



# U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Agrivida - Conditionally Activated Enzymes Expressed in Cellulosic Energy Crops

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Medford, MA; Storrs, CT

Proposed Action Description:

This award is a continuation and expansion of research performed by Agrivida under DE-AR000042 to engineer switchgrass that can be readily converted into soluble sugars for biofuels production. Funding will support efforts to develop a new strain of switchgrass by combining its intein-modified enzyme and greenstarch technologies and produce additional biomass from their transgenic strains of switchgrass..

Proposed work will consist of: (1) development of five new gene stacks of switchgrass by engineering intein-modified enzymes and greenstarch genes in switchgrass; (2) development of micropropagation and/or plant tissue culture methods capable of bulking up switchgrass lines; (3) production and growth of the new switchgrass strain within an enclosed greenhouse facility; and (4) application for a USDA-APHIS release permit for the developed switchgrass. Project work funded by ARPA-E does not involve the release of recombinant DNA or engineered plant materials into the environment.

Development and engineering of the switchgrass will take place at Agrivida's Biosafety Level I containment laboratory facility in Medford, MA. Production and growth of the developed switchgrass will take place at Agrivida's enclosed greenhouse facilities in Storrs, CT.

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: 09/19/2012



# U.S. Department of Energy

## Categorical Exclusion Determination Form



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

**Project Title:** 25A1046 - Conditionally activated enzymes expressed in cellulosic energy crops

**Location:** \*- Multiple States - Massachusetts, Connecticut

**Proposed Action or Project Description:**

American Recovery and Reinvestment Act:

In this early stage transformational R&D proposal, Agrivida requests funding to develop an innovative cellulosic biofuels technology using engineered plant traits. Our objective is to reduce oil consumption and greenhouse gas emissions (GHGe) by engineering domestic biomass crops for low-cost production of fuels and chemicals. Our research plan aims to develop cell wall degrading (CWD) enzymes as inactive precursors that can be produced at high concentration within the plant itself. By engineering the enzymes, their hydrolytic activity will be dormant during plant growth and will not impair plant development or yield. Once the crop is harvested, the engineered enzymes can be activated by using the conditions of the biofuels production process. The activated CWD enzymes are distributed throughout the plant material and capable of converting the plant cell walls into fermentable sugars. This technology would relieve the challenges of plant cell wall degradation, enabling a profitable bio-products industry based on cellulosic feedstock conversion.

**Categorical Exclusion(s) Applied:**

X - B3.6 Siting/construction/operation/decommissioning of facilities for bench-scale research, conventional laboratory operations, small-scale research and development and pilot projects

\*-For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, see Subpart D of 10 CFR10 21 [Click Here](#)

This action would not: threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders; require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities; disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or adversely affect environmentally sensitive resources (including but not limited to those listed in paragraph B.(4)) of Appendix B to Subpart D of 10 CFR 1021). Furthermore, there are no extraordinary circumstances related to this action that may affect the significance of the environmental effects of the action; this action is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

Based on my review of information conveyed to me and in my possession (or attached) concerning 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: /s/ William J. Bierbower Date Determined: 01/19/2010

Digitally signed by William J. Bierbower  
DN: cn=William J. Bierbower, o, ou,  
email=william.bierbower@hq.doe.gov, c=US  
Date: 2010.01.19 10:59:30 -05'00'

Comments:

Webmaster:

