



# ERCOT Emergency Load Response

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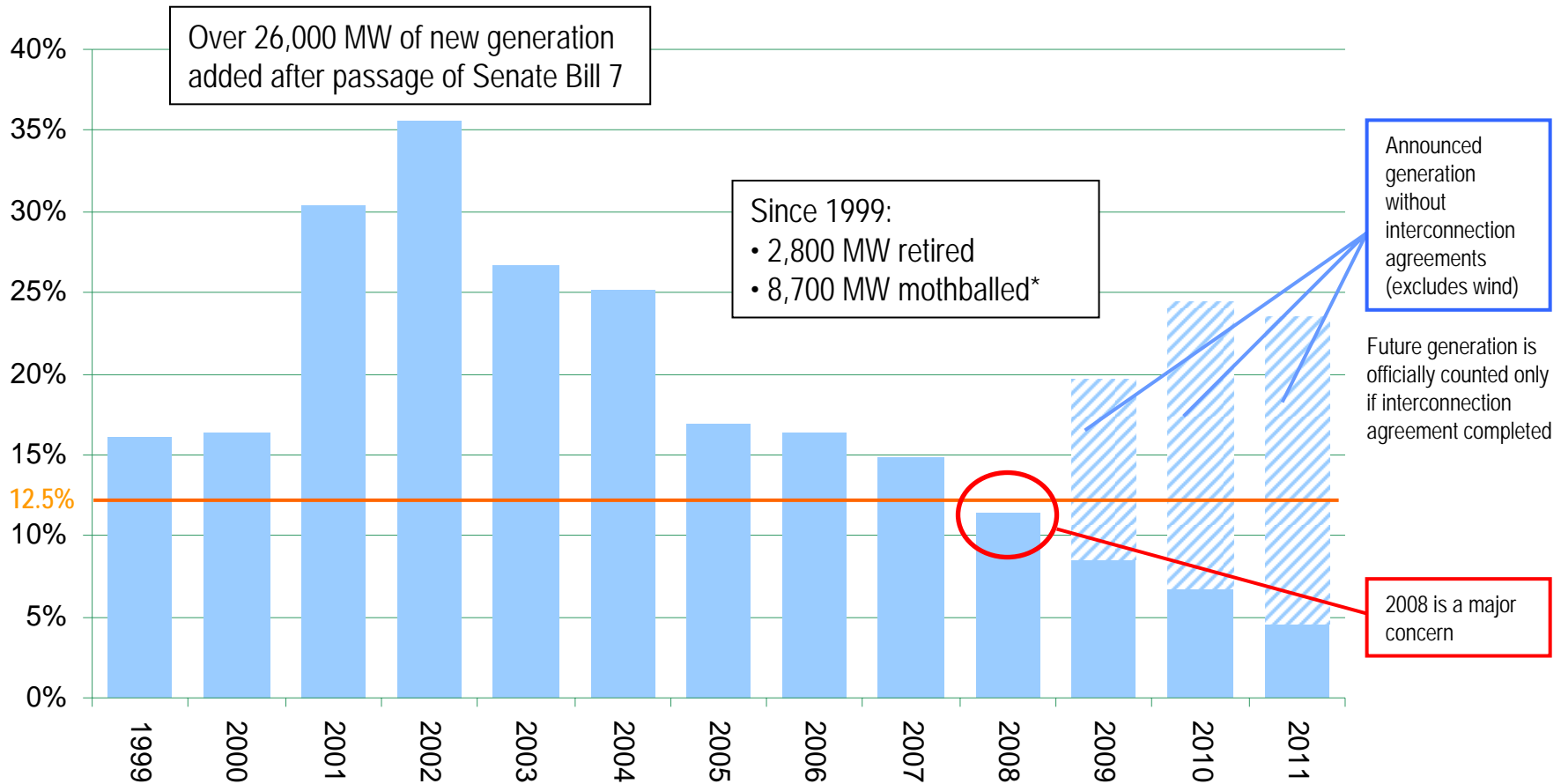
**PUC Demand Response Workshop**

