

# Utility Sector Energy Efficiency in Resource Portfolios: The New Value Proposition

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# Overview

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- Snapshot of key trends
- The New Value Proposition
- History of state-utility efficiency efforts
- Description of state spending and program approaches



# Snapshot of the Latest Trends

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- States are making new commitments to energy efficiency as a resource by setting energy savings targets—in TX, IL, CA, CT, HI, NJ, PA
- The Pacific Northwest's is setting energy efficiency as its first priority, lowest cost new resource for long-term planning
- Energy efficiency is playing a key role in emerging regional efforts to combat greenhouse gases (Northeast and West Coast)



# Snapshot of the Latest Trends

## (part 2)

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- Energy efficiency being used to address T&D constraints and system needs
- Regional efforts emerging to use energy efficiency as a tool to moderate natural gas demand and decrease prices (e.g. midwest)
- Support for energy efficiency growing rapidly in new states and areas—e.g., the Southwest and Southeast
- Other new areas—linkages to water efficiency, integration with demand response, “rapid ramp-up” efforts

# The New Value Proposition

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- Record energy prices in a post-restructuring utility world challenge state commissions to strike a new balance
- Energy efficiency provides a 5-part value proposition to PUCs:
  - Price moderation
  - Resource adequacy
  - Controlling emissions
  - Preserving system reliability
  - Helping the state's economy



# A Brief Historical Perspective on Efficiency

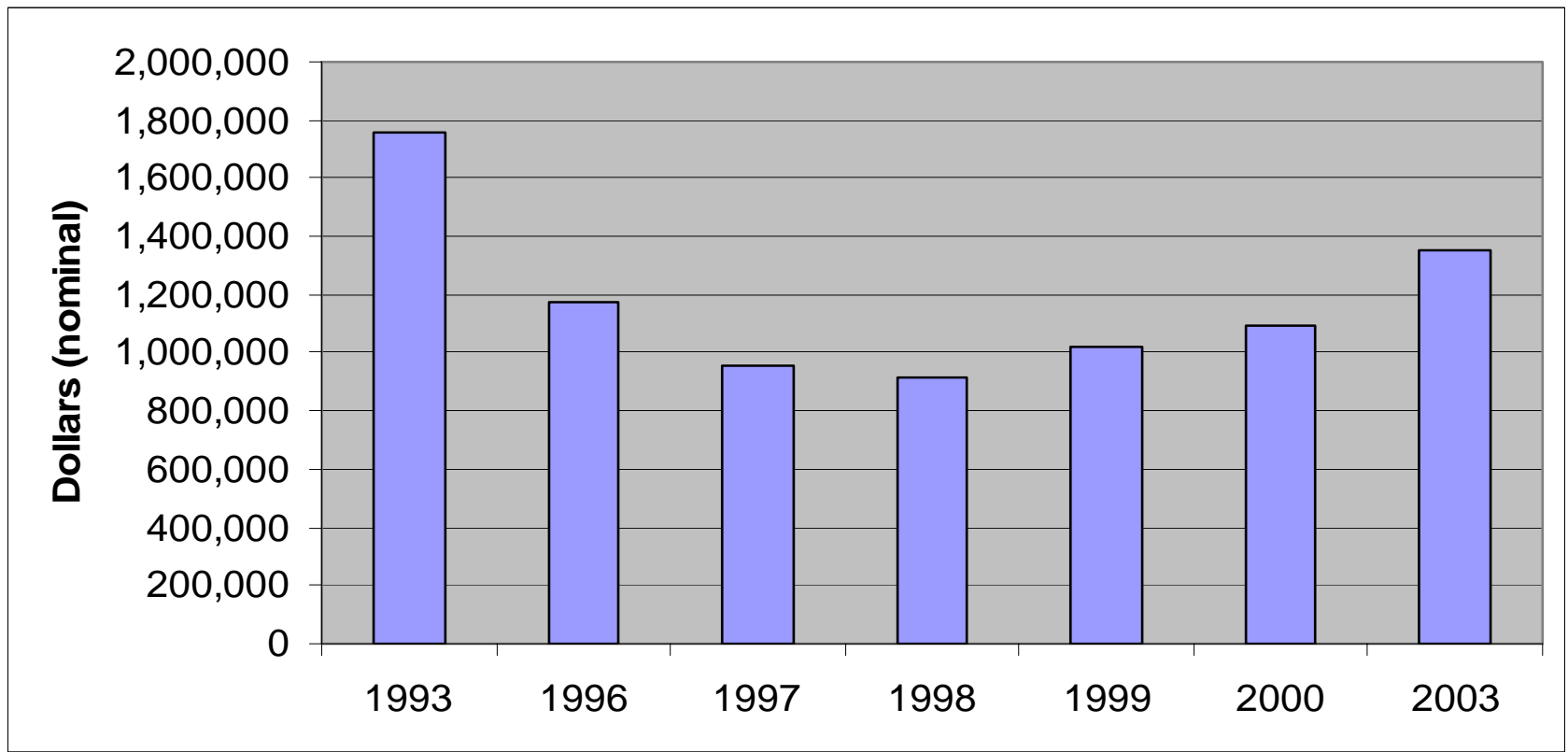
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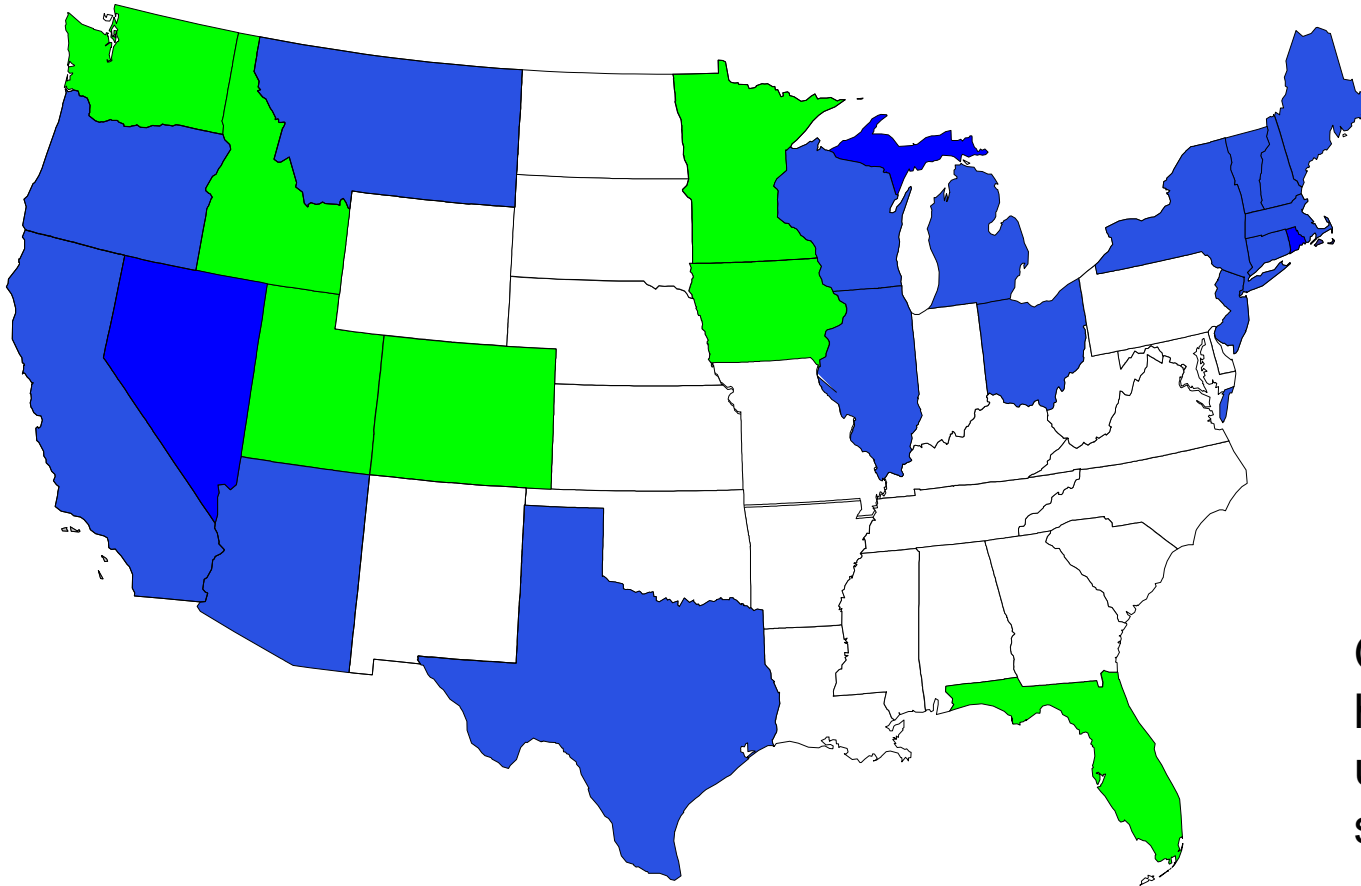
- 1980s
  - Aftershocks of 70s energy crises generate state and utility commitments to energy efficiency as a resource
  - Formulation of Demand Side Management and Integrated Resource Planning
- 1990s
  - States support boom in DSM programs
  - Late-90s restructuring cuts DSM resource commitments
  - States experiment with public benefits, market transformation, and other ideas
- 2000s
  - Restructuring's risks lead some states to seek new balance between supply and demand
  - More states embrace efficiency as a resource
  - Planning is no longer a dirty word



