Energy Efficiency as a Practical Response to the Natural Gas Crisis

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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

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, M.A.

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:

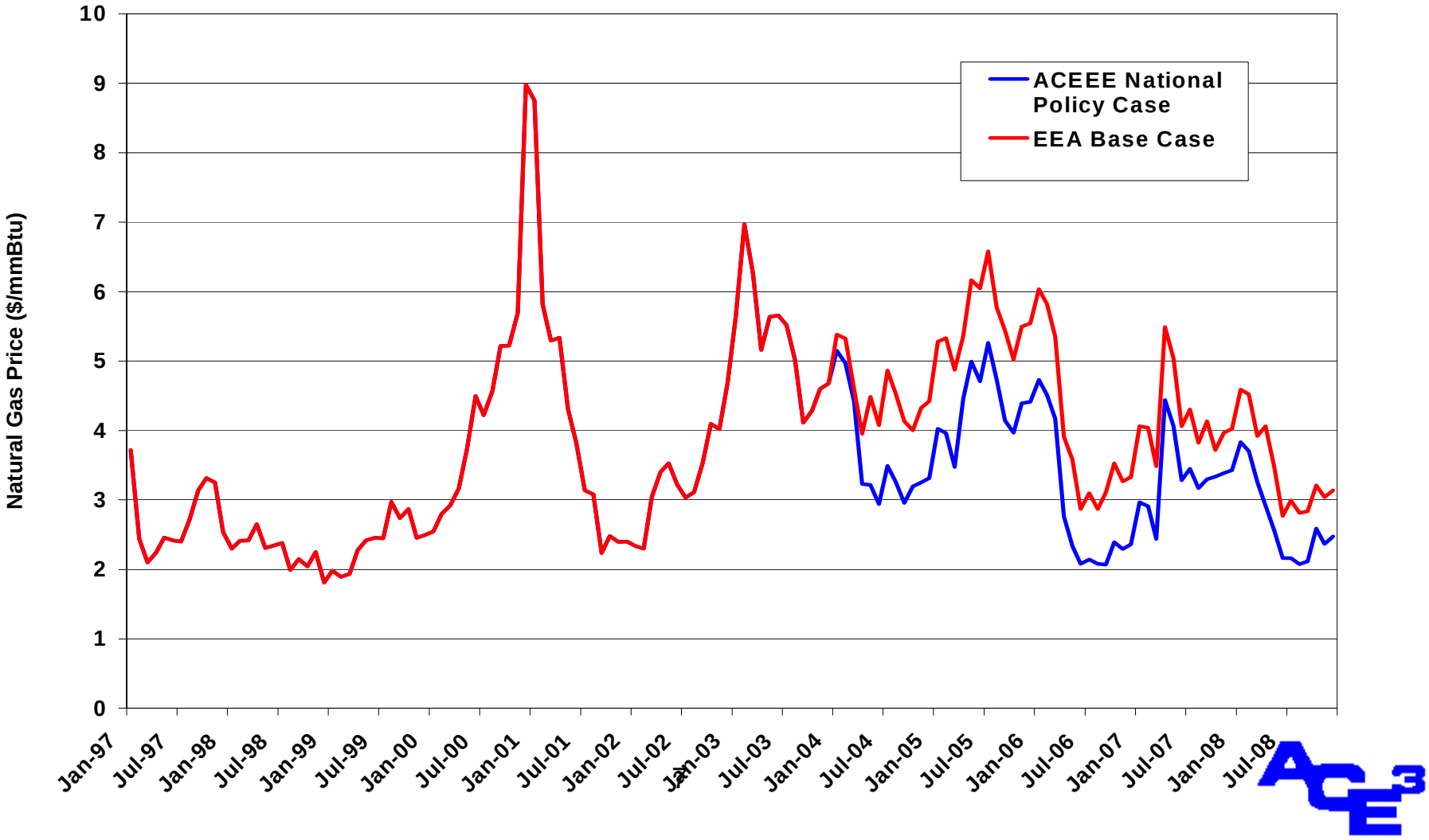
1. Natural Gas
2. Electricity
3. Renewable Resources

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

Using EEA Natural Gas Model

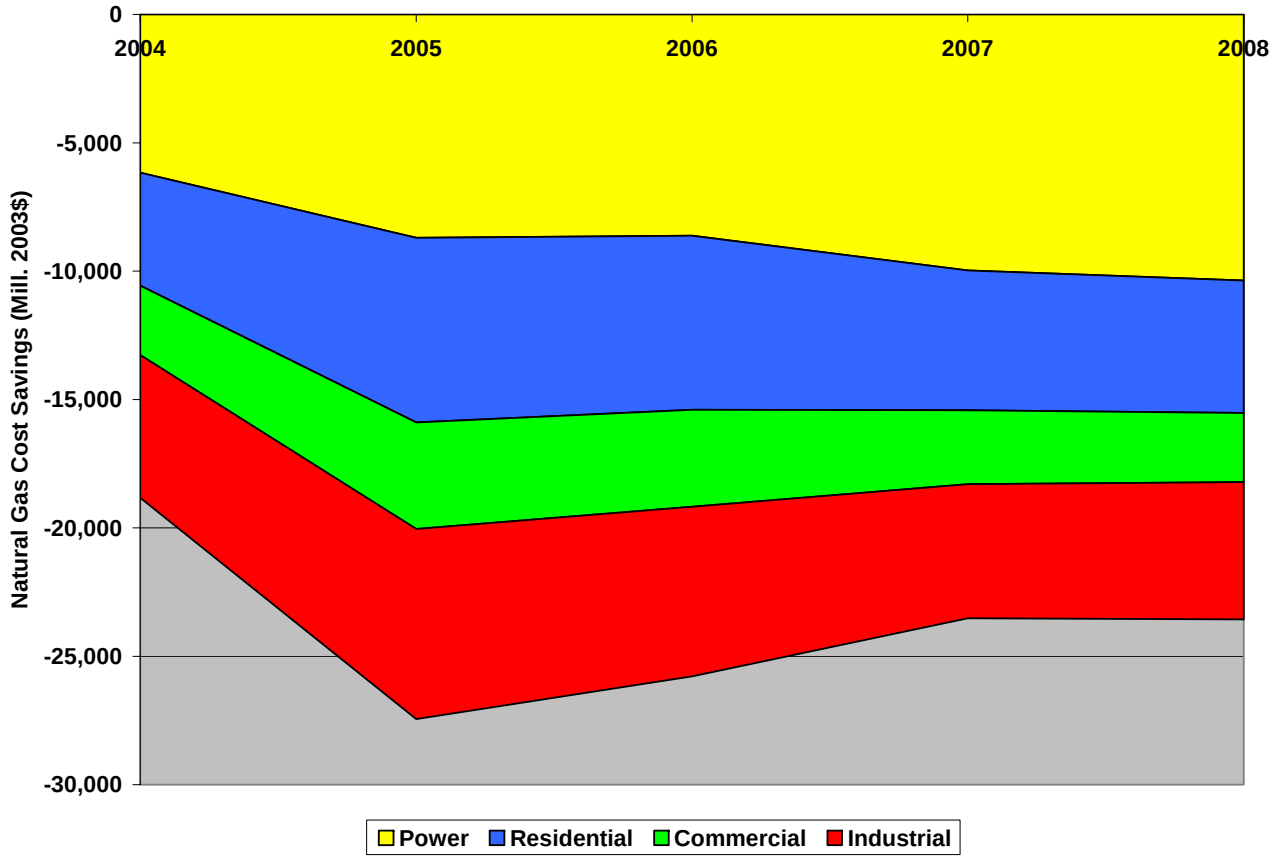
- Energy and Environmental Analysis, Inc. (EEA) respected, independent natural gas analysts – used for current and past NPC NatGas studies
- Fully integrated natural gas market model incorporating supply, transmission, storage and consumption at 106 nodes
- Using July 2003 projection as base case
- ACEEE 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

