

# Currently Existing Demand Response

Tuesday, January 27, 2009

Reliable **Power**

Reliable **Markets**

Reliable **People**



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# Current Sources of DR

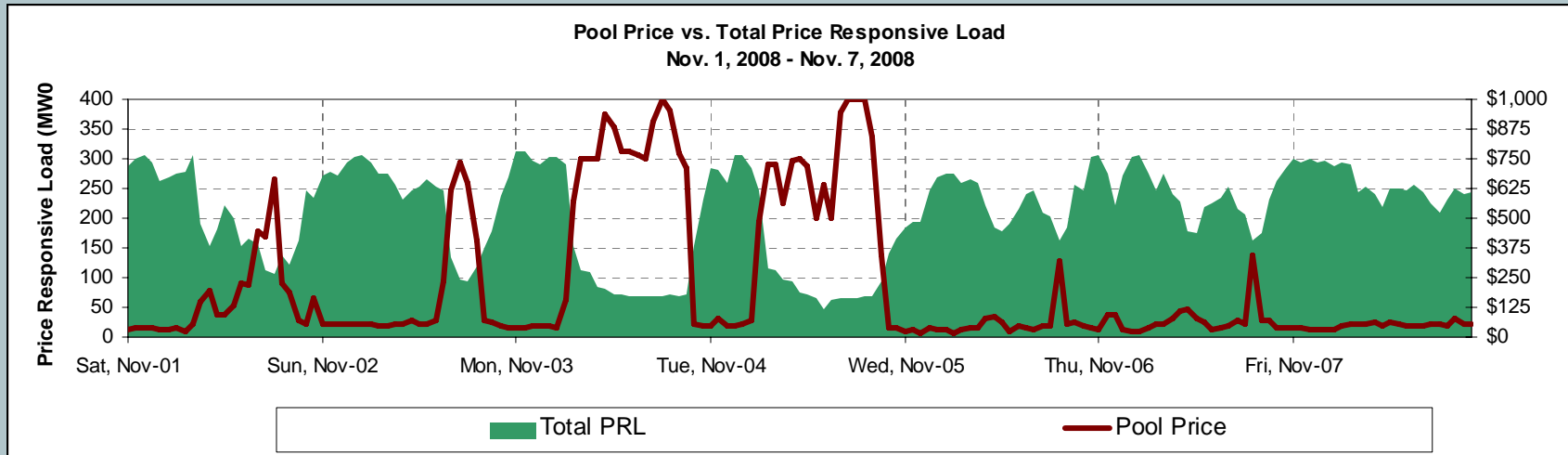
- Voluntary Price Responsive (PRL)
  - These loads voluntarily curtail for economic reasons when price increases
  - Currently 6 identified loads that are followed
  - Up to a 300 MW response using all 6 loads.
- Load Shedding Service (LSS)
  - Used in supply shortfall (OPP 801) procedures and to increase inertia capacity
  - 2 loads provide this service, both are active in the voluntary price responsive group
- Load Providing Supplemental Reserves (SUPL)
  - There are 3 loads currently active in the SUPL market
  - Up to 52 MW of SUPL have been used at the same time, on average 13% of total supplemental reserves have been provided by load in the past 3 months

# Providers



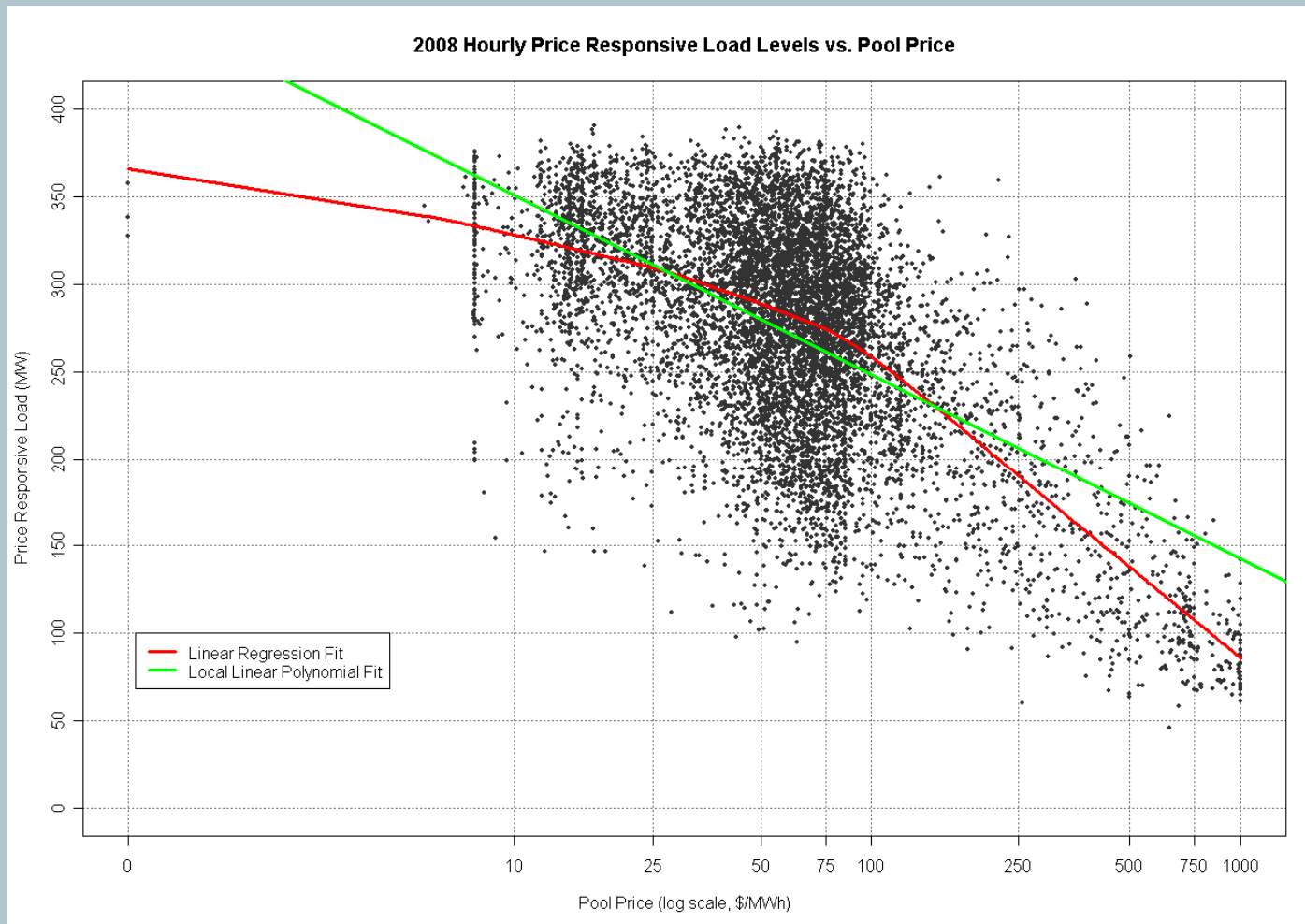
Load ID	MW	Voluntarily Respond to Price	LSS	SUPL	Process
A	135	Yes	50		Pulp & Paper
B	50	Yes	20		Pulp & Paper
C	35	Yes			Pulp & Paper
D	90	Yes		20	Pulp & Paper
E	70	Yes			Pulp & Paper
F	50	Yes			Other
G	50	No		10	Other
H	25	No		25	Other
I	25	Maybe			Other
J	25	Maybe			Pulp & Paper
K	10	Maybe			Other

# PRL - Example



- The above example shows the aggregate behavior of the PRL during a week where prices reached the cap for prolonged periods
- There was approx. a 225 MW response to the high prices seen on Monday and Tuesday
- There is a moderate to strong negative correlation between price and the amount of PRL

