

## 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 6% of U.S. electricity generation.

The U.S. Department of Energy's (DOE's) Wind Energy Technologies Office (WETO) focuses on enabling industry growth and U.S. competitiveness by supporting early-stage research on technologies that enhance energy affordability, reliability, and resilience and strengthen U.S. energy security, economic growth, and environmental quality. 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.

### 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.

For facilities that broke ground in 2017 through 2020, the amount of the allowable credit 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](#), [2015-25](#), and [2016-31](#)

For more detailed information on the phase-down of the PTC set forth in the Bipartisan Budget Act of 2018, see the most current Internal Revenue Service guidance.

[programs.dsireusa.org/system/program/detail/734](https://programs.dsireusa.org/system/program/detail/734)



The Block Island Wind Farm, the first U.S. offshore wind farm, represents the launch of an industry that has the potential to contribute significantly to a reliable, stable, and affordable energy mix. Photo by Dennis Schroeder, NREL 41193

If construction begins...	The estimated allowable tax credit is...
After Dec. 31, 2016	1.9 cents/kWh
By Dec. 31, 2017	1.8 cents/kWh
By Dec. 31, 2018	1.4 cents/kWh
By Dec. 31, 2019	1 cent/kWh
By Dec. 31, 2020	1.5 cents/kWh

After commencing construction by the deadline noted in the table, projects have four years to begin producing electricity.

**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 2021 can elect to claim the ITC in lieu of the PTC; however, the value of the credit depends on when the facility starts construction. Credit for small wind turbines (100 kilowatts or less) varies depending on when construction begins. Small wind turbines must meet the performance and quality standards set forth by either the American Wind Energy

Association Small Wind Turbine Performance and Safety Standard 9.1-2009 (AWEA), or the International Electrotechnical Commission 61400-1, 61400-11, and 61400-12 (IEC).

[programs.dsireusa.org/system/program/detail/658](https://programs.dsireusa.org/system/program/detail/658)

If construction begins by...	The credit for large wind turbines is...	The credit for small wind turbines is...
Dec. 31, 2018	18% of expenditures	30% of expenditures
Dec. 31, 2019	12% of expenditures	30% of expenditures
Dec. 31, 2020	18% of expenditures	26% of expenditures
Dec. 31, 2021	N/A	22% of expenditures
Dec. 31, 2022	N/A	22% of expenditures
Future years	N/A	N/A

### Residential Renewable Energy Tax Credit

Taxpayers who purchase and install a qualifying residential small wind electric system (100 kilowatts or less) may claim the Residential Renewable Energy Tax Credit on every kilowatt-hour of electricity generated for the power grid annually for a period of 10 years after a system is placed into service. Systems must be placed into service on or before Dec. 31, 2021. The law provides for a gradual phase-down of this credit, which will decrease annually as outlined below. Qualified expenditures include labor costs for on-site preparation, assembly, or original system installation, and for piping or wiring to interconnect a system to the home. The credit applies to existing homes, newly constructed homes, principal residences, and second homes—but not rental properties. There is no maximum credit.

[programs.dsireusa.org/system/program/detail/1235](https://programs.dsireusa.org/system/program/detail/1235)

If system is placed in service...	The estimated allowable tax credit is...
By Dec. 31, 2019	30% of qualified expenditures
After Jan. 1, 2020, and before Jan. 1, 2021	26% of qualified expenditures
After Jan. 1, 2021, and before Jan. 1, 2022	22% of qualified expenditures
Future years	N/A

**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](https://cdfifund.gov/programs-training/Programs/new-markets-tax-credit/Pages/default.aspx)

### Financing Mechanisms

#### 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 \$1.3 billion in loan guarantees for 1,169 REAP projects nationwide and \$42 million in grants and loans for 341 wind energy systems.

[rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency](https://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. Designed to accelerate the deployment of innovative clean energy technology, the Title XVII loan program authorizes the DOE Loan Programs Office to guarantee the debt on energy production or manufacturing facilities



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*

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.

[www.energy.gov/lpo/services/solicitations/renewable-energy-efficient-energy-projects-solicitation](http://www.energy.gov/lpo/services/solicitations/renewable-energy-efficient-energy-projects-solicitation)

## 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 help industry develop more efficient wind energy technologies that help America lower the cost of wind energy.

[energy.gov/eere/wind](http://energy.gov/eere/wind) [wind-energy-funding-opportunities](#)

**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.

[eere-exchange.energy.gov/](http://eere-exchange.energy.gov/)

**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](http://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



The Lakota Nation installed a 65-kW Nordtank turbine that annually supplies 120 MWh of power to KILI, the Pine Ridge Reservation radio station known as the voice of the Lakota Nation in South Dakota. *Photo by Bob Gough, NREL 16258*

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](https://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](https://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](https://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](https://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](https://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.

