

# ISO New England Winter Operational Experiences and Regional Actions



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*Federal Energy Regulatory Commission*

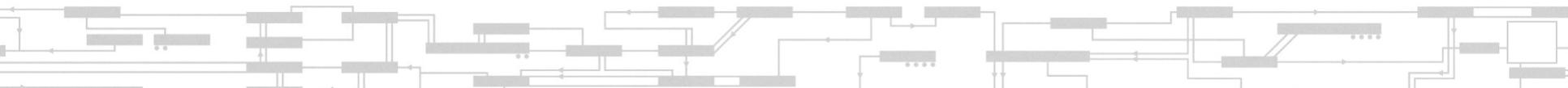
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VICE PRESIDENT, MARKET OPERATIONS



# Outline

- Fuel-related challenges to the New England region
- Winter operational experiences
  - January 2013
  - February 2013
- Summary of regional actions
- Appendices
  - Appendix A: Winter operational challenges
  - Appendix B: Regional actions



# About ISO New England

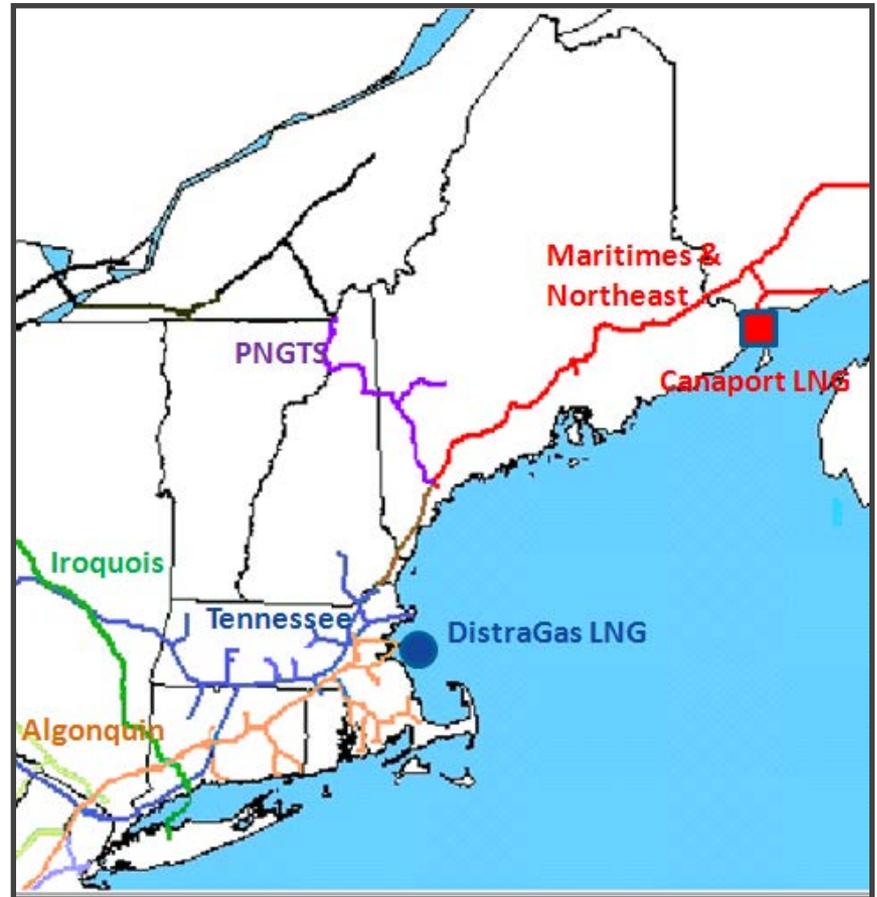
- Not-for-profit corporation created in 1997 to oversee New England's restructured electric power system
  - Regulated by the Federal Energy Regulatory Commission
- Regional Transmission Organization
  - Independent of companies doing business in the market
  - No financial interest in companies participating in the market



