

Midwest Cogeneration Association – 2007 Annual Energy Conference

Power/CoGeneration in a Deregulated Marketplace



Johnson Controls History of Power/Cogeneration Activities

- 9.4 MW Installed Between 1996 and 1999
 - All Natural Gas Recip. Engines
 - Most have Jacket water Heat Recovery
- Generation Installed as Part of Larger Performance Contracts
- All Sites Operated as Peak Shaving Facilities
- Operated under ComEd Standby Service (Rate 18) Until January 2007

January 2, 2007 – ComEd Tariff Changes

What are your Electric Supply Options?

In ComEd market: Standby Service (Rate 18) No Longer available.

All Self Generation Customers regardless of size have 2 Options for Electric Supply.

1. BES-H is only default rate available for Customers with Self-Generation
2. Contract with an ARES for Supply needs

Many Supply options available from ARES

- Fixed Price
- Real Time Index
- Block Product
- Day-Ahead Index
- Combination of options

How do you Utilize Generation Asset after Jan. 2nd 2007?

- Shut down and only use for Emergency Backup Power
- Mothball or sell exiting system due to high natural gas prices
- Use ComEd Rate BES-H or ARES 100% Index Product and only run system when economical
- Use system for available curtailment and enroll in Load Response/Demand Response programs
- Optimize Generation for best bottom line

The Case for Shutting Down or Mothballing

Most facilities in ComEd can contract for fixed price with an ARES and have a Total average electric cost in the range of 8.5 to 9.0 ¢/kWh

Assuming engine maintenance to be in the range of 1.5 to 2.0 ¢/kWh, the breakeven cost of generation would be 6.5 to 7.5 ¢/kWh

The burner tip cost of gas to achieve this breakeven cost would be:

<u>Heat Rate</u>	<u>Cost per therm</u>
10,000 btu/kWh	\$0.65 to \$0.75
12,000 btu/kWh	\$0.54 to \$0.63

Pricing like this has not been seen in recent years so shut the engines down.

The Case for ComEd Rate BES-H or ARES 100% Index Product

By utilizing a real-time hourly energy pricing electric rate, you can minimize cost by running the generation only in the hours that it is economical.

You guarantee that the maximum cost of electricity is capped at the cost of self generation.

Run decision is made daily with the receipt of day ahead hourly pricing

Generally, you can negotiate a 100% index product option with an ARES that is superior to the ComEd default rate. You also keep you flexibility with the option to “lock-in” at target prices under the ARES option.

Use System for available Curtailment Programs

As long as the generation system is operational, curtailment programs are available.

Need to work with a Curtailment Service Provider (CSP) who participates in the PJM load response program. Program availability will depend on current supply contract and generation usage.

Several Load Response programs are available including Capacity (mandatory compliance) and Energy (voluntary) programs.

The Capacity Programs are potentially the most lucrative. Several factors influence the value of load response participation including: account-specific Peak Load Contribution demand value, Capacity Auction Value price, shared savings benefit % negotiated with the CSP and the gen asset availability and performance when dispatched during a called event during the compliance period.

Optimize Generation for Best Bottom Line

Develop a customized offering specifically for self-generation customers.

Components of such an offering are:

- Integrate Electric Purchasing Strategy with Natural Gas Purchasing Strategy
- Align Commodity Price & Risk Management with Generation Asset Utilization
- Customer Specific Optimization Model
- Automated Decision Making Process
- Curtailment Service Integration

Optimized Customer Example

Electric Supply Profile

- Block/Index Supply Strategy
 - Fixed Block Pricing – hedge a position for a % of requirements. A fixed quantity “block” is a wholesale-like transaction. Can be fixed for On-Peak only (ComEd or NERC) or a 7 x 24 (around-the-clock) block type.
 - Float on index for balance of requirements – option to “lock in” when market is favorable or reach target prices.

