OSIsoft.

REGIONAL SEMINAR 2012

U · S · A

The Power of Data

Operational Insight: Using Self-Service Technologies to Do More with the PI System

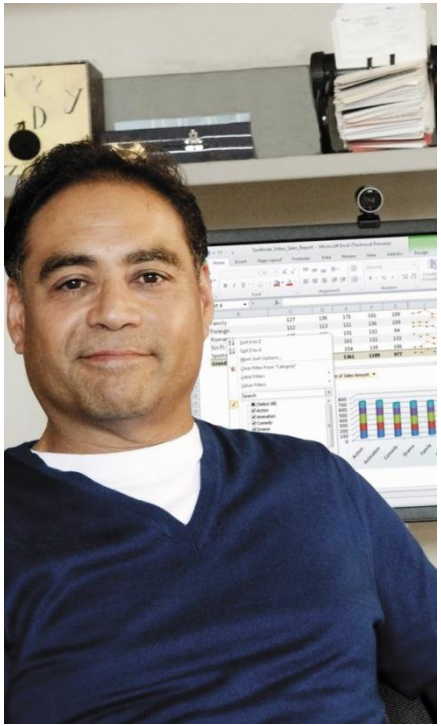
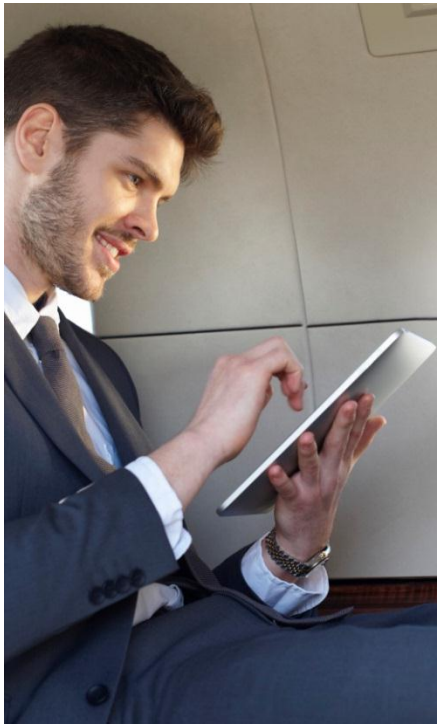
Presented by **Scott Robertson, OSIsoft**

Center of Excellence Engineer

Overview

- Business Analytics Toolkit
- Example: “Substation Power distribution Profile
  - Business Context – PI Asset Framework (PI AF)
  - Data Access – PI OLEDB Enterprise
  - Analytic Reporting – PowerPivot for Excel 2010
  - Ad Hoc Analytics and Reporting – Power View
- ***Coming soon!*** Excel 2013
- Additional Resources

The Way People Experience Data

Seamless Transition Across BI Spectrum

Personal BI	Team BI	Organizational BI
Empowered		Aligned
My Context	**Our Context**	**The Org's Context**
BI solution created by user. Context is only for user & exists as document.	BI Solution created by power user. Context is for a small team & it's managed on a server.	BI Solution created by IT, Established corporate context & is reusable, scalable and backed up.
		
PowerPivot For Excel	PowerPivot For SharePoint	Analysis Services

Business Analytics Toolkit

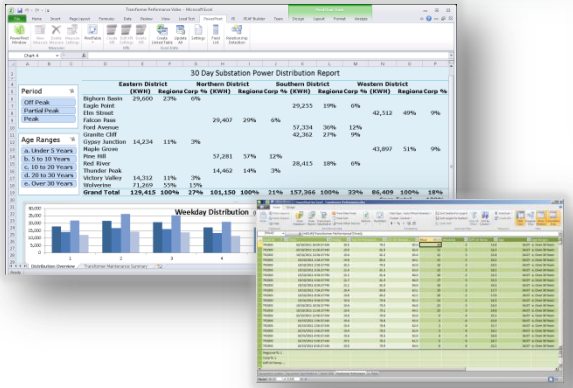
OSIsoft. | Microsoft

Microsoft® Excel® 2010

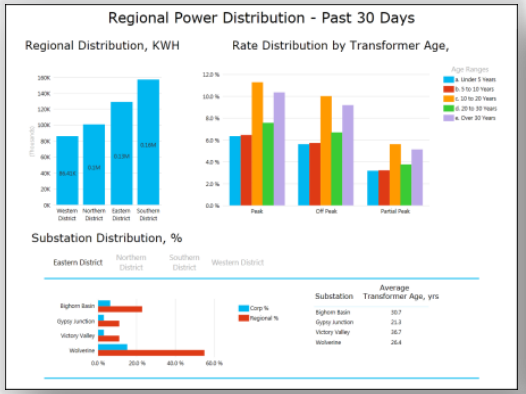
Microsoft® SQL Server® 2012 Business Intelligence

