



**LOW TEMPERATURE  
GEOTHERMAL MINERAL  
RECOVERY PROGRAM**

**FOA Webinar  
DE-FOA-0001016  
02/11/2014**

# Disclaimer

- All Applicants are strongly encouraged to carefully read the Funding Opportunity Announcement **DE-FOA-0001016 (“FOA”)** and adhere to the stated submission requirements. The content included in this presentation is intended to summarize the contents of FOA. If there are any inconsistencies between the content of this presentation and the information presented in the FOA please contact [MineralRecoveryFOA@go.doe.gov](mailto:MineralRecoveryFOA@go.doe.gov). In the event there is an inconsistency, the Funding Opportunity Announcement is the controlling document and applicants should rely on the FOA language.



# Agenda

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- 1) Registration Requirements
- 2) Award Information
- 3) FOA Information
- 4) Concept Paper
- 5) Full Application
- 6) Review Process
- 7) Technical Background on Strategic Materials
- 8) Q&A



# DE-FOA0001016

## Geothermal Strategic Materials

### Anticipated Schedule:

<b>FOA Issue Date:</b>	<b>Tuesday 02/04/2014</b>
<b>FOA Informational Webinar</b>	<b>Tuesday 02/11/2014</b>
<b>Submission Deadline for Concept Papers:</b>	<b>Thursday 03/06/2014 5:00PM EST</b>
<b>Submission Deadline for Full Applications:</b>	<b>Monday 05/02/2014 5:00PM EST</b>
<b>Submission Deadline for Replies to Reviewer Comments:</b>	<b>Wednesday 06/19/2014 5:00PM EST</b>
<b>Expected Date for EERE Selection Notifications:</b>	<b>Tuesday 08/08/2014</b>
<b>Expected Timeframe for Award Negotiations</b>	<b>Tuesday 09/30/2014</b>



# Registration Requirements

- To apply to this FOA, Applicants must register with and submit full application materials through EERE Exchange: <https://eere-Exchange.energy.gov>
- Obtain a “control number” at least 24 hours before the first submission deadline
- Although not required in order to submit an Application, the following registrations must be complete to received an award under this FOA:

Registration Requirement	Website
DUNS Number	<a href="http://fedgov.dnb.com/webform">http://fedgov.dnb.com/webform</a>
SAM	<a href="https://www.sam.gov">https://www.sam.gov</a>
FedConnect	<a href="https://www.fedconnect.net">https://www.fedconnect.net</a>
Grants.gov	<a href="http://www.grants.gov">http://www.grants.gov</a>



# Means of Submission

- Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted through EERE Exchange at <https://eere-Exchange.energy.gov>
  - EERE will not review or consider applications submitted through other means
- The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements can be found at <https://eere-Exchange.energy.gov/Manuals.aspx>



# Award Information

	Phase 1
<b>Anticipated Total Amount to be Awarded*</b>	\$2,000,000-\$4,000,000
<b>Anticipated Average Award Amount</b>	\$200,000 to \$500,000
<b>Types of Funding Agreements</b>	Cooperative Agreements, Grants, Technology Investment Agreements, Work Authorizations, and Interagency Agreements
<b>Period of Performance</b>	12-24 months

\*Any future funding is contingent upon the availability of funds appropriated by Congress for the purpose of this program



# Statement of Substantial Involvement

Substantial involvement includes, but is not limited to the following:

- EERE has substantial involvement in work performed under Awards made following this FOA. EERE does not limit its involvement to the administrative requirements of the Award. Instead, EERE has substantial involvement in the direction and redirection of the technical aspects of the project as a whole. Substantial involvement includes, but is not limited to, the following:
  - EERE shares responsibility with the Recipient for the management, control, direction, and performance of the Project. To this end, the technology office will utilize a Technical Monitoring Team (TMT) composed of geothermal experts to provide periodic support in evaluating, reviewing, and guiding the project.



