



# Agriculture and Forestry Provisions in Climate Change Bills in the 110<sup>th</sup> Congress

**Renée Johnson**  
Specialist in Agricultural Policy

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## Summary

This report describes some of the agriculture and forestry provisions that were included in climate change legislation during the 110<sup>th</sup> Congress, using as an example provisions included in the Lieberman-Warner Climate Security Act of 2008 (S. 3036, formerly S. 2191). The bill would have directed the U.S. Environmental Protection Agency to establish a program to decrease greenhouse gas (GHG) emissions. The bill's cap-and-trade framework would have established a tradeable allowance system including a combination of auctions and free allocation of tradeable allowances. As part of this overall framework, S. 3036 included three design mechanisms that could provide financial incentives to encourage land-based agricultural and forestry activities, including provisions on carbon offsets, set-aside allowances, and auction proceeds. In addition, S. 3036 would also have provided allowances for international forestry activities. These or similar types of provisions are likely to be considered during the 111<sup>th</sup> Congress as part of the ongoing climate change debate.

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In the 110<sup>th</sup> Congress, several proposals were introduced that would either mandate or authorize a cap-and-trade program to reduce greenhouse gas (GHG) emissions. A cap-and-trade program provides a market-based policy tool for reducing emissions by setting a cap, or maximum emissions limit, for certain industries. Sources covered by the cap can choose to reduce their own emissions, or can choose to buy emission credits that are generated from reductions made by other sources. This type of market-based approach to GHG reductions and trading would be similar to the acid rain reduction program established by the 1990 Clean Air Act Amendments.<sup>1</sup>

Among the cap-and-trade proposals introduced to date, none includes the agriculture sector as a covered industry subject to emission reductions under the cap.<sup>2</sup> In part, this may reflect the general consensus, as stated by the House Energy and Commerce Committee, that GHG “emissions from the agriculture sector generally do not lend themselves to regulation under a cap-and-trade program,” given the “large number of sources with small individual emissions that would be impractical to measure.”<sup>3</sup>

However, several of the cap-and-trade proposals do incorporate the agriculture and forestry sectors either as a source of carbon offsets<sup>4</sup> or as a recipient of set-aside allowances.<sup>5</sup> Some bills in the 110<sup>th</sup> Congress also specified that the proceeds from auctioned allowances be used to promote certain objectives, which could further encourage farmland conservation and bio-energy technologies and practices, among other activities.

Inclusion of such provisions in the broader cap-and-trade proposals could benefit the U.S. agriculture and forestry sectors. For example, the offset and allowance provisions would allow farmers and landowners to participate in the emerging market by granting them use of allowances and credits for sequestration and/or emission reduction activities. These allowances and credits could be sold to regulated facilities (e.g., power plants) covered by a cap-and-trade program to meet their emission reduction obligations. The proceeds from the sale of these allowances and credits, as well as proceeds from auctions that fund technology deployment, are intended to further promote and support activities in the agriculture or forestry sectors that aim to reduce, avoid, or sequester emissions.

In the Senate, for example, a bill was ordered reported by the Senate Committee on Environment and Public Works (EPW) in December 2007, the Lieberman-Warner Climate Security Act of 2008 (S. 3036, formerly S. 2191),<sup>6</sup> containing several agriculture-based provisions. A summary of these provisions is provided below. Overall, S. 3036 directed the Administrator of the U.S.

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<sup>1</sup> For more information about the GHG legislative proposals and the carbon offset provisions in these bills, see CRS Report RL33846, *Greenhouse Gas Reduction: Cap-and-Trade Bills in the 110<sup>th</sup> Congress*, by Larry Parker, Brent D. Yacobucci, and Jonathan L. Ramseur, and CRS Report RL34067, *Climate Change Legislation in the 110<sup>th</sup> Congress*.

<sup>2</sup> Some GHG bills give authority to the U.S. Environmental Protection Agency to determine covered entities, which could potentially expand the types and number of entities covered.

<sup>3</sup> Committee on Energy and Commerce, “Climate Change Legislation Design White Paper: Scope of a Cap-and-Trade Program,” prepared by committee staff, October 2007, available at [http://energycommerce.house.gov/Climate\\_Change/White\\_Paper.100307.pdf](http://energycommerce.house.gov/Climate_Change/White_Paper.100307.pdf).

<sup>4</sup> 110<sup>th</sup> Congress climate change bills that provided for agriculture and/or forestry offsets included S. 2191 (Lieberman/Warner), S. 280 (McCain/Lieberman), S. 317 (Feinstein), S. 1168 (Alexander/Lieberman), S. 1177 (Carper), S. 1766 (Bingaman/Specter), and H.R. 620 (Olver).

<sup>5</sup> Primarily S. 3036 and S. 1766 (Bingaman/Specter).

