Electricity
($K)

FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request	FY 2026 Request vs FY 2025 Enacted
280,000	280,000	193,000	-87,000

Proposed Appropriation Language

For Department of Energy expenses including the purchase, construction, and acquisition of plant and capital equipment, and other expenses necessary for electricity activities in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion, $193,000,000, to remain available until expended: *Provided*, That of such amount, $19,000,000 shall be available until September 30, 2027, for program direction: *Provided further*, That of such amount, $20,000 from unobligated funds made available under this heading for projects specified in the table that appears under the heading "Congressionally Directed Spending Electricity Projects" in the explanatory statement described in section 4 in the matter preceding division A of Public Law 117-103 shall be available for the purpose described under this heading: *Provided further*, That of such amount, $500,000 from unobligated funds made available under the "Electricity Delivery and Energy Reliability" heading for projects specified in the table that appears under the heading "Energy and Water Development (Congressionally Directed Spending Items)" in the joint explanatory statement accompanying the conference report on Public Law 111-85 shall be available for the purpose described under this heading: *Provided further*, That funds under this heading allocated for the purposes of section 9 of the Small Business Act, as amended (15 U.S.C. 638), including for Small Business Innovation Research and Small Business Technology Transfer activities, or for the purposes of section 1001 of the Energy Policy Act of 2005, as amended (42 U.S.C. 16391(a)), for Technology Commercialization Fund activities, may be reprogrammed without being subject to the restrictions in section 301 of this Act.

Mission

The Office of Electricity (OE) leads the U.S. Department of Energy's research and development to strengthen and modernize our Nation's power grid to maintain a reliable, affordable, secure, and resilient electricity delivery infrastructure.

Overview

America's energy security, economy, and sustained global leadership are anchored in a robust power grid. Through interdisciplinary research and in partnership with the private and public sectors, OE harnesses innovation to drive a more resilient, reliable, affordable, and secure North American energy system while maintaining energy independence.

The ability to securely move affordable electricity from where it is produced to where and when it is needed is the cornerstone of a reliable electric grid. The electricity delivery system must adapt to all generation resource and load types and ensure reliable, resilient grid operations under a variety of conditions. OE leads the Department's efforts in developing new technologies to strengthen, transform, and improve electricity delivery infrastructure so generation and load can be fully integrated into the energy ecosystem and all customers—from data centers to consumers—have access to reliable, and affordable electricity.

A dramatic structural transformation of the electricity delivery system is underway. America's grid is transforming into a more dynamic and structurally complex system, with bidirectional power flows and rapidly changing generation and load characteristics. Managing this will require significant reengineering and advancements in grid technology and system architectures.

In FY 2026, funding for Grid Deployment will support OE programs and projects, in close coordination with CESER, that increase generation and transmission capacity and strengthen grid security.

OE's team of experts share their technical, analytical, and policy expertise with offices throughout DOE and with energy stakeholders across the country. Continued program direction support is crucial to sustain a talented workforce to facilitate the Administration's goal of energy dominance and providing a reliable, resilient, secure, and affordable 21st century power grid for the American people.

Electricity
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request	FY 2026 Request vs FY 2025 Enacted	
				$	%
Grid Controls and Communications					
Transmission Reliability and Resilience	33,000	33,000	27,500	-5,500	-17%
Energy Delivery Grid Operations Technology	31,000	31,000	31,000	-	-
Resilient Distribution Systems	53,000	53,000	25,000	-28,000	-53%
Cyber Resilient and Secure Utility Communications Networks	15,500	15,500	10,500	-5,000	-32%
Total, Grid Controls and Communications	132,500	132,500	94,000	-38,500	-29%
Grid Hardware, Components, and Systems					
Energy Storage	92,500	92,500	50,000	-42,500	-46%
Transformer Resilience and Advanced Components	22,500	22,500	22,500	-	-
Applied Grid Transformation Solutions	13,500	13,500	7,500	-6,000	-44%
Total, Grid Hardware, Components, and Systems	128,500	128,500	80,000	-48,500	-38%
Program Direction	19,000	19,000	19,000	-	-
Total, Office of Electricity	**280,000**	**280,000**	**193,000**	**-87,000**	**-31%**
Grid Deployment			***15,000***		

Transmission Reliability and Resilience

Overview

The Transmission Reliability and Resilience (TRR) program collaborates with the electric industry to research, develop, and demonstrate system monitoring and diagnostics, advanced data analytics and modeling, and robust control technologies that are critically needed to assess and enhance the reliability and performance of the electricity system, mitigate large-scale blackouts, and adapt to evolving system needs, emerging risks, and interdependencies. This program is critical to realize the full potential of investments in generation technologies and electrification, which are dependent on the transmission grid evolving. TRR focuses on:

- Enhancing reliable systems operations through research, development, and demonstration (RD&D) of system observability and control capabilities
- Developing and validating models, approaches, and frameworks to characterize evolving system needs and the emerging operational landscape
- Advancing tools that fully capture and help grid operators and planners understand new system dynamics
- Developing and demonstrating operational tools for grid enhancing technologies (GETs), such as dynamic line ratings and power flow control, to better utilize existing transmission infrastructure
- Identifying pathways for improving grid resilience through risk-informed operational and planning tools
- Addressing ongoing industry challenges related to relay misoperations and identification and isolation of faults
- Mitigating risks across integrated energy systems through comprehensive data acquisition, augmentation, and synthesis at various scales and development of uncertainty-informed decision support systems that consider human factors

TRR brings together energy stakeholders from government, industry, academia, and national laboratories to generate novel ideas and develop transformative solutions to address the Nation's energy infrastructure challenges, including stakeholder landscape and architecture changes as well as natural and man-made hazards. TRR also fosters strategic university-based power system research, helping ensure an enduring strategic national capability for innovation in this essential area.

Transmission Reliability and Operation (TRO) develops transmission system operational planning and control tools to inform decisions on maintaining and improving system reliability. A key focus of the program is on transmission system measurement, control, and operations to improve grid stability and resilience. Visibility into transmission system conditions, through analytics and displays, allows operators to make risk-informed and cost-effective decisions. TRO develops tools that help system operators understand and respond to reliability events from electricity demand changes and uncertain conditions, such as wildfires, heat waves, cold snaps, and other hard-to-predict events, while managing interdependence with other critical infrastructure systems. TRO works to modernize transmission system tools through human factors, risk science, and cognitive science research for reliable and resilient system operations. RD&D will improve the speed, accuracy, and precision of power system state determinations required to manage the increasing complexity and uncertainty of grid operations and to monitor and manage the interconnected and interdependent effects among the Nation's critical infrastructures. TRO continues to develop research datasets and data platforms that facilitate tool development with real data and reduce the burden of data requests on utilities. This sets the groundwork for catalyzing artificial intelligence and machine learning (AI/ML) in the transmission system.

Advanced Grid Modeling (AGM) supports building electricity sector capacity and capability to analyze the electricity delivery system using Big Data, advanced mathematical theory, and high-performance computing to assess the current state of the grid, mitigate reliability risks, and understand future needs. In FY 2026, AGM includes protective relaying, which identifies and isolates faults so the remaining system will continue to operate under normal conditions and reduces equipment damage and potential injuries to utility personnel and the public. AGM leads research activities to better understand issues affecting the current and future electric power grid and develop robust model-based solutions, resulting in new software and analytical toolsets for operators and planners. Successful research enables grid operators and planners to optimize decision-making, giving the electric industry sophisticated tools, capabilities, and understanding to dramatically improve electric delivery system reliability, security, and affordability. AGM collaborates with the National Science Foundation's (NSF) Division of Mathematical Sciences on Algorithms for Modern Power Systems (AMPS) to build a community of university-level mathematicians and statisticians to solve some of the hardest power-system-related challenges.

Highlights of the FY 2026 Budget Request

TRR investigates and develops technologies that make the present and future grid resilient, reliable, efficient, affordable, and secure. In FY 2026, TRR will concentrate on:

- Advancing the application of cognitive science and human factors to identify and develop tools needed for robust decision making and training for system operators
- Advancing protective relaying methods to improve the functional integrity and effectiveness of corrective actions to prevent misoperations and mitigate power outages
- Continuing research on changes to grid system dynamics with a focus on integration of more power electronics and large dynamic loads such as data centers
- Supporting the development of industry standards and collaboration for wide-area situational awareness and control technologies on the transmission system
- Continuing support for the Grid Event Signature Library to facilitate the development of AI/ML tools for power sector
- Developing strategies for improving operations and operational planning across regions
- Identifying novel operational strategies for maintaining and improving system stability to manage uncertainty and complexity from changes in resources and loads.
- Continuing the partnership with NSF on AMPS, targeting university-based research
- Developing risk-based, measurement-model approaches to enable the operation of degraded or damaged electricity systems while sustaining critical functionality by improving detection, mitigation, recovery, and restoration from system issues
- Advancing transmission system tools that anticipate the evolution of distribution systems' operation and energy resources
- Developing and demonstrating tools with utility partners that identify, locate, and inform actions that mitigate reliability, and security issues
- Developing training tools for operators for knowledge transfer of existing skills, and developing new skills needed for grid operations

Technology, tools, and applications developed under TRR will be evaluated for and hardened against physical and cyber security risks. Testing and evaluation will be conducted in coordination with OE's SecureNet program to ensure that security is built into these technologies and to guard against new security risks to the electric delivery sector.

The FY 2026 Request will continue to support RD&D activities through the Grid Modernization Initiative, including the Grid Modernization Laboratory Consortium (GMLC).

Transmission Reliability and Resilience
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request
Transmission Reliability and Resilience			
Transmission Reliability and Operations	8,700	11,700	8,700
Advanced Grid Modeling	18,800	21,300	18,800
Protective Relaying	2,500	-	-
Data Analytics & Predictive Models to Prevent & Mitigate Failures	3,000	-	-
Total, Transmission Reliability and Resilience	**33,000**	**33,000**	**27,500**

Explanation of Changes for Transmission Reliability and Resilience

Transmission Reliability and Operations:

- Refocuses research, development, and demonstration of operational and control tools to modernize the transmission system

- Continues core work on transmission reliability to prevent power disturbances including transmission measurement, wide area situational awareness, transmission controls under uncertainty, and human factors for system operations.
- Defers some investments on lab capabilities to research and study improved dashboards and human factors for grid operations.

Advanced Grid Modeling:

- Supports RD&D to develop new models to increase the net power flowing through transmission lines
- Develops analytical methods to manage the impact of uncertainty to maintain the reliability, security, and affordability of the grid
- Helps the electric industry understand and maintain reliability as supply and load change to manage uncertainty and risk associated with the changing grid
- Develops next-generation mathematical and statistical algorithms utilizing EMT simulations, quantum technology and artificial intelligence to improve the security, reliability, and affordability of the electric power system.

Protective Relaying: Activities were merged into AGM in FY 2025.

Data Analytics & Predictive Models to Prevent & Mitigate Failures: FY 2024 funding was for a congressionally directed activity that was fully funded from FY 2024 appropriations.

Energy Delivery Grid Operations Technology

Overview

The Nation's energy resilience strategy can benefit from advancements in national-scale energy analytics, including short-term (operational) and long-term (infrastructure) planning capabilities, to better characterize risk and uncertainty across multiple utility and infrastructure boundaries. Built around rigorous and quantitative assessment, sensing, prediction, and deep learning, the Energy Delivery Grid Operations Technology (EDGOT) program enhances the analytical capability needed to ensure reliable and resilient energy delivery and provides the architecture and process for identifying a range of scalable mitigation solutions to manage emerging threats.

The core of the EDGOT portfolio is the North American Energy Resilience Model (NAERM). NAERM is a hybrid data/model platform for the quantitative assessment of the significant interdependencies that have evolved within the energy sector and that could affect reliability and resilience. NAERM allows for the simulation of impacts to the energy system from natural and manmade events and, through collaborative partnerships, strategic insights will be accessible to utilities and other Federal agencies. NAERM provides enhanced planning and analysis capabilities that can be leveraged to facilitate grid investments to address these threats.

NAERM activities focus on developing, enhancing, and operating the portfolio of tools needed to address grid reliability and resilience in a system with pervasive and evolving threats and challenges. NAERM improves capabilities by transitioning underlying capabilities to a robust, secure operational state, and prioritizes what-if scenarios affecting reliability and security, which is essential for maintaining OE's ability to identify and advance solutions for America's grid. EDGOT's tools support private and public efforts by:

- Utilizing a systems perspective to compare and collectively plan for impacts across organizational, geographic, sector, and jurisdictional boundaries
- Targeting collaboration on mitigations with energy infrastructure owners and operators to effectively address multi-regional-scale natural threats and national security concerns

The EDGOT portfolio leverages previous national laboratory efforts to fully understand the resilience risks associated with the regionally diversified North American electric system and associated infrastructure systems. National laboratories, including Argonne, Idaho, Lawrence Livermore, Los Alamos, National Renewable Energy, Oak Ridge, Pacific Northwest, and Sandia, have a long history of developing system-wide modeling and analysis tools, as well as transformational sensing and communications technology.

Highlights of the FY 2026 Budget Request

Predicting the impact of a specific event on energy system operations, restoration, and recovery is vexing due to the scale of the North American energy system—crossing organizational, geographic, sector, and jurisdictional boundaries—and the underlying physics of energy transport. NAERM will analyze these interdependencies and complex events by leveraging capabilities such as:

- Use of confidential and proprietary data not available to others to drive predictions on resulting impacts
- Tools and expertise to characterize and analyze the relationships between electricity and associated infrastructures, such as communications, and fuel supply
- Data availability to support infrastructure grid planning across seams, including transmission and distribution as well as grid-edge

The FY 2026 Request focuses on developing and enhancing the portfolio of tools to help address modeling needs and to maintain the underlying capabilities in a robust, secure operational state:

- Incorporating the best available information on threat characteristics and their evolution over time
- Hardening and integrating research innovations in advanced analytics to rapidly identify system vulnerabilities and enhance decision support for system analysis
- Developing complex multi-infrastructure contingency analyses for understanding and identifying security challenges
- Enhancing and updating the infrastructure models and facilitating their integration into the NAERM architectural framework

- Expanding NAERM's operational capability in protecting and supporting the increase in data sources and access to NAERM
- Formalizing procedures and establishing partnerships for sharing data with industry stakeholders
- Engaging with industry stakeholders to get a better understanding of issues and practices on a regional basis to ensure that threat and consequence models are realistic and representative of actual system responses
- Supporting other government offices and agencies to assess structural, operational, and contextual changes on the power grid on a regional and national level as well as identifying mitigation approaches to potential reliability, security, and resilience concerns
- Supporting short- and long-term planning activities

Technology, tools, and applications developed under the EDGOT program are evaluated for security risks including cybersecurity.

