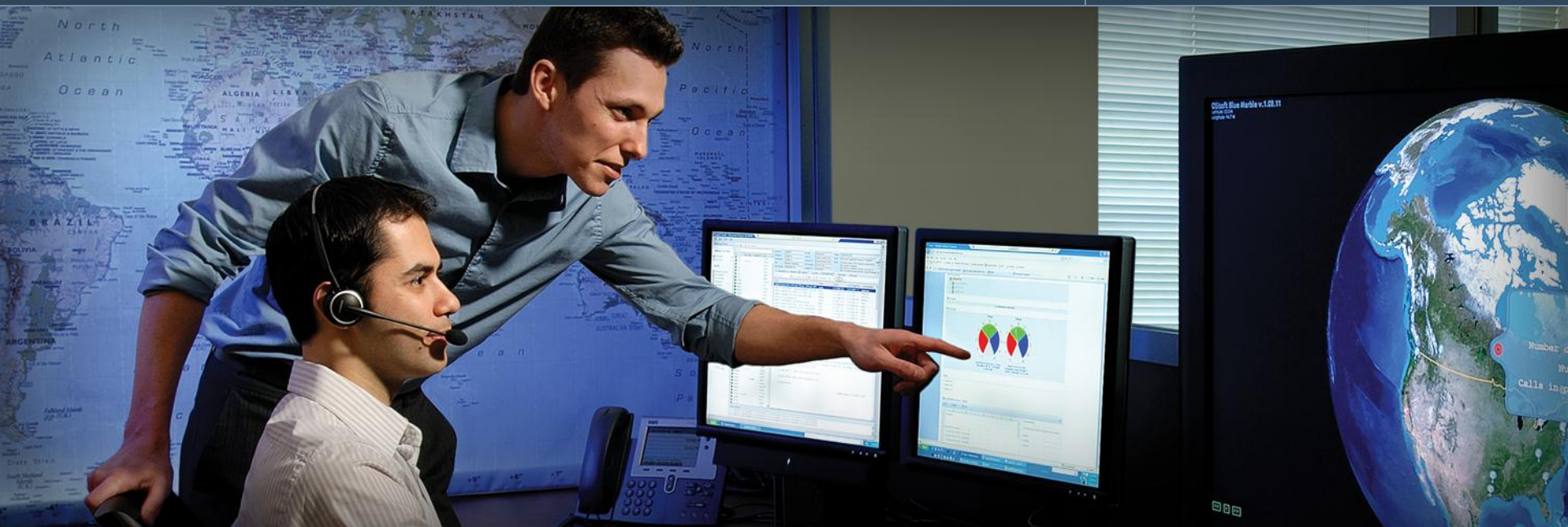




Regional Seminar Series Sao Paulo, Brazil



Gaining Advanced Insight from PI System Data Using New Self-Service BI Technologies

Curt Hertler
Marketing Manager
OSIsoft, LLC

October 27, 2010

Empowering Business in Real Time.

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- Business Intelligence (BI) Technologies
 - Multidimensional Data Analysis
 - Manufacturing Intelligence
- Introduction to “Self-service BI”
 - PI for Office 2010
 - PI OLEDB Enterprise 2010
 - Microsoft PowerPivot for Excel 2010
 - Microsoft SharePoint 2010
- Example Walk Through
- Additional Information and Next Steps

Business Intelligence (BI) Technologies



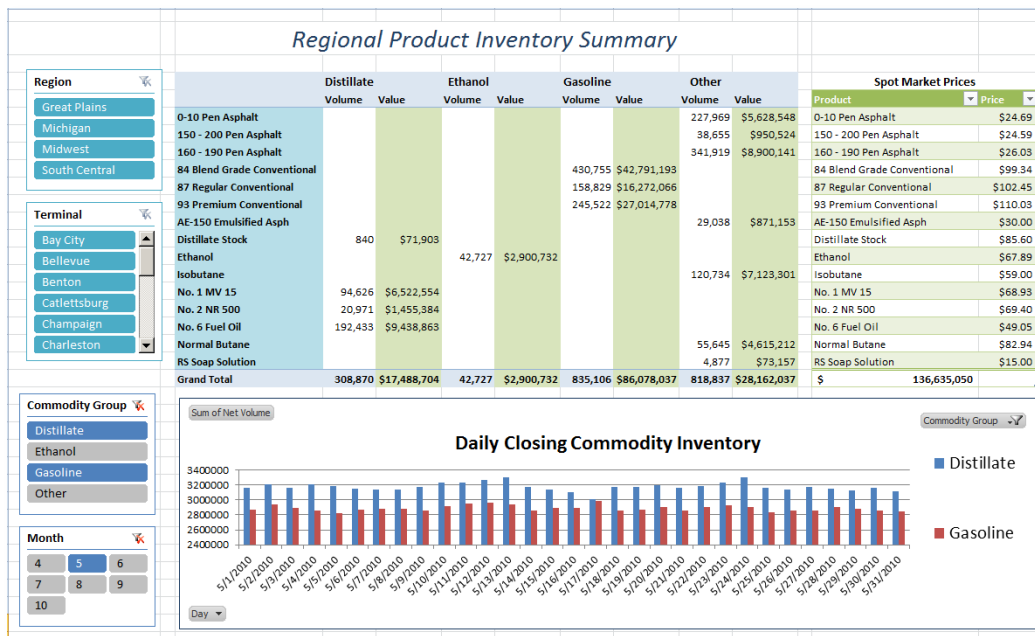
OSIsoft HVAC Power Profile - San Leandro Office

Month	Power Consumed	-20 - -15	-15 - -10	-10 - -5	-5 - 0	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	Grand Total
May 2010	12:00:00 AM	170	2,825	13,073	2,117	111	202	251						18,750
June 2010	1:00:00 AM	170	3,318	12,641	2,088	202		245						18,663
July 2010	2:00:00 AM	255	3,773	12,387	1,655	203	54	169						18,497
August 2010	3:00:00 AM	474	4,125	11,664	1,753	201		220						18,436
	4:00:00 AM	429	5,022	10,676	1,833	199		217						18,376
	5:00:00 AM	341	5,672	10,002	2,114	49		217						18,395
	6:00:00 AM	526	5,702	10,097	1,923									18,606
	7:00:00 AM	172	4,345	12,529	2,483									20,187
	8:00:00 AM		2,009	13,948	3,946	1,160		427	305					21,796
	9:00:00 AM		244	12,544	6,107	2,343		760	664	150				22,812
	10:00:00 AM		62	8,570	9,147	3,243		1,878	466	835				24,200
	11:00:00 AM		246	4,600	10,653	5,066		2,088	1,538	750	378			25,318
	12:00:00 PM		62	2,154	8,224	8,880		3,132	1,755	1,074	926			26,208
	1:00:00 PM			1,305	6,570	9,572		4,572	2,031	1,251	881	385		26,567
	2:00:00 PM			1,042	4,725	10,133		6,160	2,099	1,388	585	266	384	26,781
	3:00:00 PM			1,180	3,439	10,807		6,362	2,148	1,537	528	359	86	26,704
	4:00:00 PM			1,230	4,997	9,441		5,897	2,560	1,098	556	360		26,474
	5:00:00 PM			1,556	7,452	9,039		3,581	2,149	624	789	88	163	25,606
	6:00:00 PM			92	2,341	10,130		7,165	2,817	997	207	725		24,814
	7:00:00 PM			235	5,798	9,609		3,913	1,962	338	589	145	362	22,951
	8:00:00 PM			468	11,568	5,928		1,770	692	433	127	356		21,343
	9:00:00 PM			978	13,434	3,606		1,099	293	227	171	177		20,047
	10:00:00 PM			1,459	14,182	2,281		667	383		295			19,267
	11:00:00 PM			85	2,167	13,720		1,832	435	205	192	68		18,704
	Grand Total	2,622	42,805	202,301	114,613	86,391	42,441	18,567	10,164	6,047	1,820	973	756	529,501

Multidimensional Data Analysis



Quick, ad-hoc, aggregation of large amounts of interesting data (facts), based on user-selected criteria (dimensions), to identify opportunities for improvement.



Critical HX Monitoring

Exchanger	Water Velocity Feet/Sec	Skin Temp Deg. F	CW Flow GPM	U-Value BTU/(hr/ft2/deg F)	Heat Load MMBTU	Heat Flux BTU/hr/ft2
E-163-A	3.70	77	2237	45.5	5.1	352.1
E-163-C	3.80	78	2298	48.0	5.8	401.1
E-191-A	2.31	101	4360	62.8	36.6	2782.4
E-191-B	3.08	80	4360	52.1	13.7	1027.2
E-256-A	2.46	97	1726	117.8	6.4	1082.2
E-256-B	2.47	89	1732	130.8	5.4	911.8
E-256-C	2.46	84	1728	141.9	8.0	1362.3
E-271	4.43	132	1930	153.3	40.9	9922.5
E-343	1.79	97	249	63.3	2.6	2443.0
E-38-A	1.81	105	3752	50.9	34.2	2378.9
E-38-B	1.95	82	3731	48.6	13.1	980.1
E-77-A	2.23	105	4204	61.8	36.4	2768.5
E-77-B	2.16	84	4246	57.1	19.0	1391.1
E-98-A	1.58	108	2986	47.3	29.3	2227.0
E-98-B	1.54	86	3013	45.3	15.6	1141.8

- Optimized, memory-resident data “cubes”
- Scorecards, pivot tables, and charts
- Traditionally, a server-based, IT project
- Now, self-service BI for the Information Worker
- Enables Manufacturing Intelligence

Corporate Fuel Gas Consumption

Shift 

Shift 1

Shift 2

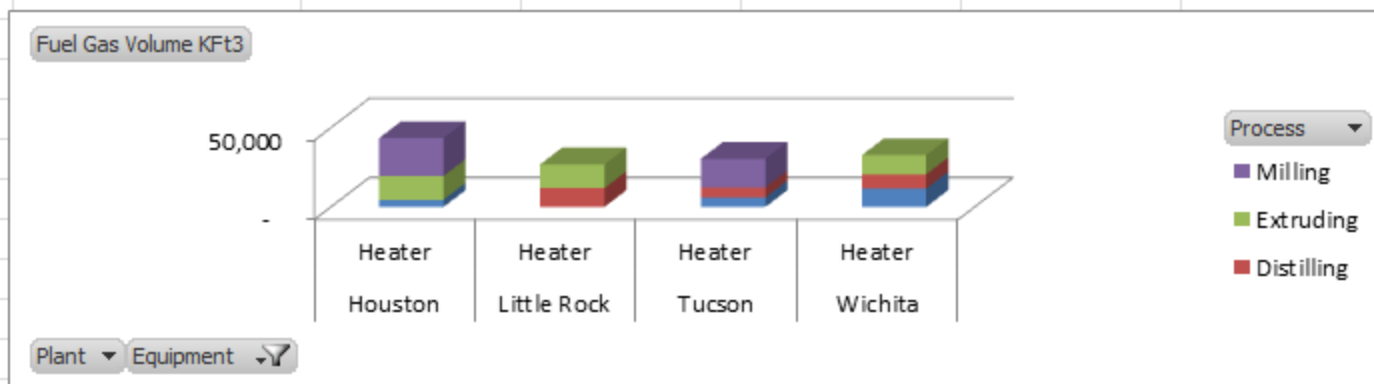
Shift 3

Equipment 

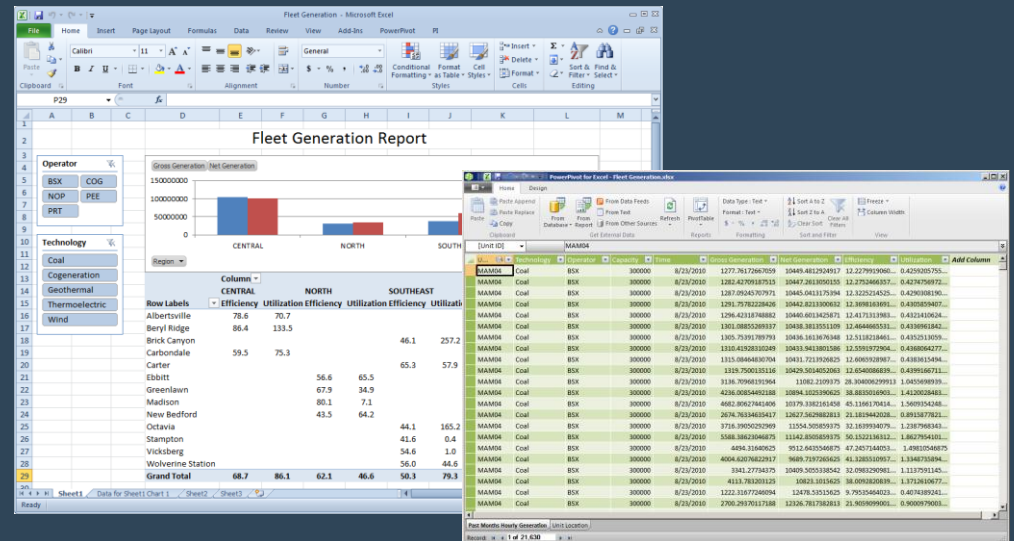
Boiler

Heater

Fuel Gas Volume Kft3 Column Labels					
Row Labels	Cracking	Distilling	Extruding	Milling	Grand Total
Houston	4,564		14,964	23,918	43,446
Heater	4,564		14,964	23,918	43,446
Little Rock		11,858	14,964		26,822
Heater		11,858	14,964		26,822
Tucson	6,039	6,298		18,096	30,433
Heater	6,039	6,298		18,096	30,433
Wichita	11,622	8,999	12,057		32,678
Heater	11,622	8,999	12,057		32,678
Grand Total	22,225	27,155	41,985	42,014	133,379



Introduction to “Self-Service” BI





Microsoft[®]
SharePoint[®] 2010



Microsoft[®]
Excel[®] 2010



Microsoft[®]
SQL Server[®] 2008 R2



OSIsoft[™]
PI for Office 2010



OSIsoft[™]
PI System 2010

- Facts and Dimensions
 - PI Asset Framework (PI System 2010)
- Datasets for BI Data Extraction
 - PI OLEDB Enterprise 2010 (PI for Office 2010)
- Desktop Analysis and Cube Configuration
 - Microsoft PowerPivot for Excel 2010
- Enterprise Accountability
 - Microsoft PowerPivot for SharePoint 2010
 - Microsoft SharePoint 2010
 - Microsoft SQL Server 2008 R2

Facts

Attributes

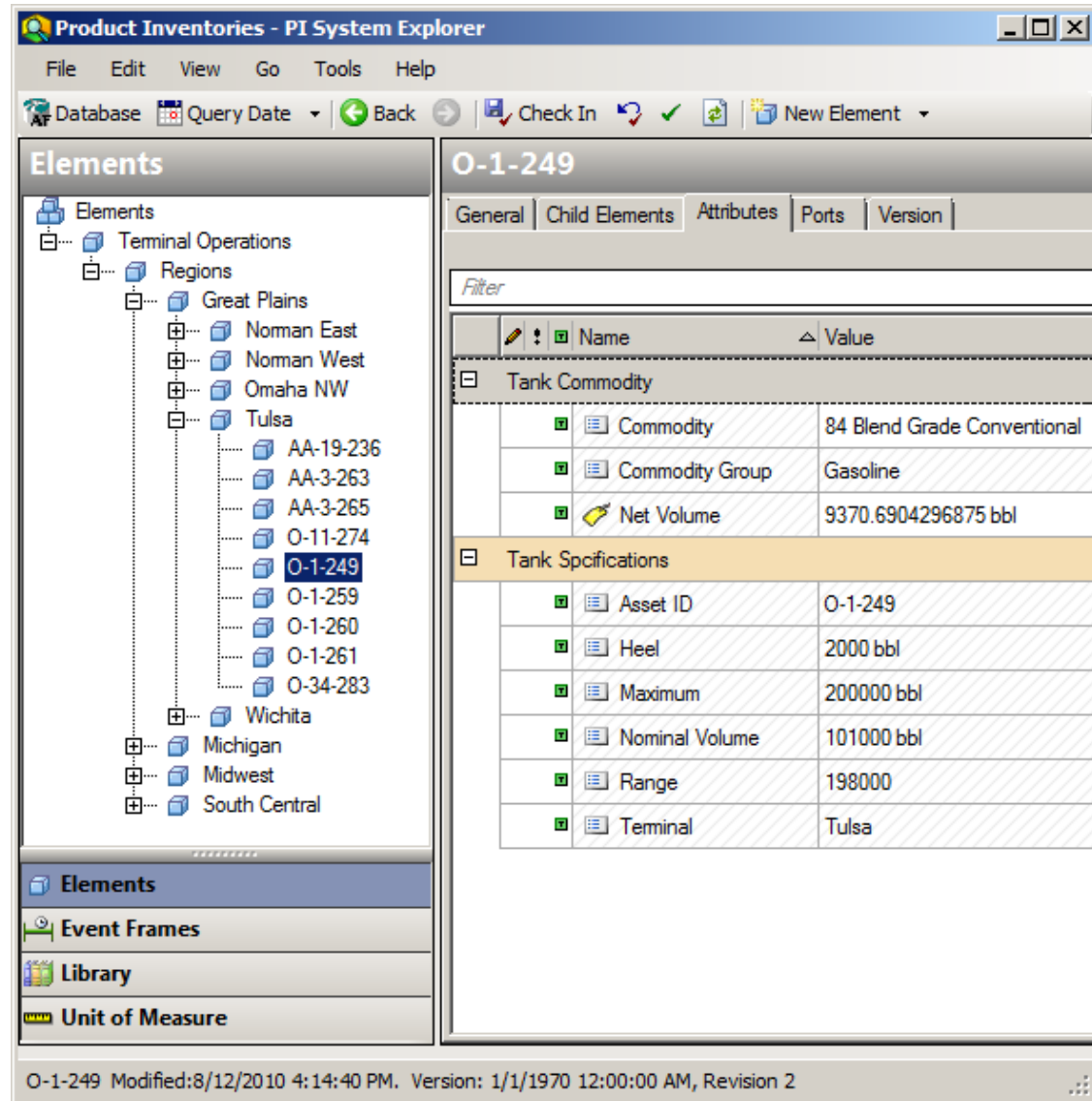
- PI Point
- Formula
- Other

Dimensions

Hierarchy

Templates

Categories



The screenshot displays the 'Product Inventories - PI System Explorer' application. The left pane shows a hierarchical tree of elements. The right pane shows the details for the selected element, O-1-249.

Elements Hierarchy:

- Elements
 - Terminal Operations
 - Regions
 - Great Plains
 - Norman East
 - Norman West
 - Omaha NW
 - Tulsa
 - AA-19-236
 - AA-3-263
 - AA-3-265
 - O-11-274
 - O-1-249**
 - O-1-259
 - O-1-260
 - O-1-261
 - O-34-283
 - Wichita
 - Michigan
 - Midwest
 - South Central

Details for O-1-249:

General | Child Elements | **Attributes** | Ports | Version

Filter

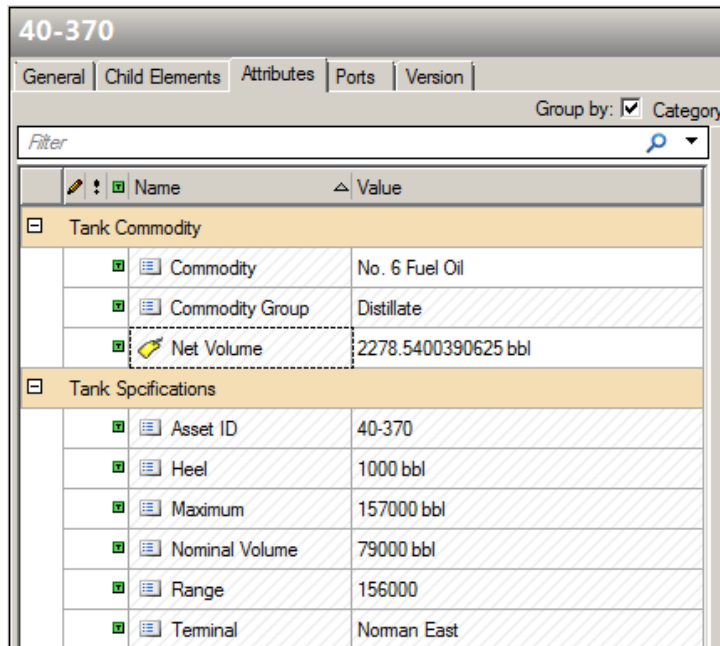
Name	Value
Tank Commodity	
Commodity	84 Blend Grade Conventional
Commodity Group	Gasoline
Net Volume	9370.6904296875 bbl
Tank Specifications	
Asset ID	O-1-249
Heel	2000 bbl
Maximum	200000 bbl
Nominal Volume	101000 bbl
Range	198000
Terminal	Tulsa

O-1-249 Modified:8/12/2010 4:14:40 PM. Version: 1/1/1970 12:00:00 AM, Revision 2

Example: “Product Inventories”

Facts – PI AF Attributes

- Commodity
- Commodity Group
- Net Volume



40-370

General | Child Elements | Attributes | Ports | Version

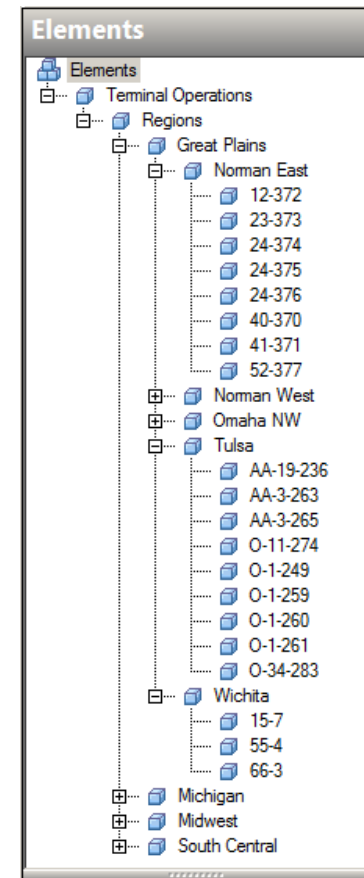
Group by: ☒ Category

Filter

	Name	Value
Tank Commodity		
	Commodity	No. 6 Fuel Oil
	Commodity Group	Distillate
	Net Volume	2278.5400390625 bbl
Tank Specifications		
	Asset ID	40-370
	Heel	1000 bbl
	Maximum	157000 bbl
	Nominal Volume	79000 bbl
	Range	156000
	Terminal	Norman East

