

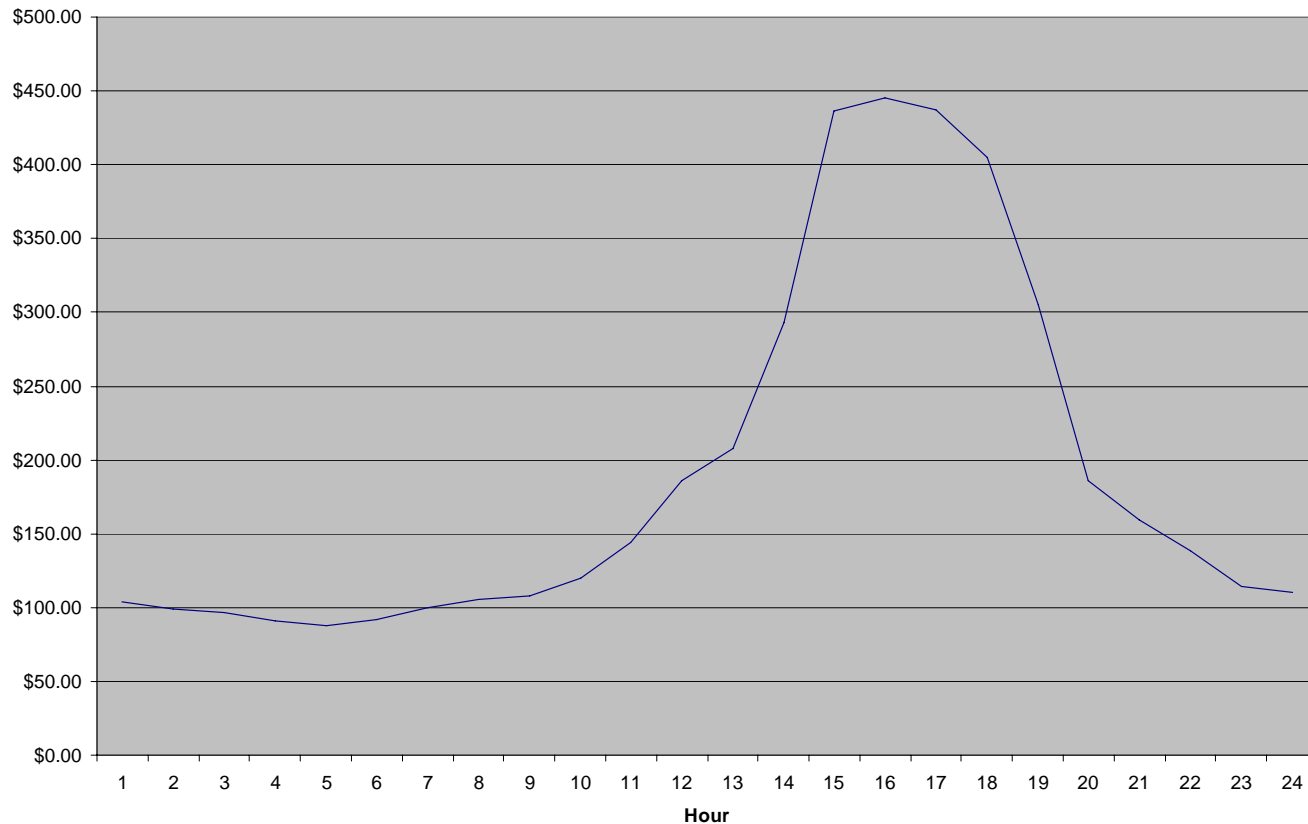
The Impact of Advanced Metering Technologies on Low-Income Consumers



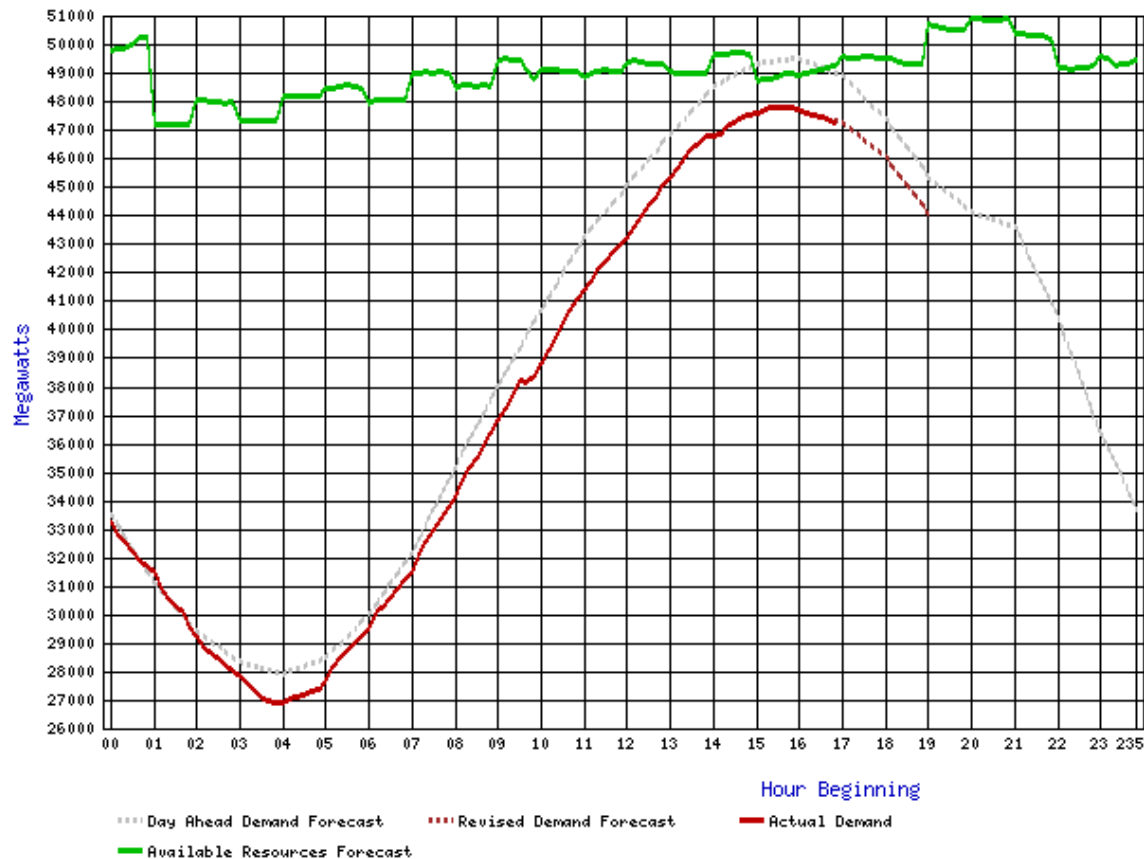
National Low Income Energy
Conference
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NYC Energy Price, 8-1-06

NYC Energy Price (8-1-06)



“Typical” Load Curve



Valid Economic Signals

- Not all due to market power
 - Gas prices up/volatile
 - Peak oil?
 - Large central station power plant construction/financing costs
 - Awareness of global warming
 - carbon market?
- Most electric customers receive monthly bills based upon average prices and monthly meter readings or estimated charges. Using older electromechanical meters means the actual consumption in each hour or day must be inferred from a class-average load shape assumed to be correct for all customers without interval meters.
- With advanced metering, the customer can be billed on actual consumption in each hourly or daily interval
- The Commission's goal is to empower customers with information and the ability to control their energy costs by responding to peak prices.

It's Deja Vu All Over Again

- Public Utility Regulatory Policies Act of 1978 (PURPA) required state regulators to consider ratemaking standards having to do with time-of-use (TOU) rates, seasonal rates, and interruptible rates
 - Energy Policy Act of 1992 renewed and expanded ratemaking standards
 - EAct 2005 – States must consider new time-based metering standards
- NYS adoption is limited, so far, to installation of interval meters for the largest commercial and industrial customers and select installation of AMR
 - Automated Meter Reading (AMR) is a relatively simple technology that eliminates the need for each meter to be visually read, thereby decreasing utility personnel costs.
 - Hourly meters are currently used for all large use customers, (varies by utility -- greater than 500 kW to 1500 kW demand). Participation is mandatory, representing over 2,200 customers and over 5,300 MW of load or over 15% of the NYISO's peak load.
 - AMR meters have been piloted by several utilities. National Grid has fully converted to an AMR system; Con Edison is implementing a saturated AMR installation in its Westchester territory

Who Benefits/Who is Harmed?

- Whether you are a “winner” or a “loser” depends on how your load curve looks compared to class average
 - Do low income use more/less than “typical” at peak?
 - Peak driven by a/c load
- Does low income = low usage?
 - Classic economics: commodities demonstrate an “income” effect
 - With electricity, income effect may be overcome by other factors
 - Older, less efficient housing stock
 - Household size -- kids aren't income-elastic
 - Spend more time at home
 - Cook more meals

Can low income shift usage?

- "Neighborhood income has little effect on price responses. Low income participants were as demand responsive as higher income participants."
 - Evaluation of CEC 2005 Energy-Smart Pricing Plan, Chicago, IL
- Don't customers make usage decisions based on price?
 - What is the value of shifting?
 - "Turn off the lights when you leave the room!"
 - Low income aggregation for demand response?
- What rate structures would be most acceptable?
 - "The best rate is the one we have"
- Who should pay for "smart" metering costs?
 - Low income households can be "winners"
 - Societal benefits (below)

Customer Protection Issues

- Voluntary vs. mandatory
 - Some customers may be unwilling or unable to change their usage patterns, and would face higher bills on a time-differentiated rate
 - NY has statutory mandate
 - Limits the potential benefits of price response and demand reductions that could be derived from wide-scale deployment of “smart” meters.
 - Mandatory TOU rates more effective
 - Set rates equal to prices
 - Address affordability with low income discounts
- Automatic disconnect – “last knock” policy
 - NY has premise visit requirement
- Privacy implications?
 - elimination of intrusions by meter readers and access with customer-provided keys to indoor meters

New York's Advanced Metering Initiative

- In an August 2006 Order (Cases 01-E-0165, *et al.*), the Commission noted recent developments in electricity markets (e.g., price increases and volatility, need for significant T&D investment and associated environmental impacts) and determined that a change in policy regarding the development of advanced metering was needed
- Electric utilities were directed to file comprehensive plans for the development and deployment of advanced metering systems, where feasible and cost effective, for the benefit of all customers

Plan Filings in Brief

- NYSEG/RG&E is seeking fast-track approval to launch a system-wide (1.8 million meters) replacement of solid state meters capable of AMI features (full implementation cost = \$268 million)
- Con Edison/O&R propose system-wide (4.8 million meters) deployment (full cost = \$713 million), but would begin with pilots in Queens (Long Island City), Westchester, Bronx, Manhattan, and O&R, totaling 500,000 meter points
- National Grid plans a pilot (possibly in Albany) to start in 2008. The company is already developing a US/Grid-wide Meter Data Repository platform
- Central Hudson wants the PSC to hold collaboratives to develop statewide standards and develop technical and rate design solutions. In the meantime, it proposes to conduct a small scale (5,000 meter point pilot), beginning later this year.

Benefits = Bill Impacts + Improved Service Quality + Societal Benefits

- Bill impacts
 - lowered consumption costs
 - demand reduction incentives
 - operational savings
 - Reduced theft losses
 - More efficient system utilization (e.g., optimal transformer sizing, improved capacitor control)
- Service quality
 - More timely/accurate bills
 - Improved outage detection/response
 - New customer services
- Societal benefits
 - Avoided generation/transmission investments
 - Avoided economic impacts from outages
 - Positive environmental benefits

Other Considerations

- Alternatives to advanced metering
 - Cheaper demand response alternatives, e.g., direct load control
 - inclining block rates
 - Alternatives could achieve demand response, but not the other benefits
- Economy of scale vs. targeted implementation
 - NY already did the "targeted" (large C&I)
- Residential class concerns
 - Much larger number of customers
 - Lower level of energy use, and therefore lower revenue
 - Less sophisticated customer
 - Much greater cost sensitivity for metering apparatus (due to lower revenue)

Issues and Problems

- Difficulty in demonstrating positive net benefits
 - Offsetting savings mostly result from reduced meter reading and other utility O&M costs
 - In general, system-wide implementation would not be cost effective without consideration of customer/societal benefits, which are harder to quantify.
 - Some of the utilities have attempted to identify and quantify these benefits in their meter filings
 - Research is needed on cost-effectiveness and how to measure demand reductions
- Limited capability of utility “back-office” systems required to process meter data and prepare customer bills
 - Billing customers based on hourly usage (versus monthly) adds exponentially to the amount of data required for processing.
 - To date, there have been limited trials of meter data management systems capable of handling the volume of hourly readings that would result from taking hourly readings of mass market customers’ consumption.

Next Steps

- Staff is currently meeting with each utility to review and discuss each advanced metering plan
 - Given the huge investments required for utilities to deploy advanced metering on a mass basis, better benefit-cost analyses are required
 - Greater efforts to incorporate harder to quantify societal benefits are needed
 - Plans may need more substantial customer education components to educate and inform customers on the benefits of new metering technologies
- After analyzing each plan, staff will make recommendations to the Commission to approve, modify or reject the individual utility advanced metering plans
 - make any necessary provisions for cost recovery

Questions?

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