Energy Delivery Grid Operations Technology
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request
Energy Delivery Grid Operations Technology			
North American Energy Resilience Model (NAERM)			
NAERM Operations	14,000	14,000	14,000
NAERM Upgrades	17,000	17,000	17,000
Total, Energy Delivery Grid Operations Technology	**31,000**	**31,000**	**31,000**

Explanation of Changes for Energy Delivery Grid Operations Technology

NAERM Operations:

- Expand NAERM use to address analytical needs from internal and external stakeholders, while protecting privileged data
- Use NAERM to conduct studies at the national and regional level

NAERM Upgrades:

- Develop and integrate models and simulation tools, such as natural gas-electricity and wildfire-electricity, into NAERM
- Expands data access and system architecture, enabling easy integration of additional tools into NAERM
- Conducting routine studies to analyze the impact of changes to the power grid whether from natural events (storms, wildfires, flooding, etc.) or man-made events (physical attacks, infrastructure upgrades, etc.) at the national or regional level to ensure grid reliability, resilience, and security

Resilient Distribution Systems

Overview

The Resilient Distribution Systems (RDS) program focuses on research, development, and demonstration (RD&D) of grid technologies, tools, and techniques needed to maintain power to end users and coordinate information and control across segments of the electricity system (transmission, distribution, the grid edge, microgrids, etc.). RDS works to improve grid operational reliability and resilience across the electricity system. RDS also creates, shares, and disseminates information and best practices with stakeholders, including utilities, state entities, and the public. The growing convergence of transmission and distribution (T&D) systems requires new architectural, control, and operational approaches alongside a more sophisticated approach to data as a collective resource to catalyze the use of analytics, leveraging artificial intelligence (AI) and machine learning (ML). As the complexity of the electricity distribution system increases, new technologies are needed to address operational uncertainty and challenges. Utilities require new tools and capabilities to enhance observability, control, and dynamic protection across all system assets.

RDS focuses on:

- Improving reliability, resilience, and affordability of electrical power delivered to consumers through RD&D of tools and technologies that support operational coordination and integrated planning across transmission, distribution, and grid edge system domains
- Lowering costs and advancing functional capabilities of microgrid solutions to ensure reliable, affordable, and secure electricity delivery to consumers, including uninterruptible power supply to critical infrastructure
- Developing tools for effective utilization of dynamic loads and distributed assets for power stability and power outage prevention
- Helping to develop and propagate best practices and methodologies for grid design and operations
- Identifying pathways for optimizing power delivery to consumers through improved transmission, distribution, and microgrid system controls and operations

RDS pursues strategic investments in innovative technologies, tools, and practices that improve overall grid reliability, affordability, and security, while also providing grid system planners, stakeholders, and operators with better solutions for coordinating decision-making and investment strategies across grid system domains.

Microgrid Research and Development (R&D) focuses on developing and validating next-generation microgrid system tools, techniques, topologies, and technologies to improve grid reliability, affordability, and security under both normal and disruptive conditions. Advanced microgrid systems can optimize integration of all types of local generation sources, energy storage, and loads to provide affordable and resilient electricity services to all customers—defense, industrial, commercial, and residential. This includes small modular nuclear-reactor-integrated microgrids that the defense, data center, and other sectors are actively pursuing to meet critical load demand at military and other installations. Advanced microgrid-based architectures can also provide grid reliability services and facilitate enhanced demand-side management, improving overall grid flexibility. Microgrid program investments enable electrically remote and Tribal communities across the Nation to navigate options and implement solutions for achieving reliable, affordable, and resilient energy systems and these investments remain of strategic value in the RDS portfolio. As microgrid technologies evolve to improve grid performance, microgrids are envisioned to become essential building blocks of the future electric grid and active participants in future power markets.

Dynamic Controls RD&D investigates new control approaches and technologies to enhance the electric distribution grid's ability to harness flexibility across all distribution and customer assets, reducing transmission burdens and freeing up capital to address load growth. Operating an electric grid supporting the growing U.S. economy requires control and balancing capabilities beyond the capabilities of single owner-operators, necessitating coordination and incentivization to attract willing and capable customer-owned resources. A new data-rich environment is emerging, with data originating both within and outside traditional utility boundaries. This new environment needs expanded sensor research to increase situational awareness at the distribution level, supporting both normal operations and the ability to withstand and recover from disruptions caused by extreme weather and man-made events. Dynamic Controls also explores implications of increasing dynamic loads and other transformative grid-edge influences.

Sensor Data Analytics (SDA) supports the development and demonstration of systems and data analytics for an increasingly advanced, robust, and diverse mix of information-gathering devices for situational awareness and decision

making. SDA develops tools to give utilities reliable and secure visibility into grid system conditions during normal and extreme events.

Electricity Delivery Systems (EDS) works closely with State officials and the utility industry to advance practices leading to the formulation of grid investment strategies that address community, State, and Federal planning processes and serve utilities and their customers. The program examines technological and institutional issues and applies grid architecture principles and decision-making processes for addressing them. Toward this end, EDS is advancing integrated system planning practices, developing guidelines to enable coordinated operations between transmission, distribution, and the grid edge—including dynamic loads. The program develops reference designs to address emerging structural complexity across the electricity delivery system. These activities are meant to establish a common understanding among utilities, regulators, and their stakeholders of grid investments needed to enable the utilization of an increasingly diversified set of resources and dynamic loads while maintaining reliability, resilience, and affordability.

RDS research results enable industry to strengthen electrical infrastructure reliability and resilience and support the ongoing evolution of the electric grid. RDS is developing a U.S. Electric Sector Data Strategy to establish a framework to allow sector participants to contextualize information created and used throughout the system, enable new uses for existing and emerging data resources, and extend data sharing capabilities without sacrificing privacy or security.

