

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** AZ Board of Regents on behalf of Arizona State University**STATE:** AZ

PROJECT TITLE: Reliability Evaluation of Bifacial and Monofacial Glass/Glass Modules with EVA and non-EVA Encapsulants

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001840	DE-EE0008565	GFO-0008565-001	GO8565

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 Arizona State University (ASU) to fabricate, develop and test solar photovoltaic (PV) modules with a glass/glass (G/G) substrate configuration. The G/G modules would be characterized and tested to compare degradation and performance with glass/backsheet (G/B) modules. Each configuration would be tested using both monofacial and bifacial solar cell types, as well as ethylene vinyl acetate (EVA) and non-EVA encapsulants. The project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Project work under BP1 would focus on characterizing lifetime failure modes of field-aged PV modules. Proposed project activities would include a literature review of commercial G/G modules, characterization of field-aged modules (approximately 64 modules), fresh module fabrication and characterization, and indoor/outdoor accelerated life testing. BP2 would center on comparing strengths/weaknesses between G/G and G/B modules. Proposed project activities would include characterization of stressed modules, root-cause failure analysis, strength/weakness analysis comparing G/G to G/B modules, and identification of a G/G design configuration for long-term reliability.

Module fabrication and indoor testing would be completed at ASU's Photovoltaic Reliability Laboratory (PRL). Approximately 138 PV modules would be fabricated using an existing, on-site laminator and an additional 34 commercial EVA-based modules would be purchased for testing. Characterization and field-testing would be performed at existing, outdoor testing areas at ASU's PRL, sub-recipient University of Central Florida's Florida Solar Energy Center ('FSEC' – Cocoa, FL), and the National Renewable Energy Laboratory (Golden, CO). Upon completion of testing, all PV modules would be shipped to and stored at ASU's PRL. No changes in the use, mission, or operation of existing facilities would be required. Neither ASU nor any of its project partners would need to obtain any additional authorization or permits in order to perform the work activities proposed as part of this award.

Project activities would involve the use and handling of PV component parts (e.g. tempered glass, solar cells, EVA

encapsulant pieces, backsheet foils) and modules, as well as laboratory-scale machinery (e.g. laminator, spectrometer). All such handling would occur indoors, in laboratory settings. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include staff training, engineering controls, the use of personal protective equipment, monitoring and internal assessments. Outdoor testing would be limited to PV modules at individual voltage levels that do not exceed 42V. ASU and its project partners would observe all Federal, state and local health, safety, and environmental laws and 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 requires a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 01/29/2019

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:  _____ Date: 1/29/2019
NEPA Compliance Officer

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