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

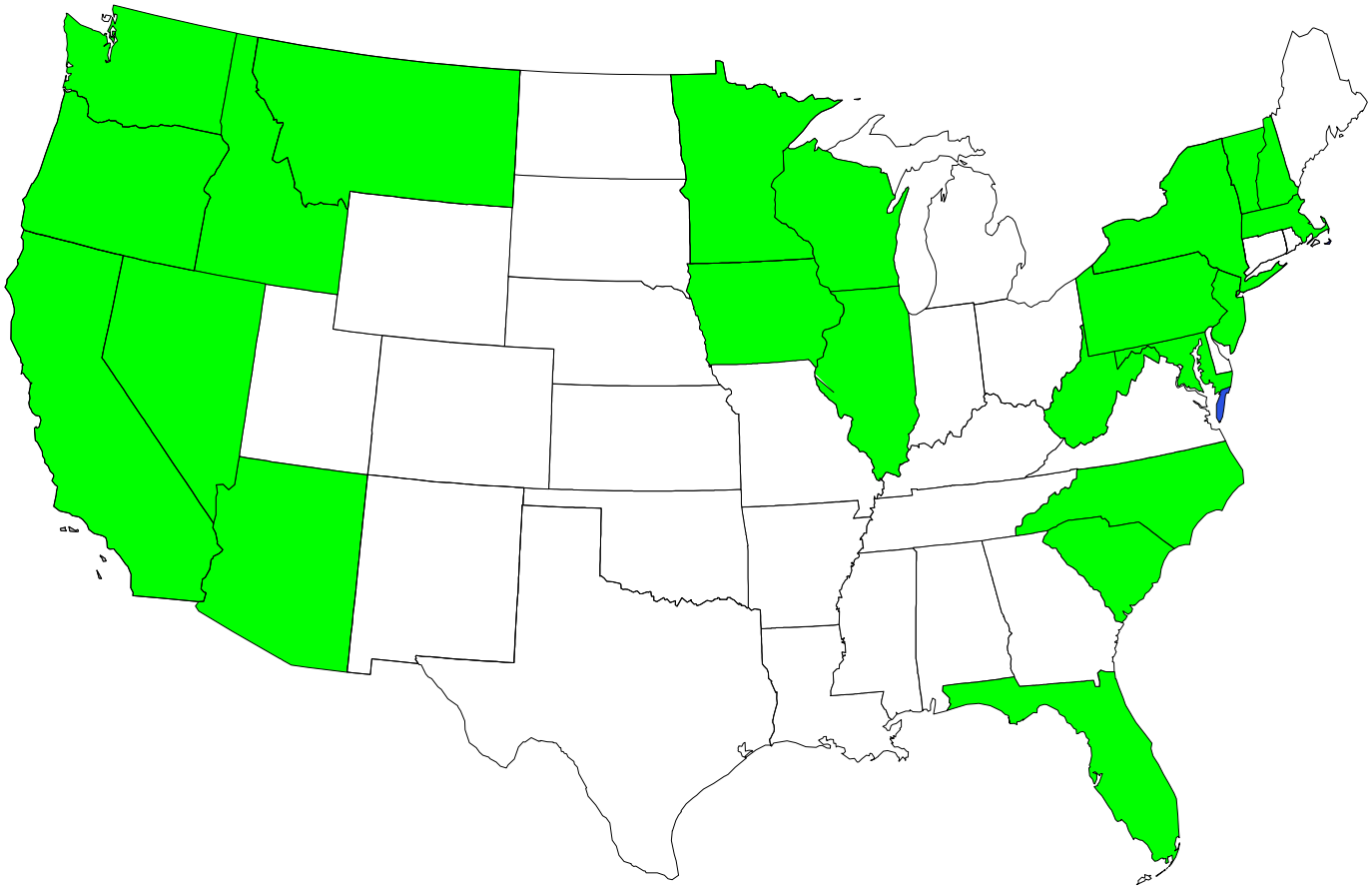
Methodology and Approach

- 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 22 states—in 19 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

- All the leading states (CA, MA, NJ, WI, VT, MN, OR, WA, and Ontario) have program cost recovery through rates or other funding mechanisms. This appears to be a necessary condition for energy efficiency programs.
- 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 & 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 $mart℠ 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**

Special Case Studies: Comprehensive Portfolios and Collaboratives		
Large Utility Effort through Multiple Local Distribution Companies: *Comprehensive Program Portfolio*	**KeySpan Energy Delivery New England**	**MA, NH**
Single Investor-Owned Utility: *Comprehensive Program Portfolio*	**Vermont Gas Systems, Inc**	**VT**
Municipal Utilities Collaborative Program: *Conserve & Save*	**The Triad: Austin Utilities, Owatonna Public Utilities and Rochester Public Utilities**	**MN**
Multi-party collaborative: *Massachusetts Low Income Energy Affordability Network*	**Massachusetts Department of Housing and Community Development in collaboration with KeySpan Energy Delivery New England**	**MA**
Regional Multi-Utility collaborative: *GasNetworks® Comprehensive Program Portfolio*	**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)	$.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: 1st 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