

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** University of Texas at Dallas**STATE:** TX

PROJECT TITLE: High-speed Solution Printing and Photonic Curing of Transparent Electrodes on Plastics

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA0002357	DE-EE0009518	GFO-0009518-001	

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 University of Texas at Dallas (UTD) to develop a novel process for the synthesis of transparent electrodes on plastic substrates for perovskite solar cells (PSCs) production. A novel design configuration would be incorporated onto polyester (PET) thin film substrates and photonic curing would be utilized as an annealing method. UTD would seek to increase production efficiencies and reduce costs through these techniques. As part of the project, PSCs would be fabricated to demonstrate the viability of the process. The project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point in between BP1 and BP2.

Proposed project activities would consist of precursor selection/material characterization, thin film synthesis, electrode assembly, material processing (e.g., photonic curing, coating), and computer modeling/data analysis. PSC fabrication would be performed at laboratory scale (approximately ten cells with a diode area of 0.1 cm²), sheet scale (approximately ten cells with a diode area > 1-cm²), and roll-to-roll (R2R) manufacturing scale. At the R2R manufacturing scale, two rolls of electrodes would be synthesized measuring approximately (15 cm x 200 ft). These would in turn be used to fabricate approximately ten 200-cm² flexible PSC mini-modules.

UTD would coordinate all project activities and perform computer modeling, material synthesis, processing, and characterization, and PSC fabrication/analysis at dedicated laboratory space at its campus in Richardson, TX. Project partner NovaCentrix would perform thin film synthesis, electrode assembly, and material processing (e.g., photonic curing) at its manufacturing facility in Austin, TX. Project partner Energy Materials Corporation would perform PSC fabrication, thin film coating and processing, and computer modeling at its laboratory and manufacturing facilities in Rochester, NY. Energy Materials Corporation would perform PSC fabrication at both sheet and R2R manufacturing scales, using existing manufacturing equipment. No physical modifications to existing facilities, ground disturbance, or changes to the use, mission, or operation of existing facilities would be required. No additional permits or authorizations would be required.

Project work would involve the use and handling of industrial chemicals, solvents, and metals. All such handling would be performed in controlled laboratory and manufacturing environments that routinely work with these materials. Potential hazards would be mitigated through adherence to established institutional health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. Laboratory work would be performed under fume hoods or glove boxes, when applicable. Waste materials would be handled and processed by qualified waste management service providers.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Solar Energy Technologies Office

This NEPA determination does not require a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 05/11/2021

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: Kristin Kerwin

NEPA Compliance Officer

Date: 5/12/2021

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: _____

Field Office Manager

Date: _____