

**Department of Energy
Office of Electricity
(DOE-OE) Grid
Innovations Facility and
Testing Voucher (VO-
12) Opportunity**

Voucher Opportunity Rules

Version 0

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Grid Innovations Facility and Testing

Voucher Opportunity Rules

The Applied Grid Transformation Solutions (AGTS) program in the Office of Electricity (OE) tests and validates innovative grid technologies that can broaden the reliability, resilience, security, and affordability of the Nation's electricity delivery infrastructure. Electric demand is projected to rapidly increase over the coming years, and advanced grid solutions are urgently needed to enable the energy additions required to meet this growth. Next-generation grid technologies can increase grid capacity, provide greater flexibility, and reduce dependence on foreign supply chains.

The Grid Innovations Facility and Testing Voucher Opportunity (VO-12) seeks to connect U.S. small businesses, innovators, and entrepreneurs with resources and the testing capabilities needed to increase the technical readiness and commercialization potential of innovative grid technologies capable of broadening the reliability, resilience, security, and affordability of the Nation's electricity delivery infrastructure. The VO, developed in a partnership between the U.S. Department of Energy (DOE) OE AGTS program, the Office of Technology Commercialization (OTC), and ENERGYWERX (PI), facilitates matchmaking between U.S.-based technology developers (voucher recipients) and test facilities with relevant capabilities (voucher providers) to address technical and performance uncertainties of innovative grid technologies. Vouchers may provide support and expertise to test, stress test, validate, and evaluate technologies for transmission and distribution (T&D) systems with Technology Readiness Level (TRL) 6 (engineering/pilot-scale, similar (prototypical) system validation in a relevant environment) to TRL 8 (Actual system completed and qualified through test and demonstration)¹. Testing activities should lead to data and insights on the functionality, performance, interoperability, applicability, durability, reliability, limits, and other characteristics needed to further development and/or adoption, including informing standards development.

This document provides rules for the Grid Innovations Facility and Testing VO and includes the following sections: Eligibility, Project Activity Rules, Cost Share, National Environmental Policy Act (NEPA), Intellectual Property (IP) and Communications, Review Criteria, Project Milestones, and Definitions. This document is subject to change, and the latest version will be made available on the [ENERGYWERX website](https://www.energywerx.org/opportunities).²

Eligibility

Eligible applicants (voucher recipients and voucher providers) must meet the following criteria:

- Applicants must qualify as a domestic entity and must certify the entity is not owned by, controlled by, or subject to the jurisdiction or direction of a government of a country of risk

¹ DOE G 413.3-4A, Technology Readiness Assessment Guide (2011), Page 9, <https://www2.lbl.gov/dir/assets/docs/TRL%20guide.pdf>.

² <https://www.energywerx.org/opportunities>.

(DOE defines countries of risk to include China, Russia, North Korea, and Iran). To qualify as a domestic entity, the entity must be organized, chartered, or incorporated (or otherwise formed) under the laws of a particular state or territory of the United States (U.S.); have majority domestic ownership and control; and have a physical place of business in the United States. This list is subject to change. DOE retains the prerogative to require additional information from the applicants to verify the applicant meets the eligibility requirements.

- Employees of DOE are **not** eligible to apply for VO-12 vouchers.
- If an applicant for voucher services is also an approved voucher provider with testing capabilities, the applicant may **not** request services from their own capabilities.
- National Laboratory (federally funded research and development center [FFRDC]) employees are eligible to apply as voucher recipients but may **not**:
 - Apply for voucher services from their own laboratory; or
 - Use other DOE funds to apply as a voucher recipient, develop a test plan, or for any other voucher activities.

Project Activity Rules

- All work performed under the approved award must be performed in the United States. Voucher recipients are responsible for ensuring that the Voucher Provider facility (in which they will be testing) has the appropriate access permissions and capabilities (e.g., ensuring there are no non-U.S. citizen access restrictions if needed).
- Project activities are expected to fall within the existing permits, licenses, and authorizations of the test facility (voucher provider).
- VO-12 will not provide financial assistance for activities that are already approved and planned to use other federal funding. This includes federal financial assistance awards resulting from a Funding Opportunity Announcement (FOA), Notice of Funding Opportunity (NOFO), Small Business Innovation Research (SBIR), prize, or challenge. However, applicants may request assistance through VO-12 for activities that may relate to, or whose results and/or outputs may be used to inform, activities that are already approved and planned to use other federal funding. The activities, scope, and reporting for each must be formally disclosed and will remain separate (i.e., VO-12 activities versus other federally funded activities).
- Voucher-supported activities must focus on testing and validation of pre-commercial technologies in a laboratory or controlled environment and must not include fabrication or manufacturing activities.
- Capabilities proposed by voucher providers must be scoped to include services costing between \$50,000 and \$250,000 for one project (i.e., one provider-recipient match).
- Capabilities must include physical testing, which means hands-on experiments in a laboratory or controlled environment that involve hardware such as an engineering/pilot-scale prototype or an actual system. Numerical modeling, simulation, and analytical activities are not within the voucher opportunity scope unless paired with physical testing.

- Project testing activities must focus on electric grid technologies as defined in the Definitions section.
- Voucher-supported activities must not include establishing new testing capabilities or significantly modifying existing testing capabilities for the voucher provider.
- Voucher recipients must enter into an agreement with the selected provider facility and comply with the terms and conditions of use (including provisions related to intellectual property and data access) as required by the Voucher Program and the selected facility, prior to accessing that facility.

Cost Share

- DOE and ENERGYWERX do not require direct cost share from voucher providers or recipients. However, selected voucher recipients are expected to fund their own travel, arrangements, materials, shipping, personnel, and any other miscellaneous costs to ensure successful completion of the proposed project activities. No funding is distributed to voucher recipients through this VO.

National Environmental Policy Act (NEPA)

- All federal agencies are required to comply with the National Environmental Policy Act (NEPA). Because VO-12 is funded by DOE, the agency is required to review proposed activities that would occur as part of the Voucher Program to evaluate potential impacts to the human environment. DOE has issued a categorical exclusion that applies to VO-12 activities, but this determination is conditional. All entities that participate in the voucher program must comply with all NEPA conditions that apply. These conditions will be communicated to voucher recipients and providers via the Voucher website. Some proposed projects may be subject to additional NEPA review.
- Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

Intellectual Property (IP) and Communications

- All intellectual property rights related to the Voucher Program will be governed by the VO-12 Intellectual Property Management Plan (stored on the [Voucher website](#)).
- DOE-OE reserves the right to leverage external merit reviewers to provide comments and feedback on applications. Any external reviewers must indicate there is no conflict of interest and must complete a nondisclosure agreement prior to reviewing applicant materials.
- By completing the voucher provider application, the facilities consent to publication of the following information on the [DOE-OE U.S. Electric Grid Testbed Inventory Website](#), for distribution to potential voucher recipients, and for DOE articles and related media:
 - Facility Main Address, City, State, Zip, Facility Website, Test Facility Owner/Organization Name, Facility Category, Capability Title, Capability Testing Objective, Capability Core Competencies, Capability Equipment Description,

Primary Testing Category, Testing Subcategory, Capability Qualifications and Credentials, Capability Background, Capability Duration, and Recipient Information Needs.

- The [DOE-OE U.S. Electric Grid Testbed Inventory Website](#) will be maintained by DOE-OE. If a participant wishes to modify or remove their listing on DOE-OE U.S. Electric Grid Testbed Inventory Website, please contact doe-oe-agt@hq.doe.gov. Subsequent opportunities may rely on the network of testing facilities identified in this initial opportunity.
- Any publication or scientific paper resulting from assistance received through this voucher program must acknowledge DOE-OE as a funding source.
- All deliverables submitted to ENWX and DOE staff with confidential or business-sensitive information (e.g., intellectual property) must clearly be marked as “Confidential Information” on each page. Project summary reports may be published on the public-facing [DOE-OE website](#). If the voucher participants choose to include Confidential Information in the project summary report, they must submit both a complete version (with Confidential Information markings) and a redacted version for publication on the [DOE-OE website](#). Private versions will be reviewed by DOE-OE and ENWX and stored securely. Any images or language not marked as Confidential Information from any of the submitted milestone documents may be used by VO-12 Program staff for public communications without prior notice to project participants.
- Voucher participants are required to provide DOE-OE staff with reasonable access to the recipient’s work site while testing at provider facility, as well as allowing the VO-12 program staff to take photographs of the assistance activity for marketing purposes, provided that, prior to such publication, the voucher recipient will be provided with the opportunity to redact, or restrict the publication of, photos that would otherwise disclose confidential intellectual property owned by the voucher recipient.