# Statement of Substantial Involvement - Continued

- EERE may intervene in the conduct or performance of work in this project for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.
- EERE may redirect or discontinue funding the Project based on the outcome of EERE's evaluation of the Project at the Go/No Go decision points.
- EERE participates in major project decision-making processes.



# Multiple Applications

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Applicants may submit more than one application to this FOA, provided that each application describes a unique, scientifically distinct project



# Eligibility Requirements

Eligible applicants for this FOA include:

1. Individuals
2. Domestic Entities
3. Foreign Entities
  - If a foreign entity applies for funding as a Prime Recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the Prime Recipient.
4. Incorporated Consortia
5. Unincorporated Consortia

For more detail about each eligible applicant, please see [Section III.A](#) of the FOA for eligibility requirements



# Prime Recipient Cost Sharing Requirements

- Applicants must propose to contribute a minimum of **20%** of the total project costs for R&D projects. *Unless the project qualifies for the Cost Share Reduction.*
- **Cost Share Reduction.** EERE has reduced the Recipient Cost Share Requirement to **10%** for R&D activities where:
  - The Prime Recipient is a domestic institution of higher education; domestic nonprofit entity; FFRDC; or U.S. State, local, or tribal government entity; and
  - The Prime Recipient performs more than 50% of the project work, as measured by the Total Project Cost.

*Applicants who believe their project qualifies for the reduced recipient cost share must be able to provide verification that the above requirements are satisfied.*



# Allowable Cost Share

- Cost Share must be allowable and must be verifiable upon submission of the Full Application
- Refer to the following applicable Federal cost principles:

Entity	Cost Principles
Educational Institutions	2 CFR Part 220
State, Local, and Indian Tribal Governments	2 CFR Part 225
Non-profit Organizations	2 CFR Part 230
For-profit Organizations	FAR Part 31

# Allowable Cost Share

- Cash Contributions
  - May be provided by the Prime Recipient, Subrecipients, or a Third Party
- In-Kind Contributions
  - Can include, but are not limited to: personnel costs, indirect costs, facilities and administrative costs, rental value of buildings or equipment, and the value of a service, other resource, or third party in-kind contribution



# Unallowable Cost Share

- The Prime Recipient may not use the following sources to meet its cost share obligations including, but not limited to:
  - Revenues or royalties from the prospective operation of an activity beyond the project period
  - Proceeds from the prospective sale of an asset of an activity
  - Federal funding or property
  - Expenditures reimbursed under a separate Federal Technology Office
  - Independent research and development (IR&D) funds
  - The same cash or in-kind contributions for more than one project or program



# Cost Share Contributions

- Contributions must be:
  - Specified in the project budget
  - Verifiable from the Prime Recipient's records
  - Necessary and reasonable for proper and efficient accomplishment of the project
- Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred



# Cost Share Payment

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- Prime Recipients must provide documentation of the cost share contribution, incrementally over the life of the award
- The cumulative cost share percentage provided on each invoice must reflect, at a minimum, the cost sharing percentage negotiated



# Cost Share Payment

- In limited circumstances, the Prime Recipient may submit a waiver request to meet its cost share requirements on a less frequent basis, such as monthly or quarterly
- Such waiver requests must be sent by email to the Contracting Officer during award negotiations and include:
  - (1) A detailed justification for the request;
  - (2) A proposed schedule of payments, including amounts and dates;
  - (3) A written commitment to meet that schedule; and
  - (4) Such evidence as necessary to demonstrate that the Prime Recipient has complied with its cost share obligations to date.
- The Contracting Officer must approve all such requests before they may go into effect



# Concept Papers

- Applicants must submit a compliant Concept Paper by 5:00 PM EST on **03/06/2014** to be eligible to submit a Full Application
  - Concept Papers are deemed compliant if the Applicant successfully uploaded all required documents and clicked the “Submit” button in EERE Exchange by the deadline stated in the FOA
- See [Section IV.C](#) of the FOA for information on the content requirements for Concept Papers



# Concept Paper Review

- Each eligible Concept Paper will be reviewed based on the criteria in [Section V.A.1.](#) of the FOA
- Applicants will be notified of an Encourage/Discourage decision, and review comments on their Concept Paper will be available in EERE Exchange
  - Applicants will be provided approximately 45 days to prepare a Full Application
  - An Applicant who receives a “discouraged” notification may still submit a Full Application
  - By **discouraging** the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project



# Full Applications

- Applicants must submit a Full Application by 5:00 PM EST [05/02/2014](#)
- Full Applications are deemed eligible if:
  - The Applicant is an eligible entity [FOA, Section III.A](#);
  - The Applicant submitted an eligible Concept Paper;
  - The Cost Share requirement is satisfied [FOA, Section III.B](#);
  - The Full Application is compliant [FOA, Section III.C](#); and
  - The proposed project is responsive to the FOA [FOA, Section III.D](#).



# Merit Review and Selection Process - Overview

- The evaluation and selection process consists of multiple phases that each include an initial eligibility review and a thorough technical review
- Rigorous technical reviews are conducted by reviewers that are experts in the subject matter of the FOA
- The Selection Official considers the recommendations of the Federal Consensus Board, along with other considerations such as program policy factors and available funding, to determine selections
- See [Section V.A.2](#) of the FOA for information on the technical review criteria for Full Applications



# Merit Review and Selection Process - Overview

- Pre-Selection Clarifications
  - Used solely for the purposes of clarifying the application, and will be limited to information already provided in the application
  - May occur before, during, or after the merit review evaluation process



# Replies to Reviewer Comments

- Applicants will have an opportunity to review the comments from Independent Reviewers and provide a Reply to Reviewer Comments.
  - Reply limited to 3 pages
  - Applicants will have approximately 5 business days to submit the Reply
  - Applicants are not required to submit a Reply
- Please see [FOA Sections IV.F. and V.A.3](#) for additional information regarding Replies to Reviewer Comments



# Selection Factors

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The Selection Official may consider the merit review recommendation, program policy factors, and the amount of funds available in arriving at selections for this FOA

