

PMC-ND
(1.08.09.13)

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



RECIPIENT:Stanford University

STATE: CA

PROJECT TITLE : Perovskite on Silicon Tandem Solar Cells

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001654	DE-EE-0008167	GFO-0008167-001	

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 (DOE) is proposing to provide funding to Stanford University to design, develop, fabricate, and test packaged perovskite-silicon tandem solar cells.

The proposed project would involve data analysis, computer modeling, design, preliminary engineering, and laboratory scale research and development. Associated activities including the design, development, fabrication, and testing of solar cells would occur at Stanford University's dedicated Geballe Laboratory for Advanced Materials (Stanford, CA). Other design, fabrication, and testing activities would take place in research laboratories at Arizona State University (Tempe, AZ). No change in the use, mission or operation of existing facilities would arise out of these efforts. The facilities have all applicable permits in place, and would not need additional permits for the proposed activities.

The proposed project would involve the use and handling of various hazardous materials, including metals such as lead and industrial solvents. All such handling would occur in-lab following existing health and safety policies and procedures, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. Both universities are dedicated to proper hazardous material handling and disposal practices, and hazardous materials would be managed in accordance with respective federal, state, and local environmental regulations.

The proposed project would also involve the use of nanoscale materials. All work with nanoscale materials would be conducted under a fume hood or in a glovebox. Laboratory personnel would wear protective jackets and gloves at all times to ensure that the materials do not get on users clothing or exterior surfaces.

At both project locations, only relatively small amounts of materials would be used because the proposed activities involve the fabrication of prototypes, not manufacturing or commercial-scale production. Less than 50 square feet of glass and five liters of solvent would be consumed over the course of a year. Less than 50 grams of material would be used to make perovskite semiconductors. Standard laboratory waste including spent chemicals, gloves and other non-hazardous waste would be properly disposed of under the direction of respective university Departments of Environmental Health and Safety.

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.
NEPA review completed by Whitney Doss, 08/09/2017

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Date: 8/10/2017
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