# New England's Natural Gas Transmission System

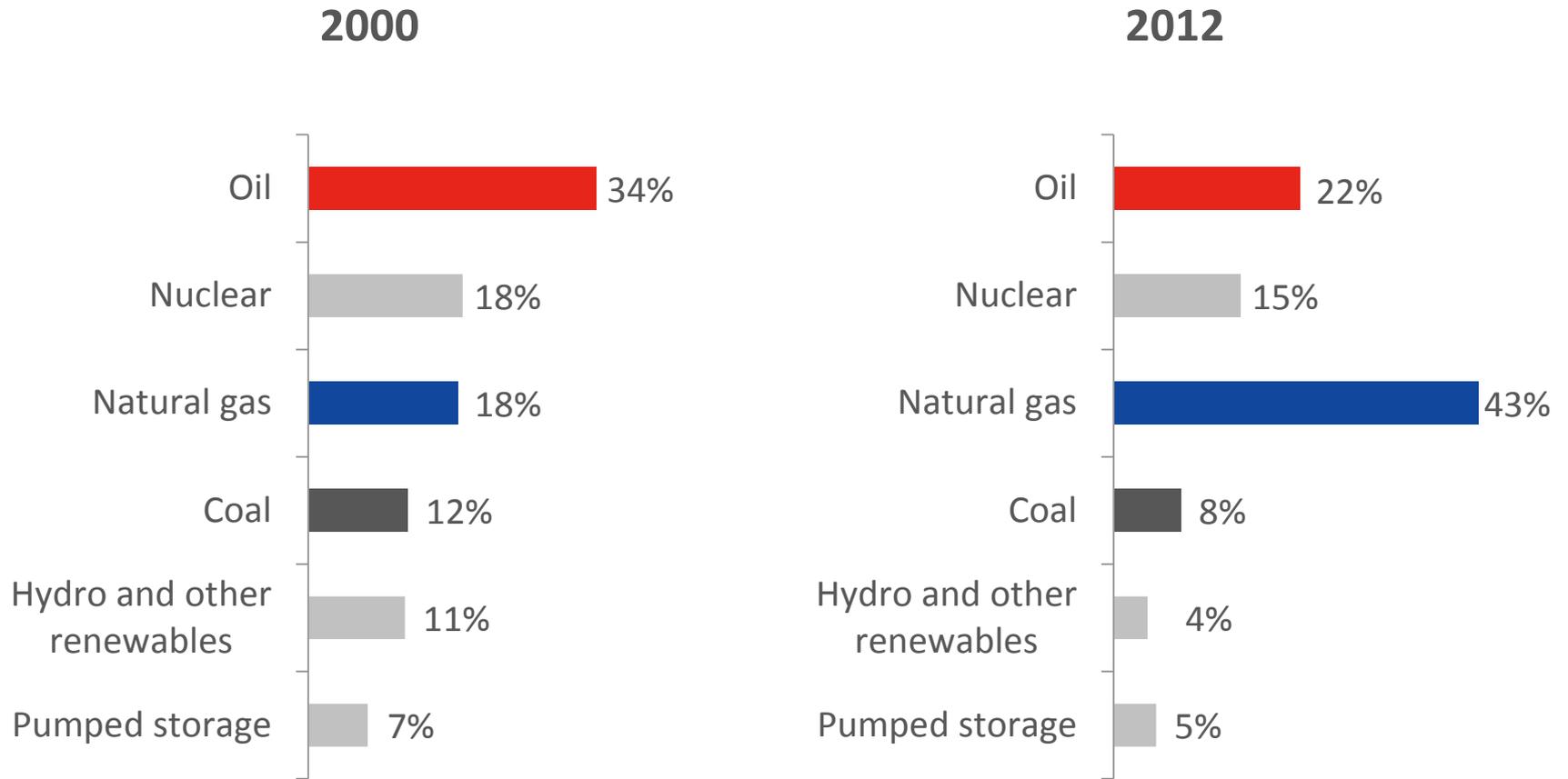
*Region has limited natural gas storage potential and additional infrastructure can help region better access natural gas supply in neighboring regions*

- 5 gas pipelines
- 2 LNG storage facilities
  - Distrigas 3.4 Bcf
  - Canaport 9.9 Bcf
- Amount of gas-fired generation on each facility
  - Algonquin: 8,224 MW
  - Distrigas: 1,694 MW
  - Iroquois: 1,472 MW
  - M&N: 2,200 MW
  - PNGTS: 436 MW
  - Tennessee: 4,486 MW