# Spending on Utility Sector Energy Efficiency Programs 1992-2003 [nominal dollars]



# States with Utility Sector Energy Efficiency Programs—Public Benefits or DSM



Blue states have public benefit funds that support EE

Green states have utility DSM under regulated structure

# Structure and Delivery of Efficiency Programs

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- Utilities are still the primary providers of energy efficiency programs—including public benefits programs. But “non-utility” segment is growing.
- ACEEE research shows that numerous structures are possible for administration and delivery of services—no single “best model”

# Examples of Non-Utility Program Administrators

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- Efficiency Vermont—the statewide “energy efficiency” utility
- Energy Trust of Oregon
- Focus on Energy [Wisconsin]
- New York Energy \$mart
- Efficiency Maine

## 2002/3 Public Benefits Energy Efficiency Program Spending

	Annual Budgets (\$ Millions)	% of revenues
<b>AZ</b>	<b>2.0</b>	<b>0.1%</b>
<b>CA</b>	<b>240.0</b>	<b>1.5%</b>
<b>CT</b>	<b>89.0</b>	<b>3.1%</b>
<b>DC</b>	<b>2.2</b>	<b>0.3%</b>
<b>DE</b>	<b>----</b>	<b>----</b>
<b>IL</b>	<b>2.0</b>	<b>0.02%</b>
<b>ME</b>	<b>2.9</b>	<b>0.3%</b>
<b>MD</b>	<b>----</b>	<b>----</b>
<b>MA</b>	<b>135.0</b>	<b>3.0%</b>
<b>MI</b>	<b>7.8</b>	<b>0.1%</b>
<b>MT</b>	<b>14.3</b>	<b>2.0%</b>



## 2002/3 Public Benefits Energy Efficiency Program Spending

	Annual Budgets (\$ Millions)	% of revenues
NH	5.2	0.5%
NJ	99.6	1.5%
NY	129.0	1.3%
NV	11.2	0.5%
OH	14.3	0.1%
OR	19.1	0.9%
PA	----	----
RI	16.4	2.7%
TX	69.0	0.4%
VT	16.8	3.3%
WI	49.7	1.4%
<b>Total</b>	<b>925.5</b>	



# What's Public Benefits Money Buying Us?

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- Total cumulative annual energy savings from utility sector programs in 2003 were over 67,198 GWH—or about 1.9% of total annual retail energy sales
- Cumulative annual impact in top 10 states is from 4 to 8%: CT, CA, WA, VT, MN, RI, MA,, OR, WI and UT
- But are energy efficiency programs cost effective?



# Public Benefits Energy Efficiency Program Cost-effectiveness

State	Benefit/Cost All programs	B/C Comm/Ind programs	B/C Residential programs	Cost of saved energy (\$/kWh)
California	2.0 – 2.4			0.03
Connecticut	NA	2.4 to 2.6	1.5 to 1.7	0.023
Maine	1.3 – 7.0			
Massachusetts	2.1	2.4 to 2.7	1.3 to 2.1	0.04
New Jersey				0.03
New York				0.044
Rhode Island	2.5	3.3	1.5	
Vermont	2.5	2.9	1.8	0.03
Wisconsin	3.0	2.0	4.3	
<b>Median</b>	<b>2.1 to 2.5</b>	<b>2.5 to 2.6</b>	<b>1.6 to 1.7</b>	<b>0.03</b>



# How Deep is the Energy Efficiency Resource Well?

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- In 2004 ACEEE recently completed a “meta-analysis” of energy efficiency potential studies
- Median economic potential of 21.5% for electricity; 22% for natural gas; this level has stayed nearly constant for 15-20 years
- Lesson: We have a lot of untapped efficiency resources; and the well is recharged with new technologies

# Renewed Commitments to Energy Efficiency as a Resource

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- Setting energy saving targets to complement or replace spending targets
- California:
  - CPUC new EE savings targets will double savings over the next decade—to ~5000 MW peak demand and ~23,000 GWh by 2013
  - Budgets have been increased by \$2.1 Billion over 3 years, increasing total national spending by more than 50%
- Illinois: Implementing an “Energy Efficiency Portfolio Standard”—will require utilities to meet 10% of annual load growth by 2008; 25% by 2017
- Texas: Utilities must meet 10% of new demand growth through energy efficiency; may rise to 50%
- Other states: PA, NJ, HI, NV, CT



# Creating New Resource Portfolios for the Post-Restructuring Era

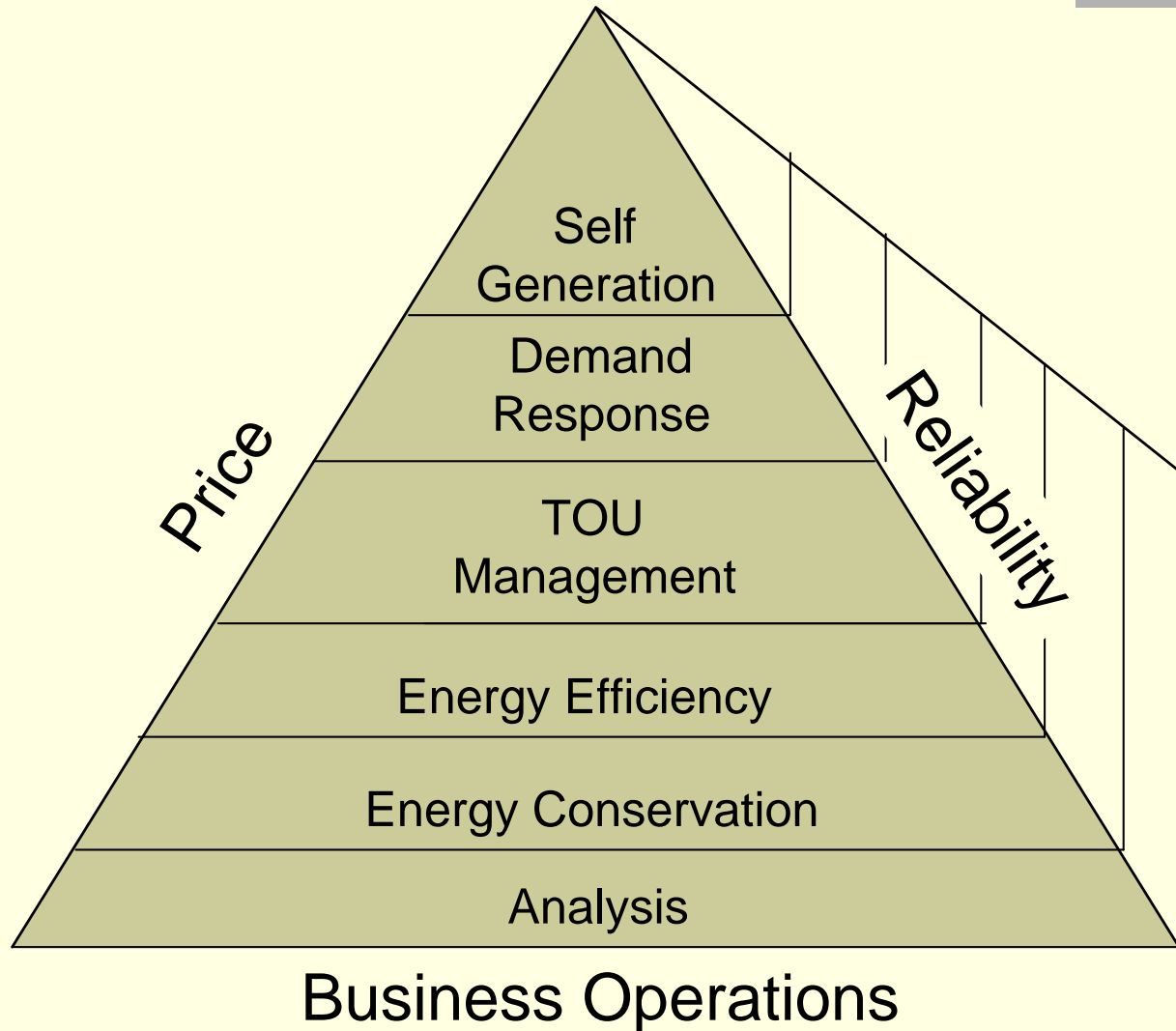
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- “Demand response”—there’s a lot of interest in pricing and market mechanisms
- “Resource acquisition”—was—and is—still a good thing
- “Market transformation”—yes, it’s important to change products and consumer demand for them (regional groups especially helpful here—MEEA, NEEP, NEEA, SWEEP—along with national programs like ENERGY STAR®)
- All fit within a broad spectrum....