Microsoft® SharePoint® 2010 Enterprise

OSIsoft.
PI Server
PI OLEDB Enterprise

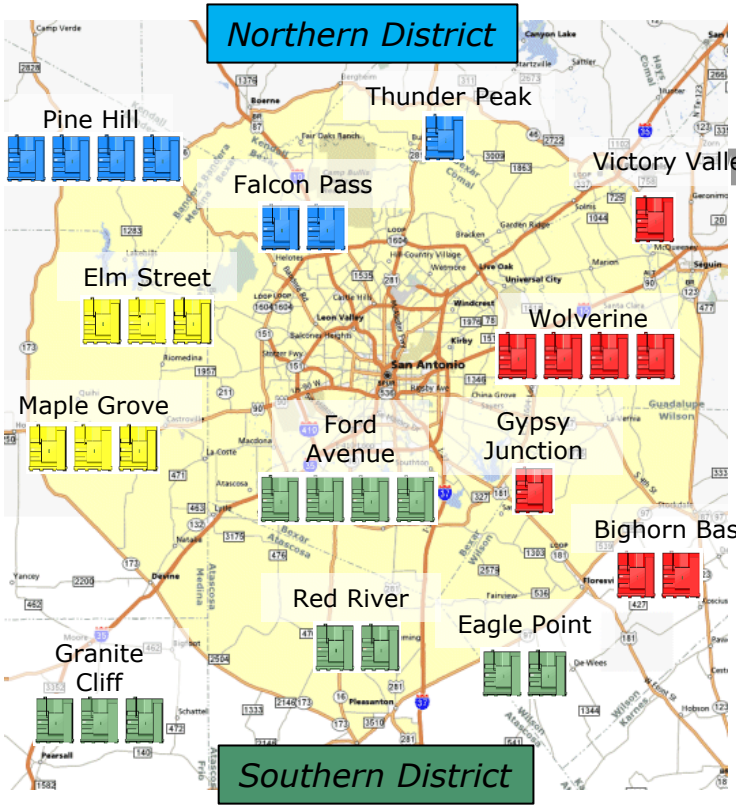


PowerPivot for Excel 2010



Power View

Example: Substation Power Distribution Profile



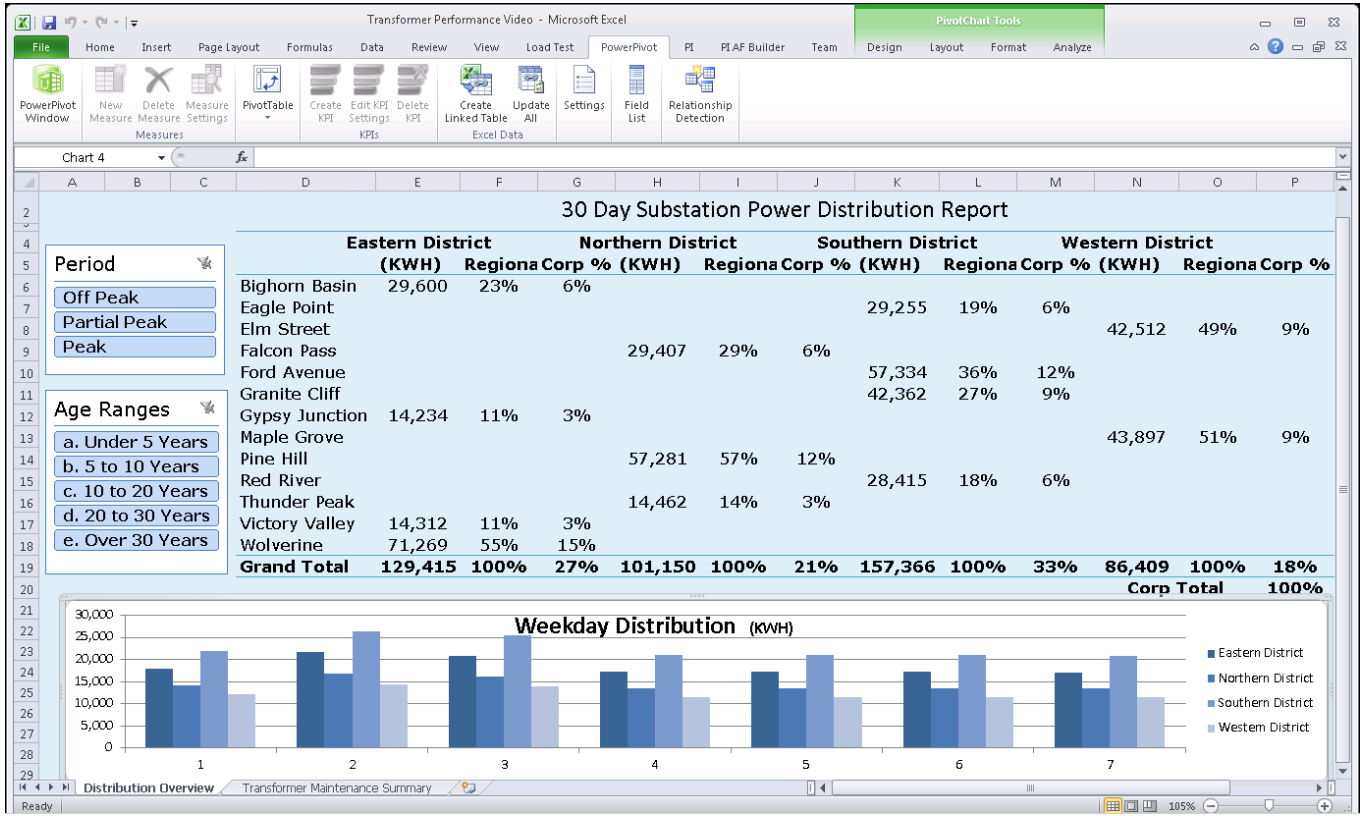
y Objectives

Regional and Rate
Power
tion

Aging Asset Risk Assessment

Want to do it myself !

PowerPivot for Excel 2010



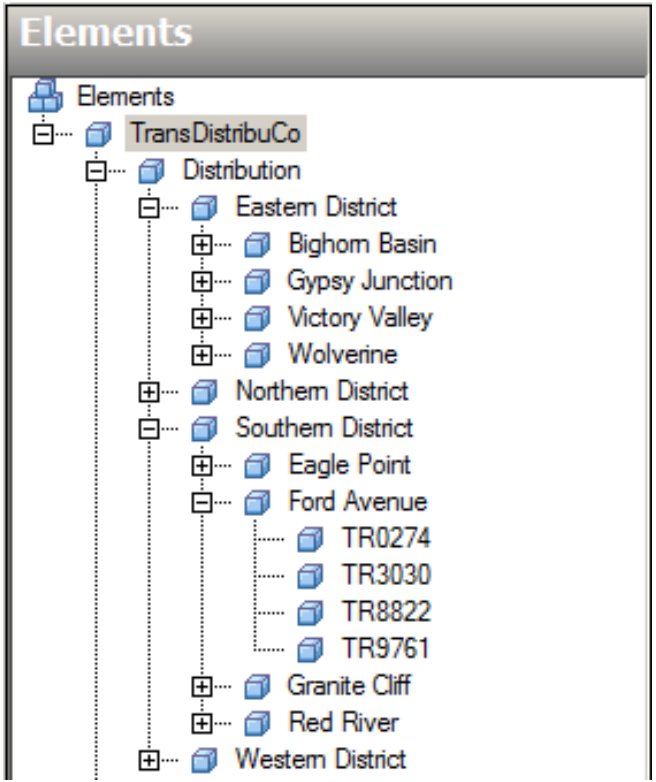
	Eastern District (KWH)	Regiona	Corp %	Northern District (KWH)	Regiona	Corp %	Southern District (KWH)	Regiona	Corp %	Western District (KWH)	Regiona	Corp %
Bighorn Basin	29,600	23%	6%									
Eagle Point							29,255	19%	6%			
Elm Street										42,512	49%	9%
Falcon Pass				29,407	29%	6%						
Ford Avenue							57,334	36%	12%			
Granite Cliff							42,362	27%	9%			
Gypsy Junction	14,234	11%	3%									
Maple Grove										43,897	51%	9%
Pine Hill				57,281	57%	12%						
Red River							28,415	18%	6%			
Thunder Peak				14,462	14%	3%						
Victory Valley	14,312	11%	3%									
Wolverine	71,269	55%	15%									
Grand Total	**129,415**	**100%**	**27%**	**101,150**	**100%**	**21%**	**157,366**	**100%**	**33%**	**86,409**	**100%**	**18%**
											Corp Total	**100%**

Power Distribution Report

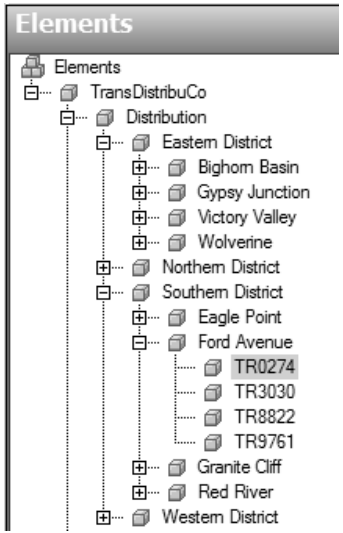
PI Server – *PI Asset Framework (PI AF)*

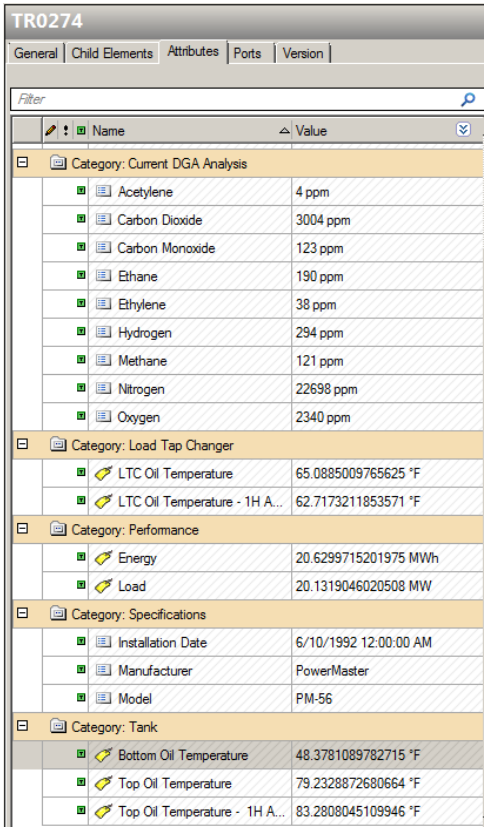
Asset Hierarchy

- District
- Substation
- Transformer



PI Server – *PI Asset Framework (PI AF)*





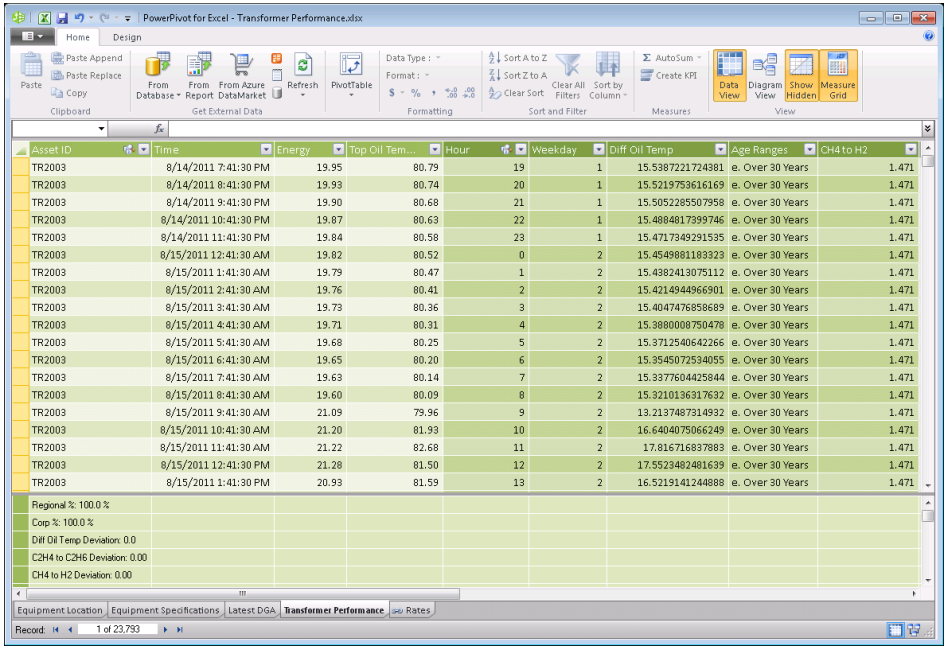
Transformer Attributes

- PI System Data
- Equipment Specifications
- DGA analysis

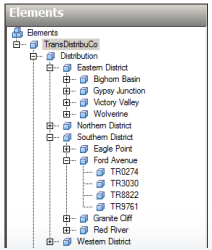
PI OLEDB Enterprise

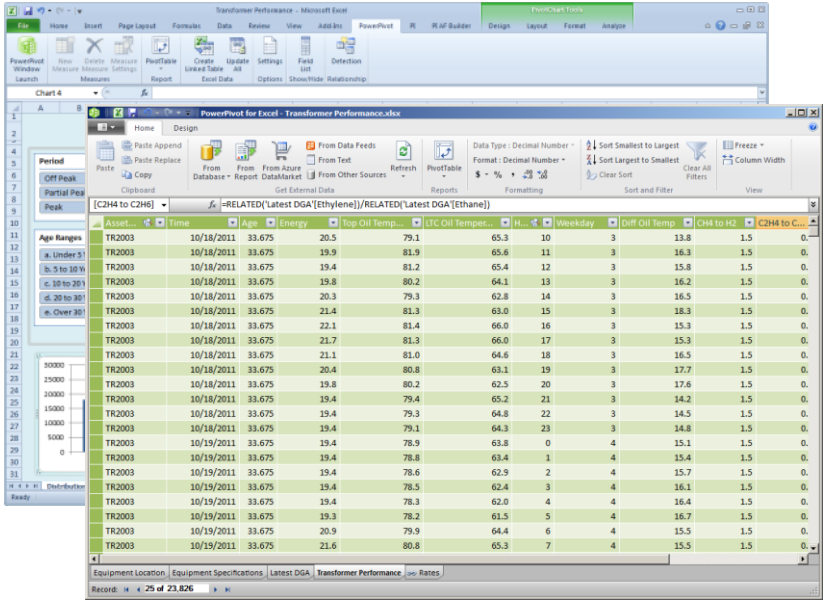
Important Considerations

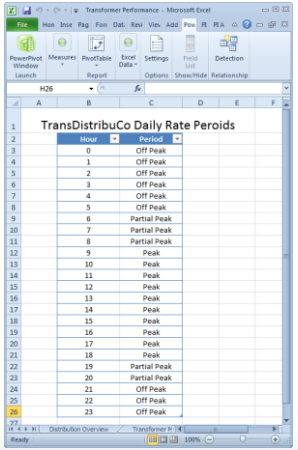
- Leverage structure used throughout your PI System infrastructure
- Ensure accurate aggregation of real-time events
- Scale-up by adding PI AF Structure

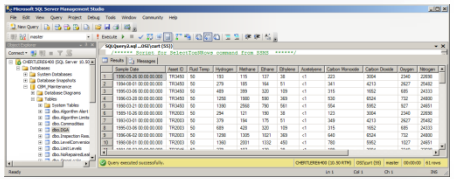


PowerPivot Enables Data Integration









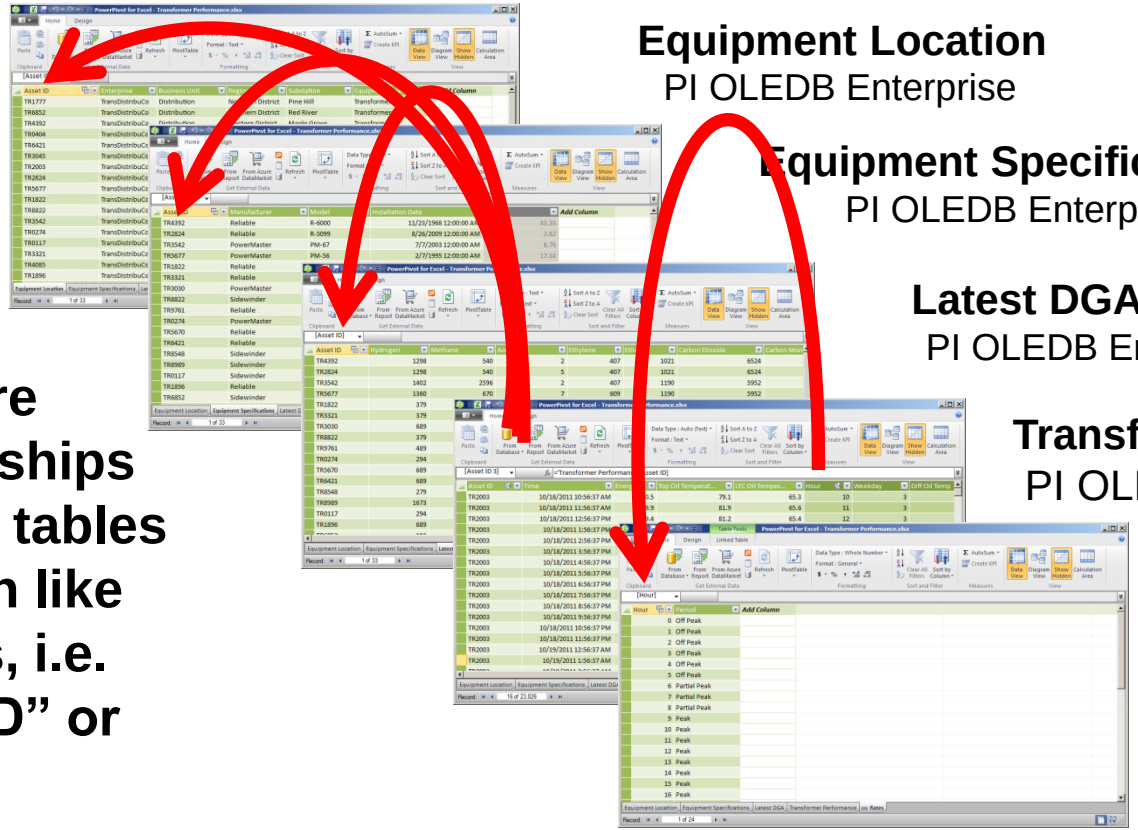
OSIsoft.
PI Server
PI OLEDB Enterprise

Microsoft® SQL Server® 2012
Business Intelligence

Windows Azure
Marketplace

Microsoft® Excel® 2010

PowerPivot Creates the “Cube”



Equipment Location
PI OLEDB Enterprise

Equipment Specifications
PI OLEDB Enterprise

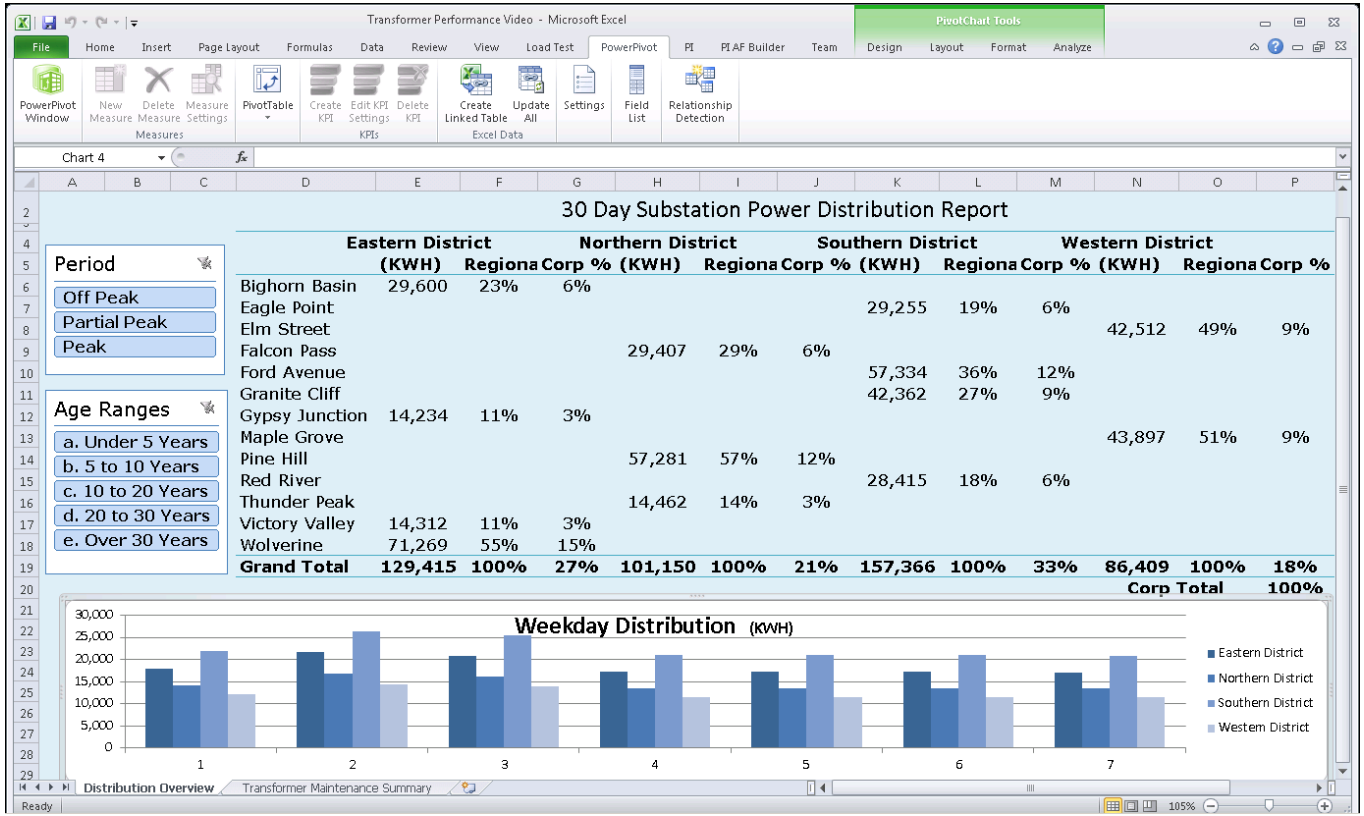
Latest DGA
PI OLEDB Enterprise

Transformer Performance
PI OLEDB Enterprise

Rates
Excel Linked Table

Configure Relationships between tables based on like columns, i.e. “Asset ID” or “Hour”

PowerPivot for Excel 2010



	Eastern District (KWH)	Regiona	Corp %	Northern District (KWH)	Regiona	Corp %	Southern District (KWH)	Regiona	Corp %	Western District (KWH)	Regiona	Corp %
Bighorn Basin	29,600	23%	6%									
Eagle Point							29,255	19%	6%			
Elm Street										42,512	49%	9%
Falcon Pass				29,407	29%	6%						
Ford Avenue							57,334	36%	12%			
Granite Cliff							42,362	27%	9%			
Gypsy Junction	14,234	11%	3%									
Maple Grove										43,897	51%	9%
Pine Hill				57,281	57%	12%						
Red River							28,415	18%	6%			
Thunder Peak				14,462	14%	3%						
Victory Valley	14,312	11%	3%									
Wolverine	71,269	55%	15%									
Grand Total	**129,415**	**100%**	**27%**	**101,150**	**100%**	**21%**	**157,366**	**100%**	**33%**	**86,409**	**100%**	**18%**
											Corp Total	**100%**

Power Distribution Report

Transformer Performance - Microsoft Excel

File | Home | Insert | Page Layout | Formulas | Data | Review | View | Add-Ins | PowerPivot | PI AF Builder

Cut | Copy | Format Painter | Paste | Clipboard
Calibri | 11 | Font
Wrap Text | Merge & Center | Alignment
General | Number
Conditional Formatting | Format as Table | Cell Styles | Styles
Insert | Delete | Format | Cells
AutoSum | Fill | Clear | Sort & Filter | Find & Select | Editing

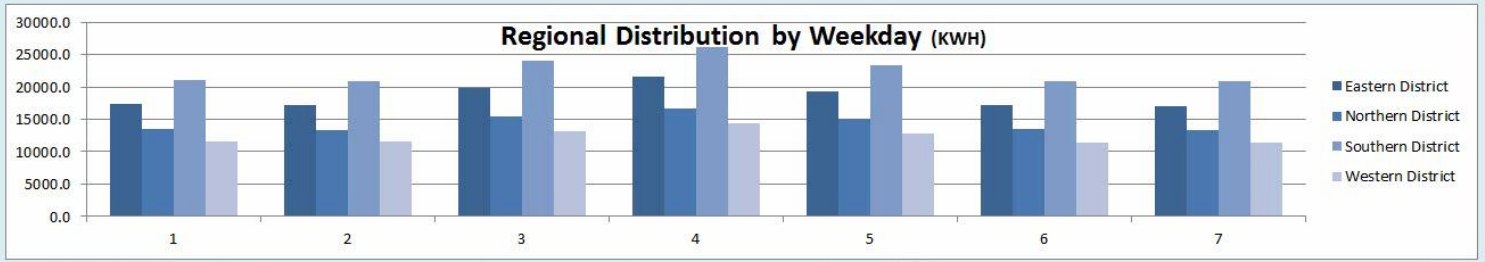
A1

30 Day Substation Power Distribution Report

Period
- Off Peak
- Partial Peak
- Peak

Age Ranges
- a. Under 5 Years
- b. 5 to 10 Years
- c. 10 to 20 Years
- d. 20 to 30 Years
- e. Over 30 Years

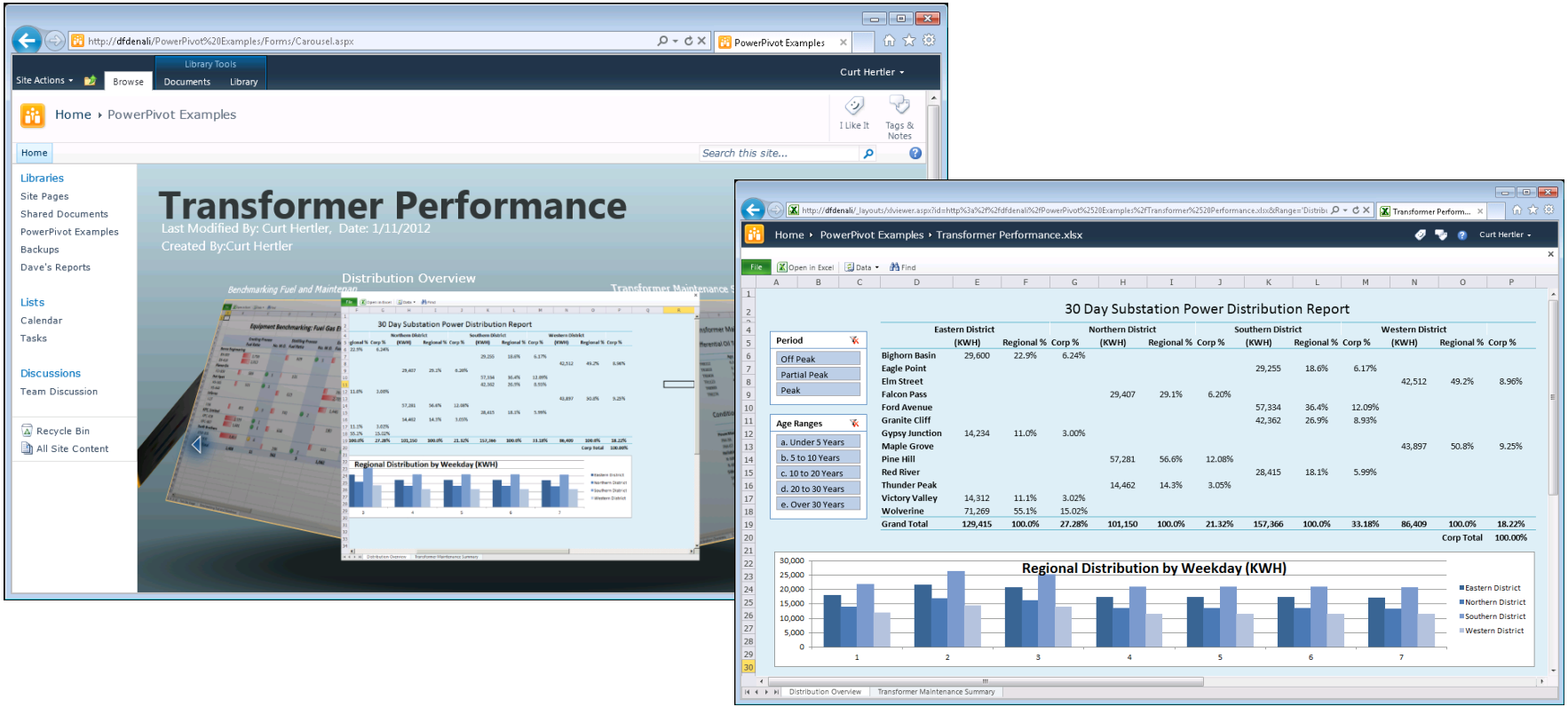
	Eastern District			Northern District			Southern District			Western District		
	(KWH)	Regional %	Corp %	(KWH)	Regional %	Corp %	(KWH)	Regional %	Corp %	(KWH)	Regional %	Corp %
Bighorn Basin	29,606	22.9%	6.2%									
Eagle Point							29,275	18.6%	6.2%			
Elm Street										42,377	49.2%	8.9%
Falcon Pass				29,263	28.9%	6.2%						
Ford Avenue							57,612	36.5%	12.1%			
Granite Cliff							42,389	26.9%	8.9%			
Gypsy Junction	14,135	10.9%	3.0%									
Maple Grove										43,763	50.8%	9.2%
Pine Hill				57,428	56.8%	12.1%						
Red River							28,365	18.0%	6.0%			
Thunder Peak				14,405	14.2%	3.0%						
Victory Valley	14,417	11.1%	3.0%									
Wolverine	71,315	55.1%	15.0%									
Grand Total	**129,473**	**100.0%**	**27.3%**	**101,097**	**100.0%**	**21.3%**	**157,641**	**100.0%**	**33.2%**	**86,140**	**100.0%**	**18.2%**
											Corp Total	**100.0%**



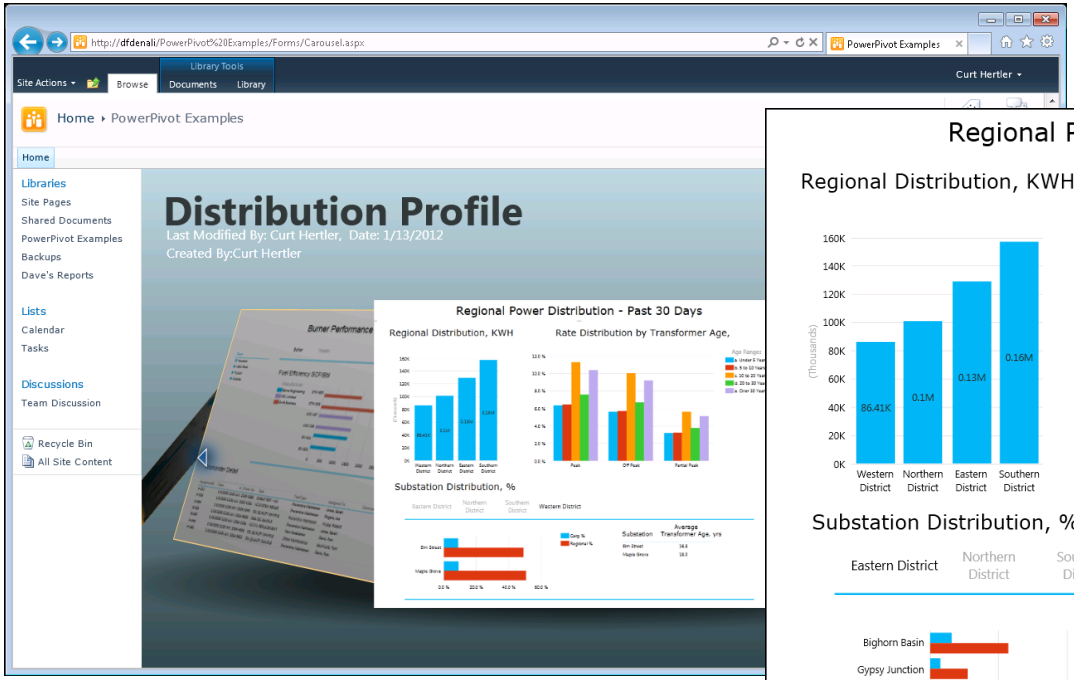
Distribution Overview | Rates | Transformer Maintenance Summary | Measures Illustration | Data for Distribution Overvi | Sheet2

