

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



RECIPIENT: Texas A&M Engineering Experiment Station

STATE: TX

PROJECT TITLE : Efficient Drying Processes of High-Quality Wood through Intelligent Desiccant Assisted Heat Pump System Innovations

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
2553-1624	DE-EE0010201	GFO-0010201-001	GO10201

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.)

**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 Texas A&M University (College Station, TX) for the design, development, and testing of a heat exchanger (HX) and heat pump prototype that would utilize adsorbent materials (desiccants) to control moisture in the air. The proposed project activities would take place over three Budget Periods (BPs).

Proposed award activities would include laboratory scale research to develop, optimize, and test an HX with regenerative desiccants that can absorb and remove water from humid air. Wood samples would be dried under different controlled conditions and characterized to generate data sets for models. A virtual testbed for the kiln chamber with the desiccant assisted heat pump (DAHP) system would be developed and established, as well as a control and neural network. Lastly, a market study, preliminary commercialization plan, and tech transfer outreach would be carried out.

University of Pennsylvania (UPenn) (Philadelphia, PA), University of Virginia (UVA) (Charlottesville, VA), and Michigan Technical University (MTU) (Houghton, MI) would assist with the design and development of the HX and heat pump prototype. UPenn would design and fabricate the HXs, develop HX coatings, and supervise minority students working on the project. UVA would develop a control system, neural network, and would evaluate the energy consumption of the prototype. MTU would develop a wood lumber drying system for the prototype. Lawrence Livermore National Lab (LLNL) (Livermore, CA) would provide technical advice.

All award activities would be carried out in purpose-built facilities that follow all federal, state, and local regulations. No changes in the use, mission, or operation of existing facilities would be required as part of this project and no additional permits would be required in order to conduct any of the work activities. Project activities would involve the use and handling of hazardous materials and machining equipment. Any risks associated with the handling of these materials and equipment would be mitigated through adherence to established health and safety policies and procedures.

UPenn would synthesize nanoparticles to be used as HX coatings. When applying the nanoparticle solutions, they would be used as aggregates and researchers would wear gloves, safety glasses, and masks. The nanoparticles would be stored in solutions until use, in order to minimize inhalation risk.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Advanced Manufacturing Office (AMO)
Review completed by Alex Colling on 08/02/2022.

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: Casey Strickland Date: 8/4/2022
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