Virtual Transmission via DG Aggregation

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Background

Premise:

Use customer on-site DG and newly created market mechanisms to off-set the costs of transmission congestion in New York City and Long Island.

What is it Worth?

About to $150,000/MW-yr to $250,000/MW-yr based upon current and recent ICAP/DA market prices.

Is it relevant to CHP?

Yes. Most CHP projects can improve their economic performance using this strategy. More importantly, this approach can off-set the major risk of any CHP project; reliance upon natural gas.

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Electric Supply Vision

Turn Retail Customer's on-site generators into a strategic asset;

*** Become a Retail Choice Customer;**

*** Purchase a block of low-cost energy from outside of the constrained zone, 8760 hrs/yr;**

*** Cap electric energy costs by operating engines when DAM price exceeds a specified threshold; and**

Eliminate concern over the uncertainty of electric commodity costs and the underlying volatility of natural gas prices.

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Assumptions for

Electric Supply Operation

- **Use engines as a load modifier**.
- See Figures 1 & 2; Buy a low-cost block of energy 8760 hrs/yr from an upstate renewable energy or coal plant;
- For incremental demand

  - Forecast energy needed for each hour in time to inform LSE and submit bid to the DAM to buy at **$XXX/MWH** (bid **accepted**/rejected for **blue**/green increment); and

  - For hours in which DAM closes at an LBMP **≥ $XXX/MWH, operate engines and sell block amount in DA or even RT market.**

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Figure 1: Building Loads

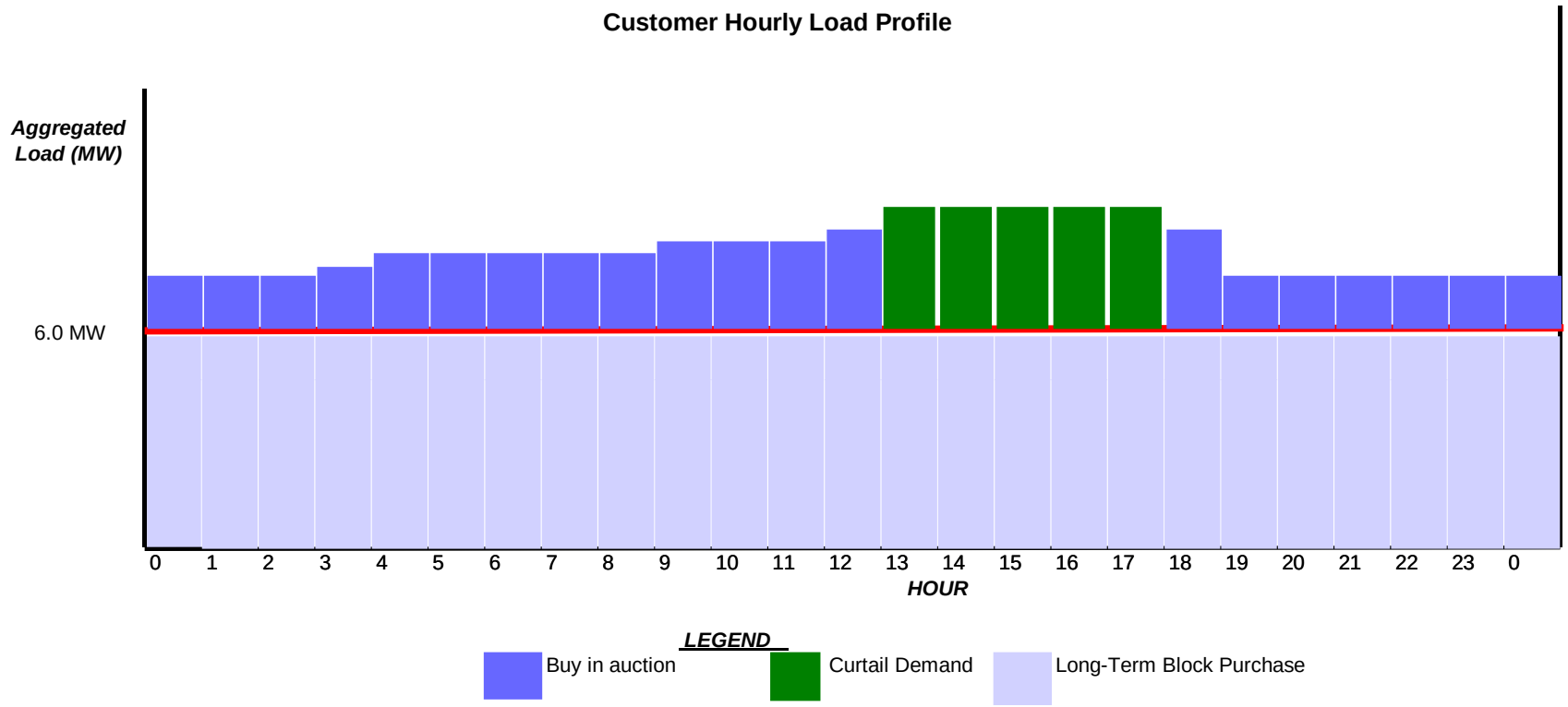
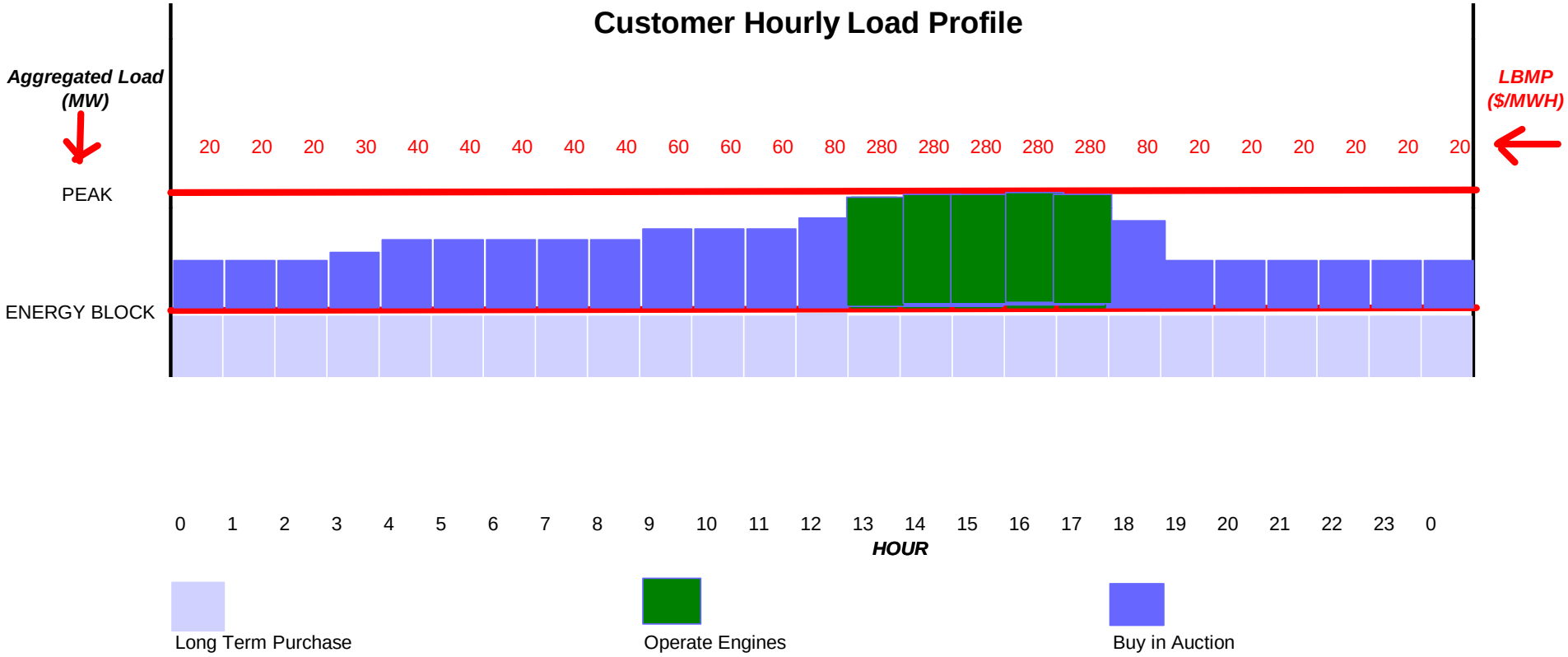


Figure 2: Engine Operating Regime



Assumptions for Electric Supply Operation

1) **Purchase a Low Cost Block (LCB) of energy 24 x 365 to cover minimum demand.**
2) Make/Buy Decisions for each hourly increment of demand; all transactions take place via the DAM.
3) Resell energy from LCB when engines run.
4) Hunt for Coincident Peak in order to reduce the requirement to purchase UCAP*.

* Since LIPA provides on-island ICAP to RC/ESCOs, there is no economic value, unless a deal can be struck with LIPA.

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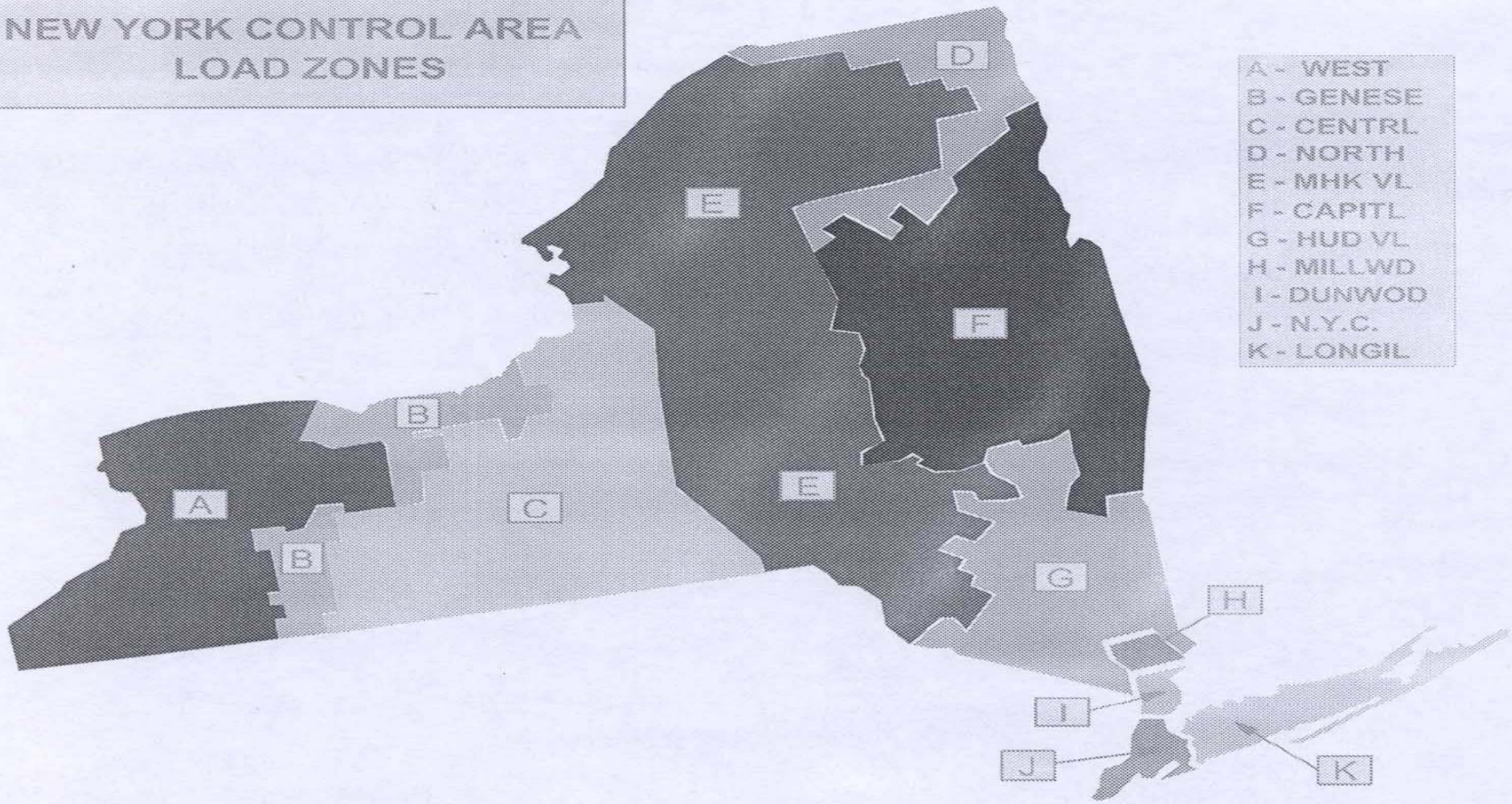
NEW YORK CONTROL AREA LOAD ZONES



Location of Low Cost Energy Source: Zone A

NYISO Zone A

⋮

⋮

Link to PJM

Energy J =
Energy A + Losses + Congestion

Supply
Loads in Zones J & K

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Key Observation:

- The energy prices in Zone A are linked to energy prices in NYC, via the energy market administered by the NYISO. In NY, the receiver must pay the added costs of losses plus congestion, which are off-set by operating on-site DG units.
- Also the energy prices in NY are linked to energy prices in PJM.

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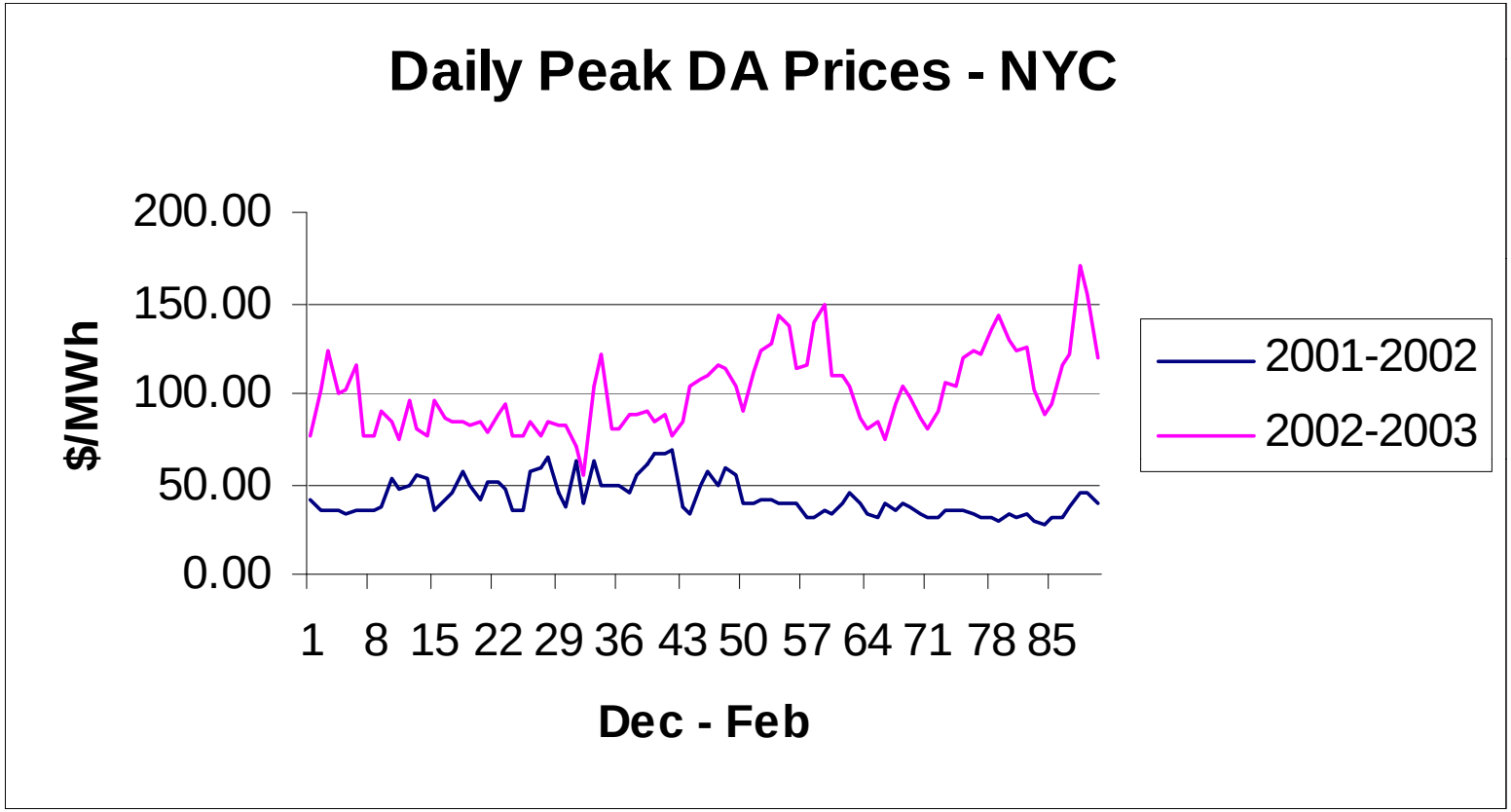
Recent Market DA Prices



Conclusions

- **The keys to the strategy are**
  - **Engine Management; and**
  - **Block purchase of cheap energy for 2003 and beyond,**

- **The benefits are reliable electricity at reasonable prices and avoidance of the uncertainties of the market due to volatility of fuel and electric supply costs.**

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