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Biomass Crop Assistance Program (BCAP): Status and Issues

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Summary

The Biomass Crop Assistance Program (BCAP) is designed to assist the bioenergy industry to overcome the hurdle of continuous biomass availability—viewed as a critical deterrent to private sector investment in the cellulosic biofuels industry. To accomplish this, BCAP is charged with two tasks: (1) to support the establishment and production of eligible crops for conversion to bioenergy in selected areas, and (2) to assist agricultural and forest land owners and operators with collection, harvest, storage, and transportation (CHST) of eligible material for use in a biomass conversion facility.

BCAP was created in 2008 by the Food, Conservation, and Energy Act of 2008 (P.L. 110-246, 2008 farm bill), shortly after Congress had vastly expanded the usage mandate for renewable fuels, including cellulosic biofuels in the Energy Security and Independence Act of 2007 (EISA, P.L. 110-140). BCAP was envisaged as a mechanism for jump-starting the production of cellulosic feedstock for what was expected to be a rapidly expanding industry. The 2014 farm bill (Agricultural Act of 2014; P.L. 113-79) extends BCAP through FY2018, but with a number of changes aimed at limiting program costs. BCAP is administered by the U.S. Department of Agriculture's (USDA's) Farm Service Agency (FSA). BCAP provides two categories of financial assistance: (1) annual and establishment payments that share in the cost of establishing and maintaining production of eligible biomass crops; and (2) matching payments that share in the cost of the collection, harvest, storage, and transportation (CHST) of biomass to an eligible biomass conversion facility. BCAP assistance for establishing and producing biomass crops is available within designated project areas. BCAP project areas are specific geographic areas where producers may enroll land into BCAP contracts and produce specified biomass crops.

Under the 2008 farm bill, BCAP was authorized to receive such sums as necessary, meaning that funding for BCAP was both mandatory through the borrowing authority of USDA's Commodity Credit Corporation and open-ended since it depended on program participation. However, Congress imposed an upper limit on BCAP funding from FY2010 through FY2012 through appropriations bills. No funds were available for BCAP for FY2013.

In fashioning the 2014 farm bill, Congress made a number of changes to BCAP. Standing out among the changes was a hard cap on the program's mandatory authorization level. The 2014 farm bill replaced the open-ended authorization for BCAP in the 2008 farm bill with a cap of $25 million per year of mandatory funding for FY2014 through FY2018. Congress has further limited BCAP through appropriations bills, with the result that outlays under the program have declined steeply since peaking at nearly $250 million in FY2010. In December 2014, Congress passed the Consolidated and Continuing Appropriations Act, 2015 (P.L. 113-235), which imposed an upper limit of $23 million in funding for BCAP for FY2015. In part, these changes reflect the much slower-than-expected pace at which the cellulosic biofuels industry has developed.

Concerns that arose in the early years after BCAP was authorized—for example, that it could heighten competition over eligible woody biomass, thus raising the price of that material to the detriment of traditional users, such as nurseries and others, and that the by-product of paper production, "black liquor," could qualify for CHST matching payments—have been addressed, and so have become less acute. Some have argued the payments are largely unnecessary and therefore wasteful. An ongoing issue is that while BCAP's primary purpose is to facilitate the development of an expanding, commercial-scale cellulosic biofuel industry by helping it meet its feedstock challenges, numerous headwinds continue to retard the development of that industry.

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BCAP Overview

The Biomass Crop Assistance Program (BCAP) is intended to assist with some of the feedstock supply challenges facing the cellulosic biofuels industry. One ongoing hurdle for cellulosic biofuels development and manufacturing is the need for a constant supply of available biomass.[1] However, the cellulosic biofuels industry has struggled with the quintessential "chicken and egg" problem—investors are reluctant to invest in processing plants based on a technology (i.e., the conversion of cellulosic biomass to biofuels) that has yet to achieve success at a commercial scale, while producers are unwilling to devote land and resources to planting a dedicated biomass crop without nearby biofuels plants to buy it. In other words, the development of a cellulosic biofuels industry hinges simultaneously on the effective availability and use of new biomass feedstocks.

This report provides a description of BCAP's main components—annual & establishment payments, matching payments, and project areas—as outlined in USDA's final rule, along with a discussion of program funding and implementation issues.

Legislative Origins

Annual U.S. ethanol production expanded rapidly between 2001 and 2011, rising from under 2 billion gallons to over 13 billion gallons during that period.[2] To date, most biofuels production in the United States has been from corn starch. As a result, corn use for ethanol grew from a 7% share of the U.S. corn crop in 2001 to an estimated 40% share of the 2011 corn crop.[3] Dedicating an increasing share of the U.S. corn harvest to ethanol production evoked fears of unintended market and environmental consequences. As a result of these and other concerns, policy makers sought to redirect their bioenergy policies to provide incentives for the research and development of new agriculture-based renewable fuels, especially second-generation biofuels (based on non-food crop biomass such as cellulose and algae), and to expand their distribution and use.[4]

In particular, through the Energy Independence and Security Act of 2007 (EISA, P.L. 110-140), Congress established a goal of 36 billion gallons of biofuel use by 2022, including 16 billion gallons of cellulosic biofuels.[5] Similarly, the 2008 farm bill (the Food, Conservation, and Energy Act of 2008, P.L. 110-246) included an energy title, Title IX, with a set of bioenergy programs administered primarily by the U.S. Department of Agriculture (USDA) that focused on non-corn-ethanol biofuels.[6] Among the Title IX bioenergy programs of the 2008 farm bill is BCAP[7]—authorized by Congress to support the establishment and production of eligible biomass crops for conversion to bioenergy in selected areas, and to assist agricultural and forest land owners and operators with collection, harvest, storage, and transportation (CHST) of eligible material for use in a biomass conversion facility.

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[1] See CRS Report R41106, *The Renewable Fuel Standard (RFS): Cellulosic Biofuels*.

[2] U.S. ethanol production has since leveled off at some 13 billion to 14 billion gallons. For a discussion of the rapid growth of the U.S. biofuels sector, see CRS Report R41282, *Agriculture-Based Biofuels: Overview and Emerging Issues*http://www.crs.gov/pages/Reports.aspx?PRODCODE=R41282.

[3] USDA, *World Agricultural Supply and Demand Estimates (WASDE) Report*, February 10, 2014.

[4] See CRS Report R41282, *Agriculture-Based Biofuels: Overview and Emerging Issues*.

[5] See CRS Report R40155, *Renewable Fuel Standard (RFS): Overview and Issues*.

[6] See CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*.

[7] BCAP is authorized by §9001 of the Food, Conservation, and Energy Act of 2008, which created a new §9011 within the Farm Security and Rural Investment Act of 2002 (P.L. 107-171; 7 U.S.C. §8111, et seq.).

