



An Energy-Efficiency Workshop and Exposition

Orlando, Florida

Demand Response: How it Can Help You

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Who is PLMA

Peak Load Management Alliance

Mission Statement

Create a community of expertise on demand response and its role in creating efficient electricity markets.

Through this community, the Alliance will bring useful information on price responsive loads, market structures and market rules.

This will include information on market participants' roles, customer needs and actions, enabling technologies, and specific programs as appropriate.

---Members---

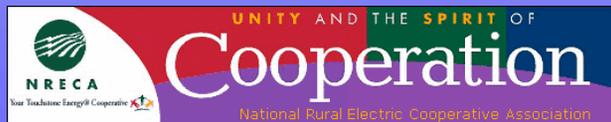


Energy Results



UHR Technologies

Lighting Research Center



August 17-20, 2003

www.energy2003.ee.doe.gov

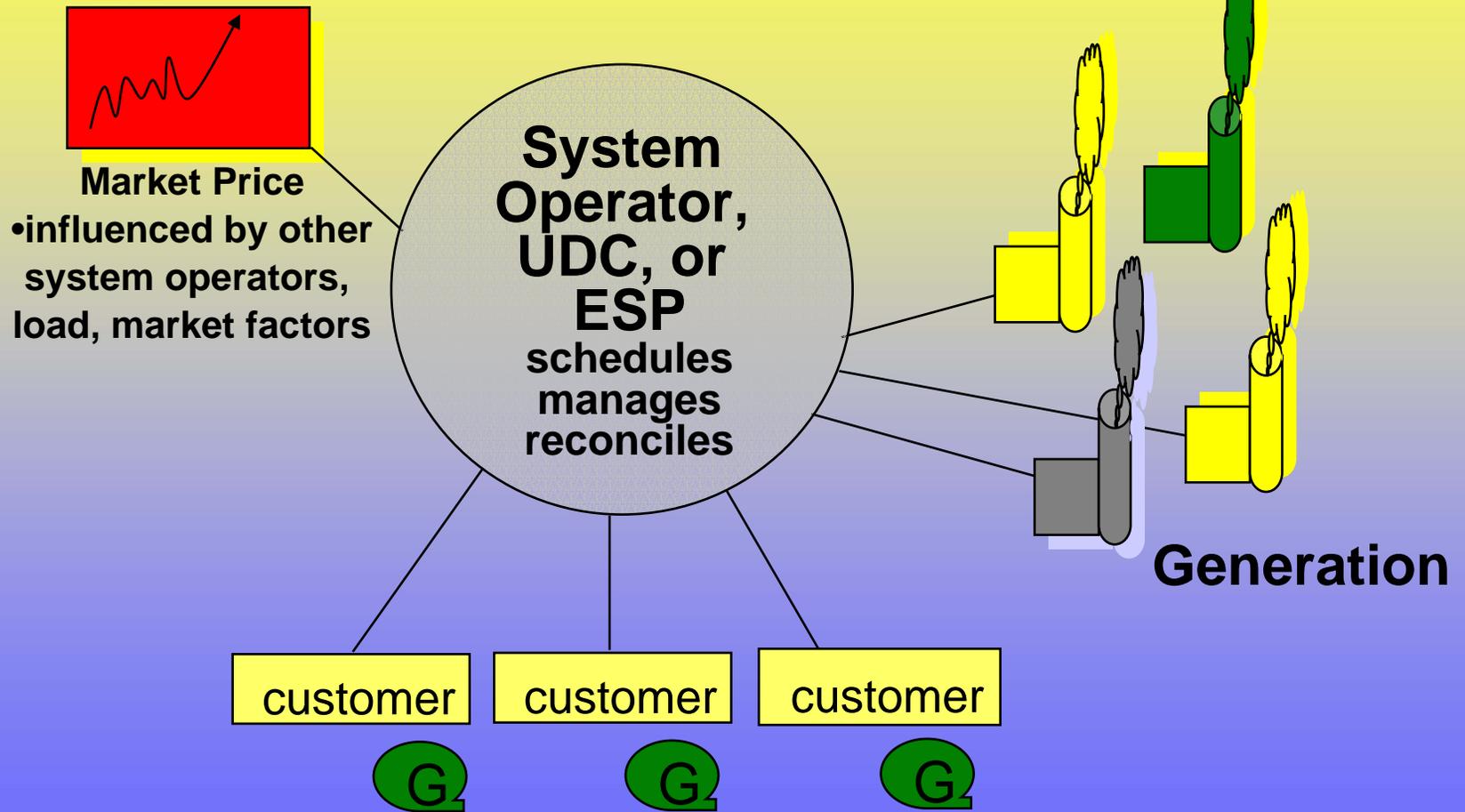