Dimensions – PI AF Hierarchy

- Region
- Terminal
- Tank



PI SQL Commander

	Tank ID	Time	Net Volume	Commodity	Commodity Group	Heel	Nominal Volume
00001	T-14	4/11/2010 12:00...	54923.87470617...	Normal Butane	Other	500	50250
00002	T-14	4/12/2010 12:00...	54975.89595661...	Normal Butane	Other	500	50250
00003	T-14	4/13/2010 12:00...	46303.33112361...	Normal Butane	Other	500	50250
00004	T-14	4/14/2010 12:00...	49875.929829075	Normal Butane	Other	500	50250
00005	T-14	4/15/2010 12:00...	57234.24132631...	Normal Butane	Other	500	50250
00006	T-14	4/16/2010 12:00...	52637.73578177...	Normal Butane	Other	500	50250
00007	T-14	4/17/2010 12:00...	47633.23074283...	Normal Butane	Other	500	50250
00008	T-14	4/18/2010 12:00...	43183.19659874...	Normal Butane	Other	500	50250
00009	T-14	4/19/2010 12:00...	44729.77210207...	Normal Butane	Other	500	50250
00010	T-14	4/20/2010 12:00...	51467.49408293...	Normal Butane	Other	500	50250
00011	T-14	4/21/2010 12:00...	51009.04464211...	Normal Butane	Other	500	50250
00012	T-14	4/22/2010 12:00...	51548.18391103...	Normal Butane	Other	500	50250
00013	T-14	4/23/2010 12:00...	49667.91267065...	Normal Butane	Other	500	50250
00014	T-14	4/24/2010 12:00...	51414.66649897...	Normal Butane	Other	500	50250
00015	T-14	4/25/2010 12:00...	54667.79901652...	Normal Butane	Other	500	50250
00016	T-14	4/26/2010 12:00...	49869.28883390...	Normal Butane	Other	500	50250
00017	T-14	4/27/2010 12:00...	50885.62532439...	Normal Butane	Other	500	50250
00018	T-14	4/28/2010 12:00...	50823.04125264...	Normal Butane	Other	500	50250

Democratizing Business Intelligence

Improving organizations by providing business insights to ***all*** employees leading to better, faster, and more relevant decisions.

Delivered through a familiar environment

Integrated into business productivity infrastructure

Built on a trusted and extensible platform



Microsoft PowerPivot for Excel 2010

- Add-In for Excel 2010. Accessible

- Supports very large datasets from a variety of sources. Scalable

- Relationships and calculations (DAX¹) are easily defined. Configurable

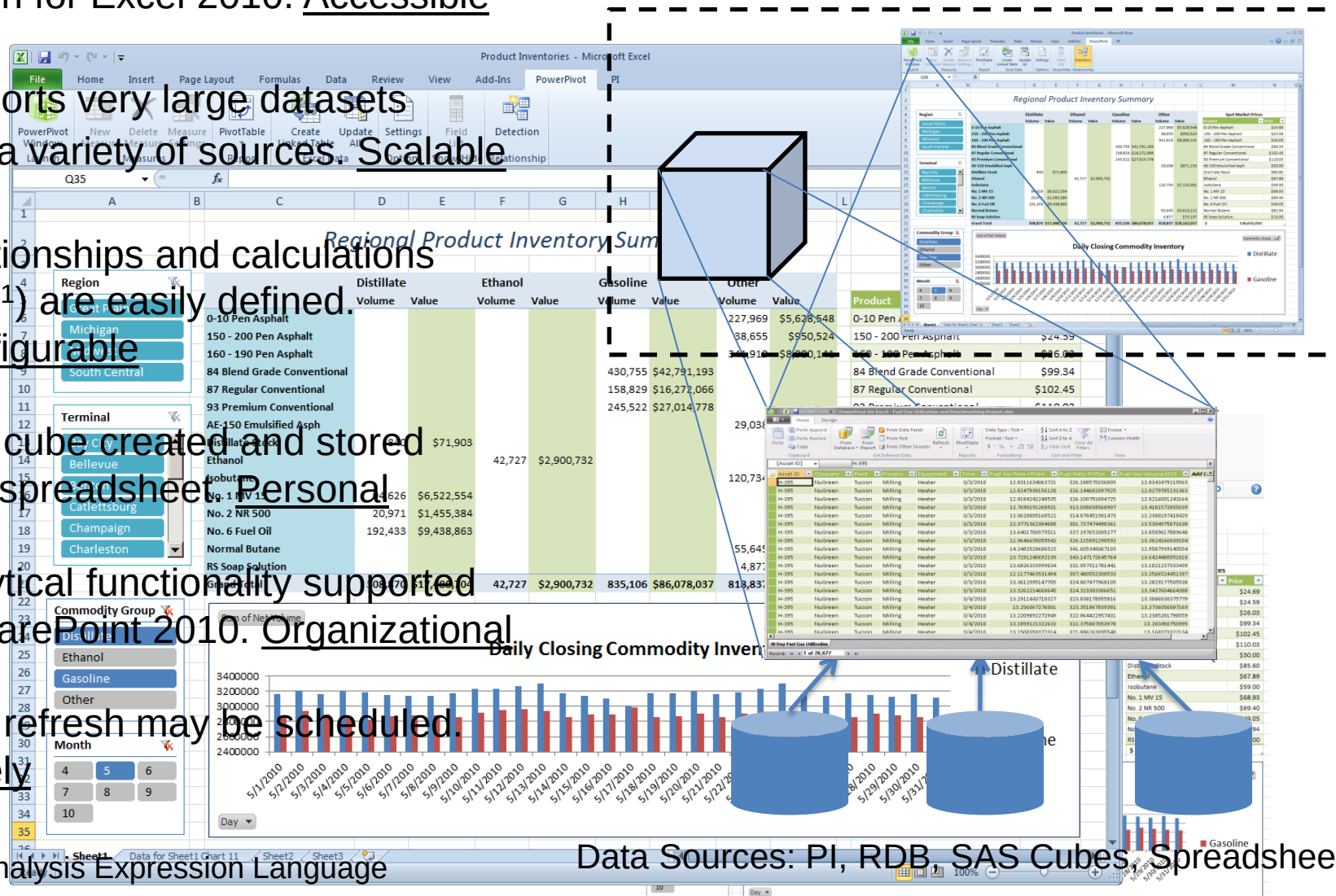
- Data cube created and stored with spreadsheet. Personal

- Analytical functionality supported in SharePoint 2010. Organizational

- Data refresh may be scheduled. Timely

1. Data Analysis Expression Language

Data Sources: PI, RDB, SAS Cubes, Spreadsheet



Example Walk Through



Regional Product Inventory Summary									
Region	Distillate		Ethanol		Gasoline		Other		
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	
Great Plains									
Michigan									
Midwest									
South Central									
Terminal									
Bay City									
Bellevue									
Benton									
Catlettsburg									
Champaign									
Charleston									
0-10 Pen Asphalt							227,969	\$5,628,548	
150 - 200 Pen Asphalt							38,655	\$950,524	
160 - 190 Pen Asphalt							341,919	\$8,900,141	
84 Blend Grade Conventional					430,755	\$42,791,193			
87 Regular Conventional					158,829	\$16,272,066			
93 Premium Conventional					245,522	\$27,014,778			
AE-150 Emulsified Asph							29,038	\$871,153	
Distillate Stock	840	\$71,903							
Ethanol			42,727	\$2,900,732					
Isobutane							120,734	\$7,123,301	
No. 1 MV 15	94,626	\$6,522,554							
No. 2 NR 500	20,971	\$1,455,384							
No. 6 Fuel Oil	192,433	\$9,438,863							
Normal Butane							55,645	\$4,615,212	
RS Soap Solution							4,877	\$73,157	
Grand Total	308,870	\$17,488,704	42,727	\$2,900,732	835,106	\$86,078,037	818,837	\$28,162,037	

