PMC-ND
(1.08.09.13)

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

RECIPIENT: Arizona State University **STATE:** AZ

PROJECT TITLE: Sonic WaferingTM of III-V substrates for High-Efficiency Cells: A path to <$0.50/W: This project will prove the viability of the recently developed sonic wafering process that uses low temperatures and intense sound waves to carefully and accurately remov

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002064	DE-EE0008973	GFO-0008973-001	GO8973

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.)
B3.15 Small-scale indoor research and development projects using nanoscale materials	Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).
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 Arizona State University (ASU) to develop manufacturing equipment and processes aimed at reducing the production costs associated with solar cells made of III–V semiconductors, while maintaining their conversion efficiency.

The proposed project would involve the design and manufacturing of specialized equipment alongside the development of related processes. Activities would be carried out by ASU in conjunction with multiple subrecipients, as follows. Tool design and initial process development would be conducted at two ASU research facilities, both located on-campus (Tempe, AZ). Tool assembly, software integration, and tuning as well as process upscaling would take place at Crystal Sonic laboratory space (Tempe, AZ). Further process development to include the characterization of manufactured devices and the quality of produced materials would be performed at the Rochester Institute of Technology (RIT; Rochester, NY) and the National Renewable Energy Laboratory (NREL; Golden, CO).

At each location, proposed activities would involve the use and handling of various hazardous chemicals, including industrial solvents and acids. The project would also employ nanotechnology; specifically, the deposition of silica

nanoparticles via aerosol impact-driven assembly. Once attached to a substrate, the nanoparticles pose relatively low risk of exposure. However, the planned disposal of this product (approximately 10 kg in total) would most likely follow hazardous waste guidelines given the composition of substrates that would be used. No hazardous chemical waste is expected to be generated by project activities.

The use and handling of all known or potentially hazardous materials would occur in-lab. Such handling would be confined to fume hoods and undertaken only by appropriately trained personnel equipped with personal protective equipment. The participating organizations are dedicated to proper hazardous material management practices in accordance with applicable Federal, state, and local environmental regulations. To help ensure compliance, project personnel would adhere to common health and safety policies and procedures established for these types of research facilities (such as engineering controls, monitoring, and internal assessments), and also would implement additional policies and procedures as necessary to minimize any newly identified exposure risks.

The nature and scale of proposed activities are consistent with past and ongoing research conducted by project participants at their respective locations, which are already fully equipped and permitted. No change in the use, mission, or operation of any site would arise out of project-related efforts. Since the project would be centered exclusively at purpose-built facilities, the proposed scope of work excludes physical modifications, permanent equipment installations, or decommissioning actions beyond the removal and transfer of prototype equipment for future research and development.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

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 Whitney Doss Donoghue, 1/31/2020

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.

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: 2/3/2020

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