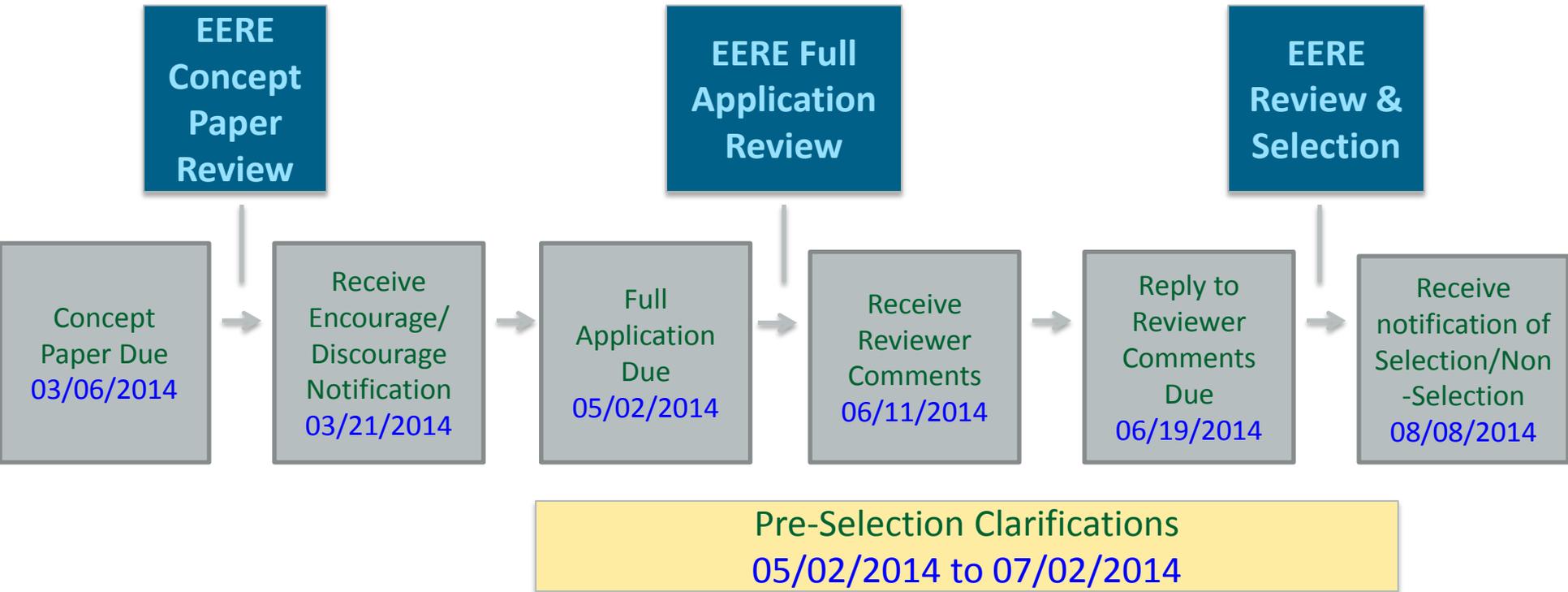


# Program Policy Factors

- The Selection Official may consider the following program policy factors in determining which Full Applications to select for award negotiations:
  - The degree to which the proposed project, including proposed cost share, optimizes the use of available EERE funding to achieve programmatic objectives
  - The level of industry involvement and demonstrated ability to commercialize energy or related technologies
  - Technical, market, organizational, and environmental risks associated with the project
  - Whether the proposed project is likely to lead to increased employment and manufacturing in the United States
  - Whether the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty
  - The degree to which the proposed project directly addresses EERE's statutory mission and strategic goals
  - The degree to which the proposed project will accelerate the development of geothermal power production in under-utilized regions



# FOA Review Timeline



EERE anticipates making awards by 9/30/2014



# Key Submission Points

- Check entries in EERE Exchange
  - Submissions could be deemed ineligible due to an incorrect entry
- EERE strongly encourages Applicants to submit 1-2 days prior to the deadline to allow for full upload of application documents and to avoid any potential technical glitches with EERE Exchange
- Make sure you hit the submit button
  - Any changes made after you hit submit will un-submit your application and you will need to hit the submit button again
- For your records, print out the EERE Exchange Confirmation page at each step, which contains the application's Control Number



# Applicant Points-of-Contact

- Applicants must designate primary and backup points-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations
- It is imperative that the Applicant/Selectee be responsive during award negotiations and meet negotiation deadlines
  - Failure to do so may result in cancelation of further award negotiations and rescission of the Selection



# Strategic Materials Initiative - Scientific Underpinnings

The association of particular critical mineral resources with certain known mineral deposit types is relatively well established. For example, platinum-group elements with layered mafic-ultramafic intrusions (e.g., Bushveld Complex), rare earth elements with alkaline-carbonatite complexes (e.g., Mountain Pass), gallium with bauxite deposits, and niobium with some carbonatite complexes. However, critical mineral resources may also occur in deposits significantly different in mineralogy, grade or geologic setting from the known deposit types. **For example, platinum-group elements are known to be enriched in some hydrothermal mineral deposits and rare earth elements are enriched in some lateritic clay deposits. These unconventional deposits are not as well documented or understood as conventional deposits. In addition, new technologies and product development continually increase the need for greater production of previously underutilized mineral commodities and the discovery of new deposits.**

-USGS

Investigations of Unconventional and Emerging  
Critical Mineral Resources



# Strategic Materials - Necessity for Modern Industry

## Quick Facts

- Rare earth and near-critical metals are essential for sophisticated technologies, but subject to supply risk with ever increasing demand.
- Global demand for lithium carbonate is expected to exceed 250,000 tons by 2017—a 60% increase



## High Demand Materials for Hi-Tech Industry

- Lithium
- Manganese
- Tellurium
- Zinc

## Uses for Geothermal Strategic Materials

- Cathodes
- Glass
- Ceramics
- Lubricants
- Advanced manufacturing technologies



# Prior DOE Efforts

## *Previously funded efforts under GTO*

Under the American Recovery and Reinvestment Act 2009, GTO funded a geothermal mineral extraction demonstration. This project built the first pilot facility to co-produce materials like lithium, manganese, and zinc from geothermal brines during the power production process.



Materials Demo Plant



Steamboat Springs, NV

Lawrence Livermore National Laboratory was funded to perform R&D work to extract silica from brines at Mammoth Lakes, California.

Brookhaven National Laboratory investigated developing economic and environmentally acceptable methods for extracting silica from fluids in Nevada (Dixie Valley and Steamboat Springs) and California (Coso)



Coso, CA



# Prior DOE Efforts

U.S. DEPARTMENT OF ENERGY

## Critical Materials Strategy

December 2011



U.S. DEPARTMENT OF  
**ENERGY**

Rare earth elements (REEs) necessary for clean energy technologies found to be critical in the short term (present–2015):

- Dysprosium
- Terbium
- Europium
- Neodymium
- Yttrium

This report is based on data collected and research performed during 2011 includes:

- Examined role of rare earth metals and other materials in the clean energy economy
- Updated criticality assessments, market analyses and technology analyses to address critical materials challenges

U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy

# Strategic Materials Goal

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- To promote the advancement of thermal energy conversion processes capable of converting geothermal heat sources into power, in conjunction with the development or exploitation of technologies capable of capturing, concentrating, and/or purifying valuable materials contained within geothermal brines to economically extract resources that can provide additional revenue streams to geothermal operators.



# Low Temperature Geothermal Mineral Program, a.k.a. Strategic Materials FOA

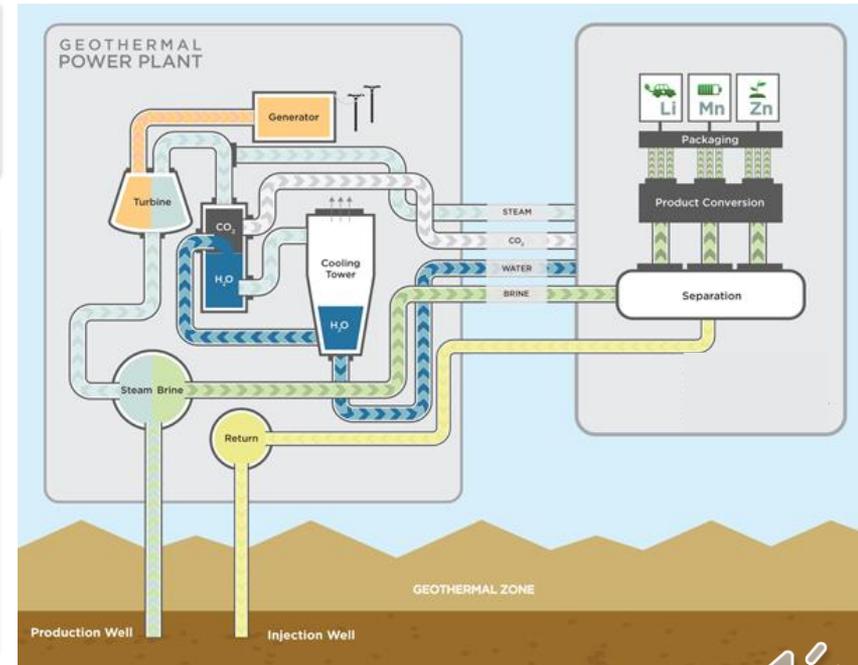
## FOA Objective:

This targeted initiative focuses on critical mineral extraction as a path to optimize the value stream of low-to-moderate temperature resources. The FOA aims to promote the advancement of thermal energy processes capable of converting geothermal heat sources into power, in conjunction with the development or exploitation of technologies capable of capturing, concentrating, and/or purifying valuable materials contained within geothermal brines to economically extract resources that can provide additional revenue streams to geothermal operators.

