



RESPONSIBILITY, STEWARDSHIP, ACCOUNTABILITY:

The Shareholder-Owned Electric Power
Industry's Commitment to the Environment



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Edison Electric Institute
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2696
Phone: 202-508-5000
Web site: www.eei.org

Abbreviations and Acronyms

APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
BART	best available retrofit technology
CO ₂	carbon dioxide
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CAMR	Clean Air Mercury Rule
CAVR	Clean Air Visibility Rule
CCPI	Clean Coal Power Initiative
CFB	circulating fluidized bed
CCP	coal combustion product
C ² P ²	Coal Combustion Products Partnership
CWA	Clean Water Act
CWRP	Corporate Wetlands Restoration Partnership
DOE	U.S. Department of Energy
EEI	Edison Electric Institute
EMF	electric and magnetic fields
EPRI	Electric Power Research Institute
EIA	U.S. Energy Information Administration
EH&S	environmental health and safety
EMS	Environmental Management System
EPA	U.S. Environmental Protection Agency
FERC	U.S. Federal Energy Regulatory Commission
GDP	Gross Domestic Product
GHG	greenhouse gas
GNEP	Global Nuclear Energy Partnership
IGCC	integrated gasification combined-cycle
IVM	Integrated Vegetation Management
kWh	kilowatt hour
MOU	memorandum of understanding
MW	megawatt
NAPEE	National Action Plan for Energy Efficiency
NERC	North American Electric Reliability Corporation
NETL	National Energy Technology Laboratory
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NRECA	National Rural Electric Cooperative Association
NO _x	nitrogen oxides
PCB	polychlorinated biphenyl
PESP	Pesticide Environmental Stewardship Program
PM	particulate matter
POP	persistent organic pollutant
REC	renewable energy credit
RPS	renewable portfolio standard
SC	supercritical
SCR	selective catalytic reduction
SEC	U.S. Securities and Exchange Commission
SF ₆	sulfur hexafluoride
SNCR	selective non-catalytic reduction
SO ₂	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasure
TMDL	Total Maximum Daily Load
TRI	Toxics Release Inventory
USC	ultra-supercritical
USFWS	U.S. Fish and Wildlife Service
USWAG	Utility Solid Waste Activities Group
UWAG	Utility Water Act Group
VOC	volatile organic compound

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OUR ENVIRONMENTAL PRINCIPLES



Our customers expect three things of us. First, they expect that when they flip the switch, the lights come on. Second, they expect that the electricity delivered to them is affordable. And third, they expect we will produce and deliver that product with as little impact on the environment as possible.

All three of these customer expectations are core values for the member companies of the Edison Electric Institute (EEI). We consider our responsibility to environmental stewardship as a commitment to leave a prosperous, sustainable planet to the next generation.

In 2003, EEI member companies formalized their stewardship responsibilities by adopting a set of Environmental Excellence Principles (see Table 1). These principles assert our industry's values, particularly our commitment to protecting public health and the environment, to continuous performance improvement, and to public outreach and reporting.

In 2005, the EEI Board of Directors directed the Institute's members to produce this report as the next step in pursuing our Excellence Principles. By providing a wide-ranging account of how the shareholder-owned segment of the electric power industry addresses environmental issues, we offer a picture of how EEI members manage their environmental responsibilities. We prepared this report with the following goals in mind:

- *To educate and inform.* Many people, even those whose jobs regularly bring them into contact with our industry, are often surprised by the array and range of the environmental issues we face. In part, this report is designed to highlight many of the most important issues and inform interested parties on how we manage those issues.
- *To demonstrate openness and honesty.* We work regularly with many stakeholders who pay close attention to our environmental performance. With this report, we offer a transparent look at many aspects of our approach to environmental management.
- *To provide a readily accessible reference tool.* Much of the data contained in this report can be found elsewhere. With this report, we provide interested parties with a single place to find relevant information about EEI members and the environment.

As an industry, we provide our customers with tremendous value. When adjusted for inflation, electricity prices are lower today than they were in 1980, and maintaining that value is one of our top priorities. By working together, we can continue to provide consumers with what they value most—affordable, reliable electricity—while at the same time honoring our commitment to be good environmental stewards.

Throughout this report we will reference additional resources and provide electronic links, when available. We hope you will avail yourself of these resources to learn more about the issues and challenges that the industry faces, both now and in the future.

James E. Rogers
EEI Chairman
Chairman, President and CEO
Duke Energy Corporation

Table 1

EEI ENVIRONMENTAL EXCELLENCE PRINCIPLES

In providing the American people with the electric energy that improves the quality of our lives, we recognize our responsibility to protect the environment. Meeting that responsibility requires commitment and effort.

To generate the electricity that powers our homes, our businesses and our nation's economy, electric companies must rely on the Earth's natural resources. It is vital to our future that our limited energy resources be used wisely. Our companies spend thousands of hours and billions of dollars each year to reduce the impact of our operations on air, water and land resources. We also realize that our commitment to the environment is not limited to what is required by law.

The member companies of the Edison Electric Institute are committed to continuous environmental improvement. That's why we have developed—and endorse—these Environmental Excellence Principles:

- **Environmental Commitment** – Establishing a company-wide commitment to environmental excellence and identifying measurable performance goals that ensure compliance with laws and regulations, protect the environment, and protect the health and safety of our employees, customers and the public.
- **Improved Performance** – Striving to make continuous improvements in our performance, while managing our ongoing environmental obligations.
- **Pollution Prevention and Resource Conservation** – Making pollution prevention and the conservation of natural resources integral foundations of our companies' business plans.
- **Public Outreach and Reporting** – Fostering open communication with our employees, key stakeholders and the public on environmental matters and our environmental performance.
- **Stakeholder Dialogue** – Interacting with a broad range of stakeholders—including governmental agencies, regulators, environmental groups and the public—to develop responsible and equitable laws, regulations and other commitments that safeguard our communities, workplaces and the environment.
- **Stewardship** – Protecting and enhancing the quality of the environment for current and future generations by pursuing activities, such as research and investment, that seek to reduce environmental, health and safety risks.

We will establish and maintain effective environmental management systems to implement these principles.

January 2003

OUR ENVIRONMENTAL COMMITMENT



Our society depends on affordable, reliable electric power, which in turn drives economic growth, spurs technological innovation and sustains our standard of living. The federal government forecasts that electricity consumption will increase more than 40 percent by 2030 due to population expansion and increased demand.

This prospect presents new challenges for the electric power industry in how we run our operations and how we continue to meet the nation's energy needs. Chief among these challenges will be our ability to meet electricity demand in a way that continues to support our national goals for securing and maintaining a healthy environment.

Shareholder-owned electric companies recognize that the process of generating and delivering electricity to consumers has an impact on the environment. We also understand that our mission presents us with a dual responsibility: to deliver the energy our society demands with as little environmental impact as possible.

EEI's member companies are proud of their environmental record. This report describes those achievements, including those that involve compliance with laws and regulations and those that the industry has undertaken largely on its own.

We also recognize that we have much to accomplish. To meet society's demand for electricity and a cleaner environment, we will need new infrastructure, including additional generating plants, transmission and distribution lines; greater efficiency in our own operations, as well as in how our customers use energy; and new technologies to provide affordable, reliable electricity with less impact on the environment.

We'll also need bold action, smart innovation, hard work and good timing. As you'll see in this report, EEI members are taking steps to prepare for this future.

With this report, we are opening the door to a new kind of accountability by providing the first wide-ranging look at the shareholder-owned electric power industry's approach to environmental management. Our commitment to environmental stewardship and continuous improvement was the key motivating force to prepare the report.

Finally, we invite readers to complete the form at the back of the report and share your thoughts and insights on how we can do an even better job going forward in managing our environmental responsibilities.

We look forward to hearing from and working with you to ensure that our society has both the plentiful electricity and the healthy environment that it needs and desires, now and in the future.

Thomas R. Kuhn
President
Edison Electric Institute

INDUSTRY OVERVIEW

The Edison Electric Institute (EEI) is the association of U.S. shareholder-owned electric companies, international affiliates and industry associates worldwide.¹

THE INDUSTRY AND THE ENVIRONMENT

When it comes to shareholder-owned electric power companies and the environment, understanding the basic structure of the industry and its environmental challenges is essential. To help place the information presented in this report in context, it's important to keep in mind that EEI's members:

- Serve 97 percent of the ultimate customers in the shareholder-owned segment of the industry, and 72 percent of all the ultimate customers in the nation.²
- Own and operate 437,000 miles of transmission lines, or approximately two-thirds of all transmission lines in the United States.
- Employ, together with other segments of the electric power industry, more than 400,000 Americans. These workers take the industry's effects on the environment very seriously.
- Recognize their responsibility to generate, transmit and distribute electricity in the most environmentally friendly way possible, while also providing customers with the affordable, reliable power they expect and deserve.
- Understand the crucial role that efficiency must play in the industry's future. From 1989-2005, electric utility programs saved more than 796 billion kilowatt hours (kWh) of electricity—enough to power nearly 74 million average U.S. homes for one year.³
- Reduced sulfur dioxide (SO₂) and nitrogen oxides (NO_x) emissions more than 40 percent since 1980, despite enormous increases in electricity use and economic growth.
- Lead the nation in taking voluntary actions to reduce, avoid or sequester carbon dioxide (CO₂) and other greenhouse gas (GHG) emissions.
- Own or manage millions of acres of land and water in accordance with all federal, state and local laws. Electric power plants, substations and other facilities needed to generate and transmit electricity, including hydropower projects, make up a portion of utility holdings. The majority of this land is rights-of-way and buffer areas surrounding facilities. It serves energy needs, offers public recreational opportunities, provides habitats for hundreds of plant and animal species, and secures wilderness areas through conservation easements.
- Operate many programs designed to enhance the wildlife that lives on and near their facilities. These include 70 percent of all species named on the federal government's Endangered Species list.
- Rely on generation technologies that are highly dependent on water, especially for cooling steam-electric equipment and for renewable hydroelectric generation.
- Develop new and innovative ways to reduce, reuse, recycle and dispose of wastes produced during the generation, transmission and distribution of electricity. For example, coal combustion products (CCPs) often are diverted from waste streams and used in cement and concrete and in road and highway construction.

¹Shareholder-owned electric companies are tax-paying businesses that are highly regulated and are financed by the sale of stocks and bonds to the general public. These companies are owned by millions of shareholders directly or indirectly through other investments such as retirement funds, life insurance policies or mutual funds. The rest of the nation's consumers are served by energy service providers and government-owned and cooperatively owned electric utilities.

²Ultimate customers are those customers that purchase electricity for their own use and not for resale.

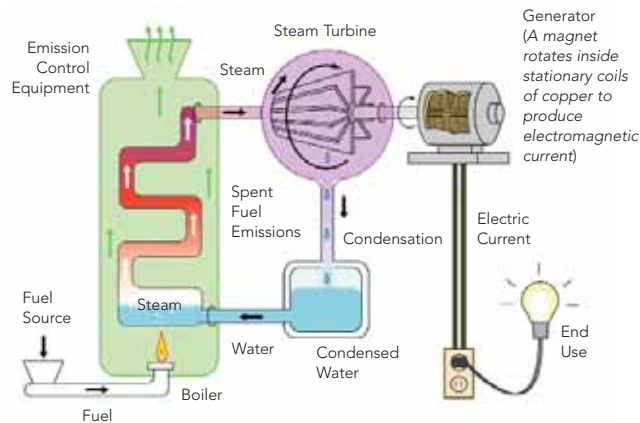
³U.S. Department of Energy, Energy Information Administration, *Electric Power Annual 2005*, October 2006.

HOW THE ELECTRIC POWER SYSTEM WORKS

Below is a simplified explanation of how electricity is generated, transmitted across great distances and distributed to individual customers (see Figures 1 and 3). Each part of this process provides unique environmental challenges.

Figure 1

HOW ELECTRICITY IS GENERATED



cities and other “load centers” where the power is needed.

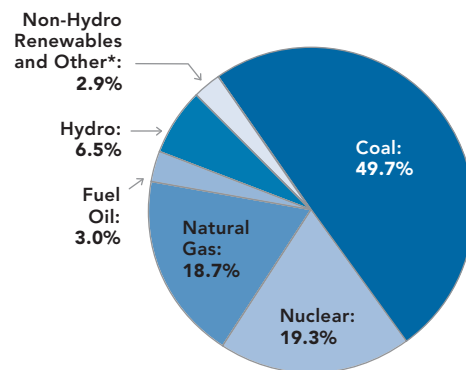
- Near these load centers, the transmission lines connect to substations, where different transformers decrease the voltage so the electricity can be sent via smaller distribution lines into neighborhoods and business centers.
- Other transformers along the distribution lines further decrease the voltage to the 120- and 240-volts that power most household appliances and equipment. The wires that run from these transformers, which can be located above ground on utility poles or buried underground, are called drop lines.
- As the electricity enters the home or business, it passes through a meter that measures how many kWh each customer uses from month to month.

For more information on how the electric power system works and on the history of the industry, please see the “Electricity 101” presentation on EEI’s Web site, www.eei.org.

- Power plants are basically energy conversion facilities—they take a fuel (in the form of coal, natural gas, uranium, fuel oil, or hydropower and other renewables) and convert it into electricity. Some plants are very large and can produce enough electricity to serve hundreds of thousands of customers; others are small and produce electricity for just hundreds of customers. Figure 2 shows the most recent national fuel mix for electricity generation.
- As the electricity leaves the power plant, transformers increase its voltage. Voltage is similar to water pressure in a garden hose: the higher the voltage, the farther the electricity can travel.
- Thick wires on tall towers carry high-voltage electricity to places where the power is needed, and connect one region to another. These transmission lines often run hundreds of miles from isolated areas where plants are located to

Figure 2

SOURCES OF FUEL USED IN ELECTRICITY GENERATION

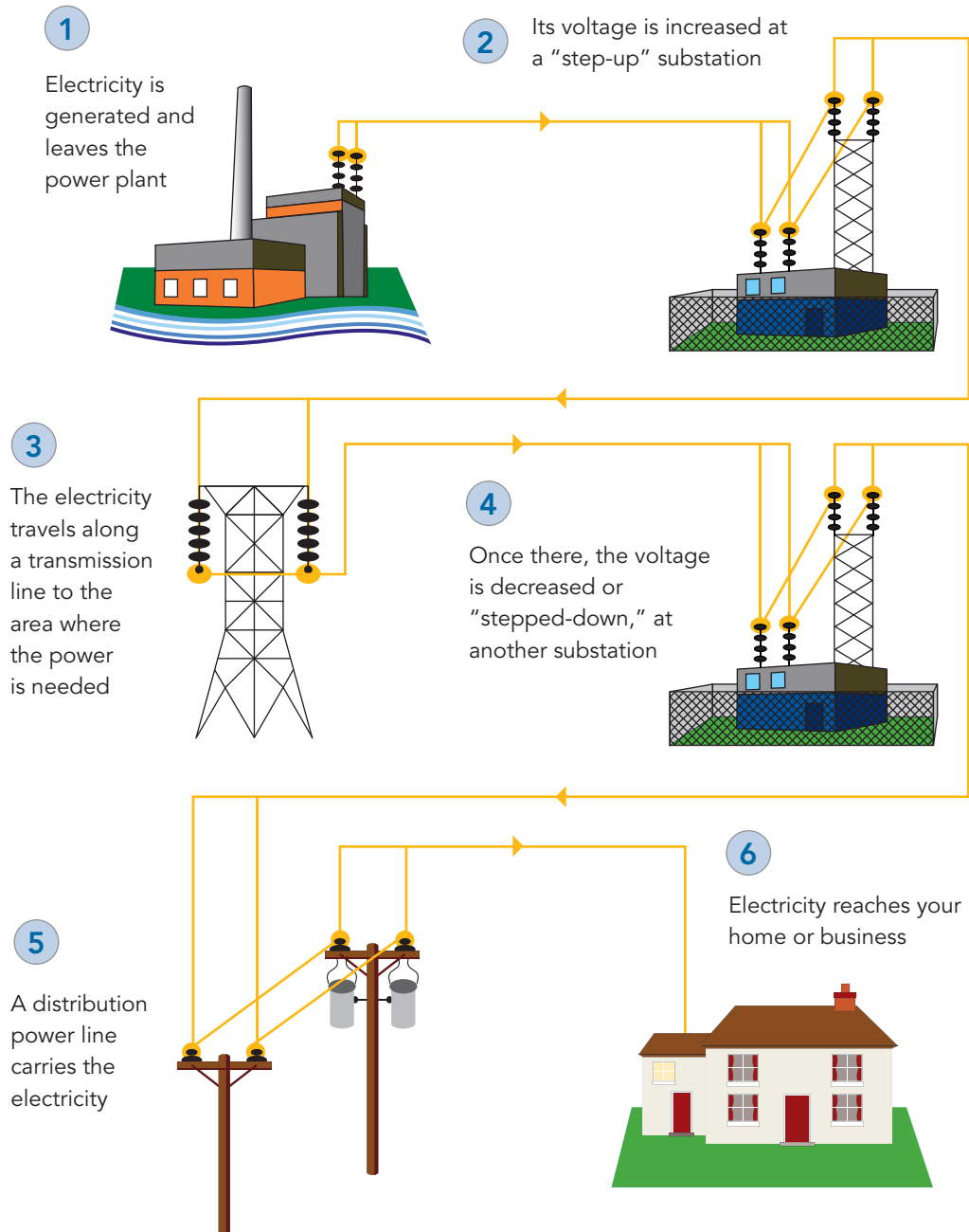


*Includes generation by agricultural waste, batteries, biomass, chemicals, geothermal, hydrogen, landfill gas recovery, municipal solid waste, non-wood waste, pitch, purchased steam, solar, sulfur, wind and wood. Note: Numbers exceed 100% due to rounding.

Source: U.S. Department of Energy, Energy Information Administration, 2005 data

Figure 3

HOW THE ELECTRIC POWER SYSTEM WORKS



INTRODUCTION

Electricity is essential to economic and social progress. It powers homes, businesses and industries; makes advances in communications, entertainment, computers and medical services possible; and drives various forms of transportation. Electricity enhances quality of life, supports high living standards and contributes to the success of our nation in countless ways. As Figure 4 shows, electricity demand and Gross Domestic Product (GDP) have closely tracked historically.

As our economy grows, so does the demand for electricity. This is a healthy sign of a growing economy and rising living standards. Even as EEI members work to meet this demand, they are strongly committed to reducing the environmental impact of electricity production.

However, this sustained growth in electricity demand is beginning to strain the system. The North American Electric Reliability Corporation (NERC) forecasts that most U.S. regions will see the reserve margins they need to meet demand decline through 2015. It is time to invest in America's electric future by:

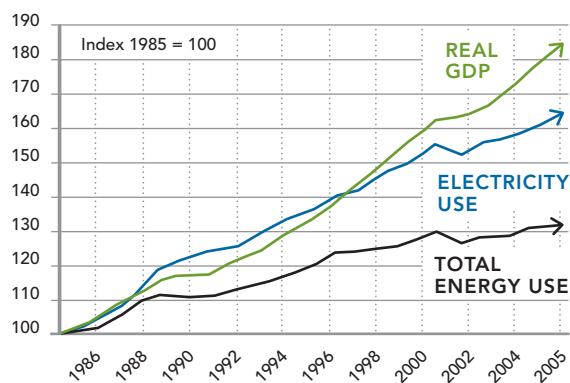
- Providing more power plants and transmission infrastructure.
- Modernizing and expanding the distribution system.
- Investing more in technologies that can further reduce environmental impacts and increase energy efficiencies.
- Adopting new policies to enhance energy efficiency and demand-side management practices.

This creates our industry's greatest environmental challenge: how to meet society's demands for affordable, reliable electric power and simultaneously protect the environment and conserve natural resources.

MUCH PROGRESS TO DATE, MORE TO DO

EEI members remain committed to reducing the environmental impacts of their generation, transmission and distribution activities. They will do so both by complying with federal, state and local laws and regulations, and by working together with

Figure 4
HISTORICALLY, GDP GROWTH AND ELECTRICITY DEMAND HAVE TRACKED CLOSELY



1985 represents the base year. Graph depicts increases or decreases from the base year.

Source: U.S. Department of Energy, Energy Information Administration (EIA)

government agencies and other stakeholders on collaborative and voluntary initiatives.

Together, these activities already have created an environment that is cleaner in many respects today than at any time in the last four decades. For example, coal-based air emissions have declined dramatically since passage of the original Clean Air Act (CAA) and the CAA Amendments of 1990, and greater reductions will continue going forward.

EEI ENVIRONMENTAL EXCELLENCE PRINCIPLES

The release of this report marks a new chapter in our industry's commitment to environmental excellence. EEI members take their responsibility to make continued environmental progress seriously. This

report is designed to inform the public by demonstrating:

- Proven progress;
- Continued commitment;
- Environmental leadership; and
- Accountability.

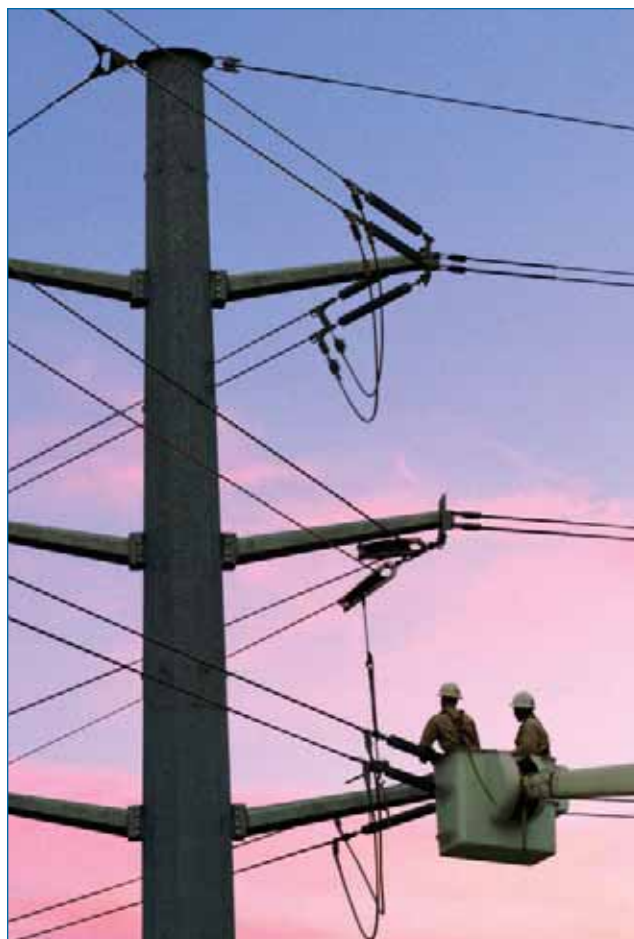
This latest phase began with a directive from the EEI Board of Directors to develop a set of guiding principles.

According to a recent survey of EEI members, 90 percent of EEI members have incorporated these Environmental Excellence Principles into their business strategies and operating practices. Others are in the process of doing so. This report represents the first attempt to quantify and characterize EEI members' compliance with these Principles in a comprehensive way.

Good business requires credibility. Both regulators and the general public increasingly insist that such credibility is borne from honest and transparent communication of relevant information. This report is designed to meet these expectations. Through this report, EEI members are inviting response from and thoughtful dialogue with their regulators, customers, public officials and other stakeholders. This report also references additional resources and provides links to more reference materials. Readers are encouraged to avail themselves of these resources to learn more about the issues and challenges that the industry currently faces, and those challenges that lie ahead.

Finally, EEI intends for this report to serve as a snapshot of its members' current environmental activities, with the goal of presenting their programs transparently and accepting accountability for continuing progress.

EEI members hope this report facilitates more dialogue with many stakeholders. They look forward to working together to continue EEI members' steady progress toward an even more environmentally friendly shareholder-owned electric power industry.



SURVEY METHODOLOGY

To help measure how EEI members are achieving the Environmental Excellence Principles, EEI and company staff developed a 34-page *Member Environmental Excellence Information Survey*. The survey was sent to all EEI member companies in July 2006; of the 76 holding companies, 56 returned the survey.

In the future, EEI will strive to have 100 percent of its membership participate. More important, the companies responding to the survey reflect more than 95 percent of the shareholder-owned electric power industry's customers, sales and service territory.

This report supplements information gathered by the survey with other EEI data and information from independent sources, such as the U.S. Department of Energy's (DOE) Energy Information Administration (EIA) and the U.S. Environmental Protection Agency (EPA).



COMMITMENT

EEI members demonstrate their commitment to the Excellence Principles through a variety of different means, including the use of environmental management systems and audits, investments, internal communications, participation in voluntary programs and company-specific initiatives.

ENVIRONMENTAL MANAGEMENT SYSTEMS

EEI members incorporate the industry's Environmental Excellence Principles into their work in part by conducting operations guided by formal environmental management systems (EMSs). A formal EMS is defined by EPA as:

"A set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency. It is a continual cycle of planning, implementing, reviewing and improving the processes and actions that an organization undertakes to meet its environmental obligations."

Half of the survey respondents already maintain a formal EMS, and 90 percent incorporate EEI's Environmental Excellence Principles. Many other respondents indicated that they are developing formal EMSs.

There is an International Standards Organization (ISO) standard, 14001, that specifies an internationally accepted voluntary specification for an EMS. It specifies requirements for establishing an environmental policy; determining environmental aspects and impacts of products, activities and services; planning environmental objectives and measurable targets; implementing and operating programs to meet objectives and targets; and undertaking corrective action and management review.

Of those survey respondents that reported maintaining a formal EMS, all have systems certified under, or consistent with, ISO 14001.

ENVIRONMENTAL AUDITS

Whether or not they maintain formal EMSs, more than 90 percent of survey respondents conduct regular

audits of their environmental commitments. These audits measure compliance with environmental standards and, in many cases, also include safety and occupational health issues. In other cases, the audits include reviews of the management systems themselves in order to increase their effectiveness and efficiency. Table 2 lists ways in which EEI helps its members with their audits.

About 35 percent of survey respondents participate in a formal third-party audit program, consortium or

Table 2

EEI Helps Members Refine/Improve Audits

Several EEI programs help members refine and improve their environmental health and safety (EH&S) auditing efforts. Some of the initiatives include:

- Sharing practices and procedures on a variety of EH&S subjects through regularly held meetings.
- Hosting formal member training sessions on EH&S auditing skills and techniques.
- Conducting benchmarking EH&S surveys on audit program structure and scope.



Survey respondents routinely report to executive management regarding their environmental performance.

group that provides a review of their environmental operations by utility peers. By participating in these assessments, companies identify best practices and opportunities for improving their environmental performance in a cost-effective manner.

COMPENSATION

Within EEI member companies, environmental responsibilities stretch from the field to the boardroom. Companies report that employees at every level have responsibilities related to environmental missions. More than 80 percent of survey respondents link environmental performance to compensation for at least some employees.

INVESTMENTS

The electric power industry is subject to hundreds of environmental regulations, including dozens of federal and state air and water quality requirements created in

the wake of the CAA and Clean Water Act (CWA). From 2002-2005, the industry as a whole spent at least \$21 billion on compliance with federal environmental laws; state and local rules drive that total even higher. Of this amount, \$13.9 billion went towards capital expenditures, while \$7.5 billion was spent on operations and maintenance.⁴

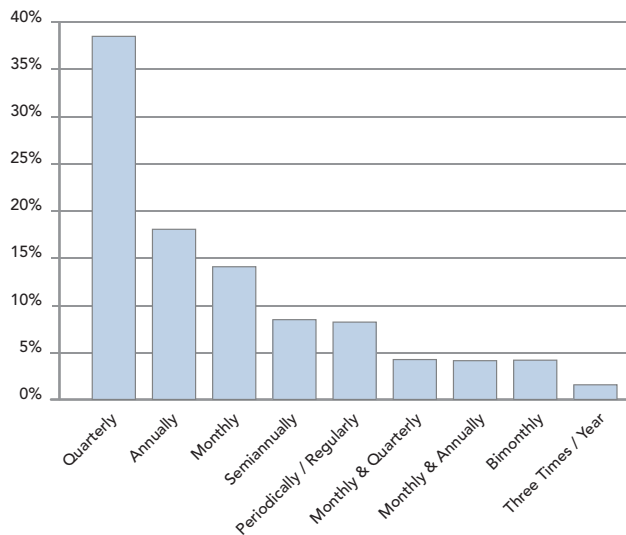
According to EPA, complying with two new federal regulations—the Clean Air Interstate Rule (CAIR) and the Clean Air Mercury Rule (CAMR), which are aimed at further reducing power plant emissions of SO₂, NO_x, as well as mercury—will cost the electric power industry \$47.8 billion between the years 2007 and 2025.⁵

EEI members also invest in research to develop, demonstrate and deploy new technologies and practices to protect the environment. In 2005, survey respondents spent nearly \$100 million on these efforts. The Electric Power Research Institute (EPRI), whose 2006 funding was approximately \$300 million, conducts a significant amount of scientific and technology research.

INTERNAL COMMUNICATIONS

EEI members have created internal communications channels to assure that environmental performance information reaches their top management. Survey respondents routinely report to executive management regarding their environmental performance. The frequency and detail of these reports vary (see Figure 5), but the objectives are the same: to ensure that management has the information it needs to make well-informed decisions related to compliance, financial risk, capital investment and other actions affecting environmental performance.

Figure 5
SURVEY RESPONDENTS REPORT ROUTINELY TO SENIOR MANAGEMENT ON ENVIRONMENTAL PERFORMANCE



Source: EEI 2006 Survey

⁴U.S. Department of Energy, EIA Form EIA-767 (2002-2005). Data analyzed by EEI and Global Energy Intelligence.

⁵U.S. EPA, Clean Air Act Markets Division, Integrated Planning Model.

VOLUNTARY PROGRAMS AND PARTNERSHIPS

EEI members often go beyond federal, state and local laws to create or participate in collaborative voluntary programs that directly benefit the environment. In fact, all survey respondents reported that they engage in environmental activities beyond those required by law.

Further, all survey respondents belong to and/or support one or more independent organizations committed to environmental improvements. Through partnership projects and cooperative programs, EEI members leverage their own resources for greater results with specific environmental protection activities. Figure 6 contains a complete list of partnerships to which survey respondents belong. Some of the most common include:

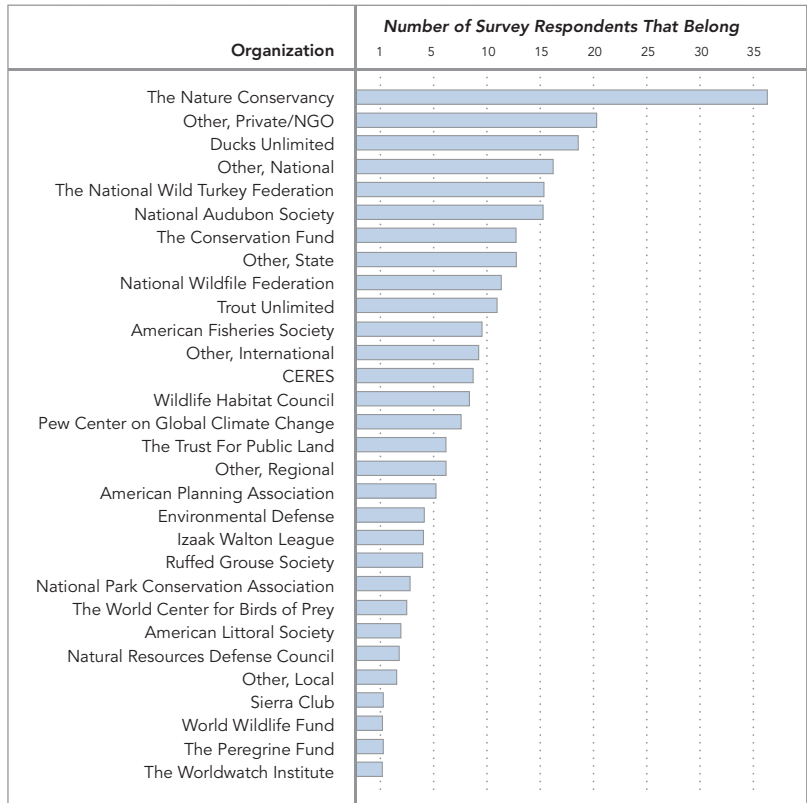
- The *Nature Conservancy* (36 survey respondents), which seeks to preserve the plants, animals and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive.
- *Ducks Unlimited* (18 survey respondents), which conserves, restores and manages wetlands and associated habitats for North America's waterfowl.
- The *National Wild Turkey Federation's Energy for Wildlife Program* (12 survey respondents), which helps to manage rights-of-way to provide habitat for wild turkeys and other wildlife species.
- The *National Wildlife Federation* (11 survey respondents), which seeks to protect wildlife in every ecosystem on earth.

EEI members also participate in dozens of voluntary environmental programs at the national, regional, state and local levels. Some of those mentioned most frequently by survey respondents include:

- *ClimateVISION*, a joint program of the U.S. government and private industry that seeks to reduce greenhouse gas (GHG) emissions through voluntary efforts. More than 40 EEI members participate.
- The DOE/EPA joint program called *ENERGY STAR®*, which encourages the use of high-efficiency practices and products, ranging from air-conditioners to windows. Twenty-eight survey respondents participate in the ENERGY STAR® program.
- The *Avian Power Line Interaction Committee (APLIC)*, a separately funded voluntary program managed by EEI, that leads the electric utility industry in the protection of avian resources while enhancing reliable energy delivery. APLIC works in partnership with utilities, resource agencies, and

Figure 6

EEI MEMBER COMPANY PARTICIPATION IN ENVIRONMENTAL ORGANIZATIONS



Source: EEI 2006 Survey



the public to develop and provide educational resources; identify and fund research; develop and provide cost-effective management options; and serve as the focal point for avian interaction issues.

