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## Executive Summary

The Edison Electric Institute (EEI) is the premier trade association for U.S. shareholder-owned electric companies. Our U.S. members serve nearly 70 percent of all electric utility ultimate customers in the nation, and generate more than 70 percent of the electricity produced by U.S. electric utilities.

Coal and electricity are inextricably linked to the economic health of the nation. Coal is the fuel for more than half of our country's electric generation, and electric generation drives economic growth. Electric demand, coal-fired generation and GDP growth are all projected to grow at a steady pace to 2025 and beyond.

The projected increase in coal use will be accompanied by continued improvement in air quality. Overlapping requirements to reduce sulfur dioxide, nitrogen oxides and mercury from coal-fired plants can be most effectively addressed in new legislation consistent with the scope and framework of the Clear Skies Initiative. In order to reduce carbon dioxide ($CO_2$) emissions or carbon intensity, new technologies must be developed that allow cost-effective capture of $CO_2$ emissions, and reliable and cost-effective methods of permanent storage of carbon must be demonstrated at a scale necessary to manage billions of tons of power plant $CO_2$ emissions.

A suite of new technologies will be necessary to meet the U.S.'s future economic growth and national security needs because there are a variety of coals available in the country, and different technologies may be best optimized for particular coal types. Among the technological improvements in coal that are most important to pursue are super-critical pulverized coal and integrated gasification combined cycle technology. With regard to financial and tax mechanisms necessary to bring these technological improvements to market, EEI supports tax credits, loan guarantees and other measures that would provide incentives for the development of these technologies. EEI also supports more rapid amortization of pollution control equipment. As a general matter, it is essential to have an effective state-federal working relationship between state regulatory commissions and the Federal Energy Regulatory Commission on all regulatory matters relating to the construction and operation of new coal-fired generation facilities to provide the stability and certainty needed to attract investment in such facilities.

Public policy should encourage rail infrastructure improvements to remedy constraints that cause service delays and poor service. It should facilitate increased rail competition without increasing utility subsidies for other commodities carried by railroads. In addition, reliable electric service and regional electricity markets depend on strong transmission systems to move power instantaneously to where it is needed.

**Coal Consumption and Fuel Diversity**: What are the likely future scenarios for the role of coal-fired generation in the U.S.?

Coal and electricity are inextricably linked to the economic health of the nation. Coal is the fuel for more than half of our country's electric generation, and electric generation drives economic growth. Electric demand, coal-fired generation and GDP growth are all projected to grow at a steady pace to 2025 and beyond:

- The Energy Information Administration (EIA) projects electricity consumption to increase at an average rate of 1.8 percent annually from 2003 to 2025, or about a 50 percent increase. *See Appendix, Figure 1*.
- Coal-based generation is projected to grow from 1.97 trillion kiloWatt-hours (KWH) to 2.89 trillion KWH over the same period, a 47 percent increase. *Id.* Overall, coal consumption is projected to increase at an average annual rate of 1.5 percent. EIA 2005 Forecast. About 90 percent of coal is currently used for electricity generation**.** *Id.*
- GDP is expected to increase about 2.8 percent annually. EIA, Annual Energy Outlook 2005 (Feb. 2005); Statement of EIA Administrator Caruso, Senate Energy and Natural Resources Committee (Feb. 3, 2005).

Coal will continue to play a key role in electric generation due to its reliability, affordability and fuel source security. Most regions in the country are heavily dependent on coal to generate electricity. *See Appendix, Figure 2.* New baseload generation is projected to come from coal and nuclear energy to 2025 and beyond. Between 2004 and 2025, EIA projects that 87 gigaWatts (GW) of new coal-fired generation will be built. EIA AEO 2005 and Caruso statement, *supra*.

