

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** NREL**STATE:** CO

**PROJECT TITLE:** NREL-19-019 Advanced Material Development to Support Low LCOE 25-Year Flexible Photovoltaic Modules

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
	DE-AC36-08GO28308	NREL-19-019	GO28308

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:

**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.

**B3.11 Outdoor tests and experiments on materials and equipment components** Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.

**DOE/EA-1968 (NREL STM)** SITEWIDE ENVIRONMENTAL ASSESSMENT, U.S. DOE NATIONAL RENEWABLE ENERGY LABORATORY, SOUTH TABLE MOUNTAIN CAMPUS, GOLDEN, COLORADO

Rationale for determination:

The U.S. Department of Energy's (DOE) Solar Energy Technologies Office proposes to provide federal funding to the National Renewable Energy Laboratory (NREL) and Sunpower to partner to develop a flexible, light-weight, efficient, and low cost photovoltaic (PV) module for residential or commercial applications.

Sunpower would screen commercially available PV component materials to identify promising technologies. They would then work with suppliers to further develop the materials to produce a novel flexible, durable, and reliable PV module. Sunpower would collect baseline data about the experimental modules via non-destructive methods, which would include visual inspection, flash testing, electroluminescence, and wet insulation testing. All screening and non-destructive testing would occur indoors at Sunpower's research facilities in Davis, CA, which are equipped to perform such work.

Sunpower would send candidate materials to NREL for characterization via destructive methods. NREL would perform destructive testing of the materials at the Outdoor Test Facility (OTF)'s laboratory facilities located in Golden, CO. Destructive testing would include Raman spectroscopy, microscopy, and differential scanning calorimetry.

After characterization, the modules would be instrumented and deployed for outdoor testing. Sunpower and NREL would conduct outdoor testing at their respective facilities in parallel. At both sites, the PV modules and associated instrumentation would be installed on existing infrastructure at facilities that perform such work. After approximately

3 months of field tests, the modules would be retrieved and re-characterized using the same non-destructive methods used to assess module performance. The modules may then be re-deployed for continued outdoor testing.

Project activities would not affect cultural resources, threatened or endangered species, wetlands, floodplains, or prime farmlands and no permits would be required. The project would not involve ground disturbance, as all equipment would be installed on existing infrastructure. No change in the use, mission, or operation of existing facilities would result from the proposed project. As such, no direct or indirect impacts resulting from the proposed project would be anticipated.

At the conclusion of testing at NREL, the undamaged PV modules would be returned to Sunpower. Waste materials produced from destructive testing would be disposed of in accordance with existing NREL policies and procedures. Any waste generated at Sunpower would be managed in accordance with their policies and procedures.

Individuals could be exposed to physical and electrical hazards during the course of this project. Existing corporate health and safety policies and procedures at NREL and Sunpower would be followed, including employee training, proper protective equipment, engineering controls, and monitoring. Additional policies and procedures would be implemented as necessary if new health and safety risks are identified.

## NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

NREL  
Nicole Serio 3/20/19

## 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: \_\_\_\_\_

  
NEPA Compliance Officer

Date: 3/22/2019

## 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: \_\_\_\_\_