Agriculture and Forestry Provisions in Climate Legislation in the 111th Congress

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December 23, 2009

Congressional Research Service
7-5700
www.crs.gov
R40994

CRS Report for Congress
Prepared for Members and Committees of Congress

Summary

In June 2009, the House passed H.R. 2454, the American Clean Energy and Security Act of 2009. In September 2009, Senator Kerry introduced S. 1733, the Clean Energy Jobs and American Power Act, which was referred to the Senate Committee on Environment and Public Works. The committee completed markup of the bill on November 5, 2009, by approving Senator Boxer's "Manager's Amendment" as a substitute, and ordered S. 1733 reported. Both the House and Senate bills would establish a cap-and-trade system to regulate greenhouse gas (GHG) emissions, as well as address energy efficiency, renewable energy, and other energy topics. Among other provisions, both bills would require major reductions in GHG emissions from entities comprising roughly 85% of current U.S. GHG emissions. Covered sectors would include electricity production, natural gas distribution, petroleum refining, and industrial sectors. These and related bills and issues are currently being debated in Congress.

Although the leading House and Senate climate proposals would not require GHG emission reductions in the agriculture and forestry sectors, provisions in these bills could potentially raise farm input costs for energy, fertilizers, and other production inputs. However, higher production costs could potentially be alleviated by possible farm revenue increases from other provisions that are part of these bills. For example, the cap-and-trade proposals in these bills would distribute tradeable allowances at no cost to certain agricultural industries, such as fertilizer manufacturers. These "free" allowances could also dampen the impact of the cap-and-trade system that would otherwise occur. Higher costs might also be dampened by possible farm revenue increases should farmers participate in carbon offset programs for domestic farm- and land-based carbon storage activities. The renewable energy provisions contained in these bills could potentially expand the market for farm-based biofuels, biomass residues, and dedicated energy crops. Both bills also provide incentives for international forestry and related land-based activities. Other provisions in these bills might also affect the U.S. agriculture sectors. These include provisions that would establish a GHG registry for reporting emissions, which might affect certain larger livestock operations, and provisions to implement certain biomass and bioenergy requirements.

This report describes some of the agriculture and forestry provisions that are included in major energy and climate legislation in the 111th Congress, comparing provisions in the House-passed bill (H.R. 2454) and the Senate-reported bill (S. 1733). Initially, when the House passed H.R. 2454 many in the Senate and in the agriculture community regarded that effort as a "good starting point" that still needed additional work to satisfy those in Congress with major agriculture constituencies. In particular, other ongoing efforts in the Senate, such as a bill introduced by Senator Stabenow (Clean Energy Partnerships Act of 2009, S. 2729), would provide for expanded carbon offset provisions benefitting U.S. farmers and landowners, among other provisions. This Senate bill is supported by many in the agricultural community. However, others (including Chairwoman Lincoln of the Senate Agriculture Committee) continue to question this legislation and cite concerns about how this legislation could affect national and local farming communities.

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Background

In June 2009, the House passed H.R. 2454, the American Clean Energy and Security Act of 2009. In November 2009, Chairwoman Boxer of the Senate Committee on Environment and Public Works completed markup of S. 1733, the Clean Energy Jobs and American Power Act, by approving a "Manager's Amendment" as a substitute, and ordered S. 1733 reported.

Both the House-passed (H.R. 2454) and the Senate-reported (S. 1733) bills would establish a cap-and-trade system to regulate greenhouse gas (GHG) emissions, as well as to address energy efficiency, renewable energy, and other energy topics. Among other provisions, both bills would require major reductions in GHG emissions from entities comprising roughly 85% of current U.S. GHG emissions. Covered sectors would include electricity production, natural gas distribution, petroleum refining, and industrial sectors. These and related bills and issues are currently being debated in Congress. For more detailed information see CRS Report R40896, *Climate Change: Comparison of the Cap-and-Trade Provisions in H.R. 2454 and S. 1733*, by Brent D. Yacobucci, Jonathan L. Ramseur, and Larry Parker.

The climate provisions in the House-passed and the Senate-reported bills would not require GHG emission reductions in the agriculture and forestry sectors. However, if enacted, provisions in these bills could potentially raise farm input costs for fossil fuels, fertilizers, energy, and other production inputs. These higher costs could potentially be alleviated by possible farm revenue increases should farmers participate in carbon offset and renewable energy provisions that are part of these bills.

This report provides a background on the energy and climate debate and pending legislation as it pertains to the U.S. agriculture and forestry sectors. It provides a brief overview of how the agricultural and forestry sectors could be affected by the proposed cap-and-trade programs in climate titles of these bills.[1] Also included in the proposed cap-and-trade programs are provisions that address which industries are to be considered sources of GHG emissions thus requiring emission reductions; which industries are to be considered as eligible sources of carbon allowances; and what types of domestic and international carbon storage and emission reduction activities might become eligible under a carbon offset credit program. This report also describes some of the carbon energy and biomass provisions pertaining to the domestic agricultural and forestry sectors in the energy titles of these bills. Finally, the report describes other related initiatives involving the U.S. agricultural sectors, including updates on related activities being addressed by the U.S. Environmental Protection Agency (EPA).

Previous Debate in the 110th Congress

During the 110th Congress, several GHG bills were debated that would have explicitly allowed for the use of carbon offsets, including agricultural activities and other land-based practices, under a

[1] A cap-and-trade program provides a market-based policy tool for reducing emissions by setting a cap, or maximum carbon emission, 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. For more information, see CRS Report RL33846, *Greenhouse Gas Reduction: Cap-and-Trade Bills in the 110th Congress*, by Larry Parker, Brent D. Yacobucci, and Jonathan L. Ramseur.

cap-and-trade framework. This builds on the concept, also expressed in the 110th Congress by the House Energy and Commerce Committee, that emissions reductions and carbon sequestration by the agricultural sector may provide an appropriate source of credits or offsets within a cap-and-trade program.[2] However, in the 110th Congress, some proposed bills did not allow for offsets, but would have set aside a percentage of allowances for various purposes, including biological sequestration.[3] Participating farmers and landowners who receive these allowances for sequestration and/or emission reduction activities could sell them to facilities that could become covered by a cap-and-trade program.

For example, one 110th Congress bill, S. 3036 (Boxer; formerly S. 2191 (Leiberman/Warner)), contained several agriculture- and forestry-based provisions. The cap-and-trade framework outlined in S. 3036 established a tradeable allowance system that included 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 provided for a range of agriculture and forestry offset projects, including agricultural and rangeland sequestration and management practices, land use change and forestry activities, manure management and disposal, and other terrestrial offset practices. S. 3036 also would have directly allocated 5% of the overall emissions allowances to domestic agriculture and forestry entities, and allocated a set percentage of available auction proceeds to carry out a cellulosic biomass ethanol technology deployment program.

Both the distribution of allowances to support agricultural and forestry activities and an offset program could provide opportunities to some farmers and landowners by allowing them to directly participate in and potentially gain a significant part of this emerging carbon market. The offset and allowance provisions could allow farmers and landowners to participate in this market by granting them the 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. Proceeds from the sale of these allowances, credits, and auctions could be used to further promote and support activities in these sectors that reduce, avoid, or sequester emissions. For more information on the agriculture and forestry provisions in S. 3036, see CRS Report RS22834, *Agriculture and Forestry Provisions in Climate Change Bills in the 110th Congress*, by Renée Johnson.

Also during Senate floor debate of S. 3036 in the 110th Congress, Senator Stabenow introduced an amendment to the bill that sought to replace the offset provisions in S. 3036 with an even more expansive version of the agriculture and forestry offset program provisions. This amendment was not adopted, but the general provisions of this proposed amendment continue to be promoted by the farm community as a desired option for establishing an offset program as part of a cap-and-trade program.[4] In May 2008, these and other issues and concerns were raised at a 110th Congress

[2] House Committee on Energy and Commerce, "Climate Change Legislation Design White Paper: Scope of a Cap-and-Trade Program," prepared by committee staff, 110th Congress, Oct. 2007.

[3] Carbon sequestration refers to the capture and storage of carbon in vegetation and soils, or the removal carbon dioxide from the atmosphere through photosynthesis. For more information see CRS Report RL33898, *Climate Change: The Role of the U.S. Agriculture Sector*.

[4] See, for example, statements by various agriculture groups to House Agriculture Committee staff, May 18, 2009. Text of the so-called Stabenow amendment is in the *Congressional Record*, June 5, 2008, pp. S5306-S5313.

Senate subcommittee hearing on the role of agriculture and forestry activities under a cap-and-trade program.[5]

Legislative Activity in the 111th Congress

Congress has continued to consider legislation in the 111th Congress to impose or permit some form of market-based controls on GHG emissions. However, with respect to the agriculture and forestry sectors, this legislation differs from that debated in the 110th Congress. Although the climate provisions in both the House-passed (H.R. 2454) and the Senate-reported (S. 1733) bills do not specifically include agricultural operations among its "covered entities" under a mandatory emissions cap, the extent to which the agricultural and forestry sectors are granted tradeable allowances and opportunities under a carbon offset program is more limited compared to some legislation debated in the 110th Congress. For more general background information about these two bills, see CRS Report R40896, *Climate Change: Comparison of the Cap-and-Trade Provisions in H.R. 2454 and S. 1733*, by Brent D. Yacobucci, Jonathan L. Ramseur, and Larry Parker.

House Action

Prior to House passage of H.R. 2454, the extent to which the agricultural and forestry sectors could be allowed to participate in an offset and allowance program was actively debated in Congress. In fact, the version of H.R. 2454 that passed the House was substantially different than the version that was reported by the House Committee on Energy and Commerce.[6] Although H.R. 2454 set the aggregate number of submitted offsets at two billion tons annually, it initially did not identify whether agriculture and forestry activities would be eligible as offsets and did not include a separate title covering domestic agriculture and forestry carbon offsets.[7] Instead eligible domestic offset types would be determined through the EPA rulemaking process.[8] This caused concern among stakeholders in the agricultural community who wanted the U.S. Department of Agriculture (USDA) to be the lead agency administering the offset program for domestic agricultural and forestry offsets. In addition, many in the agricultural community were concerned that the committee-reported bill did not include an explicit list of offset practices.

Just prior to the floor debate, following negotiations between the Chairmen of the House Energy and Commerce Committee and the House Agriculture Committee, the so-called "Peterson Amendment" was added to H.R. 2454. The Energy Committee's June 26, 2009 "Manager's Amendment" included a new Title V to H.R. 2454—"Agriculture and Forestry Related Offsets." Among other provisions, the Peterson Amendment allowed for certain agricultural and forestry activities to become eligible to participate in a carbon offset program, established that this program would be implemented by USDA (rather than EPA),[9] addressed concerns in the

[5] Senate Committee on Agriculture, Nutrition and Forestry, Subcommittee on Rural Revitalization, Conservation, Forestry and Credit hearing, May 21, 2008, "Creating Jobs with Climate Solutions: How agriculture and forestry can help lower costs in a low-carbon economy," at http://agriculture.senate.gov/.

[6] The committee ordered the bill reported on May 21, 2009. The bill was reported (as amended, H.Rept. 111-137, Part I) on June 5, 2009.

[7] Title V in the House-passed version.

[8] Title III in the House committee-reported bill.

[9] As will be described later, for the most part, the provisions in Title V are similar to those found in Title III, with the (continued...)

agricultural community about existing and evolving renewable energy and certain biomass requirements, and also recognized certain early actions that have already been taken by farmers and landowners to reduce emissions and sequester carbon.

The inclusion of provisions that allow for agricultural and forestry offsets as part of a cap-and-trade scheme is generally supported by a broad farm industry coalition. Initially this coalition consists of agricultural groups representing federally-supported crops (such as grains and cotton), livestock and dairy, the American Farm Bureau Federation, the National Farmers Union, the American Farmland Trust, and other agriculture support and utility companies.[10] Former Senators and Majority Leaders Bob Dole and Tom Daschle have also advocated on behalf of the Bipartisan Policy Center that farmers be fully integrated into any cap-and-trade program.[11] Most groups, including many within the environmental community, generally support the inclusion of carbon offset projects within a cap-and-trade scheme since this is likely to help contain overall costs of a carbon reduction program. More recently, however, several farm groups are tending to oppose any climate legislation because of concerns that it will raise production and input costs to farmers.

In March 2009, the House Agriculture Committee issued a climate change questionnaire, which was distributed to more than 400 organizations, to solicit input on proposals to reduce GHG emissions. The published survey responses are available on the committee's website and highlight some concerns, as well as the potential market opportunities for farmers and landowners.[12] These and other issues were discussed during House Agriculture Committee hearings in June and December 2009.[13]

Senate Action

After the House passed H.R. 2454 many in the Senate and in the agriculture community regarded that effort as a "good starting point" that still needed additional work to satisfy those in Congress with major agriculture constituencies.[14] These and other issues and concerns were raised at a series of Senate Agriculture Committee hearings in July and September 2009, as part of the committee's review of pending climate legislation.[15]

In September 2009, Senator Kerry introduced S. 1733, which was referred to the Senate Committee on Environment and Public Works (EPW). The committee held hearings on the bill

(...continued)

most notable exception being the difference in implementing agencies.

[10] National Association of Wheat Growers, "Ag, Utility Groups Write on Stabenow Amendment," June 13, 2008, at http://www.wheatworld.org/html/news.cfm?ID=1423.

[11] Senators Bob Dole and Tom Daschle, *The Role of Agriculture in Reducing Greenhouse Gas Emissions: Recommendations for a National Cap-and-Trade Program*, April 2008, at http://www.bipartisanpolicy.org/ht/display/ArticleDetails/i/6086.

[12] House Agriculture Committee's publications page is at http://agriculture.house.gov/inside/publications.html.

[13] House Committee on Agriculture hearings, "To review pending climate legislation," June 11, 2009; "To review the potential economic impacts of climate change to the farm sector," December 2, 2009; and "To review the cost and benefits of agriculture offsets," December 3, 2009, http://agriculture.house.gov/hearings/.

[14] For example, comments made by committee members during hearings by the Senate Committee on Agriculture, Nutrition and Forestry, "The role of agriculture and forestry in global warming legislation," July 22, 2009.

[15] Senate Committee on Agriculture, Nutrition and Forestry hearings, "The role of agriculture and forestry in global warming legislation," July 22, 2009; and "Global Warming Legislation: Carbon Markets and Producer Groups,: September 9, 2009, http://agriculture.senate.gov/.

starting October 2009, and began markup in November. On November 5, the committee approved Senator Boxer's "Manager's Amendment" as a substitute, and ordered S. 1733 reported. Although S. 1733 allows for agriculture and forestry offsets as part of a cap-and-trade scheme, and it does not specifically include agricultural operations among its "covered entities" under a mandatory emissions cap, many of the principle issues and concerns of the U.S. agriculture community were not included in the bill. Specifically, S. 1733 would delegate domestic program authority to the President and international program authority to EPA. S. 1733 also differed in terms of the types of projects and activities allowed, the total allowable quantity of domestic versus international offsets, and agency administration of the program, among other differences.

Many in the agricultural community, however, consider S. 1733 as a placeholder bill that will include more detailed agricultural provisions that have been introduced in other Senate bills or that might be addressed during Senate floor debate.

For example, some in the agricultural community have continued to support the ongoing efforts of Senator Stabenow, who continued to work on a proposal (often referred to as the "Stabenow Amendment") that would expand on the agricultural and forestry carbon offset provisions in these climate bills and also allow for certain other provisions benefitting U.S. farmers and landowners. These provisions were included in a bill, the Clean Energy Partnerships Act of 2009 (S. 2729), introduced by Senator Stabenow shortly after the Senate EPW Committee completed work on S. 1733. However, Senator Stabenow's bill is not comprehensive and does not address other concerns in the agricultural community, such as other energy and offset issues, and the role and use by EPA of its indirect land-use models (as will be discussed later in this report).

Some in the agricultural community continue to support efforts to expand upon provisions in the House-passed bill, including provisions outlined in S. 2729. Supporters of S. 2729 include the National Farmers Union and National Corn Growers Association. Other in the agricultural community, however, including Chairwoman Lincoln of the Senate Agriculture Committee and the American Farm Bureau Federation, continue to voice concerns about climate legislation and how this legislation could affect national and local farming communities, and U.S. economic competitiveness.[16]

Agriculture and Forestry Provisions

Covered Sources of Emissions Reductions

Historically, climate-related legislative initiatives have not specifically required emissions reductions in the agricultural sector. In part, this may reflect the general consensus that "emissions from the agricultural 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."[17]

[16] "Washington Insider" DNT *Progressive Farmer*, various dates in October and November 2009.

[17] Committee on Energy and Commerce, 110th Congress, "Climate Change Legislation Design White paper: Scope of a Cap-and-Trade Program," prepared by committee staff, Oct. 2007.

In general, the current legislative proposals have not included the agricultural sector as a covered industry, and therefore do not require farmers and landowners to reduce emissions associated with climate change.[18] For example, neither the House-passed bill (H.R. 2454) nor the Senate-reported bill (S. 1733) specifically includes agricultural operations among its "covered entities" under a mandatory emissions cap. However, some interest groups continue to question whether certain types of agricultural operations could or should eventually be brought in under some proposals. Some of the bills introduced in the 110th Congress would have provided authority to EPA to determine covered entities by applying cost-effective criteria to reduction options; other 110th Congress bills would have covered biogenic emissions resulting from biological processes, which some interpret as potentially including animal agriculture facilities. Although these bills would not require GHG emission reductions in the agriculture and forestry sectors, if enacted, provisions in these bills could potentially raise farm input costs for energy, fertilizers, and other production inputs. As a result, many in the farm community are worried that U.S. farmers could be adversely affected by anticipated climate legislation through generally increasing energy and production input costs.[19]

EPA has conducted a review and study of the potential economic costs of the energy and climate legislation being considered by Congress, including effects to the U.S. agriculture and forestry sectors.[20] In addition, USDA has conducted analyses of the effects to agricultural producers from possible higher production and input costs under pending climate legislation.[21] The Congressional Budget Office (CBO) also conducted an economy-wide analysis of H.R. 2454.[22] These analyses show that the overall costs of legislation to the agricultural community will be "modest."[23] USDA and EPA's studies further suggest that farm revenues from carbon offsets could result in net economic gains for the U.S. agricultural sectors.

Several other groups, including land grant universities, non-governmental organizations, industry groups, and advocacy groups also have published studies and estimates, many that focus specifically on the economic effects on the agricultural and forestry sectors. Overviews of the

[18] One exception during the 110th Congress was H.R. 6186 (Markey), which would have required performance standards for certain sources of methane and nitrous oxide emissions, including animal feeding operations; however, H.R. 6186 specifically did not include crop operations and forest management systems.

[19] See, for example, statements by the American Farm Bureau at the 2009 USDA Outlook Forum, February 19, 2009; statements by various agriculture groups to House Agriculture Committee staff, May 18, 2009; and a study conducted for the Fertilizer Institute, at http://www.tfi.org/issues/climate/doanestudy.pdf.

[20] EPA, " The United States Environmental Protection Agency's Analysis of S. 1733 in the 111th Congress, the Clean Energy Jobs and American Power Act of 2009," October 2009, "The United States Environmental Protection Agency's Analysis of H.R. 2454 in the 111th Congress, the American Clean Energy and Security Act of 2009," June 2009, http://www.epa.gov/climatechange/economics/economicanalyses.html.

[21] USDA, "The Impacts of the American Clean Energy and Security Act of 2009 On U.S. Agriculture," http://www.usda.gov/oce/newsroom/archives/releases/2009files/ImpactsofHR%202454.pdf; and USDA, "A Preliminary Analysis of the Effects of H.R. 2454 on U.S. Agriculture, USDA," July 22, 2009, http://www.usda.gov/oce/newsroom/archives/releases/2009files/H.R. 2454.pdf. Also see testimony of Joseph Glauber, USDA Chief Economist, House Committee on Agriculture hearing, "To review the potential economic impacts of climate change to the farm sector," December 2, 2009, http://agriculture.house.gov/testimony/111/h120209/Glauber.pdf.

[22] CBO, "The Estimated Costs to Households From the Cap-and-Trade Provisions of H.R. 2454," June 19, 2009, http://www.cbo.gov/ftpdocs/103xx/doc10327/06-19-CapAndTradeCosts.pdf.

[23] See, for example, USDA press release No. 0622.09, "Statement of Secretary of Agriculture Tom Vilsack on Release of USDA Climate Change Analysis," December 18, 2009, http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1OB?contentidonly=true&contentid=2009/12/0622.xml.

available cost studies have been compiled by the Agricultural Carbon Market Working Group, the 25x25 Carbon Work Group, and researchers at Kansas State University.[24]

Other studies have been conducted by Duke University's Nicolas Institute for Environmental Policy Solutions,[25] the Food and Agriculture Policy Research Institute (FAPRI),[26] Texas A&M University,[27] Iowa State University,[28] and University of Tennessee,[29] the American Farm Bureau Federation,[30] a study commissioned by the Fertilizer Institute,[31] Brookings Institution,[32] and CRA International,[33] among others.

The publicly available studies from various organizations on the economic impacts of cap-and-trade legislation on the U.S. agricultural sector span a wide range of possible effects, often with conflicting conclusions. Almost all of the studies predict that energy costs will rise, though the estimated magnitude of these potential economic effects vary widely. Study results also differ in how higher energy prices will affect farm income. Most of the studies do not provide a complete analysis of the legislation and potentially offsetting cost effects. Most studies only consider the effects of the legislation on energy costs; they do not consider the possible impacts on farm input usage, shifts in crop production and practices, farm-based adjustments and management changes, changes in food prices, as well as farm revenue from biofuel and biomass production, carbon credits and carbon offset activities, or tradeable allowances and/or auction proceeds.

Many studies also highlight that higher potential production and farm input costs might be offset by policies that reduce costs (such as allowance provisions that may provide transitional

[24] Agricultural Carbon Market Working Group, "The Value of a Carbon Offset Market for Agriculture," http://www.farmland.org/programs/environment/workshops/documents/TCGWhitePaper_ValueofOffsets_Final.pdf; 25x25 Carbon Work Group, "Summary of Recent Cost Impact Data American Clean Energy Security Act of 2009, H.R. 2454," August 2009, http://www.25x25.org/storage/25x25/documents/Carbon_Subcommittee/aces_cost_summary_final_08-15-09.pdf; and Golden, B. et al., "A Comparison of Select Cost-Benefit Studies on the Impacts of H.R. 2454 on the Agriculture Sector of the Economy," December 8, 2009, http://www.farmland.org/documents/A-Comparison-of-Select-Cost-Benefit-Studies-HR2454-Impacts-On-Agriculture-Sector.pdf.

[25] Baker, J.S. et. al, "The Effects of Low-Carbon Policies on Net Farm Income," Nicholas Institute for Environmental Policy Solutions, WP 09-04, September 2009, http://www.nicholas.duke.edu/institute/ni.wp.09.04.pdf. Also see http://www.nicholas.duke.edu/agmeeting/Potential_Economic_Effects.pdf.

[26] FAPRI, " The Effect of Higher Energy Prices from H.R. 2454 on Missouri Crop Production Costs, FAPRI-MU Report #05-09, July 2009, http://www.fapri.missouri.edu/outreach/publications/2009/FAPRI_MU_Report_05_09.pdf.

[27] Texas A&M University's Agricultural and Food Policy Center (AFPC), "Economic Implications of the EPA Analysis of the CAP and Trade Provisions of H.R. 2454 for U.S. Representative Farms," AFPC Research Paper 09-2, August 2009, http://www.afpc.tamu.edu/pubs/2/526/rr%2009-2%20paper%20-%20for%20web.pdf.

[28] Babcock, B., "Costs and Benefits to Agriculture from Climate Change Policy," Iowa State University, Center for Agricultural and Rural Development, Summer 2009, http://www.card.iastate.edu/iowa_ag_review/summer_09/article1.aspx.

[29] de la Torre Ugarte, D. et al., "Analysis of the Implications of Climate Change and Energy Legislation to the Agricultural Sector," University of Tennessee, Department of Agricultural Economics, Institute of Agriculture, November 2009, http://www.25x25.org/storage/25x25/documents/ut_climate_energy_report_25x25_november.pdf.

[30] AFBF, "Flawed' cap-and-trade bill goes to Senate," *FB News*, July 6, 2009 Vol. 88 No. 13, http://www.fb.org/newsroom/fbn/2009/FBN_07-06-09.pdf.

[31] Doane Advisory Services, "Climate Change - Effects of Cap and Trade Legislation on U.S. Agriculture," http://tfi.org/issues/climatechange.cfm.

[32] Brookings Institution, "Consequences of Cap and Trade," June 2009, http://www.brookings.edu/~/media/Files/events/2009/0608_climate_change_economy/20090608_climate_change_economy.pdf

[33] CRA International, "Impact on the Economy of the American Clean Energy and Security Act of 2009, May 2009, http://www.crai.com/uploadedFiles/Publications/impact-on-the-economy-of-the-american-clean-energy-and-security-act-of-2009.pdf.

assistance to fertilizer manufacturers and rural energy providers) and/or farm revenue increases should farmers participate in carbon offset and renewable energy provisions in these bills.[34] However, few studies are able to provide quantitative estimates or to precisely predict how such policies and programs might lessen the overall potential economic effects to farms and landowners.

Several studies also describe the potential negative effects on the U.S. agriculture sectors from climate change, absent policy changes designed to mitigate such effects, with some studies examining the possible economy-wide economic benefits of climate change legislation. Among these are large-scale studies by the Intergovernmental Panel on Climate Change (IPCC),[35] USDA,[36] and Massachusetts Institute of Technology,[37] as well as reports by New York University's School of Law[38] and others.[39]

Eligible Sources of Carbon Offsets and Allowances

Both H.R. 2454 and S. 1733 specifically incorporate the agricultural and forestry sectors as a possible source of carbon offset credits and also as a limited recipient of set-aside allowances (targeting certain segments of the agricultural community).

In the context of these legislative proposals, a carbon offset is a measurable avoidance, reduction, or sequestration of carbon dioxide (CO_2) or other GHG emission, expressed in carbon-equivalent terms.[40] A set-aside allowance 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 to support various policy objectives (e.g., biological sequestration).

Agriculture-based Allowances

Both H.R. 2454 and S. 1733 would allocate allowances or auction revenue to support various purposes. Recipients of direct allocations include entities covered by the cap-and-trade program,

[34] See, for example, USDA 2009, Texas A&M University 2009, and J.S. Baker et al., 2009.

[35] IPCC, *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Chapter 5: Food, Fibre, and Forest Products, IPCC's 4th Assessment Report, 2007, http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter5.pdf.

[36] USDA (in cooperation with the University Corporation for Atmospheric Research and the U.S. Global Change Research Program), *The Effects of Climate Change on U.S. Ecosystems*, December 2009, http://www.usda.gov/img/content/EffectsofClimateChangeonUSEcosystem.pdf; and USDA (with U.S. Climate Change Science Program and the Subcommittee on Global Change Research), *The effects of climate change on agriculture, land resources, water resources, and biodiversity in the United States*, Synthesis and Assessment Product 4.3, May 2008, http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm.

[37] Massachusetts Institute of Technology, *Agriculture: The Potential Consequences of Climate Variability and Change for the United States*, June 2002, Joint Program on the Science and Policy of Global Change (edited by John M. Reilly).

[38] Institute for Policy Integrity, *The Other Side of the Coin: The Economic Benefits of Climate Legislation*, Policy Brief 4, September 2009, http://www.policyintegrity.org/documents/OtherSideoftheCoin.pdf.

[39] For example, see Bloomfield, J., and T. Francesco, *Agriculture: The Potential Impacts Of Global Warming On U.S. Agriculture*, 2000, http://www.climatehotmap.org/impacts/agriculture.html; and the Environmental Working Group, *Crying Wolf: Climate Change Will Cost Farmers Far More Than a Climate Bill*, October 2009, http://www.ewg.org/agmag/2009/10/climate-change-will-cost-farmers-far-more-than-a-climate-bill/.

[40] In the context of credit trading, an offset is a certificate representing the reduction of one metric ton of CO_2 emissions, the principal greenhouse gas. Offsets generally fall within the categories of biological sequestration, renewable energy, energy efficiency, and reduction of non-CO_2 emissions.

such as petroleum refineries, and entities not covered by the program, such as states and other groups. In the case of non-covered entities, those entities may only use the value generated from the sale of their allowances for specific purposes. For example, electricity and natural gas local distribution companies (LDCs) must use the value to mitigate the energy cost impacts of the cap-and-trade program on their customers (either through rebates or through investment in energy efficiency), while states must use the funds for energy efficiency, renewable energy, or other projects.[41]

An allowance under a cap-and-trade system is effectively a permit to emit one ton of CO_2 or its equivalent and may be sold in the emissions trading market. Allowances may either be in the form of a directly allocated allowance or government revenue, in the case of auctioned allowances.

Few allowance categories are allocated directly to the agriculture sectors. Both H.R. 2454 and S. 1733 provide for three categories of allowances that, broadly defined, are applicable to the agricultural sectors. These include**:**

- allowances for small electricity local distribution companies or LDCs, under which some rural electric cooperatives would qualify (starting at 0.5% of total allocated allowances (from 2012-2025), phasing down to 0.1% by 2029);[42]
- allowances for various "energy-intensive and trade-exposed" industries or EITEs, under which a few agriculture-related industries (notably, the nitrogen fertilizer industry) may be eligible (percentages across all eligible industries differ somewhat between the two bills, ranging from about 12-13% of total allocated allowances annually);[43] and
- allowances for supplemental activities—including, depending on the bill, agriculture, abandoned mine land, renewable energy, and forestry[44]—that provide financial assistance from auction proceeds for projects that reduce GHGs and store carbon not covered under offset programs (intended to reward certain early adopters, such as farmers that practice conservation tillage and other land management techniques, providing 1% of total allocated allowances annually from 2012-2050).[45]

H.R. 2454 also includes a late-added provision that would provide a one-time (2012) allowance of 1% for "early action offset credits."[46] This provision was promoted in press reports as helping

[41] See CRS Report R40896, *Climate Change: Comparison of the Cap-and-Trade Provisions in H.R. 2454 and S. 1733.*

[42] H.R. 2454, Sec. 782(a)(2) subject to requirements in Sec. 783(e)(3)); S. 1733, Sec. 771(a)(1).

