

PMC-ND
(1.08.09.13)

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

**RECIPIENT:** BlueDot Photonics, Inc.**STATE:** WA

PROJECT TITLE: Single-Source Vapor Deposition Equipment for High-Throughput Manufacturing of Thin Film Perovskite Solar Absorbers

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002064	DE-EE0009017	GFO-0009017-001	GO9017

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 federal funding to BlueDot Photonics to develop a novel deposition method for thin film solar photovoltaic (PV) applications using perovskite materials. Deposition would involve the use of a vapor-based continuous flash sublimation (CFS) process which would be developed so as to be compatible with existing manufacturing methods. As part of the project, BlueDot Photonics would fabricate prototype versions of a device which would be used for thin film deposition. The prototypes would be tested and optimized over the course of the project. The project would be divided into two Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Proposed project activities for the project would include prototype development/fabrication, perovskite deposition validation using the prototype devices, material characterization (e.g. characterization of optical and physical properties of thin films/substrates), process modeling, and completion of a techno-economic analysis. Two versions of the prototype device would be developed, a CFS point source device, which would deposit perovskite material through a single aperture, and a linear CFS device, which would deposit material through a linear array of apertures. These prototypes would be fabricated and tested in BP1 and BP2 respectively.

All project activities would be performed at existing, purpose-built laboratory facilities. Characterization and testing of thin films and fabricated solar PV devices would be performed at BlueDot Photonics' laboratory space in Seattle, WA. Thin film synthesis/characterization and device fabrication would be performed at University of Washington's campus in Seattle, WA. Fabrication, characterization, and testing of the prototype devices would be performed at the National Renewable Energy Laboratory (NREL) in Golden, CO. No physical modifications to existing facilities, construction of new facilities, ground disturbing activities, or any changes to the use, mission, or operation of existing facilities would be required. Likewise, no additional permits or authorizations would be required for the performance of project activities.

Project work would involve the use and handling of hazardous materials including metal halide salts and organic

solvents. Risks associated with such handling would be mitigated through adherence to established health and safety policies and procedures at each participating institution. Protocols would include staff training, monitoring, and the use of personal protective equipment. Each participating entity also has established chemical hygiene safety plans in place which would be adhered to throughout the project. Hazardous materials would be appropriately stored, transported and disposed of. BlueDot Photonics and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

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

This NEPA determination does not require a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 01/08/2020

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: 1/10/2020

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: