

OSIsoft®

USERS²⁰¹¹ CONFERENCE



Turning **insight** into **action**.



Business Intelligence with the PI System and PowerPivot

Presented by **Matt Ziegler**, Product Manager, OSIsoft

Goals

- Refresher on Business Intelligence (BI)
- Case Study: OSIsoft customer's everyday BI
- Show the value of BI
 - Use what you already know
 - Demonstrate PI DataLink and PowerPivot

Results – Collaboration and Sharing

“BI is no longer an individual activity. Our people have to work together in more powerful, data-driven ways. OSIsoft and Microsoft are making that happen for CFE.”

Fernando Barradas, Director of Information Applications, Comisión Federal de Electricidad

Case Study Publication: <http://tinyurl.com/4qa3nsq>



Results – Utilize Existing Knowledge

“Everyone knows Excel. With our BI solution accessible through Excel Services 2010 and tools such as PowerPivot for Excel 2010, training costs will be extremely low, and everyone who needs BI access will have it.”

Fernando Barradas, Director of Information Applications, Comisión Federal de Electricidad

Case Study Publication: <http://tinyurl.com/4qa3nsq>



Results – Monetize PI System Data

“We knew that OSIsoft and Microsoft could help us save money through superior BI. But we didn’t appreciate the extent of the savings until we began to see what their solutions could do.”

Fernando Barradas, Director of Information Applications, Comisión Federal de Electricidad

Case Study Publication: <http://tinyurl.com/4qa3nsq>



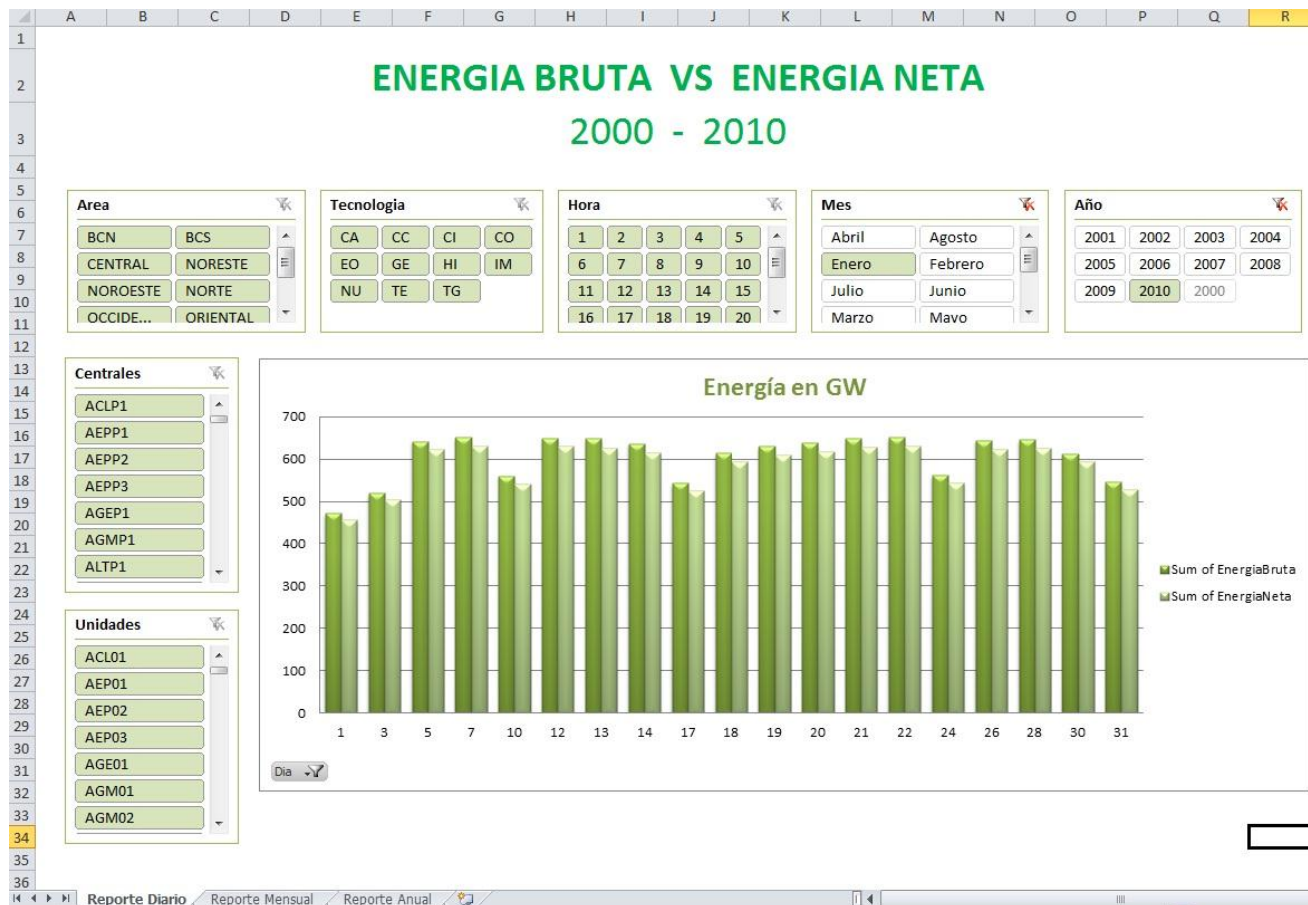
Reports

Energy Efficiency

January 2010

All Plants

All Generation Types



Reports

Energy Efficiency

Region

Technology

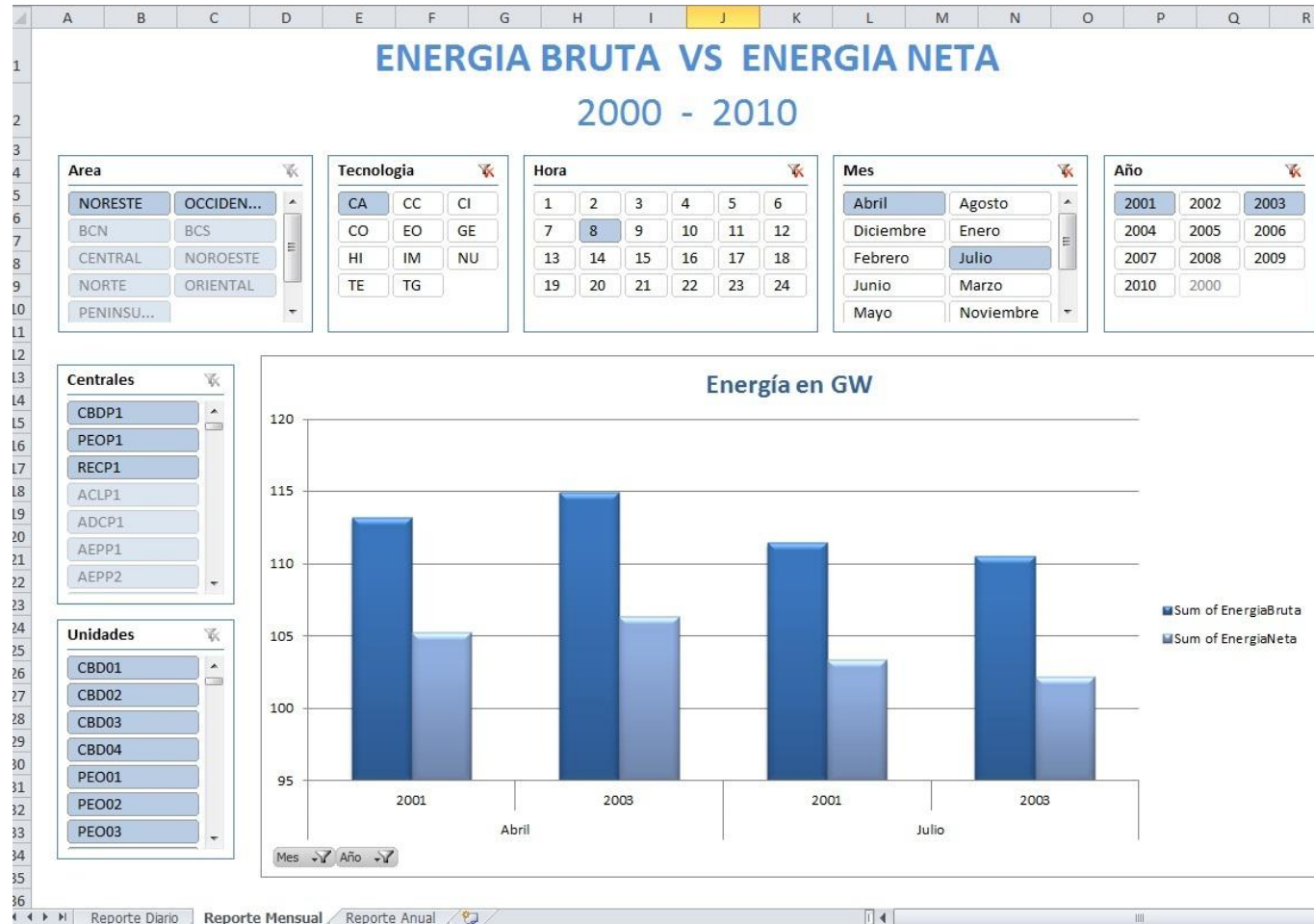
Hour

Month

Year

Plant

Units



Benefits

- Reduction in response time between information analysis and action
- Everyone has access to a single source of information using familiar Microsoft Excel
- Reduced time between data collection and data analysis
- More flexible and personal information searching

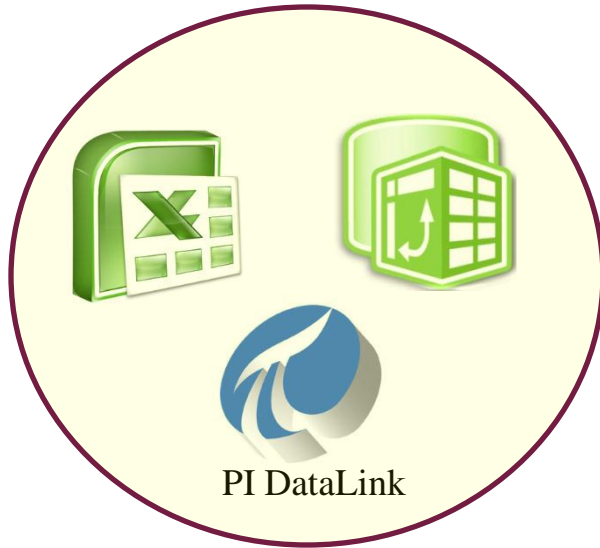
Savings

Target \$4.7 million annual savings via a 1 day increase in asset availability.

Business Intelligence Explained

- Better decisions through data
- Monetize you PI System data

Tools to recognize ...



Personal

Enterprise

PI DataLink and PowerPivot

PI DataLink

PowerPivot

Best for Targeted Questions

Best for Discovery

What was the maximum temperature of the reactor over last 4 hours?

Which of my reactors had the most temperature exceptions in the past month?

PI DataLink and PowerPivot

PI DataLink

Best for set format reports

How much was produced yesterday?

How much was produced last month?

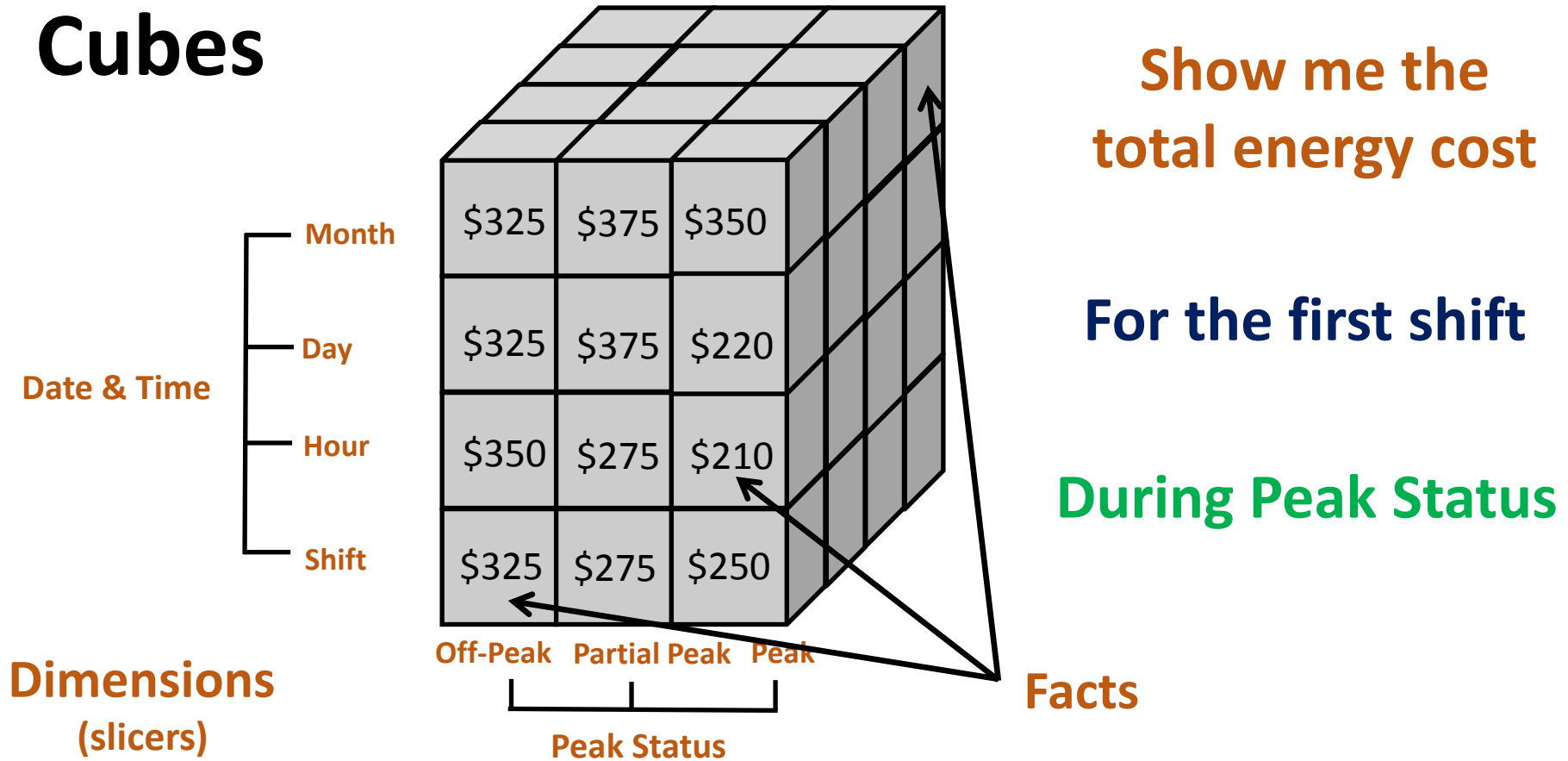
PowerPivot

Best for ad-hoc reports

What happens to my production when I ... ?

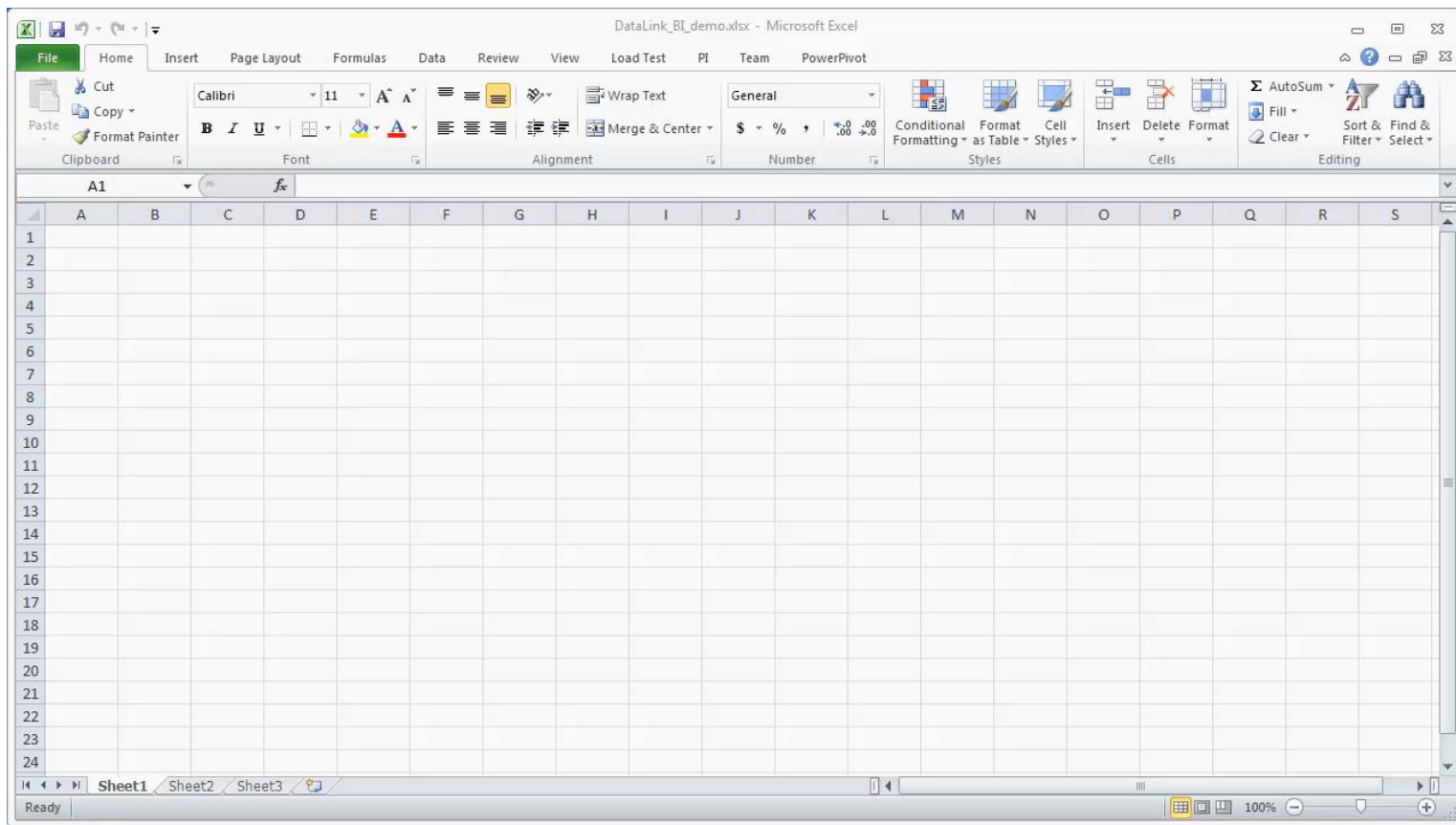
What is the total production for all wind & hydro assets in the northern region in July?

Cubes



Demonstration

1. PI DataLink & PI AF
2. Create Excel Tables
3. Link Table to PowerPivot instance



Demonstration

1. Use a simple DAX Expression

Data Analysis Expressions (DAX)

PowerPivot functions that operate on columns to do things like:

- 1) Column arithmetic – AVERAGE, MIN, MAX, SUM, etc
- 2) Relate columns – RELATED, RELATEDTABLE
- 3) Functions with the A suffix handle text
- 4) Functions with the X suffix operate on tables
- 5) Error Handling – IF, IFERROR, ISBLANK, ISNUMBER

... AND much more

[illegible]

Demonstration

1. Create a Month dimension
2. Create a report of Power Usage by Month
3. Show Value summary calculation modes

DataLink_BI_demo.xlsx - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Load Test PI Team PowerPivot

PowerPivot Window Launch New Measure Measure Settings Delete Measure Settings PivotTable Report Create Linked Table Excel Data Update All Settings Options Field List Detection

E1 X ✓ Month

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Time	Power_kWh	Demand_W		Month												
2	01-Jun-10 00:00:00	46.6875	186750														
3	01-Jun-10 00:15:00	46.6875	186750														
4	01-Jun-10 00:30:00	46.6875	186750														
5	01-Jun-10 00:45:00	46.6875	186750														
6	01-Jun-10 01:00:00	46.6875	186750														
7	01-Jun-10 01:15:00	46.6875	186750														
8	01-Jun-10 01:30:00	46.6875	186750														
9	01-Jun-10 01:45:00	46.6875	186750														
10	01-Jun-10 02:00:00	46.6875	186750														
11	01-Jun-10 02:15:00	46.6875	186750														
12	01-Jun-10 02:30:00	46.6875	186750														
13	01-Jun-10 02:45:00	46.6875	186750														
14	01-Jun-10 03:00:00	46.6875	186750														
15	01-Jun-10 03:15:00	46.6875	186750														
16	01-Jun-10 03:30:00	46.6875	186750														
17	01-Jun-10 03:45:00	46.6875	186750														
18	01-Jun-10 04:00:00	46.6875	186750														
19	01-Jun-10 04:15:00	46.6875	186750														
20	01-Jun-10 04:30:00	46.6875	186750														
21	01-Jun-10 04:45:00	46.6875	186750														
22	01-Jun-10 05:00:00	46.6875	186750														
23	01-Jun-10 05:15:00	46.6875	186750														
24	01-Jun-10 05:30:00	46.6875	186750														

PI Data Tables Reports

Enter

100%

Demonstration

1. Create Hour Dimension with Rate Table
2. Create a new Relationship
3. Show Related DAX expression
4. Create Cost by Month + Shift Report

PowerPivot for Excel - DataLink_BI_demo.xlsx

Table Tools: Home, Design, Linked Table

Clipboard: Paste, Paste Append, Paste Replace, Copy

Get External Data: From Database, From Report, From Azure DataMarket, From Data Feeds, From Text, From Other Sources, Refresh

Reports: PivotTable

Formatting: Data Type: Whole Number, Format: General, \$, %, +, -, .00, .0

Sort and Filter: Sort Smallest to Largest, Sort Largest to Smallest, Clear Sort

View: Freeze, Column Width

[Hour] 0

Hour	Peak_Status	Shift	Cost_per_kWh	Add Column
0	Off-Peak	Night	\$0.11	
1	Off-Peak	Night	\$0.11	
2	Off-Peak	Night	\$0.11	
3	Off-Peak	Night	\$0.11	
4	Off-Peak	Night	\$0.11	
5	Off-Peak	Night	\$0.11	
6	Off-Peak	Night	\$0.11	
7	Off-Peak	Day	\$0.11	
8	Off-Peak	Day	\$0.11	
9	Off-Peak	Day	\$0.11	
10	Off-Peak	Day	\$0.11	
11	Off-Peak	Day	\$0.11	
12	Peak	Day	\$0.14	
13	Peak	Day	\$0.14	
14	Peak	Day	\$0.14	
15	Peak	Swing	\$0.14	
16	Peak	Swing	\$0.14	
17	Peak	Swing	\$0.14	
18	Peak	Swing	\$0.14	
19	Off-Peak	Swing	\$0.11	
20	Off-Peak	Swing	\$0.11	

PI_Data, Month_Dimension, Hour_Dimension

Record: 1 of 24

Call to Action

Download PowerPivot for Excel 2010 today

- <http://www.powerpivot.com/>

Join the discussion

- <http://vcampus.osisoft.com/>

Building a BI Infrastructure

Personal BI with PI DataLink and Office 2010



Thank you

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