



## CRS Report for Congress

# Agriculture and Forestry Provisions in Climate Change Legislation (S. 3036)

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### Summary

This report summarizes some of the domestic agriculture and forestry provisions in the Lieberman-Warner Climate Security Act of 2008 (S. 3036, formerly S. 2191), as ordered reported out of the Senate Committee on Environment and Public Works in December 2007. The bill directs the Administrator of the U.S. Environmental Protection Agency to establish a program to decrease greenhouse gas (GHG) emissions. The bill's cap-and-trade framework establishes a tradeable allowance system that includes a combination of auctions and free allocation of tradeable allowances. As part of this overall framework, S. 3036 includes three design mechanisms that may provide financial incentives to encourage land-based agricultural and forestry activities. These include provisions on carbon offsets, set-aside allowances, and auction proceeds.

In the 110<sup>th</sup> Congress, several proposals have been 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

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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 and Brent D. Yacobucci; and CRS Report RL34067, *Climate Change Legislation in the 110th Congress*, by Jonathan L. Ramseur and Brent D. Yacobucci.

<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.

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 also specify 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 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> contains several agriculture-based provisions. A summary of these provisions is provided below. Overall, S. 3036 directs the Administrator of the U.S. Environmental Protection Agency to establish a program to decrease GHG emissions under a cap-and-trade framework.<sup>7</sup>

## Agriculture and Forestry Provisions

The cap-and-trade framework outlined in S. 3036 establishes a tradeable allowance system that includes a combination of auctions and free allocation of tradeable allowances. As part of this overall framework, S. 3036 includes three design mechanisms that may provide financial incentives to encourage land-based agricultural and forestry activities: carbon offsets, set-aside allowances, and auction proceeds. In this context, a carbon offset refers to a measurable avoidance, reduction, or sequestration of CO<sub>2</sub> or other GHG emissions, expressed in carbon-equivalent terms. A set-aside allowance

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<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> Among the GHG bills that provide for agriculture and/or forestry offsets are S. 3036 (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 also S. 1766 (Bingaman/Specter).

<sup>6</sup> On June 2, 2008, the Senate invoked cloture on S. 3036 and will proceed to debate the bill under unanimous-consent agreement.

<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 be considered by the Senate.

refers to a set percentage of available allowances under the overall 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 that is allocated for use to carry out the cellulosic biomass ethanol technology deployment program.<sup>8</sup>

**Offsets.** Title II, Subtitle D (“Offsets”), of S. 3036 provides for agriculture and forestry offset projects. The agriculture and forestry provisions in this subtitle cover 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 below shows the types of eligible agriculture and forestry offset projects listed in Section 2403 of S. 3036, which includes these listed practices or combinations of agricultural conservation practices.

#### **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

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

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<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. For more information on allowances and auction proceeds in current GHG bills, see *Allocations for Carbon Allowances and Auctions under S. 2191*, by Brent D. Yacobucci (CRS general distribution memorandum).

conservation, forestry, energy, and rural development programs under the 2008 farm bill (P.L. 110-234). 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 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 (**Table 1**). 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. For more information, see CRS Report RL33898, *Climate Change: The Role of the U.S. Agriculture Sector*, by Renée Johnson.

**Set-Aside Allowances.** Title III, Subtitle G (“Domestic Agriculture and Forestry”), of S. 3036 directly allocates 5% of the overall emissions allowances to domestic agriculture and forestry entities (Sec. 3701). This could provide a sizeable benefit to U.S. producers. Overall, the proposal starts off with 5.8 billion emissions allowances for CY2012, which phases 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 — between 290 million and 90 million emissions allowances for qualifying entities, depending on the year.

The agriculture and forestry provisions in this subtitle cover allocation (Sec. 3701), research (Sec. 3702), and distribution (Sec. 3703). The subtitle does not specify the types practices that would be applicable. However, it does state that emissions reduction and increases in carbon sequestration in the agriculture and forestry sectors should be “real, verifiable, additional, permanent, and enforceable” (Sec. 3701); it also specifies the need for reductions of both nitrous oxide emissions through soil management, and methane emissions through feed and manure management (Sec. 3702(a)).

This provision indirectly relates 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 issues, among other related issues. For information, see CRS Report RL34042, *Environmental Services Markets: Farm Bill Proposal*, by Renée Johnson.

**Auction Proceeds.** Title IV, Subtitle D (“Energy Technology Deployment”), of S. 3036 specifies 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 calls 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. This subtitle does 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>9</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>10</sup> The text box below lists some of the primary areas of concern regarding agriculture and forestry offsets and allowances. 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>11</sup> For a more detailed discussion of these issues, see CRS Report RL34241, *Voluntary Carbon Offsets: Overview and Assessment*, by Jonathan L. Ramseur, and CRS Report RL33898, *Climate Change: The Role of the U.S. Agriculture Sector*, by Renée Johnson.

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

- **Permanence/Duration** — land uses can change over time (e.g., forest lands to urban development, natural events such as fires or pests);
- **Measurement/Accounting** — measuring biological sequestration is difficult and estimates can vary, and actual emission reduction/sequestration depends on site-specific factors (e.g., location, climate, soil type, crop/vegetation, tillage practices, management);
- **Additionality** — some activities generating offsets would have occurred anyway under a pre-existing program or practice, and may not go beyond business as usual (BAU); reductions may be double-counted or attributable to other environmental goal/ programs;
- **Effectiveness** — the success of the mitigation practice depends on the type of practice, how well it is implemented and managed by the farmer or landowner, and the length of time the practice is undertaken; and
- **Leakage** — reductions in one place could result in additional emissions elsewhere.

<sup>9</sup> See, for example, E. Boyd, E. Corbera, B. Kjellén, M. Guitierrez, 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>10</sup> Commonly referred to as “land use, land use change, forestry,” or abbreviated as LULUCF.

<sup>11</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.

**Table 1. Current Conservation and Land Management Practices**

<b>USDA Program</b>	<b>Conservation Practice and Land Management</b>	<b>General Objectives</b>	<b>Objectives for Climate Change</b>
EQIP, CSP, AMA	Conservation tillage and reduced field pass intensity	Improve soil/water/air quality. Reduces soil erosion/fuel use.	Sequestration, emission reduction
	Crop diversity through crop rotations and cover cropping	Reduce erosion/water needs. Improves soil/water quality.	Sequestration
	Efficient nutrient (nitrogen) management, fertilizer application	Improves water quality. Saves expenses, time, and labor.	Sequestration, emission reduction
	Improved soil management and soil erosion controls	Improve soil/water/air quality.	Sequestration, emission reduction
EQIP CSP AMA Other <sup>a</sup>	Manure management (e.g., storage/containment, anaerobic digestion and methane recovery)	Improve soil/water/air quality. On-farm fuel cost-savings. Alternative income source. Nutrients for crops.	Emission reduction
EQIP CSP AMA	Feed management (e.g., raise feed efficiency, dietary supplements)	Improve water/air quality. More efficient use of feed.	Emission reduction
	Rangeland management (e.g., rotational grazing, improved forage)	Reduce water requirements. Help withstand drought. Raise grassland productivity.	Sequestration, emission reduction
EQIP CSP AMA WHIP	Windbreaks for crops and livestock, vegetative/riparian buffers, grassed waterways, setbacks, etc.	Improve crop/livestock protection and wildlife habitat. Alternative income source (e.g., hunting fees).	Sequestration, emission reduction
FLEP EQIP CSP AMA	Agroforestry / silvopasture with rotational grazing and improved forage	Provide income from grazing and wood products.	Sequestration, emission reduction
CRP WRP GRP FPP	Land management, including retirement, conversion, restoration (cropland, grasslands, wetlands, open space)	Improve soil/water/air quality.	Sequestration
EQIP CSP AMA Other <sup>a</sup>	Energy efficiency/conservation	Improve soil/water/air quality. Cost-savings.	Emission reduction
	Biofuel substitution and renewable energy use	Improve soil/water/air quality. On-farm fuel cost-savings. Alternative income source.	Emission reduction

**Source:** Compiled by CRS staff from USDA and EPA information. Listed programs: Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), Grasslands Reserve Program (GRP), Farmland Protection Program (FPP), Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), Agricultural Management Assistance (AMA), Wildlife Habitat Incentives Program (WHIP), and Forest Land Enhancement Program (FLEP).

a. Renewable energy projects receive additional program funding in the 2002 farm bill under Title IX (Energy) and Title VI (Rural Development), as well as other federal and state programs.