

U.S. Department of Energy Incentive Prize Competition on Microgrids

SUMMARY: The U.S. Department of Energy (DOE) announced the administration of an incentive prize competition titled “Microgrid Competition”. The goal of this Department of Energy Incentive Prize Competition is to support implementation of microgrids to enhance resiliency of the U.S. grid and to provide a cleaner and more efficient and cost-effective power system. The concept of this Competition originated from the Resilience Incentive Prizes Workshop that was sponsored by the Sandy Rebuilding Task Force to harness innovation and generate breakthroughs in energy infrastructure resilience and to help communities become more resilient to future events that may occur. The Competition is in further support of the DOE-led grand challenges to make the U.S. grid more resilient.

The Competition will award prizes for operational microgrids in the U.S. with interconnected distributed energy resources (DER) that provide uninterruptible power to critical facilities and services during emergencies. Critical facilities and services are defined by the Contestants, but typically involve those associated with preserving public health and safety. Under this Competition, critical facilities and services are grouped into the following six segments: municipal facilities; commercial facilities; industrial facilities and activities; emergency shelters; healthcare and hospitals; and other government facilities. Each Submission must clearly identify for which one of the six competition segments it is being entered. Contestants also are encouraged to partner with local utilities in the Competition submission.

A total of \$600,000 in prizes is considered to be awarded under this Competition, i.e., one award of \$100,000 in each of the six segments. The award will recognize the operational microgrid in

each segment that has had the best current performance, with evidential data of the record, in enhancing grid resiliency and providing a cleaner and more efficient and cost-effective energy system. Each winner will be invited to a public announcement event hosted by the DOE and its supporters and will be highlighted on the DOE's Web site.

Submission Period: July 1, 2014, to August 29, 2014, 11:59 PM EDT

Judging Period: September 2, 2014, to September 30, 2014

Data Validation Period: October 1, 2014, to October 20, 2014

Announcement of Winners: October 22, 2014, to October 31, 2014

FOR FURTHER INFORMATION: Questions regarding this Competition, its requirements, or evaluation criteria can be submitted to MicrogridCompetition@hq.doe.gov.

On This Page: Competition Details

- I. How Does the Competition Work?
- II. Submission Requirements
- III. Rules of the Competition
- IV. Evaluation of Submissions
- V. Verification and Announcement of Winners
- VI. Authority and Prize Amount
- VII. Privileged or Confidential Information
- VIII. Additional Terms and Conditions

IX. Contact Information

Appendix A: [Microgrid Operational Data Template File \(Excel, 33 KB, for downloads\)](#).

Appendix A is available at <http://www.energy.gov/microgridchallenge>.

I. How Does the Competition Work?

The U.S. Department of Energy (DOE) Office of Electricity Delivery and Energy Reliability (OE) is hosting a national competition among operational microgrids to enhance grid resiliency and provide a cleaner and more efficient and cost-effective energy system. All Contestants must submit (1) complete microgrid system design and benefit documentation and (2) complete microgrid operational data using the template file in [Appendix A](#).

The microgrid system design and benefit documentation shall include a description of the following:

- Boundaries of the microgrid system
- DER, electrical loads (critical and noncritical), and thermal loads (if present) in the microgrid
- Locations and quantities of fuel sources for microgrid generation assets
- Distributed resources interconnection application accepted by the utility with jurisdiction
- The microgrid electrical circuit diagram including the locations of the DER, microgrid switch, critical and noncritical electrical loads, thermal loads, microgrid protection equipment, utility protection equipment, and the interface with the area electric power system (EPS)

Using the information and data submitted, the DOE will evaluate each Submission according to four performance criteria: resiliency, clean energy system, system energy efficiency, and cost effectiveness. This evaluation will result in a score for each criterion. For example, a Submission will receive one score designated as “A” for resiliency, a score “B” for clean energy system, a score “C” for system energy efficiency, and a score “D” for cost effectiveness. In each of the six competition segments, the Submission that has the highest combined score from all four criterion scores (i.e., A+B+C+D) will be considered for a Microgrid Most Valuable Participant (MVP) Award. The six competition segments, each defined by the primary type of customer facilities or activities receiving service from the microgrid, are:

Segment #1: Municipal facilities (e.g., police stations, fire stations, water and wastewater facilities)

Segment #2: Commercial facilities (e.g., telecom/data centers, financial centers)

Segment #3: Industrial facilities and activities (e.g., transportation, critical manufacturing, fuel supply chain)

Segment #4: Emergency shelters (e.g., housing, lodging, schools, etc.)