Highlights of the FY 2026 Budget Request

RDS R&D focuses on developing and validating new technologies and methods to improve grid reliability and resilience. FY 2026 activities are supported in the following areas:

- Advancing Microgrid Building Block (MBB) development and the cutting-edge concept of dynamic boundary formation for networked microgrids, progressing from lab-based testing to developing use case(s) collaboratively with industry partners.
- Continuing to develop innovative design, control, and operational schemes for modular microgrids that can improve system reliability and resilience at airports and distribution centers.
- Developing solutions for power system engineering issues and operational challenges facing small nuclear-reactor-integrated microgrids for applications in remote communities and high-availability systems such as data centers.
- Researching transactive controls to explore the economic and reliability impacts of meeting load growth with status quo upgrades or relying on flexible resources with different control and ownership schemes.
- Researching highly resilient distribution designs accommodating evolving electricity supply and adapting to extreme events and disruptions.
- Developing control and coordination approaches addressing dynamic grid-edge load integration issues.
- Highlighting industry best practices and guidance on complex data sharing challenges across ownership and responsibility boundaries that assures data security, integrity, and privacy while ensuring attainment of stakeholder operational objectives.
- Developing analytics, platforms, frameworks, and tools to visualize the grid for electric power operations and delivery—from the grid edge through the distribution system to the transmission system.
- Advancing integrated system planning practices to enable the formulation of holistic and staged grid investment strategies.
- Establishing rules to enable coordinated operations across the T&D system domains, including developing guidelines and sharing best practices to mature and standardize institutional, business, and technical processes governing the interfaces between them.
- Advancing coordinated grid decision-making, operations, and planning across community, State, and regional jurisdictions through working groups, education, and training activities in cooperation with major national energy association groups, such as the National Association of Regulatory Utility Commissioners (NARUC), National Association of State Energy Officials (NASEO), National Rural Electric Cooperative Association (NRECA), American Public Power Association (APPA), National Governors Association (NGA), National Conference of State Legislatures (NCSL), and National Association of State Utility Consumer Advocates (NASUCA).

Technology, tools, and applications developed under RDS will be evaluated, in conjunction with SecureNet testbed capabilities, for security risks including cybersecurity. Testing and evaluations will be conducted to ensure that security is built into these technologies and that new security risks are not being introduced into the electric sector.

Resilient Distribution Systems
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request
Resilient Distribution Systems			
Microgrids	8,500	11,500	7,500
Dynamic Controls	10,000	15,000	11,500
Sensor Data Analytics	2,500	4,500	-
Electricity Delivery Systems	-	10,000	6,000
Modeling Distributed Energy Resources	2,500	-	-
Sensors Demonstration	3,500	-	-
COMMANDER National Testbed Laboratory	5,000	2,000	-
Underserved & Indigenous Community Microgrids	10,000	10,000	-
DER Distribution Planning, Interconnection, & Modeling	11,000	-	-
Total, Resilient Distribution Systems	**53,000**	**53,000**	**25,000**

Explanation of Changes for Resilient Distribution Systems

Microgrids:

- Focuses on developing MBB and DynaGrid use cases in collaboration with industry partners; scaling back and deferring completion of field validation testing of MBB prototype units and the DynaGrid concept.
- Focuses on developing communication-based microgrid protection schemes that are interoperable with any number of protection devices from different vendors; postponing the hardware-in-the-loop testing of the microgrid Protection-in-a-Box design.

Dynamic Controls: The combination of load growth and associated infrastructure expansion requires transformative control approaches to ensure affordable, reliable, and resilient electricity

- Focuses R&D efforts on distributed operational controls including grid edge resource integration, data strategy, and sector interdependencies

Sensor Data Analytics: Planned activities are completed with funding provided in FY 2025

Electricity Delivery Systems:

- Focuses work on multi-State grid planning practices to address regional and multi-jurisdictional issues associated with grid reliability, resilience, affordability and flexibility requirements

Modeling Distributed Energy Resources: FY 2024 funding was for a congressionally directed activity that was fully funded from FY 2024 appropriations

Sensors Demonstration: FY 2024 funding was for a congressionally directed activity that was fully funded from FY 2024 appropriations

COMMANDER National Testbed Laboratory: Planned activities for this congressionally directed activity are completed with funding provided in FY 2025

Underserved & Indigenous Community Microgrids: Planned activities for this congressionally directed activity are completed with funding provided in FY 2025

DER Distribution Planning, Interconnection, & Modeling: FY 2024 funding was for a congressionally directed activity that was fully funded from FY 2024 appropriations.

Cyber Resilient and Secure Utility Communications Networks (SecureNet)

Overview

Our Nation's energy system is heavily dependent on information networks for operational reliability and resilience. Meeting rapidly growing electricity needs—for example, from data centers, manufacturing, and increasing customer demands—requires both adding new generation and efficiently orchestrating the behavior of the increasingly dynamic, distributed assets on both the generation and load sides whose behavior can affect grid stability. This orchestration requirement drives increasing volume, velocity, veracity, and variety of information demands on the grid, both for situational awareness and for control and coordination messaging. Data feeds are used by human operators, automated logic, and, in the near future, artificial intelligence on increasingly rapid timescales to maintain grid stability. At the same time, these distributed assets present a broader attack surface for adversaries to exploit. Modernizing communications and control systems to support end-to-end information security for real time operations—from the edge to the control center and back—is essential to ensure the efficient, reliable, and resilient operation of the electrical power system in a complex and dynamic risk landscape.

The Cyber Resilient and Secure Utility Communications Networks (SecureNet) program develops solutions to strengthen information security in the electricity delivery system through two interdependent research, development, and demonstration (RD&D) subprograms:

- Secure Communications Network RD&D focuses on securing grid data in transit: developing next-generation grid communications systems built from inception to mitigate communication failures and detect, reject, and withstand attacks on and disruptions to information flows. Key areas of research include grid communications architectures, resilient timing systems, securing heterogeneous grid networks, spectrum interference, grid communications quality of service, and new tools for grid operators to plan, build, and manage their networks.
- Grid Technology Cyber Resilience RD&D focuses on securing grid data at the points of production and use, which helps ensure that digital grid technologies are hardened against manipulation and attacks. Key areas of research include operational technology cybersecurity architectures, digital ledger technologies, digital twin applications, hardening digital interfaces for grid hardware, and cyber situational awareness for grid operators.

Highlights of the FY 2026 Budget Request

The SecureNet program will continue to develop and validate technical solutions to strengthen electric grid communications infrastructure. SecureNet will support the Grid Modernization Initiative, including the Grid Modernization Laboratory Consortium (GMLC).

The Request includes the following core activities under the Secure Communications Network RD&D subprogram:

- Definition and evaluation of grid communications architectures.
- Buildout and operation of the Secure Pathways for Resilient Communications (SPARC) testbed. The testbed is a resource for laboratories, utilities, and communications providers to test and evaluate secure communications technologies in realistic grid environments, and a means of providing technical assistance on grid communications.
- Development and evaluation of terrestrial alternatives to GPS at the Center for Alternate Synchronization and Timing (CAST). Tool development, technical assistance, publication of testing results, and formulation of best practices enable the electric grid to implement more robust synchronization and timing capable of operating through GPS-denied environments. The CAST testbed will be consolidated with the SPARC testbed to provide an integrated capability.
- Engagement and outreach with industry on secure grid communications topics to align DOE RD&D activities to needs and to educate stakeholders on available technologies and best practices.

The Request includes the following core activities under the Grid Technology Cyber Resilience RD&D subprogram:

- Definition and evaluation of operational technology cybersecurity architectures and best practices.
- Exploration and demonstration of distributed ledger technology to support information attestation in a variety of grid use cases.
- Provision of cyber design inputs, testing capabilities, and vulnerability assessments to other OE programs early in the RD&D pipeline to ensure they are secure by design.
- Engagement and outreach with industry to align RD&D activities to pressing needs.

