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

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February 10, 2023

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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. This report outlines current federal programs providing grants, loans, loan guarantees, tax credits, and other direct or indirect incentives for energy efficiency, energy conservation, and renewable energy research, development, demonstration, and deployment (RDD&D). 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); the American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5); the Energy Act of 2020 (Division Z of P.L. 116-260); the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58), also known as the Bipartisan Infrastructure Law (BIL), and a budget reconciliation measure commonly referred to as the “Inflation Reduction Act of 2022” (IRA; P.L. 116-169). Each of those laws established, expanded, or modified energy efficiency and renewable energy 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 (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 biofuel 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 commercial, residential, and industrial needs could be met by domestic supplies. However, industrialization, population growth, and the increased demand for consumer goods led to growing dependence on foreign sources of energy during the 20th century to supplement the demands of a growing economy.

Several factors prompted federal efforts to increase U.S. energy independence and reduce domestic consumption, including dependence on foreign energy sources; environmental impacts of fossil fuels; and concerns over the volatility of prices driven by fluctuations in supply spurred by world events. As a major result, numerous programs have been established focusing on energy efficiency, conservation of domestic resources, and research that targets the development of renewable sources of energy. Many of these programs have roots dating back to the 1970s and have been redesigned many times since.

Many of the programs included in this report 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); the American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5); the Energy Act of 2020, enacted as Division Z of the Consolidated Appropriations Act of 2021 (P.L. 116-260); the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58), also known as the Bipartisan Infrastructure Law (BIL); and a budget reconciliation measure commonly referred to as the Inflation Reduction Act of 2022 (IRA; P.L. 117-169). 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 Agriculture (USDA) and the Department of the Treasury (Treasury) also 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 providing grants, loans, loan guarantees, tax credits, and other direct or indirect incentives for energy efficiency, energy conservation, and renewable energy RDD&D. It does not address other nonrenewable or energy efficiency programs at DOE (e.g., nuclear energy, fossil fuels) or climate specific and nonrenewable fuel or transportation programs.

The Congressional Research Service (CRS) identified these programs using authoritative federal resources, including, but not limited to, agency documents and websites, budget justifications, public laws, congressional hearings, committee reports, CRS and GAO reports, the Database of

State Incentives for Renewables and Efficiency (DSIRE),¹ and the Assistance Listings (formerly the *Catalog of Federal Domestic Assistance*) housed on the SAM.gov website.² This report is not intended to be comprehensive and may not include every federal program or incentive on this topic.

Federal programs are grouped by administering agency with agencies listed in descending order by number of programs, from greatest to least. Within each (agency) section, programs are listed in alphabetical order. For each program, CRS provides the administering agency; authorizing laws; the past 10 years of annual funding;³ the most recent agency budget request; scheduled termination date (if any); program description; a list of qualified applicants; a list of qualified technologies; and additional information resources in the “For More Information” section, which includes references and links to primary federal agency websites and program documents, when available.

Most program descriptions are compiled from authorizing statutes, the *U.S. Code*, agency documents and websites, Administration budget request documents, and relevant CRS reports. In some instances, program descriptions were compiled, in part, from DSIRE and the Assistance Listings. Budgetary figures are compiled primarily from executive agency budget justifications, congressional committee reports, and the annual *Budget of the United States Government*. In cases where program budget figures are not available in these documents, estimated budget data from the Assistance Listings may be included.

This report contains four appendixes, which summarize both current and expired federal renewable energy and energy efficiency programs as well as index current programs by applicant eligibility and technology type:

1. Appendix A (Table A-1) contains a summary of the programs/incentives discussed in the body of the report, listed by agency;
2. Appendix B (Tables B-1 and B-2) index all programs/incentives by applicant eligibility and technology type;
3. Appendix C is a listing of expired federal renewable energy and energy efficiency programs/incentives); and
4. Appendix D (Table D-1) contains summaries for those expired programs/incentives.

As of February 2023, this report includes programs established prior to the passage of IJJA and IRA. Funding data for and changes to programs affected by those laws are noted in this update. Additional renewable energy and energy efficiency programs and tax incentives established by IJJA and IRA will be added to this report as programs are finalized and provided guidance by federal agencies.

For more information on agriculture-related energy grant programs, energy tax incentives, and development of and deployment of alternatives to conventional fuels and engines in transportation, see the following CRS reports:

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

¹ See Database of State Incentives for Renewables & Efficiency (DSIRE), at <https://www.dsireusa.org/>.

² See <https://sam.gov/>.

³ In some instances funding information for older fiscal years is provided to demonstrate funding fluctuations. In instances where programs have been established after FY2013, a complete funding history is provided.

- CRS In Focus IF10639, *Farm Bill Primer: Energy Title*, by Kelsi Bracmort;
- CRS In Focus IF10288, *Overview of the 2018 Farm Bill Energy Title Programs*, by Kelsi Bracmort;
- CRS Report R47202, *Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)*, coordinated by Molly F. Sherlock;
- 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 (EERE)

Renewable Energy

Biomass

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

Administered by	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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title IX, Sec. 9009
Annual Funding	\$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
	\$255 million for FY2021
	\$262 million for FY2022
	\$340 million requested for FY2023
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, sustainable aviation fuel, sustainable marine fuel, and biodiesel.
Qualified Applicant(s)	Colleges and universities; profit organizations
Qualified Technologies	Biomass
For More Information	See CRS Report R42566, <i>Alternative Fuel and Advanced Vehicle Technology Incentives: A Summary of Federal Programs</i> , by Lynn J. Cunningham et al.; DOE's Bioenergy Technologies Office overview; EERE's Bioenergy Technologies Office – Funding Opportunities; and program number 81.087 at the SAM.gov website.

Geothermal

2. 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) 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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title III, Sec. 3002
Annual Funding	\$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 \$106 million for FY2021 \$109.5 million for FY2022 \$84 million additionally appropriated for FY2022 from IJJA \$202 million requested for FY2023
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; EERE's Geothermal Technologies Office – Open Funding Opportunities; and program number 81.087 at the Sam.gov website.

Hydrogen and Fuel Cells

3. 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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title IX, Sec. 9009
Annual Funding	\$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
	\$150 million for FY2021
	\$150 million for FY2021
	\$157.5 million for FY2022
	\$200 million additionally appropriated for FY2022 from IIJA
	\$200 million additionally appropriated for FY2023 from IIJA
	\$186 million requested for FY2023
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; EERE's Hydrogen and Fuel Cell Technologies Office – Funding Opportunities; and program number 81.087 at the Sam.gov website.

Solar

4. 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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title III, Sec. 3004
Annual Funding	\$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
	\$280 million for FY2021
	\$290 million for FY2022
	\$80 million additionally appropriated for FY2022 from IIJA
	\$534.6 million requested for FY2023
Scheduled Termination	None
Description	SETO partners with industry, national laboratories, and universities to develop and bring solar energy technologies to the marketplace by improving the energy efficiency, cost effectiveness, reliability, resilience, security, siting, integration, manufacturability, installation, decommissioning, and recyclability of solar energy technologies. This program finances R&D in seven major subprograms: Photovoltaics (PV), Concentrating Solar Power (CSP), Systems Integration for Solar Technologies, Balance of Systems Soft Cost Reduction, Manufacturing and Competitiveness, Equitable Access to Solar Energy, and Solar Workforce Development.
Qualified Applicant(s)	Industry; national laboratories; colleges and universities
Qualified Technologies	Solar
For More Information	See EERE's Solar Energy Technologies Office website; EERE's Solar Energy Technologies Office – Funding Opportunities; and program number 81.087 at the SAM.gov website.

Water Power

5. 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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title III, Sec. 3001
Annual Funding	\$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 \$150 million for FY2021 \$162 million for FY2022

	\$562.8 million additionally appropriated for FY2022 from IJJA ⁴ \$276.8 million additionally appropriated for FY2023 from IJJA \$190.5 million requested for FY2023
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; EERE's Water Power Technologies Office – Funding Opportunities; and program number 81.087 at the SAM.gov website.

Wind Energy

6. 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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title III, Sec. 3003
Annual Funding	\$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 \$110 million for FY2021 \$114 million for FY2022 \$100 million additionally appropriated for FY2022 from IJJA \$345.4 million requested for FY2023
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

⁴ Additional FY2022 and FY2023 IJJA appropriations to be managed by EERE as well as the Grid Deployment Office.

	research and development projects with industry to improve the performance, lower the costs, and accelerate the deployment of wind energy technologies. This program finances R&D in 10 major subprograms: Offshore Wind, Distributed Wind, Atmosphere to Electrons, Resource Assessment and Characterization, Next-Generation Wind Technology, Testing and Certification, Wind Manufacturing and Supply Chain, Environmental Impacts and Siting of Wind Projects, Workforce Development and Education, and Grid Integration.
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; EERE’s Wind Energy Technologies Office – Funding Opportunities; and program number 81.087 at the SAM.gov website.

Energy Efficiency

Buildings

7. Building Technologies Office (BTO)

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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title I, Sec. 1007
Annual Funding	\$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 \$290 million for FY2021 \$307.5 million for FY2022 \$565 million additionally appropriated for FY2022 from IJA ⁵ \$255 million additionally appropriated for FY2023 from IJA

⁵ Additional FY2022 and FY2023 IJA appropriations to be managed by EERE as well as the Office of State and Community Energy Programs (SCEP) and the Office of Manufacturing and Energy Supply Chains (MESCC).

	\$392 million requested for FY2023
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. The program's key areas are: emerging technologies residential buildings integration, commercial buildings integration, appliance and equipment standards, and building energy codes.
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; and EERE's Building Technologies Office – Funding Opportunities.

8. Weatherization Assistance Program (WAP)

Administered by	Office of State and Community Energy Programs (SCEP)
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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title I, Sec. 1011 Infrastructure Investment and Jobs Act (IIJA, P.L. 117-58)
Annual Funding	\$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 \$315 million for FY2021 \$315 million for FY2022 ⁶ \$3.5 billion additionally appropriated for FY2022 from IIJA ⁷

⁶ Of the \$315 million appropriated for FY2022, \$15 million is authorized for Weatherization Readiness Funds (WRF). WRF are designated for use by grantees in addressing structural and health and safety issues. This funding is anticipated to reduce the frequency of deferred homes that require other services, outside the scope of weatherization, before the weatherization measures can be installed. WRF were authorized by Section 1011 of the Energy Act of 2022, which amended sections of the Energy Conservation and Production Act, including the addition of Section 414D, to “expand the number of dwelling units that are occupied by low-income persons that receive weatherization assistance by making such dwelling units weatherization-ready.” See Department of Energy, *Weatherization Program Notice 22-2*, p.2.

⁷ IIJA WAP funding will be tracked, monitored, and reported separately from annual FY2022 appropriated funding and subsequent years. IIJA funds to remain available until expended. See Department of Energy, *Weatherization Program Notice BIL 22-1*, p. 3.

	\$502.2 million requested for FY2023
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 (NASCCSP's) WAP Clearinghouse; EERE's Weatherization Success Stories website; program number 81.042 at the SAM.gov website; and CRS Report R46418, The Weatherization Assistance Program Formula, by Corrie E. Clark and Lynn J. Cunningham.

Industrial

9. Advanced Materials and Manufacturing Technologies Office (AMMTO)/ Industrial Efficiency and Decarbonization Office (IEDO) (formerly the Advanced Manufacturing Office - AMO)

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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title I, Sec. 1013
Annual Funding	\$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 \$396 million for FY2021 \$416 million for FY2022

	\$475 million additionally appropriated for FY2022 from IJJA ⁸ \$250 million additionally appropriated for FY2023 from IJJA \$582.5 million requested for FY2023
Scheduled Termination	None
Description	In 2022, DOE split the Advanced Manufacturing Office (AMO) into two offices: the Advanced Materials and Manufacturing Technologies Office (AMMTO) and the Industrial Efficiency and Decarbonization Office (IEDO). AMMTO researches, develops, and demonstrates next-generation materials and manufacturing technologies needed to increase U.S. industrial competitiveness and to drive economy-wide decarbonization. It supports the national plan to revitalize American manufacturing, secure critical supply chains, and develop diverse innovation ecosystems. IEDO provides planning, management, and direction necessary for (1) a balanced national program of research, development, demonstration, technical assistance; (2) workforce development to drive energy, materials and production efficiency; and (3) decarbonization across the industrial sector to achieve net-zero carbon emissions by 2050.
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 Materials and Manufacturing Office (AMMTO) website; EERE's Industrial Efficiency and Decarbonization Office (IEDO) website; and EERE's AMMTO and IEDO Funding Opportunities.

10. Inventions and Innovations Program

Administered by	EERE
Authority	Federal Nonnuclear Energy Research and Development Policy Act of 1974 (P.L. 93-577)
Annual Funding ⁹	\$940,000 for FY2012 \$1 million for FY2013 \$0 for FY2014-FY2018 \$50,000 for FY2019 \$0 for FY2020 \$0 for FY2021 (est.) FY2022 and FY2023 budget request data are unavailable as of January 2023; the FY2022 and FY2023 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. ¹⁰

⁸ Additional FY2022 and FY2023 IJJA appropriations to be managed by EERE as well as SCEP and MESC.

⁹ Funding information taken from a now-archived Assistance Listing website.

¹⁰ According to the program description in the Assistance Listings at the beta.Sam.gov website, noted on July 9, 2018, October 18, 2019, October 26, 2020, and, most recently, at the SAM.gov website on July 28, 2021.

Qualified Applicant(s)	Individuals; small businesses
Qualified Technologies	Specific energy efficiency and renewable energy technologies not listed
For More Information	See NREL's <i>Inventions and Innovation: Helping Bring Your Energy Ideas to Market</i> ; Advanced Manufacturing & Industrial Decarbonization Offices funding opportunities website.

Vehicles

11. Vehicle Technologies Office (VTO)

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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title IX, Sec. 9009
Annual Funding	\$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 \$400 million for FY2021 \$420 million for FY2022 \$1,250 billion additionally appropriated for FY2022 from IJA ¹¹ \$1,240 billion additionally appropriated for FY2023 from IJA \$602.7 million requested for FY2023
Scheduled Termination	None
Description	The VTO 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. Key technology areas include Batteries, Charging, and Electric Vehicles; Energy Efficient Mobility Systems; Advanced Combustion Systems and Fuels; Lightweight Propulsion Materials; and Technology Integration.
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 lightweighting materials; and technology integration
For More Information	See EERE's Vehicle Technology Office website; EERE's Vehicle Technologies Office – Funding Opportunities; and EERE's Vehicle Technologies Program Factsheet.

¹¹ Additional FY2022 and FY2023 IJA appropriations to be managed by EERE as well as MESC.

Other Energy Efficiency and Renewable Energy Programs

12. Energy Efficiency and Conservation Block Grant 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) Infrastructure and Investment and Jobs Act (IIJA, P.L. 117-58), Division D, Title V, Subtitle D, Sec. 40552
Annual Funding	\$0 for FY2008 \$3.2 billion for FY2009 from ARRA \$0 for FY2010-FY2021 \$550 million for FY2022 ¹²
Scheduled Termination	This program was initially authorized through FY2012. The IIJA authorized funding for the program for FY2022 with monies to be available until expended.
Description	This program is part of DOE's Weatherization and Intergovernmental Program. The EECBG Program provides 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 can 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; district heating and cooling systems; combined heat and power systems; landfill gases, solar; wind; fuel cells; biomass
For More Information	See EERE's Energy Efficiency and Conservation Block Grant Program website; and program number 81.128 at SAM.gov website.

13. 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 ¹³	\$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 \$23.2 million for FY2021 \$7.5 million for FY2022 (est.) FY2023 budget request data are unavailable as of January 2023; the FY2023 DOE budget justifications do not provide details on this program.
Scheduled Termination	None

¹² FY2022 IIJA funding for the program to remain available until expended.

¹³ Funding information taken from the Assistance Listings, see <https://sam.gov/fal/5abada163cd316e59c6bb19b216d75e3/view>.

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 SAM.gov website.

14. 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 Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260) Title III, Sec. 3006(c)
Annual Funding	\$4.95 million for FY2006 \$4.95 million for FY2007 \$4.95 million for FY2008 \$5 million for FY2009 \$0 for FY2010-FY2022 \$0 requested for FY2023
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; marine energy (tidal energy; wave energy; ocean thermal)
For More Information	See <i>U.S. Code</i> : 42 U.S.C. §13317.

15. State Energy Program (SEP)

Administered by	SCEP
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) Infrastructure and Investment and Jobs Act (IIJA, P.L. 117-58), Division D, Title V, Subtitle D, Sec. 40109
Annual Funding	\$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
	\$62.5 million for FY2021
	\$63 million for FY2022
	\$500 million additionally appropriated for FY2022 from IIJA
	\$70 million requested for FY2023
Scheduled Termination	None
Description	<p>SEP provides grants to states, tribal governments, and territories to design and carry out their own renewable energy and energy efficiency programs, tailored to their unique resources, delivery capacity, and energy goals.</p> <p>These grants support state energy offices in their development and implementation of energy programs that deploy portfolios of clean energy technologies addressing their specific goals and needs. A broad range of activities encompass the state energy offices' formula work, including energy planning; building energy code adoption, implementation and compliance in continued coordination with EERE's Building Technologies Office; financing mechanisms for institutional retrofit programs; loan programs; energy savings performance contracting to retrofit government buildings and facilities; comprehensive residential energy programs for homeowners; transportation programs that accelerate the use of alternative fuels, including electric vehicles and infrastructure; and programs that remove barriers and support supply side and distributed renewable energy.</p>
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 SAM.gov website.

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

Administered by Authority	<p>Office of Indian Energy Policy and Programs (IE)</p> <p>Energy Policy and Conservation Act (EPCA; P.L. 94-163)</p> <p>Energy Conservation and Production Act (ECPA; P.L. 94-385)</p> <p>Department of Energy Organization Act (P.L. 95-91)</p> <p>Energy Tax Act of 1978 (P.L. 95-618)</p> <p>National Energy Conservation Policy Act (NECPA; P.L. 95-619)</p> <p>Power Plant and Industrial Fuel Use Act of 1978 (P.L. 95-620)</p> <p>Energy Security Act (P.L. 96-294)</p> <p>National Appliance Energy Conservation Act of 1987 (P.L. 100-12)</p> <p>Federal Energy Management Improvement Act of 1988 (P.L. 100-615)</p> <p>Energy Policy Act of 1992 (EPACT; P.L. 102-486)</p> <p>Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58)</p> <p>Energy Independence and Security Act of 2007 (EISA; P.L. 110-140)</p> <p>American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5)</p> <p>Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title VIII, Sec. 8013</p>
Annual Funding	\$9.4 million for FY2013

	\$8.3 million for FY2014 ¹⁴
	\$14.7 million for FY2015 ¹⁵
	\$13.2 million for FY2016
	\$13.5 million for FY2017 ¹⁶
	\$15.7 million for FY2018
	\$13.2 million for FY2019
	\$17 million for FY2020
	\$17 million for FY2021
	\$17 million for FY2022
	\$129.7 million requested for FY2023
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; the Office of Indian Energy Policy and Program’s Current Funding Opportunities; National Renewable Energy Laboratory’s (NREL’s) report: Tribal Energy Program – Assisting Tribes to Realize Their Energy Visions; DSIRE’s program summary for the Tribal Energy Program; and CRS In Focus IFI 1793, <i>Indian Energy Programs at the Department of Energy</i> , by Corrie E. Clark and Mark Holt.

Other DOE Offices/Cross-Cutting Programs

17. 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), Sec. 5012

¹⁴ The Tribal Energy Program (TEP) was funded in FY2014 within the Office of Energy Efficiency and Renewable Energy appropriation, included with the Weatherization and Intergovernmental Programs. See Department of Energy, *FY2014 Congressional Budget Request*, volume 3, p. EE-249.

¹⁵ 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. See Department of Energy, *FY2015 Congressional Budget Request*, volume 3, p. 18.

¹⁶ 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.” See Department of Energy, *FY2017 Congressional Budget Request*, volume 3, p. 756.

	America COMPETES Reauthorization Act of 2010 (P.L. 111-358) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title X, Sec. 10001 P.L. 117-167 (commonly referred to as the CHIPS and Science Act), Div. B, Title VI, Sec. 10771
Annual Funding	\$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 \$392 million for FY2021 \$392 million for FY2022 \$643 million requested for FY2023
Scheduled Termination	Authorized through FY2025. Passed in December 2020, the Energy Act of 2020 [P.L. 116-260, 42 U.S.C. 16538(l)] also stipulates that “not later than 3 years after December 27, 2020, the Secretary [of Energy] is authorized to enter into a contract with the National Academy of Sciences under which the National Academy shall conduct an evaluation of how well ARPA-E is achieving the goals and mission of ARPA-E.” Furthermore, the evaluation may include “a recommendation on whether ARPA-E should be continued or terminated.”
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. The CHIPS and Science Act (P.L. 117-167) authorized an additional \$1.2 billion in appropriations for FY2023-FY2026 for the purpose of funding specific “key technology focus areas.” ¹⁷ These focus areas include, among others, advanced energy and industrial efficiency technologies, such as batteries and advanced nuclear technologies, including but not limited to the purposes of electric generation.
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 General Questions website; National Academy of Sciences program evaluation: <i>An Assessment of ARPA-E</i> (2017); and program number 81.135 at the SAM.gov website.

