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The Farm Bill Energy Title: An Overview and Funding History

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Summary

Title IX, the energy title, of the 2018 farm bill (Agriculture Improvement Act of 2018; P.L. 115-334) contains authority for the energy programs administered by the U.S. Department of Agriculture (USDA). USDA energy programs incentivize research, development, and adoption of renewable energy projects, including solar, wind, and anaerobic digesters. However, the primary focus of USDA energy programs has been to promote U.S. biofuels production and use—including corn starch-based ethanol (the predominant biofuel produced and consumed in the United States), cellulosic biofuels, and soybean-based biodiesel. The USDA energy programs via the farm bill are separate from the Renewable Fuel Standard (RFS) and tax incentives contained in separate energy and tax legislation.

Four farm bills have contained an energy title: 2002, 2008, 2014, and 2018. For all four farm bills, the majority of the energy programs expire and lack baseline funding. Many of the energy title programs are authorized to receive both mandatory and discretionary funding. Historically, mandatory funding has been the primary support for these programs, as appropriators have not provided funding for most of the discretionary authorizations. The programs that have received discretionary authorizations under the 2018 farm bill are the Rural Energy for America Program, the Rural Energy Savings Program, and the Sun Grant Program.

The 2018 farm bill extended most of the energy provisions of the 2014 farm bill with new funding authority. There are two exceptions, as the 2018 farm bill repealed both the Repowering Assistance Program and the Rural Energy Self-Sufficiency Initiative. Additionally, the 2018 farm bill established one new program—the Carbon Utilization and Biogas Education Program.

The 2018 farm bill contains initiatives that address noncorn feedstocks (e.g., cellulosic feedstocks). The most important programs to this end are the Bioenergy Program for Advanced Biofuels, which pays producers for production of eligible advanced biofuels; the Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (formerly the Biorefinery Assistance Program), which assists in the development of new and emerging technologies for advanced biofuels; and the Renewable Energy for America Program (REAP), which has funded a variety of biofuels-related projects.

Over the five-year reauthorization period (FY2019-FY2023), the 2018 farm bill contains a total of $375 million in new mandatory funding and authorizes discretionary funding (i.e., subject to annual appropriations) of $1.7 billion for the various farm bill energy programs. This discretionary total includes discretionary authorizations for the Sun Grant Program and the Rural Energy Savings Program. The mandatory funding provided for the energy programs under the 2018 farm bill is approximately 46% less than what was provided in the 2014 farm bill, which had authorized $694 million in mandatory funding over the five-year period of FY2014-FY2018. Conversely, the 2018 farm bill provides discretionary authorizations that are approximately 13% more than what was provided in the 2014 farm bill ($1.5 billion) for the energy programs (although, as noted above, farm bill energy programs generally have not received discretionary appropriations).

At issue for Congress is oversight of the energy programs and the future of annual funding for these programs. This report provides an overview and funding summary of the various energy titles contained in the farm bills from 2002 to the present, and provides a description of the 2018 farm bill energy programs including their funding levels, program implementation status, and any changes made to the programs by the 2018 farm bill.

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Overview and History

Agriculture-based renewable energy can take several forms, including biofuels such as corn-based ethanol or soy-based biodiesel, wind-driven turbines located on farmland or in rural areas, anaerobic digesters that convert animal waste into methane and electric power, or biomass harvested for burning as a processing fuel or to generate heat as part of an industrial activity.

Since the late 1970s, U.S. policymakers at both the federal and state levels have adopted a variety of incentives, regulations, and programs to encourage the production and use of agriculture-based renewable energy (mostly biofuels).[1] Over the years, the two most widely used biofuels—ethanol produced primarily from corn starch and biodiesel produced primarily from soybean oil—have received significant federal support in the form of tax incentives, loans and grants, and regulatory programs.[2] Many of these support programs originate in legislation outside of the farm bill. For instance, the Energy Tax Act of 1978 (P.L. 95-618) provided an exemption for ethanol from the excise tax on motor fuels. By executive order the Bioenergy Program was established in 1999 and in FY2001 began making payments from the U.S. Department of Agriculture's (USDA's) Commodity Credit Corporation (CCC)[3] to eligible producers of ethanol and biodiesel based on year-to-year production increases in these fuels. The Biomass Research and Development Act of 2000 (P.L. 106-224) directed USDA and the U.S. Department of Energy (DOE) to cooperate and coordinate research and development activities for biobased industrial products, including biofuels. The 2002 farm bill (P.L. 107-171) authorized several new biofuel programs and added an energy title, Title IX. The 2008 farm bill (P.L. 110-246) subsequently extended and expanded the programs promoting renewable energy, emphasizing particularly those utilizing biomass feedstock. The 2014 farm bill (P.L. 113-79) extended the programs through FY2018. The 2018 farm bill, the Agriculture Improvement Act of 2018 (P.L. 115-334), continues federal support for the programs through FY2023. Motivations cited for these legislative initiatives include energy security concerns, reduction of greenhouse gas emissions from fossil fuel combustion, and raising domestic demand for U.S.-produced farm products.[4]

Congress has enacted temporary tax incentives for biofuels, specifically tax credits for biodiesel and second generation (formerly cellulosic) biofuel and a tax credit for small producers. Some of these temporary tax incentives have been extended numerous times. Most recently, the Bipartisan Budget Act of 2018 (BBA; P.L. 115-123) retroactively extended the tax incentive for biodiesel and renewable diesel of $1.00/gallon through the end of 2017.[5] In addition to these types of tax

[1] For a list of federal incentives in support of biofuels production, see CRS Report R42566, *Alternative Fuel and Advanced Vehicle Technology Incentives: A Summary of Federal Programs*, by Lynn J. Cunningham et al.

[2] See CRS Report R41282, *Agriculture-Based Biofuels: Overview and Emerging Issues*, by Mark A. McMinimy.

[3] The Bioenergy Program was initiated on August 12, 1999, by President Clinton's Executive Order 13134. The CCC is a U.S. government-owned and -operated corporation, created in 1933 with broad powers to support farm income and prices and to assist in the export of U.S. agricultural products. Toward this end, the CCC finances USDA's domestic farm commodity price and income support programs and certain export programs using its permanent authority to borrow up to $30 billion at any one time from the U.S. Treasury. For more information about the CCC, see CRS Report R44606, *The Commodity Credit Corporation: In Brief*, by Megan Stubbs.

[4] "Agriculture and Nutrition Act of 2018," Remarks in the Senate, *Congressional Record*, vol. 164 (June 28, 2018), p. S4699; "Agriculture Reform, Food and Jobs Act of 2013," remarks in the Senate, *Congressional Record*, May 22, 2013, p. S3747; "Providing for further consideration of H.R. 1947, Federal Agriculture Reform and Risk Management Act of 2013," House debate, *Congressional Record*, June 19, 2013, p. H3776.

[5] For more information, see CRS Report R44990, *Energy Tax Provisions That Expired in 2017 ("Tax Extenders")*, by Molly F. Sherlock, Donald J. Marples, and Margot L. Crandall-Hollick, and CRS Report R45347, *Tax Provisions That Expired in 2017 ("Tax Extenders")*, by Molly F. Sherlock.

incentives, the Renewable Fuel Standard (RFS) mandates a minimum level of renewable fuel usage.[6]

Historically, there has been a revenue cost associated with tax incentives for ethanol and biofuels. The Volumetric Ethanol Excise Tax Credit (VEETC) provided a tax credit of $0.45/gallon before it expired at the end of 2011. From FY1980 through FY2013, excise tax credits and incentives for ethanol reduced federal tax revenue by a cumulative estimated total of $46.9 billion.[7] In FY2011, the fiscal year immediately preceding the VEETC's expiration, its cost was an estimated $6.5 billion. Excise tax incentives for biodiesel producers have reduced federal excise tax revenue by an estimated $17.3 billion between FY2008 and FY2018.[8] In FY2018, excise tax receipts were reduced by $3.4 billion due to biodiesel producer credits (the reduction in FY2018 excise tax receipts is associated with tax credit claims made for biodiesel production in calendar year 2017).

Title IX of the 2018 farm bill continues long-standing congressional support for the production of renewable energy from agriculturally sourced materials. This report focuses on those policies contained in the 2018 farm bill that support agriculture-based renewable energy. The introductory sections of this report briefly describe how USDA bioenergy policies evolved and how they fit into the larger context of U.S. biofuels policy. Then, each of the bioenergy provisions of the 2018 farm bill are defined in terms of their function, goals, administration, funding, and implementation status.