SecureNet
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request
SecureNet			
Secure Communications Network RD&D	2,500	9,500	7,500
Grid Technology Cyber Resilience RD&D	1,000	6,000	3,000
Darknet	10,000	-	-
Distribution Communications & Control Technologies	2,000	-	-
Total, SecureNet	**15,500**	**15,500**	**10,500**

Explanation of Changes for SecureNet

Secure Communications Network RD&D: Continues communications technology testing activities while consolidating the CAST and SPARC testbed resources into a single program to more efficiently evaluate integrated solutions. Reduces funding for grid communications conceptual architecture activities, the bulk of which will be completed with prior-year funding.

Grid Technology Cyber Resilience RD&D: Reduces funding for core activities on grid operational technology security, since activities funded in FY 2025 are not expected to be ready for follow-on funding before the second half of FY 2026.

Darknet: FY 2024 funding was for a congressionally directed activity that was fully funded from FY 2024 appropriations.

Distribution Communications & Control Technologies: FY 2024 funding was for a congressionally directed activity that was fully funded from FY 2024 appropriations.

Energy Storage

Overview

The Energy Storage program shapes bi-directional electrical energy storage technologies into solutions for a reliable, resilient, secure, and affordable future-ready grid. The United States maintains a robust energy storage innovation ecosystem that is leading the development of emerging, innovative technologies with superior cost and performance characteristics, unlocking tremendous opportunities to a wide range of key stakeholders including utilities, industrial facilities, and critical infrastructure owners. Energy storage enhances the value of all electricity resources, provides new tools to improve grid resilience, and creates new infrastructure planning options from deferral to rapid expansion.

The Budget reflects a 46% cut to this program to focus on the development of batteries in the context of supporting firm, baseload power, microgrids, emergency response, and other areas of Administration priorities. New storage technologies with more flexible siting, added modularity, and lower marginal duration cost attributes are dramatically expanding beneficial deployment opportunities for energy storage. As deployments increase, domain expertise, from safety and valuation to operations and decommissioning, must account for continual innovations in both new and existing storage technologies. OE Energy Storage research, development, demonstration, and deployment (RDD&D) efforts recognize that the increasingly varied use cases for storage will be best served by matching user needs to technology strengths, including, but not limited to: providing reliable baseload power, critical facility resilience, data center integration and affordability. These efforts identify foundational, leverageable, and otherwise catalytic investments that help draw in industry and community support through the Energy Storage Program's four primary focus areas:

- **Materials and Systems Innovation** resolves key cost and performance challenges for storage technologies that rely on earth-abundant, domestically available storage materials, including longer-duration (10+ hour to seasonal) technologies. OE supports a diverse portfolio of energy storage materials and technologies (such as flow batteries; sodium-, zinc-, and lead-based batteries; and thermal energy storage). Additional crosscutting R&D areas include interconnections, power electronics, and power conversion systems.
- **Safety and Reliability** improves the understanding and predictability of energy storage systems and components under realistic grid conditions/use cases through advanced research, testing, and standards guidance. Key stakeholders in this focus area include fire departments and other first responders, building managers, and authorities having jurisdiction over energy storage installations.
- **Analytics** assists stakeholders in understanding optimal storage sizing, placement, operation, and valuation, as well as highlighting legacy market and regulatory structures that may not account for all the benefits provided by new technologies. These stakeholders include end-users, utilities, regulatory agencies, investors, and other decision makers. Stakeholder convenings foster collaboration across U.S. energy storage industry, exchange lessons learned, and solve barriers to further reliability and resilience benefits of energy storage nationwide. Assistance activities are enabled through the development of new analytical and open-source tools, performance protocols, and advanced modeling capabilities.
- **Grid Integration and Field Validation** helps analyze and demonstrate the economic and technical viability of storage to end users through real-world validation of storage systems, tools, and models. The Rapid Operational Validation Initiative (ROVI) will employ innovative data science methods such as artificial intelligence and machine learning to help technology innovators and stakeholders across sectors understand and forecast long-term performance, cost, and operational reliability of new storage technologies. ROVI aims to provide at least a 15-year technology life and performance prediction requiring only 1-year or less of real time testing, leveraging innovative modeling techniques informed by artificial intelligence and machine learning.

Highlights of FY 2026 Budget Request

The Request supports the program's core research, development, and demonstration (RD&D) focus areas, including the application of storage technologies that support reliable, firm power. Activities in FY 2026 provide collaborative and nimble mechanisms to nurture a rapidly growing domestic energy storage innovation ecosystem. A sharper focus is placed on highly scalable activities, where the potential exists for a single investment to benefit hundreds or thousands of users. These activities will leverage collaboration space at the newly constructed Grid Storage Launchpad (GSL) at the Pacific Northwest National Laboratory.

Increased use of energy storage across the grid and other sectors requires secure, reliable, sustainable, and affordable materials, components, and supply chains. Materials and Systems Innovation core R&D continues for materials

development and component design toward meeting established levelized cost of storage (LCOS) targets and integration of power electronics and power converter designs into additional prototype systems.

Energy storage continues to be deployed across the country at unprecedented levels.[1] Safety and Reliability R&D continues core activities involving reliability testing and modeling, safety education and safety standards development, power electronics, and stakeholder outreach. These activities will be conducted in partnership with national laboratories, industry members, first responders, authorities having jurisdiction over energy storage installations, safety standards organizations, and communities.

Grid Integration and Field Validation R&D continues core activities for innovative technology demonstrations and performance validation, project techno-economic analyses, system integration standards development, and technology integration into other systems. R&D also continues for storage system failure measures, complex system analysis, and operation requirements to capture full system benefits. These activities will be conducted in partnership with national laboratories, industry members, integration standards organizations, and communities.

Analytics core R&D continues at a reduced level for modeling and analysis, early-stage technology assessments, technical assistance, and market valuation for affordable and reliable systems development. Activities focus on developing open-source tools, establishing performance protocols, and engaging storage stakeholders. Analytics stakeholder engagement will inform stakeholder strategies that facilitate a landscape for energy storage as a tool for grid reliability and resilience.

GSL, the first national laboratory facility focused on battery materials and battery systems for grid applications, began operations in 2024. Activities at GSL focus on materials development and validation of prototype battery systems (up to 100 kW systems integration and testing) to identify and solve issues before moving to larger-scale systems. GSL provides key capabilities to accelerate energy storage RD&D:

- Standardize grid performance testing across the spectrum of battery materials, battery systems, auxiliary power, and battery management systems under market-aware and grid-specific use-case conditions
- Provide an objective national resource to report battery testing performance under grid conditions and duty cycles
- Integrate and coordinate researchers from universities and national labs to rapidly solve crosscutting science and technology challenges
- Develop new capabilities, including characterization capabilities, to rapidly scale up new materials for grid scale storage and deliver these capabilities
- Conduct realistic testing of design options in a laboratory environment

The FY 2026 Request will support RD&D activities through the Grid Modernization Initiative (GMI), including the Grid Modernization Laboratory Consortium (GMLC).

