
The Economic Impact of Energy Costs on Indiana's Economy

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Presentation at the Indiana URC Workshop:
"Reducing the Cost of Energy in Indiana"
April 13, 2006

SOURCES OF INFORMATION

ACEEE (my organization)

- Leading non-profit organization on energy efficiency research in the U.S.
- Frequent testimony before Congress
- Work with all the major leading industry groups
- The only non-profit invited to confidential energy industry “Energy Futures” forum hosted by BP

Energy and Environmental Analysis, Inc. (EEA)

- They do our energy modeling and natural gas forecasts
- Same firm that does natural gas forecasting for the National Petroleum Council

TOPICS

- 1) Background: Indiana's Energy Vulnerability
- 2) Overview: the National Energy Crisis
(special focus on natural gas)
- 3) How energy efficiency can help
- 4) References for more information

BACKGROUND: INDIANA'S ENERGY VULNERABILITY

- Indiana uses a huge amount of energy
 - Total cost was \$17 billion per year (in 2001)
(probably over \$25 billion now)
 - 13th highest energy cost burden in the nation
- Indiana is extremely dependent on fuels imported from other states and countries
 - 100% of the natural gas
 - 99% of the oil and petroleum products
 - 51% of the coal

COST OF INDIANA'S ENERGY IMPORTS

Based on a similar analysis done for Michigan, we estimate:

- Before the current crisis (circa 2000), roughly \$6 billion per year was leaving Indiana to pay for fuel imports
- At current market prices, this dollar outflow is likely to be \$13 billion or more

THIS IS A HUGE ECONOMIC DRAIN ON THE STATE ECONOMY!

EFFECTS ON HOUSEHOLDS

- In 2002, the average household nationally spent about \$3,000 on energy
[half for transportation, half for home uses]
- Today that amount is up to \$4,600 per year...
an increase of over 50%,
or \$1,600 taken out of every household's annual
disposable income

BROADER ECONOMIC RAMIFICATIONS

This **additional \$7 billion** annual drain on Indiana's economy is roughly equivalent to the lost payroll from **closing 70 large manufacturing plants**.

Even the Wall Street Journal has written about the unprecedented transfer of wealth, calling it a "bonanza" and "windfall" for the handful of big energy producing states (i.e., AK, NM, WY and TX) and countries (e.g., OPEC).

**Bottom line: States like Indiana are in an economic war regarding energy costs...
...and they are losing!**

THE ENERGY CRISIS

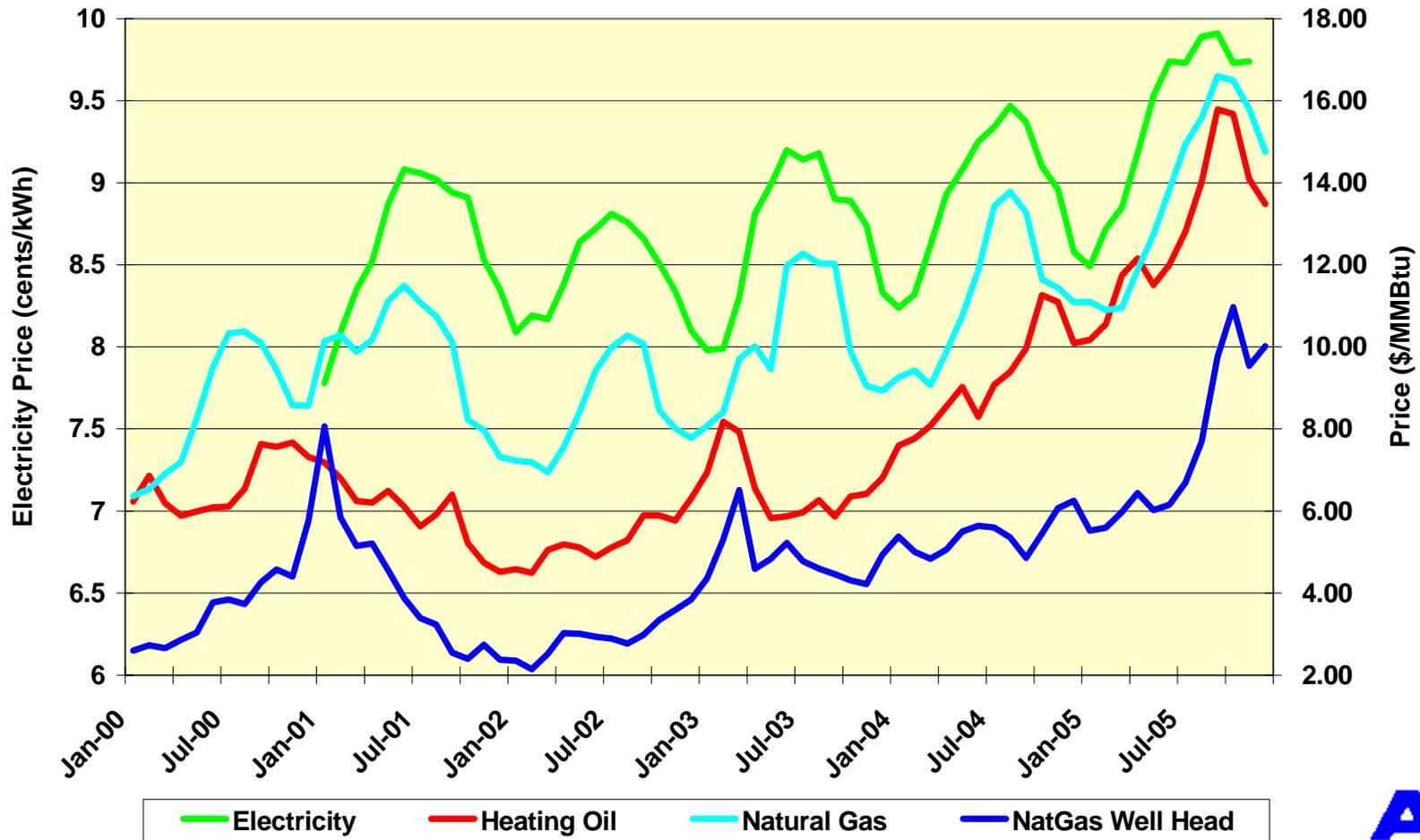
YES, IT'S REAL

Since 2000:

- World oil prices have more than doubled
- Natural gas prices have nearly tripled
- Spot market coal prices have doubled

Virtually all market experts foresee a prolonged period of high and volatile energy prices

