# Market Impacts of New York Renewable Portfolio Standard

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# Background

- NYSDPS Order on September 24, 2004 -- 25% of energy consumed in NY should be produced from eligible renewable resources by 2013.
- Current level is about 19.5%. – primarily increase to come from wind power facilities.
- Potomac Economics was engaged to assess impacts of new renewable energy resources on the NYISO markets and future investment.
- Final report provided to stakeholders on June 6, 2005.

# Methodology

- Report focuses on two economic issues:
  - ✓ Short-run (2008) and long-run (2013) effects of RPS on energy and capacity markets; and
  - ✓ Impact of alternative procurement methods (renewable energy credit (REC) payment structures) – fixed vs. variable REC;
- Short-run scenarios based on 2008 case assume RPS has not affected entry and exit decisions.
- Long-run scenarios based on 2013 case assume that entry and exit will adjust to achieve long-run equilibrium.
- Both scenarios estimate effects of RPS by running the cases with and without RPS under a variety of load conditions.
  - ✓ Analysis also includes a shortage pricing algorithm to more accurately reflect forecast errors and the implications of reserve shortages.

# Short-Run RPS Effects

- As shown in the following tables, RPS causes energy prices to decrease:
  - ✓ The largest reductions are in Western NY, 3.4 percent.
  - ✓ Most of the wind resources will be located in western NY and the new hydroelectric energy will be imported into western NY.
  - ✓ Prices will also decrease in eastern NY, associated with the reductions in western NY when there is little or no congestion.
- Capacity prices (UCAP market) in NYCA decrease by 16 percent.
  - ✓ Capacity prices in NYC or LI do not change because the RPS capacity will not be located in those areas in the short-run.
- In the short-run, load payments decrease significantly
  - ✓ Total capacity payments decrease by $80 million.
  - ✓ Energy payments decrease by $171 million.
  - ✓ Including roughly $78 million in REC payments, load payments are reduced in the short-run by $173 million.

# Short-Run Energy and Capacity Price Effects

## Energy Market Prices ($/MWh)

| | Base Case | RPS Case | Change | % Change |
|---|---|---|---|---|
| West | $ 34.83 | $ 33.64 | $ (1.19) | -3.4% |
| East | $ 39.88 | $ 39.09 | $ (0.79) | -2.0% |
| NYC | $ 38.74 | $ 38.45 | $ (0.29) | -0.7% |
| Long Island | $ 55.64 | $ 54.82 | $ (0.81) | -1.5% |

## Capacity Market Prices ($/KW-Month)

| | 2008 without RPS | | 2008 with RPS | |
|---|---|---|---|---|
| | summer | winter | summer | winter |
| New York Control Area | $2.62 | $0.62 | $2.25 | $0.41 |
| Long Island | $12.10 | $10.10 | $12.10 | $10.10 |
| New York City | $11.42 | $7.12 | $11.42 | $7.12 |

# Long-Run RPS Effects

- Long-run assumptions:
  - ✓ Marginal location for new entry is in the eastern NY, outside of NYC and LI.
  - ✓ Retirements occur primarily in western New York.
  - ✓ With no RPS, incremental retirements of 400 MW needed by 2013 to achieve long-run equilibrium.
  - ✓ With RPS, incremental retirements of 1800 MW needed by 2013 to achieve long-run equilibrium.
- The following table summarizes the long-run effects of RPS on energy and UCAP prices:
  - ✓ Energy prices decrease by 3.5 to 6.1 percent depending on location, partially due to reductions in reserve shortages and associated shortage pricing.
  - ✓ Capacity prices increase by 14.5 percent in the ROS area. Higher capacity prices are necessary to keep conventional resources online to satisfy capacity and operating reserve requirements. Renewable resources provide limited UCAP.
- On net, total payments by loads are estimated to increase by $174 million annually, including estimated RPS REC payments of $220 million in 2013.

# Long-Run Energy and Capacity Price Effects

| | Base Case | RPS Case | Change | % Change |
|---|---|---|---|---|
| UCAP Prices | | | | |
| Rest of State | $ 5.90 | $ 6.88 | $ 0.98 | 16.5% |
| LI | $ 20.00 | $ 21.00 | $ 1.00 | 5.0% |
| NYC | $ 9.27 | $ 9.27 | $ - | 0.0% |
| | | | | |
| Weighted-Average Energy Price | | | | |
| West | $ 41.41 | $ 38.89 | $ (2.52) | -6.1% |
| East | $ 49.94 | $ 47.52 | $ (2.41) | -4.8% |
| NYC | $ 46.24 | $ 44.64 | $ (1.60) | -3.5% |

# Qualitative Evaluation of Alternative Procurement Methods

- We propose the following efficiency principles to be considered in selecting the preferred mechanism:
  - ✓ It should result in bidding behavior that would contribute to efficient dispatch;
  - ✓ It should promote efficient investment decisions; and
  - ✓ It should allocate the market risk to the parties in the best position to manage it.
- Evaluating relative to these principles, the fixed REC is far superior:
  - ✓ Fixed REC – resource earns constant $/MWh REC
    - – Provides more efficient investment incentives – more valuable locations receive higher total revenue.
    - – Incentives reflect both installed cost and value of energy and capacity.
    - – Provides more efficient dispatch incentives in the short-run (supplier should respond to LBMP).
  - ✓ Variable – REC payment varies such that REC + energy revenue is constant
    - – LBMP has no effect on supplier's revenues.
    - – Favors investment at low installed-cost locations.
    - – Allocates future market risk to load.