# Pacific Gas & Electric Company's Integrated DSM Model



# Energy Efficiency is More Important Than Ever

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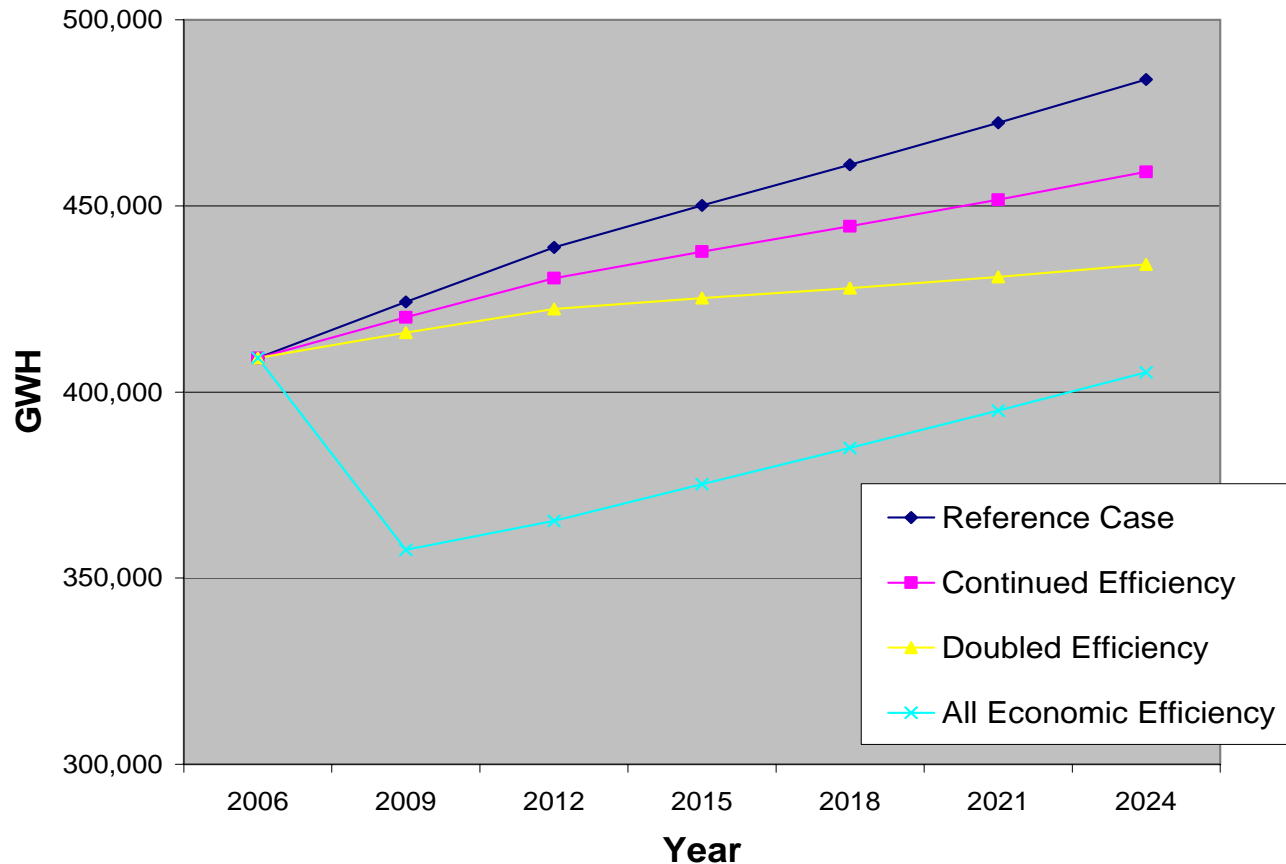
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- Energy efficiency is still the least-cost resource compared to new supply options
  - 3 cents/kWh (levelized) for efficiency
  - 5 cents/kWh and up for central station power
  - 12 cents/kWh and up for peak power
- Growing risks associated with new power plant construction
  - Cost of capital—investor reluctance
  - Fuel price risks
  - Future environmental costs
- Climate change; energy efficiency is a proven, cost-effective means to reduce emissions of greenhouse gases and cut the cost of carbon cap programs



