"COAL AND ENERGY IN THE 21ST CENTURY"

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The Coal Industry Today – Reserves

- **Coal is mined in 26 states**
- **Total domestic coal resources are 4 trillion tons.**
- **Demonstrated coal reserves are 507 billion tons.**
- **Recoverable reserves at 60% are about 304 billion tons.**
- **At current consumption, a 270-year supply.**

The Coal Industry Today - Structure

- **Production is increasing to record levels, but the numbers of companies, mines, and workers are declining.**
- **1,800 mines . . . 600,000 tons each . . . 80,000 workers.**
- **Productivity up 300% since 1970.**
  - **48 tons per miner per 8 hour shift.**
- **Industry consolidation.**
- **Top 10 companies produce over 60%.**

Coal/Railroad/Utility Connection

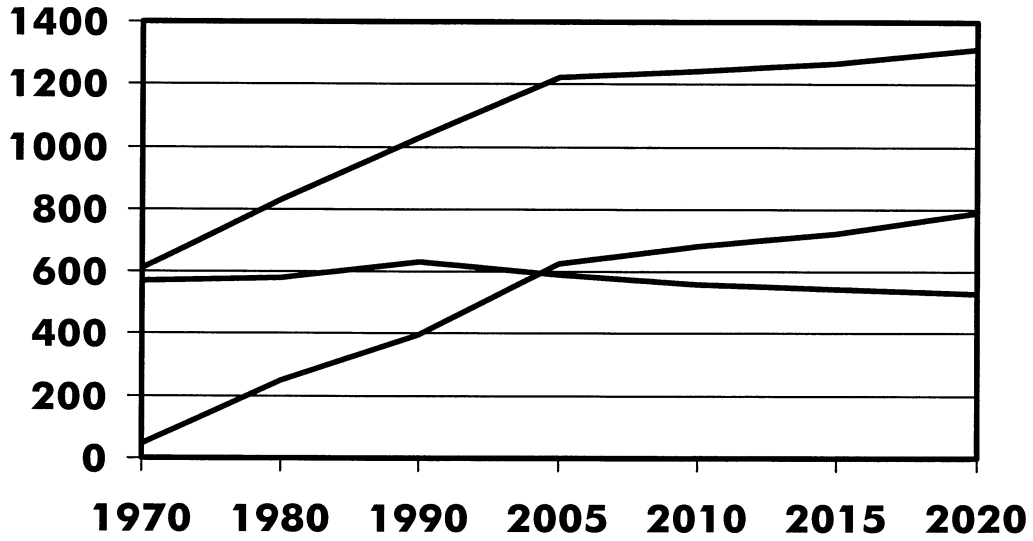
- **For the rail industry, coal represents:**
  - **Nearly 25% of total revenues.**
  - **Approximately 40% of total freight tonnage.**

- **For the utility industry coal represents:**
  - **56.3% of total electric output.**
  - **85% of U.S. coal goes to the utility market.**

Production & Consumption (1999)

Production:	**East:**	**535.1 million**
	West:	**565.0 million**
	Total:	**1,099.1 billion**
Consumption:	**Coking Coal:**	**28.1 million**
	Industrial/Retail:	**74.2 million**
	Exports:	**57.2 million**
	Electricity:	**945.0 million**
	Total:	**1,104.5 billion**

Coal Production by Region, 1970-2020



Coal's Economic Impact

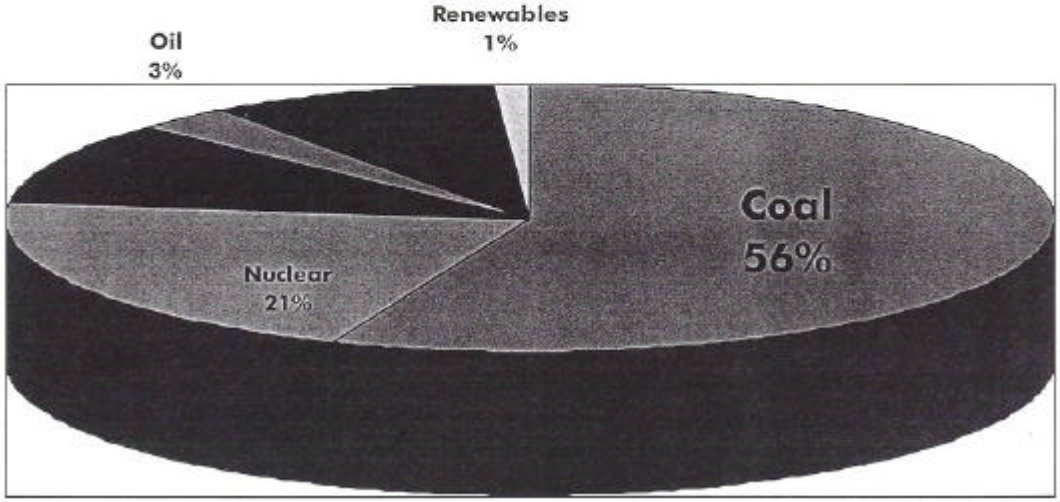
DIRECT AND INDIRECT

Business income	93.4 billion
Wages	46.5 billion
Federal Taxes	18.3 billion
State Taxes	9.0 billion
Jobs	1.6 million
Total Impact:	***167.0 billion***

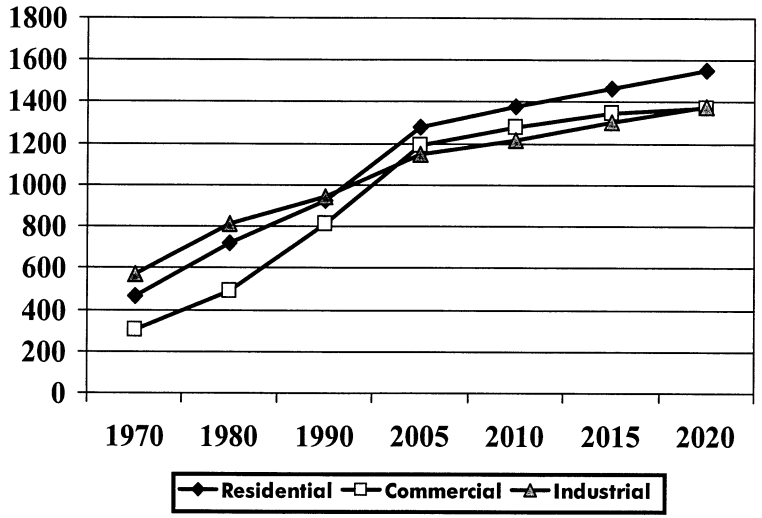
Coal and Electricity

- **Electricity and food are the two largest commodities bought and sold in America. Electricity sales amount to over $200 billion each year.**
- **Electricity demand increased 136% since 1970 and will grow another 34% by 2020.**
- **Coal demand to generate electricity has increased 191% since 1970, and will grow another 20% by 2020.**
- **Since 1970, utility coal consumption has nearly tripled, but power plant emissions have been cut by one-third.**

Electrical Generation by Fuel Source -- 1999

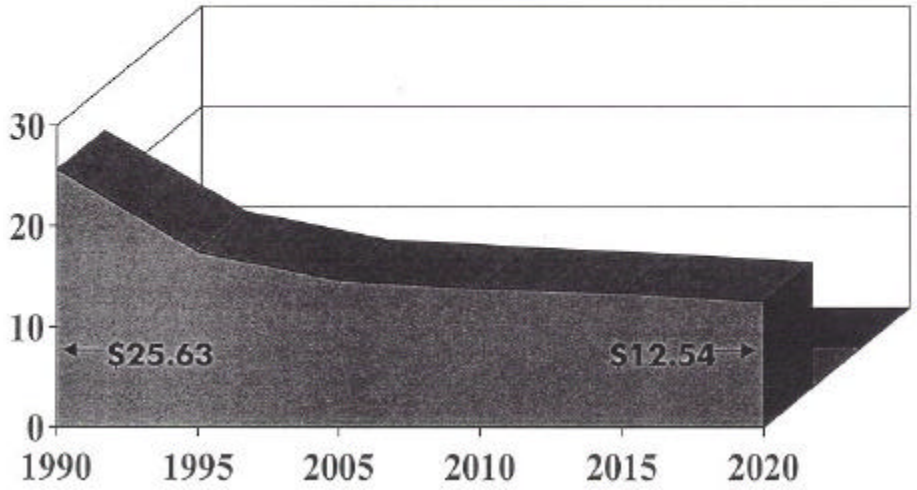


Annual Electricity Sales by Sector, 1970-2020 (billion kilowatthours)



Average Minemouth Price of Coal, 1990-2020

(1998 Dollars per Short Ton)



Comparative Electricity Costs by Source

- **2.2 cents per kilowatt hour for coal.**
- **2.2 cents for hydro-electric.**
- **3.9 cents for nuclear.**
- **4.7 cents for gas.**
- **12.5 cents for wind and biomass.**
- **15.3 cents for solar.**

Reported system costs -- Southern California Edison

Renewable Energy Issues

- **Higher Costs.**
- **Technical Limitations.**
- **Land Use.**
- **Environmental.**
  - **Bilmass**
  - **Wind**
  - **Solar**

Major Challenges Facing Coal

- **We have failed to educate people about the benefits of coal and electricity and our environmental progress.**
- **Lack of knowledge and misperceptions lead to poor public image.**
- **Poor image leads to political problems.**
- **Coal is an easy target for environmental and media critics.**
- **Adverse decisions in the political arena can restrict our ability to mine and use this abundant domestic resource.**

Earth Day 2000

Environmental groups will launch the "Clean Energy Agenda" campaign to eliminate the use of fossil fuels.

"The first of these annual campaigns will demand a swift transition from fossil fuels and nuclear power to a system based on the efficient use of clean renewable energy."

Dennis Hays - Earth Day Founder

Major Policy Issues

- **Mountain Top Mining.**
- **Proposed Black Lung Regulations.**
- **EPA Regulatory Proposals:**
  - **Regional Haze.**
  - **Ozone Transport/Nox**
  - **P.M./Ozone.**
  - **Mercury.**
  - **Toxic Release Inventory.**
  - **Hazardous Designation for Fly Ash.**
- **Global Climate Change/Kyoto Protocol.**

Kyoto Protocol

- **Mandatory emissions reduction for OECD countries, Eastern Europe, Russia.**
- **No requirements for developing nations where emissions are increasing.**
- **For the U.S. - 7% below 1999 levels by 2008 -- a 40% reduction in energy use.**
- **Higher energy costs for American consumers.**
- **A 60% drop in coal use.**
- **$21.8 billion to retrofit existing power plants.**
- **61 coal plants will be shut down.**
- **36% of existing coal-fired capacity.**
- **19% shortfall in electric capacity in 2010.**
- **If Kyoto is not ratified, various EPA regulatory proposal would amount to backdoor implementation of the treaty.**

According to Resources Data International (for EEI)

For Coal to Prosper in the 21st Century . . . Technology is Key

Mining Industry of the Future:
DOE/National Labs/Industry/Universities

- **Expansion of the resource base by improving discovery and recovery.**
- **Streamlining production – less impact on air, water, and land resources.**
- **Advanced reclamation and water quality techniques.**
- **Halving energy use in production.**
- **Double productivity.**

Technology is Key

U.S. Department of Energy "Vision 21"

- **Build on the success of the Clean Coal Technology**
- **Demonstration program . . . 33 to 45% efficiencies.**
- **Create coal-based energy complexes that can deliver:**
  - **electricity at 60% efficiency rate.**
  - **natural gas, other fuels and fuel additives.**
  - **chemical feed stocks.**
  - **carbon sequestration.**
  - **near zero emissions.**
- **According to the Energy Information Administration, every 1% increase in thermal efficiency results in a 3-4% reduction in CO2.**

For Coal to Prosper in the 21st Century, We Must Improve Our Communications

- **People don't understand how our energy systems work.**
- **People don't know about the importance of coal.**
- **Industry must take a positive message to the people.**
  - **Coal is essential.**
  - **Coal is affordable.**
  - **Coal is increasingly clean.**
  - **Technology promises continued progress.**

We CAN Improve Coal's Image

Opinion Research shows:

- **Negative views are driven by a lack of knowledge.**
- **These views are not strongly held.**
- **People believe in technology.**
- **People support a balance between economic and environmental objectives.**

Situation Analysis

- **Electricity demand will grow nearly 2% per year.**
- **Nuclear and hydro capabity will decline.**
- **Renewables will serve only niche markets and will capture only small market share.**
- **That leaves natural gas and coal as only options.**
- **Gas will provide as must as 70% of new demand.**

Coal . . . great potential . . .
. . . but even greater challenges.

Getting from Here to There

- **Coal's problems relate to environmental concerns, public perception, and politics.**
- **Tremendous progress has been made in both production and utilization.**
- **We must further reduce our impact on the environment.**
- **Coal is the fuel of choice economically.**
- **Coal MUST become the fuel of choice environmentally.**