
Energy Efficiency as a Practical Response to the Natural Gas Crisis

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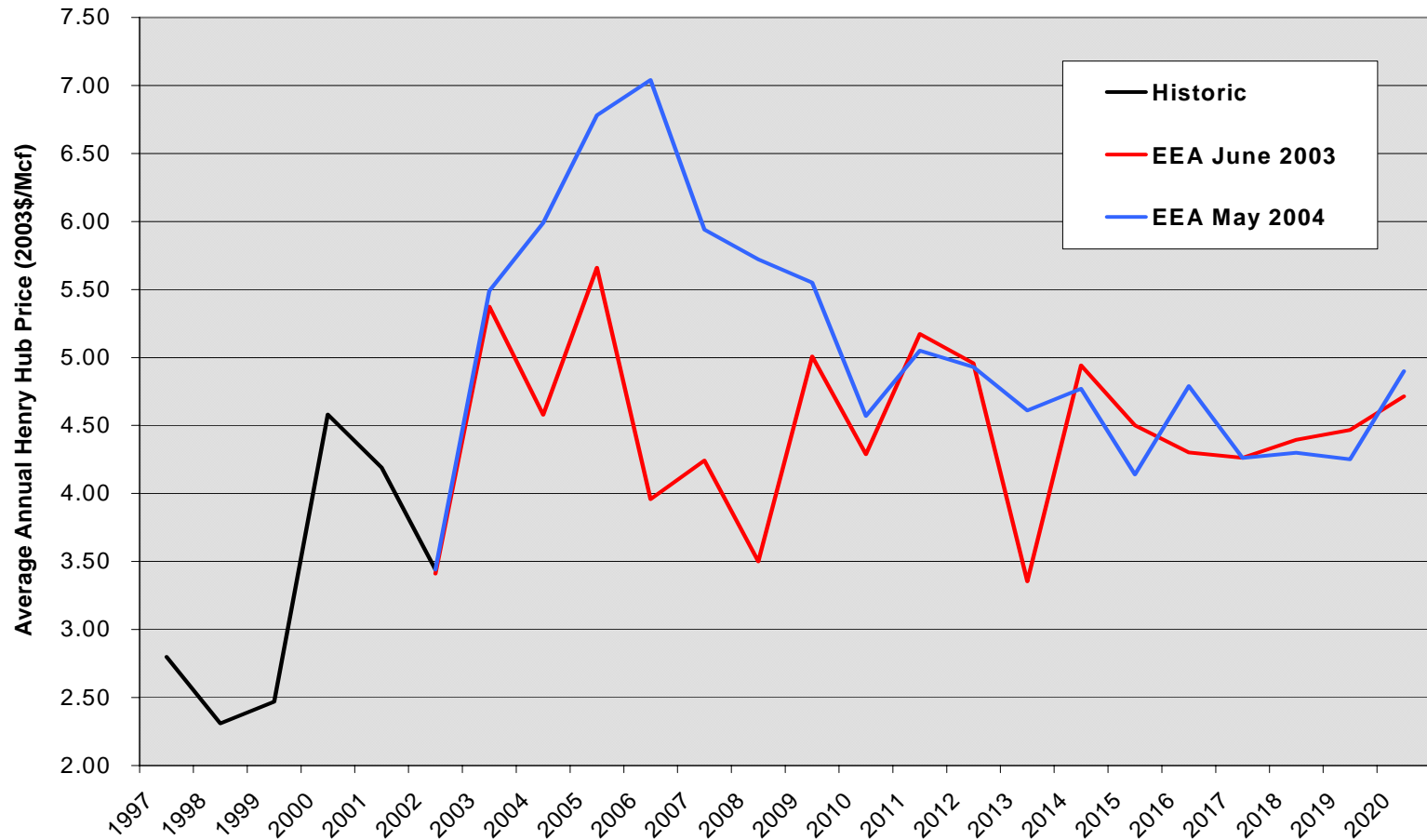
Presentation at the NASEO 2004 Annual Meeting
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The Bad News