<sup>6</sup> S. 2191 was reported by Senator Boxer with an amendment as a substitute bill (S. 3036).

Environmental Protection Agency to establish a program to decrease GHG emissions under a cap-and-trade framework.<sup>7</sup> These or similar types of provisions are likely to be considered during the 111<sup>th</sup> Congress as part of the ongoing climate change debate.

## **Agriculture and Forestry Provisions**

The cap-and-trade framework outlined in S. 3036 would have established a tradeable allowance system including a combination of auctions and free allocation of tradeable allowances. As part of this overall framework, S. 3036 included three design mechanisms that could provide financial incentives to encourage land-based agricultural and forestry activities: carbon offsets, set-aside allowances, and auction proceeds. S. 3036 also would have provided allowances for international forestry activities.

In this context, a carbon offset refers to a measurable avoidance, reduction, or sequestration of carbon dioxide (CO<sub>2</sub>) or other GHG emissions, expressed in carbon-equivalent terms. A set-aside allowance refers to a set percentage of available allowances under the emissions cap that is allocated to non-regulated entities, in this case domestic agriculture and forestry entities. For auction proceeds, this refers to the set percentage allocated to carry out the cellulosic biomass ethanol technology deployment program.<sup>8</sup>

### **Offsets**

Title II, Subtitle D (“Offsets”), of S. 3036 provided for agriculture and forestry offset projects. The agriculture and forestry provisions in this subtitle covered farmer outreach (Sec. 2401), establishment of a domestic offset program (Sec. 2402), eligible offset project types (Sec. 2403), project initiation and approval (Sec. 2404), offset verification and issuance of allowances (Sec. 2405), tracking of reversals for sequestration projects (Sec. 2406), examination and auditing of offset allowances (Sec. 2407), timing and the provision of offset allowances (Sec. 2408), offset registry (Sec. 2409), certain environmental considerations (Sec. 2410), program review (Sec. 2411), and retail carbon offset requirements (Sec. 2412).

The text box on page 3 shows the types of eligible agriculture and forestry offset projects listed in Section 2403 of S. 3036, which included these listed practices or combinations of agricultural conservation practices.

In general, these types of conservation and farmland management practices are among existing agricultural and forestry programs that are administered at both the federal and state levels. Many of these practices are provided for as part of existing conservation, forestry, energy, and rural development programs under the U.S. farm policy programs, including the most recent omnibus farm bill (P.L. 110-246, Food, Conservation, and Energy Act of 2008). These include conservation programs provided for in Title II of the farm bill, such as the Conservation Reserve Program, the Grasslands Reserve Program, the Environmental Quality Incentives Program, and

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<sup>7</sup> This analysis is based on legislative text in S. 3036 as of May 20, 2008, and does not include changes from possible amendments that may have been considered by the Senate.

<sup>8</sup> In carbon market trading, an offset is a certificate representing the reduction of the equivalence of one metric ton of carbon dioxide emissions, the principal greenhouse gas. Offsets generally fall within the categories of biological sequestration, renewable energy, energy efficiency, and non-CO<sub>2</sub> greenhouse gas emissions reductions.

the Conservation Stewardship Program, among others. These programs provide technical assistance and either cost-sharing or easement payments that, in addition to accomplishing other environmental objectives, generally encourage land retirement or the types of agricultural practices that can reduce GHG emissions and/or sequester carbon. Other farm bill programs in the Energy (Title IX) and Rural Development (Title VI) titles authorize loans, loan guarantees, and grants for energy efficiency and renewable energy systems, including anaerobic digesters.<sup>9</sup>

**Eligible Agricultural and Forestry Offset Projects  
(S. 3036, Sec. 2403)**

***Agricultural/Rangeland Sequestration and Management Practices***

- altered tillage practices
- winter cover cropping, continuous cropping, and other ways to increase biomass returned (other than planting followed by fallowing)
- conversion of cropland, rangeland, or grassland (with conditions)
- reduction of nitrogen fertilizer use or increase in nitrogen efficiency
- reduction in the frequency and duration of flooding of rice paddies
- reduction in carbon emissions from organic soils

***Land Use Change and Forestry Activities (changes in carbon stocks)***

- limited to afforestation or reforestation of acreage (not currently forested)
- forest management resulting in an increase in forest stand volume

***Manure Management and Disposal***

- waste aeration
- methane capture and combustion

***Other Terrestrial Offset Practices Identified by USDA***

- capture or reduction of non-covered fugitive emissions
- methane capture and combustion at nonagricultural facilities
- other actions that result in GHG emissions avoidance or reduction

However, this list is fairly comprehensive and includes a wide possible range of agricultural and forestry activities. This generally differs from what is actually happening within some of the active or emerging climate change initiatives throughout the United States, such as the Regional Greenhouse Gas Initiative, the Western Climate Initiative, and California's climate change statute. These programs have tended to limit the types of agricultural and forestry activities that are allowed under their programs, and tend to focus mostly on a more limited range of activities, such as afforestation/reforestation and manure management.