[43] H.R. 2454, Sec. 782(e); S. 1733 Sec. 763(a). Other sections describe how money is distributed and differ somewhat between both bills. See CRS Report R40896, *Climate Change: Comparison of the Cap-and-Trade Provisions in H.R. 2454 and S. 1733*.

[44] S. 1733 inserted "abandoned mine land" and "forestry" programs into this provision, which are not included in H.R. 2454. In S. 1733, the provision is titled "Supplemental agriculture, abandoned mines, and forestry greenhouse gas reduction and renewable energy program." In H.R. 2454, this is titled "Supplemental agriculture and renewable energy incentives program."

[45] H.R. 2454, Sec. 782(u), subject to requirements described in Sec.788; S. 1733, Sec. 771(b)(9). Under S. 1733, allowances for supplemental agriculture, renewable energy, and forestry activities would be paid out of a newly established fund from available auction proceeds.

[46] H.R. 2454, see Sec. 782(t) and Sec. 795, "Exchange for Early Action Offset Credits."

agriculture by guaranteeing money for early carbon reduction activities.[47] This provision is not in S. 1733.

The agriculture community and some in Congress have expressed the desire to expand allowances available to the farming sectors. Specifically, they would like to increase the allowances for early action offset credits.[48] Some also have indicated the desire to expand eligibility under the "energy-intensive and trade-exposed" industries. According to a study by an industry working group, three agriculture-related industries likely would be eligible for the EITE subsidy: nitrogenous fertilizer manufacturers, wet corn millers, and beet sugar producers.[49] This assessment is based on the working group's examination of available energy and trade data, and its eligibility assessment assuming established thresholds, including an energy-intensity threshold of 5% and a trade-exposure threshold of 15%.[50]

Agricultural and Forestry Carbon Offset Projects

H.R. 2454 and S. 1733 provide for a carbon offset program involving agricultural and forestry activities. However, the agricultural and forestry carbon offset programs outlined in these bills differ in terms of the types of projects and activities allowed, how eligible types would be determined, the total allowable quantity of domestic versus international offsets, and agency administration of the program, among other differences.

Appendix A compares the carbon offset programs that would be established by the House-passed bill, H.R. 2454, and Senator Stabenow's bill, S. 2729. The table does not include a comparison of offset program provisions in S. 1733, since that bill specifies that implementation of the offsets program would be delegated to the President, with only a few specific duties delegated to particular agencies. The comparison in the table is not exhaustive, but meant to highlight key differences between the programs, with a particular focus on the differing roles and responsibilities of EPA and USDA regarding agricultural and forestry offsets within the various programs that would be established by these two bills.

Program Overview

Both H.R. 2454 and S. 1733 would allow covered entities, in aggregate, to submit 2 billion tons of offsets each year. However, each covered entity is restricted to a percentage of emission reductions that can be met through carbon offsets. The House and Senate programs specify different formulas for determining the annual percentage of offsets that each covered entity could use to meet its compliance obligation. The House and Senate bills also differ in their allowable proportions of domestic and international offsets. Under the House bill, 50% of a covered entity's allowable offset submission could come from domestic projects, and 50% from international projects. Under the Senate bill, the ratio is 75% from domestic projects and 25% from international projects. Both bills provide conditional authority for EPA to increase (on an annual

[47] See, for example, the press release by Representative Kratovil, "Kratovil Backs American Clean Energy and Security Act," June 29, 2009, http://kratovil.house.gov/index.cfm?sectionid=22&parentid=21&sectiontree=21,22&itemid=155.

[48] For example, comments during the Senate Committee on Agriculture, Nutrition and Forestry, July 22, 2009.

[49] See "Attachment A" of the testimony of John J. McMackin, Energy-Intensive Manufacturers' Working Group on Greenhouse Gas Regulation, House Committee on Energy and Commerce Subcommittee on Energy and Environment, "Hearing on Competitiveness and Climate Policy: Avoiding Leakage of Jobs and Emissions," March 18, 2009, http://energycommerce.house.gov/Press_111/20090318/testimony_mcmackin.pdf.

[50] See CRS Report R40896, *Climate Change: Comparison of the Cap-and-Trade Provisions in H.R. 2454 and S. 1733.*

basis) the percentage of international offsets allowed; the annual volume of international offsets could reach up to 1.5 billion tons in H.R. 2454, but could not exceed 1.25 billion tons in S. 1733.

Program Administration

H.R. 2454 and S. 1733 authorize different agencies to implement their respective offset programs. The Senate bill would delegate domestic program authority to the President. The House bill would effectively create two offset programs: a domestic agriculture and forestry program implemented by USDA (Title V); other domestic projects and all international projects would be under the primary authority of EPA (Title III). Aside from differences in implementing agencies, the provisions in Title III and Title V are similar. The separate offset jurisdictions between EPA and USDA are created by the revised definitions of "domestic offset credit" and "offset credit." These terms now have different meanings between Part C and Part D of Title III. In effect, these changes allow (domestic) offset credits generated under Title V (agricultural and forestry offsets) to be used for compliance per Title III, Part C (i.e., the emissions cap obligations), but would separate the implementation of offsets generated under Title III (Part D) and Title V between EPA and USDA. This could raise questions about whether the Title V offsets may be used for compliance under Title III, Part C.[51]

Eligible Projects

Initially, H.R. 2454, as reported, did not specifically include certain agricultural and forestry offset projects, and Title III offset program did not include an explicit list of offset practices. Title V in the House-passed bill, however, includes an explicit list of offset practices. This "initial list" includes eligible agricultural and forestry offset project types that USDA will *consider*: "At a minimum, the list prepared under this section shall include those practices that avoid or reduce greenhouse gas emissions or sequester greenhouse gases, such as ... " (Sec. 503(b)). What remains in question is whether H.R. 2454's use of the phrase, "such as," merely refers to projects that USDA should consider (among other types of projects) or whether USDA would be required to specifically include the types of projects listed in Sec. 503(b). **Appendix B** provides a listing of the types of agricultural and forestry offset projects that USDA would consider.

Under either the Title III or the Title V programs of H.R. 2454, the process would be roughly as follows: the implementing agency would establish a list of eligible project types and associated methodologies through a rulemaking process; the offset project developers would submit a petition to the implementing agency; the implementing agency would approve or reject the petition; third-party verifiers would inspect the project, validating the emission reductions projected in the petition, and submit a report to the relevant agency; and the relevant agency would distribute offset credits based on the verification report (i.e., after the emission reduction or sequestration has occurred).

S. 1733 includes a list of specific agricultural and forestry offset projects; however, the Senate bill would delegate domestic program authority to the President. In general, the agriculture community is supporting replacing the agriculture and forestry carbon offset program provisions in S. 1733 with the offset provisions in S. 2729. This bill includes a different "initial list" (Sec. 104(b)) and places primary authority for administrating of the agricultural and forestry offsets program with USDA (**Appendix B**).

[51] For information see CRS Report R40896, *Climate Change: Comparison of the Cap-and-Trade Provisions in H.R. 2454 and S. 1733*.

Agricultural and Forestry Practices That Reduce Emissions and/or Sequester Carbon

Farming Practices

Land retirement, conversion, and restoration—conversion/restoration to grasslands, wetlands, or rangelands; and selected structural barriers, such as vegetative and riparian buffers, setbacks, windbreaks.

Cropland tillage practices—reduced/medium- till, no-till, ridge/strip-till vs. conventional tillage.

Soil management/conservation—soil supplements/amendments, soil erosion controls; precision agriculture practices, recognized best management practices.

Cropping techniques—crop rotations, cover cropping, precision agriculture practices, efficient fertilizer/nutrient (including manure) and chemical application.

Manure and feed management—improved manure storage, e.g., anaerobic digestion, methane recovery; and improved feed efficiency, dietary supplements.

Grazing management—rotational grazing, improved forage practices.

Bioenergy/biofuels substitution—on-farm use, replacing fossil fuels or deriving bioenergy from land-based feedstocks, renewable energy).

Energy efficiency/conservation (on-farm).

Forestry Practices

Afforestation/Reforestation—establishing forested areas, planting trees or their seeds.

Forest management—variety of practices, that increase growth on some stems while releasing some carbon such as: harvest for long-term wood products; reduced impact logging; certified sustainable forestry; thinning/release (mechanical, chemical, prescribed burning); fertilization; and pruning.

Avoided deforestation/forest degradation (primarily a tropical forest issue).

S. 2729 also includes include a list of specific agricultural and forestry offset projects; however, S. 2729 differs from H.R. 2454 in that it seems to identify agricultural and forestry projects that are to be included: USDA "shall include on the list ... , at a minimum, activities that provide emission reductions and meet the requirement" as identified in the "initial list" of projects (Sec. 104(b)), including various non-agricultural projects under EPA's lead.

The table in **Appendix B** compares the "initial list" of eligible agricultural and forestry carbon offset projects, among other types of offset projects, as identified either for consideration and/or for inclusion as part of the proposed carbon offset program. This comparison is based on identified offset projects in H.R. 2454, S. 2729, and S. 1733.

In general, the types of conservation and farmland management practices that reduce GHG emissions and/or sequester carbon included in all three bills 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 bill, the 2008 "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 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 2008 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.[52]

However, the list of agricultural and forestry practices that reduce GHG emissions and/or sequester carbon can be extensive and may include a wide possible range of activities (see, for example, text box). 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.

Early Offset Provisions

All three bills contain provisions for "early offset supply" or allowances for early offset credits for projects that are already approved and registered with existing carbon offset credit programs meeting certain conditions and criteria. Such provisions are important to the U.S. agricultural sectors, given the sectors' ongoing participation in voluntary carbon market programs,[53] and are often regarded as a way to reward "early actors" who have been involved in agricultural or forestry practices that offset GHG emissions. In general, all three bills allow for eligible activities under an offset project that started after January 1, 2001. However, both H.R. 2454 and S. 1733 give sole authority to EPA to approve existing offset programs, whereas S. 2729, gives authority to EPA, in conjunction with USDA, to approve existing programs. S. 2729 would also provide for greater flexibility to approve existing programs, among other differences.

