PMC-ND
(1.08.09.13)

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

RECIPIENT: Terabase Energy, Inc. **STATE:** CA

PROJECT TITLE: Field Factory for Cost Reduction and Deployment Acceleration of PV Power Plants

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002064	DE-EE0009012	GFO-0009012-001	

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.
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 Terabase Energy, Inc. to design, develop, and test hardware solutions and methods that reduce the costs and increase the speed and efficiency of solar photovoltaic (PV) power plant construction projects. The proposed hardware solutions and methods are collectively referred to as the Terabase Deployment System (TDS).

The project would be divided into two Budget Periods (BP). The types of activities associated with both BP1 and BP2 would include data analysis, computer modeling, preliminary design and engineering, laboratory research and development (R&D), and field testing. The scale of field testing activities would progressively increase over the course of the project, from a series of “alpha field trials” in BP1 to a final “beta field trial” in BP2. The proposed beta field trial would take place at an actual PV power plant project during its construction phase; however, the full scope of work related to this task has not yet been defined. Therefore, all BP2 activities are prohibited until the completion of further NEPA review. This NEPA Determination applies only to BP1 (Tasks 1-9) of the proposed project.

Tasks 1, 2, 4, and 9 would consist solely of desktop-based analysis and design to be conducted at Terabase headquarters in Berkeley, CA or the home offices of project participants. Task 5 activities would include the

preliminary engineering and testing of hardware prototypes. This work would be undertaken in an existing laboratory setting at subrecipient SunPower Corporation's solar power R&D facility in Davis, CA. Tasks 3, 6, 7, and 8 represent four separate alpha field trials involving the assembly, movement, and/or temporary installation of equipment in order to quantify various construction project bottlenecks and devise practical solutions. Collected data would inform parallel TDS design and modeling efforts. Specific activities and equipment associated with each alpha field trial are as follows.

Task 3 activities would include the pre-assembly of a pilot-scale unit that includes PV panels, supporting structure, and interfacing hardware for connection to foundations. Proof-of-concept testing would involve moving the unit over a short distance (measured in meters) using a 4-wheeled vehicle with specially adapted equipment. There would be at least two repetitions of this test to verify that the PV panels and structure did not sustain damage while being moved in assembled form. Field work would have a duration of approximately 1-2 weeks.

Task 6 would involve a re-iteration of Task 3 activities in addition to the temporary deployment of a modular structure/tent to enable the onsite assembly of parts. This prototype "field factory" would contain optimized PV tracker assembly cells and other hardware developed by the project to handle materials and automate processes. The field factory would remain in place for approximately 2-3 weeks, then it would be disassembled and stored.

Task 7 would involve the installation and evaluation of at least two different foundation types at a scale consistent with the footprint of the PV system utilized in Tasks 3 and 6 (approximately 20-30 meters long by 4 meters wide). Activities would include the use of a pile driver to install foundations to an expected depth of 2 m. Field work would have a duration of approximately 2-4 weeks.

Task 8 would involve a demonstration of all three TDS elements developed in the previous field trials (pre-assembly and movement, field factory, and foundation). Activities repeated during Task 8 would include a second deployment of the field factory and installation of the preferred foundation evaluated in Task 7. Alpha field testing would conclude with the movement of the unit onto the foundation; the PV power system would not be operational. At the conclusion of BP1, all equipment would be removed from the site. If required by the facility owner, the Recipient would remove the foundations and refill holes. Field work would have a duration of approximately 1-2 months.

Outdoor activities associated with the alpha field trials would occur at one or more of the following locations:

Navajo Technical University (Crownpoint, NM)
Dine College (Tsaile, AZ)
National Solar Thermal Test Facility at Kirkland Air Force Base (Albuquerque, NM)
Davis CA Solar Test Site (Davis, CA)
SunPower Corporation (Davis, CA)

Final selections from among this list would occur throughout BP1 based on initial project study and, for later field trials, the results of preceding tasks. DOE has reviewed project documents for BP1, and has determined that although the field trials have not yet been matched to one or more of the candidate facilities, there is sufficient information available at this time to review Tasks 3, 6, 7, and 8 due to the deliberate nature of project siting (described below) in conjunction with the relatively minor footprint and short duration of proposed activities. If during the course of project work a new location is identified and proposed for BP1 field trials (Tasks 3, 6, 7 and 8), the Recipient would submit this information for additional NEPA review before initiating any project activities at this location.

At all potential locations, outdoor work would be sited on an approximately 1-4 acre plot of previously disturbed land with a graded dirt surface. These designated plots are generally maintained by the respective facilities for testing and demonstration purposes, thus requiring minimal surface preparation for the proposed activities. Such work may include the clearing of any overgrown vegetation and rocks from a small area conforming to the dimensions of the PV system, and/or soil compaction to stabilize equipment. Subsurface ground disturbance would not exceed a limited number of pre-drilled holes for the driven pile foundations (Tasks 7 and 8). BP1 field trials would take place entirely within the developed bounds of existing private or municipal facilities that have dedicated plots for the type of research being proposed; therefore, no major or permanent modifications, new permits, additional licenses and/or authorizations would be necessary. No change in the use, mission or operation of existing facilities would arise out of project efforts. Based on these collective considerations, DOE has determined that no adverse impacts to sensitive resources are to be expected as a result of the proposed field trials at any of the listed locations.

NEPA PROVISION

DOE has made a conditional NEPA determination.

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

Budget Period 1

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

Budget Period 2

Notes:

Solar Energy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss Donoghue, 1/22/2020

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: Casey Strickland Date: 1/23/2020

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