# PRL – Historic Relationship

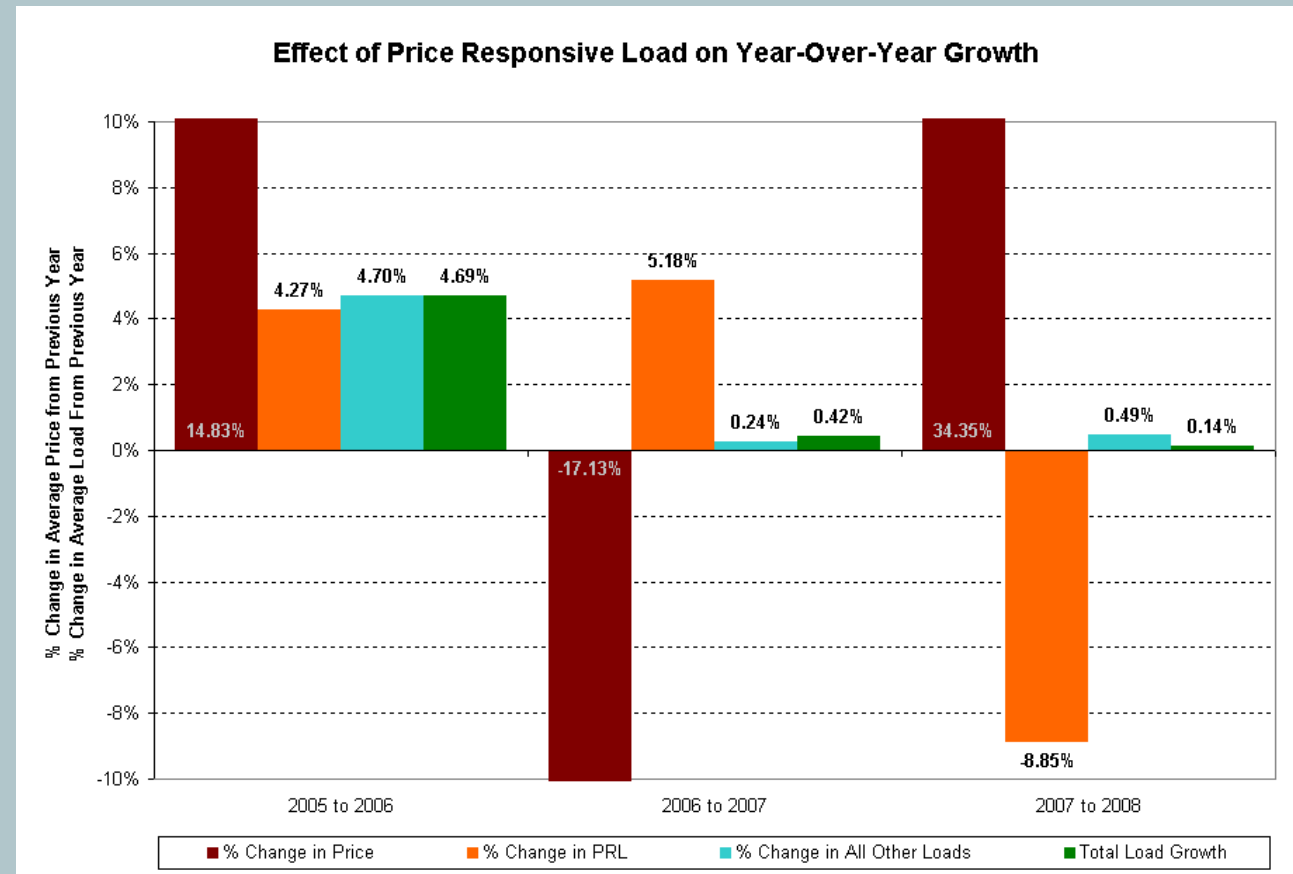


On an hourly basis there is strong evidence of these 6 loads responding to price.