Stackability[54]

S. 2729 provides for additional flexibility in designing carbon offset standards, compared to H.R. 2454 and S. 1733, by specifically addressing concerns about "stackability." In biologicial sequestration offset projects, such as those in the agricultural and forestry sectors, the concept of "stackability" refers to the ability of certain practices and activities to decrease atmospheric concentrations of GHGs, as well as to provide other non-climate-related ecosystem services, such as improved water quality and enhanced wildlife habitat. Proponents of "stackability" generally argue that offset project developers should be able to market these services separately and earn distinct financial benefits for each ecosystem service (assuming a funding source exists that would support each service).[55] Accordingly, the financial rewards for different ecosystem services would be "stackable," and the receipt of funding from one source (e.g., buyers in the offset marketplace) would not preclude the receipt of funding from another source (e.g., a government

[52] 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*; CRS Report R40692, *Agricultural Conservation Issues in the 111th Congress*; and CRS Report RL31432, *Carbon Sequestration in Forests.*

[53] For more information, see CRS Report RL33898, *Climate Change: The Role of the U.S. Agriculture Sector*.

[54] Information for this section is provided by Jonathan Ramseur, CRS Specialist in Environmental Policy.

[55] For example, some argue that a soil sequestration project should be able to generate offset credits for its GHG sequestration services and a Conservation Reserve Program (CRP) payment for the project's ability to provide erosion control.

grant). USDA has recognized the potential credits generated by these conservation programs and has removed any claim on the credits through recent changes to many of the program rules. [56]

However, allowing an offset project to accrue stackable benefits may raise concerns of additionality. If non-climate-related incentive programs or ecosystem service markets could provide financial support for a particular offset project, observers may question whether the project would have happened anyway. In some situations, an additionality assessment may be relatively straightforward. If the non-climate-related incentives stimulate activities that would mitigate GHG emissions (as a secondary effect) without the support of the offset market, the activity would not likely qualify as additional in terms of carbon offsets. On the other hand, some offset projects may not be economically viable without multiple sources of funding—combining a payment from the offset market with grants from non-climate-related government programs.[57] Thus, in some situations a determination of additionality may entail a degree of subjectivity.[58]

Permanence and Reversals[59]

GHG emissions from covered sources (e.g., power plants) will remain in the atmosphere for a relatively permanent basis (at least in the context of human lifetimes).[60] Arguably, credible offsets should maintain a degree of permanence on par with their counterpart emissions (from capped sources). Indeed, many of the recent cap-and-trade proposals (e.g., H.R. 2454 and S. 1733) have required that offsets be permanent.

Although sound as an offset principle, this requirement would likely present implementation challenges (as with many offset projects, permanence may be more difficult to monitor at international projects). With some offset projects there may be a concern that the emission offsets will be subsequently negated by human activity—change in land use—or a natural occurrence—forest fire, disease, or pestilence. In offsets parlance, such occurrences are described as reversals. Reversals are most pertinent to biological sequestration projects, specifically forestry activities.[61]

Recent cap-and-trade proposals have directed the implementing agency to account for reversals by establishing an offsets reserve (or insurance or other appropriate mechanism). Before offset

[56] The following program rules include a section recognizing the credits generated by programs and asserting no direct or indirect claim on these credits: EQIP (Sec. 1466.36, 74 *Federal Register* 2317), WRP (Sec. 1467.20, 74 *Federal Register* 2336), AMA (Sec. 1465.36, 73 *Federal Register* 70256), GRP (Sec.1415.10, 74 *Federal Register* 3875), FPP (Sec. 1491.21, 74 *Federal Register* 2822), WHIP (Sec. 636.21, 74 *Federal Register* 2800), CRP (Sec. 1410.63(6), 68 *Federal Register* 24845), and HFRP (Sec. 625.8, 74 *Federal Register* 1967).

[57] For example, installing a methane digester.

[58] For more information, see CRS Report RL34436, *The Role of Offsets in a Greenhouse Gas Emissions Cap-and-Trade Program: Potential Benefits and Concerns*.

[59] Information for this section is provided by Jonathan Ramseur, CRS Specialist in Environmental Policy.

[60] Atmospheric lifetimes different greatly among GHG—from minutes to tens of thousands of years, with CO_2 typically assumed to have half remaining in the atmosphere after about 100 years. The long-lived gases continue to influence the climate as long as they remain in the atmosphere. Thus, emissions of, say, CO_2 today are expected to continue to affect climate for hundreds of years. See CRS Report RL33849, *Climate Change: Science and Policy Implications*, by Jane A. Leggett.

[61] The risk of reversals in forestry projects has likely played a role in their limited use in the Clean Development Mechanism (CDM). Although many observers expected forestry offsets to play a large role in the CDM, this has not been observed in practice. See Frank Lecocq and Philippe Ambrosi, "The Clean Development Mechanism: History, Status, and Prospects," *Review of Environmental Economics and Policy* (Winter 2007), pp. 134-151.

credits would be issued, the relevant agency would place in the reserve a portion of the offsets to be issued: the number of credits set-aside would be based on the project's risk of reversal. If an unintentional reversal occurred, the agency would cover the loss from reserve credits, and the project developer would likely be required to replenish some portion of the used reserve credits. An offset program would likely have more stringent provisions for intentional reversals.

Another approach to address permanence concerns is to allow offset projects to generate temporary offset credits. Under this approach, offset credits would expire at the end of their term, and need to be replaced with emission allowances or unexpired offset credits. This option may allow more opportunities for projects that would have had trouble guaranteeing permanence. However, the degree to which covered entities would utilize this option is uncertain, considering that emission allowances and offset credits would likely be more expensive when the term credit expired.

Funding for Carbon Conservation and Research Programs

Other provisions in Senator Stabenow's bill, S. 2729, include a provision to create the Carbon Conservation Program (Title II) for farmers to engage in new approaches to GHG reductions and sequestration, and a provision to provide funding to support climate-related research in agriculture, including research on adaptation to changing weather patterns (Title IV).

The bill's Carbon Conservation Program would be established by USDA and jointly administered with the Department of the Interior. The program would promote GHG emissions reduction or carbon sequestration by providing incentives for projects or activities that reduce GHG emissions or sequester carbon but that may not be eligible as carbon offsets. Project types might include longer-term conservation easements, sequestration contracts, or timber harvest or grazing contracts. Funding for the program would be made available through a newly established Carbon Conservation Fund.

The bill would also provide funding for research and demonstration projects, including quantification techniques, from activities or new approaches to sequester carbon through agricultural, grazing, and forestry practices; reduce methane and nitrous oxide emissions associated with agricultural production; assist with adaptation of agricultural and forestry practices to the effects of climate change; assist specialty crop producers to reduce net GHG emissions or sequester carbon; and reduce uncertainties in estimating GHG emission reductions and carbon sequestration through agricultural and forestry activities.

International Forest Protection[62]

Both the House-passed bill (H.R. 2454) and the Senate-reported bill (S. 1733) contain provisions addressing deforestation. Tropical deforestation is estimated to contribute about 17% of all GHG emissions, and many see reducing emissions from deforestation and forest degradation (REDD) as critical to ameliorating global climate change. The two bills generally address international forest protection in two ways: allowances and REDD offsets. Both contain allowances, which can be used (1) to build capacity in developing nations to protect their forests and to make REDD offsets feasible, and (2) to supplement U.S. emissions reductions by directly reducing tropical

[62] Information for this section is provided by Ross Gorte, CRS Specialist in Natural Resources Policy.

deforestation. Both also allow REDD offsets, within limits, to be purchased by covered U.S. entities to achieve their emissions reduction targets. H.R. 2454 uses the U.S. Environmental Protection Agency to implement the international forestry provisions, while S. 1733 uses the U.S. Agency for International Development. Both bills contain provisions on eligibility of developing countries and on implementation of REDD offsets and for supplemental emissions reductions; H.R. 2454 generally contains more details on such provisions than does S. 1733.

Concerns persist about the REDD allowances and offsets in the bills. Many developing countries do not have the capacity (including personnel and equipment) to measure, monitor, and enforce forest carbon sequestration. While both bills permit allowances to be used for capacity building, neither defines acceptable capacity-building activities nor specifies the allowance allocation between capacity building and supplemental emissions reductions or among developing nations. Concerns about REDD offsets include general issues over offsets—their verification (measuring, monitoring, and reporting carbon sequestration), their additionality (activities not already occurring or required), their permanence, and leakage (shifting deforestation to other locations). In addition, some are concerned that allowing REDD offsets will inhibit the development of technologies and strategies to reduce domestic carbon emissions and may prevent developing countries from committing to GHG reductions and from growing low-carbon economies.

For additional information, see CRS Report R40990, *International Forestry Issues in Climate Change Bills: Comparison of Provisions of S. 1733 and H.R. 2454*, by Pervaze A. Sheikh, Ross W. Gorte, and Marianne Burke.

Carbon Energy and Biomass Activities

Both H.R. 2454 and S. 1733 provide for renewable biomass and biofuels feedstock provisions involving agriculture and forestry activities. However, the provisions outlined in these bills differ in terms of eligibility, according to the biomass definition in these bills. These provisions relate to other actions by EPA to revise the Renewable Fuel Standard (RFS) program, as required by the Energy Independence and Security Act of 2007 (EISA, P.L. 110-140).

In May 2009, EPA announced its proposal to revise the RFS program, as required by EISA.[63] The revised statutory requirements establish new specific volume standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that must be used in transportation fuel each year. These revised requirements include new definitions and criteria for both renewable fuels and the feedstocks used to produce them, and also new GHG thresholds for renewable fuels. These RFS requirements will apply to domestic and foreign producers and importers of renewable fuel.

Two areas of the proposed EPA rulemaking have caused concerns among those in the U.S. agricultural sector: (1) the EISA biomass definition and (2) the requirement that EPA consider "indirect land use" effects when calculating GHG emissions associated with advanced biofuels.[64] To address these issues, in May 2009, the Chairman of the House Committee on Agriculture

[63] 74 *Federal Register* 24904-25143, May 26, 2009. EISA significantly expanded the RFS established in the Energy Policy Act of 2005 (P.L. 109-58). The RFS now requires the use of 9.0 billion gallons of renewable fuel in 2008, increasing to 36 billion gallons in 2022. For more information, see http://www.epa.gov/otaq/renewablefuels/.

[64] These provisions also relate to EPA proposed revisions to the national Renewable Fuel Standard (RFS) to establish new specific volume standards and requirements for renewable fuels.

introduced legislation (H.R. 2409) seeking changes to these requirements. These and related issues were discussed at a House Agriculture Committee hearing in June 2009 as part of its review of pending climate change legislation.[65] In addition, H.R. 2454 contains language intended to partly address these issues; similar language has also been added to S. 1733.

Regarding the renewable biomass definition, the agriculture component of the EISA definition limits acreage eligibility to produce biomass feedstock to "planted crops and crop residue harvested from agricultural land cleared or cultivated at any time prior to the enactment."[66] Initially this same definition was included in H.R. 2454. The House Agriculture Committee proposed a more expansive biomass definition in law, such as the 2008 farm bill definition.[67] H.R. 2409 proposes to change the EISA definition to the 2008 farm bill definition. Both H.R. 2454 and S. 1733 include yet other alternate definitions of renewable biomass. For more information, see CRS Report R40529, *Biomass: Comparison of Definitions in Legislation*, by Kelsi Bracmort and Ross W. Gorte.

Regarding indirect land use and life-cycle analysis when calculating GHG emissions associated with advanced biofuels, the Chairman of the House Agriculture Committee has argued that, currently, "there is no reliable method to predict accurately how biofuel production will affect land use in the United States or internationally," and is concerned that this requirement could limit the availability and development of new feedstocks for biofuels and make it difficult to meet the RFS mandates set forth in EISA. These and related issues were discussed at a House Agriculture Committee hearing in June 2009 as part of its review of pending climate change legislation.[68] Both H.R. 2454 and S. 1733 include a provision that would require studies to determine whether models exist or can be developed to adequately predict international indirect land use change from biofuels.[69]

For more information, see CRS Report R40155, *Selected Issues Related to an Expansion of the Renewable Fuel Standard (RFS)*, by Brent D. Yacobucci and Randy Schnepf and CRS Report R40460, *Calculation of Lifecycle Greenhouse Gas Emissions for the Renewable Fuel Standard (RFS)*, by Brent D. Yacobucci and Kelsi Bracmort.

Senator Stabenow's bill (S. 2729, Title III, Rural Clean Energy Resources) also addresses production and use of biofuels and bioenergy, and expands upon certain existing bioenergy programs in the Food, Conservation, and Energy Act of 2008 ("Farm Bill," 7 U.S.C. 8701 et seq.). Funding for these existing and expanded programs would be through a newly created fund, called the "Rural Clean Energy Resources Fund," which would also be used to fund other carbon mitigation programs in S. 2729.

[65] House Committee on Agriculture hearing, "To review pending climate legislation," June 11, 2009. Testimonies are at http://agriculture.house.gov/hearings/statements.html.

[66] See P.L. 110-140, Energy Independence and Security Act of 2007, Title II, Sec. 201(1)(I).

[67] See P.L. 110-246, Food, Conservation, and Energy Act of 2008, Title IX, Sec. 9001(12).

[68] House Committee on Agriculture hearing, "To review pending climate legislation," June 11, 2009. Testimonies are at http://agriculture.house.gov/hearings/statements.html.

[69] See Sec. 553 of Peterson's Amendment: http://www.eenews.net/public/25/11492/features/documents/2009/06/25/document_gw_01.pdf.

Other Related Initiatives

Various other potential regulatory and legislative initiatives related to the climate change debate could affect U.S. agriculture. The most significant and immediate are two EPA rulemakings: (1) a final rule mandating GHG emissions reporting from selected sectors and (2) a solicitation for comment on how EPA should respond to GHGs under the Clean Air Act. In some cases, the House and Senate energy and climate bills contain provisions that address some of these issues.

EPA's Mandatory GHG Emissions Reporting Rule

On September 22, 2009, EPA announced its final rule to require mandatory reporting of GHG emissions from large sources in the United States to collect emissions data to inform future policy decisions.[70] Both H.R. 2454 and S. 1733 contain provisions that would require climate registries to "collect high-quality greenhouse gas emission data from facilities, corporations, and other organizations to support various GHG emission reporting and reduction policies." These bills do not specifically identify the extent to which the U.S. agriculture sector would be affected.

EPA's final reporting rule does not require control of GHGs; rather it requires only that sources above certain threshold emission levels monitor and report emissions. EPA estimates that the rule will cover about 85% of the nation's GHG emissions and apply to roughly 10,000 facilities.

The only farm-level production category subject to EPA's final rule are livestock facilities with a manure management system. Affected operations are those that meet or exceed the reporting threshold of 25,000 metric tons of CO_2-equivalent, based on the following animal population thresholds: 29,300 head of beef cows, 3,200 dairy cows, 34,100 hogs, 723,600 layers, 38,160,000 broilers, and 7,710,000 turkeys.[71] EPA estimated that there will be approximately 107 livestock facilities that will need to report under the rule.[72] These operations will be required to report aggregate methane (CH_4) and nitrous oxide (N_2O) emissions from certain manure management system components. Operations that use anaerobic digesters will be required to report CH_4 generated and destroyed, and any CH_4 leakage at the digester. The final rule excludes other agricultural categories that are known to contribute to GHG emissions, including "enteric fermentation" (livestock digestion), rice cultivation, field burning of agricultural residues, composting (except when associated with manure management), agricultural soils, settlements, forestland or other land uses and land-use changes, or emissions associated with deforestation, and carbon storage in living biomass or harvested wood products.

At this time, EPA's final rule does not address emissions from certain food processing sectors. EPA claims that "the sources of GHG emissions at food processing facilities that were to be reported under the proposed rule were stationary fuel combustion, onsite landfills, and onsite

[70] 74 *Federal Register* 56260, October 30, 2009. See EPA's website: http://www.epa.gov/climatechange/emissions/ghgrulemaking.html. EPA promulgated the rule in response to direction in the FY2008 Consolidated Appropriations Act (H.R. 2764; P.L. 110-161, Title II).

[71] Rule Part 98, subpart JJ, "Animal Population Threshold Level Below which Facilities are not required to report Emissions under Subpart JJ," Table JJ-1 of Subpart JJ, September 2009, http://www.epa.gov/climatechange/emissions/downloads09/RuleParts98SubpartsAA-PP.pdf.

[72] Ibid, p. 422.

wastewater treatment;" however, the agency has decided not to finalize the portion of the rule covering landfills and wastewater treatment.[73]

Facilities subject to reporting would report annually, starting in 2011. For more information, see EPA's preamble, fact sheets, and cost analysis.[74] Also see CRS Report RL32948, *Air Quality Issues and Animal Agriculture: A Primer*, by Claudia Copeland and CRS Report R40585, *Climate Change: Potential Regulation of Stationary Greenhouse Gas Sources Under the Clean Air Act*, by Larry Parker and James E. McCarthy.

EPA's "Endangerment Finding"

In December 2009, EPA published its final determination that the combined GHG emissions from new motor vehicles in the United States contribute to an "endangerment" from climate change. More precisely, EPA found that such emissions, in the words of Clean Air Act section 202(a) (42 U.S.C. Sec. 7521(a)), "cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare." [75] Many in the agricultural sectors are concerned that this action may set the stage for a series of rules to regulate GHG emissions in other sectors, including the U.S. agricultural sectors.[76]

EPA's endangerment finding follows action taken by EPA in 2008 when it issued an Advance Notice of Proposed Rulemaking (ANPR).[77] Since that time, there has been confusion about the extent that U.S. agriculture would be affected by that proposed rule. Some farm groups believed that, as part of the notice, EPA was proposing to impose a "cow tax" on livestock operations.[78] However, the ANPR did not recommend the use of any particular CAA authority to regulate any emissions, nor did it commit to specific next steps to deal with GHGs, and it did not include a formal proposal to regulate GHGs. Among the options discussed in the ANPR was the potential to use the CAA's permitting program (in Title V) to regulate sources of GHG emissions. Agricultural sources were not singled out or highlighted in this discussion. The ANPR did mention the agricultural sectors, but only as background discussion as a source of GHGs, similar to that for other sectors, such as electric utilities. The Title V permit program does require regulated sources to pay permit fees to states, which could be the source of concern among some that, if EPA were to use the permitting program in the CAA to regulate GHGs, which some claim

[73] Preliminary text and preamble for EPA's Mandatory Reporting of Greenhouse Gases, available at http://www.epa.gov/climatechange/emissions/downloads09/FinalMandatoryGHGPreamble.pdf.

[74] EPA, Manure Management and Agriculture factsheets, http://www.epa.gov/climatechange/emissions/downloads/ManureManagementSystems.pdf and http://www.epa.gov/climatechange/emissions/downloads/GuideAgricultureLivestockSectors.pdf, and "Economic Cost Analysis (RIA)," http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf.

[75] 74 *Federal Register* 239, 66496-66546, December 15, 2009, http://www.epa.gov/climatechange/endangerment/downloads/Federal_Register-EPA-HQ-OAR-2009-0171-Dec.15-09.pdf. See also CRS Report R40984, *Legal Consequences of EPA's Endangerment Finding for New Motor Vehicle Greenhouse Gas Emissions.*

[76] See, for example, American Farm Bureau Federation press release, December 7; and the National Cattlemen's Beef Association, "EPA Greenhouse Gas Ruling Could Be Devastating To Agriculture," *AgNetwork*, December 8, 2009.

[77] 73 *Federal Register* 147, 44354-44402, July 30, 2008. The ANPR presented information and solicited comment on how EPA should respond to a 2007 Supreme Court ruling that the agency has authority under the CAA to address GHG emissions. Information in this section was provided by CRS Senior Specialist Claudia Copeland.

[78] See, e.g., American Farm Bureau Federation (AFBF) press release, "AFBF Opposes EPA-Proposed Tax on Livestock," November 20, 2008.

would automatically result in mandatory fees.[79] EPA noted in its ANPR that the CAA allows considerable flexibility in setting fee schedules. EPA also stated that in the event of future regulation, it would be appropriate for permitting agencies to use that flexibility in setting any permit fees (by lowering fees for GHGs, compared with other pollutants, or setting lower fees for smaller sources, or other means).[80]

Some of these same issues and concerns have persisted regarding EPA's endangerment finding. However, it remains unclear whether this action will trigger other obligations by EPA that could affect the U.S. agricultural sectors.

