



U.S. Department of Energy Categorical Exclusion Determination Form

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Proposed Action Title: Research Triangle Institute, International -- Next-Generation Ammonia System Integration Utilizing Intermittent Renewable Power

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): CT, IL, MN, NC, NY, SC, TX, UT, WA

Proposed Action Description:

Funding will support the project team's research and development activities to develop a Technology Integration Platform (TIP) to test and validate next-generation ammonia (NH3) production and utilization processes in a skid-mounted, modular, load-responsive testbed at 1 metric ton per day (MTPD) from intermittent renewable energy. Specifically, the project team will (1) validate TIP operation with stable and intermittent (hybrid wind and solar) grid electricity; (2) integrate low temperature, low-pressure NH3 synthesis; elevated temperature separation; and process control strategies for load following; (3) test a novel 1-kW direct NH3-fed intermediate temperature solid oxide fuel cell (IT-SOFC); and (4) develop a commercialization package for optimum NH3 production and utilization process. If successful, the project team will validate, under realistic operating conditions, an advanced long duration energy storage technology that has the potential to increase the efficiency of power generation assets and decarbonize NH3 production (responsible for 1-2% of both global energy consumption and greenhouse gas emissions). RTI has not obtained all necessary permits and approvals applicable to proposed actions and is prohibited from commencing applicable project work before (1) obtaining the necessary permits and approvals and (2) providing written assurances to ARPA-E of the same.

Project activities will be conducted at existing facilities listed in Attachment A, designed for the applicable activities. 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

B3.11 - Outdoor tests and experiments on materials and equipment components

B5.15 - Small-scale renewable energy research and development and pilot projects

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: **William Bierbower (Approved via Email)**

Date Determined: 01/18/2022

Attachment A: Project Locations (Research Triangle Institute (RTI). -- Next-Generation Ammonia System Integration Utilizing Intermittent Renewable Power)

Project Team Member	Location
RTI International	Research Triangle Park, NC
University of Minnesota	Minneapolis, MN; Morris, MN
University of Buffalo	Buffalo, NY
GTI	Des Plaines, IL
University of South Carolina	Columbia, SC
Chemtronergy	Salt Lake City, UT
Casale	Lugano, Switzerland
Shell	Bangalore, India; Netherlands; Houston, TX
GE Research	Niskayuna, NY
Pacifica	Seattle, WA
Texas Tech University	Lubbock, TX
Nutrien	Calgary, Canada
OATI	Minneapolis, MN
Nel Hydrogen	Wallingford, CT