GTO envisions awarding multiple projects selected for up to 2-year project period

## Background:

- Rare earth and near-critical metals are essential for clean-energy technologies, but subject to supply risk with ever increasing demand.
- Minerals like tellerium, lithium, manganese, and zinc supply the raw materials for cathodes, glass, ceramics, lubricants, and many other products.
- Many minerals also have critical value for advanced manufacturing technologies.



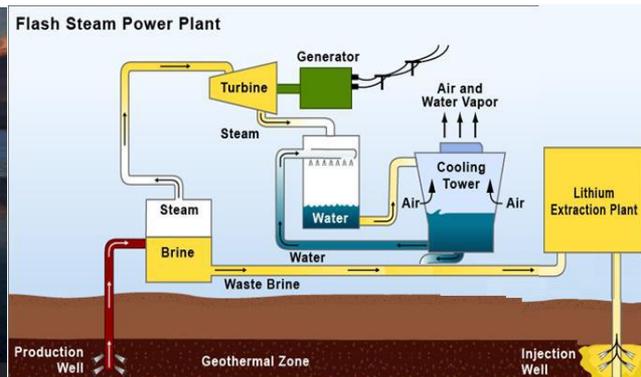
# Strategic Materials FOA

DOE is interested in:

- Feasibility studies that include fully developed business plans laying out the **technical** feasibility and **economic** viability of mineral extraction technology(s) combined with geothermal power production at a new or existing geothermal resource.
- Assessments of the current rare earth and near-critical metal resource base, with potential extraction volumes/rates including coupled techno-economic analysis.
- Applied R&D of innovative extraction technologies with accompanying feasibility studies of currently available technologies and/or potentially novel alternatives, and modeled test results for the most promising candidates.
  - Geochemical modeling and leaching experiments to optimize the composition of down-hole fluids and identify additives that selectively leach high value critical elements.



Salton Sea, CA



# Strategic Materials FOA: Feasibility Studies

**Projects will be expected to incorporate, as appropriate, the following performance measures into their applied R&D, feasibility study or analysis work:**

- Clearly defined success-rate metrics and quantification of value added to the geothermal production system from the innovative extraction method for the target material(s).
- Data gathering on geothermal and mineral resources that employs innovative techno-economic criteria/modeling that has not previously been applied in a geothermal context.
- Project-specific feasibility studies that demonstrate the techno-economic viability of the technology and the applicability of the site to a number of reciprocal sites.



# Strategic Materials FOA

## Applications Specifically Not of Interest

EERE performs a preliminary eligibility review of Full Applications. Applications that fall outside the parameters specified in Section I.B of the FOA are deemed non-responsive.

This includes but is not limited to:

- Applications that fall outside the technical parameters specified in Section I.B of the FOA, including but not limited applications that propose mineral recovery not associated with geothermal fluids.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violate the laws of thermodynamics).
- Applications that propose Phase I demonstration projects.



# Questions

- Questions about this FOA? Email [MineralRecoveryFOA@go.doe.gov](mailto:MineralRecoveryFOA@go.doe.gov)
  - All Q&As related to this FOA will be posted on EERE Exchange
    - You must first select this specific FOA Number in order to view the Q&As (DE-FOA-001016)
    - EERE will attempt to respond to a question within 3 business days, unless a similar Q&A has already been posted on the website
- Problems logging into EERE Exchange or uploading and submitting application documents with EERE Exchange? Email EERE-ExchangeSupport@hq.doe.gov.
  - Include FOA name and number in subject line
- All submitted questions will be posted on EERE Exchange