**Sept. 15, 2006**

- **Background**

- Under normal circumstances, adequate resources are on line or available to deal with most situations (RRS, NSRS, RPRS)
- Historical need for additional resources due to abnormal events (usually weather related)
  - Cold weather events can lead to abnormally high load combined with fuel curtailments (Feb. 2003)
  - Shoulder month events caused by unusual weather at unexpected times (100° weather in April with 20% of capacity offline for seasonal maintenance)
- When abnormal events occur, additional ERCOT tools could reduce the possibility of a need for firm load shedding
- Shrinking reserve margins place the system at greater risk

# Reserve Margins 1999-2011

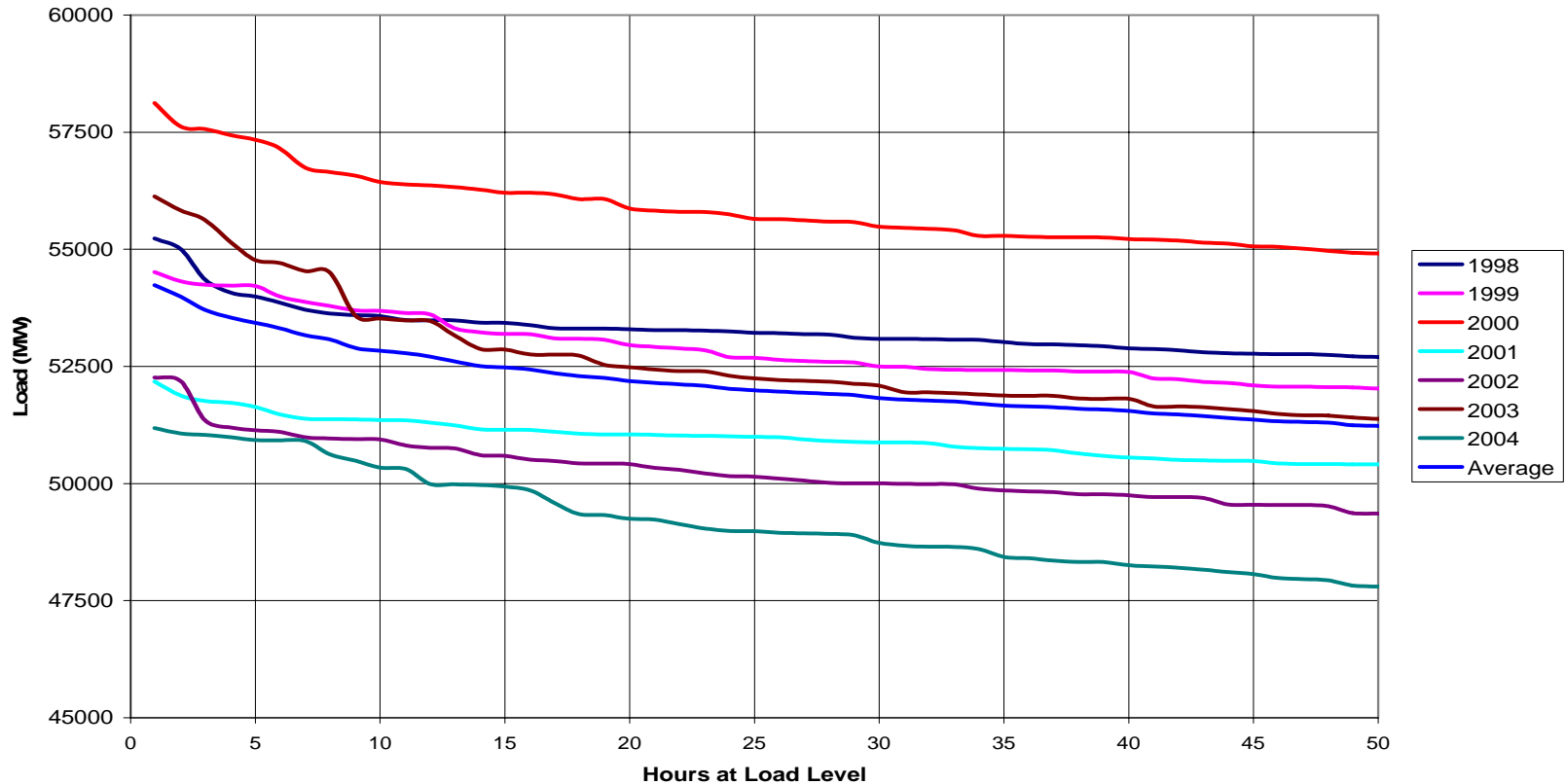


Percentage difference between peak load forecast and available generation/resources  
 12.5% is the target minimum reserve margin established by ERCOT stakeholders and Board

\*1,100 MW of mothballed units have been returned to service

# Peak Load Variability (Highly Weather Sensitive)

## ERCOT Peak Load Duration Data Normalized for Economic & Population Growth, 1998-2004



- Swing of ~3500 MW in Peak Load from an “Average” Year to high and low
  - Represents about 5% of current Peak Capacity
- Load forecasts used for reserve margin calculations are based on average temperatures

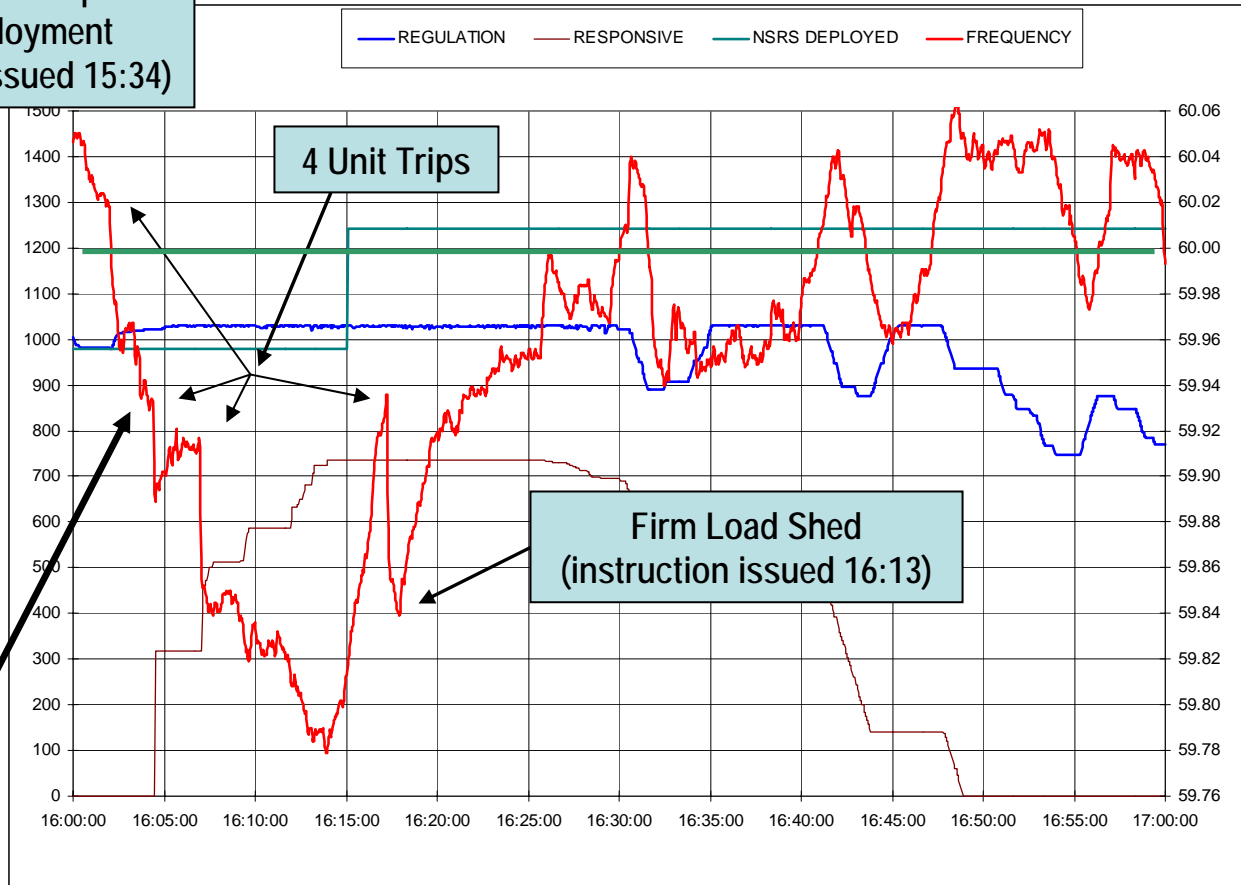
- **Region-wide demand is growing at an average of 2.3% per year**
- **Per-home energy consumption has doubled since 1980, despite appliance efficiency gains**
  - Many more devices in use
- **60% of new homes have ceilings of 9 ft. or higher**
- **100% of new homes in southern U.S. have A/C**

