

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



RECIPIENT: BrightSpot Automation LLC

STATE: CO

PROJECT TITLE : Lifecycle Reliability Testing of CdTe Solar Panels

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
3058-1527	DE-EE0011423	GFO-0011423-001	GO11423

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.

B3.11 Outdoor tests and experiments on materials and equipment components

Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to BrightSpot Automation LLC to develop a photoluminescence (PL) imaging method for detecting damage to cadmium telluride solar photovoltaic (PV) modules in the field. The proposed project would design, fabricate, and test a non-invasive, high-throughput imaging tool, and develop artificial intelligence software to correlate specific types of defects with changes seen in the PL data.

Office based project activities would be conducted by BrightSpot (Westford, MA) in addition to subrecipients Silicon Ranch (Nashville, TN) and Terabase Energy (Berkeley, CA). Design, development, fabrication, and equipment testing activities would occur at BrightSpot's research and development facility (Boulder, CO). The National Renewable Energy Laboratory (Golden, CO) would conduct outdoor testing of prototypes.

Field testing of the developed tool would occur at various solar PV sites operated by Silicon Ranch and Terabase. At this time, proposed project activities have been fully defined, but the exact locations of field testing would be selected during the course of initial project tasks. Terabase would identify relevant new solar fields slated for independent construction after the first year of the project, and Silicon Ranch would establish which of their existing sites have the most damaged panels for inspection. Due to the commercial nature of the sites that would be considered for field testing and the limited and temporary scope of project-related work (described below) DOE has determined that there is sufficient information available to review the full scope of the proposed project regardless of which Silicon Ranch/Terabase sites are ultimately selected.

The main structure of the prototype solar panel tester would consist of a shielded frame (aluminum, plastic, or carbon fiber) approximately 2.5-meter (m) x 1.4 m x 0.5 m in size and between 40-80 pounds in weight. The structure would

contain an array of LEDs with heat sinks to illuminate the panel, and an array of cameras to detect the resultant PL signal. The system would be powered by either lithium-ion batteries or a small (1000 Watt) gasoline generator. BrightSpot would transport the prototype system to the test sites in a car or wagon via existing roadways used to build each solar field. The prototype system would be placed on the solar panels without modifying the mounting structures already in place. Upon completion of imaging tests, the system would be removed for further use or adjustments.

The proposed project would not involve any ground disturbing activities or new construction. Field testing would not result in any change in the use, mission, or operation of existing facilities. No new permits, licenses, or authorizations will be required beyond access to the sites, which would be facilitated by Terabase and Silicon Ranch. Existing corporate health and safety policies and procedures will be followed, including employee training on team lifting, proper protective equipment, monitoring, and internal assessments.

DOE has considered the scale, duration, and nature of the proposed activities to determine potential impacts on sensitive resources, including those of a biological, ecological, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

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:

If the Recipient selects any field-testing site(s) outside of the Terabase or Silicon Ranch solar portfolio, further NEPA review will be required of the proposed location(s). The Recipient shall submit this information to the DOE Project Officer and must receive written approval prior to initiating project work at the selected site(s).

Notes:

Solar Energy Technologies Office (SETO)
This NEPA determination requires legal review of the tailored NEPA provision.
Review completed by Whitney Donoghue on 7/3/2024.

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: _____



Electronically Signed By: Andrew Montano

NEPA Compliance Officer

Date: 7/10/2024

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: _____