

Electricity Market Performance & Reform Options: Participant Perspectives

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Outline

- ❑ Wholesale Market Challenges
 - Market Power Monitoring and Mitigation
 - Infrastructure Investment: Generation and Transmission
 - Market Completion: Demand Response
- ❑ Retail Market Challenges
 - All of the above
 - Rationalizing “Sticker Shock”

Market Monitoring and Mitigation

Structural Problems Create Potential Market Power Problems

RTO	Load Pockets	Notes
Midwest	East, West, WUMS	3 firms have 75% of supply
New England	Connecticut, Boston	
New York	Long Island, NY City	
PJM	Baltimore, Chicago, DC, Delmarva	congestion between west and east

Conduct-Impact Thresholds Encourage and Allow Exercise of Market Power

Bid Component	Midwest ISO	ISO New England	New York ISO
Overall Cap	\$1,000		
Energy & Min Gen	Bid > \$25 AND (Bid > 400% of RP OR Bid > RP + \$100)		
Regulation & Reserves	NA	Bid > \$5 AND (Bid > 400% of RP OR Bid > RP + \$50)	
Start-Up Costs	Bid > 200% over RP		
Time-Based Parameters (relative to RL)	3 hr increase in 1 parameter 6 hr increase in multiple parameters	2 hr increase in 1 parameter 6 hr increase in multiple parameters	3 hr increase in 1 parameter 6 hr increase in multiple parameters
Other Parameters	100% increase in minima, 50% decrease for maxima		

Market Monitor Independence Is Critical

- ❑ Current MM-RTO relationship does not ensure independence and objectivity
- ❑ Market monitor better structured as internal and external units
 - Internal unit functions day-to-day, manages data, performs analysis, determines mitigation
 - External unit reviews, analyzes and recommends changes
- ❑ Greater access to market data by independent entities is needed

Infrastructure Investment: Generation and Transmission

Generation Investment Remains a Concern

- ❑ Reserve margins have been shrinking
- ❑ ISO New England has expressed concerns regarding potential capacity shortfalls in the 2008 to 2010 timeframe.
- ❑ PJM regards the current low level of new generation investment as a serious threat to reliability in just a few years
 - Additions of new capacity in the past couple of years have been offset to some extent by sizeable amounts of capacity retirement

Summer Planning Reserve Margins by Area, 2004-2006

Region	2004	2005	2006
New England	29%	16%	10%
New York	34%	17%	17%
PJM	36%	25%	14%
Midwest	16%	22%	18%
Southeast	24%	25%	27%
SPP	14%	13%	14%
ERCOT	26%	15%	14%
Northwest	23%	NR	NR
Southwest	16%	29%	24%
California	19%	13%	12%

