



VINCE GRIFFIN

VICE PRESIDENT

**ENVIRONMENTAL & ENERGY
POLICY**

INDIANA CHAMBER OF COMMERCE



“Silver Buckshot”



**Dr. Richard Smalley, Rice University
Noble Laureate**

Most Critical Issues in This Century

- 1. Energy**
- 2. Water**
- 3. Food**
- 4. Environment**
- 5. Poverty**
- 6. Terrorism and War**
- 7. Disease**
- 8. Democracy**
- 9. Population**



Are we using too much Energy?

	Population	Energy	GDP	Energy/GDP 1000Btu/\$
USA	6%	25%	33%	.758
ROW	94%	75%	67%	1.12

Do the Math

US population consumes 5.26 times the energy of the average person in the rest of the World;

But we produce 7.7 times the goods and services of the Rest Of the World.

The USA only 67% of the energy per unit of GDP as does the rest of the world.

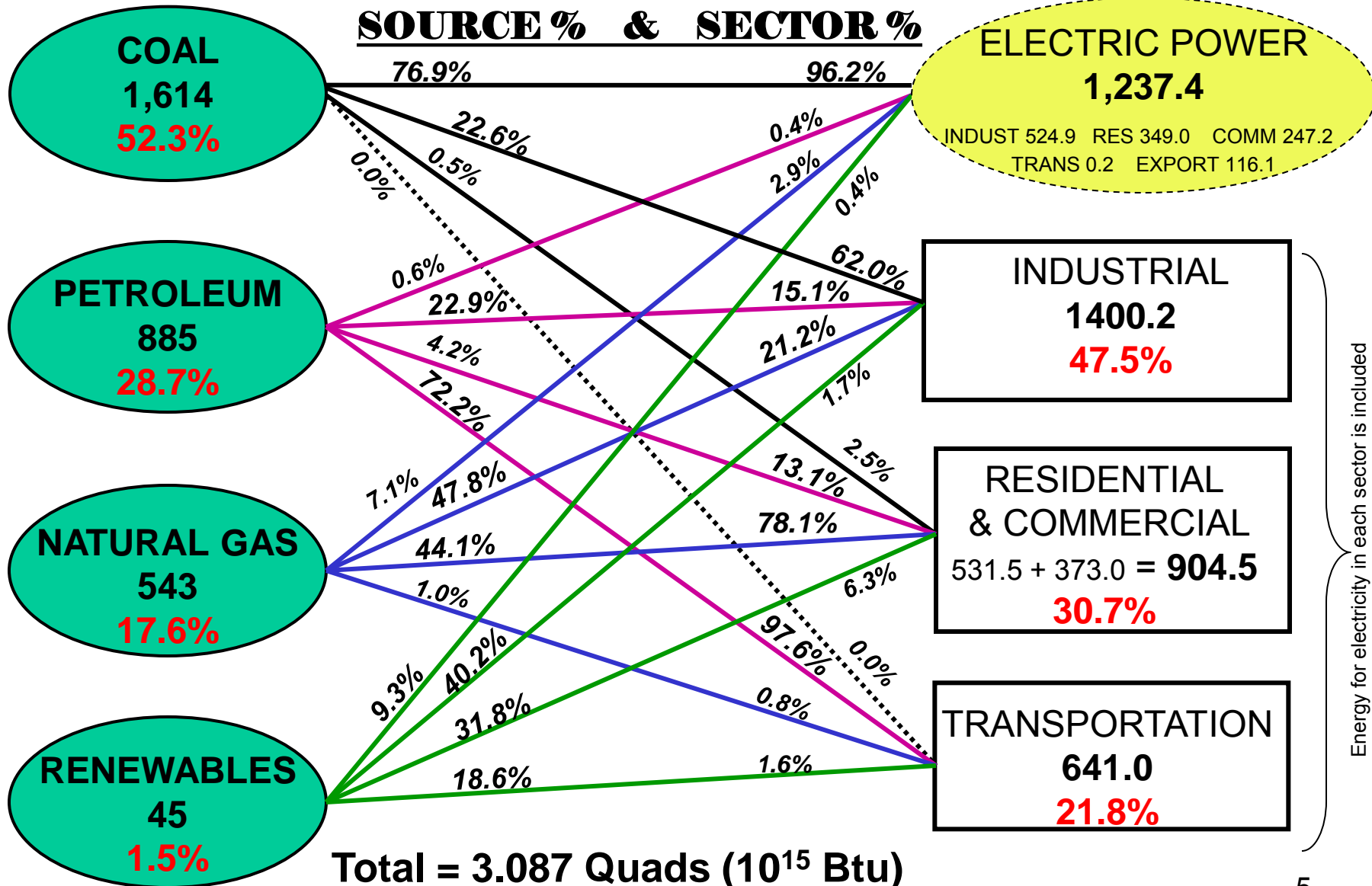
We are the model of energy efficiency, (only **Japan** and **Lichtenstein** are better).

Per capita energy is of no value to measure, to reduce your per capita consumption you need only add population.

It is what you do with the energy that matters.

Indiana Primary Energy Consumption

Source & Sector, 2004 (Trillion Btu, 10^{12} Btu)



Net inter-state flow of electricity/losses = -142 (export)