Energy Storage
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request
Energy Storage			
Materials and Systems Innovation	30,700	32,750	18,500
Safety and Reliability	15,000	15,250	12,500
Analytics	13,500	20,600	8,500
Grid Integration and Field Validation	8,500	9,100	7,700
Grid Storage Launchpad Operations	4,800	4,800	2,800
Section 3201 Pilot Demonstration Grants	20,000	10,000	-...-
Total, Energy Storage	**92,500**	**92,500**	**50,000**

Explanation of Changes for Energy Storage

[1] https://www.eia.gov/todayinenergy/detail.php?id=64586

- *Materials and Systems Innovation:* Core R&D activities continue. Prior activities for end-of-life/alternative life options for system materials and components, domestic supply chain innovations for access to/efficient use of materials, components, and other products used in energy storage technology, and strategic designs for improved manufacturability are not funded. Engagements with academic and industry partners toward identifying and advancing storage materials research for nascent chemistries/systems are not funded.
- *Safety and Reliability:* Core R&D activities continue. Funding for stakeholder awareness and access to DOE national laboratory expertise and national laboratory testing and characterization of battery materials and cells is reduced. Training opportunities for communities with storage projects are not funded.
- *Analytics:* Core R&D activities will be reduced, including energy community access to DOE national laboratory expertise and tools. Support for storage stakeholder convenings for information exchanges across the energy storage community and further development of open-source and advanced tools for storage development is reduced. Development of cutting-edge decision-making tools that utilize artificial intelligence and forums to disseminate these decision-making platforms and learnings from them are not funded.
- *Grid Integration and Field Validation:* Core R&D activities will continue. Funding for continued development of detection tools and methods for identifying and preventing ESS failure or damage caused by cyberattacks and other anomalies is reduced. Further enhancement and development of ROVI's data source expansion and storage technology validation capabilities to additional non-lithium technologies are not funded.
- *Grid Storage Launchpad Operations:* The Request supports maintaining safety, concluding current industry agreements, and conducting essential R&D functions. Future industry engagements are reduced. Education activities and planned upgrades, including system testing and prismatic cell development, are not funded.
- *Section 3201 Pilot Demonstration Grants:* Planned activities for this activity will be completed with funding provided in FY 2024 and FY 2025.

Construction Projects Summary
($K)

	Total Project Cost	Prior Years	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request	Future Years
20-OE-100 Grid Storage Launchpad						
Total Estimated Cost (TEC)	76,800[1]	76,800[1]	-[1]	-	-	-
Other Project Costs (OPC)	2,000[2]	1,000[2]	1,000[2]	-	-	-
Total Project Costs (TPC)	78,800	77,800	1,000	-	-	-

[1] An internal reprogramming was used in FY 2024 to shift $1.8M from prior year Energy Storage unobligated balances to GSL to settle an equitable adjustment request from the Design-Build General Contractor for schedule incentives and uncompensated betterments. The settlement included a release of claims and enabled the completed construction project to proceed with closeout actions.
[2] OPC is funded through national laboratory overhead.

Transformer Resilience and Advanced Components

Overview

The Transformer Resilience and Advanced Components (TRAC) program is focused on strengthening the Nation's electricity delivery system by addressing key challenges such as aging infrastructure, evolving electrical loads—including the rapid emergence of large electrical loads—and the increasing need for all grid components to withstand both system transients and extreme physical events. TRAC supports innovation and modernization to enhance the resilience, reliability, and performance of critical grid infrastructure. At the same time, supply chain disruptions and global competition for materials have highlighted the risks of relying on foreign sources for critical grid components. TRAC is focused on developing resilient, high-performance equipment that can be manufactured using domestic materials and supply chains.

TRAC is advancing technologies that carry, control, convert, and condition electricity in ways that are smarter, faster, and more adaptable. By embedding data-driven design, streamlined manufacturing, and flexible system architectures, the program supports a grid that is not only more reliable, resilient, and affordable, but also better prepared to meet the demands of a rapidly evolving energy landscape.

Flexibility will be a major advantage of new critical grid components. A single large power transformer (LPT) failure can disrupt power to a half million homes. Even prior to recent supply chain disruptions, a replacement could take over 12 months because LPTs are nearly always custom-made. Increased U.S. electricity demand is also adding an unprecedented need for distribution transformers, increasing lead times. TRAC supports innovative transformer designs that are more flexible, modular, and adaptable, enabling standardized designs to be used in more locations. This approach reduces manufacturing lead times while increasing the applicability of spare inventory. The program covers the full range of electric power transformers from LPTs to distribution service transformers addressing issues across the entire grid.

Modularity enabled by advanced power electronics will be an essential part of the future grid infrastructure. Trends such as increasing data center demand and changes at the grid edge are introducing uncertainties in load growth projections. Consumer behaviors and technological improvements could require new grid capacity in increasingly unpredictable ways. TRAC supports innovative grid-enhancing technologies (GETs), direct current (DC) systems that support electricity delivery and improve efficiency in a number of power systems, including data centers, as well as solid-state power substations (SSPS) to enable faster and more targeted capacity additions. In the near term, DC technologies and GETs, including dynamic line ratings and power flow controllers, will help unlock more capacity from existing assets. In the medium to long term, the SSPS building block concept, reliant on advanced power electronics, will allow for nearly on-demand capacity additions or reallocations. These modular and scalable designs enable greater standardization and allow for more cost-effective capacity expansion. Additional benefits include smaller module sizes for ease of transport and lower power ratings to reduce criticality.

Data-driven approaches will be necessary for a reliable and efficient grid. For example, transmission and distribution equipment such as transformers, power lines, and substation equipment are often exposed to the elements and are vulnerable to adverse conditions. Next-generation grid hardware technologies will need to anticipate, withstand, and rapidly recover from the impact of extreme events, including terrestrial and space weather events, electrical disturbances, equipment failures, accidents, deliberate attacks, and other unknowns. Local intelligence with embedded sensors, data processing, and communications will enable real-time health monitoring, reducing maintenance costs and enhancing system reliability. Leveraging results from other OE activities, including sensors and emerging technologies, will improve system observability.

The TRAC scope encompasses materials research, exploratory concepts, modeling, and analysis to address the range of challenges associated with transformers and other grid components. Specific technologies include transformers, cables, conductors, high temperature superconductors (HTS), power flow and voltage controllers, protection equipment and switchgear, and equipment sensors. Program activities, developed in close coordination with industry, aim to fill fundamental research and development (R&D) gaps and accelerate the adoption of new technologies and approaches.

For the FY 2026 Budget Request, the TRAC program will prioritize technologies that can make the grid more reliable, affordable, and resilient. These technologies include advanced transformers (solid state transformers (SSTs), flexible, hybrid, etc.), advanced power electronics wide-bandgap (WBG) devices, SSPS converters, enhanced transformer health monitoring, alternative transformer core materials, and advanced transformer insulation.

Highlights of the FY 2026 Budget Request

The Request continues materials, component, and system development to enable next-generation transformers and converters. Major technology focus areas include:

- *Market and System Impact Analysis:* The Request supports R&D of advanced transformer health monitoring for increased reliability and resilience and the continued market and system impact analyses of various grid hardware components, including DC systems, advanced conductors, advanced transformers, and GETs. This analysis supports high-fidelity modeling and simulation to help the grid community understand the value and impact of these improved grid component capabilities.