- *PowerTree Carbon Company LLC* is an initiative of 25 power companies—most of them EEI members—to plant trees in critical habitats in the Lower Mississippi Valley to help sequester CO₂. Six projects that cost approximately \$3 million are projected to sequester at least two million tons of CO₂.
- *UtiliTree Carbon Company*, formed in 1995, is sponsoring projects involving forest restoration and carbon sequestration, with more than \$3 million committed to these projects. Three million tons of CO₂ are projected to be controlled or sequestered as a result.
- EPA's *WasteWise* program, a voluntary program that helps U.S. organizations to reduce the volume of costly municipal solid waste, benefiting the bottom line and the environment. In 2004,

the program recycled more than 18 millions tons of organic materials and one million tons of paper. Eighteen survey respondents participate in the program.

- In addition to the voluntary programs listed in this section, a comprehensive list of climate change-related voluntary programs and partnerships in which EEI members participate can be found in the *Performance* section under Greenhouse Gases.

INDIVIDUAL COMPANY INITIATIVES

EEI members participate in a wide range of voluntary environmental initiatives, often in conjunction with other stakeholders.⁶ The following are some examples that illustrate the diverse nature of these initiatives.

- *Allegheny Energy* celebrates Earth Day by picking up discarded tires from waterways, roadways and dump sites for proper recycling. More than 2,600 company employees and other volunteers have collected more than 102,000 tires. In recognition, Allegheny Energy earned a West Virginia Business Environmental Award in the environmental stewardship category (www.alleghenyenergy.com).
- *Alliant Energy* has produced an award-winning program called "PowerHouse" that demonstrates energy-efficiency strategies to homeowners throughout its customer base. The half-hour weekly program focuses on home energy use, including energy savings possible from heating, cooling, insulation, lighting and safety. During each episode, the hosts perform easy, do-it-yourself projects; interview local experts; tour energy-smart homes throughout the Midwest; explore new energy technology; and provide expert tips that consumers can use in their own homes. "PowerHouse" is now in its eighth season (www.alliantenergy.com).
- *American Electric Power (AEP)*, in a long-standing commitment to reforestation, has planted more than 57 million trees since 1944. AEP recently replanted 10,000 acres of land near the Catahoula

⁶To learn more about voluntary efforts visit your local electric company's Web site or EEI's Web site, www.eei.org.

EEl members often go beyond what's required by environmental laws and have created or participated in collaborative voluntary programs that directly benefit the environment.

National Wildlife Refuge. The land is one of only 17 areas in the United States designated as a Wetland of International Importance (www.aep.com).

- *Black Hills Energy* sponsors the “Wildlife Experiences” program in local schools. The program features wildlife experts taking live animals into classrooms to explain biodiversity and encourage student participation in environmental issues, as well as conservation and respect for the environment. Every year, more than 100 classrooms benefit from visits from experts and learn about their “Wildlife Experiences” (www.blackhillscorp.com).
- *Con Edison* started Clean Air Communities in 1999 with a \$5 million initial donation. Clean Air Communities is dedicated to reducing air pollution in New York City neighborhoods. Working with the National Resources Defense Council and the New York State Department of Environmental Conservation, the organization has administered \$4 million in community-based projects to implement

clean air strategies throughout the city. One project, the advanced truck stop electrification at the Hunts Point Cooperative Market, eliminates more than 2,300 tons of pollution annually (www.coned.com).

- *Duke Energy*, through its subsidiary Crescent Resources, has established the Palmetto Bluff Conservancy, a nonprofit organization dedicated to natural resource protection at its Bluffton, South Carolina, residential community. More than one-third of the original 20,000 acres at Palmetto Bluff have been set aside in perpetuity for preservation. In 2005, Palmetto Bluff was honored with the Corporate Stewardship Award from the South Carolina Department of Archives and History. The award recognized the community's exceptional accomplishments in archaeology and historic preservation. The community also received a 2005 Stewardship Development Award from the South Carolina Department of Natural Resources. This annual award recognizes residential, public and/or commercial-industrial projects in the state that



Within EEL member companies, environmental responsibilities stretch from the field to the boardroom.

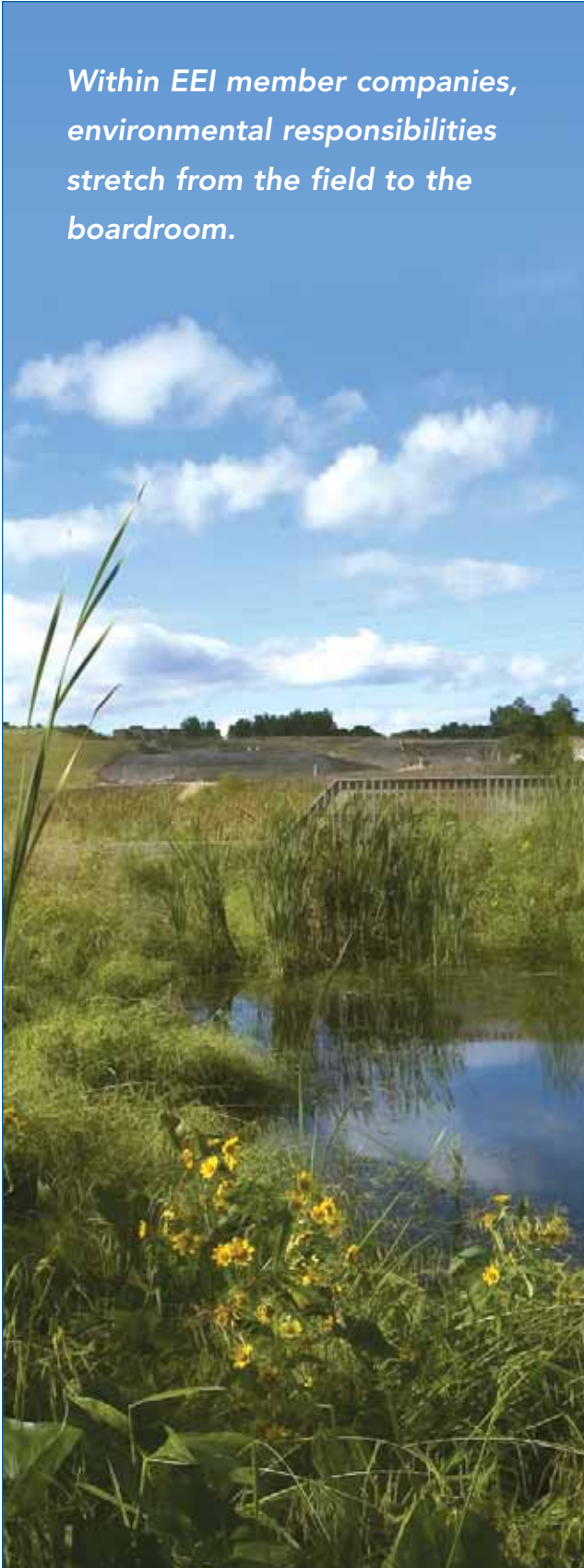


exhibit the highest level of thoughtful stewardship of the environment through careful planning and construction (www.duke-energy.com).

- *El Paso Electric (EPE)*, to reduce pollution created by brick kilns operating across the U.S.-Mexico border, worked with New Mexico State University to develop a more environmentally friendly “dome-top” kiln. The new design uses half the fuel of traditional kilns, produces the bricks in half the time and cuts NO_x emissions by 80 percent. EPE received the Texas Environmental Excellence Award from the Texas Commission on Environmental Quality (www.elpasoelectric.com).
- *Entergy* invests in innovative environmental stewardship activities and programs that go beyond compliance with environmental laws and regulations. These activities provide support to community-based projects that address energy efficiency and provide sustainable solutions that preserve the environment. Grants typically range from \$5,000 to \$25,000. In 2006, Entergy funded \$250,000 in grants ranging from more than \$22,000 to the Louisiana Universities Marine Consortium for developing classroom science and stewardship programs, to nearly \$30,000 going to New York’s Queens College to help assess human impacts on Long Island Sound.
- *FPL Energy* is the largest generator of wind power in the world, operating more than 4,000 megawatts at 47 windfarms in 15 states. Adding more than 900 megawatts of new wind generation in 2006, FPL Energy wind projects prevented the emission of 6.4 million tons of CO₂, more than 14,000 tons of SO₂ and more than 9,000 tons of NO_x (www.fpl.com).
- *Kansas City Power & Light*, a subsidiary of Great Plains Energy, worked with state and federal agencies to restore a 106-acre tract of wetlands to its original natural habitat. The benefits of the project, which took place on the grounds of a KCP&L power plant, include adding biodiversity, sediment control and other water quality enhancements. When completed, the site will look similar to what the Lewis & Clark expedition would have seen in 1804 (www.kcpl.com).

- *PG&E Corporation's (PG&E) Solar Habitat Program*, a partnership between PG&E and Habitat for Humanity, is helping to reduce energy bills for low income families, and making a real contribution to improving air quality and mitigating climate change. Through this program, PG&E is providing expertise, volunteers and charitable grants to help build energy-efficient homes and install roof-top, solar-powered systems for low- and moderate-income families. This means that these families need to buy less power to meet their basic energy needs, which saves them money and protects the environment.
- *PNM*, a subsidiary of PNM Resources, has participated in archaeological education efforts for many years. PNM supports programs at schools, parks, and museums designed to teach children and parents about the importance of New Mexico's rich and varied, non-renewable, archaeological resources. Prominent among these venues is the New Mexico Archaeology Fair, the Sun Mountain Festival and Earth Day at San Felipe Pueblo. Each event is designed to provide education in how people lived, the tools they used, and how they gathered, grew and hunted the food they ate. In particular, PNM archaeologists teach children to replicate tools such as arrow heads, make fire, hunt with atlatl darts, and play ancient games. Every year the program reaches hundreds of New Mexico's school kids.
- *PSE* became the first Northwest utility, in late 2005, to solely build and operate a large wind farm. PSE's Hopkins Ridge Wind Project in southeast Washington's Columbia County is now generating renewable power for PSE customers. Since December 2006, a second and larger PSE wind farm, Wild Horse Wind Project, in central Kittitas County, has been generating power for PSE customers. PSE remains committed to the development of additional renewable-energy resources. The company is involved in a variety of studies, pilot projects and small-scale renewable-power initiatives, including a facility that generates electricity from dairy-cow waste and research into producing power from Puget Sound tidal action. PSE also promotes the development of renewable energy through its Green Power Program which, since 2001, has offered customers the option to purchase electricity from renewable energy resources, primarily in the form of "green tag" credits from suppliers of renewable energy.
- *Southern California Edison* created an Endangered Species Alert program manual in 1989 to guide the company's environmental protection efforts. Updated in 1999, the guide has been described by the state Department of Fish and Game as the standard by which other guides should be judged. Southern California Edison's efforts to protect endangered species earned the company the National Institute for Urban Wildlife's Outstanding Conservation Award (www.sce.com).
- *Southern Company's* voluntary Renew Our Rivers program that removes debris and litter from rivers, lakes and other waterways throughout the Southeast continues to grow. Conceived by an employee, Renew Our Rivers began in 1999 as a local cleanup of the Coosa River around Alabama Power's Gadsden Steam Plant. Over the next six years, it grew to include the entire Coosa, Tallapoosa and Black Warrior River systems in Alabama, the upper Coosa in Georgia near Georgia Power's Plant Hammond and other waterways in seven watersheds in Georgia. It now includes waterways in the footprints of Gulf Power and Mississippi Power as well. Through 2006, Renew Our Rivers has removed 7 million pounds (3,500 tons) of man-made debris and litter from waterways across the Southeast. Renew our Rivers received Keep America Beautiful's highest national award for litter prevention.



PERFORMANCE

EEl members spend thousands of hours and billions of dollars each year to reduce the impact of their operations on the environment. They strive to make continuous improvements in their performance while managing their environmental obligations. Ultimately, these efforts can be seen in the way EEl members perform.

To measure the shareholder-owned electric power industry's performance against EEl's Environmental Excellence Principles, this section looks at a broad array of environmental management issues that EEl members address. These include:

- Greenhouse gases
- Air emissions
 - the Clean Air Act
 - acid rain
 - ozone
 - mercury
 - fine particles
 - haze (visibility)
- Control technologies and fuel use
- Clean coal technology
- Solid and hazardous materials
- Water use
- Siting and natural resources
 - land stewardship
 - wetlands stewardship
 - wildlife management
 - avian protection
 - vegetation management
- Electric and magnetic fields
- Renewables
- Energy efficiency
- Environmental technology research

In each case, the report discusses the current state of the industry's activities and looks forward to future initiatives and technologies designed to improve performance.

GREENHOUSE GASES (GHGs)

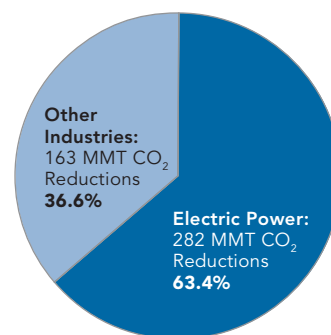
Few environmental issues have captured scientific, political and public focus like GHG emissions and their implications for climate change. Addressing the climate issue is a key component of EEl members'

commitment to environmental excellence. The most recent and important example of this commitment is the release of the EEl Global Climate Change Principles (see Table 3 on page 16).

EEl's survey results reinforce that companies are working on a variety of technological, research and policy initiatives to reduce GHG emissions from their operations while they meet the nation's growing demand for electricity. In 2004, the latest year for which data are available, the electric power sector undertook programs or projects that reduced, avoided, or sequestered more than 282 million metric tons of carbon-equivalent GHG emissions—accounting for approximately 63 percent of all reductions reported to the federal government in that year (see Figure 7).

Electricity production accounts for 32 percent of U.S. GHG emissions. The transportation sector accounts for

Figure 7
ELECTRIC POWER SECTOR'S CONTRIBUTION TO VOLUNTARY CO₂ EMISSIONS REDUCTIONS



Note: Million metric tons (MMT) represent the greater of project or entity amount, on reporter-by-reporter basis.

Source: U.S. Department of Energy, Energy Information Administration, *Voluntary Reporting of Greenhouse Gases Program 2004*. Analysis by Edison Electric Institute.

Table 3

EEL GLOBAL CLIMATE CHANGE PRINCIPLES**BACKGROUND**

EEL's member companies clearly recognize the growing concerns regarding the threat of climate change. Since 1994—when EEL joined the U.S. Department of Energy in the Climate Challenge—the electric utility industry has led all other industrial sectors in reducing greenhouse gas emissions. Through various programs now under way—including Power PartnersSM, the Asia-Pacific Partnership and individual company efforts—that commitment continues.

Today, EEL's members recognize a growing imperative to make even deeper reductions in greenhouse gas emissions. No matter what the ultimate path is, success in that mission—while maintaining the reliable and reasonably priced electricity supply so vital to our economic well-being and national security—will require an aggressive and sustained commitment by the industry and policymakers to the development and deployment of a full suite of technology options, including:

- An intensified national commitment to energy efficiency, including advanced efficiency technologies and new regulatory and business models;
- Accelerated development and cost-effective deployment of demand-side management technologies and renewable energy resources;
- Advanced clean coal technologies (e.g. advanced pulverized coal, fluidized bed and IGCC technologies);
- Carbon capture and storage for all types of fossil-based generation;
- Increased nuclear capacity and advanced nuclear designs; and
- Plug-in electric hybrid vehicles.

Although some of these options are currently available—albeit at a higher cost than conventional generation sources—many are not. All have different time horizons, but all are critical to our dual goals of addressing greenhouse gas emissions and maintaining a reliable, affordable electricity supply in a carbon-constrained world. Moreover, because of the global nature of the problem, solutions will require the participation of the entire world economy, including China and India.

PUBLIC POLICY PRINCIPLES

EEL will continue to emphasize the importance of:

- A reliable, stable and reasonably-priced electric supply to maintain the competitiveness of the U.S. economy;
- A fuel-diverse generation portfolio to assure system reliability, energy security and price stability;
- Public policies and initiatives to accelerate the development of viable and cost-effective energy efficiency programs and technologies; zero- or low-

emissions generation technologies; and carbon capture and storage technologies;

- International partnerships to address climate change as a global issue that requires global solutions, including appropriate participation by developing nations, such as China and India; and
- Solutions compatible with a market economy that deliver timely and reasonably priced greenhouse gas reductions.