http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=IN



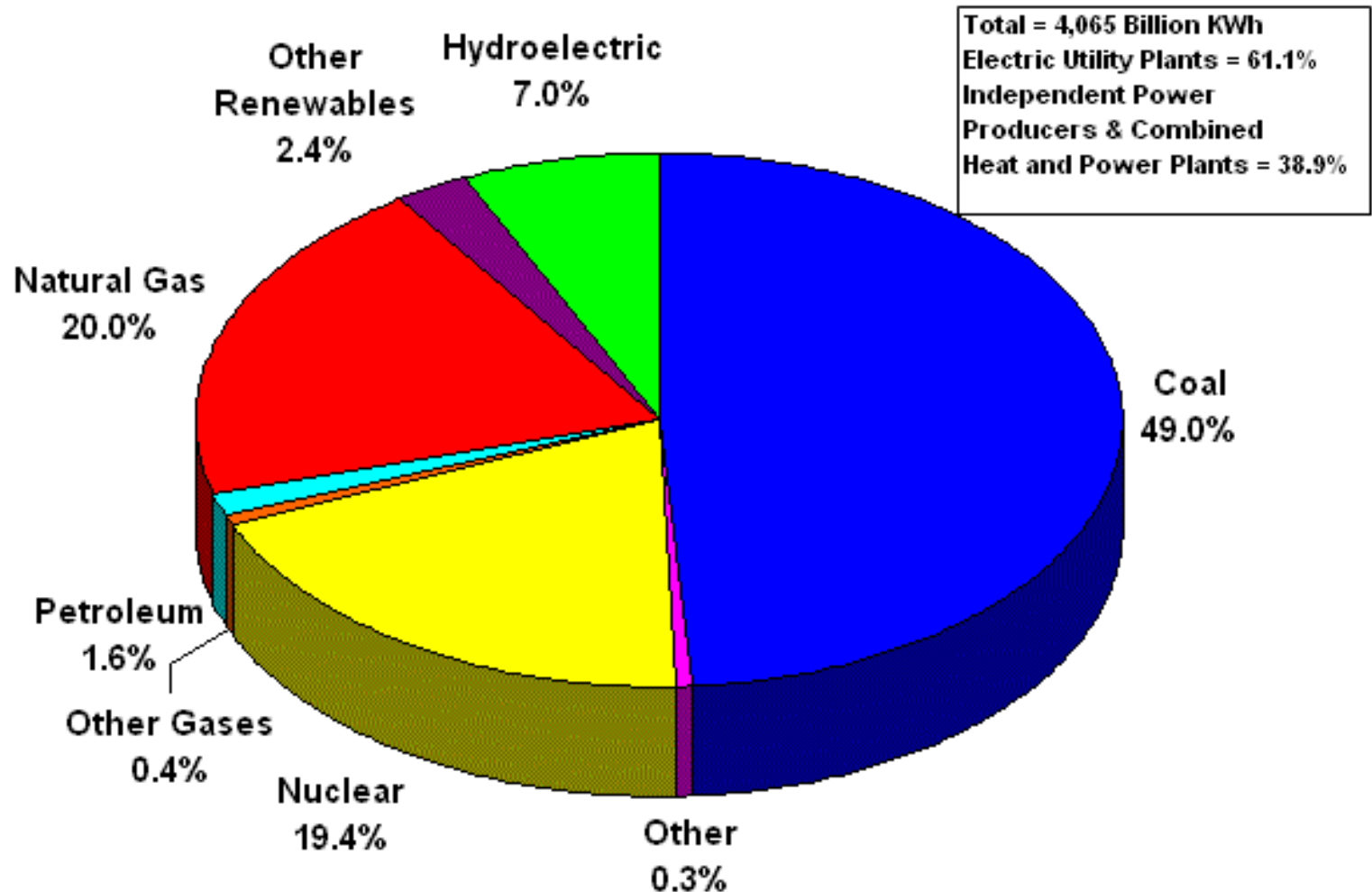
Elements of Indiana's Energy Supply

Adequate

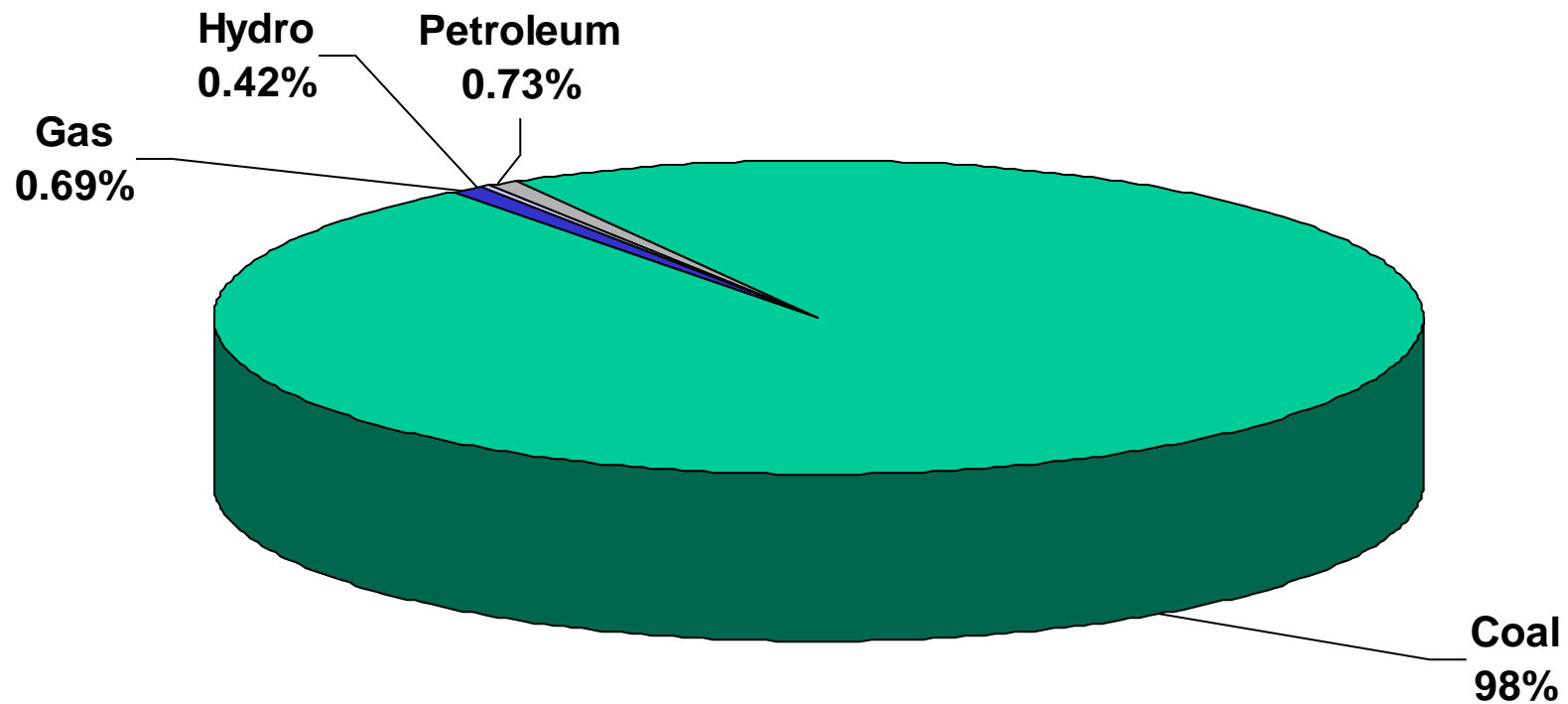
Reliable

Affordable

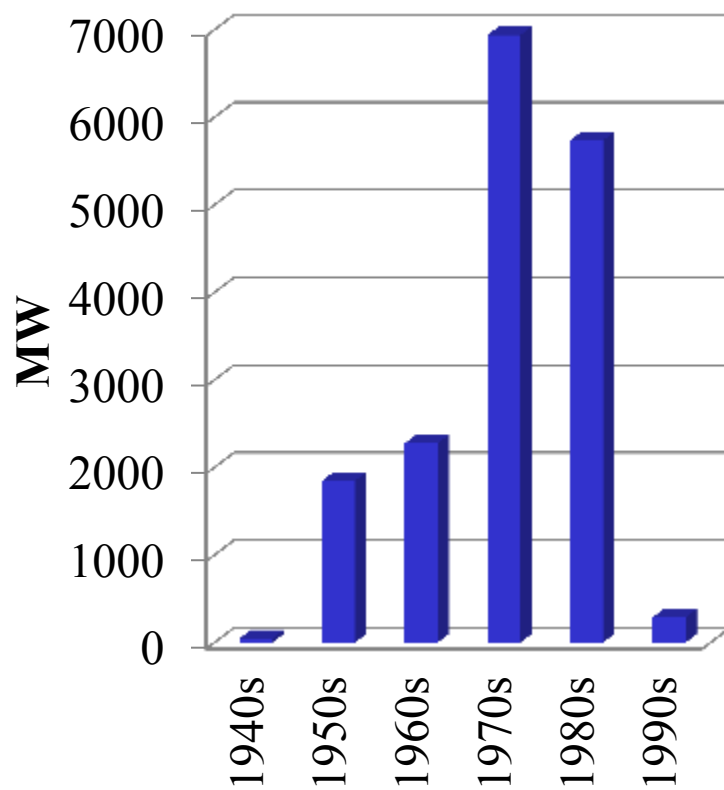
U.S. Electric Power Mix



Indiana Electricity Mix






























Indiana Price 5.5¢



	# of units	MW
1940s	1	45
1950s	20	1847
1960s	12	2275
1970s	17	6938
1980s	9	5736
1990s	2	289



PUBLIC EXPECTATIONS Sources of Electricity 15 Years From Now		GOVERNMENT PROJECTIONS*		
		2007	2020	2030
Solar energy	 72%	0%	 0.1%	 0.2%
Wind energy	 65%	 0.8%	 2.1%	 2.4%
Natural gas	 59%	 21.5%	 17.6%	 14.1%
Hydropower	 54%	 5.8%	 6.4%	 5.8%
Nuclear energy	 53%	 19.4%	 18.4%	 17.5%
Oil	 46%	 1.6%	 1.3%	 1.3%
Coal	 40%	 48.6%	 49.9%	 54.2%

*Source: Energy Information Administration Annual Energy Outlook 2008



Wind Developments

Project Name	Counties	Developer	Rated Capacity (MW)	Construction Schedule	Status
Benton County Wind Farm	Benton	Orion Energy	130	Completed Spring 2008	Completed
Fowler Ridge Phase 1	Benton	BP Alternative Energy & Dominion	400	To be completed by end of 2008	Under construction
Hoosier Wind Project	Benton	enXco	100	2009	Pending w/ PPA
Fowler Ridge Phase 2	Benton	BP Alternative Energy & Dominion	350	Begin early 2009	Approved
Tri-County Wind Energy Center	Tippecanoe, Montgomery, Fountain	Invenergy	300-500	Begin 2010	Proposed
Meadow Lake Wind Farm	Benton, White	Horizon Energy	600-1000	Begin 2010	Proposed
	Randolph	Horizon Energy	100-200		Proposed
	Howard	Horizon Energy	200		Proposed