Segment #5: Healthcare/hospitals

Segment #6: Other government facilities (military and non-military)

The microgrid for Submission can be owned and/or operated by customers, electric utilities, or independent providers. Depending on the Submissions received, the DOE anticipates making one Microgrid 2014 MVP Award in each segment, with up to a total of six MVP Awards to be

made under this Competition. Each Microgrid 2014 MVP Award recipient will receive a cash prize of \$100,000.

Each Submission will be evaluated according to the following performance criteria, with a numeric score of 0-25 resulting under each criterion.

Score A (0-25) for Resiliency

Resiliency will be evaluated and scored based on adequacy of black start capabilities for microgrid generation assets, ability to island from and reconnect with the area EPS that meets the requirements of the IEEE 1547™ Standard for Interconnecting Distributed Resources with Electric Power Systems, and adequacy and essential nature of critical facilities and loads in the microgrid. In addition, the adequacy and availability of microgrid generation and storage assets to meet and exceed the customer-defined objectives for resiliency will be evaluated and scored. These objectives include the duration required for the microgrid to continuously serve all critical loads during grid outages and the ability to support future added critical loads to the microgrid. Lastly, access to uninterruptible fuel sources for generators will be evaluated and scored to ensure that all critical loads can be adequately served for the specified outage duration.

Score B (0-25) for Clean Energy System

The Cleanness of the microgrid system is measured by the percent reduction in the annual marginal CO₂ emissions resulting from microgrid operation, as compared to the base case of no DER or microgrid for the same boundary area. It is calculated as follows:

$$\text{Reduction in total annual marginal CO}_2 \text{ emissions (\%)} = 1 - (\text{total emissions with microgrid operation} / \text{total emissions for the base case of no DER or microgrid})$$

Total emissions include both emissions produced outside of the microgrid boundary (i.e., emissions associated with the generation, transmission, and distribution of electricity that is inputted to the microgrid area) and those generated within the microgrid area. For the purpose of this Competition, the published annual marginal CO₂ emission factors¹ for the corresponding region of each microgrid area (also shown in the data file template, under tab “MEFs”) will be used to assess total emissions and the % reduction per the formula above.

Score C (0-25) for System Energy Efficiency

This evaluation will be based on the percent improvement in system energy efficiency, using the formula below:

$$\text{Improvement in system energy efficiency (\%)} = 1 - (\text{total energy supplies after microgrid implementation} / \text{total energy supplies before microgrid implementation})$$

¹ Siler-Evans, K., Azevedo, I.L., Morgan, M.G., (2012). Marginal emissions factors for the US electricity system. *Environmental Science & Technology*, 46 (9), pp. 4742–4748.

Total energy supplies for both before and after microgrid implementation include the total utility-supplied electrical and thermal energy (i.e., electricity and other fuel supplies, with all converted to source or primary BTU²) used to serve the same loads year-round.

Score D (0-25) for Cost-effectiveness

Cost effectiveness will be measured based on the NPV (net present value) of the microgrid project in \$/kW. The components for the NPV calculation shall include fixed costs (design, permitting, interconnection, installation, commission testing, etc.), annual costs (operation and maintenance [O&M], fuels, electricity import, etc.), and annual savings (from utility bills, reduced downtime, ancillary services, etc.). For the purpose of this Competition, the NPV is calculated by deducting the total costs from the sum of the annual cash flows over the project duration of 10 years using a discount rate of 10%. The annual cash flows are the net annual savings, which are the annual savings from microgrid operation less the annual costs of microgrid operation.

II. Submission Requirements

The Submission requirements are as follows:

² For the purpose of this Competition, the conversion of electric energy to primary BTU is 11,480 BTU/kW-hr.

1. Download and complete the [Microgrid Operational Data Template File \(Excel, 33 KB\)](#),
and
2. Email both the completed microgrid system design and benefit documentation and the
completed microgrid operational data file to MicrogridCompetition@hq.doe.gov by
August 29, 2014.

III. Rules of the Competition

The following rules apply to this Competition.

- To be eligible, all competing microgrids must meet the following definition of a microgrid: a group of interconnected loads and DER within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid and can connect and disconnect from the grid to enable it to operate in grid-connected or island mode.
- All competing microgrids must have more than 150 kW of aggregated generation capacity serving two or more critical facilities.
- All entities are eligible to enter their operating microgrids in the U.S. or its Territories in this Competition, inclusive of those owned and/or operated by customers, electric utilities, or independent providers.

