

Statement of the Edison Electric Institute

Submitted to the

Congressional Caucus on Coal

May 25, 2010

“Economic Impacts of Coal”

I am Quinlan Shea, Executive Director, Environment, for the Edison Electric Institute (EEI). EEI is the trade association of U.S. shareholder-owned electric utilities, with international affiliates and industry associates worldwide. The U.S. members of EEI serve 95 percent of the ultimate electricity customers in the shareholder-owned segment of the industry, and represent approximately 70 percent of the total U.S. electric power industry.

I appreciate the opportunity to appear before the Congressional Caucus on Coal to speak on the economic impacts of coal and the electric power sector. Coal and electricity are inextricably linked. Coal comprises close to 50 percent of the U.S. generation portfolio, will continue to be our largest fuel source for electricity generation going forward, and is essential to the growth needed for our national economic recovery. EEI and our member companies are committed to the continued use of this critical resource to generate power to meet future growth in the demand for electricity, and to ensure the continued reliability and affordability of our electric power supply while meeting the nation’s environmental and climate goals.

Coal Will Continue to Play a Key Role in Electric Generation Due to Its Reliability, Affordability and Abundant Domestic Supply.

The demand for energy in the United States, particularly electricity, continues to grow. Electricity is essential for powering our homes, businesses and industries. Electricity also is a strong component in our national economic recovery, with many of the jobs that will be created as part of our recovery dependent on electricity in some form. And, in what is likely to be an increasingly carbon-constrained future, electricity will be the fuel of choice, powering computers and other electric appliances, as well as new electrotechnologies, such as electric vehicles and the Smart Grid.

To meet increasing demand, the power sector will continue to rely upon coal due to its reliability, affordability, and abundant domestic supply. We have a far larger supply of domestic coal than of any other fossil fuel used to produce electricity. U.S. coal reserves are estimated to be one quarter of the world's known supply.

The electric power industry's "baseload" coal plants—the large (typically 500 megaWatts and above) plants that operate continuously to meet a market's minimum demand for power—generate about 45 percent of the country's electricity. Baseload coal plants also serve to ensure continued reliability of electric transmission systems. These units are an important component of maintaining adequate reserve margins, and thus have a dual function of providing power and ensuring the reliability and stability of regional transmission grids. Drawing on U.S. coal reserves, these baseload plants ensure that the country enjoys affordable and reliable power.

Coal Is Critical to Meeting Projected Increases in Electricity Demand.

Electricity demand, coal-based generation and gross domestic product (GDP) are all projected to grow at a steady pace to 2035 and beyond. While energy-efficiency improvements have had a major impact in meeting national electricity needs relative to new supply, the demand for electricity continues to increase. According to the Department of Energy's Energy Information Administration (EIA), consumer demand for electricity is projected to increase 30 percent by 2035.¹ *See Appendix, Figure 1.* This projected growth in demand is essential to ensuring continued economic growth, and coal is an essential element in meeting this demand.

Coal is the fuel source for 44.6 percent of the electricity generated in the U.S. today. *See Appendix, Figure 2.* Going forward, EIA's Annual Energy Outlook 2010 projects that coal-fired power plants will continue to supply the largest share of the nation's electricity through 2035, comprising 43.8 percent of the fuel mix in 2035.² *See Appendix, Figure 3.* According to EIA's forecast, coal-based generation is projected to grow from 1.81 trillion kiloWatt-hours (kWh) in 2009 to 2.31 trillion kWh in 2035, a 27-percent increase. Between 2009 and 2035, EIA projects 30.6 gigaWatts of new coal-based generation capacity will be built.³

¹ *See* U.S. Department of Energy, Energy Information Administration, Annual Energy Review and Annual Energy Outlook 2010, Table A8-Electricity Supply, Disposition, Prices and Emissions (Reference Case) (May 11, 2010).

² *See id.*, Tables A8 and A9.

³ *See id.*, Figure 62.

Most Regions of the Country Are Heavily Dependent on Coal to Generate Electricity.

EIA data demonstrate that coal is critical to electricity generation for the nation, but this does not tell the whole story. The electricity generation mix also differs from state to state and region to region, largely depending on the availability and cost of fuels located there. *See Appendix, Figure 4.* Major changes in the generation mix can have economic and reliability impacts, especially on a regional basis. Coal-based electricity ensures affordable power, which is crucial to the health of the industrial and commercial sectors and the jobs they provide, especially in the four regions that rely on coal for at least 50 percent, and as much as 72 percent, of their electricity. *See Appendix, Figure 5.*

Continued Coal Use and Environmental Performance.