Additional requirements and restrictions may be contained in project agreements between DOE-OE and the voucher participants.

Review Criteria

The following criteria will be used by DOE to review and select **voucher provider** applications.

- The proposed testing capabilities have direct relevance and benefit to advancing cost-effective, reliable, and secure electric transmission and distribution technologies.
- The proposed testing capabilities represent physical testing that can lead to clear advancements in technology and adoption readiness.
- The proposed facility is located in the United States and meets the eligibility requirements.
- The proposed facility is purpose-built for testing, has the appropriate permits to operate, and can complete the requisite NEPA review.
- The application is complete and indicates the necessary expertise, site access, equipment, and availability to conduct at least one testing activity a year if matched with an appropriate technology developer.

- The proposed applicant’s personnel possess the necessary knowledge, skills, and abilities to perform the specified tests.
 - The proposed applicant has appropriate safety procedures in place to protect personnel and the public from the relevant hazards associated with testing.
 - The proposed facility has the appropriate facilities, equipment, and material handling infrastructure to carry out the specified tests.
- The scope, cost, and duration of the proposed project activities are reasonable and within the intended purpose of the Voucher Program.

The following criteria will be used by DOE to review and select **voucher recipient** applications for voucher projects.

- The application demonstrates a direct relevance and benefit to advancing the technology and commercial readiness of a feasible, cost-effective, and scalable transmission and distribution technology that supports an affordable, reliable, and secure electric grid.
- The proposed technologies and objectives require physical testing capabilities that are within scope of the identified testing facilities to advance the readiness of the technology.
- The proposed objectives are feasible and achievable given the scope of the voucher opportunity.
- The application involves answering technical and performance questions that require testing at technology readiness level (TRL) 6 (engineering/pilot-scale, similar (prototypical) system validation in a relevant environment) to TRL 8 (Actual system completed and qualified through test and demonstration).
- The application clearly indicates that the applicant team can dedicate the time, personnel, materials, and resources needed to work with a testing facility to develop a plan of testing, conduct the tests, and evaluate results to inform refinements to the technology.

DOE retains the prerogative to require additional information from the applicants to verify the applicant meets the eligibility requirements and selection criteria. DOE-OE may disqualify an application for any reason, including but not limited to if the applicant engages with the Voucher Program in a manner that, in the sole discretion of DOE-OE, is indecent, obscene, or lacking in professionalism. This includes but is not limited to the application itself or emails to the facilities or Voucher Program staff.

The selection process for voucher applications is competitive and subject to available funding. DOE retains the prerogative to decide whether to fund the proposed project entirely, partially, or not at all. Per DOE-OE’s discretion, applicants may be selected as an alternate to be awarded if funding becomes available. Awarding the voucher is dependent on successfully establishing an agreement between the matched voucher provider and the voucher recipient.

Project Milestones

All projects will be required to complete the following four milestones, including:

- Milestone 1 – Memorandum submitted to the VO-12 point of contact verifying that all requisite agreements (e.g., nondisclosure agreements, Cooperative Research and Development Agreement (CRADA), site access paperwork) between the voucher provider

and voucher recipients are completed. This document must be signed by both the voucher provider and recipient.

- Milestone 2 – Test plan document submitted to the VO-12 point of contact describing the scope and schedule for the planned testing activities.
- Milestone 3 – Testing progress update presentation submitted to the VO-12 point of contact containing a status description of testing activities and any relevant images. A virtual meeting may also be requested by VO-12 Program staff.
- Milestone 4 – Submission of a project summary report to the VO-12 point of contact containing a summary of the project objectives, methods, test procedures, equipment, images, results, discussion, and attachments with relevant data.

The voucher provider is responsible for timely submission of all milestones to the VO-12 point of contact, but provider and recipient are expected to work collaboratively on project milestones. Templates will be provided for each milestone submission.

The schedule of milestones due dates will depend on the project and will be established in the relevant agreement between VO-12 and the voucher provider. Milestones 1 and 2 must be completed before testing activities can begin. Milestone 3 should be completed approximately 50%–75% through the project timeline, while testing is ongoing. Milestone 4 may not be scheduled beyond one year after the start of the project; participants must complete project activities within one year of the agreement start date.

Definitions

- **Voucher Providers (Test Facilities):** U.S.-based national, federal, private, or university labs with one or more testing capabilities directly relevant to electric power transmission or distribution technologies. Test facilities may be a part of a larger organization (e.g., national laboratory) with multiple facilities but generally operate independently and with a significant level of autonomy.
- **Voucher Recipients (Technology Developers):** U.S.-based for-profit companies, nonprofit research organizations, or academic institutions developing an electric transmission and distribution technology. Technologies of interest include but are not limited to: Grid-connected power electronics converters, Solid State Transformers, Advanced transformers, Advanced cables and conductors, Advanced Power Flow Control Devices, Medium-Voltage Direct Current Devices, Advanced protection equipment, Grid Automation and AI Applications, Virtualization of Substation Protection and Controls, Advanced Sensors and Analytics, secure communication technologies, Grid Management, Control, and Optimization Software, and wildfire mitigation technologies.
- **Testing Capability (or Capability):** the technical support service provided by a test facility to achieve a specific testing objective that advances the understanding, technology readiness, or commercial readiness of an innovative electric transmission or distribution technology via physical testing in a laboratory or controlled environment. Capabilities are provided at a fixed cost, set by the voucher provider, and must be repeatable and time-bound with measurable deliverables and outcomes. Capabilities should include the lab spaces, equipment, procedures, staff (including expertise and labor), time, site access, and other

resources to complete the testing objective. Capabilities must involve physical testing in a purpose-built laboratory environment. Capabilities may include modeling, simulation, analysis, or other software services if paired with an eligible physical testing service.

- **Voucher Projects:** electric grid testing activities conducted by a selected voucher provider-recipient pair. Vouchers for testing services, worth between \$50,000 and \$250,000, will be distributed as in-kind support, meaning that ENERGYWERX will directly reimburse the voucher provider for the work they have completed on behalf of the voucher recipients. Only work related to physical testing of innovative electric transmission and distribution technologies will be eligible to receive a voucher under this opportunity.

The following tables provide descriptive context for the testing capability categories and subcategories of interest. These categories are used primarily for filtering projects and enable voucher recipients to find relevant capabilities more easily. These categories are not exhaustive and are subject to change.

Voucher providers may select only one primary category and should select the most relevant if multiple are applicable.

Capability Primary Category	Description
Grid Simulation and Control Testing (SIM)	Testing integrates real hardware or controllers with simulated or representative power system environments to validate dynamic behavior, control algorithms, and interactions in a safe, controlled setting.
Electrical Performance Testing (ELEC)	Tests that verify the equipment's ability to handle electrical stresses and faults, including tests that demonstrate insulation integrity.
Mechanical Performance Testing (MEC)	Evaluates physical robustness and ability to endure mechanical stresses encountered in service.
Environmental Stress and Accelerated Aging Testing (ESAAT)	Expose equipment to harsh environmental conditions to confirm long-term reliability and performance.
Security Testing (SEC)	Assesses protections against unauthorized access, cyber threats, terrorist attacks, and physical tampering.

Material Characterization and Failure Analysis (MAT)	Involves detailed examination of materials properties and other techniques to understand failure modes and degradation mechanisms of power system equipment.
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Voucher providers may select multiple subcategories if directly applicable to the capability.