Changes in the Marketplace

- Economic, customer and load growth
- Diminished credit ratings
- Collapse of merchant generation and energy trading business
- Lack of capital spending
- Growing regulatory, environmental and public pressures
- SMD
- Deregulation



Market Situation





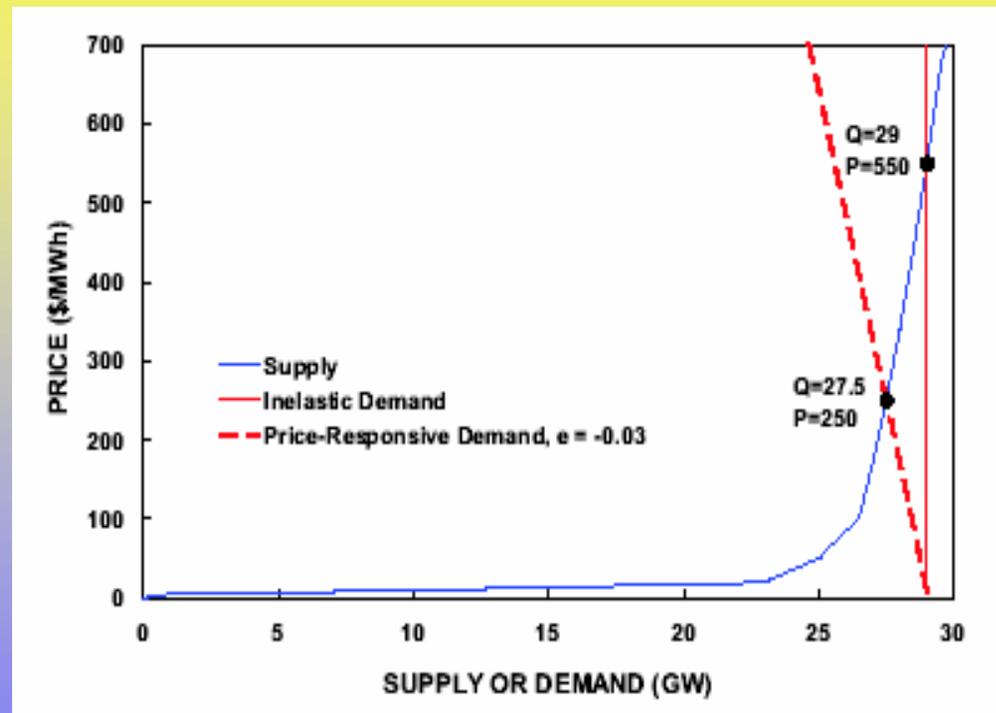
Energy Supply & Reliability Issues

*Electricity is not like any other commodity;
It must be used when generated.*

- Power Plant construction has been slowed down due to the downfall of the Energy Industry and credit issues.
- Demand is expected to increase by 2-3% per year
- About 1,300 new power plants could be needed by 2020 (393 GW)



Energy Supply & Reliability Issues



This price-spike reduction benefits all customers, not just those with price-responsive demand



