

**U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION**



RECIPIENT: Siemens Energy Inc

STATE: WA

PROJECT TITLE: Advancement of TurboCracker Technology to TRL 6

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002804	DE-EE0010840	GFO-0010840-001	GO10840

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

A9 Information gathering, analysis, and dissemination	Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)
B1.31 Installation or relocation of machinery and equipment	Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.
B3.6 Small-scale research and development, laboratory operations, and pilot projects	Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Siemens Energy, Inc. (Siemens) to manufacture and test a rotating olefin cracker turbomachine unit. Turbomachine components would be manufactured by Siemens Energy's suppliers and the unit would be assembled at Siemens Energy's Turbomachinery Test Facility in Redmond, Washington. The testing of the turbomachine would occur at Southwest Research Institute's (SRIs) facility located in San Antonio, Texas. Engineering for a sampling system, document and safety review as well as data reduction/analysis efforts would occur at Technip Energies (Technip), at both their Houston, Texas and Claremont, California facilities.

Hazards at the Siemens facility would be related to the assembly of the turbomachine, which would require handling of heavy pieces of equipment. Personnel training, policies, and procedures are in place at this facility to address these safety risks. Siemens would also comply with applicable health and safety regulations and minimize health and safety risks to staff. Award efforts at SRI would include testing with steam and propane gas. A steam generator system would be installed on site to produce high-quality steam on demand. The steam skid for this task would require water treatment chemicals that help with hardness, pH and the removal of minerals from the water. The test facility at SRI would be designed and commissioned in accordance with Class 1, Division 2 Hazardous Area specifications, where applicable; this would include sourcing equipment that is properly rated for hazardous area operation or properly isolating or nitrogen-purging/venting all areas and electrical equipment that are not rated. Propane deliveries would be handled in accordance with Texas Railroad Commission guidelines to ensure safety and compliance. Water treatment chemicals would be handled and stored per the material safety data sheets; secondary containment would be used where necessary for system fill and storage. Award efforts at Technip in both Houston and Claremont would be limited to office tasks and no significant health and safety hazardous would be associated with award activities in these locations.

Emissions are not expected to be generated at the Siemens facility, as award efforts would be limited to office tasks, assembly and disassembly of the turbomachine. Testing at SRI would be expected to produce approximately 3,200 tons CO₂ (including heaters). Emissions are estimated to be on the order of 7,400 pounds (lbs) of unburned hydrocarbons, 19,600 lbs of CO, and 3,600 lbs of NO_x. Sufficient venting, purging, and monitoring equipment would be installed for safe operation with hydrocarbon gas. This testing is also expected to emit small quantities of butadiene. SRI lies within Bexar County which has a Moderate Nonattainment classification for Ozone but is in Attainment for all other pollutants. The emissions are not expected to exceed the non-attainment criteria. Work at Technip in both Houston and Claremont are limited to office tasks and no emissions at these locations would be produced as a result of this award.

Wastewater would be chemically treated prior to supplying the steam generator and system quench at SRI. This would include the treatment of approximately 500,000 gallons of water using a reverse osmosis water treatment system.

Siemens Energy is relocating its turbomachinery test laboratory to their Redmond, Washington facility. The facility relocation would occur prior to commencing project activities at the site. No change in use or expansion of the new facility would be required. Physical modification of the test facility at SRI is ongoing and includes the install of a new utility natural gas line for supplying the steam generator skid and a new potential concrete pad. It also includes the creation of a new lot near the test facility to provide sufficient clearance of the flare system from personnel, equipment and vegetation. These are ongoing capital improvement projects and are independently funded efforts from non-governmental sources. No change in use or expansion of the facilities at Technip in either Houston or Claremont would occur as part of this award.

An air permit modification is being pursued for efforts at the SRI to cover award activities for this project as well as other parallel projects at the facility. Condensate water would be collected from the ROC and the flare knockout drum periodically. This water would be collected and treated/disposed of through existing on-campus processes. No modifications, licenses, or authorizations would be required for award efforts at Siemens, or either of the Technip sites.

Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient and must be attained before the permit-pertinent work can commence. The recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding with the permit-pertinent efforts. The recipient must receive notification of approval from the DOE. If the recipient moves forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of acquisition of any required permits, the recipient is doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

Notes:

Industrial Efficiency & Decarbonization Office
This NEPA Determination required a legal review of the tailored provision
NEPA review completed by Chris Akios, 07/29/2024

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) 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 proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action 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.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  **Electronically Signed By: Andrew Montano** _____ Date: 7/29/2024
NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____
Field Office Manager