Product Inventories



Regional Product Inventory Summary

Region

- Great Plains
- Michigan
- Midwest
- South Central

Terminal

- Bay City
- Bellevue
- Benton
- Catlettsburg
- Champaign
- Charleston

Commodity Group

- Distillate
- Ethanol
- Gasoline
- Other

Month

- 4
- 5
- 6
- 7
- 8
- 9
- 10

"Slicers"
filter data shown
in PowerPivot
Tables and
Charts

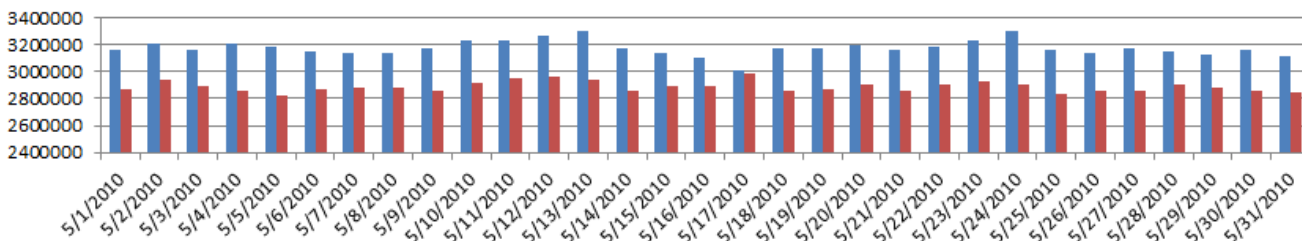
	Gasoline		Other	
	Volume	Value	Volume	Value
0-10 Pen Asphalt			227,969	\$5,628,548
150 - 200 Pen Asphalt			38,655	\$950,524
160 - 190 Pen Asphalt			341,919	\$8,900,141
84 Blend Grade Conventional	430,755	\$42,791,193		
87 Regular Conventional	158,829	\$16,272,066		
93 Premium Conventional	245,522	\$27,014,778		
AE-150 Emulsified Asph			29,038	\$871,153
Distillate Stock				
Ethanol				
Isobutane			120,734	\$7,123,301
No. 1 MV 15	94,626	\$6,522,554		
No. 2 NR 500	20,971	\$1,455,384		
No. 6 Fuel Oil	192,433	\$9,438,863		
Normal Butane			55,645	\$4,615,212
RS Soap Solution			4,877	\$73,157
Grand Total	308,870	\$17,488,704	42,727	\$2,900,732
	835,106	\$86,078,037	818,837	\$28,162,037

Spot Market Prices

Product	Price
0-10 Pen Asphalt	\$24.69
150 - 200 Pen Asphalt	\$24.59
160 - 190 Pen Asphalt	\$26.03
84 Blend Grade Conventional	\$99.34
87 Regular Conventional	\$102.45
93 Premium Conventional	\$110.03
AE-150 Emulsified Asph	\$30.00
Distillate Stock	\$85.60
Ethanol	\$67.89
Isobutane	\$59.00
No. 1 MV 15	\$68.93
No. 2 NR 500	\$69.40
No. 6 Fuel Oil	\$49.05
Normal Butane	\$82.94
RS Soap Solution	\$15.00
\$	136,635,050

Sum of Net Volume

Daily Closing Commodity Inventory



Commodity Group

Distillate

Gasoline

Day

Product Inventories



Regional Product Inventory Summary

Region	Distillate		Ethanol		Gasoline		Other	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Great Plains							227,969	\$5,628,548
Michigan							38,655	\$950,524
Midwest							341,919	\$8,900,141
South Central					430,755	\$42,791,193		
					158,829	\$16,272,066		
					245,522	\$27,014,778		
0-10 Pen Asphalt							29,038	\$871,153
150 - 200 Pen Asphalt								
160 - 190 Pen Asphalt								
84 Blend Grade Conventional								
87 Regular Conventional								
93 Premium Conventional								
AE-150 Emulsified Asph								
Distillate Stock	840	\$71,903						
Ethanol			42,727	\$2,900,732				
Isobutane							120,734	\$7,123,301
No. 1 MV 15	94,626	\$6,522,554						
No. 2 NR 500	20,971	\$1,455,384						
No. 6 Fuel Oil	192,433	\$9,438,863						
Normal Butane							55,645	\$4,615,212
RS Soap Solution							4,877	\$73,157
Grand Total	308,870	\$17,488,704	42,727	\$2,900,732	835,106	\$86,078,037	818,837	\$28,162,037

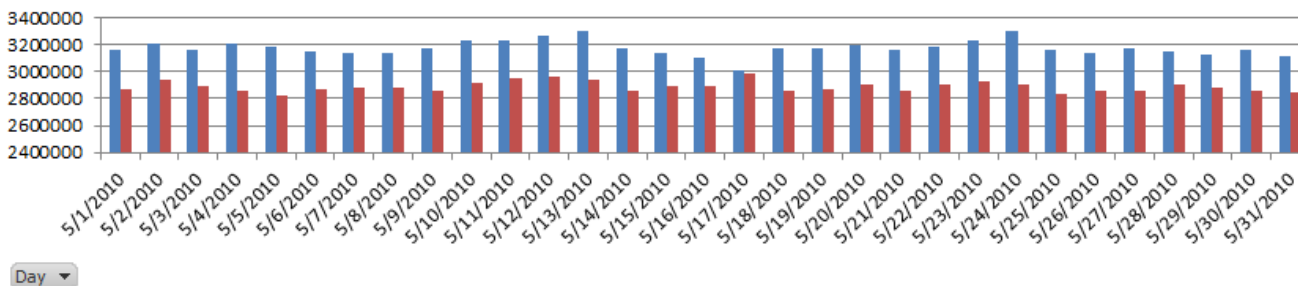
Spot Market Prices	
Product	Price
0-10 Pen Asphalt	\$24.69
150 - 200 Pen Asphalt	\$24.59
160 - 190 Pen Asphalt	\$26.03
84 Blend Grade Conventional	\$99.34
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93 Premium Conventional	\$110.03
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No. 6 Fuel Oil	\$49.05
Normal Butane	\$82.94
RS Soap Solution	\$15.00
\$	136,635,050