The substantial energy and economic advantages that coal provides in generating electricity must be balanced by environmental compliance and environmental excellence. The power industry is committed to ensuring that future coal use will be accompanied by continued improvements in environmental quality.

Electric companies spend billions of dollars each year on environmental practices, technology and operational measures to protect human health and the environment. As a result, air quality has improved dramatically in recent years. The power sector has reduced its annual emissions of sulfur dioxide (SO₂) by 67 percent—from over 17 million tons in 1980 to about 5.7 million tons in 2009—despite a 72 percent increase in both coal-based and fossil-based electricity generation over the same time period. *See Appendix, Figure 6.* Further progress in reducing SO₂ emissions will come from compliance with the Clean Air Interstate Rule (CAIR)—

Phase 1 began this year—and a revised “transport rule” (related to interstate transport of air emissions from power plants in the Eastern U.S.) to replace CAIR Phase 2, plus likely co-benefits from meeting Maximum Achievable Control Technology (MACT) standards for hazardous air pollutants and revised national ambient air quality standards (NAAQS) for SO₂ and particulate matter.

The power sector has reduced emissions of nitrogen oxides (NO_x) by 72 percent—from 7.0 million tons in 1980 to 2.0 million tons in 2009. Due largely to Phase 1 of CAIR, the electric power sector reduced its NO_x emissions from 3 million tons in 2008 to 2 million tons in 2009. Emissions will be further controlled under the “transport rule” that will replace CAIR Phase 2, plus likely co-benefits from meeting MACT standards for hazardous air pollutants and revised NAAQS for NO₂, ozone and particulate matter.

As we strive to make improvements going forward, there are many environmental issues facing the electric power industry that have implications for our existing fleet of coal-fueled generating units and on decisions whether to build new plants. Within the next two years, the Environmental Protection Agency (EPA) is expected to take action on a number of air, water and waste issues, including:

- The interstate transport rule replacing the Clean Air Interstate Rule to reduce power plant emissions of SO₂ and NO_x in the eastern U.S.
- New MACT standards addressing mercury and other hazardous air pollutants.
- Continued reexamination of National Ambient Air Quality Standards, including ozone, particulate matter, SO₂ and nitrogen dioxide (NO₂).

- More stringent standards for cooling water structures and new effluent discharge guidelines for utilities.
- New standards addressing the disposal of waste from coal combustion.

EPA recently proposed a rulemaking that includes an option to regulate the disposal of waste from coal combustion as “hazardous waste.” More than 136 million tons of coal combustion byproducts (CCBs) are generated annually and are currently managed under state regulatory authority. If EPA adopts a hazardous waste approach to addressing CCBs, this could lead to the closure of existing disposal facilities (*i.e.*, ash ponds), result in significant compliance costs—as much as \$20 billion annually – and threaten industries that “recycle” coal ash for beneficial uses, such as concrete and wall board.

EEI is working with EPA to make sure that the Agency considers all of the ramifications of a reclassification of CCBs as hazardous waste. EEI also has joined with a broad group of stakeholders—including governors, mayors, state environmental regulatory agencies and ash end-users and recyclers—in support of regulation of CCBs as non-hazardous waste.

Compliance with these regulatory actions noted above could require substantial retrofitting of the existing coal fleet with a suite of costly pollution controls and will have implications for the siting and permitting of new coal-fueled electric generating facilities. Moreover, these requirements—each of which is being developed at EPA independently, and often without recognition of the potential cumulative impact on the coal fleet (*see Appendix, Figure 7*)—may be difficult to accomplish in the timeframes allowed, due to engineering, labor and materials challenges.

EEI and our member companies are engaged in ongoing dialogs with EPA on all of these environmental challenges to craft regulations and policies that take into account the importance of coal in terms of the reliability and affordability of our national power supply.

Technology development also is a critical factor in maintaining coal as a major part of our generation portfolio while improving environmental performance. Behind the dramatic emissions reductions noted earlier is our industry's commitment to improving the technologies that we use to generate electricity. To maintain coal's viability in a lower-emissions future, the electric power sector continues efforts to develop and deploy advanced clean coal generating technologies. These new plants promise to operate much more efficiently and cleanly than existing conventional coal-fired plants. Examples of new advanced coal technologies include advanced supercritical pulverized coal and integrated gasification combined cycle units. The lead time for building new units, however, is extensive due not only to engineering complexity, but also due to the difficulty in obtaining required preconstruction environmental permits. Even permits for advanced coal technology projects are subjected to challenges that can lead to lengthy and costly construction delays.

We do not have to choose between affordable, reliable electricity and a clean environment. The environmental challenges to continued coal combustion in electricity production are not insignificant, but continued investments in, and deployment of, these advanced coal technologies will help the power sector as it strives to achieve the nation's environmental goals.