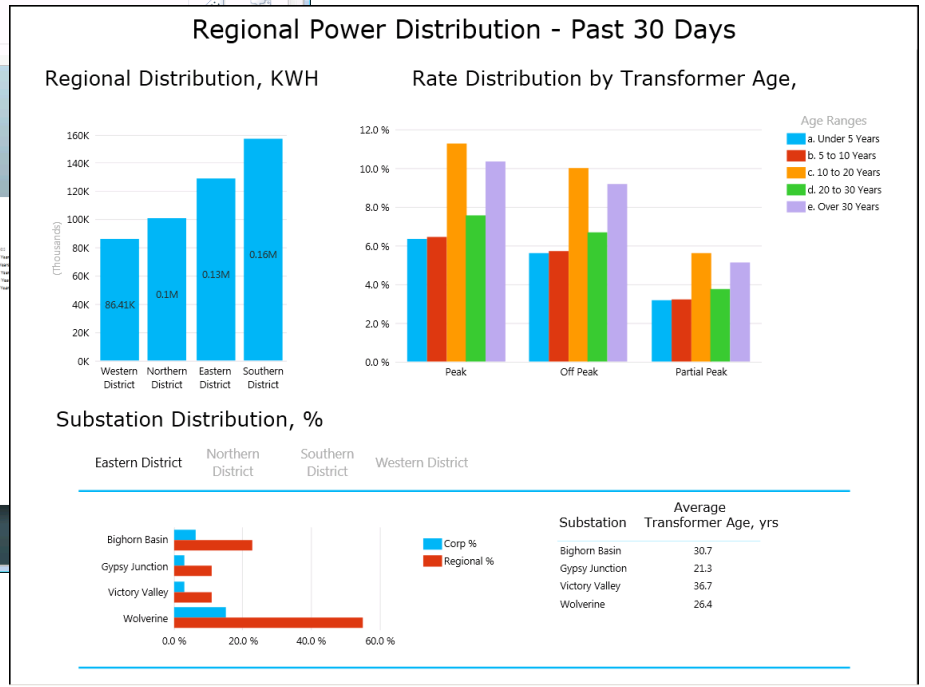
Ready | 110%

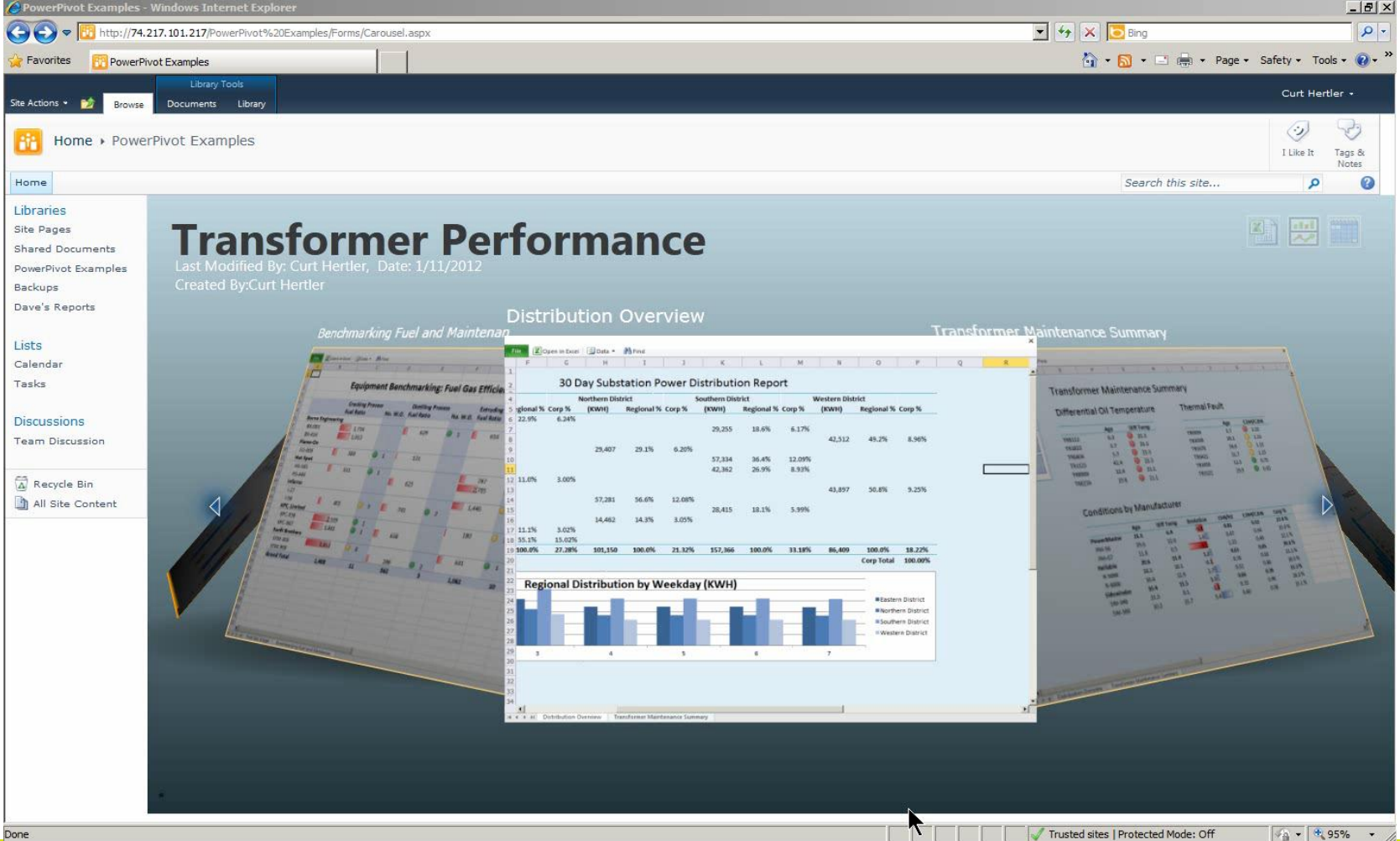
SharePoint 2010 Enterprise – *PowerPivot Gallery*