¹⁷ For a full list of specific technologies in the “key technology focuses areas” see Section 10387 of the CHIPS and Science Act (P.L. 117-167). For authorization of the additional \$1.2 billion in appropriations for ARPA-E, see Section 10771(7) of the same law.

18. 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) 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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title VIII, Sec. 8001, 8003, 8004, and 8007
Annual Funding	\$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 ¹⁸ \$172 million for FY2020 ¹⁹ \$193.7 million for FY2021 ²⁰ \$193.7 million for FY2022 ²¹ \$279.8 million requested for FY2023 ²²
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

¹⁸ 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. See Department of Energy, *FY2019 Congressional Budget Request*, volume 3 part 1, pp. 7-9, 13, 57-59.

¹⁹ The CESER appropriation for FY2020 was \$143 million. To compare to previous years, the combined appropriation for the now separated programs in FY2020 would be \$315 million. See Department of Energy, *FY2021 Congressional Budget Request*, volume 3 part 1, pp. 265, 321.

²⁰ The CESER appropriation for FY2021 was \$144 million. To compare to previous years, the combined appropriation request for FY2021 would be \$337.7 million. See Department of Energy, *FY2022 Congressional Budget Request*, volume 3 part 1, pp. 14, 74.

²¹ The CESER appropriation for FY2022 was \$143 million. To compare to previous years, the combined appropriations for FY2022 would be \$346.7 million. DOE's FY2022 budget request proposed transferring responsibility of R&D for energy sector cybersecurity to OE, including a request for \$25 million for the cyber R&D program. See Department of Energy, *FY2023 Congressional Budget Request*, volume 3, pp. 6-9 and Department of Energy, *FY2023 Congressional Budget Request*, volume 4, pp. 320-325.

²² DOE's FY2023 budget request for OE similarly proposed transferring responsibility of R&D for energy sector cybersecurity to OE. OE's appropriation request for FY2022 was \$279.8 million and included \$20 million for a Cyber Resilient and Secure Utility Communications Networks R&D program. See Department of Energy, *FY2023 Congressional Budget Request*, volume 4, pp. 349-352.

For More Information See OE's Technology Development website; and program number 81.122 at the SAM.gov website.

19. Federal Energy Management Program (FEMP)

Administered by	Office of Federal Energy Management Programs (FEMP)
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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title I, Sec. 1012
Annual Funding	\$28.3 million for FY2013 \$28.2 million for FY2014 \$27 million for FY2015 \$27 million for FY2016 \$27 million for FY2017 \$27 million for FY2018 \$30 million for FY2019 \$40 million for FY2020 \$40 million for FY2021 \$40 million for FY2022 \$250 million additionally appropriated for FY2022 from IIJA ²³ \$155.2 million requested for FY2023
Scheduled Termination	None
Description	FEMP assists federal agencies in developing and implementing cost-effective energy and water management and energy-related investment practices: (a) to coordinate and strengthen energy and water resilience; and (b) to promote environmental stewardship. The program's main activities include: providing guidance, reference materials, and resource links to help agencies comply with federal laws and requirements; facilitating technology integration for optimizing agency facilities and fleets; leveraging funding sources to support federal projects with technical and procurement expertise; providing technical assistance to federal agencies; tracking agency accountability in reporting annual energy and water consumption and resource management efforts for federal facilities; and providing training to foster and maintain a high-performance workforce that constructs, operates, and maintains energy-efficient and cost-effective federal facilities.
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.

²³ Additional FY2022 IIJA funding appropriated for the Assisting Federal Facilities with Energy Conservation Grant Program.

20. Office of Science Financial Assistance Program

Administered by	Office of Science (SC)
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 ²⁴	\$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 \$1.3 billion for FY2018 \$1.2 billion for FY2019 \$1.2 billion for FY2020 \$1.37 billion for FY2021 \$1.35 billion for FY2022 (est.) \$1.35 billion for FY2023 (est.) FY2023 budget request data are unavailable as of January 2023; the FY2023 DOE budget justifications do not contain estimates regarding how much funding from the SC are provided for renewable energy and energy efficiency R&D grants.
Scheduled Termination	None
Description	The Office of Science's (SC) mission is to deliver scientific discoveries and major scientific tools to transform our understanding of nature and advance the energy, economic, and national security of the United States. SC accomplishes its mission and advances national goals, in part, by supporting science for advanced and sustainable energy. SC supports a wide range of funding modalities from single principal investigators to large team-based activities to engage in fundamental research on energy production, conversion, storage, transmission, and use.
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 the Office of Science's Funding Opportunities website, and program number 81.049 at the SAM.gov website.

21. Loan Guarantee Program (Loan Programs Office)

Administered by	Loan Programs Office (LPO)
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) Energy Act of 2020 (Div. Z of Consolidated Appropriations Act, 2020; P.L. 116-260), Title IX, Sec. 9010 Investment Infrastructure and Jobs Act (IIJA; P.L. 117-58), Division D, Title IV, Sec. 40401

²⁴ Funding information taken from the Assistance Listings, see <https://sam.gov/fal/2ce2a503273bc133bfb5a1e142201bcd/view>. The obligations for financial assistance do not include all funding for Office of Science programs.

	Inflation Reduction Act (IRA; P.L. 117-169), Title V, Sec. 50141, 50144
Annual Funding	Section 1703 Innovative Technology Loan Guarantee Program (permanent)
	\$0 for FY2013
	\$7.9 million for FY2014 ²⁵
	\$17 million for FY2015 ²⁶
	\$17 million for FY2016 ²⁷
	\$139,000 for FY2017 ²⁸
	\$30.9 million for FY2018 ²⁹
	\$12.3 million for FY2019 ³⁰
	\$29 million for FY2020 ³¹
	\$29 million for FY2021 ³²
	\$29 million for FY2022 ³³
	\$3.6 billion appropriated for FY2022 from IRA
	\$168.2 million requested for FY2023 ³⁴
	Section 1705 Temporary Loan Guarantee Program
	\$0 for FY2008

²⁵ 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. See Department of Energy, *FY2016 Congressional Budget Request*, volume 3, pp. 721-722.

²⁶ 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. See Department of Energy, *FY2017 Congressional Budget Request*, volume 3, pp. 743-744.

²⁷ 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. See Department of Energy, *FY2018 Congressional Budget Request*, volume 3, pp. 717-719.

²⁸ 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. See Department of Energy, *FY2019 Congressional Budget Request*, volume 3 part 2, pp. 453-455.

²⁹ 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. See Department of Energy, *FY2020 Congressional Budget Request*, volume 3 part 2, pp. 455-457.

³⁰ 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. See Department of Energy, *FY2021 Congressional Budget Request*, volume 3 part 2, pp. 391-393.

³¹ 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. See Department of Energy, *FY2022 Congressional Budget Request*, volume 3 part 2, p. 309.

³² For FY2021, \$32 million was enacted for administrative expenses. These administrative expenses are expected to be offset by \$3 million for a net appropriation of \$29 million. See Department of Energy, *FY2023 Congressional Budget Request*, volume 3, p. 103.

³³ For FY2022, \$32 million was enacted for administrative expenses. These administrative expenses are expected to be offset by \$3 million for a net appropriation of \$29 million. See Department of Energy, *FY2023 Congressional Budget Request*, volume 3, p. 103.

³⁴ For FY2023, a net total of \$168.2 million was requested. This total includes \$66.2 million for administrative expenses and \$150 million for credit subsidy costs offset by an estimated \$48 million in offsetting collections. The \$150 million for credit subsidy costs is associated with an additional \$5 billion of loan guarantee authority open to a range of eligible projects, increasing available Title 17 loan authority from \$22.4 billion to \$27.4 billion. See Department of Energy, *FY2023 Congressional Budget Request*, volume 3 (p. 104).

\$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. 111-47.³⁵ 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 FY2012-FY2022

\$0 requested for FY2023³⁶

Section 1706 Energy Infrastructure Reinvestment Financing

\$5 billion appropriated for FY2022 from IRA

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 LPO continues to administer and monitor loan guarantees for Section 1705 projects. The IRA (P.L. 117-169, Title V, Section 50144) authorized Section 1706 through FY2026.
Description	<p>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 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.</p> <p>The IRA (P.L. 114-169) established a temporary Section 1706 loan guarantee authority that could finance energy infrastructure. The bill defines energy infrastructure as (1) electricity generation and transmission or (2) production, processing, and delivery of fossil fuels, petroleum-derived fuels, or petrochemical feedstocks. To qualify for a 1706 loan guarantee, projects would need to (1) retool, repower, repurpose, or replace energy infrastructure that has ceased operations—subject to a requirement that fossil fuel electricity generation projects must avoid, reduce, utilize, or sequester air pollutants and anthropogenic greenhouse gas emissions or (2) enable operating energy infrastructure to avoid, reduce, utilize, or sequester air pollutants or anthropogenic emissions of greenhouse gases.</p>
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 DOE’s Loan Guarantee Program website; See program number 81.126 at the SAM.gov website; DSIRE’s program summary for the Loan Guarantee Program; CRS Insight IN11432, Department of Energy Loan Programs: Title XVII Innovative Technology Loan Guarantees, by Phillip Brown et al.; and CRS Insight IN11984, <i>Inflation Reduction Act of 2022 (IRA): Department of Energy Loan Guarantee Programs</i> , by Phillip Brown.

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

Administered by EERE

³⁵ For more information, see CRS Report R40669, *Energy and Water Development: FY2010 Appropriations*, coordinated by Carl E. Behrens. To discuss with a CRS analyst, congressional staff may contact Mark Holt.

³⁶ The authority to enter into new loan guarantees under Section 1705 expired on September 30, 2011, but the Loan Program Office (LPO) continues to administer and monitor the portfolio of loan guarantees obligated prior to the expiration date. See Department of Energy, *FY2023 Congressional Budget Request*, volume 3. p. 116.