The Potential Impacts of An Inflexible Regulatory Regime.

Without proper coordination of EPA regulatory initiatives on air quality, water and coal ash, there is a real danger that the implementation of these rules will result in untenable risks to both the economics and reliability of the electricity generation system, including the near-term retirement or conversion to natural gas of a substantial portion of the coal-fired generation fleet.

For example, requiring control technology retrofits in too compressed a time frame will strain the ability of materials producers and equipment suppliers to deliver goods at acceptable price levels, leading to higher costs for labor and materials. These premiums will lead to higher electricity costs for consumers.

Furthermore, aggressive, inflexible implementation schedules may also lead to outright shortages of materials and labor, which would make it impossible for utilities to comply by regulatory deadlines. Units that cannot meet deadlines would need to be taken offline until retrofits could be completed. This will lead to reliability issues for the overall electric generation system if reliability guidelines, such as minimum reserve margins, cannot be maintained.

There also is a possibility that the permits needed to install new and retrofit control technologies cannot be issued by overburdened state regulators in a timely fashion, jeopardizing a utility's ability to comply with the new requirements.

However, working within the existing regulatory structures, with careful coordination between EPA offices, there may be a more logical, cost-effective, and reliability-sensitive path

forward. This path could achieve the same environmental endpoint, but, properly managed, could avoid or greatly reduce the risks to costs and reliability outlined above. This path would allow for methodical retrofitting of existing coal-fueled generation over a reasonable timeline; allow for continued environmental improvement; minimize the economic impact to consumers; and allow time for new, high-efficiency advanced coal technologies to be permitted and built as replacement generation.

Coal's Continuing Role in a Carbon-Constrained World.

The electric utility industry is committed to working with Congress to achieve greenhouse gas (GHG) legislation that will result in significant emissions reductions across the economy between now and 2050. Under any scenario, these reductions will be expensive, but the wisest, most economic, way to accomplish them in the power sector is through the development and deployment of the full portfolio of climate technologies and measures over the long term. A key component of this full portfolio is advanced coal technologies integrated with carbon capture and storage (CCS). Analysis by the Electric Power Research Institute (EPRI) shows that the price of electricity will increase in a carbon-constrained world, but that the impact on electricity customers is reduced when the full portfolio of options is available for cutting emissions.⁴

Again, technology is the key to meeting environmental goals. To maintain coal's viability in a low-carbon future, our industry is developing advanced coal with CCS capabilities. Demonstration projects, like that at American Electric Power Co.'s Mountaineer Plant in West

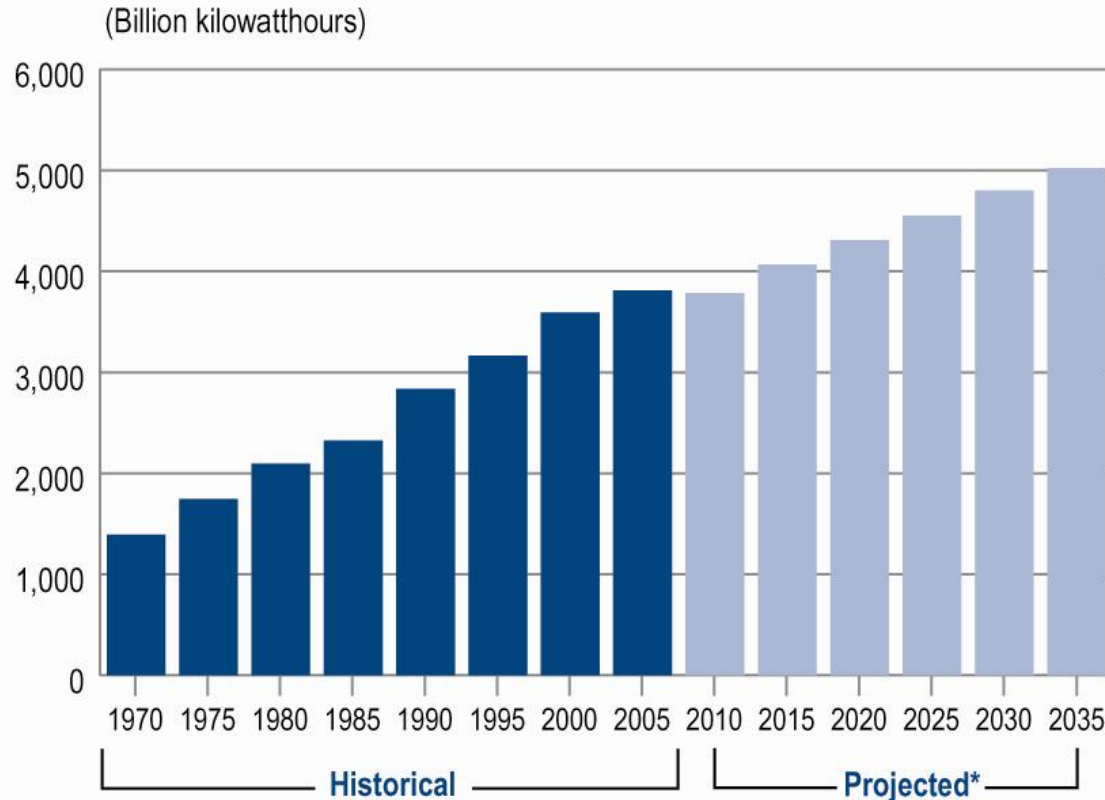
⁴ EPRI, The Power to Reduce CO₂ Emissions – The Full Portfolio, Report 1015461 (Aug. 2007), available at <http://mydocs.epri.com/docs/public/DiscussionPaper2007.pdf>.

Virginia, are critical for demonstrating these technologies at scale and helping to reduce their costs. Additional work needs to be done to address gaps in the legal and regulatory structure for deploying CCS, but steps are being taken to ensure that CCS is ready to be deployed to help reduce emissions from coal-fired generation as early as the 2020-2025 time frame.

Thank you for this opportunity to testify before the Caucus today on the value and economic implications of coal to the electric power sector and the nation.

Appendix

Figure 1: Demand for Electricity Is Projected To Increase 30% by 2035



*Electricity demand projections based on expected growth between 2008 and 2035.

Source: U.S. Department of Energy, Energy Information Administration, Annual Energy Review and Annual Energy Outlook 2010, April 2010, Table A8-Electricity Supply, Disposition, Prices, and Emissions (Reference Case).

Figure 2: Electric Companies Use a Diverse Mix Of Fuels to Generate Electricity

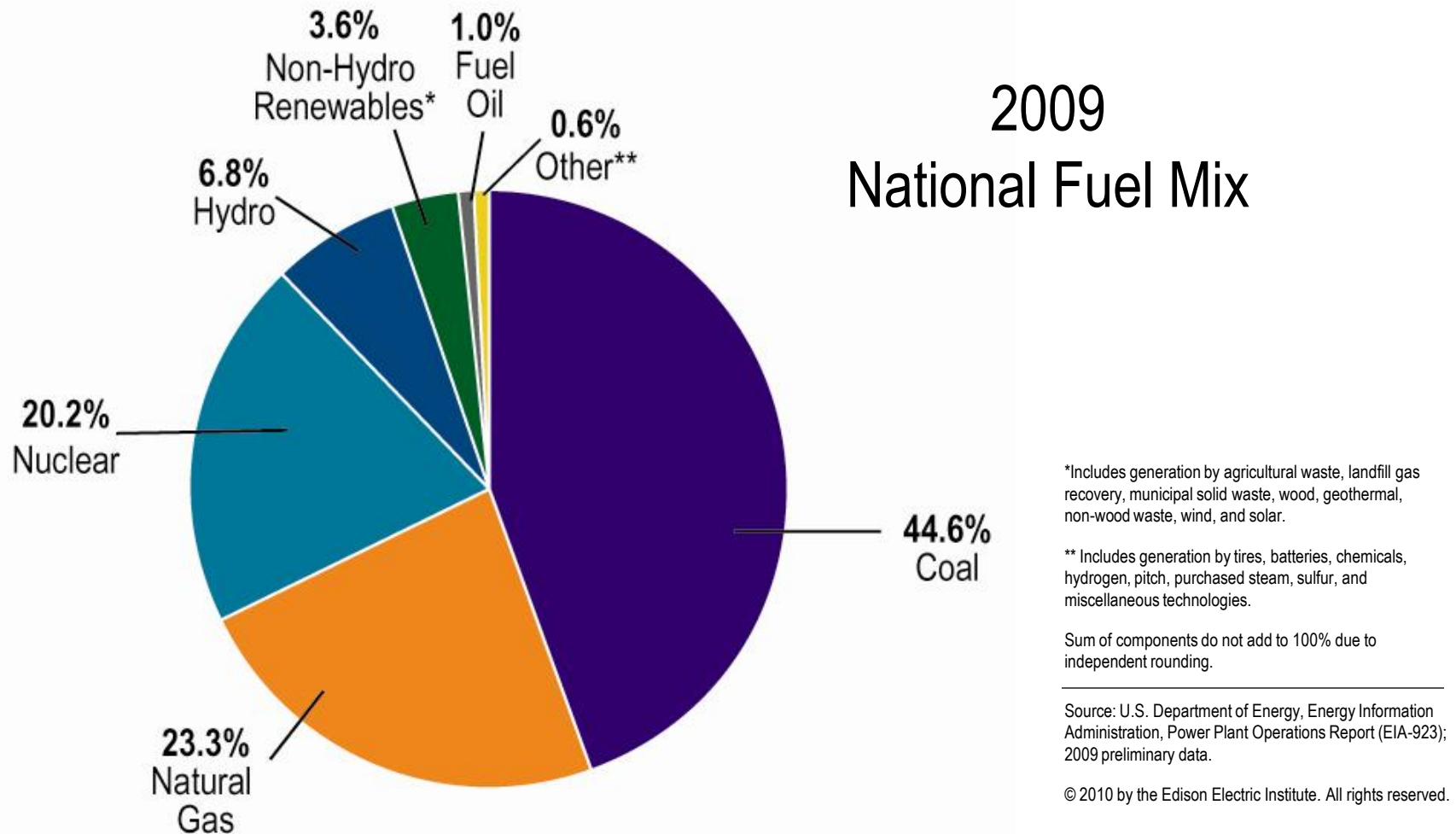
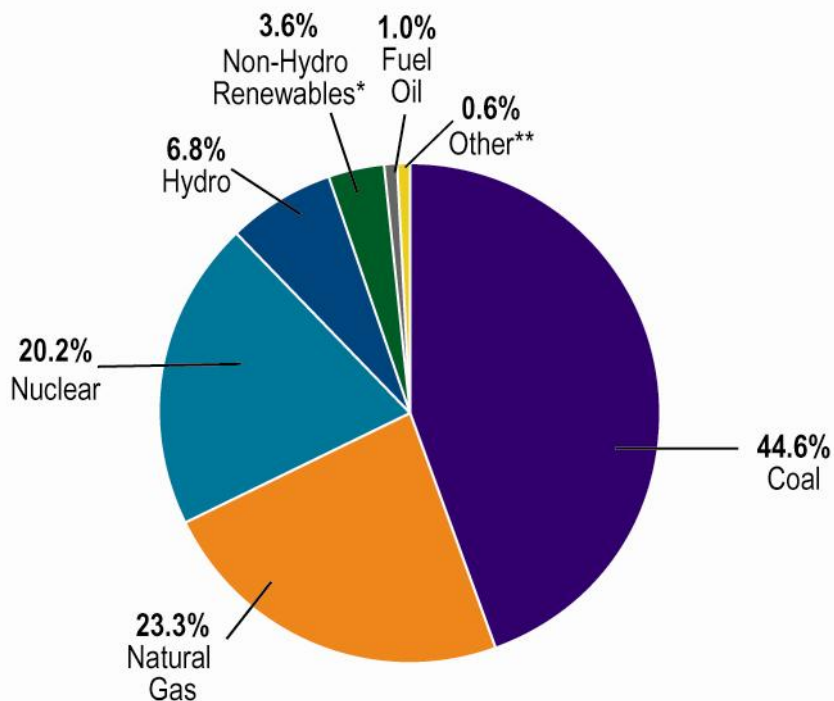
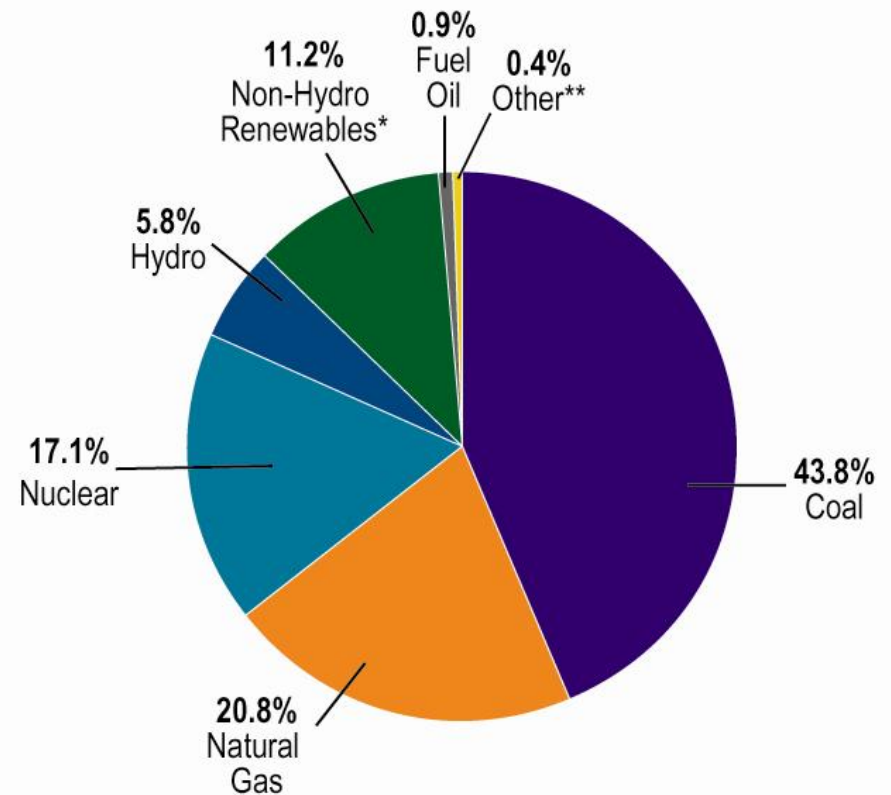


