



NATURAL RESOURCES DEFENSE COUNCIL

## **Contribution of the Energy Bill (H.R. 6) to Meeting the Global Warming Pollution Reductions Targets of S. 2191**

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In December of 2007, Congress signaled a directional shift by advancing two landmark bills. These proposals will help us tackle the climate challenge by adopting new ground rules which spur clean-technology innovation throughout the economy. The first bill, the Energy Independence and Security Act of 2007 (H.R. 6), is a broad set of policies that would promote energy efficiency and clean energy. Its provisions would improve vehicle fuel economy, expand biofuels and increase the efficiency of appliance and equipment products. The second bill, the America's Climate Security Act of 2007 (S. 2191), establishes an economy wide cap and trade program and other measures to stabilize and then reduce global warming pollution. As reported out of committee, S. 2191 would reduce emissions to 62-66 percent below 2005 levels by 2050.

These measures are related. S. 2191's success substantially depends on technological innovation. H.R. 6 provides a roadmap to stimulate that innovation, particularly in three sectors: advanced vehicles, appliance and equipment products, and low carbon fuels. Even though H.R. 6 by itself is insufficient to avert dangerous global warming, it will assist in achieving a portion of the emissions reductions called for in S. 2191. To understand the potential size of this down payment, we compare the cumulative emissions reductions through 2030 under H.R. 6 to the cumulative reductions mandated through 2030 under S. 2191. It is important to understand that total reductions required to protect the climate are much larger than what would be achieved by 2030 under either the energy bill or S.2191.

To estimate the emission benefits of the various H.R. 6 provisions, we rely upon our own estimates as well as those from analysts at the Union of Concerned Scientists and the American Council for an Energy Efficient Economy. This comparison is not comprehensive in that it only evaluates key, large-bore H.R. 6 provisions. While the Senate version of H.R. 6 will be signed into law, we also analyze key provisions for renewable electricity and tax incentives that were passed in the House but not included in the Senate version. We include these measures to illustrate the importance of the dropped provisions.

## Total Reductions

Analysis by the World resources Institute (WRI) indicates that S. 2191 would achieve 48 to 59 billion metric tonnes of cumulative GHG equivalent reduction by 2030.<sup>1</sup> Analysis of the provisions in the enacted version of the energy bill indicates a cumulative GHG equivalent reduction of 7.5-9 billion metric tonnes by 2030, or about 13-19% of the reductions achieved by S. 2191 in that timeframe.

Unfortunately, the enacted version of H.R. 6 achieves fewer cumulative emission reductions than the House version of the bill because the enacted version removed the House renewable energy mandates and tax incentives. Without the renewable electricity standard (RES) and tax title, the cumulative savings are reduced by almost 2 billion metric tonnes of GHG compared to the House-passed bill. These findings underscore the importance of the additional policies to promote renewable electricity and energy efficiency that were in the House version of H.R. 6 but stricken from the enacted bill. The chart below provides possible outcomes under H.R. 6. Ranges in the cumulative column reflect optimistic and pessimistic assumptions on program implementation. The high end represents aggressive implementation of incentive and voluntary programs. The low end represents poor implementation. These findings highlight the importance of aggressive follow through by federal agencies.

<b>GHG Reductions under H.R. 6</b>				
Title	Policy	H.R. 6 Annual Reductions in 2030 (MMT GHG)	H.R. 6 2010-2030 Cumulative Reduction (MMT GHG)	Percent of S. 2191 2010-2030 Cumulative Reductions in 2030
Title I	CAFE	375	3,660	6.1 – 7.7%
Title I	Medium and Heavy Duty Vehicles	86	479	0.8 - 1%
Title II	RFS	103	1,437	2.4 - 3%
Title III	Appliances and Lighting	140	1,772	3 - 3.7%
Titles IV	Buildings and Industry Program	14 - 107	177 - 1,645	0.3 – 3.5%
Total H.R. 6		718 - 811	7,525 – 8,992	12.6 – 18.9%

<sup>1</sup> Based on World Resources Institute analysis which compares business as usual emissions with annual emissions under major climate legislation in the 110<sup>th</sup> Congress.

## **Title I. Corporate Average Fuel Economy (CAFE) and Medium and Heavy Duty Vehicles**

Title I updates the Corporate Average Fuel Economy standards for the first time since 1975. Under the provision, the combined fuel economy for all cars and light trucks sold in the United States would reach 35 miles per gallon by 2020. The additional fuel economy credit for flex fuel vehicles is extended but is gradually phased out starting in 2014 and eventually eliminated by 2020.

