



# DOE Resources Available to Support Data Center Electricity Needs

Near-term data center driven electricity demand growth is an opportunity to accelerate the build out of clean energy solutions, improve demand flexibility, and modernize the grid while maintaining affordability. Below are the Department of Energy’s programs to help with deployment, grid enhancement and expansions, energy efficiency, demand side flexibility, and technical assistance.

## Contents

|  |   |
|--|---|
| Grid Scale Clean Energy Deployment.....  | 2 |
| Grid Infrastructure Expansion and Enhancement .....  | 4 |
| Maximizing Energy Efficiency of Data Centers .....   | 5 |
| Demand Side Flexibility .....  | 8 |
| Technical Assistance Programs for State and Local Officials, Energy Professionals, Communities, and Large Energy Users ..... | 9 |

## Grid Scale Clean Energy Deployment

Building additional clean energy is a cost-effective way to meet new loads and is necessary for meeting carbon emissions reduction goals. Tax credits such as the [Clean Energy Production Tax Credit \(§45Y\)](#) and [Clean Energy Investment Tax Credit \(§48E\)](#) also can help support clean energy investments on top of existing DOE funding.

| Name   | Type                    | Eligibility  | Description   |
|--|-------------------------|--|---|
| <a href="#">Title 17 Innovative Energy Loans (1703)</a>                    | Loan; Financing Program | Project developers                                     | Loan guarantees for projects that deploy innovative or significantly improved clean energy technologies (e.g., energy generation and storage, transmission and distribution systems, efficient end-use technologies, etc.) or employ innovative manufacturing processes or manufacture innovative technologies at commercial scale. |
| <a href="#">Title 17 Energy Infrastructure Reinvestment Program (1706)</a> | Loan; Financing Program | Project developers                                     | Direct loans and loan guarantees available to projects that retool, repower, repurpose, or replace energy infrastructure that has ceased operations.  |
| <a href="#">Tribal Energy Financing Program</a>                            | Loan; Financing Program | Federally recognized Tribes, tribally-owned developers | Direct loans and loan guarantees for energy-related projects available to federally recognized tribes, including Alaska Native village or village corporations, or a Tribal Energy Development Organization that is wholly or substantially owned by a federally recognized Indian  |

|   |  |  |  |
|---|--|--|--|
|   |  |  | tribe or Alaska Native Corporation.  |
| <a href="#">Civil Nuclear Credit Program</a>  | Grant  | Owners or operators of commercial U.S. reactors            | Funding to help preserve the existing nuclear fleet at risk of retirement due to economic factors, which can provide carbon-free power to data centers.  |
| <a href="#">Generation III+ Small Modular Reactor Pathway to Deployment Program</a> | Notice of Intent issued to for funding opportunity | Project developers   | To spur the necessary industry-wide momentum, DOE intends to offer funding for projects under this solicitation through two tiers: Tier 1 will provide up to \$800 million to support up to two first-mover teams of utility, reactor vendor, constructor, and end-users/off-takers committed to deploying a first plant while facilitating a multi-reactor, Gen III+ SMR orderbook. Tier 2 will provide up to \$100 million to spur additional Gen III+ SMR deployments by addressing key gaps that have hindered the domestic nuclear industry in areas such as design, licensing, supplier development, and site preparation. |
| <a href="#">Critical Facility Energy Resilience (CiFER)</a>                         | Notice of Intent issued for funding opportunity    | Project developers   | DOE intends to issue a Funding Opportunity Announcement (FOA) seeking applications for financial assistance awards under a competitive pilot demonstration grant program, as authorized in section 3201 of the Energy Act of 2020, for energy storage projects that are wholly U.S.-made, sourced, and supplied.   |
| <a href="#">Hydroelectric Incentive Programs</a>                                    | Grant  | Owners or authorized operators of a hydroelectric facility | More than \$750 million through three programs to support energy production, energy efficiency improvements, and enhancements at existing hydropower facilities.   |
| <a href="#">Interconnection Innovation e-Xchange (i2X)</a>                          | Technical Assistance                               | Interconnection stakeholders                               | The i2X program enables simpler, faster, and fairer interconnection of clean energy resources via stakeholder engagement, data and analysis, strategic roadmaps, and tailored technical assistance.  |
| <a href="#">Non-powered Dam Development Assistance</a>                              | Technical Assistance                               | Project developers   | Holistic pre-feasibility assessments of non-powered dam retrofits supported by the best available nationwide data and a suite of online tools.   |

|  |                      |   |  |
|--|----------------------|---|--|
| <a href="#">HydroWIREs Calls for Technical Assistance</a>  | Technical Assistance | Hydropower hybrids and pumped hydro power developers and other stakeholders | These recurring technical assistance calls aim to pair utilities and hydropower developers with leading national lab capabilities on pumped storage valuation, hydropower hybrid design, hydropower operations, and other grid integration topics.   |
| <a href="#">Rural and Agricultural Income &amp; Savings from Renewable Energy (RAISE) Initiative</a> | Technical Assistance | Farmers, farm associations  | Provides technical assistance, market analysis, and business model research to help farmers and communities deploy wind technologies at multiple scales for local and regional consumption with the goals of enabling farmers and small businesses to earn supplemental income, including through farm associations that could develop and own projects financed through fee-for-service models. Includes funding for technology development and commercialization of distributed wind turbines for the agricultural sector. |

## Grid Infrastructure Expansion and Enhancement

A variety of innovative grid solutions, including those enabled by artificial intelligence (AI), can help utilities and asset owners improve utilization of existing infrastructure. Technologies such as dynamic line ratings, grid topology optimization, and other solutions can meet growing load by more efficiently and intelligently using existing infrastructure.

| Name   | Type                    | Eligibility  | Description  |
|--|-------------------------|--|--|
| <a href="#">Grid Resilience and Innovation Partnerships (GRIP)</a> | Grant                   | Varies by Topic Area; includes states, grid operators, project developers, and others. | \$10.5 billion in federal funding to support projects that enhance grid resilience and deploy innovative grid technologies that improve reliability and resilience. This program seeks to support innovative partnerships or innovative technologies to transform the grid and catalyze non-federal public and private sector capital. |
| <a href="#">Title 17 Innovative Energy Loans (1703)</a>            | Loan; Financing Program | Project developers   | Loan guarantees for projects that deploy innovative or significantly improved clean energy technologies (e.g., energy generation and storage, transmission and distribution)   |

|  |                         |  |  |
|--|-------------------------|--|--|
|  |                         |  | systems, efficient end-use technologies, etc.) or employ innovative manufacturing processes or manufacture innovative technologies at commercial scale.  |
| <a href="#">Title 17 Energy Infrastructure Reinvestment Program (1706)</a>   | Loan; Financing Program | Project developers   | Direct loans and loan guarantees available to projects that retool, repower, repurpose, or replace energy infrastructure that has ceased operations.   |
| <a href="#">Transmission Facilitation Program</a>                            | Loan; Financing Program | Project developers   | \$2.5 billion in commercial support for qualified transmission projects through tools such as capacity contracts, public-private partnerships, and loans.  |
| <a href="#">Transmission Facility Financing Program</a>                      | Loan; Financing Program | Project developers   | \$2 billion to pay for the costs of direct loan for the construction and modification of transmission facilities.  |
| <a href="#">Reconductoring Economic &amp; Financial Analysis Tool (REFA)</a> | Tool                    | Utility transmission planners and grid planners  | REFA is a first of its kind tool designed to help utility transmission planners better understand the financial, environmental and economic benefits of reconductoring upgrades, using traditional or advanced conductors. |
| <a href="#">National Interest Electric Transmission Corridors (NIETC)</a>    | Other                   | Project developers, other stakeholders (anyone may submit information to inform NIETC designation) | Special designation that enables DOE and the Federal Energy Regulatory Commission to use financing and permitting tools to spur construction of transmission projects within a NIETC.                                      |

## Maximizing Energy Efficiency of Data Centers

Energy efficiency is a key tool in reducing energy consumption from data center facilities. DOE has long been a leader in developing improved cooling technologies, including for data centers. For instance, [ARPA-E has an ongoing COOLERCHIPS program](#) focused on commercializing innovative cooling technologies for data centers. DOE national labs have built exascale computing facilities with a Power Usage Efficiency (PUE) of 1.03, demonstrating state of the art techniques for data center efficiency.<sup>1</sup> DOE is also leading the [Energy Efficiency Scaling for 2 Decades](#) initiative, with a goal to increase the energy efficiency of the microelectronics that are needed for computation at data centers by a factor of 1000 over 2 decades. DOE is continuing to develop programs to support data center owners in energy efficiency and

<sup>1</sup> Oak Ridge Frontier Supercomputer: [https://science.osti.gov/-/media/ascr/ascac/pdf/meetings/202207/UpdateFrontier\\_ASCAC\\_202207.pdf](https://science.osti.gov/-/media/ascr/ascac/pdf/meetings/202207/UpdateFrontier_ASCAC_202207.pdf)