In March 2009, Senator Thune and Representative Lucas introduced bills (S. 527 and H.R. 1426, respectively) that would prevent EPA from imposing Title V operating permits for controlling GHGs resulting from biological processes associated with livestock production. The House Interior, Environment, and Related Agencies appropriations bill (H.R. 2996, Sec. 420) includes a similar provision prohibiting the use of available funds to promulgate or implement any regulation requiring the issuance of permits under Title V of the Clean Air Act "for carbon dioxide, nitrous oxide, water vapor, or methane emissions resulting from biological processes associated with livestock production." In October 2009, the FY2010 interim appropriations conference agreement included an amendment to block EPA efforts to require permits for GHGs emitted by livestock.

[79] AFBF press release, "Farm Bureau Calls 'Cow Tax' Bill Timely and Critical," March 5, 2009.

[80] For information, see CRS Report RL32948, *Air Quality Issues and Animal Agriculture: A Primer*, by Claudia Copeland.

Appendix A. Selected Differences in Offset Provisions: H.R. 2454 and S. 2729

	H.R. 2454	S. 2729
Selected Definitions	Title V, Sec. 501(b), states that agricultural and forestry sectors are not considered "capped sectors" (defined as a "sector of economic activity that directly emits capped emissions") for the purposes of Title III (the cap-and-trade provisions) or Title V. The phrase "capped sector" appears nowhere else in the bill. In addition, "agricultural and forestry sectors" are not defined in Title V or any other section of H.R. 2454.	Defines "appropriate official" as the Secretary of Agriculture with respect to domestic agricultural and forestry projects; the EPA Administrator is the "appropriate official" with respect to all other project types.
Establishment of technical advisory boards and/or committees	Title III (Reducing Global Warming Pollution) addresses the bill's offset program, generally. Directs EPA's Administrator to establish an independent *Offsets Integrity Advisory Board* (Title III, Sec. 301 "Part D—Offsets, Sec. 731"). Provides guidance on the Board's membership, activities, and scientific review (Part D—Offsets, Sec. 731 (b)-(d)). Title V (Agricultural and Forestry Related Offsets) addresses the bill's offset program for domestic agricultural and forestry projects. Directs USDA Secretary to establish the *USDA Greenhouse Gas Emission Reduction and Sequestration Advisory Committee* under section 1245(f) of the Food Security Act of 1985 (16 U.S.C. 3845). Provides guidance on membership, terms, duties, and scientific review (Subtitle B, Sec. 531(f)). The Advisory Committee is to recommend "methodologies to address... additionality, activity baselines, measurement, leakage, including the application of sector specific leakage factors, uncertainty, permanence, and environmental integrity" (Title V, subtitle B, Sec. 531(f)(4)).	Directs USDA and EPA to jointly establish a *Greenhouse Gas Emission Reduction and Sequestration Advisory Committee* to provide scientific and technical advice on the establishment and implementation of an offset project program with respect to offset projects under the jurisdiction of the Secretary and the Administrator (Sec. 102(a)(1)). References existing authorities, as appropriate: the Clean Air Act (42 U.S.C. 7401 et seq.); the Federal Advisory Committee Act (5 U.S.C. App.); and section 1245 of the Food Security Act of 1985 (16 U.S.C. 3845). Provides guidance on membership, duties (including reporting), expertise, powers, and personnel matters (Sec. 102(c)-(f)). The Joint Advisory Committee recommendations will cover quantifying credits, additionality, leakage, uncertainty, verification, insurance requirements (including buffer reserves and reversals), and minimizing administrative costs (Sec. 103(d)).
Establishment of domestic carbon credit offset programs	Establishes two offset programs: (1) directs EPA to establish an offsets program within 2 years of enactment (Title III, Sec. 301, "Part D—Offsets, Sec. 732"); (2) Direct USDA to establish an "Offset Credit Program from Domestic Agricultural and Forestry Sources," within 1 year of enactment (Title V, subtitle A, Sec. 502). Directs USDA to establish (1) methodologies by practice types for quantifying GHG benefits, for establishing activity baselines and determining additionality, for accounting for and mitigating potential leakage; (2) establish rules to account for and address reversals and third-party verification; (3) provide technical assistance to offset project developers; (4) establish rules for approval of offset project plans, for certification of implementation of offset project plans, and for reporting and record keeping; and (5) conduct audits (Title V, subtitle A, Sec. 502). Similar provisions required for EPA's program under Title III. Among	Directs USDA and EPA to establish a *Program to Credit Emission Reductions from Uncapped Domestic Sources and Sinks*, covering both agriculture and forestry projects, and non-agricultural projects within 1 year of enactment (Sec. 103). Further directs USDA to gather data; provide such information to landowners and project representatives; provide technical assistance; expand existing USDA training and accreditation programs for third-party technical service providers; conduct outreach, education, and training; and promulgate regulations (Sec. 103). Does not include "permanence" language found in H.R. 2454 (Titles III and V). Instead, for agricultural and forestry sequestration projects listed under Sec. 104, directs USDA to "develop mechanisms... to ensure that less-than-perpetual sequestration agreements" meet the requirements and maintain the integrity of the overall GHG emission reduction targets (Sec. 105(b)).

	H.R. 2454	S. 2729
	other requirements, EPA regulations must "ensure offset credits issued for sequestration offset projects are only issued for GHG reductions that are permanent" (Title III, Sec. 301, "Part D—Offsets, Sec. 732(b)"). Gives EPA authority to set fees payable by the project developers to cover EPA's administrative costs (Title III, Sec. 301, "Part D—Offsets, Sec. 732(f)").	
Eligible projects to generate offset credits	Directs USDA and EPA to develop a list of eligible offset practice types. For agricultural and forestry projects: "At a minimum, the list prepared... shall include those practices that avoid or reduce GHG emissions or sequester greenhouse gases" ("such as" those listed in Title V, Subtitle A, Sec. 503(b)). By using the phrase, "such as," the House text appears not to require the projects listed to be specifically included on the eligible list. Provides for USDA to add practices or revise the list and allows parties to petition USDA to add practices to the list. For other eligible projects, EPA "shall establish, and may periodically revise, a list of types of projects eligible to generate offset credits, including international offset credits" (Title III, Sec. 301 "Part D—Offsets, Sec. 733"). Unlike Title V, Title II does not contain a list of potential project types.	Identifies USDA as the lead agency for eligible agricultural and forestry projects listed in Sec. 104(b) (Sec. 103(c)(2)). EPA is the lead agency for other eligible projects listed in Sec. 104. For agricultural and forestry projects: USDA "shall include on the list..., at a minimum, activities that provide emission reductions and meet the requirement" as outlined (for projects listed in Sec. 104(b)), including various non-agricultural projects under EPA's lead. Contains a list of project types that, at a minimum, are to be included (not just considered) on the list of eligible projects listed in Sec. 104. Per section 103, USDA would create the list for agricultural and forestry projects; EPA would create the list for all other eligible project types. Provides for revising the list or allowing parties to submit petitions for list additions.
Establishment of offset registries	EPA shall establish an Offset Registry for qualifying offset projects and offset credits (Title III, Sec. 301, "Part D—Offsets, Sec. 732").	EPA, in consultation with USDA and other appropriate federal agencies, "shall establish a registry (or expand an established emission allowance registry) for use in recording approved credits issued under this section to reflect emission reductions from uncapped sources and sinks" within 1 year after enactment (Sec. 103(b)).
Requirements for offset projects	For domestic agricultural and forestry projects, directs USDA to develop methodologies (covering activity baselines, additionality, quantification methods, and leakage); address other considerations (such as existing offset practices); reversals; term offset credits; crediting periods; and environmental integrity (Title V, subtitle A, Sec. 504). Crediting periods are limited: 5 years for agricultural sequestration; 20 years for forestry sequestration; and 10 years for other projects and practices (Sec. 504(e)). USDA may issue "term offset credits" in lieu of offset credits for offset practices with crediting periods of 5 years or less, but requires USDA to implement different reversal requirements for such credits. For other offset project types, EPA shall establish, for each type of offset project, methodologies (covering additionality, activity baselines, quantification methods, and leakage); accounting for reversals; crediting periods; environmental integrity; pre-existing methodologies; and added	Directs each "appropriate official" to establish (per a regulatory rulemaking process) methodologies or a performance standard for the eligible offset practices listed per section 104. Performance standards are not defined in the bill. Identifies USDA as the lead agency for establishing requirements for eligible agricultural and forestry projects listed in Sec. 104(b) (Sec. 105, Sec. 103(c)(2)). EPA is the lead agency for establishing requirements for other eligible projects listed in Sec. 104. For agricultural and forestry projects, directs USDA to develop methodologies (covering additionality, activity baselines, determining GHG reductions achieved by an offset project, accounting for and mitigating potential leakage); accounting for reversals; crediting periods; emission reduction integrity; preexisting methodologies; additional benefits; and data collection (Sec. 105(a)-(g)).