GHG reductions were calculated by comparing the fuel use and emissions from the fleet of on-road vehicles with and without the increased CAFE policy. In both cases we applied a stock turnover model that simulates introduction of new vehicles and retirement of older vehicles. The reference case assumes new vehicle fuel economy increases as projected by Department of Energy's Annual Energy Outlook 2007. The Energy Bill CAFE case gradually increases new vehicle fuel economy from 2011 to 2020 to achieve a fleetwide average for new vehicles of 35 mpg in 2020. Annual fuel consumption was determined by dividing the on-road fleet fuel economy in each case into the fleet mileage. GHG emission reductions are determined by applying a full fuel cycle reduction per gallon of gasoline equivalent avoided (25.4 lbs GHG/gallon of gasoline equivalent)

We estimate that the new standards will achieve a cumulative GHG savings of 3.7 billion metric tonnes by 2030. These assumptions are conservative in the sense that they are based on EIA's assumption that fuel economy would improve somewhat absent the new law. Assuming stagnant fuel economy produces higher savings. Under that assumption, CAFE would avoid 4.2 billion metric tonnes of GHG.

Additionally we examined improvements to medium and heavy duty vehicles. Emissions reductions from the medium- and heavy-duty stock were calculated by comparing fuel use and emissions with and without a fuel economy standard required by the Energy Bill. Again, we applied a stock turnover model. The baseline case assumes the medium and heavy truck fuel economy projected by AEO 2007. The Energy Bill does not specify a specific fuel economy level for trucks, but directs federal agencies to set the "maximum feasible" and "cost-effective" levels. Analysis by the American Council for an Energy Efficient Economy (ACEEE) found that cost-effective technologies exist to achieve new vehicle fuel economy improvements from today's levels of 50 percent for medium-duty trucks and 39 percent for long-haul heavy duty trucks.<sup>2</sup> We assume that technologies required to reach these cost-effective levels are introduced into the fleet of new vehicles over fifteen years. Our modeling finds that improvements to the heavy and medium duty fleet would save 480 million metric tonnes of cumulative GHG.

## **Title II. Renewable Fuel Standard**

HR 6's renewable fuel standard (RFS) substantially increases the volume of renewable fuels used for transportation. Under the provision, the requirement for renewable fuels,

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<sup>2</sup> Elliot, Langer and Nadel, "Reducing Oil Use through Energy Efficiency: Opportunities Beyond Cars and Trucks," ACEEE Report EO61, January 2006.

such as ethanol and biogasoline, will grow from 9 billion gallons in 2008 to 36 billion gallons in 2022. By 2022, 21 billion gallons must be “advanced” biofuels<sup>3</sup> of which 16 billion gallons must be cellulosic biofuels. The new RFS will require conventional, advanced, and cellulosic fuels to provide a respective 20 percent, 50 percent, and 60 percent greenhouse gas lifecycle savings benefit over gasoline on energy basis. These standards, along with other restrictions, will help ensure that market expansion does not come at the expense of environmental performance.

Because the current RFS (adopted in 2005) requires 7.5 billion gallons by 2012, in calculating the reductions achieved by H.R. 6, we estimate the additional reductions from increasing the RFS from 7.5 billion gallons to 36 billion gallons. We further conservatively assume that renewable fuels produced meet the bare minimum greenhouse gas (GHG) performance standards required by this law. As with our CAFE calculations, we assume gasoline full fuel cycle emission to be 25.4 pounds per gallon, and estimated the emission reductions for conventional, advanced, and cellulosic based on their minimum required improvements described above. Based on our methodology, we estimate that the new RFS would cumulatively save 1.4 billion metric tonnes of emissions by 2030.

### **Title III. Efficient Appliances and Lighting**

Title III of HR 6 contains a number of provisions related to energy efficiency standards for appliance and equipment products. ACEEE analysis estimates that these provisions will reduce emissions by nearly 1.8 billion metric tonnes by 2030.<sup>4</sup> The largest GHG reductions come from new energy efficiency standards for typical light bulbs, which would decrease emissions by about 0.735 billion metric tones by 2030 according to ACEEE. The standards would require bulbs to use 25-30 percent less power by 2012-14 and 60 percent less by 2020. Other key provisions of Title III include: 1) new authority for Department of Energy (DOE) to establish regional efficiency standards for heating and cooling equipment; 2) requirements that DOE develop revised efficiency standards for refrigerators, dehumidifiers, clothes washers, dish washers, external power supplies, battery chargers, walk-in coolers, walk-in freezers, freezers, metal halide fixtures, and general service lamps; 3) direction to DOE to make a determination every 6 years whether a standard should be revised, and 2 years to develop a revised standard if it determines a standard should be revised; 4) a requirement that the Federal Trade Commission develop new energy consumption labeling programs for consumer electronic devices.

