

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



RECIPIENT: University of Alaska Fairbanks

STATE: AK

PROJECT TITLE: Agrivoltaics: Unlocking Mid-Market Solar in Northern Climates and Rural North America

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002697	DE-EE0010442	GFO-0010442-001	

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.)

**B3.1 Site characterization and environmental monitoring**

Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: (a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; (b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); (c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; (d) Aquifer and underground reservoir response testing; (e) Installation and operation of ambient air monitoring equipment; (f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes); (g) Sampling and characterization of water effluents, air emissions, or solid waste streams; (h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); (i) Sampling of flora or fauna; and (j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

**B5.1 Actions to conserve energy or water**

(a) Actions to conserve energy or water, demonstrate potential energy or water conservation, and promote energy efficiency that would not have the potential to cause significant changes in the indoor or outdoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, manufacturers, and designers), organizations (such as utilities), and governments (such as state, local, and tribal). Covered actions include, but are not limited to weatherization (such as insulation and replacing windows and doors); programmed lowering of thermostat settings; placement of timers on hot water heaters; installation or replacement of energy efficient lighting, low-flow plumbing fixtures (such as faucets, toilets, and showerheads), heating, ventilation, and air conditioning systems, and appliances; installation of drip-irrigation systems; improvements in generator efficiency and appliance efficiency ratings; efficiency improvements for vehicles and transportation (such as fleet changeout); power storage (such as flywheels and batteries, generally less than 10 megawatt equivalent); transportation management systems (such as traffic signal control systems, car navigation, speed cameras, and automatic plate number recognition); development of energy-efficient manufacturing, industrial, or building practices; and small-scale energy efficiency and conservation research and development and small-scale pilot projects. Covered actions include building renovations or new structures, provided that they occur in a previously disturbed or developed area. Covered actions could involve commercial, residential, agricultural, academic, institutional, or industrial sectors. Covered actions do not include rulemakings, standard-settings, or proposed DOE legislation, except for those actions listed in B5.1(b) of this appendix. (b) Covered actions include rulemakings that establish energy conservation standards for consumer products and industrial equipment, provided that the actions would not: (1) have the potential to cause a significant

change in manufacturing infrastructure (such as construction of new manufacturing plants with considerable associated ground disturbance); (2) involve significant unresolved conflicts concerning alternative uses of available resources (such as rare or limited raw materials); (3) have the potential to result in a significant increase in the disposal of materials posing significant risks to human health and the environment (such as RCRA hazardous wastes); or (4) have the potential to cause a significant increase in energy consumption in a state or region.

#### **B5.15 Small-scale renewable energy research and development and pilot projects**

Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

#### Rationale for determination:

##### B1.18 Water supply wells

Siting, construction, and operation of additional water supply wells (or replacement wells) within an existing well field, or modification of an existing water supply well to restore production, provided that there would be no drawdown other than in the immediate vicinity of the pumping well, and the covered actions would not have the potential to cause significant long-term decline of the water table, and would not have the potential to cause significant degradation of the aquifer from the new or replacement well.

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Alaska Fairbanks (UAF) to design and implement an agrivoltaic growing experiment, herein referred to as “proposed project,” within the footprint of a utility scale solar photovoltaic (PV) farm in Houston, Alaska named the Houston Solar Array (HSA). Proposed project activities aim to investigate the HSA’s microclimate effects on plant physiology, agricultural yield, and solar PV production for the purpose of developing agrivoltaic best practices for high latitude agrivoltaics and mid-market solar arrays.

Construction and operation of the HSA is a separate effort from the proposed project. Construction of the HSA is ongoing and would be completed during Budget Period (BP) 1 of the proposed project. The HSA was designed to be approximately 60 acres in size and consist of approximately 15,000 solar panels that are mounted on pile foundations and racking. Energy 49, LLC (Energy 49; owner of the HSA’s site assets) prepared an Environmental Assessment (EA) for the HSA and its alternatives. The U.S. Department of Agriculture (USDA) issued a Finding of No Significant Impact (FONSI) in June 2022 for the HSA.

Proposed project activities would result in the creation of economic models for solar developers and farmers that quantify expected economic outputs of agrivoltaic projects. The proposed project would achieve this by growing three different high-value agricultural and food-bearing crops. The types of activities associated with the proposed project would include stakeholder outreach, data analysis, site monitoring and characterization, ground disturbance, and field testing. The proposed project would consist of two BPs. BP1 would involve the preparation of a land use agreement between UAF and Energy 49, site preparation activities, development of data collection and agricultural plans, and stakeholder outreach activities. BP2 would include the agrivoltaic growing experiment and associated data collection over the course of two growing seasons. In addition to, further outreach activities and creation of a technoeconomic (TEA) report.

Project management activities and data analysis would occur on campus at the University of Alaska Anchorage (Anchorage, AK). UAF would also be responsible for data analysis on their campus in Fairbanks, AK. Spring Creek Farm (Palmer, AK; owned by Alaska Pacific University) would be utilized as the primary location for the farmer training program. The economic analysis portion of the proposed project, such as creation of the TEA report, would be completed at the main office of Renewable IPP, LCC in Anchorage, AK. Lastly, the HSA would be the site of the agrivoltaic growing experiment.

The proposed project would involve ground disturbance associated with HSA site preparation activities. These activities include soil testing for soil fertility baseline data, drilling of a water well, and the preparation of test and control agrivoltaic growing plots. All ground disturbing activities would be within the previously disturbed areas of the HSA. However, the proposed project would not utilize the entire HSA footprint for the agrivoltaic growing experiment. Nine test plots and three control plots are proposed to achieve project goals. All plots would measure approximately 130 feet (ft) by 20 ft and would involve soil tilling via a tractor and soil amendments (i.e., addition of lime, fishmeal, fertilizer, and bone meal) for their preparation. The nine test plots would be located between the rows of solar panels. The three control plots would be located away from the solar array to the south, adjacent to the HSA’s existing gravel laydown area. Both the test and control plots would be located within areas that were previously mulched during construction of the HSA. The existing gravel laydown area would be utilized for the location of the water well and a staging area for equipment associated with the proposed project. The proposed water well would require a local water well contractor and a standard water well drill rig for its construction as well as the submission of a water well drilling log to the State of Alaska Department of Natural Resources. Additionally, the water well would measure approximately 100 feet deep and be used for irrigation purposes only.

Proposed project activities would also involve automated data collection achieved through the installation of sensors and data loggers as well as instrumentation to measure meteorological variables. Additional data related to plant physiology would be manually collected by trained research technicians. Data collection technology would be installed on and near the solar array. The instrumentation located near the solar array would be installed on tripods reaching approximately 5 to 15 ft high and anchored to the ground using guy lines. A drip irrigation system would be installed and include a pump, tank, and PVC and drip irrigation piping. All drip irrigation infrastructure would be located on the ground surface and not involve additional ground disturbance. No change in the use or mission of existing facilities would arise out of the proposed activities. Existing HSA roads and paths would be utilized to access the agrivoltaic experiment locations.

Proposed activities would involve typical hazards associated with farming including manual labor and the operation of heavy equipment. Hazards associated with working on and near electrical equipment would also be present during proposed project activities. Existing health, safety, and environmental policies and procedures would be followed to mitigate hazards to acceptable levels. Additionally, farming staff would undergo a two-week training program that would include health and safety protocols. Staff would be outfitted with proper personal protective equipment and trained on how to safely work around an energized solar array. All activities would comply with existing federal, state, and local laws and regulations.

DOE has considered the scale, duration, and nature of the proposed activities to determine potential impacts on resources, including those of an ecological, historical, 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 provided that the proposed project does not interfere with the mitigation strategies (i.e., stormwater mitigation, et al.) put forth by the HSA EA and adheres to the following conditions.

#### Migratory Birds

Ground disturbing activities associated with the proposed project must follow the timing restrictions listed in the U.S. Fish & Wildlife Service (USFWS) Region 7 Timing Recommendations for Land Disturbance & Vegetation Clearing document to the greatest extent possible. However, if ground disturbing activities must occur during the May 1 to July 15 Southcentral bird nesting window, please note that vegetation clearing is not authorized as part of this award. Prior to vegetation clearing activities occurring, an additional NEPA review would need to take place as well as a subsequent bird nest survey prior and during such activities to avoid the incidental take of birds. Additionally, if a bald/golden eagle or migratory bird nest is identified near proposed ground disturbing activities, work must stop immediately and USFWS consulted to determine the appropriate course of action.

#### Cultural Resources

If during project work cultural or archaeological artifacts are encountered, the recipient shall stop work immediately and inform the DOE Project Officer of the finding. The Alaska State Historic Preservation Office (SHPO) and applicable tribal contacts shall be consulted and a Class III: Intensive Cultural Resources Inventory shall be required prior to re-commencing project work.

#### Water Resources

If any water resources, see U.S. Army Corps of Engineers (USACE) definition of Waters of the U.S., are found to be within areas of disturbance associated with the proposed project, a Section 404 Nationwide Permit from the USACE must be obtained before these resources receive discharge of dredged or fill material.

## NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

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Notes:

**Solar Energy Technologies Office**

This NEPA determination requires legal review of the tailored NEPA provision.  
NEPA review completed by Corrin MacLuckie, 5/22/2023. Updated Migratory Bird Provision on 11/3/2023.

**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:  Andrew Montano Date: 5/23/2023  
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