PMC-ND
(1.08.09.13)

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

RECIPIENT: Colorado State University **STATE:** CO

PROJECT TITLE: High lifetime and mobility CdTe alloys by co-sublimation

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001654	DE-EE0008177	GFO-0008177-001	

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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 is proposing to provide funding to Colorado State University (CSU) to make modifications to the existing CSU sublimation system so a thin film of cadmium selenium telluride (CST) alloy can be deposited on solar cells to achieve higher lifetime and efficiency of cells.

Project activities include: design, assembly and minor modification to the Advanced Research Deposition System (i.e. sublimation system) to allow for controllable deposition of CST using existing software; fabrication of devices containing graded CST layers; and characterization of the layers to understand the grain structure and selenium profile.

The sublimation process and fabrication of films/cells will occur at the CSU Engineering Research Center, which is a laboratory dedicated to cadmium telluride research. In addition, CSU would perform characterization activities including measurements of solar cell efficiency and identification of optical properties of the thin films using equipment such as a transmission electron microscope. CSU may send cells/films to other laboratories including First Solar, Inc. for additional characterization activities to supplement the standard device measurements available at CSU. No change in use, mission, or operation of existing facilities would occur from this proposed project. The facilities have all applicable permits in place and would not need additional permits for the proposed activities.

The proposed project would require the use of flammable solvents and small amounts of cadmium, selenium and tellurium which are toxic materials. Lab workers are experienced and trained in proper use and disposal of these materials; and existing university health and safety policies and procedures would be followed including use of personal protective equipment. CSU hazardous waste disposal procedures would be followed for disposal of excess materials and waste. The deposition of the thin CST film is on the nanometer scale but since it is adhered to glass it does not pose a health or safety threat unless it is scraped off as a dust. When this is necessary it is conducted in a filtered containment environment and all workers use respirators, containment suits and gloves. Completed solar cells would be archived permanently at CSU.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2)

the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

Solar Energy Technologies Office
This NEPA determination does not require a tailored NEPA provision.
Review completed by Lori Gray 7/31/2017

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 7/31/2017

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager