

PMG-ND  
(1.08.09.13)

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



**RECIPIENT:** Sunpreme, Inc.

**STATE:** CA

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

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
de-ee0001400	DE-EE0007632	GFO-0007632-001	GO7632

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

**CX, EA, EIS APPENDIX AND NUMBER:**

Description:

- |   |  |
|---|--|
| <b>A9 Information gathering, analysis, and dissemination</b>                                | 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.)   |
| <b>B3.6 Small-scale research and development, laboratory operations, and pilot projects</b> | 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 Sunpreme to develop a next-generation manufacturing toolset and process workflow for low-cost, high-performance copper patterning on photovoltaic (PV) cells by adapting technologies from the ultra-cost-sensitive Printed Circuit Board industry.

Sunpreme would develop processes to make copper plated electrodes on silicon solar cells using a laminated photoresist. They would develop a lamination process using existing lab-scale tools; and pattern it using existing exposure, developer, plater, stripper and etcher processes. Sunpreme would then install new toolsets in their R&D facility located in San Francisco, CA, fabricate test cells, submit modules for certification to a 3rd party entity, and start pilot production of test cells.

If successful, the toolset and process workflow would be installed in a manufacturing line of a high volume manufacturing (HVM) facility that is to be constructed. Data from the HVM production run would be used to create and validate a detailed cost-model to project future manufacturing costs. DOE funding would not be used to construct the HVM facility which would be constructed regardless of the outcome of this proposed project. The HVM facility has independent utility from this proposed project.

The project would involve the use and handling of hazardous materials, including industrial solvents and metals. Sunpreme 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 would be carried out 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 to the municipal waste water treatment plant.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410 (2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant

actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

**NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:

Prohibited from:

Recipient is prohibited from using DOE funding including cost share funds to construct the high volume manufacturing facility.

Note to Specialist :

Solar Energy Technologies Office

This NEPA determination requires a tailored NEPA provision.

Review completed by Chris Rowe, 8/24/2016

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature: \_\_\_\_\_

   
 NEPA Compliance Officer

Date: 8/24/2016

**FIELD OFFICE MANAGER DETERMINATION**

Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: \_\_\_\_\_

Field Office Manager

Date: \_\_\_\_\_