

# *NYS Renewable Portfolio Standard (RPS)*

## Overview of Cost Analysis

# Methodology

Considered:

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- **Cost Premium for Renewable Generation**
- **Annual Increments of Chosen Resources**
- **Prices Paid Under Long-Term Contracts**
- **Aggregate Compliance Costs**
- **Wholesale Price and Air Emissions Reductions**
- **UCAP Revenues**
- **Net Ratepayer Bill Impacts**

## Cost Premium for Renewable Generation

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- **Used to construct supply curve**
- **Assumes renewable generators “price takers”**
- **Dependent on RECs or other mechanism to recover above-market costs**
- **Assumes use of CFDs over 15 year contracts**

## Annual Increments of Chosen Resources

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- **Assumes contracts to lowest cost resources first**
- **Each year individually modeled**

## Prices Paid Under Long-Term Contracts

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- **Sum of costs for all contracted resources (cost-based approach) to establish lower bound**
- **Alternative calculation (to bound upper limit) based on assumption each resource would receive same premium as market-clearing resource**

## Aggregate Compliance Costs

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- **Annual compliance costs calculated as aggregate of prior years' and current year's long-term contract costs**

## Wholesale Price and Air Emissions Reductions

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- **Estimated resources displaced by RPS and effects on wholesale price and air emissions**
- **Modeling limited to years 2006, 2009 and 2013**
- **Intermediate years estimated through interpolation**
- **Wholesale price effects reduced to account for pre-existing long-term “hedge” contracts**
- **Air emissions reductions by 2013:**
  - **NO<sub>x</sub> 2,000 tons- 5.22%**
  - **SO<sub>2</sub> 7,000 tons- 6.04%**
  - **CO<sub>2</sub> 3,683,000 tons- 7.43%**

## UCAP Revenues

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- **Calculated for years 2006, 2009 and 2013**
- **Intermediate years estimated through interpolation**
- **Limited to 10% capacity factor for intermittent wind resources**
- **Wholesale price effects reduced to account for pre-existing long-term “hedge” contracts**

## Net Ratepayer Bill Impacts

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- **Estimated by customer class for each utility**
- **Estimated for years 2006, 2009 and 2013**
- **Cumulative bill impacts by 2013:**
  - Residential -1.38%--+2.66%
  - Commercial -1.19%--+3.29%
  - Industrial -2.36%--+5.31%

# Key Assumptions

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- **Eligibility**
- **Tiers**
- **Market Structure**
- **Schedule of Targets**
- **Wholesale Market Prices**
- **Supply Curve**
- **Price Zones**
- **Treatment of Other Renewable Demands**
- **Additional Context**
- **Other Effects**

## Eligibility (generation on-line after 1/1/03)

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- **Preliminary eligibility assumptions**
- **Wind**
- **New low impact hydro (<30 MW, upgrades to existing facilities)**
- **Biomass (including co-firing)**
- **Landfill Gas**
- **Manure Digestion**
- **Solar**
- **Geothermal**
- **Ocean (tidal, wave)**
- **Fuel Cells**

# Tiers

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- **Main Tier**
  - **Consists of technologies to compete “head to head”**
  - **Sell output in wholesale market**
- **Customer-Sited Tier**
  - **Installed by end-users**
  - **Commodity value function of displaced retail rate**

## Market Structure

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- **Long term contracts to meet each year's target**
- **Lowest cost awarded first**
- **Upper and lower bounds of potential costs calculated (market-clearing approach vs. cost-based approach)**

## Schedule of Targets

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- **Begin in 2006 (2005 renewables 19.2%)**
- **Add equal % each year through 2013 to reach 25% goal**
- **Baseline adjusted to reflect possible attrition of small hydros and expansion of green markets**

## Wholesale Market Prices

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- **MAPS model estimated generation units displaced by RPS**
- **Quantified wholesale price & air emissions effects of displacement**
- **UCAP revenues calculated using “demand curve” methodology**
- **Supply & UCAP effects discounted to account for hedges**

## Supply Curve

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- **Contains resources & technologies expected to be major RPS contributors**
- **Broad & flat in shape**
- **Any reordering would probably have minimal effect**

## Price Zones

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- **11 NYISO zones**
- **Aggregated into 3 “megazones”**
- **Captures vast majority of state price differentials**
- **Within each megazone, prices similar & transmission constraints minimal**

# Treatment of Other Renewable Demands

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- **Green Marketing**
- **Executive Order 111**
- **Demand from NE RPS**
- **Not considered (expected to be net exporters):**
  - **PJM RPS**
  - **Hydro Quebec**
  - **Ontario RPS**

## Additional Context

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- **Higher LBMP – lower REC; based on CFD approach**
- **Resources added in Zones 1&2 may be less costly than shown in analysis**
- **Procurement design will effect actual RPS cost**
- **Analysis does not reflect strategic bidding or market power**
- **Ignores potential of SBC funds to “buy down” costs of renewables**
- **Ignores potential improvements in capacity factors**

## Other Effects

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- **Introduction of large wind resources could cause increase in regulation service & capacity reserve requirements**
- **Displacement of fossil-fueled generation could put downward pressure on those fuels regionally**
- **Does not capture effects of fuel diversity as a hedge on retail electric rates**

# Imports

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- **32.5% of RPS MWh estimated to come from imports**
- **Hydro upgrades from Ontario & Quebec; wind from PJM**
- **NE assumed to be a net importer of renewables**
- **Siting issues necessitate imports to reach goal**
- **Assuming no imports increases RPS costs due to replacement by higher cost in-state generation**
- **Must satisfy hourly matching rules for delivery except intermittants may use monthly matching**

# Factors Effecting Actual Results

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- **Assumed CFD- Actual used fixed REC price**
- **Assumed long-term contracts- Actual contracts up to 10 years**
- **Assumed ample time for projects to come on line- Actual results effected by rush to capitalize on PTC**
- **Assumed cost assumptions in late 2003- Actual costs likely higher due to:**
  - **Increased costs of steel**
  - **Effects of a weak dollar**
  - **Turbine availability**

# Administrative Costs

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- **New York State Energy Research & Development Authority (NYSERDA) RPS administrator**
- **Estimated direct payroll, fringe benefits, indirect labor, overheads, outside consulting, and non-personnel service costs**
- **Includes yearly cost estimates of administering, monitoring, and evaluating the RPS program**
- **Budget of \$3.2 million per year, on average, through 2013**
- **Does not include potential NYS government fees NYSERDA may incur**

## Detailed Information

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- **All documents related to NY Renewable Portfolio Standard (RPS) Case 03-E-0188 may be viewed at:**
- **[www.dps.state.ny.us](http://www.dps.state.ny.us)**
- **Click on “What’s New”**
- **Click on “Renewable Portfolio Standard”**