

Good afternoon, everyone and welcome to our webinar. Thank you for your interest in the U.S. Department of Energy's efforts on renewable energy and energy efficiency. You are joining us for the Informational Webinar for Applicants and other Interested parties for the Productivity Enhanced Algae and ToolKits Funding Opportunity Announcement, or FOA, which was issued on December 12th. My name is Daniel Fishman and I am a Technology Manager in the Bioenergy Technologies Office within the DOE's Office of Energy Efficiency and Renewable Energy. We hope to cover the basic aspects of the Funding Opportunity Announcement during this webinar.

Before we begin, I'd like to draw your attention to the email address on the left hand side of this cover page. This is the official mailbox to direct all of your questions during the entire FOA process. Please do not contact EERE individuals directly with questions, including myself. All questions received at this mailbox are posted publicly at the Q&A section of the FOA page on EERE Exchange in an anonymous way. The official answers to your questions will typically also be posted within 3 business days. Please be careful not to submit any language that might be business sensitive, proprietary or confidential.

We will NOT have a live Q&A period, so please email questions to PEAKFOA as they come up. Again, please be careful not to submit any language that might be business sensitive, proprietary or confidential. We will be posting all Q&As to EERE Exchange after the webinar. There may be questions that require further discussion with EERE staff and will

not be addressed today. If you don't hear your question during the Webinar, please check EERE Exchange in the next few days as the answer will be posted there.

Also, just to be clear, there are no particular advantages or disadvantages to the application evaluation process with respect to participating on the webinar today. Your participation is completely voluntary.

Let's get started!

DE-FOA- 0001628
Productivity Enhanced Algae and ToolKits

Anticipated Schedule:

FOA Issue Date:	12/15/2016
FOA Informational Webinar:	12/20/2016
Submission Deadline for Concept Papers:	1/13/2017
Submission Deadline for Full Applications:	2/22/2017
Submission Deadline for Replies to Reviewer Comments:	3/17/2017
Expected Date for EERE Selection Notifications:	6/15/2017
Expected Timeframe for Award Negotiations:	60 Days from selection

2

This slide shows the anticipated schedule for the FOA. The FOA has already been posted, and we are conducting the FOA Informational Webinar now. Please note that there are a few requirements that we will go over in the presentation that are different than in past FOAs, such as Replies to Reviewer Comments – we will cover all requirements for this FOA later in the presentation.

Notice

- All applicants are strongly encouraged to carefully read the Funding Opportunity Announcement **DE-FOA-0001628 ("FOA")** and adhere to the stated submission requirements.
- This presentation summarizes the contents of FOA. If there are any inconsistencies between the FOA and this presentation or statements from DOE personnel, the FOA is the controlling document and applicants should rely on the FOA language and seek clarification from EERE.
- If you believe there is an inconsistency, please contact PEAKFOA@ee.doe.gov.

3

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Agenda

- 1) FOA Description
- 2) Topic Areas/Technical Areas of Interest
- 3) Award Information
- 4) Statement of Substantial Involvement
- 5) Cost Sharing
- 6) Concept Papers
- 7) Full Applications
- 8) Merit Review and Selection Process
- 9) Registration Requirements

The agenda for this presentation is as follows: READ SLIDE

We encourage you to have a copy of the FOA in front of you for reference as we go through the presentation.

FOA Description

- The production, transportation, and consumption of liquid transportation fuels underpins the U.S. economy. BETO's mission is to accelerate the research, development, and demonstration of advanced biofuels to provide enduring benefit to the nation.
- Advanced biofuels and bioproducts made from algae have the potential to enhance energy security, create domestic jobs, and spur the advancement of the bioeconomy.

5

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FOA Description

- This FOA will use multidisciplinary biological innovation to deliver strains, tools, data, and techniques to enhance algal biofuel potential and enable accelerated future innovation in algal biofuels and bioproducts.
- To do so, this FOA will follow strategies used in plant domestication, agriculture, and microbial ecology.
- Plant domestication capitalizes on genetic diversity. Algae have a rich genetic pool compared to plants. However, it remains difficult to access this rich diversity due to a number of limiting factors, including: representative genomes; predictive gene annotation; robust high-throughput screening methods and tools; and robust genetic transformation and engineering tools.
- This FOA will capitalize on algae diversity and potential by encouraging multidisciplinary innovation that could accelerate innovation in algal biology with modern biotechnology and computational science practices and, in parallel, demonstrate the improvements such innovations can bring.

6

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FOA Description

- The FOA objectives are tightly focused on developing strain and cultivation improvements that increase algal areal productivity, in grams of ash-free dry weight of algae produced per square meter per day (g/m²/d), and fuel yield, as understood by proximate analysis of biomass composition and paper-based calculation of gasoline-gallon equivalency (GGE) using literature-based conversion factors.
- Strain improvement methods may include gene discovery and biological pathway analysis, directed evolution, breeding, and/or genetic engineering of novel algal strains that can reproducibly out-perform the current best available strains in outdoor conditions, where “performance” is represented by productivity, robustness, and composition.
- Cultivation biology development improvements may include leveraging natural or designed microbial assemblages of the cultivation ecosystem to boost performance and resist pathogens, and understanding under what cultivation conditions certain strains should be employed. These developments in algal biology will be validated under laboratory test environments as well as at outdoor field sites to evaluate cultivation readiness and potential.

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FOA Description

- Achieving the PEAK FOA objective requires that projects achieve, at minimum, **double the current BETO SOT seasonal algal biomass productivities** (below) through economical and LCA-appropriate strain improvement techniques or ecological or abiotic cultivation management techniques.

Season	2016 BETO SOT (g/m ² /day), ash free basis	2020 PEAK Performance Target (g/m ² /day)
Spring	11.1 (Nanno)	22
Summer	13.3 (Desmo)	26
Fall	7.0 (Desmo)	14
Winter	5 (Nanno)	10
Annual average	9.1	18
*Nanno refers to <i>Nannochloropsis maritima</i> KA32 (saline media) and Desmo refers to <i>Desmodesmus</i> sp. C046 (saline media)		

8

Achieving the PEAK FOA objective requires that projects achieve, at minimum, double the current BETO SOT seasonal algal biomass productivities (Table 1) through economical and LCA-appropriate strain improvement techniques or ecological or abiotic cultivation management techniques. The current BETO SOT is derived from public, long-term, open raceway pond cultivation data, provided for public use by the DOE BETO-supported Algae Testbed Public-Private Partnership (ATP3). These data are available at http://en.openei.org/wiki/ATP3_Data. A crop-rotation strategy is used in the 2016 SOT to achieve the SOT productivity of 9.1 g/m²/d and is envisioned as necessary in meeting the PEAK FOA technical targets. Applicants are only required to, at minimum, select one strain, rotation period, location, or season for improvement. To relate improvements in a single season to an annualized average, reasonable projections of progress from the SOT for seasons not targeted by a given project may be used.

FOA Description

- Additionally meeting the PEAK FOA objective will also require projects to achieve advanced biofuel yields of **greater than 80 GGE per ton of algae feedstock**. Yield of advanced biofuel is understood to be tightly linked to both input biomass composition and the conversion process efficiency. However, as conversion of the algal biomass is not a focus of this FOA (but has been the focus of significant BETO investment), achievement of the advanced biofuel yield will be demonstrated through a paper analysis based on the proximate analysis of the biomass cultivated in the PEAK project in combination with conversion efficiencies from literature values.

Additionally meeting the PEAK FOA objective will also require projects to achieve advanced biofuel yields of greater than 80 GGE per ton of algae feedstock. Yield of advanced biofuel is understood to be tightly linked to both input biomass composition and the conversion process efficiency. However, as conversion of the algal biomass is not a focus of this FOA (but has been the focus of significant BETO investment), achievement of the advanced biofuel yield will be demonstrated through a paper analysis based on the proximate analysis of the biomass cultivated in the PEAK project in combination with conversion efficiencies from literature values. These conversion efficiencies based on realistic biorefinery processes are provided for applicant's use within the FOA.

This yield objective is most understandable through the example of a fractionation pathway (represented by the Combined Algae Processing (CAP) Design Case), where constituents of algal biomass are fractionated and separately converted into a slate of appropriate products. In one recent result using the CAP design, the authors project very high yields (126 GGE per ton of biomass) in an integrated biorefinery setting, but it must be noted that this result is based on critical assumptions related to both composition and cost of biomass delivered to the conversion process. It is important, in the context of this FOA, to understand that the biomass used to generate the 126 GGE result was high in lipids as FAME (40%) and carbohydrates as fermentable sugars (40%) because it was subjected to lengthy nitrogen deprivation which arrested productivity and shifted composition and this deprivation strategy may not be representative of realistic, scalable cultivation practices. The cost and annual average productivity of that biomass was not provided by the authors, but it is expected to be of significantly higher cost and lower annual average productivity

than the BETO SOT.

Process Design and Economics for the Conversion of Algal Biomass to Biofuels: Algal Biomass Fractionation to Lipid-and Carbohydrate-Derived Fuel Products (2014).

<http://www.nrel.gov/docs/fy14osti/62368.pdf>.

Tao Dong, et al, (2016). Combined algal processing: A novel integrated biorefinery process to product algal biofuels and bioproducts. *Algal Research*, 19 316-323,

<http://dx.doi.org/10.1016/j.algal.2015.12.021> .

Topic Areas

Topic Area 1: Strain Improvement

- This topic area is for small teams to develop enhanced algal strains with increased areal productivity and biofuel yield, along with improved or novel algal toolkits and/or methods.
- Strain improvement methods may include gene discovery and biological pathway analysis, directed evolution, breeding, and/or genetic engineering of novel algal strains that can reproducibly out-perform the current best available strains in outdoor conditions, where “performance” is represented by productivity, robustness, and composition.
- Applicants must include a detailed discussion of the reasoning behind their proposed strategy or strategies, strain choice, and why the proposed strain improvement approach has/have the highest probability of success.

10

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Topic Areas


Topic Area 2: Cultivation Biology Improvement

- This topic area is for small teams to develop increased areal productivity and biofuel yield through enhanced management of ecological or abiotic contributions to cultivation biology, along with improved or novel algal toolkits and/or methods. Cultivation biology development improvements may include leveraging natural or designed microbial assemblages of the algal culture ecosystem to boost performance and resist pathogens, and understanding species-specific cultivation conditions.
- This topic area is about improving management of a current cultivation system. Abiotic contributions, including nutrient and stochastic climatological variables, can have a profound effect on outdoor performance. Topic Area 2 supports improving the understanding of physiology and performance under fluctuating and uncontrollable abiotic conditions.
- Applicants must include a detailed discussion of the reasoning behind their proposed strategy or strategies and why the proposed cultivation improvement approach has/have the highest probability of success.

11

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Topic Areas
<p><u>Application Requirements for both Topic Areas</u></p> <p>In addition to responding to sections I.A and B, the applicant must address each of the following requirements for either topic area. Failure to address all of the listed requirements will result in the application being considered “not of interest.”</p> <ol style="list-style-type: none"> 1. Justification of the selected strain(s) requirement 2. Sustainability requirement 3. Toolkit requirement 4. “Cultivation ready” requirement 5. Validation requirement <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 20px;"> <div>12</div> <div>  <div> U.S. DEPARTMENT OF ENERGY </div> <div> Energy Efficiency & Renewable Energy </div> </div> </div>

Justification of the selected strain(s) requirement:

The algae selected in each topic area must be capable growth in saline, brackish, or otherwise non-potable water. Applicants must justify their selection(s) with a discussion of the potential strain performance in algal cultivation, a rationale behind how the proposed improvements are expected to increase the cultivation performance, and any previous work in enhancing the proposed strain(s).

Sustainability requirement:

In addition to growth using saline, brackish, or non-potable water, proposed technology and management approaches must include a discussion of lifecycle impacts (such as nutrient use and energy requirements) in an integrated, scaled system, and must support producing an advanced biofuel. Limited techno-economic and life-cycle analyses will be required of project performers.

Toolkit requirement:

Applicants must pursue the development of at least one novel omics tool, technique (method), or dataset that upon completion of the project will enable developers to accelerate innovation in that topic area. The types of tools, techniques, and omics datasets of interest span biological, computational, and analytic strategies that will advance the state of the art and are complementary to the scope of improved strain development work. Cultivation datasets and growth profiles do not satisfy this toolkit requirement because they are expected of all projects as part of the productivity data validation requirement (see validation requirement below). Examples of toolkits may include techniques that

enable robust genetic engineering, datasets that predict enhanced productivity based on metagenomics or environmental conditions, and rapid computational tools that screen for indicators of environmentally robust or biochemically attractive algal strains. In the Market Transformation and Demonstration section of the application, the applicant must describe how innovations will be made available or incorporated into a business strategy. Applicants must make datasets available through <https://greenhouse.lanl.gov> if appropriate. Applicants must disseminate methods through publications or share on the above mentioned website.

“Cultivation ready” requirement:

Algae cultivation literature highlights the importance of evaluating the effect of temperature, light intensity, sinusoidal light, and light quality on biomass productivity. Applicants must demonstrate proficiency in culturing algae and particularly their proposed strain(s) of interest under actual or simulated climate conditions, including but not limited to media composition, analytical standard operating procedures and quality control, and prior handling of the strain(s) of interest at the facilities proposed for the PEAK project. Applicants must have an internal baseline for the performance of their proposed system.

The cultivation ready requirement means that applicants must discuss how their demonstrated proficiency with their strain(s) and system(s) of choice and their internal baseline compares to the BETO SOT for algal productivities, which was (as stated above) developed through several years of continuous outdoor cultivation efforts undertaken through the test-bed network. Applicants are not required to have long-term cultivation datasets as their baseline, but are required to discuss why their proposed development is likely to surpass the BETO SOT by the end of the project performance period. Cultivation readiness is subject to validation prior to proceeding with proposed development efforts, as described below.

Validation requirement:

All projects in both Topic Areas will be required to undergo external validation after selection, at an interim review, and toward the end of the projects. The initial external validation will verify cultivation readiness. The interim validation will measure productivity and yield improvements and verify outdoor preparedness through an outdoor cultivation. The final validation, called the PEAK Challenge, will evaluate outdoor robustness using a set of decathlon-like criteria. These validations will support developing biological improvements in the lab, testing innovation outdoors, and increasing shared learnings in practicing robust lab-to-field transfer functions.

All steps are performed in concert with BETO’s validation team and the project team. The project’s basic process operation parameters, and the information requested in the technical datasheet template, will be disclosed to non-conflicted DOE National Laboratory personnel and/or external third party non-conflicted validators performing the validations (BETO’s validation team). The objectives of the initial validation effort are to verify the applicant’s technical data, performance metrics, baseline, and targets as proposed in the original application; establish a framework to evaluate and track progress over time; update the technical datasheet to specifically match the project scope; establish benchmark and baseline and associated target values; identify potential major showstoppers; and align project goals with BETO’s expectations and therefore projects must pass the initial validation

before commencing the full scope of proposed work.

Additional Requirements

1. Identification of which Topic Area the applicant is applying to is required.
2. Discussion of why the applicant believes their proposed technologies are currently at a minimum of Technology Readiness Level 3 – demonstrated proof of concept stage is required. Please refer to Appendix F.
3. Definition of baseline state of technology and establishment of target improvements for improved productivity is required.
4. Completion of the technical and financial datasheet (TechFin data) is required.
5. The use of robust production strains and explicit feedback between laboratory-based studies and field cultivation is required to meet the FOA objectives.
6. Description of proposed methods for compositional analysis of algal biomass is required. DOE BETO strongly supports standardized analytical methods for measuring the key biochemical constituents. Applicants should plan to use or implement the standard procedures developed by BETO that are available at: [https://www.energy.gov/beto/standard-methods](#) or discuss in detail how their own proposed methods can be comparable to BETO's standard methods. Conversion to fuel yield given in Table 2 of this FOA are based on use of the standard methods developed by BETO; if an applicant wishes to use other methods, the applicant must also discuss the methods used and the comparability to the standard method used by BETO in its SOT. Alternative methods may be verified through the validation process.
7. Discussion of what strain(s) will be utilized within their project, why, and inclusion of data to show that their proposed strain(s) can be compared to the SOT shown in Tables 1 and 2 is required. Project funding may not be used for bioprospecting activities.
8. If experimental plans rely on genetically modified organism (GMO) technology, a discussion of U.S. regulatory landscape – e.g., Toxic Substance Control Act (TSCA), the Animal and Plant Health Inspection Service (APHIS) – and the impacts of regulations on the project objectives, scope, and schedule are required.
9. The applicant's algae cultivation systems for the PEAK outdoor field challenge must be one of the following: open ponds, attached growth systems, closed photobioreactors (PBRs), or combinations of these systems.
10. Facilities to conduct the proposed project scope must be available; construction and capital costs to build cultivation acreage or capacity are not allowed within this FOA.
11. Facilities for the PEAK Challenge must support simultaneous replicate experiments with experimental controls and operated continuously outdoors for days to weeks.
12. Applications must propose to work on algal biomass (i.e., proposing research activities on biofuels and bioproducts derived from lignocellulosic biomass (e.g., agricultural residues, woody biomass) is considered non-responsive and will not be accepted). Cellulosic biomass and derivatives may be used for mixotrophic growth strategies.
13. Applicants that propose to use mixotrophic growth strategies to boost productivity or alter compositions must provide in their proposals, at minimum, a concise description of the likely economics of their envisioned commercial strategy that includes sufficient details for a reviewer to understand how the procurement and use of the substrate results in a net positive economic benefit.
14. All work under EERE funding agreements must be performed in the United States. See Section IV.J.4 and Appendix C for information on waiver requests.

Non-Responsive Applications

The following types of applications will be deemed nonresponsive and will not be reviewed or considered for an award:

- Applications that fall outside the technical parameters specified in Section I.B of the FOA, including but not limited to:
 - Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the law of thermodynamics).
 - Applications that do not follow the requirements specified in Section I.C Applications that envision potable or fresh water as primary cultivation media.
 - Applications that propose heterotrophic or mixotrophic algae cultivation strategies that utilize food-based sugars (i.e., derived from food-based crops including but not limited to corn, beets, sorghum, and sugar cane).

14

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Non-Responsive Applications, cont.

- Applications that propose to develop technology for the artificial lighting-based cultivation of algae for energy products (other than as an enabling tool for high-throughput laboratory-based screening). Bench-top laboratory systems to improve strains and cultivation practices are allowable provided there is clear iteration between lab and outdoor cultivation in the proposed project scope.
- Applications that propose to work on biomass other than algae biomass (e.g., lignocellulosic biomass).
- Applications that propose research activities on biofuels and bioproducts derived from lignocellulosic biomass (e.g., agricultural residues, woody biomass).
- Applications that propose construction of new facilities or expansion of existing facilities.

15

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Award Information

Total Amount to be Awarded	\$8 million
Average Award Amount	EERE anticipates making awards that range from \$1.5 million to \$3 million
Types of Funding Agreements	Cooperative Agreements, Work Authorizations, and Interagency Agreements
Period of Performance	Up to 36 months
Cost Share Requirement	20% of Total Project Costs; (10% for a domestic institution of higher education; domestic nonprofit entity; FFRDC; or U.S. State, local, or tribal government entity that completes more than 50% of the project work)

*Subject to the availability of appropriated funds

EERE expects to make approximately \$8 million of Federal funding available for new awards under this FOA subject to the availability of appropriated funds. The average award amount is anticipated to range from \$1.5 to \$2.5.

EERE intends to fund mostly cooperative agreements under this FOA. Cooperative Agreements include Substantial Involvement, which we will discuss next.

Statement of Substantial Involvement

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:

1. EERE shares responsibility with the recipient for the management, control, direction, and performance of the Project.
2. EERE may intervene in the conduct or performance of work under this Award for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.
3. EERE may redirect or discontinue funding the Project based on the outcome of EERE's evaluation of the Project at that the Go/No Go decision point(s).

17

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- Under cooperative agreements, there will be what is known as “substantial involvement” between EERE and the Recipient during the performance of the project.
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Statement of Substantial Involvement, cont.

4. EERE participates in major project decision-making processes.
5. In order to adequately monitor project progress and provide technical direction and/or redirection to the Recipient, DOE must be provided an adequate level of insight into various Recipient activities. Government insight activities include but are not limited to access for DOE's consultants to perform independent evaluations of Recipient's plans and processes. (Consultants to DOE may not provide technical direction and/or redirection to the Recipient.)
6. DOE will be actively involved with the Recipient in verifying the current technology readiness level of the project (and specific unit operations) as well as establishing the project technology baseline and interim and concluding performance metrics. This includes working with the Recipient to generate the baseline technical and financial data sheet that will then be updated periodically throughout the project.

18

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Cost Sharing Requirements

- Applicants must 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

19

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

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

20

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The total budget presented in the application must include both Federal (DOE), and Non-Federal (cost share) portions, thereby reflecting TOTAL PROJECT COSTS proposed. All costs must be verifiable from the Recipient's records and be necessary and reasonable for the accomplishment of the project.

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
For-profit entities	FAR Part 31
All other non-federal entities	2 CFR Part 200 Subpart E - Cost Principles

21

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Cost Share must be allowable and must be verifiable upon submission of the Full Application. Please refer to this chart for your entity’s applicable cost principles. It is imperative that you follow the applicable cost principles when creating your budget for the full application.

Allowable Cost Share
<ul style="list-style-type: none">• Cash Contributions<ul style="list-style-type: none">○ May be provided by the Prime Recipient, Subrecipients, or a Third Party• In-Kind Contributions<ul style="list-style-type: none">○ 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
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Cost share can be provided in cash and/or in-kind. It can be provided by the Prime Recipient, subs, or a third party.

The basic definition of in-kind cost share is the donation of personnel time, equipment, facilities, or other items that an organization will contribute to the project. It can take many forms, each of which must be assigned a dollar value to be included in the budget. Some examples of in-kind cost share are the donation

of work hours, facility use, equipment use.

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

23

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Be aware that there are items that are considered unallowable cost share. If a cost is considered unallowable, it cannot be counted as cost share. This slide provides some examples of cost share that is unallowable.

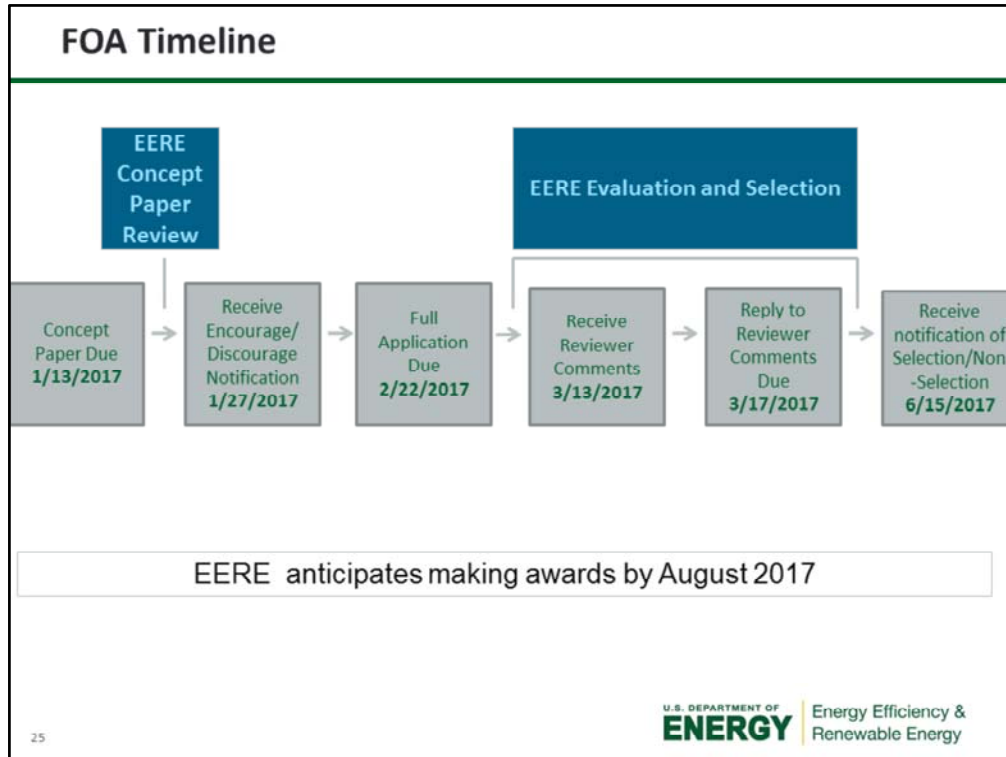
Cost Share Payment

- 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
- In limited circumstances, and where it is in the government's interest, the EERE Contracting Officer may approve a request by the Prime Recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly.

24

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Cost Share must be provided on an invoice basis, unless a waiver is requested and approved by the DOE Contracting Officer.



EERE's Evaluation and Selection Process is shown in blue here. EERE will review Concept Papers, Replies to Reviewer Comments (which we will cover later in the presentation), and Full Applications. The gray boxes represent the actions that apply to applicants throughout the FOA process.

Concept Papers

- Applicants must submit a Concept Paper
 - Each Concept Paper must be limited to a single concept or technology
- The Concept Paper must include a technology description (See Section IV.C of the FOA)
 - The technology description is limited to 3 pages
 - The Concept Paper can also include graphs, charts, or other data
- Concept Papers must be submitted by January 13 by 5:00pm ET, through EERE Exchange, and must comply with the content and form requirements in Section IV.C of the FOA
- EERE provides applicants with: (1) an “encouraged” or “discouraged” notification, and (2) the reviewer comments

26

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Concept Papers are required for this FOA. Concept Papers are brief descriptions of the proposed project. It allows applicants to submit their ideas with minimal time and expense. EERE will provide feedback on the proposed project so the Applicant can make an informed decision whether to expend additional resources to prepare a full application.

If an applicants fails to submit an eligible Concept Paper, the applicant is not eligible to submit a Full Application.

Concept Papers must be submitted by [January 13](#) through EERE Exchange.

EERE will provide applicants with either an encouraged or discouraged notification. A “discouraged” notification conveys EERE’s lack of programmatic interest in the proposed project. An applicant who receives a “discouraged” notification may still submit a Full Application.

Concept Paper Review

EERE evaluates the Concept Papers based on the **Overall Responsiveness and Viability of the Project** (Weight: 100%), including:

- The degree to which the applicant clearly describes the proposed technology, describes how the technology is unique and innovative, and how the technology will advance the current state-of-the-art as evidenced by proposed progress from the applicant's baseline to the performance target.
- The degree to which the applicant identifies risks and challenges, including possible mitigation strategies, and has shown the impact that EERE funding and the proposed project would have on the relevant field and application.
- The degree to which the applicant's qualifications, experience, capabilities and other resources are adequate to complete the proposed project with available resources.
- The degree to which the proposed work, if successfully accomplished, could clearly meet the objectives as stated in the FOA.

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EERE will provide applicants with (1) either an “encouraged” or “discouraged” notification, and (2) the reviewer comments.

Please note that regardless of the date applicants receive the Encourage/Discourage notifications, the submission deadline for the

Full Application remains the date stated on the
FOA cover page

Full Applications

- The Full Application includes:
 - **Technical Volume:** The key technical submission - info relating to the technical content, project team members, etc.
 - **SF-424 Application for Federal Assistance:** The formal application signed by the authorized representative of the applicant.
 - **SF-424A Budget & Budget Justification:** a detailed budget and spend plan for the project.
 - **Summary for Public Release**
 - **Summary Slide**
 - **Administrative Documents:** E.g., U.S. Manufacturing Plan, FFRDC Authorization (if applicable), Disclosure of Lobbying Activities, etc

28

The Full Application includes:

Technical Volume: The key technical submission. Applicants submit info pertaining to the technical content, project team members, etc.

SF-424 Application for Federal Assistance: The formal application signed by the authorized representative of the applicant. Includes cost share amounts and Federal certifications and assurances.

SF-424A Budget & Budget Justification: Budget documents that asks applicants to submit a detailed budget and spend plan for the project.

Summary for Public Release: Applicants must provide a 1 page summary of their technology appropriate for public release.

Summary Slide: Powerpoint slide that provides quick facts about the technology. Slide content requirements are provided in the FOA.

Administrative Documents: E.g., U.S. Manufacturing Plan, FFRDC Authorization (if applicable), Disclosure of Lobbying Activities, etc.

Full Applications: Technical Volume Content	
<ul style="list-style-type: none"> • Technical Volume: the key technical component of the Full Application 	
Content of Technical Volume	Suggested % of Technical Volume
Cover Page	
Project Overview	10%
Technical Description, Innovation and Impact	40%
Research Plan	30%
Market Transformation Plan	5%
Technical Qualifications and Resources	15%

The key technical component of the full application is the Technical Volume, which helps applicants frame the technical information that the application will be evaluated on. The Technical Volume provides information regarding what the project is, how the project tasks will be accomplished, and the project timetable.

The Technical Volume is comprised of a cover page, project overview, technical description, innovation, and impact; research plan; market transformation plan; and technical qualifications and resources. Please note that the percentages listed here are suggested and are not mandatory.

- The Cover Page will be a one page document and provides basic information on their project, such as title, topic area, points of contact, etc.
- The Project Overview constitutes approximately 10% of the Technical Volume and provides information on project background, goals, impact of EERE funding
- The Technical Description, Innovation, and Impact section is approximately 40% of the Technical Volume. It provides information on project relevance and outcomes, feasibility, and innovation/impacts. This ultimately provides the justification as to why EERE should fund the project.
- The Research Plan is the key element to the Technical Volume, and constitutes approximately 30% of the Technical Volume. It details the proposed milestones and project schedule. If selected for award negotiations, the Research Plan serves as the starting point when negotiating the Statement of Project Objectives.
- The Market Transformation Plan should compose approximately 5%, and should identify the target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including a mitigation plan.
- The Technical Qualifications and Resources section is approximately 15% of the Technical Volume. It provides applicants and opportunity to provide information about the proposed project team and demonstrate how the applicant **will** facilitate the successful completion of the proposed project.

Full Application Eligibility Requirements

- Applicants must submit a Full Application by February 22
- Full Applications are eligible for review if:
 - The Applicant is an eligible entity Section III.A of FOA;
 - The Applicant submitted an eligible Concept Paper;
 - The Cost Share requirement is satisfied Section III.B of FOA;
 - The Full Application is compliant Section III.C of FOA; and
 - The proposed project is responsive to the FOA Section III.D of FOA
 - The Full Application meets any other eligibility requirements listed in Section III of the FOA.

30

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As we previously pointed out, applicants must submit full applications by [Insert Date]. EERE will conduct an eligibility review, and full application will be deemed eligible if: READ SLIDE

Who's Eligible to Apply?

Eligible applicants for this FOA include:

1. Individuals
2. Domestic Entities
3. Foreign Entities
4. Incorporated Consortia
5. Unincorporated Consortia

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

Nonprofit organizations described in Section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

31

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Please note that nonprofit organizations described in Section 501(c)(3) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

Also, note that all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. 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. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

Merit Review and Selection Process (Full Applications)

- The Merit Review 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
- Ultimately, the Selection Official considers the recommendations of the reviewers, along with other considerations such as program policy factors, to make the selection decisions

32

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Technical Merit Review Criteria

Criterion 1: Technical Merit, Innovation, and Impact (50%)

- Extent to which the proposal is responsive to the FOA objectives and the application requirements.
- Extent to which the proposed technology or process has merit and is innovative.
- Degree to which the current state of the technology and the proposed advancement are clearly described.
- Extent of technical detail in the application to allow assessment of whether:
 - the proposed work is at the claimed level of development;
 - the applicant's baseline is supported by data;
 - the state of art can be advanced within the project
- Extent to which relevant data, calculations, and discussion of prior work by the applicant are provided within the technical volume and support the viability of the proposed work.
- Extent to which the project supports the topic area objectives and target specifications and metrics.
- The extent of the impact to the state of the art in achieving the project objectives.

33

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Applications will be evaluated against the following merit review criteria:
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Technical Merit Review Criteria - Continued

Criterion 2: Project Research Plan (30%)

- Extent to which applicant's approach is reasonable, informed by prior work, and efficient.
- Degree to which the approach is likely to succeed within the timeline and a critical path has been identified.
- Degree to which the task descriptions are comprehensive, detailed, and reasonable.
- Degree to which the Workplan and SOPO are aligned with the project objectives, contain meaningful, timely milestones that relate to the project objectives, and provide strong Go/No-go decision points that encompass the critical points in the project progression.
- Extent to which the discussion and demonstrated understanding of the key technical risks is forthcoming and comprehensive and the proposed mitigation strategies to address identified risks are reasonable.
- Extent to which the baseline and metrics are clear, measurable, and supported within the proposal.
- Extent to which interim deliverables will demonstrate measurable progress towards objectives.
- Extent to which the approach to the PEAK challenge is integrated with the research plan and objectives.

34

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Technical Merit Review Criteria - Continued

Criterion 3: Market Transformation Plan, Team, and Resources (20%)

Market Transformation Plan

- Extent of identification of target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including mitigation plan.
- Comprehensiveness of commercialization plan including but not limited to product development and/or service plan, commercialization timeline, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, data dissemination, U.S. manufacturing plan etc., and product distribution.

Team and Resources

- The capability of the Principal Investigator(s) and the proposed team to address all aspects of the proposed work with a good chance of success. Qualifications, relevant expertise, and time commitment of the individuals on the team.
- Degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further development and commercial deployment of the proposed technologies.
- Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Workplan.
- The sufficiency of the facilities to support the work.
- Reasonableness of budget and spend plan for proposed project and objectives.

35

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Replies to Reviewer Comments

- EERE provides applicants with reviewer comments
- Applicants are not required to submit a Reply - it is optional
- Applicants should anticipate having approximately three (3) business days to submit Replies to Reviewer Comments.
- Content and form requirements:

Section	Page Limit	Description
Text	3 pages max	Applicants may respond to one or more reviewer comments or supplement their Full Application.
Optional	1 page max	Applicants may use this page however they wish; text, graphs, charts, or other data to respond to reviewer comments or supplement their Full Application are acceptable.

36

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The Full Application are reviewed by experts in the FOA topic area(s). After those experts review the applications, EERE will provide applicants with reviewer comments. Applicants will have a brief opportunity to review the comments and prepare a short Reply to Reviewer Comments responding to comments however they desire. The Reply to Reviewer Comments is due by the date and time provided on this slide. Applicants should anticipate receiving the independent reviewer comments approximately three business days before this due date. The Reply to Reviewer Comments is an optional submission; applicants are not required to submit a Reply to Reviewer Comments.

This a **customer centric** process that provides applicants with a unique opportunity to correct misunderstandings and misinterpretations and to provide additional data that might influence the selection process in their favor. The Replies are considered by the reviewers and the selection official.

Replies to Reviewer Comments must conform to the content and form requirements listed here, including maximum page lengths. If a Reply to Reviewer Comments is more than three pages in length, EERE will review only the first three pages and disregard any additional pages.

Please see [Sections IV.F. and V.A.3](#) for additional information regarding Replies to Reviewer Comments

Selection Factors

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

37

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Program Policy Factors

The Selection Official may consider the following program policy factors in making his/her selection decisions:

- The degree to which the proposed project exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject FOA.
- 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 accelerate commercialization and overcome key market barriers.
- The degree to which the proposed project is likely to lead to increased employment and manufacturing in the United States.
- The degree to which 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 collectively represents diverse types and sizes of applicant organizations.
- The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications).
- Whether the applicant is a Climate Action Champion designated under DOE's Request for Applications DE-FOA-0001189 (RFA) or the applicant has a letter of support from a Climate Action Champion designated under the above referenced RFA.

38

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After the Merit Review process, the Selection Official may consider program policy factors to come to a final selection decision.

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Registration Requirements

- To apply to this FOA, Applicants must register with and submit 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 to submit an Application, the following registrations must be complete to received an award under this FOA:

Registration Requirement	Website
DUNS Number	http://fedgov.dnb.com/webform
SAM	https://www.sam.gov
FedConnect	https://www.fedconnect.net
Grants.gov	http://www.grants.gov

There are several one-time actions before submitting an application in response to this FOA, and it is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant’s ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is selected.

DUNS Number

Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number.

System for Award Management

Register with the System for Award Management (SAM). Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Please update your SAM registration annually.

Fedconnect

Register in FedConnect. To create an organization

account, your organization’s SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at the FedConnect site.

Grants.gov

Register in Grants.gov to receive automatic updates when Amendments to this FOA are posted. However, please note that [Delete if Letters of Intent are not applicable] Letters of Intent, Concept Papers, and Full Applications will not be accepted through Grants.gov.

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>

40



All required submissions must come through EERE Exchange. EERE will not review or consider applications submitted through any other means.

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

41

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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 cancellation of further award negotiations and rescission of the Selection

42

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Questions

- Questions about this FOA? Email PEAKFOA@ee.doe.gov
- All Q&As related to this FOA will be posted on EERE Exchange
 - You must select this specific FOA Number in order to view the Q&As
 - 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 questions asked during this presentation will be posted on EERE Exchange

43

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