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§1252 Smart Metering

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Déjà Vu All Over Again

Is it time?
PURPA 1

**Tying Rates to Varying Costs**

- Rates to reflect *cost of providing service*
  - §111d(1) Cost of Service

- Rates to reflect *changing costs as consumption changes*
  - §111d(2) Declining Block Rates

- Rates to reflect *time-of-day costs if cost-effective*
  - §111d(3) Time-of-Day Rates

- Rates to reflect *seasonality if costs change by season*
  - §111d(4) Seasonal Rates

- Rates to reflect *interruptibility*
  - §111d(5) Interruptible Rates

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PURPA 1

**Supporting Demand Response**

- Utilities to offer *load management if practicable, cost-effective, reliable, and provide advantages to the utility*
  - §111d(6) Load Management Techniques

- Utilities to *employ Integrated Resource Planning*
  - §111d(7) Integrated Resource Planning

- Utility *investments in and expenditures for energy conservation, energy efficiency resources, and other DSM shall be at least as profitable (considering lost sales) as expenditures for new generation, transmission or distribution*
  - §111d(8) Investments in Conservation and Demand Management
What Has Changed? 
A Lot and Nothing!

- Changes
  - Competitive wholesale markets and retailers
  - Unbundling wholesale from retail functions
  - Significant reliance on wholesale markets that can be very volatile
  - Metering and communication technology – better and cheaper!

- No Changes
  - Increasing cost industry
  - Energy on minds of all consumers
  - Issues over role of natural gas for electric generation
  - Politicization of Regulation

What Should We Have Learned?

- There are real costs and benefits
- Mistakes can be costly – and this is NOT the time to make them
- Relatively few utilities have exactly the same economics, politics opportunities – no one single answer for everyone
  - This also applies to customers
- Programs that are well thought out and provide benefits to utilities and their consumers will move forward faster
- Customer education is key – but that has a cost also!
What Do Consumers Want?

Do DR and Rate Programs Meet Those Needs?

- Lower bills
- Stable rates
- No hassle

TOU 1980-90s

- 1985 – EPRI study “Innovative Rate Design Survey” 244,665 customers on TOU rates – 44,842 commercial / industrial
  - Most utilities had <1% residential customers
  - 20% of utilities with Commercial TOU had >50%
  - 33% of utilities with Industrial TOU had >50%

  - Nearly 78% of utilities surveyed offered some type of residential TOU
  - 1.4% residential customers

- 1980 – 2004 Large Northeast Utility
  - 26,500 residential customers mid-80s
  - 11 residential customers 2004

- Today picture still mixed
  - Most have <1% residential but a few have a large percentage
  - Same for industrials but more cases with the larger percentage
The “No So New” PURPA Standards

Smart Metering (Time Based Rates)

- If adopted - utilities to offer time-based rates and meters
  - “Time-of-use pricing” - Prices for specific periods and typically changed twice a year
  - “Critical peak pricing” - Prices for peak days, discounts for reducing peak period consumption
  - “Real-time pricing” - Prices may change hourly
  - “Credits” - Large load customers who reduce a utility’s planned capacity obligations

- States to investigate demand response and time based metering
- Third-party marketers must provide same devices

Pricing Can Always Help

- Dynamic pricing can produce economic benefits during periods of both high and low wholesale costs
  - Under RTP
    - Lower-than-average prices during most of hours of the year
    - Much higher-than-average prices during relatively small number of hours
  - Under CPP
    - Discount on their fixed prices during most hours of the year
    - Much higher prices during critical periods
  - Consumers can benefit
    - Load reductions during high prices
    - Usage increases at low prices
  - Typically DR programs produce benefits only during high-cost periods
DR Benefits Depend on Two Key Factors

- Variability of wholesale costs and consumers’ flexibility to respond to time-varying retail prices
  - If hourly wholesale costs vary only within a relatively narrow range, then the extent of market inefficiency is small, as are the potential benefits of DR.
  - In contrast, widely varying wholesale costs and frequent periods of high costs create numerous opportunities for DR benefits.

- DR benefits only occur when consumers actually respond
  - Some customers do modify their usage patterns when they face time-varying prices, while others do not or can not – is the response certain and sustainable?
  - But modifications come at a cost
    - Modifying production schedules, shut down processes, or forgo some energy services such as lighting or air conditioning
  - Some consumers are inherently more flexible
    - Industrial customers whose production process involves storable or easily shifted elements, such as rock crushing or grinding, and petroleum or water pumping

Encouraging DR

- Alternative business models can encourage utilities to implement demand response

- State policies can:
  - Support cost recovery
  - Compensate for DR risks
  - Incentives for aggregation
  - Utility sharing in cost savings
  - Incentive payments based on the volume of DR implemented

- Other incentives to advance DR
  - Tax credits for installing advanced meters
  - Accelerated depreciation of demand response infrastructure equipment
Cost / Benefit

- Adoption of the standard or some other standard is optional for state commissions
- Adoption must be based on evaluation of costs and benefits
- Benefits include
  - Labor savings, improved reliability / outage management, reduced peak demand (lower average rates), new rate base / new services
- Costs include
  - Meters, communications, customer load controls, distributed generators, billing system upgrades, customer education

Summary

- DR does “work”
  - Consumers do respond to dynamic pricing and DR payments
  - Can reduce usage during critical periods of low capacity reserves or transmission constraints
- DR has potential to replace or delay need for additional reserve capacity
- Logical solution
  - Self-financing market-based pricing and / or DR payments
  - No need to subsidize DR beyond such market-based levels
- List of utility programs
  - WWW.EEI.ORG > industry issues > retail services and delivery > demand response > Efficiency and Demand Response Programs