In an appendix at the end of this report, **Table A-1** presents data on 2018 farm bill budgetary authority for energy provisions, while **Table A-2**, **Table A-3**, and **Table A-4** present the original budget authority for Title IX programs under the previous 2014 farm bill, the 2008 farm bill, and the 2002 farm bill, respectively.[9]

Non-USDA/Non-Farm Bill Programs and Authorizations

Renewable energy production plays a key role not just in agricultural policy, but also in energy, tax, and environmental policy. As a result, many of the federal programs that support renewable energy production in general, and agriculture-based energy production in particular, are outside the purview of USDA and have origins outside of omnibus farm bill legislation. For example, the three principal federal biofuels policies of the past decade were all established outside of farm bills:

- The Renewable Fuel Standard (RFS) mandates an increasing volume of biofuels use and has its origins in the Energy Policy Act of 2005 (P.L. 109-58). The RFS was expanded in the Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) and divided into four distinct, but nested biofuel categories—total, advanced, cellulosic, and biodiesel—each with its own mandated volume.[10]
- The VEETC, originally established in the American Jobs Creation Act of 2004 (P.L. 108-357), provided a tax credit that varied in value over the years. It was

[6] For more information on the RFS, see CRS Report R43325, *The Renewable Fuel Standard (RFS): An Overview*, by Kelsi Bracmort.

[7] This estimate does not take into account inflation. Analysis by Molly Sherlock, CRS Specialist in Public Finance.

[8] Ibid.

[9] For a side-by-side comparison of Title IX energy-related provisions for current versus previous law, see CRS Report R45525, *The 2018 Farm Bill (P.L. 115-334): Summary and Side-by-Side Comparison*, coordinated by Mark A. McMinimy.

[10] See CRS Report R43325, *The Renewable Fuel Standard (RFS): An Overview*, by Kelsi Bracmort.

$0.45 per gallon of pure ethanol blended with gasoline when it expired on December 31, 2011.[11]

- The ethanol import tariff was intended to offset the ethanol tax incentives and was originally established by the Omnibus Reconciliation Act of 1980 (P.L. 96-499). The ethanol import tariff also expired on December 31, 2011.

In addition to the RFS, VEETC, and the ethanol import tariff, several other tax credits that originated outside of farm bills were available for biodiesel production as well as for small producers (less than 60 million gallons per year per plant) of ethanol and biodiesel. A substantial number of federal programs also support renewable energy sources other than biofuels.[12] In addition to federal programs, many states offer additional support to biofuels producers, blenders, and consumers.[13]

An awareness of the non-USDA federal programs is important for appreciating the role envisioned for the energy title of both the 2018 farm bill and previous farm bills. The farm bill programs were designed to provide incentives for the research and development of new agriculture-based renewable fuels, especially second-generation biofuels (those based on non-food crop biomass such as cellulose and algae), and to expand their distribution and use. A summary of the evolution of these programs follows.

2002 Farm Bill—First Energy Title

The 2002 farm bill (Farm Security and Rural Investment Act of 2002; P.L. 107-171) was the first omnibus farm bill to explicitly include an energy title (Title IX). The energy title authorized grants, loans, and loan guarantees to foster research on agriculture-based renewable energy, to share development risk and to promote the adoption of renewable energy systems.[14] Since enactment of the 2002 farm bill, interest in renewable energy has grown rapidly, due in large part to periods of steep increases in domestic and international petroleum prices and a dramatic acceleration in domestic biofuels production (primarily corn-based ethanol).

2008 Farm Bill—Refocus on Non-Corn-Based Biofuels

Annual U.S. ethanol production expanded rapidly between 2002 and 2007, rising from approximately 2 billion gallons to over 6.5 billion gallons during that period.[15] Similarly, corn use for ethanol grew from an 11% share of the U.S. corn crop in 2002 to an estimated 23% share of the 2007 corn crop.[16] During the 2008 farm bill debate, government and industry projections had ethanol's corn-use share rising rapidly, sparking concerns about unintended consequences of the

[11] For more information, see CRS Report R41282, *Agriculture-Based Biofuels: Overview and Emerging Issues*, by Mark A. McMinimy.

[12] For a complete listing of federal programs that support all types of renewable energy, see CRS Report R40913, *Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs*, by Lynn J. Cunningham.

[13] For information on state programs, see "Database of State Incentives for Renewables & Efficiency (DSIRE)," at http://www.dsireusa.org/.

[14] For an overview of the 2002 farm bill's energy title, see CRS Report RL33037, *Previewing a 2007 Farm Bill*, coordinated by Jasper Womach.

[15] For a discussion of the rapid growth of the U.S. biofuels sector, see CRS Report R41282, *Agriculture-Based Biofuels: Overview and Emerging Issues*, by Mark A. McMinimy. For recent data regarding fuel ethanol production, see U.S. Energy Information Administration, *Short-Term Energy Outlook*, 2019.

[16] U.S. Department of Energy, Alternative Fuels Data Center, *U.S. Corn for Fuel Ethanol, Feed and Other Use*, February 2019, https://afdc.energy.gov/data/10339.

policy-driven expansion of U.S. corn ethanol production.[17] Dedicating an increasing share of the U.S. corn harvest to ethanol production evoked fears of higher prices for all grains and oilseeds that compete for the same land, which could lead to higher livestock feed costs, higher food prices, and lower U.S. agricultural exports.[18] In addition, several environmental concerns emerged regarding water impacts, and the expansion of corn production onto nontraditional lands, including native grass and prairie land, among other things.[19] In response, policymakers sought to refocus biofuels policy initiatives in the 2008 farm bill (the Food, Conservation, and Energy Act of 2008; P.L. 110-246) in favor of non-corn starch feedstock, especially cellulosic-based feedstock, by introducing a number of programs aimed at facilitating the production and use of bioenergy from nonfood feedstock.

The 2008 farm bill became law six months after the enactment of the EISA. A key component of EISA was a significant expansion of the RFS, which in part mandates the increasing use of "advanced biofuels" (i.e., non-corn starch biofuels), whose minimum use was scheduled to increase from zero gallons in 2008 to 21 billion gallons by 2022.[20] The energy provisions of the 2008 farm bill were intended to reinforce EISA's program goals via a further refocusing of federal incentives toward non-corn-based sources of renewable energy. These advanced biofuel goals—in particular for the RFS—have proven difficult to meet.[21]

2014 Farm Bill—Extends Most Programs with New Funding

Funding for the majority of the energy programs from the 2008 farm bill expired at the end of FY2012 and lacked baseline funding going forward.[22] The 2014 farm bill (Agricultural Act of 2014; P.L. 113-79) extended most of the renewable energy provisions of the 2008 farm bill and provided new mandatory funding, with some notable exceptions. Again, most of the 2014 farm bill energy programs lacked a mandatory funding baseline going forward beyond FY2018.[23]

The 2014 farm bill included some key changes to select programs including Section 9007, the Renewable Energy for America Program (REAP), which precludes the use of REAP funding for any mechanism for dispensing energy at the retail level (e.g., blender pumps). The 2014 farm bill

[17] U.S. Department of Agriculture, *USDA Agricultural Projections to 2016*, Long-term Projections Report OCE-2007-1, February 2007; U.S. Department of Agriculture, *Feed Grains Backgrounder*, FDS-07c-01, March 2007.

[18] U.S. Congress, Senate Committee on Energy and Natural Resources, *Biofuels Impact on Food Prices*, 110th Cong., 2nd sess., June 12, 2008, S. Hrg. 110-529; Congressional Budget Office, *The Impact of Ethanol Use on Food Prices and Greenhouse-Gas Emissions*, April 2009; U.S. Department of Agriculture, *Ethanol Expansion in the United States: How Will the Agricultural Sector Adjust?*, FDS-07D-01, May 2007; The World Bank, *Biofuels: The Promise and the Risks*, Report Number 41382, 2008.

[19] National Research Council of the National Academies, *Water Implications of Biofuels Production in the United States*, 2008; Ecological Society of America, *ESA Biofuel Policy*, January 2008, https://www.esa.org/biofuels/esa-biofuel-policy/; T. Searchinger, R. Heimlich, and R.A. Houghton, et al., "Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change," *Science Magazine*, vol. 319 (February 29, 2008).

[20] 42 U.S.C. §7545(o).