- *Component Design and Development:* The Request supports continued device and operational improvements for SSPS technologies as identified in the 2020 SSPS roadmap.[1] The high-voltage, high-power, and high-reliability requirements of grid applications present unique challenges for SSPS technologies, especially when operating at higher frequencies. Greater utilization of high-voltage power electronic converters within substations, including hybrid and solid-state transformer applications, can provide power flow control capabilities and reactive power support, limit fault currents, and increase system flexibility, reliability, and resilience. The Request advances modular, scalable, flexible, and solid-state transformers from early concept prototypes systems to larger systems suitable for field validation, enabling standardized designs to increase grid resilience. The Request supports the development of DC hardware components, controls, testbeds, and advanced concepts to address technical challenges. The Request also supports the development of low voltage (LV) grid components and power electronic systems that support grid operations and enhance system resiliency and reliability. The Request also supports the continued development of technologies to improve situational awareness of power grid system, subsystems, and component conditions. This includes developing and applying sensing technologies and utilizing emerging platforms such as robotics, unmanned aerial vehicles (UAVs), advanced transformers, and other component health monitoring.

- *Applied Material R&D:* The Request supports continued improvements in magnetics, semiconductor devices, alternative transformer core materials, conductors, packaging, and insulation, targeting increases in heat dissipation, electrical and thermal conductivity, mechanical strength, voltage limits, and operational durability.

Technology, tools, and applications developed under TRAC will be evaluated for risks including physical security of electrical infrastructure, cybersecurity, electromagnetic pulses, and geomagnetic disturbances. Testing and evaluations will be conducted to ensure that security is built-in and new risks are not being introduced into the electric sector.

The FY 2026 Request continues to support R&D activities through the Grid Modernization Initiative (GMI), including the Grid Modernization Laboratory Consortium (GMLC).

Transformer Resilience and Advanced Components
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request
Transformer Resilience and Advanced Components			
Market and System Impact Analysis	3,000	3,000	3,000
Component Design and Development	15,600	16,600	16,600
Applied Material R&D	2,900	2,900	2,900
Silicon Carbide Semiconductors	1,000	-	-
Total, TRAC	**22,500**	**22,500**	**22,500**

[1] https://www.energy.gov/sites/prod/files/2020/06/f75/2020%20Solid%20State%20Power%20Substation%20Technology%20Roadmap.pdf

Explanation of Changes for Transformer Resilience and Advanced Components

- *Market and System Impact Analysis:* continues market and system analyses for different grid hardware components, including SST characterization, flexible modeling of interactions between transformers and power electronics assets, and expands R&D for advanced transformer health monitoring.

- *Component Design and Development:* continues addressing DC hardware technical challenges, including accelerating the development of WBG packaging solutions for higher power density grid-scale power electronics, the development of SSPS, and expands advanced transformer development, including solid-state, flexible, and modular transformers

- *Applied Material R&D:* continues R&D on advanced transformer insulation, conductors, alternative materials for transformer cores, dielectrics, and semiconductor devices.

- *Silicon Carbide Semiconductors:* FY 2024 funding was for a congressionally directed activity that was fully funded from FY 2024 appropriations.

Applied Grid Transformation Solutions

Overview

The Applied Grid Transformation Solutions (AGTS) program tests and validates innovative grid technologies prior to their deployment in the field and increases awareness of advanced grid solutions that can meet pressing industry needs. Modernizing the grid to broaden reliability, resilience, and security while maintaining affordability requires significant reengineering of system architectures and well-informed adoption of advanced grid solutions. By assembling and enhancing testbed capabilities to stress test advanced grid technologies and identify performance limitations; methodically assessing pilot demonstrations in integrated and operational environments to document best practices, requirements, and capability gaps; and developing decision-making tools and resources for a variety of stakeholders, AGTS will provide industry with the data, insights, and support to inform grid transformation, infrastructure investments, and future R&D needs.

Transformation Toolkit: The speed of innovation and change facing the electric grid is overwhelming decision makers, especially around different technologies and options that can provide similar benefits. The information available for consideration is vast, unstructured, and diverse due to the various objectives, approaches, and processes for different technologies in different states, regions, and jurisdictions across the United States. Information asymmetry between utilities and regulators leads to suboptimal solutions and slows adoption of beneficial grid technologies that can meet pressing industry needs. OE is a trusted entity that can serve as a clearinghouse for technical information and an unbiased evaluator of options to facilitate grid transformation.

Transformation Toolkit focuses on developing tools, resources, and programs to empower grid stakeholders with actionable information. Activities include documenting best practices, baselining technology readiness, providing technical assistance, and compiling outputs and impacts of OE and DOE grid R&D investments.

Testbed Network: Grid testbeds are vital tools in the technology development process, providing capabilities to evaluate innovative technologies in a controlled and realistic environment prior to integration with operational assets and systems in the field. Stress tests help evaluate their performance, reliability, safety, and security under blue sky, grey sky, and black sky conditions and can surface technical and capability gaps that may require additional or new R&D efforts. While industry has established testing facilities**,** they are facing capacity and capability limitations due to historic underinvestment after a bulk of grid technology manufacturing went overseas. These limitations impose time and cost constraints that the industry can't afford, especially for small businesses and innovators. Facility upgrades and advanced testbeds are also needed to evaluate new grid hardware and software technologies such as grid power electronics and AI operator tools. Investments in grid test facilities and increasing access to their capabilities is vital for the United States to exert global leadership in next-generation grid technology innovations.

Testbed Network focuses on identifying and assembling needed grid testbed facilities across the Nation to test, validate, and evaluate advanced grid technologies. By leveraging and connecting unique capabilities at national laboratories, private sector facilities, and academic testbeds, industry will have a coordinated testing platform to support testing and validation of innovative grid technologies for a variety of use cases and scales while minimizing redundant investments. Activities also include bridging capability gaps and facilitating access to testing resources to bolster local grid innovation ecosystems.

Strategic Pilots and Evaluation: Pilot demonstrations of innovative grid technologies are often required prior to broader implementation since benefits are difficult to quantify when tested in isolation and results are difficult to extrapolate to real utility systems. Due to variations across jurisdictional boundaries, different utilities frequently conduct their own pilots for the same or similar technology. While there are unique characteristics of each project, there are also commonalities and shared learning that can shorten, reduce, or obviate the need for some utility pilots. The current practice is a suboptimal use of ratepayer and taxpayer dollars and slows adoption of beneficial grid technologies that can meet pressing industry needs. Systematic assessment and evaluation of pilot demonstrations will yield the actionable information desired by utilities and regulators such as project use cases, technology performance, integration and operational requirements, and quantified economic benefits.

Strategic Pilots and Evaluation focuses on assessing pilot demonstrations that fill strategic knowledge gaps, integrating innovations into operational environments to identify R&D needs, and systematically documenting project results to inform scaling, replication, and/or extension. Activities include establishing evaluation frameworks based on grid architecture to chart transformation and conducting strategic pilot demonstrations that combine synergistic technologies and innovations to provide enhanced value.