Changes to BCAP in 2014 Farm Bill

The 2014 farm bill (Agricultural Act of 2014; P.L. 113-79) extends BCAP through FY2018 with some modifications to its implementation and with new mandatory funding.[8]

- **Land Eligibility.** Enrolled land eligibility is expanded by including land under expiring Conservation Reserve Program (CRP) or ACEP easement contracts.
- **Eligible Material.** Residue from crops receiving Title I payments is included as eligible material, while exclusions are extended to any whole grain from a Title I crop, as well as bagasse and algae.
- **One-Time Establishment Payments.** These payments are limited to no more than 50% of the cost of establishment (down from 75%), not to exceed $500 per acre or $750/acre for socially disadvantaged farmers or ranchers.
- **CHST Matching Payments.** These payments may not exceed $20 per dry ton (down from $45 per dry ton) and are available for a two-year period. In addition, CHST funding is now available for technical assistance. Not less than 10% or more than 50% of funding may be used for CHST.
- **New BCAP Report.** Not later than four years after enactment of the 2014 farm bill, USDA shall submit to the House and Senate Agriculture Committees another report on best practices from participants receiving assistance under BCAP.

Program Operation

BCAP is administered by USDA's Farm Service Agency (FSA)[9] and receives mandatory funding through the Commodity Credit Corporation (CCC).[10] BCAP has two main statutory purposes: to support the establishment and production of eligible crops for conversion to bioenergy in selected areas; and to assist agricultural and forest land owners and operators with collection, harvest, storage, and transportation (CHST) of eligible material for use in a biomass conversation facility.

To meet the above-stated statutory purposes, BCAP provides financial assistance to owners and operators of agricultural land and non-industrial private forest land who wish to establish, produce, and deliver biomass feedstocks. BCAP provides two categories of financial assistance:[11]

1. **establishment and annual payments**,[12] including a one-time payment of up to 50% of the cost of establishment for perennial crops,[13] and annual payments (i.e., rental rates based on a set of criteria) of up to 5 years for non-woody and 15 years for woody perennial biomass crops; and

[8] CRS Report R43076, *The 2014 Farm Bill (P.L. 113-79): Summary and Side-by-Side.*

[9] For additional BCAP information, see the Farm Service Agency's BCAP website, http://www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap.

[10] See footnote 25 for a description of the CCC.

[11] Farm Service Agency, USDA, "Biomass Crop Assistance Program (BCAP), "Fact Sheet," at http://www.fsa.usda.gov/Internet/FSA_File/bcap_update_may2011.pdf.

[12] Because annual payments and establishment payments have similar eligibility requirements and limitations they are discussed together and referred throughout this report as "annual and establishment payments."

[13] Originally under the 2008 farm bill, establishment payments of up to 75% of the cost of establishment were available for perennial crops; however, the 2014 farm bill, §9010, lowered the rate to 50% starting in FY2014.

2. **CHST matching payments**, at a rate of $1 for each $1 per ton provided, up to $20 per ton, for a period of two years, which may be available to help eligible material owners with CHST of eligible material for use in a qualified biomass conversion facility.[14]

These two payments types—annual/establishment and matching—include different eligibility and sign-up requirements, payment rates, and contract lengths (**Table 1**).

Annual and Establishment Payments

BCAP's annual and establishment payments are available to certain producers who enter into contracts with USDA to produce eligible biomass crops on contract acres within designated BCAP project areas. They are intended to encourage longer-term investment by producers in dedicated biomass crops for bioenergy production.

Producer eligibility under BCAP's establishment and annual payments is limited to approved project areas.

Establishment Payments

BCAP establishment payments may cover up to 50% of the cost of establishing (i.e., clearing, planting, and seeding) a perennial crop, including woody biomass, within a project area. These costs may include the cost of seeds and stock for perennials; the cost of planting the perennial crop; and, for nonindustrial private forestlands, the cost of site preparation and tree planting. Previously established biomass crops, crops established using other federal sources, and annual crops are not eligible for establishment payments but may still be eligible for annual payments.

Annual Payments

BCAP annual payments would support up to 15 years of eligible woody crop production and 5 years of non-woody crop production. These payments would assist with the additional risk and possible forgone income associated with shifting away from traditional crop production. Annual payments are on a per-acre basis and would use market-based rental rates determined by FSA. Rental rate calculations are similar to those used for the CRP, a land conservation program under which farmers receive annual payments for removing environmentally sensitive land from agricultural production.[15]

Table 1. Differences Between Annual & Establishment Payments and CHST Matching Payments in the BCAP

	Annual & Establishment Payments	CHST Matching Payments
Location	Project areas only	Nationwide
Eligible Lands	Private lands	Federal, state, tribal, and private lands
Who participates	Eligible producers	Eligible biomass material owners

[14] Originally under the 2008 farm bill, CHST matching payments of up to $45 per ton were available for two-year period; however, the 2014 farm bill, §9010, lowered the rate to $20 per ton starting in FY2014.

[15] For more information, see CRS Report RS21613, *Conservation Reserve Program: Status and Current Issues*.

	Annual & Establishment Payments	CHST Matching Payments
Contract vs. Agreement	Contract with producers; agreement with project area sponsors	Agreement with biomass conversion facilities; material owner must apply
Contract or agreement period	5 to 15 years	2 years
Payment type	Annual payments at the market rate plus incentives and payments for establishing the initial crop	Matching payment for the collection, harvest, storage, and transportation of eligible material
Payment limit[a]	50% of the cost to establish the crop	Up to $20 per ton matching payment
Eligible for payments	**Eligible Crop**—crop of renewable biomass. Generally, crops that receive payments under Title I of the 2014 farm bill (e.g., corn, wheat, rice, and soybeans) and noxious weeds or invasive species are not eligible for annual payments	**Eligible Material**—renewable biomass harvested directly from the land, including residue from any crop that receives payments under Title I. Invasive and noxious species are considered eligible material. However, crops eligible to receive payments under Title I of the 2014 farm bill; animal waste and byproducts (including fats, oils, greases, and manure); food waste and yard waste; algae, bagasse, and woody eligible material collected or harvested outside of contract acreage that would otherwise be used for existing market products are not eligible.
Payment Reduction	Annual payments are reduced if crop is sold for any other purpose, including BCAP matching payments, or for contract violation.	Payments are reduced for contract violations.

Source: CRS and USDA, Commodity Credit Corporation, "Biomass Crop Assistance Program," Final Rule, 75 *Federal Register* 66212, October 27, 2010; and the Agricultural Act of 2014 (P.L. 113-79).

a. Originally under the 2008 farm bill, establishment payments of up to 75% of the cost of establishment were available for perennial crops and CHST matching payments of up to $45 per ton were available for two-year period; however, the 2014 farm bill, §9010, lowered the establishment rate to 50% and the CHST matching payment to $20 per ton starting in FY2014.

Annual payments may be reduced by a percentage of the sum of both the value of the harvest/collection and any BCAP matching payments for several reasons, including

- if an eligible crop is delivered to the biomass conversion facility:
  - for conversion to cellulosic biofuels (payments reduced by 1%);
  - for conversion to advanced biofuels (payments reduced by 10%); or
  - for conversion to heat, power, or biobased products (payments reduced by 25%);
- if an eligible crop is used for purposes other than conversion to heat, power, biobased products, or advanced biofuels (payments reduced by 100%);
- if the producer violates a term of the contract; or
- under other circumstances determined by USDA.

