



Energy Management and Sustainability

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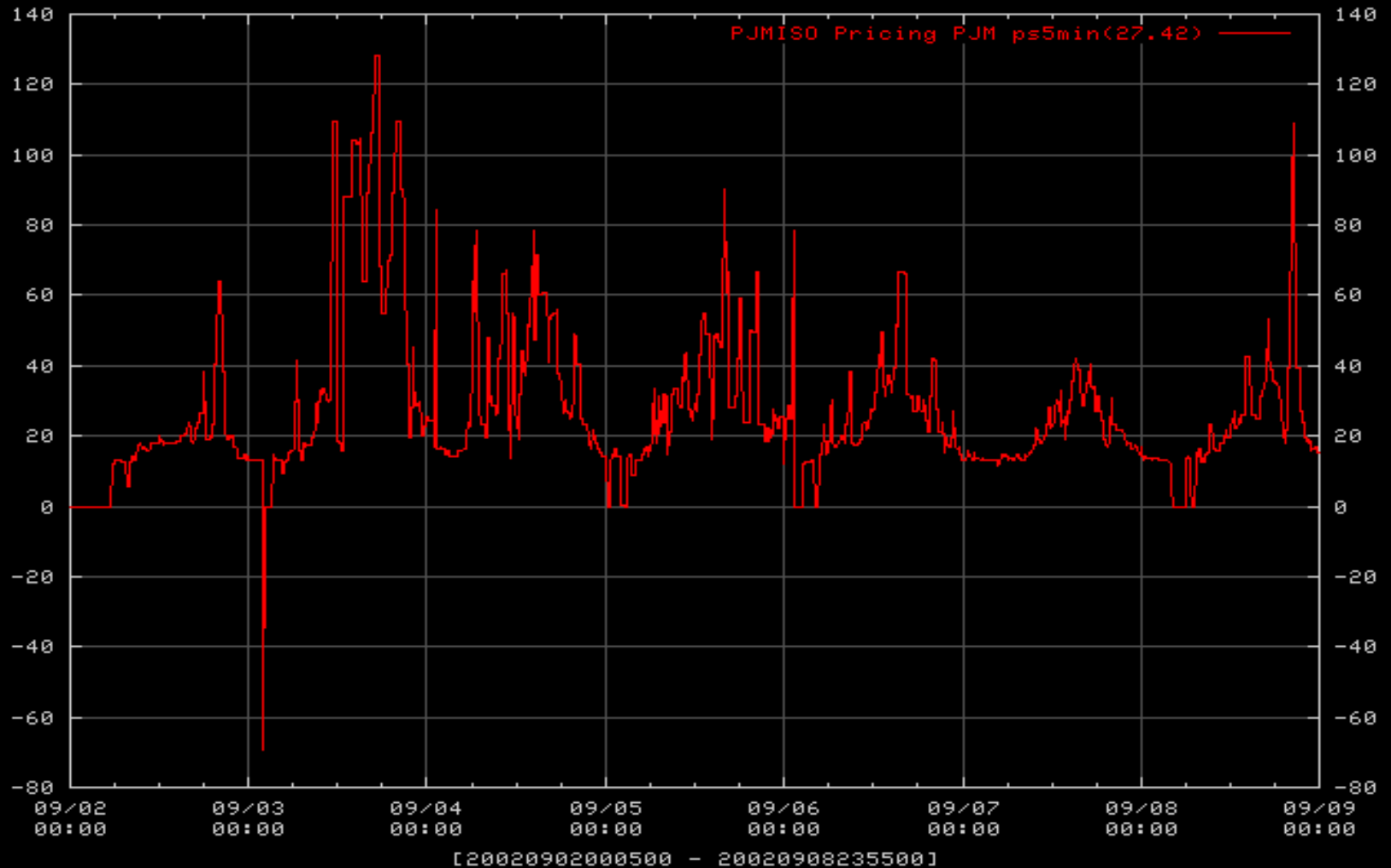
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Energy Management, Markets and Sustainability

- Markets are volatile
- Power demand drives generation mix
- Increased demand brings less efficient generation on line
- Power consumed in less expensive hours generally correlates with lower emissions
- Significant cost savings from managing energy use according to price provides funds for other sustainability projects

Electric Markets are Volatile



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Generation Stack

Lowest to Highest Marginal Cost

- Hydro
- Nuclear
- Coal
- Gas
- Oil
- Gas and Coal compete according to fuel cost and unit efficiency

Heat Rate and Fuel Cost and Emissions

- Heat Rate = BTU's to make 1 kilowatt hour of electricity
- Low heat rate = higher efficiency and lower Carbon emissions and cost (for the same fuel type and fuel cost)
- Obviously does not apply if marginal plant is coal and next on-line is gas.

Use Less Electricity When Prices are High!

