

Global Climate Policy Costs and Benefits - Program 102

Program Overview

Program Description

International and domestic climate policies may cost the global economy trillions of dollars. Cost-effective implementation and technology advances can substantially reduce the cost of achieving the environmental objectives of these policies. Scientific, economic, and technological concerns of the electricity sector must be addressed in the policy debate. Research results are critical to informing stakeholder discussions over proposed national and international policies. The Electric Power Research Institute's (EPRI's) climate policy program provides members and public- and private-sector decision makers with analysis and information on the potential costs and benefits of domestic and international global climate policy proposals.

This program provides local, state, national, and international policymakers with crucial information for making economically and environmentally sound global climate policy decisions. The program focuses on estimating the economic costs of climate policy proposals, identifying policy principles for reducing these costs, and comparing these potential costs with the potential benefits of lower greenhouse gas concentrations. The program examines in depth the role of technology advances in limiting policy costs.

Research Value

Climate policies will fundamentally change the economics of electricity and energy, and smart policy approaches can substantially reduce the costs of meeting the environmental goals of these policies. The program's primary value is its ability to provide integrated assessments of potential costs and benefits of climate change management proposals and impacts on national and international economies. Within these analyses, the program illuminates the role of technology in achieving climate policy goals, with a specific emphasis on the electricity sector. The program's nationally and internationally recognized experts are able to bridge gaps between the technical and policy communities. This research provides

- U.S. decision makers and modeling community with a highly respected and valuable source of information and analyses,
- national and international policy debates efficient and thoughtful design, and
- electric utility industry issues a strong analytical basis for informing climate policy discussions

Approach

The program informs the public policy process by communicating research results to the broadest possible audience. The program provides issue briefs; newsletters; congressional testimony; briefings for stakeholders, policymakers, researchers, and the press/media; and peer-reviewed literature submitted to prestigious journals. This program delivers

- high-profile messages on the value of technology in climate policy discussions,
- scenario analyses through program-funded analytical models,
- study results for program members to use in presentation materials for internal and external communications, and
- program experts that provide expertise to the domestic and international climate science and policy communities.

Accomplishments

Program accomplishments include the following:

- The Intergovernmental Panel on Climate Change (IPCC) and the U.S. Secretary of Energy highlight EPRI research on the importance of climate policy flexibility.
- The U.S. Climate Change Science Program uses three EPRI-supported models for scenario analysis.
- EPRI research on the value of technology development informs research and development investment decisions.
- EPRI research on developing country emissions and the implications of coalitions of countries agreeing to climate policy has helped inform international negotiations.
- EPRI experts are playing key roles in a new National Academy of Science study, America's Climate Choices, and in the initial efforts to define the IPCC's 5th Assessment Report.

Current Year Activities

Program R&D for 2010 will continue to focus on informing climate policy at the state, national, and international level. Key collaboration with EPRI programs in EPRI's Generation (e.g., Coal Fleet) and Power Delivery and Utilization (e.g., energy efficiency) sectors will be crucial to providing comprehensive analysis of climate policy. Specific efforts will include

- analysis of the costs of specific proposed climate policies at the national and international level for use in policy negotiations,
- integrated assessment of potential costs and benefits of alternative climate change management proposals,
- examination of the role of technology and electrification in achieving climate policy goals, and
- development of U.S. regional modeling capability to assess domestic climate policy details.