Commodity Group
Distillate
Ethanol
Gasoline
Other

Month
4
5
6
7
8
9
10

Sum of Net Volume

Daily Closing Commodity Inventory



Product Inventories



Regional Product Inventory Summary

Region

Great Plains

Michigan

Midwest

South Central

Terminal

Norman East

Norman West

Omaha NW

Tulsa

Wichita

Bay City

Commodity Group

Distillate

Ethanol

Gasoline

Other

Month

4

5

6

7

8

9

10

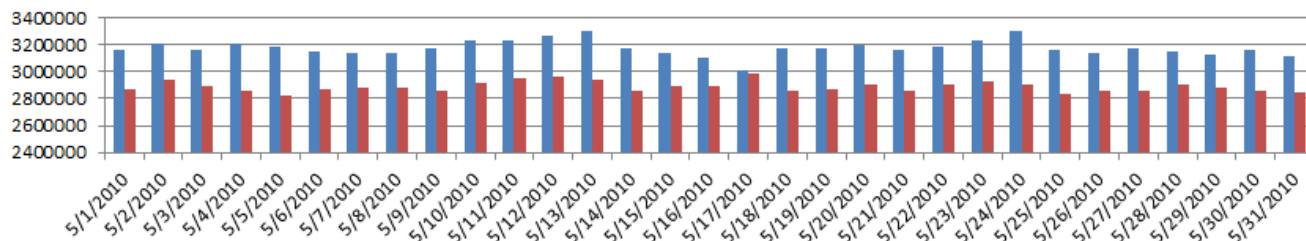
	Distillate		Ethanol		Gasoline		Other	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
0-10 Pen Asphalt							6,409	\$158,234
150 - 200 Pen Asphalt							9,970	\$245,154
160 - 190 Pen Asphalt							15,884	\$413,457
84 Blend Grade Conventional					5,882	\$584,359		
87 Regular Conventional					23,159	\$2,372,672		
93 Premium Conventional					15,078	\$1,659,028		
AE-150 Emulsified Asph								
Distillate Stock								
Ethanol			10,940	\$742,691				
Isobutane							103,641	\$6,114,800
No. 1 MV 15								
No. 2 NR 500								
No. 6 Fuel Oil	77,687	\$3,810,562						
Normal Butane								
RS Soap Solution								
Grand Total	77,687	\$3,810,562	10,940	\$742,691	44,120	\$4,616,060	135,903	\$6,931,645

Spot Market Prices

Product	Price
0-10 Pen Asphalt	\$24.69
150 - 200 Pen Asphalt	\$24.59
160 - 190 Pen Asphalt	\$26.03
84 Blend Grade Conventional	\$99.34
87 Regular Conventional	\$102.45
93 Premium Conventional	\$110.03
AE-150 Emulsified Asph	\$30.00
Distillate Stock	\$85.60
Ethanol	\$67.89
Isobutane	\$59.00
No. 1 MV 15	\$68.93
No. 2 NR 500	\$69.40
No. 6 Fuel Oil	\$49.05
Normal Butane	\$82.94
RS Soap Solution	\$15.00
\$	16,369,608

Sum of Net Volume

Daily Closing Commodity Inventory



Day

Commodity Group

Distillate

Gasoline

Product Inventories



Regional Product Inventory Summary

Region

Great Plains

Michigan

Midwest

South Central

Terminal

Norman East

Norman West

Omaha NW

Tulsa

Wichita

Bay City

Commodity Group

Distillate

Ethanol

Gasoline

Other

Month

4

5

6

7

8

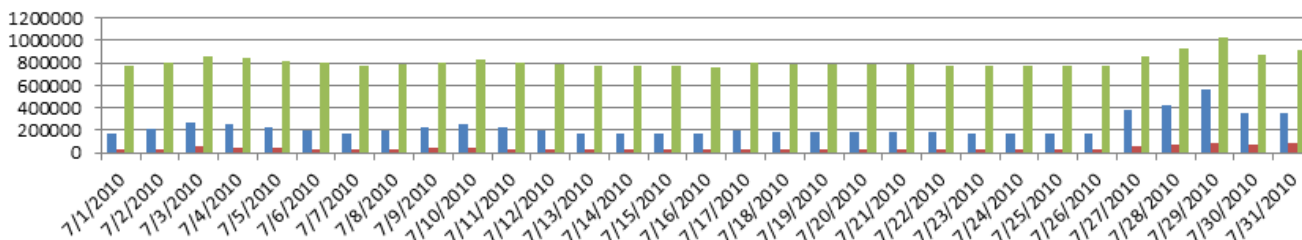
9

10

	Distillate		Ethanol		Gasoline		Other		Spot Market Prices	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Product	Price
0-10 Pen Asphalt							6,409	\$158,234	0-10 Pen Asphalt	\$24.69
150 - 200 Pen Asphalt							9,970	\$245,154	150 - 200 Pen Asphalt	\$24.59
160 - 190 Pen Asphalt							15,884	\$413,457	160 - 190 Pen Asphalt	\$26.03
84 Blend Grade Conventional					5,882	\$584,359			84 Blend Grade Conventional	\$99.34
87 Regular Conventional					23,159	\$2,372,672			87 Regular Conventional	\$102.45
93 Premium Conventional					15,078	\$1,659,028			93 Premium Conventional	\$110.03
AE-150 Emulsified Asph									AE-150 Emulsified Asph	\$30.00
Distillate Stock									Distillate Stock	\$85.60
Ethanol			10,940	\$742,691					Ethanol	\$67.89
Isobutane							103,641	\$6,114,800	Isobutane	\$59.00
No. 1 MV 15									No. 1 MV 15	\$68.93
No. 2 NR 500									No. 2 NR 500	\$69.40
No. 6 Fuel Oil	77,687	\$3,810,562							No. 6 Fuel Oil	\$49.05
Normal Butane									Normal Butane	\$82.94
RS Soap Solution									RS Soap Solution	\$15.00
Grand Total	77,687	\$3,810,562	10,940	\$742,691	44,120	\$4,616,060	135,903	\$6,931,645	\$	16,369,608

Sum of Net Volume

Daily Closing Commodity Inventory



Product Inventories

Regional Product Inventory Summary

Region

Great Plains

Michigan

Midwest

South Central

Terminal

Norman East

Norman West

Omaha NW

Tulsa

Wichita

Bay City

Commodity Group

Distillate

Ethanol

Gasoline

Other

Month

4

5

6

7

8

9

10

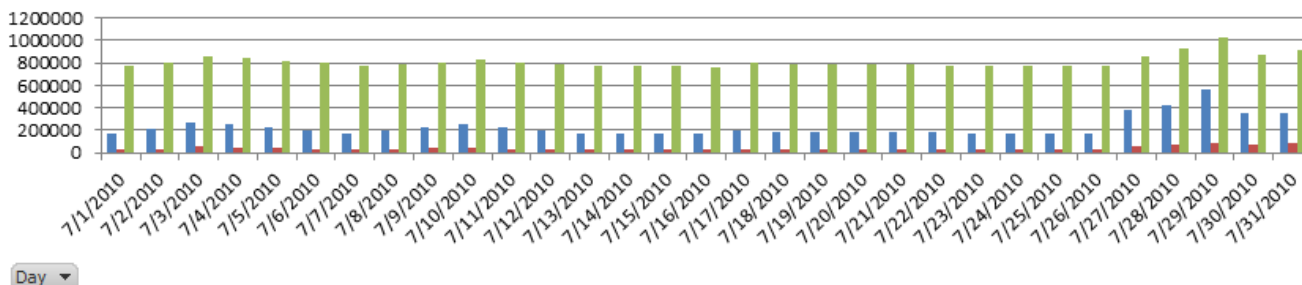
	Distillate		Ethanol		Gasoline		Other	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
0-10 Pen Asphalt							6,409	\$158,234
150 - 200 Pen Asphalt							9,970	\$245,154
160 - 190 Pen Asphalt							15,884	\$413,457
84 Blend Grade Conventional								
87 Regular Conventional								
93 Premium Conventional								
AE-150 Emulsified Asph								
Distillate Stock								
Ethanol								
Isobutane							105,641	\$14,800
No. 1 MV 15								
No. 2 NR 500								
No. 6 Fuel Oil	77,687	\$3,810,562						
Normal Butane								
RS Soap Solution								
Grand Total	77,687	\$3,810,562	10,940	\$742,691	44,120	\$4,616,060	135,903	\$6,931,645

