



WORLD
RESOURCES
INSTITUTE

**Greenhouse Gas Emission Reductions under the Lieberman-Warner Bill
As Amended in Subcommittee**

Daniel Lashof

Climate Center Science Director, NRDC

John Larsen, Associate; Robert Heilmayr, Research Assistant
Climate and Energy Program, World Resources Institute

Tuesday, November 13, 2007

The Lieberman-Warner bill will cover all sources that emit more than 10,000 tons of carbon dioxide equivalent per year in the electric power and industrial sectors as well as all transportation fuel providers whose products will produce more than 10,000 tons per year when consumed and, as amended in the Subcommittee, all emissions from natural gas consumption in the United States.

The World Resources Institute (WRI) estimates that the bill, as amended, covers 84% of U.S. emissions in 2004; based on the estimated growth of covered and uncovered sources between 2004 and 2005 we estimate that covered emissions were 6125 MMTCO₂e in 2005.¹ The bill nominally caps emissions from covered sources at 5200 MMTCO₂e in 2012; however this cap must be adjusted for the additional emissions associated with natural gas consumption outside of sectors otherwise covered by the bill. Adding 2005 CO₂ emissions from residential (263 MMTCO₂), commercial (167 MMTCO₂), and transportation (31.8 MMTCO₂), plus methane emissions from natural gas systems (111.1 MMTCO₂e) increases the 2012 cap to 5773 MMTCO₂. This cap is reduced annually (proportionally to the reductions specified in the bill), reaching 15% below the 2012 level in 2020 and 70% below 2012 levels in 2050.

The impact of the bill on total greenhouse gas emissions depends on assumptions made about state action, emissions from non-covered sources, and changes in biological carbon sequestration. The bill includes incentives for states to adopt climate policies that are more stringent than the federal program and to adopt and enforce model building codes; decouple electric and gas utility revenue from sales; and make energy efficiency investments as profitable as increasing energy supplies. The bill also includes energy efficiency standards for residential boilers and provisions requiring regular updates to residential and commercial building codes. The majority of these measures will largely affect emissions in covered sectors, lowering the overall cost of the program, but not achieving additional reductions in uncovered emissions. Finally, the bill sets aside 5% of the total allowance pool to promote increased biological sequestration in domestic farms and forests and an additional 2.5% for similar international efforts.

¹ This amount assumes that all emissions from natural gas systems and the combustion of natural gas are covered by the program.

These provisions will reduce emissions from non-covered sources below business as usual levels but the magnitude of these benefits is difficult to quantify. NRDC and WRI have constructed the following Conservative and Optimistic cases to bound the likely range of total greenhouse gas emission reductions achieved under the bill.

- The Optimistic case assumes that states that enact climate programs more stringent than the federal program retire the bonus allowances allocated to them (2% of the total allowance pool). While the bill makes clear that states have the authority to enforce global warming pollution standards more stringent than federal requirements currently there is no clear mechanism by which these state programs would result in reductions in national emissions other than by retiring their bonus allowances. Further elaboration of the state authority provisions could allow for greater national benefits from state programs. The Pessimistic case assumes that these states programs help achieve the emission caps specified in the bill but do not achieve additional environmental benefits.
- In the Optimistic case non-covered emissions from the residential and commercial sectors and non-covered methane emissions are assumed to decline at the same annual rate as they did from 2000 to 2005 (0.7% and 1.2%, respectively). Emissions of nitrous oxide and other non-covered greenhouse gases are assumed to remain constant at 2005 levels. In addition, the 7.5% allowance set aside for biological sequestration is assumed to generate one ton of benefits for each ton of allowances devoted to this purpose.²
- In the Conservative case emissions from all non-covered sources are assumed to increase at the rate projected by EPA in its analysis of S.280 using the ADAGE model (0.3% per year). This scenario assumes no additional emission reductions from allocations to biological sequestration programs or states.

The assumed breakdown of emissions between covered and non-covered sources is shown in Table 1. Table 2 presents the results of the analysis.

Table 1. 2005 Emissions from Covered and Non-Covered Sources (MMTCO₂e)³

Covered Sources	Non-covered Residential and Commercial CO₂	Non-covered Methane	Non-covered Nitrous Oxide (less industrial)	Other non-covered sources	Total
6125	226	423	447	34	7260

² The bill as amended does not explicitly ensure that activities qualifying for biological sequestration allocations be additional to what is already being undertaken. This analysis includes two treatments of this program. The Optimistic case assumes that, although some “anyway” tons are likely, the price differential between the incentives for biological sequestration and the price of allowances sold compensates for these anyway tons. In the Conservative case, it is assumed that, as a result the lack of environmental certainty, no additional net reductions take place. It should be noted that the distribution of the 2.5 percent of allowances for international biological sequestration is subject to more stringent environmental safeguards than the 5 percent distributed to domestic projects. A middle case could be constructed by assuming that on average one-half ton of additional sequestration is generated per ton allocated. Under this scenario an additional 185 MMTCO₂ of annual net reductions would be expected in 2020, and 65 MMTCO₂ would be expected in 2050, compared to the Conservative case.

³ U.S. EPA, 2007. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005. EPA-430-R-07-002

Table 2. Emission Reductions under the Lieberman-Warner Bill

Year	Emissions of Covered Sources	Estimated Total Emissions Optimistic Case (MMTCO₂e)	Estimated Total Emissions Conservative Case (MMTCO₂e)	Reductions in Emissions from Covered Sources (2005 Baseline)	Estimated Range of Reductions in Total Greenhouse Gas Emissions (2005 Baseline)
2012	5,773	6,359	6,932	6%	5-12%
2020	4,920	5,538	6,107	20%	16-24%
2030	3,854	4,517	5,078	37%	30-38%
2040	2,789	3,501	4,049	54%	44-52%
2050	1,732	2,499	3,031	72%	58-66%