
Demand Response National Trends: Implications for the West?

Charles Goldman

Lawrence Berkeley National Laboratory

**Committee on Regional Electric Power Cooperation
San Francisco, CA
March 25, 2004**

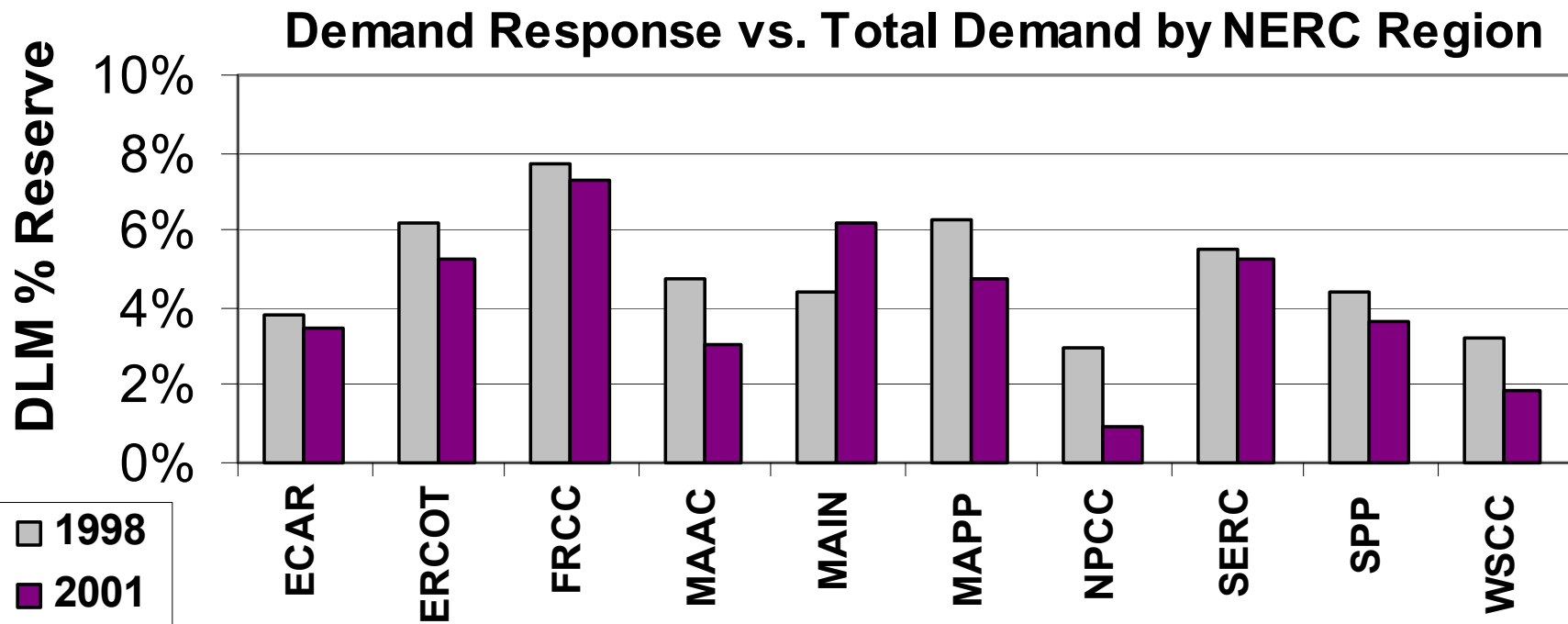
Energy Analysis Department



Overview of Presentation

- **National Trends in Demand Response**
- **Integrating Demand Response into IRP Plans – Some Technical issues**
- **Incorporating DR as part of Utility Resource Portfolio: Policy Issues**