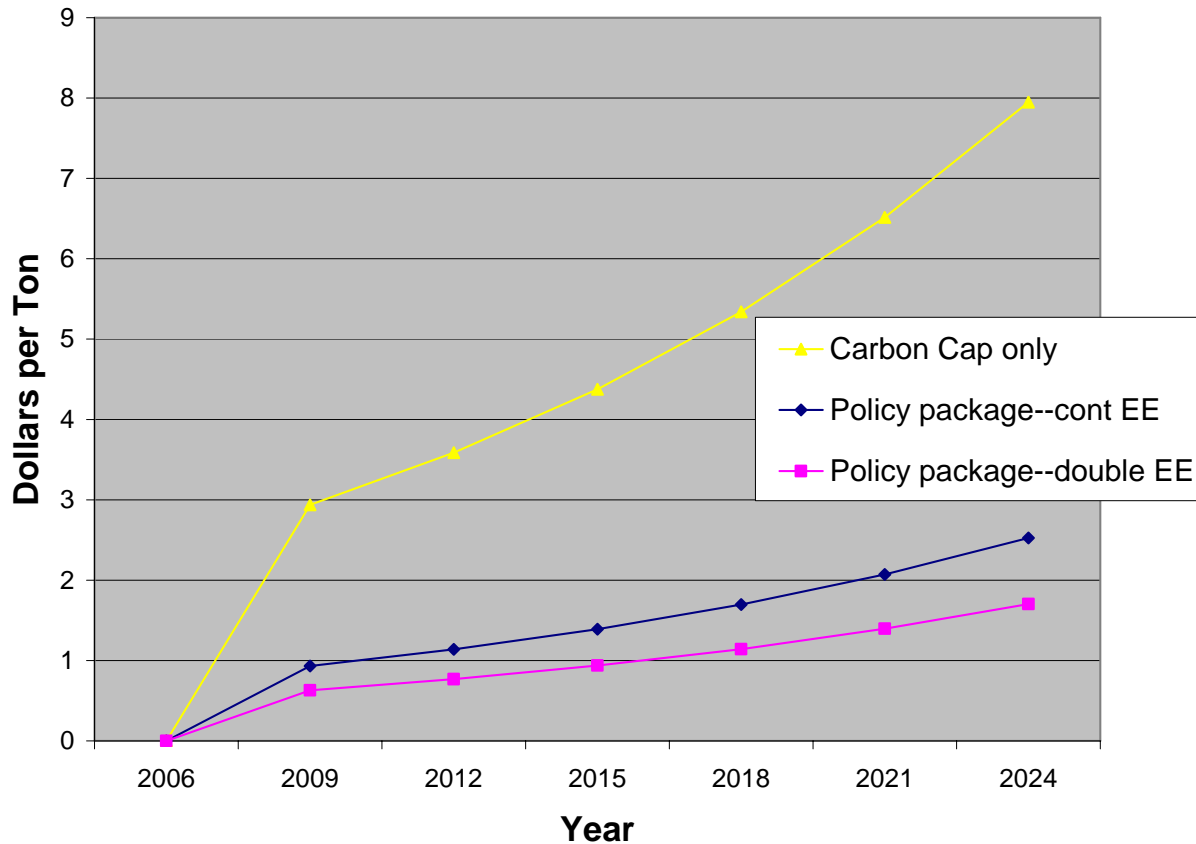
# RGGI Modeling Results

## Electricity Generation



# RGGI Modeling Results

Carbon Allowance Prices



# Energy Efficiency is More Important Than Ever

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- Energy efficiency can provide T&D system reliability benefits—reduce overall and targeted loads to reduce system stress—reduce scale or delay need for expansions and upgrades
- Energy efficiency can create more jobs per dollar invested, and creates more in-state spending than energy supply investments help reduce overall energy prices



