TESTIMONY OF

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AMERICAN ELECTRIC POWER

ON BEHALF OF

THE EDISON ELECTRIC INSTITUTE

BEFORE THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

JULY 26, 2001

Good morning Chairman Jeffords, Senator Smith, and distinguished members of the Senate Committee on Environment and Public Works, and thank you for inviting me here today. My name is Dale Heydlauff, and I am the Senior Vice President for Environment at American Electric Power Company. AEP is a multinational energy company based in Columbus, Ohio. AEP owns and operates more than 38,000 megawatts of generating capacity, making it America's largest generator of electricity. AEP generates about 6% of the electricity in the United States, a figure comparable to the annual electric power consumption in Mexico and Australia. We are the largest consumer of coal and the third largest consumer of natural gas in the U.S. AEP provides retail electricity to more than 6.8 million customers worldwide and has more than $55 billion in assets, primarily in the U.S. with holdings in select international markets.

I am grateful for this opportunity to address the Committee on behalf of the Edison Electric Institute (EEI). EEI is the association of U.S. shareholder-owned electric companies, international affiliates and industry associates worldwide. EEI's U.S. members serve over 90 percent of all customers served by the shareholder-owned segment of the industry, generate approximately three-quarters of all the electricity generated by electric companies in the country, and service about 70 percent of all ultimate customers in the nation.

In my testimony, I will provide the Committee with a context in which to view the statements of my fellow panelists. The electric utility industry has had a great deal of success, especially over the past twenty years, in achieving emissions reductions goals set

by Congress, and is on course to make significant additional reductions over the next twenty years (see chart A-1). These goals, which were set largely under Title IV of the Clean Air Act, have been met through a well-crafted process and a shared implementation between state and federal government, a process which sets air quality standards, including an adequate margin of safety, and allows the states to develop specific plans for attainment of those standards. I hope to dispel some myths and misconceptions about electric utilities and environmental regulations, including the notion that some of our power plants have been "grandfathered," or exempted from regulation, to build the committee's appreciation of our industry's ability to respond to changing policies and priorities, to reinforce the need for reliable and affordable energy. The electric power industry neither supports nor recognizes a dichotomy between environmental and economic energy policies. A sound economy and national energy policy is inextricably linked to our country's environmental priorities, and the electric power industry supports the recognition of that linkage in the crafting and implementation of present and future environmental goals. Finally, I will share with you our industry's understanding of what types of policies work best to maintain environmental progress and promote the availability of reliable and affordable energy, along with the vital economic goods provided through the use of electric power.

Difficult choices have been made, and still others remain undecided regarding our national energy policies and priorities for improving the quality of the air, water, and land of the communities in which we all live. The electric power industry supports and will continue to promote environmental policies based upon the best available science, an appreciation of the related energy policy challenges, and an understanding of the most

effective types of policies and regulatory programs to accomplish environmental and energy policy goals.

I. Electric Power and Air Emissions: The Clean Air Act is Working

While our national energy needs continue to grow, so does our ability to produce electricity in an increasingly clean and efficient manner (See Appendix A-4). Comparisons of electric power production with emissions show that electric power produced in today's coal-fired electric power plants contributes far less sulfur dioxide("SO_2"), nitrogen oxides (NO_x), and particulate matter (PM) than just two decades ago (See Appendices A2 – A3). Coal, which currently accounts for more than half of the electricity produced nation wide (See Appendix A1) is an increasingly clean and an exceptionally reliable energy source, and a fuel whose use has shown great progress in the reduction of emissions from electric power plants, in the implementation of Title IV of the Clean Air Act, and in achievement of the standards set under the Act to protect public health and the environment.

Electric utilities have implemented the first phase of this section of the Clean Air Act, including substantial reductions of NO_x and SO_2, as well as the second phase of NO_x reductions, as illustrated in the attached graphs (Appendices A-2 – A-3). Additional reductions in SO_2 are currently underway, and requirements under the NO_x State Implementation Plan ("SIP") Call will result in additional NO_x reductions of nearly one million tons. Over a period of just ten years, utilities will have reduced SO_2 emissions by about 50 percent compared to levels in 1980; national SO_2 emissions will be at their lowest level in one hundred years, largely due to utility reductions; and electric utility

NO_x emissions will account for about 20% of all man-made emissions. When you combine these emission reductions with the fact that coal use increased dramatically, emissions of SO_2 and NO_x per ton of coal burned will be reduced by 75% compared to 1980 levels (See Appendix A-4). This is a tremendous record.

These advancements in the control and minimization of electric power emissions have resulted from significant capital investment in control technologies and a strong record of utility compliance. Over the past 25 years, the electric power industry has invested approximately $40 billion (capital) in technologies to reduce these air emissions. In addition, utilities spend $3 billion to $5 billion annually in operations and maintenance related to environmental performance. Conservative estimates assigning even half of these operational expenses to air-related activities indicates that total utility expenditures for the control of air emissions amount to $100 billion over the past 25 years.

II. New Source Performance Standards and the Myth of "Grandfathering"

Contrary to some claims that power plants were "grandfathered" under the Clean Air Act in 1970, Congress did not exempt any sources of pollution from emission controls, but did differentiate between existing sources and new sources. Existing sources were required to make whatever level of emission reductions were deemed necessary by the states in their implementation plans to attain National Ambient Air Quality Standards (NAAQS). New sources were required to install the best available control technology to guard against deterioration in air quality once it had been achieved. There were no special deals for electric generating units under the Act. They were treated just like all other sources of industrial pollution (whether chemical manufacturers, steel mills, aluminum smelters, petroleum refiners, or automobile assembly plants). The

industry has an impeccable compliance record in meeting these standards, often exceeding emission reduction requirements in order to provide an extra margin to protect public health and the environment.

