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Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs

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SUMMARY

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Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs

Energy is crucial to operating a modern industrial and services economy. Concerns about the availability and cost of energy and about environmental impacts of fossil energy use have led to a wide variety of federal incentives for renewable energy and energy efficiency. These incentives aim to implement renewable energy and energy efficiency measures and to develop and commercialize renewable energy and energy efficiency technologies.

Many of the existing energy efficiency and renewable energy programs have authorizations tracing back to the 1970s. Many programs have been reauthorized and redesigned repeatedly to meet changing economic factors. The programs apply broadly to sectors ranging from industry to academia and from state and local governments to rural communities.

Since 2005, Congress has passed several major energy laws: the Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58); the Energy Independence and Security Act of 2007 (EISA; P.L. 110-140); the Energy Improvement and Extension Act (EIEA), enacted as Division B of the Emergency Economic Stabilization Act of 2008 (EESA; P.L. 110-343); and the American Recovery and Reinvestment Act (ARRA; P.L. 111-5). Each of those laws established, expanded, or modified energy efficiency and renewable energy research, development, demonstration, and deployment (RDD&D) programs.

The Department of Energy (DOE) operates the greatest number of efficiency and renewable energy incentive programs, including RDD&D grants and contracts, weatherization assistance, production incentives, loan guarantees, and technology transfers. DOE also provides grants to states for energy policy development and assists other federal agencies in developing and implementing energy efficient and renewable energy resources.

The Department of Agriculture (USDA) runs several programs that largely focus on biofuels, such as ethanol and wood energy. Other USDA programs include assistance to rural communities with high energy costs, biomass crop assistance, grants and loans to promote energy efficiency and renewable energy for agricultural producers and rural businesses, assistance to general consumers for rural energy savings, and sustainable agricultural research.

The Department of the Treasury administers tax credits and other incentives for energy efficiency and renewable energy. Eligible activities include energy efficient home improvements, renewable energy production, and business investments in energy efficiency and renewable energy.

Other federal agencies with energy efficiency and renewable energy programs include the following:

- Department of the Interior (DOI), with programs on tribal energy production and use;
- Department of Housing and Urban Development (HUD), with energy efficient mortgages and loan programs;
- Small Business Administration (SBA), with loan programs to help borrowers upgrade their facilities and fund energy efficiency or renewable energy projects;
- Fannie Mae, with a "Green Initiative" loan program;
- Department of Health and Human Services (HHS), which provides energy assistance to low-income households; and
- Department of Veterans Affairs (VA), which provides energy efficient mortgages.

A wide range of entities are eligible for these energy efficiency and renewable incentives, including biofuels producers; state, local, and tribal governments; businesses; schools and universities; research organizations; builders and developers; homeowners; utilities; and veterans. Eligibility also includes a variety of energy-related technologies, such as advanced batteries, heating and cooling systems, vehicles and biofuels, appliances, building envelope technologies, renewable energy production technologies, lighting, and electricity generation and transmission.

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Introduction

The United States has an abundance of natural resources. For much of the nation's history, energy availability was not a concern as commerce and industry needs could be met by domestic supplies. However, industrialization and population growth, and the continuing development of a consumer-oriented society, led to growing dependence on foreign sources of energy during the 20th century to supplement the demands of a growing economy.

Recognition of the impacts of depending on foreign energy sources, coupled with concerns over the volatility of prices driven by fluctuations in supply spurred by world events, prompted federal efforts to increase U.S. energy independence and reduce domestic consumption. As a major result, numerous programs have been established, focusing on energy efficiency, domestic conservation resources, and research that targets the development of renewable sources of energy. Many of these programs have roots dating back more than 40 years and have been redesigned many times over that period.

Many of the current programs have been reauthorized and redesigned periodically to meet changing economic conditions and national interests. The programs apply broadly to sectors ranging from industry to academia and from state and local governments to rural communities. Each program has been designed to meet perceived current needs as well as future anticipated challenges.

Since 2005, Congress has passed several major energy laws: the Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58); the Energy Independence and Security Act of 2007 (EISA; P.L. 110-140); the Energy Improvement and Extension Act (EIEA), enacted as Division B of the Emergency Economic Stabilization Act of 2008 (EESA; P.L. 110-343); and the American Recovery and Reinvestment Act (ARRA; P.L. 111-5). Each of those laws established, expanded, or modified energy efficiency and renewable energy research, development, demonstration, and deployment (RDD&D) programs. The Department of Energy (DOE) operates the greatest number of efficiency and renewable energy incentive programs. The Department of the Treasury and the Department of Agriculture (USDA) operate several programs. A few programs can also be found within the Department of the Interior (DOI), the Department of Housing and Urban Development (HUD), the Small Business Administration (SBA), Fannie Mae, the Department of Health and Human Services (HHS), and the Department of Veterans Affairs (VA).

This report outlines current federal programs and provisions providing grants, loans, loan guarantees, tax credits, and other direct or indirect incentives for energy efficiency, energy conservation, and renewable energy RDD&D. The programs are grouped by administering agency with references to applicable federal agency websites. Incentives are summarized and indexed in the appendixes.

Most program descriptions were compiled from authorizing statutes, the *U.S. Code*, and Administration budget request documents. Other program descriptions and some funding information were compiled from the Database of State Incentives for Renewables and Efficiency (DSIRE), the Assistance Listings (formerly the *Catalog of Federal Domestic Assistance* or CFDA) housed on the beta.SAM.gov website, and the Energy Star website. Most budgetary figures were compiled from executive agency budget justifications and congressional committee reports.

For more information on agriculture-related grant programs, see CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort; and CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill*, by Kelsi Bracmort. For more

information on programs supporting the development and deployment of alternatives to conventional fuels and engines in transportation, see CRS Report R42566, *Alternative Fuel and Advanced Vehicle Technology Incentives: A Summary of Federal Programs*, by Lynn J. Cunningham et al.

I. Department of Energy Office of Energy Efficiency and Renewable Energy

Renewable Energy

Biomass

1. Bioenergy Technologies Office (formerly the Biomass and Biorefinery Systems R&D Program)

Administered by	Office of Energy Efficiency and Renewable Energy (EERE)
Authority	Federal Nonnuclear Energy Research and Development Act of 1974 (P.L. 93-577) Energy Policy and Conservation Act (EPCA; P.L. 94-163) Energy Conservation and Production Act (ECPA; P.L. 94-385) Department of Energy Organization Act (P.L. 95-91) Energy Tax Act (P.L. 95-618) National Energy Conservation Policy Act (NECPA; P.L. 95-619) Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620) Energy Security Act (P.L. 96-294) National Appliance Energy Conservation Act of 1987 (P.L. 100-12) Federal Energy Management Improvement Act of 1988 (P.L. 100-615) Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218) Clean Air Act Amendments of 1990 (P.L. 101-549) Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990 (P.L. 101-575) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Biomass Research and Development Act of 2000 (Title III of Agricultural Risk Protection Act of 2000; P.L. 106-224) Farm Security and Rural Investment Act of 2002 (P.L. 107-171) Healthy Forests Restoration Act of 2003 (P.L. 108-148) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) Food, Conservation, and Energy Act of 2008 (P.L. 110-234) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$180 million for FY2011 $195 million for FY2012 $185.2 million for FY2013 $182.3 million for FY2014 $175.9 million for FY2015 $225 million for FY2016 $205 million for FY2017 $221.5 million for FY2018 $226 million for FY2019

	$259.5 million for FY2020 $44.5 million requested for FY2021
Scheduled Termination	None
Description	This program works with industrial partners, national laboratories, universities, and other stakeholders to develop the technologies and systems needed to cost-effectively transform the nation's renewable and abundant domestic biomass resources into clean, affordable, and sustainable biofuels, bioproducts, and biopower. In recent years, the program has been primarily geared toward development and deployment of ethanol from non-food feedstocks (e.g., wastes, switchgrass, algae), but is now expanding its scope to include additional alternative fuels, such as bio-butanol, green gasoline, jet fuel, and diesel.
Qualified Applicant(s)	Colleges and universities; profit organizations
Qualified Technologies	Biomass
For More Information	See CRS Report R42566, *Alternative Fuel and Advanced Vehicle Technology Incentives: A Summary of Federal Programs*, by Lynn J. Cunningham et al.; DOE's Bioenergy Technologies Office overview; DOE's Bioenergy Technologies Office – Funding Opportunities online resource; and program number 81.087 at the beta.SAM.gov website.

2. Regional Biomass Energy Grant Programs

Administered by	Bioenergy Technologies Office, EERE
Authority	Department of Energy Organization Act (P.L. 95-91) Energy and Water Development Appropriations Act for FY1987 (P.L. 99-591)
Annual Funding	$0 for FY2011-FY2020 FY2021 budget request data are currently unavailable; the FY2021 DOE budget justifications do not provide details on this program.
Scheduled Termination	None
Description	This program provides assistance to increase America's use of fuels, chemicals, materials, and power made from domestic biomass on a sustainable basis. Assistance may be used to develop and transfer any of several biomass energy technologies to the scientific and industrial communities. For regional programs, such technologies will be appropriate for the needs and resources of particular regions of the United States. This program has not expired, but it has not been regularly funded since 2011, and it is unlikely that it will receive significant funding in future years.[1]
Qualified Applicant(s)	State and local governments; colleges and universities; profit organizations; nonprofit organizations
Qualified Technologies	Biomass
For More Information	See program number 81.079 at the beta.SAM.gov website.

Geothermal

3. Geothermal Technologies Office (GTO)

Administered by	EERE
Authority	Geothermal Energy Research, Development, and Demonstration Act of 1974 (P.L. 93-410) Department of Energy Organization Act (P.L. 95-91) Energy Tax Act of 1978 (P.L. 95-618) Energy Security Act of 1980 (P.L. 96-294)

[1] According to the program description in the Assistance Listings at the beta.Sam.gov website on July 9, 2018, and, more recently, on October 18, 2019.

	Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218) Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990 (P.L. 101-575) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$37 million for FY2011 $37 million for FY2012 $35 million for FY2013 $44.8 million for FY2014 $54.3 million for FY2015 $71 million for FY2016 $69.5 million for FY2017 $80.9 million for FY2018 $84 million for FY2019 $110 million for FY2020 $26 million requested for FY2021
Scheduled Termination	None
Description	This program partners the federal government with industry, academia, and research facilities to further the development and deployment of innovative geothermal energy technologies. Currently, the program's technology portfolio has prioritized early-stage R&D in four geothermal categories: hydrothermal, enhanced geothermal systems (EGS), low temperature and co-produced resources, and systems analysis. Competitive solicitations issued as Funding Opportunity Announcements (FOAs) are the principal mechanism used by the GTO to contract for cost-shared research, development, and demonstration projects.
Qualified Applicant(s)	Profit organizations; colleges and universities
Qualified Technologies	Geothermal
For More Information	See EERE's Geothermal Technologies Office website; and program number 81.087 at the beta.Sam.gov website.

Hydrogen and Fuel Cells

4. Hydrogen & Fuel Cell Technologies Office

Administered by	EERE
Authority	Federal Energy Administration Act of 1974 (P.L. 93-275) Federal Nonnuclear Energy Research and Development Act of 1974 (P.L. 93-577) Energy Policy and Conservation Act (EPCA; P.L. 94-163) Electric and Hybrid Vehicle Research, Development and Demonstration Act (P.L. 94-413) Department of Energy Organization Act (P.L. 95-91) Automotive Propulsion Research and Development Act of 1978 (Title III of Department of Energy Act of 1978-Civilian Applications; P.L. 95-238) Energy Security Act (P.L. 96-294) Methane Transportation Research, Development, and Demonstration Act of 1980 (P.L. 96-512) Alternative Motor Fuels Act of 1988 (P.L. 100-494) Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 (P.L. 101-566) Energy Policy Act of 1992 (EPACT; P.L. 102-486)

	Hydrogen Future Act of 1996 (P.L. 104-271) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$95.8 million for FY2011 $101.3 million for FY2012 $95.8 million for FY2013 $89.5 million for FY2014 $94.8 million for FY2015 $101 million for FY2016 $101 million for FY2017 $115 million for FY2018 $120 million for FY2019 $150 million for FY2020 $42 million requested for FY2021
Scheduled Termination	None
Description	This program partners with industry, academia, and national laboratories and works in close coordination with Vehicle Technologies and other programs at DOE to overcome technical barriers through R&D of hydrogen production, delivery, and storage technologies; overcome technical barriers to fuel cell technologies for transportation, distributed stationary power, and portable power applications; address safety issues and facilitate the development of model codes and standards; validate and demonstrate hydrogen and fuel cells in real-world conditions; and educate key stakeholders whose acceptance of these technologies will determine their success in the marketplace.
Qualified Applicant(s)	Federal government; national laboratories; colleges and universities; and profit organizations
Qualified Technologies	Hydrogen and fuel cells
For More Information	See EERE's Hydrogen and Fuel Cell Technologies website; and program number 81.087 at the beta.Sam.gov website.

Solar

5. Solar Energy Technologies Office (SETO)

Administered by	EERE
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Energy Conservation and Production Act (ECPA; P.L. 94-385) Department of Energy Organization Act (P.L. 95-91) Solar Photovoltaic Energy Research, Development and Demonstration Act of 1984 (P.L. 95-590) National Energy Conservation Policy Act (NECPA; P.L. 95-619) Energy Security Act (P.L. 96-294) Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218) Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990 (P.L. 101-575) P.L. 102-46 [Technical amendment to the Solar, Wind, Waste, and Geothermal Power Production Incentives of 1990] Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)

Annual Funding	$259.6 million for FY2011 $284.7 million for FY2012 $269.1 million for FY2013 $254.3 million for FY2014 $230.8 million for FY2015 $241.6 million for FY2016 $207.6 million for FY2017 $241.6 million for FY2018 $246.5 million for FY2019 $280 million for FY2020 $67 million requested for FY2021
Scheduled Termination	None
Description	SETO partners with industry, national laboratories, and universities to develop and bring reliable and affordable solar energy technologies to the marketplace. This program finances R&D in five major subprograms: Photovoltaics (PV), Concentrating Solar Power (CSP), Systems Integration for Solar Technologies, Balance of Systems Soft Cost Reduction, and Technology to Market.
Qualified Applicant(s)	Industry; national laboratories; colleges and universities
Qualified Technologies	Solar
For More Information	See EERE's Solar Energy Technologies Office website; and program number 81.087 at the beta.SAM.gov website.

Water Power

6. Water Power Technologies Office (formerly Wind and Hydropower Technologies Program)

Administered by	EERE
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218) Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990 (P.L. 101-575) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$29.2 million for FY2011 $58.1 million for FY2012 $54.7 million for FY2013 $57.8 million for FY2014 $60 million for FY2015 $70 million for FY2016 $84 million for FY2017 $105 million for FY2018 $105 million for FY2019 $148 million for FY2020 $45 million requested for FY2021
Scheduled Termination	None
Description	This program partners with the national laboratories, industry, universities, and other federal agencies to promote the development and deployment of technologies

	capable of generating environmentally sustainable and cost-effective electricity from the nation's water resources (both conventional and marine and hydrokinetic technologies).
Qualified Applicant(s)	Federal, state, local, and tribal governments; national laboratories; industry; small businesses; colleges and universities
Qualified Technologies	Hydroelectric; hydrokinetic energy; wave energy; tidal energy; ocean thermal energy conversion
For More Information	See EERE's Water Power Technologies Office website; and program number 81.087 at the beta.SAM.gov website.

Wind Energy

7. Wind Energy Technologies Office (formerly Wind and Hydropower Technologies Program)

Administered by	EERE
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218) Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990 (P.L. 101-575) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$78.8 million for FY2011 $91.8 million for FY2012 $86.1 million for FY2013 $87 million for FY2014 $105.9 million for FY2015 $95.5 million for FY2016 $90 million for FY2017 $92 million for FY2018 $92 million for FY2019 $104 million for FY2020 $22.1 million requested for FY2021
Scheduled Termination	None
Description	This program partners with federal, state, and other stakeholder groups to conduct research and development activities through competitively selected, cost-shared research and development projects with industry to improve the performance, lower the costs, and accelerate the deployment of wind energy technologies.
Qualified Applicant(s)	Federal, state, local, and tribal governments; national laboratories; industry; small businesses; colleges and universities
Qualified Technologies	Wind
For More Information	See EERE's Wind Energy Office website; and program number 81.087 at the beta.SAM.gov website.

Energy Efficiency

Buildings

8. Building Technologies Office

Administered by	EERE
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Energy Conservation and Production Act (ECPA; P.L. 94-385) Department of Energy Organization Act (P.L. 95-91) Energy Tax Act of 1978 (P.L. 95-618) National Energy Conservation Policy Act (NECPA; P.L. 95-619) Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620) Energy Security Act (P.L. 96-294) National Appliance Energy Conservation Act of 1987 (P.L. 100-12) National Appliance Energy Conservation Amendments of 1988 (P.L. 100-357) Federal Energy Management Improvement Act of 1988 (P.L. 100-615) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$207.3 million for FY2011 $214.7 million for FY2012 $204.6 million for FY2013 $173.6 million for FY2014 $168.2 million for FY2015 $200.5 million for FY2016 $199.1 million for FY2017 $220.7 million for FY2018 $226 million for FY2019 $285 million for FY2020 $61 million requested for FY2021
Scheduled Termination	None
Description	In partnership with the private sector, state and local governments, national laboratories, and universities, the Building Technologies Office works to improve the efficiency of buildings and the equipment, components, and systems within them, including electric grid integration and advanced energy storage. The program supports research and development (R&D) activities and provides tools, guidelines, training, and access to technical and financial resources.
Qualified Applicant(s)	State, local, and tribal governments; universities; national laboratories
Qualified Technologies	Energy-efficient innovations for building envelopes, equipment, lighting, daylighting, and windows; passive solar; photovoltaics; fuel cells; advanced sensors and controls; and combined heating, cooling, and power systems
For More Information	See EERE's Building Technologies Office website.

