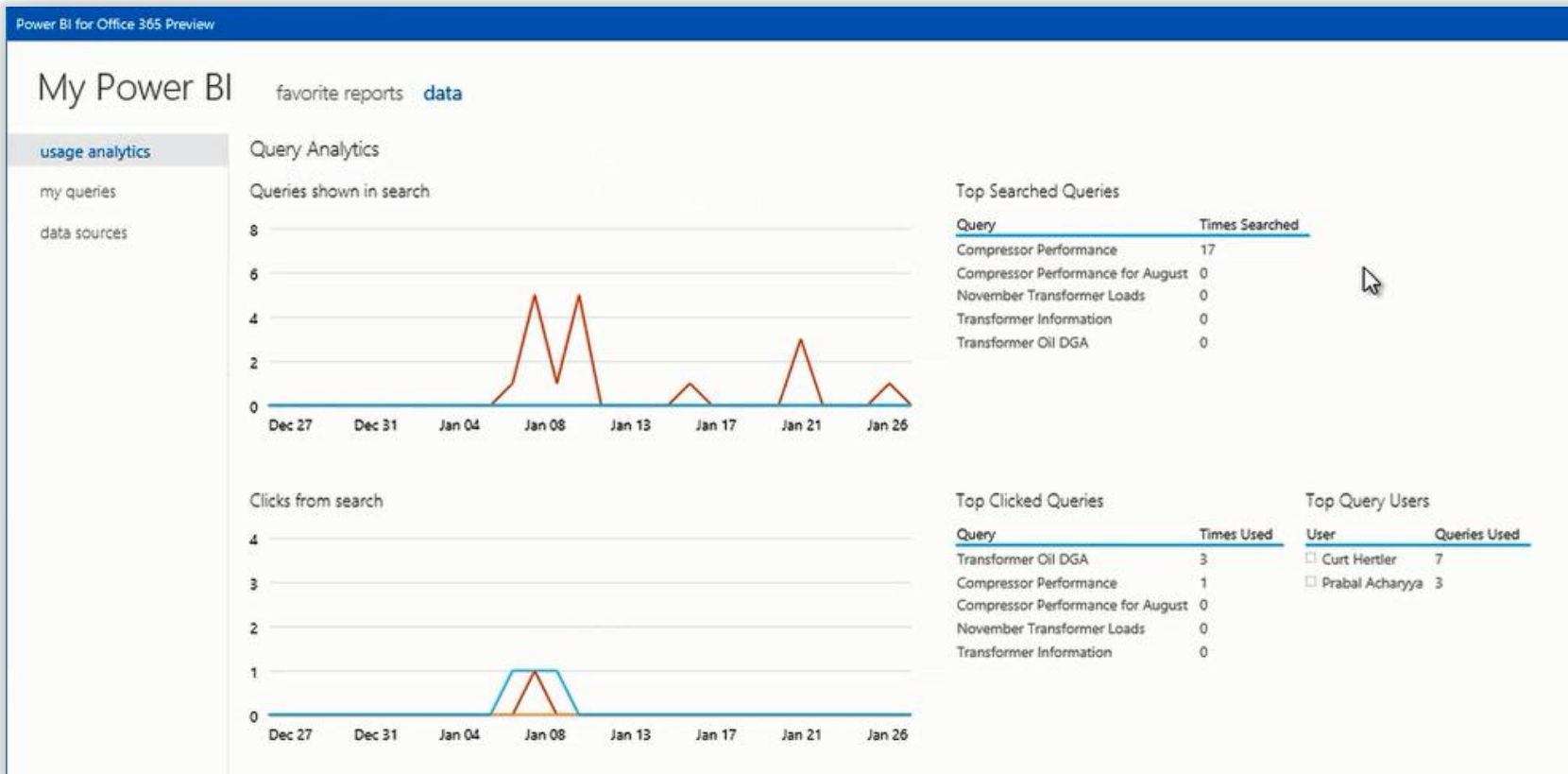
Sheet1

Workbook Queries

1 query

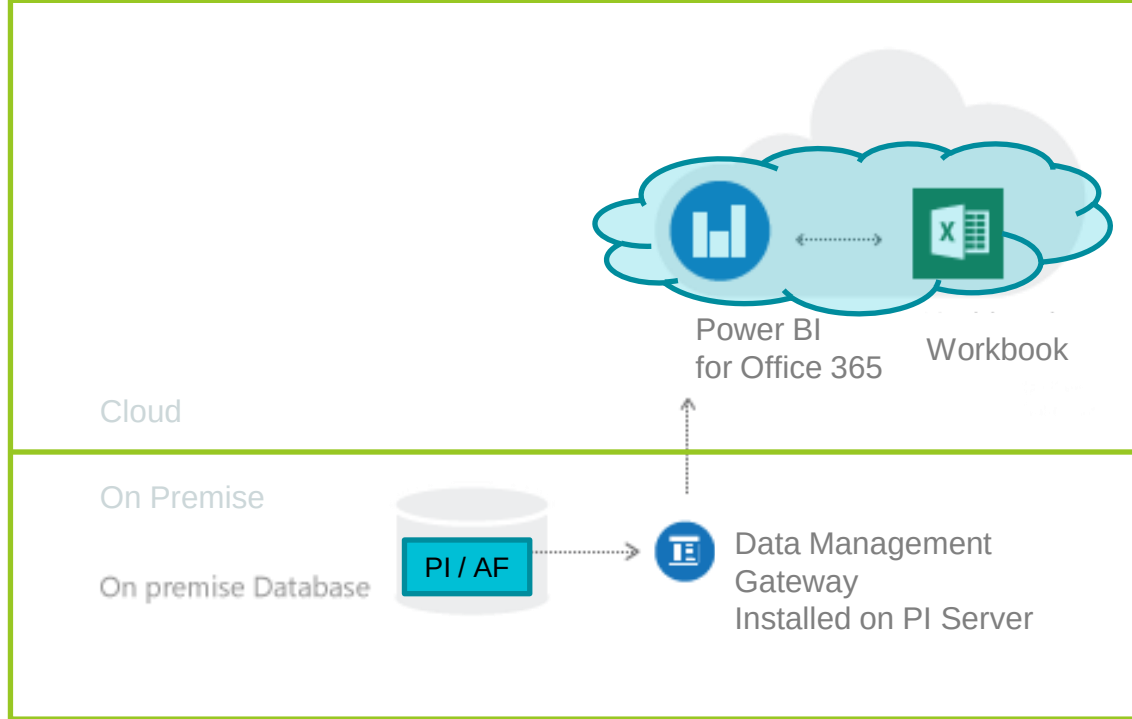
SiteInterpolations
Last updated at 5:10 PM.
61,356 rows loaded.

Sharing Queries in My Power BI



Data Refresh

Keep reports up to date with scheduled data refresh



Office 365

1

Outlook

← Feeder Loading.xlsx

history [settings](#)

Refresh schedule

ON



1. Select data connections in the Data Model to refresh

☒ PI AF

2. Configure refresh schedule

Frequency Daily

Ends by 12/01/2014

As close as possible to Set time

(UTC-08:00) Pacific Time (US & Canada)

3. Send notifications to

curt@osisoft.com;

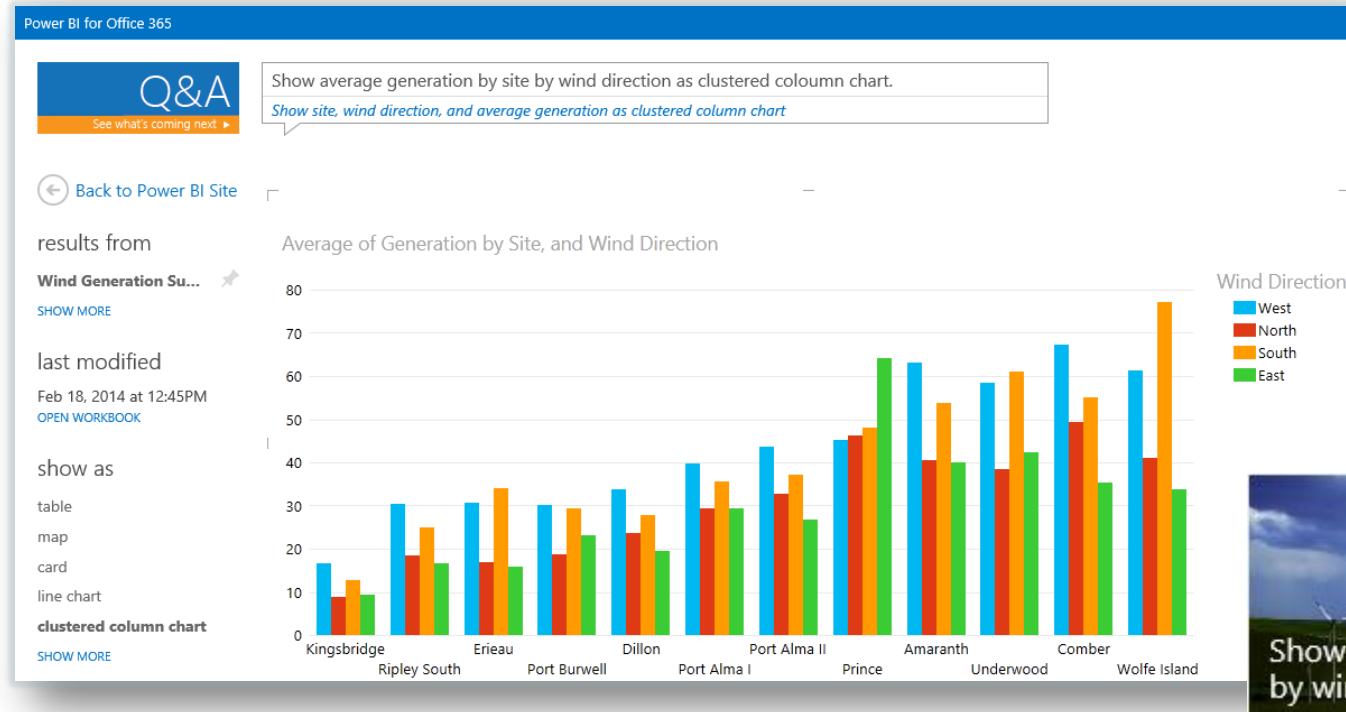
save and refresh report

save settings

discard changes

Power BI Q&A

“Show average generation by site by wind direction as clustered column chart.”



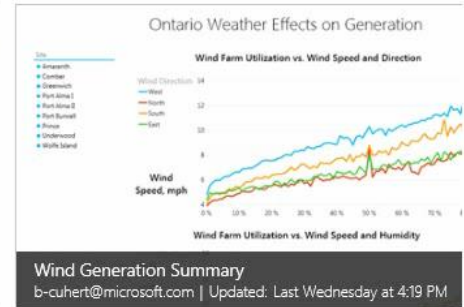
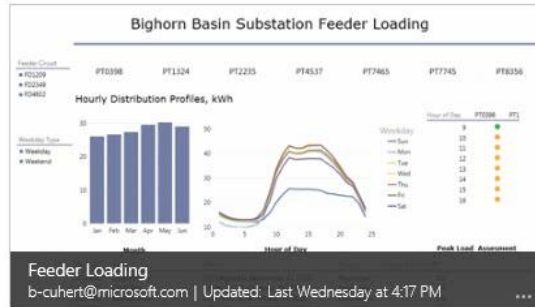
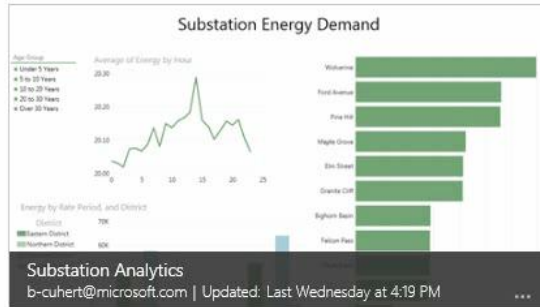


DEMO

b-cuhert@microsoft.com

Power BI

Featured reports



Featured questions

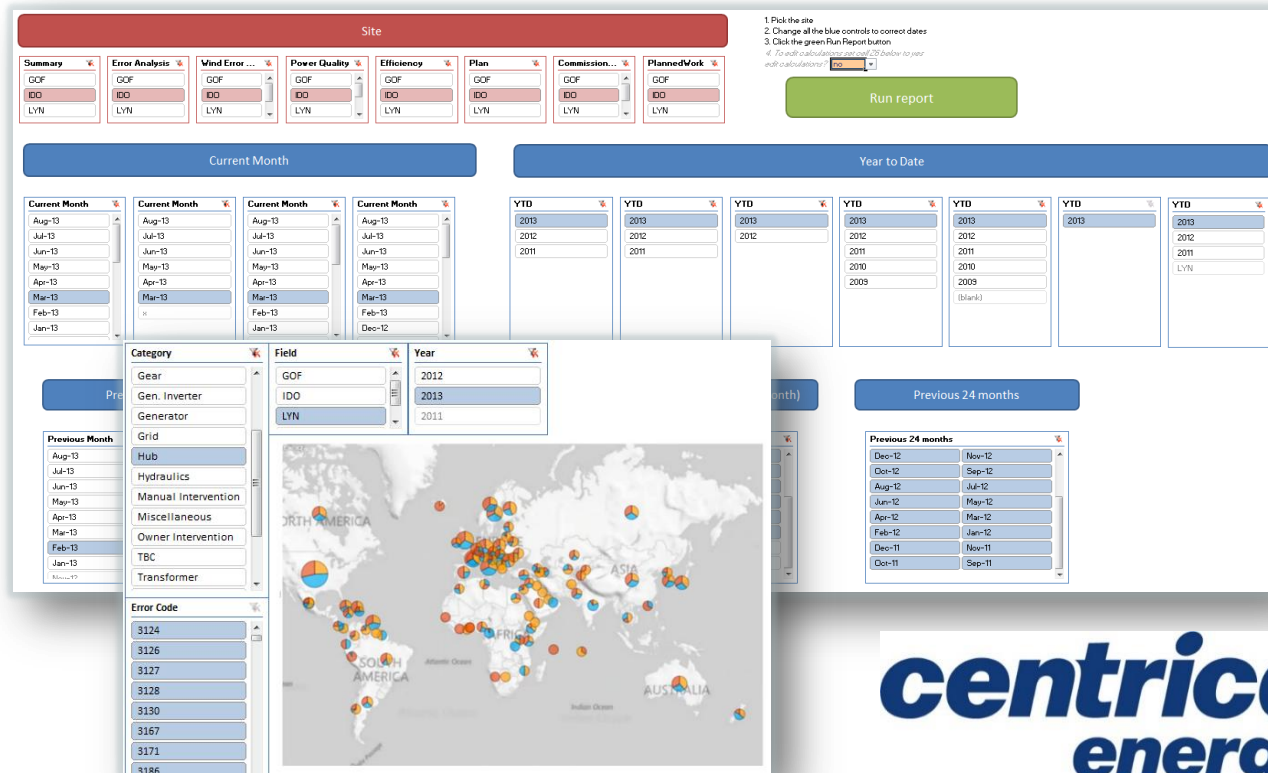


Sustainable “Decision Ready” Reporting

Centrica Energy

Asset Performance

- Expanding wind business by 10 fold.
- Configured concise, scalable reports based on PI AF using PowerPivot for Excel.
- Eliminated 199,000 custom calculations in Excel.