EEL supports federal action or legislation to reduce greenhouse gas emissions that:

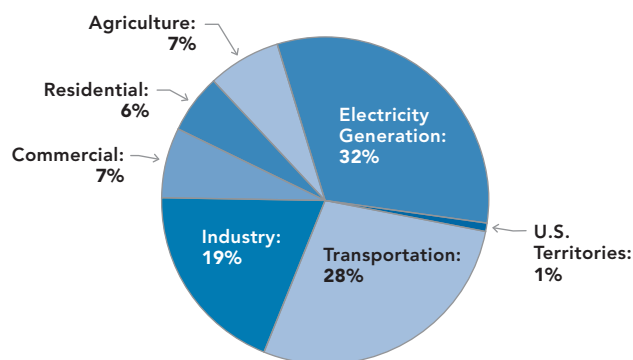
- Involves all sectors of the economy, and all sources of GHG;
- Assures stable, long-term public/private funding to support the development and deployment of needed technology solutions;
- Assures compliance timelines consistent with the expected development and deployment timelines of needed technologies;
- Employs market mechanisms to secure cost-effective GHG reductions, and provides a reasonable transition and an effective economic safety valve;
- Establishes a long-term price signal for carbon that is moderate, does not harm the economic competitiveness of U.S. industry and 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;
- Recognizes early actions/investments made to mitigate greenhouse gas emissions;
- Provides for the robust use of a broad range of domestic and international GHG offsets;
- Provides certainty and a consistent national policy; and
- Recognizes the international dimensions of the challenge and facilitates technology transfer.

February 8, 2007

approximately 28 percent of GHG emissions, with the remainder coming from the industrial, commercial, residential and agricultural sectors (see Figure 8).

Figure 8

UNITED STATES GHG EMISSIONS



Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2004*

Survey respondents emitted more than 1.4 billion tons of CO₂ in 2005, with individual company emissions ranging from zero (for companies that own no fossil fuel generation) to more than 161 million tons (for a large company that relies primarily on coal-based generation to meet customer demand).

Ninety-four percent of the survey respondents are pursuing one or more projects to reduce GHG emissions (see Table 4 on page 18). These efforts can be placed into the following broad categories:

- *Carbon sequestration and storage* – Companies offset CO₂ emissions through “terrestrial sequestration” by planting trees, which absorb CO₂. Companies also are researching ways to store CO₂ underground, which is “geologic sequestration.”
- *Energy efficiency and demand-side management (DSM)* – All survey respondents encourage their customers to use electric power more efficiently.

They also incorporate this advice into their own work through internal energy-efficiency programs (see the Energy Efficiency section for more details).

- *New technology and changing fuel mix* – Approximately half of survey respondents report adjusting their fuel mix. Burning natural gas produces less CO₂ than other fossil fuels. Clean coal technologies also help reduce CO₂ emissions and bring other benefits. By increasing the utilization of renewable energy and nuclear power, electric utilities also can reduce the need to burn fossil fuels.

The U.S. electric power industry leads all other sectors in taking voluntary actions to address GHG emissions, and has been taking steps to reduce its emissions since the early 1990s. For example, under the “Climate Challenge,” a partnership created in 1994 between the power sector and DOE, EEI members have been responsible for more than two-thirds of all the reported GHG emissions reductions (including avoided and sequestered emissions) under the DOE 1605(b) voluntary GHG reporting system.

Although GHGs are not federally regulated pollutants, the federal government in 2003 created a national goal to reduce the nation’s carbon intensity—that is, the ratio of carbon emissions to economic activity—18 percent by 2012.

To help the nation meet this GHG intensity goal, the power sector has teamed with DOE to form “Power PartnersSM,” an initiative under which the electric power sector will reduce, avoid or capture CO₂ emissions over this decade. Power PartnersSM will build on the success of the Climate Challenge as EEI members work with their industry allies and DOE to reduce power sector carbon intensity.

EEI member companies participating in Power PartnersSM represent nearly 90 percent of the electric generation produced by EEI members. Individual company initiatives are the cornerstone of EEI’s response, which includes additional natural gas and clean coal technology generation; additional nuclear generation; new renewable energy, energy efficiency and DSM programs; forestry initiatives; methane recovery projects; and international

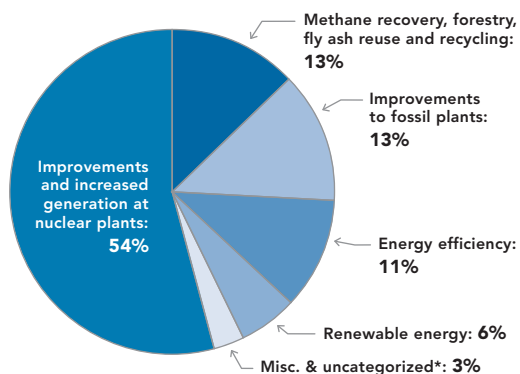
Table 4

EEI Members Engage in Numerous Voluntary Activities to Control Greenhouse Gas Emissions

Illustrative Examples

- **AEP** announced in 2004 its intent to build approximately 1,200 megawatts of large, commercial scale integrated gasification combined-cycle (IGCC) generation and also announced plans to build two ultra-supercritical pulverized coal power plants.
- **Aquila Energy** has planted 230,000 trees since 1992 as part of a carbon sequestration program that has sequestered 13,000 tons of CO₂ emissions.
- **Con Edison** participates in the Sulfur Hexafluoride (SF₆) Emissions Reduction Partnership. SF₆, a highly potent GHG, is primarily used as an electrical insulator in high-voltage equipment that transmits and distributes electricity. To date, no suitable alternative has been found for SF₆ in this application. Since 1996, Con Edison has reduced SF₆ emissions by 67 percent, the equivalent of nearly three million tons of CO₂ emissions.
- **Constellation Energy** initiatives, led by improved and expanded nuclear generation, have resulted in a 27-percent reduction in the company's GHG emissions intensity from the 2000-2002 base-period average.
- **DTE Energy** helps reduce GHG emissions by developing, owning and operating landfill gas recovery systems. In 2001 alone, the company recovered more than 20 billion cubic feet of landfill gas—the equivalent of nearly four million tons of CO₂ emissions.
- **Entergy** became the first utility company, in May 2001, to voluntarily commit to stabilizing emissions of CO₂ and other GHGs. Entergy set a goal of stabilizing its 2001-2005 emissions at 2000 levels. At the end of 2005, the company actually beat its target by 23 percent. In addition, Entergy has completed the planning process for a second GHG stabilization commitment for 2006-2010, which was set at 20 percent below the company's 2000 emission levels.
- **Exelon** established a voluntary goal, in May 2005, to reduce its GHG emissions by eight percent from 2001 levels by the end of 2008. More than half of the reductions are expected to come from renewable generation, increased output from landfill gas and hydroelectric facilities, and retiring several older, less efficient fossil-fueled generating stations. The remainder will come largely from energy and process efficiency measures, including building and fleet efficiency improvements, reduction of methane and SF₆ leakage and waste recycling efforts, with a small contribution from carbon sequestration.
- **FPL Group** is a charter member of EPA's Climate Leaders Program, committing to reduce its CO₂ emissions rate 18 percent by 2008 as compared to a 2001 baseline year. FPL Group also is the largest U.S. power company to have joined World Wildlife Fund's Powerswitch! program, agreeing to a 15-percent improvement in electric generation efficiency by 2020. FPL Group's commitment is projected to avoid approximately 19 million tons of CO₂ emissions annually in 2020.
- **Green Mountain Power** has joined forces with Clean Air-Cool Planet on a voluntary, customer-funded effort to build new renewable energy resources.
- **Southern Company** signed a cooperative agreement with DOE in 2006 to design, construct and demonstrate an IGCC power generation system at the Orlando Utilities Commission's Stanton Energy Center. The system will produce 285 megawatts of electricity for the Orlando area—which will power approximately 285,000 households—and is scheduled to begin operations in 2010.
- **Xcel Energy's** demand-side management activities saved more than 38 million kilowatt-hours of electricity in 2005—enough to power more than 35,000 average homes. Moreover, electricity not generated avoids the creation of GHGs.

Figure 9
**ELECTRIC POWER CO₂ EMISSIONS REDUCTIONS
BY PROJECT TYPE**



*Includes improvements to transmission and distribution systems, transportation and off-road vehicles, and halogenated substances.

Source: U.S. Department of Energy, Energy Information Administration, Voluntary Reporting of Greenhouse Gases Program 2004

partnerships (see Figure 9). Other efforts will include industry-wide and cross-sector initiatives.

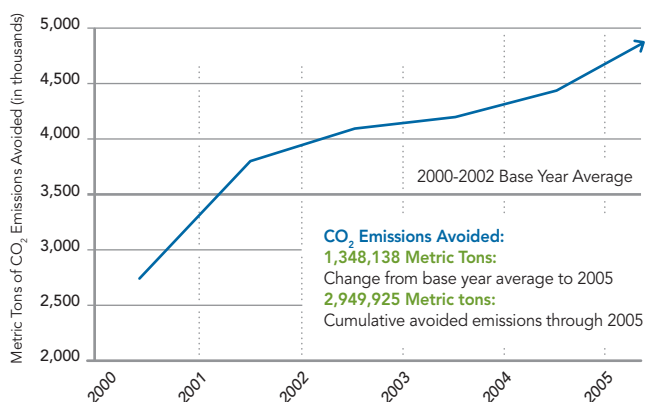
As part of Power PartnersSM, EEI and the other associations representing electric utilities and generators signed a memorandum of understanding (MOU) with DOE in 2004 that established a voluntary framework for reducing the GHG intensity of the power generation sector. Under the MOU, the power sector pledged to reduce its GHG emissions intensity by the equivalent of three to five percent below the 2000-2002 base period average by 2012. EEI members are currently on track to meet this reduction target, which comes on top of a 10-percent decrease in carbon intensity between 1980 and 2004.

More detailed information on the electric power sector's progress in meeting its GHG intensity reduction goal, including voluntary efforts being undertaken by member companies, can be found in *The Power PartnersSM Annual Report*, released in January 2007, and posted on EEI's Web site, www.eei.org.

EEI members also are involved in numerous international, national and regional initiatives and partnerships designed to reduce CO₂ and GHG emissions intensity, including:

- The *Asia-Pacific Partnership on Clean Development and Climate*, in which the founding nations—Australia, China, India, Japan, Korea and the United States—are harnessing public-private partnerships to address energy security, air pollution and GHG emissions in ways that promote sustainable economic growth and poverty reduction.
- *Climate VISION*, a joint program of the U.S. government and private industry that seeks to reduce GHG emissions through voluntary efforts.
- The *Coal Combustion Products Partnership (C²P²)*, a cooperative effort by the EPA, American Coal Ash Association, Utility Solid Waste Activities Group, DOE and the U.S. Federal Highway Administration, which helps promote the beneficial use of Coal Combustion Products (CCPs) and the environmental benefits that result from their use, including the reduction of CO₂ emissions from the production of the materials replaced by CCPs. A goal of C²P² is to increase CCP utilization to 50 percent by 2011, thereby avoiding the annual generation of 20 million tons of CO₂. As of 2006, 43 utilities have become C²P² partners and 24 of these are EEI members (see Figure 10).
- *EPA Climate Leaders*, an industry-government partnership that works with companies to develop long-term comprehensive climate change

Figure 10
**AVOIDED CO₂ EMISSIONS FROM UTILIZATION
OF COAL COMBUSTION PRODUCTS**



Source: Company responses to Power PartnersSM Survey (19 respondents)

According to EPA's 2005 NO_x Budget Trading Program Report, electric generators in eastern states have reduced summertime NO_x emissions by 57 percent since 2000 and by 72 percent since 1990, which has greatly assisted in meeting the 1997 ozone standard.

strategies. Partners set a corporate-wide GHG emissions reduction goal and inventory their emissions to measure progress. By tracking and reporting their progress, partners create a lasting record of their accomplishments.

- *EPA Sulfur Hexafluoride (SF₆) Emission Reduction Partnership*, a collaborative effort between EPA and the electric power industry to identify and implement cost-effective solutions to reduce emissions of SF₆, a highly potent GHG used primarily as an electrical insulator in high-voltage equipment that transmits and distributes electricity. These efforts include the deployment of equipment to detect leaks of SF₆ emissions. More than 80 electric companies currently participate, including 24 survey respondents. For 2005, the Partnership achieved a 32-percent decrease in emissions compared to the 1999 baseline year. Overall, the Partnership has eliminated 635,182 pounds of SF₆—or the equivalent of 6.8 million metric tons of CO₂.
- *International Power Partnerships*, a team effort with DOE to support and deploy energy-efficient projects overseas.
- *PowerTree Carbon Company LLC* is an initiative of 25 power companies—most of them EEI members—to plant trees in critical habitats in the Lower Mississippi Valley to help sequester CO₂. Six projects that cost approximately \$3 million are projected to sequester at least two million tons of CO₂.
- *Regional Geologic Sequestration Partnerships*, which involve electric companies working with state and federal government officials, universities and other key stakeholders to identify regional potentials for sequestering or storing carbon in geologic structures (to prevent them from entering

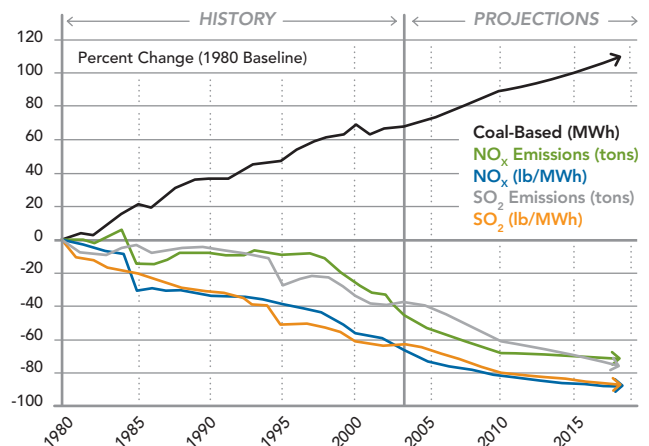
the atmosphere), and to implement programs to take advantage of those potentials.

- *UtiliTree Carbon Company*, formed in 1995, is sponsoring projects involving forest restoration and carbon sequestration, with more than \$3 million committed to these projects. Three million tons of CO₂ are projected to be sequestered as a result.

AIR EMISSIONS

The U.S. electric power sector has reduced air emissions substantially over the last three decades despite large increases in the use of coal to generate electricity (see Figure 11). U.S. electric companies already have cut SO₂ by more than 40 percent, with

Figure 11
SO₂ AND NO_x EMISSIONS FROM COAL PLANTS HAVE DECLINED



Sources: U.S. EPA. National Emissions Inventory; U.S. EPA. 2003 Acid Rain Progress Report; U.S. EPA. Preamble to Proposed Interstate Air Quality Rule; Energy Information Administration (EIA). Annual Energy Review; EIA. 2004 Annual Energy Outlook; EIA. Electric Power Annual 2002. Emissions projections are based on EPA data for the future with continuation of the acid rain program, the NO_x SIP call and addition of the Clean Air Interstate Rule. Emissions reductions would be greater if "best available retrofit technology" provisions were included. Based on 2002 data, the chart assumes coal-based generation contributes 95 and 87 percent, respectively, of total projected electric sector emissions of SO₂ and NO_x in 2003-2018.

significant reductions over the past 10 years primarily due to implementation of the CAA's Acid Rain Program. U.S. utilities also have reduced NO_x emissions by almost 50 percent since 1980, attributable to installation of controls to meet the CAA's Acid Rain Program requirements and other programs in the Northeast to address ozone. Currently installed controls for particulates, NO_x and SO_2 already capture about 40 percent of the mercury contained in the coals that power generators use to produce electricity. Additional EPA programs begun in 2005 will generate even greater reductions.

The Clean Air Act

The CAA establishes numerous programs to reduce air pollution and protect public health. Every power plant in the United States, including older power plants, is covered under the CAA and associated regulations. The requirements of the CAA address the key power-plant related concerns of acid rain, ozone, mercury, particles and haze.

Due in large part to the 1970 CAA and subsequent amendments, the nation has made significant progress in improving air quality. Over the previous 30 years, emissions related to the six principal air pollutants (the National Ambient Air Quality Standard-regulated pollutants) have been reduced by 48 percent. During that same period, gross domestic product increased 164 percent, vehicle miles traveled increased 155 percent, energy consumption increased 42 percent and the U.S. population increased 38 percent.

The following subsections address in more detail the requirements of the CAA and EPA regulations to reduce power plant emissions.

Acid Rain

Acid deposition, commonly called acid rain, occurs when airborne SO_2 and NO_x undergo chemical reactions to produce sulfates and nitrates. These particles can fall back to Earth with rain or snow (wet deposition or acid precipitation) or may settle without any precipitation (dry deposition). Acid deposition can contribute to acidification of water bodies and soil.

Electric utilities emit approximately two-thirds of man-made SO_2 in the United States, with other important sources being coal and oil burning by industrial

Due in large part to the 1970 Clean Air Act and subsequent amendments, the nation has made significant progress in improving air quality.



sources, metals processing, petroleum refining and fuels used by transportation sources. Electric utilities also emit approximately 20 percent of man-made NO_x in the United States, with other important sources being coal and oil burning by industrial sources, other industrial processes, chemical manufacturing and fuel use for transportation.