# Regional *Capacity* has Shifted from Oil to Natural Gas

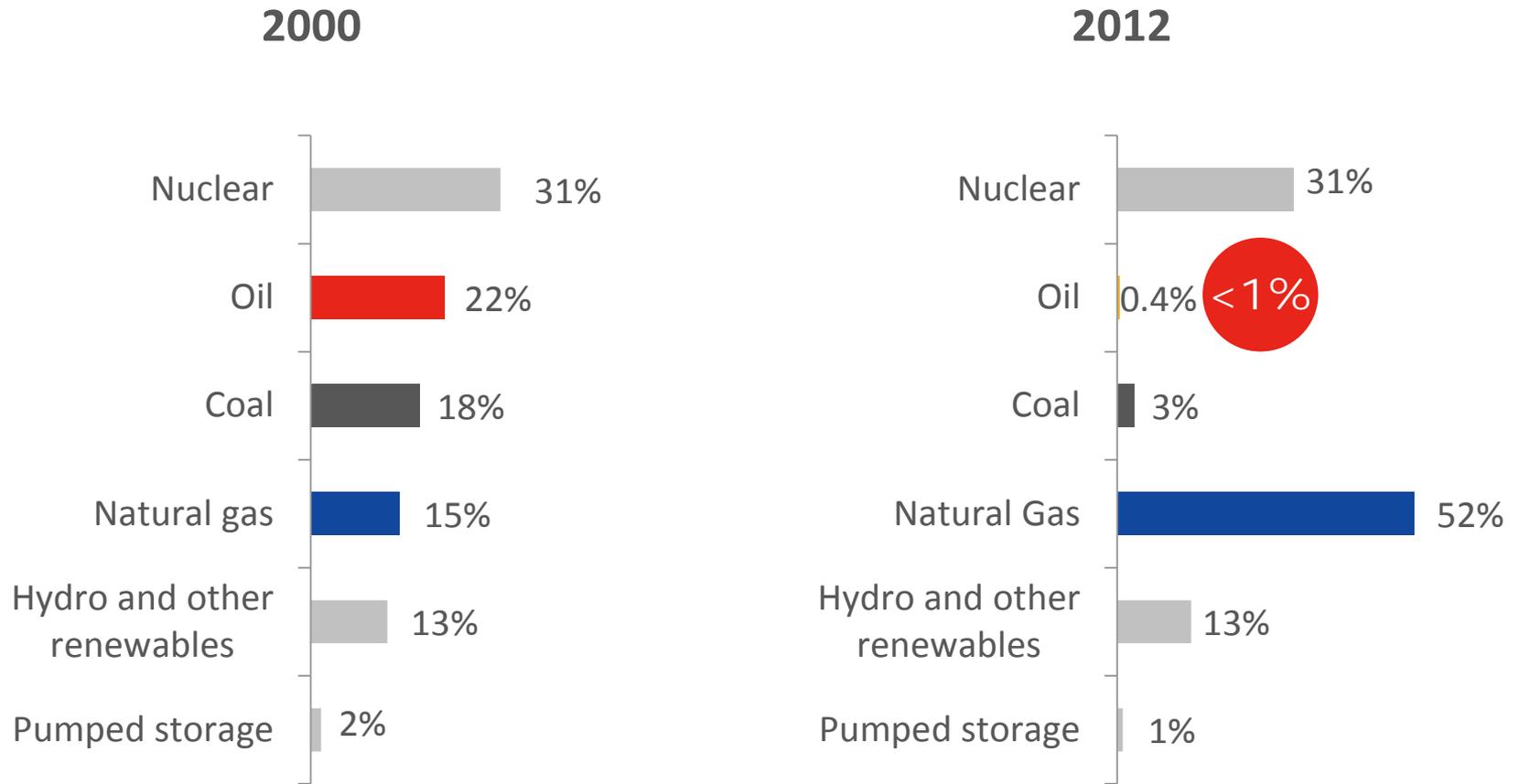
*Percent of Total System Capacity*



*Other renewables* include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.

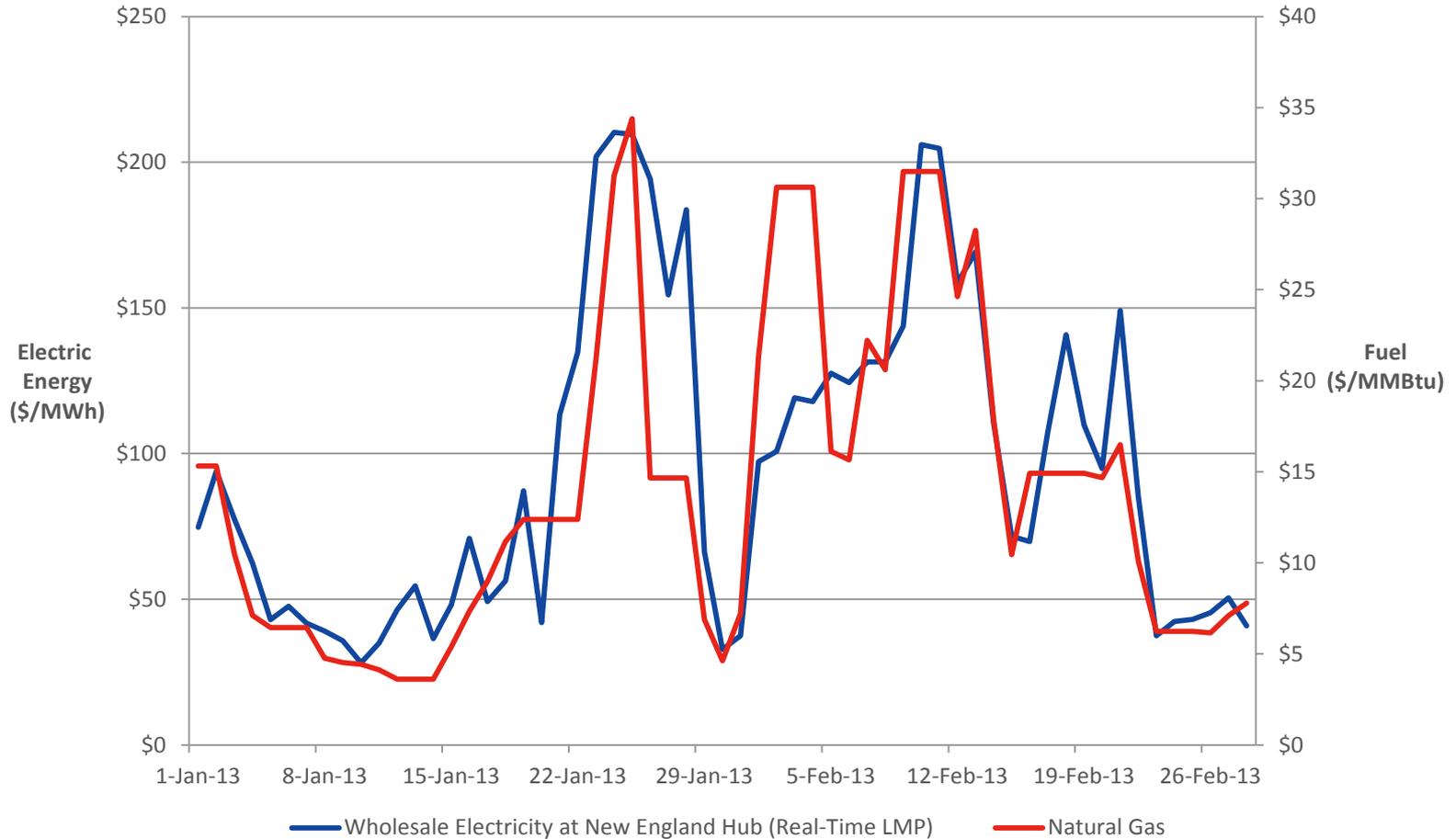
# Regional *Energy* has Shifted from Oil to Natural Gas

