



Memorandum

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TO: The Honorable Ken Salazar
Attention: Steve Black

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SUBJECT: Legislative History of Lifecycle Greenhouse Gas Definition in the Energy Independence and Security Act of 2007

As you requested, this memorandum provides legislative history of the definition of “lifecycle greenhouse gas emissions” contained in the Energy Independence and Security Act of 2007 (EISA, P.L. 110-140). CRS found only limited legislative history of this language in terms of Member statements on the floor of the House or Senate or in committee proceedings. However, we believe that we have tracked the source of the legislative language to bills to establish a low-carbon fuel standard similar to that in the state of California. If you have questions, or would like to discuss this further, please contact Brent at x7-9662.

The Energy Policy Act of 2005 (EPAAct, P.L. 109-58) established a renewable fuel standard (RFS) that requires the use of ethanol and other renewable fuels in motor fuel. EISA significantly expanded this mandate in terms of the total volume of renewable fuel required. Further, EISA added a specific carve-out for “advanced biofuels” — fuels produced from feedstocks other than corn starch. Advanced biofuels must also have 50% lower lifecycle greenhouse gas (GHG) emissions than conventional fuels. Similarly, within the advanced biofuel mandate, there is an additional carve-out for cellulosic biofuels. Cellulosic biofuels must be produced from cellulosic (generally woody or fibrous material) feedstocks and have 60% lower lifecycle GHG emissions. Conventional biofuels produced at newly-established facilities must have at least a 20% reduction in lifecycle GHG emissions.

The lifecycle emissions from a biofuel include all emissions resulting from the growth and harvesting of the feedstock, the transport of that feedstock, conversion into fuel, distribution of the finished fuel, and combustion in the vehicle. In many cases, the emissions

resulting from the production of the feedstock may be the most difficult to quantify. For corn ethanol, these emissions include preparation of the soil for planting, production and use of chemical fertilizers, and the operation of farm machinery to till the soil and harvest the crop. Further, the expansion of land used for biofuel production may lead to indirect land use changes. For example, increased corn production in the Midwest could displace soybean production. If, in response, soybean production expands into areas that were forest or grassland, the preparation of that soil for agricultural production could also lead to a release of greenhouse gases. Total emissions are a result of a myriad of variables, and different methodologies for assessing these emissions can lead to widely varying results.

Section 201 of EISA (42 U.S.C. 211(o)(1)(H)) defines lifecycle greenhouse gas emissions:

(H) LIFECYCLE GREENHOUSE GAS EMISSIONS.—The term ‘lifecycle greenhouse gas emissions’ means the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.

EISA directs the Environmental Protection Agency (EPA) to develop the methodology to assess different fuels’ lifecycle emissions. However, a key question raised by various stakeholders is just how EPA will interpret the above language, especially the inclusion of “direct and significant indirect emissions.”

Several bills were introduced in the 109th and 110th Congresses to expand EPA’s RFS mandate. However, none of these bills contained the language on lifecycle GHG emissions. However, in March 2007, Senator Feinstein introduced S. 1073, which was an attempt to establish a low-carbon fuel standard (LCFS) similar to that proposed for California. A LCFS would require that all motor fuels or transportation fuels reduced lifecycle GHG emissions relative to a baseline year. Unlike an RFS, a LCFS does not specifically require the use of renewable fuels. The specifics of the LCFS vary among proposals. S. 1073 mentions lifecycle analysis, but does not include the language on “direct and indirect” emissions:

(2) LIFECYCLE GREENHOUSE GAS EMISSIONS- The term ‘lifecycle greenhouse gas emissions’ means the aggregate quantity of greenhouse gases emitted per unit of fuel from production to use (including feedstock production or extraction and distribution).

When she introduced the bill, Senator Feinstein stated that “we must start considering fuel emissions not only in terms of emissions produced at the tailpipe, but also in terms of the emissions generated by the production and transportation of fuels.” (*Congressional Record*, p. S4210). While Senator Feinstein discusses emissions “from production to end-use,” she does not discuss land use or indirect emissions in her introductory remarks.

In May 2007, Senator Boxer introduced a different version of the LCFS (S. 1297) that included direct and indirect emissions, but did not mention land use change:

(J) LIFECYCLE GREENHOUSE GAS EMISSIONS- The term ‘lifecycle greenhouse gas emissions’ means, with respect to a transportation fuel, the aggregate quantity of greenhouse gases emitted, directly or indirectly, during production, feedstock production

or extraction, distribution, marketing, and use of the transportation fuel, or waste disposal relating to the transportation fuel, as determined by the Administrator under paragraph (11)(B).

However, S. 1297 would have required the National Academy of Sciences to study the effects of renewable fuel use on greenhouse gas emissions, including the effects of land use change.

In June 2007 Representative Inslee introduced a larger bill, with a similar LCFS provision (H.R. 2809). This appears to be the first time that language substantially similar to the final EISA language appears:

“(4) LIFECYCLE GREENHOUSE GAS EMISSIONS- The term ‘lifecycle greenhouse gas emissions’ means greenhouse gases emitted during the entire cycle of extraction, cultivation, production, manufacturing, feedstock extraction, marketing, and distribution for a fuel or other sources of energy, as well as those emitted during the use of such fuels and sources by vehicles and aircraft. The term includes changes in land use and land cover associated with each phase of such cycle.

These above bills would establish a low-carbon fuel standard, as opposed to amending the RFS. H.R. 6, as it passed the Senate (June 2007), would have expanded the RFS but did not contain the language on lifecycle analysis. A proposed amendment to H.R. 6 by Senator Bingaman included the study from S. 1297; however, while the amendment was agreed to, the section on the lifecycle emissions study was not (S.A. 1693, Sec. 162). The amendment also contained a grant program for fuels with a 50% lifecycle GHG reduction. In comments on that provision, Senator Boxer stated:

The amendment to me is also exciting because it includes a grant program for biofuels that achieve at least a 50-percent reduction of lifecycle emissions of greenhouse gases. So what we are saying is, we want innovation, and we are saying we will start a grant program so we get that technology that we all know is going to, in fact, step up and meet the challenge of global warming. (*Congressional Record*, p. S8032)

However, this statement provides no specifics on how federal agencies (in this case the Department of Energy) should interpret the definition of “lifecycle greenhouse gas emissions.”

H.R. 2337, introduced in June 2007 by Representative Lampson, as reported by the House Committee on Science and Technology contained a similar study to that in S. 1297. Ultimately, language from H.R. 2337 was incorporated into H.R. 3221, a parallel bill to H.R. 6. H.R. 3221 passed the House in August 2007, with the language on the lifecycle study. In the “Committee Views” section of the House Science Committee report (H.Rept. 110-302), the Committee stated that:

The Committee also believes we need a better understanding of the emissions and energy balance associated with the full life-cycle of biofuels from feedstock production to final use. If we are to reduce carbon emissions associated with fuel use, we need to understand the emissions associated with biofuels as well as others. Because biofuels are produced from feedstocks that first absorb carbon from the atmosphere, it may be possible to produce, process, and utilize biofuels in a manner that substantially reduces our current level of greenhouse gas emissions. Better life-cycle models that track emissions throughout the production, processing and fuel use cycle can help in the design of systems to minimize carbon emissions. The Committee intends that DOE support

improvements to the current modeling capabilities in this area as well as supporting research to develop new modeling and analytical techniques.

Ultimately, the House version of H.R. 6, which passed the House in December 2007, contained the final language in EISA, expanding the RFS and requiring lower lifecycle GHG emissions. However, CRS was unable to find significant statements by Members or Committees to determine what Members' views were on this provision, other than the language contained in the final law.