Estimated 2010 Program Funding

\$5.0M

Program Manager

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Summary of Projects

Project Number	Project Title	Description
P102.001	Climate Policy Design, Implementation, and Costs	This project improves understanding of what constitutes cost-effective climate policy. Research includes analysis of the elements of policy design and implementation, as well as estimates of the economic costs at various levels of achieving GHG emission reductions specified in prominent climate change policy proposals. This work also elucidates the role of the electric power sector under various policy alternatives, with new emphasis on regional specificity in the U.S. domestic context.
P102.002	Integrated Assessment of Costs and Benefits of Climate Change Management Proposals	This project uses information developed about the costs and benefits (damages avoided) of proposed climate change proposals to objectively facilitate economically and environmentally sound policies. The frameworks developed for this integration will be continuously refined and updated with new methods and information, taking into account changes in knowledge about the future character of the energy and economic system, climate-relevant physical processes, and new proposals in the evolving debate.
P102.003	The Role of Technology in Managing Climate Change	Technology is the key to the transition to a low-carbon future. An effective technology policy that speeds development and demonstration of technological advances can dramatically reduce the cost of meeting any prescribed emissions reduction goal. Using EPRI-sponsored models, this project will examine the role of technological advances in managing the costs of climate change policy compliance. In particular, this research highlights the opportunity for decarbonization of the economy through electrification.
P102.004	Communications	Effective communication is the key to getting value from this program. This project funds efforts to communicate key insights to members, key stakeholders, and the public through workshops, the Annual Climate Seminar, issue briefs, newsletters, and www.epri.com .

P102.001 Climate Policy Design, Implementation, and Costs (SP0294)

Key Research Question

Estimates of the economic costs of reducing greenhouse gas (GHG) emissions at both the national and international levels are needed for global climate change policy negotiations. In the United States, the priorities of the new administration and members of Congress suggest that a policy may come into force in the very near future. Insights are needed into the importance of policy design and the role of the electric power sector under various policy alternatives.

Approach

Comprehensive analyses of the cost of achieving GHG emission reductions specified in prominent climate change proposals will be developed. Research into cost-effective reductions will be undertaken to clarify the role of carbon and noncarbon greenhouse gases as well as terrestrial carbon release associated with land use change in an overall least-cost emission reduction portfolio. Analyses at the national and international level will examine the effect of such policies on carbon intensity, fuel and electricity prices, reliability of supply, household income, and other factors of interest to policymakers. The information, methods, and tools provided in this project represent key inputs for integrated assessment of the potential costs and benefits of climate change management proposals, helping to lay the foundation for sound policymaking.

Impact

- Essential elements of cost-effective policy measures provide members, the public, and policymakers with important insights on proposed regional, national, and international policies.
- Economic and technological concerns of the electric sector are addressed in policy debates, ensuring a substantial “seat at the table” for members.
- Participants gain vital knowledge and insights that facilitate strategic planning and enhance risk management activities within their organizations.

How to Apply Results

The main strategy for applying project results will be to inform the public policy process by communicating with the broadest possible audience. Equally important vehicles to ensure that member environmental staff, media/federal relations staff, and executives stay current on the research results include EPRI Climate Briefs and newsletters; attendance at EPRI advisory meetings and its annual Climate Seminar; up-to-date web content; briefings for stakeholders, including policymakers, researchers, and press/media; and peer-reviewed papers submitted to prestigious journals. Only through these means can members understand the constantly evolving key policy issues and position themselves at the leading edge of knowledge.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
<p>Assessment of the Near-Term Costs of Domestic GHG Emission Reduction Proposals: A federal policy constraining GHG emissions appears to be very likely. The range of proposals includes hybrid schemes composed of cap-and-trade along with energy efficiency, renewable portfolio standards, and other regulatory measures. Technology R&D investment policies are among the most crucial elements of these proposals. Key policy features, such as sectoral coverage, point of regulation, and use of revenues from permit auctions, and their implications for cost-effective climate management will be analyzed and communicated to members and policymakers.</p>	12/31/10	Peer Literature
<p>Examination of Post-Kyoto Proposals: The 15th Conference of Parties (COP 15) to the U.N. Framework Convention on Climate Change (UNFCCC), scheduled for December 2009 in Copenhagen, is likely to establish targets and timetables for a post-Kyoto agreement. At the same time, other major emitting countries are developing emission reduction proposals on their own, and the role of abatement in developing countries is becoming increasingly crucial. It is important to understand the implications of these proposals for the U.S. economy and its competitors in terms of both economic and environmental impacts.</p>	12/31/10	Peer Literature

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
Assessment of the Near-Term Costs of Domestic GHG Emission Reduction Proposals: Future-year products will focus on implications of domestic climate policies for regional transmission and distribution networks, land resource availability, and electricity markets.	12/31/11	Peer Literature
Examination of Post-Kyoto Proposals: Future-year products will continue to assess the implications of international proposals for the United States, focusing on the role of abatement in developing countries in meeting international climate goals.	12/31/11	Peer Literature

P102.002 Integrated Assessment of Costs and Benefits of Climate Change Management Proposals (057737)

Key Research Question

Integrating economic policy cost information with estimates of market and nonmarket impacts is the central problem addressed by this project. The costs and environmental benefits of U.S. and international proposals for managing greenhouse gases (GHGs) need to be evaluated using a consistent and comprehensive approach so that stakeholders use objective information to arrive at economically and environmentally sound policy decisions.

