

Public Benefit Programs: Energy Efficiency and Renewable Energy in Deregulated Energy Markets

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Demand Management Programs in A Vertically Integrated Market

- 1984 → Commission directed NY's electric utilities to implement energy efficiency and load management programs on pilot basis
- 1987 → Commission concluded demand management should be considered on equal/integrated basis with other electricity supply options
- Annual funding for utility sponsored demand management
 - 1984–1992 → increased from \$25 to \$286+ million
 - 1993–1997 → decreased from \$280 to \$47 million

Demand Management Programs in A Vertically Integrated Market

- 1987–1996 → Utilities invested \$1.3 billion to achieve lifetime resource savings of \$2.2 billion
- Diverse demand management programs
 - *Emphasis on high efficiency lighting, commercial cooling and ventilation equipment*

A Period of Transition

- Late nineties decline in utility investment in demand management
 - *Sales reductions attributable to the programs*
 - *Fixed costs of utilities now recovered from smaller sales base*
 - *Electricity sales reduced by about 3%*
 - *Incremental rates increased by about 4%*

A Period of Transition

- 1996 → Commission moved decisively toward competitive electricity markets
- Important to continue benefits of demand management during transition to retail competition

System Benefits Charge Program

- Commission initiated System Benefits Charge in 1998 for 3-year period
- Program goals
 - *Encourage energy efficiency*
 - *Cleaner environment*
 - *Reduce energy cost burden on low-income New Yorkers*

System Benefits Charge Program

- Program administered by New York State Energy Research and Development Authority (NYSERDA)
- Funding via small charge on consumers' electric bills
 - *Collections total approximately 1.4% of utility's annual electric revenues*

System Benefits Charge Program

- System Benefits Charge offers wide range of programs
 - *Initiatives promoting energy efficiency and load management*
 - *Providing services to low-income New Yorkers*
 - *Conducting research and development*
- Nearly \$1 billion dollars has been invested in System Benefits Charge programs to date

System Benefits Charge Program

- 2005 → Commission extended System Benefits Charge program for additional 5-years (with annual funding of \$175 million)
- System Benefits Charge program accomplishments through 12/05
 - *Annual electricity savings = 1,950 gwh*
 - *Peak demand reduction = 1040 MW*
 - *Annual energy bill savings = \$275 million*

SBC and Rate Design Issues

- Programs that reduce the sale of electricity have potential to reduce utility's ability to recover fixed delivery service costs as well as profits
- Produces potential conflict between shareholder financial interests and environmental, energy and consumer goals

SBC and Rate Design Issues

- Do rate designs serve to discourage energy efficiency, renewable technologies and distributed generation?
- Answer not totally clear

SBC and Rate Design Issues

- Under utility Demand Management (DM) programs of the 1980's and 1990's, the Commission approved plans that allowed recovery of program costs, lost revenues, and incentives for Demand Side Management performance
- Declining electricity sales during this period
 - ➔ *Increased rates, decreasing utility enthusiasm*
 - ➔ *Downward pressure on Demand Management budgets*
- Possible use for a Revenue Decoupling Mechanism (RDM) to break link between lost revenue resulting from energy programs and utility profitability?

SBC and Rate Design Issues

- Previous experience in NY suggests Revenue Decoupling Mechanism would require careful attention to certain details.
 - *Need to isolate effects of weather, economic growth, and other factors from impacts of the energy programs*
- Revenue Decoupling Mechanism may still result in rate volatility

SBC and Rate Design Issues

- Under current System Benefits Charge program in New York
 - *Utilities do not apply for lost revenues resulting from declines in electricity sales attributable to these programs*
- Revenue impacts ultimately captured in rate cases as element of sales forecasts

SBC and Rate Design Issues

- Commission currently soliciting comments on impact of rate design on energy programs and re-examining the Revenue Decoupling Mechanism and other alternatives
- One alternative
 - *Consider using improved cost-based electric (class revenue-neutral), delivery rates as rate design targets for future rates that can be applied to all standard delivery service customers*

