

# AN INTEGRATED, FOUR-POLLUTANT APPROACH TO POWER PLANT EMISSIONS

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## **Rationale for an Integrated Policy**

Fossil-fueled power plants are the nation's largest source of sulfur dioxide (66%) and carbon dioxide (36%) emissions, the largest industrial source of nitrogen oxide emissions (29%), and a significant source of mercury emissions (21%). While the electric power industry has made progress in reducing environmental impacts in the 30 years since the Clean Air Act became law, it is clear that continued progress toward achieving national clean air goals and health-based clean air standards will require further significant reductions in power plant emissions.

As the national debate over energy policy proceeds, a key task will be to ensure that the effort to provide safe, secure, reliable and affordable energy supplies does not compromise environmental progress and public health. The requirement to reconcile energy policy and environmental policy is especially critical for the electric power industry because of its significant impact on air quality. A comprehensive solution to energy supply issues related to growing demand and the need to rebuild an aging electric power infrastructure must recognize that energy and environmental policy issues are interdependent and must include a long-term strategy for reducing the air quality impacts associated with the industry.

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The public policy debate over energy policy also comes during a period in which the economic rules governing the electric industry are undergoing fundamental change. The energy production component of the industry is now a highly competitive business in which participants must respond to the rigors of the marketplace and the scrutiny and judgment of financial markets.

These factors highlight the strong business rationale for an integrated approach that complements the environmental and public health considerations. The electric power industry needs to know now what the future environmental performance requirements will be. We do not want to confront a situation in which large amounts of capital investment predicated on one set of requirements is put at risk or wasted by short-term shifts and turns in public policy. It is important to recognize that public policy outcomes will affect the lives and livelihoods of millions of energy industry employees and investors, the financial health of American families, and the ability of American businesses to compete in international markets.

The best way to meet these challenges – assuring reliable and affordable energy supplies, attracting the capital necessary to rebuild infrastructure, and reducing environmental impact – is through an integrated, multi-pollutant approach that sets out uniform and unambiguous targets and timetables for reducing emissions of nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), mercury, and carbon dioxide (CO<sub>2</sub>), the pollutants most associated with the generation of electricity. This strategy should include cost-effective, market-based compliance mechanisms and streamlining of existing regulatory programs in a manner that removes impediments to investment without compromising environmental efficacy. This long-term, integrated strategy for addressing power plant emissions will provide energy companies and the financial markets on which they depend a high degree of certainty about environmental regulatory requirements. The industry will be better equipped to make critical decisions about allocation of capital because investment strategies will be based on a clear understanding of future environmental compliance obligations. This is a framework that reduces the risks associated with the current system of piecemeal, pollutant-by-pollutant regulation. The industry will respond by building new power plants, refurbishing existing electric generating capacity, and creating new markets and new opportunities for emerging technologies and products that increase the diversity and improve the reliability and environmental performance of the nation's electric supply system. The result will be an increased supply of energy and significant reductions of emissions.

## The Need for Federal Legislation

The Clean Energy Group<sup>1</sup> (CEG) is a coalition of electric generating and distribution companies that has developed a specific legislative proposal for implementing an integrated multi-pollutant strategy for the electric power industry.

CEG member companies have been actively involved in the public policy debate on energy and environmental policy and have brought to these deliberations a perspective forged from a number of shared attributes and principles. Member companies operate and are developing power plants in almost every region of the United States; they operate coal, gas, and oil-fired generating plants and nuclear powered facilities; and they are committed to working cooperatively with government, the environmental community, and other stakeholders to promote adoption of progressive policies that provide meaningful environmental improvements on an economically sustainable basis.

The legislation CEG is now proposing would implement, over a reasonable time period, a tonnage cap on emissions of the four major pollutants (NO<sub>x</sub>, SO<sub>2</sub>, mercury, CO<sub>2</sub>) associated with fossil-fueled power plants. The caps would deliver significant reductions in power plant emissions of NO<sub>x</sub>, SO<sub>2</sub>, and mercury and implement mandatory CO<sub>2</sub> reductions in a manner that will not compromise the reliability, fuel-diversity, or affordability of the nation's electric energy supply.

The legislation also would reform elements of the U.S. Environmental Protection Agency's (EPA) New Source Review (NSR) program that have proven to be an impediment to investment in new generation and environmental control technology.

The pollutants targeted for reduction under this program contribute to various health and environmental problems, including fine particulate exposure, ground-level ozone (smog), acid rain, regional haze, and climate change. In addition, mercury exposure is a growing health concern.