Transmission Development

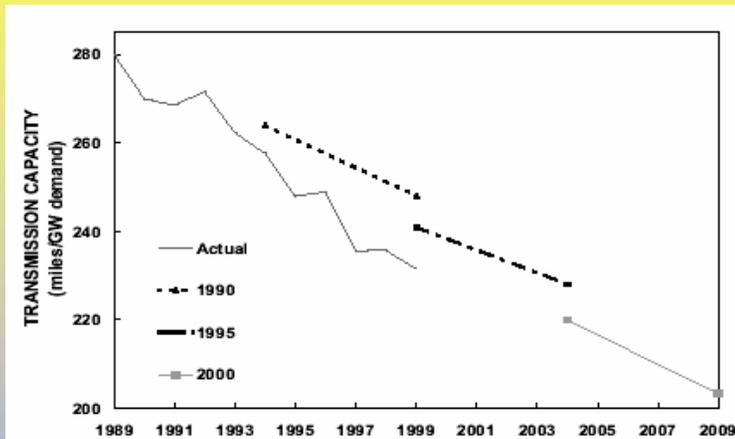


Fig. 4. U.S. transmission capacity normalized by summer peak demand from 1989 through 1999 plus 10-year projections from 1990, 1995, and 2000. Note that the y axis does not begin at zero.

Transmission Capacity

Transmission Investments

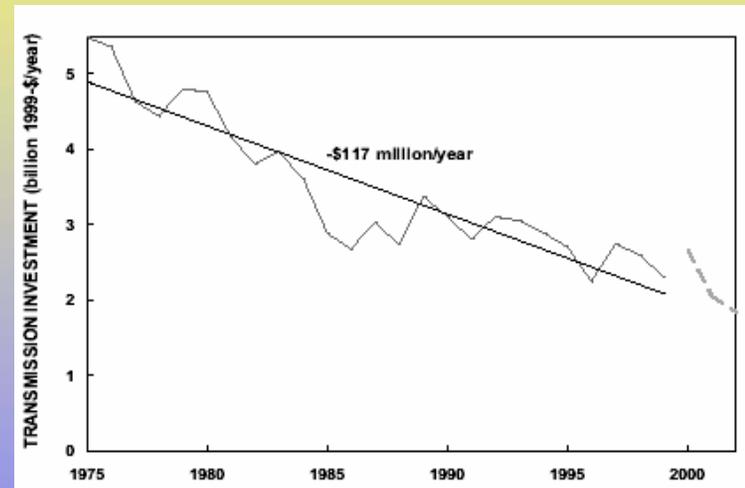


Fig. 3. Annual transmission investments from 1975 through 1999 and projections for 2000, 2001, and 2002.

EEI has shown that transmission investments have declined by almost \$120 M per year for a quarter century



2003 Transmission Constraints

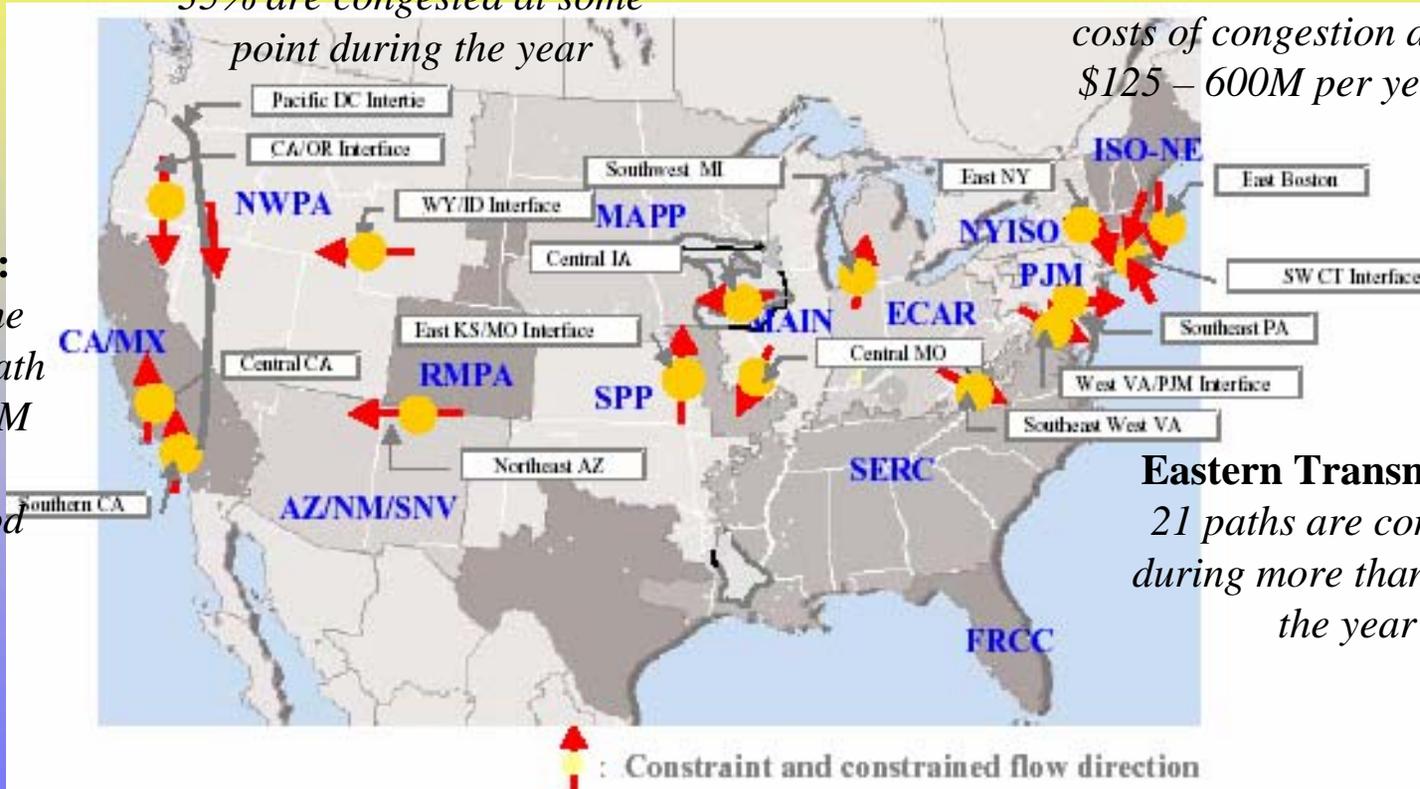
Western Transmission:

35% are congested at some point during the year

Northeast:

ISO-NE estimates the costs of congestion are \$125 – 600M per year

California:
Estimates the cost of one path to was \$222M over a 16-month period



Eastern Transmission:
21 paths are congested during more than 10% of the year

National Transmission Grid Study: U.S. Department of Energy; May 2002

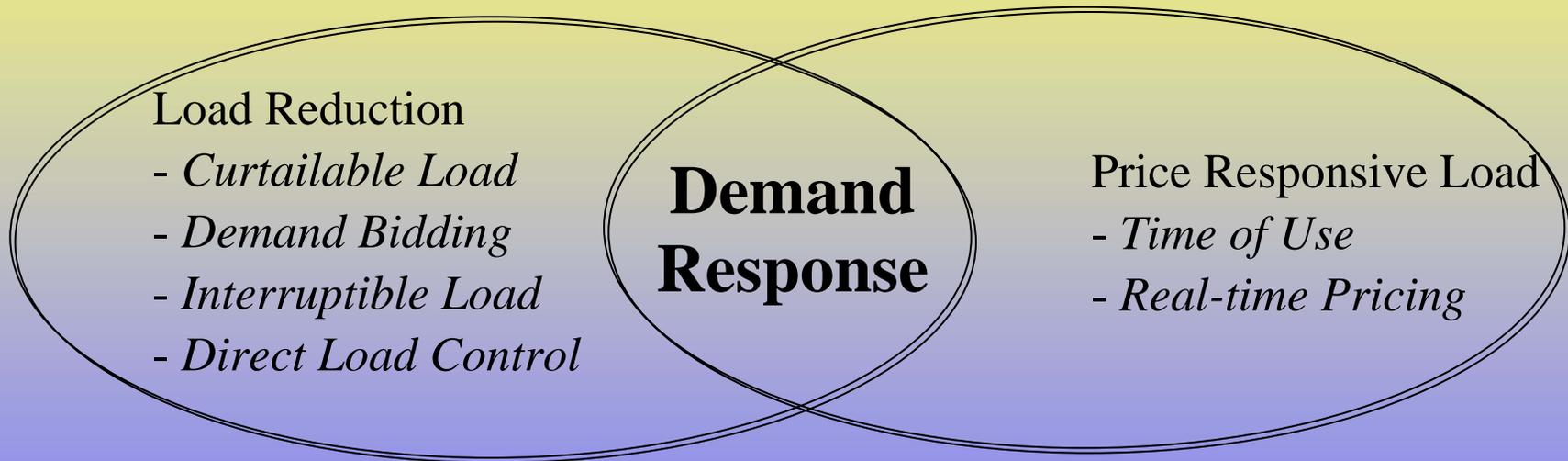


What is Demand Response?

- Electric load reductions called for by others (ISOs, utilities, or load serving entities) and price response managed by end-use customers
 - Economic load reduction – reduction at time of peak or during emergencies with payments based on wholesale prices
 - Price responsive load – demand reduction driven by market signals
- Extension of demand-side management and load management concepts of the 1980s and 1990s
- Key underlying principle – price/market-driven



Multiple Components of Demand Response





Why the Interest in Demand Response?

- Network Transmission Congestion
- Generation Shortfalls
- To cover contingency and planning reserves
- SMD
- Improved capabilities & economics of control & communications technology
- Explosion of new & innovative program designs



Market Potential for DR

NARUC states that “Responsible estimates of the Demand-side potential concluded that as much as 40% - 50% of the nation’s peak load growth over the next twenty years could be met through *energy efficiency, price-response, and load management* measures that would be less expensive than their supply-side substitutes.¹

EPRI estimates that Demand Response has the potential to reduce U.S. peak demand by 45,000 MWs by 2010 and 90,000 MWs by 2030.²

FERC recently unveiled a cost-benefit analysis that showed a \$60 billion savings over the next 20 years if demand response is incorporated into RTO market design and operations.³

¹ NARUC - *Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets Study*;

² *Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets*; Richard Cowart; June 2001

³ FERC - Energy Info Source – *Demand Response Programs*; May 2002

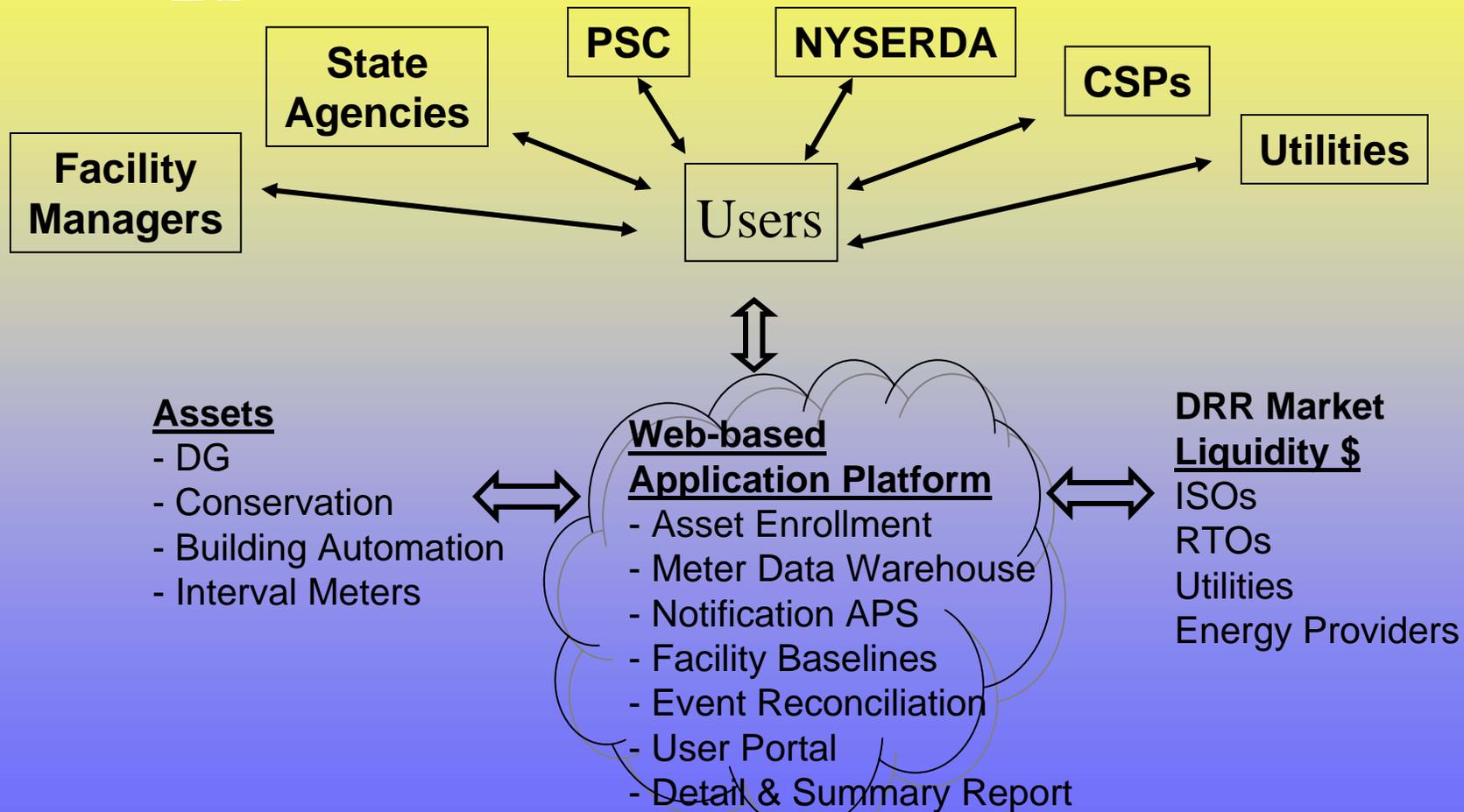
The logo for Energy 2003 features a stylized sunburst in shades of orange and yellow on the left. To its right, the word "Energy" is written in a blue, italicized font with a white outline, and "2003" is written in a purple, italicized font above it.

Energy 2003 DR Benefits

- Decrease the need to build new generation and transmission facilities
- Cost Reduction
- Improves Environmental Quality
- Manage Congestion
- Improves System Reliability
- Improves Economic Efficiency
- Market Power Reduction



Practical Example – State Facilities





Enabling Technologies for DRP

- Interval metering, energy monitoring and load data display capabilities
- Offer-participant interface capabilities (for notification, alarming & remote control)
- Software to enable analysis and enhanced performance by facility operators
- Building automation & energy management systems
- Interface/controls for back-up generation
- Aggregation of multiple sites
- Billing & settlement, including verification of performance



Funding for these Enabling Technologies



- Real-Time Demand Response—
 - 100% of the hardware costs for the first 1,000 installations, charged back to NEPOOL on a Load Zone basis
 - For customers 300kW or more of load reduction available, NEPOOL will cover \$100 of the monthly fee for IBCS
- Real-time Price Response
 - 50% of the installation costs will be covered by NEPOOL



Funding for these Enabling Technologies



- New York State Energy Research and Development
- Administered by the New York Energy \$mart program
- *Principal goal* is to help all New York State utility customers solve their energy and environmental problems while developing new, innovative products and services that can be manufactured or commercialized by New York State firms.
- Issue funds through Competitive Solicitations and Unsolicited Proposals



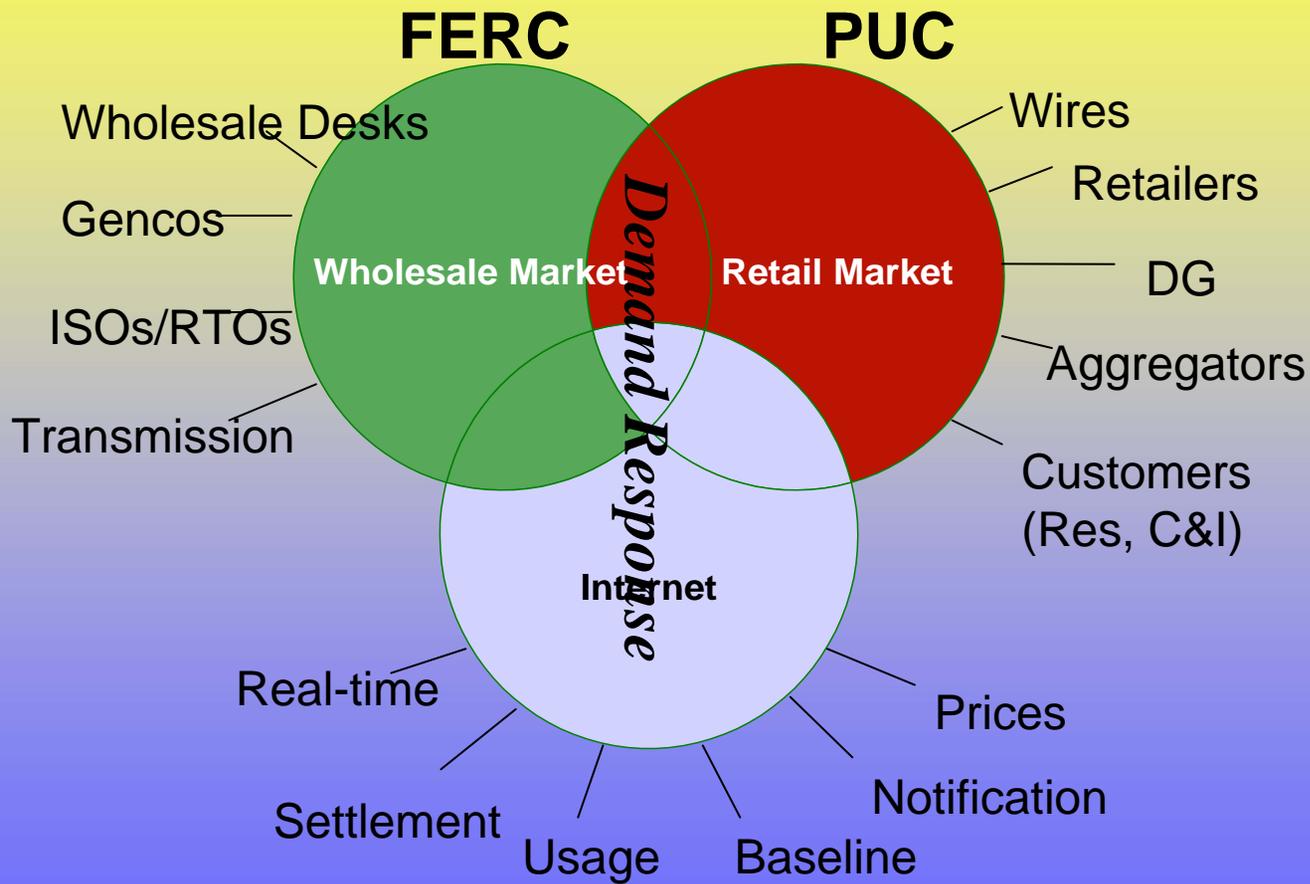
Funding for these Enabling Technologies



- Assembly Bills 970 (August 2000), and Assembly Bill 29X and Senate Bill 5X (April 2001) provides funding to the California Energy Commission and other state agencies for grants and rebates to reduce electricity peak load demand.
- Funds are available for the installation of communication and energy management systems for all types of customers ranging from homeowners to businesses and industrials to the public sector.



What is needed?





Senate Approved Energy Bill

- Incentives or tax credits for advance metering and other enabling technologies.
- Requirements by Utilities, States, DOE and ISOs for aggressive implementation of demand response and annual reporting requirements by FERC on the progress toward established goals for demand response implementation.
- A requirement for all Federal facilities to implement advanced metering systems.



Call to Action

- Determine demand response potential
- Investigate Energy Bill requirements
- Evaluate enabling technologies
- Develop demand response strategic plan



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