NYS Renewable Portfolio Standard

- Renewable Portfolio Standard goals
 - *25% of NY energy sales from renewable resources by 2013*
 - 24% from the Commission's Revenue Portfolio Standard program
 - At least 1% from voluntary green market
 - Represents about 3,000 to 4,000 MW
 - *5,000 MW of wind in "the queue"*
 - *Increase energy resource diversity*
 - *Reduce air emissions*
 - *Support NYS economic development*

Key Component of the RPS

- Central procurement model
- Administered by New York State Energy Research and Development Authority
 - *Procurement of renewable attributes*
 - *Ongoing monitoring/evaluation of program*
 - *Receiving/managing Renewable Portfolio Standard funds from utilities*
 - *Developing process for 2009 review*
- Why central procurement?
 - *Commission's long-term vision: robust competition for retail functions*
 - *Most efficient way to jump start program*

Categories of RPS Eligible Resources

- Main tier
 - *General requirement: commercially operational on or after January 1, 2003*
- Customer-sited tier
 - *General requirements: (1) commercially operational on or after January 1, 2003, and (2) must be located in New York*
- Maintenance resources
 - *General requirements: (1) in commercial operation any time prior to January 1, 2003, and (2) must demonstrate need to receive Renewable Portfolio Standard financial support*

Eligible Resources by Tier

- Main Tier
 - Biogas
 - Biomass
 - Liquid Biofuel
 - Fuel Cells
 - Hydroelectric
 - Solar
 - Tidal/Ocean
 - Wind

Eligible Resources by Tier

(Customer-Sited Tier)

- 2% of increment
- “Behind the Meter Technologies”
 - Fuel cells
 - Solar
 - Wind
 - Methane digesters for farm waste

Maintenance Tier Eligibility

- Maintenance resources
 - *Hydroelectric (Run of River, 5 MW or less)*
 - *Wind*
 - *Biomass direct combustion*

First Procurement

- Request for proposals circulated December 20, 2004
- 16 bids received January 2005
- Results
 - *7 contracts awarded*
 - *Procured 821,611 mwh/yr*
 - *Average price about \$23/mwh*
- Second procurement likely this year
- Will be multiple procurements over term of program

Maple Ridge Wind Farm Tug Hill Plateau

- 140 turbines
- 231 MW
- Largest wind farm east of Mississippi River
- 198 MW (120 turbines) already in operation



RPS Early Lessons Learned

- Central procurement very efficient way to start program
- Offering long-term contracts (10-years) helped reduce what New York paid for renewable energy credits
 - *\$23/mwh vs. \$50/mwh in Massachussettes*

Reliability Impact of Intermittent Resources

- Commission issued Renewable Portfolio Standard order in September 2004
 - *Maintaining reliable electric system while integrating significant amounts of non-traditional generation is a core concern*
- NYSERDA/Independent System Operator retained General Electric Company to conduct a study on impact to NYS's bulk transmission system resulting from addition of large scale wind generation

Reliability Impact of Intermittent Resources

- General Electric focused on the addition of 3,300 MW (about 10% of NYS's peak load), and examined
 - *Affect on capacity*
 - *Forecast accuracy*
 - *Load following*
 - *Regulation*
 - *Stability performance*

Reliability Impact of Intermittent Resources

- Conclusions
 - *Impact on the bulk transmission system would require only minor adjustments to existing planning, operation, and reliability practices*
- General Electric recommended that wind farm interconnection agreements should have
 - *Voltage regulation with power factor range of plus/minus 95%*
 - *Low voltage ride through capabilities*
 - *Monitoring, metering and event recording capability*
 - *Power curtailment capability*

Reliability Impact of Intermittent Resources

- PSC staff reviewed General Electric's study and was in fundamental agreement with the findings
- PSC staff found that local operation and site-specific considerations may need to be addressed as part of individual interconnection studies
- PSC staff also concluded that the NYS Independent System Operator would need to monitor developments to assure that the General Electric findings remain valid