Natural gas prices are a serious problem, and expected to get worse

- Latest gas price forecast is scary
- Several key factors contributing to the problem

EEA Natural Gas Price Forecast [2004 Update vs. 2003 Original]



Key Factors Contributing to the Problem

- Demand growth has outpaced supply (especially due to dramatic shift to gas for electricity generation)
- No net additional production projected from “lower 48” (additions in Rocky Mtn. region offset by depletion of old fields)
- Imports available from Canada projected to decline from current levels
- Alaska gas pipeline is a decade away
- LNG is the only relatively near term additional supply (and it has substantial risks that may delay and/or raise costs)

The Good News

Energy Efficiency is available to provide a very effective response

...in fact, it's the only viable near-term option

“Policies most likely to have an immediate impact are actions to promote consumer conservation and energy efficiency.”

-- National Petroleum Council, Sept. 2003

More Nice Quotes

“Based on the Department’s analysis, we concur that over the next 12 to 18 months there are only limited opportunities to increase supply, and that, therefore, the emphasis must be on conservation, energy efficiency, and fuel switching.

-- DOE Secretary Abraham, June 2003

“Specifically, we need a concerted national effort to promote greater energy efficiency....”

-- Letter to the White House and Congress from the CEOs of the 11 largest U.S chemical manufacturers, January 2004



Gee, With a Consensus Like That....

.... You'd think we could get an aggressive federal policy to fund and promote energy efficiency.....

[Naaaahhh.... looks like the states will continue to have to provide leadership]

Fortunately, Help Is Available

Focus of this presentation:

Highlight results from two recent ACEEE natural gas studies

1. Potential economic impacts of energy efficiency on natural gas markets
2. America's best natural gas energy efficiency programs

Information Sources

Reports available for free, download from www.aceee.org

Natural Gas Price and Availability Effects of Aggressive Energy Efficiency and Renewable Energy Policies

R. Neal Elliott, Ph.D., P.E., Anna Monis Shipley, Steven Nadel, and Elizabeth Brown Dec. 2003

URL: <http://www.aceee.org/energy/efnatgas-study.htm>

Responding to the Natural Gas Crisis: America's Best Natural Gas Energy Efficiency Programs

Martin Kushler, Ph.D., Dan York, Ph.D. And Patti Witte Dec 2003

URL: <http://www.aceee.org/utility/ngbestprac/u035.pdf>

1. Economic Impacts of Energy Efficiency in Natural Gas Markets

A recent ACEEE study modeled the effects of aggressive but achievable energy efficiency and renewable energy on regional and national natural gas prices.