Authority	<p>Small Business Innovation Development Act of 1982 (P.L. 97-219)</p> <p>Small Business Research and Development Enhancement Act of 1992 (P.L. 102-564)</p> <p>Consolidated Appropriations Act, 2001 (P.L. 106-554), Appendix I, Title I (Small Business Innovation Research Program Reauthorization Act of 2000)</p> <p>Small Business Technology Transfer Program Reauthorization Act of 2001 (P.L. 107-50)</p> <p>SBIR/STTR Reauthorization Act of 2011 (P.L. 112-81, Div. E, Title L)</p> <p>National Defense Authorization Act for Fiscal Year 2017 (P.L. 114-328), Div. A, Title XVIII, Sec. 1834</p> <p>SBIR and STTR Extension Act of 2022 (P.L. 117-183)</p>
Annual Funding ³⁷	<p>\$26.4 million for FY2013 (SBIR: \$23.4 million; STTR: \$3 million)</p> <p>\$30.8 million for FY2014 (SBIR: \$27.4 million; STTR: \$3.4 million)</p> <p>\$28.4 million for FY2015 (SBIR: \$25.1 million; STTR: \$3.3 million)</p> <p>\$30.2 million for FY2016 (SBIR: \$26.3 million; STTR: \$3.9 million)</p> <p>\$45.2 million for FY2017 (SBIR: \$38.9 million; STTR: \$6.3 million)</p> <p>\$58.2 million for FY2018 (SBIR: \$51 million; STTR: \$7.2 million)</p> <p>\$58.9 million for FY2019 (SBIR: \$51.5 million; STTR: \$7.4 million)</p> <p>\$78.33 million for FY2020 (SBIR: \$66.76 million; STTR: \$11.57 million)</p> <p>\$80.5 million for FY2021 (SBIR: \$70.3 million; STTR: \$10.1 million)</p> <p>\$68.1 million for FY2022 (SBIR: \$59.7 million; STTR: \$8.4 million)</p> <p>\$102.1 million requested for FY2023 (SBIR: \$89.6 million; STTR: \$12.6 million)</p>
Scheduled Termination	<p>The SBIR and STTR Extension Act of 2022 (P.L. 117-183) reauthorized SBIR and STTR through FY2025.</p>
Description	<p>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.</p>
Qualified Applicant(s)	<p>Small businesses</p>
Qualified Technologies	<p>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</p>
For More Information	<p>See EERE's Small Business Innovation Research/Small Business Technology Transfers (SBIR/STTR) website; program number 10.212 (SBIR) at the SAM.gov website; and CRS Report R43695, <i>Small Business Research Programs: SBIR and STTR</i>, by Marcy Gallo.</p>

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

Administered by	<p>LPO</p>
Authority	<p>Energy Policy Act of 1992 (EPACT; P.L. 102-486)</p> <p>Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58), Title V, Section 503(a)</p> <p>Indian Tribal Energy Development and Self-Determination Act Amendments of 2017 (P.L. 115-325), Title I, Sec. 101(c)</p>

³⁷ 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. See Department of Energy, *FY2023 Congressional Budget Request*, volume 4, p. 16.

	Inflation Reduction Act of 2022 (IRA, P.L. 117-169), Title V, Sec. 50145
Annual Funding	\$9 million for FY2017 \$8.939 million for FY2018 \$1 million for FY2019 \$2 million for FY2021 \$2 million for FY2022 \$75 million appropriated for FY2022 from IRA \$1.9 million requested for FY2023
Scheduled Termination	None. However, in FY2021, LPO has proposed to terminate the Tribal Energy Loan Guarantee Program. ³⁸
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, <i>Department of Energy Loan Programs: Tribal Energy Loan Guarantee</i> , by Corrie E. Clark et al.; CRS Insight IN11984, <i>Inflation Reduction Act of 2022 (IRA): Department of Energy Loan Guarantee Programs</i> , by Phillip Brown; and CRS In Focus IF11793, <i>Indian Energy Programs at the Department of Energy</i> , by Corrie E. Clark and Mark Holt.

II. Department of Agriculture (USDA)

1. Assistance to High Energy Cost Rural Communities Program

Administered by	Rural Development (RD)
Authority	Rural Electrification Act of 1936 (P.L. 74-605) Grain Standards and Warehouse Improvement Act of 2000 (P.L. 106-472)
Annual Funding	\$9.2 million for FY2013 \$10 million for FY2014 \$10 million for FY2015 \$10 million for FY2016 \$10 million for FY2017 \$10 million for FY2018 \$10 million for FY2019 \$10 million for FY2020 \$10 million for FY2021 \$10 million for FY2022 \$10 million requested for FY2023
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

³⁸ For FY2021, DOE proposed eliminating the Tribal Energy Loan Guarantee Program. See Department of Energy, *FY2021 Congressional Budget Request, volume 3*, part 2, p. 401.

Qualified Technologies	Solar water heat, solar space heat, solar thermal electric, solar thermal process heat, solar photovoltaics, wind (all), biomass, hydroelectric, wind (small), hydroelectric (small)
For More Information	See USDA's High Energy Cost Grants website; program number 10.859 on the SAM.gov website; and DSIRE's program summary for the High Energy Cost Grant Program.

2. Bioenergy Program for Advanced Biofuels

Administered by	RD
Authority	Food, Conservation, and Energy Act of 2008 ("2008 farm bill," P.L. 110-246), Title IX, Section 9005 Agricultural Act of 2014 ("2014 farm bill," P.L. 113-79) Agriculture Improvement Act of 2018 ("2018 farm bill," P.L. 115-334)
Annual Funding	<ul style="list-style-type: none"> • 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 annually for FY2019, FY2020,³⁹ FY2021, and FY2022⁴⁰. • Discretionary: The 2018 farm bill authorized discretionary funding of \$20 million annually for FY2019-FY2023. No discretionary funding was appropriated for FY2019-FY2022.
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. ⁴¹ 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 USDA program website; program number 10.867 on the SAM.gov website; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i> , by Kelsi

³⁹ In the FY2022 Budget Appendix, USDA notes a transfer of an additional \$100 million from the Commodity Credit Corporation (CCC) in FY2020 for \$107 million total available funding for that fiscal year, likely reflecting the availability of carryover funding. See the Appendix volume for FY2022 *Budget of the United States Government*, p. 133.

⁴⁰ USDA notes a similar transfer of an additional \$100 million from the CCC in FY2022 for \$107 million total available funding for that fiscal year. See the Appendix volume for FY2023 *Budget of the United States Government*, p. 136.

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

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; “2002 farm bill,” P.L. 107-171), Title IX Food, Conservation, and Energy Act of 2008 (“2008 farm bill,” P.L. 110-246), Title IX, Sec. 9001 created new Section 9011 under FSRIA Agricultural Act of 2014 (“2014 farm bill,” P.L. 113-79), Sec. 9010 Agriculture Improvement Act of 2018 (“2018 farm bill,” P.L. 115-334)
Annual Funding	<ul style="list-style-type: none">• 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 (P.L. 115-141) 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-FY2022.
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, <i>Biomass Crop Assistance Program (BCAP): Status and Issues</i> , by Mark A. McMinimy; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i> , by Kelsi Bracmort; and CRS Report R45943, <i>The Farm Bill Energy Title: An Overview and Funding History</i> , 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; “2002 farm bill,” P.L. 107-171), Title IX, Sec. 9008 Food, Conservation, and Energy Act of 2008 (“2008 farm bill,” P.L. 110-246), Title IX, Sec. 9008 Agricultural Act of 2014 (P.L. 113-79), Section 9010

	Agriculture Improvement Act of 2018 (“2018 farm bill,” P.L. 115-334), Title VII, Sec. 7507
Annual Funding	<ul style="list-style-type: none"> • 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 was appropriated through FY2022.
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 the Biomass Research and Development (BR&D) Board’s BRDI website; program number 10.312 on the Sam.gov website; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i> , by Kelsi Bracmort; and CRS Report R45943, <i>The Farm Bill Energy Title: An Overview and Funding History</i> , by Kelsi Bracmort.

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

Administered by	RD
Authority	<p>Food, Conservation, and Energy Act of 2008 (“2008 farm bill,” P.L. 110-246), Title IX, Sec. 9001 created the Biorefinery Assistance Program</p> <p>Agricultural Act of 2014 (“2014 farm bill,” P.L. 113-79), Title IX, Sec. 9003 amended and renamed the program as the Biorefinery, Renewable Chemical and Biobased Product Manufacturing Assistance Program</p> <p>Agriculture Improvement Act of 2018 (“2018 farm bill,” P.L. 115-334), Title IX, Sec. 9003</p>
Annual Funding	<ul style="list-style-type: none"> • 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 FY2020.⁴² \$5 million in funding was made available for FY2021. No funding was made available for FY2022. • 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 was appropriated for this program through FY2022, and there is no budget request for discretionary appropriations for FY2023.⁴³

⁴² 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 FY2021 *Budget of the United States Government* on p. 142.

⁴³ See the Appendix volume to the FY2023 *Budget of the United States Government*, p. 146: “The 2023 Budget does not request discretionary funding for this program because mandatory funding is provided through the 2018 Farm Bill.”

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.
Qualified Applicant(s)	Individuals; tribal entities; state government entities; local government entities; U.S. territory 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; USDA's Biorefinery program fact sheet; program number 10.865 at the SAM.gov website; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i> , by Kelsi Bracmort; and CRS Report R45943, <i>The Farm Bill Energy Title: An Overview and Funding History</i> , by Kelsi Bracmort.

6. Community Wood Energy and Wood Innovation Program

Administered by	Forest Service (FS)
Authority	Food, Conservation, and Energy Act of 2008 ("2008 farm bill," P.L. 110-246), Title IX, Sec. 9013 Agricultural Act of 2014 ("2014 farm bill," P.L. 113-79), Title IX, Sec. 9012 Agriculture Improvement Act of 2018 ("2018 farm bill," P.L. 115-334), Title VIII, Sec. 8644
Annual Funding	<ul style="list-style-type: none">• 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. \$1.5 million was appropriated for FY2020. This was the first year Congress appropriated funds directly for the Community Wood Energy and Wood Innovation competitive funding program.⁴⁴ \$2 million was appropriated for FY2021, \$16.4 million for FY2022,⁴⁵ and the agency requested \$12.5 million for FY2023.
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

⁴⁴ United States Department of Agriculture, Forest Service FY2022 Budget Justification (p. 146).

⁴⁵ The Consolidated Appropriations Act of 2022 (P.L. 117-103) appropriated \$12 million and an additional \$4.373 million from IJA (P.L. 117-58) was used to fund Community Energy Wood grants in FY2022.

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 Forest Service’s Wood Innovations Grants program website; the Forest Service’s Community Wood Grant Program Awards website; the federal Biomass Research and Development (BR&D) Board’s “Wood Innovations Program” Power Point document; program number 10.708 at the Sam.gov website; CRS In Focus IF10288, *Overview of the 2018 Farm Bill Energy Title Programs*, 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 (“2008 farm bill,” P.L. 110-246)
 Agricultural Act of 2014 (“2014 farm bill,” P.L. 113-79)
 Agriculture Improvement Act of 2018 (“2018 farm bill,” P.L. 115-334), Title VII, Sec. 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 received no funding for FY2019 through FY2022.
 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 (RD)
 Authority Food Conservation, and Energy Act of 2008 (“2008 farm bill,” P.L. 110-246), Title IX, Sec. 9001(a)
 Agricultural Act of 2014 (“2014 farm bill,” P.L. 113-79), Title IX, Sec. 9007
 Agriculture Improvement Act of 2018 (“2018 farm bill,” P.L. 115-334), Title IX, Sec. 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, \$706,000 for FY2020, \$10.4 million for FY2021,⁴⁶ and \$12.9 million for FY2022. \$30 million was requested for FY2023.

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	<p>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).</p> <p>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.</p> <p>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.</p>
Qualified Applicant(s)	Commercial; schools; state, local, and tribal governments, rural electric cooperatives; agricultural; public power entities. Eligibility extends to these listed entities in the U.S. territories.
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 REAP program website; program number 10.868 at the Sam.gov website; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i> , by Kelsi Bracmort; and CRS Report R45943, <i>The Farm Bill Energy Title: An Overview and Funding History</i> , by Kelsi Bracmort.

9. Rural Energy Savings Program (RESP)

Administered by	RD
Authority	Agricultural Act of 2014 ("2014 farm bill," P.L. 113-79), Title VI, Sec. 6205

⁴⁶ the Consolidated Appropriation Act, FY2021 (P.L. 116-260, §781) appropriated \$10 million in additional discretionary funding to REAP. This additional amount was added to the base discretionary appropriation of \$392,000 for loan subsidies and grants and is to remain available until expended. Section 781 directs the Agriculture Secretary to use the additional \$10 million "to carry out a pilot program to provide financial assistance for rural communities to further develop renewable energy."

	Agriculture Improvement Act of 2018 (“2018 farm bill,” P.L. 115-334), Title VI, Sec. 6303
Annual Funding	<ul style="list-style-type: none">• 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; \$12 million was appropriated for FY2020; \$11 million was appropriated for FY2021; \$11.5 million was appropriated for FY2022; \$26.3 million was requested for FY2023.
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 RESP program website; USDA’s RESP fact sheet; program number 10.751 at the Sam.gov website; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i> , by Kelsi Bracmort; and CRS Report R45943, <i>The Farm Bill Energy Title: An Overview and Funding History</i> , by Kelsi Bracmort.

10. Sun Grant Program

Administered by	NIFA
Authority	Food, Conservation, and Energy Act of 2008 (“2008 farm bill,” P.L. 110-246), Title VII, Sec. 7526 Agricultural Act of 2014 (“2014 farm bill,” P.L. 113-79), Title VII, Sec. 7516 Agriculture Improvement Act of 2018 (“2018 farm bill,” P.L. 115-334), Title IX, Sec. 7414
Annual Funding	<ul style="list-style-type: none">• 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-FY2021. \$3.5 million was appropriated for FY2022. \$3 million was requested for FY2023.
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

	<p>development programs.⁴⁷ 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.</p> <p>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.</p>
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 Sam.gov website; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i> , by Kelsi Bracmort; and CRS Report R45943, <i>The Farm Bill Energy Title: An Overview and Funding History</i> , by Kelsi Bracmort.

11. Sustainable Agriculture Research and Education Program (SARE)

Administered by	NIFA; Agricultural Research Service (ARS)
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 (“2008 farm bill,” P.L. 110-246)
Annual Funding	\$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 \$40 million for FY2021 \$40 million for FY2022 \$60 million requested for FY2023
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.
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 SAM.gov website.

⁴⁷ University of Tennessee; “Sun Grant Initiative” [archived].

III. U.S. Department of the Treasury (Treasury)

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. Energy Efficient Home Improvement Credit (formerly the tax credit for Nonbusiness Energy Property or Residential Energy Efficiency Tax Credit)

Administered by	Internal Revenue Service (IRS)
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) Inflation Reduction Act of 2022 (IRA, P.L. 117-169)
Scheduled Termination	December 31, 2032
Description	For 2006 through 2022, this incentive provided 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 serve a dwelling in the United States that is owned and used by the taxpayer as a primary residence. The maximum lifetime amount of homeowner credit through 2022 is \$500. The Inflation Reduction Act of 2022 (P.L. 117-169) extended the tax credit through 2032. Beginning in 2023, the credit's rate increases to 30% with an annual limit of \$1,200 and a \$600 per-item limit for most equipment. The annual limit will be \$2,000 for taxpayers who claim expenses related to air source (natural gas) or geothermal electric heat pumps, air source or geothermal heat pump water heaters, and biomass stoves. Biomass stoves are eligible for the Residential Clean Energy Tax Credit through 2022, but eligibility for biomass-related expenses switches over to this credit starting in 2023. Other modifications include: increasing the annual limits for windows; creating an annual limit for doors; providing a 30% credit (up to \$150) for home energy audits; permitting taxpayers who do not own their residence to claim the credit for expenditures on energy property and allowing the credit for residences other than the taxpayer's primary residence; and, starting in 2025, requiring taxpayers to submit a product identification number to the IRS to claim the credit.
Qualified Applicant(s)	Residential
Qualified Technologies	Water heaters; furnaces; boilers; heat pumps; air conditioners; building insulation; windows; doors; 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 R47202, <i>Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)</i> , by Molly Sherlock.

2. Residential Clean Energy Tax Credit (formerly the Residential Renewable Energy Tax Credit)

Administered by	IRS
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) Inflation Reduction Act of 2022 (IRA, P.L. 117-169)
Scheduled Termination	December 31, 2034
Description	This incentive provides a tax credit for qualified expenditures for qualified energy property that serves a dwelling unit located in the United States and is used as a residence by the taxpayer. Expenditures include both the purchase of the system and installation labor costs. The Inflation Reduction Act of 2022 (P.L. 117-169) extended the tax credit through 2034 and modified the annual credit rate for each technology. A 26% credit for all qualified technology systems (see below) was in place through December 31, 2021, but the new law increases the credit rate to 30% for 2022 through 2032, and then reduces the rate to 26% in 2033 and 22% in 2034. Additional modifications include: adding stand-alone energy (battery) storage systems to the list of qualified technologies starting in 2023; moving eligibility for biomass-related expenses for the credit to the Energy Efficient Home Improvement Credit; and renaming this credit as the Residential Clean Energy Credit.
Qualified Applicant(s)	Residential
Qualified Technologies	Solar electric (including photovoltaics); solar water heating; small wind; fuel cells; geothermal heat pumps; energy (battery) storage systems; qualified biomass fuel property
For More Information	See IRS Form 5695: Residential Energy Credits; IRS Form 5695 Instructions; CRS Report R47202, <i>Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)</i> , by Molly Sherlock; CRS Report R42089, <i>Residential Energy Tax Credits: Overview and Analysis</i> , by Margot L. Crandall-Hollick and Molly F. Sherlock.

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

Administered by	IRS
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; multifamily 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 IRS Publication 525 (2021), <i>Taxable and Nontaxable Income</i> ; or all archived versions (1995-2020) of IRS Publication 525.

Business and Industry

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

Administered by	IRS
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) Inflation Reduction Act of 2022 (IRA, P.L. 117-169)
Scheduled Termination	None
Description	<p>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 three 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> <p>The 2017 tax revision (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 depreciation; 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 2026.⁴⁸</p> <p>The IRA (P.L. 117-169) amended the deduction by adding energy storage technologies to the list of eligible technologies/equipment; and allowing any facility qualifying for the clean electricity PTC or any facility or property qualifying for the clean electricity ITC to be treated as 5-year property under the modified accelerated cost recovery system (MACRS), making it so that cost recovery for renewable energy investments would be generally similar to current law. This last amendment applies to facilities and property placed in service after December 31, 2024.</p> <p>Solar illumination, fuel cells, microturbines, CHP, and small wind property are eligible for five-year cost recovery if construction began before January 1, 2022.</p>
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; energy storage technologies
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, <i>Energy</i>

⁴⁸ 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. See CRS Insight IN11828, *Effective Marginal Tax Rates on Energy-Related Capital Investments: Effects of the Investment Tax Credit and Accelerated Depreciation*, by Molly F. Sherlock, for more information.

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	IRS
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) Inflation Reduction Act of 2022 (IRA, P.L. 117-169)
Scheduled Termination	Expires on December 31, 2024; superseded by the Clean Electricity Investment Credit after 2024 (26 U.S.C. §48E)
Description	<p>The ITC is a credit against the cost of investments in qualified renewable-energy property. The Inflation Reduction Act of 2022 (P.L. 117-169) extends the expiration date for this credit to December 31, 2024. After 2024, the credit will be superseded with a new technology-neutral tax credit (Clean Electricity Investment Tax Credit) under section 45E of the Internal Revenue Code.</p> <p>IRA further modifies the tax credit by expanding the list of eligible technologies and establishing the following: new base credit amounts for qualified energy technology property; new criteria to qualify for the full credit; a new bonus credit for projects using domestically produced steel, iron or other component parts; increases the credit amount for facilities located in “energy communities”⁴⁹ as well as for facilities paying prevailing wages during the construction phase and meeting apprenticeship requirements; bonus credits for small solar and wind projects (less than 5 MW) built in low-income communities; and procedures for tax-exempt entities to monetize the tax credit, allowing payments in excess of tax liability to be refunded as “direct pay.”</p> <p>Base credit percentage rates for most technologies is 6%, including solar, small wind, fuel cells, geothermal, waste energy recovery, biogas, combined heat and power, energy storage, and microgrid controllers. The base percentage rate for microturbine property is 2%. These amounts can increase to 30% and 10%, respectively, if projects pay prevailing wages during the construction phase, during the first five years of operation, and meet registered apprenticeship requirements. The higher credit rates are also available to any project with a maximum net output of less than one megawatt of electrical or thermal energy and for facilities that begin construction before 60 days after the Secretary of the Treasury publishes guidance on the wage and registered apprenticeship requirements.</p> <p>Technologies eligible for the Production Tax Credit (PTC) are eligible to opt for the ITC in lieu of the PTC.</p>

⁴⁹ CRS Report R47202, *Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)*, by Molly Sherlock: “An energy community is defined as being a brownfield site; an area which has or had certain amounts of direct employment or local tax revenue related to oil, gas, or coal activities and has an unemployment rate at or above the

Qualified Applicant(s)	Commercial; industrial; utilities; agricultural; tax exempt entities, including nonprofits, state governments, tribal governments, local governments, and Alaska Native Corporations
Qualified Technologies	Solar energy technologies (solar water heat; solar space heat; solar thermal electric; solar thermal process heat; photovoltaics); hybrid (fiber-optic) solar lighting; wind energy systems (small wind; large wind; offshore wind); biomass/biogas; fuel cells; geothermal systems (electric, heat pumps, direct-use); CHP/Cogeneration; microturbines; waste energy recovery property; energy storage systems; thermal energy storage; microgrid controllers; electrochromic glass; interconnection property associated with the installation of energy property
For More Information	See IRS Form 3468 (Investment Credit); CRS Report R47202, <i>Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)</i> , by Molly Sherlock; and CRS In Focus IF10479, <i>The Energy Credit or Energy Investment Tax Credit (ITC)</i> , by Molly F. Sherlock.

6. Energy Efficient Commercial Buildings Tax Deduction

Administered by	IRS
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) Inflation Reduction Act of 2022 (IRA, P.L. 117-169)
Scheduled Termination	None ⁵⁰
Description	<p>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 in comparison to a building meeting minimum requirements set by ASHRAE/IESNA Standard 90.1. Beginning in 2023, taxpayers may claim a deduction for energy efficiency building retrofits that reduce a building's energy usage intensity.</p> <p>The previous maximum deduction allowed was \$1.80 per square foot, but reduced deductions were available for single-system upgrades. The IRA made several modifications to the deduction, effective January 1, 2023, including modifying the value of the deduction; changing the deduction's energy efficiency requirements; establishing a bonus deduction value for projects meeting certain prevailing wage and apprenticeship requirements; and allowing tax-exempt entities (building owners) to allocate the deduction to the person primarily responsible for designing the property in lieu of the owner of such property. Government entities were previously allowed to claim the credit, but IRA expanded the list of tax-exempt entities to include non-profit organizations.</p> <p>The updated efficiency standard requires a qualifying building to increase its efficiency relative to a reference building by 25%. Deduction values are set at \$0.50 per square foot, and increased by \$0.02 for each percentage point by which the certified efficiency improvements reduce energy and power costs, with a maximum amount of \$1.00 per square foot. For projects that meet prevailing wage and</p>

national average; or a census tract or any adjoining tract in which a coal mine closed after December 31, 1999, or in which a coal-fired electric power plant was retired after December 31, 2009.”

⁵⁰ 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).

	<p>registered apprenticeship requirements, the base amount is \$2.50 per square foot, which increases by \$0.10 for each percentage point increase in energy efficiency, with a maximum amount of \$5.00 per square foot. The maximum deduction amount is the total deduction a building can claim less deductions claimed with respect to the building in the preceding three years.</p> <p>Taxpayers making energy-efficiency retrofits that are part of a qualified retrofit plan on a building that is at least five years old are able to deduct their adjusted basis in the retrofit property (so long as that amount does not exceed a per-square foot value determined on the basis of energy usage intensity). To qualify, retrofit plans must be expected to reduce a building's energy use intensity by at least 25%.</p>
Qualified Applicant(s)	Commercial; builder/developer. Tax exempt entities, including non-profits, local governments, state governments, and the federal government can transfer their deduction to the party responsible for creating the energy-efficient environment.
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; <i>Energy Savings Modeling and Inspection Guidelines for Commercial Building Federal Tax Deductions in 2016 or Later</i> (September 2016) by the National Renewable Energy Laboratory (NREL); and CRS Report R47202, <i>Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)</i> , by Molly Sherlock.

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

Administered by	IRS
Authority	<p>26 U.S.C. §45L</p> <p>Tax Technical Corrections Act of 2007 (P.L. 110-172)</p> <p>Energy Improvement and Extension Act of 2008 (EIEA; P.L. 110-343)</p> <p>Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312)</p> <p>American Taxpayer Relief Act of 2012 (ATRA; P.L. 112-240)</p> <p>Tax Increase Prevention Act of 2014 (P.L. 113-295)</p> <p>Consolidated Appropriations Act of 2016 (P.L. 114-113)</p> <p>Bipartisan Budget Act of 2018 (P.L. 115-123)</p> <p>Further Consolidated Appropriations Act, 2020 (P.L. 116-94)</p> <p>Consolidated Appropriations Act, 2021 (P.L. 116-260)</p> <p>Inflation Reduction Act of 2022 (IRA, P.L. 117-169)</p>
Scheduled Termination	December 31, 2032
Description	<p>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. The IRA of 2022 extended this credit through December 31, 2032, increased and modified the credit amount, and established bonus credits for multifamily units.</p> <p>For homes constructed and acquired after 2022, a \$2,500 credit is available for new homes meeting certain Energy Star efficiency standards, and a \$5,000 credit is available for new homes that are certified as zero-energy ready homes. Multifamily dwellings meeting certain Energy Star efficiency standards are eligible for a \$500 credit per unit, with a \$1,000 per unit credit available for eligible zero-energy ready multifamily dwellings.</p> <p>The credits for multifamily dwelling units are increased to \$2,500 and \$5,000, respectively, if the taxpayer ensures that laborers and mechanics employed by contractors and subcontractors in the construction of the residence are paid prevailing wages.</p>
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 R47202, <i>Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)</i> , by Molly Sherlock.

8. Renewable Electricity Production Tax Credit (PTC)

Administered by	IRS
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) Inflation Reduction Act of 2022 (IRA, P.L. 117-169)
Scheduled Termination	December 31, 2024; superseded by the Clean Electricity Production Credit after 2024 (26 U.S.C. §45Y)
Description	<p>The federal 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.</p> <p>The Inflation Reduction Act of 2022 (P.L. 117-169) extends the expiration date for this credit to December 31, 2024. After 2024, it will be superseded with a new technology-neutral tax credit (Clean Electricity Production Credit) under section 45Y of the Internal Revenue Code.</p> <p>The law also: reinstates the credit for solar technologies (previously expired in 2005); establishes a new bonus credit for projects using domestically produced steel, iron or other component parts; increases the credit amount for facilities located in “energy communities”⁵¹ as well as for facilities paying prevailing wages during the construction phase and meeting apprenticeship requirements; and extends the option to claim the energy investment tax credit (ITC) in lieu of the PTC.</p>
Qualified Applicant(s)	Commercial; industrial; tax exempt entities, including: non-profits; state government; and local government
Qualified Technologies	Wind (large, small, offshore); solar photovoltaic; solar thermal electric; geothermal electric; hydroelectric; marine and hydrokinetic power (i.e., flowing water, tidal energy, wave energy, ocean thermal); biomass; landfill gas; municipal solid waste; anaerobic digestion

⁵¹ CRS Report R47202, *Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)*, by Molly Sherlock : “An energy community is defined as being a brownfield site; an area which has or had certain amounts of direct employment or local tax revenue related to oil, gas, or coal activities and has an unemployment rate at or above the national average; or a census tract or any adjoining tract in which a coal mine closed after December 31, 1999, or in which a coal-fired electric power plant was retired after December 31, 2009.”

For More Information See IRS Notice 2016-31; CRS Report R47202, *Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376)*, by Molly Sherlock; and CRS Report R43453, *The Renewable Electricity Production Tax Credit: In Brief*, by Molly F. Sherlock

IV. Department of the Interior (DOI)

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 \$5.3 million for FY2019 \$6.5 million for FY2020 No data available for FY2017, FY2018, FY2021, or FY2022
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 SAM.gov website; or contact the Division of Energy and Mineral Development at (303) 969-5270.

2. Tribal Energy Development Capacity (TEDC) Grant Program

Administered by	BIA/DEMD
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 \$1.7 million for FY2017 \$1 million for FY2019 No data available for FY2018, FY2020-FY2022
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 BIA's Tribal Energy Development Capacity Grant Program website; and program number 15.148 at the SAM.gov website; or contact the Division of Energy and Mineral Development at (303) 969-5270.

V. Small Business Administration (SBA)

1. 7(a) Loan Guarantees

Administered by	Small Business Administration (SBA)
Authority	Small Business Act of 1953 (P.L. 83-163)
Annual Funding	<p>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, \$155.150 million in FY2019 and FY2020, \$160.3 million in FY2021, and \$163.0 million in FY2022).</p> <p>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, \$91.569 million in FY2019, \$71.723 million in FY2020, and \$58.493 million in FY2021 on 7(a) loan administration. The SBA budgeted \$73.703 million for 7(a) loan administration in FY2022.</p> <p>In addition, the 7(a) loan guaranty program was provided \$80 million in FY2010, \$80 million in FY2011, \$139.4 million in FY2012, \$213.8 million (after sequestration) in FY2013, \$99.0 million in FY2020, and \$15 million in FY2021 for loan credit subsidies. No funding was provided for loan credit subsidies for FY2014 through FY2019 or for FY2022.</p>
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 the SBA website; program number 59.012 at the SAM.gov website; and CRS Report R41146, <i>Small Business Administration 7(a) Loan Guaranty Program</i> , by Robert Jay Dilger. To discuss with a CRS analyst, congressional staff may contact Anthony Cilluffo.

2. 504 Loan Guarantees

Administered by	SBA
Authority	Small Business Investment Act of 1958 (P.L. 85-699)

Annual Funding	<p>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, \$155.150 million in FY2019 and FY2020, \$160.3 million in FY2021, and \$163.0 million in FY2022).</p> <p>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, \$38.355 million in FY2019, and \$32.778 million in FY2020, and \$29.270 million in FY2021 on 504 loan administrative costs. The SBA budgeted \$36.374 million for 504 loan administration in FY2022.</p> <p>In addition, the 504 loan guaranty program was provided \$67.7 million in FY2012, \$98.1 million (after sequestration) in FY2013, \$107.0 million in FY2014, and \$45.0 million in FY2015 for loan subsidy costs. No funding was provided for loan credit subsidies for FY2016 through FY2022.</p>
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 the SBA website; program number 59.041 at the SAM.gov website; and CRS Report R41184, <i>Small Business Administration 504/CDC Loan Guaranty Program</i> , by Robert Jay Dilger. To discuss with a CRS analyst, congressional staff may contact Anthony Cilluffo.

VI. U.S. Department of Housing and Urban Development (HUD)

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 111 th 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	FHA
Authority	No statutory authority. HUD developed the PowerSaver as part of the <i>Recovery Through Retrofit</i> 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. ⁵²
Scheduled Termination	PowerSaver began as a nationwide two-year pilot program, launched in 2011. No termination date has been identified.
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 fact sheet; DSIRE website; and FHA's approved list of lenders for PowerSaver.

⁵² U.S. Department of Housing and Urban Development, "HUD Announces Pilot Program to Help Homeowners Pay for Energy Improvements to their Homes," press release, November 9, 2010, at <https://archives.hud.gov/news/2010/pr10-251.cfm>

VII. Department of Health and Human Services (HHS)

1. Low Income Home Energy Assistance Program (LIHEAP)

Administered by	Administration For Children and Families Office of Community Services (OCS), Division of Energy Assistance (DEA)
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	\$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 ⁵³ \$8.2 billion for FY2021 ⁵⁴ \$3.76 billion for FY2022 ⁵⁵
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.

⁵³ 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 nonsupplemental FY2020 funding by September 30, 2020.

⁵⁴ OCS' Division of Energy Assistance initially released approximately \$3.36 billion of FY2021 regular block grant funding to LIHEAP grantees on November 5, 2020. This funding was provided under the Continuing Appropriations Act, 2021 and Other Extensions Act (P.L. 116-159). A second release of \$346 million was appropriated by Congress under the Consolidated Appropriations Act, 2021 (P.L. 116-260), signed into law on December 27, 2020. A third round of \$4.5 billion in supplemental LIHEAP funding for FY2021 was announced on May 4, 2021. These supplemental funds were appropriated under the American Rescue Plan Act of 2021 (ARPA; P.L. 117-2).

⁵⁵ OCS' Division of Energy Assistance initially released approximately \$3.37 billion of FY2022 regular block grant funding to LIHEAP grantees on November 1, 2021. This funding was provided under the Extending Government Funding and Delivering Emergency Assistance Act (P.L. 117-43). A second (non-supplemental) release of over \$385 million was announced on April 21, 2022. The funds for the second release were appropriated under the Consolidated Appropriations Act, 2022 (P.L. 117-103).

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 OCS' Low Income Home Energy Assistance Program (LIHEAP) website; program number 93.568 at the Sam.gov website; and CRS Report RL31865, <i>LIHEAP: Program and Funding</i> , by Libby Perl.

VIII. Department of Veterans Affairs (VA)

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 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 111 th 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	<p>This program provides owners of multifamily properties (rental or cooperative properties with five or more units) with two financing options,⁵⁶ as well as tools to make energy- and water-saving property improvements:</p> <ul style="list-style-type: none">• The <i>Green Rewards</i> program provides up to an additional 5% of loan proceeds by including up to 75% of projected owner energy and water savings and 25% of projected tenant savings in the loan underwriting. Selected property upgrades must be completed within 12 months of loan closing.• The <i>Green Building Certification</i> financing option provides preferential pricing on loans secured by a multifamily property with a Fannie Mae-recognized green building certification. Fannie Mae currently recognizes 40 Green Building Certifications from 13 Green Building Certification organizations.⁵⁷ Depending on the type of certification secured, loans can be used toward a newly constructed or retrofitted multifamily property.
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; Fannie's Mae's <i>Multifamily Green Financing</i> fact sheet; and Fannie Mae's <i>Green Building Certifications At-A-Glance</i> fact sheet.

⁵⁶ The third financing option previously available, Fannie Mae's Green Preservation Plus product, was retired in November 2018. See Fannie Mae's *Fannie Mae Multifamily Green Bond Framework* (July 2020), p.5.

⁵⁷ For a list of the Green Building Certifications and certification organizations, see Fannie's Mae's "Green Building Certification," fact sheet, February 2020.

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

Table A-1 distills select information for each program from the body of the report and lists it by agency. This table can be used for general overviews of each program. For specific details and more information, refer to each program in the body of this report.

Table A-1. Federal Incentives by Agency

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^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.	\$416 million; \$475 million additionally appropriated for FY2022 from IJJA	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	\$392 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	\$262 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	\$307.5 million; \$565 million additionally appropriated for FY2022 from IJJA	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.	\$193.7 million	None
	Energy Efficiency and Conservation Block Grants Program	Grants finance energy efficiency and conservation programs/projects in local communities and renewable energy installations on government buildings	42 U.S.C. §§17151-17158	\$500 million	Authorized for FY2022 with monies to remain available until expended.

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^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	\$7.5 million	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; \$250 million additionally appropriated for FY2022 from IJJA	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.	\$109.5 million; \$84 million additionally appropriated for FY2022 from IJJA	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.	\$157.5 million; \$200 million additionally appropriated for FY2022 from IJJA	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 air pollutants or greenhouse gas emissions	42 U.S.C. §§16511 et seq.	\$29 million for the Innovative Technology Loan Guarantee Program (Section 1703); \$3.6 billion additionally appropriated for FY2022 from IJJA (to remain available through FY2026) \$0 for the Temporary Loan Guarantee	None for the Section 1703 program. For Section 1705 program, construction had to begin by 9/30/2011

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^a Appropriations	Expiration Date
				Program (Section 1705) \$5 billion appropriated for the Energy Infrastructure Reinvestment Financing Loan Guarantee Program (Section 1706) for FY2022 from IIJA (to remain available through FY2026)	
	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
	Office of Science Financial Assistance Program	Grants support research in the basic sciences and advanced technology concepts and assessments in fields related to energy	42 U.S.C. §13503	\$1.35 billion (est.)	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
	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	\$59.7 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.	\$290 million; and an additional \$80 million appropriated for FY2022 from IIJA	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; \$500 million additionally appropriated for FY2022 from IIJA	None

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^a Appropriations	Expiration Date
	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; \$75 million additionally appropriated for FY2022 from IJJA (to remain available through FY2028)	None
	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.	\$420 million; \$1.250 billion additionally appropriated for FY2022 from IJJA	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.	\$162 million; \$562.8 million additionally appropriated for FY2022 from IJJA	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.	\$315 million; \$3.5 billion additionally appropriated for FY2022 from IJJA	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.	\$114 million; \$100 million additionally appropriated for FY2022 from IJJA	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 through FY2023

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^a Appropriations	Expiration Date
				authorized annually for FY2019-FY2023 No discretionary funding has been appropriated for FY2022	
	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 FY2022	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 not extended by 2018 farm bill Discretionary funding of \$20 million authorized annually for FY2019-FY2023 No discretionary funding has been appropriated through FY2022	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	No mandatory funding was made available for loan guarantees for FY2022 No discretionary funding has been appropriated through FY2022	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	\$16.4 million	Authorized through FY2023

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^a Appropriations	Expiration Date
	New Era Rural Technology Competitive Grants Program	Provides grant funding for approved technology development, applied research, and training to develop bioenergy and agriculture-based renewable energy resources	7 U.S.C. §3319e	No discretionary funding has been appropriated through FY2022	Authorized through FY2023
	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; \$12.9 million in discretionary funding was appropriated for FY2022	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	\$11.5 million	Authorized through FY2023
	Sun Grant Program	Provides grants to national network of land-grant universities and national labs to: promote economic diversification and environmental sustainability or agricultural production through biobased energy and product technologies; and enhance the efficiency of bioenergy and biomass R&D.	7 U.S.C. §8114	\$3.5 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.	\$40 million	None
Department of the Treasury	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	26 U.S.C. §48	N/A	12/31/2024

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^a Appropriations	Expiration Date
		combined heat and power systems (10%)			
	Energy Efficient Commercial Buildings Tax Deduction	Tax deduction for certain qualifying systems and buildings	26 U.S.C. §179D (amended)	N/A	None
	Energy Efficient Home Improvement Credit	Provides tax credit to residents/individuals for the installation of qualified energy efficient equipment to existing homes (primary or other residences)	26 U.S.C. §25C	N/A	12/31/2032
	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	12/31/2032
	Modified Accelerated Cost-Recovery System (MACRS)	Allows businesses to recover investments in certain renewable energy property through depreciation deductions	26 U.S.C. §168 and 26 U.S.C. §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	12/31/2024
	Residential Clean 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	12/31/2034
	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
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.	\$3.76 billion	None

Administering Agency	Program	Description	U.S. Code Citation	FY2022 ^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.	\$6.5 million for FY2020; no data currently available for FY2021 or FY2022	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 million for FY2019; no data currently available for FY2020 through FY2022	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 U.S.C. §§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)	\$73.7 million for loan administration; No funding provided for loan credit subsidies	None

Administering Agency	Program	Description	U.S. Code Citation	FY2022^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	\$37.4 million for loan administration; No funding provided for loan credit subsidies	None

Source: The Congressional Research Service (CRS).

- a. FY2022 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*.

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

Table B-1 and **Table B-2** list each applicant category and technology type, respectively, included in this report as well as the corresponding programs that each applicant category or technology type is eligible for.

Program numbers correspond to agency (Roman numeral) and (Arabic) number assigned to each program as displayed in this report’s Table of Contents. For example, “Land Grant Universities” are eligible for both the Biomass Research and Development Initiative program and the Sun Grant Program. Similarly, “Chillers” are a qualified technology under the Office of Indian Energy Assistance Programs and the Energy Efficient Commercial Buildings Tax Deduction.

Table B-1. Index of Programs by Applicant Eligibility

Applicant Eligibility	Program Numbers
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-13, III-5
Builder/Developer	III-6, III-7
Commercial/Industrial/For-Profit	I-1, I-2, I-3, I-4, I-5, I-6, I-9, I-11, I-13, I-17, I-18, I-20, I-21, II-1, II-2, II-3, II-5, II-8, III-4, III-5, III-6, III-8, III-9
Cooperative/Collaborative/Consortia	I-14, I-17, II-1, II-4, II-5, II-8, II-9, II-11
Federal Government	I-3, I-5, I-6, I-11, I-19, 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-11, I-13, I-17, I-18, I-20, I-21, II-4, II-5, II-7, II-10, II-11
Land Grant Universities (1862 1890, 1994)	II-4, II-10
Local Government	I-5, I-6, I-7, I-9, I-11, I-12, I-13, I-14, I-18, I-20, I-21, II-1, II-5, II-6, II-8, III-5
National Laboratories	I-3, I-4, I-5, I-6, I-7, I-9, I-11, II-4, II-5
Nonprofit	I-13, I-14, I-17, I-18, I-20, I-21, II-1, II-11, III-5, III-6
Other/Cross-Cutting	I-17, III-4
Research Organization	I-17, I-18
Residential/Individual	I-10, I-13, I-17, 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-5, I-6, I-10, I-17, I-20, I-22, II-4, III-5, III-9, V-1, V-2
State Government	I-5, I-6, I-7, I-8, I-9, I-11, I-12, I-13, I-14, I-15, I-18, I-20, I-21, II-1, II-4, II-5, II-6, II-8, II-11, III-5, III-6, VII-1
Tribal Government	I-5, I-6, I-7, I-8, I-9, I-12, I-13, I-14, I-15, I-16, I-18, I-20, I-21, I-23, II-1, II-5, II-8, III-5, IV-1, IV-2, VII-1

Applicant Eligibility	Program Numbers
U.S. Territories	See sub-categories below for a breakdown of incentives by applicant eligibility groups within the U.S. territories. ⁵⁸
-- Commercial/Industrial/For-Profit	I-21, II-1, II-5, II-8, V-1, V-2,
-- Government	I-9, I-12, I-15, I-21, II-1, II-5, II-8,
-- Nonprofit	I-21, II-1
-- Residential/Individual	II-1
Utilities	I-14, II-5, II-8, II-9, III-5
Veterans	VI-1, VIII-1

Source: CRS.

⁵⁸ CRS has not verified applicant eligibility for federal tax incentives in the U.S. territories and none are listed for any applicant group in this breakdown of incentives.

Table B-2. Index of Programs by Technology Type

Qualified Technologies	Program Numbers
Advanced Batteries	I-12
Air Conditioners	I-8, I-16, III-1, III-6, VI-1, VI-2, VII-1, IX-1
Alternative Vehicles/Vehicle Technologies	I-3, I-11, III-4, III-9
Anaerobic Digestion	II-7, III-4
Batteries/Energy Storage	I-11, I-18, I-23, II-9, III-2, III-4, III-5
Biodiesel / Biofuels	I-1, I-11, I-21, II-2, II-4, II-5, II-10, II-11, III-4
Boilers	I-8, I-16, III-1, III-6, VI-1, VI-2, VII-1, IX-1
Biomass / Bioenergy	I-1, I-12, I-14, I-16, I-19, II-1, II-2, II-3, II-4, II-5, II-6, II-7, II-8, II-10, II-11, III-1, III-2, III-4, III-5, III-8
Caulking/Weather Stripping	I-8, I-16, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1
Chillers	I-16, III-6
Clothes Washers	I-16, IX-1
Combined or District Systems/CHP/Energy Management Systems	I-7, I-12, I-16, II-8, III-4, III-5
Comprehensive/Whole Building	I-16, III-6, III-7, IX-1
Doors	I-16, III-1, III-6, VI-1, VI-2, VIII-1, IX-1
Duct/Air Sealing	I-8, I-16, III-1, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1
Electricity Transmission Infrastructure	I-23
Electrochromic Glass	III-5
Equipment (Energy Efficient)	I-7, I-12
Fuel Cells	I-3, I-7, I-12, I-21, II-8, III-2, III-4, III-5
Furnaces	I-8, I-16, III-1, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1
Geothermal (All)	I-2, I-19, I-23, II-8, III-5, VI-1, VI-2, VIII-1
—Geothermal (Direct Use)	I-2, II-8, III-4, III-5, VI-1, VI-2, VIII-1
—Geothermal (Electric)	I-2, I-14, I-16, I-21, II-7, III-4, III-5, III-8, VI-1, VI-2, VIII-1
—Geothermal (Heat Pumps)	I-2, I-16, II-8, III-2, III-4, III-5, VI-1, VI-2, VIII-1
Heat Pumps (Air Source)	III-1, III-6, VI-1, VI-2, VIII-1, IX-1
Hybrid Electric	I-11
Hydrogen	I-3, II-8
Hydropower (All)	I-5, I-19, I-23, III-8
—Hydroelectric	I-5, I-16, I-21, I-23, II-1, II-8, III-8
—Marine and Hydrokinetic	I-5, I-14, III-8
—Ocean	I-5, I-14, I-19, I-21, II-8, III-8
—Tidal	I-5, I-14, I-21, II-8, III-8
—Wave	I-5, I-14, I-21, II-8, III-8
Insulation	I-8, I-16, III-1, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1
Interconnection Property	III-5

Qualified Technologies	Program Numbers
Landfill Gas	I-12, I-14, III-4, III-8
Lighting/Lighting Sensors	I-7, I-12, I-16, I-21, III-4, III-5, III-6, VI-1, VIII-1, IX-1
Manufacturing Facilities	I-21
Microturbines	II-8, III-4, III-5
Microgrid Controllers	III-5
Municipal Solid Waste	III-4, III-8
Other Technologies ⁰	I-8, I-10, I-13, I-15, I-16, I-17, I-18, I-20, I-22, II-1, II-8, II-9, II-11, III-3, IV-1, IV-2, V-1, V-2, VI-1, VI-2, VII-1, VIII-1, IX-1
Smart/Programmable Thermostats	I-8, I-16, III-1, VI-1, VI-2, VII-1, VIII-1, IX-1
Refrigerators/Freezers	I-16
Renewable Transportation Fuels	I-21, II-8, III-4
Roofs	I-16, III-6, IX-1
Siding	I-16, III-6
Smart Grid	I-18
Solar (All)	I-4, I-7, I-12, I-19, I-23, II-1, II-8, III-2, III-4, III-5
—Photovoltaics	I-4, I-7, I-12, I-14, I-16, I-21, I-23, II-1, II-8, III-2, III-3, III-4, III-5, III-8, VI-1, VI-2, VIII-1
—Solar Space Heat	I-4, I-16, II-1, II-8, III-2, III-3, III-4, III-5, VI-1, VIII-1
—Solar Thermal Electric/Process	I-4, I-12, I-14, I-21, II-1, II-8, III-2, III-4, III-5, III-8
—Solar Water Heat	I-4, II-1, II-8, III-2, III-3, III-4, III-5, VI-1, VI-2, VIII-1
Water Heaters	I-16, III-1, III-6, VI-1, VIII-1, IX-1
Wind	I-6, I-12, I-14, I-16, I-19, I-21, I-23, II-1, II-8, III-2, III-4, III-5, III-8, VI-2
Windows	I-7, I-8, I-16, III-1, III-6, VI-1, VI-2, VII-1, VIII-1, IX-1

Source: CRS.

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

Appendix C contains a list of expired energy efficiency and renewable energy incentive programs. Programs in this section include the same information categories as the active programs in the main body of the report (e.g., administering agency/office, authority, termination date) and this information was obtained using the same methodology as described in the Introduction. All programs in this appendix are organized alphabetically, not by agency.

In cases where URL's for additional information resources are no longer accessible, CRS has attempted to identify archived web addresses. When none are found or no alternative resources located, CRS has deleted the "For More Information" row for that program.

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	\$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 (IRS)
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 (P.L. 110-343), 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, <i>Tax Credit Bonds: Overview and Analysis</i> , by Grant A. Driessen; and archived CRS Report R41573, <i>Tax-Favored Financing for Renewable Energy Resources and Energy Efficiency</i> , by Molly F. Sherlock and Steven Maguire.

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

Administered by Authority	Office of Energy Efficiency and Renewable Energy (EERE) 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

4. 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.
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 DOE's website for the State Energy Efficient Appliance Rebate Program, which includes links to two reports on program design and program results.

5. Energy Efficient Appliance Tax Credit for Manufacturers

Administered by	IRS
Authority	26 U.S.C. §45M Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58), Title XIII, Subtitle C, Sec. 1334(a) Energy Improvement and Extension Act of 2008 (P.L. 110-343), Division B, Sec. 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 [archived] IRS website for this credit; and IRS form 8909.

6. 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	\$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 <i>Catalog of Federal Domestic Assistance</i>) at the 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) <i>Training and Employment Notice</i> for this program.

7. Qualified Energy Conservation Bonds (QECCB)

Administered by	IRS
Authority	26 U.S.C. §54A 26 U.S.C. §54D 26 U.S.C. §643I 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	QECCBs were used by state, local, and tribal governments to finance certain types of energy projects. QECCBs, 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. The 2017 tax revision (P.L. 115-97) permanently repealed several tax credit bonds, including QECCBs.
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, <i>Tax Credit Bonds: Overview and Analysis</i> , by Grant A. Driessen; and archived CRS Report R41573, <i>Tax-Favored Financing for Renewable Energy Resources and Energy Efficiency</i> , by Molly F. Sherlock and Steven Maguire.

8. Qualifying Advanced Energy Manufacturing Investment Tax Credit

Administered by	IRS
Authority	26 U.S.C. §48C American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5), Division B, Sec. 1302 IRS Notice 2013-12 Qualifying Advanced Energy Project Credit Phase II
Scheduled Termination	Applications no longer accepted. Phase concept papers were due to Department of Energy (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.

9. 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) 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)
Scheduled Termination	None
Description	This program provided assistance to increase America's use of fuels, chemicals, materials, and power made from domestic biomass on a sustainable basis. Assistance may have been used to develop and transfer any of several biomass energy technologies to the scientific and industrial communities. For regional programs, such technologies would be appropriate for the needs and resources of particular regions of the United States. This program has not expired, but it has not received funding since 2011. ⁵⁹
Qualified Applicant(s)	State and local governments; colleges and universities; profit organizations; nonprofit organizations
Qualified Technologies	Biomass
For More Information	See <i>Regional Biomass Energy Program Blueprint for Progress: 2000-2005 Clean Bioenergy Technologies for the 21st Century</i> (December 2004), by NREL; and DOE's Regional Biomass Energy Program (archived) website.

10. Renewable Energy Grants (1603 Program)

Administered by	U.S. Department of the Treasury (Treasury)
Authority	Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), Sec. 707 American Recovery and Reinvestment Act of 2010 (ARRA; P.L. 111-5) Division B, Sec. 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, <i>ARRA Section 1603 Grants in Lieu of Tax Credits for Renewable Energy: Overview, Analysis, and Policy Options</i> , by Phillip Brown and Molly F. Sherlock.

11. Repowering Assistance Program (RAP)

Administered by	Rural Development
Authority	Food, Conservation, and Energy Act of 2008 ("2008 farm bill"; P.L. 110-246), Title IX, Sec. 9004

⁵⁹ The Assistance Listings at the Sam.gov website no longer include this program and it can be considered no longer active. The program had not been funded between FY2011 and FY2022.

	<p>Agricultural Act of 2014 (“2014 farm bill”; P.L. 113-79). Title IX, Sec. 9004 Agriculture Improvement Act of 2018 (“2018 farm bill”; P.L. 115-334)</p>
Annual Funding	<ul style="list-style-type: none">• 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	<p>The program had no fixed termination date. It was authorized through FY2018, but then repealed by the 2018 farm bill.</p>
Description	<p>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.</p>
Qualified Applicant(s)	<p>Eligible biorefineries in existence on or before June 18, 2008 (including in the U.S. territories)</p>
Qualified Technologies	<p>Renewable biomass</p>
For More Information	<p>See the archived USDA program website; CRS In Focus IF10288, <i>Overview of the 2018 Farm Bill Energy Title Programs</i>, by Kelsi Bracmort; and CRS Report R43416, <i>Energy Provisions in the 2014 Farm Bill (P.L. 113-79): Status and Funding</i>, by Kelsi Bracmort.</p>

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

Table D-1 distills select information for each expired program listed in **Appendix C**. This table can be used for general overviews of each program, which are organized by agency. Agencies and programs are listed in alphabetical order.

For specific details and more information, refer back to each program in **Appendix C**.

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 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
	Regional Biomass Program	Provided financial assistance to increase America's use of fuels, chemicals, materials, and power made from domestic biomass	N/A	None
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	A tax credit for each manufacturer was limited to a total of \$25 million for	26 U.S.C. §45M	12/31/2013

Administering Agency	Program	Description	U.S. Code Citation	Expiration Date
	Credit for Manufacturers	2011, 2012, and 2013 combined		
	Qualified Energy Conservation Bonds (QECBs)	Bond authority was allocated to state, local, and tribal governments to finance a broad range of energy efficiency and renewable energy projects	26 U.S.C. §54A 26 U.S.C. §54D 26 U.S.C. §6431	12/31/2017
	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	N/A; 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	N/A; 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	N/A	None

Source: CRS.

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

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