While it is true that plants built before 1970 do not have to meet NSPS, this decision was a conscious one, made in full recognition of the following facts: First, Congress comprehensively regulates industry, including utilities, through enforceable state implementation plans (SIP's) to meet NAAQS for NO_x, SO_2, and PM ozone and others. These standards are set in light of the best available science, and require an adequate margin of safety to protect public health. For decades each state has evaluated what emission reductions need to be made by each electric utility plant to meet the NAAQS and then required any needed emission reductions through a permit process. Second, Congress deliberately chose in 1970 to target improved air quality rather than mandate across-the-board technological solutions, primarily due to the difficulty and great expense of retrofitting new controls on already constructed facilities. Finally, perhaps most importantly, the 1990 Clean Air Act Amendments included a cap on the total tons of SO_2 and NO_x, and required all facilities to address these pollutants to mitigate acid rain (through Title IV). Additional new regulatory initiatives since, have served to significantly reduce the gap between the emissions levels of new versus older units (See Appendices A-2 and A-3).

Simply put, in Title IV of the Clean Air Act, Congress crafted an environmental policy which maximized the effectiveness of environmental regulation while reducing the economic consequences. Strategies like these, which allow for flexibility and partnerships with state government to ensure effective and efficient compliance, do not

ignore environmental challenges. Instead, they demonstrate what can be accomplished when policies integrate economic realities with environmental goals. Based upon the progress attained under Title IV, and the projected emissions reductions yet to come, as well as the rigorous state-level and other federal environmental regulations which apply to all electric power plants, "grandfathering," and the underlying implication that many power plants are unregulated, is neither an accurate nor an appropriate term. Furthermore, we have been shown by this experience what can be accomplished through flexible regulatory programs.

III. Future Environmental Policy Challenges

Mercury

According to the Environmental Protection Agency ("EPA"), U.S. electric power companies are estimated to emit about 30 percent of manmade mercury emissions. Current research and information do not indicate that there is a direct link between electric utility mercury emissions and levels of mercury in fish that potentially affect public health. Even so, on December 14, 2000, EPA announced it would regulate mercury emissions from power plants. The agency likely will propose regulations by December 2003, promulgate a final rule by December 2004, and expect compliance by December 2007.

Exposure to mercury can be toxic and lethal at high levels. However, there continues to be scientific uncertainty and disagreement as to what level of mercury exposure is harmful to public health. In 1999, Congress instructed the National Academy of Sciences ("NAS") to assess the validity of the EPA's "reference dose" the amount of

a substance that can be consumed safely over a lifetime – for mercury and to provide recommendations on what level of mercury exposure is "safe." The NAS panel, after actively reviewing existing mercury health studies, issued a final report in July 2000.

While significant uncertainty remains regarding the health effects of mercury emitted from powerplants, EEI intends to work cooperatively with EPA as it determines the extent to which mercury reductions from power plants may be needed and how those reductions should be achieved.

Climate

EEI's members have long supported voluntary, flexible, and cost-effective approaches to reducing greenhouse gases. For example, under the Climate Challenge program initiated in 1995, the electric utility industry was projected to reduce 174 million metric tons of CO_2-equivalent greenhouse gases in 2000.

The electric power industry is currently developing the framework for a voluntary climate initiative that would serve as an extension of the Climate Challenge, a partnership program developed by EEI and the Department of Energy (DOE). The industry expects to partner with the federal government – particularly DOE – and other industries to pursue approaches that further reduce greenhouse gases. This initiative will reduce greenhouse gases in the near term, and promote a technology research, development and deployment (R,D&D) program that will lead to the development over the longer term of cost-effective options to reduce greenhouse gases.

EEI supports continued scientific research to evaluate the extent to which human activity is adversely affecting the climate, to evaluate the causes, costs, policies and

adaptation strategies to address possible solutions. EEI believes that any alternative to the Kyoto Protocol developed in the coming months should contain implementation rules for market mechanisms, forestry and compliance, that are cost-effective, flexible, inclusive and transparent.

EEI opposes regulation of CO_2 and other greenhouse gases as pollutants under the Clean Air Act or other legislation. Because there is currently no cost-effective control technology for greenhouse gas emissions, compliance with stringent, mandatory targets and timetables such as those contained in the Protocol would cause massive fuel switching in the electric utility industry from coal to natural gas,[1] which would be very expensive and increase electricity prices.[2] It also would further accentuate EEI's concerns, noted above, about fuel diversity.

In summary, EEI believes that a climate policy premised on a voluntary climate initiative would achieve both environmental and economic objectives, and would help maintain fuel diversity. Such a strategy would reduce greenhouse gases in the short term as technological responses are developed for long-term availability, all the while maintaining the viability of coal as a vital component of electric generation. In short,

[1] See, *e.g.*, the reference study that demonstrates that under a Kyoto Protocol-type scenario, coal would decline from 50 percent of electric generation to as low as 13 percent in 2010, while natural gas would rise from 25 percent to 50 percent in the same time frame. Research Data International, Inc., U.S. Gas and Power Supply under the Kyoto Protocol, Vol. I at 1-9 (Sept. 1999).