PRL tends to drop off steeply when price is  $>$  \$100/MWh

# PRL – Impact on Load Growth

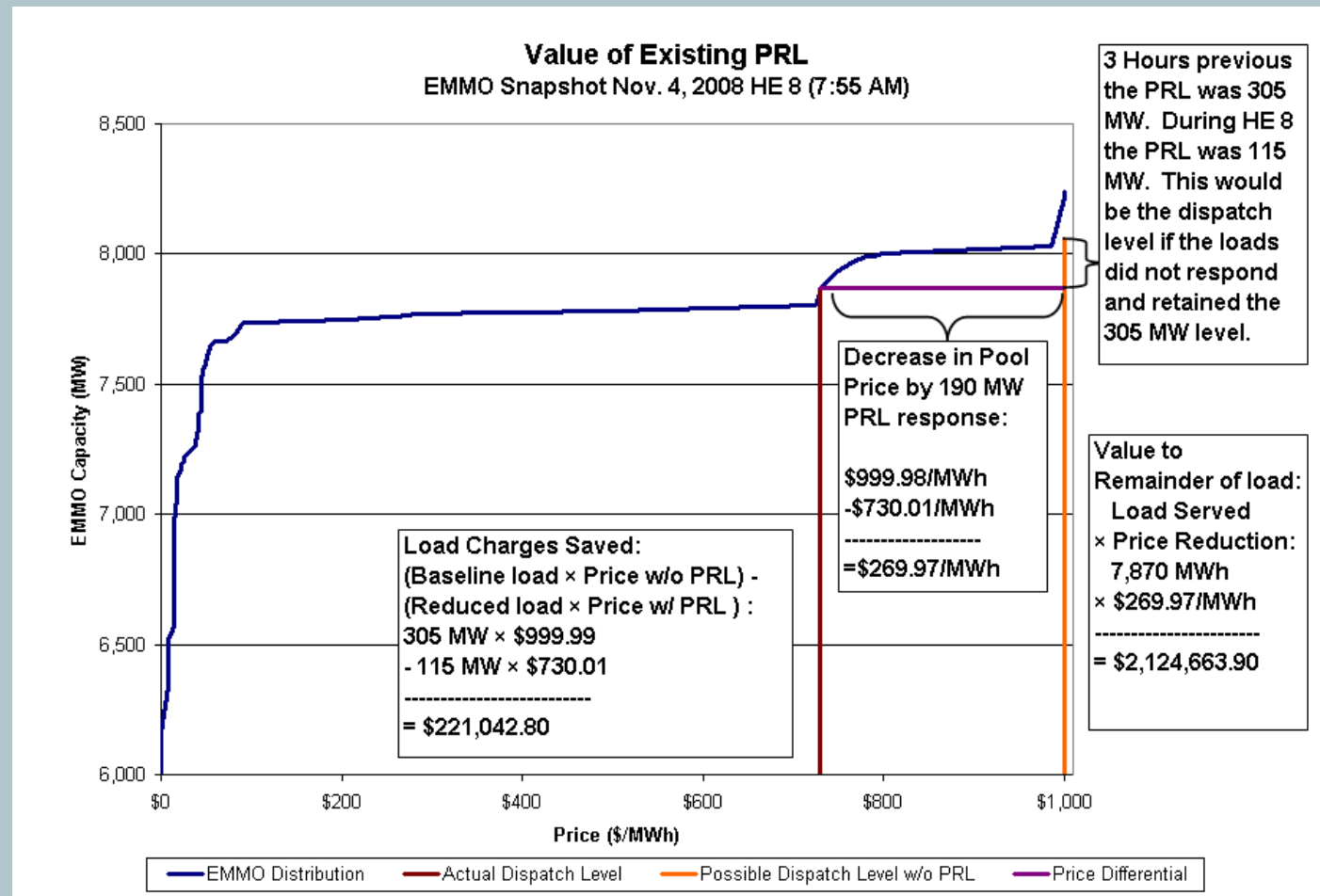
- Overall load growth in 2007 & 2008 were impacted by changes in the amount PRL
- The changes in PRL in 2007 & 2008 were driven by the changes in price over each year
- In 2009 will there be any loss of the existing PRL providers due to the economy?



# PRL – Value of Existing Providers



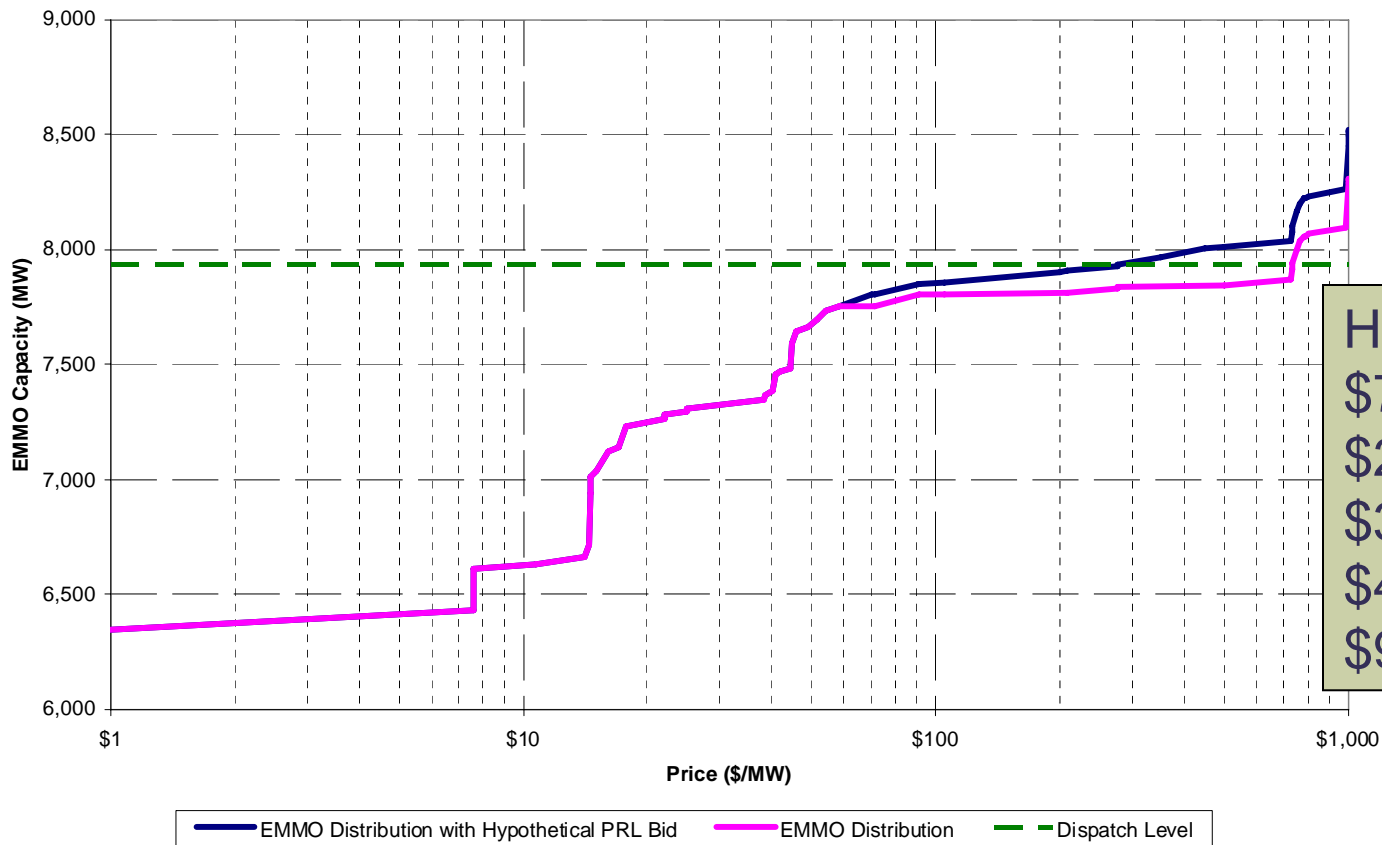
- By reducing load during high cost periods a load avoids paying higher electricity costs
- By reducing load the price lowers and all other loads benefit (free rider concern)