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<sup>9</sup> For information on the types of agricultural and forestry activities that either reduce emissions and/or sequester carbon, and on USDA programs intended to support farmland conservation activities, see CRS Report RL33898, *Climate Change: The Role of the U.S. Agriculture Sector*, and CRS Report RL31432, *Carbon Sequestration in Forests*.

## **Set-Aside Allowances: Domestic Agriculture and Forestry**

Title III, Subtitle G, of S. 3036 would have directly allocated 5% of the overall emissions allowances to domestic agriculture and forestry entities (Sec. 3701). Such a proposal could provide a sizeable benefit to U.S. producers. Overall, the proposal started off with 5.8 billion emissions allowances for CY2012, phasing down to 1.7 billion emissions allowances for CY2050 (Sec. 1201). A 5% set-aside for domestic agriculture and forestry entities could give these sectors a significant part of this emerging market. This could provide the domestic agriculture and forestry sectors with between 290 million and 240 million emissions allowances for qualifying entities during the first 10 years (2012-2022); allowance prices could range from about \$20 to \$60 each during this same time period.<sup>10</sup>

The agriculture and forestry provisions in this subtitle covered allocation (Sec. 3701), research (Sec. 3702), and distribution (Sec. 3703). The subtitle did not specify the types of practices that would be applicable. The bill stated that emissions reduction and increases in carbon sequestration in the agriculture and forestry sectors should result in real, verifiable, additional, permanent, and enforceable reductions in greenhouse gas emissions from the agriculture and forestry sectors (Sec. 3701), but did not elaborate on the types of requirements necessary to achieve this. However, the bill required the U.S. Department of Agriculture (USDA) to submit a report to Congress on the status of research on agricultural and forestry greenhouse gas management; USDA also would be required to establish a standardized system of carbon measurement and certification for the agricultural and forestry sectors (Sec. 3702). Such requirements indirectly relate to a new USDA conservation provision that was included in the 2008 farm bill. This provision would facilitate the market development of environmental services from the agriculture and forestry sectors, including carbon storage and tradeable credits, by addressing measurement, quantification, verification, and enforcement, among other related issues.

For more information on this farm bill provision, see CRS Report RL34042, *Environmental Services Markets in the 2008 Farm Bill*. For information on the types of issues associated with measuring and monitoring carbon in the agriculture and forestry sectors, see CRS Report RS22964, *Measuring and Monitoring Carbon in the Agricultural and Forestry Sectors*.

## **Set-Aside Allowances: International Forest Protection**

Title III, Subtitle F, of S. 3036 would have directly allocated 2.5% of the overall emissions allowances to activities that reduce greenhouse gas emissions from deforestation and forest degradation in countries other than the United States (Sec. 3801). A 2.5% set-aside for international forestry activities could give these sectors up to 140 million emissions allowances for qualifying entities during the first few years of the program. Eligible activities included those that increase carbon sequestration through restoration of forests, and degraded lands that have not been forested prior to restoration, afforestation, and improved forest management, given certain specified requirements. For additional background on international deforestation issues and on

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<sup>10</sup> Based on estimated “Number of Emission Allowances,” ranging from 5.775 billion (2013) to 1.732 billion (2050) (see S. 3036, Sec. 1201, Emission Allowance Account). Estimated emission allowance prices are expressed in terms of \$/mtCO<sub>2</sub>-equivalent.

international forestry provisions in other GHG bills, see CRS Report RL34634, *Climate Change and International Deforestation: Legislative Analysis*.

## Auction Proceeds

Title IV, Subtitle D (“Energy Technology Deployment”), of S. 3036 specified that 6% of auction proceeds be used to carry out a variety of projects to promote cellulosic biomass ethanol technology deployment (Sec. 4401, Sec. 4404). This provision called for the use of producer incentives, such as loan guarantees and production payments, to promote the construction of production facilities and supporting infrastructure for cellulosic biomass. This could benefit U.S. agriculture and forestry producers that produce transportation fuels from cellulosic biomass using different feedstocks. The subtitle did not specify the types of practices that would be applicable.