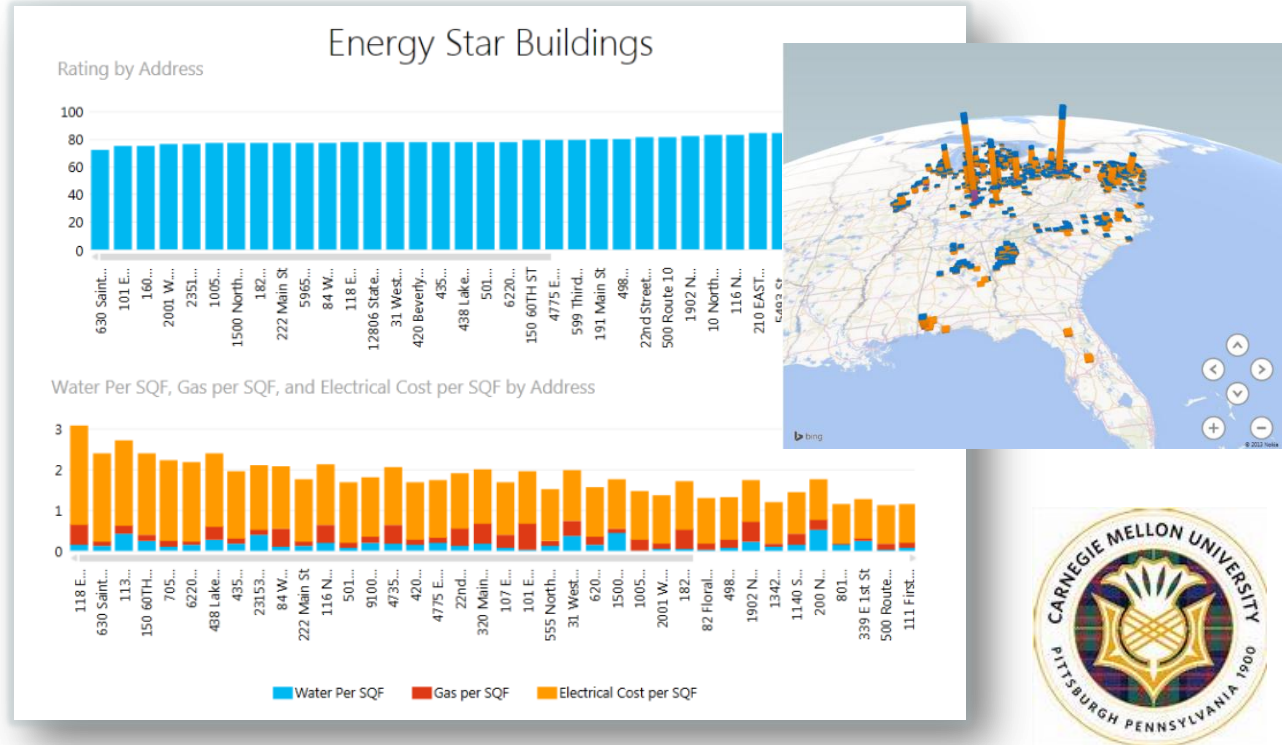
centrica
energy

Less time to “Decision Ready”

Carnegie Mellon University – School of Architecture

Asset Management

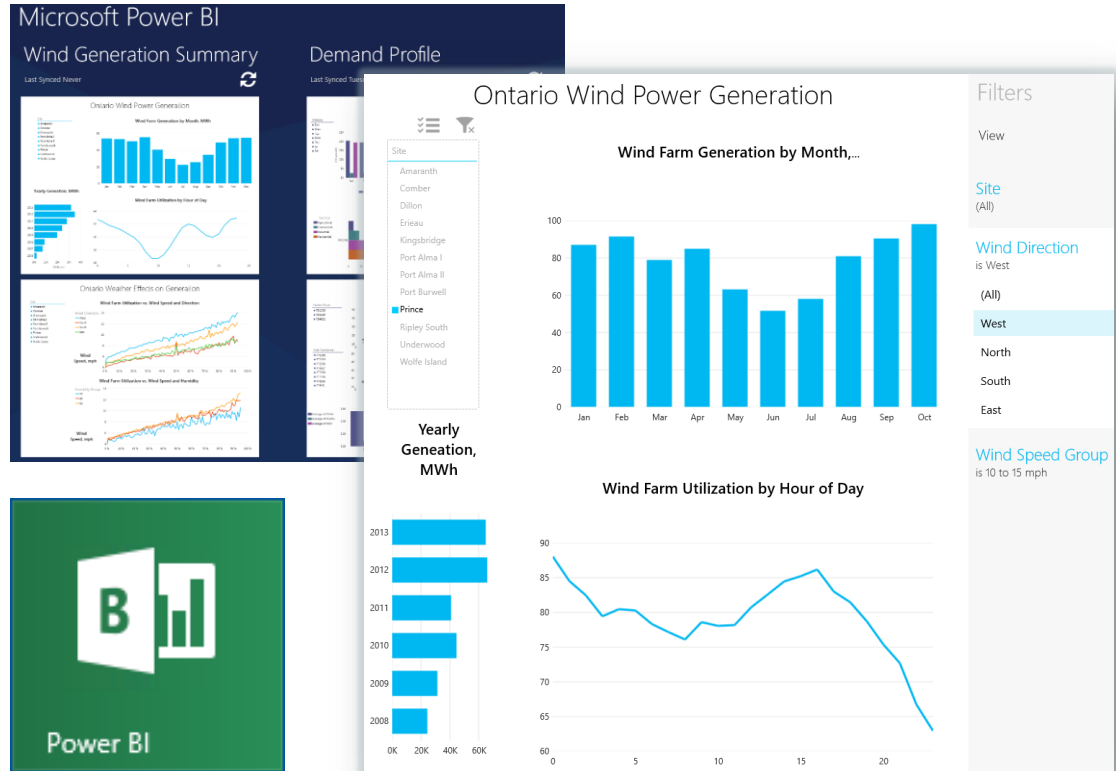
- Utility usage and costs for 1600 branch offices.
- Rapid delivery of analytical reporting.
- Increased the value of the data.



Power BI – Windows 8 App

Analyze Data Anywhere

- Free app on Windows Store
- Displays Power View reports posted in SharePoint for Office 365
- Supports most Power View visuals
- Exposes view filters for additional analysis



Additional Information

OSIsoft Resources

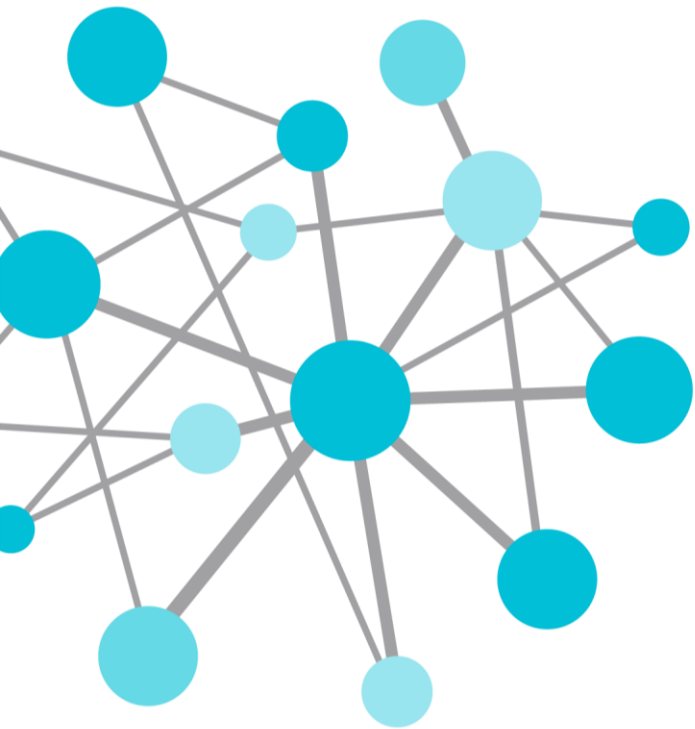
- Product & Partner Expo –BI Demonstration Pod
- “Enabling the PI Data Scientist” – Friday Training Day 9:30 – 11:00
- For Everyone learning.osisoft.com
- For OSIsoft vCampus Members vcampus.osisoft.com
 - “Builders' Café Webinar Series: Preview of PI Web API” – OSIsoft vCampus
 - PI Web API – CTP available on OSIsoft vCampus
- For EA Customers, contact your EPM

Christian Leroux

cleroux@osisoft.com

Enterprise Program Manager

OSIsoft España SL



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this session

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#UC2014

