

# Welcome

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U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy



FY22 Scale-Up of Integrated  
Biorefineries and Greenhouse  
Gas Reduction in First  
Generation Ethanol  
Production (Scale-Up+)  
[fy22betoscaleup@ee.doe.gov](mailto:fy22betoscaleup@ee.doe.gov)

FOA Webinar  
DE-FOA-0002638  
6/15/2022

# Notice

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- NO NEW INFORMATION OTHER THAN THAT PROVIDED IN THE FOA AND IN THE EERE eXCHANGE SYSTEM WILL BE DISCUSSED IN THE WEBINAR.
- 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.

# Notice

- All applicants are strongly encouraged to carefully read the Funding Opportunity Announcement [DE-FOA-0002638](#) (“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 by submitting a question to [FY22BetoScaleUp@ee.doe.gov](mailto:FY22BetoScaleUp@ee.doe.gov).

# **FY22 Scale-Up of Integrated Biorefineries and Greenhouse Gas Reduction in First Generation Ethanol Production (Scale-Up+)**

## **Anticipated Schedule:**

|   |                         |
|---|-------------------------|
| <b>FOA Issue Date:</b>  | 06/01/2022              |
| <b>Submission Deadline for Concept Papers:</b>                        | 07/08/2022<br>5:00pm ET |
| <b>Submission Deadline for Full Applications:</b>                     | 09/09/2022<br>5:00pm ET |
| <b>Expected Submission Deadline for Replies to Reviewer Comments:</b> | 10/20/2022<br>5:00pm ET |
| <b>Submission Deadline for Replies to Reviewer Comments:</b>          | 09/09/2022<br>5:00pm ET |
| <b>Expected Date for EERE Selection Notifications:</b>                | November 2022           |
| <b>Expected Timeframe for Award Negotiations:</b>                     | 03/31/2023              |

# Agenda

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- 1) FOA Description (FOA Section I.A)
- 2) Topic Areas (FOA Section I.B)
- 3) Award Information (FOA Section II)
- 4) Frequently Asked Questions (EERE Exchange Q&As)
- 5) Statement of Substantial Involvement (FOA Section VI.B.ix)
- 6) Cost Sharing (FOA Section II.B)
- 7) FOA Timeline (FOA Cover Page)
- 8) Concept Papers (FOA Section V.A.i)
- 9) Full Applications (FOA Section V.A.ii)
- 10) Merit Review and Selection Process (FOA Section V)
- 11) Registration Requirements (FOA Section VI.B.i)

# FOA Description

The Department of Energy is committed to pushing the frontiers of science and engineering, catalyzing clean energy jobs through research, development, demonstration, and deployment (RDD&D)

- *This FOA will support high-impact RD&D on the production of low-GHG fuels for the aviation, marine, long-haul trucking, and rail industries, and the reduction of first-generation ethanol GHG emissions*
- *The FOA will support the Biden Administration's new action items to produce 3 billion gallons of sustainable aviation fuel (SAF) per year and reduce aviation emissions by 20% by 2030*
- *BETO is targeting biofuel production pathways that can deliver at least 70% lower lifecycle greenhouse gas emissions, however a minimum 50% reductions are allowable for this year's demonstration scale applications (Topic Area 3)*



# FOA Description

| Subtopic Area                        | Anticipated Minimum Award Size for Any One Individual Award (Fed Share) | Anticipated Maximum Award Size for Any One Individual Award (Fed Share) |
|--------------------------------------|---|---|
| <b>1.a Pre-Pilot</b>                 | \$1,000,000   | \$2,000,000   |
| <b>1.b Pre-Pilot (Algae CO2)</b>     | \$3,300,000   | \$9,000,000   |
| <b>2.a Pilot (Phase 1)</b>           | \$500,000   | \$2,000,000   |
| <b>2.b Pilot (Phase 2)</b>           | \$5,000,000   | \$15,000,000  |
| <b>3.a Demonstration (Phase 1)</b>   | \$500,000   | \$2,000,000   |
| <b>3.b Demonstration (Phase 2)</b>   | \$10,000,000  | \$100,000,000*  |
| <b>4.a Gen-1 (Feasibility study)</b> | \$250,000   | \$500,000   |
| <b>4.b Gen-1 (Pre-pilot)</b>         | \$4,000,000   | \$9,000,000   |

\*\$100,000,000 is the absolute maximum federal funding for a demonstration facility under Topic Area 3b; however, applicants are highly encouraged to be judicious when budgeting their demonstration scale projects, as funding for these projects is subject to future Congressional appropriations.