## Percent of Total Electric Energy Production



*Other renewables* include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.

# Wholesale Electricity Prices Track Natural Gas Prices



# Growing Dependence on Natural Gas-Fired Generation Highest Priority for Region

- Types of natural gas-related operating conditions that cause reliability concerns for the electric system
  - Gas-fired generators without secure fuel arrangements
  - Availability of gas-fired generators during pipeline maintenance
  - Fuel limitations when responding to changing power system conditions
  - Pipeline constraints due to shift in natural-gas flows
  - Failure of gas generators to be available as required increases the need to commit oil generators, many of whom operate infrequently and have low oil inventories

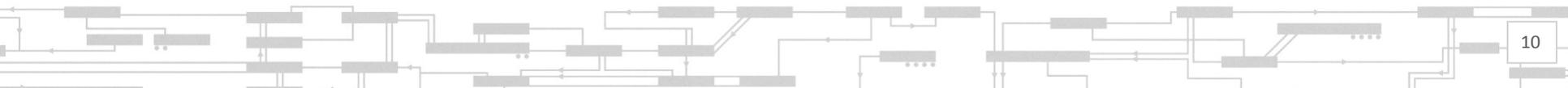
Though winter operational challenges manifested themselves this winter, natural gas-related dependency issues exist year-round, not just in cold weather

# Winter 2013 Operating Issues: January

- High demand driven by sustained cold temperatures limited the availability of gas from the west
- Higher gas prices caused supplies to flow south from Canadian sources
  - Generators utilized re-offer provisions to reflect the updated price of fuel in their offers
- System-wide Real-Time Demand Response dispatched on January 28, 2013
  - 99.59% of RTDR responded in the aggregate with a range of individual resource performance
- Due to the failure of some gas-fired generators to perform in accordance with their offers, ISO needed to commit additional generation
  - Already low oil inventories were further depleted during cold weather
  - Operation of a large oil unit was significantly limited due to a lack of oil inventory
  - Low oil inventories left system at risk if cold weather had continued

# Winter 2013 Operating Issues: February

- The region was vulnerable following the January cold weather due to low fuel inventories. A relatively mild February averted the implementation of emergency procedures
- Blizzard impacted gas- and oil-fired generation
  - The loss of non-gas-fired generation (e.g., oil, nuclear and coal plants) increased reliance on gas-fired plants and exacerbated concerns related to the failure of natural-gas-fired generating facilities to obtain fuel
  - More than 6,000 MW of gas- and oil-fired generating capacity became unavailable on Friday, February 8 and Saturday, February 9, either because of storm-related outages or because of a failure to obtain fuel
  - In response to generation and transmission outages during the overnight period from Friday, February 8, through early Saturday morning, February 9, the ISO system operators needed to bring on additional generation to secure the system, but more than half a dozen generators informed the ISO that they could not get gas