[21] EPA has waived the statutory volume requirements for both the advanced biofuel component and cellulosic biofuel component of the RFS when certain conditions outlined in statute have prevailed. In short, these requirements have proven unattainable. For more information, see CRS Report R44045, *The Renewable Fuel Standard (RFS): Waiver Authority and Modification of Volumes*, by Kelsi Bracmort.

[22] A baseline essentially gives programs built-in future funding if policymakers decide that the programs should continue, or, if not, the baseline can be reallocated to other programs or used as an offset for deficit reduction. For more information on baseline funding, see CRS In Focus IF10780, *Farm Bill Primer: Programs Without Baseline Beyond FY2018*, by Jim Monke.

[23] For more information, see CRS Report R44758, *Farm Bill Programs Without a Budget Baseline Beyond FY2018*, by Jim Monke.

repealed one program and two studies—Section 9011, the Forest Biomass for Energy Program; Section 9013, the Biofuels Infrastructure Study; and Section 9014, the Renewable Fertilizer Study. Additionally, the 2014 farm bill did not address the Rural Energy Self-Sufficiency Initiative of the 2008 farm bill.

2018 Farm Bill—Less Mandatory Funding

The 2018 farm bill (Agriculture Improvement Act of 2018; P.L. 115-334) extends most of the 2014 farm bill energy title programs through FY2023 and provides new mandatory funding. It establishes one new program—the Carbon Utilization and Biogas Education Program. It repeals one program and one initiative—the Repowering Assistance Program and the Rural Energy Self-Sufficiency Initiative.

A key point of the 2018 farm bill is that it provides less mandatory funding than previous farm bills for energy title programs. For instance, the 2018 farm bill energy title programs mandatory funding level ($375 million) is approximately 46% less than the mandatory funding provided in the 2014 farm bill ($694 million). On the other hand, the total discretionary authorization provided by the 2018 farm bill ($1.7 billion) is approximately 13% more than what was authorized in the 2014 farm bill ($1.5 billion) for the energy programs. However, most energy title programs did not receive discretionary appropriations under previous appropriation acts.

The 2018 farm bill energy title programs are described in more detail in the section below entitled "Major Energy Provisions in the 2018 Farm Bill."

Funding for Agriculture-Based Energy Programs

In general, two types of funding are authorized by Congress in a farm bill—mandatory and discretionary. Some farm bill programs receiving mandatory funds are automatically funded at levels "authorized" in the farm bill unless Congress limits funding to a lower amount through the appropriations or legislative process.[24] For many of these programs, mandatory funding is provided through the borrowing authority of USDA's Commodity Credit Corporation (CCC). The farm bill may also specify some discretionary funding as "authorized to be appropriated"—such discretionary funding is actually determined each year through the annual appropriations process and may or may not reflect the funding level suggested in the authorizing legislation.

Funding Under the 2002 Farm Bill

The 2002 farm bill (P.L. 107-171) provided mandatory funding of $801 million and identified discretionary authorizations of $294 million for the farm bill energy programs for FY2002-FY2007 (**Table A-4**).[25] The Section 9010 Continuation of the Bioenergy Program (7 U.S.C. §8108)—which was the predecessor to the Bioenergy Program for Advanced Biofuels—received approximately 75% of the mandatory appropriations. The Section 9006 Renewable Energy Systems and Energy Efficiency Improvements program (7 U.S.C. §8106)—which became a part of REAP when it was created in the 2008 farm bill—received approximately 15% of the

[24] Mandatory funding remains subject to sequestration under the Budget Control Act of 2011 (P.L. 112-25). Mandatory funding may also be reduced by appropriation acts via Changes in Mandatory Program Spending (CHIMPS). For more information on mandatory versus discretionary authorizations, CHIMPS, and sequestration, see CRS Report R45230, *Agriculture and Related Agencies: FY2019 Appropriations*, by Jim Monke.

[25] Discretionary authorizations for four programs in the farm bill were not specified. Rather, the programs were authorized to be appropriated "such sums as may be necessary" (SSAN).

mandatory appropriations. The entirety of the $294 million in discretionary authorizations went to Section 9008 Biomass Research and Development (26 U.S.C. §7624).

Funding Under the 2008 Farm Bill

The 2008 farm bill authorized slightly over $1.0 billion in mandatory funding and nearly $1.5 billion in discretionary appropriations to Title IX energy programs for FY2008-FY2012 (**Table A-3**). Mandatory authorizations included $320 million for the Biorefinery Assistance Program, $300 million for the Bioenergy Program for Advanced Biofuels, and $255 million for the Rural Energy for America Program (REAP). The Biomass Crop Assistance Program (BCAP) was authorized to receive such sums as necessary (i.e., funding is open-ended and depends on program participation); however, limits were later set on BCAP outlays under the annual appropriations process beginning in FY2010.[26] The $1.5 billion of discretionary funding authorization included $600 million for the Biorefinery Assistance Program, and $100 million for both the Bioenergy Program for Advanced Biofuels and REAP. However, actual discretionary appropriations through FY2012 to all Title IX energy programs were substantially below authorized levels.

As regards mandatory funding, all of the bioenergy provisions of Title IX—with the exception of Section 9010, the Feedstock Flexibility Program for Bioenergy Producers, which is authorized indefinitely—had mandatory funding only for the life of the 2008 farm bill, FY2008 through FY2012. As a result, all of the bioenergy provisions in Title IX of the 2008 farm bill, with the exception of the Feedstock Flexibility Program for Bioenergy Producers (§9010), expired on September 30, 2012.[27]

Funding Under Continuing Resolutions for FY2013

The 112th Congress did not complete action on any of the regular FY2013 appropriations bills during 2012. Instead, a continuing resolution (CR) for the first half of FY2013 (P.L. 112-175) was signed into law on September 28, 2012.[28] This was followed by a second CR to provide appropriations for the second half of FY2013 (P.L. 113-6).[29] The Rural Energy for America Program was the sole Title IX bioenergy program that received an appropriation of discretionary funds ($3.4 million) in FY2013.[30]

Funding Under ATRA—The 2008 Farm Bill Extension

Many of the 2008 farm bill programs were extended through September 30, 2013, by Section 701 of the American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240) signed into law by President Obama on January 2, 2013. Under ATRA, discretionary funding was authorized to be appropriated at the rate that programs were funded under the 2008 farm bill.

[26] See CRS Report R41296, *Biomass Crop Assistance Program (BCAP): Status and Issues*, by Mark A. McMinimy.

[27] For more information, see CRS Report R42442, *Expiration and Extension of the 2008 Farm Bill*, by Jim Monke, Randy Alison Aussenberg, and Megan Stubbs.

[28] See out-of-print CRS Report R42782, *FY2013 Continuing Resolutions: Analysis of Components and Congressional Action*, available upon request for congressional staff from the author.

[29] Consolidated and Further Continuing Appropriations Act, 2013, P.L. 113-6, March 26, 2013.

[30] Ibid.

Funding Under the 2014 Farm Bill

The five-year reauthorization period (FY2014-FY2018) of the 2014 farm bill (P.L. 113-79) contained a total of $694 million in new mandatory funding and authorized $1.5 billion to be appropriated for the various farm bill renewable energy programs (**Table A-2**). Under the 2014 farm bill, Congress acted through annual appropriations bills to lower the amount of mandatory funding available to four of these programs (i.e., the Biorefinery Assistance Program, the Repowering Assistance Program, the Bioenergy Program for Advanced biofuels, and the Biomass Crop Assistance Program) and did not appropriate discretionary funding for most of these programs. Programs that did receive discretionary funding under the 2014 farm bill include the Rural Energy for America Program and the Rural Energy Savings Program.

Funding Under the 2018 Farm Bill

The 2018 farm bill reauthorizes the energy title programs for a five-year term, FY2019-FY2023. It contains $375 million in new mandatory funding and authorizes to be appropriated $1.7 billion (**Table A-1**). Of the four farm bills since 2002, the 2018 farm bill gives the least amount of mandatory funding for energy title programs. The amount of discretionary authorization is comparable to what was provided in the 2014 farm bill. In short, under the 2018 farm bill, Congress has reduced the number of energy programs that receive mandatory funding, and reduced the amount of mandatory funding, while keeping both the number of discretionary programs and the discretionary funding similar to levels found in the 2014 farm bill. Further, some programs that received mandatory funding under the 2014 farm bill are now authorized to receive only discretionary funding under the 2018 farm bill (i.e., the Biodiesel Fuel Education Program, the Biomass Research and Development Initiative, and the Biomass Crop Assistance Program). Details of the funding levels provided in the 2018 farm bill—and the 2014, 2008, and 2002 farm bills—are provided in the discussion of individual provisions below and are summarized in the appendix tables.

