

PMC-ND
(1.08.09.13)

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



RECIPIENT: Halo Industries, Inc.

STATE: CA

PROJECT TITLE : Brittle Fracture Wafering of Silicon Ingots for Low Cost, High Efficiency c-Si Solar Cells

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001640	DE-EE0008130	GFO-0008130-001	GO8130

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:

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 Halo Industries, Inc. to develop and test an advanced laser-based cutting system for the manufacturing of silicon solar wafers from single crystal, solar-grade silicon ingots.

The proposed project would design, assemble, and optimize an automated pilot system for wafer fabrication based on an existing tool that performs the same basic functions but is largely unautomated. The developed tool would then be optimized by testing the viability of several hundred solar-grade silicon wafers produced by the prototype system. These materials would ultimately be compared with incumbent wafering technology by fabricating full solar cell devices for investigative (non-commercial) purposes. The types of activities associated with the proposed project would be limited to data analysis, preliminary engineering, and laboratory research and development (R&D). Design and fabrication work would occur entirely indoors at the recipient's dedicated R&D facility in San Mateo, CA. Third party contractors would be used to perform industry standard microscopic and electronic analyses of the produced wafers as well as solar cell fabrication and evaluation.

No change in the use, mission, or operation of existing facilities would arise out of these efforts. The proposed project would not involve installation or deployment of equipment outdoors. The recipient has all permits in place, and would not need additional permits, licenses, or authorizations to perform project activities.

Approximately 100 kg of solar grade silicon ingots would be used to produce solar wafers of similar aggregate weight. Small quantities (on the order of a few gallons) of acetone, methanol and isopropyl alcohol would be used for various cleaning processes. All such handling would occur in purpose-built laboratories, and Halo Industries is committed to proper hazardous material management practices in accordance with Federal, state, and local environmental regulations. Existing corporate health and safety policies and procedures would be followed, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. Typical amounts of non-hazardous solid waste and recyclables would be generated and disposed of using local collection services. Since the proposed project is a strictly R&D endeavor, no decommissioning would be necessary as all equipment and materials would be used to continuously refine the process before any eventual industrial-use deployment after the conclusion of the proposed project.

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.

Note to Specialist :

Solar Energy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 6/28/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Casey Strickland Date: 6/28/2018
NEPA Compliance Officer

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: _____ Date: _____
Field Office Manager