

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



RECIPIENT: Bert Thin Films LLC

STATE: KY

PROJECT TITLE : Front Side Copper Metallization Paste for Silicon Solar Cells

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002437	DE-EE0009638	GFO-0009638-002	

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.

B3.15 Small-scale indoor research and development projects using nanoscale materials

Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Bert Thin Films LLC to develop and demonstrate improved materials and processing conditions for high efficiency silicon (Si) photovoltaic (PV) solar cells.

DOE previously completed one NEPA Determination (ND) for this award (GFO-0009638-001; A.9, B3.6, and B3.15; 10/13/2021). The proposed project activities involve bench-scale materials synthesis in solution phase. These materials would be mixed into a paste and screen printed on Si solar cells. The cells would be subsequently fired in atmospheric belt furnaces. Chemical synthesis and paste formulation would occur at Bert Thin Films (Louisville, KY). Screen printing, firing, and device analysis would occur at Bert Thin Films, the University of North Carolina's Charlotte campus, the Georgia Institute of Technology, Arizona State University PV Foundry, International Solar Energy Research Center Konstanz e.V., and Fraunhofer Institute for Solar Energy systems. Other laboratory-based analytical work such as x-ray diffraction and scanning electron microscopy would take place at the University of Louisville, Clemson University, North Carolina State University, and an external lab in California. The project would also involve indoor PV testing, calibrating, an analytical analysis at the National Renewable Energy Laboratory (NREL; Golden, CO), PVEL (Berkeley, CA), D2 Solar (San Jose, CA), and EAG Laboratories (Sunnyvale, CA).

The proposed project would involve the use of steam and the handling of various hazardous chemicals, including metals and industrial solvents. All such handling and uses would occur in-lab, and hazardous materials would be managed, stored, and disposed of in accordance with applicable federal, state, and local environmental regulations. Existing corporate, university, and governmental health and safety policies and procedures would be followed, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. The proposed project would also involve the use of nanomaterials. Metal-based composite nanoparticles would be synthesized at Bert Thin Films and used in the paste to provide functionality. The synthesis and use of the

nanoparticles would be restricted to a fume hood until the material is added to the paste, at which point it would no longer pose a risk to project personnel.

Project activities would occur entirely within existing research and development facilities that are purpose-built for the type and scale of activities being proposed; therefore, no adverse impacts to sensitive resources are expected as a result of the proposed activities at any location. No change in the use, mission, or operation of existing facilities would arise out of this effort. New permits, additional licenses and/or authorizations would not be necessary for the proposed activities.

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 Amy Lukens on 01/11/2023

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.

DOE has determined that work to be carried out outside of the United States, its territories and possessions is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; "Environmental Effects Abroad of Major Federal Actions."

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: 1/11/2023

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: _____