Indiana Utility Wind Projects

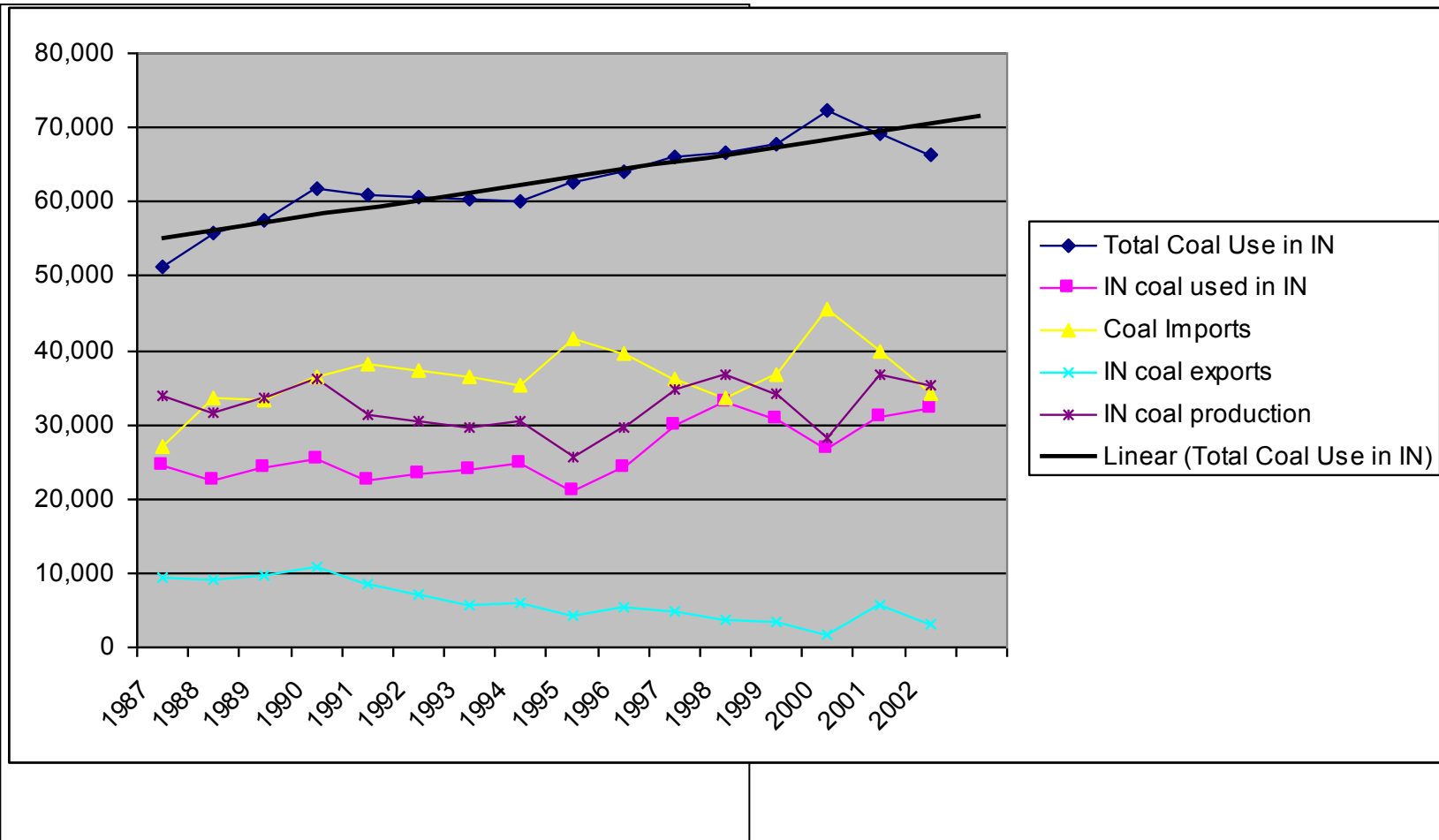
Utility	Project	State	MW	Status
Duke Energy	Benton County Wind Farm	IN	100	Operational
SIGECO	Benton County Wind Farm	IN	30	Operational
WVPA	AgriWind	IL	8	Operational
Indiana Michigan	Fowler Ridge	IN	100	Approved
NIPSCO	Buffalo Ridge	SD	50	Approved
NIPSCO	Barton Windpower	IA	50	Approved
IPALCO	Hoosier Wind	IN	100	Pending





Coal Use Trend

Indiana coal consumption growing much faster than
Indiana coal production



Evolution of the Coal Power Plant

Yet the electricity per ton of coal input stays level

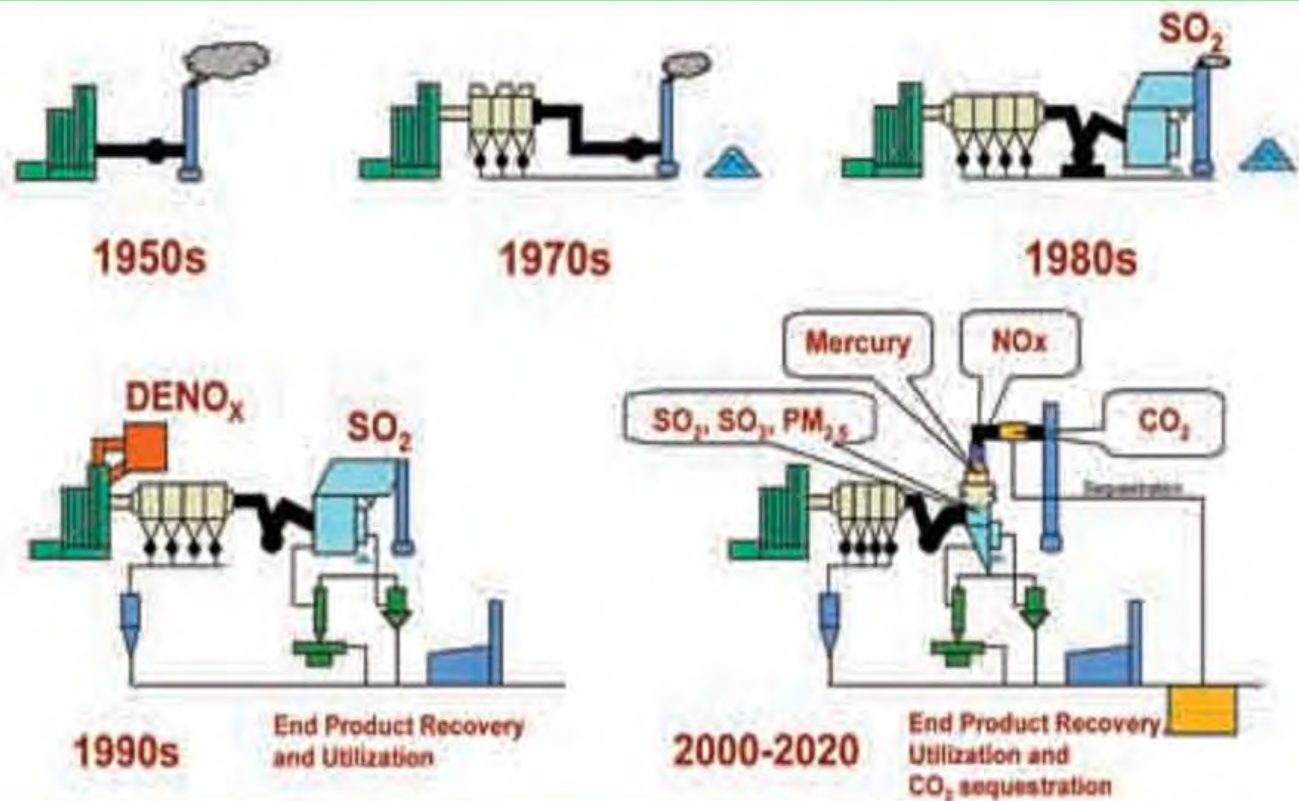


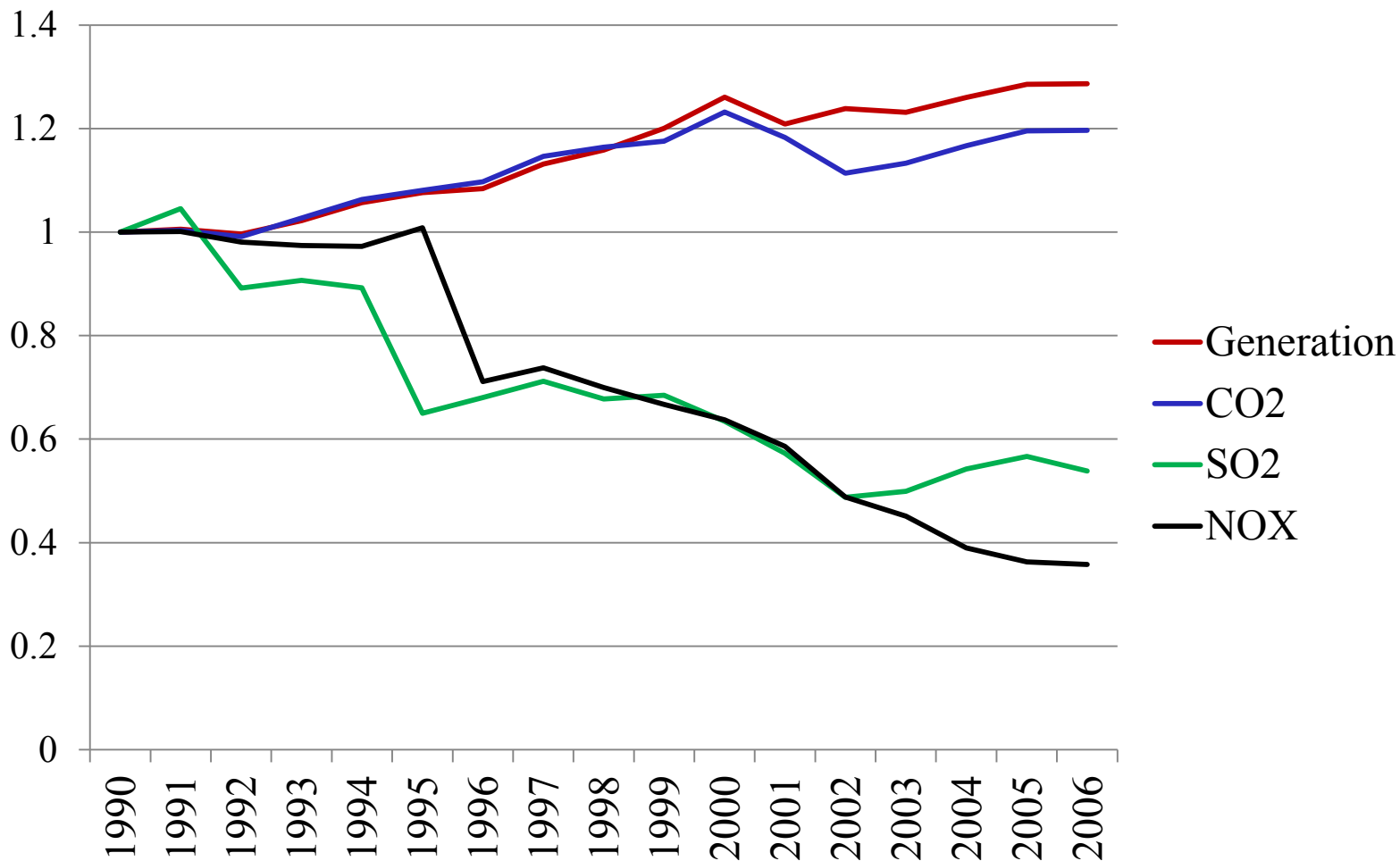
Figure ES-1

Evolution of Coal Fired Power Plant Emissions Capture²

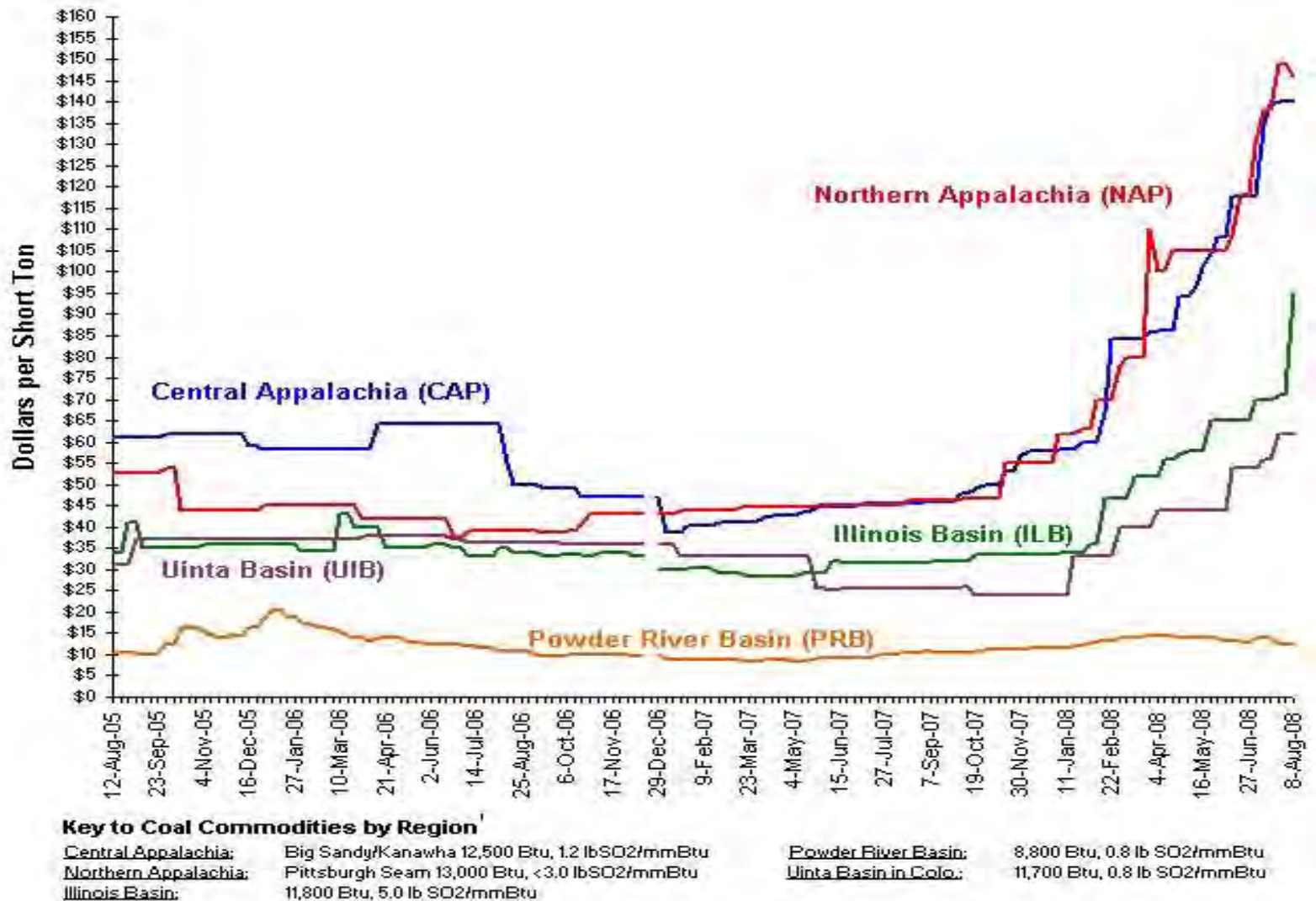
Emissions Trends for Indiana

Electricity Industry

(normalized to 1990 values)

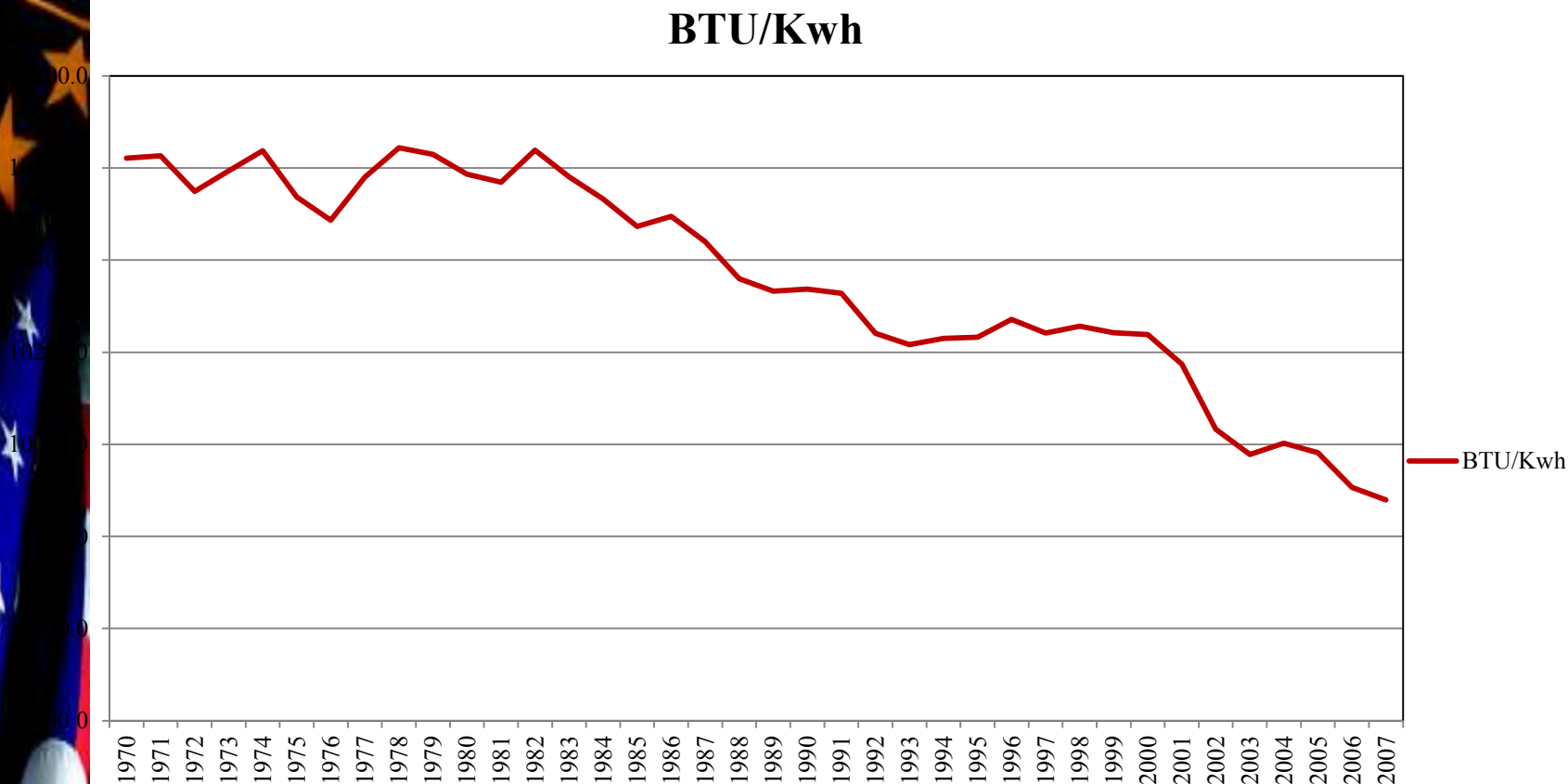


Coal Spot Price



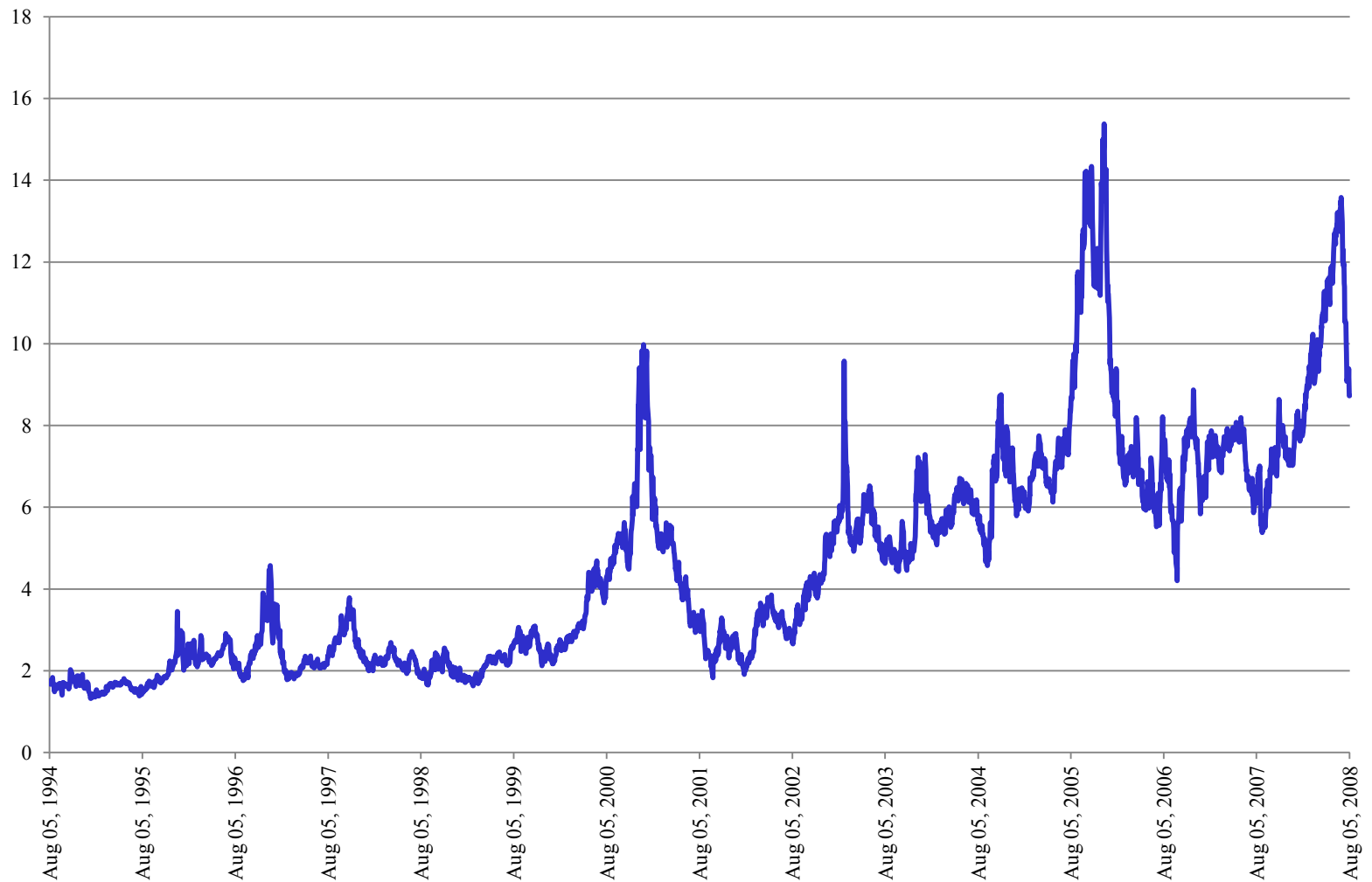
Source: Energy Information Administration

The production of a KWh of electricity even with the added environmental equipment and its parasitic load, takes 9% less energy than it did 35 years ago





Natural Gas Futures (\$/mmBtu)

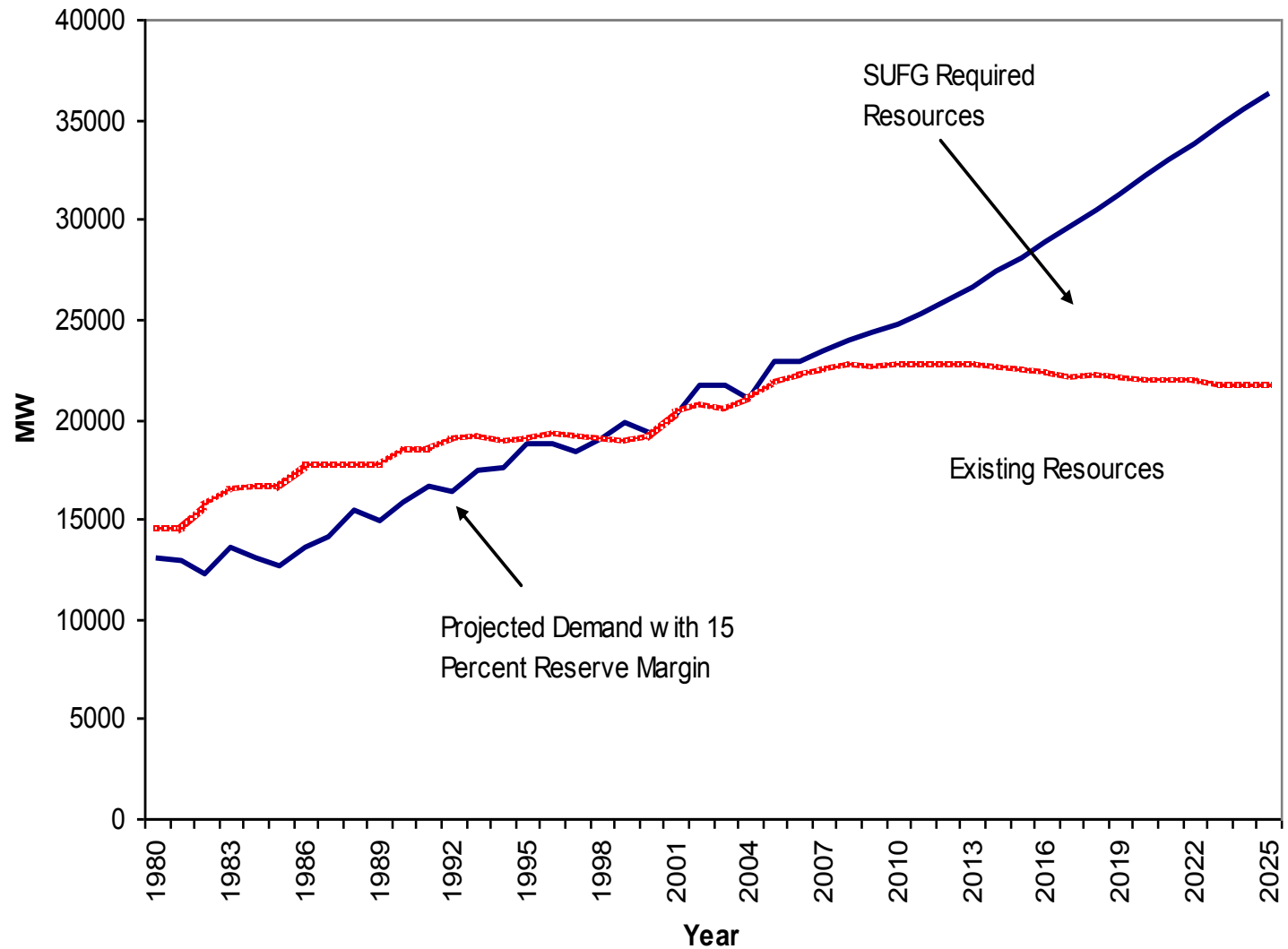




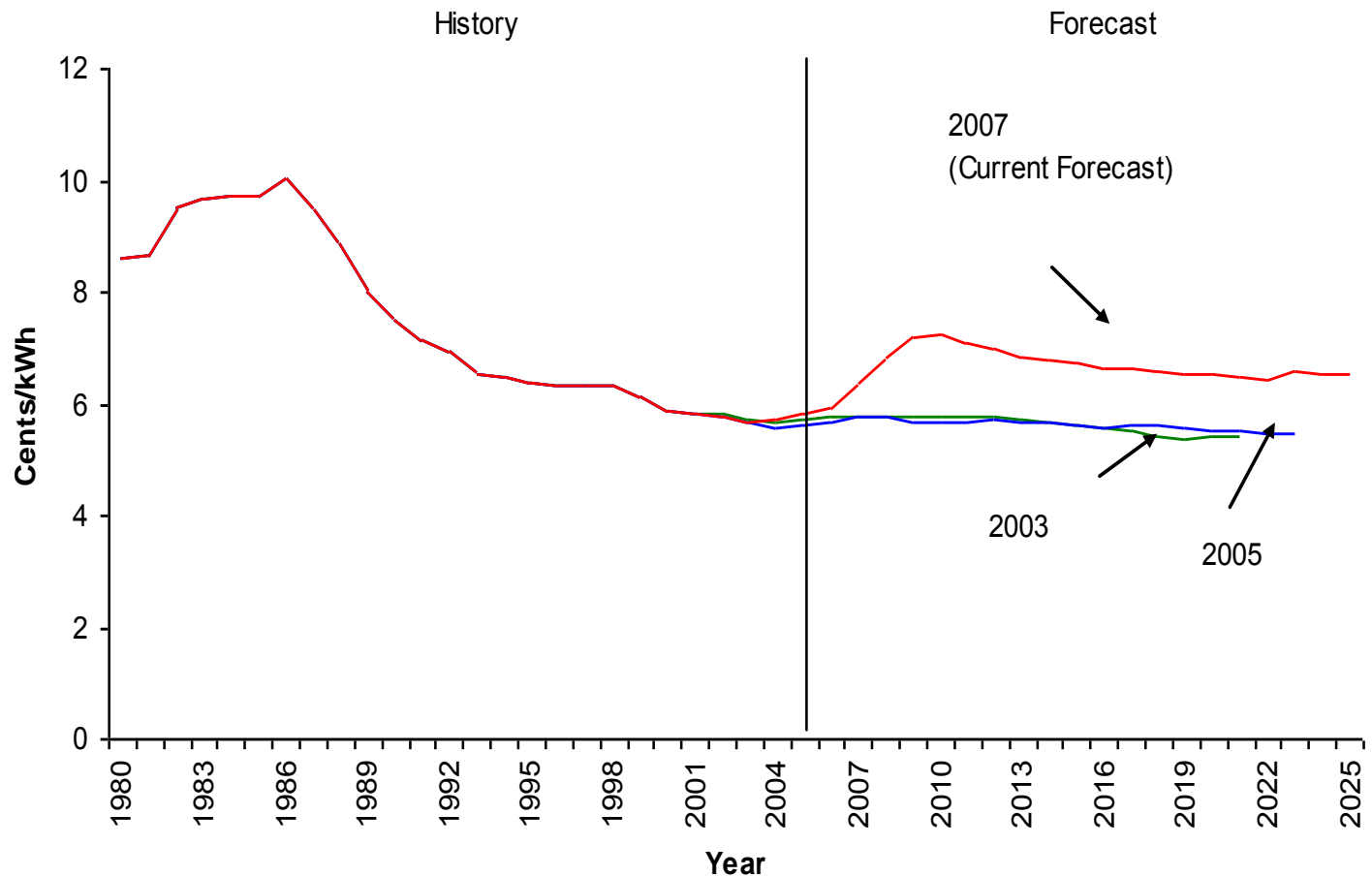
SUFG Forecast Highlights

- ❑ **Significant** real electricity price increase through **2012**, then leveling off
- ❑ Electricity requirements and peak demand **projections are higher** than the previous forecast in the later years of the forecast
- ❑ **Industrial** electricity consumption is projected to grow **faster** than previously projected

Indiana Resource Requirements



Indiana Real Price Projections (2005 \$)



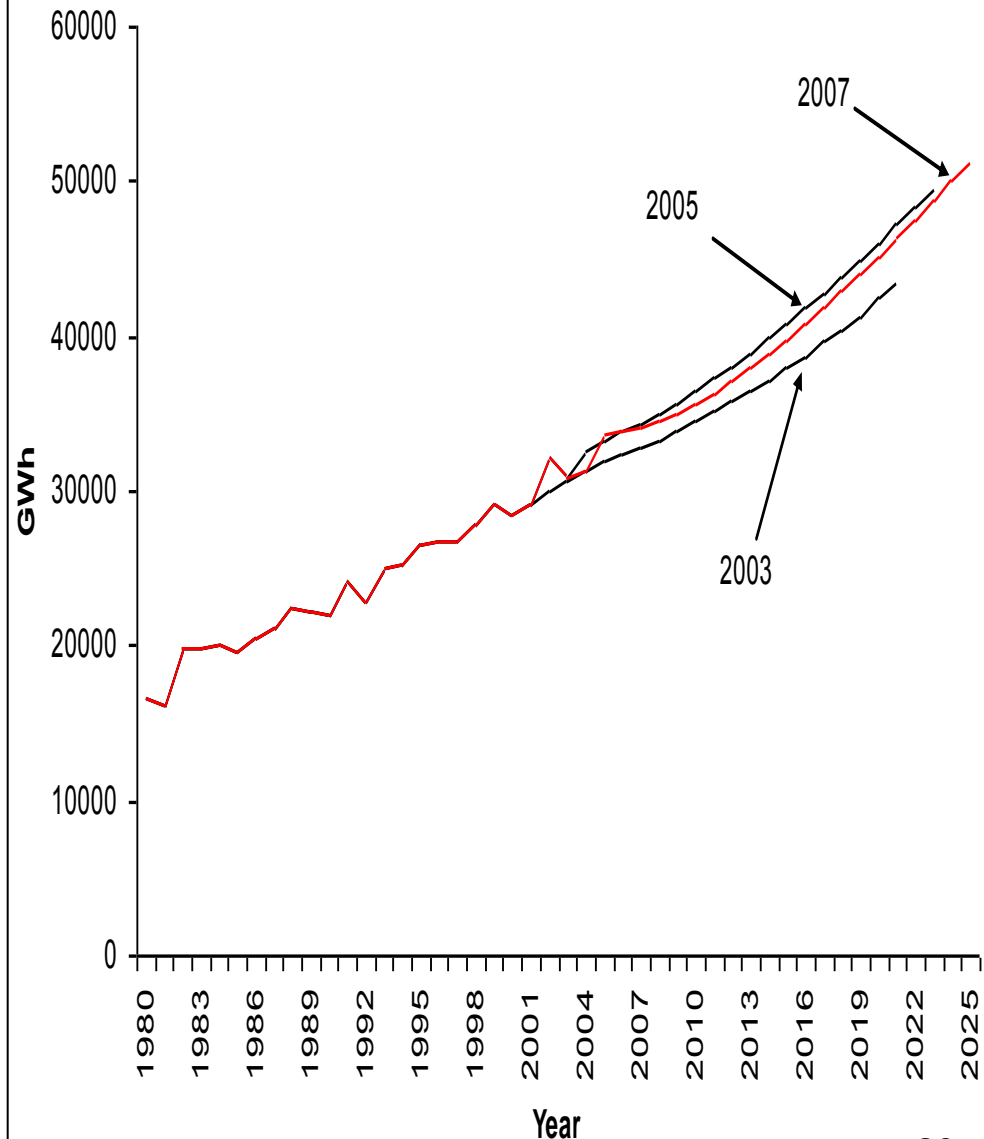
Residential Electricity Sales

Estimated from:

- demographics
- households
- household income
- energy prices

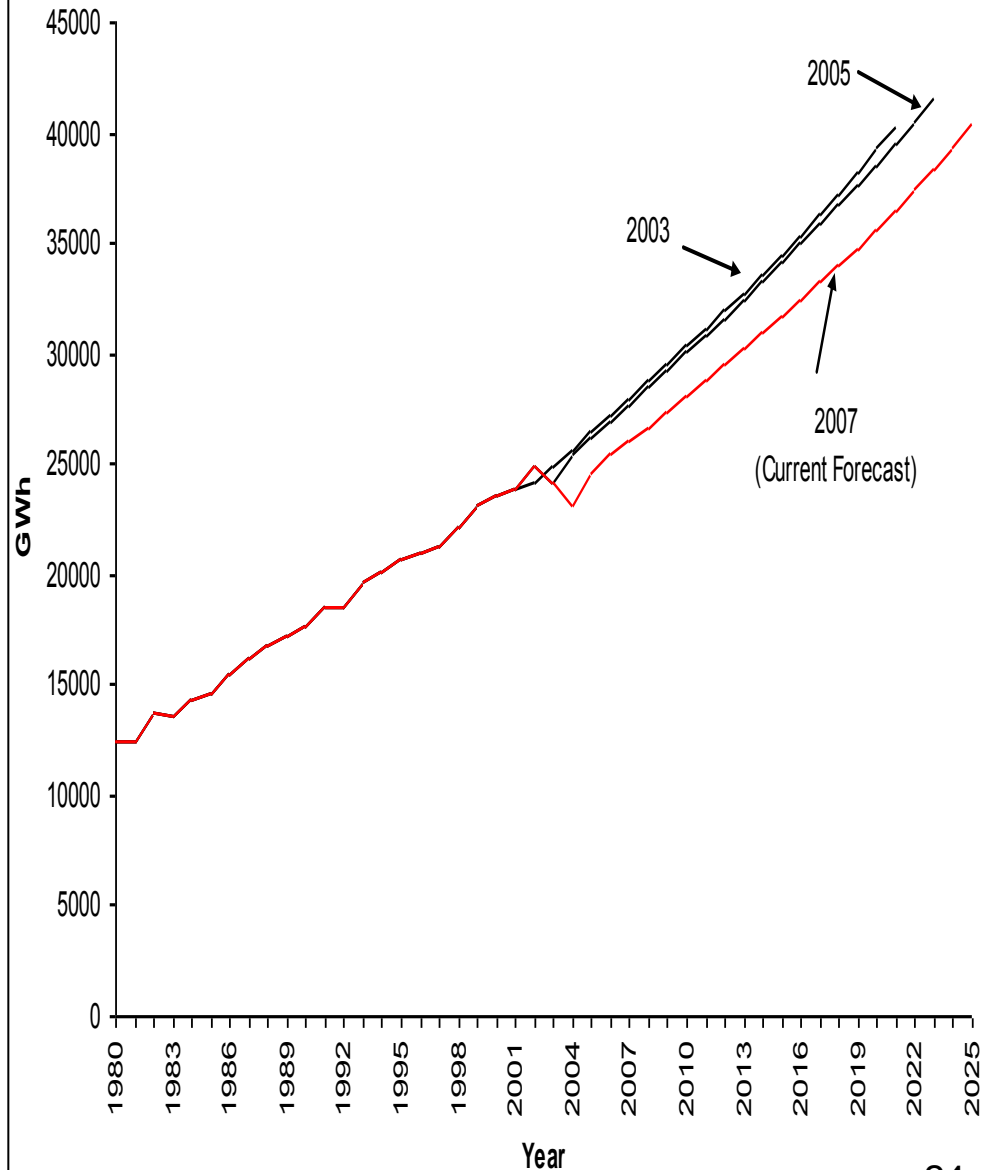
Growth rates

- 2007 forecast: 2.21%
- 2005 forecast: 2.22%
- 2003 forecast: 1.95%



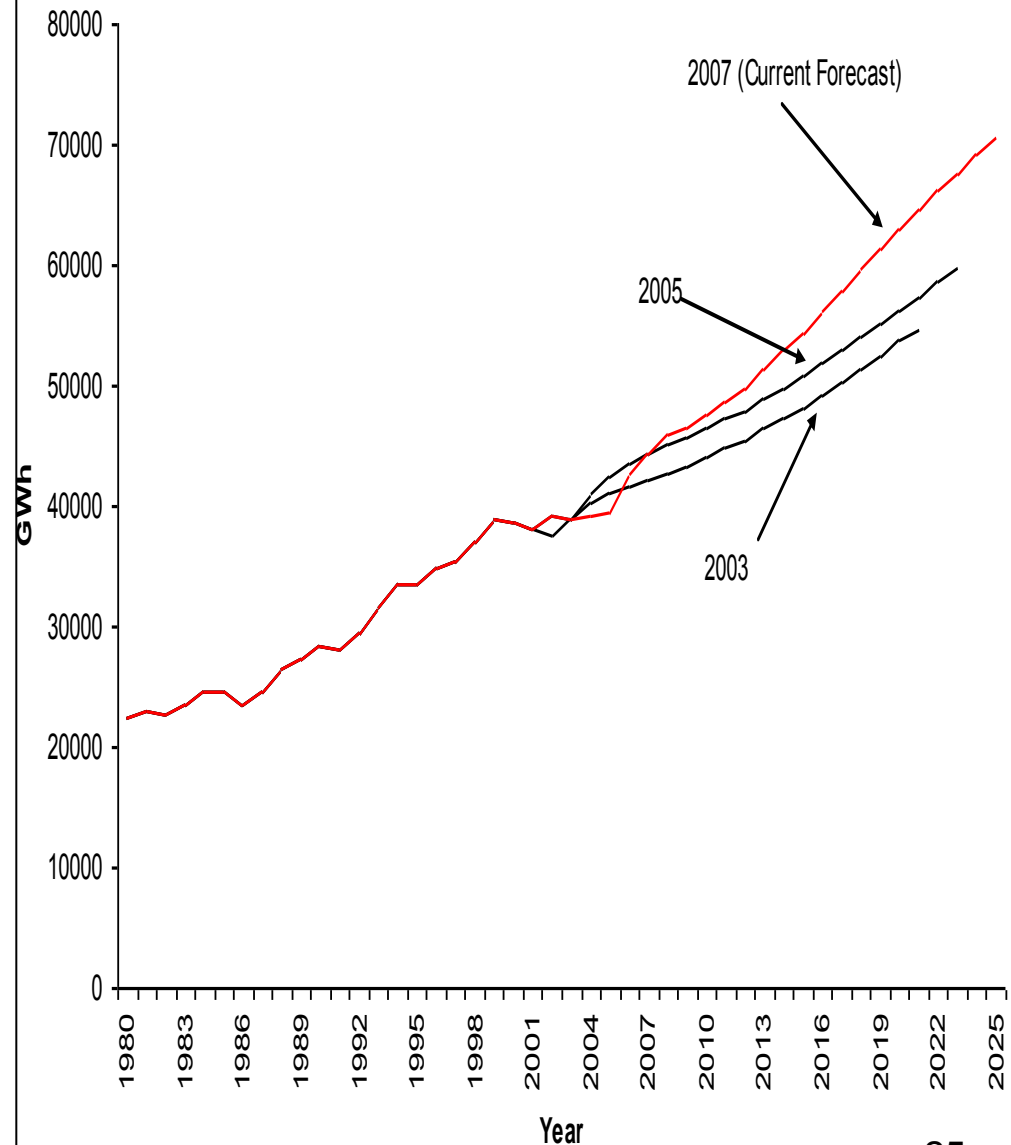
Commercial Electricity Sales

- ☐ Estimated from:
 - ☐ floor space inventory
 - ☐ end use intensity
 - ☐ employment
 - ☐ energy prices
- ☐ Growth rates
 - ☐ 2007 forecast: 2.46%
 - ☐ 2005 forecast: 2.61%
 - ☐ 2003 forecast: 2.71%



Industrial Electricity Sales

- ☐ Estimated from:
 - ☐ GSP by industry
 - ☐ energy prices
- ☐ Growth rates
 - ☐ 2007 forecast: 2.67%
 - ☐ 2005 forecast: 1.99%
 - ☐ 2003 forecast: 1.97%

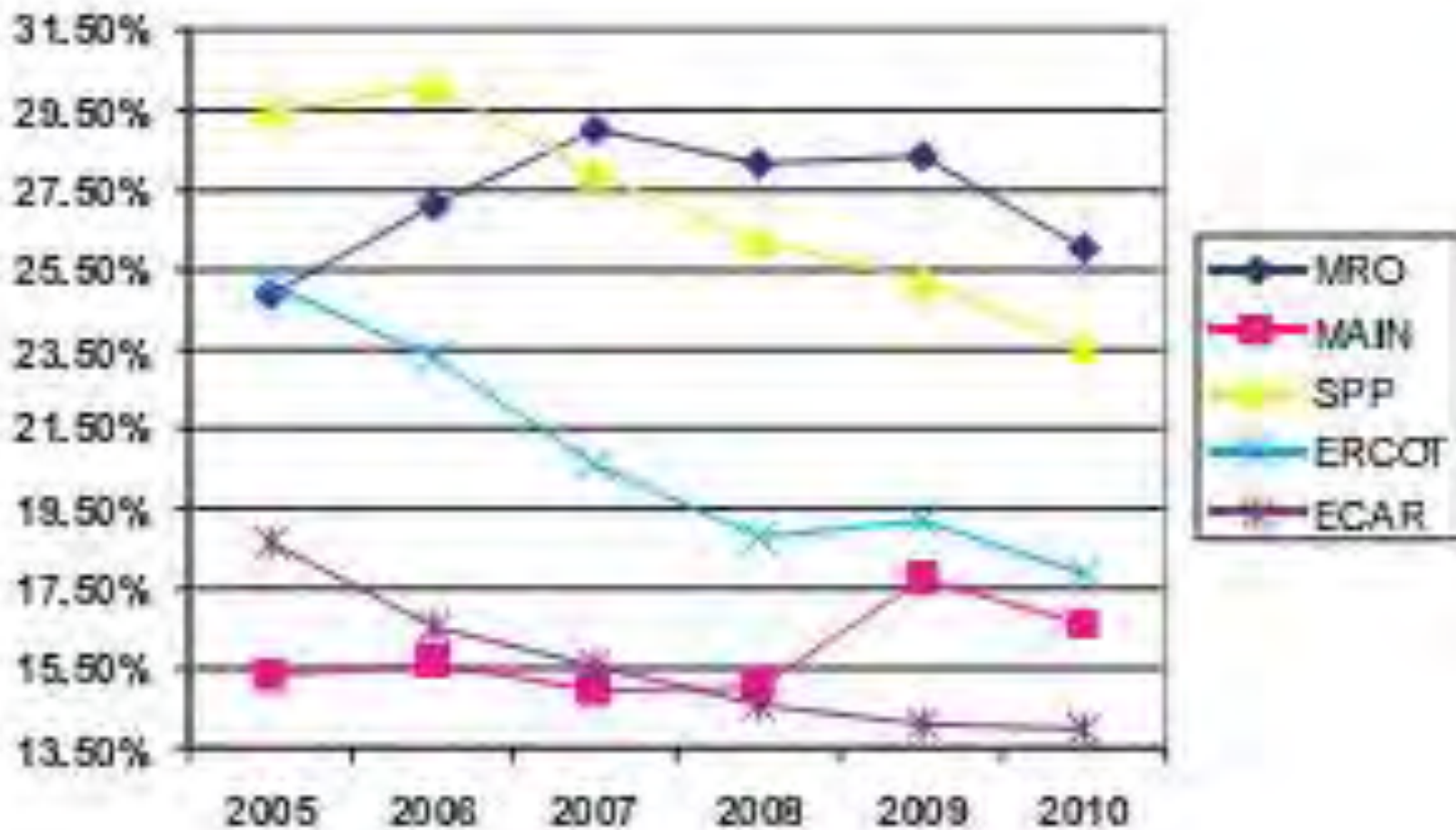


The image shows a vertical strip of the Indiana state flag on the left side of the slide. It features a blue field with a yellow torch in the center, surrounded by yellow stars. The word "INDIANA" is written in yellow at the top. Below the torch, there are red and white stripes.

Growth in Electricity Use

- ❑ Economic development
 - ❑ **Toyota** adds production at Lafayette **SIA** plant
 - ❑ **Honda** announces new plant near Greensburg
 - ❑ Several new **ethanol** production facilities
- ❑ Suppliers will increase production and the suppliers' suppliers will increase production
 - ❑ e.g., an increase in automobiles may result in an increase in steel. Indiana is **#1 steel producer.**

Declining Reserve Margins



Source: Megawatt Daily, January 3, 2006



Fuel Sources for New Resources

☐ Coal

- ☐ Environmental permitting, construction time

☐ Natural gas

- ☐ Fuel cost

☐ Nuclear

- ☐ Permitting, public opposition, construction time

☐ Wind

- ☐ Limited resource, intermittent supply

☐ Solar

- ☐ Limited resource, cost, intermittent supply

☐ Biogas

- ☐ Limited resource

The Indiana state flag is partially visible on the left side of the slide. It features a blue field with a yellow torch in the center, surrounded by yellow stars. The word "INDIANA" is written in yellow at the top. The bottom of the flag shows red and white stripes.

Indiana Chamber of Commerce Energy Leadership Elements

- A diversified fuel mix including clean coal technologies, natural gas, nuclear and renewable energy sources
- Investment in new energy technologies
 - such as the fuel cell
- Assessment of our electric power infrastructure, including transmission and distribution capabilities



Indiana Chamber of Commerce

Energy Leadership Elements

- Sensible regulatory controls that promote the responsible building of new electric power stations
- Energy efficiency and conservation