ACEEE Research Approach

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

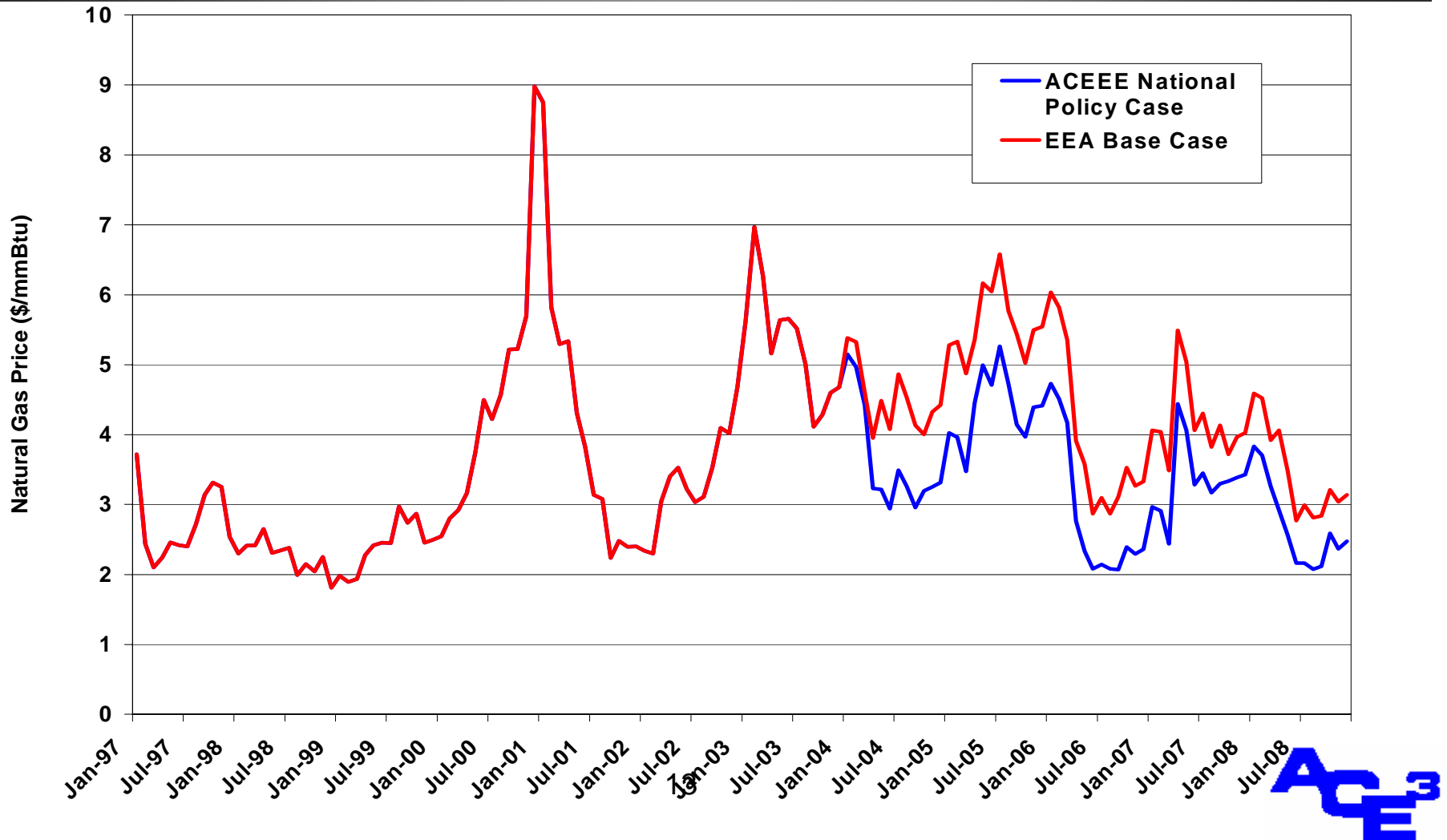
1. Natural Gas
2. Electricity
3. Renewable Resources

