PMC-ND
(1.08.09.13)

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

RECIPIENT: The Regents of the University of California **STATE:** CA

PROJECT TITLE: Innovative design and manufacturing of 2.5D battery with high energy and power density

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001980	DE-EE0009108	GFO-0009108-001	GO9108

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.
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 the Regents of the University of California to develop novel additive manufacturing (AM) processes for the production of 2.5D batteries. The project would focus on the development of cathode inks, electrodes, and other components of the 2.5D batteries. These components would be designed, fabricated, and assembled into 2.5D batteries. The batteries would then undergo performance testing.

The proposed project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP. This NEPA review will be applicable to all activities from both BPs. BP1 would focus on the development of cathode ink formulations and deposition techniques. Specific activities to be performed during this period would include material synthesis, material characterization, ink formulation development, and development of AM processes for electrode manufacturing (i.e. deposition processes). BP2 would utilize the inks developed in the previous BP to fabricate 3D cathode arrays and assemble/evaluate a 2.5D battery which incorporates the 3D cathode array. Specific activities to be performed would include electrode structure fabrication via AM, electrochemical testing/characterization, AM parameter development, battery component development (e.g. ionogel solid electrolyte and the lithium anode), battery assembly, and performance testing.

All project activities would be coordinated by University of California, Los Angeles (UCLA) and performed at existing, purpose-built laboratory facilities. UCLA would perform design work, material synthesis, battery assembly, and electrochemical testing at its campus in Los Angeles, CA. Project partner Lawrence Livermore National Laboratory (LLNL) would assist with design and development, and would fabricate electrodes via AM. No modifications to existing facilities, ground disturbing activities, or changes to the use, mission, or operation of existing facilities would be required. No additional permits, licenses, or authorizations would be required.

Project work would involve the use and handling of flammable and toxic materials (e.g. industrial chemicals, solvents, metallic powders). All such handling would be performed in controlled laboratory environments. Potential risks associated with the performance of project activities would be mitigated through adherence to established health and safety policies and procedures. Protocols would include the use of personal protective equipment when handling project materials, as well as engineering controls, including the use of fume hoods and glove boxes. UCLA and LLNL would observe all applicable Federal, state, and local health, safety, and environmental regulations.

Nano-scale materials would be used throughout the project. Potential exposure risks (e.g. inhalation/absorption) would be mitigated through proper storage and handling. Nanomaterials would be handled in glove boxes or fume hoods. Personal protective equipment, including gloves and respirators would be used. Disposal procedures established by each entity's respective Environmental, Health & Safety Office would be observed. Dry nanomaterial waste would be disposed of in sealed containers.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Advanced Manufacturing Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 04/16/2020

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: 4/17/2020

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] 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