9. Weatherization Assistance Program (WAP)

Administered by	EERE
Authority	Energy Conservation and Production Act (ECPA; P.L. 94-385) National Energy Conservation Policy Act (NECPA; P.L. 95-619) Energy Security Act (P.L. 96-294)

	Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$171 million for FY2011 $68 million for FY2012 $131.7 million for FY2013 $173.9 million for FY2014 $193 million for FY2015 $215 million for FY2016 $228 million for FY2017 $251 million for FY2018 $254 million for FY2019 $308.5 million for FY2020 $0 requested for FY2021
Scheduled Termination	None
Description	This program reduces energy costs for low-income households by increasing the energy efficiency of their homes while ensuring their health and safety. DOE provides funding and technical guidance to states, which manage the day-to-day details of the program. Low-income families receive services from a network of more than 900 local weatherization service providers who install energy efficiency measures in the homes of qualifying homeowners free of charge.
Qualified Applicant(s)	State and tribal governments, including U.S. territories
Qualified Technologies	Weatherization technologies include a wide range of energy efficiency measures for retrofitting homes and apartment buildings. Weatherization service providers choose the best package of efficiency measures for each home based on an energy audit of the home. Typical measures may include installing insulation, sealing ducts, tuning and repairing heating and cooling systems, and if indicated, replacing the same; mitigating air infiltration; and reducing electric base load consumption.
For More Information	See EERE's Weatherization Assistance Program website; the National Association for State Community Services Program's (NASCSP's) WAP Clearinghouse; EERE's Weatherization Success Stories website; program number 81.042 at the beta.SAM.gov website; and CRS Report R46418, *The Weatherization Assistance Program Formula*, by Corrie E. Clark and Lynn J. Cunningham.

Industrial

10. Advanced Manufacturing Office (AMO, formerly the Industrial Technologies Program - ITP)

Administered by	EERE
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Energy Conservation and Production Act (ECPA; P.L. 94-385) Department of Energy Organization Act (P.L. 95-91) National Energy Conservation Policy Act (NECPA; P.L. 95-619) Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620) Energy Security Act (P.L. 96-294) Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)

Annual Funding	$105.9 million for FY2011 $112.7 million for FY2012 $114.3 million for FY2013 $175.4 million for FY2014 $194.2 million for FY2015 $228.5 million for FY2016 $257.5 million for FY2017 $305 million for FY2018 $320 million for FY2019 $395 million for FY2020 $94.6 million requested for FY2021
Scheduled Termination	None
Description	AMO works with industry to improve industrial energy efficiency and environmental performance while increasing productivity by conducting R&D on new energy efficient technologies; supporting commercialization of emerging technologies; providing plants with access to proven technologies, energy assessments, software tools, and other resources; and promoting energy and carbon management in industry.
Qualified Applicant(s)	National laboratories; companies; state, local, and tribal governments; colleges and universities
Qualified Technologies	Crosscutting technologies that improve the efficiency of technologies that are common to many industrial processes and can benefit multiple industries. Crosscutting technology R&D areas include combustion, distributed energy, energy intensity processes, fuel and feedstock liability, industrial materials for the future, nanomanufacturing, and sensors and automation.
For More Information	See EERE's Advanced Manufacturing Office website.

11. Inventions and Innovations Program

Administered by	EERE
Authority	Federal Nonnuclear Energy Research and Development Policy Act of 1974 (P.L. 93-577)
Annual Funding	$0 for FY2011 $940,000 for FY2012 $1 million for FY2013 $0 for FY2014-FY2018 $50,000 for FY2019 $0 for FY2020 FY2021 budget request data are currently unavailable; the FY2021 DOE budget justifications do not provide details on this program.
Scheduled Termination	None
Description	This program provides financial and technical assistance for research and development of innovative, energy-saving ideas and inventions with future commercial market potential. It supports energy efficiency and renewable energy technology development in areas that align with Office of Energy Efficiency and Renewable Energy programs. This program has not expired, but it has not been regularly funded since 2013, and it is unlikely that it will receive significant funding in future years.[2]
Qualified Applicant(s)	Individuals; small businesses
Qualified Technologies	Specific energy efficiency and renewable energy technologies not listed

[2] According to the program description in the Assistance Listings at the beta.Sam.gov website, noted on July 9, 2018, October 18, 2019, and, most recently, on October 26, 2020.

For More Information	See program number 81.036 at the beta.SAM.gov website. The U.S. Department of Energy's Inventions & Innovations website has been retired. To access information on financial opportunities and current solicitations, visit the Advanced Manufacturing Office's (formerly the Industrial Technologies Program's) funding opportunities website.

Vehicles

12. Vehicle Technologies Office

Administered by	EERE
Authority	Department of Energy Organization Act (P.L. 95-91) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$293.2 million for FY2011 $321 million for FY2012 $303.2 million for FY2013 $282.2 million for FY2014 $272.5 million for FY2015 $310 million for FY2016 $307 million for FY2017 $337.5 million for FY2018 $344 million for FY2019 $396 million for FY2020 $74.4 million requested for FY2021
Scheduled Termination	None
Description	The Vehicle Technologies Program works with industry leaders to develop and deploy advanced transportation technologies that could achieve significant improvements in vehicle fuel efficiency and displace oil with other fuels that ultimately can be domestically produced in a clean and cost-competitive manner. Program activities include research, development, demonstration, testing, technology validation, technology transfer, and education.
Qualified Applicant(s)	Industry; colleges and universities; federal, state, and local governments; national laboratories
Qualified Technologies	Hybrid electric systems; biofuels or fuels technology; advanced internal combustion engines; advanced charging and battery systems; advanced propulsion and lighweighting materials; and technology integration
For More Information	See EERE's Vehicle Technology Program website; and EERE's Vehicle Technologies Program Factsheet.

Other Energy Efficiency and Renewable Energy Programs

13. Conservation Research and Development Grants

Administered by	EERE
Authority	Federal Nonnuclear Energy Research and Development Act of 1974 (P.L. 93-577) Department of Energy Organization Act (P.L. 95-91) Further Continuing Appropriations Act for FY1983 (P.L. 97-377) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$300 million for FY2011

	$188.3 million for FY2012 $164 million for FY2013 $38.5 million for FY2014 $0 for FY2015; $142.4 million was de-obligated from this CFDA program number for FY2015 $180.7 million for FY2016 $102.7 million for FY2017 $156.7 million for FY2018 $181.4 million for FY2019 $88.5 million for FY2020 (est.) FY2021 budget request data are unavailable; the FY2021 DOE budget justifications do not provide details on this program.
Scheduled Termination	None
Description	This program provides project grants to conduct balanced, long-term research efforts in buildings, industrial, vehicle, and hydrogen and fuel cell technologies.
Qualified Applicant(s)	State, local, and tribal governments; universities; profit organizations; private nonprofit institutions/organizations
Qualified Technologies	Hydrogen and fuel cells; energy efficient technologies; advanced battery manufacturing
For More Information	See program number 81.086 at the beta.SAM.gov website.

14. Energy Efficiency and Renewable Energy Information Dissemination, Outreach, Training, and Technical Analysis/Assistance Grant Program

Administered by	EERE
Authority	Energy Reorganization Act of 1974 (P.L. 93-438) Department of Energy Organization Act (P.L. 95-91) Energy Policy Act of 1992 (EPACT; P.L. 102-486)
Annual Funding	$15 million for FY2011 $32.2 million for FY2012 $36.1 million for FY2013 $27.1 million for FY2014 $33.1 million for FY2015 $19.5 million for FY2016 $41 million for FY2017 $21.7 million for FY2018 $16 million for FY2019 $8.1 million for FY2020 (est.) FY2021 budget request data are unavailable; the FY2021 DOE budget justifications do not provide details on this program.
Scheduled Termination	None
Description	This program provides financial assistance for information dissemination, outreach, training, and related technical analysis/assistance that will (1) stimulate increased energy efficiency in transportation, buildings, industry, and the federal sector and encourage increased use of renewable and alternative energy; and (2) accelerate the adoption of new technologies to increase energy efficiency and the use of renewable and alternative energy through the competitive solicitation of applications.
Qualified Applicant(s)	State and local governments; Native American organizations; individuals; universities; profit organizations; private nonprofit organizations; public nonprofit organizations; Alaskan Native corporations and universities
Qualified Technologies	Specific energy efficiency and renewable energy technologies not listed
For More Information	See program number 81.117 at the beta.SAM.gov website.

15. Renewable Energy Production Incentive (REPI)

Administered by	EERE
Authority	Energy Policy Act of 1992 (EPACT; P.L. 102-486), Title XII, Section 1212 Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58), Title II, Subtitle A, Section 202
Annual Funding	$4.95 million for FY2006 $4.95 million for FY2007 $4.95 million for FY2008 $5 million for FY2009 $0 for FY2010-FY2020 $0 requested for FY2021
Scheduled Termination	End of FY2026
Description	This program provides incentive payments for electricity generated and sold by new qualifying renewable energy facilities. Qualifying systems are eligible for annual incentive payments of 1.5¢ per kilowatt-hour in 1993 dollars (indexed for inflation) for the first 10-year period of their operation, subject to the availability of annual appropriations in each federal fiscal year of operation.
Qualified Applicant(s)	State, local, and tribal governments; public utilities; not-for-profit electrical cooperatives; Native American corporations
Qualified Technologies	Solar thermal electric; photovoltaics; landfill gas; wind; biomass; geothermal electric; anaerobic digestion; tidal energy; wave energy; ocean thermal
For More Information	See United States Code: 42 U.S.C. §13317

16. Renewable Energy Research and Development Program

Administered by	EERE
Authority	Department of Energy Organization Act (P.L. 95-91) Department of Energy Act of 1978-Civilian Applications (P.L. 95-238), Section 207 Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$114.7 million for FY2011 $233.2 million for FY2012 $356.6 million for FY2013 $157.7 million for FY2014 $0 for FY2015 (est.); $109.4 million was de-obligated from this CFDA program number for FY2015 $245.4 million for FY2016 $384.8 million for FY2017 $249 million for FY2018 $339.5 million for FY2019 $252.2 million for FY2020 (est.) FY2021 budget request data are unavailable; the FY2021 DOE budget justifications do not provide details on this program.
Scheduled Termination	None
Description	This program provides financial assistance to conduct balanced research and development efforts in the following energy technologies: solar, biomass, hydrogen, fuel cells and infrastructure, wind, waterpower, hydrogen, and geothermal. Assistance may be used to develop and transfer renewable energy technologies to the scientific and industrial communities, states, and local governments.

Qualified Applicant(s)	State, local, and tribal governments; colleges and universities; profit organizations; private nonprofit organizations
Qualified Technologies	Solar; biomass; hydrogen; fuel cells; wind; hydropower; geothermal
For More Information	See program number 81.087 at the beta.SAM.gov website.

17. State Energy Program (SEP)

Administered by	EERE
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Energy Conservation and Production Act (ECPA; P.L. 94-385) National Energy Conservation Policy Act (NECPA; P.L. 95-619) State Energy Efficiency Programs Improvement Act of 1990 (P.L. 101-440) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Conservation Reauthorization Act of 1998 (P.L. 105-388) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$50 million for FY2011 $50 million for FY2012 $47.1 million for FY2013 $50 million for FY2014 $50 million for FY2015 $50 million for FY2016 $50 million for FY2017 $55 million for FY2018 $55 million for FY2019 $62.5 million for FY2020 $0 requested for FY2021
Scheduled Termination	None
Description	SEP provides grants to states to design and carry out their own renewable energy and energy efficiency programs.
Qualified Applicant(s)	State and tribal governments, including U.S. territories
Qualified Technologies	Emerging renewable energy and energy efficiency technologies
For More Information	See EERE's State Energy Program website; EERE's State Energy Program Success Stories website; and program number 81.041 at the beta.SAM.gov website.

18. Office of Indian Energy Assistance Programs (formerly the Tribal Energy Program, TEP)

Administered by	Office of Indian Energy Policy and Programs (IE)
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Energy Conservation and Production Act (ECPA; P.L. 94-385) Department of Energy Organization Act (P.L. 95-91) Energy Tax Act of 1978 (P.L. 95-618) National Energy Conservation Policy Act (NECPA; P.L. 95-619) Power Plant and Industrial Fuel Use Act of 1978 (P.L. 95-620) Energy Security Act (P.L. 96-294) National Appliance Energy Conservation Act of 1987 (P.L. 100-12) Federal Energy Management Improvement Act of 1988 (P.L. 100-615) Energy Policy Act of 1992 (EPACT; P.L. 102-486)

	Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$7 million for FY2011 $10 million for FY2012 $9.4 million for FY2013 $8.3 million for FY2014[3] $14.7 million for FY2015[4] $13.2 million for FY2016 $13.5 million for FY2017[5] $15.7 million for FY2018 $13.2 million for FY2019 $17 million for FY2020 $4.5 million requested for FY2021
Scheduled Termination	None
Description	This program promotes tribal energy sufficiency, economic growth, and employment on tribal lands through the development of renewable energy and energy efficiency technologies. The program provides financial assistance, technical assistance, education, and training to tribes for the evaluation and development of renewable energy resources and energy efficiency measures. In FY2015, DOE transferred TEP from the Weatherization and Intergovernmental Program (WIP) to the new Office of Indian Energy Policy and Programs (IE).
Qualified Applicant(s)	Tribal governments
Qualified Technologies	Energy efficient technologies: clothes washers; refrigerators/freezers; water heaters; lighting; lighting controls/sensors; chillers; furnaces; boilers; air conditioners; programmable thermostats; energy management; systems/building controls; caulking/weather-stripping; duct/air sealing; building insulation; windows; doors; siding; roofs; comprehensive measures/whole building; and other energy efficiency improvements may be eligible. Renewable energy technologies: passive solar space heat; solar water heat; solar space heat; photovoltaics; wind; biomass; hydroelectric; geothermal electric; geothermal heat pumps
For More Information	See the Office of Indian Energy Policy and Program's website; National Renewable Energy Laboratory's (NREL's) report: Tribal Energy Program – Assisting Tribes to Realize Their Energy Visions; and DSIRE's program summary for the Tribal Energy Program.

Other DOE Offices/Cross-Cutting Programs

19. Advanced Research Projects Agency—Energy Financial Assistance Program (ARPA-E)

Administered by	Advanced Research Projects Agency-Energy (ARPA-E)
Authority	Department of Energy Organization Act (P.L. 95-91) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) America COMPETES Act (P.L. 110-69), Section 5012 America COMPETES Reauthorization Act of 2010 (P.L. 111-358)

[3] The Tribal Energy Program (TEP) was funded in FY2014 within the Office of Energy Efficiency and Renewable Energy appropriation.

[4] In 2015, TEP was transferred to the Office of Indian Energy (IE) and funding for FY2015 and FY2016 was provided within the DOE Departmental Administration appropriation.

[5] For FY2017, DOE requested funding for TEP as a separate appropriation from the Departmental Administrative appropriation "to align the budget structure with IE's mission and activities."

Annual Funding	$165.6 million for FY2011 $275 million for FY2012 $250.6 million for FY2013 $280 million for FY2014 $280 million for FY2015 $261.7 million for FY2016 $276.8 million for FY2017 $353.3 million for FY2018 $334.8 million for FY2019 $390 million for FY2020 $0 requested for FY2021[6]
Scheduled Termination	Passed in August 2007, the America COMPETES Act (P.L. 110-69) stipulated that, "after ARPA-E has been in operation for four years, the Secretary of Energy shall offer to enter into a contract with the National Academy of Sciences (NAS) under which the National Academy shall conduct an evaluation of how well ARPA-E is achieving its goals and mission." Furthermore, the evaluation should "include the recommendation of the National Academy of Sciences on whether ARPA-E should be continued or terminated." NAS published its assessment of ARPA-E in 2017 and did not recommend program termination. Two key findings in the report state that "the projects ARPA-E has funded support its statutory mission and goals" and "while six years is not long enough to produce observable evidence of widespread deployment of funded technologies, there are clear indications that ARPA-E is making progress toward its statutory mission and goals."
Description	This program will fund organizations that have proposed sophisticated energy technology R&D projects that (1) translate scientific discoveries and cutting-edge inventions into technological innovations and (2) accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of high technical or financial risk. Transformational energy technologies are those that have the potential to create new paradigms in how energy is produced, transmitted, used, or stored.
Qualified Applicant(s)	ARPA-E welcomes submissions from any type of capable technology research and development entity. This includes, but is not limited to for-profit entities, academic institutions, research foundations, not-for-profit entities, collaborations, and consortia. Individuals are typically eligible to apply for funding. However, any ARPA-E award funding would need to be made to a business entity formed by the applicant, if selected for award negotiations. The lead organization that will enter into the agreement with ARPA-E must be a U.S. entity.
Qualified Technologies	Transformational energy technologies
For More Information	See ARPA-E's Frequently Asked Questions (FAQ) website; National Academy of Sciences program evaluation: *An Assessment of ARPA-E* (2017); and program number 81.135 at the beta.SAM.gov website.

20. Electricity Delivery and Energy Reliability, Research, Development and Analysis Grant Program (Office of Electricity - OE)

Administered by	Office of Electricity (OE)
Authority	Department of Energy Organization Act (P.L. 95-91) Energy Security Act (P.L. 96-294) National Superconductivity and Competitiveness Act of 1988 (P.L. 100-697)

[6] The FY2021 budget request proposes to eliminate ARPA-E while incorporating APRA-E's approach to technology development into the execution of applied energy office funding. The FY2021 budget requests no additional appropriation for new ARPA-E competitive solicitations and requests the cancellation of $332 million of unobligated balances.

	Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$138.2 million for FY2011 $136.2 million for FY2012 $129.2 million for FY2013 $144.2 million for FY2014 $144.2 million for FY2015 $178 million for FY2016 $201.1 million for FY2017 $220 million for FY2018 $139 million for FY2019[7] $173 million for FY2020[8] $175.4 million requested for FY2021[9]
Scheduled Termination	None
Description	This grant program aims to develop cost-effective technology that enhances the reliability, flexibility, efficiency, resiliency, affordability, and security of the electric grid.
Qualified Applicant(s)	State, local, and tribal governments; universities; profit organizations; private nonprofit organizations; research organizations
Qualified Technologies	Specific technologies not listed
For More Information	See OE's Technology Development website; and program number 81.122 at the beta.SAM.gov website.

21. Federal Energy Management Program (FEMP)

Administered by	EERE
Authority	Energy Policy and Conservation Act (EPCA; P.L. 94-163) Energy Conservation and Production Act (ECPA; P.L. 94-385) Department of Energy Organization Act (P.L. 95-91) National Energy Conservation Policy Act (NECPA; P.L. 95-619) Federal Energy Management Improvement Act of 1988 (P.L. 100-615) Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140)
Annual Funding	$30.4 million for FY2011 $29.9 million for FY2012 $28.3 million for FY2013 $28.2 million for FY2014 $27 million for FY2015 $27 million for FY2016 $27 million for FY2017

[7] For FY2019, DOE split the Electricity Delivery and Energy Reliability appropriation into two appropriations: Electricity Delivery (OE) and Cybersecurity, Energy Security, and Emergency Response (CESER). The CESER appropriation for FY2019 was $108.5 million. To compare to previous years, the combined appropriation for the now separated programs in FY2019 would be $247.5 million.

[8] The CESER appropriation for FY2020 is $143 million. To compare to previous years, the combined appropriation for the now separated programs in FY2020 would be $316 million.

[9] DOE's budget request for CESER for FY2021 is $173.1 million. To compare to previous years, the combined appropriation request for FY2021 would be $348.5 million.

	$27 million for FY2018 $30 million for FY2019 $40 million for FY2020 $8.4 million requested for FY2021
Scheduled Termination	None
Description	FEMP assists federal agencies in developing and implementing energy efficient and renewable energy resources to meet energy management regulations and goals.
Qualified Applicant(s)	Federal agencies
Qualified Technologies	Energy efficient technologies; solar; wind; incremental hydro; ocean; biomass; geothermal
For More Information	See EERE's Federal Energy Management Program website; and FEMP's Annual Reports to Congress on Federal Government Energy Management.

22. *Financial Assistance Program (Office of Science)*

Administered by	Office of Science
Authority	Atomic Energy Act of 1954 (P.L. 83-703), Section 31 Energy Reorganization Act of 1974 (P.L. 93-438), Title I, Section 107 Federal Nonnuclear Energy Research and Development Act of 1974 (P.L. 93-577) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$1.3 billion for FY2011 $1 billion for FY2012 $965.1 million for FY2013 $1.1 billion for FY2014 $1.1 billion for FY2015 $1.1 billion for FY2016 $1.1 billion for FY2017 (est.) $1.3 billion for FY2018 (est.) $1.2 billion for FY2019 (est.) $1.2 billion for FY2020 (est.) FY2021 budget request data are unavailable; the FY2021 DOE budget justifications do not provide details on this program.
Scheduled Termination	None
Description	This program provides financial support for fundamental research in the basic sciences and advanced technology concepts and assessments in fields related to energy.
Qualified Applicant(s)	State, local, and tribal governments; colleges and universities; profit commercial organizations; private nonprofit organizations; public nonprofit organizations; small businesses
Qualified Technologies	Specific advanced technologies not listed
For More Information	See program number 81.049 at the beta.SAM.gov website; and the Office of Science's Funding Opportunities website.

23. *Loan Guarantee Program (Loan Programs Office)*

Administered by	Loan Programs Office
Authority	Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58), Title XVII American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) Omnibus Appropriations Act, 2009 (P.L. 111-8) Department of Defense and Full-Year Continuing Appropriations Act, 2011 (P.L. 112-10)
Annual Funding	*Section 1703 Innovative Technology Loan Guarantee Program (permanent)* $169.6 million for FY2011

	$0 for FY2012 $0 for FY2013 $7.9 million for FY2014[10] $17 million for FY2015[11] $17 million for FY2016[12] $139,000 for FY2017[13] $30.9 million for FY2018[14] $12.3 million for FY2019[15] $29 million for FY2020[16] $0 requested for FY2021[17] *Section 1705 Temporary Loan Guarantee Program* $0 for FY2008 $6 billion was appropriated for FY2009. However, $2 billion of that funding was transferred to the "cash for clunkers" automobile trade-in program by P.L. 111-47.[18] An additional $1.5 billion was rescinded for the Education Jobs and Medicaid Assistance Act, P.L. 111-226 (Section 308), leaving a total of $2.5 billion remaining from the FY2009 appropriations. $0 for FY2010-FY2019 $0 requested for FY2020[19]
Scheduled Termination	None for the permanent (Section 1703) loan guarantee program. Projects authorized by the temporary loan guarantee (Section 1705) had to begin construction no later than September 30, 2011. The Loan Programs Office (LPO) continues to administer and monitor loan guarantees for Section 1705 projects.
Description	This program provides federal loan guarantees to encourage early commercial use in the United States of new or significantly improved technologies in energy projects that (1) avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and (2) employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the

[10] For FY2014, $42 million was enacted for administrative purposes only, but these expenses were offset by $34.1 million in collections from borrowers for a net appropriation of $7.9 million.

[11] For FY2015, $42 million was enacted for administrative expenses. These administrative expenses were offset by $25 million in collections from borrowers for a net appropriation of $17 million.

[12] For FY2016, $42 million was enacted for administrative expenses. These administrative expenses were offset by $25 million in collections from borrowers for a net appropriation of $17 million.

[13] For FY2017, $37 million was enacted for administrative expenses. These administrative expenses were reduced by (1) an offset of $27 million in collections from applicants and borrowers and (2) a rescission of an additional $9.861 million of administrative appropriations from FY2012 and FY2013 (P.L. 115-31) for a net appropriation of $139,000.

[14] For FY2018, $33 million was enacted for administrative purposes. These administrative expenses were reduced by an offset of $2.1 million in collections from applicants and borrowers for a net appropriation of $30.9 million.

[15] For FY2019, $33 million was enacted for administrative expenses. These administrative expenses were reduced by $20.7 million in collections from applicants and borrowers for a net appropriation of $12.3 million.

[16] For FY2020, $32 million was enacted for administrative expenses. These administrative expenses were reduced by $3 million in collections from applicants and borrowers for a net appropriation of $29 million.

[17] For FY2021, $3 million is requested for administrative expenses. These administrative expenses are expected to be offset by an estimated $3 million for a net appropriation of $0. The FY2021 budget requests also proposes to cancel an FY2011 loan subsidy appropriation of $160.7 million for the Section 1703 loan guarantee program along with $489 million in remaining, emergency designated, unobligated credit subsidy balances appropriated by the American Reinvestment and Recovery Act of 2009 (P.L. 111-5).

[18] For more information, see CRS Report R40669, *Energy and Water Development: FY2010 Appropriations*, coordinated by Carl E. Behrens.

[19] The authority to enter into new loan guarantees under Section 1705 expired on September 30, 2011, but LPO continues to administer and monitor the portfolio of loan guarantees obligated prior to the expiration date.

	guarantee is issued. Temporary loan guarantees were also made under Section 1705 for rapid deployment of certain renewable and electric transmission projects up through September 30, 2011.
Qualified Applicant(s)	State, local, and tribal governments; universities; profit organizations; public nonprofit organizations. No federal entity may apply.
Qualified Technologies	Solar thermal electric; solar thermal process heat; photovoltaics; wind; hydroelectric; renewable transportation fuels; geothermal electric; fuel cells; manufacturing facilities; daylighting; tidal energy; wave energy; ocean thermal; biodiesel
For More Information	See program number 81.126 at the beta.SAM.gov website; DSIRE's program summary for the Loan Guarantee Program; DOE's Loan Guarantee Program website; and CRS Insight IN11432, *Department of Energy Loan Programs: Title XVII Innovative Technology Loan Guarantees,* by Philip Brown, Mark Holt, Corrie Clark, and Raj Gnanarajah.

24. Small Business Innovation Research Program (SBIR)/Small Business Technology Transfer Program (STTR)

Administered by	EERE
Authority	Small Business Innovation Development Act of 1982 (P.L. 97-219) Small Business Research and Development Enhancement Act of 1992 (P.L. 102-564) Consolidated Appropriations Act, 2001 (P.L. 106-554), Appendix I, Title I (Small Business Innovation Research Program Reauthorization Act of 2000) Small Business Technology Transfer Program Reauthorization Act of 2001 (P.L. 107-50) SBIR/STTR Reauthorization Act of 2011 (P.L. 112-81, Div. E, Title L) National Defense Authorization Act for Fiscal Year 2017 (P.L. 114-328), Div.A, Title XVIII, Section 1834
Annual Funding[20]	$24.2 million for FY2011 $29.1 million for FY2012 $26.4 million for FY2013 (SBIR: $23.4 million; STTR: $3 million) $30.8 million for FY2014 (SBIR: $27.4 million; STTR: $3.4 million) $28.4 million for FY2015 (SBIR: $25.1 million; STTR: $3.3 million) $30.2 million for FY2016 (SBIR: $26.3 million; STTR: $3.9 million) $45.2 million for FY2017 (SBIR: $38.9 million; STTR: $6.3 million) $58.2 million for FY2018 (SBIR: $51 million; STTR: $7.2 million) $58.9 million for FY2019 (SBIR: $51.5 million; STTR: $7.4 million) $67.9 million for FY2020 (SBIR: $59.5 million; STTR: $8.4 million) $16.5 million requested for FY2021 (SBIR: $14.5 million; STTR: $2 million)
Scheduled Termination	The National Defense Authorization Act for Fiscal Year 2017 (P.L. 114-328, Division A, Title XVIII, Section 1834) reauthorized SBIR and STTR through FY2022.
Description	Small Business Innovation Research (SBIR) and Small Business Technology Transfers (STTR) are U.S. government programs in which federal agencies with large research and development (R&D) budgets set aside a small fraction of their funding for competitions among small businesses only. DOE's SBIR-STTR program is designed to stimulate technological innovation by small advanced technology firms and provide new, cost-effective scientific and engineering solutions to challenging problems. EERE funds appropriated for SBIR/STTR are allocated to larger EERE technology programs, detailed earlier in this report, including Biomass, Geothermal, Hydrogen & Fuel Cell, Solar Energy, Water Power, Wind Energy, Advanced Manufacturing, Building Technologies, and Vehicle Technologies.
Qualified Applicant(s)	Small businesses

[20] Annual funding listed for the Small Business Innovation Research (SBIR) and Small Business Technology Transfers (STTR) programs includes only those funds distributed to DOE's energy efficiency and renewable energy programs.

Qualified Technologies	Research areas include energy production (fossil, nuclear, renewable, and fusion energy); energy use (in buildings, vehicles, and industry); fundamental energy sciences (materials, life, environmental, and computational sciences, and nuclear and high energy physics); environmental management; and nuclear nonproliferation
For More Information	See EERE's Small Business Innovation Research/Small Business Technology Transfers (SBIR/STTR) website; and program number 10.212 (SBIR) at the beta.SAM.gov website.

25. Tribal Energy Loan Guarantee Program (Loan Programs Office)

Administered by	Loan Program Office
Authority	Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58), Title V, Section 503(a) Indian Tribal Energy Development and Self-Determination Act Amendments of 2017 (P.L. 115-325), Title I, Section 101(c)
Annual Funding	$9 million for FY2017 $8.939 million for FY2018 $1 million for FY2019 $2 million for FY2020 $0 requested for FY2021[21]
Scheduled Termination	None. However, in FY2021, LPO has proposed to terminate the Tribal Energy Loan Guarantee Program.
Description	This is a partial loan guarantee program that can guarantee up to $2 billion in loans to support economic opportunities to tribes through energy development projects and activities.
Qualified Applicant(s)	Tribal government; members of eligible Tribes, including eligible joint ventures or authorized corporate entities
Qualified Technologies	A broad range of energy-related projects can be supported, including, but not limited to solar, wind, geothermal, hydropower, electric transmission infrastructure, and energy storage.
For More Information	See LPO's Tribal Energy Loan Guarantee Program website; CRS Insight IN11452, Department of Energy Loan Programs: Tribal Energy Loan Guarantee, by Corrie E. Clark et al.

II. Department of Agriculture

1. Assistance to High Energy Cost Rural Communities Program

Administered by	Rural Development
Authority	Rural Electrification Act of 1936 (P.L. 74-605) Grain Standards and Warehouse Improvement Act of 2000 (P.L. 106-472)
Annual Funding	$12.0 million for FY2011 $9.5 million for FY2012 $9.2 million for FY2013 $10 million for FY2014 $10 million for FY2015 $10 million for FY2016 $10 million for FY2017

[21] The FY2021 budget request proposes to eliminate the Tribal Energy Loan Guarantee Program and to cancel the $8,500,000 in unobligated balances appropriated by the Consolidated Appropriations Act of 2017 (P.L. 115-31) for the cost of loan guarantees. See DOE'S FY2021 Congressional Budget Request, vol. 3, part 2, p. 404.

	$10 million for FY2018 $10 million for FY2019 $10 million for FY2020 No funds requested for FY2021
Scheduled Termination	None
Description	This program provides financial assistance to rural communities with extremely high energy costs (exceeding 275% of the national average).
Qualified Applicant(s)	State, local, and tribal governments (including U.S. territories); for-profit businesses; nonprofit businesses; cooperatives; individuals
Qualified Technologies	Not specifically identified
For More Information	See USDA's High Energy Cost Grants website; DSIRE's program summary for the High Energy Cost Grant Program; and program number 10.859 on the beta.SAM.gov website.

2. *Bioenergy Program for Advanced Biofuels*

Administered by	Rural Development
Authority	Food, Conservation, and Energy Act of 2008 (P.L. 110-246), Title IX, Section 9005 Agricultural Act of 2014 (P.L. 113-79) Agriculture Improvement Act of 2018 (P.L. 115-334)
Annual Funding	Mandatory: The 2018 farm bill (P.L. 115-334) authorized mandatory funding of $7 million annually for FY2019-FY2023 to remain available until expended. $7 million was appropriated for FY2019 and FY2020. Discretionary: The 2018 farm bill authorized discretionary funding of $20 million annually for FY2019-FY2023. No discretionary funding was appropriated for FY2019 or FY2020.
Scheduled Termination	Mandatory funding authorized through FY2023.
Description	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. The policy goal is to create long-term, sustained increases in advanced biofuels production.[22] 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).
Qualified Applicant(s)	Eligible advanced biofuels producers
Qualified Technologies	Payments will be made to eligible advanced biofuel producers for the production of fuel derived from renewable biomass, other than corn kernel starch, to include biofuel derived from cellulose, hemicellulose, or lignin; biofuel derived from sugar and starch (other than ethanol derived from corn kernel starch); biofuel derived from waste material, including crop residue, other vegetative waste material, animal waste, food waste, and yard waste; diesel-equivalent fuel derived from renewable biomass, including vegetable oil and animal fat; biogas (including landfill gas and sewage waste treatment gas) produced through the conversion of organic matter from renewable biomass; butanol or other alcohols produced through the conversion of organic matter from renewable biomass; and other fuel derived from cellulosic biomass
For More Information	See program number 10.867 on the beta.SAM.gov website; USDA program website; CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill,*

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

by Kelsi Bracmort; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

3. Biomass Crop Assistance Program (BCAP)

Administered by	Farm Services Agency (FSA)
Authority	Farm Security and Rural Investment Act of 2002 (FSRIA; P.L. 107-171), Title IX Food, Conservation, and Energy Act of 2008 (P.L. 110-246), Title IX, Section 9001 created new Section 9011 under FSIRA Agricultural Act of 2014 (P.L. 113-79), Section 9010 Agriculture Improvement Act of 2018 (P.L. 115-334)
Annual Funding	• Mandatory: The 2018 farm bill did not authorize any mandatory annual funding for FY2019-FY2023. Previously, the 2014 farm bill authorized mandatory funding of $25 million annually from FY2014 through FY2018. The FY2015, FY2016, and FY2017 appropriation acts (P.L. 113-235, P.L. 114-113, and P.L. 115-31, respectively) limited mandatory funding to $23 million in FY2015, $3 million in FY2016, and $3 million for FY2017. The FY2018 appropriations act provided no mandatory funding for BCAP. • Discretionary: The 2018 farm bill authorized $25 million in annual discretionary funding for BCAP for FY2019-FY2023. No funding was appropriated for FY2019 or FY2020.
Scheduled Termination	Funding authorized through FY2023.
Description	BCAP provides assistance to support the production of eligible biomass crops on land within approved BCAP project areas. In exchange for growing eligible crops, the FSA will provide annual payments through 5- to 15-year contracts. Under these contracts up to 50% of establishment costs may also be provided. FSA will also provide matching payments to eligible material owners at a rate of $1 for each $1 per dry ton paid by a qualified biomass conversion facility. Matching payments may not exceed $20 per ton and are limited to no more than two years per participant.
Qualified Applicant(s)	Eligible biomass material owners and eligible biomass producers
Qualified Technologies	Eligible material for a matching payment is renewable biomass, as defined by the 2014 farm bill, with several important exclusions including harvested grains, fiber, or other commodities eligible to receive payments under the Commodity Title (Title I) of the 2014 farm bill. (The residues of these commodities, however, are eligible and may qualify for payment.) Also excluded are animal waste and animal waste by-products including fats, oils, greases, and manure; food waste and yard waste; and bagasse. Eligible crops include renewable biomass, with the exception of crops eligible to receive a payment under Title I of the 2014 farm bill and plants that are invasive or noxious, or have the potential to become invasive or noxious.
For More Information	See the USDA BCAP website; CRS Report R41296, Biomass Crop Assistance Program (BCAP): Status and Issues, by Mark A. McMinimy; CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill,* by Kelsi Bracmort; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