- Further, in accordance with the America COMPETES Reauthorization Act of 2010, 15 U.S.C. 3719(g), the following requirements must be met to be eligible to win a prize under this Competition:
 - (1) A private entity shall be incorporated in and maintain a primary place of business in the United States; an individual, whether participating singly or in a group, shall be a citizen or permanent resident of the United States; and
 - (2) An individual or entity may not be a Federal entity or Federal employee acting within the scope of their employment."
- Each Submission must clearly identify for which one of the six competition segments it is being entered. Although each entity is allowed to submit more than one microgrid project under this Competition, only one microgrid project can be entered by an entity in each segment. Also, the same microgrid project cannot be entered into more than one segment.
- All Contestants must submit complete microgrid system design and benefit documentation. The documentation must not exceed 20 pages, including cover page, table of contents, charts, graphs, maps, photographs, tables, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left, and right) {single spaced} with font not smaller than 11 point.

All Contestants must submit complete microgrid operational data using the template file in [Appendix A](#). All Submissions must provide one full year of microgrid operational data for the period of June 1, 2013 to May 31, 2014 and one full year of the base-case data for the same yearly period (i.e., June 1 to May 31) immediately before microgrid operation. For example, if

the microgrid project began its full operation in July 2011, the full-year microgrid operational data will be for the period of June 1, 2013 to May 31, 2014 and the full-year base-case data will be for the period of June 1, 2010 to May 31, 2011. All Submissions including complete system design and benefit documentation (submitted in a single file named “DesignBenefit.pdf”) and operational data file (submitted in a single file named “data.xls or .xlsx”) must be submitted before the Competition deadline of August 29, 2014.

IV. Evaluation of Submissions

All Submissions that meet the Competition rules will then be subject to evaluation by an expert panel. The expert panel will be appointed by the DOE, may include both Federal and non-Federal personnel, and will determine the Microgrid 2014 MVP Award winners. Each Submission will be evaluated on the four performance criteria and will be given a score for each criterion. The Submission that receives the highest combined score for all four performance criteria in each of the six competition segments is the presumptive winner for that segment.

The presumptive winners will be required to have their microgrid design/benefit information and operational data (before and after microgrid implementation) validated by the DOE Technical Advisory Group (TAG) before receiving the Microgrid 2014 MVP Award. The TAG comprises microgrid experts from DOE national laboratories.

The DOE reserves the right not to make a Microgrid MVP Award in a segment, if there are few qualifying Submissions submitted to that segment or if the submitted information or data cannot be validated by the TAG.

V. Verification and Announcement of Winners

The DOE anticipates notifying the Competition winners of the Microgrid 2014 MVP Award in October 2014. Each winner will be required to sign and return to the DOE, within ten (10) days of the date that the notice was sent, an Affidavit of Eligibility and Liability/Publicity Release (except where prohibited) in order to claim the award cash prize. At the sole discretion of the DOE, a potential winner will be deemed ineligible to receive the \$100,000 cash prize if the entity fails to sign and return the affidavit of eligibility and liability/publicity release within the required time period or if the Submission or the entity is disqualified for any other reason. In the event of a disqualification of a winner, the DOE, at its sole discretion, may award the applicable prize to an alternate winner. Winners will be invited to a public announcement event hosted by the DOE and its supporters and will be highlighted on the DOE's Web site.

VI. Authority and Prize Amount

This Competition is being conducted under the authority of the America COMPETES Reauthorization Act of 2010, 15 U.S.C. 3719. Monetary prizes will be awarded subject to the availability of funds. The DOE reserves the right to suspend, cancel, extend, or curtail the

Competition as required or determined by appropriate DOE officials. Nothing within this document or in any documents supporting the Competition shall be construed as obligating the DOE or any other Federal agency or instrumentality to any expenditure of appropriated funds, or any obligation or expenditure of funds in excess of or in advance of available appropriations. The DOE will award a single dollar amount to a winning Team, and each Team, whether consisting of a single or multiple Contestants, is solely responsible for allocating any prize amount among its member Contestants as they deem appropriate. The DOE will not arbitrate, intervene, advise on, or resolve any matters between entrant members. It will be up to each winning Team to reallocate the prize money among its member Contestants, if they deem it appropriate.

