



U.S. Department of Energy

Categorical Exclusion Determination Form

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Proposed Action Title: University of Illinois, Urbana - Champaign -- The "System of Systems" Solutions for Commercial Field-Level Quantification of Soil Organic Carbon and Nitrous Oxide Emission for Scalable Applications (SYMFONI)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Champaign, Illinois

Proposed Action Description:

AMENDED NEPA DETERMINATION: (See attached original Determination, dated November 17, 2020). This Amended Determination follows the approval of additional funding and period of performance to support the project team's information gathering and analysis efforts to quantify feedstock-related GHG emissions and soil carbon dynamics at the field-level. Specifically, the project team will incorporate satellite imaging sources into the "System of Systems" Solutions for Commercial Field-Level Quantification of Soil Organic Carbon and Nitrous Oxide Emission for Scalable Applications (SYMFONI) to enable more widespread applicability to support sustainable agriculture. If successful, SYMFONI will provide a software tool to the feedstock-producing community to enable increased soil carbon sequestration and reduced nitrous oxide emissions.

The proposed project activities under this award are limited exclusively to intellectual, academic, or analytical activities. The project team will not conduct physical experiments, prototype fabrication, demonstration projects, or similar activities under this award. Project tasks continue to fit within the class of actions identified under the DOE Categorical Exclusion identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the project.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE
Date: 2023.04.11 10:52:55 -04'00'

Date Determined:



U.S. Department of Energy

Categorical Exclusion Determination Form

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Proposed Action Title: Systems for Monitoring and Analytics for Renewable Transportation Fuels from Agricultural Resources and Management (SMARTFARM) Program

Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): AR; CA; CO; CT; FL; IL; KS; MI; NC; NE; NH; NJ; OH; OK; UT; WI

Proposed Action Description:

Projects funded under the SMARTFARM Program seek to develop technologies that quantify feedstock-related GHG emissions and soil carbon dynamics at the field-level in order to bridge the data gap in the biofuel supply chain. These technologies will allow for improved efficiency in feedstock production and enable new ag-sector carbon removal and management opportunities. Teams will work to develop robust quantification methods so that management practices can be linked to environmental and economic outcomes simultaneously. If successful, SMARTFARM teams will further develop the core technologies for the agricultural community to more efficiently support the biofuels supply chain, while enabling carbon markets to incentivize greater feedstock production efficiency and carbon management opportunities for producers.

The SMARTFARM Program is composed of 6 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. This Determination covers all of the 6 projects (listed in Attachment A). All 6 projects fit within the class of actions identified under the DOE Categorical Exclusion identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

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

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined: 11/17/2020

Attachment A: Projects in the SMARTFARM (FOA No. DE-FOA-0002250) & SMARTFARM SBIR/STTR (FOA No. DE-FOA-0002251) Programs

Full Application Control Number	Lead Organization	Project Title	Categorical Exclusion
2250-1516	University of Illinois at Urbana-Champaign	The "System of Systems" Solutions for Commercial Field-Level Quantification of Soil Organic Carbon and Nitrous Oxide Emission for Scalable Applications (SYMFONI)	A9; B3.6; B3.11
2250-1525	University of Utah (Salt Lake City, Utah)	Soil organic carbon networked measurement system (SOCNET)	A9; B3.6; B3.11
2250-1530	Soil Health Institute	A Rapid In-field System to Measure Deep Soil C Stock and Flux	A9; B3.6; B3.11
2250-1538	Princeton University	NitroNet: Smart System to Quantify Nitrous Oxide Emissions	A9; B3.6; B3.11
2251-1511	Michigan Aerospace Corporation	DroN2O: A Drone-Based System for Measuring Nitrous Oxide Emissions from Agricultural Fields	A9; B3.6; B3.11
2251-1515	Dagan, Inc.	Integrating Sensors, Remote Sensing and DNDC Model for Quantifying N2O Emissions	A9; B3.6; B3.11