



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: University of Tennessee - SynPLASTome 2.0: Synthetic Plastid Genome to Reprogram Chloroplast Function for the Production of Fuels and Chemicals

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Knoxville, TN; Philadelphia, PA; Berkeley, CA

Proposed Action Description:

Funding will support the project team's small-scale, research and development activities to develop synthetic genomes for plant chloroplasts and incorporate them into energy crops. Synthetic chloroplast genomes will allow researchers to engineer more complex traits into bioenergy crops, and could greatly accelerate the yields from biomass energy crops along with the production of specialty chemicals. Specifically, the project team proposes to (1) design and synthesize synthetic chloroplast genomes; (2) install synthetic chloroplast into tobacco and switchgrass plants in laboratory and greenhouse settings; (3) examine and analyze chloroplast function of the plants; and (4) make any necessary modifications based on the analysis to improve function.

Proposed work authorized under this CX Determination is limited to computer modeling and indoor, laboratory, and greenhouse-based growth and analysis of these plants. There will be no field testing of engineered plants.

Project activities will be conducted at existing facilities that are designed for the applicable activities, and will be conducted in accordance with applicable Federal, State, and local safety and environmental requirements. Participants will receive and maintain all required authorizations for all work involving recombinant DNA molecules and GM plants prior to beginning work with these materials.

Categorical Exclusion(s) Applied:

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

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: 02/03/2016



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: University of Tennessee -- SYNPLASTOME 2.0: Synthetic Plastid Genome to Reprogram Chloroplast Function for the Production of Fuels and Chemicals

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Berkeley, California; Palo Alto, California; Philadelphia, Pennsylvania; Knoxville, Tennessee

Proposed Action Description:

Funding will support the project team's small-scale, research and development activities to develop, install, and validate synthetic chloroplast genomes ('synplastomes') for use in metabolic engineering in tobacco and corn crops. Specifically, the project team will: (1) install Synplastome into tobacco and corn protoplasts; (2) analyze plant health and transgene expression levels and regenerate transplastomic crops; and (3) demonstrate the potential of the technology to produce commercially relevant products. If successful, the development of a synplastome would allow researchers to introduce complex metabolic pathways for bio-fuels and high-value chemicals into plants much more efficiently than current tools allow.

Project tasks will be conducted on a small-scale basis in dedicated laboratory, testing, and fabrication facilities at University of California-Berkeley (Berkeley, CA); Stanford University (Palo Alto, CA); University of Pennsylvania (Philadelphia, PA); and University of Tennessee (Knoxville, TN). Like the first phase of this project approved under a prior NEPA determination, 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, to include compliance with USDA Animal and Plant Health Inspection Service (APHIS) requirements. No modifications will be made to the existing facilities to accommodate the proposed work.

Categorical Exclusion(s) Applied:

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

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: 05/21/2018