It is clear that any meaningful approach to addressing the issue of climate change must include mandatory participation by the electric power industry. There is no question that the issue of CO<sub>2</sub> reductions presents a real and significant challenge especially in relation to continued use of coal as an electric genera-

tion fuel. However, scientific evidence on climate change has progressed to the point where prudent action on reducing greenhouse gas emissions is warranted. The CO<sub>2</sub> emissions reductions targets, the flexibility mechanisms for compliance, and the compliance timetable included in the CEG legislation would begin the transition to a less carbon-intensive energy future for the U.S. without bankrupting the economy or eliminating coal as a viable fuel for electric power generation.

The following table outlines the proposed caps, emission reduction targets and timetables called for in the CEG legislation. These targets provide deeper reductions for NO<sub>x</sub> and SO<sub>2</sub> than called for under existing regulations now in place and begin the process for reducing mercury and CO<sub>2</sub> which are currently unregulated.

Key elements of this proposal are the market-based, cap-and-trade regulatory approach, NSR reform, and flexibility mechanisms for implementing the CO<sub>2</sub> cap that will ensure cost-effective emissions reductions.

Pollutant	National Tonnage Cap	Reduction Target	Schedule
NO <sub>x</sub>	2.11 million tons	Roughly a 50% reduction from current commitments (including implementation of the NO <sub>x</sub> SIP Call in the eastern U.S.) <sup>2</sup>	2008
SO <sub>2</sub>	4.5 million tons	50% reduction beyond Phase II Acid Rain <sup>3</sup> requirements	2008
	3.58 million tons	60% reduction beyond Phase II Acid Rain requirements	2012
Mercury	~ 26 tons	50% reduction from existing levels	2008
	~ 5-16 tons	70%-90% reduction from existing levels	2012
CO <sub>2</sub>	Stabilization at 2000 emission levels (plus flexibility mechanisms)		2008
	Stabilization at 1990 emission levels (plus flexibility mechanisms)		2012
	Stabilization at 1990 emission levels (only internationally agreed upon flexibility measures)		2015

## Benefits of a Cap-and-Trade Approach

The cap-and-trade program establishes a national limit – an emissions cap – for the pollutants. Allowances – the right to emit one ton (or, in the case of mercury, one pound) – are provided to each power plant based on the overall limit of the cap and the electrical output of the facility. Power plant operators can then decide how best to use allowances to meet regulatory requirements. For example, an operator of an older facility might decide to purchase allowances from another source rather than incur the costs of reducing emissions. An operator of a low-emissions facility might decide to sell allowances or bank them for future use. And an operator might decide to create an additional business opportunity by installing emissions control technology that will deliver marketable allowances.

The benefits of a cap-and-trade system have been clearly demonstrated by the Acid Rain program established under Title IV of the 1990 Clean Air Act Amendments. The program introduced an allowance trading system as a compliance mechanism for reducing the SO<sub>2</sub> emissions that are a major contributor to creation of acid rain. The program has been an environmental and economic success. Emissions reductions are being achieved at costs 75% less than originally estimated by EPA. Because cap-and-trade systems take advantage of market forces, direct capital investment to least-cost control opportunities, and minimize total pollution reduction costs across all regulated sources, there is no reason to believe national cap-and-trade programs for NO<sub>x</sub> and CO<sub>2</sub> won't replicate the success of the Acid Rain program.

There are various options available for allocating allowances under a cap-and-trade system. Traditionally, NO<sub>x</sub> and SO<sub>2</sub> power plant allowances have been based on historical heat input (fuel usage) expressed in terms of million British thermal units (mmBtu). In Phase 1 of EPA's Acid Rain program, for example, EPA allocated allowances to each participating power plant at an emissions rate of 2.5 pounds of SO<sub>2</sub> multiplied by the unit's baseline mmBtu (the average amount of fossil fuel used in a year from 1985 through 1987).

The Clean Energy Group legislative proposal, however, uses an allowance allocation system based on the power plant's electrical output. Recent analysis by EPA indicates that an output-based system will produce more megawatts of generation with fewer emissions, which, in turn, mitigates potential increases in compliance costs.

## **Reforming NSR**

EPA's NSR program is the component of the Clean Air Act designed to ensure that new power plants or existing units that undergo significant modification or expansion would be equipped with the latest and most effective emissions control technology. There has been much discussion and debate about NSR and its future role in relation to cap-and-trade methodologies for emissions reductions. CEG's proposed legislation would preserve most of the NSR requirements for new facilities. However, routine maintenance and modifications that improve the performance and efficiency of existing facilities would be exempt from NSR consideration unless such work creates significant changes to the output and nature of the facility.

