

Retirements, Repowering and New Construction: The Expected Impact on Coal and Natural Gas Demand

Presented by: Douglas J. Gotham
State Utility Forecasting Group
Purdue University

Presented to: Indiana Coal Mining Institute
Evansville, Indiana

May 17, 2002

<http://iies.www.ecn.purdue.edu/IIES/SUFG>

Recent Events

- NIPSCO announces shutdown of Mitchell Generating Station (December 2001)
- Indiana Utility Regulatory Commission approves Cinergy's plan to convert Noblesville Generating Station from coal to natural gas (December 2001)
- According to the Indianapolis Star, Indianapolis Power & Light is considering the fate of its Eagle Valley Generating Station, formerly known as Pritchard (April 2, 2002)

Other Events

- In late 1990s, Cinergy buys out coal gasification contract at Wabash River Repowering Project; switches from gasified coal to natural gas
- In 1993, American Electric Power retires Breed Generating Station
- In late 1990s, IPALCO retires Perry Generating Station from producing electricity (still makes steam)
- The last 3 years has seen a large number of new natural gas-fired plants coming on-line

Causes of Retirements/Repowering

- Environmental regulations
 - SO₂, NO_x, mercury
 - New source review
- Age of plants
 - Maintenance costs
 - Efficiency

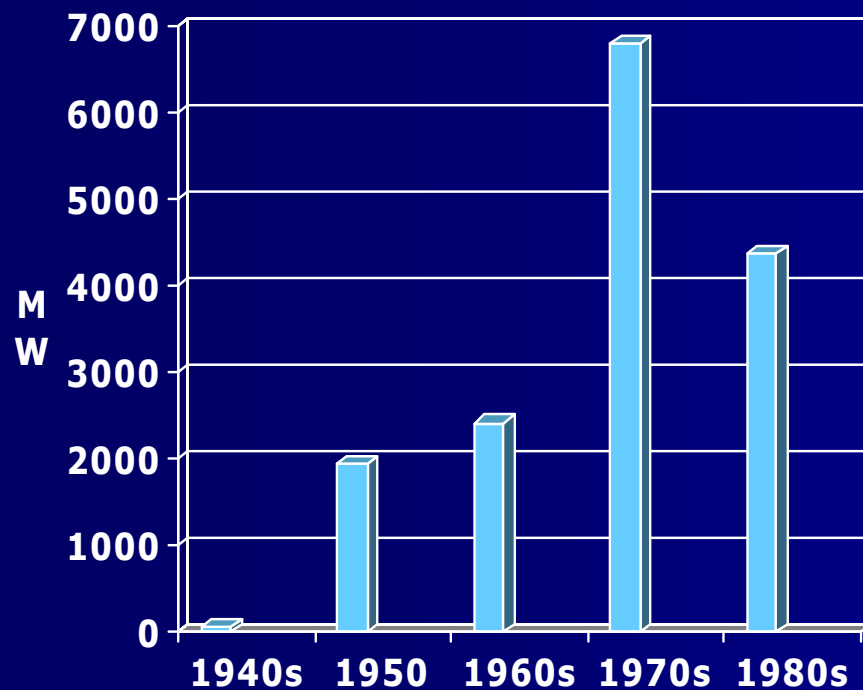
Characteristics of Affected Plants

- Old
- Small
- Not equipped with SO₂ removal system
- Entire station retired or retrofitted, not just individual units

Are There Other Plants with Similar Characteristics?

- Eagle Valley
 - All units installed in the 1950s
 - All units less than 100 MWs
- Edwardsport
 - Units installed in 1940s and 1950s
 - All units less than 100 MW
- Other stations have a mix of older, smaller and relatively newer/larger units

Coal-fired Generating Capacity by Decade Installed



Decade	MW	# of Units
1940s	45	1
1950s	1937	20
1960s	2415	10
1970s	6799	17
1980s	4373	9

Characteristics of Coal Burned at Affected Plants

- Mitchell low Btu/sulfur
- Noblesville high Btu/sulfur
- Wabash River Repowering high Btu/sulfur
- High Btu/sulfur coal is typical of Illinois Basin, low Btu/sulfur coal is typical of western U.S.

How Will This Affect Coal Consumption?