In 1990, the CAA was amended to include a new program that requires electric utilities to reduce SO_2 and NO_x emissions in order to reduce acid rain. The SO_2 portion of this program incorporates a mechanism called "emissions trading" through which EPA sets successive stages of lower emission "caps." Developed by EPA and Environmental Defense, this "cap-and-trade" program is considered the most successful CAA program because it has reduced SO_2 significantly in both an economic and efficient manner.

Since its inception, the Acid Rain Program has reduced SO_2 emissions from power plants by more than 7 million tons, or about 41 percent (compared to 1980); has reduced NO_x emissions more than 3 million tons, or almost 50 percent (compared to 1980 levels), in

The Clean Air Act includes a goal to reduce any existing impairment of visibility resulting from man-made sources of air pollution.



conjunction with NO_x reductions; and has led to significant cuts in acid deposition, including reductions in sulfate deposition of about 36 percent in some U.S. regions and improvements in environmental indicators, such as fewer acidic lakes.⁷

In 2005, EPA established the Clean Air Interstate Rule (CAIR) to further reduce SO₂ emissions from electric utilities. For affected states, CAIR will reduce SO₂ emissions by 45 percent in 2010, 57 percent in 2015 and 73 percent when fully implemented (compared to 2003 levels).⁸

Ozone

NO_x emissions from fossil fuel-burning sources contribute to the formation of ground-level ozone, or smog. Ozone is formed by chemical reactions with NO_x and volatile organic compounds (VOCs) in the presence of heat and sunlight, typically during the summer months. Power plants emit about 20 percent of the nation's NO_x currently and less than one percent of VOCs.

The 1990 CAA amendments created the Ozone Transport Commission for the Northeast and Mid-Atlantic states to work together to reduce ozone levels. In 1997, EPA revised the ozone standard, going from a one-hour standard to the current eight-hour standard, which increased its stringency. The 1998 "NO_x SIP Call," now known as the "NO_x Budget Trading Program," requires power plants and some industrial sources in the East to reduce NO_x during the ozone season from May to September.

According to EPA's 2005 NO_x Budget Trading Program Report, electric generators in the East already have reduced summertime NO_x emissions by 57 percent since 2000 and by 72 percent since 1990. Going forward, states affected by CAIR also will reduce NO_x 53 percent by 2010 and 61 percent by 2015 (compared to 2003 levels). The combination of the Acid Rain, NO_x Budget and CAIR programs will require electric utilities in the East to reduce NO_x emission rates by almost 90

⁷U.S. EPA, Acid Rain Program 2005 Progress Report.

⁸U.S. EPA, Basic Facts on CAIR, www.epa.gov/air/interstateairquality/basic.html.

percent (compared to 1980). EPA expects CAIR and other existing air regulatory requirements to help most areas failing the ozone standard to improve their air quality significantly.

Mercury

Mercury is a naturally occurring metal in the Earth's crust. It is released into the environment by natural sources such as volcanoes, as well as by man-made processes such as mining, municipal and hazardous waste combustion, cement manufacturing, fossil fuel combustion, and pulp and paper milling. Because trace amounts of mercury are present in fossil fuels, primarily coal, mercury is released when electric utilities burn this fuel to generate electricity.

Most human intake of mercury comes from eating certain types of fish or seafood containing a form of mercury called "methylmercury." When mercury enters bodies of water, it can be partially converted to "methylmercury" and enter the aquatic food chain, where it bioaccumulates in fish tissue. The magnitude of human exposure to methylmercury depends on the level of mercury in the fish consumed and the amount of fish eaten.

U.S. electric utilities released about 40 percent of domestic man-made mercury emissions and about one percent of total global mercury emissions in 1999, the latest year for which data are available, (see Figure 12). Most of the mercury deposited in the United States—more than 60 percent on average—comes from outside

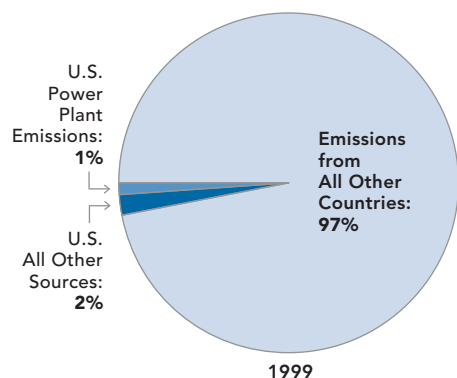
the country. According to EPA, about 144 tons of mercury from all sources (international, natural, U.S. electric power-related, and other U.S. man-made) currently deposits in the United States; only 11.1 tons of that total is from U.S. utilities.

In 2005, EPA issued CAMR—the first-ever program in the world to reduce power plant mercury emissions. CAMR sets stringent control requirements and employs a market-based cap-and-trade approach to reduce mercury emissions from coal-based power plants in two phases, for a total 70-percent reduction from current levels. CAMR allows time for continued development, installation and demonstration of mercury control technologies, and will help to ensure that the most promising technologies are commercially deployed with minimal impact on the reliability and security of the U.S. electric grid. After CAIR and CAMR are fully implemented, only 3.4 tons of mercury will be deposited by U.S. electric utilities.

Some stakeholders believe that allowing emissions trading in CAMR would result in the creation of mercury "hot spots," or localized areas of elevated mercury concentrations near power plants primarily due to power plant mercury emissions. Based on extensive scientific research and analyses to date, EPA and EPRI predict that no mercury hot spots will be created due to the CAIR and CAMR cap-and-trade programs, and CAMR's mercury cap-and-trade program will reduce overall mercury deposition in each state—in essence safeguarding against the creation of hot spots.

Figure 12

GLOBAL MERCURY EMISSIONS



Source: Based on Pacyna, J., Munthe J., Presentation at Workshop on Mercury, Brussels, March 2004

Fine Particles

Atmospheric particulate matter (PM) is composed of many different chemical compounds. Particulates are emitted by power plants, cars, trucks and other sources that burn fossil fuels or convert natural minerals to common commodities (e.g., cement, steel and other metals). Particulate matter also enters the atmosphere from natural sources such as fire and windblown soil.

EPA created a new standard to address the smallest or "fine" particles, which are particles with a diameter of 2.5 micrometers or less (PM_{2.5}). Electric utilities must comply with PM_{2.5} standards by 2010. Electric utility emissions of fine particles are very low, but reactions in the atmosphere involving emissions of SO₂ and NO_x

generate small sulfate and nitrate particles. The same emissions control programs that reduce electric power SO₂ and NO_x emissions—the Acid Rain program, the NO_x Budget Trading Program and CAIR—also reduce fine particles.⁹

Haze (Visibility)

Haze is caused when sunlight is absorbed or scattered by airborne particles, gases and water vapor that, in turn, reduce the clarity and color of what we see. Airborne particles are produced by a variety of natural sources (e.g., windblown dust, soot from wildfires and even vegetation) and man-made sources (e.g., motor vehicles, fuel burning incineration, pulp mills). Sulfate and nitrate particles from power plant SO₂ and NO_x emissions can contribute to haze.

The CAA includes a goal to reduce any existing impairment of visibility in national parks and wilderness areas resulting from man-made sources of air pollution. The regional haze rule issued in 1999 requires the states, in coordination with EPA and other federal agencies, to develop and implement plans to reduce emissions that cause visibility impairment.

The CAA also requires that certain existing stationary emission sources install “best available retrofit technology” (BART) in order to reduce emissions. In July 2005, EPA promulgated the Clean Air Visibility Rule (CAVR), which defines BART requirements for affected sources, including certain electric generating units that will be required to meet emission limits for SO₂ and NO_x depending on their age, size and other considerations. CAVR’s requirements are national in scope, but states can choose to let CAIR requirements satisfy BART and to allow emissions trading to reduce these emissions.

The same emissions control programs that reduce electric power SO₂ and NO_x emissions—the Acid Rain, NO_x Budget Trading and CAIR programs—also reduce haze.

CONTROL TECHNOLOGIES AND FUEL USE

U.S. electric power plants use a variety of methods to reduce emissions of SO₂, NO_x, particles and mercury, including:

- *Switching to low-sulfur coal* – Most EEI member companies met the Phase I Acid Rain Program SO₂ reductions using lower-sulfur coal.
- *Installing technologies* – Virtually every plant that generates electricity has installed some type of pollution control device. For example, SO₂ is controlled with flue-gas desulfurization technologies, also called scrubbers, which can reduce emissions up to 95 percent. NO_x can be controlled with boiler modifications and advanced technologies such as selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR), which typically reduce emissions by up to 90 and 50 percent, respectively.¹⁰ Electrostatic precipitators and fabric filters remove more than 99 percent of direct particle emissions.
- *Finding new capture technologies* – Many EEI member companies are researching improved and new technologies that will capture more emissions—especially mercury emissions—before they are emitted from a power plant.
- *Increasing energy efficiency* – By helping consumers use energy wisely—and by making their own operations increasingly more efficient—EEI members can do more with less energy. No matter how effectively the industry controls and contains emissions, using less energy means lower emissions rates. For more information, see the discussion of energy efficiency.

EPA projects the electric power industry will invest close to \$50 billion through 2025 to comply with CAIR, CAMR and CAVR alone, in addition to tens of billions of dollars to meet the requirements of the Acid Rain and NO_x Budget programs.

⁹U.S. Environmental Protection Agency, NO_x Budget Trading Program – 2005 Program Compliance and Environmental Results.

¹⁰SCR is a process where a gaseous or liquid reagent (most commonly ammonia or urea) is added to the flue or exhaust gas stream and is absorbed onto a catalyst. The reagent reacts with NO_x in the flue gas to form H₂O (water vapor) and N₂ (nitrogen gas). SNCR works in a similar way, but without a catalyst. SCR can achieve 90-percent reductions while SNCR can achieve reductions of up to 50 percent.

CLEAN COAL TECHNOLOGY¹¹

“Clean coal technology” or “advanced coal technology” describes a suite of existing and developing energy generation technologies that further reduce air emissions and other pollutants from coal-burning power plants through increased efficiencies and other unique processes. The deployment and continued development of these technologies will help EEI members to meet more stringent CAA requirements and any future CO₂ limits while continuing to utilize America’s most plentiful domestic energy resource—coal.

Both the electric power industry and the federal government are investing in research to find new, more environmentally friendly ways of generating electricity from coal. The federal government has committed \$2 billion in the coming decade to develop low-emission coal-based power plants. Industry is currently spending billions on the installation of technologies to improve both plant efficiency and environmental performance. More than 60 percent of survey respondents currently engage in, or plan to engage in, advanced combustion projects.

New programs in clean coal technology—such as the Clean Coal Power Initiative (CCPI)—are essential to finding solutions for reducing trace emissions of mercury, reducing or eliminating CO₂ emissions through carbon storage, and increasing fuel efficiencies. Over the longer term, research in clean coal technology will include developing coal-based hydrogen fuels. If coupled with sequestration, this will allow greater use of coal with zero emissions.

Most recently, DOE began implementing “FutureGen,” a \$1 billion project that will lead to the world’s first emissions-free plant to produce electricity and hydrogen from coal while capturing GHGs. More information on “FutureGen” can be found on DOE’s Web site, www.doe.gov.



DOE announced a Presidential initiative to build “FutureGen,” a \$1 billion project that will lead to the world’s first emissions-free plant to produce electricity and hydrogen from coal while capturing greenhouse gases.

Clean coal technologies are essential to meeting the electric power industry’s twin goals of providing affordable, reliable electricity with the least possible impact on the environment. As demand for electricity continues to rise, DOE estimates that coal will remain the largest single fuel source for electricity—accounting for 57 percent of power generation in 2030.¹² Clean coal technologies will help meet these needs, plus continue the decline in SO₂ and NO_x emissions already underway.

Specific clean coal technologies include:

- Advanced pulverized coal combustion, including supercritical (SC) and ultra-supercritical (USC) processes. Both of these processes pulverize coal into fine particles before it is burned. The high

¹¹To learn more about clean coal technologies, visit the DOE Clean Coal Technology Projects Web site at www.fossil.energy.gov; the Coal Utilization Research Council Web site at www.coal.org; or the March 2006 National Coal Council report: “Coal: America’s Energy Future” at www.nationalcoalcouncil.org/informat.htm.

¹²U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook 2007*, February 2007.

EEI members rely on a variety of programs to manage, recycle and contain the solid and hazardous materials they create through their operations.

temperatures and pressures used mean that less coal is needed to generate a unit of electricity, thus decreasing overall emissions.

- Circulating fluidized bed (CFB) process, which incorporates upward blowing jets of air mixed with pulverized coal to ensure complete combustion at relatively low temperatures. Because of the lower temperature, the formation of SO₂ and NO_x is decreased to the point where the need for external environmental controls often is eliminated. CFB processes can accommodate a variety of coal types as well as other fuels, such as biomass and waste coal.
- Integrated gasification combined-cycle plants (IGCC) gasify coal to create a synthetic gas (syngas). This gas can be used to power a gas turbine and to create steam to power a steam turbine. The process achieves emissions control levels of 99 and 95 percent for SO₂ and NO_x, respectively, and may eventually achieve a net thermal efficiency of 40-50 percent. Current commercial gasifiers are designed to work best

with high-quality coals at lower altitudes, but the development of gasifiers that use lignite and sub-bituminous coals is advancing rapidly.

A number of EEI member companies have announced plans to build clean coal technology plants. According to the January 2007 DOE-National Energy Technology Laboratory (NETL) database, "Tracking New Coal-Fired Power Plants," 45 percent of all planned plant announcements will use clean coal technologies.¹³

It is important to note that all of the above technologies have the potential to be retrofitted with carbon capture technologies in the future. A robust research program by federal and private entities is investigating the applicability of a diverse group of carbon capture technologies.

SOLID AND HAZARDOUS MATERIALS

The electric power industry relies on a variety of programs to manage, recycle and contain the solid and hazardous materials they produce. It has implemented efforts that reduce the volume and toxicity of wastes generated. In addition, the industry actually recycles those wastes, conserving natural resources and energy.



One of the industry's most effective approaches has been working through the Utility Solid Waste Activities Group (USWAG), whose mission is to address the regulation of utility wastes, byproducts and materials in a manner that protects human health and the environment and is consistent with the business needs of its members.

Through USWAG, other organizations and their own programs, EEI members are addressing several issues related to waste management:

¹³Klara, Scott, and Eric Shuster. *Tracking New Coal-Fired Power Plants: Coal's Resurgence in Electric Power Generation*. U.S. Department of Energy, National Energy Technology Laboratory. 24 January 2007. www.netl.doe.gov/coal/refshelf/ncp.pdf.

- *PCBs* – EEI members are implementing voluntary programs to retire or reclassify oil-filled equipment that contains polychlorinated biphenyls (PCBs). The industry is working on PCB reduction approaches that will support both individual company needs and international environmental standards, such as the Stockholm Convention.¹⁴ As of April 2006, nearly all utilities reported having procedures in place to ensure they retire or retrofit equipment identified as containing PCBs in concentrations greater than or equal to 50 parts per million.
- *Wood pole management* – USWAG is working to support the continued secondary use of used wood poles and crossarms, both within utility distribution networks and in other secondary uses. The secondary use of this resource avoids the landfilling of approximately one million wood poles each year. USWAG, EPRI and other groups also are pursuing new research on ways to reduce waste and to encourage sustainable practices. For example, the organizations' work on wood pole research opened opportunities for companies to use tropical hardwoods certified by the Forest Stewardship Council as a source of wood poles that do not need chemical treatment.
- *Manufactured gas plants* – Nearly three-quarters of survey respondents are involved in efforts to restore contaminated sites that they or their predecessor companies owned. These remediation efforts vary from cleanup and removal to brownfield development.
- *Coal combustion products (CCPs)* – Finding new uses for CCPs such as fly ash, bottom ash, boiler slag and flue-gas desulfurization material takes this material out of the waste stream and turns it into a useful material. EEI members report that they typically utilize nearly half of the CCPs they produce each year.

Managing both low-level and high-level radioactive waste remains an ongoing responsibility.



The electric power industry generated approximately 123 million tons of CCPs in 2005. Forty percent of that is beneficially used in applications such as concrete products, cement, filler, wallboard and waste stabilization. This beneficial use avoided the generation of more than 15 million tons of CO₂ in 2005 alone. CCPs not utilized are disposed of in controlled landfills and surface impoundments. Other benefits of CCP use include reducing the need for landfill space and conserving natural resources by reducing the need to mine and mill materials replaced by the CCPs.

Mercury may create challenges for CCP management. Because mercury occurs naturally in coal, coal ash and other CCPs may contain trace amounts of mercury, amounts that could increase as EEI members control the amount of the mercury that otherwise would be emitted to the atmosphere. Industry organizations are investigating how this potential increased level of mercury could affect utilities' CCP management and whether the ash is beneficially utilized or managed in a landfill or surface impoundment.