EEI member companies are already planning for substantial investment in new, large, baseload coal and nuclear generating plants to respond efficiently to growth demands, environmental requirements, and the expected limited availability and relatively high cost of natural gas. Public data bases indicate that there are currently at least 38 large-scale (500 megaWatts (MW) or more) coal projects totaling 30,197 MW being planned. Twenty-two projects (or 18,247 MW) have been announced, while 16 projects (or 11,950 MW) are undergoing feasibility studies. They all have scheduled online dates between 2006 and 2013. EEI believes that many more such projects are under study but have not yet been announced. These new plants promise to be much cleaner than the ones in today's coal-fired fleet, and they will provide opportunities for new advanced clean coal technologies such as super-critical pulverized coal and integrated gasification combined cycle. Some of these projects may present above-market costs in the short run or financial risks in capitalization, but costs will come down and risks will diminish as new plants are built and improved designs become standardized.

Nuclear energy uprates are estimated to account for an additional 3.5 GW of electric generation. EIA AEO 2005 and Caruso statement, *supra*. However, EEI does not agree

with EIA's projection that no new nuclear plants will become operational between 2003 and 2025, as several consortia are working on new plants.

New natural gas plants will primarily serve a peaking function. Generation from non-hydroelectric renewables – particularly wind energy – is expected to increase as they become more economically competitive and as reliability and transmission issues are addressed. Because of their intermittent nature and the concomitant need for backup generation, renewables resources such as wind and solar energy will be limited in their ability to displace coal plants, nuclear energy and hydroelectric plants in baseload generation. And, while no new hydroelectric generation is expected, the challenge will be to maintain the nation's hydropower resource through relicensing. In short, it is important to recognize that different regions of the country rely on different fuel mixes for their electric generation. *See Appendix, Figure 3.* Secure and diverse electric generation sources are critical to the economy and national security.

**Environmental, Legislative and Regulatory Challenges:** What are the environmental and regulatory challenges associated with the future use of coal for power generation?

The substantial energy and economic advantages that coal provides for electric generation must be balanced by environmental compliance and environmental excellence. The projected increase in coal use will be accompanied by continued improvement in air quality. The 67-percent increase in electricity from coal-fired generation and the 75-percent increase in coal use since 1980 came with a 40-percent decline in sulfur dioxide ($SO_2$) and nitrogen oxides ($NO_x$). *See Appendix, Figure 4.* In addition, controls to reduce $SO_2$, $NO_x$ and particulate matter are reducing mercury emissions by 40 percent. Air emissions and emission rates for $SO_2$, $NO_x$ and mercury are projected to continue their decline even as coal use increases, due to either passage of Clear Skies legislation or implementation of the proposed Clean Air Interstate Rule.

Overlapping requirements to reduce $SO_2$, $NO_x$ and mercury from coal-fired plants can be most effectively addressed in new legislation consistent with the scope and framework of the Clear Skies Initiative. Doing so will provide flexibility and certainty to generators, and ensure the most positive future for coal-fired generation. More onerous proposals would leave many generators with no other choice but to switch to a different fuel source – most likely natural gas. These other proposals and the current regulatory framework threaten fuel diversity because of their costly, duplicative and infeasible requirements, and could unnecessarily increase the demand for natural gas.

As for carbon dioxide ($CO_2$), power **sector** carbon intensity (measured as the ratio of $CO_2$ emissions per kiloWatt-hour generated) declined by 10 percent from 1980 to 2004. Carbon intensity in electric generation is expected to decrease additionally by the equivalent of 3-5 percent by 2012 under the voluntary Power Partners$^{SM}$ program with the Department of Energy. When viewed from a **national** perspective, electric generation carbon intensity (measured as the ratio of $CO_2$ emissions to GDP) and coal-fired

generation carbon intensity are projected to continue to decline due to greater efficiencies in combustion technologies and, ultimately, the ability to capture and store carbon cost effectively. *See Appendix, Figure 5.*

The environmental advantages of advanced clean coal technologies – such as super-critical pulverized coal, integrated gasification combined cycle and FutureGen – are clear, and costs will come down and financial risks will diminish as new plants are built and improved designs become standardized. General Electric's entry into the gasification power plant business provides improved choices and performance "wraps" (*i.e.*, single sources of technology design and equipment supply) for plant owners.