Residential Energy Prices



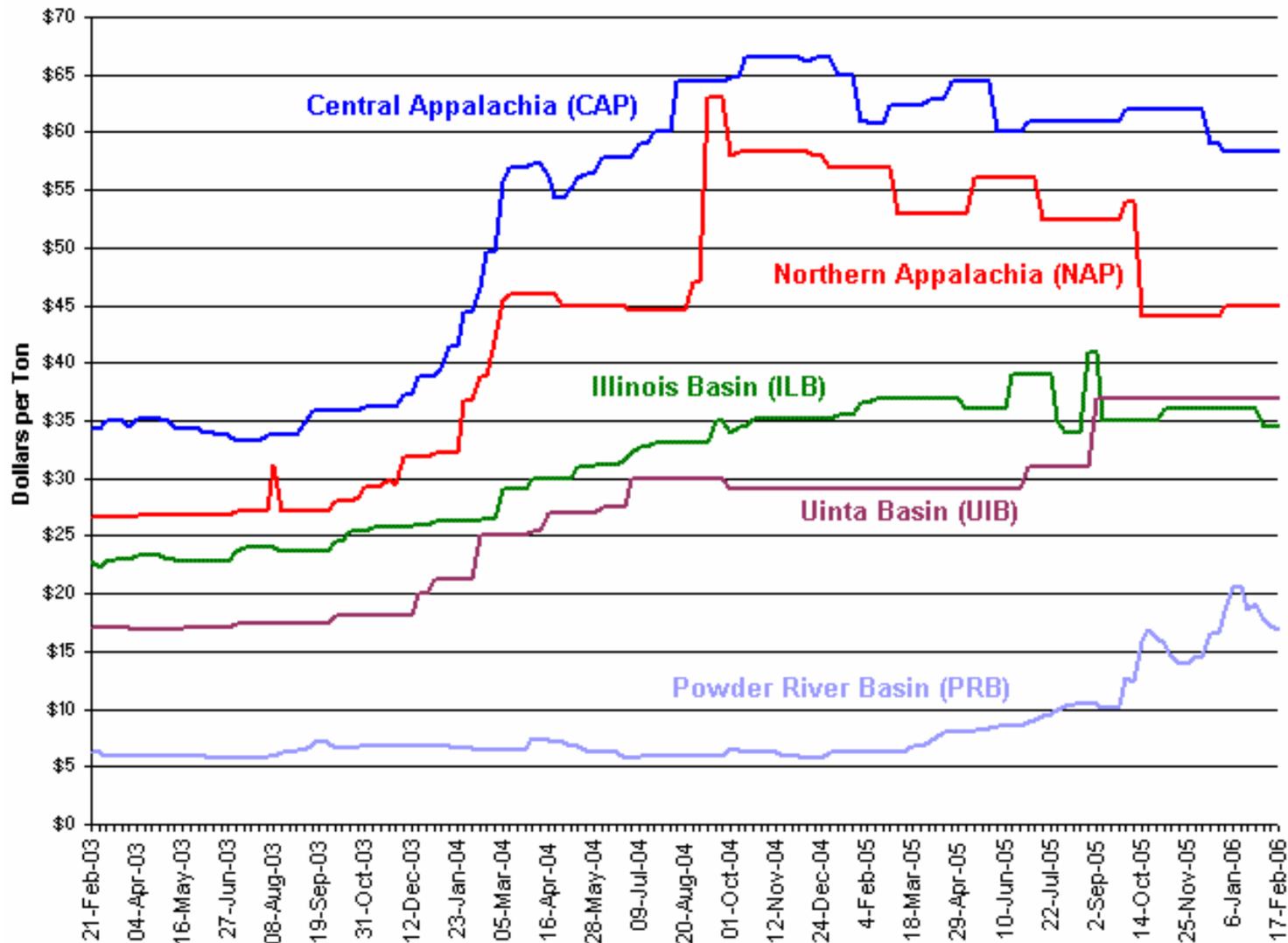
THE CRISIS IS NOT A TEMPORARY BLIP

THE MARKET FUNDAMENTALS HAVE CHANGED:

- Oil
 - growth in world demand (China & India esp.)
 - OPEC losing control
 - Approaching world production peak
- Natural Gas
 - Primarily North American Market
 - several major negatives (see later slide)
 - no supply relief in sight
- Coal
 - spot prices have doubled
 - plentiful supply,
BUT major environmental costs are looming
- No magic bullet (Forget about Hydrogen)



Average Weekly Coal Spot Prices



Source: Platts Coal Outlook 2006

The Natural Gas Crisis Has Particularly Serious Implications for the Midwest

- Very dependent on natural gas for space heating
- Very large industrial use of natural gas
- Very dependent on gas imports from outside the region

[Overall, Midwest imports 92% of the natural gas it uses from other states and countries. Every \$1.00 per Mcf increase in price drains an additional \$4 billion a year from the region.]

The Natural Gas Crisis

Natural gas prices are a serious problem, and no relief is expected

- This past fall, prices went ‘crazy’, showing the volatility of the market
- The huge spikes have declined (we dodged a bullet), but gas price forecasts show prices will continue indefinitely at triple 1990’s levels
[will drain over \$4 billion/year from Indiana]
- Several major factors contributing to the problem

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)

*OK, so we believe there is a serious
problem....*

What can we do about it?

Fortunately, Help Is Available

- **Energy Efficiency** can save energy for half the cost of new energy supply, or less (both natural gas and electricity)

[Typical current elec. market cost, generation only: 5.0 cents/kWh. Fully loaded costs, incl. generation, transmission, distribution: 6.0 to 10.0 cents/kWh
Recent natural gas commodity cost: \$7.50/Mcf]

- In addition, energy efficiency produces a number of other significant economic benefits

Electric 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				0.03
Connecticut	NA	2.4-2.6	1.5-1.7	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				0.03
Wisconsin	3.0	2.0	4.3	
Median	2.1 to 2.5	2.5 to 2.6	1.6 to 1.7	0.03

Natural Gas Program 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*

Economic Impacts of Energy Efficiency in Natural Gas Markets

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

Natural Gas Price Effects of Energy Efficiency and Renewable Energy Practices and Policies

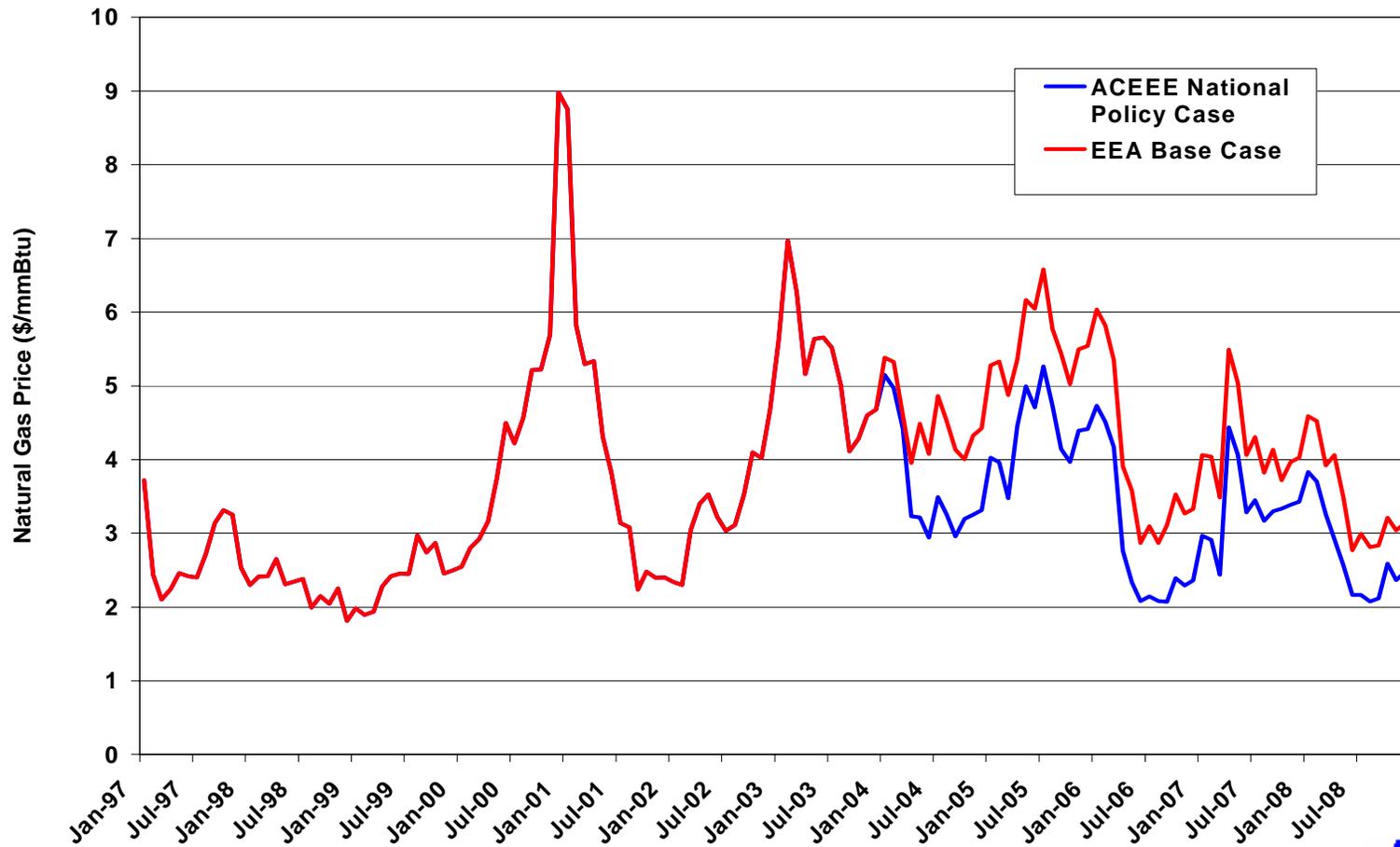
R. Neal Elliott, Ph.D., P.E., Anna Monis Shipley, Steven Nadel, and Elizabeth Brown Dec. 2003

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

ACEEE Research Approach

- 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
- 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 natural gas and electricity (save ~ 0.8% to 1.0% per year)

Impact on Henry Hub Natural Gas Pricing



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%)

Some Great Quotes

“Policies most likely to have an immediate impact are actions to promote consumer conservation and energy efficiency.”-- National Petroleum Council, Sept. 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, Jan. 2004

“We need to lend a greater voice to this thing so that the department will feel a need to move more quickly. We can't wait much longer for increased energy efficiency in this country.” -- Peter Molinaro VP, Dow Chemical, January 22, 2005

Gee, With a Consensus Like That....

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

Unfortunately, Washington, D.C. is entirely dominated by the energy extraction industries....

