

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



RECIPIENT: University of Hawaii

STATE: HI

PROJECT TITLE : Monolithic Encapsulation of Perovskite Solar Cells with Transparent Conductive Composites for Long-Term Stability

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002606	DE-EE0010241	GFO-0010241-001	

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 (DOE) is proposing to provide funding to the University of Hawai'i (UH), Hawai'i Natural Energy Institute (HNEI) to develop polymers that would protect perovskite solar cells (PSC) from the elements and enhance their lifetime. Transparent conductive composites (TCCs) would be used to encapsulate the PSCs and protect them.

Proposed project activities would include laboratory scale research, comprised of testing existing TCCs, manufacturing new TCCs if necessary, conducting accelerated aging testing, identifying failure mechanisms, and conducting electrical testing. Outdoor testing would be carried out to investigate the effect of weathering on the electrical and optical properties of the TCCs. All proposed work would be completed in existing, purpose-built facilities.

All project activities would occur at HNEI (Honolulu, HI) and the National Renewable Energy Laboratory (NREL) (Golden, CO) over one Budget Period. HNEI would develop and outdoor test polymers, which would be ultimately integrated into NREL's solar cells. Outdoor testing would be carried out on the roof of UH (Honolulu, HI). NREL would then test the solar cells with the HNEI polymer coating.

This project would include the handling of potentially hazardous materials, including gas, solvents, and lead-based solar cells. All materials would be handled in the lab, which follows strict standards for handling chemical waste, including proper disposal in accordance with federal, state, and local regulations. Outdoor testing would be conducted only on hardened and stable polymers.

There are no physical modifications to existing facilities, construction of new facilities, no ground disturbing activities, no changes in use of existing facilities, and no installation or deployment of outdoor equipment. There are no new permits or licenses required.

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.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Solar Energy Technologies Office (SETO)
Review completed by Alex Colling on 08/09/22.

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: 8/17/2022
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