NREL Energy Integration Facility: <https://www.nrel.gov/computational-science/measuring-efficiency-pue.html>

industrial decarbonization. In addition, tax incentives, such as the [179D Tax Deduction](#), enable building owners to claim a tax deduction for installing qualifying energy efficient systems in buildings.

| Name  | Type                       | Eligibility   | Description   |
|---|----------------------------|---|---|
| <a href="#">Center of Expertise for Energy Efficiency in Data Centers</a> | Technical Assistance       | Data center operators, owners, and other stakeholders                               | Lawrence Berkeley National Laboratory offers assessment tools, trainings on specific technologies and best practices, and certification for data center energy practitioners.   |
| <a href="#">Data Center Energy Practitioner Program (DCEP)</a>            | Training and Credentialing | Individuals, groups, organizations, federal employees                               | <p>The DCEP Program training is a comprehensive program spanning 1-4 days. The DCEP program certifies practitioners as qualified to evaluate the energy status as well as efficiency and decarbonization opportunities in data centers. The curriculum includes several software tools with what-if capabilities to enhance the learning experience. Three credentials are available.</p> <ul style="list-style-type: none"> <li>• Generalist</li> <li>• IT specialist</li> <li>• HVAC specialist</li> </ul> <p>Best practices factsheets and other resources are available through the DCEP website.</p> |
| <a href="#">Better Plants Initiative</a>                                  | Technical Assistance       | Any U.S. based manufacturing company or industrial-scale energy-using organizations | Manufacturers and owners of industrial facilities (including data centers) in the Better Plants Program set energy saving goals, usually 25% over 10 years. Participants receive national recognition, technical support, in-plant trainings, energy saving resources, and other opportunities.   |
| <a href="#">Data Center Accelerator</a>                                   | Report/Resource Collection | Data centers  | The Data Center Accelerator Toolkit collects  |

|  |   |   |   |
|--|---|---|---|
| <a href="#">Toolkit</a>  |   |   | guidance, factsheets, best practices, and other resources to help navigate these dynamics, based on the work of <a href="#">DOE's Better Buildings Data Center Accelerator</a> . This toolkit addresses specific barriers and solutions for energy management in 5 primary data center types, including real-world examples for each. |
| <a href="#">Better Climate Challenge</a>   | Technical Assistance                    | Organizations, such as data center owners or operators, committed to reducing GHG emissions | Owners and operators of commercial and industrial facilities commit to a target of at least 50% reduction in scope 1&2 GHG emissions within 10 years. Participants receive national recognition, direct technical assistance, resources, and opportunities for peer exchange.   |
| <a href="#">Onsite Energy Program</a>  | Technical Assistance                    | Industrial facilities and other large energy users  | Provides technical assistance, market analysis, and best practices to help large energy users, including data centers, increase the adoption of onsite clean energy technologies.   |
| <a href="#">Energy Efficiency Revolving Loan Fund Capitalization Grant Program</a> | Direct Support;<br>Technical Assistance | States  | \$250 million in federal funding to provide capitalization grants to States to establish a revolving loan fund under which the state provides loans and grants for energy efficiency audits, upgrades, and retrofits to increase energy efficiency and improve the comfort of buildings.  |
| <a href="#">50001 Ready</a>  | Resource                                | Facilities and organizations  | Energy management program provides guidance and resources for implementing best practices and standard operating procedures aligned with the  |



|  |  |  |  |
|--|--|--|--|
|  |  |  | ISO 50001 energy management system standard. |
|--|--|--|--|

## Demand Side Flexibility

Demand flexibility can help avoid increasing peak demand. Distribution resources, such as virtual power plants, have the potential to increase the efficiency of existing and new grid infrastructure. DOE is accelerating the use of virtual power plants to support grid needs. For example, the Office of Clean Energy Demonstrations Distributed Energy Systems' program provided \$50 million for projects that design and operate distributed energy systems that integrate high levels (>25% of peak demand) of variable clean energy resources.