# PRL – Improvement of the Merit Order Distribution



**EMMO Capacity & EMMO Capacity with Hypothetical PRL Bid**  
EMMO Snapshot Nov. 4, 2008 HE 8 (7:55 AM) - SMP = 730.01



Hypothetical Bid	
\$70	50 MW
\$200	95 MW
\$350	130 MW
\$450	165 MW
\$999	210 MW

# PRL – Application of “uplift” payment

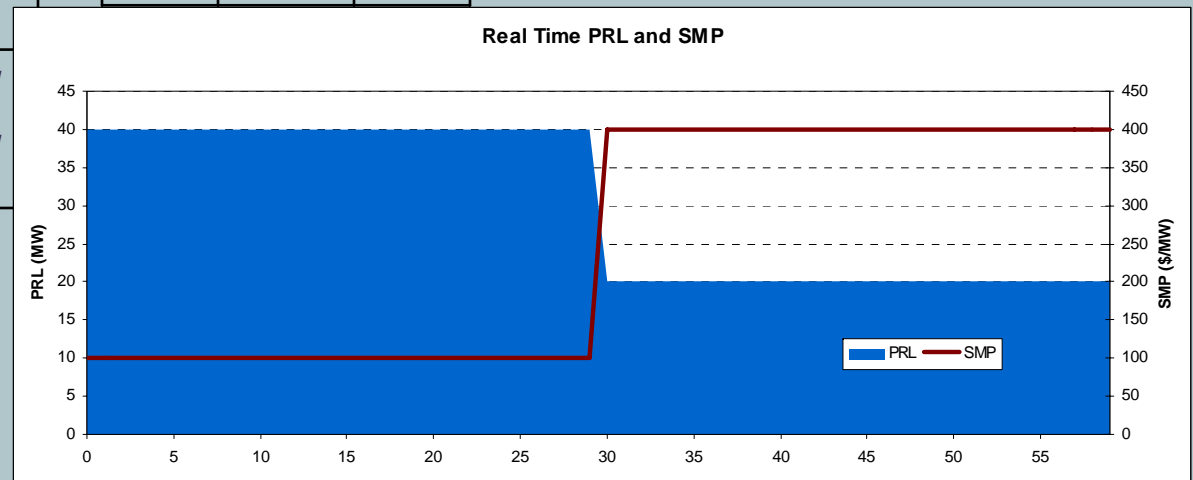


- Payments to suppliers on the margin (“uplift”) could be applicable to load
- Better alignment with real time pricing
- PRL would have to bid into the market and receive a dispatch

Load MV	30
Pool Price	\$250
Load Charges	\$7,500
Real Time (integrated) Price	$0.5h * \$100/MW * 40MW$ $+ 0.5h * \$400/MW * 20MW$ $= \$6,000$

Load Bid		
BL #	Price	MW
0	\$500	20
1	\$150	40

Uplift calculation based on rule 8.1.2	
A	30
B	40
C	30
D	150
Uplift	-\$1,000
Pool Price * MV	\$7,500
Total Load Charges	\$6,500