Approach

The environmental and economic implications of various proposed climate change policies will be evaluated using integrated assessment frameworks based on the latest results from economic, scientific, and technological research. This project will combine economic assessment with policy-relevant information about the key processes controlling the earth's carbon cycle and climate, including the attendant uncertainties, as well as the responses of human systems and natural ecosystems. The resulting integrated assessments will be continuously refined and updated with new methods and information, taking into account changes in knowledge about climate-relevant emissions and processes as well as new proposals in the evolving policy debate.

Impact

- Develops state-of-the-art, consistent, comprehensive frameworks for complex climate policy evaluations
- Integrates credible and objective information on costs and benefits of climate change policies
- Creates teams of experts able to quickly examine new information crucial to the policy debate in a manner available nowhere else by supporting continuous refinement of frameworks and policy assessments

How to Apply Results

The main strategy for applying project results will be to inform the public policy process by communicating with the broadest possible audience. Equally important vehicles to ensure that member environmental staff, media/federal relations staff, and executives stay current on the research results include EPRI Climate Briefs and newsletters; attendance at EPRI advisory meetings and its annual Climate Seminar; up-to-date web content; briefings for stakeholders, including policymakers, researchers, and press/media; and peer-reviewed papers submitted to prestigious journals. Only through these means can members understand the constantly evolving key policy issues and position themselves at the leading edge of knowledge.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
<p>Enhanced and Updated Frameworks for Integrated Assessment of Policy Proposals: Improvements to integrated assessment frameworks will be implemented by including the latest scientific developments detailed in the literature, in particular the integration of terrestrial ecosystems with atmospheric-ocean models. These frameworks will be used to analyze the long-term climate stabilization scenarios on an ongoing basis, incorporating the latest insights in climate science, impacts, economics, and technology.</p>	12/31/10	Peer Literature
<p>Assessments of the Costs and Benefits of Policy Proposals: The international climate regime will continue to be fragmented. The potential costs and benefits of various emerging international climate policy proposals will be analyzed from the perspective of strategic interaction between coalitions of countries. Updated assessments will incorporate evolving scientific and technological information as well as new decision modeling techniques.</p>	12/31/10	Peer Literature

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
<p>Enhance and Updated Frameworks for Integrated Assessment of Policy Proposals: Future-year products will begin to examine the environmental and economic implications of geoengineering options. Both improved analytical techniques and new integrated assessments will be provided that take these options into account.</p>	12/31/11	Peer Literature
<p>Assessments of the Costs and Benefits of Policy Proposals:</p>	12/31/11	Peer Literature

P102.003 The Role of Technology in Managing Climate Change (067506)

Key Research Question

Technology is the key to making the transition to a low-carbon economy, both domestically and globally. An effective technology policy that speeds development and demonstration of technological advances can dramatically reduce the cost of meeting any future greenhouse gas reduction goal. For developing countries in particular—a rapidly increasing emissions source—technology-based policy incentives are likely to be the most effective near-term approach. Moreover, there are potentially large benefits to developed countries of technology diffusion globally. Research is needed into the value of the availability, timing, and interactions of new climate-friendly technologies.

Approach

Using EPRI-sponsored models, the role of technological advance in managing the costs of climate change policy compliance will be examined. Analysis will focus on individual electric sector technologies, including nuclear, carbon capture and sequestration (CCS), renewables, and end-use technologies. The value of advances in these technologies under various policy scenarios will be calculated, both domestically and internationally, with emphasis on how electricity competes with fossil fuels at the end use and on the role of electricity in decarbonizing other sectors of the economy. In addition, research will analyze what constitutes a prudent portfolio in the face of uncertain technology availability and costs, public acceptance, and future greenhouse gas limits.