[2] A recent EIA report (which actually understates costs because mercury had not yet been analyzed) found that reductions in sulfur dioxide, nitrogen oxides and CO_2 consistent with recent legislative proposals would increase electricity prices by 17-33 percent in 2005, and by 30-43 percent in 2010. EIA, Analysis of Strategies for Reducing Multiple Emissions from Power Plants: Sulfur Dioxide, Nitrogen Oxides and Carbon Dioxide xvii, 27 (Dec. 2000). The bulk of the cost increases are due to CO_2 restrictions.

environmental policy would complement energy policy, which is consistent with EEI's goal ensuring that climate change issues are addressed synergistically with a national energy policy that protects our environment, consumers, and economy.

IV. Electricity: Powering Economic Growth

Perhaps no single index serves as a better indicator of the growth and productivity of the U.S. economy than the trends in electricity use. In fact, since 1970, electricity growth has closely tracked the rise in GDP (See Appendix A-4). The electronic economy, and all of the telecommunications services and computing technology which support it, currently accounts for 3% of electricity use at the national level, a significant statistic which has outpaced past projections and is expected to increase in the near future.[3] The Energy Information Administration (EIA) recently revised its estimates of future electricity demand growth from 1.3 to 1.8 percent per year between now and 2020. New electric generating capacity is needed in many areas of the country in order to avoid shortages and reliability problems. To meet increased demand and to offset retirements of existing power plants, EIA forecasts that 1,310 new power plants – with 393,000 megawatts of capacity – will be needed by 2020.[4] A sound national energy policy is needed to continue to assure the availability of affordable and reliable electricity supplies, and to meet future energy demands.

[3] Koomey, Jonathan et. al. "Electricity Used by Office Equipment and Network Equipment in the U.S.," Lawrence Berkeley Lab, U.S. Department of Energy, February 9, 2001

[4] EIA, Annual Energy Outlook 2001, p.73.

Even as it faces the new challenge of increasing demand, the electric power industry is well along the path toward the creation of a national retail energy market. Re-structuring of the electric power industry is motivated by anticipation of the economic benefits these new markets will bring, but this change does not come without uncertainty. As our industry and our nation advances toward these new economic opportunities, we find ourselves at a point in history which brilliantly illustrates the need for sound and substantial coordination of energy needs and other national policy priorities. The role of policies concerning the development of retail energy markets is and should be focused on facilitating the necessary economic, organizational, and regulatory transitions within the industry, and on providing electricity producers and service providers with the opportunity to conduct efficient market transactions with its customers. While EEI supports a balancing and coordination of energy and environmental policies, EEI does not support the incorporation of environmental policies in legislation or regulation concerning industry structure or retail energy competition.

New environmental policies can benefit from the changes taking place in the structure of the electric power industry. Policies which include flexible implementation mechanisms, avoid prescriptive technology standards, and adopt compliance schedules which take advantage of the ability of the market forces in a competitive industry will help assure our continued progress as a provider of increasingly clean energy to a growing economy.

EEI believes that fuel diversity – including the use of coal, natural gas, nuclear energy, oil, hydropower and other renewables, to generate electricity – must be maintained as a matter of national energy policy and national security (See Appendix A-

1). An energy policy that maintains fuel diversity can appropriately balance continued utilization of coal, the most essential fuel for reliable and affordable electricity, with a sensitivity to the climate change and individual air quality issues that reflects both economic and environmental objectives. A diverse fuel mix helps protect companies and consumers from the impacts of fuel shortages and price fluctuations. Diverse fuel and technology options contribute to a stable, reliable and affordable energy supply over the long term.

We need a national energy policy that takes advantage of energy resources available within our country. One of the most plentiful energy resources is coal, and more than 90 percent of U.S. coal usage is the generation of electricity. This valuable but underutilized asset can meet the nation's energy needs for about 250 to 350 years.[5] Nuclear power can also be a plentiful resource with a virtually unlimited supply potential. On the other hand, the known supply of natural gas reserves looks adequate only for 40 years, based on current consumption. And when you consider the multiple beneficial uses for natural gas, especially for heating, it is reasonable to question its use for generating substantial amounts of power when electricity from coal is available to do the same work. Coal-based capacity additions, which already look attractive, will look even better as technology drives down their costs.

As the nation's electricity reserve margins continue to decrease – from a high of 26 percent to a low of 11 percent just in the past decade – we must now look at coal in a renewed role of prominence in the United States energy mix. The combination of this old

[5] EIA, Annual Energy Review 1999, T.11.2, T.11.3.

source of energy and new technology is an important part of the solution to meeting America's energy needs, which are projected to grow 44 percent by 2020.[6]

New technology puts coal-based plants in position to clear today's environmental hurdles. Although Germany and Japan have built generating plants using clean coal technology in the past decade, none have yet been built in the United States – other than subsidized or demonstration projects.

Modern coal-based plants generate electricity with dramatically less environmental impact than traditional coal-based plants. The lower emissions and higher efficiency of new coal-based plants exceed current environmental requirements for sulfur dioxide (SO_2) and nitrogen oxides (NO_x). Clean coal technology also addresses greenhouse gases. Because of increased efficiency, new technology coal plants produce significantly less carbon dioxide (CO_2) per megawatt hour than old plants. The units that we propose to build likely would result in a 30 percent reduction in the fuel needed to generate the same amount of electricity. In other words, the fuel once used to power three homes would power four. Consequently, the fourth home would be powered with virtually zero environmental impact, and the other homes would be served with less environmental impact than before.

