



# U.S. Department of Energy

## Categorical Exclusion Determination Form

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Proposed Action Title:

Program or Field Office:

Location(s) (City/County/State):

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Proposed Action Description:

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Categorical Exclusion(s) Applied:

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For the DOE procedures regarding categorical exclusions, including the full text of each categorical exclusion, see 10 CFR 1021.102 and Appendix B to [10 CFR Part 1021](#), and also Section 5.4 (Applying one or more categorical exclusions to a proposal) and Appendices B and C of [DOE's National Environmental Policy Act Implementing Procedures](#) (June 30, 2025).

**Requirements and guidance in 10 CFR 1021.102 and DOE's NEPA Implementing Procedures:** (See full text in regulation and in Implementing Procedures)

The proposal fits within a class of actions that is listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures (June 30, 2025).

To fit within the classes of actions listed in Appendix B to 10 CFR Part 1021, or Appendix B of DOE's NEPA Implementing Procedures, a proposal must satisfy the conditions that are integral elements of the classes of actions in Appendix B of both 10 CFR Part 1021 and DOE's NEPA Implementing Procedures.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. DOE or an applicant may modify the proposal to avoid reasonably foreseeable adverse significant effects such that the categorical exclusion would apply.

The proposal has not been segmented to meet the definition of a categorical exclusion.

[Note: For proposals that fit within the categorical exclusions listed in Appendix C of DOE's NEPA Implementing Procedures, see DOE's notice of adoption for the subject Appendix C categorical exclusion for additional considerations. DOE notices of adoption for other agency categorical exclusions may be found on [DOE's Section 109 webpage](#).]

Based on my review of the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class(es) of action, the other requirements and guidance set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined:



# U.S. Department of Energy

## Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Range Extenders for Electric Aviation with Low Carbon and High Efficiency (REEACH) Phase 2 (DE-FOA-0002240 and DE-FOA-0002241)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Connecticut, Maryland, New York, Ohio, Pennsylvania, West Virginia

Proposed Action Description:

SECOND AMENDED PROGRAMMATIC NEPA DETERMINATION (See attached original and First Amended Determination, dated September 12, 2023 and November 14, 2023, respectively.) The REEACH Phase 2 Program seeks to develop a disruptive system to convert the chemical energy contained in energy-dense carbon neutral liquid fuels (CNLF) into electric power for aircraft propulsion via electric powertrains and other key systems. REEACH teams will build upon their Phase I systems to further develop innovative, cost-effective, and high-performance energy storage and power generation (ESPG) sub-systems. If successful, REEACH teams' components and sub-system architectures will enable sufficient power to propel a fully electric, narrow-body aircraft through all the various flight phases and store sufficient energy to power the entire aircraft during a long-range mission with adequate safety reserves, reducing fossil fuel combustion and CO2 emissions.

The REEACH Phase 2 Program is composed of 5 small-scale research and development projects that will be conducted by universities, non-profit, and for-profit entities. This Second Amended Determination adds 1 project (RTX Corporation). See Attachment for all 5 projects covered by this and the prior Determinations. These projects fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.15 - Small-scale indoor research and development projects using nanoscale materials

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE  
Date: 2024.03.25 16:35:03 -04'00'

Date Determined:

**Attachment A: Projects in the REEACH (FOA No. DE-FOA-0002240 and DE-FOA-0002241)  
Phase II Program**

<b>Prime Recipient (Control No.)</b>	<b>Project Title</b>	<b>Categorical Exclusion</b>
<b>RTX Corporation (2240-1502)</b>	<b>Compact Propulsion Engine Optimized with Waste Heat Recovery (CO-POWER)</b>	<b>A9, B3.6</b>
GE Research (2240-1505)	Fuel Cell Embedded ENGINE (FLyCLEEN)	A9, B3.6, B3.15
University of Maryland (2240-1518)	Hybrid SOFC-Turbogenerator for Aircraft	A9, B3.6
Precision Combustion, Inc. (2241-1514)	SOFC's for FLIGHT	A9, B3.6
University of Connecticut (2240-1532)	High Performance Metal Supported SOFC System for Range Extension of Commercial Aviation	A9, B3.6, B3.15