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

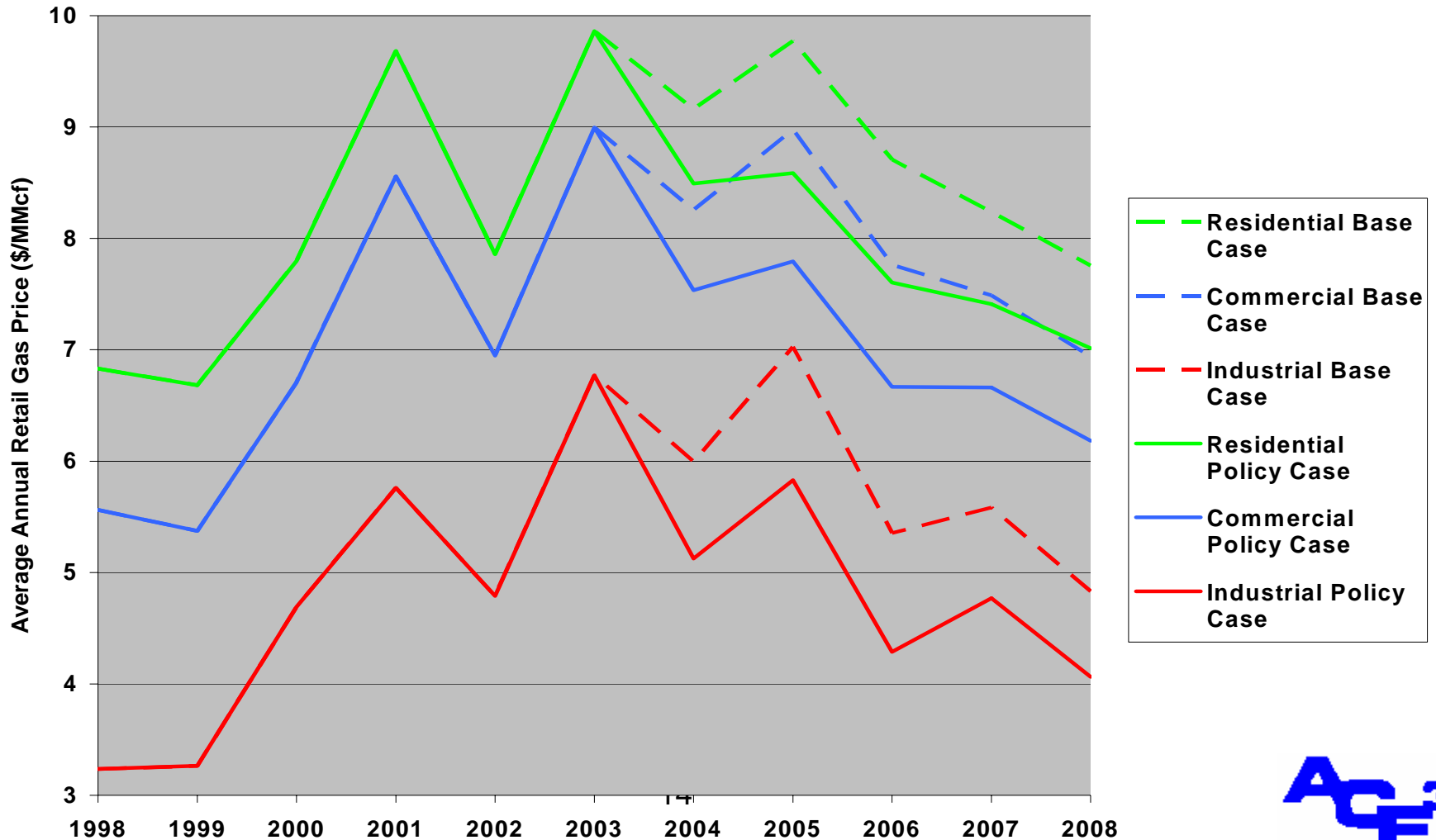
Using EEA Natural Gas Model

- Energy and Environmental Analysis, Inc. (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)

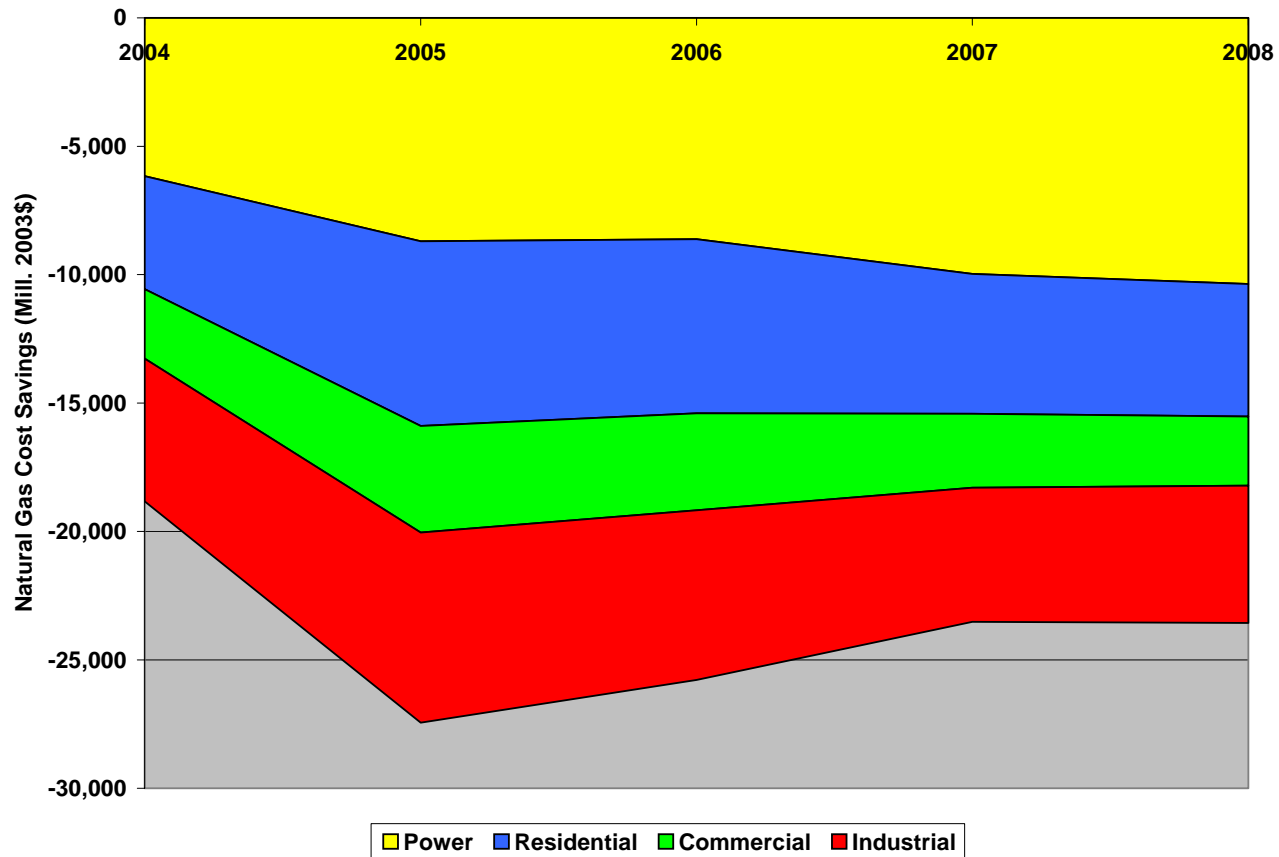
Impact on Henry Hub Natural Gas Pricing



Impacts on Annual Retail Natural Gas Prices



NATIONAL NATURAL GAS COST SAVINGS



KEY NATURAL GAS STUDY RESULTS

An aggressive but achievable national policy of Energy Efficiency and renewable energy could:

- Reduce wholesale natural gas prices by 10-20%
- Save consumers over \$75 billion in gas costs over the next five years
- Save up to an additional \$30 billion in electricity costs over that time period

[Savings = market price effects + direct program savings]

Also, the model showed that strong efforts in a single region can have significant effects in lowering regional natural gas prices (~ 5 to 7%)

Policy Options

- Energy efficiency performance targets
- System benefits funds/ratepayer funding
- 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

More Information Sources

Reports available for free download, at www.aceee.org

Energy Efficiency's Next Generation: Innovation at the State Level

Prindle, Dietsch, Elliott, Kushler, Langer & Nadel Nov. 2003

URL: <http://aceee.org/pubs/e031full.pdf>

Describes and gives examples of seven different categories of state energy efficiency policies (elec & gas)

(Appliance and Equipment Standards; Building Energy Codes; Combined Heat and Power; State Facilities; Tax Incentives for Efficiency; Transportation; Utility Energy Efficiency Programs)

More Information Sources

“ACEEE Testifies on Energy Efficiency Solutions to Looming Natural Gas Crisis” June 2003

URL:

<http://www.aceee.org/press/0306bptstnatlgas.htm>

Includes a list of 15 top natural gas energy efficiency measures, which combined could reduce U.S. gas demand by more than 10% by 2020.

So in the utility sector, once you've decided that energy efficiency is an important objective.....

Utility Sector Policy Approaches

- Establish binding savings targets for utilities/states (e.g., an “energy efficiency portfolio standard”)
[Targets could be established at the state level, as Texas has done, or at the federal level.]
- Provide funding for energy efficiency through state system benefit funds, or through electric and gas rates
- Programs should be tailored to meet the unique needs of their states

2. Proven Programs for Gas Efficiency

Responding to the Natural Gas Crisis: America's Best Natural Gas Energy Efficiency Programs

- Key project objective: Provide public utility commissions, utility managers, and other decision-makers with examples of exemplary natural gas end-use efficiency programs.
- Also survey states to see how many have natural gas efficiency programs in place
- Also examine regulatory and policy mechanisms that support such programs

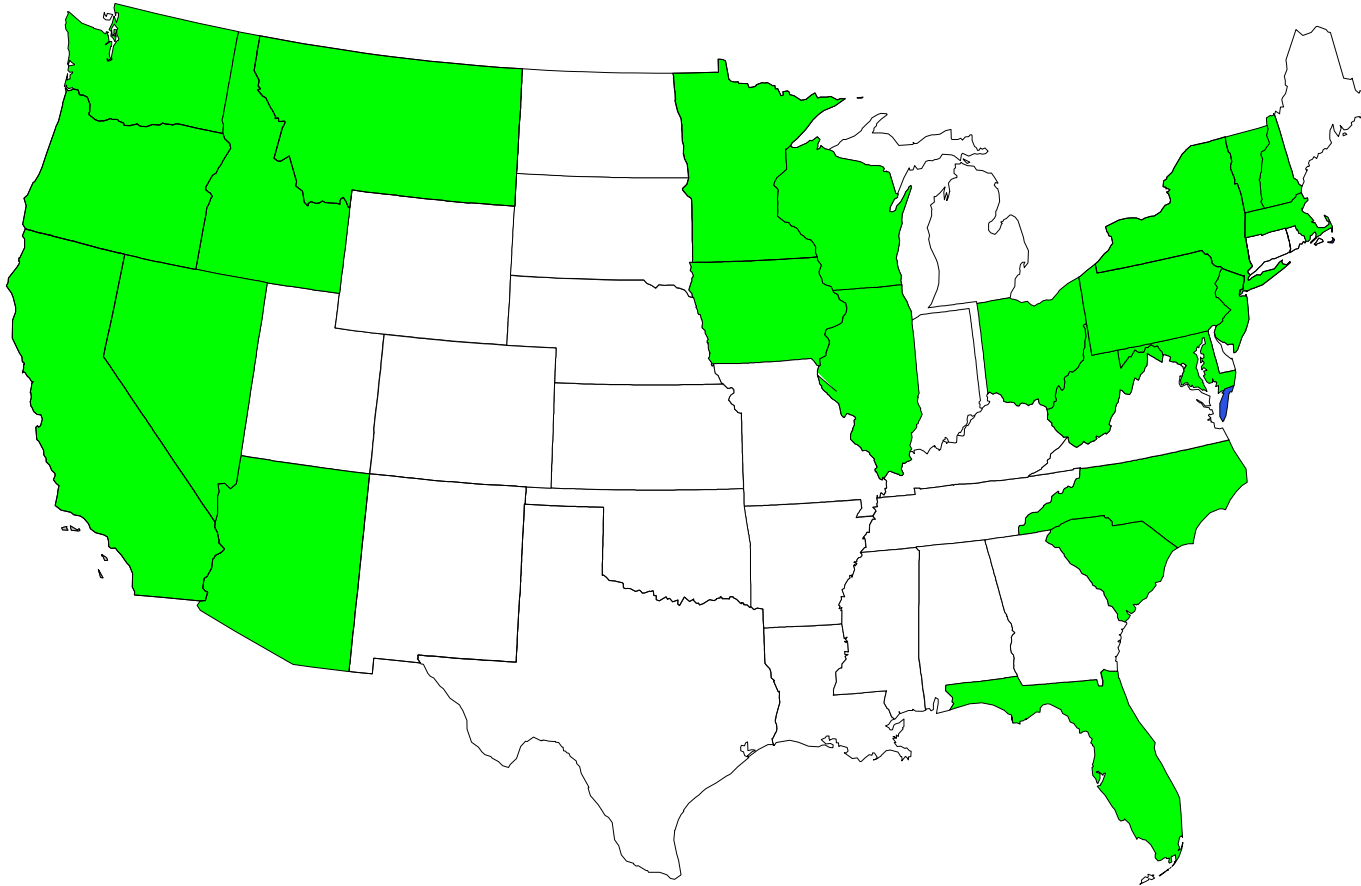
Methodology and Approach

- Phone survey and other contacts with PUC staff for 50-state (and DC) survey
- Follow-up, more in-depth surveys and communications with key PUC staff and program experts for regulatory mechanisms and program nominations
- Broad “call for nominations” for exemplary programs.

Results: 50-state (+DC) survey

- NG programs are offered in only 23 states—in 20 of these, utilities operate programs. In the other 3, NG efficiency is addressed by statewide public benefits programs.
- Some current discussion and consideration of NG efficiency programs in the states not offering anything - - 4 out of 24 responding - - and a lot of interest in our project from various parties we contacted.

FIGURE 1. STATES WITH NATURAL GAS UTILITY-FUNDED ENERGY EFFICIENCY PROGRAMS



Regulatory Mechanisms

- Utilities do not pursue serious EE on their own.
- All the leading states (CA, MA, NJ, WI, VT, MN, OR, WA, and Ontario) have statutory and/or regulatory ‘push’, and program cost recovery through rates or other funding mechanisms. This appears to be a necessary condition for EE.
- Performance incentives for the utilities and “lost revenue” recovery are offered in several states, e.g.,
 - Performance incentives: MA, MN, Ontario
 - Lost revenue recovery: MA, VT, Ontario
 - De-coupling of sales &²⁶ profits: CA, OR

Exemplary Natural Gas Efficiency Programs

- Selected 29 programs plus 5 special case studies of comprehensive portfolios and collaboratives
- Small number of states represented—a few states dominate: MN, MA, NJ, VT, NY and WI with multiple selections—other states with single selections—WA, OR, PA, CA and Quebec.
- Obvious correlation with regulatory mechanisms and statutes/orders for programs

Exemplary Programs Selected

Program Name	Organization(s)	State
Residential Retrofit		
HomeBase Retrofit Program	Vermont Gas Systems, Inc.	VT
Residential Weatherization Program	KeySpan Energy Delivery	MA
Home Performance with ENERGY STAR®	New York State Energy Research and Development Authority	NY
Residential Audit		
Residential Home Performance Audit Program	CenterPoint Energy Minnegasco	MN

Residential Space Heating Equipment		
Joint Gas & Electric High Efficiency Furnace Rebate Program	GasNetworks®	MA, NH
High Efficiency Furnace Program	NW Natural	OR
High Efficiency Furnace Programs	Gaz Métro	Quebec
HomeBase Equipment Replacement Program	Vermont Gas Systems, Inc	VT
Residential Windows		
ENERGY STAR® Residential Windows Program	Northwest Energy Efficiency Alliance	OR, WA, ID, MT
Residential New Construction		
ENERGY STAR® Homes	Joint Management Committee (Massachusetts)	MA
New Jersey ENERGY STAR® Homes	New Jersey Clean Energy Program	NJ
Vermont ENERGY STAR® Homes	Efficiency Vermont and Vermont Gas Systems, Inc.	VT

