

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** UNIVERSITY OF SOUTH FLORIDA**STATE:** FL**PROJECT****TITLE:**

Novel n-type Device Architectures to Achieve 1 Volt VOC in Thin Film CdTe Cells

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001840	DE-EE0008745	GFO-0008745-001	

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 South Florida (USF) to develop a novel cadmium telluride (n-CdTe) photovoltaic (PV) cell with enhanced performance capabilities. The project would seek to increase cell efficiency by optimizing the performance parameters of the n-CdTe absorber and a p-type transparent heterojunction partner. The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Throughout the project, USF would perform thin film deposition experiments and device modeling. Specific project activities for BP1 would include n-type doping during the deposition process, thin film characterization, post-deposition treatments/processing (e.g. dopant activation and passivation), and installation of n-CdTe absorbers in solar devices for characterization within a device structure. BP2 would continue all BP1 tasks. Additionally, the following activities would be performed during BP2: post-deposition dopant diffusion analysis, development of wide gap p-type heterojunction partner options, and stakeholder engagement (e.g. webinars, teleconferences, meetings with industry). Finally, BP3 would continue and build on activities from BP1 and BP2.

All fabrication activities would be performed at USF's Thin Film Electronic Materials Lab (TFEM) in Tampa, FL. The TFEM is an existing, purpose-built laboratory facility that regularly performs solar cell fabrication and characterization experiments. Additionally, material characterization would be performed at the National Renewable Energy Laboratory (NREL) to assess the quality of the PV absorbers and junctions. No modifications to existing facilities, ground disturbing activities, or changes in the use, mission, or operation of the laboratory facilities would be required to perform project activities. Likewise, no additional permits or authorizations would be required.

The project would involve the use and handling of various hazardous materials, including acids, chemical compounds, solvents, and industrial compressed gases. All such handling would take place in a controlled laboratory environment. USF would adhere to its established Chemical Hygiene Plan (CHP) when performing laboratory work. The CHP outlines safety procedures and guidelines for laboratory research. All laboratory

personnel would be required to receive health and safety training prior to performing lab work. USF and NREL would regularly monitor laboratory activities and perform reviews of laboratory facilities. Both USF and NREL would adhere to all relevant Federal, state, and local health, safety and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

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.

Notes:

Solar Energy Technologies Office

This NEPA determination does not require a tailored NEPA Provision. Please include the standard DOE laboratory language in the award.

NEPA review completed by Jonathan Hartman, 06/07/2019

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: 6/7/2019

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