



EDISON ELECTRIC
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EPAct 2005 *§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



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%
- 1991 – EPRI "Survey of Innovative Rates"
 - 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 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