Declining Load Mgmt Resources in most U.S. regions



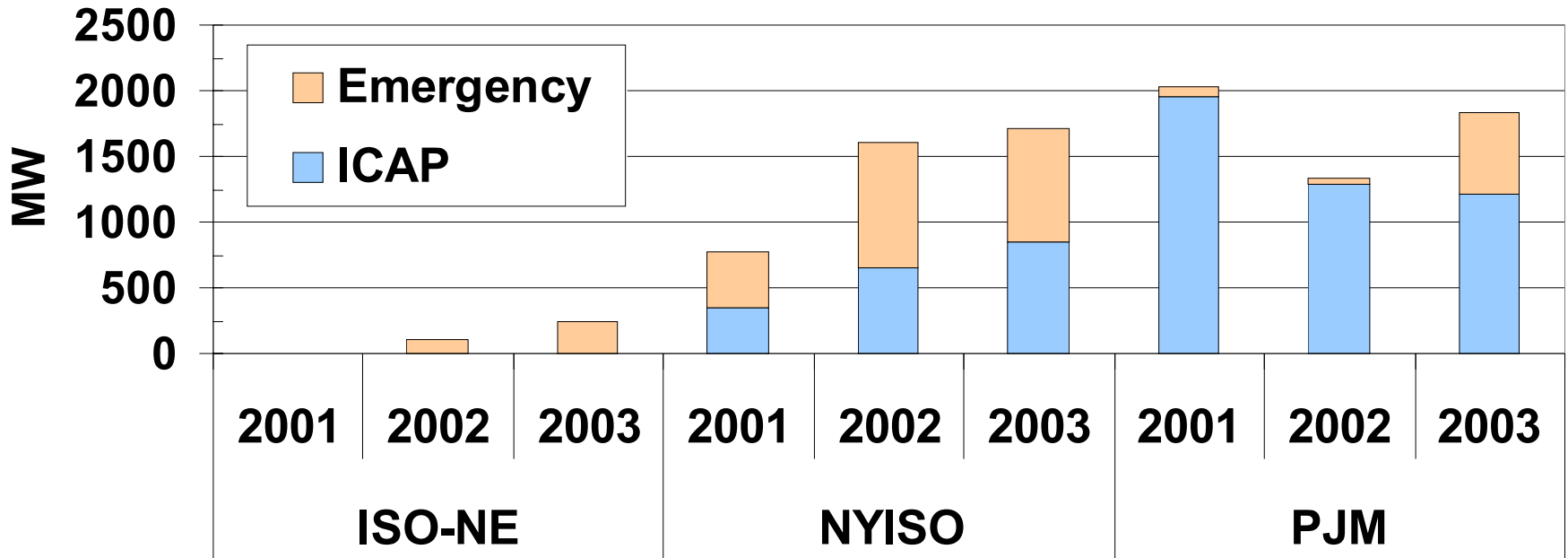
- Uncertainties surrounding electricity restructuring
- Changing load resource balance

Increasing Policy Support from FERC and DOE

- **National Transmission Grid Study Recommendations**
- **At a December 16, 2003, meeting of the PJM Demand Side Response Working Group, Alison Silverstein, Advisor to FERC Chairman Pat Wood, advised:**
 - FERC wants demand response, “no matter what”
 - FERC is not kidding: prefer that we design and send up good programs and strong filings, instead of making them do it
 - FERC expects credible, quality programs that yield “big time” results
- **DOE designated as lead for IEA study on Demand Response Resources**