Certainty and Regulatory Flexibility

Coal-based power plants, which supply more than half of the nation's electricity, face a wide range of existing and proposed emission control requirements from federal and state agencies, and even neighboring countries (See Appendix A-5). These

[6] EIA, Annual Energy Review 1999, T.8.2 & T.8.3; Annual Energy Outlook 2001, T.A.8.

requirements and proposed new programs are focused primarily on the reductions of four power plant emissions: SO_2, NO_x, mercury and CO_2.

Because these regulatory initiatives are largely uncoordinated and often conflicting, the electric power industry faces enormous uncertainty as it tries to develop appropriate plans to upgrade plants and add pollution control equipment. Utility planners are even more challenged by the need to ensure their customers continue to receive reliable and affordable energy. In essence, the unfortunate results of today's regulatory paradigm are higher costs for both shareholders and consumers, longer downtimes for our generating stations, and continued uncertainty in an industry that is critical to the U.S. economy (See Appendix A-5).

America's electricity prices are substantially lower than most of our international competitors, giving our businesses and industries a significant competitive advantage in the global marketplace. The U.S. has enjoyed low electricity prices, in part, because we rely on a variety of fuels to generate electricity. The resulting competition among these fuels keeps prices in check.

The combination of fuel sources used is referred to as the generation mix. Today, more than half of the nation's electricity supply is generated from coal. Nuclear energy produces nearly twenty percent of the supply, while natural gas provides sixteen percent. Hydropower and, to a much lesser extent, other renewable sources – biomass, geothermal, solar, and wind – provide nearly eleven percent of the supply. Fuel oil provides nearly three percent of the generation mix. There are sharp regional differences in generation mix.

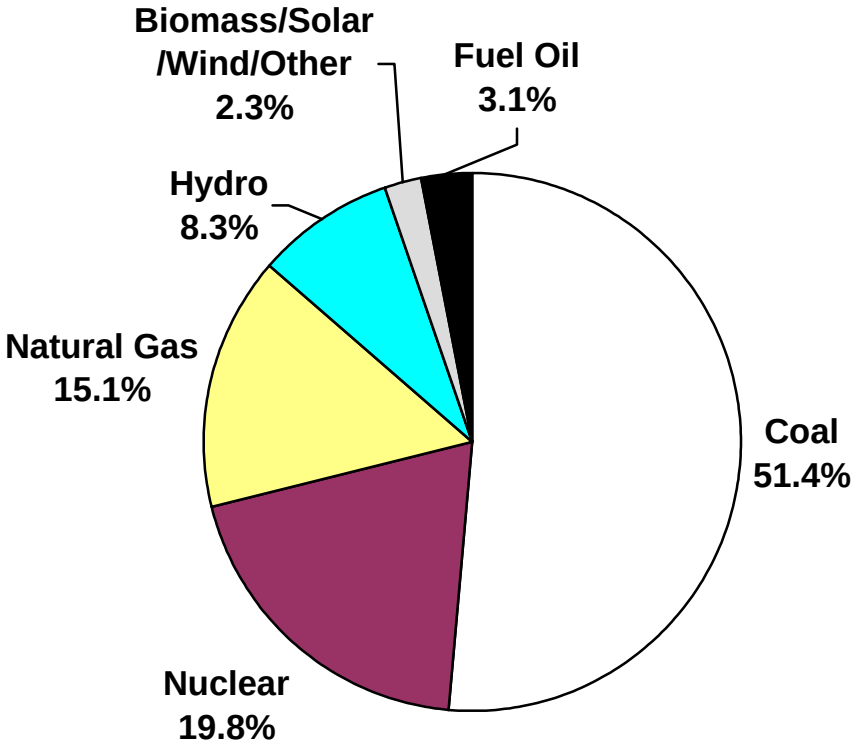
Summary

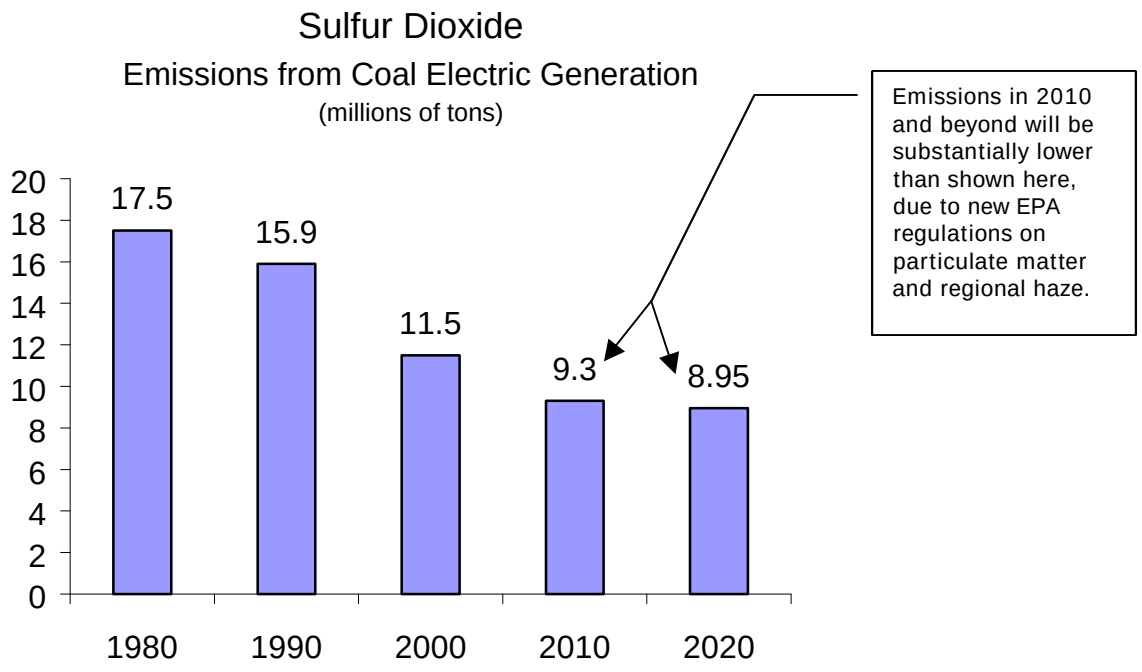
The electric utility industry is committed to working with the Committee to help design multi-pollutant control legislation that is comprehensive, cost-effective, employs market-based instruments to achieve compliance, provides the industry with sufficient time to install conventional or innovative pollution control technologies, avoids forced premature plant retirements, preserves fuel diversity, and ultimately provides the industry with planning certainty.