| Name   | Type                    | Eligibility                                     | Description  |
|--|-------------------------|---|--|
| <a href="#">Title 17 Innovative Energy Loans (1703)</a>            | Loan; Financing Program | Project developers                              | Loan guarantees for projects that deploy innovative or significantly improved clean energy technologies (e.g., energy generation and storage, transmission and distribution systems, efficient end-use technologies, etc.) or employ innovative manufacturing processes or manufacture innovative technologies at commercial scale.    |
| <a href="#">Grid Resilience and Innovation Partnerships (GRIP)</a> | Grant                   | Project developers                              | \$10.5 billion in federal funding to support projects that enhance grid resilience and deploy innovative grid technologies that improve reliability and resilience. This program seeks to support innovative partnerships or innovative technologies to transform the grid and catalyze non-federal public and private sector capital. |
| <a href="#">Connected Communities 2.0</a>                          | Grant                   | Governments, industry stakeholders, communities | \$65 million in federal funding to validate grid-edge technology innovations in real-world situations and provide new tools for utilities, grid planners and operators.  |
| <a href="#">Distributed Energy Systems Demonstrations</a>          | Financial Assistance    | Project developers                              | \$50 million in federal funding to support a portfolio of projects that demonstrate and validate reliable operations and financial value from a range of grid topologies with diverse energy resources and distributed energy systems ownership models.  |



## Technical Assistance Programs for State and Local Officials, Energy Professionals, Communities, and Large Energy Users

DOE and the National Laboratories can provide technical assistance to states to help develop specific solutions and projects to address growing electricity demand.

| Name  | Type                                   | Eligibility   | Description  |
|---|--|---|--|
| <a href="#">State Technical Assistance Program</a>        | Technical Assistance                   | Public utility commissions and state energy offices | For State Regulators, offered through a multi-lab consortium including Lawrence Berkeley National Laboratory, National Renewable Energy Laboratory, and Pacific Northwest National Laboratory. This program provides regulators targeted support in addressing regulatory challenges, including developing innovative tariffs structures and regulatory environments to enable efficient deployment of resources for data centers, and in developing regulatory strategies to enable data center operational flexibilities and behind-the-meter resources. |
| <a href="#">State Energy Program Technical Assistance</a> | Technical Assistance                   | States, territories, and the District of Columbia   | For State Energy Offices, to provide national lab and 3 <sup>rd</sup> party expertise in support of state-led energy initiatives. This can include supporting development of regional plans and solutions for states that want to plan for data center development.  |
| <a href="#">Clean Energy Innovator Fellowship Program</a> | Technical Assistance/Capacity Building | Recent graduates and energy professionals           | The program supports recent graduates and energy professionals to spend two years working with eligible Institutions including electric  |

|   |                      |   |  |
|---|----------------------|---|--|
|   |                      |   | cooperatives, grid operators, municipal utilities, public utility commissions, state energy offices and Tribal entities.   |
| <a href="#"><u>National Association of Regulatory Utility Commissioners (NARUC)-National Association of State Energy Officials (NASEO) Advanced Nuclear State Collaborative</u></a> | Technical Assistance | Public utility commissions and state energy offices | Provides state energy officials access to DOE and national lab nuclear expertise to inform regulatory and policy questions surrounding the consideration and deployment of new nuclear generation.   |
| <a href="#"><u>The Interagency Working Group (IWG) on Coal and Power Plant Communities and Economic Revitalization</u></a>  | Technical Assistance | Energy communities                                  | Provides technical assistance, resources, and funding guides to support economic revitalization in Energy Communities. The IWG houses resources such as the Coal Power Plant Redevelopment Visualization Tool, which serves as a public database and map to enable state and local economic development officials, project developers, and power plant owners to identify clean energy generation and data center siting opportunities in fossil energy communities. |
| <a href="#"><u>Renewable Energy Siting through Technical Engagement and Planning (R-STEP)</u></a>   | Technical Assistance | State and local governments, communities            | Helps communities better plan for and meaningfully engage in the development of large-scale renewable energy and energy storage projects.  |
| <a href="#"><u>Onsite Energy Technical Assistance Partnerships (TAPs)   Better Buildings Initiative</u></a>   | Technical Assistance | Industrial facilities and other large energy users  | DOE's regional network of Onsite Energy Technical Assistance Partnerships helps facilities across the nation integrate the latest onsite energy technologies by providing specialized technical assistance, including initial screenings for multi-technology solutions, more advanced analysis to support project installations, and more.  |

|   |                      |                       |  |
|---|----------------------|-----------------------|--|
| <a href="#">Supercharging the Electric Grid</a> | Technical Assistance | Industry Stakeholders | Enhances internal and external coordination in the energy industry through resources and best practices, analytical and capacity support, and field validations. |
|---|----------------------|-----------------------|--|

If you have questions on the DOE resources listed above, please feel free to submit them through the [businesshub@hq.doe.gov](mailto:businesshub@hq.doe.gov) mailbox with the subject "Load Growth".