Eligible Land

As defined in statute, only private agricultural and non-industrial private forest lands are considered eligible under the annual and establishment payment portion of BCAP. Federal and state-owned lands are ineligible. Lands enrolled in existing land retirement programs for

conservation purposes—the Conservation Reserve Program (CRP) or the Agricultural Conservation Easement Program (ACEP)—also become eligible during the fiscal year that their land retirement contract expires. To address the concern of native grassland conversion, any land considered "native sod" as of June 18, 2008, (i.e., the date of enactment of the 2008 farm bill) is considered ineligible.[16]

Eligible Producer

Producers within the selected BCAP project area would be eligible to receive annual and establishment payments after entering into a BCAP contract. According to the USDA final rule, producers with already established eligible crops would be unable to collect an establishment payment but would remain eligible for annual payments. The project sponsor would also be eligible to collect annual and establishment payments, so long as the land is eligible and not federal, state, or government owned.

Eligible Crop

The 2008 farm bill defines the term "eligible crop" under the annual and establishment payment portion of BCAP as a crop of renewable biomass (see text box below).[17] This is different from the matching payment portion of BCAP, which includes a separate definition for "eligible material." Although both eligible crops and eligible material are defined as renewable biomass, exclusions for the two differ. Eligible crops under the annual and establishment payment portion of BCAP may not include crops eligible for payments under Title I of the 2008 farm bill[18] or any plant that is invasive or noxious or has the potential to become invasive or noxious. It is noteworthy that algae is included as an eligible crop, but not as an eligible material; thus, algae may qualify for annual and/or establishment payments but not matching payments, as described below.

Contract

BCAP contracts for annual and establishment payments vary in length: 5 years for non-woody perennial crops and 15 years for woody perennial crops. All contracts are required to have an active and current conservation plan or forest stewardship plan, depending on the type of crop grown. These plans seek to address environmental concerns of potential impact on soil, water, and related resources. Participants must also be in compliance with highly erodible and wetland conservation requirements.[19]

[16] §9011(a)(5)(B)(ii) of the Farm Security and Rural Investment Act of 2002, (7 U.S.C. 8111 et seq.) as amended by §9001 the Food, Conservation, and Energy Act of 2008 (P.L. 110-246).

[17] For additional discussion about biomass definitions, see CRS Report R40529, *Biomass: Comparison of Definitions in Legislation*.

[18] As defined in the USDA final rule, these include whole grain derived from a crop of wheat, corn, grain sorghum, barley, oats, or rice; honey; mohair; oilseeds such as sunflower seed, rapeseed, canola, safflower, flaxseed, mustard seed, crambe, soybeans, and sesame seed; pulse crops such as dry peas, lentils, or small chickpeas; peanuts; sugar; dairy products; wool; and cotton boll fiber.

[19] Highly erodible lands compliance may be found under Subtitle B of Title XII of the Food Security Act of 1985 (16 U.S.C. 3811 et seq.) and wetlands compliance may be found under Subtitle C of Title XII of the Food Security Act of 1985 (16 U.S.C. 3821 et seq.).

Defining Renewable Biomass

The 2008 farm bill included a definition for renewable biomass under Title IX. This definition is retained intact by the 2014 farm bill. Accordingly, biomass has separate and distinct definitions on public and private lands.

Federal Lands includes National Forest System land, as defined in Section 11(a) of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. §1609), and public lands managed by the Bureau of Land Management, as defined in Section 103 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. §1702). Biomass on public lands typically comes from tree and brush removal for fire prevention purposes, trees unsuitable for commercial harvest, invasive plant removal, and diseased, damaged, or immature tress culled in accordance with forest management practices. Thus in the case of federal lands, **renewable biomass** includes materials, pre-commercial thinnings, or invasive species that:

(1) are byproducts of preventive treatments that are removed to reduce hazardous fuels, to reduce or contain disease or insect infestation, or to restore ecosystem health;

(2) would not otherwise be used for higher-value products; and

(3) are harvested in accordance with applicable law and land management plans and the requirements for old-growth maintenance, restoration, and management direction, and large-tree retention.

Private Lands include nonfederal land or land belonging to an Indian or Indian tribe that is held in trust by the United States. Thus in the case of private land, **renewable biomass** is more broadly defined than when derived from federal lands, and includes any organic matter that is available on a renewable or recurring basis, including:

(1) renewable plant material such as feed grains, other agricultural commodities, other plants and trees, and algae;

(2) waste material (crop residue, wood waste, wood residues, and other vegetative waste material);

(3) animal waste and byproducts such as fats, oils, greases, and manure; and

(4) food waste and yard waste.

For additional discussion on the definition of biomass, see CRS Report R40529, *Biomass: Comparison of Definitions in Legislation*.

USDA-Sponsor Agreement

Agreements for annual and establishment payments may be made between USDA and a project area sponsor. Agreements specify the qualified project area sponsor's plans and how the sponsor will support the establishment and production of eligible crops for conversion to bioenergy in the BCAP project areas. This could include the type of biomass that will be used for the project, the intended use of the biomass and type of energy produced, and any new or proposed uses for the biomass.

CHST Matching Payments

CHST matching payments under BCAP assist agricultural and forest land owners and operators with collection, harvest, storage, and transportation of eligible material for use in a biomass conversion facility. Unlike the annual and establishment payments discussed above, the matching payments do not define eligible facilities by project areas.

BCAP's matching payments are available to eligible material owners who deliver eligible material to qualified biomass conversion facilities. They provide two-year contracts whereby USDA would pay—at the rate of up to $1 for each $1 per dry ton equivalent of biomass—the price to collect, harvest, store, and transport eligible material to biomass conversion facilities. Payments may not exceed $20 per ton.

Matching payments are intended to provide incentives for collecting underutilized biomass for bioenergy production. This would remove existing biomass where it might not currently be

profitable to do so (e.g., crop residue or forest undergrowth). Eligible material must be harvested directly from the land and separate from a higher-value product (e.g., Title I crops). Invasive and noxious species are considered eligible material and land ownership (private, state, federal, etc.) is not a limiting factor to receive matching payments.

Conversion Facilities

A biomass conversion facility is defined in statute as a facility that converts or proposes to convert renewable biomass into heat, power, biobased products, or advanced biofuels. To become a BCAP qualified biomass conversion facility, the facility must enter into an agreement with USDA within the state where it is located.[20]

Eligible Land

Unlike under the BCAP annual and establishment payments, land is not a limiting factor. If the material is determined to be eligible, then the land from which it comes is not an issue. According to the USDA final rule, eligible material may be harvested or collected from certain National Forest System and Bureau of Land Management lands; from nonfederal lands, including state and locally held government lands; and from tribal lands held in trust by the federal government.[21]

Material Owner

A material owner must first apply and be approved as eligible by FSA before deliveries to qualified biomass conversion facilities are eligible for matching payments. For materials collected on private lands, an eligible material owner could be the landowner, the operator or producer of the farming operation, a biomass conversion facility that owns or operates eligible land, or a person designated by the landowner. For public lands, material owners must have the right to harvest or collect material through a permit, contract, or agreement with the appropriate agency or government entity. Federal government entities are not eligible.

Eligible Material

Similar to eligible crops under the annual and establishment payments, eligible material is also defined as renewable biomass. However, the exclusions to renewable biomass differ for eligible materials as compared with eligible crops. Eligible material does not include crops eligible to receive payments under Title I of the 2014 farm bill; animal waste and byproducts (including fats, oils, greases, and manure); food waste and yard waste; algae; and bagasse. Also, any woody eligible material collected or harvested outside of the contract acreage that would otherwise be used for existing market products is ineligible—this provision was added to prevent BCAP matching payments from pulling resources away from existing industries such as particle-board producers that often rely on low-cost scraps from construction zones and lumber yards.

In contrast, invasive and noxious species are considered eligible material. According to the final rule, eligible material must be collected directly from the land, separated from a high-valued product (such as a Title I crop), and collected according to an approved conservation plan, forest stewardship plan, or equivalent plan. This requirement is intended to prevent high-value products from becoming eligible for matching payments.

[20] FSA makes the list of qualified biomass conversion facilities publicly available on its website: http://www.fsa.usda.gov/Internet/FSA_File/bcapfacilitieslist.pdf.

[21] Some restrictions do apply to the harvesting times, methods, and levels from non-private land.

USDA—Biomass Conversion Facility Agreement

Agreements for matching payments may be made between USDA and an eligible biomass conversion facility. According to USDA's final rule, these agreements include items such as the obligations of the facility to provide a purchase list, receipts, and scale tickets for the eligible material owners; maintain accurate records of all eligible material purchases; calculate the dry ton weight equivalent of tonnage delivered; pay fair market value for eligible material regardless of the material owner's eligibility for BCAP matching payments; and make the facility's address and contact information publicly available.

Payment

Eligible material owners must notify FSA following delivery to an eligible biomass conversion facility. Once delivery is verified by FSA, payments are made based on total actual tonnage delivered, total payment received, and certification from the conversion facility. BCAP matching payments are limited to $1 per dry ton equivalent provided by the biomass conversion facility, not to exceed $20 per ton. Payment terms are limited to no more than two years beginning on the date of first payment by USDA.

Project Areas

BCAP assistance for establishing and producing biomass crops is available within designated project areas. BCAP project areas are specific geographic areas where producers may enroll land into BCAP contracts and produce specified biomass crops.[22] Participants may be eligible to receive financial and technical assistance as well as annual payments to establish these crops.

Project areas are established based on proposals submitted (on a voluntary basis) to USDA's Farm Service Agency (FSA) by either a group of producers or an entity that converts biomass to heat, power, a biobased product, or an advanced biofuel. The USDA final rule (75 *Federal Register* 66212) makes no restrictions on who may sponsor a project. Sponsors could include biomass conversion facility owners, such as federal entities, private entities, state or local government agencies, schools, or nongovernment organizations. Those interested in submitting a proposal are encouraged to contact their FSA state office for details. Upon designation of a project area, certain producers within the project area are then eligible to enroll land into the program.

The statute authority requires project area sponsors to include the following as part of the proposal:[23]

- a description of the eligible land including the geographic boundary describing the area where land can be enrolled;
- a list of eligible crops of each producer that will participate in the proposed project area;
- a letter of commitment from a biomass conversion facility that the facility will use the eligible crops intended to be produced in the project area;
- evidence that the biomass conversion facility has sufficient equity available, if the facility is not operational at the time the proposal is submitted; and

[22] See FSA, USDA, "BCAP Project Area Information," at http://www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap-pjt.

[23] §9011(c)(2) of the Food Security and Rural Investment Act of 2002 (7 U.S.C. 8111 et seq.), as amended.

- any other appropriate information about the biomass conversion facility that gives reasonable assurance that the plant will be in operation by the time eligible crops are ready for harvest.

Project area proposals are submitted to the applicable FSA state office for recommendation to the national office. If the project areas spans multiple states, the project proposals are submitted to the FSA state office where a majority of the project area land is located.[24] Proposals are evaluated on a set of statutorily defined criteria, including the volume of crops proposed to be produced; the volume of biomass from sources other than those grown on contract acres; the anticipated economic impact to the project area; the opportunity for local producers to participate in ownership of the facility; the impact on soil, water, and related resources; the variety of biomass production approaches within the project area; and the range of eligible crops among project areas. Proposals meeting these criteria would be considered eligible for BCAP as project areas.

Project proposals are accepted by FSA on a continuous basis and, if the project is approved, producers within the project area could be eligible for annual payments and establishment payments. Producers within a designated BCAP project area may apply to enroll land into the program and receive assistance to grow eligible biomass crops. Biomass must be established, produced, and harvested or collected according to an approved conservation, forest stewardship, or similar plan to ensure that soil, water, and other resource concerns are adequately addressed on the enrolled land.

As of this report, 11 BCAP project areas had been approved. The project areas and their approved eligible biomass crops are listed in **Table 2**.

Table 2. List of Approved BCAP Project Areas with Location and Feedstock

Project Area	Location	Eligible Feedstocks
1	Kansas and Missouri: 39 counties	Mixtures of perennial native grasses and forbs, such as Switchgrass, Big Bluestem, Illinois Bundleflower and Purple Prairie Clover. Additionally, existing suitable stands of native grasses, legumes and forbs (existing native grass stands can be located on expired CRP fields).
2	Arkansas: 8 counties	Giant Miscanthus rhizomes of the "Illinois Clone," a sterile cultivar of perennial miscanthus giganteus.
3	Missouri: 9 counties	Giant Miscanthus rhizomes of the "Illinois Clone," a sterile cultivar of perennial miscanthus giganteus.
4	Missouri: 7 counties	Giant Miscanthus rhizomes of the "Illinois Clone," a sterile cultivar of perennial miscanthus giganteus.
5	Ohio: 4 counties; and Pennsylvania: 3 counties	Giant Miscanthus rhizomes of the "Illinois Clone," a sterile cultivar of perennial miscanthus giganteus.
6	Oregon: 5 counties; and Washington: 1 county	Camelina
7	Kansas: 5 counties; and Oklahoma: 1 county	Perennial native grasses and forbs, e.g., Switchgrass, Big Bluestem, Illinois Bundleflower and Purple Prairie Clover.

[24] For more information, see "BCAP Project Area Proposal Guidelines," FSA, USDA, available at http://www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap-pjt-bpro.

Project Area	Location	Eligible Feedstocks
8	California: 17 counties; Washington: 17 counties; and Montana: 56 counties	Camelina
9	Oregon: 1 county	Hybrid poplar trees
10	New York: 9 counties	Shrub willow
11	North Carolina: 11 counties	Switch grass and Freedom Giant Miscanthus

Source: Farm Service Agency (FSA), USDA, "BCAP Area Project Listing," at http://www.fsa.usda.gov/bcap.

Note: The list was completed in June 2012. No new project areas have been added since June 2012.

BCAP Funding History and Current Status

Funding Under the 2008 Farm Bill

Under the 2008 farm bill, BCAP was authorized to receive "such sums as necessary" for each of the fiscal years 2008 through 2012. This mandatory funding is provided through the borrowing authority of USDA's Commodity Credit Corporation (CCC).[25] As a result, USDA could use a virtually unlimited amount of funding from the CCC to implement BCAP, until the program's authority expired on September 30, 2012. Because funding is mandatory and paid through CCC, no annual appropriations are required for BCAP. Instead, actual BCAP outlays were to depend on the number of participants and the extent of eligible biomass crops involved in the program. However, as BCAP implementation unrolled and outlays exceeded initial expectations, Congress placed spending caps on the program's mandatory funding authority via annual appropriations measures.

Table 3. BCAP Funding Snapshot, FY2008-2015

(Millions of Dollars)

	Mandatory Farm Bill Authorization	Authorization after Enacted Reduction	Program Outlays
FY2008	SSAN[a]	n.a.	$0[b]
FY2009	SSAN	n.a.	$2.1
FY2010	SSAN	$552	$248.2
FY2011	SSAN	$112	$24.3
FY2012	SSAN	$17	$15.9
FY2013	$0[c]	n.a.	$9.4
FY2014	$25	n.a.	$13.6[d]

[25] The CCC is the funding mechanism for the mandatory payments that are administered by various agencies of USDA, including all of the farm commodity price and income support programs and selected conservation programs. The CCC is a wholly owned government corporation that has the legal authority to borrow up to $30 billion at any one time from the U.S. Treasury (15 U.S.C. §714 et seq.). It repays most of the funds it borrows with appropriations within the annual Agriculture appropriations law, usually as an indefinite "such sums as necessary" appropriation. For more information on mandatory versus discretionary authorizations, see CRS Report R43110, *Agriculture and Related Agencies: FY2014 and FY2013 (Post-Sequestration) Appropriations*.

	Mandatory Farm Bill Authorization	Authorization after Enacted Reduction	Program Outlays
FY2015	$25	$23	$7.4[d]

Source: 2008 and 2014 farm bills; various appropriations bills; and USDA Budget Explanatory Notes for Committee on Appropriations, Vol. 2, various years

Notes: Click here and type the notes, or delete this paragraph

a. Such sums as necessary (SSAN)

b. No program outlays were recorded for FY2008 because BCAP was not yet operational.

c. The American Taxpayer Relief Act of 2012 (ATRA, P.L. 112-240) authorized to be appropriated discretionary funding of $20 million for BCAP for FY2013, but no follow-on appropriation was enacted

d. Estimate

Under the 2008 farm bill (FY2008-FY2012), nearly $300 million was paid out to projects in 31 states. This is substantially more outlays than projected under the initial 2008 projections of program costs by the Congressional Budget Office (CBO), which estimated $36 million cumulative during the authority of the program (FY2008-FY2012).[26]

No outlays were made under BCAP in FY2008 since the program was not yet operational. Program costs totaled $2.1 million in FY2009, then soared to $248 million in FY2010. The sharp increase in outlays for FY2010 was mostly the result of CHST matching payments to biomass materials that met the legal definition of qualifying materials but that were not intended for use in the production of second-generation biofuels (see **Table 3**). As a result, Congress became concerned about limiting this type of unintended outlays and began to limit the program through appropriations. For FY2010, Congress limited the mandatory authorization for BCAP to $552 million, and subsequently reduced its program authority to $112 million for FY2011, In response to the reduced level of funding for FY2011, FSA suspended the CHST matching payment portion of the program through FY2011.[27] Outlays subsequently declined to $24.3 million in FY2011.In its final rule for the BCAP program,[28] USDA announced a re-prioritization of program funds that emphasized annual and establishment payments, especially under existing contracts, over CHST matching payments (see next section "**Selected Issues**" for details). For FY2012, Congress further limited mandatory funding for BCAP to $17 million, while actual outlays were $15.9 million.

Interim Funding in FY2013

BCAP, along with most of the other major Title IX bioenergy programs—with the exception of the Feedstock Flexibility Program for Bioenergy Producers—expired at the end of FY2012 and lacked baseline funding going forward.[29] However, the American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240)—signed into law by President Obama on January 2, 2013—extended the 2008 farm bill (P.L. 110-246) through FY2013.[30] No new mandatory funding was included for

[26] CBO, "Food, Conservation, and Energy Act of 2008—Conference Agreement," March 2007 CBO baseline (modified to reflect subsequent enacted legislation), May 12, 2008.

[27] USDA, FSA, *Prioritizing Limited BCAP Funds for Establishment of and Annual Payments for Approved Project Area Activities*, Notice BCAP-27, Washington, DC, September 15, 2011, http://www.fsa.usda.gov/Internet/FSA_Notice/bcap_27.pdf.

[28] Biomass Crop Assistance Program," Final Rule, 75 Federal Register 66212, October 27, 2010.

[29] See CRS Report R41433, *Programs Without a Budget Baseline at the End of the 2008 Farm Bill*.

[30] See CRS Report R42442, *Expiration and Extension of the 2008 Farm Bill*.

BCAP under ATRA; instead, ATRA included discretionary funding of $20 million for BCAP authorized to be appropriated for FY2013, but Congress appropriated no funds for BCAP for FY2013

Funding Under the 2014 Farm Bill

The 2014 farm bill authorized mandatory funding of $25 million annually for FY2014 through FY2018; no discretionary funding is authorized. In its final score of the 2014 farm bill, CBO projected cumulative BCAP outlays of $99 million for the five-year period FY2014-FY2018. As of March 2014, USDA projected that outlays under BCAP for FY2015 would recede to $7.4 million.[31] For FY2015, Congress further limited mandatory funding for BCAP to not more than $23 million in the Consolidated and Continuing Appropriations Act, 2015 (P.L. 113-235).

Implementation of the 2008 Farm Bill

As the administrating agency for BCAP, USDA's Farm Service Agency (FSA) maintains on its website a "BCAP Handbook" and other program documents, the latest USDA BCAP notices and news releases, as well as current information on BCAP project areas.[32] This section includes a brief chronology of BCAP rule development and program implementation.

On May 5, 2009, President Barack Obama issued a directive addressing a variety of advanced biofuel priorities. The presidential memorandum requested the Secretary of Agriculture to accelerate investment in and production of biofuels, and it specifically listed energy programs in the 2008 farm bill, including "guidance and support for collection, harvest, storage, and transportation (CHST) assistance for eligible materials for use in biomass conversion facilities."[33]

On June 11, 2009, USDA published a Notice of Funds Available (NOFA; 74 *Federal Register* 27767) to implement the CHST matching payments component of BCAP.[34] USDA's notice eventually raised concern about possible market competition between the CHST matching payments program and existing wood manufacturing industries.[35] The NOFA was terminated on February 3, 2010.

On February 8, 2010, USDA published a proposed rule for BCAP (75 *Fed. Reg.* 6264) suspending CHST program enrollment and proposing rules to implement the remainder of the BCAP program.[36]

On October 27, 2010, USDA issued the BCAP interim (i.e., final) rule (74 *Fed. Reg.* 27767) which implements the full BCAP program, including the annual and establishment payment component.[37] The interim (final) rule adopted many of the provisions outlined in the proposed rule, made further revisions, and responded to the more than 24,000 comments received on the proposed rule.

[31] CBO, "CBO March 2012 Baseline for CCC & FCIC," March 2012.

[32] For additional BCAP information, see the Farm Service Agency's BCAP website at http://www.fsa.usda.gov/bcap.

[33] U.S. President (Obama), "Memorandum on Biofuels and Rural Economic Development," *Daily Compilation of Presidential Documents*, vol. DCPD200900328 (May 5, 2009).

[34] USDA, Commodity Credit Corporation (CCC), "Notice of Funds Availability (NOFA) for the Collection, Harvest, Storage, and Transportation of Eligible Material," 74 *Federal Register* 27767-27772, June 11, 2009.

[35] "CPA says USDA Biomass Program a Threat to Wood Products Industry," *Wood and Wood Products*, Trends and News, December 2009.

[36] USDA, CCC, "Biomass Crop Assistance Program," 75 *Federal Register* 6264, February 8, 2010.

[37] USDA, CCC, "Biomass Crop Assistance Program," 75 *Federal Register* 66201, October 27, 2010.

In response to funding reductions through the appropriations process, FSA suspended the CHST matching payments portion of the program through FY2011.[38] The last deadline for submitting project area proposals for annual and establishment payments was September 23, 2011.[39]

As of June 2012, USDA had selected 11 BCAP project areas and continued to enroll producers for annual and establishment payments. However, due to the reduced funding availability imposed by limitations on the availability of mandatory funding through the annual appropriations process (see above discussion), USDA published an interim rule on September 15, 2011 (76 *Fed. Reg.* 56949), amending the BCAP regulation to provide specifically for prioritizing limited program funds in favor of the ''project area'' portion of BCAP. The limited funding available for BCAP means that not all BCAP requests can be funded. The interim rule explicitly provides a priority for funding establishment and annual payments for project area activities because "such activities will produce the greatest long term good in BCAP by providing an ongoing supply of new biomass."[40] Under the interim rule, matching payments for CHST would only be funded if resources are available after funding all eligible project area applications. The interim rule also enables prioritization among project area proposals if eligible requests exceed available funding.

Among the remaining BCAP-related tasks of the 2008 farm bill, USDA was required to submit a report to the House and Senate Agriculture Committees on the dissemination of the best practice data and information gathered from participants receiving assistance under BCAP no later than four years after enactment of the 2008 farm bill (i.e., by June 18, 2012). This report was made available in February 2013.[41]

In June 2014, under the authority of the 2014 farm bill, USDA issued a Notice of Funds Availability for BCAP for FY2014[42] in which it made available $12.5 million for BCAP matching payments to facilitate the delivery of eligible biomass material, with the balance of the funds available for FY2014 to be used for technical assistance activities, such as implementation, operation, compliance, monitoring and maintenance of all components of BCAP. Citing time limitations, the agency indicated that no funding would be made available for crop establishment activities for project areas in 2014, nor for creating new project areas.

In December 2014, USDA announced it would issue final regulations to implement changes to BCAP included in the 2014 farm bill during the winter of 2015, which it indicated would be followed by a new funding opportunity.[43]

[38] USDA, FSA, *Prioritizing Limited BCAP Funds for Establishment of an Annual Payments for Approved Project Area Activities*, Notice BCAP-27, Washington, DC, September 15, 2011, http://www.fsa.usda.gov/Internet/FSA_Notice/bcap_27.pdf.

[39] USDA, FSA, *BCAP Funding and Project Proposal Submission and Review*, Notice BCAP-22, Washington, DC, September 16, 2011, http://www.fsa.usda.gov/Internet/FSA_Notice/bcap_28.pdf.

[40] *Federal Register*, Vol. 76, No. 179, Thursday, September 15, 2011, p. 56949.

[41] FSA, USDA, *BCAP: Biomass Crop Assistance Program: Energy Feedstocks From Farmers & Foresters*," February 2013; available at https://www.fsa.usda.gov/Internet/FSA_File/bcap_documentation.pdf.

[42] Notice of Funds Availability (NOFA) for the Biomass Crop Assistance Program. at https://www.federalregister.gov/articles/2014/06/11/2014-13617/notice-of-funds-availability-nofa-for-the-biomass-crop-assistance-program.

[43] USDA, FSA, *USDA Improves Forest Health by Harvesting Biomass for Energy*, December 16, 2014, http://www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=ner&newstype=newsrel&type=detail&item=nr_20141216_rel_0270.html.

Selected Issues

Initially BCAP's CHST matching payments raised questions and concerns about feedstock eligibility, sustainability, and the slow development of cellulosic biofuels. Some of these issues were addressed by the 2014 farm bill. They are briefly reviewed here for historical context.

Eligible Crops and Material

Defining what is considered an eligible material or eligible crop under BCAP became somewhat contentious during the early years of implementation. By 2010, concerns had surfaced about eligible material creating direct competition with existing uses through the CHST matching payments.[44] Others have expressed concerns about allowing certain fast-growing non-native plants to be included as eligible crops.[45] Many of the issues that initially arose around BCAP have been addressed, and so have become less acute over time. Among lingering issues is a concern that a number of grasses that are considered invasive species, and that also have favorable characteristics as energy crops, may in theory have the potential to cause economic and environmental damage in spite of efforts to prevent such an outcome. Another concern centers on the continued slow development of a commercial-scale cellulosic biofuels industry that BCAP was meant to support. A summary of issues related to eligible crops and materials follows.

Wood Residue Competition

In early 2010, after USDA's 2009 notice on CHST matching payments, some manufacturing and nursery industries that use wood shavings, wood chips, sawdust, and other wood "scraps" noticed an increase in price for their raw materials. This increase was linked, by some, to the CHST matching payments, which offered a federal payment match for the same materials if delivered to a qualified biomass conversion facility.[46] The CHST matching payment of up to $45 per ton created an incentive for material owners to sell to biomass facilities rather than to manufacturers that use the same raw materials for products such as composite panels, particle board, and fiberboard, or to nurseries and landscaping firms that use bark and wood chips for mulch.

Renewable biomass harvested from the National Forest System and other public land is subject to a statutory provision that prohibits material that would otherwise be used for higher-value products.[47] This prohibition, however, did not initially apply to renewable biomass harvested from private land. In USDA's initial proposed rule (February 8, 2010), such biomass remained eligible for CHST matching payments, largely because the 2008 farm bill (P.L. 110-246) did not specifically prohibit biomass that would have otherwise been used for higher-value products produced on private land. However, based on the initial reaction to the CHST matching payments, USDA expanded the public land restriction to private land as well. Therefore, all biomass

[44] U.S. Congress, House Committee on Agriculture, Subcommittee on Conservation, Credit, Energy, and Research, Representative Minnick's comments on BCAP, hearing, *To review the implementation of the 2008 Farm Bill energy title*, 111th Cong., 2nd sess., June 9, 2010.

[45] S. Raghu, R. C. Anderson, and C. C. Daehler et al., "Adding Biofuels to the Invasive Species Fire?," *Science*, September 22, 2006, p. 1742.

[46] Juliet Eilperin, "The Unintended Ripples from the Biomass Subsidy Program," *The Washington Post*, January 10, 2010, p. A03.

[47] Under Section 9001(12)(A)(ii) of the Farm Security and Rural Investment Act of 2002 (P.L. 107-171), as amended by §9001 of the Food, Conservation, and Energy Act of 2008, the term "renewable biomass" includes material that would not otherwise be used for higher-value products, if from National Forest System lands and public lands.

material that would otherwise be used for higher-value products, from either public or private sources, is considered ineligible under USDA's final rule.

In an effort to enforce this division between higher-value products, in its final rule (October 27, 2010) USDA added the requirement that ***"eligible material be directly harvested from the land"*** in accordance with an approved conservation plan, forest stewardship plan, or equivalent plan; be separated from a higher-value product; and not be classified as a higher-value product by USDA. For example, wood chips are considered eligible material if they are collected directly from the land. Therefore, wood chips collected from delivered and processed trees after the trees are delivered to pulp and paper facilities do not qualify. However, wood chips created in the field from diseased trees for ease of transport to a biomass conversion facility are eligible for matching payments. Another example would be corn cobs as an eligible material. If corn cobs are separated from the higher-value product (i.e., corn kernels) in the field and the cobs are then collected as residue in accordance with a conservation plan and delivered to a conversion facility they are considered eligible for matching payment. If the corn cobs are collected at a vegetable processing facility after being delivered and separated from the higher-value product, they are not considered eligible. This is considered incidental to the normal marketing of the crop and not representative of the collection or harvesting of biomass that would not otherwise be collected.

While manufacturing industries that use wood residue offered the greatest opposition to CHST matching payments as published under the USDA notice, those in the lumber industry that were receiving higher prices also questioned the sustainability of the provision. Some in the biomass industry highlight the temporary nature of the CHST matching payments (maximum two years), and hope that future implementation will focus on the BCAP annual and establishment payments, which are longer-term.[48] As mentioned earlier, in its final rule for the BCAP program, USDA announced a re-prioritization of program funds that emphasized annual and establishment payments, especially under existing contracts, over CHST matching payments. In addition, the 2014 farm bill lowered the maximum CHST payment rate per ton to $20, in part, to further minimize any incentive or preference away from existing uses.

Others questioned USDA's ability to distinguish between high-value product material and renewable biomass material in the future, despite the language in the final rule requiring it to be harvested directly from the land. Some believe the fungible nature of wood could continue to generate competition between wood-based product output and renewable energy production.[49] The 2014 farm bill explicitly addressed this issue in Section 9010, where the definition of "eligible material" in previous law was rewritten to include the following exclusion: "(vi) any woody eligible material collected or harvested outside contract acreage that would otherwise be used for existing market products."

Finally, the watchdog group Taxpayers for Common Sense has asserted that the great majority of facilities for CHST payments are in the mature wood products industry, with relatively few participating facilities utilizing alternative biomass sources, such as municipal waste and bioenergy crops, in the production of advanced biofuels.[50]

[48] Conference discussion at the Renewable Energy and Technology Conference, Washington, DC, February 4, 2010.

[49] Roger A. Sedjo, *The Biomass Crop Assistance Program: Some Implications for the Forestry Industry*, Resources for the Future, RFF DP 10-22, Washington, DC, March 2010.

[50] Taxpayers for Common Sense, Updated: Biomass Crop Assistance Program Fact Sheet, July 24, 2014, http://www.taxpayer.net/library/article/biomass-crop-assistance-program-fact-sheet.

Invasive and Noxious Species

Some have expressed concern that eligibility criteria for materials and crops under BCAP may conflict with practices aimed at limiting the introduction of invasive and noxious species. Others, including USDA, praise invasive and noxious species' inclusion in BCAP as an incentive to further eradication efforts.[51] The BCAP program provides separate definitions of eligible material and eligible crops. Eligible *crop* criteria apply to the annual and establishment payments portion of BCAP and eligible *material* criteria refer to BCAP's CHST matching payments. Invasive and noxious species are considered ineligible as crops for BCAP's annual and establishment payments, but are not excluded as eligible material under BCAP's CHST matching payments.

The inclusion of invasive and noxious species as eligible material has generated both concern and interest in the environmental community.[52] Some note that while the incentive for removal is praiseworthy, such removal could have the unintended consequence of perpetuating the species. USDA's final rule addresses this concern by excluding removal and transportation during reproductive periods and requiring removal be in accordance with a new or amended conservation plan, forest stewardship plan, or equivalent plan. If a material owner violates the current federal standards for noxious weeds,[53] then all matching payments must be repaid. According to USDA, removal costs associated with spreading or establishing an invasive or noxious species while carrying out the activities to receive a matching payment are "outside the scope of BCAP" and would rely on state and other federal laws for penalties.[54]

Several plant traits of an ideal biomass crop are also commonly found among invasive grasses: low energy requirements for maintenance; efficient use of light, water, and nutrients; perennial growth; and high yields.[55] Based on comments received from USDA's proposed rule, crops of species such as giant miscanthus, pennycress, and black locust may be considered eligible energy crops. Many of these are non-native, fast-growing, perennial grass or trees that some consider an ideal energy crop for many of the reasons stated above.[56] Others are concerned that non-sterile varieties can become invasive and noxious[57] or that genetically engineered (GE) varieties could result in hybridization with wild relatives, resulting in invasive or noxious species causing economic and ecological damage.[58] Some states include varieties of these species on statewide noxious weed listings. In these states, they would be ineligible as a crop under USDA's final rule; however, there is continued concern that the plant's introduction as a crop could have unintended

[51] USDA, "Biomass Crop Assistance Program to Spur Production of Renewable Energy, Job Creation," press release, February 3, 2010, http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2010/02/0046.xml.

[52] Letter from Bruce Leopold, President, Wildlife Society, to Director of CEPD, USDA Farm Service Agency, April 9, 2010, http://joomla.wildlife.org/documents/BCAP_rule_comments.pdf.

[53] Executive Order 13112, "Invasive Species," 64 *Federal Register* 6183, February 3, 1999. Also see, CRS Report RL30123, *Invasive Non-Native Species: Background and Issues for Congress*.

[54] USDA, Commodity Credit Corporation, "Biomass Crop Assistance Program," 75 *Federal Register* 66222, October 27, 2010.

[55] Joseph M. DiTomaso, Jacob N. Barney, and Alison M. Fox, *Biofuel Feedstocks: The Risk of Future Invasions*, Council for Agricultural Science and Technology, CAST Commentary QTA2007-1, November 2007, http://www.cast-science.org/websiteUploads/publicationPDFs/Biofuels%20Commentary%20Web%20version%20with%20color%20%207927146.pdf.

[56] Dan Burden, *Miscanthus Profile*, Agricultural Marketing Resource Center, August 2009, http://www.agmrc.org/commodities__products/biomass/miscanthus_profile.cfm.

[57] USDA, NRCS National Plants Database, *PLANTS Profile: Miscanthus Andersson Silvergrass*, June 2010, http://plants.usda.gov/java/profile?symbol=MISCA.

[58] USDA, FSA, *Biomass Crop Assistance Program Programmatic Environmental Impact Statement*, Final, June 2010, pp. 4-52, http://www.fsa.usda.gov/Internet/FSA_File/bcapfinalpeis062510.pdf.

consequences, given that the USDA final rule does not distinguish between the sterile varieties and non-sterile varieties. Even the BCAP Final Programmatic Environmental Impact Statement (FPEIS)[59] highlights potential issues associated with the introduction of GE species and non-native varieties for use as biomass crops. To prevent the spread of invasive or noxious species, USDA is relying on thorough, site-specific environmental evaluation of a project area prior to selection. This could potentially slow implementation of the program or impose costs on biomass producers.[60]

"Black Liquor"

In 2009, concerns emerged about "black liquor" meeting the definition of renewable material under BCAP, and thus potentially qualifying for CHST matching payments. Black liquor is a waste product from the paper production process composed of mostly organic lignin and inorganic pulping chemicals, and has long been used in the pulp and paper industry as a source of energy.[61] An existing alternative fuel excise tax credit targeting blends of biofuels with petroleum products for transportation purposes was expanded under the 2007 Energy Independence and Security Act (EISA; P.L. 110-140) to include alternative fuels used by non-transportation industries. As a result, paper companies, who were already using black liquor for processing energy at the treatment plant, by including a small mixture of diesel were now able to claim their black liquor as a biofuel that qualified for the biofuel excise tax credit. According to news reports, the black liquor loophole cost taxpayers over $4 billion in 2009.[62]

A provision in the enacted health care bill (P.L. 111-148) disqualified black liquor from eligibility as of January 1, 2010. USDA's final rule for BCAP states that black liquor is considered an industrial waste by-product and therefore is not eligible under BCAP. Despite this declaration, those in favor of black liquor's inclusion as an eligible source object to USDA's reasoning that black liquor is made from "inorganic" material, citing that "neither the statute nor the BCAP eligible materials list requires that eligible biomass actually originate directly from the land."[63]

The 2008 farm bill definition of "eligible material" simply referred to renewable biomass as: "(A) IN GENERAL.—The term 'eligible material means renewable biomass. The 2014 farm bill explicitly addressed this issue in Section 9010 by adding precision to the definition of "eligible material" as follows: "(A) IN GENERAL.—The term 'eligible material means renewable biomass harvested directly from the land ... "

Sustainability

BCAP has a dual purpose of establishing new dedicated biomass crops for bioenergy production (annual and establishment payments) and increasing the collection of existing and underutilized biomass for bioenergy production (matching payments). The latter purpose—incentives for

[59] Ibid.

[60] Jody M. Endres, Timothy A. Slating, and Christopher J. Miller, "The Biomass Crop Assistance Program: Orchestrating the Government's First Significant Step to Incentivize Biomass Production for Renewable Energy," *Environmental Law Reporter*, vol. 40 (2010), p. 10076.

[61] *Bloomberg News*, "Black Liquor Tax Boondoggle May Net Billions for Papermakers," by Bob Ivory and Christophe Doneville, April 17, 2009.

[62] *New York Times*, "Tax Loopholes Block Efforts to Close Gaping U.S. Deficit," by Jonathan Weisman, July 20, 2012; and *Accuval*, "Black Liquor Tax Credits: The End of a Loophole for the Pulp & Paper Industry," March 2010, at http://www.accuval.net.

[63] Letter from Paul Noe, Vice President for Public Policy at the American Forest and Paper Association, April 8, 2010.

biomass removal in areas where it is possible but not currently profitable—is a key factor for the forestry sector. The removal of hazardous wildfire fuels and invasive species could provide biomass for renewable energy conversion rather than being disposed of in ways that contribute additional carbon to the atmosphere.[64]

In addition to biomass removal from forestland, crop residue is also considered to be viable biomass for renewable energy production. Following harvest, the remaining plant, or residue, can be left on the ground for soil health, erosion and weed control, water quality, and nutrient management. Many federal conservation programs provide financial assistance for practices that increase crop residue retention on the land, because of the environmental benefits.[65] The BCAP payments to remove this residue for bioenergy production have caused some to question whether this is a duplication of the federal effort and is counterproductive. Soil scientists in particular are concerned that the benefits to bioenergy would not outweigh the potential soil and environmental concerns associated with the removal of crop residue and caution against removing too much residue in sensitive areas.[66]

Dedicated biomass crops, such as switchgrass, hybrid poplars, and hybrid willows, are considered by many to be more desirable crops because they have a short rotation (re-grow quickly after each harvest) and use fewer resources, such as water and fertilizers, than traditional field crop production. Compared with field crops such as corn, dedicated biomass crops are also thought to have less impact on available food supplies.[67] Despite potential environmental benefits, concerns persist about the additional use of fertilizers and water resources that could be required to increase the per-acre yields for these crops to become economically feasible.[68]

Slow Development of Cellulosic Biofuels

The potential development of a cellulosic-based ethanol industry is presently impeded by the state of cellulosic conversion technology, which has been slow to move production from laboratory setting to commercial scale and which is thought to be expensive relative to corn-based production. In addition, U.S. ethanol production now appears to have hit the "blend wall"—the potential inability of the domestic market to absorb ethanol above a 10% share of domestic gasoline fuels.[69] However, the enormous potential supply of low-cost cellulosic plant material available in the United States makes it an attractive prospective feedstock and helps to explain the continuing interest in it among policy makers.[70]

The 2014 farm bill energy title provides nearly $1.5 billion in financial incentives and support to encourage the production and use of advanced (mainly cellulosic) biofuels, including the $125

[64] See CRS Report R40811, *Wildfire Fuels and Fuel Reduction*.

[65] For more information on available agricultural conservation programs, see CRS Report R40763, *Agricultural Conservation: A Guide to Programs*.

[66] Rattan Lal, "Is Crop Residue a Waste?" *Journal of Soil and Water Conservation*, vol. 59, no. 6 (Nov/Dec 2004), pp. 136A-139A.

[67] Bruce A. Babcock, *Breaking the Link between Food and Biofuels*, Briefing Paper 08-BP 53, July 2008, Center for Agricultural and Rural Development, Iowa State University, http://www.card.iastate.edu.

[68] Institute for Agriculture and Trade Policy, *Growing a New Crop for a New Market*, August 2009, http://www.iatp.org/iatp/publications.cfm?refid=106612.

[69] For a discussion, see CRS Report R40155, *Renewable Fuel Standard (RFS): Overview and Issues*.

[70] See the section entitled "Potential Issues with the Expanded RFS" in CRS Report R40155, *Renewable Fuel Standard (RFS): Overview and Issues*; and see CRS Report R41106, *The Renewable Fuel Standard (RFS): Cellulosic Biofuels*.

million in mandatory funding for BCAP.[71] Grants and loan guarantees leverage industry investments in new technologies and infrastructure, as well as in the production of cellulosic feedstocks. However, BCAP is the principal program designed to help "kick start" the U.S. cellulosic biofuels sector. BCAP attempts to remove some of the risk for biomass growers by supporting the production of dedicated crop and forest cellulosic feedstocks and by providing incentives for harvest and post-production storage and transport.

Despite government support for BCAP and other related federal programs, the cellulosic ethanol sector has been slow to develop. Prior to the startup of several commercial-scale facilities earlier this year, including the POET-DSM Project LIBERTY plant in Iowa and the Abengoa SA plant in Kansas, only small volumes of cellulosic ethanol had been produced by a few small refineries (mostly pilot or demonstration in scope). Due to the slow progress in establishing a commercial-scale cellulosic ethanol industry, EPA has been compelled to substantially reduce the cellulosic biofuel RFS mandates set by Congress for the years 2010 through 2014.[72] The EPA waiver of the cellulosic biofuels RFS for five consecutive years, coupled with reduced BCAP funding under the 2014 farm bill, and the congressional climate of budget austerity, likely has increased the uncertainty associated with the future investments needed to kick-start this sector.[73]

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[71] Advanced biofuels include biofuels derived from cellulosic feedstocks; sugar and starch other than corn kernel-starch; waste material including crop residue, animal, plant, or food waste; diesel fuel produced from renewable biomass including vegetable oil and animal fat; butanol or other alcohols produced through the conversion of organic matter; and other fuels derived from cellulosic biomass. For more information, see details of Title IX in CRS Report R43076, *The 2014 Farm Bill (P.L. 113-79): Summary and Side-by-Side*.

[72] See CRS Report R40155, *Renewable Fuel Standard (RFS): Overview and Issues*.

[73] See CRS Report R41106, *The Renewable Fuel Standard (RFS): Cellulosic Biofuels*.