## Considerations for Congress

Many see the involvement of the agriculture and forestry sectors in a climate change mitigation strategy as an opportunity to further encourage farmers and landowners to make environmental improvements on their land and to transition to more sustainable production practices. Nevertheless, inclusion of the agriculture and forestry sectors in a cap-and-trade program has remained controversial since the Kyoto Protocol negotiations.<sup>11</sup> During those negotiations, there was marked disagreement among countries and interest groups, arguing either for or against the inclusion of offsets from the agriculture and forestry sectors.<sup>12</sup>

### **Agricultural/Forestry Offsets and Allowances: Areas of Concern**

- **“Measurement”/Accounting**—measurement is difficult and estimates can vary; actual uptake depends on site-specific factors (e.g., location, climate, soil type, crop/vegetation, tillage practices, farm management, etc.); and effectiveness depends on the type of practice, how well implemented, and length of time practice is undertaken.
- **Validation/Verification**—reduction/storage activity must be real and measurable.
- **Monitoring/Enforcement**—reduction/storage activity must be monitored and enforced by authorities or through contracts.
- **“Additionality”/“Double counting”**—some activities generating offsets would have occurred anyway under a pre-existing program or practice, and may not go “beyond business as usual” (BAU); and reductions may be double-counted or attributable to other environmental goal/ programs.
- **“Permanence”/Duration**—land uses can change over time (e.g., forest lands to urban development, natural events such as fires or pests); and benefits may accrue over time; some contracts shorter-term.
- **“Leakage”**—reductions one place may cause additional emissions elsewhere.

<sup>11</sup> See, for example, E. Boyd, E. Corbera, B. Kjellén, M. Guitiérrez, and M. Estrada, “The Politics of ‘Sinks’ and the CDM: A Process Tracing of the UNFCCC Negotiations (pre-Kyoto to COP-9),” Feb. 2007, draft submitted for *International Environmental Agreements*; also see two articles in *Nature*, no. 6812, Nov. 2000, “Deadlock in the Hague, but Hope Remains for Spring Climate Deal,” and “Critical Politics of Carbon Sinks.”

<sup>12</sup> Commonly referred to as “land use, land use change, forestry,” or abbreviated as LULUCF.



The text box on page 5 lists some of the areas of concern regarding agriculture and forestry offsets and allowances. For a more detailed discussion of these types of issues, see CRS Report RL34241, *Voluntary Carbon Offsets: Overview and Assessment*, and CRS Report RS22964, *Measuring and Monitoring Carbon in the Agricultural and Forestry Sectors*.

In part because of these types of concerns, some of the existing or emerging greenhouse gas programs either do not include agricultural and forestry activities, or limit the types of agricultural and forestry activities that are allowed under their programs. For example, the EU's GHG emission program, the Emission Trading System (ETS), which was established in 2005, does not provide for agricultural or forestry projects and activities. Among the reasons are (1) pragmatic concerns regarding measurement and verification, given the sheer number of farmers and landowners, and (2) ideological concerns about granting too much flexibility in how emission reductions are met, which could undermine overall program goals.<sup>13</sup> In the United States, some of the active or emerging climate change initiatives—such the Regional Greenhouse Gas Initiative, the Western Climate Initiative, and California's climate change statute—do allow or are considering allowing certain types of agricultural and forestry projects as part of their offset/allowance programs. However, the eligible list of agricultural and forestry activities tends to focus on either high-end, tested technologies (e.g., anaerobic digesters) and/or projects that are fairly easy to measure, verify, and monitor (afforestation and reforestation, manure management, etc.). Instead, many offset/allowance projects under these initiatives tend to be outside the agriculture and forestry sectors, such as landfill gas and wastewater management, reduced CO<sub>2</sub> and sulfur hexafluoride (SF<sub>6</sub>) emissions from energy production, and various energy efficiency measures.<sup>14</sup>

## Author Contact Information

Renée Johnson  
Specialist in Agricultural Policy  
rjohnson@crs.loc.gov, 7-9588

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<sup>13</sup> Comments and presentation by Michael Grubb, Chief Economist of the Carbon Trust, during a Congressional staff briefing, February 29, 2008. Although private parties subject to the ETS cap cannot purchase LULUCF offsets, EU governments can purchase eligible LULUCF offsets—i.e., from afforestation or reforestation projects—up to 1% of their state's base year (1990) emissions each year (See European Union Directive 2004/101/EC, October 27, 2004; Kyoto Protocol, Decision 17/CP.7, November 2001). The World Bank reported that global transactions of LULUCF offsets have only accounted for 6% of this allowable limit.

<sup>14</sup> See Stockholm Environment Institute, *A Review of Offset Programs: Trading Systems, Funds, Protocols, Standards and Retailers*, October 2008, <http://www.sei-us.org/climate-and-energy/SEIOffsetReview08.pdf>. Also: RGGI, Overview of RGGI CO<sub>2</sub> Budget Trading Program, Oct. 2007 [http://www.rggi.org/docs/program\\_summary\\_10\\_07.pdf](http://www.rggi.org/docs/program_summary_10_07.pdf); WCI, *Design Recommendations for the WCI Regional Cap-and-Trade Program*, September 2008, <http://www.westernclimateinitiative.org>; California Environmental Protection Agency, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, Oct. 2007 [http://www.arb.ca.gov/cc/ccea/meetings/ea\\_final\\_report.pdf](http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf).