



ARPA-E GO COMPETITION CHALLENGE 1: RULES

1. INTRODUCTION

The Advanced Research Projects Agency-Energy (ARPA-E) is challenging the research and industrial communities to successfully discover, develop, and test innovative and disruptive software solutions for a variety of critical energy challenges and to overcome existing barriers. This effort begins with the design of a competition, which will provide fair and transparent comparisons of industrially relevant modeling and algorithmic approaches on high-fidelity, open-access, large-scale problems and will provide a platform for the identification of transformational approaches.

The Grid Optimization (GO) Competition Challenge 1, which will focus on the security-constrained optimal power flow (SCOPF) problem, is the first effort associated to this broader pursuit. The broader goal of the existing and all future challenges of the GO Competition is to accelerate the development of transformational and disruptive methods for solving problems related to the electric power grid and to provide a transparent, fair, and comprehensive evaluation of new solution methods. In particular, the GO Competition seeks to identify innovative power system optimization and control methods that will accelerate the development and adoption of emerging technologies. Innovative solutions that are identified by the GO Competition will enable increased grid flexibility, reliability, and resiliency while also significantly increasing energy security, providing greater energy efficiency, and substantially reducing the costs of integrating emerging technologies and resources into the electric power system in the United States.

The GO Competition will consist of multiple challenges, with Challenge 1 focusing on the SCOPF problem and future challenges potentially focusing on a variety of topics: grid resiliency, dynamic operations and grid stability, stochastic optimization, distributed energy resource management and coordination, transmission and distribution integration challenges, as well as other grid challenges.

All relevant GO Competition information, documentation, and access can be found on the GO Competition website (<https://gocompetition.energy.gov/>).

2. PARTICIPATING IN THE GO COMPETITION

The term **Entrants** will be used to refer to all participants; Eligible Entrants make up the subset of Entrants that are eligible for awards (see Section 2.B below for the requirements to be eligible for awards). All Entrants will be evaluated against the same criteria and will be placed on the leaderboards. All Entrants agree to the terms and conditions stated in this Rules Document when registering for the GO Competition. ARPA-E reserves the right to require additional documentation demonstrating an Entrant's compliance with the rules of the GO Competition at any time.

A. Proposal Entrant Path and Open Entrant Path

ARPA-E will provide two paths for participating in the GO Competition Challenge 1: a path for Proposal Entrants and a path for Open Entrants. The Open Entrant Path allows any Entrant to be placed on the GO Competition leaderboards without being selected by ARPA-E DE-FOA-0001952 as a Proposal Entrant. Eligible Entrants (i.e., Entrants that will be eligible for an award) are those that are selected by and successfully complete negotiations for award with ARPA-E under the Proposal Entrant Path (see ARPA-E DE-FOA-0001952) and the subset of Open Entrants that meet specific eligibility requirements (defined below in Section 2.B of this Rules Document); all Eligible Entrants will compete for awards and will be placed on the leaderboards. The Proposal Entrant Path will likely consist of up to 20 teams selected through ARPA-E DE-FOA-0001952 and awarded up to \$250,000 to develop an entry for Challenge 1. Proposal Entrants that place among the top ten performers in Challenge 1 (see additional information on scoring and awards on the GO Competition website) will receive additional grant funding. Rankings on the GO Competition leaderboards will be based on the same technical evaluation criteria and scoring mechanisms for all Entrants, irrespective of track or eligibility for an award.

B. Eligibility for Awards

Any Entrant that wishes to compete in the GO Competition Challenge 1 **for awards** (prize money for Open Entrants and follow-on grant funding for Proposal Entrants) must agree and adhere to the following terms and conditions, in order to be classified as an Eligible Entrant.¹ An Eligible Entrant must satisfy the following requirements.