Achieving continual improvement in the environmental performance of our coal-fired generating fleet will require that the nation pursue an aggressive and sustained technology development program. This will require billions of dollars in new investments shared by the public and private sector.

In addition, two criteria must be met in order to reduce $CO_2$ emissions or carbon intensity:

- New technologies must be developed that allow cost-effective capture of $CO_2$ emissions.
- Reliable and cost-effective methods of sequestration (*i.e.*, permanent storage) of carbon must be demonstrated at the scale necessary to manage billions of tons of power plant $CO_2$ emissions.

The most effective way to accomplish these objectives is through significant government support of carbon capture and storage technologies. This includes substantial Department of Energy support of the international Carbon Sequestration Leadership Forum.

**Financial, Tax and Regulatory Improvements:** What technological improvements in coal are most important to pursue? What financial and/or regulatory mechanisms are necessary to bring these technological improvements to market?

<u>Technological Improvements and Financial and Tax Mechanisms</u>

A suite of new technologies will be necessary to meet the U.S.'s future economic growth and national security needs because there are a variety of coals available in the country, and different technologies may be best optimized for particular coal types. Among the technological improvements in coal that are most important to pursue are: 1) super-critical pulverized coal and 2) integrated gasification combined cycle (IGCC). Furthermore, work is underway, in programs such as FutureGen, to develop and commercialize technologies that are expected to achieve ultra-low/net-zero emissions from new coal-fired generating plants. In addition, two criteria must be met in order to reduce carbon dioxide ($CO_2$) emissions or carbon intensity:

- New technologies must be developed that allow cost-effective capture of $CO_2$ emissions.
- Reliable and cost-effective methods of sequestration (*i.e.*, permanent storage) of carbon must be demonstrated at the scale necessary to manage billions of tons of power plant $CO_2$ emissions.

The most effective way to accomplish these objectives is through significant government support of carbon capture and storage technologies.

With regard to financial and tax mechanisms necessary to bring technological improvements such as combustion-based advanced pulverized coal and gasification to market, EEI supports tax credits, enhanced accelerated depreciation and loan guarantees. These incentives would encourage deployment of IGCC technology and other advanced coal-fired generation technology by addressing cost and other issues that have inhibited deployment of these technologies.

Moreover, rapid amortization (from 20 to five years) of pollution control equipment for electric generating units built after 1975 is needed. Under current law this tax treatment is available only for equipment added to generating plants placed in service before 1976. This tax treatment would be a significant economic incentive for utilities to develop and deploy new environmental technologies on generating plants. This would result in emission reductions that would provide real environmental benefits in the use of an abundant domestic resource that may not be realized without tax relief.

Regulatory Improvements

In addition to the transmission infrastructure improvements discussed in response to topic 4, it is essential to have an effective state-federal working relationship between state regulatory commissions and the Federal Energy Regulatory Commission (FERC) on all regulatory matters relating to the construction and operation of new coal-fired generation facilities to provide the stability and certainty needed to attract investment in such facilities.

- Regulators should provide sufficient certainty in their rules and decisions to stimulate long-term investments by avoiding after-the-fact revisions, decisions that implement a "lower of cost or market" approach or decisions that transfer uncompensated risks to utilities. Federal regulators should recognize the retail service obligations of utilities and promote policies consistent with those state-imposed obligations.

- Competitive market rules should not favor one corporate structure, business model or retail regulatory model over another. Many different structures and business models can coexist in a competitive wholesale marketplace provided there are fair rules in place for all market participants.

- Under the Federal Power Act, it is FERC's responsibility to prevent the exercise of market power in competitive wholesale markets and to develop the rules for such markets. Any analysis of market power in wholesale markets should take into account existing commitments and obligations under state law and state policies relating to service obligations, resource procurement, resource adequacy, fuel supply choices and environmental aspects of electric generation.

