UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 24 2007

OFFICE OF
AIR AND RADIATION

The Honorable Joseph Lieberman
United States Senate
Washington, D.C. 20510

Dear Senator Lieberman:

At your request, the Environmental Protection Agency (EPA) conducted a technical and economic analysis of the Climate Stewardship and Innovation Act of 2007 (S.280).

EPA analyzed how the U.S. economy would respond to S. 280, focusing on:

- what technologies could be used to reduce greenhouse gas (GHG) emissions;
- how and when U.S. GHG emissions would be reduced;
- how much such reductions would cost the U.S. economy as a whole as well as impacts on incomes, prices of electricity and gasoline; and
- how much those reductions would slow the growth of global GHG concentrations.

In its analysis, EPA used models that are state-of-the-art and well-respected within the climate economics community. EPA's analysis covers all GHGs, all sectors in the economy, both domestically and internationally, and makes projections to 2050. This analysis does not represent an agency position on the legislation.

As part of its analysis, EPA developed a set of scenarios that are useful for the evaluation and comparison of legislative approaches to climate change. This set of scenarios describes a wide range of possibilities but does not include an EPA assessment of which scenarios are more likely to occur. These scenarios begin with a "reference case," which assumes no additional domestic or international climate policies or measures to reduce GHG emissions after 2006, and the S. 280 Senate scenario, under which U.S. GHG emissions are capped, and emissions trading, domestic offsets and international credits are used. Other scenarios cover some of the most important uncertainties in this analysis, including what policies will be adopted by other countries, how much new nuclear power is built, and whether carbon capture and storage technology will be available at a large scale.

Some of the key insights from this analysis include the following:

- Relative to the reference scenario, S. 280 would reduce U.S. GHG emissions by about a quarter in 2030 and by about 44 percent in 2050. Compared to historical emissions, emissions under S. 280 would be approximately 1-3% lower than 2000 levels in 2030, and 1-5% lower than 1990 levels in 2050.

- The electricity sector provides the greatest source of emission reductions largely through an expansion of nuclear power (up to a 150 percent increase) and deployment of carbon capture and storage (CCS). CCS is not currently available at large scales and at the cost used in this analysis. The U.S. government is performing research pilots and working with industry to develop CCS at a commercial scale for the power sector. If this technology is not available then the costs of S. 280 to the economy would increase significantly. The effect would be even greater if nuclear deployment were limited as well.

- Under S. 280 if enabling technologies are widely available, the cost of additional GHG reductions is about $30 per ton of CO_2 equivalent in 2030 and more than $70 per ton of CO_2 equivalent in 2050. In other scenarios that limit the availability of enabling technologies, costs range up to $40 per ton of CO_2 equivalent in 2030, and up to $105 per ton of CO_2 equivalent in 2050.

- In the reference case, GDP is projected to more than double by 2030. Under S.280, if enabling technologies are widely available:
    - reductions in GDP would range between 0.6% ($146 billion) and 1.6% ($419 billion) in 2030, and between 1.1% ($457 billion) and 3.2% ($1,3 trillion) in 2050;
    - the present value of the cumulative reduction in real GDP for the 2012-2030 period ranges from $660 billion to about $ 2.1 trillion (in 2005 dollars and discounted at 5%); the present value of the cumulative reduction in real GDP for the 2012-2050 period ranges from about $1.6 trillion to $5.2 trillion.
    - per household average annual consumption would be approximately $550 lower and gasoline prices would increase approximately $0.26 per gallon in 2030; in 2050, per household average annual consumption would be approximately $1,900 lower and gasoline prices would increase approximately $0.68 per gallon; and
    - electricity prices are projected to increase 22% in 2030 and 25% in 2050.

- The range of impacts on GDP reflects different estimates from the two economy -wide cost models EPA used. When the Energy Information Administration (EIA) releases their analysis of S. 280, they will provide estimates from a third model. Combined, these three models provide a more complete picture of possible impacts than can be provided from any single model. These models use different timeframes (ranging from about 20 years to 40 years) and take different approaches to estimating technological development and macro-economic effects.

- The use of domestic offsets and international credits reduces GHG prices and total U.S. costs. The cost reduction needs to be weighted against the reliability of offset reductions and other approaches to increase incentives for U.S. technology development and deployment. Total payments for offsets and international credits are approximately $25 billion in 2030 and $57 billion in 2050. The present value of the cumulative total payments for offsets and international credits for the 2012-2030 period is $149 billion and $305 billion for 2012-2050.

- Assuming that international credits are purchased only after the supply of domestic offsets at the market clearing price is exhausted, the value of international credits are approximately $12 billion in 2030 and $13 billion in 2050. The present value of the cumulative payments for international credits for the 2012-2030 period is $100 billion and $159 billion for 2012-2050.

- In 2095, the incremental effect of S. 280 on lowering global CO_2 concentration is estimated to be between 23 and 25 parts per million.
    - The reference scenario, which does not include any additional domestic or international climate policies or measures to reduce GHG emissions after 2006, shows that global CO_2 concentrations would increase from 380 parts per million today to 718 parts per million in 2095.

    - If S. 280 becomes law and no one in the international community changes their current policies, then global CO_2 concentrations are estimated to be approximately 695 parts per million in 2095 (or 23 parts per million lower than in the reference case).

    - If S. 280 becomes law and international climate policies described in the Senate scenario of the analysis are carried out then global CO_2 concentrations are estimated to be approximately 481 parts per million, to which the U.S. contributes a 25 parts per million reduction. The Senate scenario assumes that Kyoto countries, with the exception Russia, follow an allowance path that falls gradually from simulated Kyoto levels in 2012 to 50% below 1990 in 2050; and the rest of the world adopts a policy in 2025 that returns them and holds them at 2015 emissions levels through 2034 and returns and maintains them at 2000 emissions levels from 2035 to 2050.

EPA's analysis did not estimate to what degree the higher prices for electricity and other energy that could result from S. 280 would cause manufacturing or other sectors to move overseas. This effect likely would increase global GHG emissions. Although not quantified, this effect would be larger in the scenario with less international action and would be reduced in the scenario with more international action.

My staff is available to you and your staff to answer questions you may have on the accompanying package.

Sincerely,

Robert J. Meyers
Principal Deputy Assistant Administrator