Major Energy Provisions in the 2018 Farm Bill

Like the three preceding farm bills, the 2018 farm bill (P.L. 115-334) contained a distinct energy title (Title IX) that extends many of the previous bioenergy programs.[31] What follows is a summary of the bioenergy-related authorities found in the 2018 farm bill, including (where applicable) a brief description of each program, 2018 farm bill funding levels, and the status of program implementation, including any noteworthy legislative changes.[32] This section provides a description for all sections listed under 7 U.S.C. Ch. 107 Renewable Energy Research and Development, which includes those sections that are under other titles of the 2018 farm bill.[33]

[31] For a side-by-side comparison of previous law with the energy provisions of the 2018 farm bill, see CRS Report R45525, *The 2018 Farm Bill (P.L. 115-334): Summary and Side-by-Side Comparison*, coordinated by Mark A. McMinimy.

[32] For authorized funding levels in the 2014 farm bill, the 2008 farm bill, and the 2002 farm bill, see **Table A-2**, **Table A-3**, and **Table A-4**.

[33] 7 USC §8107a Rural Energy Savings Program may be found under the rural development title of the 2018 farm bill as Sec. 6303. Both 7 USC §8108 Biomass Research and Development and 7 USC §8114 Sun Grant Program may be found under the research title of the 2018 farm bill as Sec. 7507 and Sec. 7414, respectively.

7 U.S.C. 8101: Definitions

The 2018 farm bill made three substantive modifications to bioenergy-related definitions as follows (7 U.S.C. §8101):

1. **"biobased product"—**similar to prior law except it expands the term to include renewable chemicals;
2. **"biorefinery"—**defined as a facility that converts renewable biomass or an intermediate ingredient or feedstock of renewable biomass into biofuels, renewable chemicals, or biobased products and may produce electricity; and
3. **"renewable energy system"—**defined as a system that produces useable energy from a renewable source, including the distribution components necessary to move energy produced by the system to the initial point of sale, and other components and ancillary infrastructure such as a storage system, but not any mechanism for dispensing energy at retail (e.g., a blender pump).

The first two modifications were designed to expand access to federal support for renewable chemicals and intermediate ingredients or feedstocks of renewable biomass, respectively. The last modification was designed to expand access to federal support for ancillary infrastructure (e.g., storage system) associated with a renewable energy system.

7 U.S.C. 8102: Biobased Markets Program

Administered by: Rural Business and Cooperative Service, Rural Development Agency (RD), USDA.[34]

Program Overview: The Biobased Markets Program was originally established under the 2002 farm bill as a federal procurement preference program that required federal agencies to purchase biobased products under certain conditions (7 U.S.C. §8102). The 2008 farm bill renamed the federal biobased procurements preference program as the Biobased Markets Program. USDA refers to the program as the BioPreferred® Program. The BioPreferred® Program promotes biobased products—those derived from marine and forestry materials—through two initiatives: (1) a mandatory purchasing requirement for federal agencies and their contractors and (2) a voluntary labeling initiative for biobased products. Products that meet the minimum biobased content criteria may display the USDA Certified Biobased Product label.[35]

Under the Biobased Markets Program, federal agencies and their contractors are generally required to purchase biobased products from 109 categories of goods—among which are cleaners, carpets, lubricants, office supplies, and paints—when an agency procures $10,000 or more worth of an item within these categories during the course of a fiscal year, or where the quantity of such items or of functionally equivalent items purchased during the preceding fiscal year was $10,000 or more.[36]

Changes in 2018 Farm Bill: The 2018 farm bill (P.L. 115-334) extended the Biobased Markets Program through FY2023, while adding some new implementation requirements. It requires the Secretary to update the eligibility criteria for determining which renewable chemicals will qualify

[34] The official USDA biobased markets program website is at http://www.biopreferred.gov/.

[35] For policies and laws, see http://www.biopreferred.gov/BioPreferred/faces/pages/PoliciesAndLaws.xhtml.

[36] For more detail and exceptions to this requirement, see http://www.ecfr.gov/cgi-bin/text-idx?SID=f511776b8ee3c0092343d0e8736f5224&mc=true&node=se7.15.3201_13&rgn=div8. For a list of product categories, see https://www.biopreferred.gov/BioPreferred/faces/pages/ProductCategories.xhtml.

for a "USDA Certified Biobased Product" label. The farm bill requires the Secretary and the Secretary of Commerce to develop North American Industry Classification System (NAICS) codes for both renewable chemical manufacturers and biobased product manufacturers, and for the Secretary to establish a national registry of testing centers for biobased products. The bill also requires USDA to establish an expedited approval process for products to be determined eligible for the procurement program and to receive a biobased product label. The farm bill prohibits a procuring agency from establishing procurement guidelines for biobased products that are more restrictive than what the Secretary has established.

Funding: The 2018 farm bill authorized mandatory CCC funding of $3 million for each of FY2019-FY2023 for biobased products testing and labeling. Discretionary funding of $3 million was authorized to be appropriated for each of FY2019-FY2023. However, through FY2019 no discretionary funding has been appropriated for the Biobased Markets Program.

7 U.S.C. 8103: Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program

Administered by: Rural Business and Cooperative Service, Rural Development Agency (RD), USDA in consultation with DOE.

Program Overview: Originally called the Biorefinery Assistance Program (BAP) as authorized in the 2008 farm bill, this program assists in the development of new and emerging technologies for advanced biofuels, renewable chemicals, and biobased products.[37] Competitive grants and loan guarantees are available for construction and/or retrofitting of demonstration-scale biorefineries to demonstrate the commercial viability of one or more processes for converting renewable biomass to advanced biofuels. Biorefinery grants can provide for up to 30% of total project costs. Each loan guarantee is limited to $250 million or 80% of project cost (7 U.S.C. §8103). Mandatory funds are used for the loan guarantee portion of BAP, whereas discretionary appropriations are to be used to fund grants.[38] With no appropriation of discretionary funds for BAP during the life of the 2008 farm bill, Congress permitted USDA to move forward with only the loan guarantee portion of BAP. Rural Development administers the program under 7 C.F.R. §4279, Subpart C, and 7 C.F.R. §4287, Part D.

For loan guarantees, project lenders (not prospective borrowers) must submit the application.[39] Each loan guarantee application undergoes at least three rounds of review, including review by the Rural Development Agency, USDA; the National Renewable Energy Laboratory (NREL), DOE; and the Office of the Chief Economist (OCE), USDA.

Changes in 2018 Farm Bill: The 2018 farm bill (P.L. 115-334) extended the program through FY2023. It expanded the definition of eligible technology to include technologies that produce one or more of the following, or a combination thereof: an advanced biofuel, a renewable chemical, or a biobased product.

Funding: The 2018 farm bill authorized mandatory CCC funding of $50 million for FY2019 and $25 million for FY2020 for the cost of loan guarantees. Discretionary funding of $75 million was

[37] For more program information, see Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program, Business and Cooperative Programs (BCP), Rural Development (RD), USDA, at https://www.rd.usda.gov/programs-services/biorefinery-renewable-chemical-and-biobased-product-manufacturing-assistance.

[38] Based on information received by CRS from Kelly Oehler, Branch Chief, Energy Division, RD, USDA.

[39] More information on the BAP loan guarantee applications is available at https://www.ecfr.gov/cgi-bin/text-idx?SID=053b4252b720dd2ab341a62759c8032c&pitd=20150624&node=20150624y1.19.

authorized to be appropriated for each of FY2019-FY2023. No discretionary funds have been appropriated through FY2019.

7 U.S.C. 8104: Repowering Assistance Program (RAP) (Repealed)

Administered by: Rural Business and Cooperative Service, RD, USDA.

Program Overview: The Repowering Assistance Program (RAP) was originally established under the 2008 farm bill to encourage biorefineries to replace fossil fuels with renewable biomass as the feedstock. RAP made payments to eligible biorefineries (i.e., those in existence on the date of enactment of the 2008 farm bill, June 18, 2008) to encourage the use of renewable biomass as a replacement for fossil fuels used to provide heat for processing or power in the operation of these eligible biorefineries.[40]

Changes in 2018 Farm Bill: The Repowering Assistance Program was repealed.

7 U.S.C. 8105: Bioenergy Program for Advanced Biofuels

Administered by: Rural Business and Cooperative Service, RD, USDA.