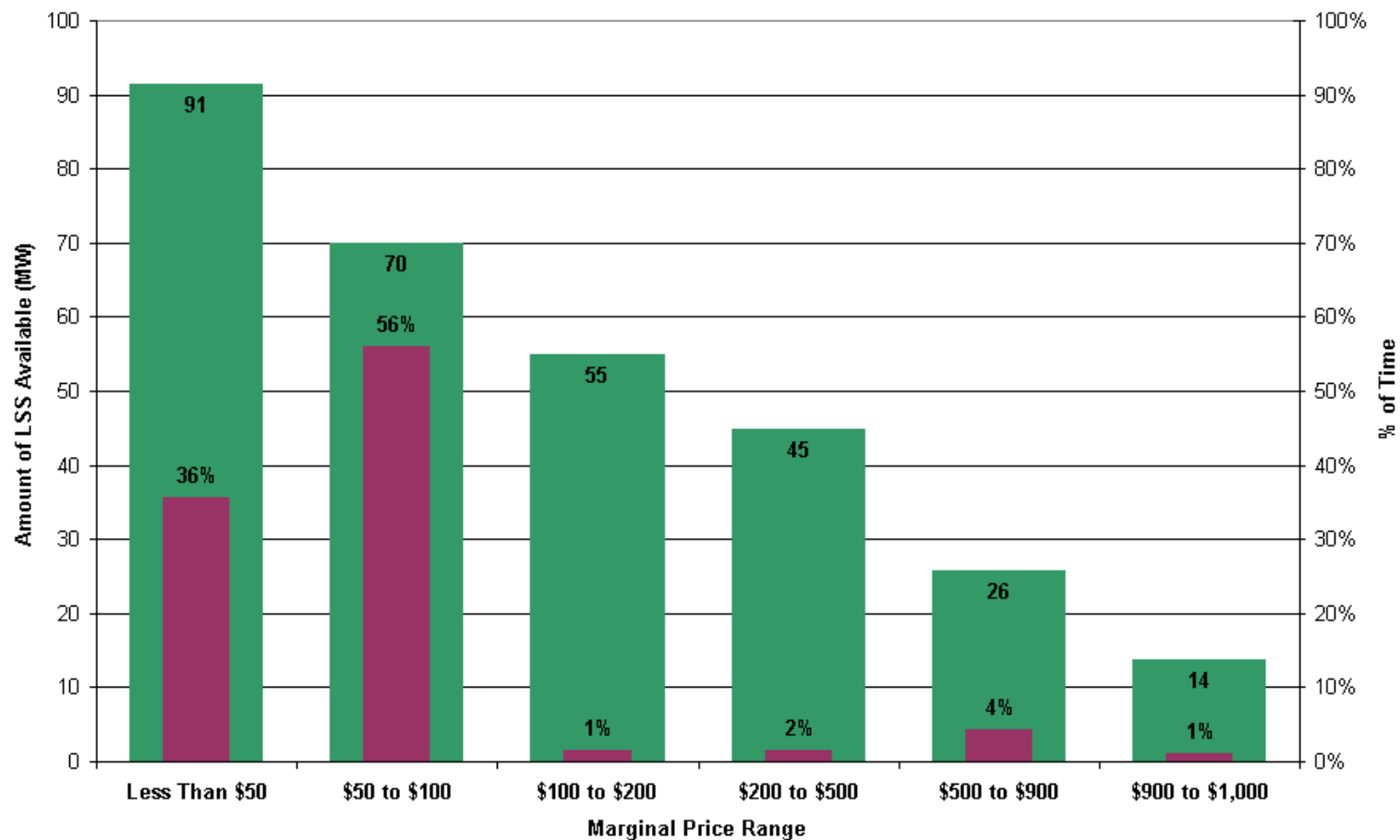


# LSS



- 3 LSS providers (110 MW) until Dec. 1<sup>st</sup>, 2008
- 2 since Dec. 1<sup>st</sup> (70 MW)
  - One reduced their LSS contract by 10 MW due to reduced demand, they have the option to increase to their old level if demand firms up
- LSS contracts: must arm 75% of the contracted amount over a 60 day rolling average
  - This allows flexibility for the load
  - This allows them to participate in PRL, meaning during supply shortfall events the amount of LSS armed may not be the total in the contract
- Total LSS costs are approximately approx. \$4.50/MWh (~\$250,000/mo)

