

# Energy Efficiency as a Supply Resource in Indiana

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# Overview and History of Energy Efficiency in Indiana

## ■ 1970s - U.S. Energy Crisis

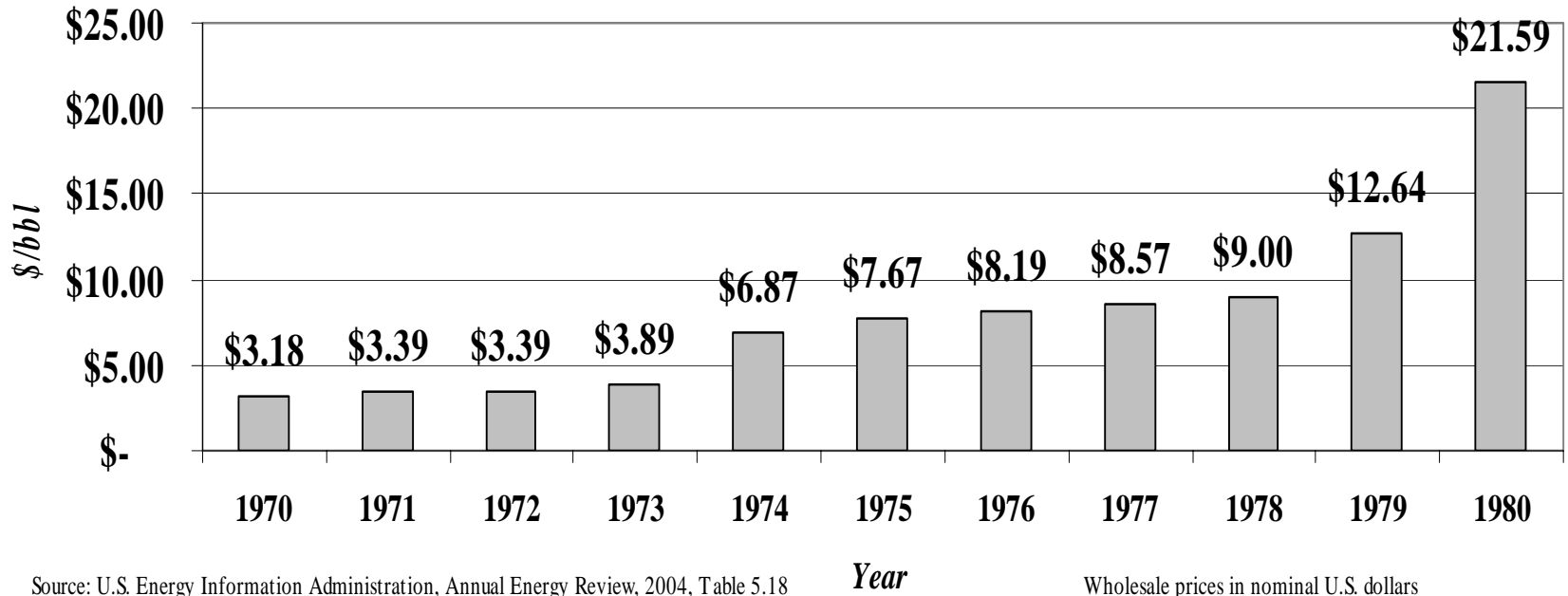
### □ Petroleum

- OPEC Cartel: growing dependence on foreign supplies
- Oil Embargo: huge price escalations
- Gasoline shortages and huge price escalations