Figure 3: Current National Fuel Mix Compared To EIA's 2035 Projections

2009 National Fuel Mix



2035 Projections



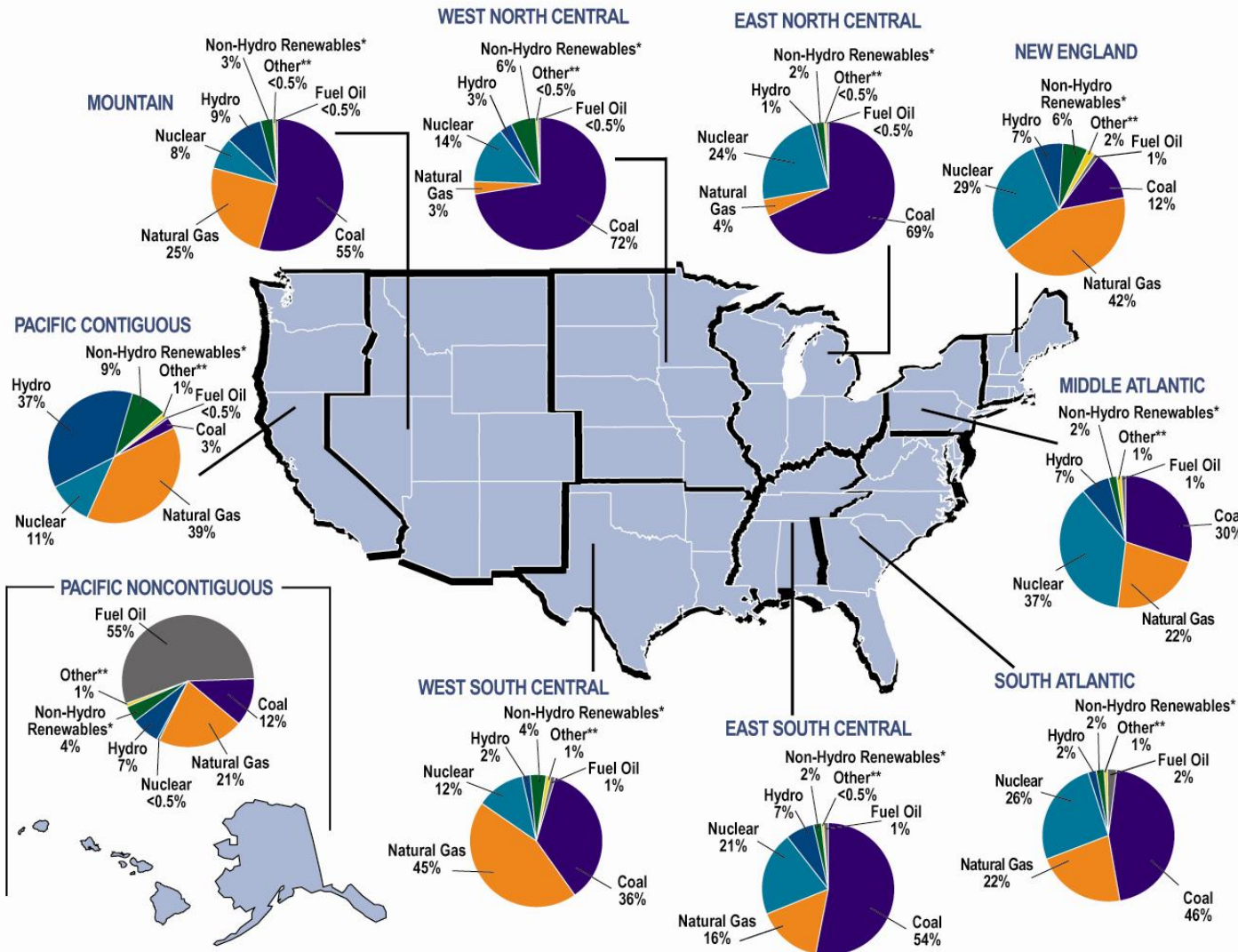
*Includes generation by agricultural waste, landfill gas recovery, municipal solid waste, wood, geothermal, non-wood waste, wind, and solar.