**Bold text indicates the one project included in this Second Amended CX.**



# U.S. Department of Energy

## Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Range Extenders for Electric Aviation with Low Carbon and High Efficiency (REEACH) Phase 2 (DE-FOA-0002240 and DE-FOA-0002241)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Connecticut, Maryland, New York, Ohio, West Virginia,

Proposed Action Description:

The REEACH Phase 2 Program seeks to develop a disruptive system to convert the chemical energy contained in energy-dense carbon neutral liquid fuels (CNLFs) into electric power for aircraft propulsion via electric powertrains and other key systems. REEACH teams will build upon their Phase I systems to further develop innovative, cost-effective, and high-performance energy storage and power generation (ESPG) sub-systems. If successful, REEACH teams components and sub-system architectures will enable sufficient power to propel a fully electric, narrow-body aircraft through all the various flight phases and store sufficient energy to power the entire aircraft during a long-range mission with adequate safety reserves, reducing fossil fuel combustion and CO2 emissions.

The REEACH Phase 2 Program is composed of 5 small-scale research and development projects that will be conducted by universities, non-profit, and for-profit entities. This First Amended Determination adds 2 projects (University of Maryland and GE Research) to the Determination signed on September 12, 2020 (see Attachment for all 4 projects covered by this and the prior Determination). These projects fit within the class of actions identified under the DOE Categorical Exclusions identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.15 - Small-scale indoor research and development projects using nanoscale materials

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: Approved via email

Date Determined: November 14, 2023

**Attachment A: Projects in the REEACH (FOA No. DE-FOA-0002240) Phase II Program**

<b>Prime Recipient (Control No.)</b>	<b>Project Title</b>	<b>Categorical Exclusion</b>
<b>GE Research (2240-1505)</b>	<b>Fuel Cell Embedded Engine (FLyCLEEN)</b>	<b>A9, B3.6, B3.15</b>
<b>University of Maryland (2240-1518)</b>	<b>Hybrid SOFC-Turbogenerator for Aircraft</b>	<b>A9, B3.6</b>
Precision Combustion, Inc. (2241-1514)	SOFC's for FLIGHT	A9, B3.6
University of Connecticut (2240-1532)	High Performance Metal Supported SOFC System for Range Extension of Commercial Aviation	A9, B3.6, B3.15

Bold text indicates the two projects included in the First Amended CX.



# U.S. Department of Energy

## Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Range Extenders for Electric Aviation with Low Carbon and High Efficiency (REEACH) Phase 2 (DE-FOA-0002240 and DE-FOA-0002241)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Connecticut, Ohio

Proposed Action Description:

The REEACH Phase 2 Program seeks to develop a disruptive system to convert the chemical energy contained in energy-dense carbon neutral liquid fuels (CNLFs) into electric power for aircraft propulsion via electric powertrains and other key systems. REEACH teams will build upon their Phase I systems to further develop innovative, cost-effective, and high-performance energy storage and power generation (ESPG) sub-systems. If successful, REEACH teams components and sub-system architectures will enable sufficient power to propel a fully electric, narrow-body aircraft through all the various flight phases and store sufficient energy to power the entire aircraft during a long-range mission with adequate safety reserves, reducing fossil fuel combustion and CO2 emissions.

The REEACH Phase 2 Program is composed of 5 small-scale research and development projects that will be conducted by universities, non-profit, and for-profit entities. This Determination covers 2 of the 5 projects (listed in Attachment A). All 2 projects fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.15 - Small-scale indoor research and development projects using nanoscale materials

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

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Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: Approved via email

Date Determined: September 12, 2023

**Attachment A: Projects in the REEACH (FOA No. DE-FOA-0002240) Phase II Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
Precision Combustion, Inc. (2241-1514)	SOFC's for FLIGHT	A9, B3.6
University of Connecticut (2240-1532)	High Performance Metal Supported SOFC System for Range Extension of Commercial Aviation	A9, B3.6, B3.15