# Topic Area 1 : Pre-Pilot Scale-Up of Integrated Biorefineries

Topic Area 1 will scale-up key process steps that are ready to move out of the laboratory scale (TRL 3 or 4) and into industrially-relevant piece(s) of equipment (TRL 5). The proposed unit operation(s) within an application do not have to comprise a fully integrated pilot scale unit (TRL 6) by the end of the project, but rather can be utilized to support future integration of the entire process at pilot or demonstration scale.

- *Applicants to Topic Area 1 will be required to demonstrate proof of technology success at the laboratory scale and provide a market justification for further system scaling*

Topic Area 1 is broken out into two distinct Subtopic Areas.

- *Subtopic Area 1a focuses on technologies using conventional bio-based feedstocks*
- *Subtopic Area 1b focuses on technologies that use CO<sub>2</sub> from ambient air in algal systems.*

## Subtopic Area 1a – Pre-Pilot Scale-Up of Integrated Biorefinery Technologies

|  |   |
|--|---|
| Metric:                                      | Minimum:  |
| Fuel Type                                    | sustainable aviation fuel, renewable diesel, sustainable marine fuel, and/or sustainable rail fuel  |
| Fuel Selling Price                           | Cost competitive with petroleum-based fuels (model TEA for envisioned mature commercial facility (n <sup>th</sup> plant))   |
| Cumulative Time on Stream                    | 500 hours   |
| Continuous Time on Stream                    | 100 hours   |
| Throughput Equivalent                        | 0.5 DTPD equivalent; or<br>8 MMBTU/day of biogas equivalent; or<br>35 gallons/day of final fuel equivalent for processes that utilize CO <sub>2</sub> as a feed                     |
| Greenhouse Gas (GHG) Reductions              | 70%   |
| <b>Allowable Feedstocks (see Appendix G)</b> | <b>Lignocellulosic Feedstocks, Algae, Organic Wet Waste, Sorted Municipal Solid Waste, Food Waste, Biogas, Grain Starch, Oilseed Crops, C&amp;D Waste, and Waste CO<sub>2</sub></b> |

## Subtopic Area 1b: Pre-Pilot Scale-Up of Integrated Biorefineries: Use of Carbon Dioxide from Ambient Air in Algal Systems

The use of carbon dioxide captured directly from the ambient air in algal systems has been developed at the bench scale, both externally and within the other BETO programs and requires further development to reduce scale-up risks prior to full system scaling. Subtopic Area 1b will scale up key process steps that are ready to move out of the laboratory scale (TRL 3 or 4) and into industrially-relevant piece(s) of equipment (TRL 5).

| Metric:                         | Minimum:  |
|---------------------------------|---|
| Fuel Type                       | sustainable aviation fuel, renewable diesel, sustainable marine fuel, and/or sustainable rail fuel  |
| Fuel Selling Price              | Cost competitive with petroleum-based fuels (model TEA for n <sup>th</sup> plant)   |
| Cumulative Time on Stream       | 500 hours of CO <sub>2</sub> delivery to algal systems  |
| Continuous Time on Stream       | 100 hours of CO <sub>2</sub> delivery to algal systems  |
| Throughput Equivalent           | 35 gallons/day or 12,500 gallons/year of biofuel intermediate (e.g., extracted lipid suitable for upgrading to SAF)   |
| Greenhouse Gas (GHG) Reductions | 70% reduction in gCO <sub>2</sub> e/MJ of the biofuel as compared to petroleum baseline   |
| <b>Allowable Feedstocks</b>     | <b>CO<sub>2</sub> from the ambient air, either:</b> <ul style="list-style-type: none"><li>• captured via operation of Direct Air Capture (DAC) systems and supplied directly to co-located algal systems; or</li><li>• captured through chemically, biologically, or mechanically-assisted accelerated diffusion of air into algal system growth media.</li></ul> |

## Topic Area 2 : Pilot Scale-Up of Integrated Biorefineries

Topic Area 2 will identify, evaluate, and select applications proposing project definition, development, and execution plans for the scaling of pre-pilot biofuel and bioproduct technologies to pilot scale for:

- *The manufacturing of sustainable aviation fuel, renewable diesel, sustainable marine fuel, and/or sustainable rail fuel*

Topic Area 2 is broken into two separate Subtopic Areas.