** Includes generation by tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies. Sum of components do not add to 100% due to independent rounding.

Source 2009 Preliminary: U.S. Department of Energy, Energy Information Administration, Power Plant Operations Report (EIA-923); 2009 preliminary generation data.

Source 2035 Forecast: U.S. Department of Energy, Energy Information Administration, *EIA Annual Energy Outlook 2010, Table A8*, and EEI estimates. © 2010 by the Edison Electric Institute. All rights reserved.

Figure 4: Different Regions of the Country Use Different Fuel Mixes to Generate Electricity



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

** Includes generation by tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

Sum of components may not add to 100% due to independent rounding.

Source: U.S. Department of Energy, Energy Information Administration, Power Plant Operations Report (EIA-923); 2009 preliminary generation data.

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Figure 5: Most Regions of the Country Are Heavily Dependent on Coal to Generate Electricity

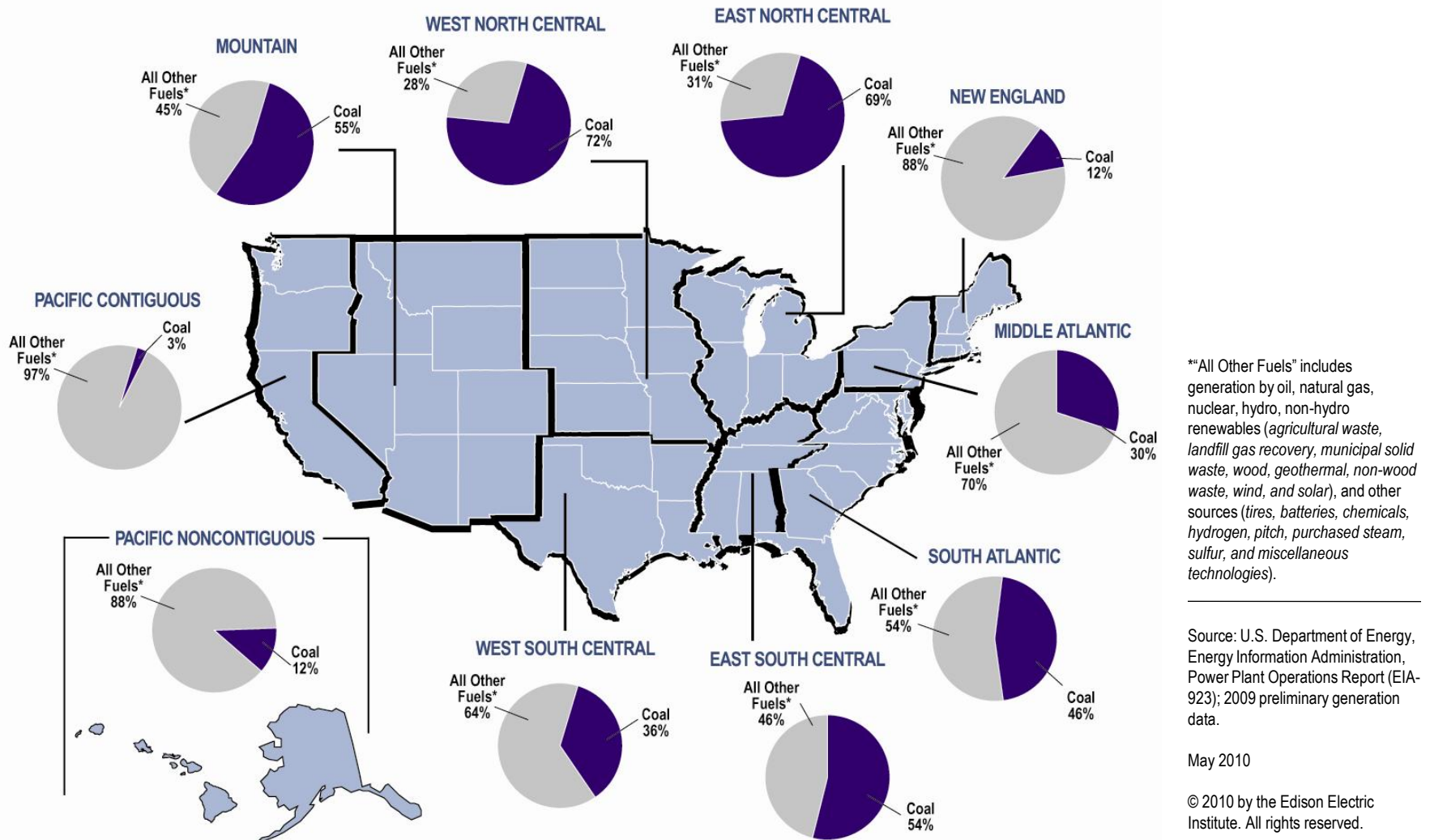
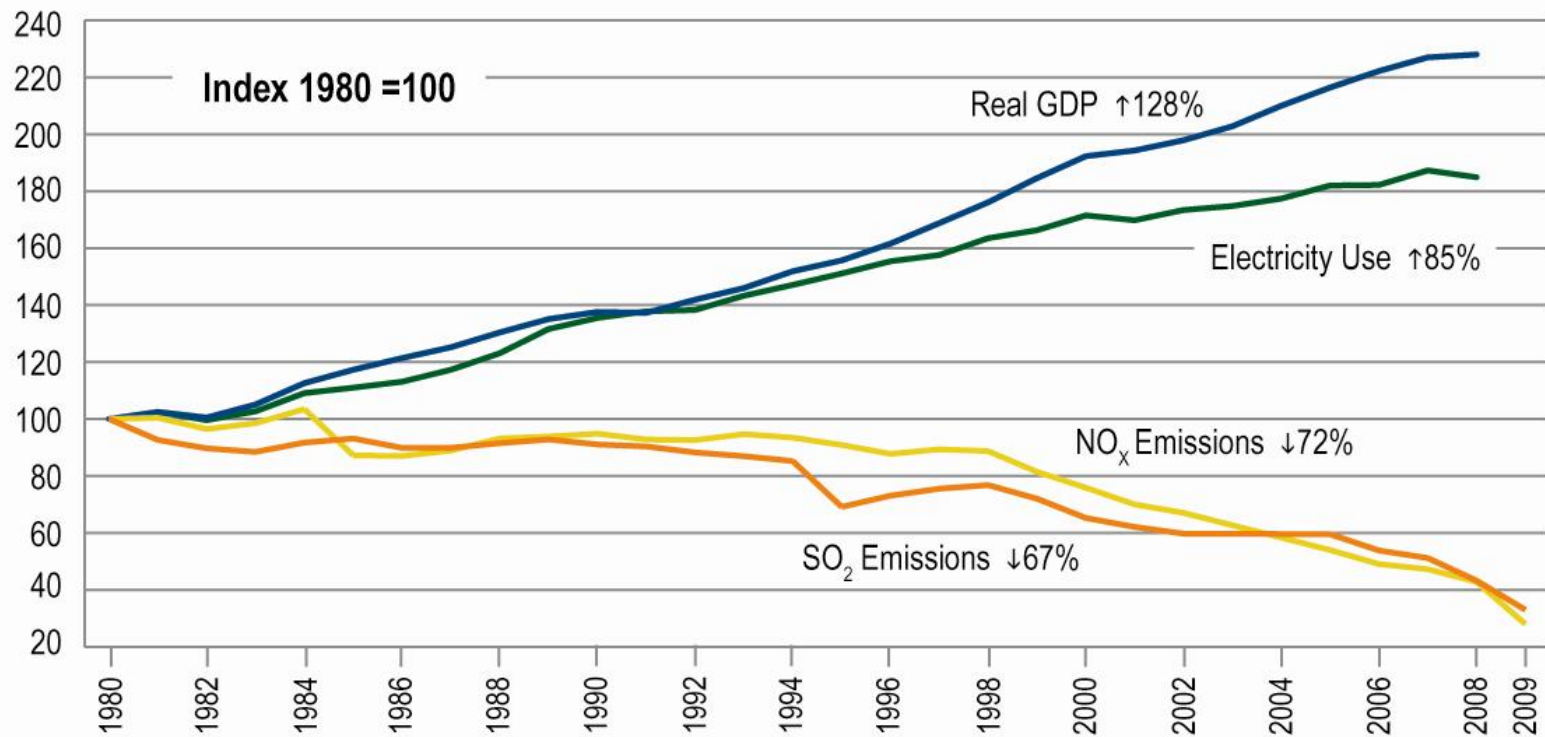


Figure 6: Power Plants Reduce Emissions Despite Increasing Electricity Demand



1980 represents the base year. Graph depicts increases or decreases from the base year.

Sources: U.S. Department of Energy, Energy Information Administration (EIA), U.S. Environmental Protection Agency (EPA), and U.S. Bureau of Economic Analysis.

Figure 7: Possible Timeline for Environmental Regulatory Requirements for the Utility Industry

