

# The Impact of Energy-Efficiency and Renewable Energy on Natural Gas Markets

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24<sup>th</sup> Annual North American Conference  
of the USAEE/IAEE

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ACEEE

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# The American Council for an Energy Efficient Economy (ACEEE)

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- Non-profit (501c (3)) dedicated to advancing energy efficiency through research and dissemination.
- 20 staffers in DC, Delaware, Michigan and Wisconsin
- Industry, Buildings, Utilities, Transportation, and National Policy
- Funding:
  - Foundation and Federal grants (50%)
  - Specific Contract work (20%)
  - Conferences (25%)



# Energy Price Outlook

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- Natural Gas are high - likely remain high
- World Oil prices high - likely remain high
- Coal facing new emissions restrictions and demand pressure - likely increase
- Electricity face upward price pressures - fuel prices and demand driving price
- Energy has become an increasingly important business decision

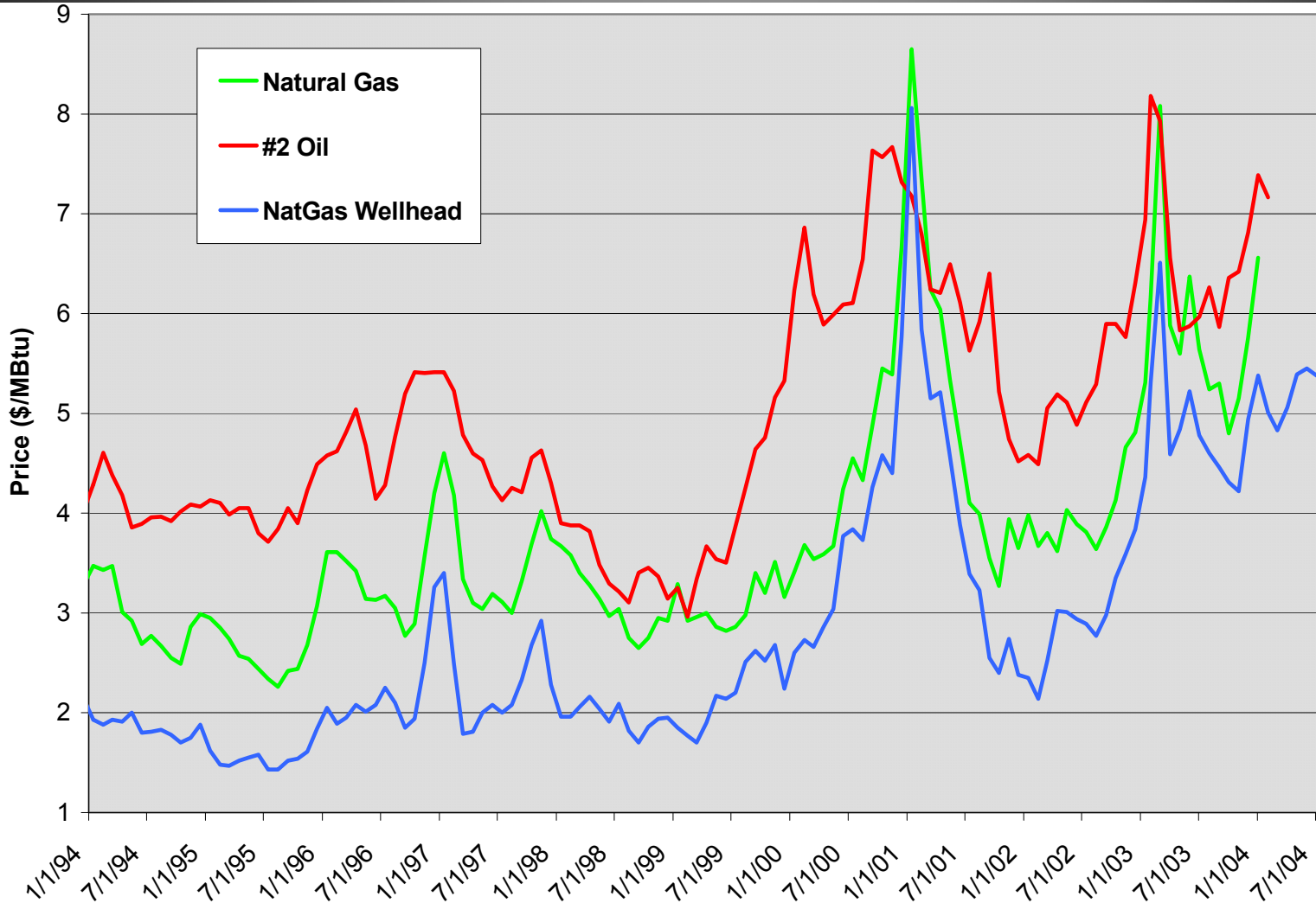
# Why is this happening & where will this lead us?

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- Demand has out-stripped ability of suppliers
- Electricity demand puts pressure on other fuel markets (220GW new capacity)
- Demand likely to remain high domestically and globally (e.g., China)
- Energy markets moving from regional to global (e.g., Oil and LNG)

# Industrial Fuel Prices



# ACEEE Research Approach

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Sector estimates by State of the near-term (1 year) and mid-term (5 year) implementable potential for energy efficiency and conservation programs for:

1. Natural Gas
2. Electricity
3. Renewable Resources

Calculated "reasonably achievable" savings based on sector end-uses (i.e. space heating, motors, lighting...)