- *Subtopic Area 2a: Pilot Scale – Preliminary Design and Phased Construction, is intended for projects that have all prior scale data and are ready to design a pilot facility*
- *Subtopic Area 2b: Pilot Scale – Final Design and Construction, is intended for projects that have completed the design of the pilot scale facility*

## Topic Area 2 Minimum Requirements

| Metric:                   | Minimum:  |
|---------------------------|---|
| Fuel Type                 | sustainable aviation fuel, renewable diesel, sustainable marine fuel, and/or sustainable rail fuel  |
| Fuel Selling Price        | Cost competitive with petroleum-based fuels (model TEA for n <sup>th</sup> plant)   |
| Cumulative Time on Stream | 1,000 hours   |
| Continuous Time on Stream | 500 hours   |
| Throughput Equivalent     | 20,000 gallons of biofuel per year equivalent   |
| GHG Reductions            | 70%   |
| Allowable Feedstocks      | Lignocellulosic Feedstocks, Algae, Organic Wet Waste, Sorted Municipal Solid Waste, Food Waste, Biogas, Grain Starch, Oilseed Crops, C&D Waste, Waste CO <sub>2</sub> , and CO <sub>2</sub> by Direct Air Capture |

## Subtopic Area 2a: Pilot Scale-Up of Integrated Biorefineries (Preliminary Design and Phased Construction)

Subtopic Area 2a is intended for projects that have all relevant prior scale data and are ready to design a biofuels pilot facility. Projects selected have an opportunity to construct and operate their designed pilot facility subject to the down-select process described in detail below.

- Only projects selected following the down-select process will be eligible to proceed into a final design/construction/operation phase.

| Phases   | Budget Periods  | Scope   |
|--|---|---|
| <b>Phase 1 –<br/>Verification<br/>&amp; Design<br/>Basis<br/>Definition<br/>(12 Months)<br/>Up to \$2M<br/>federal</b> | <b>BP1</b>  | <b>Verification of baseline<br/>data presented in<br/>application</b> |
|  | <b>Go/No-Go<br/>Review of Verification outcome</b>                                  |   |
|  | <b>BP2</b>  | <b>Design Basis Definition</b>  |
| <b>Down-select (CD-2)<br/>Approve project scope and begin design (Subject to future<br/>appropriations)</b>            |   |   |
| <b>Phase 2 –<br/>Final Design,<br/>Construction,<br/>Operation<br/>(42-48<br/>Months)<br/>Up to \$15M<br/>federal</b>  | <b>BP3</b>  | <b>Project Definition - preliminary<br/>planning and design</b>       |
|  | <b>Go/No-Go (CD-3)<br/>Review to approve start of construction</b>                  |   |
|  | <b>BP4</b>  | <b>Project Execution - complete final<br/>design and construction</b> |
|  | <b>Go/No-Go (CD-4)<br/>Performance test to verify readiness to begin operations</b> |   |
|  | <b>BP5</b>  | <b>Operations</b>   |

**Selection for Phase 1 award  
does not guarantee a Phase 2  
award.**

**Phase 2 funds are subject to  
future appropriations and  
availability of funds, which  
may be obligated to  
successful Phase 2 awards  
once a down-select occurs**

## Subtopic Area 2b: Pilot Scale-Up of Integrated Biorefineries (Final Design and Construction)

Subtopic Area 2b is intended for projects that are fully ready to build and operate a pilot scale biorefinery. Eligible Applicants must have a completed full design package, whether that design was funded through past DOE funding or not.

- A full design package includes items like Process Design Basis Documents, Process Flow Diagrams, Mass and Energy Balances, budgetary estimates, and schedules. See **APPENDIX I – PRELIMINARY DESIGN REQUIREMENTS**

| Title  | Budget Periods  | Scope  |
|--|---|--|
| Construction and Operation (42-48 Months)<br>Up to \$15M federal | BP1   | Verification of Design Package and Readiness to Proceed    |
|  | Go/No-Go (CD-3)<br>Review to approve start of construction                  |  |
|  | BP2   | Project Execution - complete final design and construction |
|  | Go/No-Go (CD-4)<br>Performance test to verify readiness to begin operations |  |
|  | BP3   | Operations   |

**Unlike Subtopic Area 2a, recipients under Subtopic Area 2b will not be subject to the down-select process. The full federal share of the award will be obligated at the time of initial award, up to \$15,000,000.**



## Topic Area 3 : Demonstration Scale-Up of Integrated Biorefineries

Topic Area 3 will identify, evaluate, and select applications proposing project definition, development, and execution plans for the scaling of pilot biofuel and bioproduct technologies to demonstration scale for:

- *The manufacturing of sustainable aviation fuel, renewable diesel, sustainable marine fuel, and/or sustainable rail fuel;*

Topic Area 3 is broken into two separate Subtopic Areas.

- *Subtopic Area 3a: Demonstration Scale – Preliminary Design and Phased Construction, is intended for projects that have all requisite prior scale data and are ready to design a demonstration facility.*
- *Subtopic Area 3b: Demonstration Scale – Final Design and Construction, is intended for projects that have completed the design of the demonstration scale facility*

# Topic Area 3 Minimum Requirements

| Metric:                   | Minimum:  |
|---------------------------|---|
| Fuel Type                 | sustainable aviation fuel, renewable diesel, sustainable marine fuel, and/or sustainable rail fuel  |
| Fuel Selling Price        | Cost competitive with petroleum-based fuels (model TEA for n <sup>th</sup> plant)   |
| Cumulative Time on Stream | 1,000 hours   |
| Continuous Time on Stream | 1,000 hours   |
| Throughput Equivalent     | 1,000,000 gallons of biofuel per year equivalent  |
| GHG Reductions            | 50%   |
| Allowable Feedstocks      | Lignocellulosic Feedstocks, Algae, Organic Wet Waste, Sorted Municipal Solid Waste, Food Waste, Biogas, Grain Starch, Oilseed Crops, C&D Waste, Waste CO <sub>2</sub> , and CO <sub>2</sub> by Direct Air Capture |

## Subtopic Area 3a: Demonstration Scale-Up of Integrated Biorefineries (Preliminary Design and Phased Construction)

Subtopic Area 3a is intended for projects that have all requisite prior scale data and are ready to design a biofuels demonstration facility. Projects selected under Subtopic Area 3a may have an opportunity to construct and operate their designed demonstration facility subject to the down-select process described in detail below.

- Only projects selected following the down-select process will be eligible to proceed into a final design/construction/operation phase.

| Phases  | Budget Periods  | Scope   |
|---|---|---|
| <b>Phase 1 –<br/>Verification &amp;<br/>Design Basis<br/>Definition<br/>(12-18<br/>Months)<br/>Up to \$2M<br/>federal</b> | <b>BP1</b>  | <b>Verification of baseline<br/>data presented in<br/>application</b> |
|   | <b>Go/No-Go<br/>Review of Verification outcome</b>                                  |   |
|   | <b>BP2</b>  | <b>Design Basis Definition</b>  |
| <b>Down-select (CD-2)<br/>Approve project scope and begin design (Subject to future appropriations)</b>                   |   |   |
| <b>Phase 2 – Final<br/>Design,<br/>Construction,<br/>Operation<br/>(42-48 Months)<br/>Up to \$100M<br/>federal</b>        | <b>BP3</b>  | <b>Project Definition - preliminary<br/>planning and design</b>       |
|   | <b>Go/No-Go (CD-3)<br/>Review to approve start of construction</b>                  |   |
|   | <b>BP4</b>  | <b>Project Execution - complete final<br/>design and construction</b> |
|   | <b>Go/No-Go (CD-4)<br/>Performance test to verify readiness to begin operations</b> |   |
|   | <b>BP5</b>  | <b>Operations</b>   |

**Selection for Phase 1  
award does not guarantee  
a Phase 2 award.**

**Phase 2 funds are subject  
to future appropriations  
and availability of funds,  
which may be obligated to  
successful Phase 2 awards  
once a down-select occurs**

## Subtopic Area 3b: Demonstration Scale-Up of Integrated Biorefineries (Final Design and Construction)

Subtopic Area 3b is intended for projects that are fully ready to build and operate a demonstration scale biorefinery. Eligible Applicants must have a completed full design package, whether that design was funded through past DOE funding or not.