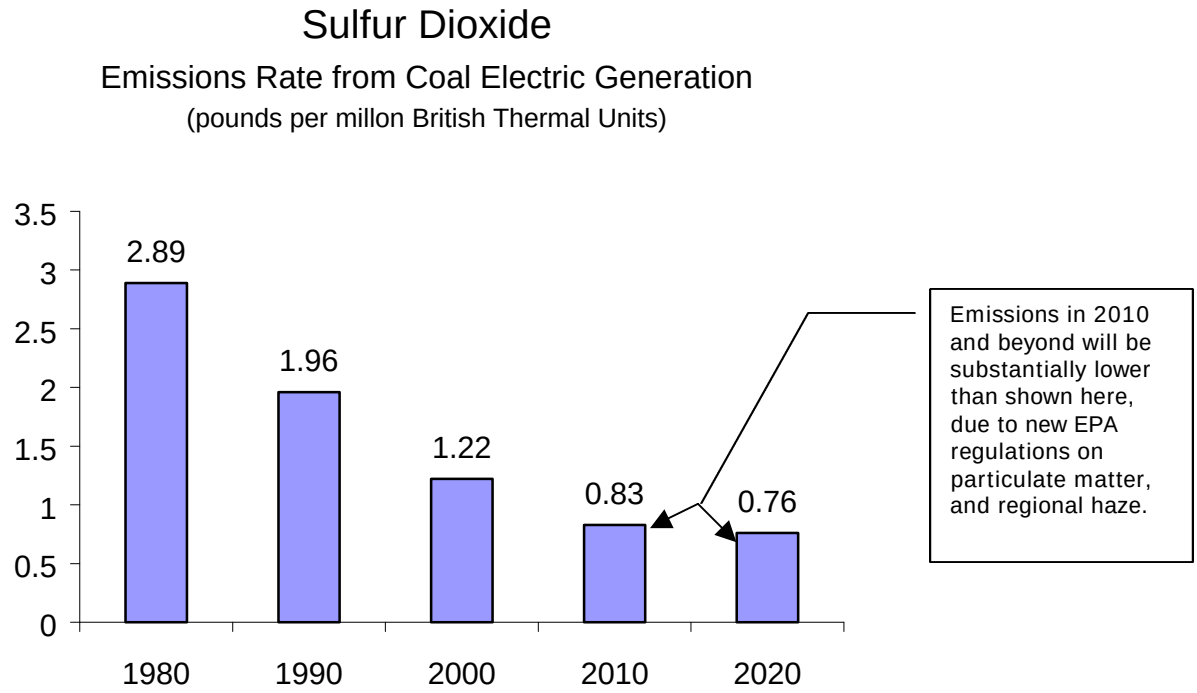
Our nation is building a legacy for taking firm steps to address environmental challenges, promoting sustainable use of our natural resources and improving public health. Based upon our record of compliance, improved efficiency, and increasing emissions reductions, as well as our future commitments, the electric power industry will continue to be a key partner in the accomplishment of these national priorities. This industry is certain that these priorities can be balanced with a national energy policy which protects consumers from fuel market volatility, keeps electric power affordable and reliable, and promotes continuing investment in technologies which will ensure increasingly clean power supplies in the future.