- 1) Each Eligible Entrant team must **include and be led by** an approved U.S. Entity: a U.S. Citizen, U.S. Permanent Resident, or U.S. Organization. A U.S. Organization (such as a U.S.-based corporation or university) may compete while having employees that are not U.S. Citizens or U.S. Permanent Residents. An Eligible Entrant team may include Foreign Nationals and foreign entities as team members.
- 2) An Entrant from an organization that employs individuals funded by ARPA-E to facilitate the design and development for the GO Competition Challenge 1 or to create or validate

¹ Individuals or organizations that do not meet requirements to be eligible to receive awards may still participate in the GO Competition by submitting their program for evaluation and they will be placed on the leaderboards. Such non-eligible Entrants must still register through the official GO Competition website and they can be listed on the leaderboard alongside Eligible Entrants.

datasets to be used in the GO Competition Challenge 1 may compete in the GO Competition Challenge 1 and is eligible for awards (prize money for Open Entrants or a follow-on grant for Proposal Entrants).² However, ARPA-E will require that an Eligible Entrant in this scenario submit a signed affidavit confirming that the Eligible Entrant had no assistance from individuals supporting the GO Competition and that no individual supporting the GO Competition is a member of the Eligible Entrant team.

- 3) Additional restrictions apply for all Entrants, as stated throughout this Rules Document and by the terms and conditions specified on the GO Competition website.

There are additional eligibility requirements for Proposal Entrants, which are contained within ARPA-E DE-FOA-0001952.

C. Additional Entrant Restrictions

The following additional restrictions apply to all Entrants.

- 1) The Entrant cannot be a Federal entity³ and any individual participating on an Entrant team cannot be a Federal employee acting within the scope of his/her employment. A Federal employee acting outside the scope of his or her employment should consult his or her ethics official and must receive approval from his or her supervisor before participating in the GO Competition Challenge 1.
- 2) ARPA-E employees and contractors,⁴ along with their spouses, dependents, and household members, cannot participate in the GO Competition.
- 3) Any DOE Federal employee, prior ARPA-E employee, or individual working on or supporting the GO Competition Administrator (Pacific Northwest National Laboratory),⁵ which has assisted, is assisting, or will assist in the design or operation of the GO Competition Challenge 1, in creation of the GO Competition software platform for Challenge 1, or in the evaluation of the Entrant submitted approaches for Challenge 1, cannot participate in Challenge 1 and their spouses, dependents, and household members cannot participate in Challenge 1.⁶
- 4) Individuals that are funded by ARPA-E to support the GO Competition Challenge 1 cannot participate in the GO Competition Challenge 1. This group includes, but is not limited to, any particular individual with the specific tasks to create or validate datasets

² For example, if a university has an ARPA-E DE-FOA-0001357 GRID DATA awardee working on dataset generation for the GO Competition, an Entrant from that university may compete in the GO Competition so long as each individual from that Entrant team did not receive any assistance from the ARPA-E DE-FOA-0001357 awardee team, from other individuals supporting ARPA-E for the GO Competition, or have any role in supporting ARPA-E for the GO Competition.

³ Government Owned Contractor Operator (GOCO) facilities (e.g., a DOE National Laboratory) may participate in the GO Competition as an Entrant that is made up of non-federal employees and/or federal employees, which satisfy the requirements specified in this Rules Document and the terms and conditions posted on the GO Competition website.

⁴ ARPA-E support contractors include Booz Allen Hamilton, Inc. and Quantitative Scientific Solutions, LLC.

⁵ This group includes, but is not limited to, specific individuals at Arizona State University, the Pacific Northwest National Laboratory, and the University of Wisconsin.

⁶ The GO Competition Administrator and staff may test programs on the platform to ensure functionality. During any such testing phase, their program will be displayed on the Leaderboards. However, their submissions will be removed for Trial 1, Trial 2, and the Final Event.

that are used in the GO Competition Challenge 1 (including certain project awardees funded under ARPA-E GRID DATA DE-FOA-0001357).^{7,8}

- 5) Reviewers for ARPA-E DE-FOA-0001952 cannot participate in the GO Competition Challenge 1.
- 6) Any individual that is not a Federal employee that wishes to compete outside of the scope of his/her employment must comply with the rules established by his/her employer.
- 7) An individual, organization, or sponsor cannot participate in the GO Competition if he, she, or it is on the Specially Designated Nationals list.