Linked Tables
Manual entry of
data into
PowerPivot cube
for "What-If"
analysis

Spot Market Prices	
Product	Price
0-10 Pen Asphalt	\$24.69
150 - 200 Pen Asphalt	\$24.59
160 - 190 Pen Asphalt	\$26.03
84 Blend Grade Conventional	\$99.34
87 Regular Conventional	\$102.45
93 Premium Conventional	\$110.03
AE-150 Emulsified Asph	\$30.00
Distillate Stock	\$85.60
Ethanol	\$67.89
Isobutane	\$59.00
No. 1 MV 15	\$68.93
No. 2 NR 500	\$69.40
No. 6 Fuel Oil	\$49.05
Normal Butane	\$82.94
RS Soap Solution	\$15.00
\$	16,369,608

Sum of Net Volume

Daily Closing Commodity Inventory



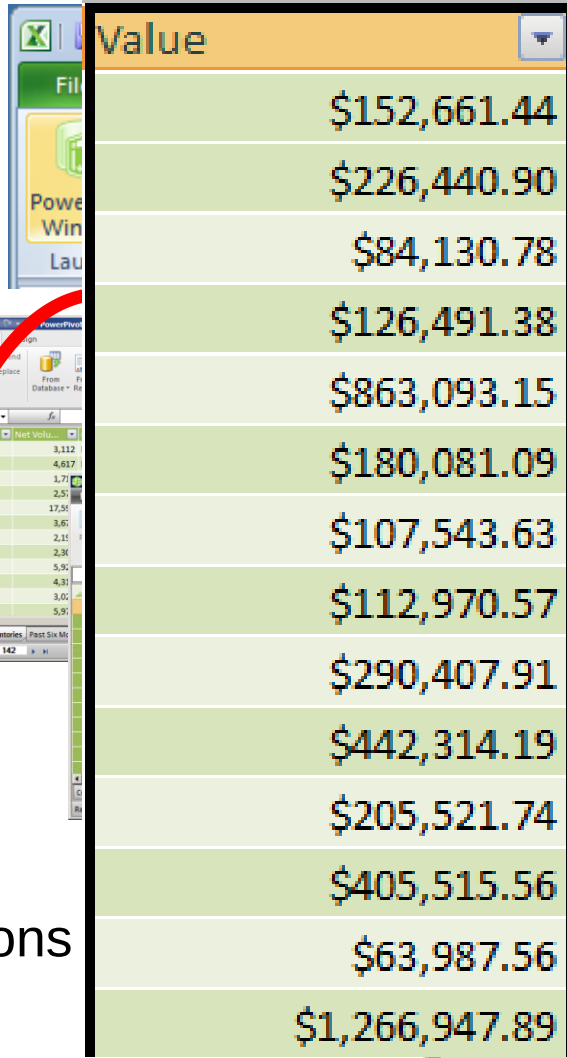
Commodity Group

- Distillate
- Ethanol
- Gasoline

Day

Import Data into PowerPivot

PowerPivot
Add-In for
Excel 2010

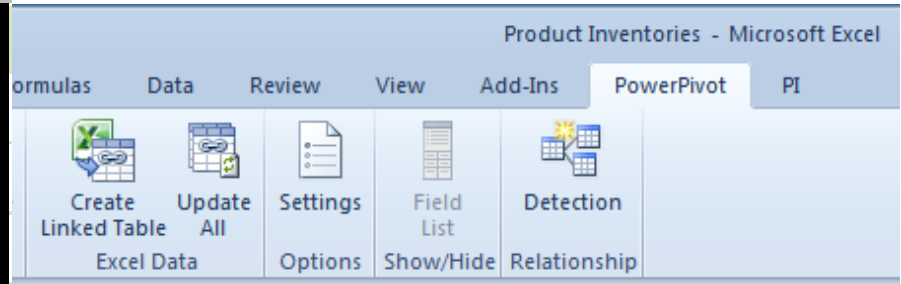


	Value
	\$152,661.44
	\$226,440.90
	\$84,130.78
	\$126,491.38
	\$863,093.15
	\$180,081.09
	\$107,543.63
	\$112,970.57
	\$290,407.91
	\$442,314.19
	\$205,521.74
	\$405,515.56
	\$63,987.56
	\$1,266,947.89

