

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



RECIPIENT: Tandem PV

STATE: CA

PROJECT TITLE : Manufacturing 1 x 2m Tandem Modules

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002357	DE-EE0009527	GFO-0009527-002	GO9527

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 Tandem PV, Inc. (TPV) to design, develop, fabricate, and test advanced perovskite/silicon (Si) solar photovoltaic (PV) panels. The aim of the proposed project is to demonstrate prototype product efficiency, durability, and projected cost structure, leverage existing Si module production infrastructure, and familiarize candidate commercialization partners with the advanced technology.

A previous NEPA Determination (GFO-0009527-001; CXs A9, B3.6; 08/19/2021), below, reviewed project activities associated with Tasks 1-12, Tasks 14-20, and Tasks 22-24 and restricted Task 13 and Task 21 pending further NEPA review. Since that time, TPV has obtained a new location at which some of the previously reviewed tasks would occur. Activities at their new location in San Jose, CA would include data analysis, design, development, fabrication, and testing of perovskite/silicon films, solar cells, and modules. This facility is a purpose-built industrial space for which TPV would need only to obtain a business permit. Implementation of such activities at the new project location would not have the potential to result in new adverse impacts to sensitive resources or environmental effects that differ (quantitatively or qualitatively) to those considered in the existing NEPA Determination.

GFO-0009527-001: The types of activities associated with the proposed project would include data analysis, computer modeling, preliminary design and engineering, laboratory research, and field testing. Data analysis, design, development, fabrication, and in-lab testing of perovskite/silicon films, solar cells, and modules would occur at TPV's research and development facility in Santa Clara, CA as well as at the University of North Carolina (UNC; Chapel Hill, NC) and the University of Washington (UW; Seattle, WA). Additional data analysis, fabrication, and in-lab testing of films would occur at FOM Technologies, Inc. (Seattle, WA) and the University of California San Diego (UCSD; La Jolla, CA). Portions of product design and packaging would occur at Hanwha Q Cells in Bitterfeld-Wolfen, Germany.

The locations and facilities for accelerated and field testing (Subtasks 13.1-13.4 and Subtasks 21.1-21.4) have not yet been fully defined. As such, there is not enough information available for DOE to conduct a meaningful review of these testing activities. Further NEPA review will be necessary before any activities associated with Task 13 and Task 21 may be undertaken.

The proposed project would involve the use and handling of bench-scale quantities of various hazardous materials, including heavy metals and industrial solvents. All such handling would occur in-lab. The aforementioned facilities have dedicated hazardous material disposal practices in place and all employees have been trained in the proper use, storage, handling, and disposal of these materials. Existing health and safety policies and procedures would be followed, including personal protective equipment, engineering controls, monitoring, and internal assessments. All hazardous materials would be managed in accordance with applicable federal, state, and local environmental regulations.

At the end of the project, all materials purchased for the purposes of the proposed project are expected to have been fully consumed. Any remaining materials are expected to be de minimis. Any project-related prototype equipment would be properly decommissioned or transferred to new research projects.

The facilities in which project work would occur were purpose-built for the type of activities being proposed under the reviewed Tasks/Subtasks; therefore, no adverse impacts to sensitive resources are expected as a result of project work at these locations. No change in the use, mission, or operation of existing facilities would arise out of this effort. The facilities have all applicable permits in place, and would not need additional permits for the proposed activities.

## NEPA PROVISION

DOE has made a conditional NEPA determination.

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

Tasks 1-12

Tasks 14-20

Tasks 22-24

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

Task 13 - Intermediate Indoor and Outdoor Durability Testing

Task 21 - Final Indoor and Outdoor Durability Testing

Notes:

Solar Energy Technologies Office (SETO)

Review completed by Whitney Donoghue on 04/05/2022

## 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:  **Electronically Signed By: Kristin Kerwin** \_\_\_\_\_ Date: 4/6/2022  
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