Funding Energy Efficiency in Regulated & Restructured Markets

NARUC Energy Regulatory Partnership Program

The Vermont Public Service Board

and

The Georgian National Energy and Water Regulatory Commission

by

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Benefits of Energy Efficiency

- Cost
  - kWh supplied by efficiency = 2.6¢
  - kWh average retail cost = 10.7¢
- Reduction in constraints on transmission and distribution system
  - Potentially deferring or negating the cost of upgrades
- Environmental benefits of reduced emissions from generation

Delivering Efficiency Programs

- Two general models for delivering efficiency programs:
  - Individual utilities – usually funded through rates
  - Comprehensive entity (Vermont Energy Efficiency Utility) – funded through a wires charge, sometimes called a Systems Benefits Charge

System Benefits Fund

- Utilities do not have an incentive to implement energy efficiency
- A system benefits fund provides assurance that important services, such as efficiency, are delivered in a competitive environment
- Every customer subject to a non-bypassable wires charge
- Vermont is not a deregulated state, but has a Systems Benefits Fund

Funding the EEU in Vermont

- The Board sets three-year budgets for the EEU based on available potential and statutory considerations
- The EEU is funded by a non-bypassable volumetric wires charge known as the Energy Efficiency Charge ("EEC")
- The EEC is shown as a separate line on customers' electric bills
- All utilities in the state charge the same EEC rates

Determining the EEC

- Collections are based on the allocation of statewide utility revenue by customer class for residential, commercial, and industrial
- A kWh charge is set for each class
- Customers with capacity charges pay a lower kWh charge plus a demand use charge
- All rates are updated annually to reflect the most recent utility revenues

Forward Capacity Market

- An open market where capacity suppliers offer to sell a guarantee for delivering capacity in the future
- Purpose is to ensure that sufficient capacity is available to meet New England's peak demand
- Designed to allow both demand and supply resources to participate

Forward Capacity Market (cont.)

- VEIC, the Energy Efficiency Utility contractor, sells demand resources in the FCM on behalf of Vermont electric ratepayers
- Revenue from the FCM auction is being used to fund a non-regulated fuels energy efficiency program authorized by statute

Financing Efficiency

- Using bonds or other mechanisms to pay for efficiency programs
- Advantage – could fund significant amount of efficiency up-front
- Disadvantage – carrying costs
- More appropriate for "bubble" in delivery of efficiency program rather than as long-term funding source

Efficiency Loans

- Low or no-interest loans to customers provided that the money is used to implement efficiency measures
- Customer pays the full cost of efficiency but is able to finance the cost
- Loans can be combined with subsidies to achieve larger savings

Exemptions to the EEC

- Self-administered efficiency program
- Customer must pay at least $5,000 in EEC to be eligible
- A percentage of the EEC would be placed into an energy savings account to be used by the customer for efficiency programs
- The remaining percentage would be used for system-wide benefits

Rate Designs and Energy Efficiency

- Promote and encourage energy efficiency investments with rate design:
  - Inclining Block Rate Structure
  - Seasonal Rates
  - Time-of-use Rates
  - Smart Metering and Real-time Pricing
- Vermont legislature recently passed a statute encouraging the Board to approve rate designs that encourage the efficient use of electricity

Rate Designs and Energy Efficiency (cont.)

- The Board opened a docket to investigate using rate designs and smart-metering technology to promote energy efficiency in Vermont
- Statute requires the Board to issue a report and plan for implementation by Dec. 31, 2008
- Plan should allow for high-energy users to have a reasonable opportunity to implement energy-efficiency and conservation measures

Inclining Block Rate Structure

- Design rates to include a base block of power
- Increase rates by each additional block of power to encourage consumers to decrease usage
- Effect is to charge low-usage customers less
- Customers should be charged for the marginal cost of power
- Sends a strong price signal to encourage customers to implement cost-effective energy efficiency efforts

Inclining Block Rate Structure (cont.)

- Municipal and cooperative utilities have rate designs that include a low-cost initial block of power for residential customers
- Rates are based on the utility's power contracts
- Low-usage customers realize the most benefit on their bills under this structure

Seasonal Rates

- Charge higher rates during peak season and lower rates during off-peak season
- Work to match rates charged to customers with demand patterns
- May reduce the need for transmission upgrades due to seasonal load peaks which reduces costs to all customers
- Encourages customers to implement cost-effective load management measures

Seasonal Rates (cont.)

- Utilities in Vermont no longer use seasonal rates because the rate design did not reflect reality
- Electric heat for residential customers, which helped drive winter demand, is no longer common
- Vermont recently moved from a winter-peaking state to a summer-peaking state

Time-of-Use Rates

- Charges are determined based on the time of day the usage occurs
- Peak hours are the most expensive
- Off-peak hours are the least expensive and occur during the utility's lowest load
- Gives customers a price incentive to reduce usage during peak periods

Time-of-Use Rates (cont.)

- Vermont's utilities do not charge residential customers time-of-use rates
- Some commercial and industrial customers are charged based on peak and off-peak usage for both demand and energy charges
- The next step in implementing time-of-day pricing is smart meters

Time-of-Use Vs. Real Time Rates

- Time-of-use rates are based on average blocks of time
  - For example, higher rates from 10 a.m. to 6 p.m., which is generally the time when electric usage is highest
- Real time rates are based upon the actual time of usage
  - For example, rates are based upon the cost of delivering power at that time

Smart-Metering Technology

- Smart meters allow a utility to know the usage of specific customers at any given time which could allow for real-time pricing
- Meters also provide information on cost of power to customers
- Customers can change their usage based on information that the utility provides to the meter
- Emerging technology will allow for automated controls in homes

Efficiency Resource Standards Overview

- Efficiency savings targets for utilities or other efficiency program providers
- Savings can include
  - end-use efficiency
  - Improvements in generation, transmission, distribution efficiency
  - Combined heat and power

Efficiency Resource Standards Targets

- Targets can start at modest levels and be ramped up over time
- Typically two types of targets:
  - A requirement that a utility offset a certain percentage of their growth in demand
  - A predetermined amount of MWh and MW to be saved

Efficiency Resource Standards Trading

- If a utility exceeds its targets it can sell excess savings to a utility that hasn't met its target
- Market will find lowest cost method of achieving savings
- Downside of trading – the customers in a utility that meets its target through trading do not receive the benefits of efficiency

Efficiency Resource Standards in Vermont

- Board's contract with EEU has MWh and MW goals
- With one state-wide efficiency provider, there is not the option for trading