Configure
Relationships

Add Calculations
Using DAX¹

1. Data Analysis Expression Language

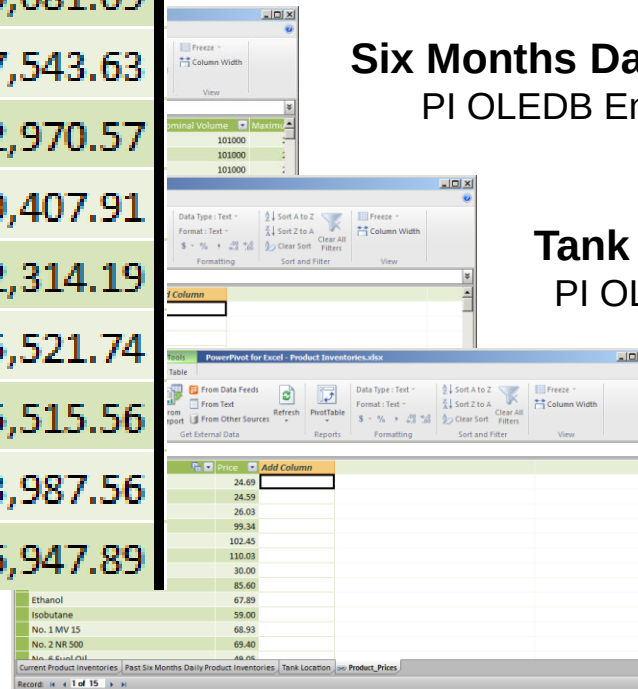


Current Product Inventories
PI OLEDB Enterprise 2010

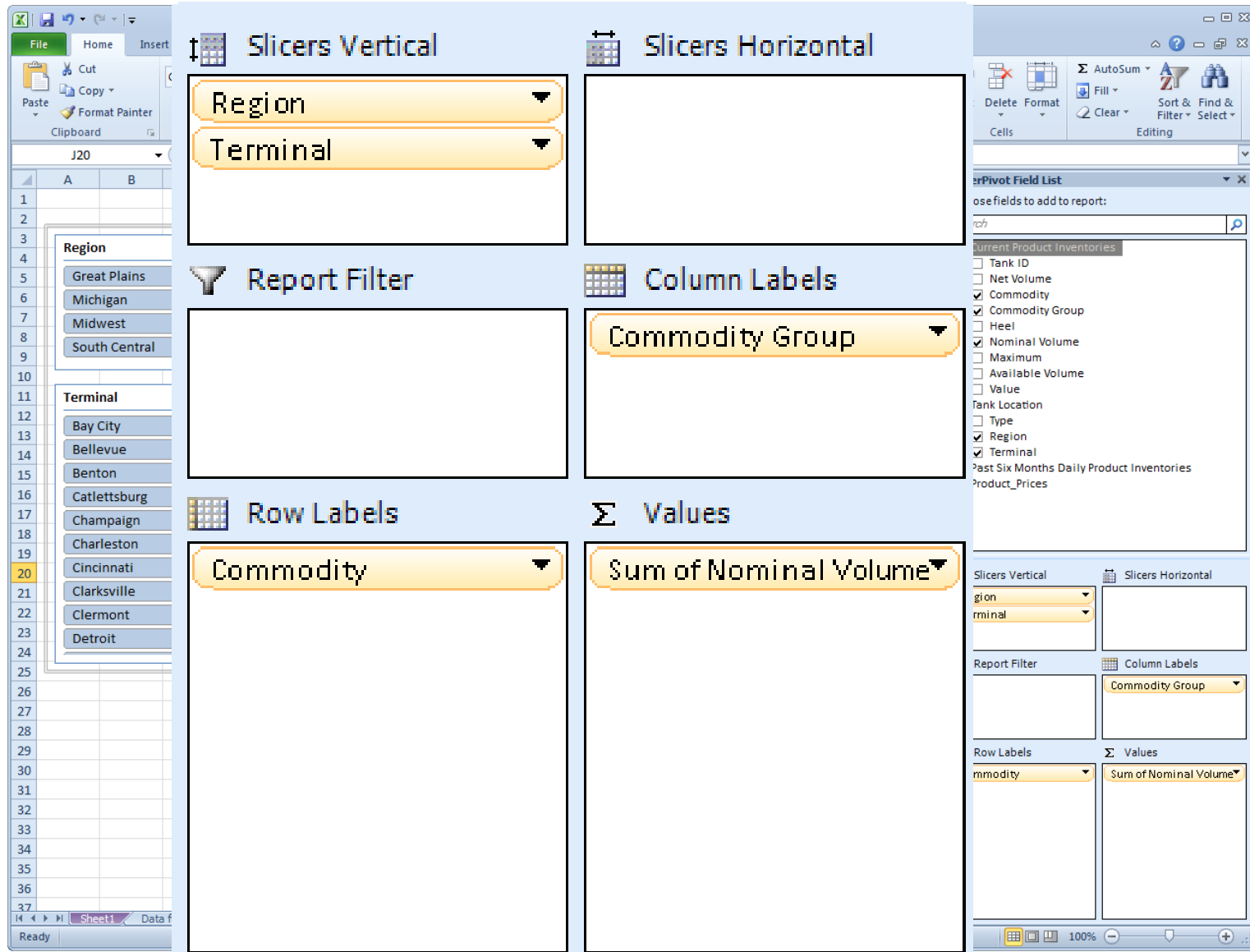
Six Months Daily Inventories
PI OLEDB Enterprise 2010

Tank Location
PI OLEDB Enterprise 2010

Commodity Prices
Excel Linked Table



Build PowerPivot Tables and Charts



The screenshot displays the Microsoft Excel interface with the PowerPivot task pane open. The main workspace is divided into six sections for configuring a PivotTable:

- Slicers Vertical:** Contains two slicers, 'Region' and 'Terminal'.
- Slicers Horizontal:** Currently empty.
- Report Filter:** Currently empty.
- Column Labels:** Contains the 'Commodity Group' field.
- Row Labels:** Contains the 'Commodity' field.
- Values:** Contains the 'Sum of Nominal Volume' field.

On the left side of the Excel window, a list of regions and terminals is visible:

- Region:** Great Plains, Michigan, Midwest, South Central.
- Terminal:** Bay City, Bellevue, Benton, Catlettsburg, Champaign, Charleston, Cincinnati, Clarksville, Clermont, Detroit.

On the right side, the **PivotField List** pane shows the following fields:

- ☐ Tank ID
- ☐ Net Volume
- ☒ Commodity
- ☒ Commodity Group
- ☐ Heel
- ☒ Nominal Volume
- ☐ Maximum
- ☐ Available Volume
- ☐ Value
- ☐ Tank Location
- ☐ Type
- ☒ Region
- ☒ Terminal

Below the PivotField List, there are two sections: 'Current Product Inventories' and 'Past Six Months Daily Product Inventories'.

The bottom right corner shows a smaller version of the same interface, likely a thumbnail or a secondary view.

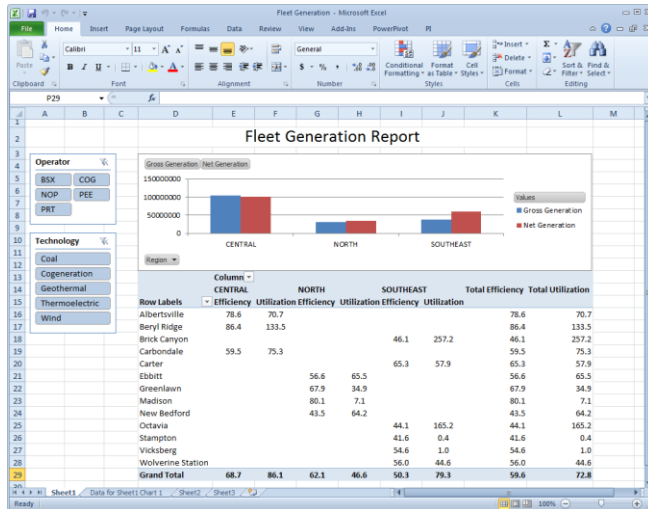
Additional Information and Next Steps



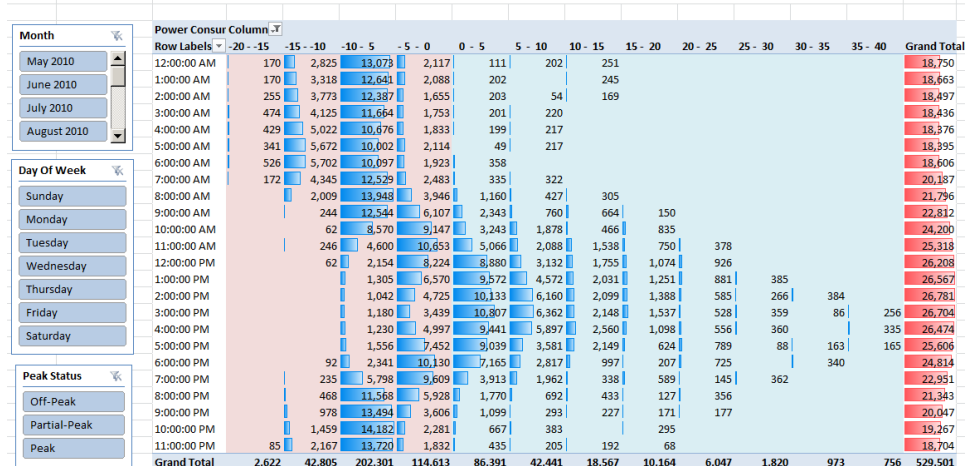
- Resources on OSIsoft vCampus
 - SQL Development Forum
 - Recorded Presentations
 - “Personal BI with PI DataLink and Office 2010”
 - “Building a BI Infrastructure Part 1: Warehousing, ETL, and Cube Building”
 - “Building a BI Infrastructure Part 2: Visualization, Analysis, and Personalization”
 - Prescriptive Architecture Guides
- Resources from Microsoft
 - PowerPivot (www.PowerPivot.com)
 - CFE Case Study (www.microsoft.com/casestudies/Microsoft-Sharepoint-Server-2010/Comisi-n-Federal-de-Electricidad-CFE/Mexico-s-Electrical-Utility-Sees-Saving-Millions-of-Dollars-through-Collaborative-BI/4000007996)
 - Project Dallas (www.sqlazureservices.com/Subscriptions.aspx)

Come Learn More ! Stand 4 “PI Client e PowerPivot”

Bruno Squassoni
Leonardo Duarte
Curt Hertler



OSIsoft HVAC Power Profile - San Leandro Office





Thank you

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