Impact

- Quantifies the value of technology under various climate policy scenarios
- Provides insights into technology advances and deployment
- Informs policymakers about ways to encourage technology innovation
- Highlights the potential benefits of technology diffusion abroad

How to Apply Results

The main strategy for applying project results will be to inform the public policy process by communicating with the broadest possible audience. Equally important vehicles to ensure that member environmental staff, media/federal relations staff, and executives stay current on the research results include EPRI Climate Briefs and newsletters; attendance at EPRI advisory meetings and its annual Climate Seminar; up-to-date web content; briefings for stakeholders, including policymakers, researchers, and press/media; and peer-reviewed papers submitted to prestigious journals. Only through these means can members understand the constantly evolving key policy issues and position themselves at the leading edge of knowledge.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
Global Role of Climate Technology: While the value of new technology development in reducing the costs of U.S. emissions reductions is significant, the value of global deployment could be much larger. This project will conduct analysis on international abatement costs and the implications of successful technology transfer abroad, particularly in developing countries with rapidly growing emissions but limited ability to pay for reductions.	12/31/10	Peer Literature
Analysis of the Sensitivity of Policy Cost to Timing and Characteristics of New Technologies: While certain emerging low-carbon technologies may be very valuable if successful, they face substantial technological and economic hurdles. This project will explore the sensitivity of climate policy costs to the availability and characteristics of specific technologies, with emphasis on regional detail in the United States.	12/31/10	Peer Literature
Developing Robust Technology Portfolios: This project will explore the interaction of individual technologies in the suite of technologies available for meeting future needs. The goal will be to develop a robust investment mix in the face of technological, economic, and geopolitical uncertainty. The project will also examine the implications of alternative technological development paths for the way energy is provided in the future.	12/31/10	Peer Literature

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
Examining the Competitiveness of Electricity at the End Use: Electricity has the potential to compete cost-effectively in many end-use markets, such as transportation, space conditioning, and industrial processes. This project will examine the potential role of electrification in decarbonizing energy, both regionally in the United States and globally.	12/31/11	Peer Literature
Global Role of Climate Technology: Future-year products will examine alternative international policy instruments to create incentives for technology transfer.	12/31/11	Peer Literature

P102.004 Communications (067507)

Key Research Question

Effective communication of climate policy research results helps to inform stakeholder decisions. Climate policy is one of the most significant national and global environmental issues ever contemplated in terms of costs and implications for society. It is critical that decision makers have the best available information at their disposal.

Approach

EPRI climate research produces numerous insights for policymaking at a variety of levels. It is essential that these insights be effectively communicated to various stakeholder groups if the results are to help inform relevant policy discussions. Various activities undertaken by EPRI staff include ongoing communication of past and current research results through participation in international and domestic committees, workshops, and seminars; through presentations, briefings, and testimony; and through publication of Climate Briefs, newsletters, and papers in the peer-reviewed literature.

Impact

- Improved understanding of critical design and implementation issues of cost-effective climate policy
- Improved understanding of the value of technology in managing the costs of climate policy
- Improved understanding of the results of integrated assessment of climate policy costs and benefits

How to Apply Results

Company environmental staff can use project information to inform company climate strategy, help identify and evaluate key investments in climate technology, and guide development of corporate policy positions. EPRI will facilitate broader use and awareness of the results by briefing key stakeholders, including policymakers and policy researchers; developing written materials for distribution; keeping the public web page current; presenting at meetings and seminars; and continuing service on various advisory panels.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
Communications Activities and Materials: Deliverables will include papers, research summaries, webcasts, the program web site, briefings, and presentations, supplementing EPRI reports and peer-reviewed literature created by other projects in the program.	12/31/10	Technical Resource

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
Communications Activities and Materials: Deliverables will include papers, research summaries, webcasts, the program web site, briefings, and presentations, supplementing EPRI reports and peer-reviewed literature created by other projects in the program.	12/31/11	Technical Resource