**Total Amount of LSS Available**  
Based on November 2008 Data



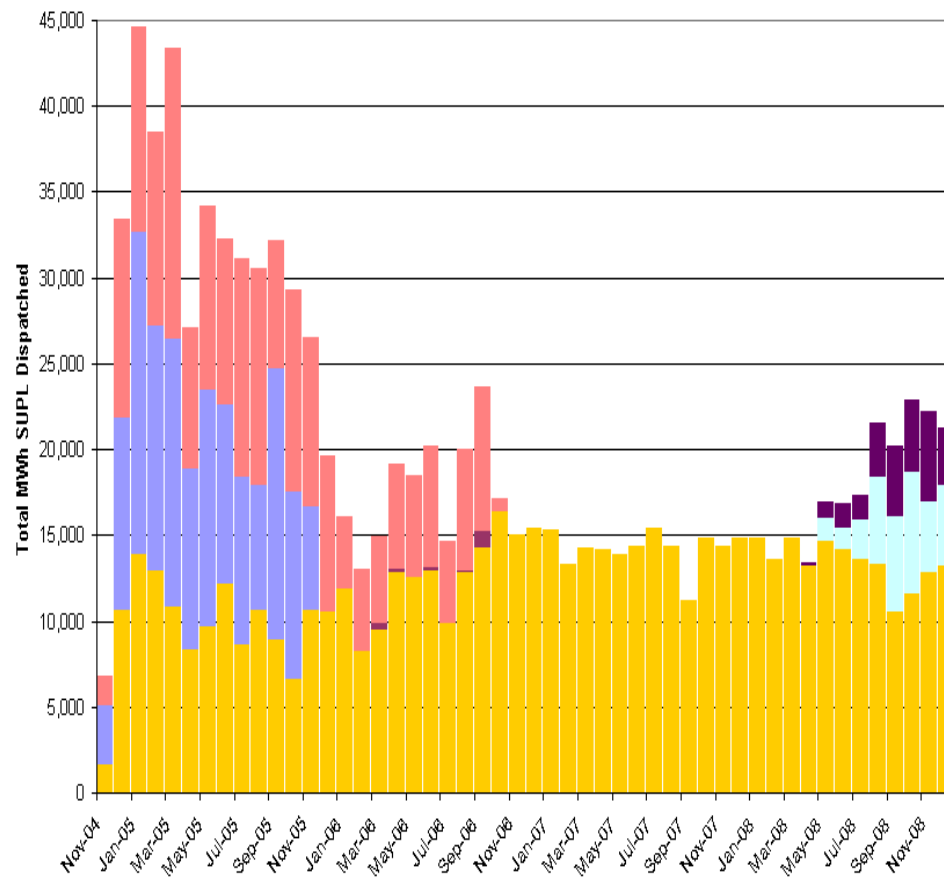
# SUPL Providers



- Load's average share of the dispatched supplemental reserve market is about 10%
- One load has been active since Nov. 2004
- Load D's PRL activity is affected by its SUPL dispatches
  - Will reduce load to the level of the SUPL dispatch depending on the price
- 2 new loads became active in 2008, this increased load's participation in this market, though this is not as high as in the past
- The 2 new loads do not appear to be price responsive, and only appear to be active in the SUPL market
- In 2007 supplemental reserves were priced at \$26/MWh

# History of SUPL provision

Historical SUPL Participants



- Over the past five years there have been 3 additional SUPL participants
  - 1 dropped out to participate in the LSS program
  - 1 original LSS provider did not renew their contract and dabbled briefly in SUPL after not renewing
  - 1 shut down operations
- Based on historical levels could easily accommodate more load in the supplemental market

# SUPL provides a small amount of the total supplemental reserves

### Hourly Share of Supplemental Reserves

