Advancing the Growth of the U.S. Wind Industry: Federal Incentives, Funding, and Partnership Opportunities

Wind power is a burgeoning power source in the U.S. electricity portfolio, supplying more than 5% of U.S. electricity generation.

The U.S. Department of Energy's (DOE's) Wind Energy Technologies Office (WETO) works to accelerate the development and deployment of wind power. The office provides information for researchers, developers, businesses, manufacturers, communities, and others seeking various types of federal assistance available for advancing wind projects. Outlined below are the primary federal incentives for developing and investing in wind power, resources for funding wind power, and opportunities to partner with DOE and other federal agencies on efforts to move the U.S. wind industry forward.

Federal incentives, funding resources, and partnership opportunities are available for wind energy projects. Shown here: The Block Island Wind Farm, the first U.S. offshore wind farm. *Photo by Dennis Schroeder, NREL 41193*

Incentives for Project Developers and Investors

To stimulate the deployment of renewable energy technologies, including wind energy, the federal government provides incentives for private investment, including tax credits and financing mechanisms such as tax-exempt bonds, loan guarantee programs, and low-interest loans.

Tax Credits

Renewable Electricity Production Tax Credit (PTC)— The PTC allows owners and developers of wind energy facilities (land-based and offshore) to claim a federal income tax credit on every kilowatt-hour of electricity generated for the power grid annually for a period of 10 years after a facility is placed into service. Established in 1992, the PTC was set to expire at the end of 2015, but in December of that year the Consolidated Appropriations Act extended the expiration date through December 31, 2016, for wind facilities that started construction before then.

For facilities that break ground after 2016, the law provides for a gradual phase-down of the PTC. As shown in the table below, the amount of the allowable credit will decrease annually and is based on when the project begins construction.

For Internal Revenue Service guidance on how it will evaluate whether construction has commenced, see Notices *2013-29*, *2013-60*, *2014-46*, and *2016-31*.

If construction begins by...	The estimated allowable tax credit is...
Dec. 31, 2016	2.3 cents/kilowatt-hour
Dec. 31, 2017	Reduced 20%
Dec. 31, 2018	Reduced 40%
Dec. 31, 2019	Reduced 60%

For more detailed information on the phase-down of the PTC set forth in the Protecting America from Tax Hikes Act of 2015, see the most current Internal Revenue Service guidance.
programs.dsireusa.org/system/program/detail/734

Business Energy Investment Tax Credit (ITC)—The ITC is a federal income tax credit for capital investments in renewable energy projects. Unlike the PTC, this one-time credit is based on the dollar amount of the investment and earned when the equipment is placed into service. Owners and developers of large wind energy facilities (land-based and offshore) that break ground (or, in the case of developers, commence construction) prior to 2020 can elect to claim the ITC in lieu of the PTC; however, the value of the credit is subject to the same phase-down schedule as the PTC for facilities that start construction in 2017, 2018, or 2019.
programs.dsireusa.org/system/program/detail/658

If construction begins by...	The estimated allowable tax credit is...
Dec. 31, 2016	30% of expenditures
Dec. 31, 2017	24% of expenditures
Dec. 31, 2018	18% of expenditures
Dec. 31, 2019	12% of expenditures

New Markets Tax Credit (NMTC)—The NMTC Program incentivizes community development, job creation, and economic growth by attracting private investment to underserved communities. The program allows individual and corporate taxpayers to receive federal income tax credits in exchange for making equity investments in vehicles certified as Community Development Entities (CDEs) by the Treasury Department's Community Development Financial Institutions Fund. CDEs that receive tax credit allocation authority under the program are domestic corporations or partnerships that provide loans, investments, or financial counseling in low-income urban and rural communities. An investor in a CDE will benefit from a tax credit equal to 39% of the cost of the investment over a 7-year period, in addition to the returns on the investment. The CDEs, in turn, use the capital raised to provide flexible, affordable financing for environmentally sustainable projects in low-income communities. The NMTC Program has helped support renewable energy projects, including the Coastal Energy Project, a 6-megawatt wind farm in Grayland, Washington.
cdfifund.gov/programs-training/Programs/new-markets-tax-credit/Pages/default.aspx

Financing Mechanisms

Qualified Energy Conservation Bonds (QECBs)—Available through the Treasury Department, QECBs enable qualified state, tribal, and local government issuers to borrow money at attractive rates to fund energy conservation projects. QECBs are taxable bonds, meaning investors must pay federal taxes on any QECB interest they earn. Issuers can structure QECBs as tax-credit bonds, in which case investors receive federal tax credits in lieu of interest payments, or as direct-subsidy bonds, in which case bond issuers receive cash rebates from the Treasury Department to subsidize their interest payments to investors. Because the Treasury Department subsidizes the borrowing costs of bond issuers, QECBs are among the lowest-cost public financing tools available for renewable energy projects.
irs.gov/tax-exempt-bonds/qualified-energy-conservation-bonds-faqs

Innovative Technologies in Manufacturing (ITM) Loan Guarantee Program—In September 2016, the U.S. Department of Commerce's Economic Development Administration (EDA) issued a notice of proposed rulemaking to implement and administer the ITM Program, as authorized by section 26 of the Stevenson-Wydler Technology Innovation Act of 1980. Enacted as part of the America COMPETES Reauthorization Act of 2010, the Stevenson-Wydler Act authorizes EDA to provide loan guarantees to small- or medium-sized businesses for the use or production of innovative technologies. Under the program, the loan guarantee represents a portion of the loan, not to exceed 80%, which EDA will repay in the event that the borrower defaults. The intent is to incentivize lending by reducing the risk to the lender, thereby providing innovative technology manufacturers with access to affordable capital. In addition, EDA will guarantee loans specifically for projects that re-equip, expand, or establish U.S. manufacturing facilities to use an innovative technology or manufacturing process; manufacture an innovative technology product or product component; or commercialize an innovative product, process, or idea that was developed through a federal government grant.
eda.gov/about/proposed-rulemakings.htm

Rural Energy for America Program (REAP) Renewable Energy Systems & Energy Efficiency Improvement Loans & Grants—Through REAP, the U.S. Department of Agriculture provides agricultural producers and rural small businesses with guarantees on loans for energy efficiency improvements and renewable energy systems, including small and large wind generation projects. REAP provides guarantees on loans for up to 75% of total eligible project costs. Applicants must provide at least 25% of the project cost and demonstrate sufficient revenue to repay the loan and cover any operation and maintenance expenses. Established through the 2002 Farm Bill, REAP was reauthorized in the 2014 Farm Bill because of its demonstrated success in helping to increase American energy independence and, over time, lower the cost of energy for farmers, ranchers,

and rural small business owners. Since 2009, the U.S. Department of Agriculture has awarded $545 million for 8,800 REAP projects nationwide, including $361 million in REAP grants and loans for 2,900 renewable energy systems.
rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency

Title XVII Innovative Clean Energy Loan Guarantee Program—Established as part of the Energy Policy Act of 2005, this program helps stimulate the financing of ground-breaking energy efficiency, renewable energy, and advanced transmission and distribution projects. In 2009, Section 1705 of the Recovery Act amended the program to include commercial technologies. Under the Section 1705 Loan Program, the DOE Loan Programs Office guarantees the debt on energy production or manufacturing facilities associated with a broad spectrum of energy technologies, including renewables. The government guarantee on the debt lowers the risk associated with funding wind and other clean energy projects, making more capital available to the industry. For each loan guarantee awarded, the government sets aside a credit subsidy—a sum of money that serves as insurance in case the project fails. Since its inception, the program has helped finance four commercial wind projects, including the 845-megawatt Shepherds Flat wind farm in Oregon, one of the world's largest.
energy.gov/lpo/title-xvii
energy.gov/lpo/services/section-1705-loan-program

For more information on financing mechanisms, see Federal Financing Programs for Clean Energy: *energy.gov/sites/prod/files/2016/05/f32/Federal%20Financing%20Programs%20for%20Clean%20Energy.pdf*

Small and large wind generation projects can benefit from the U.S. Department of Agriculture's Rural Energy for America Program Renewable Energy Systems & Energy Efficiency Improvement Loans. *Photo from NREL, 11919*

Sources of Funding for Renewable Energy Research, Development, and Deployment

A number of federal government agencies also provide funding to support renewable energy research and development (R&D), commercialization, and deployment through grants or cooperative research and development agreements (CRADAs). Some of the leading funding organizations and associated programs are listed in the upcoming sections. These funding opportunities are available through federal agencies that are subject to annual Congressional appropriations, so availability of funds may vary over time.

R&D Grants and Cooperative Agreements

DOE Wind Energy Technologies Office—WETO works with businesses, industry, universities, and other organizations that focus on technological developments to improve the reliability and affordability of wind energy and address barriers to deployment. One way WETO encourages the growth of these technologies is by offering competitive Funding Opportunity Announcements for their development and demonstration. WETO supports high-impact projects that can significantly advance its mission to develop more efficient and environmentally friendly wind energy technologies that help America lower the cost of wind energy. In addition to issuing competitive solicitations for proposals to fund R&D activities on a regular basis, WETO maintains a strong commitment to partnerships that help promote market acceptance and adoption of the technologies being developed.
http://energy.gov/eere/wind/wind-energy-funding-opportunities

The U.S. Department of Energy's Office of Indian Energy provides financial assistance to federally recognized tribal governments and Alaska Native corporations to develop and deploy renewable energy projects on tribal lands. Shown here: a 65-kilowatt turbine supplies power to the Pine Ridge Reservation radio station in South Dakota. *Photo by Bob Gough, NREL 16258*

DOE Office of Energy Efficiency and Renewable Energy (EERE)—Through funding opportunities offered by various office programs (including WETO), EERE offers financial assistance to businesses, industry, universities, and other organizations to encourage the development and demonstration of renewable energy and energy efficiency technologies with the goal of increasing their adoption.
energy.gov/node/1906821/consumers.html

DOE Advanced Research Projects Agency-Energy (ARPA-E)—ARPA-E funds short-term, technology-focused, applied R&D aimed at creating real-world solutions to important problems in energy creation, distribution, and use. The agency's focus is advancing high-impact energy technologies that are too early for private-sector investment but have the potential to radically improve U.S. economic security, national security, and environmental well-being.
arpa-e.energy.gov/?q=programs/apply-for-funding

Small Business Innovation Research (SBIR) program—The Small Business Administration's SBIR program encourages U.S. small businesses to engage in federal R&D that has potential for commercialization. Its mission is to support scientific excellence and technological innovation through the investment of federal research funds in critical American priorities to build a strong national economy. Eleven federal agencies, including DOE, participate in the program, soliciting grant proposals from small businesses and making awards on a competitive basis.
science.energy.gov/sbir/funding-opportunities/
sbir.gov

Technology Deployment Grants

DOE Office of Indian Energy—The Office of Indian Energy provides financial assistance, including grants and technical assistance, to federally recognized tribal governments and Alaska Native corporations to develop and deploy renewable energy projects on tribal lands. In addition, the Office of Indian Energy's Energy Development Assistance Tool provides information for tribes about federal grant, loan, and technical assistance programs available from more than 10 federal agencies to support energy development and deployment in Indian Country and Alaska Native villages.
energy.gov/indianenergy/funding

DOE Office of Technology Transitions Technology Commercialization Fund (TCF)—The TCF leverages the R&D funding in DOE's applied energy programs to advance energy technologies with the potential for high impact. It uses 0.9% of the funding for DOE's applied energy research, development, demonstration, and commercial application budget for each

fiscal year from the Office of Electricity, Office of Energy Efficiency and Renewable Energy, Office of Fossil Energy, and Office of Nuclear Energy. These funds are matched with funds from private partners to promote promising energy technologies with the goal of increasing the commercialization and economic impact of energy technologies developed at DOE's national labs.
energy.gov/technologytransitions/technology-commercialization-fund

Rural Energy for America Program Renewable Energy Systems & Energy Efficiency Improvement Grants— In addition to loan guarantees, REAP provides grant funding to agricultural producers and rural small businesses to install renewable energy systems or make energy efficiency improvements. These renewable energy system grants, which range between $2,500 and $250,000, can be used to fund up to 25% of total eligible project costs and can be combined with loan guarantee funding to fund up to 75% of total eligible project costs.
rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency

Small Business Technology Transfer (STTR) program— The Small Business Administration's STTR program funds collaborative efforts between small businesses and research institutions with the goal of transferring technologies and products from the laboratory to the marketplace. STTR's focus is on bridging the gap between the performance of basic science and the commercialization of resulting innovations. Five federal agencies, including DOE, participate in the program, soliciting grant proposals from small businesses and making awards on a competitive basis.
sbir.gov/about/about-sttr

State Energy Competitive Financial Assistance—DOE's EERE offers competitive grants through its State Energy Program. Designed to meet DOE's nationally focused energy initiatives, the funding provides states and territories with opportunities to develop public and private partnerships to deploy energy efficiency and renewable energy technologies and programs with high potential for regional and local economic impact.
http://energy.gov/eere/wipo/state-energy-program-competitive-financial-assistance-program

Partnership Opportunities with DOE National Laboratories

In addition to offering a wide range of financial incentives and resources designed to spur wind technology development and deployment, the federal government actively seeks opportunities to collaborate with industry, government agencies, academia, small businesses, international organizations, and nonprofits to advance the development and deployment of wind energy. This collaboration is possible through DOE's national laboratories, facilities where partners can access technical expertise and highly specialized commercialization and deployment capabilities.

Agreement Type	Definition	Cost	Benefits
Cooperative Research and Development Agreements (CRADAs)	Collaboration between a lab and one or more partners outside the federal government (usually from industry, nonprofit organizations, or academia, domestic or foreign); collaborate and share the results of a jointly conducted research and development project	Lab and participant may share costs or participant pays 100% of funds	▪ Leverage and optimize resources ▪ Share technical expertise in a secure environment ▪ Option to obtain license to the lab CRADA-generated intellectual property (IP) on agreed-upon terms and conditions ▪ Five-year data protection ▪ Each partner may take title to their own CRADA-generated IP
Agreements for Commercializing Technology	Labs partner with nonfederal entities to complete a project using highly specialized or unique DOE facilities, services, or technical expertise	Participant pays full cost recovery plus additional negotiated compensation to the contractor	▪ Flexible terms for IP, indemnity, and advanced payment ▪ Optional performance guarantee ▪ Negotiable IP terms ▪ Option for limited government R&D license

Agreement Type	Definition	Cost	Benefits
Strategic Partnership Projects (Formerly known as Work-for-Others)	Labs conduct work for non-DOE entities, such as industry, small businesses, or other federal agencies, and may utilize DOE facilities	Participant pays full cost of the lab's effort	▪ Access to unique facilities, services, and/or technical expertise ▪ Flexible terms for IP and licensing rights
User Facility Agreements (UFAs)	Users may access facilities, specialized equipment, instrumentation, and/or personnel to conduct proprietary or nonproprietary research	User pays approved user rate or each party covers its own cost	▪ Generated data treated as proprietary (if proprietary UFA) ▪ Access to unique facilities and equipment to validate or improve user technology
Technical Service Agreements	Lab staff provide short-term technical assistance to organizations with technical problems requiring expertise that is not available commercially	Participant pays full cost of the lab's efforts	▪ Access to lab scientists and engineers expertise
Licenses	Companies acquire intellectual property rights, such as patents, copyrights, and trademarks, to commercialize technology developed by the lab	Payment (in the form of issue fees, royalties on sales, equity in company, and so on) is nonrefundable and provided by the licensee	▪ Leverage cutting-edge inventions to drive technology commercialization ▪ Licenses may be nonexclusive or exclusive ▪ Available to small and large businesses

Working Together To Move the Wind Industry Forward

For additional information on the unique partnering opportunities available at each national laboratory, visit their partnering, technology transfer, and commercialization web pages.

Argonne National Laboratory
anl.gov/technology

Idaho National Laboratory
inl.gov/td

Lawrence Berkeley National Laboratory
ipo.lbl.gov

National Renewable Energy Laboratory
nrel.gov/wind/work-with-us.html

Pacific Northwest National Laboratory
pnnl.gov/business

Sandia National Laboratories
sandia.gov/working_with_sandia

This fact sheet focuses on federal government support for wind energy. For information on state-level policies and incentives, see http://www.dsireusa.org/.

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