- A full design package includes items like Process Design Basis Documents, Process Flow Diagrams, Mass and Energy Balances, budgetary estimates, and schedules. See **APPENDIX I – PRELIMINARY DESIGN REQUIREMENTS**

| Title   | Budget Periods  | Scope  |
|---|---|--|
| Construction and Operation (42-48 Months)<br>Up to \$100M federal | BP1   | Verification of Design Package and Readiness to Proceed    |
|   | Go/No-Go (CD-3)<br>Review to approve start of construction                  |  |
|   | BP2   | Project Execution - complete final design and construction |
|   | Go/No-Go (CD-4)<br>Performance test to verify readiness to begin operations |  |
|   | BP3   | Operations   |

**Unlike Subtopic Area 3a, recipients under Subtopic Area 3b will not be subject to the down-select process. A partial or full federal share of the award will be obligated at the time of initial award, up to \$100,000,000.**

\$100,000,000 is the absolute maximum federal funding for a demonstration facility under Topic Area 3b; however, applicants are highly encouraged to be judicious when budgeting their demonstration scale projects, as funding for these projects is subject to future Congressional appropriations.

## Topic Area 4: First Generation (Gen-1) Corn Ethanol Emission Reduction

Topic Area 4 will analyze or demonstrate strategies to lower GHG emissions and Carbon Intensity (CI) within the existing Gen-1 corn ethanol industry, such as:

- Low-carbon agricultural practices
- Switching to renewable process heat and power (i.e., renewable natural gas, or biomass)
- Utilization of process produced CO<sub>2</sub>
- New productivity or conversion efficiency measures in ethanol facilities.

Topic Area 4 is broken into two separate Subtopic Areas.

- *Subtopic Area 4a focuses on the development of feasibility studies to analyze the technoeconomic and lifecycle emissions benefits of proposed technologies*
- *Subtopic Area 4b will scale technologies to reduce Gen-1 emissions to the pre-pilot level.*

## Subtopic Area 4a: Gen-1 Corn Ethanol Emission Reduction: Feasibility Studies

Topic Area 4a seeks projects that create feasibility studies or models to assess the technical viability and costs associated with implementing a new GHG emission reduction technology into the corn-to-ethanol chain.

- Project teams must include an industry partner, either corn farming or ethanol production related, in order to utilize real world processes and data in their studies.
- Teams must have a rigorous technoeconomic analysis (TEA) and verify the lifecycle GHG benefits allowing for sufficient geographical and technical diversity to provide a representative sample of replicable cases to catalyze widespread adoption.
- Projects are encouraged to utilize predictive modeling and high-performance computing to accelerate and optimize their unit operation(s) design(s).

## Subtopic Area 4b: Gen-1 Corn Ethanol Emission Reduction: Pre-Pilot

|   |   |
|---|---|
| Metric:   | Minimum:  |
| Carbon Intensity (CI) Reduction                             | 3.58 gCO <sub>2</sub> e/MJ, which equates to 5% CI reduction of a typical corn ethanol, preference may be shown for larger GHG reductions.                      |
| <b>Applications Proposing Conversion Facility Processes</b> |   |
| Cumulative Time on Stream                                   | 500 hours   |
| Continuous Time on Stream                                   | 100 hours   |
| Throughput Equivalent                                       | 0.5 DTPD equivalent; or<br>8 MMBTU/day of biogas equivalent; or<br>35 gallons/day of final fuel equivalent for processes that utilize CO <sub>2</sub> as a feed |
| Allowable Feedstocks (see Appendix G)                       | Lignocellulosic Feedstocks, Algae, Organic Wet Waste, Sorted Municipal Solid Waste, Food Waste, Biogas, Grain Starch, Oilseed Crops, and Waste CO <sub>2</sub>  |
| <b>Applications Proposing Field Studies</b>                 |   |
| Number of Plots   | 3 plots   |
| Growing Seasons   | 3 seasons   |