¹⁴In May 2001, the United States signed the Stockholm Convention on Persistent Organic Pollutants (POPs). The Stockholm Convention targets 12 toxic chemicals—pesticides, industrial chemicals (including PCBs) and unintended byproducts of combustion such as dioxin—calling for the elimination of their manufacture, use and release. PCBs are subject to the Convention's ban on production, and the Convention restricts their use in electrical equipment and requires parties to the convention (e.g., governments) to establish programs or policies designed to eliminate their use.

In concert with DOE and private research organizations, companies are exploring non-traditional sources of water for the industry, such as innovative water reuse and recovery designs, advanced cooling technologies and advanced power systems that are more water efficient.

- *Spill prevention* – The electric utility industry implements oil spill response procedures designed to minimize the impact of spills on waterways. In December 2006, EPA revised the Spill Prevention Control and Countermeasures (SPCC) program as it applies to oil-filled electrical equipment in recognition of the low risk such equipment poses, and as a result of the excellent oil discharge history achieved as a result of the industry's efforts.
- *Radioactive waste* – Many companies in the electric power industry operate nuclear power plants and are considering new nuclear generation to meet future demand. As a result, managing both low-level and high-level radioactive waste (spent fuel) remains an ongoing responsibility. Although companies have several options for disposing of low-level radioactive waste, they must continue to store high-level waste onsite until the federal government fulfills its obligation for opening a national high-level waste repository.

Survey respondents generated 661,345 cubic feet of low-level radioactive waste in 2005 (e.g., protective clothing, tools, etc.). EEI members that operate nuclear power plants also work with EPRI and federal agencies on ways to minimize their low-level radioactive waste.

EEI's survey did not collect information regarding high-level waste. Nuclear utilities are working with the federal government on long-term options for

high-level radioactive waste. For example, through the Global Nuclear Energy Partnership (GNEP), DOE is planning to safely turn high-level nuclear waste into recycled fuel for nuclear energy plants. This would reduce the country's overall volume of radioactive waste.

WATER USE

The production of electricity requires water for cooling, hydropower and emissions controls. Thermoelectric power plants, including coal, oil, natural gas and nuclear units require large, reliable, abundant and predictable quantities of cooling water, and therefore must withdraw water from various water bodies. The vast majority of those withdrawals are by power plants that return nearly all the withdrawn water to the source.

While thermoelectric power generation accounts for 39 percent of freshwater withdrawals (132 billion gallons per day), it only accounts for approximately three percent of water consumed.¹⁵

Electricity production accounts for a growing portion of water consumption. A recent report by NETL suggests a 32-percent increase by 2030 in the consumption of water by the energy sector.¹⁶ This is mostly attributable to regulatory constraints promoting the use of "recirculating cooling" instead of "once-through cooling" for all new generation facilities. In a once-through system, water is diverted from a waterbody, used for cooling and returned to the waterbody.

¹⁵For additional information see "Energy Demands on Water Resources – Report to Congress on the Interdependency of Energy and Water." December 2006. www.sandia.gov/energy-water/congress_report.htm.

¹⁶"Estimating Freshwater Needs to Meet Future Thermoelectric Generation Requirements," DOE/NETL 2006. www.netl.doe.gov/technologies/coalpower/ewr/pubs/WaterNeedsAnalysisPhase1006.pdf.

A recirculating system diverts water from a waterbody and then cools the water in a tower or pond for reuse.

In addition to the primary use of water for cooling, the electric power industry also manages cooling ponds, wastewater, wetlands and other water resources.

Under the Clean Water Act (CWA) and other statutes, the federal government regulates nearly all utility water use and discharge. Provisions of the Act that relate to electric utility operations include:

- *Cooling water* – As noted, nearly all power plants withdraw substantial amounts of cooling water, usually from lakes, rivers, estuaries or oceans. This water is used to condense steam and provide cooling for plant generating systems. Facilities use the water from nearby waterbodies for this cooling.

EPA regulations that address cooling water designate technology-based performance standards or alternatives that a power plant must adopt to protect fish and other aquatic species and local watersheds. Researchers in the electric power industry, government and academia have been studying the effects of power plant cooling on aquatic ecosystems and have been working to develop strategies for fish protection for more than 30 years. One consistent finding is that the environmental impacts of power plant cooling vary widely from plant to plant and depend largely on local conditions. The best solution for fish and wildlife protection at one locale may not be the best at another.

- *Process water discharges* – The CWA requires permits to control discharges of pollutants, requiring companies to reduce the quantity of such discharges using the technology available to each industry.
 - *National effluent limitations* – EEI members are working to avoid, mitigate and reduce the low-volume wastes (water purification regenerant, boiler blowdown, floor drains, scrubber water, etc.) that result from electricity generation. Regulations are in place that address metal cleaning wastes, transport water, coal pile runoff and other waste streams that are



permitted under the national pollutant discharge elimination system (NPDES).

- *TMDLs* – A Total Maximum Daily Load (TMDL) is the amount of a pollutant that a water body can absorb on a daily basis and still meet federal and state water quality standards. Under the CWA, each state must identify and formally list waters that do not meet water quality standards and, when appropriate, develop TMDLs for those waters. The types of pollutants and allowable amount of each pollutant vary for each "impaired" water body. EEI member companies have taken a proactive role working with federal, state and local authorities to accurately and reliably determine appropriate TMDLs for water bodies throughout the country.
- *Alternate sources of water* – Since the generation of electricity is a water-intensive operation, EEI members constantly are looking for alternate sources of water for use in cooling and other operational processes. In many areas of the country, available water resources often are allocated fully among other competing uses. Therefore, it is good business sense to examine the effectiveness of using alternate sources of water operational processes. Currently, EPRI and other organizations are conducting research on the use of treated sewage, non-potable groundwater,

industrial effluent and water produced from the oil and gas industries as possible alternate sources of the water needed for electricity production.

- *Stormwater runoff* – Stormwater runoff is caused when rainwater (or other precipitation) runs off construction, industrial and agricultural sites, as well as parking lots, and picks up pollutants on the way to rivers, lakes and coastal waters. Because stormwater pollution is caused by so many different activities, traditional regulatory controls have limited application. Electric utilities must manage runoff from parking lots, rights-of-way, and other sites and obtain stormwater permits if necessary.
- *Hydropower projects* – Hydropower is our nation's largest source of renewable energy. The benefits of hydropower projects are numerous: essentially emissions-free, domestic energy; fish and wildlife habitat and water to help sustain fisheries and wildlife; flood control; drinking water and irrigation water; and recreation.

Many dams are undergoing, or soon will undergo, relicensing. As part of the relicensing process, agencies often request or require project owners to conduct corollary environmental upgrades such as the protection of surrounding land, the integration

of fish ladders or the construction of recreational facilities. In addition, utilities typically provide other benefits to help ensure that the projects are in the overall public interest.

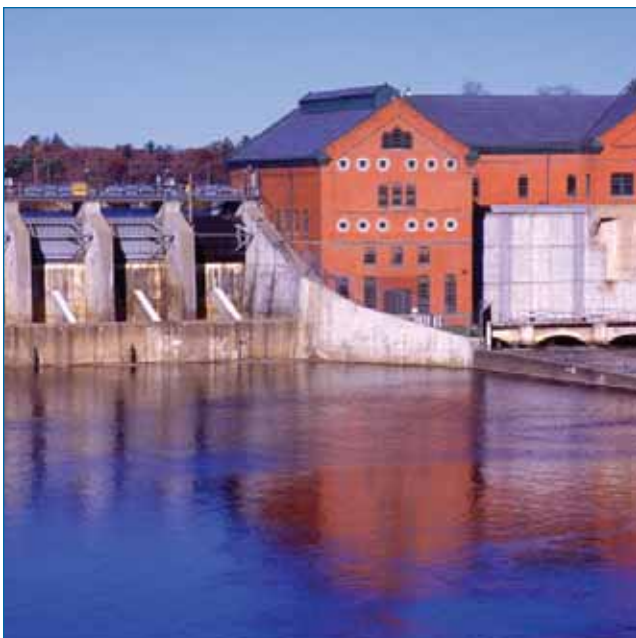
Through the Utility Water Act Group (UWAG), other organizations and their own programs, EEI members are addressing several key issues related to water resource management. For example, in concert with DOE and private research organizations, companies are exploring non-traditional sources of water for the industry, such as innovative water reuse and recovery designs, advanced cooling technologies and advanced power systems that are more water efficient.

The Energy Policy Act of 2005 instructs DOE to address issues related to adequate water supplies, optimal management, efficient use of water and efficient use of energy. DOE is carrying out an integrated RD&D effort that cuts across its coal, oil and natural gas programs to focus specifically on the nexus between energy and water.

SITING AND NATURAL RESOURCES

New electric transmission lines and generation plants are needed to maintain reliability, meet increased customer demand and serve competitive regional energy markets. Siting new electric facilities can be a lengthy and complex process involving the public as well as local, state and federal government agencies. The ultimate goal of EEI members in siting new transmission lines is to identify the most cost-effective route for construction, operation and maintenance, while minimizing adverse environmental and socioeconomic impacts. In addition to environmental concerns, considerations in siting new generation plants include access to energy sources (such as coal, wind and natural gas), water and proximity to the transmission grid so electricity can be delivered to customers.

After construction, EEI members operate and maintain their facilities in ways to minimize damage to natural resources. Natural resource concerns associated with the siting, operation and maintenance of electric transmission lines and generation plants include land and wetlands stewardship, wildlife protection, vegetation management and potential electric and magnetic fields (EMF) effects.



Land Stewardship

The electric power industry has a business interest in—and many federal, state and local regulatory responsibilities for—managing millions of acres across the country. Survey respondents hold and manage 1.3 million acres of land and water. Some of the key laws governing utility land management include:

- *Archaeological Resource Protection Act* – Protects archeological resources and sites on public and Native American lands.
- *Clean Water Act* – Sets water quality standards, regulates wetlands activities.
- *Endangered Species Act (ESA)* – Protects endangered or threatened species of fish, wildlife, plants and habitats.
- *Federal Land Policy and Management Act* – Governs use of public lands.
- *National Forest Management Act* – Administers use of national forest land for multiple uses and

integrates resource management planning techniques.

EEI members are active in more than 70 programs that help conserve and protect wildlife habitat, cultural history, and recreational opportunities on both the lands they own and elsewhere. Figure 13 shows a breakdown of how survey respondents restore, protect or preserve the land and water they own.

Survey respondents also are working on programs to promote new tree growth, planting 158 million trees in the United States that cover 146,567 acres of land (as of 2005). This work not only offsets the vegetation losses that occur as companies trim brush to maintain power lines, it also helps reduce the amount of CO₂ in the air, because trees are a natural carbon “sink.”

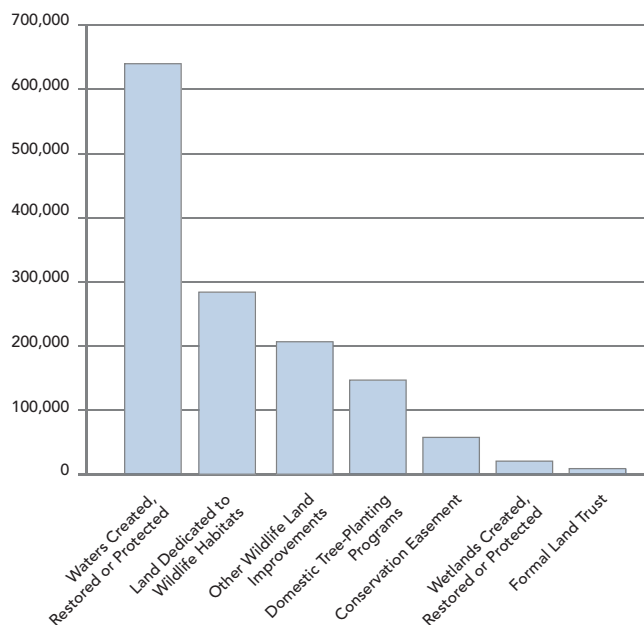
Wetlands Stewardship

With so many facilities adjacent to waterways, EEI also members manage thousands of acres of wetlands. Wetlands offer many environmental benefits, including habitats for waterfowl and wildlife, flood protection, erosion control and water-quality improvement.

Electric utilities sometimes have to cross designated wetlands to perform routine maintenance operations that support the transmission of electricity over great distances. EEI members work with federal and state resource agencies to obtain the required permits in order to conduct these activities. The CWA requires companies to obtain permits from the Army Corps of Engineers for operations that may involve clearing, dredging or filling wetlands. In addition, utilities participate in mitigation banking¹⁷ efforts to protect and restore wetland resources.

Survey respondents reported management programs that have created, restored or protected 20,000 acres of wetlands across the country.

Figure 13
SURVEY RESPONDENTS MANAGE, PROTECT OR MAINTAIN MORE THAN 1.3 MILLION ACRES OF LAND AND WATER



Source: EEI 2006 Survey

¹⁷A mitigation bank is a wetland, stream or other aquatic resource area that has been restored, established, enhanced or (in certain circumstances) preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources permitted under CWA Section 404 or a similar state or local wetland regulation. A mitigation bank may be created when a government agency, corporation, nonprofit organization or other entity undertakes these activities under a formal agreement with a regulatory agency.

EEI members are active in more than 70 programs that help preserve wildlife habitat, cultural history and recreational opportunities on both the lands they own and elsewhere.



EEI Members Restore Wetlands

Electric power companies preserve, enhance and restore wetland ecosystems. For example, Duke Energy is actively engaged in the Corporate Wetlands Restoration Partnership's (CWRP) National Advisory Council. This voluntary public-private collaboration protects, enhances and restores America's freshwater and saltwater wetlands and other aquatic habitats. CWRP has been active in the Northeast particularly, as well as in Alaska, California and other states. The Partnership is well on its way to meeting its goal of restoring 100,000 acres of wetlands annually. For more information, see www.coastalamerica.gov/text/cwrp.html and Duke Energy's Web site at www.duke-energy.com.

Wildlife Management

Every survey respondent conducts at least one program designed to protect wildlife and wildlife habitats. These efforts include 287 programs to protect endangered species and 157 programs to support non-endangered species. Although some of these programs are designed specifically to help the industry comply with the Endangered Species Act (ESA) and other laws, many of the programs stem from the companies' own voluntary initiatives. In addition to the ESA, two of the key laws governing utility wildlife management include:

- *Bald and Golden Eagle Protection Act* – Protects bald and golden eagles, nests, eggs and parts.
- *Migratory Bird Treaty Act* – Prohibits “taking” (killing or injuring) 836 bird species, whether intentionally or unintentionally.

Survey respondents explained that they use many different approaches when it comes to protecting wildlife:

- Just over half use specific wildlife management tools, such as designed and maintained protection and shelters, food stations and nesting plots to protect and propagate animals on their lands. Others reported projects ranging from building nesting boxes for peregrine falcons to protecting remote breeding grounds for rare blanding turtles.
- Thirteen percent report that they have restoration programs for prairies, meadows and grasslands, which provide a habitat for a variety of different species. Small mammals and birds, for example, often inhabit the “edge” habitats along rights-of-way that the companies maintain.
- With a combination of open fields, wooded lands and “edge” habitats, electric utility lands are a particular favorite with wild turkeys. Nearly 20 percent of the companies in the survey report that they maintain habitats for these birds.
- Wildlife often needs protection from invasive species that creep into habitats either naturally or because of our activities. According to the survey, EEI members conduct 103 different programs to combat invasive species throughout the country.



Avian Protection

Avian protection is a critical issue for electric power lines. Raptors (birds of prey) and other endangered and migratory birds especially like power lines, using power poles and towers as perches from which to establish territorial boundaries, hunt, rest, find shade, feed and sun themselves. The electric power industry, government agencies, conservation organizations and the general public are concerned about avian safety. The vast majority of migratory birds in North America are protected under the Migratory Bird Treaty Act. In addition, North American eagle species are protected under the Bald and Golden Eagle Protection Act. These laws provide civil and criminal penalties for the “take” of such species. Certain avian species also are protected under the ESA.

Utility poles can benefit raptors by providing perching and/or nesting structures in areas where few natural perches or nest sites exist. However, utility structures also can pose a threat to raptors and other birds through electrocutions or collisions. Electrocution can occur when a bird completes an electric circuit by simultaneously touching two energized parts or an energized part and a grounded part of the electrical equipment. Most electrocutions occur on medium-voltage distribution lines, in which the spacing between conductors may be small enough to be bridged by

birds. Poles with energized hardware, such as transformers, can be especially hazardous, even to small birds, as they contain numerous, closely spaced energized parts.

Bird collisions with power lines are influenced by the configuration and location of the line with respect to the proximity to high bird-use areas, vegetation that may attract the birds and topographical features. Collisions may occur with the overhead static wire on transmission lines, which may be less visible than the other wires due to its smaller diameter. Also, birds can fly into wind power facilities.

Avian interactions with electric utility infrastructure sometimes creates problems, including bird fatalities and damage to transmission facilities that can cause outages. More than 75 percent of survey respondents have retrofitted transmission, distribution and substation structures to reduce avian injuries and mortalities.

Through the formation of the Avian Power Line Interaction Committee (APLIC), the industry and the U.S. Fish and Wildlife Service (USFWS) have worked together since 1989 to reduce avian electrocution and collision mortality. This cooperative effort resulted in the April 2005 announcement by EEI, APLIC, the National Rural Electric Cooperative Association (NRECA) and the USFWS of an agreement on voluntary guidelines for Avian Protection Plans (APPs). The APPs include training, compliance, facility design, public education, corporate standards and other mortality reduction measures. Utilities that implement APPs can benefit through regulatory compliance, reliability improvements, cost savings and positive recognition from regulators and customers. The APP guidelines enable companies to develop cost-effective programs that are tailored to their specific transmission and distribution engineering circumstances and geographic areas. Half of the survey respondents have instituted formal APPs to protect birds from electrocutions and collisions with power lines or wind facilities.

In addition to working with the USFWS to promote voluntary APPs at the local and regional levels, APLIC activities include:

- Conducting training workshops for developing APPs and minimizing adverse avian power line interactions;
- Continuing to work cooperatively with the USFWS and other federal agencies and conservation groups interested in avian protection;
- Promoting a resource guide, “Suggested Practices for Avian Protection On Power Lines: The State of the Art in 2006.” The 2006 edition of “Suggested Practices” was produced in cooperation with the California Energy Commission and is recognized as the authoritative guide to reducing avian electrocutions;
- Updating the 1994 manual on mitigating avian collisions with power lines.

APLIC information is available on the group’s Web site, www.aplic.org.

Vegetation Management

Vegetation management is one of the largest single maintenance expenses for EEI’s members. Trees and other vegetation can cause interruptions of electrical service by growing into or falling through power lines. A single tree contacting a transmission power line can initiate catastrophic outages.

EEI’s members promote the use of integrated vegetation management (IVM) for transmission line rights-of-way. The goal of electric utility IVM is to convert rights-of-way from tall-growth plant species to low-growth plants. IVM involves a balance of control methods, costs, public and worker health, and environmental quality. IVM control options include biological, chemical (herbicides), cultural, manual and mechanical methods. Herbicide methods are a critical component of IVM programs, and can have less overall environmental and safety impacts than mechanical and manual methods. Selective herbicide use in an IVM program can reduce the need of repetitive cutting and disturbances on rights-of-way.

Many EEI members participate in the EPA Pesticide Environmental Stewardship Program (PESP), which works with EPA to promote the use of IVM. EEI was a recipient of the PESP’s 2005 Champion award.

As a result of tree-related outages, utility vegetation management practices have been under close scrutiny by DOE, the Federal Energy Regulatory Commission (FERC), state utility regulatory commissions and NERC. EEI promotes the use of IVM to meet mandatory electric reliability standards.

Many miles of transmission lines are located on lands managed by federal agencies. On May 25, 2006, EEI signed an MOU with the U.S. Forest Service, Bureau of Land Management, USFWS, National Park Service and EPA to facilitate consistency and timeliness in the processing of utility vegetation management plans for rights-of-way on public lands while ensuring conservation of critical wildlife habitat in these areas. The Energy Policy Act of 2005 requires federal land agencies to expedite approvals for vegetation management activities on rights-of-way to meet mandatory reliability standards. The MOU promotes the use of IVM for transmission line vegetation management on federal lands.



ELECTRIC AND MAGNETIC FIELDS

EMF are invisible lines of force that surround any electrical device. Power lines, electrical wiring, electrical equipment and appliances produce EMF. Research to understand EMF and possible health effects has been conducted since the 1960s and continues today. Three decades of research on EMF exposures and human health has not established a human health hazard.

While some health authorities, such as the International Agency for Research on Cancer, have identified magnetic field exposure as a possible human carcinogen, they acknowledge that additional research will be necessary before a more definitive conclusion can be made.

The National Institute of Environmental Health Sciences (NIEHS) submitted a report to Congress on the findings of the EMF Research and Public Information Dissemination Program in 1999. The report stated the, "NIEHS believes that the probability that ELF [extra-low frequency]-EMF exposure is truly a health hazard is currently small." The report also suggested that the electric power industry continue its current practices, such as educating the public about EMF and siting and designing power lines to reduce magnetic fields. EEI members have provided more than \$16 million to match federal funds appropriated for education efforts.

In response to the findings of the NIEHS Report to Congress, the EEI Board of Directors adopted the Institute's current policy position. In accordance with the position, EEI supports:

- Continued targeted scientific research into EMF and health, exposure assessment and field management as recommended in the NIEHS *Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*;
- Continuing the industry's current practices for siting power lines, as recommended by NIEHS;
- Continued dialogue and educational efforts regarding EMF, especially wide dissemination and open discussion of research results; and

- Basing EMF public policy on the best available scientific information.

When electric companies site new power lines, they continue to address EMF concerns on the local and state levels where the power lines are built. At the request of customers, many EEI members will measure EMF levels in their homes. The electric power industry also provides funds for independent scientists to conduct EMF research through EPRI.



RENEWABLES

Electric utilities constantly look for new ways to balance their mission of providing affordable, reliable electricity with their commitment to fuel diversity, customer demand and to reduce their impact on the environment. As they have for decades, EEI member companies continue to pursue new options in renewable energy.

Renewable energy production has been accelerated in recent years by high fuel costs and technological advancements, as well as states that have adopted renewable portfolio standards (RPS). Currently, 22 states and the District of Columbia have RPS mandates

to encourage the use of renewable technologies (see Figure 14). Although program requirements vary by state, they all stipulate that electric utilities supply a certain percentage of their overall electric generation through the use of renewable energy by a certain date.

More than 60 percent of survey respondents offer one or more renewable options to their retail customers. These include generating or buying “green” power and participating in special programs that encourage generation from wind, solar and other resources. Survey respondents indicate that, in 2005, approximately 1.5 million customers participated in renewable energy programs that they offer. These electricity consumers purchased 200 million megawatt-hours of renewable-generated electricity, or enough to power a medium-sized city for one year.

EEI members recognize that increasing the amount of electricity generated through renewable resources can and will play an important role in addressing environmental issues. But to make this happen, the industry still must overcome several challenges:

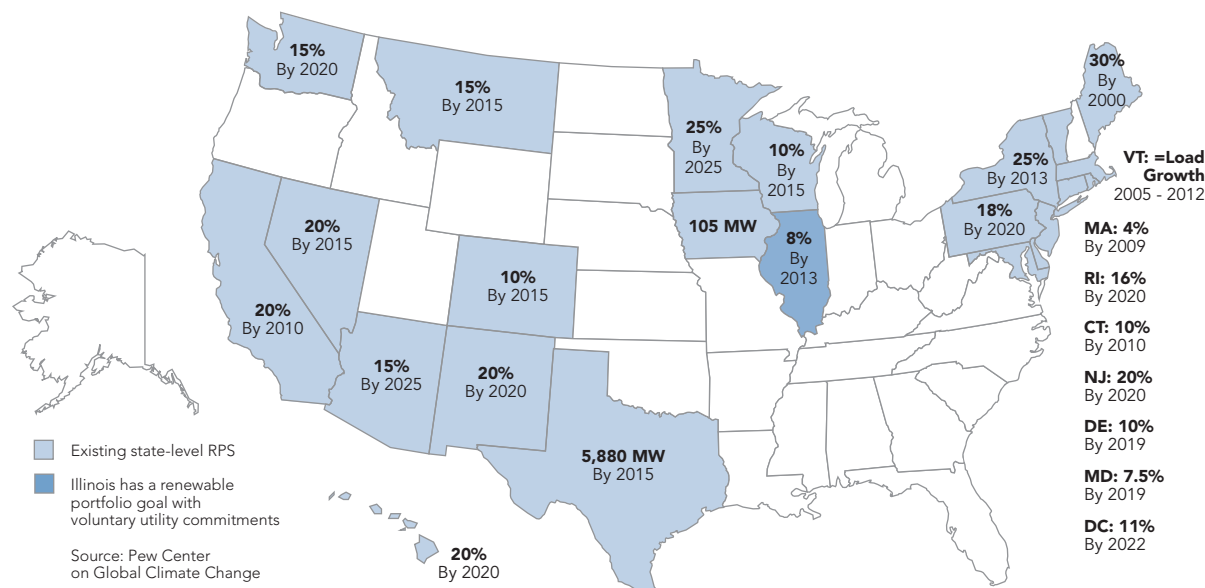
- *Regional availability* – Each region in the United States has unique renewable resources, which

affects company choices significantly. Moreover, renewables typically need a backup source of energy.

- *Expanding the transmission system* – Renewable resources generally are not located near population centers where electricity demand is greatest. That means the industry must expand its transmission systems to deliver the energy to consumers.
- *Controlling cost* – In part, this means sustaining the federal funding and support necessary to encourage capital investment. Today, most renewable resources are not cost competitive with traditional fossil fuels. Federal incentives must be consistent and predictable until the technologies can stand on their own in the marketplace.
- *Managing the application of renewable energy credits* – These state-only “tradable” renewable energy credits (RECs)—also called “green tags”—represent the environmental attributes of renewable power. Renewable producers sell these credits, and groups or individuals can buy them and in fact offset their energy use by purchasing renewable energy.

Figure 14

22 STATES AND THE DISTRICT OF COLUMBIA MANDATE A CERTAIN PERCENTAGE OF RENEWABLE ENERGY PRODUCTION



- *Addressing new environmental issues* – Every form of electricity generation we have today—including renewable energy technologies—has an environmental “footprint.” Hydropower, for example, affects many different fish species. Wind turbines can affect bird and bat populations. Survey respondents work with numerous partners and stakeholders (see Table 5) to ensure that they address these issues appropriately as new technologies come on line.

ENERGY EFFICIENCY

Energy efficiency plays a critical role in meeting the electric power industry’s energy supply and environmental challenges. EEI members view energy efficiency as an increasingly important tool, and one that is every bit as important as new generating capacity.

From 1989-2005, electric utility programs saved more than 796 billion kWh of electricity—enough to power nearly 74 million average U.S. homes for one year, according to EIA (see Figure 15). This savings is equal to the annual electricity output of slightly more than 338 baseload power plants (rated at 300 MW).

Table 5

EEI’s Relationships with Renewable Energy Groups

Survey respondents belong to and maintain strong relationships with a variety of renewable energy trade groups. These groups seek to increase the use of renewable resources to generate electricity through professional development, research and public policy initiatives:

- American Council on Renewable Energy
- American Wind Energy Association
- National Hydropower Association
- Solar Electric Power Association
- Solar Energy Industries Association
- Utility Wind Interest Group



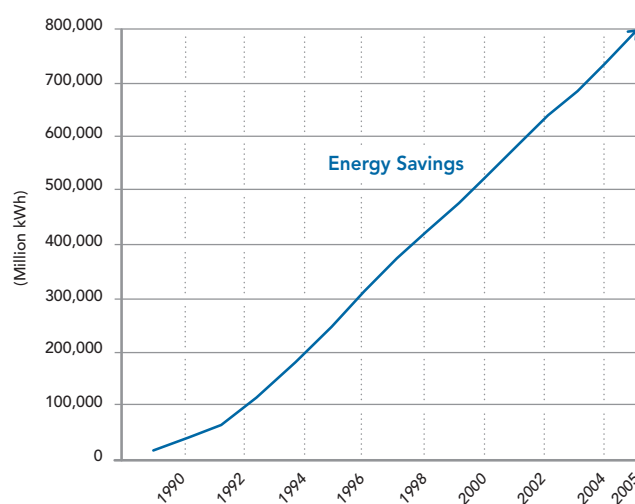
During the same time period, the electric utility sector spent more than \$30 billion on demand-side management (DSM) programs. In 2005 alone, electric utilities spent more than \$1.9 billion on DSM programs—an increase of more than 23 percent from 2004.

To help promote energy efficiency and better end use by customers, many utilities participate in and have won awards from EPA’s WasteWise and ENERGY STAR® programs; offer energy-efficiency and other DSM programs; and provide Web-based resources to help customers calculate energy savings or estimate costs for energy-efficient practices (installing insulation, buying new appliances, installing energy-efficient windows, *etc.*).

According to EIA, the energy intensity of the U.S. economy has decreased by an average of 1.9 percent per year since 1992.¹⁸ EEI members believe that energy efficiency can become even more powerful through the development and application of advanced technologies.

Figure 15

FROM 1989-2005, ELECTRIC UTILITY PROGRAMS SAVED ENOUGH ELECTRICITY TO POWER NEARLY 74 MILLION AVERAGE U.S. HOMES FOR ONE YEAR



Source: U.S. Department of Energy, Energy Information Administration. Some utilities were spending money on DSM as early as 1976. National data are not available for expenditures from 1976-1988.

¹⁸U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook 2007*, February 2007.

Table 6

EEI Members' Consumer Energy Efficiency Programs

To help improve the energy efficiency of the nation's homes and buildings, EEI members report engaging in the following activities:

- Providing energy-efficiency rebates that make purchasing high-efficiency appliances, lighting, air conditioning and refrigeration more affordable;
- Providing online energy audits that allow customers to analyze their home energy use and adjust their usage patterns;
- Supporting home construction programs that encourage professionals in the building trades to develop energy-saving designs and install high-efficiency equipment;
- Implementing direct load control and demand-response programs that help customers reduce their electricity use during peak periods;
- Fostering smart buildings that adjust automatically to changing environmental conditions (temperature, daylight, etc.) to use energy as efficiently as possible;
- Promoting the sale and use of smart and efficient appliances and equipment in residential, commercial and industrial buildings and facilities;
- Offering low-interest loans that help consumers finance energy-efficient appliance purchases;
- Accelerating the introduction of smart meters that allow customers to shape their electricity use in response to pricing signals; and
- Advancing the development and introduction of plug-in hybrid electric vehicles.



This only will become a reality through collaborative effort among utilities, regulators, environmental groups and consumers.

EEI members believe that in order to maximize the benefits of energy efficiency, it must be sustainable and the subject of a long-term commitment by all stakeholders. Business processes that provide long-term encouragement for customers to choose high-efficiency technologies ultimately will deliver the best return on investment in energy efficiency.

Many EEI members are involved actively in the National Action Plan for Energy Efficiency (NAPEE).¹⁹ Established in 2006, NAPEE presents policy recommendations for creating a sustainable, aggressive national commitment to energy efficiency. Such a commitment could save Americans many billions of dollars on energy bills over the next 10 to 15 years, contribute to energy security and improve the environment.

NAPEE was developed by more than 50 leading organizations representing key stakeholder perspectives, including privately, publicly and cooperatively owned utilities, utility regulators, state agencies, large energy users, consumer advocates, energy service providers and environmental and energy-efficiency organizations.

EEI and its members are striving to help make increased energy efficiency a reality. All survey respondents are pursuing customer energy-efficiency programs, internal energy-efficiency programs or both (see Table 6 for a partial list of customer-oriented programs).

Approximately 40 percent of survey respondents conduct corporate and plant-specific efficiency programs. These programs are demonstrating savings in energy and significant environmental gains. Respondents reported saving about 3.3 million MWh in 2005 through internal efficiency improvements (see Figure 16). This is a significant increase from the

¹⁹www.epa.gov/cleanenergy/actionplan/eeactionplan.htm.

.....

*Energy efficiency can become even more powerful through the development
and application of advanced technologies.*

.....

642,719 MWh they saved through internal energy-efficiency programs in 2000.

With internal energy-efficiency investments of \$13 million in 2005, the companies are spending about 80 percent more on this objective today than they did in 2000. Survey respondents also conduct programs to upgrade their facilities and install energy-efficient technologies at their sites. More than a quarter of the survey respondents operate fleet efficiency programs, putting electric or hybrid company vehicles on the road.

ENVIRONMENTAL TECHNOLOGY RESEARCH

EEl members recognize that finding new ways to generate electricity and reduce the industry's environmental footprint requires a substantial investment in environmental technology and research.

EPRI has been conducting environmental research since 1973 to address the key issues facing the power industry. Specific areas of research include: air quality, global climate change, land and groundwater protection and remediation, water resources sustainability, EMF, mercury and occupational health and safety. The goal is to provide scientific and technical information on possible health effects and environmental impacts related to the electricity industry.