### **Title IV. Efficient Buildings and Industry**

Buildings are responsible for nearly 40 percent of the United States’ carbon emissions and a comparable share of energy demand.<sup>5</sup> Title IV aims to significantly reduce building

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<sup>3</sup> H.R. 6 defines advanced biofuel as renewable fuels refined from biomass other than corn starch and having life cycle greenhouse gas emissions at least 50% below gasoline.

<sup>4</sup> American Council for an Energy Efficient Economy. “Preliminary estimates of energy and carbon savings from energy bill passed in House.” Last accessed 12/11/2007 at <http://www.aceee.org/energy/national/House-SenateSvgs12-6.pdf>

<sup>5</sup> EERE. 2007 Buildings Energy Databook. DOE. 2007.

energy use across the residential, commercial, public, and institutional segments. Notable provisions would increase low income weatherization funding and initiate research, development, and deployment activities for zero energy commercial buildings. Additionally, Title IV would mandate a significant reduction in federal building energy intensity by 2015.

Title IV also promotes industrial efficiency. Section 452, for instance, establishes public-private partnerships to design and demonstrate efficient processes and technologies. Activities include industrial feedstock recovery and feedstock diversification. Additionally, the program would help the industrial energy users adopt renewable resources for their heat and power requirements.

Building and industrial programs under H.R. 6 could provide significant carbon savings. Through 2030, ACEEE estimates that Title IV implementation will reduce cumulative emissions by 1.6 billion metric tonnes of GHG.<sup>6</sup> These results depend on future appropriations and rigorous exercise of discretion, since many of the provisions do not contain enforceable performance standards. Accordingly, NRDC's analysis presents a range of reductions for these provisions: 177 million to 1.6 billion tonnes of CO<sub>2</sub>.

#### **Title XIV. Renewable Electricity Standard (not enacted)**

Section 1401 of the House version established a renewable electricity standard (RES). The RES would have required electrical utilities to satisfy 15 percent of their retail sales with renewable power by 2020. Roughly 27 percent of each covered facility's annual requirement could have been met through energy efficiency. Electricity generation is a key emissions source, accounting for nearly 40 percent of the United States' GHG emissions.<sup>7</sup> To that extent, the 15 percent RES would have leveraged considerable reductions. Analysis and personal communications with the Union of Concerned Scientists indicates cumulative GHG savings of 931 million metric tonnes between 2010 and 2030.<sup>8</sup> Unfortunately, the RES was eliminated from the Senate bill.

#### **Title XV. Tax Measures (not enacted)**

Tax incentives are a key distinction between House and Senate energy bills. Favorable tax treatment for efficiency and renewables in the House was eliminated in the Senate. If included, these provisions would have helped the energy legislation become more effective in managing climate change. For example, ACEEE estimates that tax incentives for efficient commercial buildings, efficient appliances, CHP units, plug-in hybrids, home retrofits, and efficient heating, ventilation, and air conditioning systems could curb emissions by 954 million metric tonnes by 2030.

Below, we provide estimated benefits of provisions that were removed from the final bill. We further assess what the energy bill's impact would have been if these provisions had

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<sup>6</sup> American Council for an Energy Efficient Economy. "Preliminary estimates of energy and carbon savings from energy bill passed in House." Last accessed 12/11/2007 at <http://www.aceee.org/energy/national/House-SenateSvgs12-6.pdf>

<sup>7</sup> Energy Information Administration. Annual Energy Review 2006. DOE. 2007.

<sup>8</sup> Personal communications with the Union of Concerned Scientists. December 11, 2007.

been included. Under those assumptions, GHG reductions would have reached 16-23% of S. 2191's 2030 requirements.

<b>Benefits of Renewable Electricity and Tax Incentives</b>			
Title	Policy	HR 6 Cumulative Reduction 2010-2030 (MMT GHG)	Percent of S. 2191 Cumulative Reductions in 2030
Title XVI	House RES	931	1.6- 2%
Title XV	House Tax Measures	954	1.6 - 2%
Total Value of RES and Tax Measures		1,885	3.2 – 4%
Total Value of H.R. 6 with RES and Tax included		9,410 - 10,877	15.8 – 22.9%