

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Toledo Solar Inc**STATE:** OH

PROJECT TITLE: Low-Cost Manufacturing of Semitransparent CdTe PV for Building Integration

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002243	DE-EE0009330	GFO-0009330-001	

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 funding to Toledo Solar Inc. to design, develop, and fabricate semi-transparent photovoltaic (PV) window modules using a laser-ablation patterning process. Improvements would be made to the ablation process and to the time needed to complete production of highly efficient PV panels with desirable transparency. The project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point between each BP.

During the project, a variety of patterns would be prototyped for customer input to identify optimum aesthetics for PV windows. An improved back contact compatible with semitransparent windows would be developed by incorporating a semiconductor buffer layer for the efficiency and stability of PV windows. Full-size laminated photovoltaic windows with three different light transmission values and efficiencies from 10% to 16% would be fabricated and exposed to a variety of stress tests including ultraviolet exposure, hail impact, and static loads. Semitransparent PV window prototypes would be completed with back-sheet lamination and appropriate power-delivery feed-throughs for window applications. Module connection options would be included to connect to the external electrical grid as well as stand-alone options for powering electronics, communication systems, refrigeration, emergency systems, and other applications. The recipient would perform cost analysis and customer acceptance studies of aesthetics and electrical and mechanical performance. If parameters are met, at the end of the project, a letter of commitment would be obtained from a customer to beta test a site greater than one kilowatt. The recipient is restricted from conducting the proposed beta test in any building over 45 years old or any building that is eligible for listing on the National Register of Historic Places. If the proposed beta testing would be conducted in a building older than 45 years or in any building eligible for listing on the National Register of Historic Places, the recipient shall notify DOE so that DOE can complete review required under Section 106 of the National Historic Preservation Act.

Proposed project activities would include fabrication, thermal and structural testing, and stakeholder engagement. Toledo Solar Inc would be the prime recipient. Sub recipients would be University of Toledo, National Renewable Energy Laboratory (NREL), and Project Vision Dynamics. Toledo Solar would fabricate thin-film solar modules

including the coating, lamination, laser scribing, and module testing. University of Toledo would fabricate and test thin-film solar cells. NREL would perform thin-film deposition, materials analysis, and solar cell and module device testing. Project Vision would develop and assemble the glass curtain wall frame systems used to test the modules. There would be no change in the use, mission, or operation of existing facilities as part of this project and no additional permits required in order to conduct any of the work activities.

Project activities would involve the use and handling of hazardous chemicals and materials. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. All waste products would be disposed of by licensed waste management service providers. Toledo Solar Inc. 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.

Include the following condition in the financial assistance agreement:

The recipient is restricted from conducting the proposed beta test in any building over 45 years old or any building that is eligible for listing on the National Register of Historic Places. If the proposed beta testing would be conducted in a building older than 45 years or in any building eligible for listing on the National Register of Historic Places, the recipient shall notify DOE so that DOE can complete review required under Section 106 of the National Historic Preservation Act.

Notes:

Solar Energy Technologies Office
This NEPA determination requires a tailored NEPA provision.
Review completed by Shaina Aguilar on 3/5/21.

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:  _____
NEPA Compliance Officer

Date: 3/9/2021

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: _____