- Affiliates should be allowed to compete in competitive procurements conducted by regulated utilities to serve their own retail customers. Transactions with affiliates should be conducted in a fair and transparent manner to protect against bias and favor to the affiliate of such a regulated utility.

- A reasonable competitive resource procurement process should be in place that explicitly recognizes both FERC jurisdiction over wholesale transactions and state jurisdiction over retail service, planning, resource adequacy, fuel supply choices, environmental aspects of electric generation, and retail cost-recovery issues.

- Regional market structures should provide accurate price signals to promote efficient investment and ensure long-term resource adequacy. Provisions should be made for long-term resource adequacy that reflects the regulatory and market structures adopted by the states within a region. In competitive markets, this may require market mechanisms to ensure long-term resource adequacy.

Many in the electric utility industry are concerned that regulatory certainty and stability needed to support large investments in new clean coal technologies are lacking. There are many uncertainties about the impact of FERC's new approaches to the analysis of market power in situations where states approve the construction, either by existing utilities or their affiliates, of large baseload plants applying new clean coal technologies. There are also many regulatory uncertainties about how new clean coal technology plants could be financed through long-term purchases or in competitive retail markets. It is essential to resolve these matters in order to plan for the next round of clean coal facilities.

**Transportation and Transmission Improvements:** What improvements in existing transportation or transmission infrastructure are needed to improve the use of coal for power generation?

Because of its bulk nature, coal is generally transported from mines to power plants by rail or over water. Mine-mouth power plants avoid the need to transport coal, but usually require electricity transmission lines to deliver electricity to customers. All electric generation requires a robust transmission grid to assure reliability and liquid wholesale markets for electricity.

Rail and Water Infrastructure

Today, most coal moves in unit trains that shuttle continuously between the mines and the power plants. These 100-120 car utility-owned trains with 100-120 tons of coal per train efficiently shuttle from the coal mine to the power plant without ever being uncoupled. Usually, the service is contracted between the railroad and the power company. Often, particularly in the West, the utility owns the coal cars used.

At the time that Wyoming's Powder River Basin coal resource was opened, the electric industry largely financed transportation development there by entering into long-term, take-or-pay contracts while buying and owning most of the coal cars used in the movement of Powder River Basin Coal.

EEI has long been an advocate of more competition between rail carriers, whether using a build-out from a power plant to a second railroad or the long-planned Dakota, Minnesota & Eastern Railroad to provide a third competitor for origination of coal transportation from Wyoming's coal fields. Competition offers better, more permanent solutions to the current service and pricing issues between railroads and their customers than other alternatives. Mergers in the rail industry have left us with only four major railroads in the nation and fewer in each region, reducing our competitive alternatives.

Coal is the railroads' largest source of revenue and most profitable single commodity. The Staggers Rail Act of 1980, passed in a time of excess railroad capacity, made the explicit public policy decision that coal shipments would cross subsidize other railroad traffic that may have greater volumes, but which provides less revenue, and made it extremely difficult for coal shippers to challenge the reasonableness of their rates.

Today, railroads are faced with capacity constraints. Several utilities have experienced deterioration in the timeliness of coal delivery service. At the same time, utilities, while retaining coal stockpiles, have increasingly become more of a just-in-time user of rail services, and are less able to tolerate delays or missed deliveries.

Public policy should encourage rail infrastructure improvements to remedy constraints that cause service delays and poor service. It should facilitate increased rail competition without increasing utility subsidies for other commodities carried by railroads.

Because the inland waterway system provides another important method of coal transportation, its maintenance and modernization is important to the future use of coal as well.

Transmission Infrastructure

Reliable electric service and regional electricity markets depend on strong transmission systems to move power instantaneously to where it is needed. Many of the measures needed to achieve this were included in the conference report version of H.R. 6 in the 108th Congress. This includes:

1. A mandatory reliability system, with enforcement mechanisms.
2. Federal Energy Regulatory Commission (FERC) backstop siting authority for transmission lines. This is particularly important for coal to assure that coal produced at mine-mouth plants can be delivered to distant load centers.
3. Improved coordination of the federal permitting process for transmission lines. This is particularly important in the West where the federal government controls a large portion of the lands involved, as well as in the East where important transmission facilities may have to cross federal lands.
4. Reform of FERC transmission policies.
5. Repeal of the Public Utility Holding Company Act to make more investment capital available.
6. Tax code changes to increase investment, including enhanced accelerated depreciation (from 20 to 15 years) for electric transmission assets, similar to treatment governing other major capital assets.
7. Support for investment in new technologies to help improve the control and use of existing transmission lines is critically important to promote reliability.

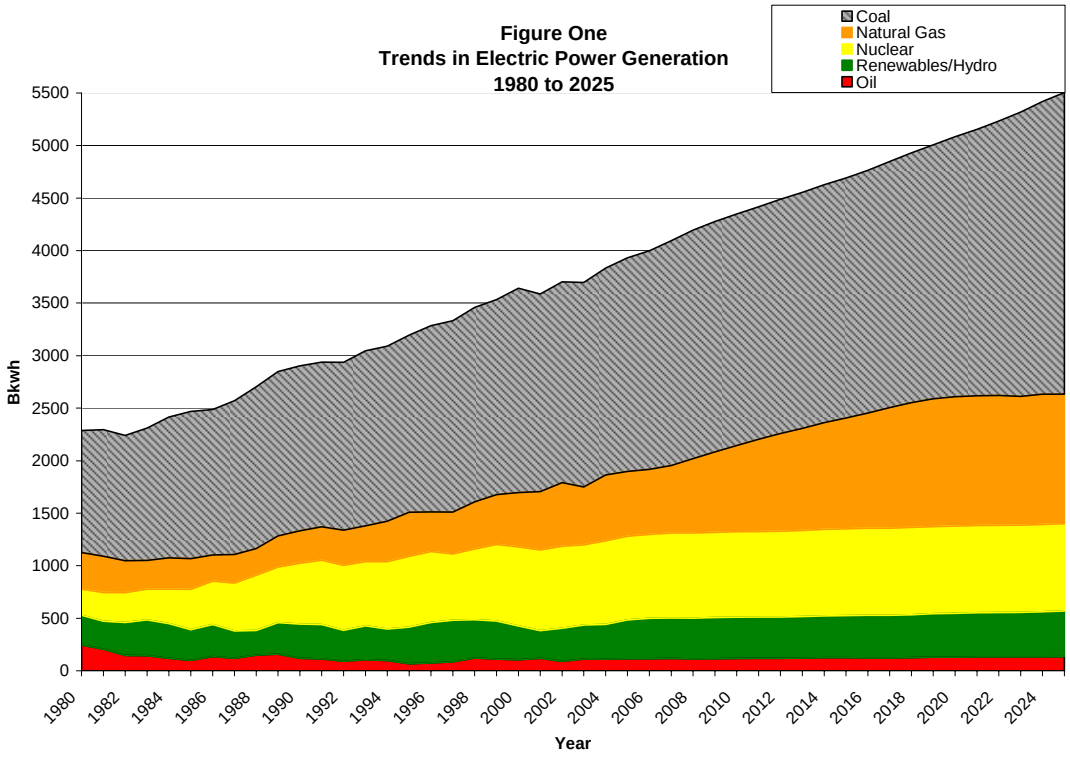
Figure One
Trends in Electric Power Generation
1980 to 2025
Coal
Natural Gas
Nuclear
Renewables/Hydro
Oil
Bkwh
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
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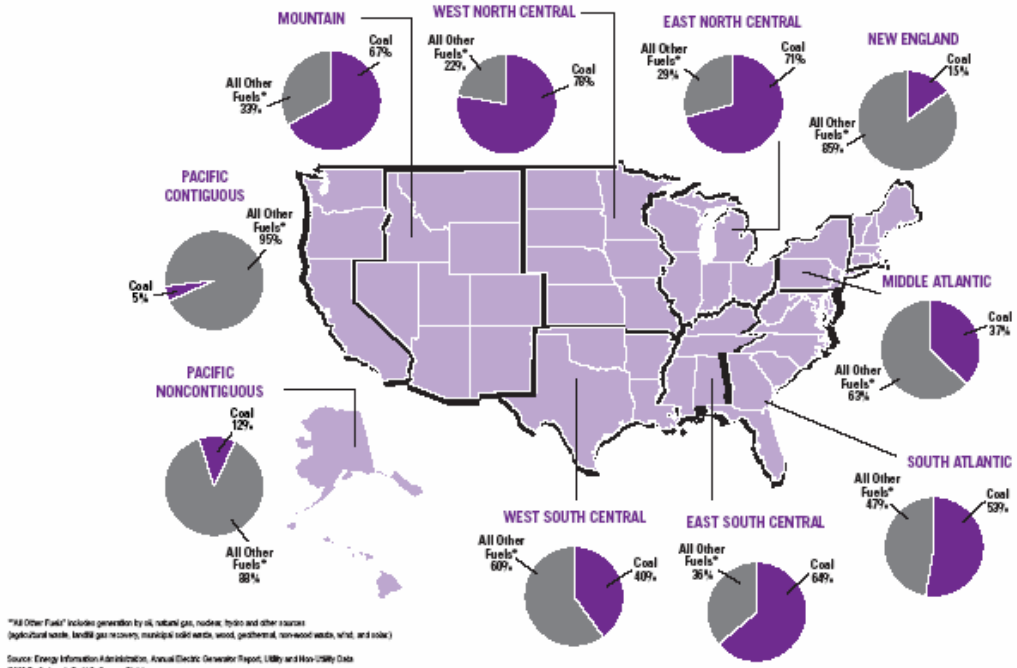
2024
Year