Natural Gas Supply Profile

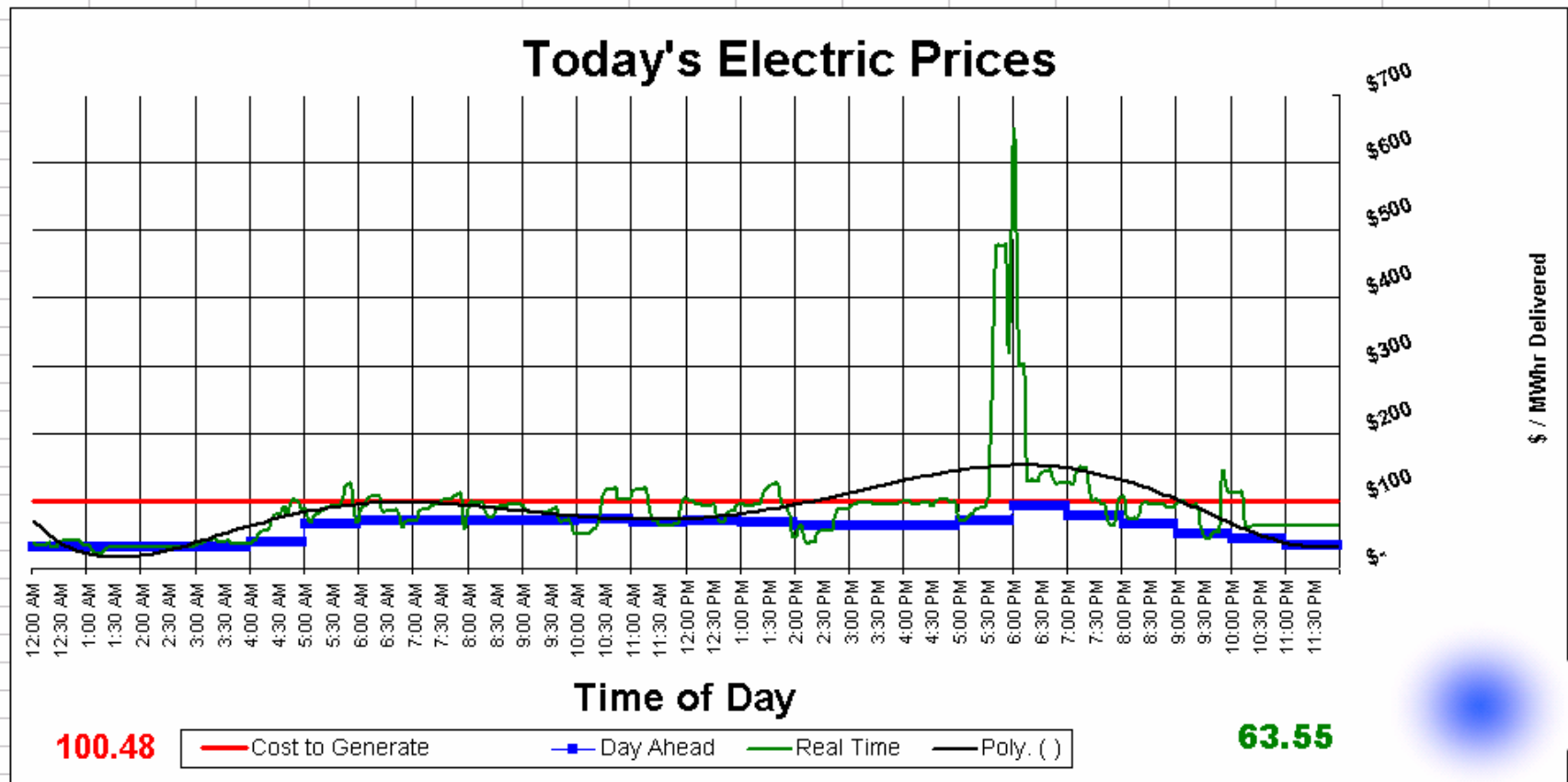
- Blended Supply Strategy
 - Actively Manage available Storage
 - Lock in portion of load at Fixed Pricing
 - Portion of load float at Spot Market Pricing

Optimized Customer Example - Continued

Optimization Model

- Automates Hourly Run Decision
 - Daily email on next day run decision based upon Day Ahead LMP Prices
 - Intraday email update based upon Actual Real Time LMP
- Monthly Savings Reconciliation
 - Actual Costs and Saving as Optimized
 - Lost Opportunity against “Perfect Optimization” scenario
 - Comparison to Other Benchmarks and comparative product options (Budget Targets, BES-H, ARES 100% index, ARES Fixed)

Actual ComEd Zone RTP Data October 23, 2007



Optimized Customer Savings Example

<u>Optimization Strategy Savings</u>	<u>July-2007</u>	<u>August-2007</u>
Actual Cost as Optimized	\$ 92,346	\$ 83,638
Perfect Optimization Cost	\$ 71,170	\$ 60,853
Monthly Optimization Savings	\$ 20,172	\$ 34,614
Perfect Optimization Potential Savings	\$ 41,348	\$ 57,399
 <u>Other Benchmark Comparisons</u>		
Block/Index Base Contract	\$ 112,518	\$ 118,252
ComEd BES-H	\$ 136,470	\$ 149,948
ARES 100% Index Price	\$ 124,063	\$ 136,316
ARES Fixed Price	\$ 115,011	\$ 119,628