*So, what happens when all else fails?*

## Operating Procedures scheduled for Board approval on 9/19/06

<i>Event/Action</i>	<i>Trigger</i>
<b>Operating Condition Notice</b>	Physical responsive reserve below 3300 MW
<b>ADVISORY</b>	Physical responsive below 3000 MW
<b>ALERT: Start RMR units, suspend unit testing, deploy RPRS &amp; NSRS</b>	Physical responsive below 2500 MW
<b><i>Emergency Electric Curtailment Plan</i></b>	
<b>Step 1: Dispatch all generation, public media appeal, DC Ties</b>	Physical responsive below 2300 MW
<b>Step 2: Deploy LaaRs</b>	Physical responsive below 1750 MW
<b>Step 3: Instruct transmission operators to shed firm load</b>	Frequency below 59.8 hz

Graph represents post-LaaR deployment (instruction issued 15:34)



- **Additional load resources deployed shortly after 1600 could have averted the need for firm load shedding**

## A proposed new tool for the ERCOT toolbox

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<b>➔ New Step: Deploy EMERGENCY INTERRUPTIBLE LOAD</b>	
<b>Step 3: Instruct transmission owners to shed firm load</b>	Frequency below 59.8 hz



- **Proposal for an Emergency Interruptible Load Response Program**
  - Loads would respond:
    - After all regular emergency resources (NSRS and RRS) have been deployed
    - Under low frequency conditions
    - Prior to shedding firm load
  - Quantity would be based on averting historical firm load shedding events which have occurred in winter peak or shoulder months
    - 1000 MW based on history
  - Quantity could be adjusted based on projected reserve margins for the following year
  - Expected deployment of these load resources would be infrequent
    - 1 or 2 events in 10 years
  - An “event” could entail deployment over several consecutive days (due to an extreme heat wave for example)
  - Customers making up these load resources should be prepared for interruption and would replace firm customers who are not prepared

- **Advantages of an Emergency Interruptible Load Program:**
  - Backstop in times of tight supply
  - Shedding voluntary and prepared end use customer load is preferred over involuntary unprepared firm load shedding
  - Shedding load is 100% effective for balancing to available generation
  - Societal cost should be lower than the cost of shedding firm load
  - Capital cost should be much lower than adding peak generation capacity

- **Potential Program Characteristics**

- Procurement/Payment

- Loads, through their QSEs, would competitively bid to provide service (similar to Black Start)
- 2-year contract term
- Initial start-up payment at time of contract award
- Pay for performance based on actual load response
- End of contract term payment based on availability
- Consider a price cap for total compensation

- **Potential Program Characteristics**

- Dispatching and Operations

- Dispatched By ERCOT thru QSEs
    - Would be deployed as a single block after all existing generation resources: under low frequency conditions but before any firm load shedding
    - Needs to be quick responding (10 minute or less response time)
    - Require IDR metering for measurement and verification
      - But no telemetry
    - Limit number of hours to be curtailed in any given year

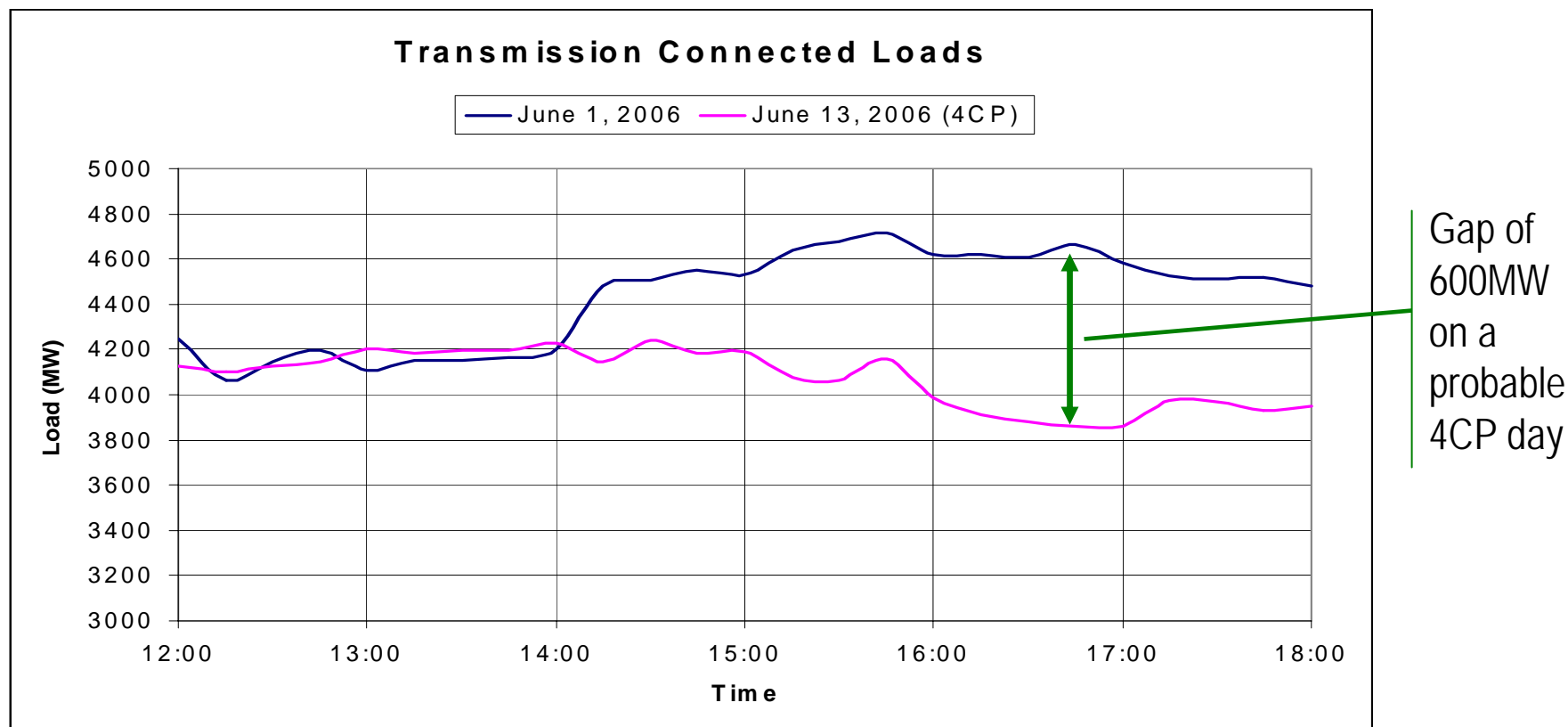
## •Potential Program Participants

- Large Commercial and Industrial Accounts
- Government and Municipal Facilities
- Retail Chains
- Others???

Program should be open to QSEs serving both competitive and NOIE load

# Emergency Interruptible Load Response at ERCOT

- **A potential issue relating to customer performance:**
  - Prospective customers may already participate in bilateral price responsive load programs and/or 4CP load adjustments
- **Payment for emergency interruption thus should be based on performance, tracked through IDR meter data**



## Proposed Emergency Interruptible Load Program

- **ERCOT takes advocacy positions on policy issues when grid reliability is affected**
  - Proposed emergency interruptible load is a reliability tool
- **Emergency interruptible load is needed ASAP**
  - Region will be near or below minimum reserve levels in 2007 and 2008 (and possibly beyond), depending on weather extremes
  - ERCOT strongly recommends enabling by Spring '07 shoulder months
- **PUC action is crucial**
  - Stakeholders cannot be expected to develop a program in time, based on history of demand-side initiatives
- **Fast-track authorization or commendation from commissioners will be necessary**