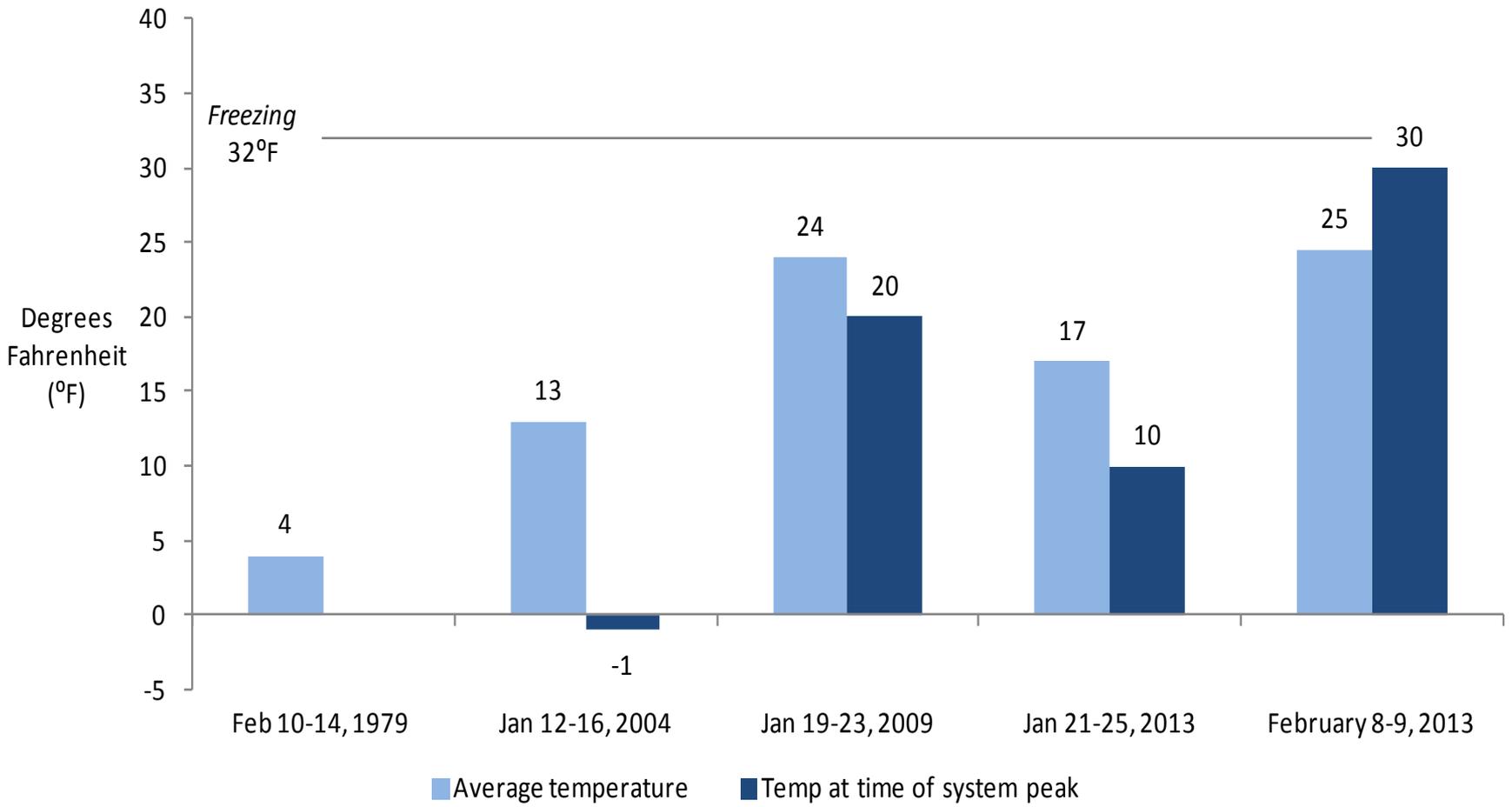
# Summary of Action Plan\*

Recently/Soon to be Implemented	Reliability Enhancements (Winter 2013-14)	Near-Term Actions (2013–2014)	Longer-Term Actions (2018-19)
<ul style="list-style-type: none"> <li>• Information sharing with gas pipelines (Jan-2013)</li> <li>• Shift Day Ahead Market Timing Earlier (May-2013)</li> </ul>	<p>Actions:</p> <ul style="list-style-type: none"> <li>• Demand Response</li> <li>• Supplemental Fuel Inventory</li> <li>• Dual Fuel Testing</li> </ul>	<p>Actions:</p> <ul style="list-style-type: none"> <li>• TMOR RCPF &amp; Replacement Reserves</li> <li>• FRM Incentives</li> <li>• FCM Shortage Event Trigger</li> <li>• Energy Offer Flexibility</li> </ul>	<p>Actions:</p> <ul style="list-style-type: none"> <li>• Pay for Performance</li> </ul>

\* Reference Appendix B for more information

# APPENDIX A: WINTER OPERATIONAL CHALLENGES

# Temperatures During Region Cold-Weather Periods



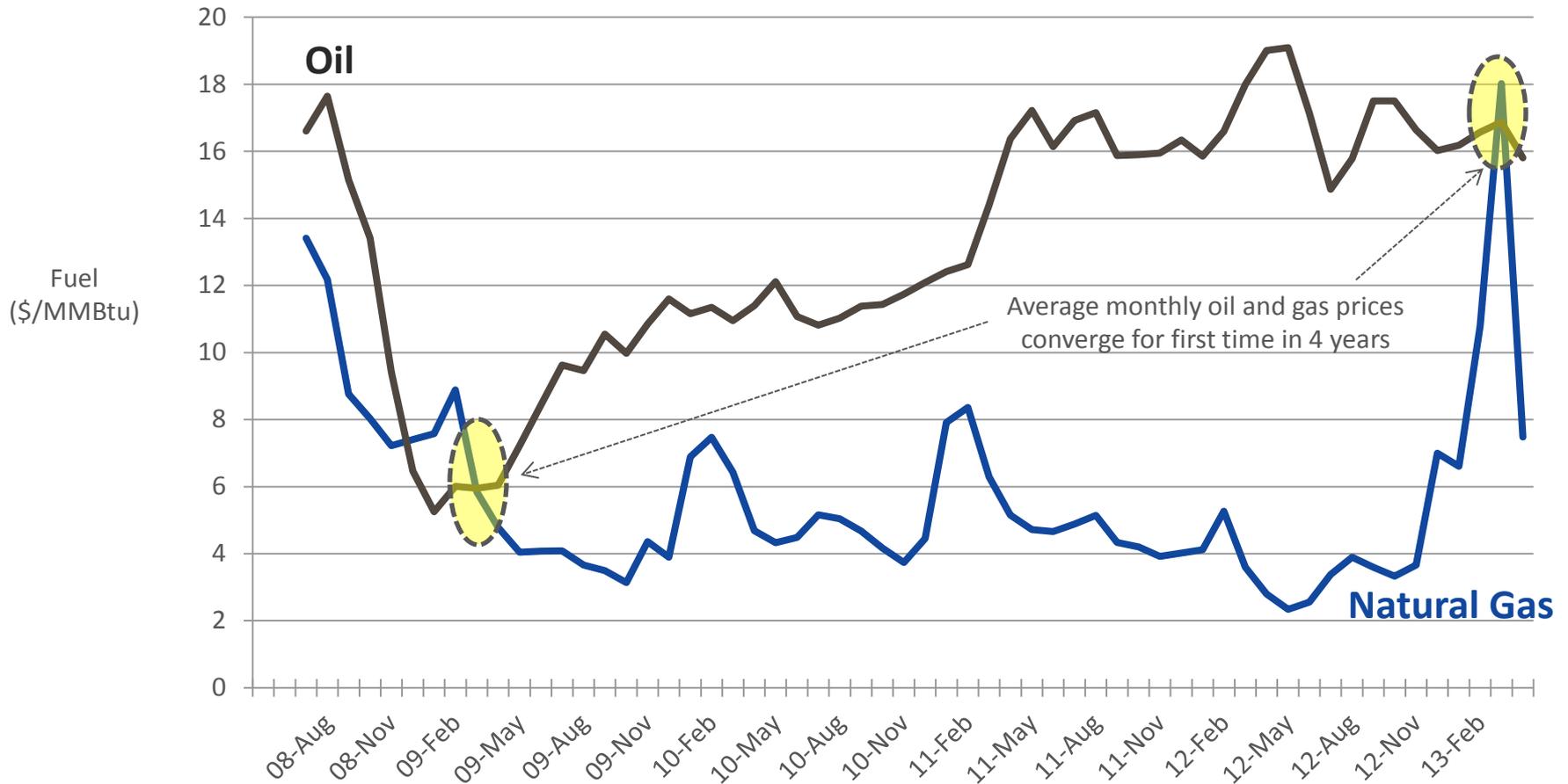
# Winter 2012-13 Relatively Mild

- Winter 2012-13
  - Average temperature 10°F warmer than January 2004
  - Actual peak load less than the 50/50 forecast

Winter	Avg. Jan. Temp Degree F	Forecasted Load		Actual
		50/50	90/10	
2003-04	20.1	22,010	22,900	22,818
2012-13	30.8	21,392	22,132	20,822
2013-14		21,383	22,033	

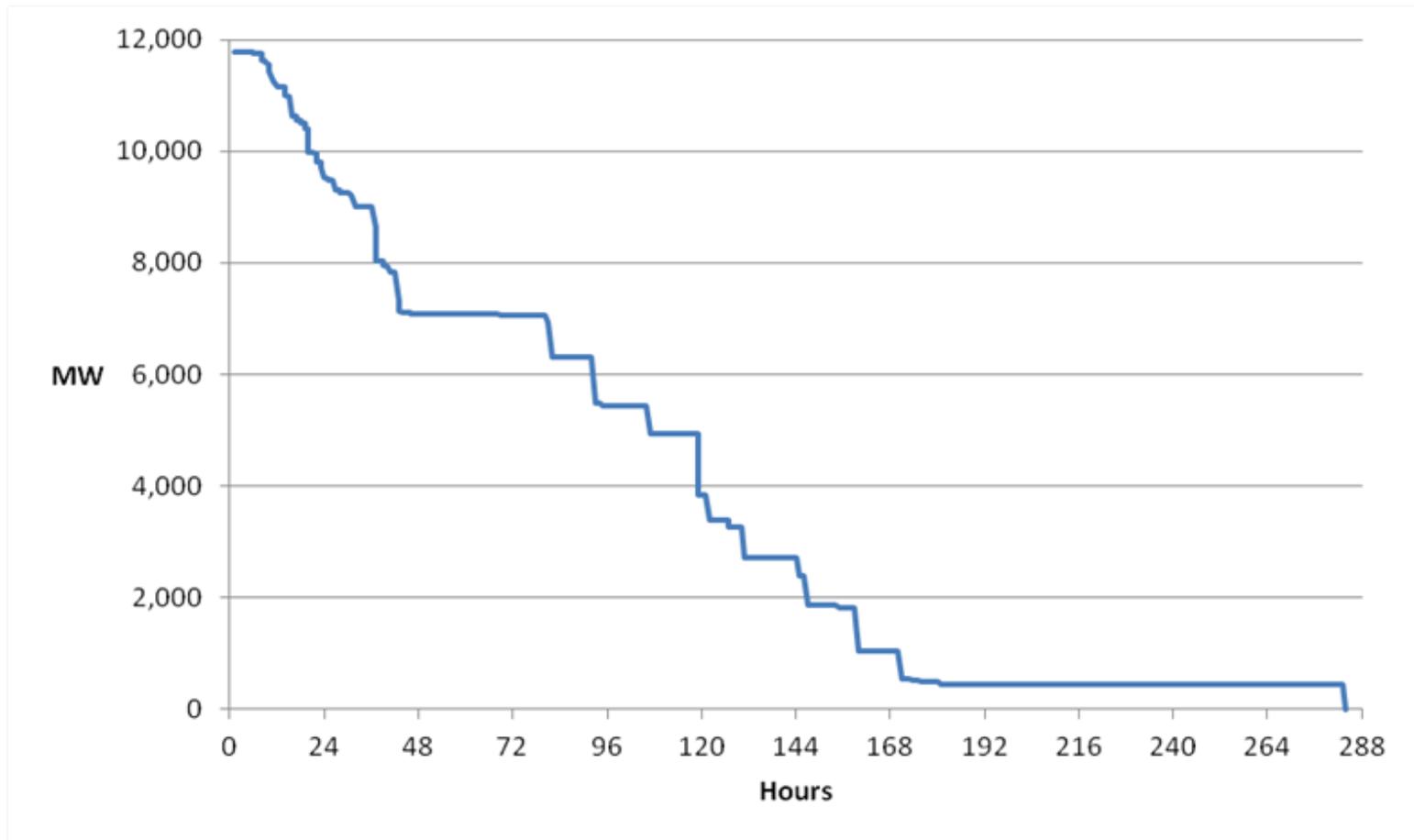
- Colder weather reduces the natural gas available for electric generation
- Natural gas fired generation reductions are begin at 30°F and these reductions continue to increase as temperatures decrease