VII. Privileged or Confidential Information

All materials submitted to the DOE as part of a Submission become DOE records and cannot be returned. The DOE will use the materials to evaluate a Submission in accordance with the Rules of the Competition, as well as to establish benchmark performance for operating microgrids from information contained in all Submissions.

The Freedom of Information Act (FOIA) and its amendments have resulted in an increasing number of requests from outside the Government for copies of materials submitted to federal agencies. If a Contestant's Submission contains information that he/she believes should be withheld from such requestors under FOIA on the grounds that they contain "trade secrets and commercial or financial information" [5 USC§552(b)(4)], the Contestant should:

1. Mark the title page with the following legend:

“Some parts of this document, as identified on individual pages, are considered by the Contestant to be privileged or confidential trade secrets or commercial or financial information not subject to mandatory disclosure under the Freedom of Information Act. Material considered privileged or confidential on such grounds is contained on page(s) _____”; and

2. Mark each individual item considered privileged or confidential under FOIA with the following legend:

“The data or information is considered confidential or privileged, and is not subject to mandatory disclosure under the Freedom of Information Act.”

Whenever a document submitted to the DOE contains information which may be exempt from public disclosure, it will be handled in accordance with the procedures pursuant to 10 CFR Section 1004.11 and described below. While the DOE is responsible for making the final determination with regard to the disclosure or nondisclosure of information contained in requested documents, the DOE will consider the Contestant's views in making its determination.

- (a) When the DOE may determine, in the course of responding to a FOIA request, not to release information submitted to the DOE without seeking any or further Contestant's views, no notice will be given the Contestant.

(b) When the DOE, in the course of responding to a FOIA request, cannot make the determination without having the consideration of the Contestant's views, the Contestant shall be promptly notified and provided an opportunity to submit its views on whether information contained in the requested document (1) is exempt from the mandatory public disclosure requirements of the FOIA, (2) contains information referred to in 18 U.S.C. 1905, or (3) is otherwise exempt by law from public disclosure. The DOE will make its own determinations as to whether any information is exempt from disclosure. Notice of a determination by the DOE that a claim of exemption made pursuant to this paragraph is being denied will be given to a person making such a claim no less than seven (7) calendar days prior to intended public disclosure of the information in question.

(c) Criteria to be applied by the DOE in determining whether information is exempt from mandatory disclosure pursuant to 5 U.S.C. 552(b)(4) include:

- (1) Whether the information has been held in confidence by the person to whom it pertains;
- (2) Whether the information is of a type customarily held in confidence by the person to whom it pertains and whether there is a reasonable basis therefor;
- (3) Whether the information was transmitted to and received by the Department in confidence;
- (4) Whether the information is unavailable in public sources;
- (5) Whether disclosure of the information is likely to impair the Government's ability to obtain similar information in the future; and

- (6) Whether disclosure of the information is likely to cause substantial harm to the competitive position of the person from whom the information was obtained.

VIII. Additional Terms and Conditions

Competition Subject to Applicable Law: The Competition is subject to all applicable Federal laws and regulations. Submitting to this Competition constitutes each Team and/or Contestant's agreement to the official rules as set forth on <http://www.energy.gov/microgridchallenge> and administrative decisions, which are final and binding in all matters related to the Competition. Eligibility for a prize award is contingent upon fulfilling all requirements set forth herein.

Publicity: Except where prohibited, participation in the Competition constitutes each winner's consent for the DOE and its agents to use each winner's Submission information for promotional purposes through any form of media, worldwide, without further permission, payment, or consideration.

Liability and Insurance: Any and all information provided by or obtained from the Federal Government is without any warranty or representation whatsoever, including but not limited to its suitability for any particular purpose. Further, in accordance with 15 U.S.C. § 3719(i), each Contestant shall provide proof of general liability insurance of \$1 million per incident and a \$5 million umbrella policy for claims by a third party for death, bodily injury, or property damage or loss resulting from an activity carried out in connection with the Competition, with the Federal Government named as an additional insured under the Contestant's insurance policy.

Additionally, Contestants must agree to indemnify the Federal Government against third party claims for damages arising from or related to competition activities and for damage or loss to Government property resulting from such an activity.

Taxes: Winners are responsible for both reporting and paying all applicable Federal, state, and local taxes payable from any prize amounts awarded under this Competition.

IX. Contact Information

For questions about this Competition, contact DOE at MicrogridCompetition@hq.doe.gov.