ISO “Emergency” DR Programs: Enrollment is increasing

**MW Enrolled:
Emergency and ICAP Programs**

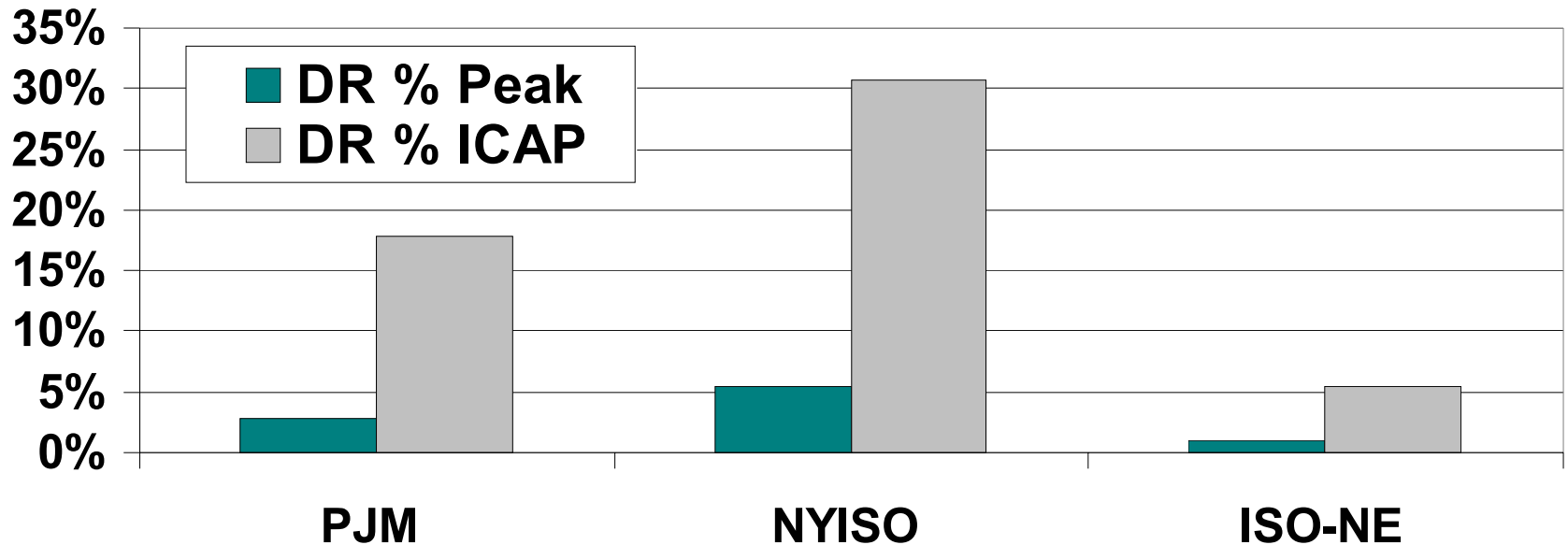


Source: Neenan Assoc.

- Steady growth in subscribed load, except for Active Load Mgmt in PJM.

DR Resource Targets: How much is enough??

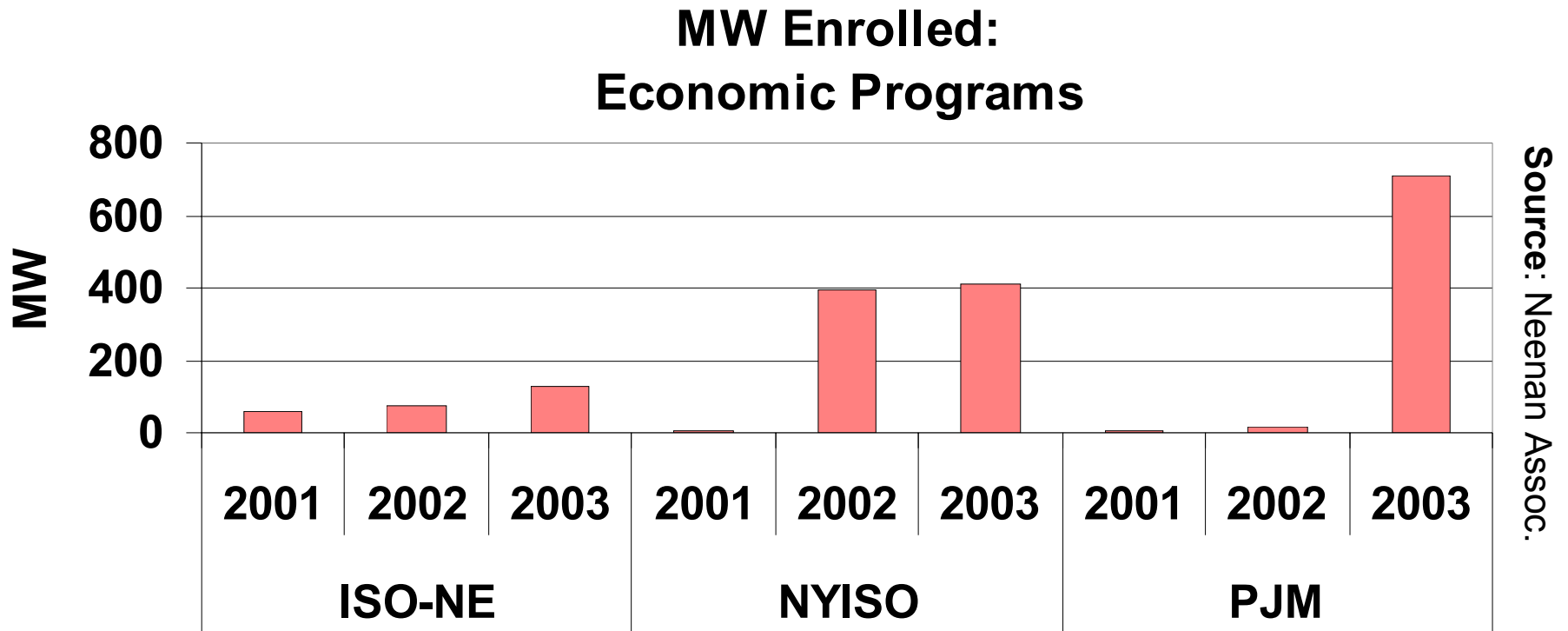
DR as % of 2003 Peak System Load
and ICAP Requirement



Source: Neenan Assoc.

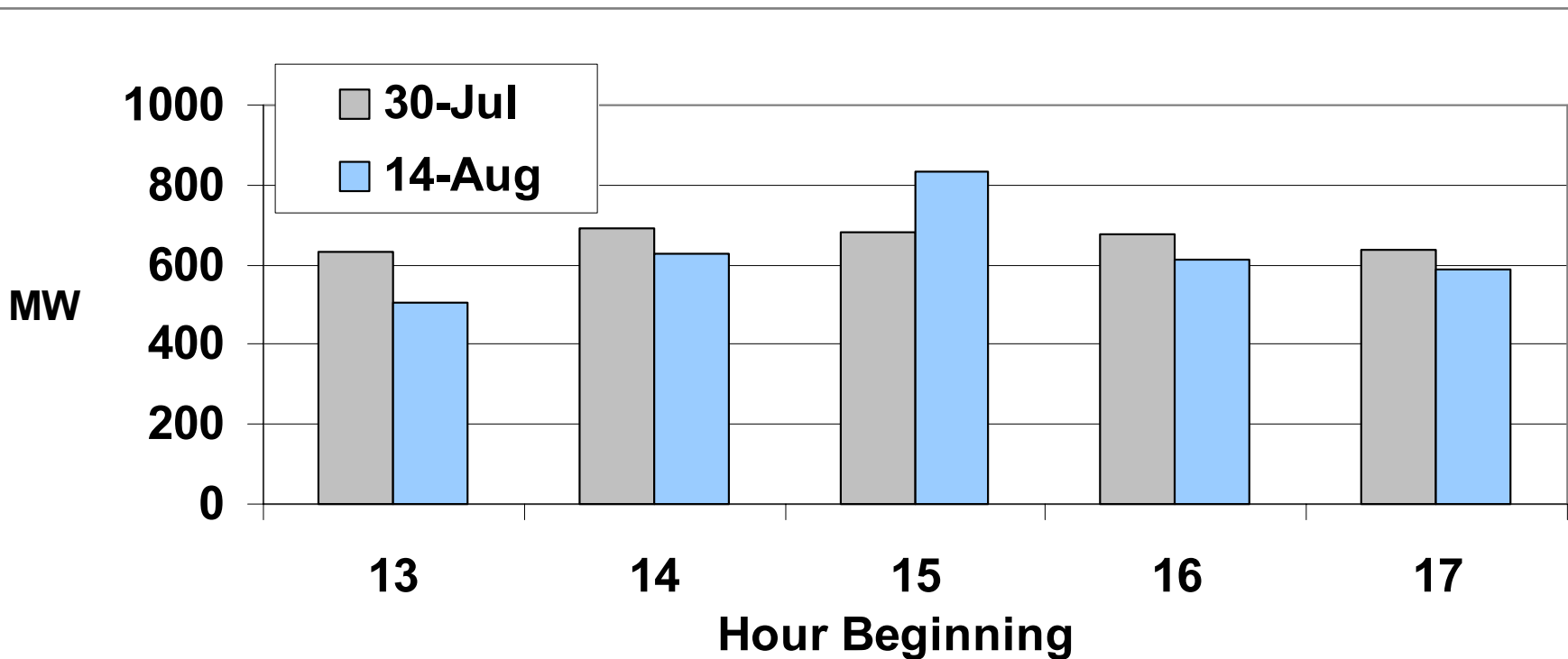
- ISOs don't have explicit targets
- NYISO DR program exemplifies "best practice"
- ISO-NE needs more DR, particularly in congested areas (SW CT)

ISO “Economic” DR Programs: Enrollment is increasing, but performance lags



- Subscribed load increasing, particularly in PJM
- However, scheduled load curtailments are ~10-15 MW in NYISO day-ahead market

NYISO EDRP Program: Customer curtailments had significant impact on system reliability



- 1,711 enrolled participants in 2002 (1,481 MW)
- ~75% load curtailment: Onsite generation ~20%

ISO Payments for DR Programs

Year		Emergency Payments	Economic Payments
2001	ISO-NE	\$380	\$226,100
	NYISO	\$4,200,000	\$200,000
	PJM	\$287,500	\$14,000
2002	ISO-NE	\$1,800,900	\$172,000
	NYISO	\$3,300,000	\$100,000
	PJM	\$282,800	\$762,000
2003	ISO-NE	\$497,100	\$212,000
	NYISO	\$3,900,000	\$121,300
	PJM	\$26,600	\$678,200

Source: Neenan Assoc.

DR programs used during August 2003 Blackout Recovery Process

- NYISO called emergency DR programs on Aug. 15 and 16
 - Every MW of load taken off system allowed another MW to come up faster during rebuilding

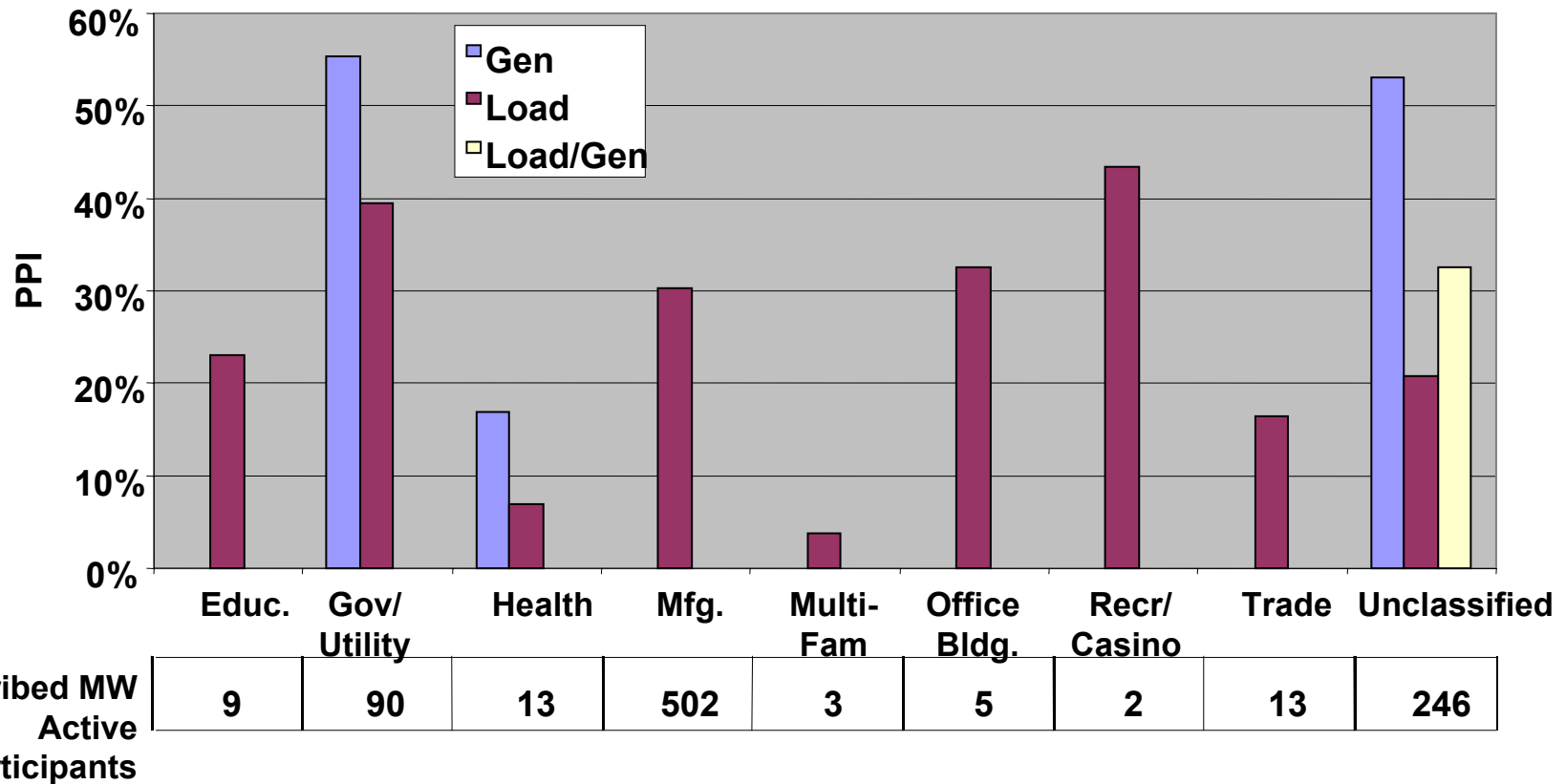
<i>Outage cost = \$5,000/MW</i>				
Date	System State	Benefit	Cost	B/C ratio
August 15	Recovering	\$50.8 million	\$5.9 million	8.6
August 16	Fully recovered	\$3.5 million	\$1.7 million	2.1

Source: NYISO 2003 PRL Program Evaluation Summary

Understanding Customer Response: Performance Metrics

- **Subscribed Performance Index (SPI)**: ratio of customer's *actual* average hourly load reduction to their *subscribed* load reduction
 - Indicates customer's actual performance relative to their commitment
- **Peak Performance Index (PPI)**: ratio of customer's *actual* average hourly load reduction to their non-coincident peak demand
 - Characterizes customer's relative technical potential when compared to similar facilities
- **Implications for system operators – how reliable a resource?**

NYISO: Customer Curtailment Potential is significant



- **Mfg & Govt. Customers can curtail 30-40% of peak demand during emergencies**

RTP as Default Service for large customers

- **Growing interest in RTP as default service tariff for large C/I in some states, primarily those with retail competition:**
 - NJ
 - MD (BG&E)
 - NY (Niagara Mohawk)
 - OH
 - OR (PGE)
- **Policy objectives include**
 - Encourage development of competitive retail market
 - Price-responsive load
- **Significant number of customers switch to competitive retailers offering products that hedge price risk**

Integrating DR into IRP plans: Some issues

- **Defining resource potential: applicability of concepts and tools from EE technical and market potential studies?**
- **Typology of DR resources**
- **Scarcity of load data on which to estimate DR potential**
- **Limited experience on which to predict price response and customer risk preferences**
- **Lead times for new DR resources**
- **Model capabilities for integrating price response into resource portfolio evaluation?**

Incorporating DR as part of Utility Resource Portfolio: Policy & Program Issues

- **Role and responsibility of utility in current market setting vs. RTO environment**
- **Establishing incentive payment levels without a transparent wholesale market**
 - **ICAP markets (NY) vs. interruptible rate**
- **Capturing locational value of DR**
- **Coordinating delivery & implementation of DR and EE programs**
 - **EIS systems offer common platform for DR and EE**
 - **Portion of DR “savings” are operational & controls improvements**

Incorporating DR as part of Utility Resource Portfolio: Policy & Program Issues (cont.)

- **Environmental impacts of onsite generators**
 - **Coordination with local air quality regulators**
 - **Limits on use of emergency generators in DR programs (“emergency” vs. economic pgms)**
- **Recovery of program costs**
 - **Are incentive payments coming from retail or wholesale market customers?**
 - **Treatment of utility & non-utility entities**