### □ Coal

# Crude Oil

*Annual Average for U.S.*  
(\$ per bbl), 1970-80

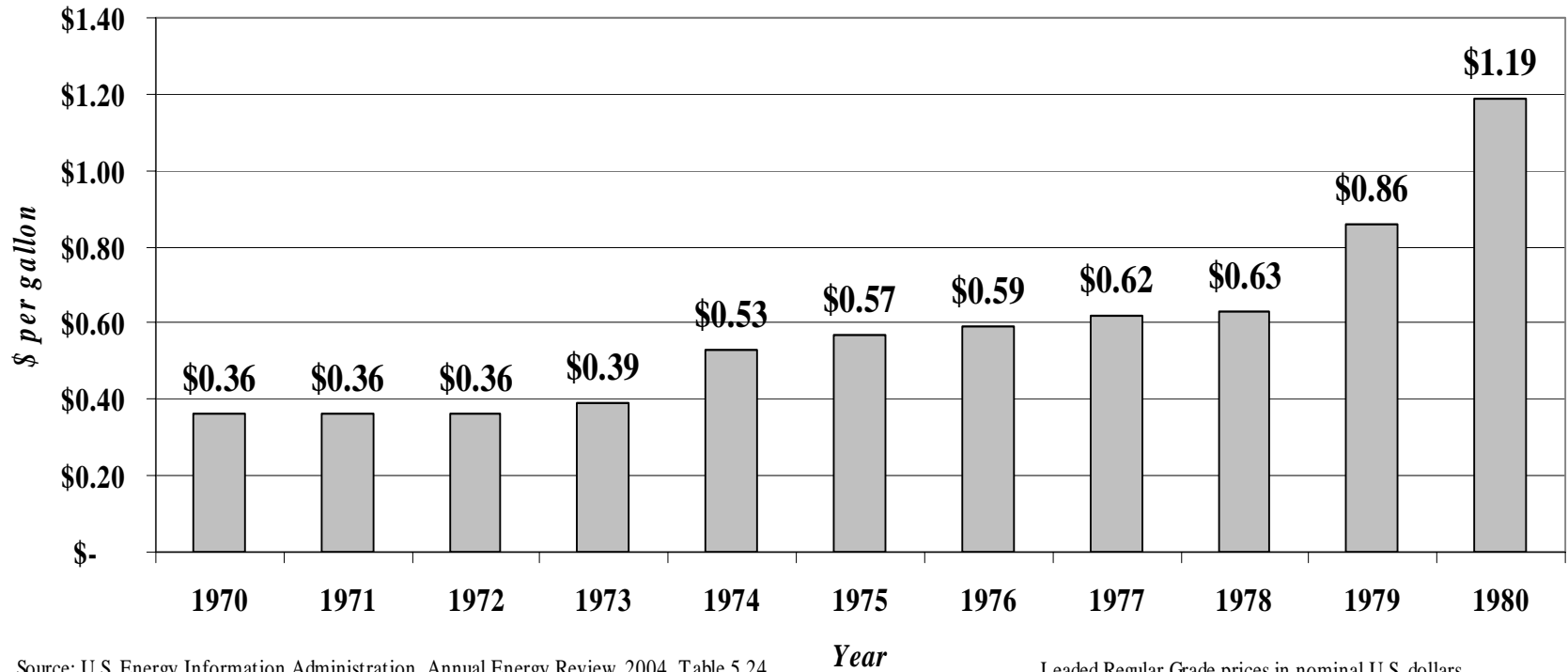


Source: U.S. Energy Information Administration, Annual Energy Review, 2004, Table 5.18

Wholesale prices in nominal U.S. dollars

## Retail Gasoline

Annual Average in U.S.  
(\$ per Gallon), 1970-80



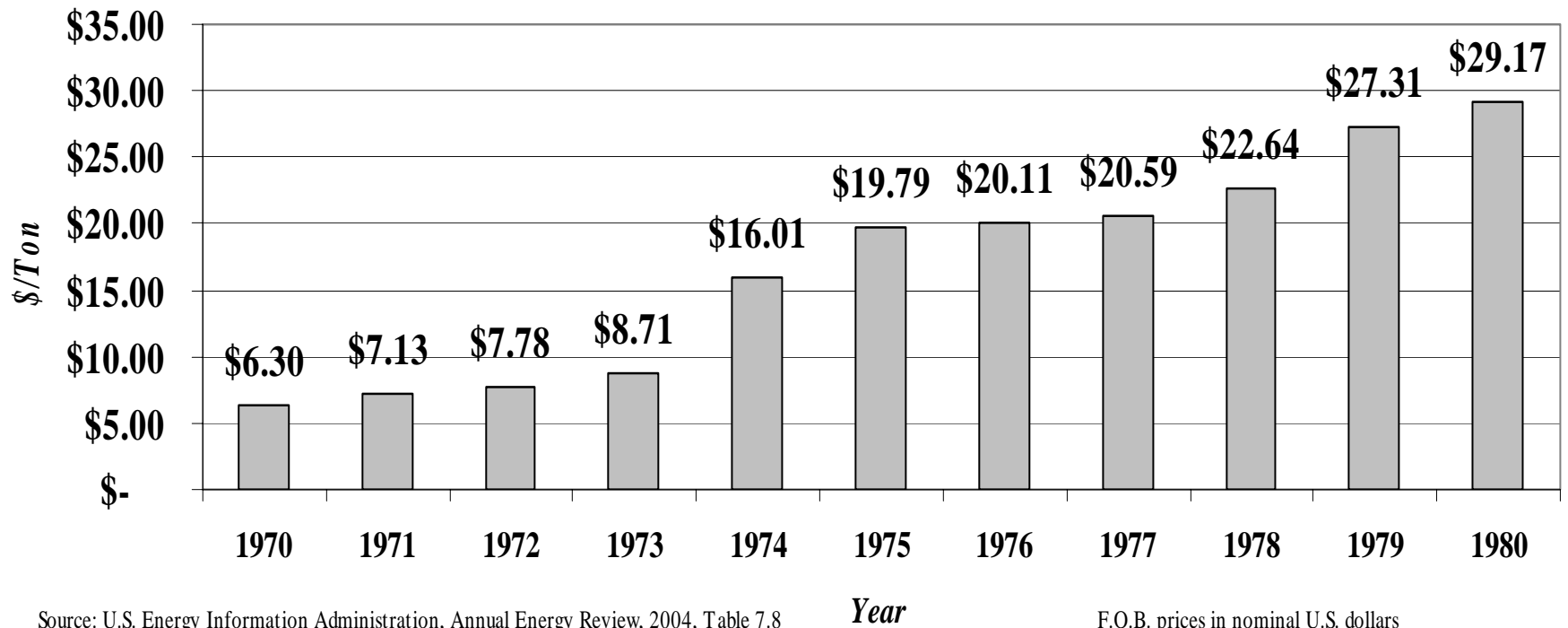
Source: U.S. Energy Information Administration, Annual Energy Review, 2004, Table 5.24