# Common Questions and Answers

| Question  | Answer  |
|---|---|
| FAQ: We believe we have a strong application, but the timing of the FOA's release doesn't allow for us to meet all of the requirements of the FOA at this time. Can we still apply? | While developing an application, it is important to make sure you meet all the requirements of the FOA. If for some reason, you do not meet a requirement, but feel your proposal is strong and this missing requirement will be met prior to the eventual selection of awards please include this in your application and address it in your risk mitigation write-up. |
| FAQ: Can the fuels produced during the project be used for ASTM, RFS pathway approval, or other regulatory approvals?   | Yes, the FOA volume requirements we designed with the intent to do just that. If your produced fuel does not currently have regulatory approval per the Subtopic Area Specific Requirements sections, the FOA requires the applicant to discuss how these regulatory approvals will be met.   |
| FAQ: Can we include fuel testing, engine testing, and/or onboard testing of fuels in the project?   | Yes.  |

# Common Questions and Answers

| Question  | Answer  |
|---|---|
| FAQ: What is the best way to present our project in an application?   | There is no requirement on how an applicant should present their data in the application. However, if possible, design your application such that it follows the FOA requirements and sections in the same order to make these complex projects and applications as easy as possible for the reviewers to follow and review.  |
| FAQ: Our process and data is proprietary and we would like to simply include it as a "black box" with process feeds and products without describing the process itself. Can we still apply? | The content that is included within an application is up to the applicant. However, if a reviewer is unable to review a portion of (or the entirety of) the process being proposed the application will receive low scores as the reviewers will be unable to support a higher score. Please note that all reviewers sign Nondisclosure Agreement with the Department of Energy prior to viewing any application materials. |

# 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.A or I.B of the FOA
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the law of thermodynamics).
- Applications submitted without the appropriate supplemental content as defined in the Topic Area and Subtopic Area will be deemed non-responsive and excluded from further review under this FOA.

# Award Information

| <b>Total Amount to be Awarded</b>  |                             | Approximately \$59,000,000            |                   |
|------------------------------------|-----------------------------|---------------------------------------|-------------------|
| <b>Types of Funding Agreements</b> |                             | Cooperative Agreements                |                   |
| <b>Subtopic Area Number</b>        | <b>Average Award Amount</b> | <b>Period of Performance (months)</b> | <b>Cost Share</b> |
| 1a                                 | \$1,500,000                 | 24-36                                 | 20%               |
| 1b                                 | \$6,150,000                 | 36-48                                 | 20%               |
| 2a                                 | \$1,250,000                 | 12                                    | 50%               |
| 2b                                 | \$10,000,000                | 48-60                                 | 50%               |
| 3a                                 | \$1,250,000                 | 12                                    | 50%               |
| 3b                                 | \$55,000,000                | 48-60                                 | 50%               |
| 4a                                 | \$375,000                   | 12-24                                 | 20%               |
| 4b                                 | \$6,500,000                 | 24-36                                 | 20%               |

\*Subject to the availability of appropriated funds

# 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:

- EERE shares responsibility with the Recipient for the management, control, direction, and performance of the Project.
- 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.
- 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.
- EERE participates in major project decision-making processes.

# Cost Sharing Requirements

| Subtopic Area Number | Subtopic Area Title   | Cost Share Requirement |
|----------------------|---|------------------------|
| 1a                   | Pre-Pilot Scale-Up of Integrated Biorefinery Technologies   | 20%                    |
| 1b                   | Pre-Pilot Scale-Up of Integrated Biorefineries: Use of Carbon Dioxide from Ambient Air in Algal Systems | 20%                    |
| 2a                   | Pilot Scale-Up of Integrated Biorefineries: Preliminary Design and Phased Construction                  | 50%                    |
| 2b                   | Pilot Scale-Up of Integrated Biorefineries: Final Design and Construction                               | 50%                    |
| 3a                   | Demonstration Scale-Up of Integrated Biorefineries: Preliminary Design and Phased Construction          | 50%                    |
| 3b                   | Demonstration Scale-Up of Integrated Biorefineries: Final Design and Construction                       | 50%                    |
| 4a                   | Gen-1 Corn Ethanol Emission Reduction   | 20%                    |
| 4b                   | Gen-1 Corn Ethanol Emission Reduction   | 20%                    |

# 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
- If you are selected for award negotiations, 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
- Please note, vendors/contractors may NOT provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.



# 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<br><a href="http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/far/31.htm">http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/far/31.htm</a>                          |
| All other non-federal entities | 2 CFR Part 200 Subpart E - Cost Principles<br><a href="https://www.ecfr.gov/cgi-bin/text-idx?node=2:1.1.2.2.1.5&amp;rgn=div6">https://www.ecfr.gov/cgi-bin/text-idx?node=2:1.1.2.2.1.5&amp;rgn=div6</a> |

# Allowable Cost Share

- Cash Contributions
  - May be provided by the Prime Recipient, Subrecipients, or a Third Party (may not be provided by vendors/contractors)
- In-Kind Contributions
  - Can include, but are not limited to: the donation of volunteer time or the donation of space or use of equipment.

*For more information, see the Cost Share Appendix A in the FOA*

# Unallowable Cost Share

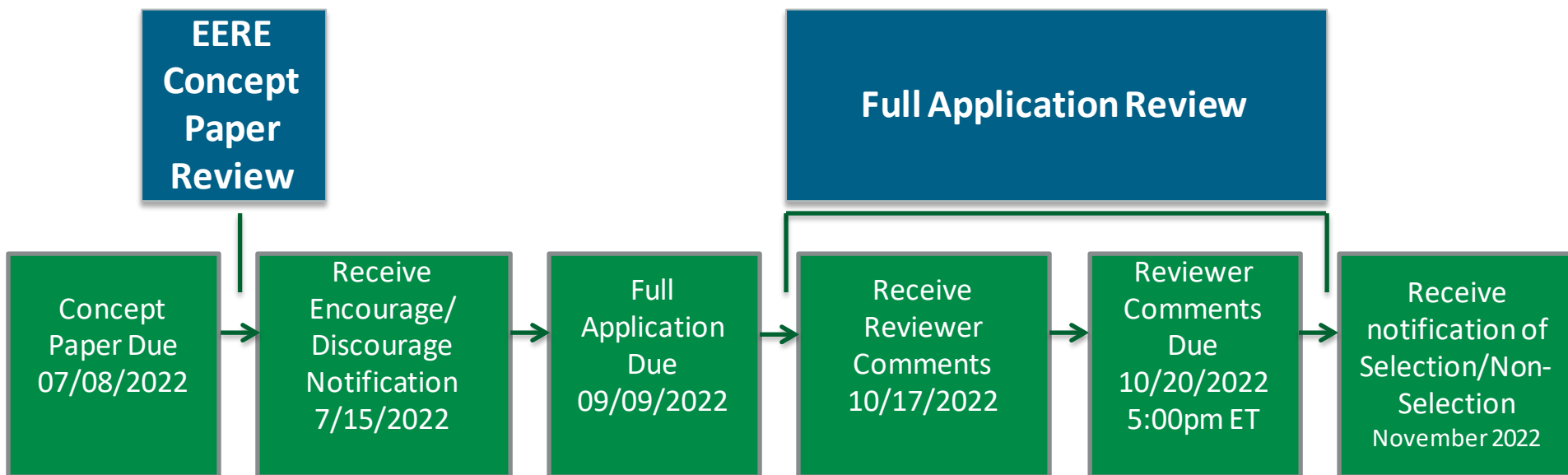
The Prime Recipient may **NOT** use the following sources to meet its cost share obligations including, but not limited to:

- 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
- The same cash or in-kind contributions for more than one project or program
- Vendor/contractor contributions

# 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. See [Section III.B.vi](#) of the FOA.

# FOA Timeline



EERE anticipates making awards by [03/31/2023](#)

# Concept Papers

- Applicants must submit a Concept Paper
  - Each Concept Paper must be limited to a single concept or technology
- Section IV.C of the FOA states what information a Concept Paper should include and the page limits.
  - Failure to include the required content could result in the Concept Paper receiving a “discouraged” determination or the Concept Paper could be found to be ineligible
- Concept Papers must be submitted by 07/08/2022 5:00pm ET, through EERE Exchange
- EERE provides applicants with: (1) an “encouraged” or “discouraged” notification, and (2) the reviewer comments

# Concept Paper Review

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EERE makes an independent assessment of each Concept Paper based on the criteria in Section V.A.i. of the FOA. EERE will encourage a subset of applicants to submit Full Applications. Other applicants will be discouraged from submitting a Full Application.

