

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



RECIPIENT: DexMat, Inc.

STATE: TX

PROJECT TITLE : Lightweight, High-Conductivity CNT Core Conductor for Power Transmission Lines

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002864	DE-EE0011022	GFO-0011022-001	GO11022

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.)

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

Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.

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

Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to DexMat, Inc. (DexMat) to develop a new carbon nanotube (CNT) conductor technology which would then be used to produce Aluminum – Carbon Nanotube (ACNT) power cables. The new type of power cable would have improved thermal and electrical conductivity, reduced weight, and increased breaking and tensile strengths, which would allow for a reduction in the cost of installation by minimizing the number of cable support towers needed. The proposed project would also provide opportunities for individuals from lower income populations and minority serving institutions to intern at Rice University and DexMat to work on project activities.

Award activities would be completed over two Budget Periods (BPs) with a Go/No Go Decision Point between the BPs. BP1 activities would include design, development, and fabrication of the prototype cable, testing site selection, and analysis. BP2 activities would include full-scale prototype design, assembly, testing, and analysis.

Design, development, and fabrication of prototype cables would be performed at the DexMat facility in Houston, TX. CNT fiber performance improvement studies, ACNT cable performance modeling, and technoeconomic analysis would be performed at Rice University in Houston, TX. Testing of prototype ACNT cables would be performed by Prysmian in Highland Heights, KY. The full-scale ACNT power cable would be built and tested by DexMat with guidance from Prysmian at a third-party power transmission line testing facility. The testing facility has not yet been identified; however, since testing would occur at a purpose-built facility where there would be no modification to the facility or ground disturbing activities, DOE has determined the testing would have no potential to impact resources of concern.

Project activities would involve handling of hazardous materials, such as acids and nanomaterials. Handling, storage, and disposal of hazardous materials would occur within controlled settings and would follow existing corporate health and safety policies and procedures in accordance with federal, state, and local environmental regulations. All

nanoscale material use would occur in a controlled laboratory setting and would be handled using proper engineering controls, including containment and monitoring, and stored in specialized containers.

All project work would be performed at existing, purpose-built facilities. No modifications to facilities, ground disturbing activities, or changes to the use, mission, or operation of facilities would be required. No additional permits, licenses, or authorizations would be required for activities performed at Dexmat, Rice University, or Prysmian. Operating permits would be obtained prior to performing the full-scale prototype cable testing at the selected third-party testing facility.

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.

Notes:

Advanced Materials & Manufacturing Technologies Office (AMMTO)
NEPA review completed by Melissa Parker, 02/20/24

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:  _____ Date: 2/20/2024
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