Program Overview: Originally created by a 1999 executive order during the Clinton Administration, the bioenergy program provided mandatory CCC incentive payments to biofuels producers based on year-to-year increases in the quantity of biofuel produced. The 2008 farm bill established a new Bioenergy Program for Advanced Biofuels to support and expand production of advanced biofuels—that is, fuel derived from renewable biomass other than corn kernel starch—under which USDA would enter into contracts with advanced biofuel producers to pay them for production of eligible advanced biofuels.[41] The policy goal is to create long-term, sustained increases in advanced biofuels production. Payments are of two types: one based on actual production, and a second based on incremental production increases. Not more than 5% of the funds in any year can go to facilities with total refining capacity exceeding 150 million gallons per year (7 C.F.R. Part 4288, Subpart B).

Changes in 2018 Farm Bill: The 2018 farm bill (P.L. 115-334) extended the program through FY2023. It modifies the equitable distribution portion of the program by limiting the amount of payments for advanced biofuel produced from a single eligible commodity to not exceed one-third of the total program funding available in a fiscal year.

Funding: The 2018 farm bill authorized mandatory CCC funding of $7 million for each of FY2019-FY2023. Discretionary funding of $20 million was authorized to be appropriated for each of FY2019-FY2023. However, no discretionary funding has been appropriated for the Bioenergy Program for Advanced Biofuels program through FY2019.

7 U.S.C. 8106: Biodiesel Fuel Education Program

Administered by: National Institute of Food and Agriculture (NIFA) and Office of Energy Policy and New Uses (OEPNU), OCE, USDA.

Program Overview: Originally established under the 2002 farm bill, the Biodiesel Fuel Education Program was extended by the 2008, 2014, and 2018 farm bills (7 U.S.C. §8106). The

[40] For more program information, see "Section 9004: Repowering Assistance Program," BCP, RD, USDA, at https://www.rd.usda.gov/programs-services/repowering-assistance-program.

[41] For more program information, see the "Advanced Biofuel Payment Program," RD, USDA at https://www.rd.usda.gov/programs-services/advanced-biofuel-payment-program.

Biodiesel Fuel Education Program awards competitive grants to nonprofit organizations that educate governmental and private entities that operate vehicle fleets, and educates the public about the benefits of biodiesel fuel use. The program is implemented by USDA through continuation grants.[42] The final rule for the program was published on September 30, 2003 (68 *Federal Register* 56137).

Changes in 2018 Farm Bill: Extended the Biodiesel Fuel Education Program from FY2019 through FY2023 without changes to program implementation other than new funding levels.

Funding: The 2018 farm bill provides no mandatory funding for the program. Discretionary funding of $2 million is authorized to be appropriated for each of FY2019-FY2023. However, through FY2019 no discretionary funding has been provided.

7 U.S.C. 8107: Rural Energy for America Program (REAP)

Administered by: Rural Business and Cooperative Service, Rural Development, USDA.

Program Overview: The 2008 farm bill combined elements of two existing programs from the 2002 farm bill—the Energy Audit and Renewable Energy Development Program and the Renewable Energy Systems and Energy Efficiency Improvements Program—into a single program renamed the Rural Energy for America Program (REAP) (7 U.S.C. §8107).[43]

REAP provides various types of financial assistance under a cost-share arrangement for the following purposes:

- grants, guaranteed loans, and combined grants and guaranteed loans for the development and construction of renewable energy systems (RES) and for energy efficiency improvement (EEI) projects (eligible entities include rural small businesses and agricultural producers);
- grants for conducting energy audits and for conducting renewable energy development assistance (eligible entities include state, tribe, or local governments; land-grant colleges and universities; rural electric cooperatives; and public power entities); and
- grants for conducting renewable energy systems (RES) feasibility studies (eligible entities include rural small businesses and agricultural producers).

The cost share feature of REAP limits the government's contribution to no more than 75% of eligible project costs for RES systems and EEI funding for combined grant and loan guarantees, and to no more than 25% for grants. Under energy audit and renewable energy development assistance grants, a grantee must pay a minimum of 25% of the cost of the energy audit. RES systems include those that generate energy from biomass (but excluding any mechanism for dispensing energy at retail—e.g., a blender pump), anaerobic digesters, geothermal, hydrogen, solar, wind, and hydropower. EEI projects typically involve installing or upgrading equipment to

[42] USDA reports that a new continuation grant is an award for a successful project application that has not been previously submitted, and by which the Department agrees to support a specified level of effort for a predetermined project period with a statement of intention to provide additional support at a future date, contingent upon the availability of appropriated funds and the satisfactory progress of this project, and the determination that continued support would be in the best interest of the federal government and the public. U.S. Department of Agriculture, *Biodiesel Fuel Education Program, Fiscal Year 2014 Request for Applications*, June 27, 2014.

[43] For more information, see the REAP program page at https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency.

significantly reduce energy use. REAP operates under regulations published under 7 C.F.R. Part 4280, subpart B.

Changes in 2018 Farm Bill: The 2018 farm bill extends the program through FY2023. It amends the financial assistance for energy efficiency improvements and renewable energy systems section to include certain limitations for loan guarantees to purchase and install energy-efficient equipment or agricultural production or processing systems. Additionally, it limits funds for loan guarantees for energy-efficient equipment to agricultural producers to not exceed 15% of the annual funding provided to the program.

Funding: The 2018 farm bill retains mandatory CCC funding of $50 million for FY2014 and each fiscal year thereafter (thus, unlike other farm bill renewable energy programs, REAP's mandatory funding authority does not expire with the 2018 farm bill). Mandatory funds are to remain available until expended. Discretionary funding is authorized to be appropriated at $20 million annually for each of FY2019-FY2023. Discretionary funding of $335,000 was appropriated for FY2019.

7 U.S.C. 8107a: Rural Energy Savings Program

Administered by: Rural Utilities Service, Rural Development, USDA.

Program Overview: The Rural Energy Savings Program (7 U.S.C. §8107a) provides loans to qualified consumers to implement durable cost-effective energy-efficiency measures. The program was established in the 2014 farm bill. Loans are to be made to eligible entities that agree to use the loan funds to make loans to qualified consumers. Eligible entities include public power districts and public utility districts, among other entities. Loans to eligible entities are offered with no interest. Loan repayment by an eligible entity may not exceed 20 years from the loan's closing date, with an exception for special advances for start-up activities. A qualified consumer is a consumer served by an eligible entity with the ability to repay the loan.

Changes in 2018 Farm Bill: The 2018 farm bill extends the program through FY2023. It modifies the definition of energy-efficiency measures to include cost-effective on- or off-grid renewable energy or energy storage systems. It amends the program such that the debt incurred by a borrower under this program may not be included when determining the borrower's eligibility for loans under programs authorized by the Rural Electrification Act of 1936. It requires the Secretary to streamline the accounting requirements on borrowers. Loans from eligible entities to qualified consumers may bear interest, not to exceed 5%, and must be used for certain purposes (e.g., to establish a loan loss reserve). Additionally, it requires the Secretary to publish an annual report containing the number of program applications received, the number of loans made to eligible entities, and the recipients of the loans.

Funding: The 2018 farm bill provides no mandatory funding for the program. Discretionary funding of $75 million is authorized to be appropriated for each of FY2019-FY2023. The program received $10 million in discretionary funding for FY2019.

7 U.S.C. 8108: Biomass Research and Development Initiative (BRDI)

Administered by: National Institute of Food and Agriculture (NIFA), USDA, and DOE, jointly.

Program Overview: BRDI—created originally under the Biomass Research and Development Act of 2000 (BRDA; P.L. 106-224)—seeks to foster significant commercial production of biofuels, biobased energy innovations, development of biobased feedstocks, and biobased

products and processes, including cost-competitive cellulosic ethanol. To this end, the program provides competitive funding in the form of grants, contracts, and financial assistance for research, development, and demonstration of technologies and processes. Eligibility is limited to institutions of higher learning, national laboratories, federal or state research agencies, private-sector entities, and nonprofit organizations.

BRDI provides for coordination of biomass research and development, including life-cycle analysis of biofuels, between USDA and DOE by creating the Biomass Research and Development Board to coordinate government activities in biomass research, and the Biomass Research and Development Technical Advisory Committee to advise on proposal direction and evaluation.[44] The 2008 farm bill moved BRDA in statute to Title IX of the 2008 farm bill and expanded the BRDI technical advisory committee (7 U.S.C. §8108).