D. Unique Technological Approach

Each Entrant must submit its own unique technological approach that has been developed by that Entrant or Entrant team. Multiple submissions of a unique technological approach are not permitted. A unique technological approach is defined as a distinct algorithmic approach. Minor variations in the same underlying algorithmic approach are considered to be non-unique approaches. For instance, variations in inputs and parameter settings with the same underlying algorithmic approach will not be considered unique. ARPA-E reserves the right to perform technical due diligence to verify that each Entrant's approach represents a unique algorithmic approach, particularly when multiple algorithmic approaches are submitted by Entrants affiliated with the same organization; this due diligence may include, but is not limited to, inspection of the underlying source code.⁹ Entrants violating this policy will have their submission removed from the GO Competition, will not be placed on the leaderboard, and will not be eligible for awards.

E. Entrant Team Members

Entrants may work alone or with one or more additional individuals or organizations as members of an overall Entrant team. Each Entrant must identify a point of contact, an Entrant Team Leader, for the duration of the GO Competition; please refer to the Entrant forms on the GO Competition website. **Individuals may participate on only one Entrant team.** An organization (e.g., a university or private company) may have multiple Entrant teams but the same individual cannot be on more than one Entrant team. This rule applies to all Entrant teams, both Open Entrants and Proposal Entrants.

⁷ This group includes, but is not limited to, specific individuals funded by ARPA-E through financial assistance awards with the National Renewable Energy Laboratory, the Pacific Northwest National Laboratory, Texas A&M University, and the University of Wisconsin.

⁸ If such individuals wish to test their algorithmic approaches on the GO Competition Challenge 1 platform, they may do so only after the GO Competition Challenge 1 has ended and all publicly available datasets have been released to the public. These individuals cannot submit their algorithmic approach at any time before the end of the GO Competition Challenge 1.

⁹ If inspection is required, it will be performed by ARPA-E Federal employees or authorized ARPA-E contractors who are under an obligation to maintain the material they inspect in confidence.

F. Entrant Sponsors

Entrants may be sponsored by an individual or organization (excluding all official GO Competition sponsors listed on the website). Official sponsors of the GO Competition cannot compete for awards.

G. Proposal Entrants

Proposal Entrants for Challenge 1 are those that have been competitively selected and successfully completed award negotiations under the ARPA-E DE-FOA-0001952. Proposal Entrants must also register for the GO Competition in the same manner as any other Entrant. For more information on how to register for the GO Competition, please visit the GO Competition website.

H. Entrant Registration

All Entrants must register for the GO Competition. There is no fee for entry. Entrant materials are available on and must be submitted in accordance with the instructions outlined on the GO Competition website. Entrants must be registered on the website with all relevant information submitted to ARPA-E no later than later than 12:00 noon (U.S. Eastern Time), TBD for Challenge 1.

I. Entrant Team Member: Minor

Any minor that wishes to participate in the GO Competition must submit, with his or her registration, a written statement signed by the minor's legal guardian authorizing the minor to participate. See the GO Competition website for the Entrant form for minors.

3. GO COMPETITION CHALLENGE 1 TIMELINE

The complete timeline of Challenge 1 is outlined in the GO Competition Challenge 1 Timeline document on the GO Competition website. The deadline to register for the GO Competition Challenge 1 can be found in Section 2.G and Section 2.H of this Rules Document.

4. GO COMPETITION CHALLENGE 1 DATA

The ARPA-E GRID DATA datasets, which will be used for the GO Competition Challenge 1, will be publicly released periodically throughout the GO Competition Challenge 1 for use without restriction. The datasets specifically used for Trial Event 1, Trial Event 2, and the Final Event of Challenge 1 will only be released to the public after the end of each event; refer to the GO Competition Challenge 1 Timeline for more information as to the dates when the datasets will be released. All released datasets can be used with publicly available software.

5. SCORING

For scoring information, which is subject to change at different stages of the GO Competition Challenge 1, see the GO Competition website and associated scoring document.

Scoring will be automated through the GO Competition platform (i.e., no person will be directly judging software). The software used to determine the scores for the Entrants’ submissions will be available on the GO Competition website as an open-source software package before Trial Event 1.