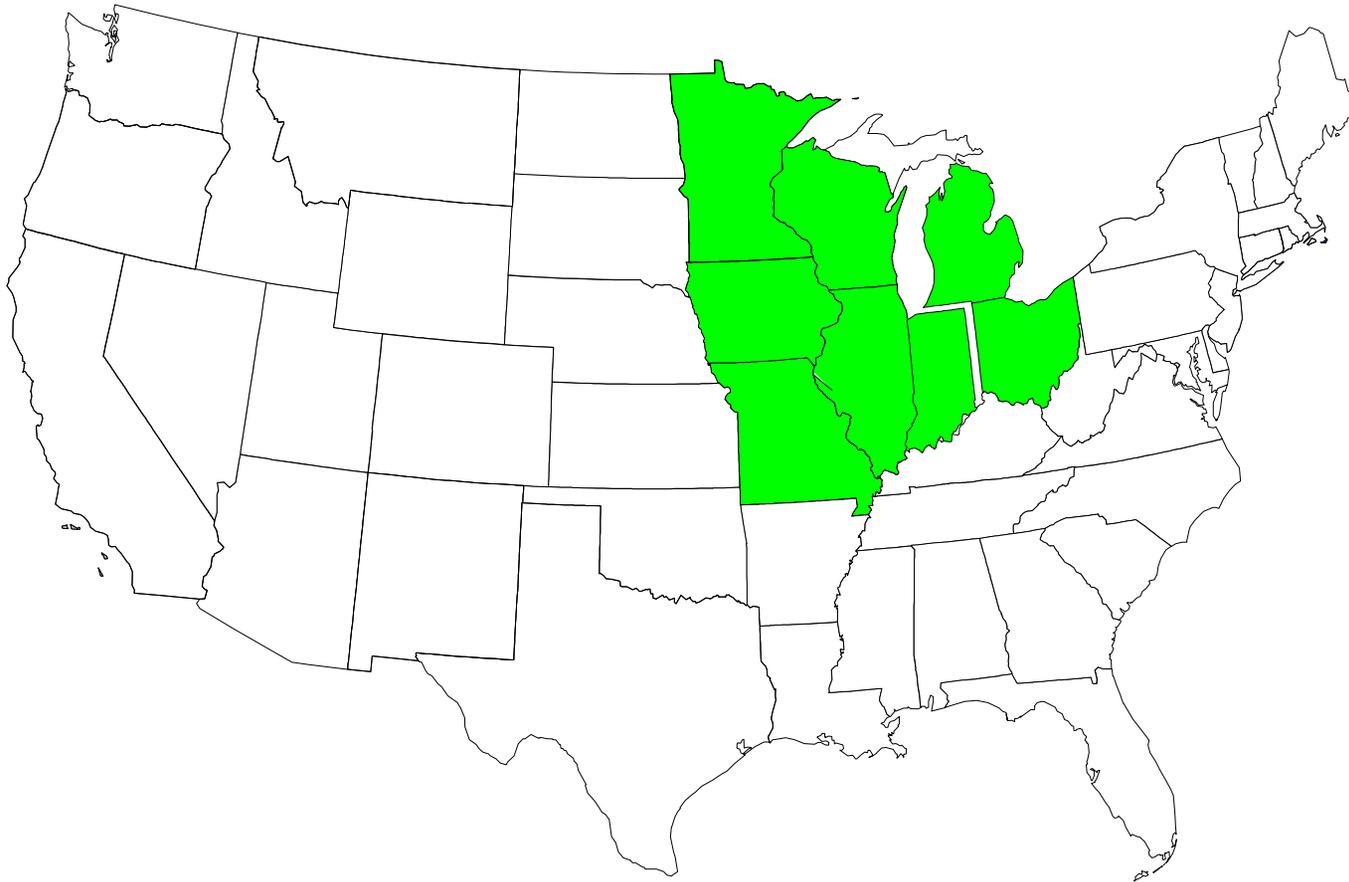
The Administration has announced no new initiatives for EE, and the new federal budget proposal contains further cuts to DOE energy efficiency programs.

It looks like the states will continue to have to provide leadership on their own [fortunately, there are some excellent examples of success]

New Midwest Natural Gas Study

- 8 states (IA, IL, IN, MI, MN, MO, OH, WI)
- Modeling the effects of aggressive but achievable Energy Efficiency programs in the Midwest (save about 1% of sales per year in electricity and natural gas)
- Same contractor (EEA) and technical models
- Looking at effects on wholesale gas prices (Chicago Hub) and on total customer savings (efficiency savings plus price effects)

FIGURE 1. STATES IN THE MIDWEST NATURAL GAS STUDY

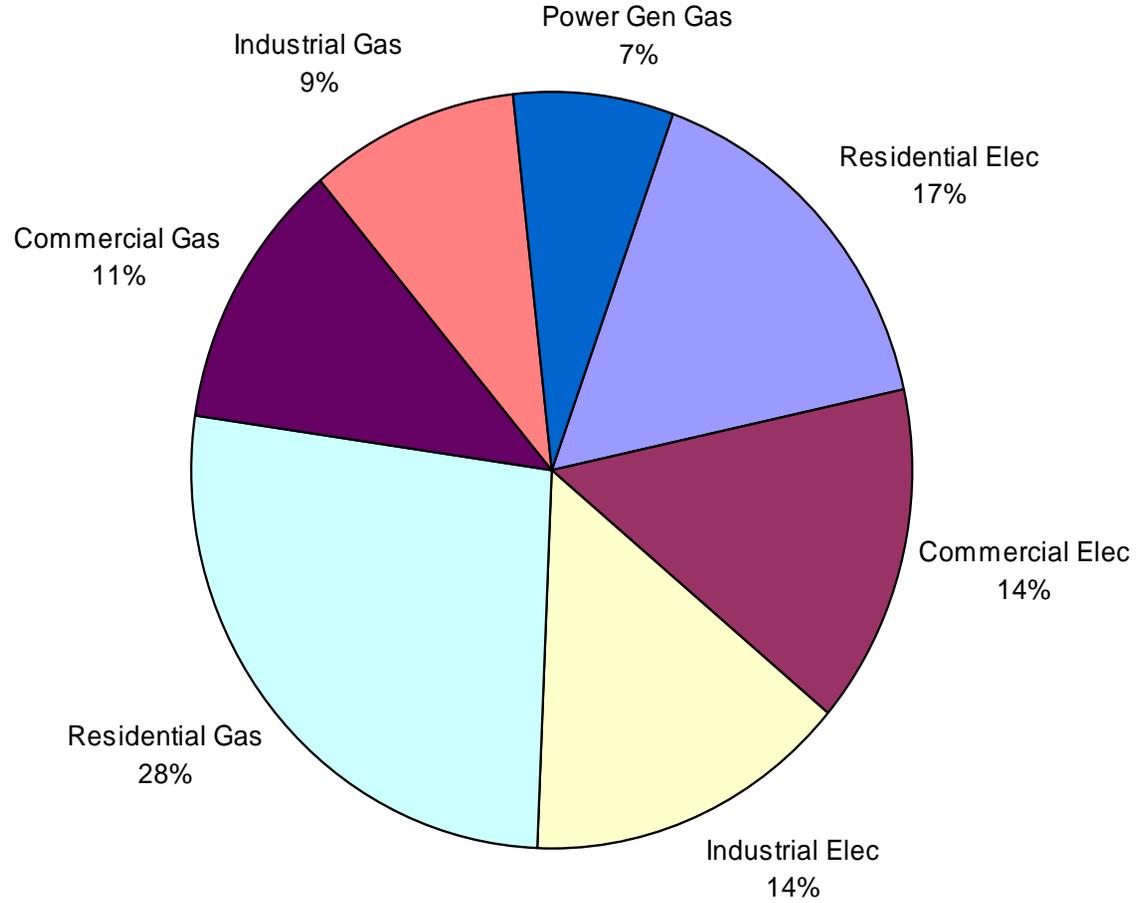


Total Midwest Customer Dollar Savings

	<u>2010 Annual</u>	<u>2010 Cumulative</u>
Gas price effects:	\$ 1.5 billion	\$ 5.2 billion
Gas Efficiency:	\$ 1.1 billion	\$ 3.9 billion
Elec. Efficiency:	\$ <u>1.86 billion</u>	\$ <u>6.75 billion</u>
Total Savings:	\$ 4.46 billion	\$15.85 billion
[INDIANA:	\$ 518 million	\$ 1.9 billion]

Total Net Energy Expenditure Reductions in 2010

Reduction in Energy Expenditures = \$4,14 billion



Other Economic Benefits to the Midwest

- 30,000 net new jobs by 2010
- \$750 million increase in net annual employee compensation by 2010

Plus: significant avoided job losses in Midwest due to avoided “demand destruction”

ACEEE Midwest Natural Gas Study

Examining the Potential for Energy Efficiency to Help Address the Natural Gas Crisis in the Midwest

**Martin Kushler, Ph.D., Dan York, Ph.D.,
and Patti Witte, M.A. January 2005**

URL: <http://aceee.org/pubs/u051.htm>

[As a result of all this, the “Midwest Natural Gas Initiative” was formed by regulators from the Midwest states. Goal: 1%/year savings in electricity and natural gas.]

Why is Govt./Regulatory Policy Needed?

Key Barriers in the Utility Industry

- Utilities will not voluntarily provide serious energy efficiency programs
 - Higher sales means higher profit (and vice-versa)
 - Institutional focus traditionally on supply side
- The “market” does not provide a viable substitute for utility sector energy efficiency programs

The “market” alone will NOT do it (continued)

The data confirm what the theoretical barriers would predict:

There is clear evidence that the “market” is not providing energy efficiency programs, even in states where the electric system has been restructured.

[see ACEEE study: *Can we Just “Rely on the Market” to Provide Energy Efficiency? An Examination of the Role of Private Market Actors in an Era of Electric Utility Restructuring*, Kushler & Witte, ACEEE, 2001

<http://aceee.org/pubs/u011full.pdf>

Interviewed nearly 100 ESCOs, electric commodity suppliers, and distribution utilities in 9 restructured states... No evidence whatsoever of the emergence of private market energy efficiency programs

Utility Sector Policy Approaches

1. 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.]
2. Provide funding for energy efficiency through state system benefit funds
3. Require funding for energy efficiency through electric and gas utility rate cases

Funding approaches and programs can be tailored to meet the unique needs of each state

A BENCHMARK TARGET FOR INDIANA

[Based on 20 states with restructuring related funding for energy efficiency programs.]

Energy Efficiency

- Range: 0.03 to 3.3 mills/kWh
- Median: 1.0 mills/kWh
- \$ Range: \$1.5 million to \$228 million/yr.

>>If Indiana spent at median:

1.0 mills/kWh =

\$90 million/yr. for energy efficiency

AN EXCELLENT INVESTMENT

\$90 Million invested in energy efficiency programs would produce 180 to 270 million dollars in lifetime utility system cost savings, based on typical program cost-effectiveness.

[Savings in Indiana would likely be even greater than average, because of the historical lack of programs in this state.]

ADDITIONAL BENEFITS TO THE STATE AND LOCAL ECONOMIES

- *FROM PROGRAM BUDGETS:* Energy efficiency program budgets are spent on staff, contractors, and other local employees, plus supplies and materials from local business outlets
- *FROM REDUCED ENERGY BILLS:* The money saved on participant utility bills is re-spent locally, rather than being exported to import more energy fuels

Conclusions

- We are in an energy crisis, with the potential to be extremely serious
- Indiana is particularly vulnerable, due to its high energy use and extensive dependence on imported fuels
- Energy efficiency is the only viable near to mid-term option
- Proven energy efficiency policies are available
- Indiana has great energy savings potential
- It's time to think big on energy efficiency, and the sooner states start the better



Help is Available

POLICY/REGULATORY/ADMINISTRATIVE STRUCTURE

Public Benefits/Utility Sector Programs

Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies

Kushler, York & Witte, ACEEE, April 2004

<http://www.aceee.org/pubs/u041.pdf>

Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets

Richard Cowart, Regulatory Assistance Project,
June 2001

<http://www.raonline.org/Pubs/General/EffReli.pdf>

Proven Programs for Electric Efficiency

America's Best: Profiles of America's Leading Energy Efficiency Programs

York & Kushler, ACEEE, 2003

<http://www.aceee.org/pubs/u032.htm>

Energy Efficiency and Electric System Reliability: A Look at Reliability-Focused Energy Efficiency Programs Used to Help Address the Electricity Crisis of 2001

Kushler, Vine and York, ACEEE, 2002.

<http://aceee.org/pubs/u021full.pdf>

Proven Programs for Natural Gas Efficiency

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

Kushler, York, and Witte, ACEEE, Dec. 2003

URL:

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

Selected 29 programs from around the U.S., covering all sectors, (plus 5 special case studies of comprehensive portfolios and collaboratives)