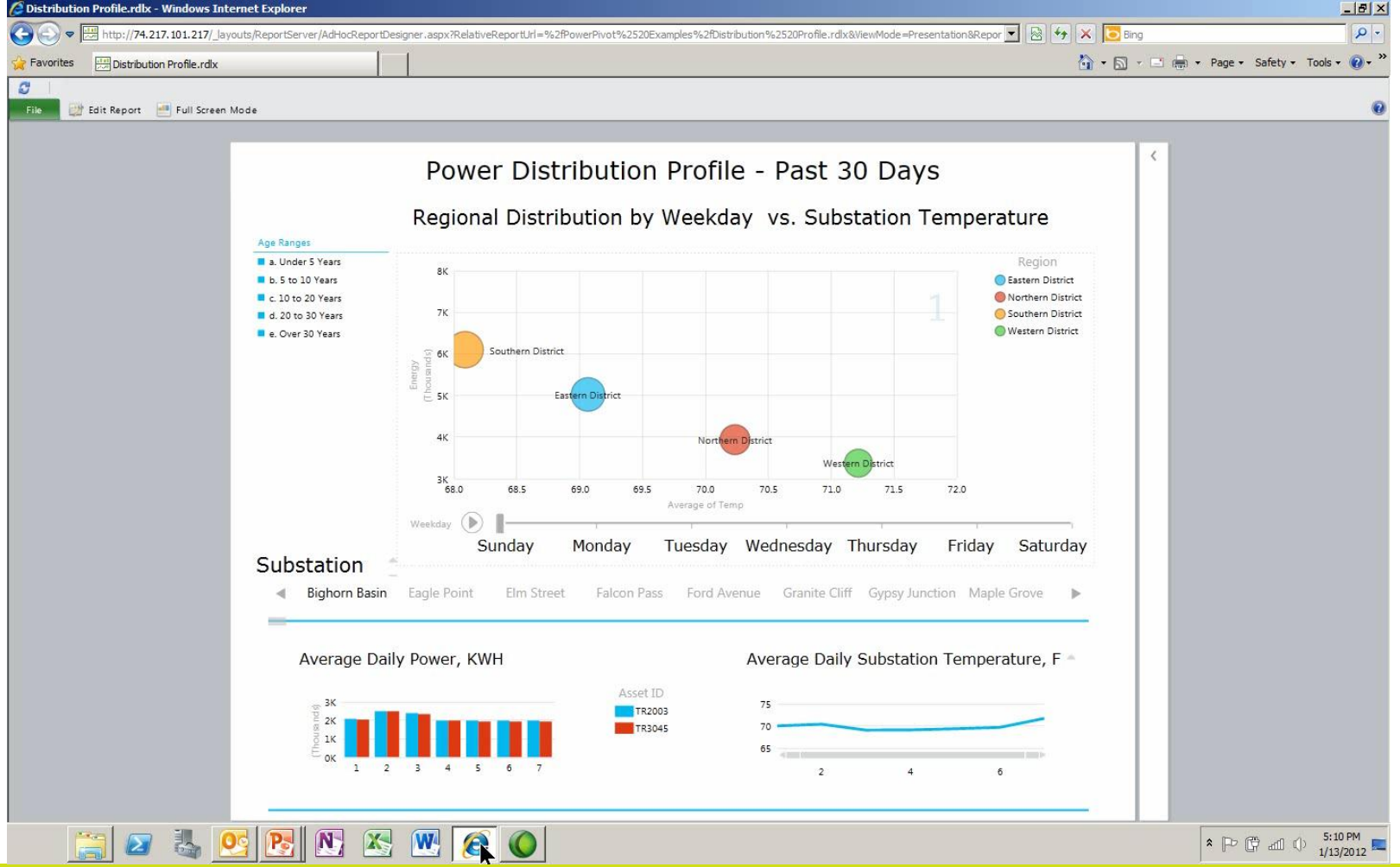


SharePoint 2010 Enterprise – *Power View*



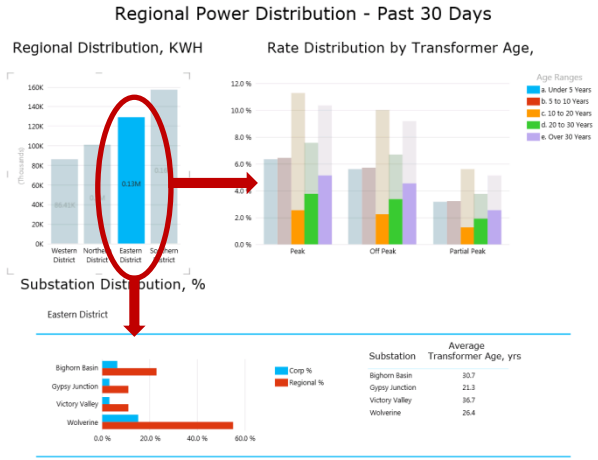




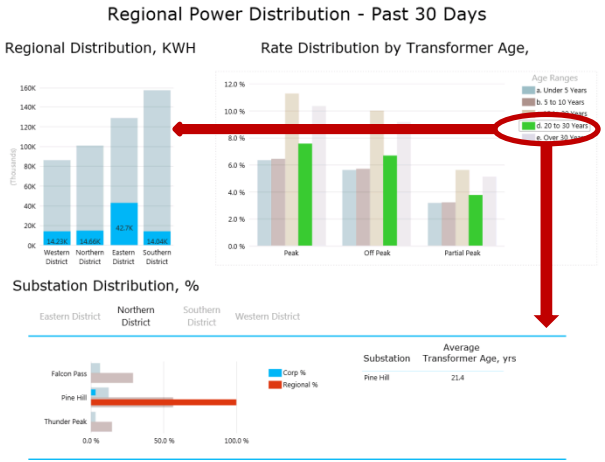


Microsoft SQL 2012 Power View

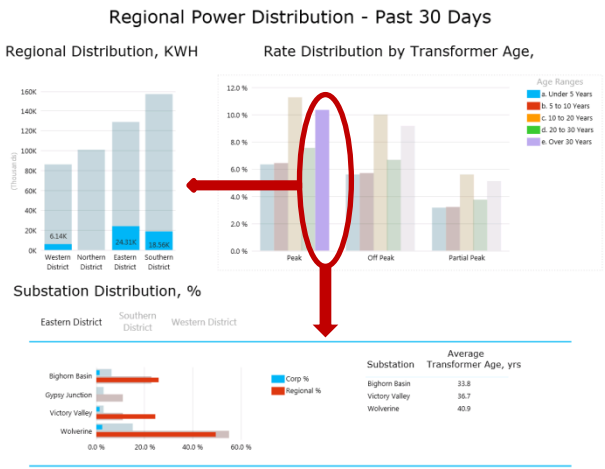
Interactive Analysis



Distribution by District



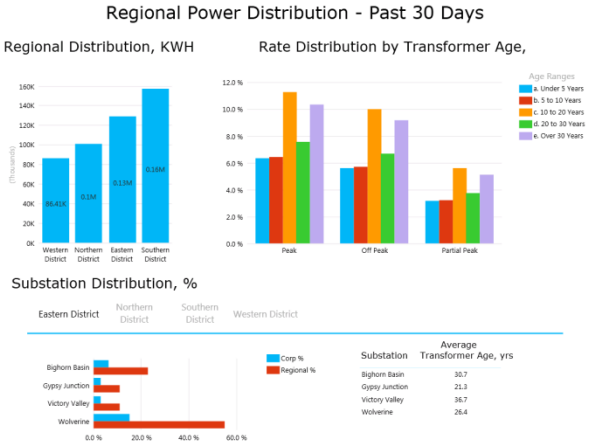
Distribution by Transformer Age



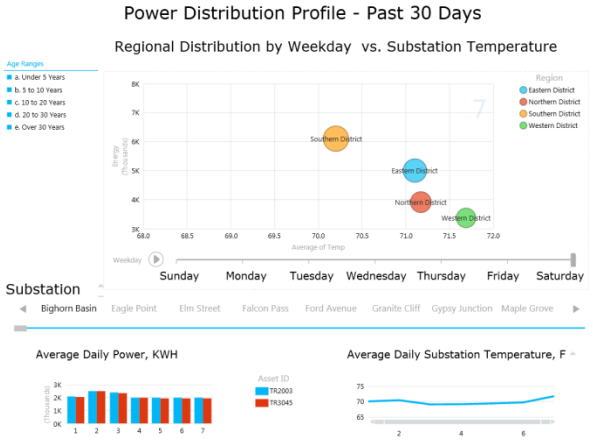
Distribution by Age and Rate

Microsoft SQL 2012 Power View

Multiple Views \ Pages

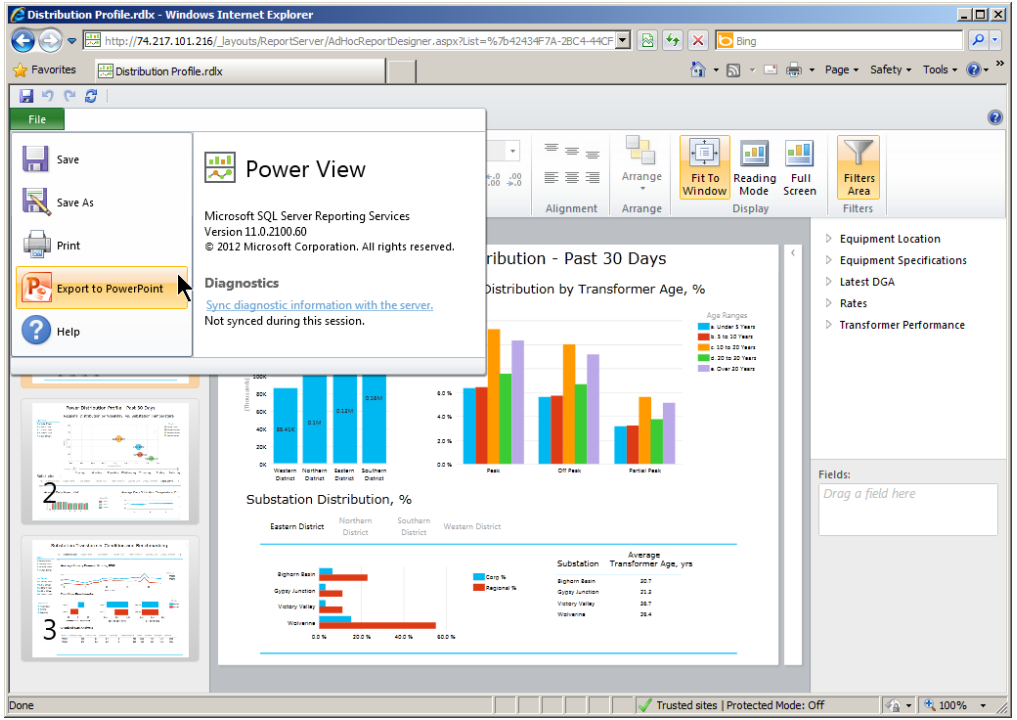


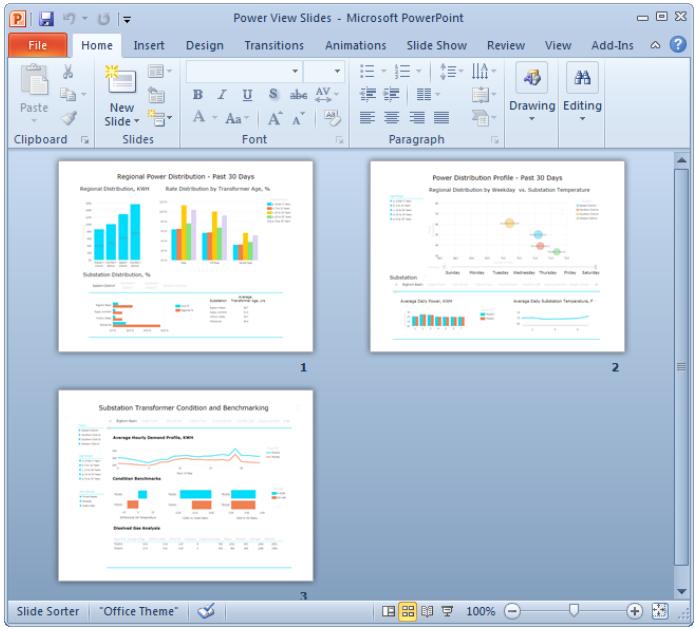
Aging Asset Risk Assessment



Weekday Distribution Profile

Power View Reports in *PowerPoint*





Office 2013 for BI

PowerPivot in Excel 2013

- The PowerPivot Add-In ships as an Excel feature
- Fully integrated engine, Data Model and Field List of Excel