6. AWARDS FOR ELIGIBLE OPEN ENTRANTS AND PROPOSAL ENTRANTS

Subject to the availability of funds, awards will be made to the top Eligible Entrants (see Section 2.B for general eligibility requirements and ARPA-E DE-FOA-0001952 for eligibility for Proposal Entrants) in Challenge 1 of the GO Competition. Eligible Open Entrants that place in the top ten in each scoring division (detailed below) will receive prize money. Prize money will be distributed to the Eligible Open Entrant. The allocation of any prize among and between team members is the responsibility of the Entrant. In general, ARPA-E will not arbitrate, intervene, advise on, or resolve any matters between Entrant team members.

Proposal Entrants that place in the top ten in each scoring division will receive follow-on grant funding, subject to successful completion of award negotiations. See Figure 1 and Figure 2 for additional information.

Figure 1 provides a visual summary of winning and awards for Challenge 1 of the GO Competition. The award structure below is tentatively planned and subject to change—please refer to the GO Competition website for the most up-to-date information.



Figure 1. Challenge 1 Paths and Awards.

For the GO Competition Challenge 1, there will be four scoring divisions, as displayed in Figure 2 (see the GO Competition website, for additional details on scoring). In Challenge 1, Eligible Open Entrants and Proposal Entrants that place in the top ten in each division will receive \$100,000, either in prize money or a grant, depending on whether the Entrant is an Open Entrant or a Proposal Entrant. Eligible Entrants are scored and eligible for awards in all four divisions; a single algorithm may win all four divisions, resulting in a total award of \$400,000.



Figure 2. Division Breakdown and Scoring Approach for Challenge 1 Awards.

7. FULL AUTOMATION REQUIREMENT

All Entrants are required to submit a program that can provide a fully automated solution; no human assistance is permitted including reverse engineering. Human assistance or any other violation of these rules during submission will result in Entrant team disqualification and further actions as appropriate under Federal law and regulation. ARPA-E will preserve the integrity of the GO Competition with safeguards to be developed during the program. These safeguards will not be shared as sharing may cause the methods to be ineffective. For this reason, all safeguard inspection schedules, methods, and capabilities will not be disclosed to any Entrant for any reason. Any information regarding human interference during any submission event should be sent to the GO Competition Administrator (Pacific Northwest National Laboratory) at arpacomp@pnnl.gov.

8. INTELLECTUAL PROPERTY, PROPRIETARY SOFTWARE, AND TRADEMARKS

ARPA-E and the GO Competition Administrator will honor the proprietary nature of the software (algorithmic approach) submitted by any Entrant. Neither ARPA-E nor the GO Competition Administrator or its affiliates may gain an interest in the intellectual property (IP) submitted to the GO Competition without the written consent of the Entrant or to the extent provided in an award made to a Proposal Entrant per the FOA.

Entrants shall specifically identify any proprietary data or information included in their entry with the marking “PROPRIETARY INFORMATION OF [ENTRANT’S NAME]” to notify ARPA-E and the GO Competition Administrator that the specified information should not be released to the public. Absent the written consent of the Entrant, neither ARPA-E nor the GO Competition Administrator shall disclose any of the Entrant’s marked proprietary information to a third party, except as required by law, statute, or regulation. By submitting an entry, Entrant understands and expressly agrees that ARPA-E and the GO Competition Administrator may use, review and permit the inspection of entry information by others who are obligated to treat the information in confidence—including the United States Department of Energy—as a part of

assuring the safe and efficient operation of PNNL and for review purposes under the GO Competition.

Each Entrant agrees to the placement of the Entrant name or team name on the leaderboard by the GO Competition Administrator. Furthermore, the Entrant agrees to the dissemination of the results by the GO Competition Administrator and ARPA-E.

Proposal Entrants should refer to ARPA-E DE-FOA-0001952 for specific information on IP rights related to their participation. Proposal Entrant IP rights are subject to the terms and conditions of ARPA-E DE-FOA-0001952 and any negotiated award documents.

9. ADDITIONAL INFORMATION

The discovery of revolutionary technologies is a key objective of the GO Competition. Outside of the required quiet period while ARPA-E DE-FOA-0001952 is active,¹⁰ Entrants are invited to communicate directly with ARPA-E and the GO Competition Administrator regarding any rule that restricts their ability to demonstrate technical achievement and innovative solutions. Questions regarding rules should be sent to arpacomp@pnnl.gov; general questions and answers will be posted on the GO Competition FAQ section of the website. Questions regarding ARPA-E DE-FOA-0001952 while the FOA is active (i.e., after the FOA is issued and before selections are publicly announced) must be directed to the ARPA-E Contracting Officer (ARPA-E-CO@hq.doe.gov).

