

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** University of Washington**STATE:** WA

**PROJECT TITLE:** Forecasting Perovskite Photovoltaic Device Performance Using Dark-Field Imaging and Machine Learning

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002243	DE-EE0009351	GFO-0009351-001	

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 is proposing to provide federal funding to University of Washington (UW) to develop a forecasting model for all-perovskite tandem solar cell performance using machine learning techniques. The model would use data from solar cell devices to project future cell degradation rates. As part of the project UW would fabricate solar cells and conduct performance testing using the developed cells. Data acquired from these activities would be used to inform forecasting model development. The project would be completed over two Budget Periods (BPs), with a Go/No-Go decision Point in between each BP.

Proposed project activities would include data analysis/computer modeling, thin film deposition, material characterization, solar cell device fabrication, and degradation testing. Testing would occur both indoors, in laboratory environments, and outdoors, at a purpose-built testing location. UW would coordinate all project activities and perform fabrication, characterization, and testing at its laboratory facility in Seattle, WA. Project partner Swift Solar would perform material characterization and solar cell device preparation at its research facility in San Carlos, CA. Outdoor performance testing would also be performed at a previously developed testing station at Swift Solar's facility. New modules, containing the solar cells developed as part of the project, would be attached to existing racking equipment. All project work would be performed at existing, purpose-built facilities. No facility modifications, groundbreaking activities, or changes to the use, mission, or operation of existing facilities would be required. No additional permits or authorizations would be required.

Project activities would involve the use and handling of potentially hazardous substances, including lead salts and chemical solvents. All such handling would occur in controlled, laboratory environments that routinely perform chemistry and device fabrication/testing as part of their regular course of business. UW and Swift Solar would adhere to established corporate health and safety policies and procedures to mitigate potential risks associated with the performance of project activities. Hazardous waste materials would be disposed of in accordance with established waste management protocols. UW and Swift Solar would observe all applicable Federal, state, and local health, safety, and environmental regulations.

## NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

[Solar Energy Technologies Office](#)

[This NEPA determination does not require a tailored NEPA Provision.](#)

[NEPA review completed by Jonathan Hartman, 12/29/2020](#)

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

 Electronically Signed By: Kristin Kerwin

NEPA Compliance Officer

Date: 12/30/2020

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