



Sustainable Manufacturing in the Information Age

Value now. Value over time.

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What is Happening to the Economy

- Fundamental Shift to Information Age
 - Alvin Toffler - Revolutionary Wealth
- Better Place - New Business Model
- Parallels to Telecom
 - Rise of the Stupid Network
 - Rise of the Stupid Gird
- Enabler of NG Telecom
 - Voice over IP, Distributed ACD, Telepresence, SMS, Remove Land Line, Personal Call Bridges, Personal Info Web Sites

Smart Grid - the Enabler

- www.oe.energy.gov
- Enabling New Business Models
- New Technology 30-50 yr adoption
- Example Microturbine
- “Load” (as in Load Management) is You
- Drives Adoption of MicroGrid

What is Microgrid

- Ability to Island
- Internal Load Balancing
- Managed Curtailment
- Ancillary Products (Standby, Reg Up, Reg Dn)

Energy Conservation – Real Example

- Results Now
- No Development Needed
- Large Benefits
- Regulation is the Problem

Kodak Park



Power at Kodak Park

KODAK Workforce Portal


Welcome JAMES BREEZE


Welcome myHR KP Energy




Utilities Home | Utilities Generation | Building Usage | Ad-Hoc Trend

Detailed Navigation

- **Steam Elec Overview**
- ▾ Steam and Electric
 - Steam Elec Overview
 - Steam Diagram
 - Purchased Power
- ▾ Refrigeration and Water
 - Refrig Water Overview
 - KPE Steam to Refrigeration
- ▾ KP Chilled Water
 - KP Chilled Water Total Tons
 - KPE Chilled Water Total Tons
 - KPW Chilled Water Total Tons
 - KPM Chilled Water Total Tons
 - KPS Chilled Water Total Tons
 - 9 Degree System Tons
 - -95 System Tons
- ▾ Waste Water Treatment
 - Waste Water Flow
 - Waste Water Electric Usage
 - Hydro Generator Output

Start Time: 

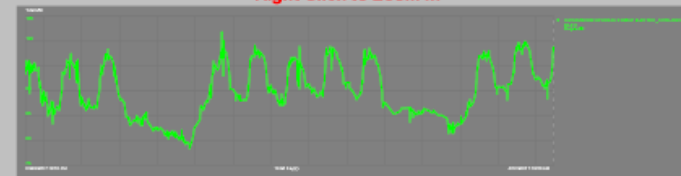
End Time: 

Apply   

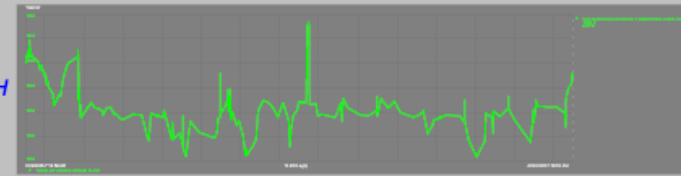
Kodak Park Power

Right Click to Zoom In

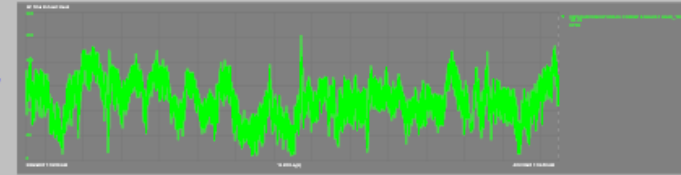
Total MW 98.4 Megawatts



Total Steam Flow 1,426 KPPH



Exhaust Head Steam Flow 132 KPPH



Steam Flows KPPH

Package Boilers	Boiler 13	Boiler 14	Boiler 15	Boiler 41	Boiler 42	Boiler 43	Boiler 44
0	116.0	103.1	410.8	400.9	402.5	0.0	0.0

Kodak Park Utilities

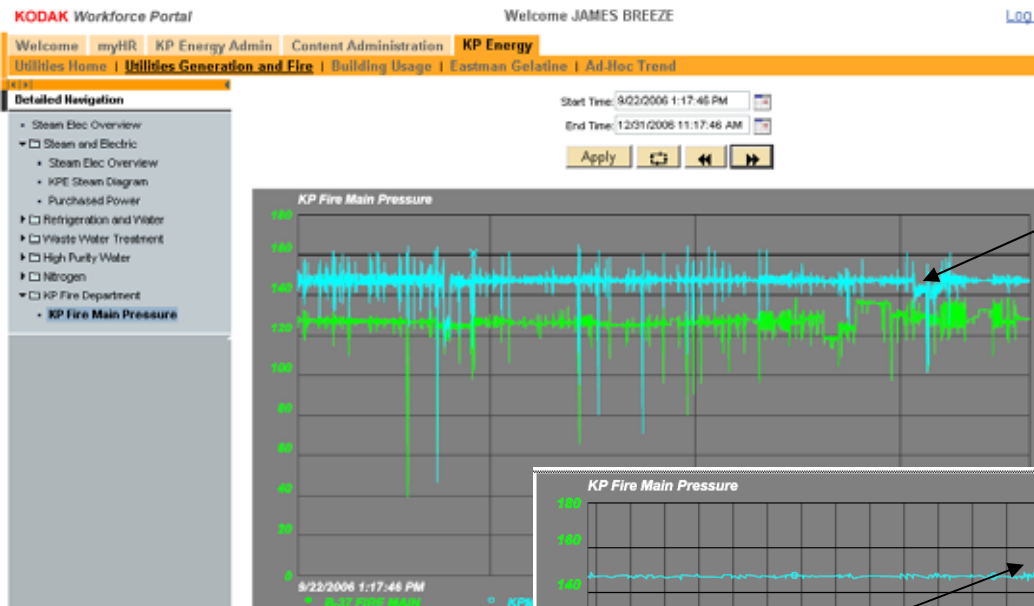
- 2,000,000 Pound/Hour Steam Load
- 125 MW Electric Load
- 80,000 Ton Refrigeration Capacity
- 30,000,000 Gallons/Day Process Water Load
- 35,000 SCFM Compressed Air Load

Utility Metering

- 600 Electric Distribution Meters
- 600 Additional Distribution Meters for:
Steam, Chilled Water, Brine, Compressed Air,
Process Water, Nitrogen, Natural Gas, etc.
- Significant Metering Used within the Power Houses to Manage the Generation Side

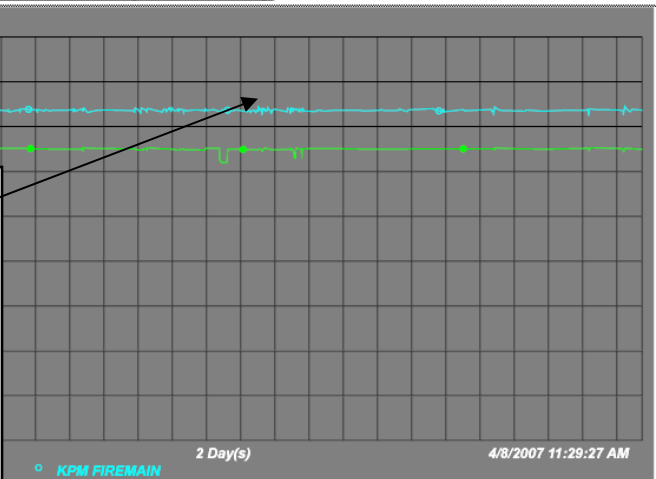
Interfaces

- BAS
 - Rosemount - Fix 32
 - Siemens - Apogee
 - Emerson - Delta V
 - SQL Based Historians
- DCS
 - Fisher Provox
 - Westinghouse WDPF
 - Westinghouse Ovation
 - Taylor Mod 300
 - Emerson - Delta V




Numerous water main breaks due to pressure control issues



Increased visibility and easy access to this data has improved control and reduced the frequency of these "costly" water main breaks dramatically.

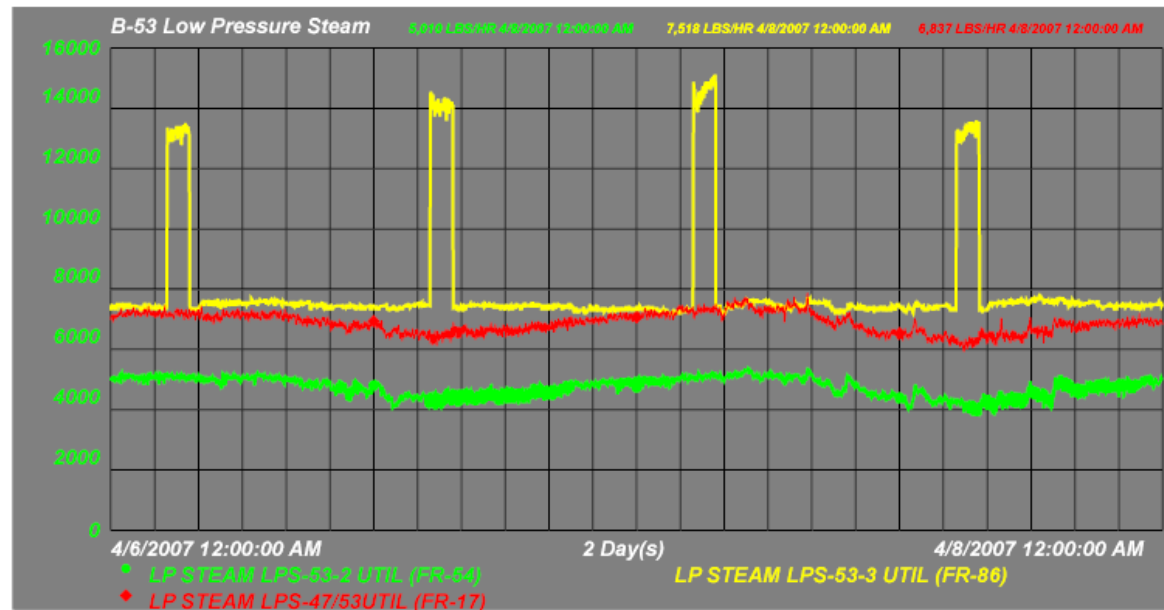


- Detailed Navigation**
- ▼ KPE
 - ▶ B6
 - ▶ B12
 - ▶ B28
 - ▶ B29
 - ▶ B30
 - ▶ B38
 - ▶ B42
 - ▶ B52
 - ▼ B53
 - B53 Electric
 - **B53 LP Steam**
 - B53 135# Steam
 - B53 Chilled Water
 - B53 Brine
 - B53 Compressed Air
 - ▶ B54
 - ▶ B59
 - ▶ B65
 - ▶ B69
 - ▶ B81
 - ▶ B81S
 - ▶ B82
 - ▶ B83
 - ▶ RL
 - ▶ KPWXX

Start Time: 

End Time: 

Apply   

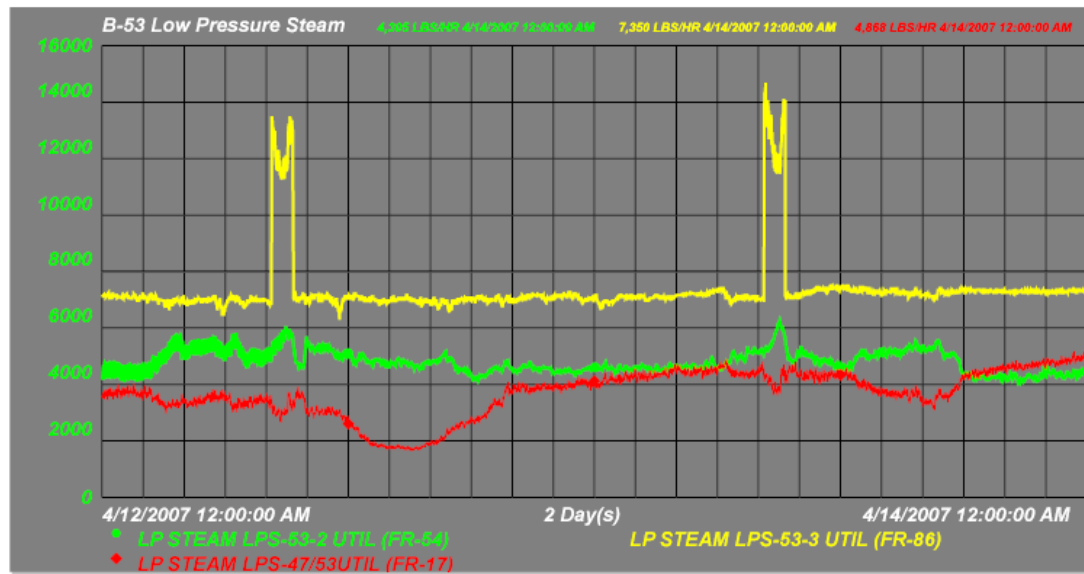


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Start Time: 4/12/2007 12:00:00 AM

