POLICY FORUM

CLIMATE

The Bush Administration's Approach to Climate Change

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As a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), the United States shares with many countries its ultimate objective: stabilization of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous interference with the climate system. Meeting this UNFCCC objective will require a long-term commitment and international collaboration.

President Bush's policy on climate change harnesses the power of markets and technological innovation, maintains economic growth, and encourages global participation. Although climate change is a complex and long-term challenge, the Bush administration recognizes that there are cost-effective steps we can take now.

Near-Term Policies and Measures

In 2002, President Bush set a national goal to reduce the greenhouse gas intensity (*1*) of the U.S. economy by 18% by 2012. This goal sets America on a path to slow the growth in greenhouse gas emissions and—as the science justifies and the technology allows—to stop and reverse that growth as needed to meet the UNFCCC goal (*2*). Our approach focuses on reducing emissions while sustaining the economic growth needed to finance investment in new, clean energy technologies. The administration estimates that this commitment will achieve about 100 million metric tons of carbon equivalent (MMTCe) of reduced emissions in 2012, with more than 500 MMTCe in cumulative savings over the decade (*3*).

To this end, the administration has developed an array of policy measures, including financial incentives and voluntary programs. For example, our Climate VISION (*4*), Climate Leaders (*5*), and SmartWay Transport Partnership (*6*) programs work with industry for voluntary reduction of emissions. The Department of Agriculture is using its conservation programs to provide an incentive for actions that increase carbon sequestration (*7*). We also are pursuing many energy supply technologies with comparatively low or zero CO_2 emissions profiles, such as solar, wind, geothermal, bioenergy, and combined heat and power. The president has proposed more than $4 billion in tax credits as incentives for these and other energy-efficient technologies over the next 5 years (*3*). Last year, the Bush administration increased fuel economy standards for new light trucks and sport utility vehicles by 1.5 miles per gallon over the next three model years, leading to the estimated avoidance of 9.4 MMTCe of emissions (*8*).

While acting to slow the pace of greenhouse gas emissions in the near term, the United States is laying a strong scientific and technological foundation to reduce uncertainties, to clarify risks and benefits, and to develop realistic mitigation options to meet the UNFCCC objective.

Advancing Climate Change Science

In 2001, President Bush commissioned the National Research Council (NRC) to examine the state of our knowledge and understanding of climate change science. The NRC's report (*9*) makes clear that there are still important gaps in our ability to measure the impacts of greenhouse gases on the climate system. Major advances in understanding and modeling of the factors that influence atmospheric concentrations of greenhouse gases and aerosols, as well as the feedbacks that govern climate sensitivity, are needed to predict future climate change with greater confidence.

Last summer, the Climate Change Science Program (CCSP) released a new strategic plan that addresses these gaps (*10*). The plan is organized around five goals: (i) improving our knowledge of climate history and variability; (ii) improving our ability to quantify factors that affect climate; (iii) reducing uncertainty in climate projections; (iv) improving our understanding of the sensitivity and adaptability of ecosystems and human systems to climate change; and (v) exploring options to manage risks. Annually, almost $2 billion is spent on climate change science by the federal government.

A review of the CCSP plan by NRC shows the administration is on the right track. While concern was expressed about future funding to execute the plan, the NRC concluded that it "articulates a guiding vision, is appropriately ambitious, and is broad in scope" (*11*).

NRC's report also identified the real need for a broad global observation system to support measurements of climate variables. Last June, the United States hosted more than 30 nations at the inaugural Earth Observation Summit, out of which came a commitment to establish an intergovernmental, comprehensive, coordinated, and sustained Earth observation system. The data collected by the system will be used to create better climate models, to improve our knowledge of the behavior of CO_2 and aerosols in the atmosphere, and to develop strategies for carbon sequestration.

Accelerating Climate Change Technology Development

The Bush administration also is moving ahead on advanced technology options that have the potential to substantially reduce, avoid, or sequester future greenhouse gas emissions. About 80% of current greenhouse gas emissions are energy related, and, although projections vary considerably, a tripling of energy demand by 2100 is not unimaginable (*12*). Therefore, to provide the energy necessary for continued economic growth while we reduce greenhouse gas emissions, we may have to develop and deploy cost-effective technologies that alter the way we produce and use energy.

By 2100, more than half of the world's energy may have to come from low- or zero-emission technologies to attain the UNFCCC goal (*13*). The pace and scope of needed change will be driven partially by future trends in greenhouse gas emissions that, like climate sensitivity, are uncertain. The complex relations among population growth; economic development; energy demand, mix, and intensity; resource availability; technology; and other variables make it impossible to accurately predict future greenhouse gas emissions on a 100-year time scale.

The Climate Change Technology Program (CCTP) was created to coordinate and prioritize the federal government's nearly $3 billion annual investment in climate-related technology research, development, demonstration, and deployment (RDD&D). Using various analytical tools, CCTP is assessing different technology options and their potential contributions to

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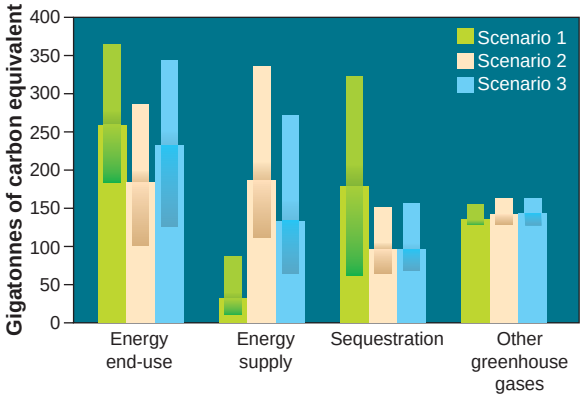
reducing greenhouse gas emissions. Given the tremendous capital investment in existing energy systems, the desired transformation of our global energy system may take decades or more to implement fully. A robust RDD&D effort can make advanced technologies available sooner rather than later and can accelerate modernization of capital stock at lower cost and with greater flexibility.

CCTP's strategic vision has six complementary goals: (i) reducing emissions from energy use and infrastructure; (ii) reducing emissions from energy supply; (iii) capturing and sequestering CO_2; (iv) reducing emissions of other greenhouse gases; (v) measuring and monitoring emissions; and (vi) bolstering the contributions of basic science (*14*).



Potential ranges of greenhouse gas emissions reductions to 2100 by category of activity for three technology scenarios characterized by viable carbon sequestration (scenario 1); dramatically expanded nuclear and renewable energy (scenario 2); and novel and advanced technologies (scenario 3) (*14*).

Ten federal agencies support a portfolio of activities within this framework. Annually, more than $700 million is being spent to advance energy efficiency technologies (plus $500 million for accelerated deployment), and more than $200 million supports renewable energy. Many activities build on existing work, but the Bush administration also has expanded and realigned some activities and launched new initiatives in key technology areas to support the CCTP's goals.

In his 2003 State of the Union address, President Bush made a commitment to the development of a hydrogen economy, pledging $1.7 billion over 5 years for his Hydrogen Fuel Initiative and FreedomCAR Partnership to develop hydrogen fuel cell–powered vehicles. The transition to hydrogen as a major energy carrier over the next few decades could transform the nation's energy system and create opportunities to increase energy security by making better use of diverse domestic energy sources for hydrogen production and to reduce emissions of air pollutants and CO_2 (*15*). Where hydrogen is produced from fossil fuels, we must also address carbon capture and sequestration.

To help coordinate and leverage ongoing work overseas, the United States led the effort to form the International Partnership for the Hydrogen Economy (IPHE). IPHE will address the technological, financial, and institutional barriers to hydrogen and will develop internationally recognized standards to speed market penetration of the new technologies.

The administration also is pursuing next-generation nuclear energy as a zero-emissions energy supply choice. The Generation IV International Forum, with nine other nations as partners, is working on reactor designs that are safe, economical, secure, and able to produce new products, such as hydrogen. Six promising technologies have been selected as candidates for future designs and could be ready as early as 2015. In 2003, President Bush announced that the United States would join the ITER project to develop fusion as an energy source. Although the technical hurdles are substantial, the promise of fusion is simply too great to ignore.

Carbon capture and sequestration is a central element of CCTP's strategy because for the foreseeable future, fossil fuels will continue to be the world's most reliable and lowest-cost form of energy. It is unrealistic to expect countries—particularly developing countries—with large fossil reserves to forgo their use. A realistic approach is to find ways to capture and store the CO_2 produced when these fuels are used.

The Department of Energy is currently working on 65 carbon sequestration projects around the country. In the last 2 years, we have increased the budget for these activities 23% to $49 million. The multilateral Carbon Sequestration Leadership Forum, a presidential initiative inaugurated in June 2003 with 16 partners, will set a framework for international collaboration on sequestration technologies.

The forum's partners are eligible to participate in FutureGen, a 10-year, $1 billion government-industry effort to design, build, and operate the world's first emissions-free coal-fired power plant. This project, which cuts across many CCTP strategic goals, will employ the latest technologies to generate electricity, produce hydrogen, and sequester CO_2 from coal. Through this research, clean coal can remain part of a diverse, secure energy portfolio well into the future.

These initiatives and other technologies in the CCTP portfolio (*16*) could revolutionize energy systems and put us on a path to ensuring access to clean, affordable energy supplies while dramatically reducing greenhouse gas emissions. The figure, left, offers a glimpse of the range of emissions reductions new technologies might make possible in energy end use, energy supply, carbon sequestration, and other greenhouse gases on a 100-year scale and across a range of uncertainties.

The Bush administration has developed a comprehensive strategy on climate change that is informed by science, emphasizes innovation and technological solutions, and promotes international collaboration to support the UNFCCC objective. Although the scientific and technology challenges are considerable, the president remains committed to leading the way on climate change at home and around the world.

References and Notes

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