The companies participating in the survey reflect the industry's commitment to supporting research. Survey respondents contributed almost \$100 million in 2005 to support environmental science and technology research programs. Examples include:

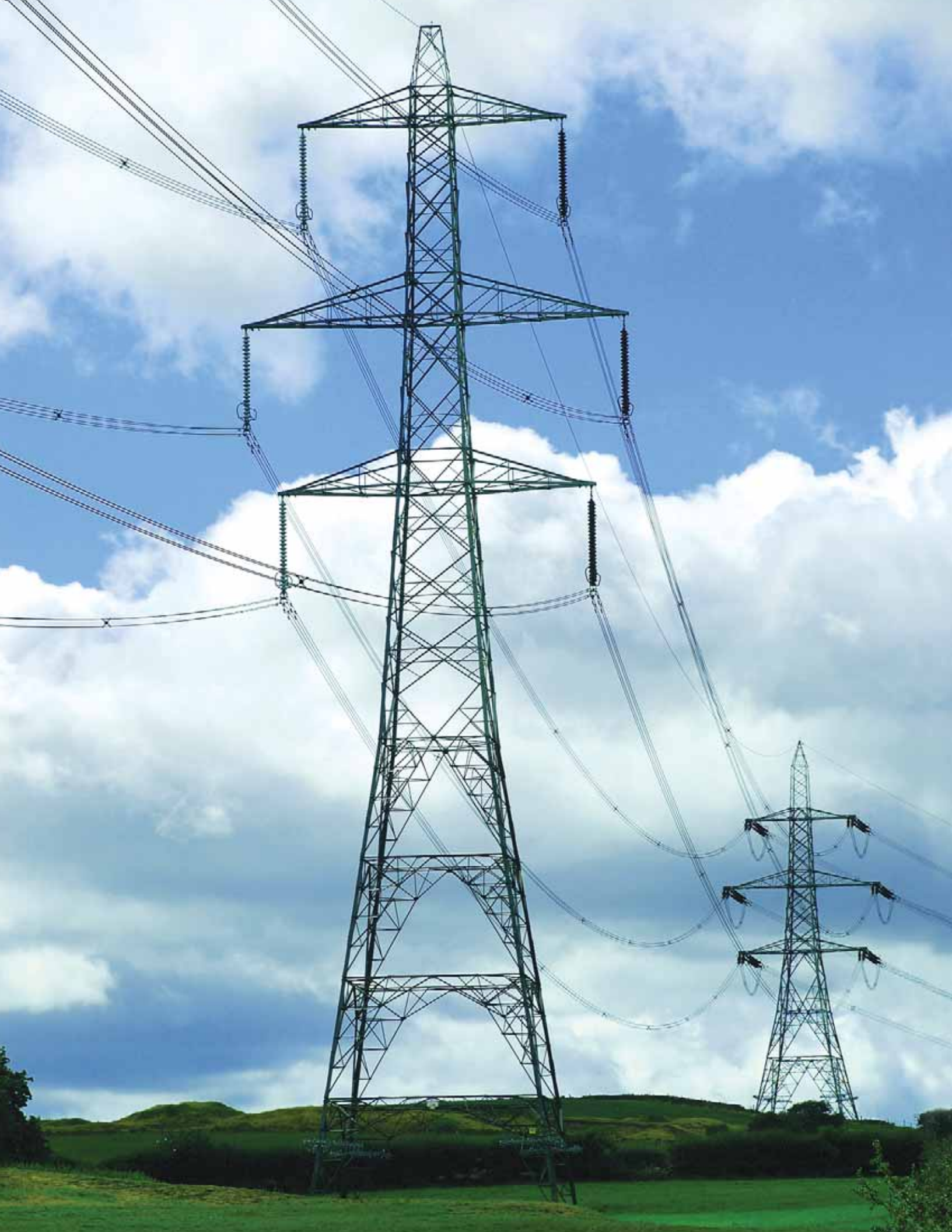
- In 2006, *Black Hills* invested in mercury testing, as well as testing and development research for low NO_x burning technologies.
- At Mount Hope Bay Natural Laboratory, *Dominion Power* sponsors a study to simulate the physical, biological and chemical interactions that take place in Mount Hope and Narragansett Bays and the Taunton River.
- As part of its commitment to alternative fuels, *NiSource* worked in 2005 to develop the technology capable of capturing all carbon monoxide and CO₂ emissions from a natural-gas fueled solid oxide fuel cell.
- *Southern Company* subsidiary *Gulf Power* established the first integrated mercury research facility at Plant Crist near Pensacola, Florida to develop and test new power plant mercury control technologies at full scale.

Figure 16

SURVEY RESPONDENT SPENDING ON INTERNAL END-USE EFFICIENCY HAS GROWN 12-FOLD SINCE 1990

	2005	2000	1990
Total Spent on Internal End-Use Efficiency Programs	\$12,869,137	\$7,381,763	\$1,000,000
Total MWh Saved by Internal End-Use Efficiency Programs	3,281,475.3	642,719	47,527
Total Peak Demand Reduction from Internal End-Use Efficiency Programs	391.508 MW	383.1 MW	1.2 MW

Source: EEl 2006 Survey



ACCOUNTABILITY

EEI members understand that their efforts to be good environmental stewards will be meaningless if those efforts lack credibility. They also recognize that an essential component of credibility is accountability, because accountability allows the industry's stakeholders to measure environmental progress in an open, transparent and accessible way. In the case of the electric power companies, these stakeholders include shareholders, customers, regulators, employees, environmental organizations and the communities in which they operate.

Through this report, EEI's members are taking a new step in their ongoing efforts to provide information and present a unique perspective on the industry's suite of environmental planning, operational and service responsibilities. It is by no means a "final" statement on environmental issues, or even a definitive analysis. It is part of a continuing process of improving the industry's continued commitment to performance and communicating openly and honestly with stakeholders.

EEI members provide government agencies with more environmental data, information and reports than any other industry in the United States. With the exception of certain company-proprietary and security information, nearly all of this information is available to the public through the individual companies or through the public agencies that collect the data. However, it is in a variety of places and often hard to find; in this report, EEI presents a lot of it in a single document. In addition, this report expands on the information provided about EEI members and their voluntary commitments.

REQUIRED REPORTS AND FILINGS

EEI members provide regular and ongoing reports on their operations to federal, state and local authorities. Examples include:

- *Securities and Exchange Commission (SEC) reports* – As corporations, EEI members file annual 10-K and quarterly 10-Q reports providing information about financial standing, corporate changes, material environmental expenditures and other business issues. Companies sometimes file 8-K reports for special disclosures.

- *FERC reports* – EEI members file many different reports on financial concerns, sales, plant and staffing information, fuel stock, quality and cost information, and the transmission and sale of electricity, as well as documents on licensing, infrastructure and siting issues.
- *EIA reports* – EEI members report information on generation, power plant design and output, sales and revenue, fuels and CO₂ emissions.
- *EPA reports* – EEI members report to EPA information on air, water and land emissions and other environmental matters. Since 1999, utilities that burn coal or oil to generate electricity have provided annual reports to EPA for the Toxics Release Inventory (TRI) program. These reports include information on toxic chemical releases and other waste management activities. In addition, EEI member companies have provided annual advance estimates of TRI releases of certain chemicals directly to the public prior to reporting to EPA.

ENVIRONMENTAL DISCLOSURE

Environmental liabilities long have been a topic covered in industry financial disclosures. The nature of these disclosures is guided by SEC regulations and guidance issued by professional accounting standard organizations. Certain investors have an interest in data about social and environmental impacts reaching beyond that which has been discussed traditionally in formal, SEC-required disclosures for publicly held companies, including forms 10-K and 10-Q.



According to research conducted by the Investor Responsibility Resource Center, the number of, and shareholder support for, resolutions demanding greater corporate disclosure on climate change-related risks has steadily increased over the last decade. In the past two years, many EEI member companies have released, or agreed to prepare, enhanced reports on climate change issues.

In the context of the Sarbanes-Oxley Act and other recent efforts to improve investor confidence and trust in the management and governance of the electric power industry, EEI has voiced its strong support for meaningful and transparent financial disclosure. In addition, EEI's Environmental Excellence Principles and Policy on Community Right-to-Know place a high value on meaningful stakeholder dialogue.

Going forward, EEI will continue to identify opportunities to increase and improve outreach and communication about environmental issues with financial and other stakeholders.

PUBLIC ENVIRONMENTAL INFORMATION

EEI members also communicate directly with the public through annual reports, environmental reports, online communications and other tools that provide information about their commitment to the environment. Sixty-five percent of survey respondents regularly release reports focusing exclusively on environmental topics. The vast majority report every one or two years.

All survey respondents provide environmental information on their company Web sites, including details about programs, background materials and information for neighbors in their communities interested in getting involved in a company-sponsored environmental program. More than half of the survey respondents discuss specific environmental performance improvement goals on their Web sites or in their environmental reports.

Through this report, EEI's members are taking a new step in their ongoing efforts to provide information and present a unique perspective on the industry's suite of environmental planning, operational and service responsibilities.

PUBLIC OUTREACH AND PHILANTHROPY

EEI members value their roles as members of the communities in which they operate, and they actively seek ways to involve their neighbors in their environmental work. Nearly all (95 percent) survey respondents conduct environmentally oriented community participation programs, a total of 234 in all.

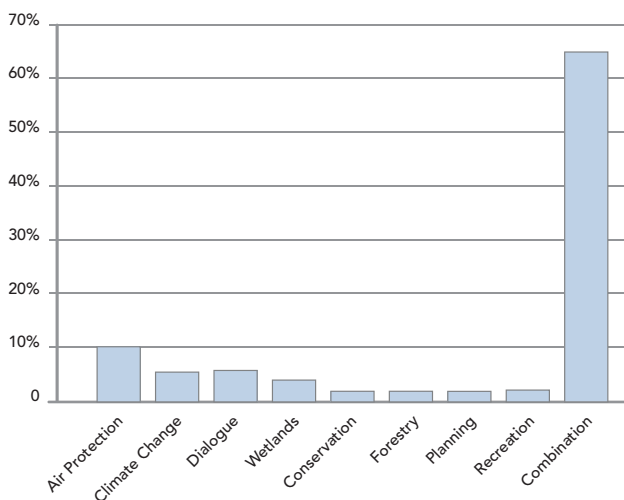
Survey respondents also contributed \$20.5 million to environmental-related philanthropies in 2005. Ten percent of the companies said they contributed more than \$1 million to environmental philanthropies in 2005. Respondents also report participating in numerous environmental programs that involve active participation by the public. These include student and educational programs, animal protection initiatives and reforestation projects.

STAKEHOLDER DIALOGUE

In addition to community-wide public outreach work, 95 percent of survey respondents reach out specifically to local, regional, national and international stakeholder groups and non-governmental organizations to provide information about programs and encourage open dialogue. These include partnerships with 182 different organizations and programs focused on everything from air quality protection to forestry and recreation (see Figure 17).

EEI members hope this report will prompt new dialogue with a full range of stakeholders. Because EEI members serve more than 70 percent of all U.S. electricity customers and manage facilities that reach across the country, they are committed to including all stakeholders in their work.

Figure 17
EXTERNAL STAKEHOLDER DIALOGUE/PARTNERSHIPS



Source: EEI 2006 Survey



LOOKING TO THE FUTURE

EEl and its members still believe in the promise that Thomas Edison's first generating plant at Pearl Street Station in New York offered Americans 125 years ago: unimaginable innovation and convenience. Today, that innovation and convenience require sound environmental management.

Electricity is the driving force behind our nation's economy, powering our homes, offices and industries, and enhancing our daily lives. Today, U.S. demand for electricity is at an all-time high. The population is growing, and homes are larger and have more appliances, computers, and electronic equipment than ever before. As a result—despite continued energy-efficiency improvements—electricity consumption is expected to increase 41 percent by 2030 (see Figure 18).

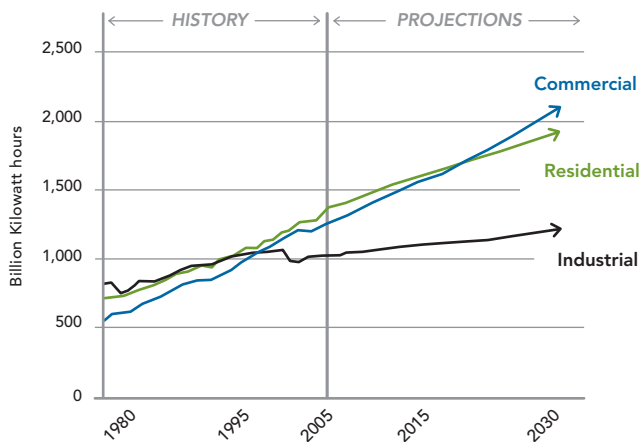
DEMAND FOR POWER

From the very beginning, the nascent electric power industry faced challenges related to the environment. One of these was the rapid increase in demand for power. Since Edison first flipped the switch at Pearl Street Station in 1882, American consumers and businesses have demanded electricity in ever-growing amounts.

It's a challenge that remains with the industry to this day. To meet growing demand for power, we need more generating plants, more transmission and distribution facilities, and greater energy-efficiency. Today's electric power industry must balance its efforts to meet demand with operations that meet rigorous environmental standards. Consider:

- Every new generating plant helps meet growing demand, but it creates environmental impacts that EEI members and their stakeholders must manage. By using new fuel options, new emissions-control technologies and more renewable-energy generation resources, EEI members are generating more electricity with fewer detrimental environmental impacts.
- Developing new transmission and distribution facilities involves careful planning. When EEI members site and construct these facilities, they look for every possible way to avoid, mitigate and repair unacceptable impact on adjacent wetlands, wildlife habitat and recreational areas. In doing so, they work closely with federal, state and local officials. Through careful environmental management strategies, the industry offers a dual benefit to the community: protected, managed habitats and access to affordable, reliable electricity.
- EEI members are continuously improving in all areas: generation, transmission, distribution, energy-efficiency, environmental management systems and natural resource protection. By using each kWh as efficiently as possible, they can reduce environmental impact.

Figure 18
ELECTRICITY USE EXPECTED TO GROW 41% BY 2030



Source: U.S. Department of Energy, Energy Information Administration



The industry will be investing in new plants, infrastructure and environmental controls to keep pace with the country's growing demand for electricity.

RELIABILITY OF THE SYSTEM

Effective environmental management also can help ensure the reliability of the electric power system. The industry strives to provide electricity to our customers 100 percent of the time, but storms, technical limitations and sudden demand shifts still leave the system vulnerable to disruptions. Improved environmental performance can help. One example is keeping rights-of-ways clear. Through techniques such as IVM, EEI members are better able to avoid service disruptions that occur as a result of vegetation coming into contact with transmission or distribution lines.

DELIVERING AFFORDABLE POWER

Finally, environmental management can play an important role in keeping electricity affordable. Edison's early customers clamored for power even at the modern-day equivalent of more than \$4 per kWh. This is almost 50 times greater than the average 2005 price for all customers. Nevertheless, EEI members understand the impact that rising energy prices can have on families, businesses and the economy.

The introduction to this report discussed the shareholder-owned electric power industry's commitment to a process of continuous improvement in the pursuit of environmental excellence. EEI

members acknowledge that the electric power industry still faces many challenges as it prepares for the future. But, as an industry, EEI member companies already are pushing forward by:

- *Fulfilling legal and civic obligations* – EEI members operate in an arena where thousands of regulations, laws, reports and obligations govern how they do business. EEI members meet these commitments today, and they will continue to serve the public interest in the future.
- *Acting voluntarily* – EEI members often don't wait for regulators and legislators to prescribe ways to manage their environmental impact. They take the initiative to identify opportunities and establish new initiatives with key partners and stakeholders that help improve environmental performance.
- *Thinking globally, acting locally* – It is an environmental slogan that's been around for decades, but for electric utilities, it's also an important management concept. EEI members look at the big picture: energy resources, global environmental concerns, demand growth and other issues. Then, they formulate strategies that make sense on a local level: using the energy resources that support customer priorities; adapting environmental strategies to accommodate local species; and offering efficiency programs that respond to communities' needs.
- *Telling our story...and listening to yours* – One of the industry's fundamental Environmental Excellence Principles is to build a dialogue with stakeholders and exchange ideas about how the industry can meet its many challenges. For EEI's members, this report is the next phase in that process. By offering a candid accounting of these efforts, EEI's members hope that they've opened the door to new ideas and opportunities.

Now, it's your turn to talk. The participants in and producers of this report hope that you'll take the time to share your ideas on how the shareholder-owned electric power industry can meet America's growing electricity demand while minimizing the industry's environmental impact. EEI's members look forward to working with all of their stakeholders on this important goal.

STAKEHOLDER FEEDBACK FORM



The Edison Electric Institute (EEI) prepared this report in part to allow the shareholder-owned electric power industry's many stakeholders to measure its environmental progress in an open and transparent manner.

This form is designed for readers to provide EEI with feedback.

Please use the space below to share your thoughts, comments or suggestions. You may return this form in one of three ways:

- 1) By e-mail to EEIstewardship@eei.org
- 2) By fax to (202) 508-5150
- 3) By mail to:

Edison Electric Institute
c/o Environmental Stewardship
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

Thank you very much for taking the time to read this report, and for providing your feedback.

Name (optional): _____

E-mail (optional): _____

Comments: _____

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**EDISON ELECTRIC
INSTITUTE**

701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2696
202-508-5000
www.eei.org

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