# High Natural Gas Prices Provided Incentive for Dual-Fuel Generators to Switch to Oil

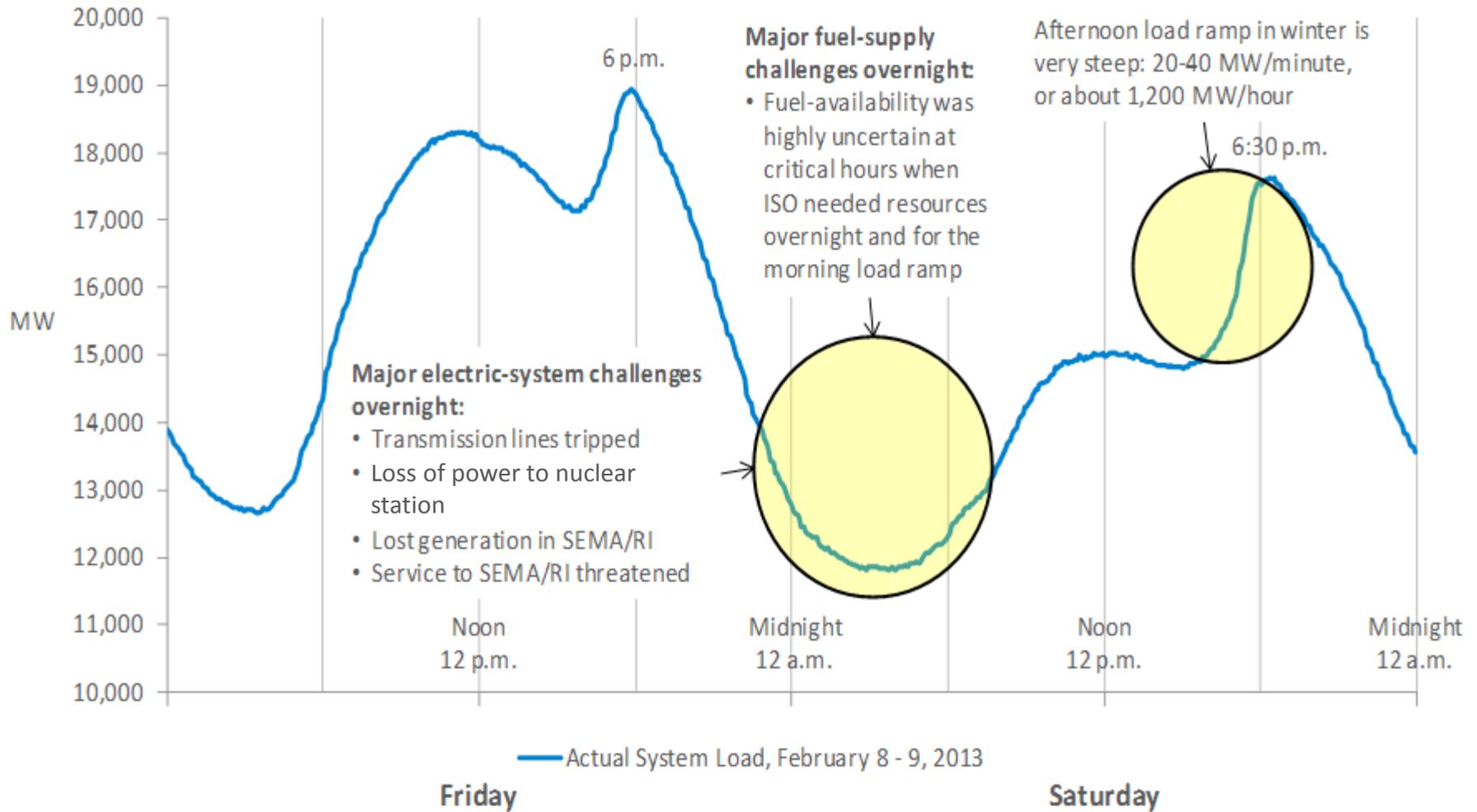


# ISO's Winter Operating Experience Shows Oil Resources have Limited Fuel Reserves

*Runtimes diminish quickly without replenishment*



# Challenges in Overnight Period, February 8-9



# APPENDIX B: REGIONAL ACTIONS

# Recently/Soon to be Implemented

- Allow sharing of generator-specific information with gas pipelines under certain circumstances
  - Commission approved change in Docket No. ER13-356; Provisions were in effect from January 24, 2013 to April 30, 2013
  - Although ISO did not need to invoke the specific provisions during the past winter, the order allowed for communications with pipeline operators to alleviate emergency situations
  - ISO is continuing to work with stakeholders to expand when communications are allowed
- Shift Day-Ahead Market Timing Earlier
  - Commission approved change in Docket No. ER13-895; Provisions will be effect starting at May 23, 2013
  - Changes facilitate supplemental commitment of oil and coal generators if necessary and provide gas-fired generators more time to line up fuel for the operating day

# Near-Term Actions: 2013–2014

- Use replacement reserves to model normal “supplemental” commitment and improve real-time price formation
  - Create new reserve constraint penalty factor for replacement reserves proposed as \$250
- Improve incentives within the Forward Reserve Market to be available and perform when dispatched
  - Modify the trigger for when resources meeting TMOR obligations have their performance measured and are penalized for underperformance through the ‘Failure-to-Activate’ penalty
  - Modify the ‘Failure-to-Reserve’ penalty rate to better reflect replacement costs when a participant is unavailable to meet its FRM obligation

## Near-Term Actions: 2013–2014 *(continued)*

- Modify the definition of an FCM shortage event to ensure resource performance is measured against their capacity obligations and underperformance penalized when the power system is at risk
  - Events will now be triggered when the system is experiencing a deficiency in thirty-minute operating reserves for at least 30 minutes in addition to the existing provisions that trigger a shortage event that occurs when ten-minute reserves are short for at least 30 minutes
- Provide greater ability to reflect changing fuel costs into the market through allowing hourly (rather than daily) offers and intra-day offer modifications (rather than only prior to the operating day)

# Longer-Term Actions: 2018-19

## Enhance Forward Capacity Market performance incentives

- ISO is proposing a pay-for-performance (PFP) incentive approach
  - Over-performing resources will be paid a premium through revenue transfers from under-performing resources
- This incentive will drive resources to perform when and where needed, including creating a strong incentive for investment in fuel security
- ISO anticipates filing market rule changes in late 2013 to be effective ahead of FCA 9 for the 2018–19 Capacity Commitment Period