Since 2002 USDA and DOE jointly have announced annual solicitations and awards of funding allocations under BRDI.[45] Pursuant to the 2008 farm bill, applicants seeking BRDI funding must propose projects that integrate science and engineering research in the following three technical areas that are critical to the broader success of alternative biofuels production: feedstock development, biofuels and biobased products development, and biofuels development analysis. A minimum of 15% of funding must go to each area.[46] The minimum cost-share requirement for demonstration projects was increased in the 2018 farm bill to 50%, and for research projects to 20%.

Changes in 2018 Farm Bill: The 2018 farm bill extends the program through FY2023. It amends the definition of biobased product to include carbon dioxide, and it requires the initiative's technical advisory committee to include an individual with expertise in carbon capture, utilization, and storage. Further, it expands the objectives of the initiative to include the development of high-value biobased products that permanently sequester or utilize carbon dioxide. It also expands the technical areas of the initiative to include the biofuels and biobased products development of technologies that permanently sequester or utilize carbon dioxide.

Funding: The 2018 farm bill provides no mandatory funding for the program. Discretionary funding of $20 million is authorized to be appropriated for each of FY2019-FY2023. However, no discretionary funding has been appropriated for BRDI through FY2019.

7 U.S.C. 8109: Rural Energy Self-Sufficiency Initiative (Repealed)

Administered by: Rural Business and Cooperative Service, RD, USDA.

Program Overview: The 2008 farm bill authorized the Rural Energy Self-Sufficiency Initiative to assist rural communities with community-wide energy systems that reduce conventional energy use and increase the use of energy from renewable sources. Grants were to be made available to assess energy use in a rural community, evaluate ideas for reducing energy use, and develop and install integrated renewable energy systems. Grants were not to exceed 50% of the total cost of the activity (7 U.S.C. §8109). No funding was ever appropriated, and regulations were never announced for this program. No provision was included in the 2014 farm bill for the Rural

[44] For more information on the Biomass Research and Development Board, the Technical Advisory Committee, and project selection, https://biomassboard.gov/.

[45] For BRDI current and historical (FY2003-FY2015) solicitations and awards, visit https://biomassboard.gov/initiative/past_solicitations.html.

[46] For details on BRDI technical areas, see https://biomassboard.gov/initiative/initiative.html.

Energy Self-Sufficiency Initiative, with the result that program funding authority expired after FY2013.

Changes in 2018 Farm Bill: The Rural Energy Self-Sufficiency Initiative was repealed.

7 U.S.C. 8110: Feedstock Flexibility Program (FFP) for Bioenergy Producers

Administered by: Farm Service Agency (FSA), USDA.

Program Overview: Under the 2008 farm bill, the FFP required that USDA establish and administer a sugar-for-ethanol program using sugar intended for food use but deemed to be in surplus. USDA would subsidize the use of sugar for ethanol production through federal purchases of surplus sugar for resale to ethanol producers. USDA would implement the program only in those years where purchases are determined to be necessary to ensure that the sugar program operates at no cost to the federal government (7 U.S.C. §8110).[47]

The intent of the FFP is to provide the CCC a tool for avoiding sugar forfeitures. Under the sugar program, domestic sugar beet or sugarcane processors may borrow from the CCC, pledging their sugar production as collateral for any such loan, and then satisfy their loans either by repaying the loan on or before loan maturity, or by transferring the title for the collateral to the CCC immediately following loan maturity, also known as ''forfeiture'' of collateral (as specified in 7 C.F.R. §1435). The CCC is required to operate the sugar program, to the maximum extent practicable, at no cost to the federal government, by avoiding forfeitures to CCC. If domestic sugar market conditions are such that market rates are less than forfeiture level (i.e., forfeitures appear likely), current law requires CCC to use FFP to purchase sugar and sell such sugar to bioenergy producers to avoid forfeitures.

The FFP became effective upon publication of the final rule by USDA in the *Federal Register* on July 29, 2013.[48] By late July 2013, U.S. sugar prices were below effective federal support levels, compelling USDA to activate FFP on August 15, 2013, and use an estimated $148 million of CCC funds to avoid possible sugar forfeitures.[49] No outlays have been required since 2013.

Changes in 2018 Farm Bill: Extended the FFP through FY2023 with no changes to program implementation.

Funding: The 2018 farm bill extends the mandatory funding authority of such sums as necessary through FY2023. The CBO baseline does not project any outlays for the program.[50] Discretionary funding is not authorized for the program.

[47] For more information on the sugar program, see CRS In Focus IF10689, *Farm Bill Primer: Sugar Program*, by Mark A. McMinimy.

[48] "Sugar Program: Feedstock Flexibility Program for Bioenergy Producers," *Federal Register*, vol. 78, no. 145, July 29, 2013.

[49] For more information see USDA, Economic Research Service (ERS), *Sugar and Sweeteners Outlook*, SSS-M-305, January 16, 2014.

[50] Congressional Budget Office, *Details About Baseline Projections for Selected Programs—USDA Mandatory Farm Programs*, May 2019.

7 U.S.C. 8111: Biomass Crop Assistance Program (BCAP)

Administered by: Farm Service Agency (FSA), USDA.

Program Overview: BCAP provides financial assistance to owners and operators of agricultural land and nonindustrial private forest land who wish to establish, produce, and deliver biomass feedstocks to eligible processing plants.[51] BCAP provides two categories of assistance:[52]

1. **establishment and annual payments**, including a one-time payment of up to 50% of the cost of establishment for perennial crops, and annual payments (i.e., rental rates based on a set of criteria) of up to five years for nonwoody and 15 years for woody perennial biomass crops; and
2. **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 collection, harvest, storage, and transportation (CHST) of eligible material for use in a qualified biomass conversion facility.

Establishment and annual 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.[53] Eligible land for BCAP project area contracts includes agricultural land and nonindustrial private forestland, but does not include federal or state-owned land, or land that is native sod. 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. Generally, crops that receive payments under Title I (the commodity title) of the farm bill (e.g., corn, wheat, rice, and soybeans) and noxious weeds or invasive species are not eligible for annual payments.

Matching payments are available to eligible material owners who deliver eligible material to qualified biomass conversion facilities. 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 (7 U.S.C. §8111).

The 2014 farm bill changed enrolled land eligibility by including land under expiring CRP or ACEP easement contracts. It also included residue from crops receiving Title I payments as eligible material, but extended exclusion to any whole grain from a Title I crop, as well as bagasse and algae. One-time establishment payments were limited to no more than 50% of cost of establishment from 75% previously, not to exceed $500 per acre ($750 per acre for socially disadvantaged farmers or ranchers). CHST matching payments may not exceed $20 per dry ton (down from $45 per dry ton) and are available for a two-year period. CHST funding shall be available for technical assistance. Not less than 10% or more than 50% of funding may be used for CHST. Not later than four years after enactment of the 2014 farm bill, USDA is to submit to

[51] For more information, see CRS Report R41296, *Biomass Crop Assistance Program (BCAP): Status and Issues*, by Mark A. McMinimy, and U.S. Department of Agriculture, "Biomass Crop Assistance Program," 80 *Federal Register*, February 27, 2015.

[52] Farm Service Agency, USDA, "Biomass Crop Assistance Program for Fiscal Year 2017, Fact Sheet," at https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/archived-fact-sheets/bcap_fact_sheet_nov2016.pdf.

[53] See FSA, USDA, "BCAP Project Area Information," at https://www.fsa.usda.gov/programs-and-services/energy-programs/BCAP/bcap-project-area/index.

the House and Senate Agriculture Committees a report on best practices from participants receiving assistance under BCAP.[54]

Changes in 2018 Farm Bill: The 2018 farm bill extends the program through FY2023. The 2018 farm bill expands the definition for eligible material to include algae.

Funding: The 2018 farm bill provides no mandatory funding for the program. Discretionary funding of $25 million is authorized to be appropriated for each of FY2019-FY2023. No discretionary funding was provided for FY2019.

7 U.S.C. 8112: Forest Biomass for Energy (Repealed)

Administered by: Forest Service, USDA.

Program Overview: The 2008 farm bill authorized the Forest Biomass for Energy program to function as a research and development program to encourage use of forest biomass for energy. The Forest Service, other federal agencies, state and local governments, Indian tribes, land-grant colleges and universities, and private entities were to be eligible to compete for program funds. Priority was to be given to projects that use low-value forest byproduct biomass for the production of energy; develop processes to integrate bioenergy from forest biomass into existing manufacturing streams; develop new transportation fuels; and improve the growth and yield of trees for renewable energy (7 U.S.C. §8112). In the end, the Forest Service never announced any regulations for this program.

