

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** The Ohio State University**STATE:** OH**PROJECT TITLE:** IMPROVED SOLAR CELL PERFORMANCE AND RELIABILITY THROUGH ADVANCED DEFECT CHARACTERIZATION AND GROWTH STUDIES

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001840	DE-EE0008755	GFO-0008755-001	

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 federal funding to The Ohio State University (OSU) to apply unique multi-scale electrical, chemical, structural, and optical characterization techniques to identify defects limiting solar cell performance and establish the fundamentals of improving Cu(In,Ga)Se₂ (CIGS) device efficiency and reliability.

The proposed project would involve fabricating and processing samples of (Ag,Cu)(In,Ga)(Se,S) solar cells. Initial sample growth and characterization, including composition and electrical performance testing, would be performed by subrecipients Miasole Hi-Tech and Siva Power (Santa Clara, CA), Global Solar Energy (Tucson, AZ), and EMPA (Dubendorf, Switzerland). EMPA is a Swiss government laboratory specializing in materials science and technology. Further sample fabrication and/or characterization using a variety of industry techniques would be performed by OSU (Columbus, OH) along with subrecipients Colorado School of Mines and the National Renewable Energy Laboratory (Golden, CO).

The proposed project would involve the use and handling of various hazardous materials, including metals and industrial solvents, while fabricating samples. Growth of solar cell films would not involve the use of nanoscale materials. All such handling would occur in-lab, and project participants are dedicated to proper hazardous material handling and disposal practices. Hazardous materials would be managed and disposed of in accordance with applicable Federal, state, and local environmental regulations. Established health and safety policies and procedures would be followed at all project locations, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments.

Quantities of materials expected to be used and produced by the proposed project would not exceed bench-scale metrics. Less than approximately 60 square meters of solar cell samples with thickness of 2 micrometers or less would be produced over the course of project work. Non-hazardous waste generated by the proposed fabrication activities would include glass and stainless steel sheets. These would be treated and recycled as appropriate. No

equipment would require decommissioning at the conclusion of the proposed project since all work would be conducted entirely within existing, fully-equipped research facilities that were designed for the types of activities being proposed.

No change in the use, mission, or operation of existing facilities would arise out of these efforts. All applicable permits are in place, and no new or additional authorizations would be required for project work. Because the facilities in which project work would occur are purpose-built for the type of activities being proposed, no adverse impacts to sensitive resources are expected as a result of the proposed activities at any project location.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

DOE has determined that work to be carried out outside of the United States, its territories and possessions is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; "Environmental Effects Abroad of Major Federal Actions."

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. Include the standard DOE lab language in the NEPA provision.

NEPA review completed by Whitney Doss, 5/17/2019

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.

DOE has determined that work to be carried out outside of the United States, its territories and possessions is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; "Environmental Effects Abroad of Major Federal Actions."

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  _____
NEPA Compliance Officer

Date: 5/24/2019

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: _____
Field Office Manager

Date: _____