Leaded Regular Grade prices in nominal U.S. dollars

## Bituminous Coal

*Annual Average for U.S.*

(\$ per Short Ton), 1970-80




# 1970's U.S. Energy Crisis (continued)

## ■ Natural Gas

- Shortages and Curtailments
- Restrictions on Expanded Usage
- Major Reforms Needed

# Late 1970's and Early 1980's

- Electric Power Industry – Emerging Problems
  - Excess Capacity
  - Nuclear Power
    - Three Mile Island Accident (1979)
    - Indiana's Nuclear Power Experience
    - Marble Hill Nuclear Write-off
  - Large Price Increases in Some Regions of U.S.
  - Implications of Indiana's "used and useful" standard
  - Risk Perceptions and Capital Attraction



# Early 1980's

- Need For Improved Planning Including Demand Side Options
- Expanded State of Indiana Oversight of Electric Power Planning

# Early 1980's (continued)

- Indiana Utility Power Plant Construction Act – 1983 (a.k.a. Certificate of need law)
  - <http://www.in.gov/legislative/ic/code/title8/ar1/ch8.5.html>
  - Pre-Approval of New Generating Plant Construction
  - Reduced Risk for Investors
  - Assurance of Cost Recovery
  - More Stringent and Transparent Planning
  - Least Cost Planning
  - Integrated Resource Planning (IRP) including Demand Side Options



■ From Power Plant Construction Act (IC 8-1-8.5-4)

Consideration of petition

Sec. 4. In acting upon any petition for the construction, purchase, or lease of any facility for the generation of electricity, the commission shall take into account:


(1) the applicant's current and potential arrangement with other electric utilities for:


- (A) the interchange of power;
- (B) the pooling of facilities;
- (C) the purchase of power; and
- (D) joint ownership of facilities; and

(2) other methods for providing reliable, efficient, and economical service, including the refurbishment of existing facilities, *conservation, load management*, cogeneration and renewable energy sources. (emphasis added)

# Late 1980's and Early 1990's

- 1989 - First Indiana Certificate of Need Case Under the 1983 Act
  - IURC Cause No. 38738 Regarding Southern Indiana Gas and Electric Company (SIGECO)
  - Request To Build 80 MW Combustion Turbine
  - Certificate Granted BUT Commission Clarified Need to Consider Demand Side Options in Planning Process

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- From IURC Order in Cause No. 38738 issued 10/25/89, Regarding SIGECO:
    - An electric utility should receive a certificate for the construction of generation only if and when all other sources of capacity have been evaluated and found to be inferior in terms of least cost reliability. (page 4)
    - Least-cost planning is a planning approach which will find the set of options most likely to provide utility services at the lowest cost once appropriate service and reliability levels are determined. ... We find that least-cost planning is an essential component of our Certificate of Need law. Any applicant must be able to demonstrate development and implementation of a least cost plan. (page 5)

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- State Law and Commission Precedent Require Integration of Demand Side Options into Electric Utility Planning Process
  - Integrated Resource Planning
  - Public Service of Indiana (PSI) Energy Launches Major Utility Sponsored DSM Initiatives

# Mid 1990's

- Conflicting Trends in U.S. Energy Policy Impacting Indiana
  - Development of Rigorous and Transparent Integrated Resource Planning
  - Substantial Government Oversight and Involvement
  - Development of Indiana IRP and DSM Cost Recovery Rules
    - <http://www.in.gov/legislative/iac/T01700/A00040.PDF>

# Mid 1990's (continued)

- National Policy and Movement Toward Industry Restructuring (a.k.a. “Deregulation”)
  - Unbundling Generation, Transmission, and Distribution
  - Less Government Oversight
  - Greater Reliance on Market Forces
  - Increased Competitive Pressures
  - Merchant Power Plants
  - Conflicts with transparent planning process
  - Uncertainty and risk of long term investment

# Mid 1990's (continued)

- Retail Electric Industry Restructuring Legislation Passes in Many States
  - Many East and West coast states, and surrounding states Illinois and Ohio
- Government Role in Generation Planning is Questioned
- Major Reduction In PSI DSM Program
  - Cost Recovery Considerations
  - Reliance on “market-driven” conservation and energy efficiency
- Restructuring Legislation Introduced in Indiana
  - Indiana ultimately does not “Deregulate” Retail Electric power

# Beyond the 1990s: A New Century with Harsh Realities

- California Energy Market Meltdown
- Major Blackout Across Eastern U.S.
- Disappointing Results From Retail Electric “Deregulation”
- Major Scandals Involving Unregulated Energy Marketers
  - Enron
- Huge Oil and Natural Gas Price Increases
  - Natural Gas as fuel for new generation
- Climate Change
  
- Renewed Interest in Energy Efficiency, Conservation, and Demand Side Management



# Energy Efficiency and IRP's

- DSM is Part of Integrated Resource Planning Based On:
  - Expected Customer Response to Programs measured by Number of Kilowatt Hours (kWh), OR
  - Avoided Generation and Energy Costs

# DSM includes two components:

- Reduction of Demand (kW)
  - Direct load control, time pricing incentives, interruptible load, self-generation
- Energy Efficiency (kWh)
  - Residential audits, educational programs, weatherization, and efficient internal lighting, traffic signals and street lighting



# Economic, Environmental and Societal benefits:

- Lower Customer Bills
- Cleaner Environment
- Local Economic Considerations
- Fuel Diversity

## Indiana Energy Efficiency Programs

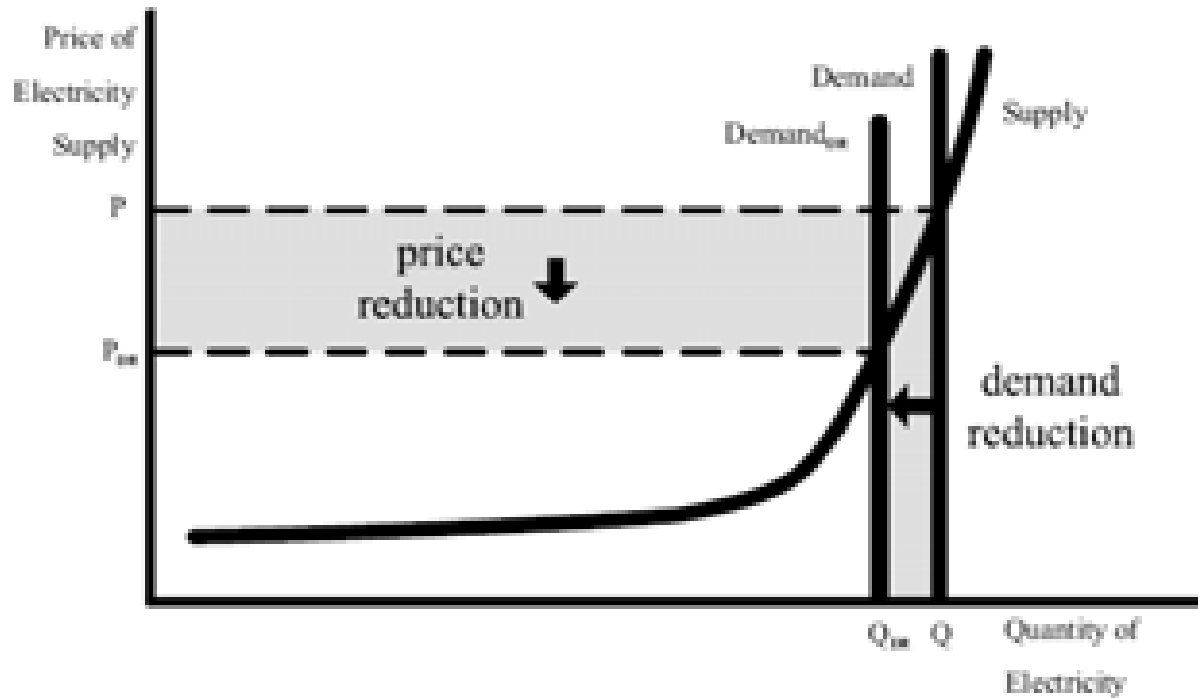
Topic	Duke Energy Indiana (PSI)	Indianapolis Power & Light	Northern Indiana Public Service Co.	Vectren (SIGECO)	Indiana & Michigan Power
<b>Demand Reduction Components</b>					
Interruptible	231 MW	17 MW	435 MW		226 MW
Direct Load Control	9 MW	12 MW		44 MW	
Other Programs	83 MW	33 MW			
<b>Efficiency Components</b>	Lighting Incentive Plan, Energy Efficient Cooling System, Energy Efficient Motors, Residential Audit, Low Income EE Program	Income Qualified Weatherization, High Efficiency HVAC Program (2,437,261 kWh), Change a Light (468,138 kWh), National Energy Education Development	Traffic light, Street light, Energy efficient equipment		Utility Residential Weatherization Program
<b>Total Annual Costs</b>	\$6 million/year	Total of \$5.25 million to be spent in 4 yrs	n/a	\$1.06 million/year	
<b>Cost Recovery Practice</b>	Rider 66,70	Standard Contract Rider No. 3	n/a	DSM tracker	n/a
<b>Lost Revenue \$ Recovered</b>		No		Yes (\$535,000 for May-July 06)	
<b>Total Reduction Annually</b>	323 MW	86 MW		14,080,916 kWh	
<b>Pertinent IURC Cause No.</b>	40229, 42612	42639, 40292		39453, 40322	
<b>Cost Tests Used</b>	Utility Cost Test	Utility Cost Test	Utility Cost Test	Utility Cost Test	Ratepayer Impact Measure



# Demand Response

- Changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.
- Source: “Benefits of Demand Response in Electricity Markets and Recommendations for Achieving Them”, Department of Energy, February 2006

# Supply and Price Relationship



■ Source: "Benefits of Demand Response in Electricity Markets and Recommendations for Achieving Them", Department of Energy, February 2006



# Demand Response Options

- Load Reduction
- Distributed Generation from Alternative Energy Sources with net-metering
- Seven landfill gas plants in Indiana provide enough energy for 10,500 homes
- Other fuels such as photovoltaic cells, wind, hydro, and other biomass

# DSM Funding and Cost Recovery Ratemaking Issues

- DSM Tracker Mechanisms may include:
  - Administrative Costs
  - Lost Revenue
  - Shared Savings
- Cost Tests include:
  - Utility cost, ratepayer impact, and total resource cost
- We continue to be challenged to:
  - Balance costs, incentives & benefits for utilities as well as ratepayers
  - Monitor & Evaluate Impacts



# Program Administrative Options

- Utility Administration
- Third Party Administration

# Catalysts for DSM

- Government sponsored efficiency initiatives, both Federal and State (tax credits, efficiency standards, building codes, etc.)
- Regulatory Actions e.g. In Indiana, Certificate of Public Convenience and Necessity (CPCN) have been linked to DSM (See causes in reference document.)
- Energy Policy Act of 2005 dictates Department of Energy review of national impact of Demand Response, encourages Distributed Generation and Energy Efficiency
- Market drivers such as individual utility rate options or the evolution of a capacity market (See link to MISO website in reference document.)



# Technical Challenges for DSM

- Transmission Access
- Transmission Capacity
- Investment Return Unknowns
- Advanced Metering Infrastructure



# Future Opportunities for Indiana

- Consistent Statewide Approach/Program
- Collaborative with Regulators, Utilities, Consumer Groups, Regional Transmission Organizations, Trade Associations
- Include Third Party audit and administration
- Utilize the Market to Incent Energy Efficiency