ARPA-E may modify these rules at any time and for any reason, including the accommodation of a promising technical approach that would have been otherwise excluded by the rules. Please consult the GO Competition website and the most up-to-date Rules Document.

Entrant information collected by ARPA-E will be used solely for the purpose of administering the GO Competition Challenge 1. Use of Entrant information is governed by the Privacy Policy posted on the GO Competition website.

Entrants may be listed on the GO Competition website to enable the event to be tracked by interested members of the public. The names and photographs of Entrant team members may be posted on the ARPA-E website and released to the media. It is the responsibility of the Entrant that appropriate releases have been obtained from anyone whose photograph is submitted to ARPA-E by the Entrant.

In addition, except where prohibited, participation in the competition constitutes each Entrant's consent to DOE's and its agents' use of each Entrant's name, likeness, photograph,

¹⁰ As stated in Section VII.A (Communications with ARPA-E) of ARPA-E DE-FOA-0001952, "upon the issuance of a FOA, only the Contracting Officer may communicate with Applicants. ARPA-E personnel and our support contractors are prohibited from communicating (in writing or otherwise) with Applicants regarding the FOA. This 'quiet period' remains in effect until ARPA-E's public announcement of its project selections." To review ARPA-E DE-FOA-0001952, please visit <https://arpa-e-foa.energy.gov/>.

voice, opinions, and/or hometown and state information for promotional purposes through any form of media, worldwide, without further permission, payment or consideration; the only exception to this policy is when the Entrant lists that they wish to remain anonymous. Anonymous Entrants will not be eligible for awards.

ARPA-E reserves the right to disqualify an Entrant whose actions are deemed to violate these rules or the spirit of the GO Competition for any reason, including but not limited to, the violation of relevant laws or regulations in the course of participation in the GO Competition. No appeal is allowed and the decision is at the sole discretion of ARPA-E.

By registering for and/or participating in the GO Competition Challenge 1, Entrants agree to follow these rules. Entrants must agree to assume any and all risks and waive claims against the Federal Government, its related entities, and the GO Competition Administrator and its affiliates, except in the case of willful misconduct, for any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from participation in the GO Competition, whether the injury death, damage, or loss arises through negligence or otherwise.

Questions regarding the rules, privacy policy, or other aspects of the GO Competition may be directed to arpacomp@pnnl.gov.

10. SCOPE AND PRECEDENCE

The rules outlined herein apply to all Entrants in the GO Competition Challenge 1. However, nothing in these rules, included in this document and any subsequent GO Competition Challenge 1 Rules Documents, may be interpreted as modifying the statement of work or authorizing work outside the terms and conditions of any existing agreements or contracts with ARPA-E.

ARPA-E may release additional documents with rules updates, procedures, and other information for Entrants. Unless otherwise stated in writing, any additional documents carry the full authority of the rules in this document.

All documents, including this Rules Document, will be posted and updated on the GO Competition website (<https://gocompetition.energy.gov/>). All GO Competition documents including these rules should be considered living documents, subject to update and clarification throughout the GO Competition.

11. GENERAL CONDITIONS

ALL DECISIONS BY ARPA-E ARE FINAL AND BINDING IN ALL MATTERS RELATED TO THE GO COMPETITION.

ARPA-E reserves the right to cancel, suspend, and/or modify the GO Competition, any part of the GO Competition, or any associated events or funding opportunities at ARPA-E's sole discretion. Considerations may include availability of funds and technical viability, or if any fraud, technical failures, or any other factor beyond ARPA-E's reasonable control impairs the integrity or proper functioning of the GO Competition. ARPA-E is not responsible for, nor is it required to accept, incomplete, late, misdirected, damaged, corrupted, unlawful, or illicit submissions.

ARPA-E does not authorize or consent to an Entrant infringing on any U.S. patent or copyright while participating in the GO Competition. No illegal activities may be undertaken for the purpose of participation in the GO Competition.

