

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



RECIPIENT: Sunprime Inc.

STATE: CA

PROJECT TITLE: High - Performance Cu-Plating for Heterojunction Silicon Cells, Based on Ultra-Low Cost Printed Circuit Board Technology

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001400	DE-EE0007632	GFO-0007632-002	GO7632

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 Sunprime, Inc. to develop a next-generation manufacturing toolset and process workflow for low-cost, high-performance copper patterning on solar photovoltaic (PV) cells by adapting technologies from the Printed Circuit Board industry.

The proposed project is comprised of three Budget Periods (BP). Sunprime received a previous, final NEPA determination (GFO-0007632-001; CXs A9, B3.6) in August of 2016, which reviewed all project activities. Since that time, changes have been made to the Statement of Project Objectives involving a downscoping of the proposed project as well as changes to the locations of certain project activities in BP 2 and BP 3. This NEPA determination is to review all remaining BP 1 activities and all BP 2 activities with the exception of Task 10. Task 10 of BP 2 in addition to all tasks of BP 3 will be restricted pending the submission of additional information for further NEPA review, as described below.

The types of activities associated with BP 1 and BP 2 would include data analysis, preliminary design and engineering, and laboratory research. Sunprime would develop processes to make copper plated electrodes on silicon solar cells using a laminated photoresist. A lamination process would be developed using existing lab-scale tools. Sunprime would then install independently purchased, production-scale tools in their existing research and development (R&D) facility and transfer these processes to the new toolset. All BP 1 and BP 2 tasks with the exception of Task 10 would be undertaken at Sunprime's established, previously reviewed facility in San Francisco, CA. No change in the use, mission, or operation of this existing facility would arise of out project efforts.

While completely defined, Task 10 of BP 2 cannot be undertaken at Sunprime's current facility due to local restrictions on the use of particular chemicals. Sunprime is planning to relocate and/or acquire a new R&D facility in which Task 10 would be undertaken; however, the location has not yet been determined. Further, the future facility may require new permits and/or physical modifications to accommodate the types of R&D activities being proposed. As such, there is insufficient information available at this time to review Task 10. Further NEPA review of Task 10

will be required once the new facility has been identified and described.

If successful optimization performance metrics are achieved during BP 2, BP 3 of the proposed project would involve the following activities. The developed toolset and process workflow would be installed and demonstrated in the manufacturing line of a high volume manufacturing (HVM) facility that is to be constructed. Data from the HVM production test run would be used to create and validate a detailed cost-model to project future manufacturing costs. The location of the planned manufacturing facility and associated demonstration activities therein have not yet been fully defined; hence there is insufficient information available to review BP3. Further NEPA review of BP 3 will be required if the Recipient advances to this funding phase.

DOE funding would not be used to construct the HVM facility which would be constructed regardless of the outcome of the proposed project. Further, the Recipient is prohibited from using DOE funding including cost share funds to construct the planned High Volume Manufacturing (HVM) facility. The HVM facility has independent utility from this proposed project and is not a connected action subject to NEPA review by DOE.

The project would involve the use and handling of hazardous materials, including industrial solvents and metals. Sunprime would use proper hazardous material handling and disposal practices. All hazardous materials would be managed in accordance with Federal, state, and local environmental regulations. In addition, appropriate health and safety practices and procedures would be followed at all times throughout the project. Metal-containing waste would be managed in accordance with applicable regulations. Acid- and base-containing waste would go through an acid waste neutralization process prior to disposal via the municipal waste water treatment plant.

NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

Budget Period 1: All Tasks

Budget Period 2:

Task 7: Project Management

Task 8: Process integration and optimization

Task 9: Higher efficiency and full size module

Task 11: IEC/UL certification

Task 12: Execute Agreement for US Manufacturing Facility

Task 13: Business Development Tasks

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

Budget Period 2:

Task 10 Evaluation of different Cu plating chemicals and dry photo resist

Budget Period 3: All Tasks

Notes:

Solar Energy Technologies Office

This NEPA determination requires a tailored NEPA Provision.

NEPA review completed by Whitney Doss, 11/16/2018

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.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  _____ Date: 11/19/2018
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