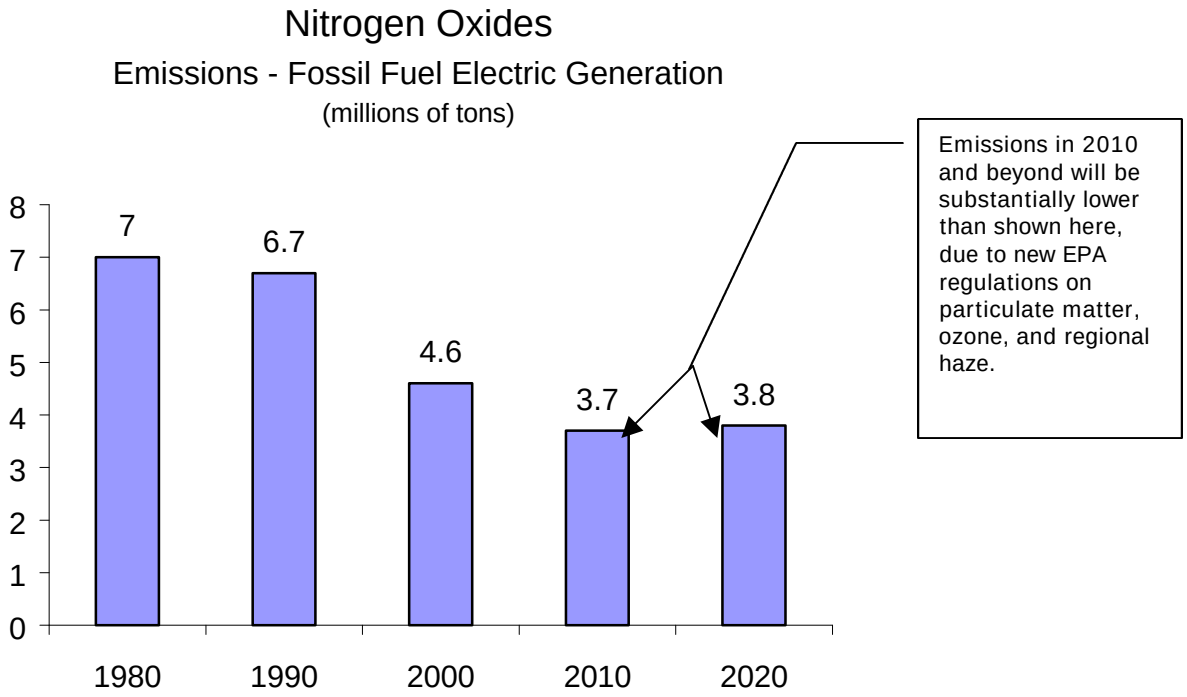
APPENDICES

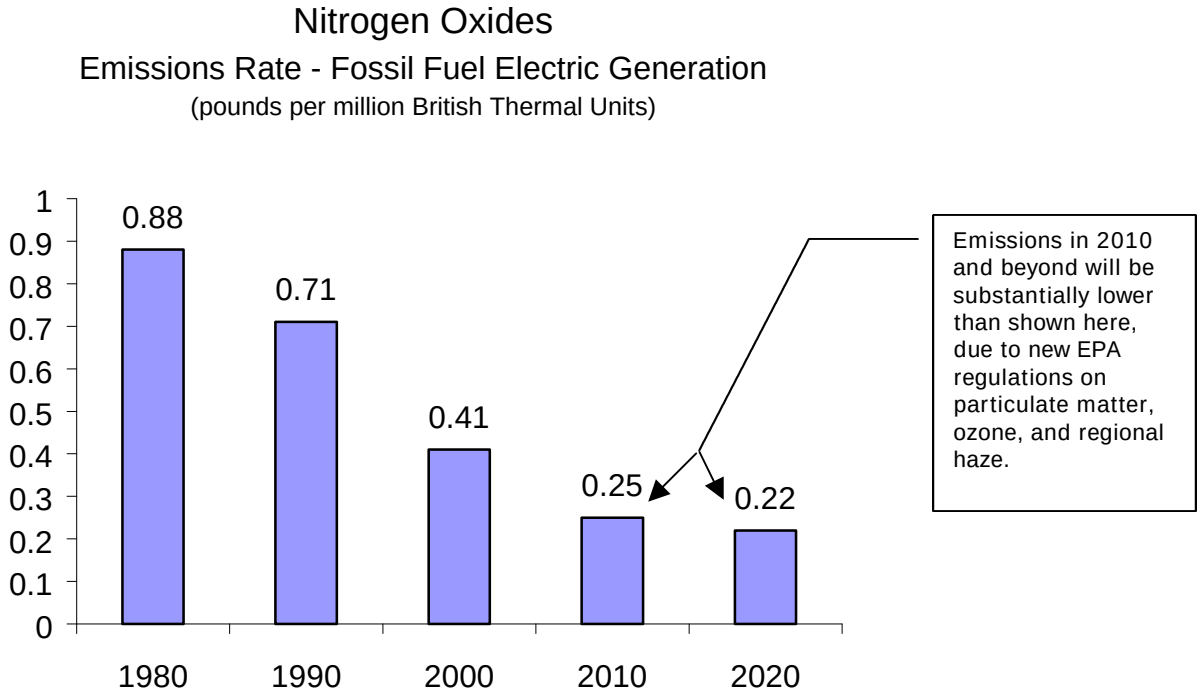
U.S. Electricity Generation Fuel Mix

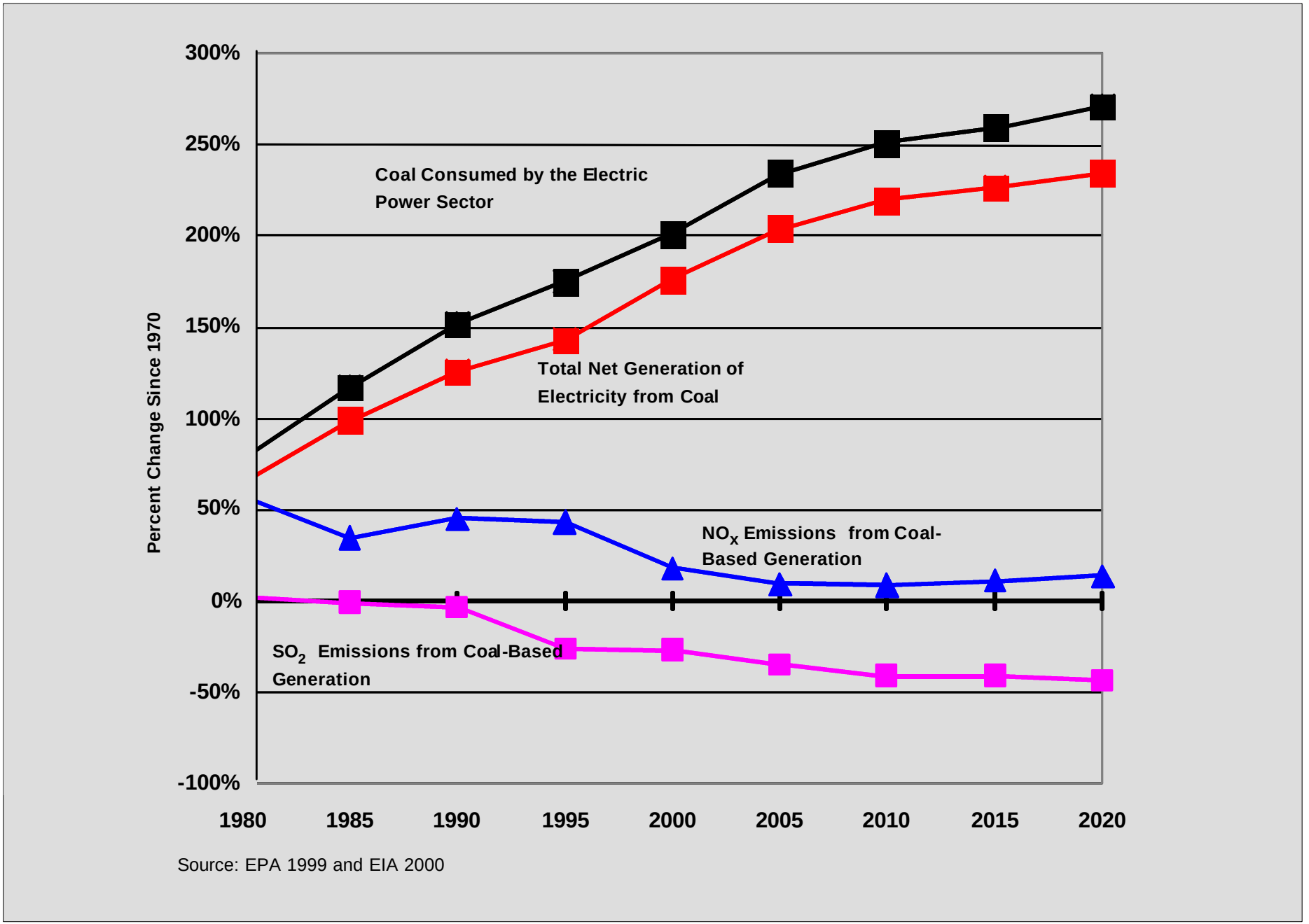



Sulfur Dioxide
Emissions from Coal Electric Generation
(millions of tons)
20
18
16
14
12
10
8
6
4
2
0
17.5
15.9
11.5
9.3
8.95
1980
1990
2000
2010
2020
Emissions in 2010 and beyond will be substantially lower than shown here, due to new EPA regulations on particulate matter and regional haze.


Sulfur Dioxide
Emissions Rate from Coal Electric Generation
(pounds per millon British Thermal Units)
3.5
3
2.5
2
1.5
1
0.5
0
2.89
1.96
1.22
0.83
0.76
1980
1990
2000
2010
2020
Emissions in 2010 and beyond will be substantially lower than shown here, due to new EPA regulations on particulate matter, and regional haze.


Nitrogen Oxides
Emissions - Fossil Fuel Electric Generation
(millions of tons)
8
7
6
5
4
3
2
1
0
7
6.7
4.6
3.7
3.8
1980
1990
2000
2010
2020
Emissions in 2010 and beyond will be substantially lower than shown here, due to new EPA regulations on particulate matter, ozone, and regional haze.


Nitrogen Oxides
Emissions Rate - Fossil Fuel Electric Generation
(pounds per million British Thermal Units)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.88
0.71
0.41
0.25
0.22
1980
1990
2000
2010
2020
Emissions in 2010 and beyond will be substantially lower than shown here, due to new EPA regulations on particulate matter, ozone, and regional haze.



Source: EPA 1999 and EIA 2000

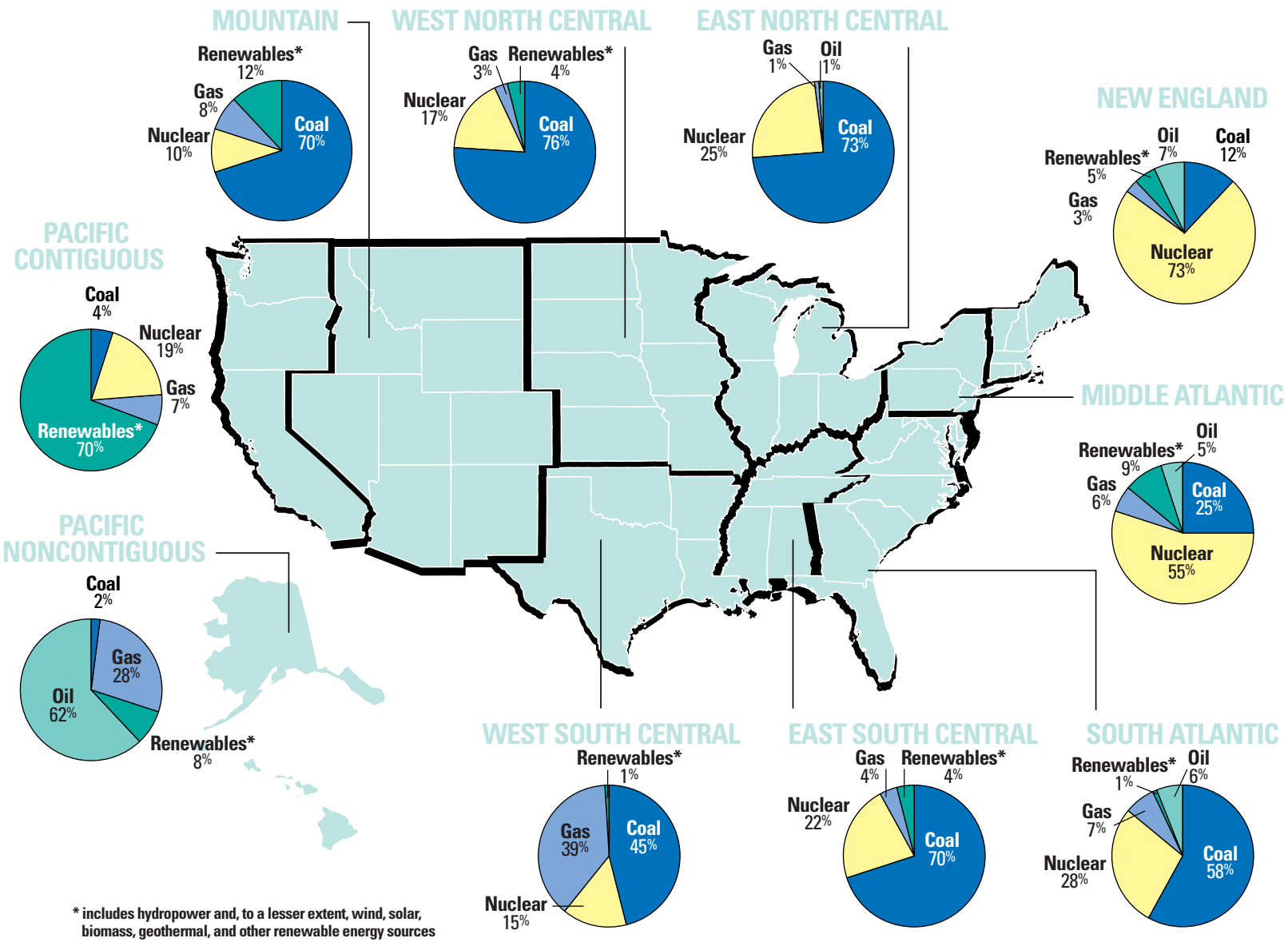
Major Air Quality Programs for Electric Utilities+

Current	
Ozone NAAQS (1-hour) / SIPs	1970
SO_2 NAAQS / SIPs	1970
NO2 NAAQS / SIPs	1970
Total Suspended Particulates NAAQS / SIPs **	1970
Carbon Monoxide NAAQS / SIPs	1970
New Source Review	1970
Citizens' Suits	1970
Prevention of Significant Deterioration	1977
Class I Areas	1977
LAER and Offsets for Nonattainment Areas	1977
Visibility - Section 169A	1977
PM_{10} NAAQS / SIPs	1978
Lead NAAQS / SIPs	1978
Title V Permitting	1992
Continuous Emission Monitors for SO_2 and NO_X	1995
Flow Monitoring	1995
Title IV (acid rain) permits	1995
Title IV SO_2 Phase 1	1995
Compliance Assurance Monitoring	1995
Credible Evidence	1995
Periodic Monitoring	1995
Title IV NO_X Phase 1	1996
NO_X NSPS	1997
Mercury Emission Reporting	1999
TRI	1999
NSR Enforcement Initiative	1999
Title IV NO_X Phase 2	2000
Title IV SO_2 Phase 2	2000

The Future	
TRI – Mercury	2001
NSR Reform Rule	2002?
Revised $PM_{2.5}$ NAAQS	2002
NO_X 126 State Petitions *	2003
U.S./Canada NO_X Treaty	2003
NO_X SIP Call *	2004
Ozone (8-hour) NAAQS *	2005
Mercury Standards	2007
Possible short-term SO_2 NAAQS SIP's *	2007?
Possible Title IV SO_2 Phase 3	2007?
Kyoto Protocol	2008?
$PM_{2.5}$ NAAQS *	2009
Regional Haze *	2009
Future NAAQS revisions	Every five years
Clean Air Act Reauthorization	?
Possible TMDL (water-based) NO_X controls	?
Possible TMDL (water-based) Mercury controls	?
Generation Performance Standards	?
Renewable Requirements	?
Labeling and Disclosure Requirements	?
Air Quality Related Values	?

* In litigation
** Phased out after PM_{10} standard
+ Dates reflect actual or potential implementation of emission controls.

Different Regions of the Country Rely on Different Generation Mixes for Electricity



* includes hydropower and, to a lesser extent, wind, solar, biomass, geothermal, and other renewable energy sources

Electric companies use a diverse mix of fuel sources to generate electricity. Several factors influence a utility's decision to use particular fuels. These include the price, the availability, and the reliability of supply. This map, arranged by census region, illustrates the diversity of fuel use across our nation and shows how the electricity generation mixes in various regions of the country differ. For example, the New England and Middle Atlantic states depend on nuclear power plants to generate more than half of their electricity. The Pacific Contiguous states, on the other hand, have abundant renewable hydro resources. The map further demonstrates that major changes in the generation mix could have economic and reliability impacts, especially on a regional basis.

Utility Data Only
by U.S. Census Division
Source: *Electric Power Monthly,* EIA
Year to Date — August 2000