Highlights of the FY 2026 Budget Request

- Enhance at least one grid testbed capability in collaboration with national laboratories, private industry, and academia to evaluate and stress test advanced grid technologies such as:
    - AI tools for operational environments
    - Advanced transformers
    - Sensors and equipment condition monitoring solutions
    - Medium voltage (MV) grid power electronics systems and solutions
    - Coordination and control of distributed energy resources
- Continue industry engagement to share information, gather technology adoption insights and best practices, and identify new grid technology testing and validation needs.
- Refine grid architecture assessment and documentation frameworks for pilot demonstrations to systematically evaluate benefits and scalability.

AGTS is inherently crosscutting and activities are coordinated with other OE programs and DOE offices, including through the Grid Modernization Initiative (GMI), on shared technology development needs, objectives, and results.

Applied Grid Transformation Solutions
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request
Applied Grid Transformation Solutions			
Transformation Toolkit	3,500	2,000	1,500
Testbed Network	-	5,500	4,000
Strategic Pilots and Evaluation	10,000	6,000	2,000
Total, AGTS	**13,500**	**13,500**	**7,500**

Explanation of Changes for Applied Grid Transformation Solutions

- *Transformation Toolkit:* reduces tool development efforts and decision-making resources
- *Testbed Network:* reduces the scope of tests and test bed enhancements supported
- *Strategic Pilots and Evaluation:* focus efforts on assessment and documentation of pilot demonstration projects

Program Direction

Overview

The Program Direction (PD) program provides for the Federal workforce responsible for the overall direction and administrative support of the Office of Electricity (OE). Headquarters Federal employees provide executive management, programmatic oversight, and analysis for the effective implementation of the OE program, as well as communications, finance, operations, planning, and workforce development functions. PD funding is also provided for time spent by Office of Fossil Energy (FE) technical staff at the National Energy Technology Laboratory (NETL) in support of OE financial assistance activities, including procurement, finance, and legal functions.

Contractor support services are utilized for some administrative tasks and special purpose analyses for management, such as technology and market analyses and development of tools to improve overall office efficiency, consolidate organizational knowledge, track performance and inventory data, and facilitate staff use of the information. Other related PD expenses include corporate IT support and equipment through DOE's Energy Information Technology Services (EITS), Office of Research, Technology, and Economic Security (RTES) reviews, and common administrative services such as rent for office space leased from the General Services Administration, telecommunications, and corporate business systems through DOE's Working Capital Fund (WCF).

Highlights of the FY 2026 Budget Request

OE's team of experts share their technical, analytical, and policy expertise with offices throughout DOE and with energy stakeholders across the country. Continued program direction support is crucial to sustain a talented workforce to facilitate the Administration's goal of energy dominance and providing a reliable, resilient, secure, and affordable 21st century power grid for the American people.

Program Direction
Funding ($K)

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request	FY 2026 Request vs FY 2025 Enacted	
				$	%
Program Direction Summary					
Washington Headquarters					
Salaries and Benefits	10,671	11,659	10,727	-932	-8%
Travel	420	350	360	+10	+3%
Support Services	1,566	818	1,035	+217	+27%
Other Related Expenses	3,040	2,963	3,543	+580	+20%
Total, Washington Headquarters	**15,697**	**15,790**	**15,665**	**-125**	**-1%**
National Energy Technology Laboratory					
Salaries and Benefits	1,676	1,692	1,709	+17	+1%
Travel	35	35	45	+10	+29%
Support Services	365	375	383	+8	+2%
Other Related Expenses	1,227	1,108	1,198	+90	+8%
Total, National Energy Technology Laboratory	**3,303**	**3,210**	**3,335**	**+125**	**+4%**
Total Program Direction					
Salaries and Benefits	12,347	13,351	12,436	-915	-7%
Travel	455	385	405	+20	+5%
Support Services	1,931	1,193	1,418	+225	+19%
Other Related Expenses	4,267	4,071	4,741	+670	+17%
Total, Program Direction	**19,000**	**19,000**	**19,000**	**-**	**-**

	FY 2024 Enacted	FY 2025 Enacted	FY 2026 Request	FY 2026 Request vs FY 2025 Enacted	
				$	%
Federal FTEs	**55**	50	47	-3	-6%
Additional FE FTEs at NETL supporting OE[1]	10	12	11	-1	-8%
Total OE-funded FTEs	65	62	58	-4	-7%
Support Services and Other Related Expenses					
Support Services					
Technical Support	860	777	908	+131	+17%
Management Support	1,071	416	510	+94	+23%
Total, Support Services	**1,931**	**1,193**	**1,418**	**+225**	**+19%**
Other Related Expenses					
EITS Desktop Services	525	438	550	+112	26%
WCF	2,499	2,525	2,190	-335	-13%
Other Services	1,243	1,108	2,001	+893	+81%
Total, Other Related Expenses	**4,267**	**4,071**	**4,741**	**+670**	**+17%**

[1] OE funds FE FTEs at NETL that support OE activities. The NETL FTEs are included in FE's FTE totals and not in the OE FTE totals shown on the "Federal FTEs" line.

Program Direction
($K)
Activities and Explanation of Changes

FY 2025 Enacted	FY 2026 Request	Explanation of Changes FY 2026 Request vs FY 2025 Enacted
Program Direction		
$19,000	**$19,000**	**$0**
Salaries and Benefits		
$13,351	*$12,436*	*-$915*
• Support 62 FTEs at Headquarters and NETL, providing executive management, programmatic oversight, and analysis for the effective implementation of the OE program	Support 58 FTEs at Headquarters and NETL, providing executive management, programmatic oversight, and analysis for the effective implementation of the OE program	• OE reflects a reduction in the workforce to support the Department's reorganization efforts and the Administration's goals and priorities
Travel		
$385	*$405*	*+$20*
• Funds transportation, subsistence, and incidental expenses allowing OE to effectively facilitate its mission	• Funds transportation, subsistence, and incidental expenses allowing OE to effectively facilitate its mission	• Increases for growth in hotel rates and air fares
Support Services		
$1,193	*$1,418*	*+$225*
• Includes contractor support directed by Federal staff to perform administrative tasks and provide analysis to management • May also include support for post-doctoral fellows and IPA assignments	• Includes contractor support directed by Federal staff to perform administrative tasks and provide analysis to management • May also include support for post-doctoral fellows and IPA assignments	Reflects work scope adjustments due to reduction of Federal staffing changes
Other Related Expenses		
$4,071	*$4,741*	*+$670*
• Includes EITS desktop services and equipment upgrades and replacements • WCF expenses include rent, supplies, copying, graphics, mail, printing, and telephones • Supports commercial credit card purchases using simplified acquisition procedures to the maximum extent possible, security clearances, and other needs	• Includes EITS desktop services and equipment upgrades and replacements • WCF expenses include rent, supplies, copying, graphics, mail, printing, and telephones • Supports commercial credit card purchases using simplified acquisition procedures to the maximum extent possible, security clearances, and other needs	Increases are anticipated for EITS, other IT systems, RTES, and NETL cost share.