Changes in 2014 Farm Bill: The Forest Biomass for Energy program was repealed.

7 U.S.C. 8113: Community Wood Energy and Wood Innovation Program

Administered by: Forest Service, USDA.

Program Overview: The 2008 farm bill authorized the Community Wood Energy Program to provide matching grants—up to $50,000 and subject to a match of at least 50%—to state and local governments to acquire community wood energy systems for public buildings. Under the 2008 and 2014 farm bills, participants were to implement a community wood energy plan to meet energy needs with reduced carbon intensity through conservation, reduced costs, utilizing low-value wood sources, and increased awareness of energy consumption (7 U.S.C. §8113). The 2014 farm bill defined a Biomass Consumer Cooperative and authorized grants of up to $50,000 to be made to establish or expand biomass consumer cooperatives that would provide consumers with services or discounts relating to the purchase of biomass heating systems or products (including their delivery and storage); and required that any biomass consumer cooperative that received a grant match at least the equivalent of 50% of the funds toward the establishment or expansion of a biomass consumer cooperative.

Changes in the 2018 Farm Bill: The 2018 farm bill extends the program through FY2023. The 2018 farm bill changes the name to the Community Wood Energy and Wood Innovation Program, and modifies the scope of the program and participant requirements. The program provides financial assistance for the installation of community wood energy systems or building an innovative wood product facility. In short, the 2018 farm bill defines a community wood energy system as a system that produces thermal energy or combined thermal energy and electricity,

[54] 7 U.S.C. §8111(e). USDA reports it has not yet submitted the report to Congress. Email from U.S. Department of Agriculture to CRS, August 1, 2019.

services public facilities owned or operated by state or local governments, and uses woody biomass. The capacity of the community wood energy system shall not exceed 5 megawatts of thermal energy or combined thermal and electric energy. In short, an innovative wood product facility is defined as a manufacturing or processing plant or mill that produces building components that use large panelized wood (including mass timber), wood products from nanotechnology, or other innovative wood products that use low-value, low-quality wood.

The 2018 farm bill removes the requirements for participants to implement a community wood energy plan and the requirements for biomass consumer cooperatives. Cost-share grants may cover up to 35% of the capital cost of the system or facility, and, for special circumstances, up to 50%. The Secretary is required to take into account certain selection criteria for awarding grants (e.g., energy efficiency, cost effectiveness, displacement of fossil fuel generation). The Secretary is to give priority to grant applicants that use the most stringent control technology for a wood-fired boiler; would be carried out in a location where markets are needed for low-value, low-quality wood; would be carried out in a location with limited access to natural gas pipelines; would include the use or retrofitting of existing sawmill facilities that meet certain conditions; and would be carried out in a location where the project will aide with forest restoration. A maximum of 25% of the funds for the program for a fiscal year may go toward grants for innovative wood facilities, unless the Secretary has received an insufficient number of community wood energy system proposals.

Funding: The 2018 farm bill provides no mandatory funding for the program. Discretionary funding of $25 million is authorized to be appropriated for each of FY2019-FY2023. No funds have been appropriated through FY2019.

7 U.S.C. 8114: Sun Grant Program

Administered by: NIFA, USDA. Each regional Sun Grant center manages the programs and activities within its region, although a process based on peer and merit review is used to administer grants.

Program Overview: Created under the 2008 farm bill, the Sun Grant Initiative (SGI) is a national network of land-grant universities and federally funded laboratories coordinated through regional Sun Grant centers. The centers receive funding to enhance national energy security using biobased energy technologies, to promote diversification and environmental sustainability of agricultural production through biobased energy and product technologies, to promote economic diversification in rural areas through biobased energy and product technologies, and to enhance the efficiency of bioenergy and biomass research and development programs.[55] Competitive grants are available to land-grant schools within each region to be used toward integrated, multistate research, extension, and education programs on technology development and implementation.

The Sun Grant Program is an offshoot of the Sun Grant Research Initiative Act of 2003 (§778, Consolidated Appropriations Act, 2004; P.L. 108-199), which was created subsequent to the 2002 farm bill. The initiative was originally established with five Sun Grant research centers based at land-grant universities, each covering a different region, to enhance coordination and collaboration among USDA, DOE, and land-grant universities in the development, distribution, and implementation of biobased energy technologies. The 2008 farm bill established the Sun Grant Program and added a sixth regional center (7 U.S.C. §8114). NIFA administers the program under 7 C.F.R. part 3430. The 2014 farm bill extended the Sun Grant Program with its

[55] See "Sun Grant Initiative," at http://www.sungrant.org/.

discretionary funding authority (i.e., subject to appropriations) of $75 million annually through FY2018. It also consolidated and amended the Sun Grant Program to expand input from other appropriate federal agencies and replace authority for gasification research with bioproducts research and makes the program competitive by removing designation of certain universities as regional centers.

Changes in 2018 Farm Bill: Extended the Sun Grant Program through FY2023 with no changes to program implementation.

Funding: The 2018 farm bill provides no mandatory funding for the program. Discretionary funding of $75 million is authorized to be appropriated for each of FY2019-FY2023. The program received $3 million in discretionary funding for FY2019.

7 U.S.C. 8115: Carbon Utilization and Biogas Education Program

Administered by: USDA, in consultation with DOE.[56]

Program Overview: The 2018 farm bill establishes a carbon utilization and biogas education program. It requires the Secretary to award competitive grants to eligible entities for two purposes: (1) education to the public and biogas producers about the benefits of carbon utilization and sequestration, and (2) education about the opportunities to aggregate multiple sources of organic waste into a single biogas system.

Changes in 2018 Farm Bill: The program was established in the 2018 farm bill.

Funding: The 2018 farm bill provides no mandatory funding for the program. Discretionary funding of $2 million is authorized to be appropriated for each of FY2019-FY2023. No funds have been appropriated through FY2019.

[56] USDA reports that multiple agencies, and DOE, will collaborate to implement the program.

Appendix. Supplementary Tables

Table A-1. Authorized Funding for 2018 Farm Bill Title IX Energy Provisions, FY2019-FY2023

(budget authority in $ millions)

U.S. Code Citation	Provision Name	Type	FY2019	FY2020	FY2021	FY2022	FY2023	Total FY19-FY23
7 U.S.C. 8102	Biobased Markets Program	M	3	3	3	3	3	15
		D	3	3	3	3	3	15
7 U.S.C. 8103	Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (formerly BAP)	M	50	25	0	0	0	75
		D	75	75	75	75	75	375
7 U.S.C. 8105	Bioenergy Program for Advanced Biofuels	M	7	7	7	7	7	35
		D	20	20	20	20	20	100
7 U.S.C. 8106	Biodiesel Fuel Education Program	M	0	0	0	0	0	0
		D	2	2	2	2	2	10
7 U.S.C. 8107	Rural Energy for America Program (REAP)	M	50	50	50	50	50	250
		D	20	20	20	20	20	100
7 U.S.C. 8107a	Rural Energy Savings Program	M	0	0	0	0	0	0
		D	75	75	75	75	75	375
7 U.S.C. 8108	Biomass Research and Development	M	0	0	0	0	0	0
		D	20	20	20	20	20	100
7 U.S.C. 8110	Feedstock Flexibility Program for Bioenergy Producers	M	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN
		D	0	0	0	0	0	0
7 U.S.C. 8111	Biomass Crop Assistance Program (BCAP)	M	0	0	0	0	0	0
		D	25	25	25	25	25	125

U.S. Code Citation	Provision Name	Type	FY2019	FY2020	FY2021	FY2022	FY2023	Total FY19-FY23
7 U.S.C. 8113	Community Wood Energy and Wood Innovation Program	M	0	0	0	0	0	0
		D	25	25	25	25	25	125
7 U.S.C. 8114	Sun Grant Program	M	0	0	0	0	0	0
		D	75	75	75	75	75	375
7 U.S.C. 8115	Carbon Utilization and Biogas Education Program	M	0	0	0	0	0	0
		D	2	2	2	2	2	10
Total Mandatory Funding Authorized			**110**	**85**	**60**	**60**	**60**	**375**
Total Discretionary Funding Authorized			**342**	**342**	**342**	**342**	**342**	**1710**

Source: P.L. 115-334 (Agriculture Improvement Act of 2018).