Power View in Excel 2013

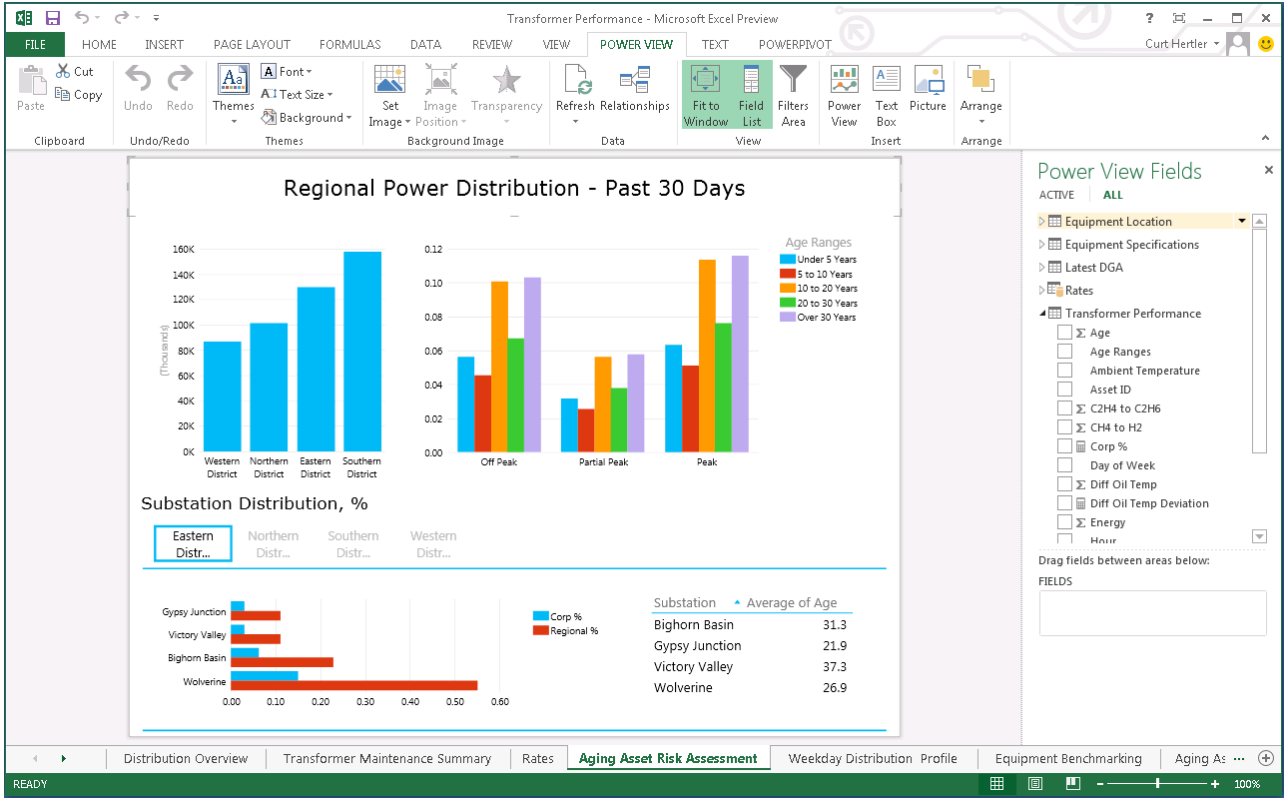
- As Power View in SharePoint 2013
- Interactive data exploration, visualization, and presentation
- Interactive tables, matrices, maps, and a variety of charts

Power View in Excel 2013

Microsoft Power View Included with Excel 2013

Ad hoc analysis of

- PowerPivot
- Excel Tables

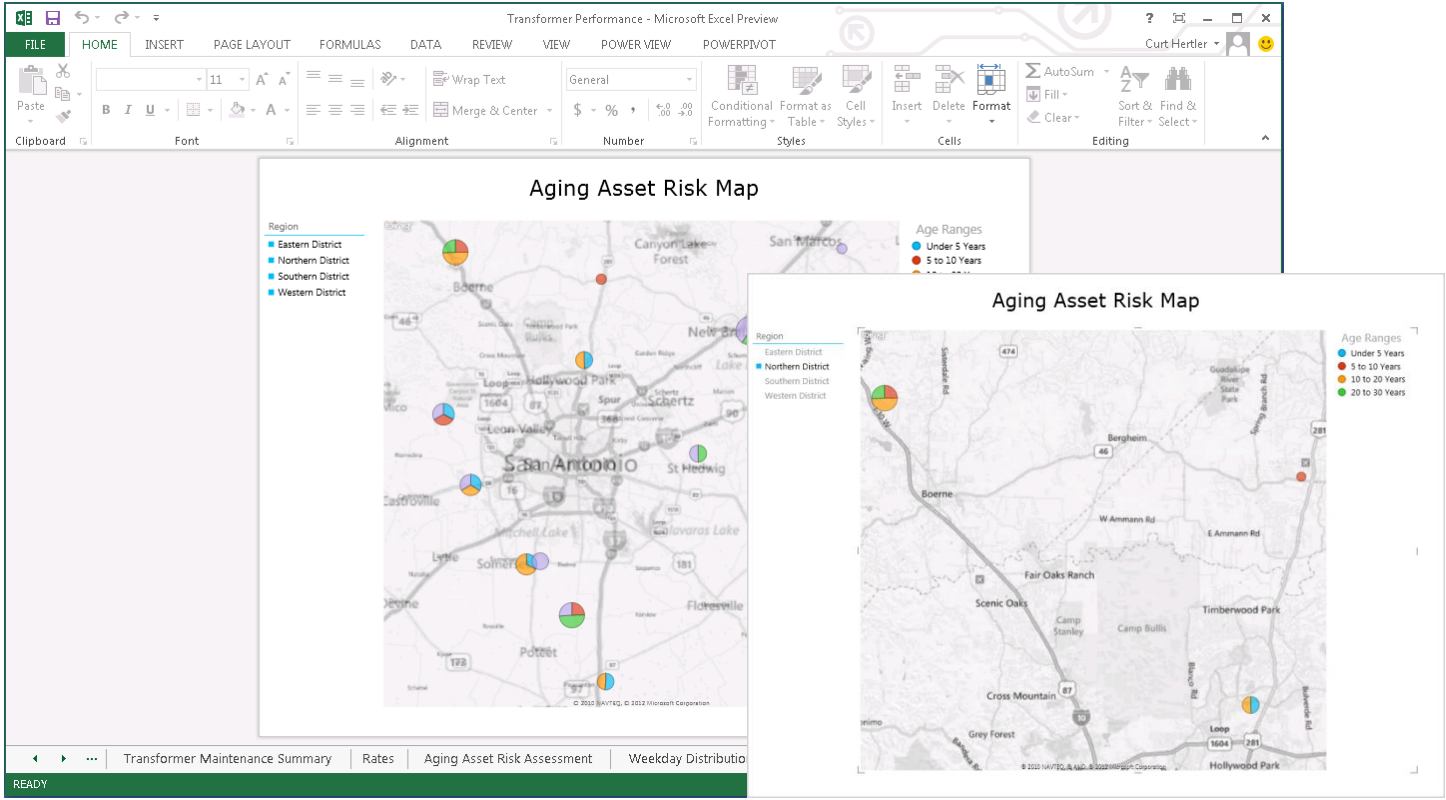


Power View in Excel 2013

Microsoft Power View Included with Excel 2013

Bing Map Integration

- Street Address or Lat – Long
- Filtered Zoom and Pan



Additional Information

OSIsoft Resources

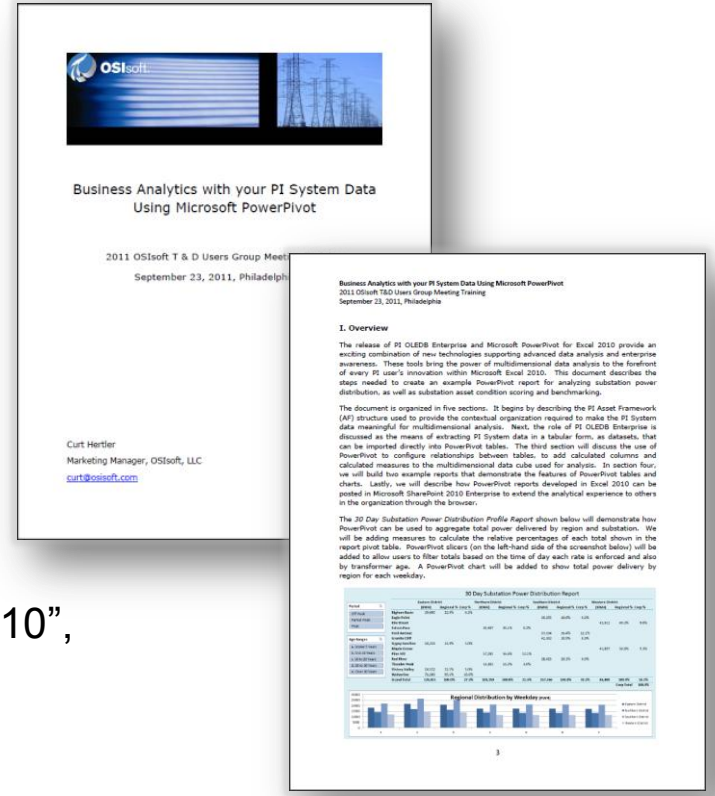
- "Business Analytics with your PI System Data using Microsoft PowerPivot"
- OSIsoft vCampus vcampus.osisoft.com
- For SRP Customers learning.osisoft.com

Microsoft Resources

- www.microsoft.com/en-us/bi/powerpivot.aspx

Helpful Books

- "PowerPivot for the Data Analyst", Bill Jelen
- "Practical PowerPivot & DAX Formulas for Excel 2010", Art Tennick



THANK YOU

Brought to you by OSIsoft.