4. Biomass Research and Development Initiative (BRDI)

Administered by	National Institute of Food and Agriculture (USDA)/EERE (DOE)
Authority	Biomass Research and Development Act of 2000 (BRDA; P.L. 106-224), Title III Farm Security and Rural Investment Act of 2002 (FSRIA; P.L. 107-171), Title IX, Section 9008 Food, Conservation, and Energy Act of 2008 (P.L. 110-246), Title IX, Section 9008 Agricultural Act of 2014 (P.L. 113-79), Section 9010 Agriculture Improvement Act of 2018 (P.L. 115-334), Title VII, Section 7507
Annual Funding	• Mandatory: Under the 2014 farm bill, mandatory funds of $3 million were authorized for FY2014 through FY2017 to remain available until expended. No

	mandatory funds were authorized or appropriated for FY2018. The 2018 farm bill did not extend mandatory funding for BRDI. • Discretionary: The 2018 farm bill authorized $20 million in annual appropriations for FY2019-FY2023. No discretionary funding has been appropriated through FY2020.
Scheduled Termination	Funding authorized through FY2023.
Description	BRDI is an interagency collaboration program between USDA's National Institute of Bioenergy (Institute of Bioenergy, Climate, and Environment) and DOE's Office of Energy Efficiency and Renewable Energy (Bioenergy Technologies Program). The program provides competitive grants, contracts, and financial assistance for research, development, and demonstration of technologies and processes for biofuels and biobased products.
Qualified Applicant(s)	Colleges and universities (including 1862, 1890, and 1994 Land-Grant Colleges and Universities); national laboratories; federal research agencies; state research agencies; small businesses; nonprofit organizations; and/or a consortium of two or more entities identified as eligible
Qualified Technologies	Biomass; biofuels; biobased products
For More Information	See program number 10.312 on the beta.Sam.gov website; CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill,* by Kelsi Bracmort; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

5. Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (formerly the Biorefinery Assistance Program)

Administered by	Rural Development
Authority	Food, Conservation, and Energy Act of 2008 (P.L. 110-246), Title IX, Section 9003 created the Biorefinery Assistance Program Agricultural Act of 2014 (P.L. 113-79), Title IX, Section 9003 amended and renamed the program as the Biorefinery, Renewable Chemical and Biobased Product Manufacturing Assistance Program Agriculture Improvement Act of 2018 (P.L. 115-334), Title IX, Section 9003
Annual Funding	• Mandatory: Under the 2018 farm bill, mandatory Commodity Credit Corporation (CCC) funding of $50 million for FY2019 and $25 million for FY2020 (to remain available until expended) was authorized for loan guarantees. $50 million was made available for FY2019. $24 million in funding was made available for FY2020.[23] • Discretionary: Funds of $75 million annually are authorized to be appropriated for FY2014-FY2018 and FY2019-FY2023. For FY2009-FY2013, $150 million was authorized to be appropriated annually. No discretionary funding has been appropriated for this program through FY2020.
Scheduled Termination	Mandatory funding authorized through FY2020 and discretionary funding authorized through FY2023.
Description	The purpose is to assist in the development of new and emerging technologies for the development of advanced biofuels, so as to increase the energy independence of the United States; promote resource conservation, public health, and the environment; diversify markets for agricultural and forestry products and agriculture waste material; and create jobs and enhance the economic development of the rural economy. Competitive grants and loan guarantees are made to fund the development, construction, and retrofitting of commercial-scale biorefineries using eligible technologies. Biorefinery grants can provide for up to 30% of total project costs. Loan guarantees are limited to $250 million or 80% of project cost.

[23] The original mandatory funding of $25 million for FY2020 was reduced by $1 million for a final total of $24 million in mandatory funds made available to the Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program. This reduction is noted in the Appendix volume to the Budget of the United States Government for FY2021 on p. 142.

Qualified Applicant(s)	Individuals; tribal entities; state government entities; local government entities; corporations; farm cooperatives; farmer cooperative organizations; associations of agricultural producers; national laboratories; institutions of higher education; rural electric cooperatives; public power entities; consortia of any of the previous entities
Qualified Technologies	Technologies being adopted in a viable commercial-scale operation of a biorefinery that produces an advanced biofuel, renewable chemical, or biobased product; and technologies that have been demonstrated to have technical and economic potential for commercial application in a biorefinery that produces an advanced biofuel, renewable chemical, or biobased product.
For More Information	See the USDA program website; program number 10.865 at the beta.SAM.gov website; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

6. Community Wood Energy and Wood Innovation Program

Administered by	Forest Service
Authority	Food, Conservation, and Energy Act of 2008 (P.L. 110-246), Title IX, Section 9013 Agricultural Act of 2014 (P.L. 113-79), Title IX, Section 9012 Agriculture Improvement Act of 2018 (P.L. 115-334), Title VIII, Section 8644
Annual Funding	• Mandatory: No mandatory funding has been authorized. • Discretionary: Discretionary funding of $25 million annually is authorized to be appropriated for FY2019-FY2023 under the 2018 farm bill, but no funds have been appropriated through FY2020.
Scheduled Termination	Funding authorized through FY2023.
Description	The 2018 farm bill extended the program through FY2023 and changed the name to the Community Wood Energy and Wood Energy Innovation Program. The program provides matching grants for the installation of community wood energy systems or building an innovative wood product facility. A community wood energy system is defined in the 2018 farm bill as an energy system that produces thermal energy or combined thermal energy and electricity, services public facilities owned or operated by state or local governments, and uses woody biomass. This includes single-facility central heating, district heating systems for multiple buildings, combined heat and electric systems, and other related biomass energy systems. The 2018 farm bill added innovative wood product facilities to the program, defining such a facility as a manufacturing or processing plant or mill that produces: building components or systems using panelized wood construction; wood products derived from nanotechnology or other new technology processes; or other innovative wood products using low-value, low-quality wood. Grants are capped at 35% of the capital cost of the system or facility (50% under special circumstances), and are awarded for systems with a nameplate capacity not exceeding 5 megawatts of thermal energy or combined thermal and electric energy as directed by statute.
Qualified Applicant(s)	State and local governments
Qualified Technologies	Biomass
For More Information	See the program website; CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill*, by Kelsi Bracmort; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

7. New Era Rural Technology Competitive Grants Program

Administered by	National Institute of Food and Agriculture (NIFA)
Authority	National Agricultural Research, Extension, and Teaching Policy Act of 1977 (P.L. 95-113) Food, Conservation, and Energy Act of 2008 (P.L. 110-246)

	Agricultural Act of 2014 (P.L. 113-79) Agriculture Improvement Act of 2018 (P.L. 115-334), Title VII, Section 7130
Annual Funding	The program received $875,000 for FY2010 and an estimated $875,000 for FY2011. The program authorization expired after the end of FY2012, and it received no funding through FY2018. Despite being reauthorized by the 2018 farm bill (P.L. 115-334), the program has received no funding for FY2019 and FY2020.
Scheduled Termination	Authorized through FY2023.
Description	This program provides grant funding for approved technology development, applied research, and training to develop an agriculture-based renewable energy workforce. The initiative supports bioenergy, pulp and paper manufacturing, and agriculture-based renewable energy resources. The program's authority expired after FY2012, but the 2018 farm bill reauthorized the program for FY2019 through FY2023.
Qualified Applicant(s)	Public or private nonprofit community colleges; advanced technology centers
Qualified Technologies	Biomass; bioenergy
For More Information	See the archived CFDA web page for program number 10.314; and 7 U.S.C. §3319e

8. Rural Energy For America Program (REAP) Grants and Loans

Administered by	Rural Development
Authority	Food Conservation, and Energy Act of 2008 (P.L. 110-246), Title IX, Section 9001(a) Agricultural Act of 2014 (P.L. 113-79), Title IX, Section 9007 Agriculture Improvement Act of 2018 (P.L. 115-334), Title IX, Section 9007
Annual Funding	• Mandatory: 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: Under the 2018 farm bill, discretionary funding of $20 million annually is authorized to be appropriated for FY2019-FY2023; of this amount, $335,000 was appropriated for FY2019 and $706,000 for FY2020. Under the 2014 farm bill, discretionary funding of $20 million annually was authorized to be appropriated for FY2014-FY2018; of this amount, $3.5 million was appropriated for FY2014, $1.35 million for FY2015, $0.5 million for FY2016, $352,000 for FY2017, and $293,000 for FY2018. Under the 2008 farm bill, $25 million was authorized to be appropriated annually for FY2009-FY2013. Actual discretionary appropriations have been $5 million in FY2009, $39.3 million in FY2010, $5 million in FY2011, $3.4 million in FY2012 and in FY2013; $3.5 million in FY2014; and $1.35 million in FY2015.
Scheduled Termination	None
Description	REAP promotes energy efficiency and renewable energy for agricultural producers and rural small businesses through the use of: (1) grants and loan guarantees for energy efficiency improvements (EEI) and renewable energy systems (RES); (2) grants for energy audits and renewable energy development assistance; and (3) grants for conducting renewable energy systems (RES) feasibility studies (eligible entities include rural small businesses and agricultural producers). The 2014 farm bill added new funding and a three-tiered application process with separate application processes for grants and loan guarantees for RES and EEI projects based on the project cost. It also excluded the use of REAP funds for installing retail energy dispensing equipment, such as blender pumps. The 2018 farm bill amended 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. It also placed a cap of 15% of available funds per year to be imposed on loan guarantees to agricultural producers for energy efficiency equipment.

Qualified Applicant(s)	Commercial; schools; state, local, and tribal governments; rural electric cooperatives; agricultural; public power entities
Qualified Technologies	Solar water heat; solar space heat; solar thermal electric; photovoltaics; wind; biomass; hydroelectric; renewable transportation fuels; geothermal electric; geothermal heat pumps; CHP/cogeneration; hydrogen; direct-use geothermal (electric); anaerobic digestion; small hydroelectric; tidal energy; wave energy; ocean thermal; renewable fuels; fuel cells using renewable fuels; microturbines. Specific energy efficiency technologies not identified.
For More Information	See the program website; CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill*, by Kelsi Bracmort; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

9. Rural Energy Savings Program (RESP)

Administered by	Rural Development
Authority	Agricultural Act of 2014 (P.L. 113-79), Title VI, Section 6205 Agriculture Improvement Act of 2018 (P.L. 115-334), Title VI, Section 6303
Annual Funding	• Mandatory: No mandatory funding has been authorized. • Discretionary: Under the 2014 farm bill, discretionary funding of $75 million was authorized to be appropriated for FY2014-FY2018. The 2018 farm bill extended this authorization of $75 million for FY2019-FY2023. Of this amount, no funding was appropriated for FY2015 and FY2016; $8 million was appropriated annually for FY2016-FY2018; $10 million was appropriated for FY2019; and $12 million was appropriated for FY2020.
Scheduled Termination	Funding authorized through FY2023.
Description	The Rural Energy Savings Program provides loans to entities that agree to make affordable loans to help qualified consumers implement durable and cost-effective energy efficiency upgrades or install cost-effective renewable energy or energy storage systems. The 2018 farm bill requires that loans from eligible entities to qualified consumers may not exceed 5% in interest and must be used for certain purposes (e.g., to establish a loan loss reserve).
Qualified Applicant(s)	Public power entities (public power districts and public utility districts) and rural electric cooperatives that have borrowed, repaid, prepaid, or are paying an electric loan made or guaranteed by the Rural Utilities Service (RUS); or any other entity that is determined eligible for a loan from RUS according to federal regulations (see 7 CFR 1701.101)
Qualified Technologies	On- or off-grid renewable energy systems; on- or off-grid energy storage systems; cost-effective, commercial technologies to increase energy efficiency Specific renewable energy, energy storage, and energy efficiency technologies not identified.
For More Information	See the program website; Rural Energy Savings Program (RESP) factsheet; program number 10.751 at the beta.Sam.gov website; CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill*, by Kelsi Bracmort; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

10. Sun Grant Program

Administered by	National Institute of Food and Agriculture
Authority	Food, Conservation, and Energy Act of 2008 (P.L. 110-246), Title VII, Section 7526 Agricultural Act of 2014 (P.L. 113-79), Title VII, Sections 7128, 7516 Agriculture Improvement Act of 2018 (P.L. 115-334), Title IX, Sections 7414, 7614
Annual Funding	• Mandatory: No mandatory funding has been authorized. • Discretionary: Under the previous 2008 and 2014 farm bills, discretionary funding of $75 million was authorized to be appropriated for FY2008-FY2018. The 2018 farm bill extended this authorization of $75 million for FY2019-FY2023. Of this amount,

	$2.5 million was appropriated in FY2015 and FY2016, and $3 million was appropriated for FY2017-FY2020.
Scheduled Termination	Funding authorized through FY2023.
Description	The Sun Grant Initiative (SGI) is a national network of land-grant universities and federally funded laboratories coordinated through six 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.[24] 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 combined six regions and subregions, covering all 50 states and U.S. territories are North-Central Region, Northeastern Region, Southeastern Region, South-Central Region, Western Region, and the Western Insular Pacific Subcenter Region.
Qualified Applicant(s)	Colleges and universities: specifically, eligible applicants must represent a consortium of 1862, 1890, and 1994 land-grant universities made up of one university from each of the (six) Sun Grant regions and subregion.
Qualified Technologies	Biomass; biofuels; biobased products
For More Information	See the program website; program number 10.320 at the beta.Sam.gov website; CRS In Focus IF10288, *Overview of Bioenergy Programs in the 2018 Farm Bill*, by Kelsi Bracmort; and CRS Report R45943, *The Farm Bill Energy Title: An Overview and Funding History*, by Kelsi Bracmort.

11. Sustainable Agriculture Research and Education Program (SARE)

Administered by	National Institute of Food and Agriculture; Agricultural Research Service; and other appropriate agencies
Authority	Food, Agriculture, Conservation and Trade Act of 1990 (P.L. 101-624) Food, Agriculture, Conservation and Trade Act Amendments of 1991 (P.L. 102-237) Federal Agriculture Improvement and Reform Act of 1996 (P.L. 104-127) Food, Conservation, and Energy Act of 2008 (P.L. 110-246)
Annual Funding	$19.2 million for FY2011 $13.5 million for FY2012 $19.3 million for FY2013 $22.7 million for FY2014 $23 million for FY2015 $25 million for FY2016 $27 million for FY2017 $27 million for FY2018 $37 million for FY2019 $37 million for FY2020 $37 million requested for FY2021
Scheduled Termination	None
Description	The Sustainable Agriculture Research and Education Program (SARE) is designed to increase knowledge concerning agricultural production systems that conserve soil, water, energy, natural resources, and fish and wildlife habitat. SARE provides grants through the agricultural bioenergy feedstock and energy efficiency research and extension initiative for projects with the purpose of enhancing the production of biomass energy crops and the energy efficiency of agricultural operations.

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

Qualified Applicant(s)	Federal and state governments; colleges and universities; state agricultural experiment stations; state cooperative extension services; nonprofit organizations; individuals with demonstrable expertise
Qualified Technologies	Biomass; biofuels; other technologies not identified.
For More Information	See the USDA/NIFA supported website for SARE; program number 10.215 at the beta.SAM.gov website; and CRS Report R41985, Renewable Energy Programs and the Farm Bill: Status and Issues, by Randy Schnepf.

III. U.S. Department of the Treasury

Please note that tax credits for biofuels and vehicles are covered in detail in CRS Report R42566, Alternative Fuel and Advanced Vehicle Technology Incentives: A Summary of Federal Programs, by Lynn J. Cunningham et al.

Homeowner

1. Residential Energy Conservation Subsidy Exclusion (Corporate and Personal)

Administered by	Internal Revenue Service
Authority	26 U.S.C. §136 Energy Policy Act of 1992 (EPACT; P.L. 102-486) Small Business Job Protection Act of 1996 (P.L. 104-188)
Scheduled Termination	None
Description	Energy conservation subsidies provided by public utilities, either directly or indirectly, are nontaxable: "Gross income shall not include the value of any subsidy provided (directly or indirectly) by a public utility to a customer for the purchase or installation of any energy conservation measure."
Qualified Applicant(s)	Residential; multi-family residential
Qualified Technologies	Technologies installed to reduce electricity or natural gas consumption or improve the management of energy demand in a dwelling unit, including, but not limited to, solar water heat, solar space heat, photovoltaics, and other energy efficiency technologies not identified.
For More Information	See current Internal Revenue Service (IRS) Publication 525 (2020), Taxable and Nontaxable Income; or all archived versions (1995-2020) of IRS Publication 525.

2. Residential Energy Efficiency Tax Credit

Administered by	Internal Revenue Service
Authority	26 U.S.C. §25C Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Improvement and Extension Act of 2008 (EIA; P.L. 110-343) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240) Tax Increase Prevention Act of 2014 (P.L. 113-295) Consolidated Appropriations Act of 2016 (P.L. 114-113) Bipartisan Budget Act of 2018 (P.L. 115-123) Further Consolidated Appropriations Act, 2020 (P.L. 116-94) Consolidated Appropriations Act, 2021 (P.L. 116-260)
Scheduled Termination	December 31, 2021
Description	A 10% credit for energy efficiency improvements to the building envelope of existing homes and capped amounts ($50-$300) for the purchase of specific types of

	high-efficiency heating, cooling, and water-heating equipment. Efficiency improvements or equipment must have served a dwelling in the United States that is owned and used by the taxpayer as a primary residence. For purchases made in 2011-2020, the maximum lifetime amount of homeowner credit for all improvements combined is $500 total. For purchases made in 2009 or 2010, the maximum amount of homeowner credit was $1,500 total.
Qualified Applicant(s)	Residential
Qualified Technologies	Water heaters; furnaces; boilers; heat pumps; air conditioners; building insulation; windows; doors; roofs; circulating fans used in a qualifying furnace; biomass and stoves that use qualified biomass fuel
For More Information	See IRS Form 5695: Residential Energy Credits; IRS Form 5695 Instructions; CRS Report R42089, Residential Energy Tax Credits: Overview and Analysis, by Margot L. Crandall-Hollick and Molly F. Sherlock; and CRS Report R46451, *Energy Tax Provisions Expiring in 2020, 2021, 2022, and 2023 ("Tax Extenders")*, by Molly F. Sherlock, Margot L. Crandall-Hollick, and Donald J. Marples.

3. Residential Renewable Energy Tax Credit

Administered by	Internal Revenue Service
Authority	26 U.S.C. §25D Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Improvement and Extension Act of 2008 (P.L. 110-343) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) Consolidated Appropriations Act of 2016 (P.L. 114-113) Bipartisan Budget Act of 2018 (P.L. 115-123) Consolidated Appropriations Act, 2021 (P.L. 116-260)
Scheduled Termination	December 31, 2023
Description	Prior to 2020, a taxpayer could claim a 30% credit for qualified expenditures for an installed system that serves a dwelling unit located in the United States and is used as a residence by the taxpayer. A 26% credit for all qualified technology systems (see below) is in place through December 31, 2022, but is reduced to 22% for 2023, the final year for the tax credit. The federal tax code (26 U.S.C. §25D) does not explicitly reference energy storage, so stand-alone energy storage systems do not qualify for the tax credit.
Qualified Applicant(s)	Residential
Qualified Technologies	Solar electric (including photovoltaics); solar water heating; small wind; fuel cells; geothermal heat pumps; qualified biomass fuel property
For More Information	See IRS Form 5695: Residential Energy Credits; IRS Form 5695 Instructions; and CRS Report R42089, Residential Energy Tax Credits: Overview and Analysis, by Margot L. Crandall-Hollick and Molly F. Sherlock; and CRS Report R46451, *Energy Tax Provisions Expiring in 2020, 2021, 2022, and 2023 ("Tax Extenders")*, by Molly F. Sherlock, Margot L. Crandall-Hollick, and Donald J. Marples.

Business and Industry

4. Accelerated Depreciation Under the Modified Accelerated Cost-Recovery System (MACRS)

Administered by	Internal Revenue Service
Authority	26 U.S.C. §168 26 U.S.C. §48 Tax Reform Act of 1986 (P.L. 99-514) American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240)

	Tax Increase Prevention Act of 2014 (P.L. 113-295) Consolidated Appropriations Act of 2016 (P.L. 114-113) Tax Cuts and Jobs Act of 2017 (P.L. 115-97) The Bipartisan Budget Act of 2018 (P.L. 115-123)
Scheduled Termination	None
Description	Under MACRS, businesses may recover investments in certain property through depreciation deductions. The MACRS establishes a set of class lives for various types of property, ranging from 3 to 50 years, over which the property may be depreciated. A number of renewable energy technologies are classified as five-year property (26 U.S.C. §168(e)(3)(B)(vi)) under MACRS. P.L. 115-97, signed in December 2017, extended the "placed in service" deadline for bonus depreciation. Equipment placed in service after September 2017 and before January 1, 2023 can qualify for 100% bonus deprecation; for equipment placed in service during the period covering 2023 through 2026, bonus depreciation reduces 20% each year: 80% for 2023, 60% for 2024, 40% for 2025, and 20% for 2026.[25] Solar illumination, fuel cells, microturbines, CHP, and small wind property are eligible for five-year cost recovery if construction begins before January 1, 2022.
Qualified Applicant(s)	Commercial; industrial
Qualified Technologies	Solar water heat; solar space heat; solar thermal electric; solar thermal process heat; photovoltaics; landfill gas; wind; biomass; renewable transportation fuels; geothermal electric; fuel cells; geothermal heat pumps; municipal solid waste; CHP/cogeneration; solar hybrid lighting; direct use geothermal; anaerobic digestion; microturbines
For More Information	See IRS Publication 946: How To Depreciate Property, IRS Form 4562: Depreciation and Amortization, and Instructions for Form 4562; and CRS Report R46451, *Energy Tax Provisions Expiring in 2020, 2021, 2022, and 2023 ("Tax Extenders")*, by Molly F. Sherlock, Margot L. Crandall-Hollick, and Donald J. Marples.

5. Business Energy Investment Tax Credit (ITC)

Administered by	Internal Revenue Service
Authority	26 U.S.C. §48 Energy Tax Act of 1978 (P.L. 95-618) Crude Oil Windfall Profit Tax Act of 1980 (P.L. 96-223) Tax Reform Act of 1986 (TRA86; P.L. 99-514) Technical and Miscellaneous Revenue Act of 1988 (P.L. 100-647) Omnibus Budget Reconciliation Act of 1989 (P.L. 101-239) Omnibus Budget Reconciliation Act of 1990 (P.L. 101-508) Tax Extension Act of 1991 (P.L. 102-227) Energy Policy Act of 1992 (P.L. 102-486) Energy Improvement and Extension Act of 2008 (EISA; P.L. 110-343) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) Consolidated Appropriations Act of 2016 (P.L. 114-113) Bipartisan Budget Act of 2018 (P.L. 115-123) Consolidated Appropriations Act, 2021 (P.L. 116-260)

[25] Bonus depreciation applies to many classes of property or equipment other than renewable energy technologies covered by MACRS. With 100% bonus depreciation available, businesses can choose to deduct the cost of renewable energy property immediately, as opposed to recovering the cost of the investment over five years (MACRS). Beginning in 2023, when bonus depreciation reduces 20% annually through 2026 (see program description above), businesses can opt to deduct the remaining percentage immediately or the entire amount over five years under MACRS if they choose not to take the bonus depreciation deduction.

Scheduled Termination	None for solar and geothermal (at 10% rate); see description below for termination dates for other specific technologies.
Description	The energy investment tax credit (ITC) is a credit against the cost of investments in qualified renewable-energy property. There is a permanent ITC for solar and geothermal (electric) technologies equal to 10% of the cost basis of the investment. Temporarily, the credit rate for solar was 30% through 2019, before being reduced to 26% for 2020 through 2022, and 22% for 2023 through 2025. Investments in small wind property (i.e., a wind turbine with 100 kilowatts of capacity or less) could qualify for a 30% ITC through 2019, with the credit rate reduced to 26% for 2020 through 2022 and 22% for 2023. Investments in fuel cell power plants, fiber-optic solar, and waste energy recovery systems may qualify for the ITC at these same rates. The credit for fuel cells is limited to $1,500 per 0.5 kilowatts in capacity. Investments in microturbines, combined heat and power (CHP) systems, and geothermal heat pumps qualify for a 10% ITC through 2023. With the passage of P.L. 116-260, offshore wind energy systems under construction prior to 2026 are eligible for a 30% tax credit. Technologies eligible for the Production Tax Credit (PTC) are eligible to opt for the ITC in lieu of the PTC if construction commenced prior to January 1, 2021.
Qualified Applicant(s)	Commercial; industrial; utilities; agricultural
Qualified Technologies	Solar energy (solar water heat; solar space heat; solar thermal electric; solar thermal process heat; photovoltaics); hybrid (fiber-optic) solar lighting; small wind; large wind; offshore wind; biomass; fuel cells; geothermal (electric, heat pumps, direct-use); CHP/Cogeneration; microturbines; waste energy recovery property
For More Information	See IRS Form 3468 (Investment Credit); and CRS In Focus IF10479, *The Energy Credit or Energy Investment Tax Credit (ITC)*, by Molly F. Sherlock.

6. Energy Efficient Commercial Buildings Tax Deduction

Administered by	Internal Revenue Service
Authority	26 U.S.C. §179D Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Tax Relief and Health Care Act of 2006 (P.L. 109-432) Energy Improvement and Extension Act of 2008 (P.L. 110-343) Tax Increase Prevention Act of 2014 (P.L. 113-295) Consolidated Appropriations Act of 2016 (P.L. 114-113) Bipartisan Budget Act of 2018 (P.L. 115-123) Further Consolidated Appropriations Act, 2020 (P.L. 116-94) Consolidated Appropriations Act, 2021 (P.L. 116-260)
Scheduled Termination	No termination date. This tax deduction was made permanent with passage of the Taxpayer Certainty and Disaster Tax Relief Act of 2020 (Division EE, section 102 of the Consolidated Appropriations Act of 2021, P.L. 116-260).
Description	A tax deduction is available to owners of new or existing buildings who install (1) interior lighting, (2) building envelope, or (3) heating, cooling, ventilation, or hot water systems that reduce the building's total energy and power cost by 50% or more in comparison to a building meeting minimum requirements set by ASHRAE/IESNA Standard 90.1. The maximum deduction allowed is $1.80 per square foot. A reduced deduction may be available if a single system is upgraded (lighting, heating and cooling, or building envelope) and the 50% reduction threshold is not met. Separate energy cost reduction percentage thresholds are specified for single-system upgrades. The

	maximum deduction for a single-system improvement is $0.60 per square foot. Government entities making energy-efficiency upgrades to public buildings, such as schools, can allocate the Section 179D deduction to designers of energy-efficient commercial building property. With the passage of P.L. 116-260, this deduction is now adjusted annually for inflation (cost-of-living adjustment).
Qualified Applicant(s)	Commercial; builder/developer; state government; federal government (deductions associated with government buildings are transferred to the designer)
Qualified Technologies	Equipment insulation; water heaters; lighting; lighting controls/sensors; chillers; furnaces; boilers; heat pumps; air conditioners; caulking/weather-stripping; duct/air sealing; building insulation; windows; doors; siding; roofs; comprehensive measures/whole building
For More Information	See DOE's 179D Commercial Buildings Energy Efficiency Tax Deduction web page; *Energy Savings Modeling and Inspection Guidelines for Commercial Building Federal Tax Deductions in 2016 or Later* (September 2016) by the National Renewable Energy Laboratory (NREL); and CRS Report R46451, *Energy Tax Provisions Expiring in 2020, 2021, 2022, and 2023 ("Tax Extenders")*, by Molly F. Sherlock, Margot L. Crandall-Hollick, and Donald J. Marples.

7. Energy-Efficient New Homes Tax Credit for Home Builders

Administered by	Internal Revenue Service
Authority	26 U.S.C. §45L Tax Technical Corrections Act of 2007 (P.L. 110-172) Energy Improvement and Extension Ac of 2008 (EIEA; P.L. 110-343) Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312) American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240) Tax Increase Prevention Act of 2014 (P.L. 113-295) Consolidated Appropriations Act of 2016 (P.L. 114-113) Bipartisan Budget Act of 2018 (P.L. 115-123) Further Consolidated Appropriations Act, 2020 (P.L. 116-94) Consolidated Appropriations Act, 2021 (P.L. 116-260)
Scheduled Termination	December 31, 2021
Description	Contractors building energy-efficient homes and producers of manufactured energy-efficient homes are eligible for a tax credit for each qualifying new home they build that is purchased before 2022. The amount of the credit is equal to $2,000 per home for homes built by contractors and $1,000 per manufactured home. To be eligible, an energy-efficient new home is required to have annual heating and cooling consumption that is at least 50% (30% in the case of manufactured homes) below a comparable unit. The home is also required to be in accordance with the standards of the 2006 International Energy Conservations Code. Contractors and manufacturers claiming this credit are required to submit certification to an eligible certifier before claiming the credit.
Qualified Applicant(s)	Builder/developer
Qualified Technologies	Comprehensive measures/whole building
For More Information	See IRS Form 8908 (Energy Efficient Home Credit); and CRS Report R46451, *Energy Tax Provisions Expiring in 2020, 2021, 2022, and 2023 ("Tax Extenders")*, by Molly F. Sherlock, Margot L. Crandall-Hollick, and Donald J. Marples.

8. Renewable Electricity Production Tax Credit

Administered by	Internal Revenue Service
Authority	26 U.S.C. §45

	Energy Policy Act of 1992 (EPACT; P.L. 102-486) Ticket to Work and Work Incentives Improvement Act of 1999 (P.L. 106-170) Job Creation and Worker Assistance Act of 2002 (P.L. 107-147) Working Families Tax Relief Act of 2004 (P.L. 108-311) American Jobs Creation Act of 2004 (P.L. 108-357) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Tax Relief and Health Care Act of 2006 (P.L. 109-432) Energy Improvement and Extension Act of 2008 (P.L. 110-343) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240) Tax Increase Prevention Act of 2014 (P.L. 113-295) Consolidated Appropriations Act of 2016 (P.L. 114-113) Bipartisan Budget Act of 2018 (P.L. 115-123) Further Consolidated Appropriations Act, 2020 (P.L. 116-94) Consolidated Appropriations Act, 2021 (P.L. 116-260)
Scheduled Termination	December 31, 2021
Description	The federal renewable electricity Production Tax Credit (PTC) is a per-kilowatt-hour tax credit for electricity generated by qualified energy resources and sold by the taxpayer to an unrelated person during the taxable year. The duration of the credit is 10 years after the date the facility is placed in service for all facilities placed in service after August 8, 2005; unused credits may be carried forward for up to 20 years following the year they were generated or carried back one year if the taxpayer files an amended return. P.L. 116-260 extended the expiration date for this tax credit for one year to December 31, 2021. Wind projects starting construction in either 2020 or 2021 will qualify for a production tax credit at 60% of the full rate on the electricity produced for 10 years. Tax credits for other technologies may be claimed at the full rate.
Qualified Applicant(s)	Commercial; industrial
Qualified Technologies	Wind (all); biomass; landfill gas; hydroelectric; geothermal electric; municipal solid waste; hydrokinetic power (i.e., flowing water); anaerobic digestion; small hydroelectric; tidal energy; wave energy; ocean thermal
For More Information	See IRS Notice 2016-31; CRS Report R43453, The Renewable Electricity Production Tax Credit: In Brief, by Molly F. Sherlock.; and CRS Report R46451, Energy Tax Provisions Expiring in 2020, 2021, 2022, and 2023 ("Tax Extenders"), by Molly F. Sherlock, Margot L. Crandall-Hollick, and Donald J. Marples.

Cross-Cutting

9. Alternative Motor Vehicle Tax Credit

Administered by	Internal Revenue Service
Authority	26 U.S.C. §30B Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Improvement and Extension Act of 2008 (P.L. 110-343) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) Consolidated Appropriations Act, 2016 (P.L. 114-113) Bipartisan Budget Act of 2018 (P.L. 115-123) Further Consolidated Appropriations Act, 2020 (P.L. 116–94) Consolidated Appropriations Act, 2021 (P.L. 116-260)
Scheduled Termination	December 31, 2021, for fuel cell motor vehicles only. Tax credits for all other technology types have expired; see Table A-2 in Appendix A for a complete list.

Description	Enacted in the Energy Policy Act of 2005, this provision includes separate credits for four distinct types of vehicles: fuel cells, advanced lean burn technologies, qualified hybrid and plug-in electric technologies, and qualified alternative fuels technologies. P.L. 116-260 extended the tax credit for fuel cell vehicles only through December 31, 2021.
Qualified Applicant(s)	Taxpayers/individuals
Qualified Technologies	Hybrid gasoline-electric; diesel; battery-electric; alternative fuel and fuel cell vehicles; advanced lean-burn technology vehicles; plug-in hybrid electric vehicles
For More Information	See the IRS website for the Alternative Motor Vehicle Credit; IRS News Releases, Fact Sheets and Legal Guidance on Hybrid Vehicles and Alternative Motor Vehicles; IRS Form 8910 for 2019, Alternative Motor Vehicle Credit; and IRS Instructions for Form 8910 (2019).

IV. Department of the Interior

1. Energy and Mineral Development Program (EMDP): Minerals and Mining on Indian Lands

Administered by	Bureau of Indian Affairs (BIA); Division of Energy and Mineral Development (DEMD)
Authority	Snyder Act of 1921 (P.L. 67-85), 25 U.S.C. §13 Indian Self-Determination and Education Assistance Act (P.L. 93-638), 25 U.S.C. §450 Indian Mineral Development Act of 1982 (P.L. 97-382), 25 U.S.C. §§2101 et seq. Umatilla Basin Project Act (P.L. 100-557), 16 U.S.C. §§1271 et seq.
Annual Funding	$12.87 million for FY2011 $12.7 million for FY2012 $12 million for FY2013 $9.62 million for FY2014 $5.14 million for FY2015 $6 million for FY2016 No data available for FY2017-FY2020
Scheduled Termination	None
Description	Funding may be used to facilitate the inventory, assessment, promotion, and marketing of both renewable and nonrenewable energy and mineral resources on Indian lands. Funds are awarded competitively to support assessment and inventory programs or to develop baseline data, but they cannot be used for development purposes.
Qualified Applicant(s)	Federally recognized Indian tribes; individual American Indian mineral owners
Qualified Technologies	Renewable energy technologies
For More Information	See BIA's Energy and Mineral Development Program (EMDP) website; and program number 15.038 at the beta.SAM.gov website.

2. Tribal Energy Development Capacity (TEDC) Grant Program

Administered by	Bureau of Indian Affairs
Authority	Energy Policy Act of 1992 (EPACT; P.L. 102-486) Indian Tribal Energy Resource Development and Self-Determination Act of 2005 (Title V of Energy Policy Act of 2005; P.L. 109-58)
Annual Funding	$250,000 for FY2011 $0 for FY2012 $400,000 for FY2013 (est.) $700,000 for FY2014 $1.56 million for FY2015

	$1.4 million for FY2016 No data available for FY2017-FY2020
Scheduled Termination	None
Description	This program provides grants to Indian tribes to (1) develop and sustain the managerial and technical capacity needed to develop their energy resources; and (2) properly account for resulting energy production and revenues.
Qualified Applicant(s)	Tribal governments
Qualified Technologies	Renewable energy technologies
For More Information	See program number 15.148 at the beta.SAM.gov website; BIA's Tribal Energy Development Capacity Grant Program website; or contact IEED, the Division of Indian Energy at (202) 219-0740.

V. Small Business Administration

1. 7(a) Loan Guarantees

Administered by	Small Business Administration (SBA)
Authority	Small Business Act of 1953 (P.L. 83-163)
Annual Funding	7(a) loan guaranty administrative costs are funded through the SBA's appropriation for business loan administration. ($159.5 million in FY2010, $152.694 million in FY2011, $147.958 million in FY2012, $140.219 million in FY2013 (after sequestration), $151.560 million in FY2014, $147.726 million in FY2015, $152.726 million in FY2016, $152.726 million in FY2017, $152.782 million in FY2018, and $155.150 million in FY2019 and FY2020). The SBA reports that it spent $95.090 million in FY2010, $88 million in FY2011, $93.640 million in FY2012, $75.390 million in FY2013, $66.578 million in FY2014, $63.013 million in FY2015, $75.791 million in FY2016, $82.173 in FY2017, $89.785 million in FY2018, and $91.569 million in FY2019 on 7(a) loan administration. The SBA has budgeted $95.871 million for 7(a) loan administration in FY2020. In addition, the 7(a) loan guaranty program was provided $80 million in FY2010, $80 million in FY2011, $139.4 million in FY2012, and $213.8 million in FY2013 (after sequestration) for loan credit subsidies.
Scheduled Termination	None
Description	This program guarantees loans from lenders to small businesses that are unable to obtain financing on reasonable terms and conditions in the private credit marketplace, but can demonstrate an ability to repay loans if granted, in a timely manner. Guaranteed loans are made available to for-profit small businesses. The SBA's 7(a) lending authority includes (1) regular 7(a); (2) SBAExpress Program; (3) the CapLines Program; (4) Small/Rural Lender Advantage initiative; (5) Export Express Program; (6) Export Working Capital Program; (7) International Trade; and (8) Community Advantage initiatives.
Qualified Applicant(s)	Small businesses meeting the size and eligibility standards
Qualified Technologies	Not specifically listed
For More Information	See CRS Report R41146, Small Business Administration 7(a) Loan Guaranty Program, by Robert Jay Dilger; the SBA website; and program number 59.012 at the beta.SAM.gov website.

2. 504 Loan Guarantees

Administered by	Small Business Administration (SBA)
Authority	Small Business Investment Act of 1958 (P.L. 85-699)
Annual Funding	504 loan guaranty administrative costs are funded through the SBA's appropriation for business loan administration ($159.5 million in FY2010, $152.694 million in FY2011, $147.958 million in FY2012, $140.219 million in FY2013 (after

	sequestration), $151.560 million in FY2014, $147.726 million in FY2015, $152.726 million in FY2016, $152.726 million in FY2017, $152.782 million in FY2018, and $155.150 million in FY2019 and FY2020). The SBA reports that it spent $36.232 million in FY2010, $38.888 million in FY2011, $39.612 million in FY2012, $40.474 million in FY2013, $39.410 million in FY2014, $40.018 million in FY2015, $29.998 million in FY2016, $30.676 million in FY2017, $38.792 million in FY2018, and $38.355 million in FY2019 on 504 loan administrative costs. The SBA has budgeted $40.117 million for 504 loan administration in FY2020. In addition, the 504 loan guaranty program was provided $67.7 million in FY2012, $98.1 million in FY2013 (after sequestration), $107.0 million in FY2014, and $45.0 million in FY2015 for loan subsidy costs.
Scheduled Termination	None
Description	This program provides long-term fixed rate financing for major fixed assets, such as land, buildings, equipment, and machinery. Of the total project costs, a third-party lender must provide at least 50% of the financing; the Certified Development Company provides up to 40% of the financing through a 100% SBA-guaranteed debenture; and the applicant provides at least 10% of the financing. Qualified projects are required to modernize or upgrade facilities by (1) reducing energy use by at least 10%; (2) employing sustainable or low-impact design that reduces fossil fuel use; (3) planning, equipping, and/or installing process upgrades or renewable energy sources; or (4) supporting renewable fuels production by biodiesel and ethanol producers.
Qualified Applicant(s)	Small businesses meeting the size and eligibility standards
Qualified Technologies	Fossil fuels; energy efficiency equipment; renewable energy sources (unspecified); renewable fuels, including biodiesel and ethanol
For More Information	See CRS Report R41184, Small Business Administration 504/CDC Loan Guaranty Program, by Robert Jay Dilger; the SBA website; and program number 59.041 at the beta.SAM.gov website.

VI. U.S. Department of Housing and Urban Development

1. Energy Efficient Mortgages (EEMs)

Administered by	Federal Housing Administration (FHA) and Department of Veterans Affairs (VA). Conventional mortgages: Private lenders that sell mortgage loans to Fannie Mae or Freddie Mac may also offer Energy Efficient Mortgages (EEMs).
Authority	EEMs were initially introduced by lenders in the 1980s. In 1992, three pieces of legislation passed by Congress worked toward standardizing and expanding the use of EEMs. In 1992, Congress established an FHA Energy Efficient Mortgage Pilot Program (P.L. 102-550). The program was later expanded beyond five states to become a national program. The Housing and Economic Recovery Act of 2008 (HERA; P.L. 110-289) increased the maximum amount that can be added to an FHA mortgage for energy efficient improvements. The 111th Congress included incentives to encourage green home improvements in the American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5).
Scheduled Termination	None
Description	Homeowners can take advantage of EEMs to finance a variety of energy efficiency measures, including renewable energy technologies, in a new or existing home. The federal government directly provides these loans through the FHA and VA lending programs. Fannie Mae and Freddie Mac will also purchase EEMs from primary lenders. Primary lenders may issue EEMs that do not conform to underwriting standards.

Qualified Applicant(s)	The loan is available to anyone who meets the income requirements for FHA's Section 203 (b) program, provided the applicant can meet the monthly mortgage payments. New and existing owner-occupied homes of up to two units qualify for this loan. Cooperative units are not eligible. VA: available to qualified military personnel, reservists, and veterans; Conventional: Applicants qualifying for a conventional mortgage are also eligible for an energy efficient mortgage.
Qualified Technologies	Passive solar space heat; solar water heat; solar space heat; photovoltaics; daylighting; and other technologies not specifically identified
For More Information	See the HUD, RESNET (Residential Energy Services Network), Energy Star, and DSIRE websites.

2. FHA PowerSaver Loan Program

Administered by	Federal Housing Administration (FHA)
Authority	No statutory authority. HUD developed the PowerSaver as part of the *Recovery Through Retrofit* initiative launched in May 2009 by the White House Task Force on Middle Class Working Families to develop federal actions for expanding green job opportunities in the United States and boosting energy savings by improving home energy efficiency.
Scheduled Termination	PowerSaver began as a nationwide two-year pilot program, launching in 2011. No termination date for this program is listed in online government information sources identified at this time.
Description	PowerSaver offers FHA-backed loans, with three financing options for homeowners to make energy efficiency and renewable energy upgrades in their residences: (1) PowerSaver Home Energy Upgrade (up to $7,500) for smaller projects; (2) PowerSaver Second Mortgage (Title I, up to $25,000) for larger retrofit projects; and (3) PowerSaver Energy Rehab (203(k)). This 203(k) loan is for home purchase or refinance, targeting either home buyers wishing to combine home improvements with a home purchases or to homeowners wishing to include home improvements when refinancing an existing mortgage. For the 203(k), current loan limits for a single-unit property vary by area from $217,500 to $625,000. For all three PowerSaver products, borrowers must select from a list of approved PowerSaver lenders.
Qualified Applicant(s)	These loans are available to homeowners who meet the following criteria: a minimum credit score of 660 and a maximum total debt to income ratio of 45% (monthly income divided by monthly debt payments). Eligible housing is limited to single unit homes that must be owner-occupied.
Qualified Technologies	Energy efficient improvements, including installation of insulation, duct sealing, replacement doors and windows, HVAC systems, water heaters, home automation systems and controls (e.g., smart thermostats), solar panels, solar thermal hot water systems, small wind power, and geothermal systems.
For More Information	See EERE's factsheet; DSIRE website; and FHA's approved list of lenders for PowerSaver.

VII. Department of Health and Human Services

1. Low Income Home Energy Assistance Program (LIHEAP)

Administered by	Administration For Children and Families Office of Community Services, Division of Energy Assistance
Authority	Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35), Title XXVI, §2602 The Human Services Amendments of 1994 (P.L. 103-252), Title III, §§302–304(a), 311(c)(1) Community Opportunities, Accountability, and Training and Educational Services Act of 1998 (P.L. 105-285), Title III, §302,

	Energy Policy Act of 2005 (P.L. 109-58), Title I, Subtitle B, §121(a))
Annual Funding	$4.7 billion for FY2011 $3.47 billion for FY2012 $3.29 billion for FY2013 $3.43 billion for FY2014 $3.39 billion for FY2015 $3.37 billion for FY2016 $3.39 billion for FY2017 $3.64 billion for FY2018 $3.65 billion for FY2019 $4.64 billion for FY2020[26]
Scheduled Termination	None
Description	LIHEAP is a federal program that helps low-income households pay for heating or cooling their homes. In most states, it also helps people make sure their homes are more energy efficient by paying for certain home improvements, known as weatherization. Funds are allotted to states, tribes, and territories according to a formula prescribed by the LIHEAP statute. State, tribal, and territorial governments manage the day-to-day details of the program, including the award of assistance to eligible applicants. The LIHEAP statute limits the amount of funds that each grantee (state, tribe, or territory) may spend on weatherization to 15% of the funds available, or up to 25% with a waiver from HHS. However, in cases of floods or natural disasters, work can be done under the crisis part of the grantee's LIHEAP program, thus bypassing the weatherization limits.
Qualified Applicant(s)	State and tribal governments, including U.S. territories
Qualified Technologies	Weatherization technologies include a wide range of energy efficiency measures for retrofitting homes and apartment buildings. Typical measures may include installing insulation; sealing ducts; tuning and repairing broken or inefficient heating and cooling systems and if indicated, replacing the same; mitigating air infiltration; and reducing electric base load consumption.
For More Information	See CRS Report RL31865, LIHEAP: Program and Funding, by Libby Perl; and the LIHEAP Frequently Asked Questions (FAQ) website.

VIII. Department of Veterans Affairs

1. Energy Efficient Mortgages (EEMs)

Administered by	FHA and VA. Conventional mortgages: Private lenders that sell mortgage loans to Fannie Mae or Freddie Mac may also offer EEMs
Authority	EEMs were initially introduced by lenders in the 1980s. In 1992, three pieces of legislation passed by Congress worked toward standardizing and expanding the use of

[26] The Office of Community Services (OCS), Division of Energy Assistance (DEA), initially released approximately $3.32 billion of FY2020 regular block grant funding to LIHEAP grantees on November 1, 2019. This funding was provided under the Continuing Appropriations Resolution 2020, and Health Extenders Act of 2019, (P.L. 116-59). A second release of $381 million was appropriated under the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and announced on February 27, 2020. A third round of funding of $37 million was released on April 3, 2020 under the Further Consolidated Appropriations Act, 2020 (P.L.116-94). Finally, an additional $900 million in supplemental funding was appropriated for FY2020 under the CARES Act (P.L. 116-136) on March 27. 2020. Those funds were released on May 8, 2020. The CARES Act allows LIHEAP grantees to carryover up to 100% of the supplemental funding for obligation in FY2021. Grantees must obligate at least 90% of the non-supplemental FY2020 funding by September 30, 2020.

	EEMs. In 1992, Congress established an FHA Energy Efficient Mortgage Pilot Program (P.L. 102-550). The program was later expanded beyond five states to become a national program. The Housing and Economic Recovery Act of 2008 (HERA; P.L. 110-289) increased the maximum amount that can be added to an FHA mortgage for energy efficient improvements. The 111th Congress included incentives to encourage green home improvements in the American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5).
Scheduled Termination	None
Description	Homeowners can take advantage of EEMs to finance a variety of energy efficiency measures, including renewable energy technologies, in a new or existing home. The U.S. federal government directly provides these loans through the FHA and VA lending programs. Fannie Mae and Freddie Mac will also purchase EEMs from primary lenders. Primary lenders may issue EEMs that do not conform to underwriting standards.
Qualified Applicant(s)	The loan is available to anyone who meets the income requirements for FHA's Section 203 (b) program, provided the applicant can meet the monthly mortgage payments. New and existing owner-occupied homes of up to two units qualify for this loan. Cooperative units are not eligible. VA: available to qualified military personnel, reservists, and veterans; Conventional: applicants qualifying for a conventional mortgage are also eligible for an energy efficient mortgage.
Qualified Technologies	Passive solar space heat; solar water heat; solar space heat; photovoltaics; daylighting; and other technologies not specifically identified
For More Information	See the HUD, RESNET, Energy Star, and DSIRE websites.

IX. Fannie Mae

1. Fannie Mae Green Initiative-Loan Program

Administered by	Fannie Mae
Authority	Housing and Urban Development Act of 1968 (P.L. 90-448)
Scheduled Termination	None
Description	This program provides owners of multifamily properties (rental or cooperative properties with five or more units) with three financing options and tools to make energy- and water-saving property improvements: • The *Green Rewards* program provides up to an additional 5% of loan proceeds by including up to 50% of projected energy and water savings in the loan underwriting. Selected property upgrades must be completed within 12 months of loan closing. • The *Green Preservation Plus* program provides additional loan proceeds to Multifamily Affordable Housing (MAH) properties by allowing up to an 85% Loan-to-Value (LTV) ratio; lower Debt-Service-Credit-Ratio (DSCR) up to five basis points lower than standard rates; and access to property's equity amount equal to investments in efficiency. Energy- and water-saving improvements must equal at least 5% of the original mortgage loan amount. • The *Green Building Certification Pricing Break* provides the 10-basis-point pricing break to any acquisition or refinance loan on a conventional or affordable property that has a current, eligible Green Building Certification.
Qualified Applicant(s)	Only multifamily properties are eligible for the program.
Qualified Technologies	Clothes washers, dishwashers, dehumidifiers, water heaters, lighting, furnaces, boilers, heat pumps, air conditioners, caulking/weather-stripping, duct/air sealing, building insulation, windows, roofs, comprehensive measures/whole building, custom/others pending approval, insulation, tankless water heaters
For More Information	See the Fannie Mae and DSIRE websites.

Appendix A. Summary of Federal Renewable Energy and Energy Efficiency Incentives/Index of Programs

Table A-1. Federal Incentives by Agency

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
Department of Energy	Advanced Manufacturing Office (formerly Industrial Technologies Program)	Develops and supports the commercialization of new energy efficient technologies to improve industrial efficiency while increasing productivity	42 U.S.C. §§17111 et seq.	$395 million	None
	Advanced Research Projects Energy Financial Assistance Program (ARPA-E)	Grants to finance sophisticated energy technology R&D projects to accelerate transformational technology advances	42 U.S.C. §16538	$390 million	Program evaluation after FY2012
	Bioenergy Technologies Office (formerly Biomass and Biorefinery Systems R&D Program)	Grants to develop cost-effective technologies and systems to transform domestic biomass resources into biofuels, bioproducts, and biopower	42 U.S.C. §16232	$259.5 million	None
	Building Technologies Office	Provides financial and technical assistance to improve efficiency of buildings and the equipment, components, and systems within them	42 U.S.C. §§17061-17124	$285 million	None
	Conservation Research and Development Grant Program	Grants to finance long-terms R&D efforts in buildings, industrial, vehicles, and hydrogen/fuel cell technologies	42 U.S.C. §§5901 et seq.	$88.5 million (est.)	None
	Electricity Delivery and Energy Reliability, Research, Development and Analysis Grant Program	Grants to develop cost-effective technology to enhance the reliability, efficiency, and resiliency of the electric grid	42 U.S.C. §§17381 et seq.	$173 million	None

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
	Energy Efficiency and Renewable Energy Information Dissemination, Outreach, Training, and Technical Analysis/Assistance Program	Provides financial assistance to stimulate increased usage of energy efficiency/ renewable energy technologies and accelerate the adoption of these technologies	See Notes field[b]	$8.1 million (est.)	None
	Federal Energy Management Program	Provides assistance to federal agencies in developing and implementing energy efficiency and renewable energy technologies to meet energy management goals	42 U.S.C. §§17131 et seq.	$40 million	None
	Financial Assistance Program (Office of Science)	Grants support research in the basic sciences and advanced technology concepts and assessments in fields related to energy	42 U.S.C. §13503	$1.2 billion (est.)	None
	Geothermal Technologies Office	Partners DOE with industry, academia, and research facilities to develop geothermal energy technologies	42 U.S.C. §16231 et seq. and 42 U.S.C. §§17191 et seq.	$110 million	None
	Hydrogen & Fuel Cell Technologies Office	Partners DOE with industry, academia, and national laboratories to develop hydrogen and fuel cell technologies for the marketplace	42 U.S.C. §§16151 et seq.	$150 million	None
	Inventions and Innovations Program	Provides financial and technical assistance to develop innovative cost-effective ideas and inventions with future commercial value and focuses on energy efficiency and renewable energy technologies	42 U.S.C. §5913	$0	None
	Loan Guarantee Program	Loan guarantees to encourage commercial use of new or significantly improved technologies that avoid, reduce, or sequester	42 U.S.C. §§16511 et seq.	$29 million for the Innovative Technology Loan Guarantee Program (Section 1703)	None for the Section 1703 program. For Section 1705 program,

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
		air pollutants or greenhouse gas emissions		$0 for the Temporary Loan Guarantee Program (Section 1705)	construction had to begin by 9/30/2011
	Office of Indian Energy Assistance Programs (formerly the Tribal Energy Program)	Provides financial and technical assistance, education, and training to tribes to evaluate and develop renewable energy sources and energy efficiency measures	25 U.S.C. §§3501 et seq.	$17 million	None
	Regional Biomass Energy Programs	Provides financial assistance to increase America's use of fuels, chemicals, materials, and power made from domestic biomass	See Notes field[b]	$0	None
	Renewable Energy Production Incentive	Provides incentive payments for electricity generated and sold by new qualifying renewable energy facilities	42 U.S.C. §13317	$0	End of FY2026
	Renewable Energy Research and Development Program	Provides financial assistance to conduct R&D efforts in renewable energy technologies	42 U.S.C. §§16231 et. seq.	$252.2 million (est.)	None
	Small Business Innovation Research/Small Business Technology Transfer Programs	Grants for small businesses to develop and commercialize energy technologies, including energy efficiency and renewable energy technologies	15 U.S.C. §638	$59.5 million for SBIR $8.4 million for STTR	End of FY2022
	Solar Energy Technologies Office	Partners with industry, universities, and national laboratories to finance R&D and bring reliable and affordable solar energy technologies to the marketplace	42 U.S.C. §§16231 et seq. and 42 U.S.C. §§17171 et seq.	$280 million	None
	State Energy Program	Provides grants to states to design and implement their own renewable energy and energy efficiency programs	42 U.S.C. §§6321 et seq.	$62.5 million	None
	Tribal Energy Loan Guarantee Program	A partial loan guarantee program to support economic opportunities to tribes through energy development projects and activities.	25 U.S.C. §3502	$2 million	None

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
	Vehicle Technologies Office	Partners with industry leaders to develop and deploy advanced transportation technologies to improve vehicle fuel efficiency and domestically produce clean and affordable alternative fuels	42 U.S.C. §§17011 et seq.	$396 million	None
	Water Power Technologies Office (formerly Wind and Hydropower Technologies Program)	Partners with industry, states, federal entities, and other stakeholders on R&D projects to improve performance, lower costs, and accelerate deployment of water power technologies	42 U.S.C. §§16231 et. seq. and 42 U.S.C. §§17211 et seq.	$148 million	None
	Weatherization Assistance Program	Provides financial and technical assistance to states to increase the energy efficiency of low-income households	42 U.S.C. §§6861 et seq.	$308.5 million	None
	Wind Energy Technologies Office (formerly Wind and Hydropower Technologies Program)	Partners with industry, states, federal entities, and other stakeholders on R&D projects to improve performance, lower costs, and accelerate deployment of wind energy technologies	42 U.S.C. §§16231 et. seq.	$104 million	None
Department of Agriculture	Assistance to High Energy Cost Rural Communities Program	Provides financial assistance to rural communities with high energy costs	7 U.S.C. §918a	$10 million	None
	Bioenergy Program for Advanced Biofuels	Supports and ensures an expanding production of advanced biofuels by providing payments to advanced biofuels producers	7 U.S.C. §8105	Mandatory funding of $7 million annually for FY2019-FY2023 to remain available until expended Discretionary funding of $20 million authorized annually for FY2019-FY2023 No discretionary funding has been appropriated for FY2020	Authorized through FY2023

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
	Biomass Crop Assistance Program (BCAP)	Provides assistance to support the production of eligible biomass crops on land within approved project areas	7 U.S.C. §8111	The FY2018 farm bill authorized no mandatory funding for FY2019-FY2023 Discretionary funding of $25 million authorized annually for FY2019-FY2023 No discretionary funding has been appropriated for FY2020	Authorized through FY2023
	Biomass Research and Development Initiative	Provides competitive grants, contracts, or financial assistance for RD&D of technologies and processes for biofuels and biobased products.	7 U.S.C. §8108	Mandatory funding of $3 million for FY2014-2017 to remain available until expended; Mandatory funding not extended by 2018 farm bill Discretionary funding of $20 million authorized annually for FY2019-FY2023 No discretionary funding has been appropriated through FY2020	Authorized through FY2023
	Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program	Assists in the development of new technologies for development of biofuels	7 U.S.C. §8103	$24 million in mandatory funding was made available for loan guarantees for FY2020. No discretionary funding has been appropriated through FY2020	Authorized through FY2023
	Community Wood Energy and Wood Innovation Program	Provides grants to states and local governments to develop community wood energy plans or acquire or upgrade community wood energy systems	7 U.S.C. §8113	No discretionary funding has been appropriated through FY2020	Authorized through FY2023
	New Era Rural Technology	Provides grant funding for approved technology development, applied	7 U.S.C. §3319e	No discretionary funding has been	Authorized through FY2023

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
	Competitive Grants Program	research, and training to develop bioenergy and agriculture-based renewable energy resources		appropriated through FY2020	
	Rural Energy for America Program	Provides grants and loan guarantees to promote energy efficiency and renewable energy to agricultural producers and rural small businesses	7 U.S.C. §8107	Mandatory CCC funds of $50 million authorized for FY2014 and each fiscal year thereafter; $706,000 in discretionary funding was appropriated for FY2020	None
	Rural Energy Savings Program	Provides loans to power producing entities to make loans to consumers for durable, cost-effective energy efficiency upgrades or installation of renewable energy or energy storage systems	7 U.S.C. §8107a	$12 million for FY2020	Authorized through FY2023
	Sun Grant Program		7 U.S.C. §8114	$3 million	Authorized through FY2023
	Sustainable Agriculture Research and Education	Provides grants for research projects with the purpose of enhancing biomass energy crop production and increasing the energy efficiency of agricultural operations	7 U.S.C. §§5801 et seq.	$37 million	None
Department of the Treasury	Alternative Motor Vehicle Credit	Provides tax credit for hybrid and lean-burn vehicles	26 U.S.C. §30B	N/A	The Fuel Cell Motor Vehicle Credit expires on 12/31/2020; all credits for other technology types have expired. See Table A-2 below.
	Business Energy Investment Tax Credit	Provides a tax credit for 30% of total expenditures on eligible systems placed in service, except geothermal systems, microturbines, and combined heat and power systems (10%)	26 U.S.C. §48	N/A	12/31/2019 for large wind systems; 12/31/2021 for geothermal heat pumps, microturbines, CHP systems, hybrid solar lighting, fuel cells, small wind systems;

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
					No expiration date for geothermal electric and solar thermal
	Energy Efficient Commercial Buildings Tax Deduction	Tax deduction for certain qualifying systems and buildings	26 U.S.C. §179D (amended)	N/A	12/31/2017
	Energy-Efficient New Homes Tax Credit for Home Builders	Provides tax credits of up to $2,000 for builders of new, energy-efficient homes	26 U.S.C. §45L (amended)	N/A	12/31/2017
	Modified Accelerated Cost-Recovery System (MACRS)	Allows businesses to recover investments in certain renewable energy property through depreciation deductions	26 USC §168 and 26 USC §48	N/A	N/A
	Renewable Energy Production Tax Credit (PTC)	Provides a per-kilowatt-hour tax credit for electricity generated by qualified renewable energy technologies and sold during the tax year	26 U.S.C. §45 (amended)	N/A	12/31/2019 for wind energy systems 12/31/2017 for all other systems
	Residential Energy Conservation Subsidy Exclusion (Corporate and Personal)	Corporate and personal tax exemptions for energy-conservation subsidies are provided by public utilities, either directly or indirectly	26 U.S.C. §136 (amended)	N/A	None
	Residential Energy Efficiency Tax Credit	Provides tax credit to residents/individuals for the installation of qualified energy efficient equipment to existing homes (primary residence)	26 U.S.C. §25C	N/A	12/31/2017
	Residential Renewable Energy Tax Credit	Provides a tax credit to residents/ individuals for the installation of qualified renewable energy systems to existing homes (primary residence)	26 U.S.C. §25D (amended)	N/A	12/31/2021
Department of Health and Human Services	Low Income Energy Assistance Program	Provides assistance to help low income households pay for heating and cooling their homes and energy efficiency improvements	42 U.S.C. §§8621 et seq.	$4.64 billion	None

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
Department of Housing and Urban Development	Energy Efficient Mortgages	Provides backing of loans for energy efficient mortgages to finance the installation of energy efficiency or renewable energy technologies in new or existing homes	12 U.S.C. §§1701z-16	N/A	None
	FHA PowerSaver Loan Program	Offers loans backed by FHA to finance energy efficiency and renewable energy upgrades to single-unit homes	See Notes field[b]	N/A	None
Department of the Interior	Energy and Mineral Development Program: Minerals and Mining on Indian Lands	Facilitate the inventory, assessment, promotion, and marketing of both renewable and nonrenewable energy and mineral resources on Indian lands	25 U.S.C. §5301; 25 U.S.C. §13; 25 U.S.C. §§2101 et seq,; and 16 U.S.C. §§1271 et seq.	$6 million for FY2016; no data currently available for FY2017-FY2020	None
	Tribal Energy Development Capacity Grant	Grants to Indian tribes to develop and sustain the managerial and technical capacity needed to develop their energy resources and properly account for resulting energy production and revenues	25 U.S.C. §3502	$1.4 million for FY2016; no data currently available for FY2017-FY2020	None
Department of Veterans Affairs	Energy Efficient Mortgages	Provides backing of loans for energy efficient mortgages to finance the installation of energy efficiency or renewable energy technologies in new or existing homes	12 U.S.C. §§1701z-16	N/A	None
Fannie Mae	Fannie Mae Green Initiative- Loan Program	Provides owners of multifamily properties (rental or cooperative properties with 5 five or more units) with three financing options and tools to make energy- and water-saving property improvements	12 USC §§1716 et. seq.	N/A	None
Small Business Administration	7(a) Loan Guarantees	Provides guaranteed loans from lenders to small businesses	15 U.S.C. §636(a)	$95.9 million	None

Administering Agency	Program	Description	*U.S. Code* Citation	FY2020[a] Appropriations	Expiration Date
	504 Loan Guarantees	Provides long-term fixed rate financing for major fixed assets, such as land, buildings, equipment, and machinery	16 U.S.C. §685	$40.1 million	None

Source: The Congressional Research Service (CRS).

a. FY2020 appropriations data compiled by CRS using executive agency budget justifications, congressional committee reports, and program descriptions from the online edition of the *Assistance Listings*.

b. Some programs are not specifically identified or codified in the *United States Code*.

Table A-2. Alternative Motor Vehicle Credit (26 U.S.C. §30B)

Type of Credit	Expiration Date
Fuel Cell Motor Vehicle Credit	December 31, 2021
Qualified Plug-In Electric Drive Motor Vehicle Credit	December 31, 2014
Qualified Plug-In Electric Motor Vehicle Conversion Credit	December 31, 2011
Advanced Lean Burn Technology Motor Vehicle Credit	December 31, 2010
Qualified Alternative Fuel Motor Vehicle Credit	December 31, 2010
Qualified Hybrid Motor Vehicle Credit	December 31, 2010

Source: *U.S. Code* and the Internal Revenue Service (IRS).

Appendix B. Index of Programs by Applicant Eligibility and Technology Type

Table B-1. Index of Programs by Applicant Eligibility

Applicant Eligibility	Program Numbers[a]
Advanced Technology Centers	II-7
Agricultural/Extension/Biofuel Producers	II-2, II-3, II-5, II-8, II-11, III-5
Alaska Native Corporations	I-14
Builder/Developer	III-6, III-7
Commercial/Industrial/For-Profit	I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-10, I-12, I-13, I-14, I-16, I-19, I-20, I-22, I-23, II-1, II-2, II-3, II-5, II-8, III-4, III-5, III-6, III-8, III-9
Cooperative/Collaborative/Consortia	I-15, I-19, II-1, II-4, II-5, II-8, II-9, II-11
Federal Government	I-4, I-6, I-7, I-12, I-21, II-4, II-11, III-6
Higher Education (Colleges and Universities)	I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-12, I-13, I-14, I-16, I-19, I-20, I-22, I-23, II-4, II-5, II-7, II-10, II-11
Land Grant Universities (1862 1890, 1994)	II-4, II-10
Local Government	I-2, I-6, I-7, I-8, I-12, I-13, I-14, I-15, I-16, I-20, I-22, I-23, II-1, II-5, II-6, II-8
National Laboratories	I-4, I-5, I-6, I-7, I-8, I-12, II-4, II-5
Nonprofit	I-2, I-13, I-14, I-15, I-16, I-19, I-20, I-22, I-23, II-1, II-11
Other/Cross-Cutting	I-19, III-4
Research Organization	I-19, I-20
Residential/Individual	I-11, I-14, I-19, II-1, II-5, II-11, III-1, III-2, III-3, III-9, IV-1, V-1, VI-1, VI-2, IX-1
Schools	II-8
Small Businesses	I-6, I-7, I-11, I-19, I-22, I-24, II-4, III-5, III-9, V-1, V-2
State Government	I-2, I-6, I-7, I-8, I-9, I-12, I-13, I-14, I-15, I-16, I-17, I-20, I-22, I-23, II-1, II-4, II-5, II-6, II-8, II-11, III-6, VII-1
Tribal Government	I-6, I-8, I-9, I-10, I-13, I-14, I-15, I-16, I-17, I-18, I-20, I-22, I-23, I-25, II-1, II-5, II-8, IV-1, IV-2, VII-1
U.S. Territories	I-9, I-17, VII-1
Utilities	I-15, II-5, II-8, II-9, III-5
Veterans	VI-1, VIII-1

Source: CRS.

a. Program numbers correspond to agency (Roman numeral) and (Arabic) number assigned to each program as displayed in this report's Table of Contents.

Table B-2. Index of Programs by Technology Type

Qualified Technologies	Program Numbers[a]
Advanced Batteries	I-12, I-13
Air Conditioners	I-9, I-18, III-2, III-6, VI-1, VI-2, VII-1, IX-1
Alternative Vehicles/Vehicle Technologies	I-4, I-12, III-4, III-9
Anaerobic Digestion	I-16, II-7, III-4
Batteries (Energy Storage)	I-12, I-13, I-20, I-25, II-9
Biodiesel / Biofuels	I-1, I-12, I-23, II-2, II-4, II-5, II-10, II-11, III-4
Boilers	I-9, I-18, III-2, III-6, VI-1, VI-2, VII-1, IX-1
Biomass / Bioenergy	I-1, I-2, I-15, I-16, I-18, I-21, II-2, II-3, II-4, II-5, II-6, II-7, II-8 II-10, II-11, III-2, III-3, III-4, III-5, III-8
Caulking/Weather Stripping	I-9, I-18, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1
Chillers	I-18, III-6
Clothes Washers	I-18, IX-1
Combined Systems/CHP/Energy Management Systems	I-8, I-18, II-8, III-4, III-5
Comprehensive/Whole Building	I-18, III-6, III-7, IX-1
Doors	I-18, III-2, III-6, VI-1, VI-2, VIII-1, IX-1
Duct/Air Sealing	I-9, I-18, III-6, VI-1, VI-2, VII-I, VIII-1, IX-1
Electricity Transmission Infrastructure	I-25
Equipment (Energy Efficient)	I-8
Fuel Cells	I-4, I-8, I-13, I-16, I-23, II-8, III-3, III-4, III-5
Furnaces	I-9, I-18, III-2, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1
Geothermal (All)	I-3, I-16, I-21, I-25, II-8, III-5, VI-1, VI-2, VIII-1
—Geothermal (Direct Use)	II-8, III-4, III-5, VI-1, VI-2, VIII-1
—Geothermal (Electric)	I-15, I-18, I-23, II-7, III-4, III-5, III-8, VI-1, VI-2, VIII-1
—Geothermal (Heat Pumps)	I-18, II-8, III-3, III-4, III-5, VI-1, VI-2, VIII-1
Heat Pumps	III-2, III-6, VI-1, VI-2, VIII-1, IX-1
Hybrid Electric	I-12, III-9
Hydrogen	I-4, I-13, I-16, II-8
Hydropower (All)	I-6, I-16, I-21, I-25, III-8
—Hydroelectric	I-6, I-18, I-23, I-25, II-8, III-8
—Hydrokinetic	I-6, III-8
—Ocean	I-6, I-15, I-21, I-23, II-8, III-8
—Tidal	I-6, I-15, I-23, II-8, III-8
—Wave	I-6, I-15, I-23, II-8, III-8
Insulation	I-9, I-18, III-2, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1
Landfill Gas	I-15, III-4, III-8
Lighting/Lighting Sensors	I-8, I-18, I-23, III-4, III-5, III-6, VI-1, VIII-1, IX-1

Qualified Technologies	Program Numbers[a]
Manufacturing Facilities	I-23
Microturbines	II-8, III-4, III-5
Municipal Solid Waste	III-4, III-8
Other Technologies[b]	I-9, I-11, I-13, I-14, I-17, I-18, I-19, I-20, I-22, I-24, II-1, II-8, II-9, II-11, III-1, IV-1, IV-2, V-1, V-2, VI-1, VI-2, VII-1, VIII-1, IX-1
Smart/Programmable Thermostats	1-9, I-18, VI-1, VI-2, VII-1, VIII-1, IX-1
Refrigerators/Freezers	I-18
Renewable Transportation Fuels	I-23, II-8, III-4
Roofs	I-18, III-2, III-6, IX-1
Siding	I-18, III-6
Smart Grid	I-20
Solar (All)	I-5, I-8, I-16, I-21, 1-25, II-8, III-3, III-4, III-5
—Photovoltaics	1-5, I-8, I-15, I-18, I-23, I-25, II-8, III-1, III-3, III-4, III-5, VI-1, VI-2, VIII-1
—Solar Space Heat	I-18, II-8, III-1, III-3, III-4, III-5, VI-1, VIII-1
—Solar Thermal Electric/Process	I-15, I-23, II-8, III-3, III-4, III-5
—Solar Water Heat	II-8, III-1, III-3, III-4, III-5, VI-1, VI-2, VIII-1
Water Heaters	I-18, III-2, III-6, VI-1, VIII-1, IX-1
Wind	I-7, I-15, I-16, I-18, I-21, I-23, I-25, II-8, III-3, III-4, III-5, III-8, VI-2
Windows	I-8, I-9, I-18, III-2, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1

Source: CRS.

a. Program numbers correspond to agency (Roman numeral) and (Arabic) number assigned to each program as displayed in this report's Table of Contents.

b. Other technologies include cross-cutting and advanced technologies; other unspecified technologies; and all energy efficiency and/or renewable energy technologies not specifically identified.