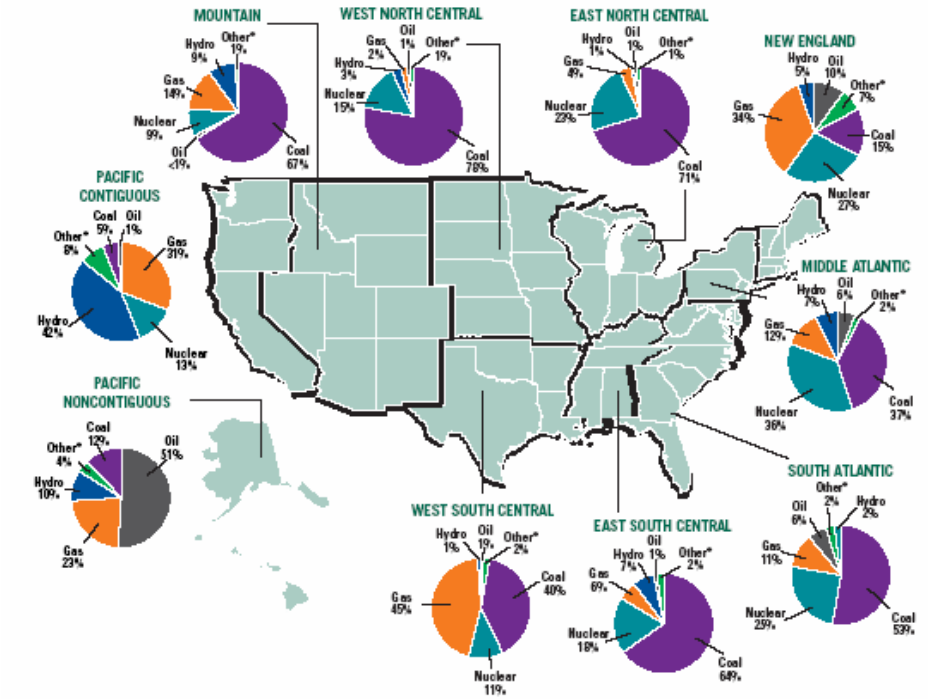
# Figure 2: **Most Regions of the Country Are Heavily Dependent on Coal to Generate Electricity.**




"All Other Fuels" includes generation by oil, natural gas, nuclear, hydro and other sources (agricultural waste, landfill gas recovery, municipal solid waste, wood, geothermal, non-wood waste, wind, and solar.)

Source: Energy Information Administration, Annual Electric Generator Report, Utility and Non-Utility Data (2003 Preliminary). By U.S. Census Division.

# Figure 3: Different Regions of the Country Rely on Different Fuel Mixes to Generate Electricity.




Across the U.S., a diverse mix of fuel is used to generate electricity. Several factors influence an electric company's decision to use particular fuels. These include the price and the availability of supply. This map, arranged by census region, illustrates the diversity of fuel use across the U.S. and shows how the electricity generation mixes in various regions of the country differ. The map further demonstrates that major changes in the generation mix could have economic and reliability impacts, especially on a regional basis.

Some numbers may not equal 100% due to rounding.

* "Other" includes generation by agricultural waste, landfill gas recovery, municipal solid waste, wood, geothermal, non-wood waste, wind, and solar.

Source: Energy Information Administration, Annual Electric Generator Report, Utility and Non-Utility Data (2003 Preliminary). By U.S. Census Division.

**Figure Four**
**Coal-Based Generation & Emissions (1980-2025)**

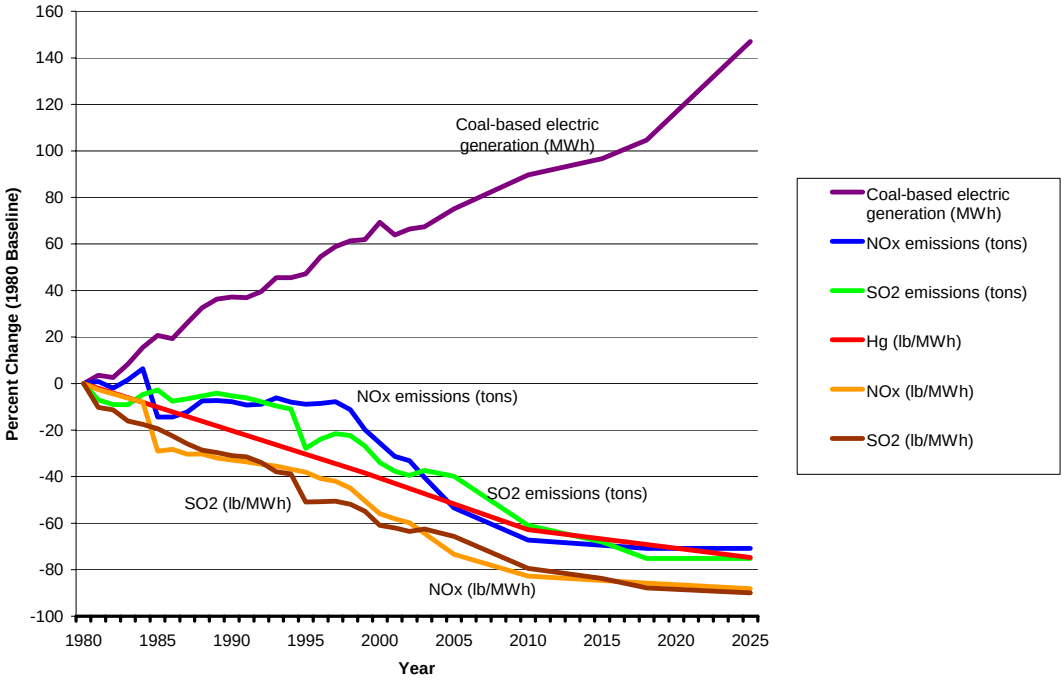


**Figure Five**
**Electric Power Sector Carbon Emissions Intensity**
**CO2 Emissions as % of GDP 1980 to 2025**