PMC-ND

(1.08.09.13)

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

RECIPIENT: Optigon, Inc. **STATE:** MA

PROJECT TITLE : High-Throughput Materials Characterization Tools for Accelerated Photovoltaic Research

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002378	DE-EE0009838	GFO-0009838-001	

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 federal funding to Optigon, Inc. to build an optical measuring tool that can be mounted to an existing roll-to-roll (R2R) manufacturing line in order to collect in-situ measurements of important photovoltaic parameters. NREL would provide solar cells and other photoactive materials for testing, and Washington Clean Energy Testbeds (WCET) would complete the demonstration of the device. All proposed project activities would take place over a one-year period.

Optigon would coordinate all project activities in its laboratory at Greentown Labs in Massachusetts, and WCET would perform all project activities at its facility in Seattle, WA. The proposed project would be limited to data analysis, computer modeling, and various small-scale research and development tasks performed within controlled laboratory settings.

Proposed project activities at Optigon would include building a mobile probe head that can take measurements of photon emission and light penetration and absorption from stationary samples. Both rigid and thin-film photovoltaics would be tested. Photovoltaic device models for predicting power conversion efficiency (PCE) would be developed. Optimization and automation of measurements and PCE would be carried out as well.

At WCET, the probe created at Optigon would be integrated into the roll-to-roll (R2R) manufacturing line to evaluate the accuracy of the measurements, and for comparison against existing calibrated instruments. Specific photovoltaic layers would be deposited, and the device models would provide feedback on performance and quality. Following the activities at WCET, Optigon would create a business plan by engaging potential partners and soliciting feedback on both their business plan and commercialization strategy.

Project activities at Optigon and WCET would involve the use and handling of potentially hazardous substances, such as the lead (100ppm) in photovoltaic devices. Lead iodide and other iodides would be used, including other potentially hazardous laboratory chemicals. The R2R equipment that would be used deposits materials that are

dissolved in solvents, all of which are potentially hazardous. Normal laboratory quantities of chemicals and solvents would be used, in the range of 5g, 5mL, or 50mL. Plastics such as PLA, ABS, and PET would be used, and in quantities of 1kg to 5kg, respectively. Samples would be stored and handled with proper practices and procedures in accordance with Federal, state, and local environmental regulations as well as existing hazardous material handling policies and procedures as outlined by the host facilities. Both WCET and Optigon have well established procedures and experience handling such materials. Employees would receive training, and would follow the specific protocols for health, safety, and contamination control. When the samples are no longer needed, the host facility's resident hazardous waste disposal service would be used to dispose of the samples in accordance with all environmental regulations. Hazardous materials would be stored in appropriate satellite accumulation areas and in appropriate containers. Solar cells would be stored in a low humidity environment and disposed of as hazardous waste when no longer useful. Optigon would complete a final lead contamination test after the samples have been disposed of.

Emissions of particulate matter, airborne pollutants, and greenhouse gases would be possible at Optigon and WCET. This would be in addition to standard emissions from construction, procurement, and operation of equipment and materials. Optigon predicts that 1 ton of CO2 would be produced from manufacturing tools, and another 100kg from shipping. This project site is in an attainment area. Approximately 3 tons of CO2 would be produced during the transportation trips between the two facilities. Solvent evaporation would be sequestered by facility filtration systems. These facilities are equipped for these types of emissions, and thus there would be no risk to public health.

All project work would be performed at existing, purpose-built facilities. No facility modifications, ground breaking activities, or changes to the use, mission, or operation of existing facilities would be required. No additional permits or authorizations would be required. All necessary permits for this type of work have already been obtained.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Solar Energy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Alex Colling, 1/12/2021.

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: Kristin Kerwin Date: 1/13/2022

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