Appendix C. Expired Federal Energy Efficiency and Renewable Energy Incentive Programs

1. Assisted Housing Stability and Energy and Green Retrofit Investments Program (Recovery Act Funded)

Administered by	Department of Housing and Urban Development (HUD)
Authority	American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	(Project Grants) $0 for FY2009 $235 million for FY2010 $0 for FY2011
Scheduled Termination	9/30/2012. All obligations were to be made by September 30, 2010. Receiving property owners were required to spend the funds on the specific improvements within two years of receipt.
Description	Program provided funding for energy and green retrofit investments to certain eligible assisted, affordable multifamily properties. Funding included incentives for participating property owners, a set-aside for administrative functions, and a set-aside for due diligence and underwriting support. Assistance was for specific retrofit purposes.
Qualified Applicant(s)	Residential
Qualified Technologies	Specific technologies not identified

2. Clean Renewable Energy Bonds (CREBs)

Administered by	Internal Revenue Service
Authority	26 U.S.C. 54 (CREBs or "old CREBs"); 26 U.S.C. 54A and 26 U.S.C. 54C (New CREBs) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Tax Relief and Health Care Act of 2006 (P.L. 109-432) Energy Improvement and Extension Act of 2008 (P.L. 110-343) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) Tax Cuts and Jobs Act of 2017 (P.L. 115-97)
Annual Funding	EPACT originally allocated $800 million of tax credit bonds to be issued between January 1, 2006, and December 31, 2007. Following the enactment of the federal Tax Relief and Health Care Act of 2006, the IRS made an additional $400 million in CREBs financing available for 2008 through Notice 2007-26. In November 2006, the IRS announced that the original $800 million allocation had been reserved for a total of 610 projects. The additional $400 million (plus surrendered volume from the previous allocation) was allocated to 312 projects in February 2008. Of the $1.2 billion total of tax-credit bond volume cap allocated to fund renewable-energy projects, state and local government borrowers were limited to $750 million of the volume cap, with the rest reserved for qualified municipal or cooperative electric companies. The Energy Improvement and Extension Act of 2008 (Div. A, Section 107) allocated $800 million for New CREBs. In February 2009, the American Recovery and Reinvestment Act of 2009 (Div. B, Section 1111) allocated an additional $1.6 billion to expand the total New CREBs allocation to $2.4 billion. IRS Notice 2015-12 announced the availability of close to $1.4 billion in remaining volume cap for New CREBs. On March 5, 2015, the IRS opened the rolling volume-cap application window for governmental bodies and cooperative utilities, as well as a closed-end application period for public power providers.
Scheduled Termination	December 31, 2017

Description	CREBs were used to finance renewable energy projects and were issued, theoretically, with a 0% interest rate. The borrower paid back only the principal of the bond and the bondholder received federal tax credits in lieu of the traditional bond interest. P.L. 115-97 permanently repealed several tax credit bonds, including CREBs.
Qualified Applicant(s)	State, local, and tribal governments; municipal utility; rural electric cooperative
Qualified Technologies	Solar thermal electric; photovoltaics; landfill gas; wind; biomass; hydroelectric; geothermal electric; municipal solid waste; hydrokinetic power; anaerobic digestion; tidal energy; wave energy; ocean thermal
For More Information	See IRS Bulletin 2007-14; IRS Notice 2009-33; IRS Notice 2015-12; CRS Report R40523, *Tax Credit Bonds: Overview and Analysis*, by Grant A. Driessen and Jeffrey M. Stupak; and archived CRS Report R41573, Tax-Favored Financing for Renewable Energy Resources and Energy Efficiency, by Molly F. Sherlock and Steven Maguire.

3. Energy Efficiency and Conservation Block Grants Program (EECBG)

Administered by	EERE
Authority	Energy Independence and Security Act of 2007 (EISA; P.L. 110-140), Title V, Subtitle E American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$0 for FY2008 $3.2 billion for FY2009 from ARRA $0 for FY2010-FY2012
Scheduled Termination	This program was authorized through FY2012. An act of Congress is required to reauthorize this program.
Description	This program was part of DOE's Weather and Intergovernmental Program. The EECBG Program provided formula and competitive grants to empower local communities to make strategic investments to meet the nation's long-term goals for energy independence and leadership on climate change. Grants could be used for energy efficiency and conservation programs and projects community-wide, as well as renewable energy installations on government buildings.
Qualified Applicant(s)	State, local, and tribal governments, including U.S. territories
Qualified Technologies	Energy efficient equipment and lighting; combined heating and cooling systems; combined heat and power systems; solar; wind; fuel cells; biomass
For More Information	See EERE's Energy Efficiency and Conservation Block Grants Program website; and program number 81.128 at beta.SAM.gov website.

4. Energy Efficiency and Renewable Energy Technology Deployment, Demonstration, and Commercialization Grant Program

Administered by	EERE
Authority	Energy Policy Act of 1992 (EPACT; P.L. 102-486) Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$0 for FY2008 $21.8 million for FY2009 $7.2 million for FY2010. All funds obligated under this program in FY2010 were Recovery Act funds. $1 million for FY2011 $0 for FY2012-FY2018; all obligations under this program were made with Recovery Act (P.L. 111-5) funds. This program expired on 9/30/2015 and all awarded funds had to be expended by that date.
Scheduled Termination	None

Description	This program provided financial assistance for the technology deployment, demonstration, and commercialization of energy efficiency and renewable energy technologies. This included biomass, building technologies, federal energy management, geothermal technologies, projects involving hydrogen, fuel cells and infrastructure technologies, industrial technologies, solar energy technologies, vehicle technologies, weatherization and intergovernmental technologies, and wind and hydropower technologies.
Qualified Applicant(s)	State governments; profit organizations
Qualified Technologies	Biomass; geothermal; hydrogen and fuel cell technologies; solar; hydropower
For More Information	See program number 81.129 at the beta.SAM.gov website

5. Energy Efficient Appliance Rebate Program (EEARP)

Administered by	EERE
Authority	Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) Title I, Part B; American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)
Annual Funding	$0 for FY2008 $298.5 million in FY2009 from ARRA $0 for FY2010-FY2013
Scheduled Termination	This program was authorized through FY2010. An act of Congress is required to reauthorize this program.
Description	The program provided financial and technical assistance to states to establish residential Energy Star rated appliance rebate programs. The program's objectives were to reduce fossil fuel emissions created as a result of activities within the jurisdictions of eligible entities, and to improve energy efficiency in the residential sector.
Qualified Applicant(s)	State governments, including U.S. territories and possessions
Qualified Technologies	Energy efficient appliances
For More Information	See program number 81.127 at the beta.SAM.gov website.

6. Energy Efficient Appliance Tax Credit for Manufacturers

Administered by	Internal Revenue Service
Authority	26 U.S.C. §45M Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58), Title XIII, Subtitle C, Section 1334(a) Energy Improvement and Extension Act of 2008 (P.L. 110-343), Division B, Section 305 Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312) American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240)
Scheduled Termination	December 31, 2013
Description	A tax credit for each manufacturer was limited to a total of $25 million for 2011, 2012, and 2013 combined.
Qualified Applicant(s)	Industrial; appliance manufacturers
Qualified Technologies	Clothes washers; dishwashers; refrigerators
For More Information	See the IRS website for this credit; IRS form 8909.

7. Program of Competitive Grants for Worker Training and Placement in High Growth and Emerging Industry Sectors

Administered by	Employment Training Administration
Authority	American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5), Title VIII
Annual Funding	Project Grants: $0 for FY2008 $750 million for FY2009 from ARRA which remained available through June 30, 2010 $0 for FY2010-FY2015
Scheduled Termination	The program had no fixed termination date. It was established and funded by the Recovery Act, but the program has not been funded since 2009. It is no longer listed in the online federal Assistance Listings (formerly the *Catalog of Federal Domestic Assistance)* at the beta.SAM.gov website.
Description	This program provided competitive grants for worker training and placement in high growth and emerging industry sectors.
Qualified Applicant(s)	State, local, and tribal governments; colleges and universities; private nonprofit institutions/organizations
For More Information	See the U.S. Department of Labor's (DOL's) *Training and Employment Notice* for this program.

8. Qualified Energy Conservation Bonds

Administered by	Internal Revenue Service
Authority	26 U.S.C. §54A 26 U.S.C. §54D 26 U.S.C. §6431 Energy Improvement and Extension Act of 2008 (P.L. 110-343) American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) Tax Cuts and Jobs Act of 2017 (P.L. 115-97)
Scheduled Termination	December 31, 2017
Description	QECBs were used by state, local, and tribal governments to finance certain types of energy projects. QECBs, as tax credit bonds, provided federally subsidized financing to all issuers. The original limit on the volume of energy conservation tax credit bonds to be issued by state and local governments was $800 million. The American Recovery and Reinvestment Act of 2009 expanded the allowable bond volume to $3.2 billion. P.L. 115-97 permanently repealed several tax credit bonds, including QECBs.
Qualified Applicant(s)	State, local, and tribal governments
Qualified Technologies	Solar thermal electric; photovoltaics; landfill gas; wind; biomass; hydroelectric; geothermal electric; municipal solid waste; hydrokinetic power; anaerobic digestion; tidal energy; wave energy; ocean thermal
For More Information	IRS Notice 2009-29; IRS Notice 2010-35; IRS Announcement 2010-54; IRS Notice 2012-44; CRS Report R40523, *Tax Credit Bonds: Overview and Analysis*, by Grant A. Driessen and Jeffrey M. Stupak; and archived CRS Report R41573, Tax-Favored Financing for Renewable Energy Resources and Energy Efficiency, by Molly F. Sherlock and Steven Maguire.

9. Qualifying Advanced Energy Manufacturing Investment Tax Credit

Administered by	Internal Revenue Service
Authority	26 U.S.C. §48C American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5), Division B, Section 1302 IRS Notice 2013-12 Qualifying Advanced Energy Project Credit Phase II

Scheduled Termination	Applications no longer accepted. Phase concept papers were due to DOE by 4/9/2013; final applications were due to DOE on 7/23/2013.
Description	This tax credit was designed to encourage a U.S.-based renewable energy manufacturing sector. Projects receiving awards were eligible for a tax credit of 30% of the qualified investment required for an advanced energy project.
Qualified Applicant(s)	Commercial; industrial; manufacturing
Qualified Technologies	Lighting; lighting controls/sensors; energy conservation technologies: smart grid; solar water heat; solar thermal electric; photovoltaics; wind; geothermal electric; fuel cells; geothermal heat pumps; batteries and energy storage; advanced transmission technologies that support renewable energy generation; renewable fuels; fuel cells using renewable fuels; microturbines
For More Information	See DOE's 48C Manufacturing Tax Credits Fact Sheet; EERE's FAQ web page for 48C Phase II Program; and the IRS's 48C web page.

10. Renewable Energy Grants (1603 Program)

Administered by	U.S. Department of the Treasury
Authority	Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), Section 707 American Recovery and Reinvestment Act of 2010 (ARRA; P.L. 111-5) Division B, Sections 1104 and 1603 U.S. Department of Treasury: Grant Program Guidance (amended)
Scheduled Termination	Construction must have begun by December 31, 2011. Applications must have been submitted before October 1, 2012.
Description	The purpose of the 1603 payment was to reimburse eligible applicants for a portion of the cost of installing specified energy property used in a trade or business or for the production of income.
Qualified Applicant(s)	Commercial; Industrial; Agricultural
Qualified Technologies	Solar water heat; solar space heat; solar thermal electric; solar thermal process heat; photovoltaics; landfill gas; wind; biomass; hydroelectric; geothermal electric; fuel cells; geothermal heat pumps; municipal solid waste; CHP/cogeneration; solar hybrid lighting; hydrokinetic; anaerobic digestion; tidal energy; wave energy; ocean thermal; microturbines
For More Information	See the Treasury's 1603 website; 1603 program guidance; and archived CRS Report R41635, ARRA Section 1603 Grants in Lieu of Tax Credits for Renewable Energy: Overview, Analysis, and Policy Options, by Phillip Brown and Molly F. Sherlock.

11. Repowering Assistance Program (RAP)

Administered by	Rural Development (USDA)
Authority	Food, Conservation, and Energy Act of 2008 (P.L. 110-246), Title IX, Section 9004 Agricultural Act of 2014 (P.L. 113-79). Title IX, Section 9004 Agriculture Improvement Act of 2018 (P.L. 115-334)
Annual Funding	• Mandatory: Under the 2014 farm bill, mandatory funding of $12 million for FY2014 was authorized, to remain available until expended (i.e., no new baseline funding after FY2014). For FY2015, Congress reduced available funds by $8 million through the FY2015 agricultural appropriations act (P.L. 113-235). Under the agricultural appropriations act for FY2013 (P.L. 113-6), Congress directed that funds available for this program be reduced by $28 million. Under the 2008 farm bill (P.L. 113-79) mandatory funding of $35 million for FY2009, was authorized to remain available until expended. • Discretionary: The 2014 farm bill authorized discretionary funding of $10 million annually to be appropriated for FY2014-FY2018, but no discretionary funding was appropriated through FY2018.

	Discretionary funding of $15 million annually for FY2009-FY2013 was authorized to be appropriated under the 2008 farm bill and the American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240, §701) extension. Of this amount, $15 million was appropriated in FY2010 through FY2013.
Scheduled Termination	The program had no fixed termination date. It was authorized through FY2018, but then repealed by the 2018 farm bill.
Description	The Repowering Assistance Program (RAP) made payments to eligible biorefineries (those in existence on the June 18, 2008, enactment of the 2008 farm bill) 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. Not more than 5% of the funds were made available to eligible producers with a refining capacity exceeding 150 million gallons of advanced biofuel per year. RAP was repealed by the 2018 farm bill.
Qualified Applicant(s)	Eligible biorefineries in existence on or before June 18, 2008.
Qualified Technologies	Renewable biomass
For More Information	See the USDA program website; CRS In Focus IF10288, *Overview of the 2018 Farm Bill Energy Title Programs*, by Kelsi Bracmort; and CRS Report R43416, *Energy Provisions in the 2014 Farm Bill: Status and Funding*, by Kelsi Bracmort.

Appendix D. Summary of Expired Federal Renewable Energy and Energy Efficiency Incentives/Index of Programs

Table D-1. Expired Federal Incentives by Agency

Administering Agency	Program	Description	*U.S. Code* Citation	Expiration Date
Department of Agriculture	Repowering Assistance Program	Provided financial incentives to biorefineries in existence on June 18, 2008, to replace the use of fossil fuels used to produce heat or power by installing new systems that use renewable biomass or to produce new energy from renewable biomass	7 U.S.C. §8104	Authorized through FY2018
Department of Energy	Energy Efficiency and Conservation Block Grants Program	Grants financed energy efficiency and conservation programs/projects in local communities and renewable energy installations on government buildings	42 U.S.C. §§17151-17158	Authorized through FY2012[a]
	Energy Efficiency and Renewable Energy Technology Deployment, Demonstration, and Commercialization Grant Program	Provided financial assistance for deployment, demonstration, and commercialization of energy efficiency and renewable energy technologies	42 U.S.C. §§16191 et seq. and 42 U.S.C. §§16231 et seq.	Authorized through FY2015
	Energy Efficient Appliance Rebate Program	Provided financial and technical assistance to states to establish residential Energy Star rated appliance rebate programs	42 U.S.C. §15821	Authorized through FY2010
Department of Treasury/Internal Revenue Service	Clean Renewable Energy Bonds (CREBs)	Bonds financed renewable energy projects	26 U.S.C. §54 (old CREBs); 26 U.S.C. §54A; and 26 U.S.C. §54C(New CREBs)	12/31/2017
	Energy Efficient Appliance Tax Credit for Manufacturers	A tax credit for each manufacturer was limited to a total of $25 million for 2011, 2012, and 2013 combined	26 U.S.C. §45M	12/31/2013
	Qualified Energy Conservation Bonds (QECBs)	Bond authority was allocated to state, local, and tribal governments to	26 U.S.C. §54A 26 U.S.C. §54D 26 U.S.C. §6431	12/31/2017

Administering Agency	Program	Description	*U.S. Code* Citation	Expiration Date
		finance a broad range of energy efficiency and renewable energy projects		
	Qualifying Advanced Energy Manufacturing Investment Credit	Tax credit was designed to encourage a U.S.-based renewable energy manufacturing sector	26 U.S.C. §48C	7/23/2013
	Renewable Energy Grants (1603 Program)	Purpose of the 1603 payment was to reimburse eligible applicants for a portion of the cost of installing specified energy property used in a trade or business or for the production of income	No U.S. Code citation; see P.L. 111-5 (ARRA) §1603(a)	Construction had to begin by 12/31/2011; the last day to submit applications was 10/1/2012)
Department of Housing and Urban Development (HUD)	Assisted Housing Stability and Energy and Green Retrofit Investments Program (Recovery Act Funded)	Program provided funding for energy and green retrofit investments to certain eligible assisted, affordable multifamily properties. Funding included incentives for participating property owners, a set-aside for administrative functions, and a set-aside for due diligence and underwriting support. Assistance was for specific retrofit purposes	No U.S. Code citation; see P.L. 111-5 (ARRA)	End of FY2012
Department of Labor	Program of Competitive Grants for Worker Training and Placement in High Growth and Emerging Industry Sectors	Intended to preserve and create jobs; promote economic recovery; assist those most impacted by the recession; provide investments; and invest in infrastructure	See Notes field	None

Source: CRS.

Notes: Some programs are not specifically identified or codified in the *U.S. Code*.

a. The EECBG program was designed as a part of the Recovery Act (P.L. 111-5), with a one-time appropriation in FY2009. Due to the size of the appropriation, funds were let out over multiple fiscal years. DOE had an evaluation of the EECBG program. For more details, see DOE's evaluation results website.

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