More specifically, the legislation would reform the NSR program in these primary areas: Existing power plants would not be subject to NSR unless the physical modifications to the facility qualify as a reconstruction under EPA regulatory guidelines or result in an increase in emission rates (measured in pounds per megawatt-hour); the criteria for determining "Lowest Achievable Emissions Rate" technology would be changed so that clean generating sources would not be required to make disproportionately large investments in pollution control equipment that produce minor incremental reductions in emissions; and the emissions off-set requirement for new generating facilities located in non-attainment areas, which has been an impediment to the siting and construction of new, clean generating plants, would be eliminated because all facilities would be subject to the more stringent emissions caps called for in the legislation.

## **An Industry Approach to Climate Change**

There has been extensive discussion and debate about climate change and a national policy for reducing greenhouse gases that contribute to global warming. Much of the debate has centered on the emissions reductions framework included in the Kyoto protocol and whether the U.S. should ratify the international agreement that codifies the Kyoto reductions.

The economic costs associated with meeting the Kyoto targets and in reducing carbon emissions in general and the impact on energy supply, energy reliability, and continued use of coal are legitimate and worthy concerns. However, the

science of climate change is robust enough and the evidence for potentially serious environmental consequences is strong enough to make greenhouse gas reductions a component of national environmental policy.

Carbon dioxide, however, unlike NO<sub>x</sub>, SO<sub>2</sub>, and mercury, is an inevitable product of fossil fuel combustion. It cannot be scrubbed from flue gas or eliminated through other control technologies. Responding to the climate change threat by reducing CO<sub>2</sub> emissions requires complicated strategies implemented over the long-term. It makes economic and environmental sense to start this process now.

Implementing a prudent CO<sub>2</sub> reduction program now also reduces the risk that costlier and more dramatic action will be required at a later date. The CEG proposed legislation calls for a number of compliance options and flexibility mechanisms that will insure cost-effective reductions. These include credit for early reductions; CO<sub>2</sub> allowance trading, allowance allocations for nuclear and renewable sources, an investment credit program for renewable energy sources and energy efficiency projects, domestic and international projects that effectively sequester carbon, and credit for greenhouse gas reductions achieved outside of the electric power industry.

These provisions provide strong incentives for immediate investment in the new technologies – renewable energy sources and efficiency improvements – that will begin the long-term transition to an energy system much less dependent on carbon-based fuels. The early credit and investment credit mechanisms included in the legislation should provide attractive options for energy companies because it allows investment in domestic projects that contribute to electric system reliability.

The ongoing debate over the Kyoto Protocol should not be an excuse for inaction or policy paralysis on climate change and CO<sub>2</sub> emissions reductions. We can and should start taking positive, prudent, and achievable actions to reduce emissions.

## **Conclusion**

The integrated, comprehensive, coordinated approach to meeting the environmental challenges facing the electric power industry represents sound environmental, energy, and economic policy that will reduce emissions of harmful

pollutants while encouraging investment in the nation's electric energy infrastructure. This is an approach that will:

- Provide the industry and the capital markets with clear direction and business certainty about future environmental requirements, avoiding the risks and the financial uncertainties associated with a piecemeal, pollutant-by-pollutant regulatory regime.
- Support energy reliability by reducing risk and implementing an emissions reduction program that is reasonable and achievable.
- Remove barriers to building new electric generation facilities by applying the same environmental standards to all generation sources, providing allowance allocations to new sources, and streamlining existing regulations that create barriers to siting and construction of new facilities.
- Support fuel diversity through cap-and-trade mechanisms that allow power plant operators the option to meet compliance obligations through least-cost options.
- Maintain energy security by creating flexible compliance options that allow continued use of coal as an electric generating source.
- Protect public health and environmental quality by delivering real, substantial, and measurable reductions in emissions of pollutants on established compliance timetables.

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## Endnotes

1. The Clean Energy Group was founded in 1997. Member companies are Conectiv; Consolidated Edison, Incorporated; Exelon Corporation; KeySpan Corporation; Northeast Utilities; PGE National Energy Group, Public Service Enterprise Group Incorporated (PSEG); and Sempra Energy.

2. The NO<sub>x</sub> SIP Call refers to a regulation promulgated by EPA in 1997 requiring 22 states in the eastern half of the U.S. to produce State Implementation Plans or "SIPS" outlining programs to reach mandatory (up to 80%) nitrogen oxide emissions reductions.

3. Title IV of the 1990 Clean Air Act Amendments established the Acid Rain Program, which included mandatory sulfur dioxide reductions in two phases (1995 and 2000) and established an allowance trading system as a compliance mechanism.