# Policy Scenarios Analyzed

Region	Scenario Analyzed		
	Electric Efficiency	NG Efficiency	Renewable Resources
National (lower 48)	X	X	X
Pacific West*	X	X	X
Northeast/PJM**	X	X	X
New York			X

\*California, Oregon and Washington

\*\* ME, MA, VE, NH, CT, RI, NY, NJ, PA, DE, and MD



# Using EEA Natural Gas Model

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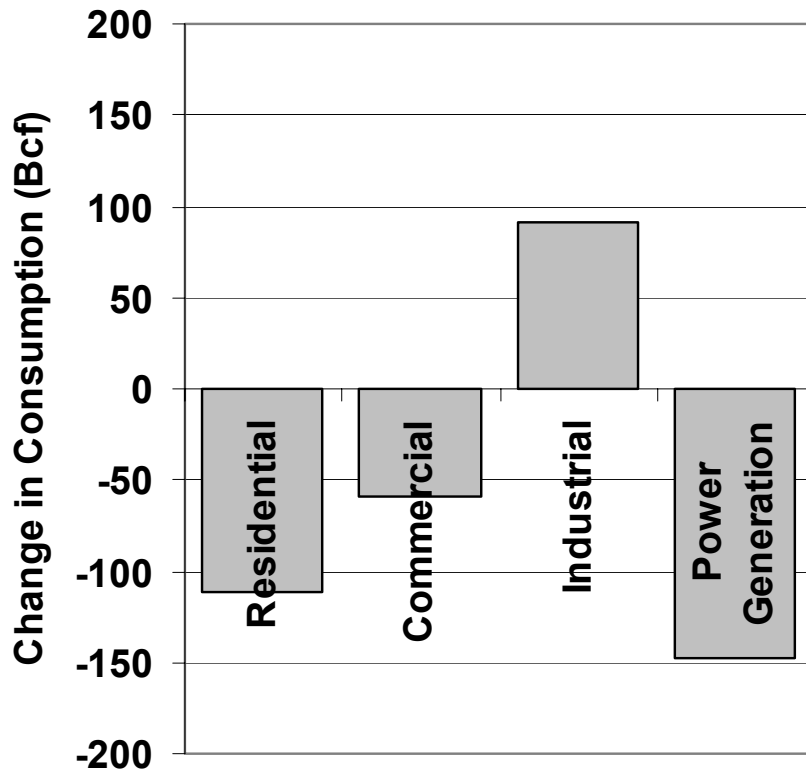
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- EEA respected, independent natural gas analysts - used for current and past NPC NatGas studies
- Fully integrated natural gas market model incorporating supply, transmission, storage and consumption at 106 nodes
- Using July 2003 projection as base case
- ACEEE modified consumption only - model handles other issues (e.g., fuel switching, demand destruction)

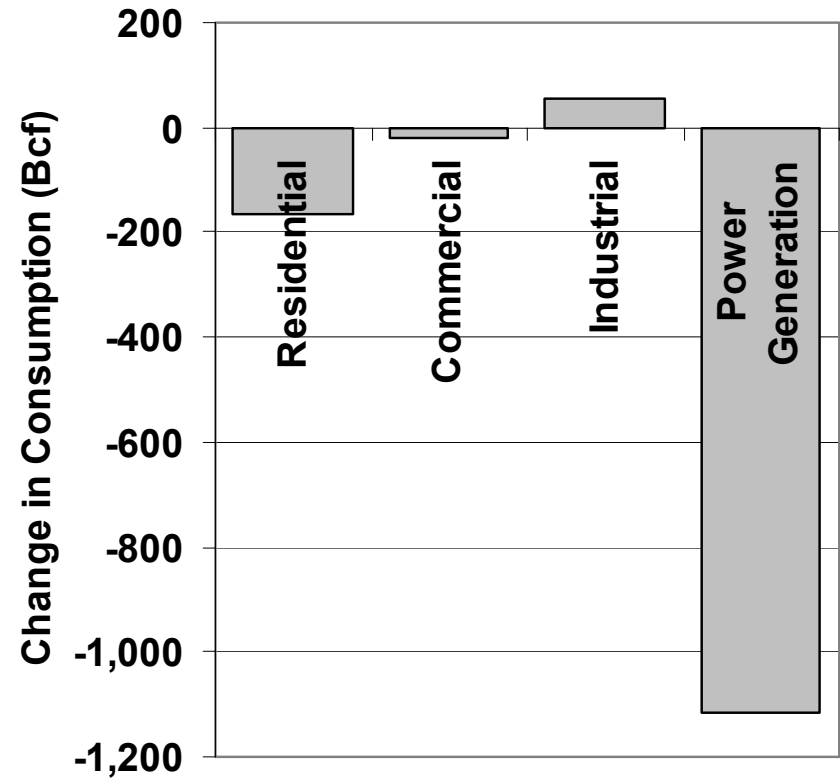


# Changes in National Natural Gas Consumption from EE & RE

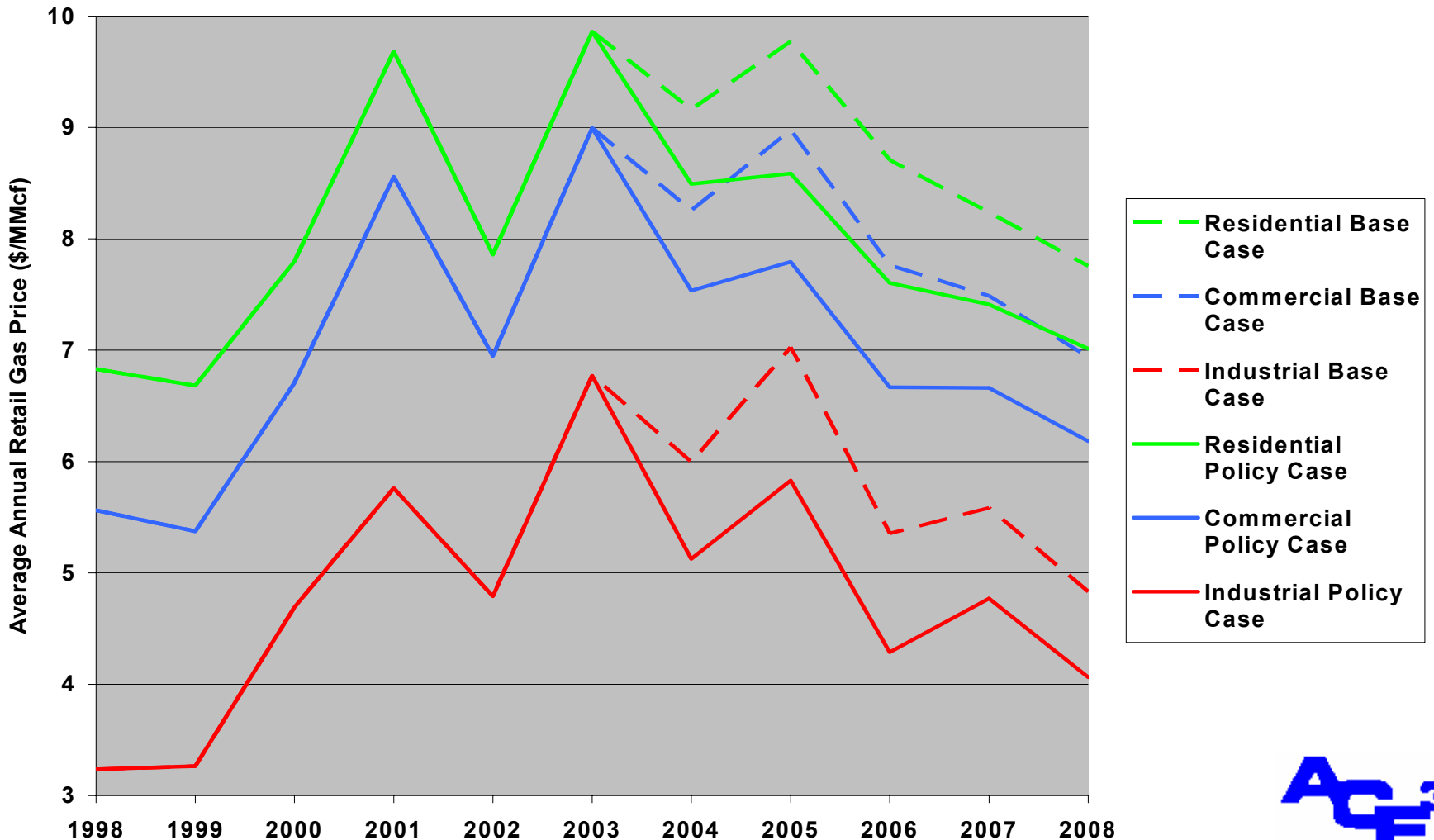
## 2004 National Policy Case



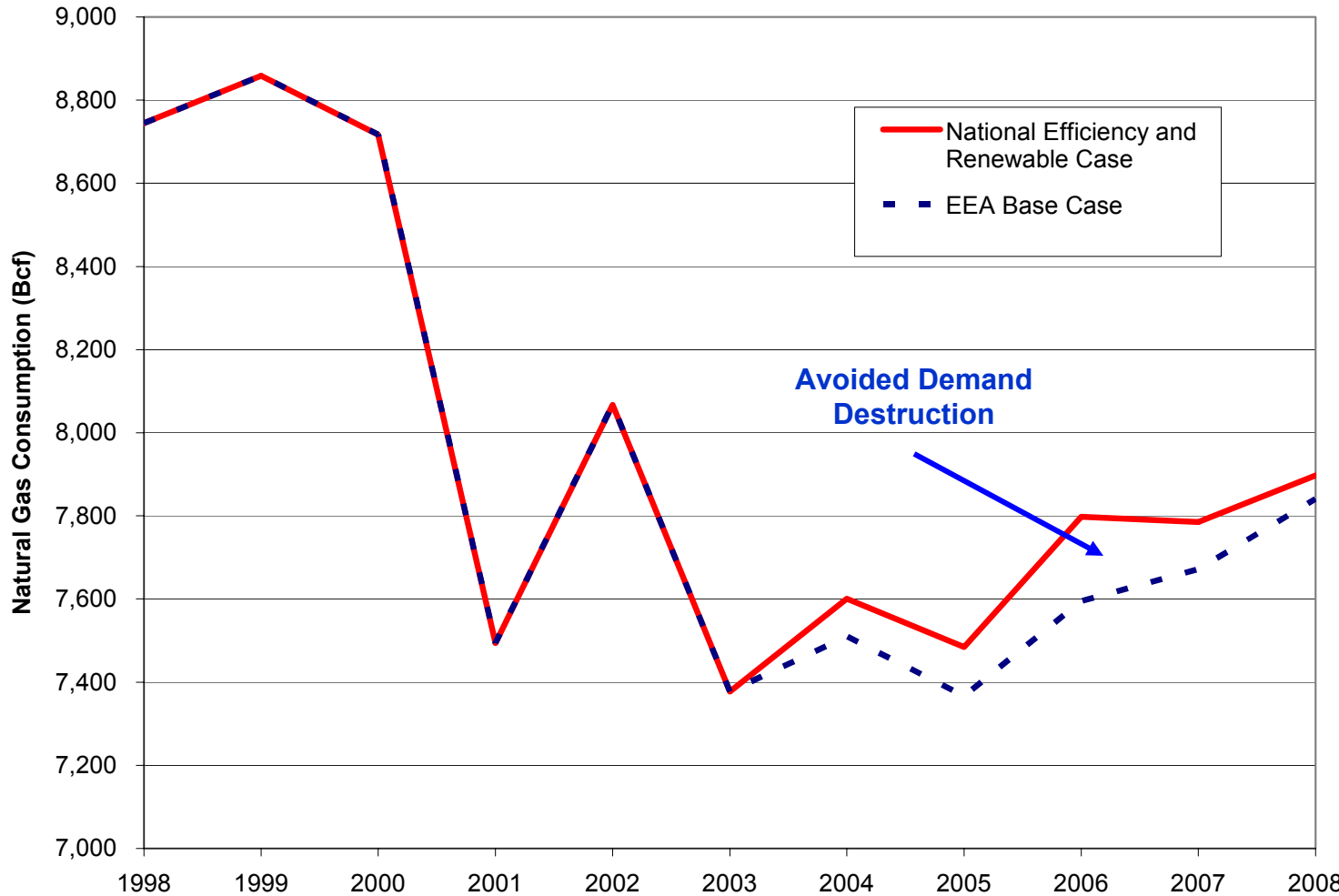
## 2008 National Policy Case



# Impacts of EE & RE on Annual Retail Natural Gas Prices

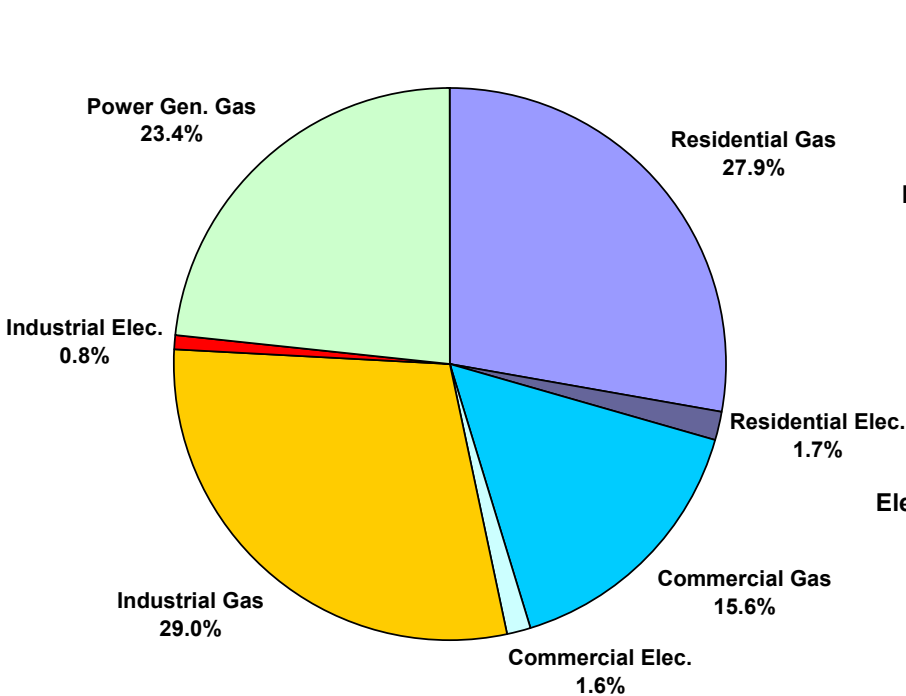


# Changes in Industrial Gas Consumption

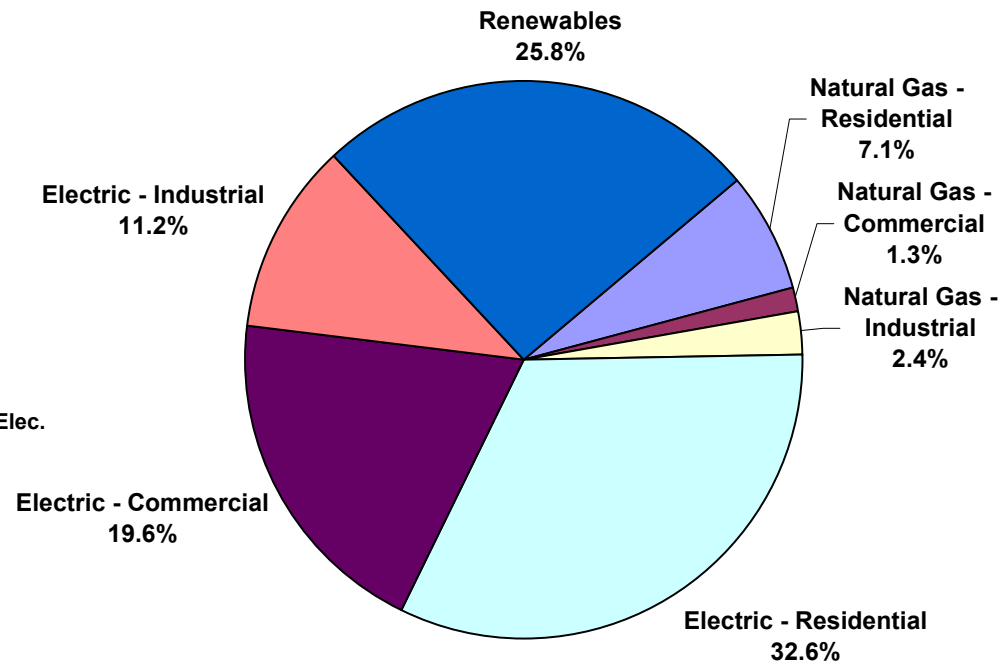


# Benefits and Costs from Reductions in Energy Expenditures 2004-2008

Total Benefits = \$103,937 Million  
Total Investment and Program Costs = \$30,243 million



Benefits



Costs



# Benefits/Costs Analysis

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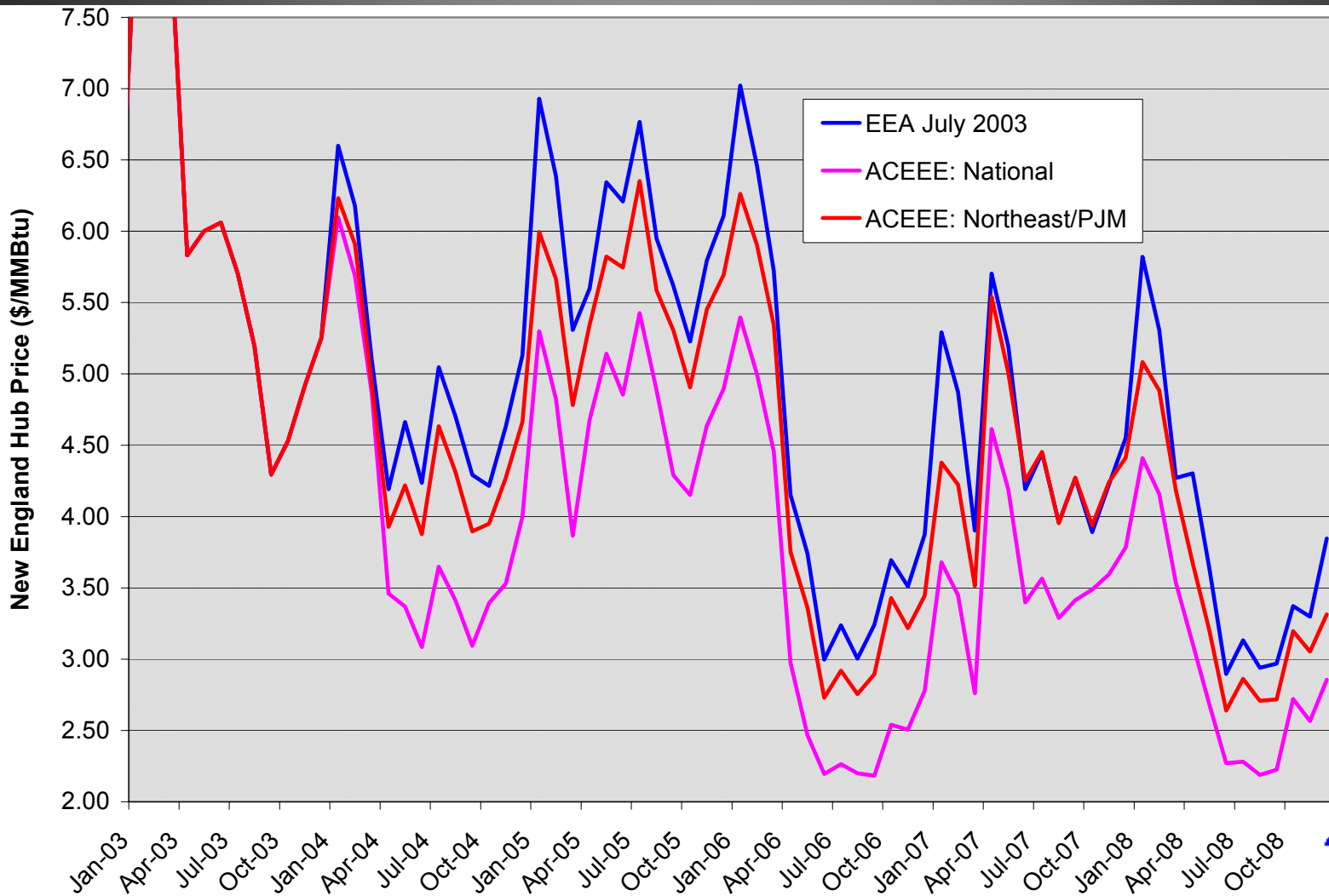
- Benefit/Cost ratio of approximately 3.4
- Investment dominated by electric efficiency and renewables measures
- Benefits predominately result from gas expenditure reductions
- Benefits result from combination of price reductions and consumption reductions

# Wholesale Price Impacts

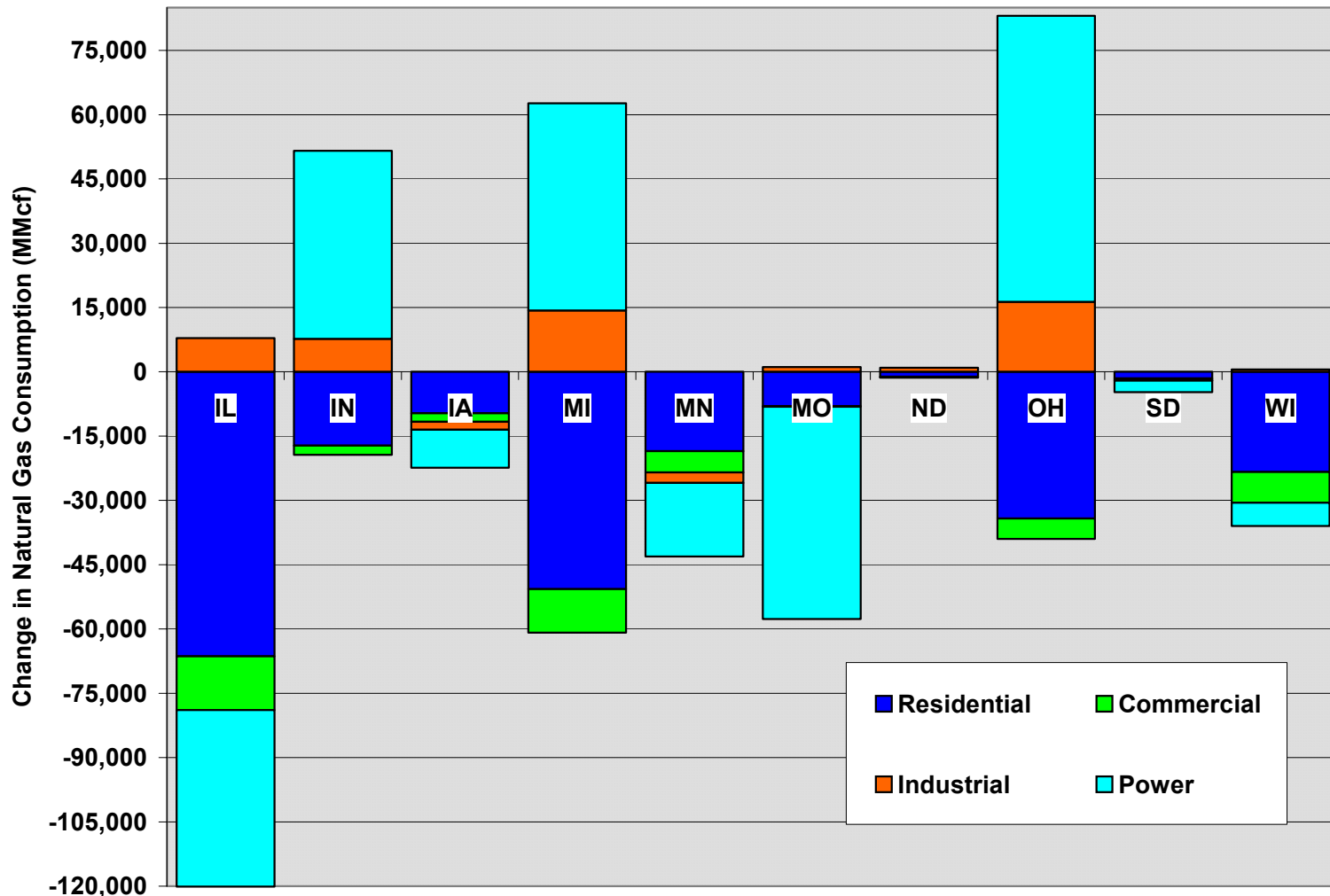
Gas Prices (in 2002\$/MMBtu)	Change from EEA Base Case in 2004		Change from EEA Base Case in 2008	
	Dollars	Percent	Dollars	Percent
<b>Henry Hub</b>				
EEA July 2003 Base Case				
ACEEE: National	-0.89	-19.8%	-0.76	-22.1%
ACEEE: Pacific West	-0.27	-5.9%	-0.15	-4.3%
ACEEE: Northeast/PJM	-0.28	-6.2%	-0.21	-6.0%
ACEEE: NY Renewables	0.00	0.0%	-0.02	-0.5%
<b>New England</b>				
EEA July 2003 Base Case				
ACEEE: National	-0.95	-19.2%	-0.90	-23.6%
ACEEE: Pacific West	-0.26	-5.3%	-0.14	-3.6%
ACEEE: Northeast/PJM	-0.35	-7.0%	-0.36	-9.3%
ACEEE: NY Renewables	0.00	0.0%	-0.03	-0.7%
<b>Southern California</b>				
EEA July 2003 Base Case				
ACEEE: National	-0.91	-20.1%	-0.95	-29.1%
ACEEE: Pacific West	-0.34	-7.4%	-0.66	-20.3%
ACEEE: Northeast/PJM	-0.28	-6.1%	-0.15	-4.7%
ACEEE: NY Renewables	0.00	0.0%	-0.01	-0.4%



# Changes in NE Hub Wholesale Prices Under Different Scenarios

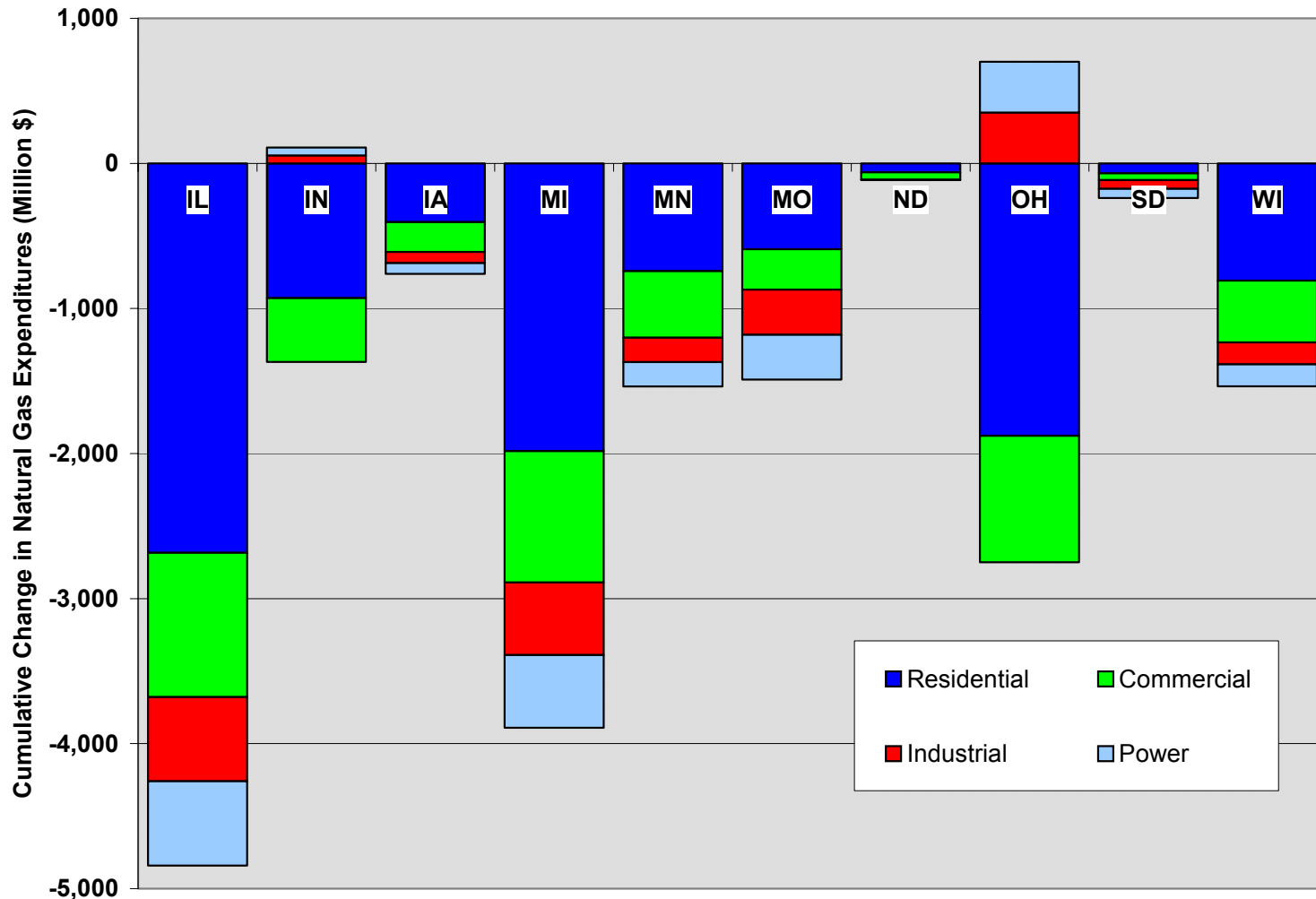


# NatGas Consumption Reductions In Midwest 2004-2008

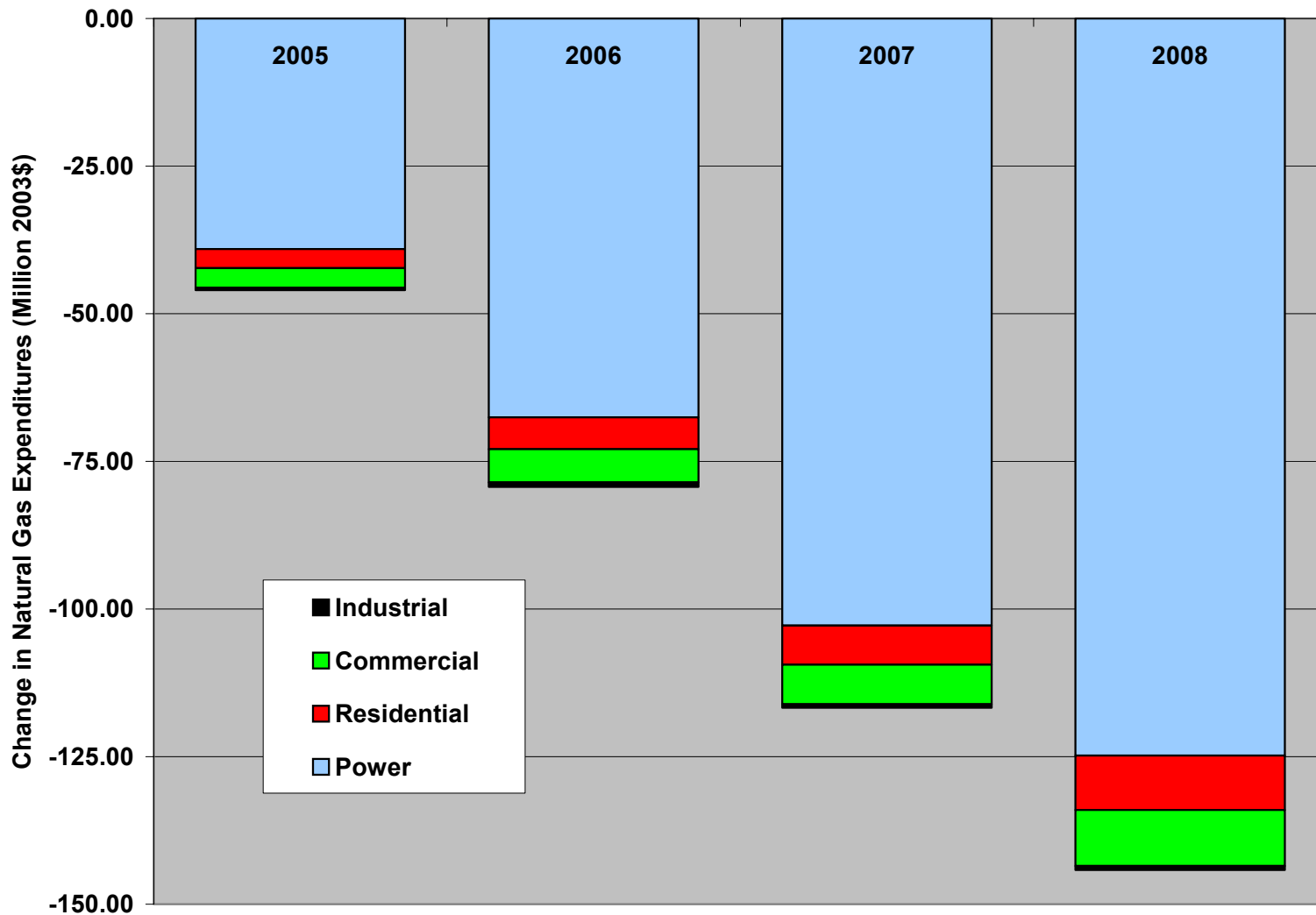




# NatGas Expenditure Reductions In Midwest 2004-2008



# Impact of Expanded Renewables in New York State



# Policy Solutions

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- Energy efficiency performance targets
- Expanded federal funding for EERE implementation programs at DOE and EPA
- Appliance efficiency standards
- More efficient buildings through codes
- Support of clean and efficient distributed generation
- Renewable portfolio standards
- Public awareness campaign by state and national leaders



# Conclusions

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- We can do something about high natural gas prices - encourage energy efficiency and renewable energy
- Only viable near-term options - supply options will take 2-7 years
- Electric efficiency critical because of expanded natural gas generation
- National decision makers need to lead **NOW** - consumers are motivated but need direction
- Sooner we start the sooner states will see benefits

# Future Natural Gas Analysis

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ACEEE is preparing follow-on research:

- Update baseline and national impacts
- Extend analysis period to 2020
- Assess Midwest impacts
- Assess Pacific-West impacts

# For Further Information

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<http://www.aceee.org/energy/natlgas.htm>