Notes: In the past, many of the energy title programs authorized to receive discretionary funding have not received such funding or have received lesser amounts in the annual appropriations process than originally authorized in the farm bill. Congressional clients may contact the author for inquiries pertaining to mandatory funding expiration and actual appropriations.

Abbreviations: M = mandatory funding; D = discretionary funding; "SSAN" = such sums as necessary.

Table A-2. Authorized Funding for 2014 Farm Bill Title IX Energy Provisions, FY2014-FY2018

(budget authority in $ millions)

U.S. Code Citation	Provision Name	Type	FY2014	FY2015	FY2016	FY2017	FY2018	Total FY2014-FY2018
7 U.S.C. 8102	Biobased Markets Program	M	3	3	3	3	3	15
		D	2	2	2	2	2	10
7 U.S.C. 8103	Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (formerly BAP)	M	100	50	50	0	0	200
		D	75	75	75	75	75	375
7 U.S.C. 8104	Repowering Assistance Program	M	12	0	0	0	0	12
		D	10	10	10	10	10	50
7 U.S.C. 8105	Bioenergy Program for Adv. Biofuels	M	15	15	15	15	15	75
		D	20	20	20	20	20	100
7 U.S.C. 8106	Biodiesel Fuel Education Program	M	1	1	1	1	1	5
		D	1	1	1	1	1	5
7 U.S.C. 8107	Rural Energy for America Program (REAP)	M	50	50	50	50	50	250
		D	20	20	20	20	20	100
7 U.S.C. 8107a	Rural Energy Savings Program	M	0	0	0	0	0	0
		D	75	75	75	75	75	375
7 U.S.C. 8108	Biomass Research and Development	M	3	3	3	3	0	12
		D	20	20	20	20	20	100
7 U.S.C. 8110	Feedstock Flexibility Program for Bioenergy Producers	M	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN
7 U.S.C. 8111	Biomass Crop Assistance Program (BCAP)	M	25	25	25	25	25	125
		D	0	0	0	0	0	0
7 U.S.C. 8113	Community Wood Energy Program	M	0	0	0	0	0	0
		D	5	5	5	5	5	25

U.S. Code Citation	Provision Name	Type	FY2014	FY2015	FY2016	FY2017	FY2018	Total FY2014-FY2018
7 U.S.C. 8114	Sun Grant Program	M	0	0	0	0	0	0
		D	75	75	75	75	75	375
Total Mandatory Funding Authorized			**209**	**147**	**147**	**97**	**94**	**694**
Total Discretionary Funding Authorized			**303**	**303**	**303**	**303**	**303**	**1515**

Source: P.L. 113-79 (Agricultural Act of 2014).

Notes: Many of the discretionary programs never received any funding or received lesser amounts through the annual appropriations process than originally authorized in the farm bill. Additionally, mandatory funding for some programs for some years was limited. Congressional clients may contact the author for inquiries pertaining to mandatory funding expiration and actual appropriations. Mandatory funding is to remain available until expended for Title IX programs under the following programs: the Biorefinery Assistance Program, the Repowering Assistance Program, the Bioenergy Program for Advanced Biofuels, the Rural Energy for America Program, and the Biomass Research and Development Initiative.

Abbreviations: M = mandatory funding; D = discretionary funding; "SSAN" = such sums as necessary.

Table A-3. Authorized Funding for 2008 Farm Bill Title IX Energy Provisions, FY2008-FY2012

(budget authority in $ millions)

U.S. Code Citation	Provision Name	Type	FY2008	FY2009	FY2010	FY2011	FY2012	Total
7 U.S.C. 8102	Biobased Markets Program	M	1	2	2	2	2	9
		D	0	2	2	2	2	8
7 U.S.C. 8103	Biorefinery Assistance Program (BAP)	M	0	75	245	0	0	320
		D	0	150	150	150	150	600
7 U.S.C. 8104	Repowering Assistance Program	M	0	35	0	0	0	35
		D	0	15	15	15	15	60
7 U.S.C. 8105	Bioenergy Program for Adv. Biofuels	M	0	55	55	85	105	300
		D	0	25	25	25	25	100
7 U.S.C. 8106	Biodiesel Fuel Education Program	M	1	1	1	1	1	5

U.S. Code Citation	Provision Name	Type	FY2008	FY2009	FY2010	FY2011	FY2012	Total
		D	0	0	0	0	0	0
7 U.S.C. 8107	Rural Energy for America Program (REAP)	M	0	55	60	70	70	255
		D	0	25	25	25	25	100
7 U.S.C. 8108	Biomass Research and Development	M	0	20	28	30	40	118
		D	0	35	35	35	35	140
7 U.S.C. 8109	Rural Energy Self-Sufficiency Initiative	M	0	0	0	0	0	0
		D	0	5	5	5	5	20
7 U.S.C. 8110	Feedstock Flexibility Program for Bioenergy Producers	M	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN
7 U.S.C. 8111	Biomass Crop Assistance Program (BCAP)	M	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN
7 U.S.C. 8112	Forest Biomass for Energy	M	0	0	0	0	0	0
		D	0	15	15	15	15	60
7 U.S.C. 8113	Community Wood Energy Program	M	0	0	0	0	0	0
		D	0	5	5	5	5	20
7 U.S.C. 8114	Sun Grant Program	M	0	0	0	0	0	0
		D	75	75	75	75	75	375
Total Mandatory Funding Authorized			**2**	**243**	**391**	**188**	**218**	**1042**
Total Discretionary Funding Authorized			**75**	**352**	**352**	**352**	**352**	**1483**

Source: P.L. 110-246 (Food, Conservation, and Energy Act of 2008) and P.L. 113-6 (Consolidated and Further Continuing Appropriations Act, 2013).

Notes: All mandatory funding authority expired at the end of FY2012, with the exception of the Feedstock Flexibility Program. Authority for discretionary funding was extended under the Continuing Resolution (P.L. 112-175), for the first half of FY2013 effective October 1, 2012, through March 27, 2013; the American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240, §701), and P.L. 113-6 (Consolidated and Further Continuing Appropriations Act, 2013), which appropriated funds for the second half of FY2013. Many of the discretionary programs never received any funding or received lesser amounts through the annual appropriations process than originally authorized in the farm bill. Additionally, mandatory funding for some programs for some years were limited. Congressional clients may contact the author for inquiries pertaining to actual appropriations.

Abbreviations: M = mandatory funding; D = discretionary funding; "SSAN" = such sums as necessary.

Table A-4. Authorized Funding for 2002 Farm Bill Title IX Energy Provisions, FY2002-FY2007

(budget authority in $ millions)

U.S. Code Citation	Provision Name	Type	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Total
7 U.S.C. 8102	Federal Procurement of Biobased Products	M	1	1	1	1	1	1	6
		D	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN	
7 U.S.C. 8103	Biorefinery Development Grants	M	0	0	0	0	0	0	0
		D	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN	
7 U.S.C. 8104	Biodiesel Fuel Education Program	M	0	1	1	1	1	1	5
		D	0	0	0	0	0	0	0
7 U.S.C. 8105	Energy Audit and Renewable Energy Development Program	M	0	0	0	0	0	0	0
		D	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN	
7 U.S.C. 8106	Renewable Energy Systems and Energy Efficiency Improvements	M	0	23	23	23	23	23	115
		D	0	0	0	0	0	0	0
7 U.S.C. 8107	Hydrogen and Fuel Cell Technologies	M	0	0	0	0	0	0	0
		D	0	0	0	0	0	0	0
26 U.S.C. 7624	Biomass Research and Development	M	5	14	14	14	14	14	75
		D	49	49	49	49	49	49	294
7 U.S.C. 6711	Cooperative Research and Extension Projects	M	0	0	0	0	0	0	0
		D	SSAN	SSAN	SSAN	SSAN	SSAN	SSAN	
7 U.S.C. 8108	Continuation of Bioenergy Program	M	0	150	150	150	150		600
		D	0	0	0	0	0	0	0
Total Mandatory Funding Authorized			**6**	**189**	**189**	**189**	**189**	**39**	**801**
Total Discretionary Funding Authorized			**49**	**49**	**49**	**49**	**49**	**49**	**294**

Source: P.L. 107-171 (Farm Security and Rural Investment Act of 2002).

Notes: Congressional clients may contact the author for inquiries pertaining to mandatory funding expiration and actual appropriations.
Abbreviations: M = mandatory funding; D = discretionary funding; "SSAN" = such sums as necessary.

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