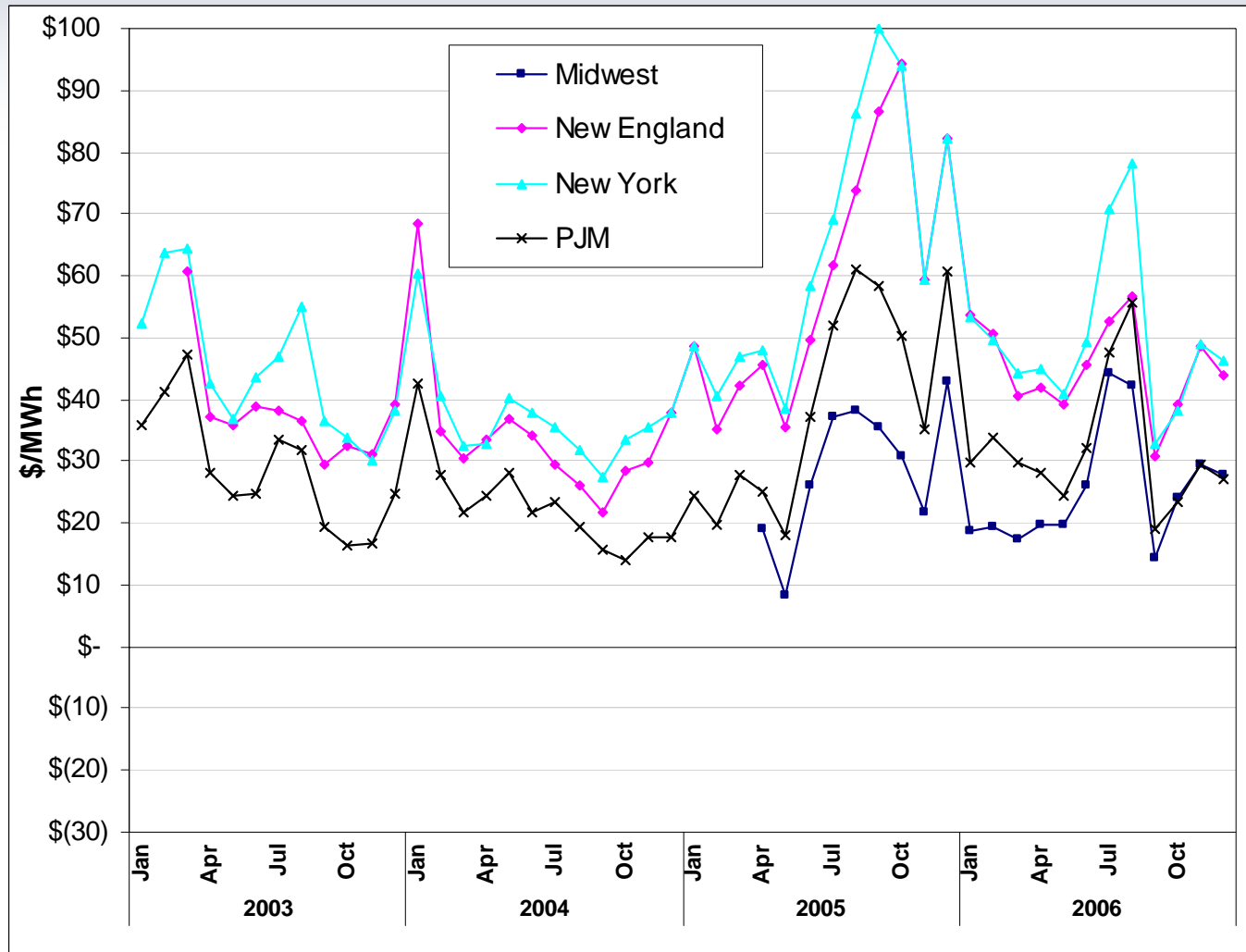
NR stands for "Not Reported"

Generation Investment Energy & Ancillary Services Annual Net Revenue (\$ 1000)

Generator Type	Heat Rate (BTU/kWh)	Midwest ISO		ISO New England		NY ISO		PJM	
		2005	2006	2005	2006	2005	2006	2005	2006
Comb. Turbine	10,500	~ 15	NR	51	NR	W: 20 HV: 50 NYC: ~190		~10	~15
Combined Cycle	7,000	~ 60	NR	114	NR	W: 60 HV: 150 NYC: ~350		~52	~50

Some Generation Is Profitable

Dark Spread for RTO Markets: 2003-2006



Jury Still Out On Whether New Capacity Markets Will Deliver the Goods

- ❑ New England: The first forward auction yielded deficient capacity offers in 3 of four capacity regions. Prices hit about \$467/MW-day.
- ❑ New York: 6-month strip auction prices and spot market capacity prices tended to converge. No new capacity investments have occurred since the market opened.
- ❑ PJM: The first two rounds of RPM auctions yielded:
 - higher capacity prices (\$/MW-day) in Eastern and Southwestern MAAC for '07-'08 (\$197, \$188) & '08-'09 delivery years (\$149, \$210);
 - 311 MW new capacity ('07-'08);
 - 2,300 MW of “new” capacity ('08-'09) that was formerly slated for retirement; and
 - 127 MW of demand response ('08-'09).

Transmission Investment in PJM Illustrates the Problem

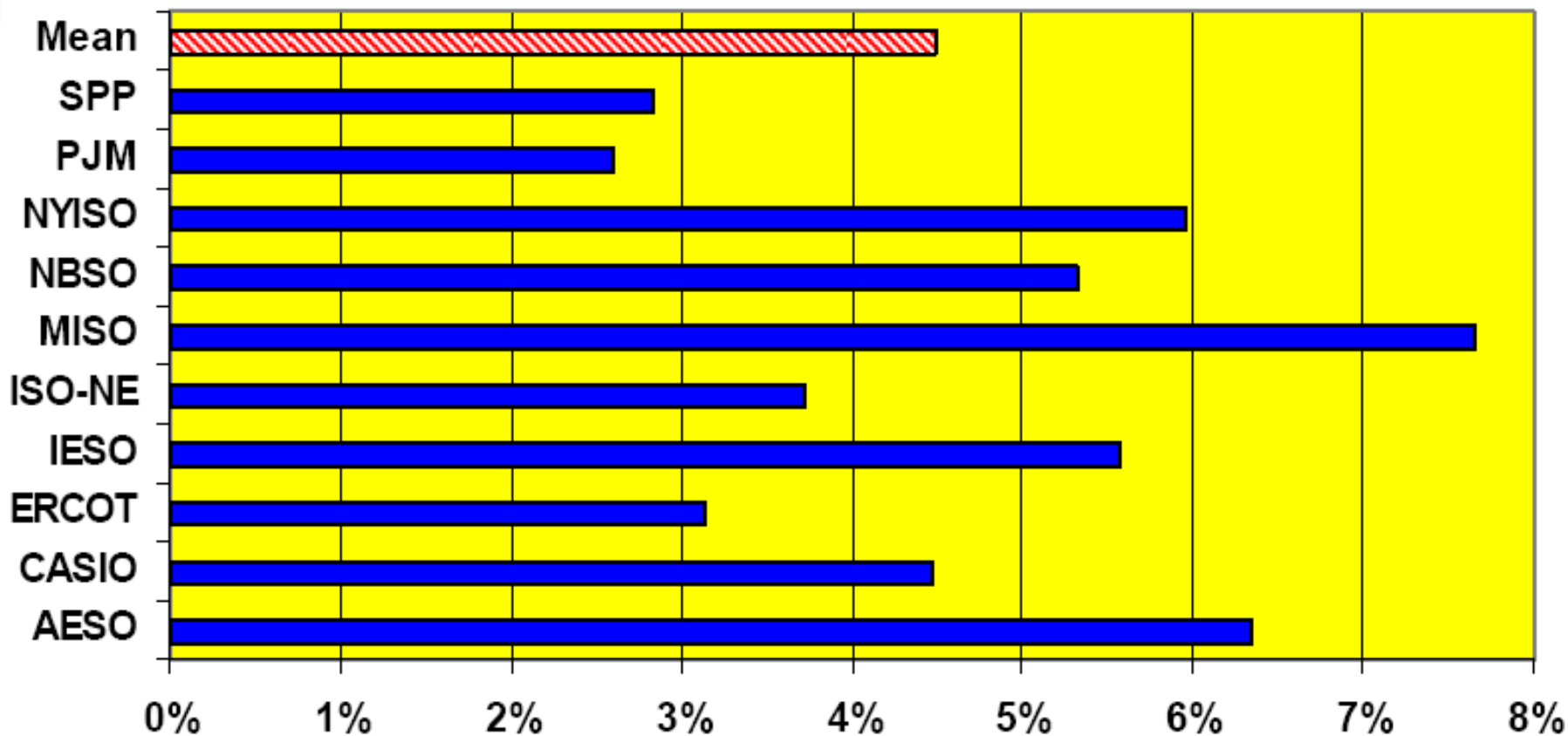
- ❑ In PJM, according to the most recent Board-approved Regional Transmission Expansion Plan (RTEP),
 - nearly \$4.2 billion of transmission upgrades and additions have been authorized since 1999 through December 31, 2006,
 - with \$2.3 billion authorized in 2006 alone.
 - as of the end of 2006:
 - \$683 million of the \$4.2 billion (or **16%**) are **in-service**
 - \$639 million (or **15%**) are **under construction**.
 - about \$2.9 billion (or **69%**) are **under study**.
- ❑ Of the \$639 million of transmission investment under construction,
 - **\$0 for network upgrades.**

Market Completion: Demand Response

Barriers to Demand Response

- ❑ Programs are difficult to understand:
 - Market rules are written for generators and full of jargon.
 - Poor documentation of implementation guidelines.
- ❑ Economic hurdles remain:
 - It is costly to satisfy requirements (metering, communications equipment, etc.).
 - It is costly to actually respond to RTO dispatch signals.
- ❑ Responsibility for demand response is divided among RTOs, LSEs, and market participants.