[energy.gov/eere/wipo/state-energy-program-competitive-financial-assistance-program](https://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	Estimated Timeline*	Benefits
<b>Cooperative Research and Development Agreement (CRADA)</b>	Collaboration between a lab and one or more partners outside the federal government (usually from industry, nonprofit organizations, or academia, domestic or foreign) to collaborate and share the results of a jointly conducted R&D project.	Lab and participant may share costs or participant pays 100% funds-in.	One month	<ul style="list-style-type: none"> <li>• Leverage and optimize resources</li> <li>• Share technical expertise in a protected environment</li> <li>• Option to obtain license to the lab CRADA-generated intellectual property (IP) on agreed-upon terms and conditions</li> <li>• Five-year data protection</li> <li>• Each partner may take title to its own CRADA-generated IP</li> </ul>
<b>Agreement for Commercializing Technology (ACT)</b>	ACT is an agreement type allowed by DOE for its laboratory contractors to use third-party terms provisions for work performed with or for that third party. DOE IP provisions are required. ACT permits a more flexible cost structure to enable the laboratory contractor to cover certain costs, such as insurance, associated with risks of projects.	Varies, depending on circumstance. Participant pays 100% for laboratory contractor's cost of work. Example: lab and participant may share costs or participant pays 100% funds-in.	Two to four months to establish, depending on U.S. or foreign ownership and length of terms negotiations (about the same as other agreement types).	<ul style="list-style-type: none"> <li>• Leverage and optimize existing capabilities at lab, freedom to negotiate as lab, releasing DOE from obligation</li> <li>• Option to work at the speed and style of industry partners: operating more like a business</li> <li>• Terms flexibility provides room to modularize each aspect of the agreement, to explore more thoroughly the risks (financial, performance, funding, resources/skills)</li> <li>• Allows lab to engage in more relevant, impactful work, such as accepting funds from foundations</li> </ul>
<b>Strategic Partnership Project (formerly known as work-for-others)</b>	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.	One month	<ul style="list-style-type: none"> <li>• Access to unique facilities, services, and/or technical expertise</li> <li>• Flexible terms for IP and licensing rights</li> </ul>
<b>User Facility Agreement</b>	Users may access facilities, specialized equipment, instrumentation, and/or personnel, and so on, to conduct proprietary or nonproprietary research.	User pays approved user rate or each party covers its own cost.	Two weeks	<ul style="list-style-type: none"> <li>• Generated data treated as proprietary (if proprietary user facility agreement)</li> <li>• Access to unique facilities and equipment to validate or improve user technology</li> </ul>

Agreement Type	Definition	Cost	Estimated Timeline*	Benefits
<b>Technical Service Agreement</b>	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 effort.	Five–ten business days	<ul style="list-style-type: none"> <li>• Access to lab scientists' and engineers' expertise</li> </ul>
<b>Licenses</b>	Companies acquire IP 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.	One month or more depending on the license	<ul style="list-style-type: none"> <li>• Leverage cutting-edge inventions to drive technology commercialization</li> <li>• Licenses may be nonexclusive or exclusive</li> <li>• Opportunity available to small and large businesses</li> </ul>

Note that this table does not capture all partnering mechanisms, and there might be differences between each of the laboratories. Please contact the potential laboratory partner being considered for additional information.

\*The exact timeline for completing agreements is determined on a case-by-case basis (the estimated timelines above reflect time to complete agreements after the statement of work and funding have been agreed upon). Agreements with non-U.S. entities take longer.

## 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](http://anl.gov/technology)

### Idaho National Laboratory

[inl.gov/td](http://inl.gov/td)

### Lawrence Berkeley National Laboratory

[ipo.lbl.gov](http://ipo.lbl.gov)

### Lawrence Livermore National Laboratory

[llnl.gov/doing-business](http://llnl.gov/doing-business)

### Los Alamos National Laboratory

[lanl.gov/collaboration](http://lanl.gov/collaboration)

### National Renewable Energy Laboratory

[nrel.gov/wind/work-with-us.html](http://nrel.gov/wind/work-with-us.html)

### Oak Ridge National Laboratory

[ornl.gov/cleanenergy](http://ornl.gov/cleanenergy)

### Pacific Northwest National Laboratory

[pnnl.gov/business](http://pnnl.gov/business)

### Sandia National Laboratories

[sandia.gov/working\\_with\\_sandia](http://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 [dsireusa.org/](http://dsireusa.org/).



For more information, visit: [energy.gov/eere/wind](http://energy.gov/eere/wind)

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