An applicant who receives a “discouraged” notification may still submit a Full Application. EERE will review all eligible Full Applications. However, by discouraging the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project in an effort to save the applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

# 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**
- **Block Flow Diagram and Supplemental Data**
- **Diversity Equity and Inclusion Plan**
- **Administrative Documents:** E.g., U.S. Manufacturing Plan, FFRDC Authorization (if applicable), Disclosure of Lobbying Activities, and Foreign Entities and Foreign Work



# Full Applications: Technical Volume Content

## 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 | 30%   |
| Work Plan                                    | 40%   |
| Technical Qualifications and Resources       | 20%   |
| Diversity, Equity, Inclusion                 | As needed to throughout Technical Volume. A separate DEI Plan is required |

# Full Application Eligibility Requirements

- Applicants must submit a Full Application by 09/09/2022

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.

# Who is Eligible to Apply?

Eligible applicants for this FOA include:

1. U.S. citizens and lawful U.S. permanent residents
2. For-profit entities
3. Educational institutions
4. Nonprofits
5. State, local, and tribal government entities
6. DOE/National Nuclear Security Administration (NNSA) FFRDCs are eligible to apply for funding as a subrecipient, but are not eligible to apply as a prime recipient.

For more detail about eligible applicants, please see [Section III.A](#) of the FOA

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.

Prime Recipients must be incorporated (or otherwise formed) under the laws of a State or territory of the United States and have a physical location for business operations in the United States. See [Section III.A.iii](#) for requirements applicable to foreign entities applying under this FOA.

# Multiple Applications

## **Subtopic Areas 1a, 1b, 4a, and 4b:**

An entity may submit more than one Concept Paper and Full Application to these Topic Areas, provided that each application describes a unique, scientifically distinct project and provided that an eligible Concept Paper was submitted for each Full Application.

## **Subtopic Areas 2a, 2b, 3a and 3b:**

An entity may only submit one Concept Paper and one Full Application to these Topic Areas. The Concept Paper and Full Application must address no more than one topic area identified in Section I.B. of the FOA. If an entity submits more than one Concept Paper and Full Application, EERE will request a determination from the applicant's authorizing representative as to which application should be reviewed. Any other submissions received listing the same entity as the applicant will not be eligible for further consideration. This limitation does not prohibit an applicant from collaborating on other applications (e.g., as a potential subrecipient or partner) so long as the entity is only listed as the applicant on one Concept Paper and one Full Application submitted under this FOA.

**An entity may only submit one Concept Paper and Full Application to Subtopics 2a, 2b, 3a, or 3b. The Applicant should determine which topic area best fits the application submission.**

# Merit Review and Selection Process (Full Applications)

- The Merit Review process consists of multiple phases that each include an 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

# Technical Merit Review Criteria

Applications will be evaluated against the merit review criteria shown below. All sub-criteria are of equal weight.

## Full Application

- Criterion 1: Technical Merit, Innovation, and Impact (50%)
- Criterion 2: Project Research and Market Transformation Plan (25%)
- Criterion 3: Team and Resources (15%)
- Criterion 4: Diversity, Equity, and Inclusion (10%)

# Replies to Reviewer Comments

- EERE provides applicants with reviewer comments
- Applicants are not required to submit a Reply - it is optional
- To be considered by EERE, a Reply must be submitted by **10/20/2022 5:00pm ET** and submitted through EERE Exchange
- Content and form requirements:

| Section  | Page Limit  | Description  |
|----------|-------------|--|
| Text     | 2 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. |

# 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 (FOA section V.C.i)

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, or group of projects, represent a desired geographic distribution (considering past awards and current applications);
- The degree to which the proposed project incorporates diversity, equity, and inclusion elements, including but not limited to team members from Minority Serving Institutions (e.g. Historically Black Colleges and Universities (HBCUs)/Other Minority Institutions), Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, Veteran Owned Businesses, or members within underserved communities.
- The degree to which the proposed project's primary biofuel stream(s) contains the proposed process(es)'s utilizable biogenic carbon; and
- The degree to which the proposed project reduces Greenhouse Gas emissions when compared to the petroleum derived equivalent.

# 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   |
|--------------------------|---|
| 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>

# 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 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 cancellation of further award negotiations and rescission of the Selection

# Questions

- Questions about this FOA? Email [FY22BETOScaleUp@ee.doe.gov](mailto:FY22BETOScaleUp@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](mailto: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