Residential Low-Income Single Family		
Low-Income Gas Program	NSTAR Gas Company	MA
Non-Profit Affordable Housing Project	CenterPoint Energy Minnegasco, Habitat for Humanity, Project for Pride in Living, and the Greater Metropolitan Housing Corporation	MN
Low-Income Usage Reduction Program (LIURP)	National Fuel	PA
New Jersey Comfort Partners Program	New Jersey Clean Energy Program	NJ
Residential Multifamily		
Multifamily Low-Income Program	Efficiency Vermont, Vermont Gas Systems, Inc. and the Burlington Electric Department	VT
Apartment and Condo Efficiency Services	Focus on Energy	WI
Residential Appliances		
ENERGY STAR® Products	Wisconsin Energy Conservation Corporation	WI

Commercial/industrial Technical Assistance and Demonstration		
New York Energy \$martSM FlexTech Program	New York State Energy Research and Development Authority	NY
Multifamily and C&I Building Practices and Technology Demonstration Program	KeySpan Energy Delivery	MA
Commercial/industrial Building and Equipment Retrofit		
WorkPlace Equipment Replacement Program and WorkPlace Retrofit Program	Vermont Gas Systems, Inc	VT
Flexible Gas-Efficiency Portfolio Standard	Avista Utilities	WA
Boiler Efficiency	Xcel Energy	MN
Custom Process Rebate	CenterPoint Energy Minnegasco	MN





Commercial/industrial New Construction

New Jersey SmartStart Buildings®	New Jersey Clean Energy Program	NJ
Energy Design Assistance	Xcel Energy, the Weidt Group, Herzog/Wheeler & Associates	MN
WorkPlace New Construction Program	Vermont Gas Systems, Inc	VT

Commercial/industrial Small Business

2002 Express Efficiency	Pacific Gas and Electric Company	CA
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Special Case Studies: Comprehensive Portfolios and Collaboratives		
Large Utility Effort through Multiple Local Distribution Companies: <i>Comprehensive Program Portfolio</i>	KeySpan Energy Delivery New England	MA, NH
Single Investor-Owned Utility: <i>Comprehensive Program Portfolio</i>	Vermont Gas Systems, Inc	VT
Municipal Utilities Collaborative Program: <i>Conserve & Save</i>	The Triad: Austin Utilities, Owatonna Public Utilities and Rochester Public Utilities	MN
Multi-party collaborative: <i>Massachusetts Low Income Energy Affordability Network</i>	Massachusetts Department of Housing and Community Development in collaboration with KeySpan Energy Delivery New England	MA
Regional Multi-Utility collaborative: <i>GasNetworks® Comprehensive Program Portfolio</i>	GasNetworks®	MA, NH



Detailed Program Descriptions Available

Detailed descriptions of each of the exemplary programs selected are available on our website.

URL:

<http://www.aceee.org/utility/ngbestprac/ngbestpractoc.pdf>

Program Spending, Savings and Cost-Effectiveness

	Min	Max	Mean	Median	Total
Annual program spending: all programs* (n = 32) (\$ million)	\$0.079	\$36	\$3.7	\$0.954	\$131
Annualized 1st year savings: all programs* (million therms)	0.025	10	1.3	0.568	44.8
•Savings: residential programs (n = 20)	0.025	7.0	0.824	0.267	16.5
•Savings: C/I programs (n = 10)	0.025	10	2.4	1.3	23.9
Cost-effectiveness					
•Cost of conserved energy: 1 st year \$/therm (n = 8)	1.53	6.70	3.63	2.59	
•Cost of conserved energy: lifetime \$/therm (n = 7)	0.07	0.80	0.38	0.28	
•Benefit/cost ratio (n = 9)	1.08	5.05	1.98	1.42	

**All programs data include two portfolios of multiple programs*

Conclusions

- We can do something about high natural gas prices – encourage energy efficiency!
- EE is the only viable near-term option – supply options will take 2-7 years (and still be high cost)
- Electric savings are also a critical part of this because of expanded natural gas generation
- Decision makers need to lead **NOW** – consumers are motivated but need direction
- There are excellent examples of well-proven energy efficiency programs available
- Sooner we start the sooner states will see benefits