- Indiana ranks #2 in the nation in the amount of coal consumed by electric utilities
- Only 45% of the coal comes from Indiana (many plants use low sulfur coal from other sources for some or all of their needs).
- Affected plants do not have SO₂ scrubbers; therefore, repowering/retrofit should loosen emission allowance market

Coal Consumed in 2000

State of Indiana	70.6 million tons
Electric Utilities	57.7 million tons
Mitchell	1.124 million tons
Noblesville	207 thousand tons
Wabash River Repowering	124 thousand tons

Possible Future Threats

- Equipment failure
- Environmental
 - Triggering new source review
 - Future restrictions (mercury, particulates, additional SO₂ or NO_x, CO₂)

What Caused the Recent Rush to Natural Gas?

- State (and region) has been long on baseload capacity and short on peaking capacity
- Fear of deregulation and stranded costs made utilities avoid large investments
- Price spikes of 1998 and 1999 brought new players to the market (merchant plants)
- All of the above favor new generation that is low construction cost/high operating cost (natural gas) over high construction cost/low operating cost (coal)

Indiana Merchant Plant Activity

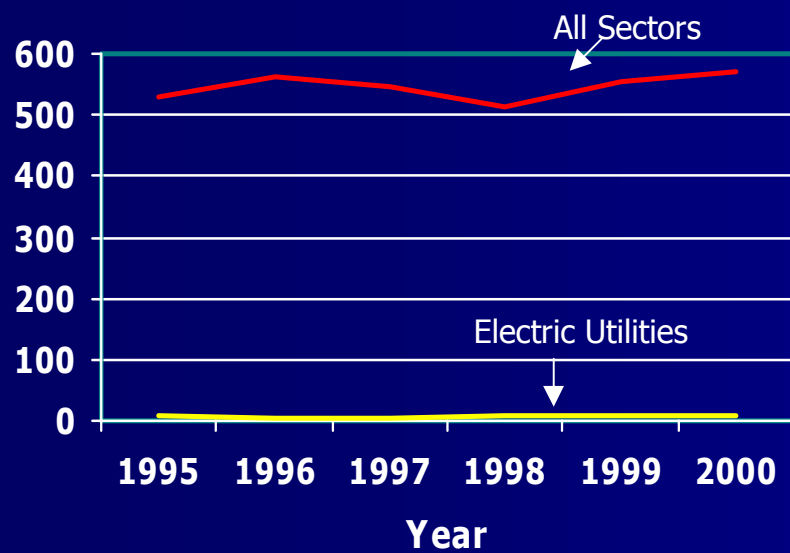
	Status of Plant			Fuel Type				
# of Plants	Proposed/ Pending Approval	Approved/ Under Construction	In Operation	Simple Cycle Gas	Combined Cycle Gas	Coal	Other	Total MW
20	3340	5738	1961	4071	6418	550	0	11039

Increase in Gas Consumption from Merchant Plants

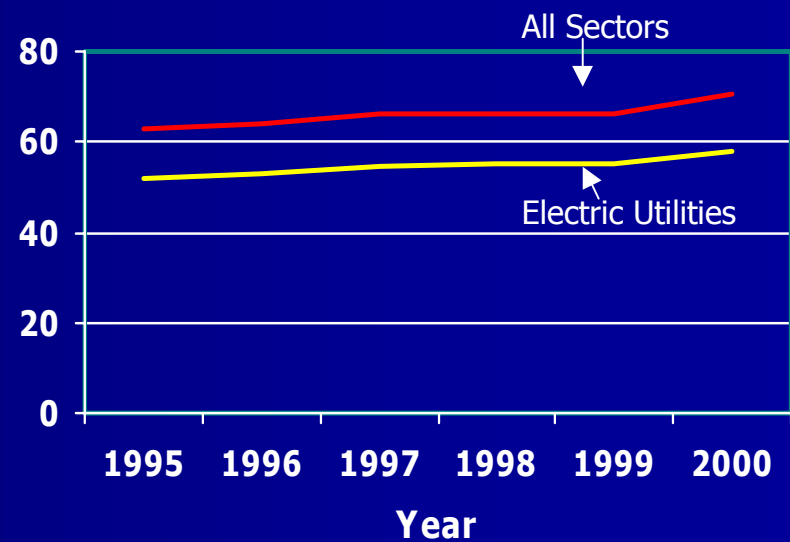


Historical Consumption in Indiana

Natural Gas (Bcf)



Coal (Million Tons)



Will There Be New Coal-fired Plants?

- Illinois and Kentucky have established tax incentives and/or low interest loans for new coal-fired plants
- Indiana has established the potential for an increased return on investment for new coal plants (Senate Enrolled Act 29)
- SUFG has identified a need for new baseload capacity (2001 forecast)
- Some utilities expressed an interest in new coal plants in their presentations to the Indiana Utility Regulatory Commission this week
- Uncertainty over future environmental regulation is a concern