A. Entrant Representations and Warranties

Upon registration, Entrant hereby represents and warrants on its behalf and on behalf of all team members, that:

- It is the sole author and copyright owner of the submission; that the submission is an original work of the Entrant and/or that the Entrant has sufficient rights to use and to authorize others, including ARPA-E, to use the submission, as specified throughout the Rules Document; that the submission does not infringe upon any U.S. patent, copyright, or upon any other third party rights of which the Entrant is aware; and that the submission is free of malware;
- The submission, and any use thereof by ARPA-E is not defamatory or libelous in any manner; does not constitute or result in any misappropriation or other violation of the publicity rights or right of privacy of any person or entity, or infringe, misappropriate or otherwise violate any intellectual property rights, privacy rights, or any other rights of any person or entity;
- It is free to enter into this competition without the consent of any third party (unless the Entrant is required to obtain a written consent from a third party by the terms and conditions established for the GO Competition, e.g., a minor must provide the written consent of a legal guardian to participate) and has the capability to fully perform its obligations as stipulated by the Rules Document;
- If the Entrant is a U.S. Organization, it is validly existing and duly organized in the state or jurisdiction of its incorporation;
- It is not a party to (and it agrees that it shall not become a party to) any agreement, obligation, or understanding that is inconsistent with the Rules Document or might limit or impair the ARPA-E's rights or the Entrant's obligations under the GO Competition Rules Document;
- There is no suit, proceeding, or any other claim pending or threatened against the Entrant, nor does any circumstance exist, to its knowledge, which may be the basis of any such suit, proceeding, or other claim, that could limit or impair the Entrant's performance of its obligations pursuant to GO Competition Rules Document;
- It will not infringe, violate, or interfere with the intellectual property, publicity, privacy, contract or other right of any third party in the course of its participation in the GO

Competition or cause ARPA-E or the GO Competition Administrator or its affiliates to do any of the same;

- It will comply with all applicable laws, rules, and regulations in performing under these rules;
- It meets the terms and conditions specified in the GO Competition Rules Document to be an Entrant and, if the Entrant is seeking an award, it further satisfies the eligibility requirements to be classified as an “Eligible Entrant.”

B. Government Representations and Warranties

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.

C. Personally Identifiable Information

Unless otherwise required, all information provided by the Entrant must not include any Personally Identifiable Information (PII). PII refers to information which can be used to distinguish or trace an individual’s identity, such as the individual’s name, social security number, date and place of birth, personal telephone or cell phone number, or any other information this is linked or linkable to an individual such as employment information.

D. Relationship of the Parties

Nothing contained in this Rules Document is intended to create or constitute a relationship between ARPA-E or the GO Competition Administrator or its affiliates with the Entrants. Participation in the GO Competition does not constitute or imply any form of sanction or support or endorsement of the Entrant by ARPA-E or the GO Competition Administrator or its affiliates, nor does it grant any party any authority to act as agent, nor assume or create any obligation, on behalf of another party. An Entrant may not use the ARPA-E or DOE logos or official seals in their submission. ARPA-E reserves the right to use Entrant names and images for publicizing the GO Competition and results.

E. Trademark License

GO Competition and any associated nicknames and logos (“Competition Marks”) are trademarks owned by the U.S. Department of Energy. The trademark license granted to Entrants is below. Non-Entrants can request individualized trademark licenses (for the purpose of engaging with Entrants and/or expressing interest in the technology); the decision to grant such licenses is under the sole discretion of ARPA-E.

Entrants are granted, for the duration of the GO Competition, a revocable, non-exclusive, royalty-free license to use the Competition Marks for the purposes of producing materials for the competition and other approved competition-related activities as long as the use does not suggest or imply endorsement of the Entrant by ARPA-E or the U.S. Department of Energy, and

the use of the Competition Marks by a Entrant does not imply the endorsement, recommendation, or favoring of the Entrant by ARPA-E or the Department of Energy.

Entrants may not use the Competition Marks for any other purpose. Entrants may not sublicense the Competition Marks.

Challenge 1 winners will be provided with an individualized trademark license for ongoing use of the Competition Marks once the competition winners have been declared. All Entrants can request individualized trademark licenses; the decision to grant such requests is under the sole discretion of ARPA-E.