End Time: 4/14/2007 12:00:00 AM

Apply   

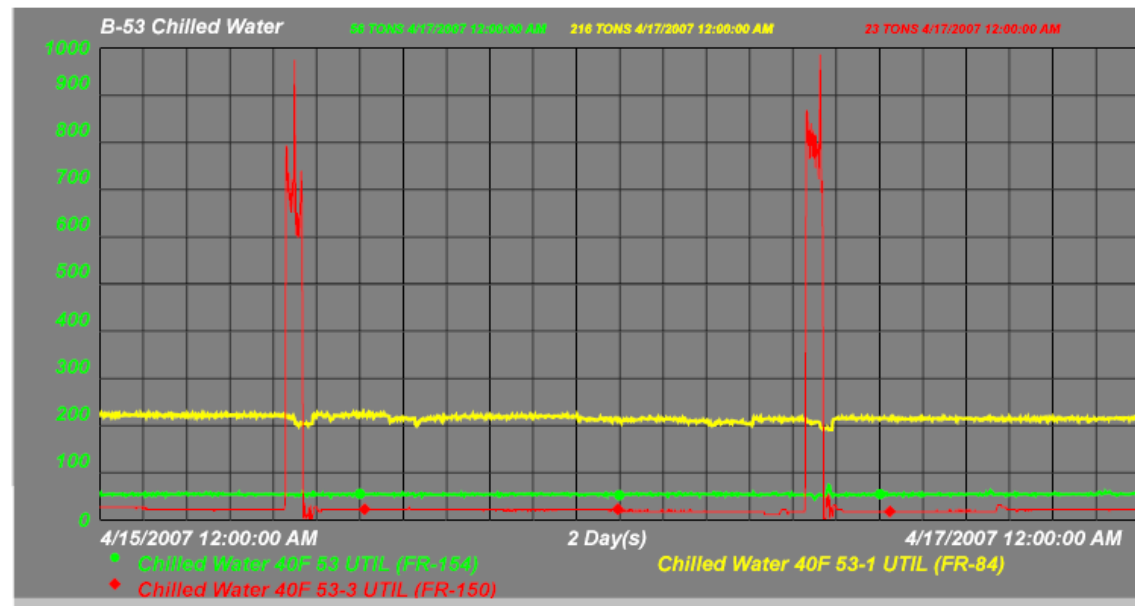


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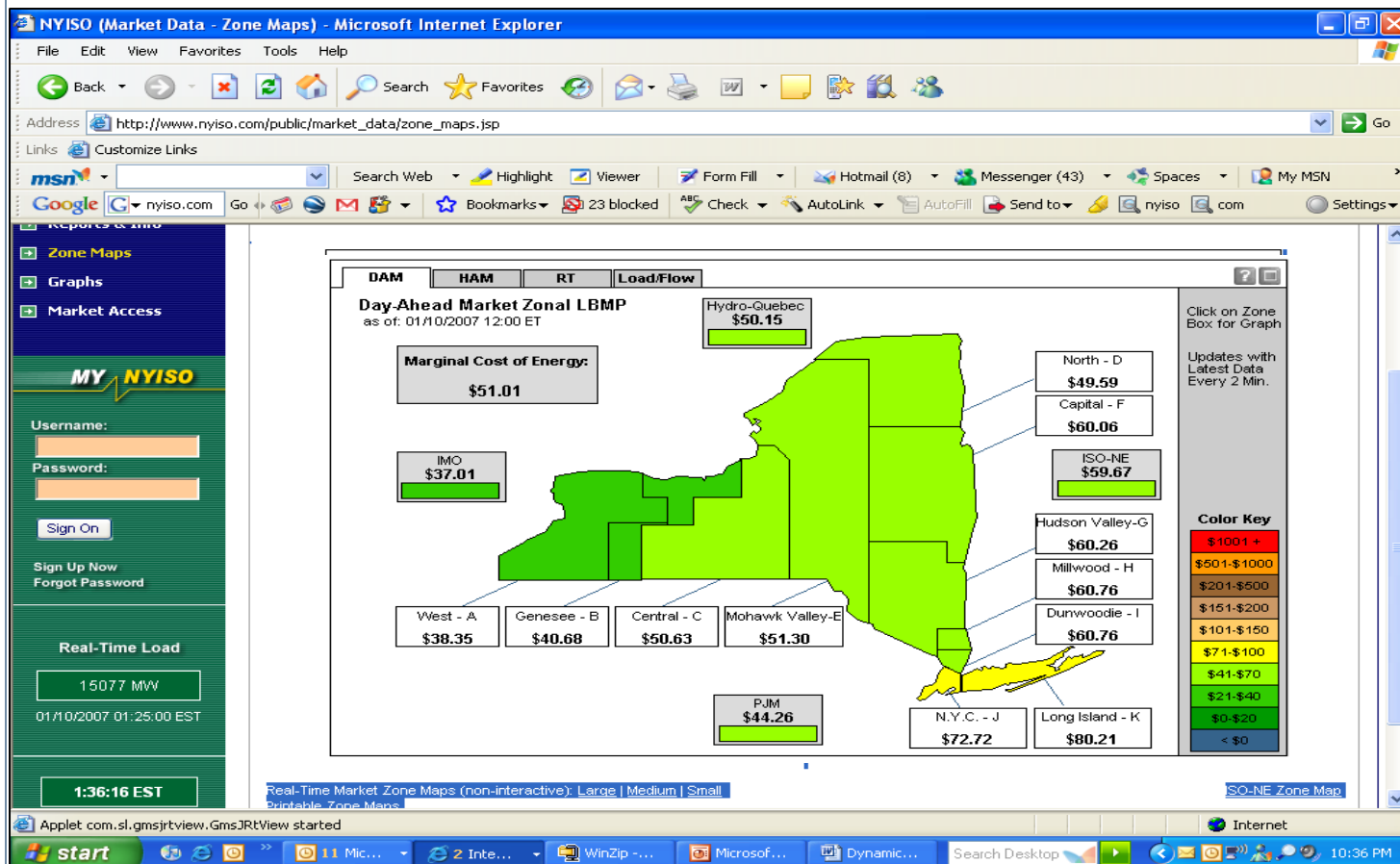
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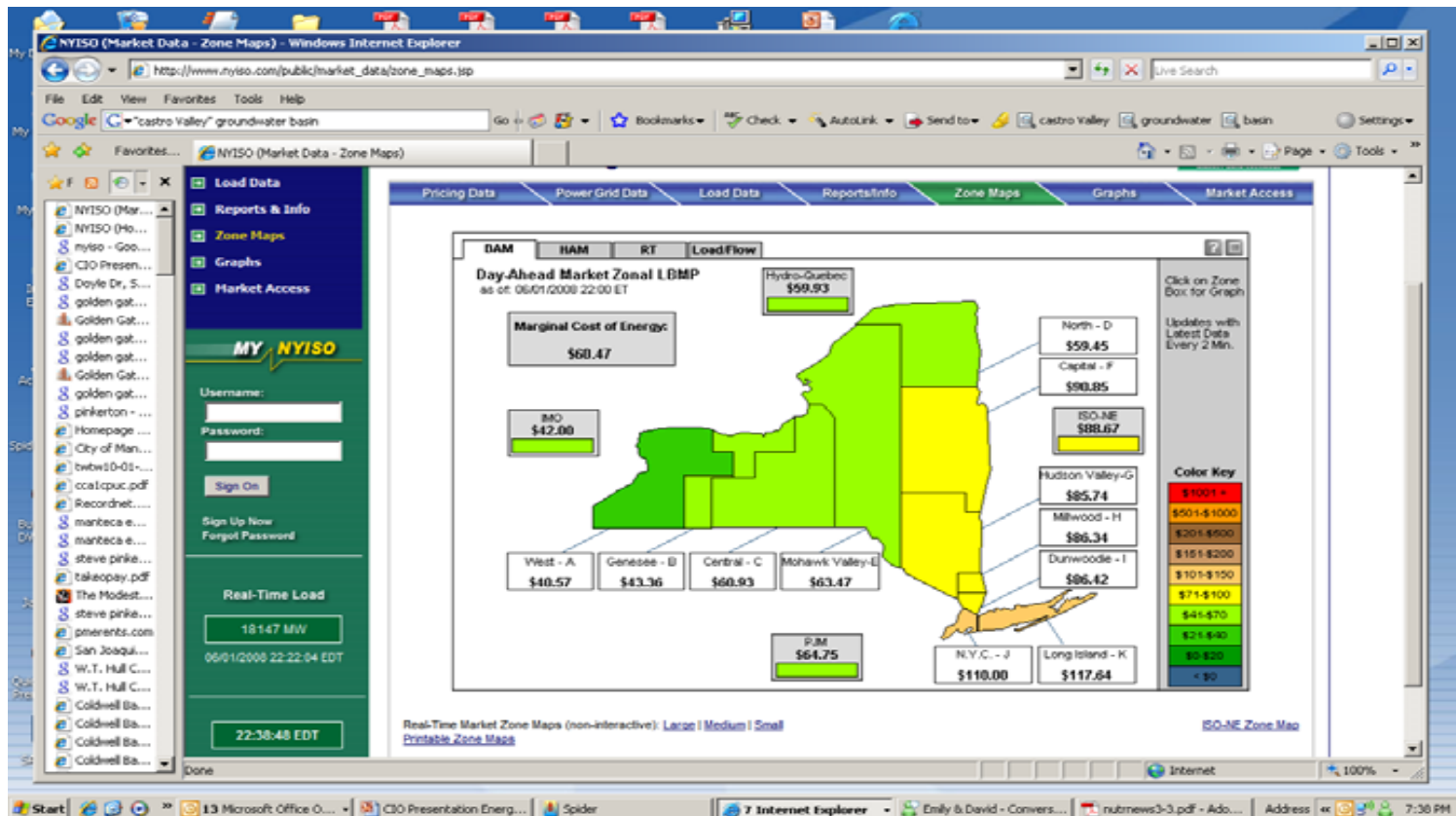
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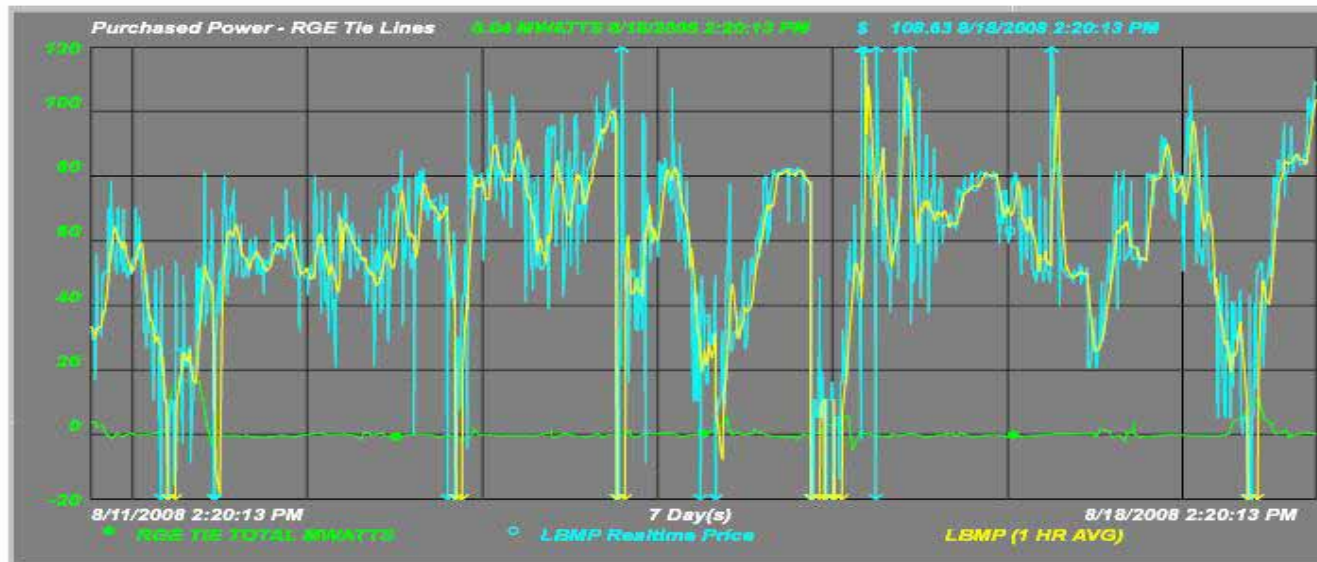
Nodal Pricing



Nodal Pricing



Tariff Help



Harvest Time

- The Energy Information System (EIS) has been an essential tool to help us reach our goal of:

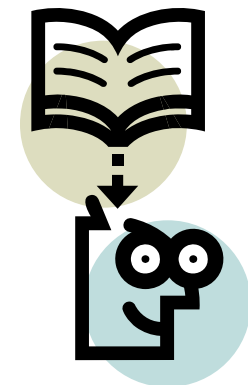
“One Powerhouse for Kodak Park”

Collectively these efforts have yielded savings into the millions of dollars.

- 2006 \$21,000,000
- 2007 \$28,000,000

Lessons Learned at Kodak

- Capital Spent on Faith
- No BIG BANG – 1000 little bangs
- Continuous Improvement Process
- Combined Capital and Intelligence Operation
- Infrastructure Approach
- Lowers the Cost of Curiosity
- Culture Change





Thank you

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