Capability Subcategory	Description
SIM-Power Hardware-in-the-Loop (PHIL) Testing	Connects physical power devices such as inverters or converters to a real-time simulation of the grid via high power amplifiers, enabling closed-loop testing of real power exchange and hardware response under realistic grid conditions.
SIM-Controller Hardware-in-the-Loop (CHIL) Testing	Integrates physical controllers such as relays or inverter control units with real-time simulations of the power system, focusing on signal-level interactions without full power exchange.
SIM-Operational Technology / Real-time operations Testing	Validates real-time control, monitoring, and automation systems in operational technology (OT) environments, ensuring timely response, data accuracy, and stability during grid operations.
SIM-Power Electronics & PFC Device Specialized Testing	Evaluates performance, efficiency, and control of power electronic converters and power flow control (PFC) devices, including Flexible AC Transmission Systems (FACTS) devices under various operating scenarios.
SIM-Protection and Control System, Substation Automation Testing (including interoperability)	Assesses protective relays, control logic, and substation automation systems for correct operation, coordination, and seamless communication across multi-vendor equipment (interoperability per standards like IEC 61850).
SIM-Microgrid and Islanding Mode Testing	Simulates islanded operation and seamless transition between grid-connected and islanded modes for microgrids.
SIM-Grid Integration Testing	Actual operational grid test bed to confirm compliance with grid codes for interconnection, including response to extreme grid events such as fault ride-through and power quality impacts of large dynamic loads.
ELEC - High Voltage Dielectric Testing	Applies high voltages to assess insulation withstand capability, ensuring no breakdown or flashover occurs (AC/DC withstand or impulse tests per IEC/IEEE standards). Includes wet dielectric testing which simulates rainfall while high voltage is applied.
ELEC - Short Circuit and Fault Interruption Testing	Simulates high fault currents to verify equipment such as circuit breakers can safely interrupt and withstand short-circuit conditions without failure.

ELEC - Arc Flash and Fault Simulation Testing	Recreates arcing faults to evaluate incident energy, protective boundaries, and equipment resilience against arc flash hazards.
ELEC – Partial Discharge and Dissipation Factor Testing	Detects localized insulation defects (partial discharges) and measures dielectric losses (dissipation factor/ $\tan \delta$) to assess insulation quality and aging.
ELEC – Overload and Continuous Current Testing	Verifies equipment can carry rated or overload currents continuously without excessive heating or degradation.
ELEC – Power Quality and Transient Evaluation	Monitors and analyzes voltage/current waveforms for disturbances (harmonics, sags, swells, transients) and records events for performance evaluation.
ELEC – Accuracy and Dynamic Range of Sensors	Demonstrate the accuracy and dynamic range of new power system sensors.
ELEC – Electromagnetic Compatibility (EMC) and Immunity Testing	Verifies emission limits and immunity to electromagnetic interference, including high-altitude electromagnetic pulse (EMP) effects.
MEC – Mechanical Strength and Structural Integrity	Assesses the mechanical properties of power system equipment by simulating mechanical stresses such as tensile loads, torsional forces, cantilever loads, etc.
MEC – Vibration and Seismic Testing	Simulates vibrations (transport, installation, operation), conductor dynamics, or seismic events to ensure equipment remains functional and undamaged in extreme events.
ESAAT – Environmental Chamber Testing	Subjects equipment to controlled temperature, humidity, ultraviolet light, and other ambient variations to verify operation across specified ranges.
ESAAT – Salt Fog and Corrosion Testing	Tests resistance to corrosive environments (coastal conditions) using salt spray exposure.
ESAAT – Thermal Cycling and Temperature Rise Testing	Cycles equipment through temperature extremes and measures temperature rise under load to ensure thermal limits are not exceeded.
ESAAT – Wildfire Resilience	Tests to determine components' ability to cause a wildfire and/or its ability to withstand wildfire conditions.
SEC – Information Technology and Cyber Security Testing	Evaluates IT/OT systems for vulnerabilities, resilience against cyberattacks, and compliance with cybersecurity standards.

SEC – Physical Security Testing	Tests barriers, access controls, and enclosures against physical intrusion or tampering.
MAT – Materials Characterization and Analysis	Examines material properties to assess suitability and degradation.
MAT – Failure Investigation	Analyzes failed components or systems to determine root causes through forensic methods.