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	project types (Sec. 301, Title III, "Part D, Offsets, Sec. 734").	The "appropriate official" (depending on whether an EPA or USDA project) will specify crediting periods for each practice. Specifies that crediting periods must be between 5 and 10 years, except for forestry activities, which cannot exceed 30 years. Directs the "appropriate official" (depending on whether an EPA or USDA project) to develop a process that accounts for "reversals." These provisions are similar to H.R. 2454, except that the intentional reversal provisions are more stringent in S. 2729. Unintentional reversals are not specifically addressed. Includes a provision that allows USDA to "develop mechanisms... to ensure that less-than-perpetual sequestration agreements" meet the requirements and maintain the integrity of the overall GHG emission reduction targets (Sec. 105(b)). This may be intended to address issues such as permanence. For example, these provisions would seem to allow for the creation of mechanisms that would function similarly to a term offset credit and also potentially address unintentional reversals. Does not provide further guidance or detail on how this would work.
Additionality Requirements	Identifies eligible agricultural and forestry projects as those that are not required by or undertaken to comply with any law, including any regulation, or consent order; were not commenced prior to January 1, 2009 (with certain exceptions); and exceed the established activity baseline (Sec. 301, Part D "Offsets," Sec. 734(a)(1)(A-C)).	Eligible agricultural and forestry projects are those that are "not required by or undertaken to comply with any law (including any regulation or consent order, but excluding any contract); were not commenced prior to January 1, 2009," with certain exceptions; and exceed the established activity baseline (Sec. 105(a)(1)(A-C)).
Stackability	Does not include language addressing "stackability," [Note: Stackability is typically discussed in the context of biologicial sequestration offset projects. In addition to decreasing atmospheric concentrations of GHGs, biological sequestration projects may provide non-climate-related ecosystem services, such as improved water quality and wildlife habitat enhancement. Allowing an offset project to accrue stackable benefits may raise concerns of additionality.]	Addresses stackability: "Nothing in this section precludes an offset project from meeting the requirements of this section, or from approval under section 106, only because the relevant activity under section 104 receives an additional payment from another source for an ecological service other than emission reductions, including conservation program payments" (Sec. 105(f)).
Project approval of offset projects	Directs EPA to determine whether the offset project is eligible for issuance of offset credits (Sec. 301, Title III, "Part D, Offsets, Sec. 735"). Directs USDA to approve agriculture and forestry projects (Title V, subtitle A, Sec. 505).	USDA is the lead agency for approving eligible agricultural and forestry projects listed in Sec. 104(b) (Sec. 106, Sec. 103(c)(2)). EPA is the lead agency for approving other eligible projects.

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Verification of offset projects	Directs USDA to implement a verification and certification program for agricultural and forestry projects (Title V, Subtitle A, Sec. 506, Sec. 507). Directs EPA to establish requirements, including protocols, for verifying the quantity of GHG emission reductions or avoidance, or GHG sequestration, resulting from an offset project (Title III, Sec. 301, "Part D, Offsets," Sec. 736").	EPA and USDA would "jointly establish requirements, including protocols, for verification of the quantity of GHG emission reductions that have resulted from an offset project" (Sec. 107).
Issuance of offset credits	Directs EPA to issue offset credits to an offset project developer for each ton of carbon dioxide equivalent that EPA has determined has been reduced, avoided, or sequestered during the period covered (Title III, Sec. 301, "Part D, Offsets, Sec. 737").	Directs EPA, with USDA's consultation, to issue offset credits (Sec. 108).
Audits and reviews of offset credits	For agricultural and forestry projects, directs USDA to conduct annual random audits of offset projects, offset credits, and the practices of third-party verifiers (Title V, subtitle A, Sec. 511). USDA shall: "At least once every 5 years, ... review and, based on new or updated information and taking into consideration the recommendations of the Advisory Board, update and revise" the program (Title V, Subtitle A, Sec. 509). Similar requirements for EPA for other eligible projects.	Identifies USDA as the lead agency for auditing and review of eligible agricultural and forestry projects undertaked in Sec. 104(b) (Sec. 109, Sec. 103(c)(2)). EPA would audit and review other eligible projects.
Early Offset Supply	Directs EPA to issue one offset credit for each ton of carbon dioxide equivalent emissions reduced, avoided, or sequestered—(1) under an offset project that was started after January 1, 2001; (2) for which a credit was issued under any regulatory or voluntary GHG emission offset program that the Administrator determines, subject to certain specified conditions, and (3) for which the credit described in (2) is transferred to EPA (Title III, Sec. 301, "Part D, Offsets, Sec. 740"). Title V does not include similar language specific to agricultural and forestry offsets.	Directs EPA, in conjunction with USDA, to approve as a qualified early offset program any regulatory or voluntary GHG emission offset program that—(A) was established before January 1, 2009; (B) has developed or approved offset project-type standards, methodologies, and protocols through a public consultation process or a public peer review process; (C) has made available to the public the standards, methodologies, and protocols of the program for emission reduction projects; (D) requires that all emission reductions be verified by a State regulatory agency or an accredited third-party independent verification entity; (E) requires that all issued credits be registered in a publicly accessible registry, with individual serial numbers assigned for each ton of carbon dioxide equivalent emission reductions; and (F) ensures that no credits are issued for activities for which the administrator of the program has funded, solicited, or served as a fund administrator for the development of the project or activity that caused the emission reduction (Sec. 110(b)(3)).

Source: Prepared by CRS.

Appendix B. Comparison of Carbon Offset Project Types Identified in Legislation

H.R. 2454[a]	S. 2729	S. 1733[a]
afforestation or reforestation of acreage that is not forested	projects involving afforestation or reforestation of acreage not forested as of January 1, 2009	projects involving afforestation or reforestation of acreage not forested as of January 1, 2009
forest management resulting in an increase in forest carbon stores including but not limited to harvested wood products	forest management resulting in an increase in forest carbon stores, including harvested wood products	forest management resulting in an increase in forest carbon stores, including harvested wood products
no comparable language	projects that capture and geologically sequester uncapped GHG emissions with or without enhanced oil or methane recovery in active or depleted oil, carbon dioxide, natural gas reservoirs or other geological formations	no comparable language
no comparable language	recycling and waste minimization projects	no comparable language
no comparable language	projects to abate the production of nitrous oxide at nitric acid production facilities and other stationary sources	no comparable language
no comparable language	projects for biochar production/use	no comparable language
no comparable language	projects that destroy ozone-depleting substances that have been phased out of production	no comparable language
no comparable language	projects in communities reliant on small, isolated electricity grids involving conversion from diesel to renewable sources of energy, including electricity generation facilities with emissions below required levels for compliance with any limitation on district or home heating in those communities	no comparable language
altered tillage practices	altered tillage practices, including the avoided abandonment of conservation practices	altered tillage practices, including avoided abandonment of such practices; also practices to reduce and eliminate soil tillage
winter cover cropping, continuous cropping, and other means to increase biomass returned to soil in lieu of planting followed by fallowing	winter cover cropping, continuous cropping, and other means to increase biomass returned to soil in lieu of planting followed by fallowing	winter cover cropping, continuous cropping, and other means to increase biomass returned to soil in lieu of planting followed by fallowing

H.R. 2454[a]	S. 2729	S. 1733[a]
reduction of nitrogen fertilizer use or increase in nitrogen use efficiency	the use of technology or practices to improve the management of nitrogen fertilizer use, including slow and controlled-release fertilizers (e.g., absorbed, coated, occluded, or reacted fertilizers) and stabilized nitrogen fertilizers (e.g., urease, nitrification inhibitors, and nitrogen stabilizers) that are recognized by state regulators of fertilizers	reduction of nitrogen fertilizer use or increase in nitrogen use efficiency
reduction in the frequency and duration of flooding of rice paddies	reduction in methane emissions from rice cultivation	reduction in the frequency and duration of flooding of rice paddies
reduction in carbon emissions from organic soils	reduction in carbon emissions from organically managed soils and farming practices used on certified organic farms	reduction in carbon emissions from organic soils
reduction in GHG emissions due to changes in animal management practices, including dietary modifications	reduction in GHG emissions due to changes in animal management practices, including dietary modifications and pasture-based livestock systems	reduction in GHG emissions due to changes in animal management practices, including dietary modifications
no comparable language	resource-conserving crop rotations of at least 3 years	no comparable language
conservation of grassland and forested land	practices to increase sequestration of carbon in soils on cropland, hayfields, native and planted grazing land, grassland, or rangeland	conservation of grassland and forested land
improved forest management, including accounting for carbon stored in wood products	improved management or restoration of cropland, grassland, rangeland (including grazing practices), and forest land	improved forest management, including accounting for carbon stored in wood products
no comparable language	avoided conversion that would otherwise release carbon stocks	no comparable language
reduced deforestation or avoided forest conversion	reduced deforestation	reduced deforestation or avoided forest conversion
management of peatland or wetland	management and restoration of peatland or wetland	reductions in GHG emissions through restoration of wetlands, forestland, and grassland; and management of peatland or wetland
urban tree planting and maintenance	urban tree-planting, landscaping, greenway construction, and maintenance	urban tree planting and maintenance
agroforestry	sequestration of GHGs through management of tree crops	planting and cultivation of permanent tree crops; agroforestry; also sequestration of GHGs through management of tree crops
adaptation of plant traits or new technologies that increase sequestration by forests	adaptation of plant traits or new technologies that increase sequestration by forests	adaptation of plant traits or new technologies that increase sequestration by forests

H.R. 2454[a]	S. 2729	S. 1733[a]
no comparable language	projects to restore or prevent the conversion, loss, or degradation of vegetated marine coastal habitats	no comparable language
reduction in GHG emissions from manure and effluent manure management and disposal, e.g., waste aeration; biogas capture and combustion; and application to fields as a substitute for commercial fertilizer	projects that reduce emission reductions from manure and effluent, including (i) waste aeration; (ii) biogas capture and combustion; and (iii) improved management or application to agricultural land	reduction in GHG emissions from manure and effluent
no comparable language	projects that reduce the GHG intensity per unit of agricultural production	no comparable language
no comparable language	methane collection at mines, landfills, and natural gas systems	methane collection and combustion projects at active coal mines and landfills; capture of venting, flaring, and fugitive emissions from oil and natural gas systems
no comparable language	capture of fugitive emissions from the oil and gas sector that reduce GHG emissions that would otherwise be flared or vented	no comparable language
no comparable language	nonlandfill projects that involve collection, combustion, or avoidance of emissions from organic waste streams that would have otherwise emitted methane into the atmosphere, including manure management, composting, or anaerobic digestion projects	nonlandfill methane collection, combustion and avoidance projects involving organic waste streams that would have otherwise emitted methane in the atmosphere, including manure management and biogas capture and combustion
no comparable language	no comparable language	GHG emission reductions from improvements and upgrades to mobile/stationary equipment (including engines)

Source: Prepared by CRS.

Notes: "Included" under S. 2729 refers to language in the bill that specifies that for all offset projects, the "appropriate official" "shall include on the list ... , at a minimum, activities that provide emission reductions and meet the requirement." "Considered" under H.R. 2454 and S. 1733 refers to language in the bill that specifies that for agricultural and forestry projects, the list prepared shall include practices "such as" those listed.

a. Title III includes an offset program for domestic projects other than agriculture and forestry, but an analogous list of potential offset project types is not in Title III.

b. The text examined in the memorandum is based on information in the publicly available version of S. 1733, as of October 30, 2009.

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