Demand-Responsive Load as Percentages of System Peak



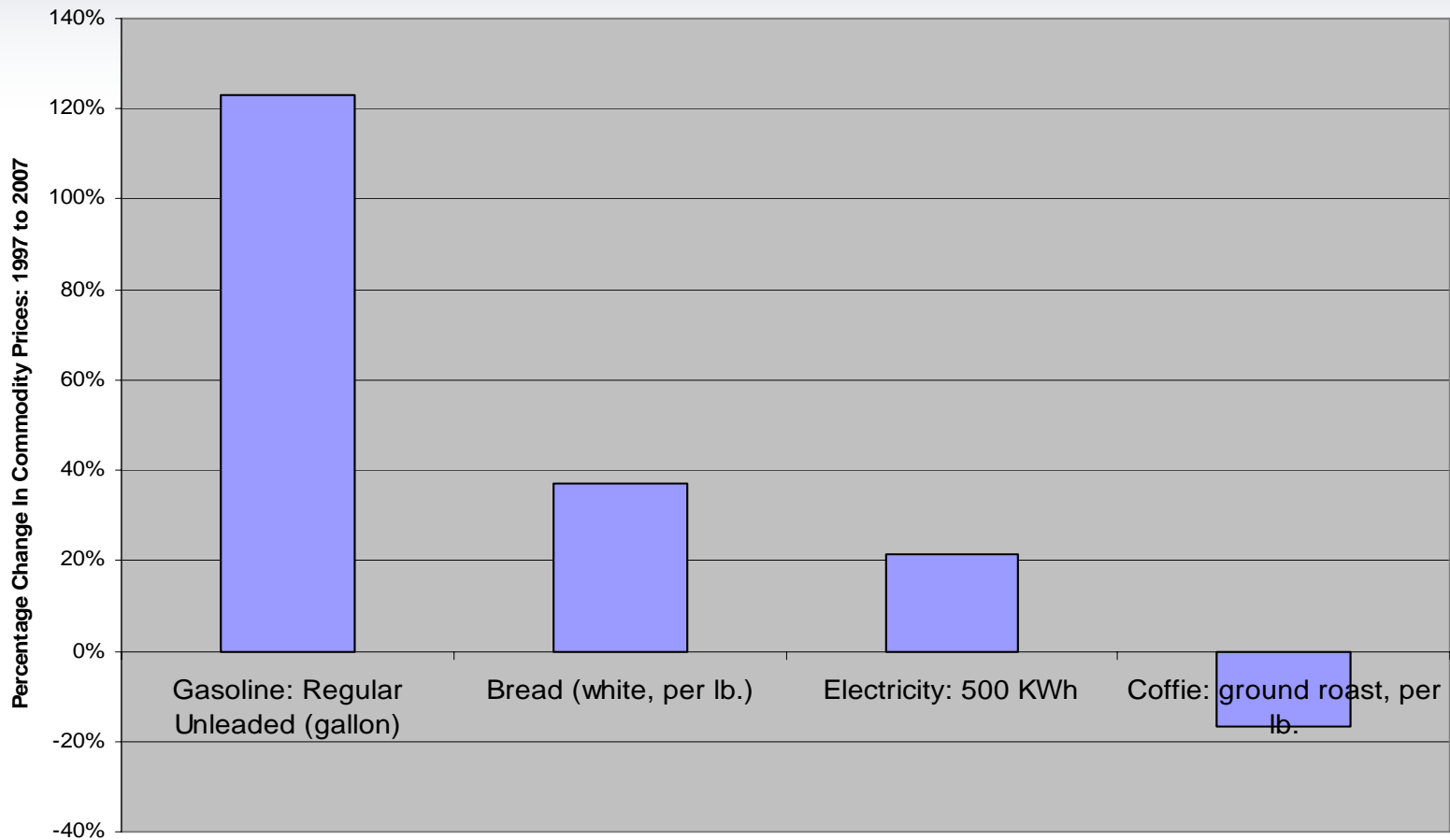
Source: ISO/RTO Council Report, October 2007, p. ES-2.

Retail Market Challenges

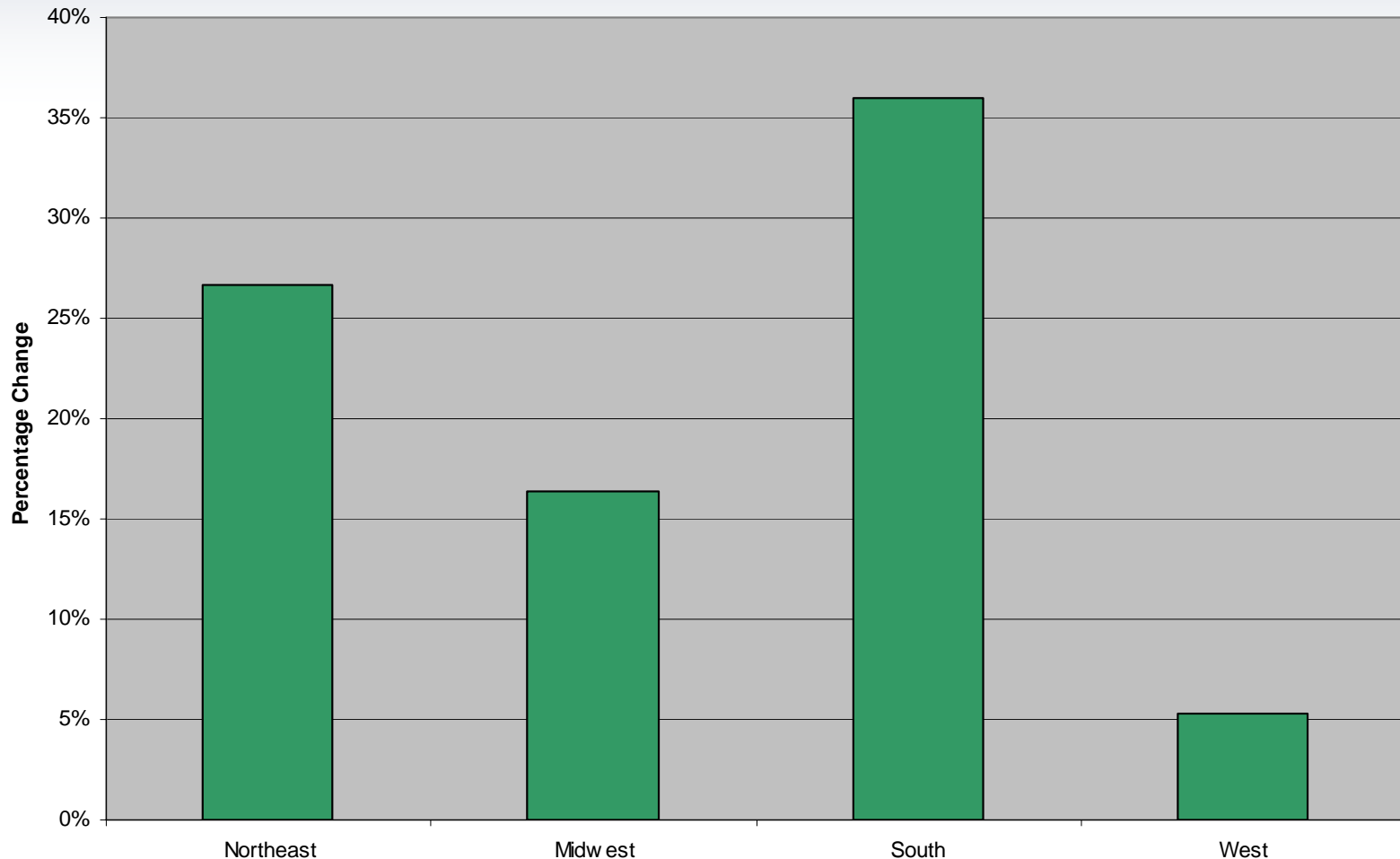
Retail Markets Need Competitive Wholesale Markets to Work

- ❑ Retail Markets need:
 - Greater transmission access
 - Generation portfolio diversity
 - Diversity in demand response programs
 - Stronger market monitoring and mitigation
 - A liquid bilateral (Over the Counter) forward market
 - Greater exposure to wholesale prices

Getting Over Sticker Shock



Percentage Change in Avg. Retail Electricity Prices in Urban Areas 500 KWh – 1997 - 2007



Short-term Markets Don't Ensure Long-Term Objectives Are Met

- ❑ RTO/ISO spot markets are short-term (5 minute dispatch intervals, and hourly pricing), and are more profitable if tighter margins exist.
- ❑ Transmission planning relegated (**up to now**) to maintaining “short-term” minimum reliability standards; has not facilitated long-term investments.
- ❑ Long-term financial transmission rights are new in 2007 and likely to evolve.
- ❑ Rules are continually being revised to “fix” spot market deficiencies, leading to increased uncertainty and risk for long-term planning and investment.

Are Society and Consumers Better Off With Restructured Centralized Markets?

- ❑ Short-term consumer benefits are unclear.
- ❑ It is too early to determine long-term benefits.
- ❑ If net benefits emerge at wholesale, the extent to which retail consumers share those benefits will depend upon:
 - retail rate structures and proceedings,
 - lagged reflection of wholesale savings in retail rates, and
 - continued application of bundled retail service rate structures to most retail customers.
- ❑ An inability to access much of the market data held by RTOs limits the degree and extent of analysis.