CLIMATE CHANGE: LESSONS LEARNED FROM EXISTING CAP-AND-TRADE PROGRAMS

TESTIMONY OF RALPH IZZO
CHAIRMAN AND CEO-ELECT
PUBLIC SERVICE ENTERPRISE GROUP INCORPORATED

BEFORE

HOUSE SUBCOMMITTEE
ON
ENERGY AND AIR QUALITY
ENERGY AND COMMERCE COMMITTEE
MARCH 29, 2007

Chairman Boucher and members of the Subcommittee, I am pleased and honored to appear before you today on behalf of Public Service Enterprise Group Incorporated (PSEG).

PSEG is a diversified energy company with more than $28 billion in assets and more than $12 billion in annual revenues. Our family of companies distributes electric and natural gas energy to more than two million utility customers in New Jersey, and owns and operates approximately 16,000 megawatts of electric generating capacity in New Jersey, New York, Connecticut, Texas, Pennsylvania, New Hampshire, California, and Hawaii. This is a diverse generating fleet in terms of fuel source and technology and includes about 2,400 megawatts (MW) of coal-fired capacity and almost, 3,500 MW of nuclear capacity.

Let me state at the outset that PSEG believes that global climate change represents a real environmental threat and significant business challenge, as well as opportunity. We support mandatory greenhouse reductions on a national level and a cap-and-trade mechanism to achieve necessary reductions.

PSEG has been an active participant in the on-going policy debate on how our industry can best contribute to achieving our nation's environmental objectives. We have advocated independently, and through a coalition of companies known as the Clean Energy Group, for our

industry to make further reductions in air pollutants traditionally associated with the production of electricity – sulfur dioxide (SO2), nitrogen oxide (NOx), particulates, and mercury and to begin mandatory carbon dioxide reductions. We've been actively engaged in the climate change policy debate for more than a decade.

In 1993, PSEG set a voluntary goal through EPA's Climate Challenge program to stabilize its CO2 emissions at 1990 levels by 2000. PSEG reached this goal. In continuation of this effort, in 2002, we joined EPA's Climate Leaders program, and made a voluntary commitment to reduce our greenhouse gas emissions rate 18% from 2000 levels by 2008. Through investments in clean and highly efficient new generation sources and the retirement of older, higher-emitting generation, PSEG is well on the way to meeting this goal.

We've established a greenhouse gas emissions inventory and voluntarily report our greenhouse gas emissions to the U.S. Environmental Protection Agency. We worked with the World Resources Institute to develop accounting protocols for registering greenhouse gas emissions and measuring reductions. PSEG participated in the development of the Edison Electric Institute's (EEI's) climate change policy principles calling for federal action to reduce greenhouse gas emissions. We continue to be an active stakeholder in the development of the Regional Greenhouse Gas Initiative (RGGI)—a CO_2 cap-and-trade program in the Northeast (A comprehensive list of PSEG's greenhouse gas reduction initiatives is included as Appendix 1 to this testimony). We spend a significant amount of time thinking about the design and implementation of these programs and we appreciate the opportunity to share our insights with you today.

Climate Change Principles

Before I comment on our experience with existing cap-and-trade programs for SO2 and NOx, I would like to outline the principles that guide my thinking and my company's position on the issue of global climate change.

First, global temperatures are rising and human activities are very likely contributing to this change.

Second, the risk to our economy and to our civil society warrants an immediate and aggressive federal policy response, including enactment of a mandatory program to limit greenhouse gas emissions.

Third, I have confidence that our nation has the intellectual capital and the innovative spirit that will allow us to meet this challenge while providing new economic opportunities. What we need now is the political will to take those necessary first steps toward a lower-carbon economy.

Climate change poses an enormous challenge to our industry, and I am under no illusions as to the magnitude of the task ahead. However, with the right combination of policies and the establishment of a national market for greenhouse gas emission allowances, I am optimistic that we can reverse the current emissions trend and position our nation as a leader in the fight to combat global climate change.

The point was made at last week's hearing that we have no "back-end" control technology with which to retrofit a fossil-fired power plant for the capture of CO_2 emissions. Some take this as a reason for delay. I disagree. We have, in fact, many options available to reduce our emissions, all of which are commercially available; many more will emerge as we reduce regulatory uncertainty by enacting a market-based climate change policy that establishes a price signal for carbon and other greenhouse gases.

These options include: (1) end-use energy efficiency; (2) supply-side energy efficiency; (3) renewable energy technologies; (4) nuclear energy technology; and (5) a wide range of greenhouse gas offsets. There is no silver bullet – no single solution to this problem. But I can assure you that we have options that can be implemented now and that the pace of technology development and deployment will hasten dramatically when the United States—the largest economy on the planet—establishes a market price for carbon. Until this happens, however, the electric industry and other capital-intensive sectors of the economy will be forced to make business planning decisions in a state of regulatory uncertainty; technology innovators and entrepreneurs will be hampered in their efforts to secure capital as they pursue low carbon technologies; and we risk exposure to a growing patchwork of overlapping and inconsistent regional and individual state carbon reduction requirements.

Lessons Learned from Existing Cap-and-Trade Programs

As I indicated at the outset, PSEG has been involved in the development and implementation of several national and regional cap-and-trade programs for SO_2, NOx, and CO_2. Prior to 2000, our electricity generation business participated in these markets as part of a vertically integrated, regulated utility, and since 2000 our generation business has operated as a merchant electric generator in competitive wholesale electricity markets, predominantly in the Northeast.

To summarize, we believe that cap-and-trade based regulation provides the best option for regulating greenhouse gas emissions from the electric power sector and other segments of the economy. Second, despite the success of existing NOx and SO2 programs in delivering cost-effective reductions, we would argue that we should improve upon the existing models in our efforts to control greenhouse gas emissions. The most important is that the methodology used for distributing allowances should be adapted to address the unique challenges associated with the control of greenhouse gas emissions. We recommend using an output-based approach for allocations in the early years of the program as the best way to encourage efficiency upgrades and the deployment of new, clean technologies. We further recommend an initial allocation or distribution of allowances to affected industries accompanied by a transition to an auction system over a period of 10 years.

We have watched cap-and-trade programs develop and mature and we have become a strong advocate for these mechanisms. The details matter—a lot—but our overall assessment is that a cap-and-trade system works. Electric generators, regulators, and environmental advocates have come to accept that cap and trade systems for NOx and SO_2 have, in fact, worked very well. The cap-and-trade systems for NOx and SO2 have encouraged least-cost compliance solutions by allowing the market to select a variety of compliance strategies. Overall electric industry SO_2 emissions have been reduced about 44% and NOx emissions have been cut about 36% since 1990. SO2 emissions were reduced at a cost well below the $1,800/ton that was originally anticipated.

The success of existing cap-and-trade programs provides an ample basis on which to support enactment of federal legislation to establish a CO_2 cap-and-trade program for the electric power

sector. Ideally, while we would like to see an economy-wide system adopted, there are some good reasons for the electric sector to lead the transition to a lower carbon economy. Our industry is the largest source of CO_2 emissions in the United States, and we need an appropriate price signal to guide capital planning and investment decisions.

I would caution, however, that there are important distinctions between the existing NOx and SO_2 markets and a possible CO_2 program.

First and foremost is the potential scale of the CO_2 compliance market which will dwarf the SO2 and NOx markets. Under an economy-wide cap-and-trade system, it's estimated that the value of emissions allowances will exceed $40 billion annually (assuming a CO2 price of $7/ton). It is because the potential value of these emissions permits is so large, that decisions Congress makes regarding their distribution will have far greater implications than for NOx or SO_2.

The other important distinction between the existing NOx and SO_2 markets and a CO_2 program stems from the compliance solutions that will be needed. Under the Acid Rain program, there were basically two compliance options used: (1) switching to lower sulfur coals; and (2) the installation of SO2 scrubbers. In order to achieve significant greenhouse gas reductions, we need to create incentives for the rapid deployment of existing renewable and energy efficiency technologies and for the development of new compliance options such as carbon capture and storage. In short, we need to transform the ways in which we use and generate electricity.

Both of these distinctions speak to the need for a well crafted, carefully considered, nationwide, uniform system for distributing emissions permits. The key questions in this regard are: (1) on what basis should permits be distributed among the affected industry sectors and companies; and (2) to what extent should the emissions permits be auctioned, rather than distributed at no cost.

Under the Acid Rain program, virtually all SO_2 allowances were distributed at no cost to power plant operators. Since relatively few allowances have been auctioned, new generating facilities are generally required to purchase their permits from companies that were included in the initial distribution of allowances. A number of the witnesses before this Subcommittee last week suggested we continue this approach in a CO2 cap-and-trade program when they recommended

an allocation to electric generators based on historic emissions (or fuel adjusted heat input which effectively translates to historic emissions).

We disagree. This grandfathering approach, as it is commonly known, creates a perverse incentive that should be avoided under a CO_2 cap-and-trade program. New generating technologies, like integrated coal gasification/combined cycle (IGCC) and ultra supercritical coal-fired power generation, would be completely excluded from the no-cost distribution of allowances because only existing facilities would be entitled to an allocation. This doesn't make sense from a public policy perspective because it rewards technologies with lower efficiency and higher emissions rates and provides no incentives for innovation and investment in low emission technologies.

PSEG, along with a coalition of companies, supports an alternative to grandfathering—a performance-based, efficiency approach—also known as an updating output based allocation. Under this system, allowances would be distributed based on a facility's proportionate share of recent electricity output measured in kilowatt hours. Both new facilities, like the IGCC and the ultra supercritical coal-fired power plants that I mentioned above, and existing generating plants, would be entitled to compete for allowances, and companies would have an incentive to upgrade the efficiency of their plants to reduce their compliance costs and increase the number of allowances they receive. In the electric industry, low-cost, higher efficiency power plants are generally dispatched more than high-cost lower efficiency facilities. Under an output based allocation, because CO2 permits are distributed based on actual production of electricity, there is an incentive to invest in high efficiency generating technologies. This could mean upgrading an existing facility or constructing an entirely new power plant.

An output based allocation can also be used to encourage investment in non-emitting technologies by making all forms of electricity generation eligible for an allocation. Several states have done this with their NOx allocations by providing allowances to renewable energy projects.

I recognize that there are those within the electric industry who are opposed to this approach. They suggest that distributing allowances to non-emitting facilities represents a windfall to these

generators. My response is that we need to encourage efficiency in all forms of generation, which is precisely what an output based allocation method will accomplish. This might result in a turbine upgrade at a hydroelectric facility or the replacement of a condenser at a coal-fired power plant. Both strategies are equally valid in the effort to reduce electric industry CO_2 emissions.

In the 2005 Energy Policy Act, Congress enacted a number of provisions designed to spur the construction of new nuclear and clean coal technologies. And, the combination of federal research and development, tax incentives and loan guarantees has sparked a certain level of interest in these technologies. We believe that Congress can, and should, build on this foundation as it develops its carbon reduction strategies and believe that the updating output based methodology we support is the best means of improving the economics of both new nuclear, and clean coal, generation and will result in actual investment decisions on these, and other, new, low and zero-carbon technologies. The choice is between preserving the status quo or providing incentives that will move our industry forward.

The other lesson that I would offer from our experience with existing cap-and-trade programs and an issue that I think policymakers should understand is: who bears the costs under a cap-and-trade system? Power plant operators will seek to recover their CO2 compliance costs when they bid into the wholesale electric energy markets. Depending upon the structure of the electricity markets and the fuel mix of generation serving those markets, some portion of these costs will be recovered by generators in the form of higher wholesale electricity prices that ultimately impact electricity consumers.

Because electricity consumers ultimately bear these costs, you can argue that consumers should be entitled to a portion of the emission allowances – really the value inherent in the allowances. This can be accomplished by auctioning the allowances and returning the proceeds to consumers in the form of rebates, energy efficiency credits, or reduced taxes. Economists also generally agree that the auction approach is the most efficient and transparent method for distributing allowances.

However, while economic theory may suggest this course, PSEG believes that as a matter of public policy, existing coal-fired power plants must continue to be an important energy resource in the U.S. Therefore, we think it makes sense to limit the auction of allowances in the early years of the program.

As a case in point, PSEG is currently evaluating whether to make an investment of approximately $600 million on a 600 MW coal plant in New Jersey for selective catalytic reduction (SCR) for NOx control, and a scrubber and baghouse for SO2, particulate, and mercury control. The Northeast as you know is moving forward with implementation of a regional greenhouse gas cap-and-trade program. A number of states in the Northeast have been considering adopting a 100% auction system when the program is implemented in 2009. For this particular investment, given our assumptions about forward prices associated with natural gas, energy markets, and CO2 allowances, for every 10% auction of allowances, this plant loses about $15 million of Net Present Value (NPV). Therefore, a 100% auction makes this investment a very questionable decision and one that will have a direct bearing on whether we continue to operate this facility.

I should point out that this investment analysis assumed that CO2 allowances would not be grandfathered and that in order to qualify for an allocation this specific unit had to be operating and producing electricity. Under a grandfathering allocation system, I would be granted an allocation regardless of whether I make the capital investment.

Moving too quickly to a full auction system may also create problems for facilities with contract obligations that would prevent them from recouping auction costs until their contracts could be renegotiated.

These economic realities suggest that we are best served by transitioning to a full auction process over a reasonable period of time. PSEG supports auctioning 25% of the allowances at the outset of the program and transitioning to full 100% allowance auction over the course of 10 years. In the short term, I would advocate using an output based allocation for allowances as a tool to encourage power plant efficiency and the deployment of low and zero carbon technologies. Auction proceeds can be used to fund research and development into advanced energy

technologies and to compensate households and companies that are disproportionately burdened by the costs of a cap-and-trade program.

Another important distinction for CO_2 program is the critical need for "offsets," both as a cost control measure and as source of innovative compliance solutions. Offsets are reductions generated at sources that are outside of the emissions cap. Offsets can include forest sequestration, agricultural sequestration, methane capture and destruction from coal mines and landfills, repair of gas leaks associated with electric circuit breakers that use sulfur hexafluoride (SF6 is a greenhouse gas 10,000 times more potent that CO2), and other measures. Engineering assessments by EPA and experience with existing greenhouse gas markets suggests that offsets can dramatically reduce the costs of a cap-and-trade program. PSEG, in conjunction with Entergy and three other energy companies recently issued a request for proposal (RFP) seeking 10 million tons of high-quality greenhouse gas offsets that we hope to acquire and use for RGGI compliance. We would advocate the inclusion of both domestic and international offset categories in the context of a national cap-and-trade program.

In addition to offsets, a safety valve limiting the price of emission allowances may be warranted as well. By controlling the maximum price of allowances, it is possible to limit the financial exposure of affected sources to unanticipated spikes in the cost of allowances. In establishing a safety valve trigger; however, we must ensure that allowance prices are high enough to drive innovation and the deployment of advanced energy technologies.

Conclusion

Mr. Chairman and Members of the Subcommittee, on behalf of PSEG, I thank you for the opportunity to provide these comments today.

To summarize my comments, I believe the time has come to enact national legislation that will reduce the environmental and business risks associated with global climate change and spur investment in the new technologies that will move our economy toward a less carbon-intensive future.

I would be pleased to respond to your questions.

Appendix 1 – PSEG Greenhouse Gas Related Actions

Emission Reductions
PSEG maintains a comprehensive company-wide greenhouse gas inventory for its participation in EPA's Climate Leaders program. In addition, the company has also been reporting greenhouse gas emissions to the Department of Energy Voluntary Greenhouse Gas Reporting program for over a decade.

In 1993, PSEG set a voluntary goal through EPA's Climate Challenge to stabilize its CO2 emissions at 1990 levels by 2000. PSEG reached this goal. In continuation of its efforts to reduce greenhouse gas emissions, in 2002, PSEG joined the EPA's Climate Leaders program, and made a voluntary commitment to reduce its GHG emissions by 18% from 2000 levels by 2008. Through investments in clean and highly efficient new generation sources and the retirement of older, higher emitting generation, PSEG is well on the way to meeting its goal.

PSEG is also reducing emissions across the company's operations. For example, it has reduced emissions of sulfur-hexaflouride (SF6), a highly potent greenhouse gas, through an aggressive leak detection program. It has also reduced CO2 emissions from its vehicle fleet through its use of biodiesel for all of its diesel vehicles. It has also made significant improvements in its nuclear generating fleet, which reduces the need for electricity generated using fossil fuels.

Emissions Benchmarking
PSEG has worked in partnership with the Natural Resources Defense Council (NRDC) and CERES on a series of benchmarking reports comparing the emissions of the 100 largest generators in US. In the latest report that was published in April 2006 PSEG is identified as the 19th largest US electric generator and the 30th largest electric power emitter of CO2. That same report highlights that seven electric power producers contribute to 25% of the industry's total CO2 emissions, and the top 19 account for approximately 50%. The top 100 power producers account for 85% of all electricity generated in the US.

Resource Conservation
PSEG is a Hall of Fame winner of EPA's Wastewise voluntary waste reduction program. The company has been recycling over 90% of its solid waste for more than a decade resulting in greenhouse gas reductions. PSEG also participates in the voluntary Natural Gas Star and is making steady progress in reducing leakage throughout our natural gas distribution operating system.

Vehicle Emission Reductions
PSEG's uses 1.5 million gallons annually of a biodiesel blend in its vehicle fleet. Biodiesel is made from renewable sources such as soybeans and recycled oils from restaurants. Because the carbon in biodiesel comes from renewable sources, it does not contribute to global warming. As a result, PSEG has been able to reduces its greenhouse gas emissions from diesel vehicles by 20%.

Re-forestation
PSEG is a member of the PowerTree Carbon Company. The PowerTree Carbon Company is currently investing in 6 reforestation projects in the United States. These projects involve planting a total of 3,609 acres of trees, which are projected to capture and sequestration of over 1.6 million tons of CO2 over the project lifetime.

PSEG is also an equity owner in Clean Air Action that is investing in tree plantings in Africa. The program is called the TIST program which empowers small groups of subsistence farmers in countries such as Tanzania, Kenya, Uganda and India to reverse the devastating effects of deforestation, drought, and famine while capturing and reducing CO2 in the atmosphere. Over 3 million trees have been planted to date and will result in the sequestration of up to 3 millions tons of CO2 over 30 years.

Energy Master Plan
PSEG is actively supporting Governor Corzine's Energy Master Plan and has proposed various initiatives that if adopted by NJ policymakers would result in realization by 2020 of approximately a 10% reduction of electric consumption across the state, 50 trillion Btu's of natural gas savings, 9.5 million gallons of gasoline savings annually, and approximately 500 MWs of photovoltaic solar energy.

Appendix 2 - PSEG Principles for Sound Climate Change Legislation

Emissions Reduction Requirement

- Incorporate a science-based, long-term emissions reduction requirement with a goal of avoiding dangerous anthropogenic interference with the climate system. Based on current state of the science, legislation should stabilize and begin to reduce greenhouse gas emissions within the next ten years, and achieve emissions reduction of 60 to 80% below relative to current levels by 2050.

- Legislation should institutionalize a periodic review of climate science and allow for a revision of emissions reduction requirements based on the current state of the science.

Policy Approach

- Assures stable, long-term public/private funding to support the development and deployment of needed technology solutions;

- Establishes a long term price signal for carbon that is moderate, does not harm the economic competitiveness of U.S. industry and that stimulates future investments in zero or low-carbon technologies and processes;.

- Addresses regulatory or economic barriers to the use of carbon capture and storage and increased nuclear, wind or other zero-or low-GHG technologies;.

- Minimizes economic disruptions or disproportionate impacts on sectors of the U.S. economy;.

- Recognizes early actions/investments made to mitigate greenhouse gas emissions;.

- Provides for robust use of a broad range of domestic and international GHG offsets;.

- Provides certainty and a consistent national policy;.

- Recognizes the international dimensions of the challenge and facilitate s technology transfer;.

Design Process

- Pursue a portfolio approach to reducing emissions, acknowledging that a cap-and-trade program is appropriate for large stationary sources, and that other policies may be more appropriate for addressing emissions from other sectors. Such a portfolio approach should also recognize the unique of role of states in relative to setting policies and measures for development of in-state energy production resources, energy efficiency, transportation, waste management, agriculture, and other economic sectors. Also adopt policies that encourage electric and gas utilities to use their so-called “patient capital” for making investments in cost-effective energy efficiency and

renewable energy supply .that other invsestors with less patient capital have passed over.

- Seek to harmonize Federal legislation with policy work already completed or underway at the state level.

Cap-and-Trade Program Design

- Provide a safety valve so that investors have regulatory certainty. They need to be able to assess the full extent of liability, and to provide assurance to the public that electric market prices are not going to be allowed to skyrocket. The mechanism to provide this is the use of a safety valve. The safety valve should be periodically readjusted to market experience and to allow for needed price signals to stimulate future investment in new low and zero carbon technologies.

- In the electric power sector, allowances should be allocated for the electric power sector on an updating output based allocation methodology with 25% initially withheld for auction. The percentage that is auctioned should be gradually increased up to 100% over 10 year time period. The proceeds from an auction should be dedicated to development and deployment of new zero or low carbon generating technologies and carbon capture.

- Grant allowances for new investments made in zero carbon generating technologies in order to stimulate investment in these technologies.

- Encourage unlimited use of verifiable domestic and international emissions offsets. Offsets should be encouraged to meet compliance obligations of the capped sector or sectors. Design robust requirements to ensure that emissions offsets are of high quality and represent incremental emissions reductions beyond business-as-usual reductions. Requirements should include strong additionality criteria to avoid crediting of “anyway tons” and provide a reasonable assurance that the cap-and-trade program is what is actually driving emission reductions achieved through offsets. Quantification and verification protocols should be rigorous and detailed, and apply conservative assumptions when appropriate.