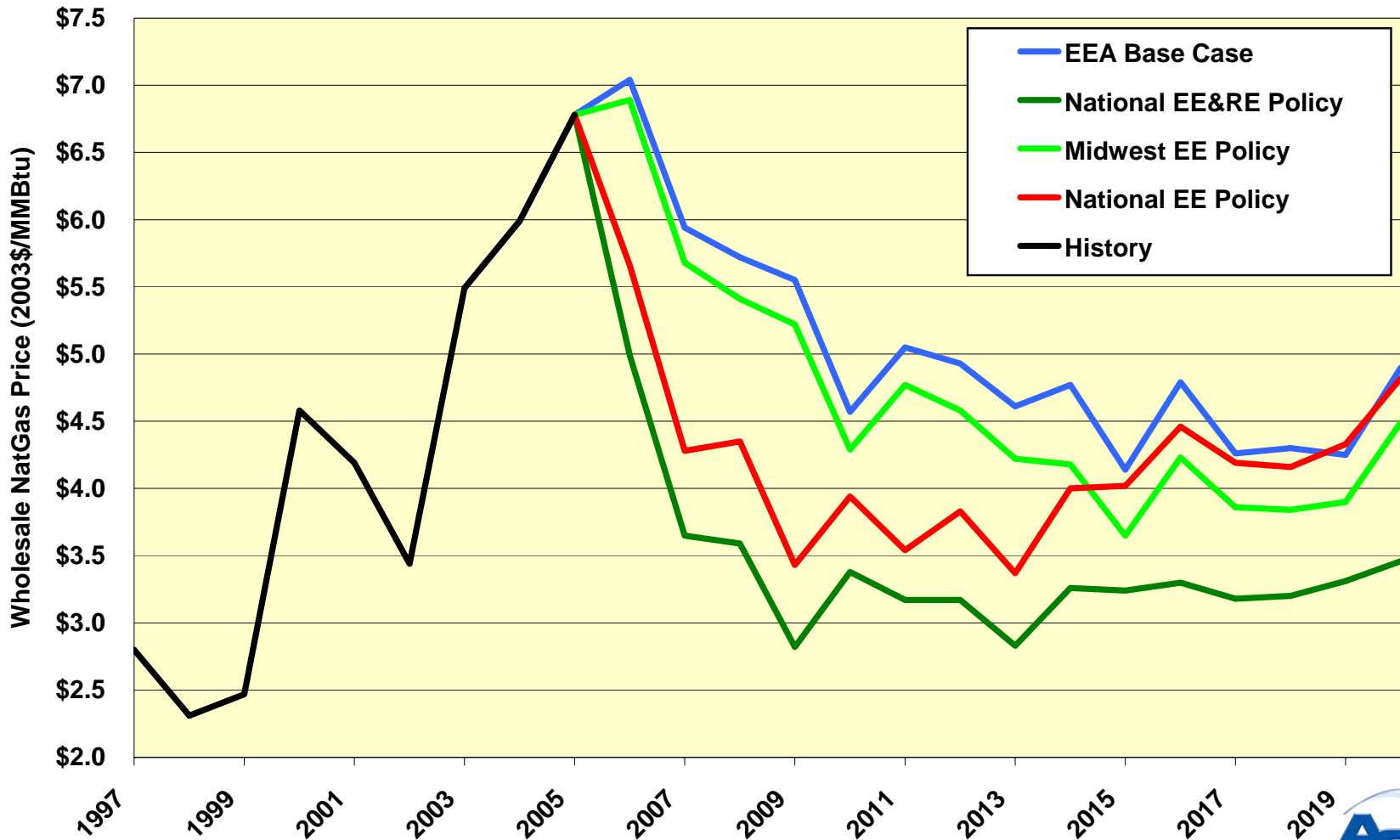
# Energy Efficiency Investments and Energy Prices

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- Efficiency can reduce whole gas and power prices:
  - ACEEE's recent analysis of market impacts of increased energy efficiency and renewables investment shows that natural gas costs could be decreased by about 20% by relatively modest energy efficiency savings of about 1% per year
  - What's remarkable is that 90% of gas savings come from end-use electricity efficiency, as gas gen units are backed off on the margin in most power markets

# Impacts of EE/RE on Natural Gas Prices (from Elliott et al. 2003, ACEEE)



# What Efficiency Programs Need to Keep Thriving

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- A reliable infrastructure:
  - Stable, adequate funding
  - An effective administrative and delivery structure
  - Programs that demonstrate success—effective evaluation in place to monitor and report results
  - Support from customers, regulators, utilities and other key stakeholders
- Without the infrastructure, the efficiency resource won't be there when it's needed
- This calls for....planning!



# A Little Help from the Feds

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- Federal initiatives that can help states' efficiency efforts
  - Energy Efficiency Leadership Committee, co-chaired by NARUC President Munns and EEI Chair Rogers
  - EPA's Clean Energy-Environment *Guide to Action*
  - Tax incentives: [www.energytaxincentives.org](http://www.energytaxincentives.org)



# Conclusions

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- Energy efficiency has proven its worth as a viable resource for over 20 years. After 10 years of restructuring, more and more states are taking another look at *resource planning*
- *Portfolios* of resources, including demand side resources, are more essential than ever for:
  - Price moderation
  - Resource adequacy
  - Controlling emissions
  - Preserving system reliability
  - Helping the state's economy

