

PMC-EF2a

(2.04.02)

**U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION**



RECIPIENT: Montana Department of Environmental Quality

STATE: MT

PROJECT TITLE : SEP - Algae Aqua-Culture Technology's Green Power House

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|--|--------------------------------------|----------------------------|-------------------|
| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
| DE-FOA-0000052 | DE-EE0000138 | GFO-10-633-001 | EEO |

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

B5.1 Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

Rational for determination:

The Montana Department of Environmental Quality proposes to provide Algae Aqua-Culture Technology, Inc. (AACT) \$350,000 of SEP funds for the conversion of woody biomass and waste gases to alternative energy and organic fertilizer. The project will be located on the Stoltze Land and Lumber Company (Stoltze) mill site in Columbia Falls, MT.

AACT partnered with Stoltze to construct a 1/9th scale prototype Green Power House™ (GPH) system that is now operating on the mill site. SEP funds will be used to construct a full scale GPH system similar to the prototype. The project consists of a 5,550 square foot greenhouse, multiple photobioreactors (PBR) and an anaerobic bioreactor (ABR) constructed on Stoltze property, a 149 acre facility. The GPH is a closed-loop system that consumes waste streams, such as woody biomass, industrial/power generation heat and CO2 waste products and waste water to create electricity, high quality weed-free organic fertilizer and food crops.

Algae are grown within the GPH in shallow-pond PBRs exposed to sunlight through the south-facing walls of the GPH. The PBRs are heated under the ponds by waste heat from the Stoltze boilers delivered via underground piping. Waste CO2 from the same gas stream is used as food for the algae. Cellulosic materials (saw mill fines) are added to the PBRs as an additional input. At maturity the algae are harvested and drained. The excess water is returned to the PBR to start the next batch of algae. The concentrated algae is then pumped into an ABR where digestion of the algae releases methane and carbon dioxide. A computer software program that can mimic the biological environment conducive to the growth and digestion of algae is used to regulate the temperature in the tank and maximize productivity. The carbon dioxide is recycled back to the PBR and the methane is captured and sent to a 30KW microturbine for electrical generation. The GPH produces more electricity than it consumes and the excess is provided to Stoltze.

The DOE conducted a site visit at the Stoltze-AACT facility in Columbia Falls, MT on September 15, 2010 to tour the prototype GPH. Because the proposed project is a closed-loop system it is unlikely to result in any environmental impacts. The system not only utilizes waste products from the saw mill operation it also utilizes its own waste to produce commercially valuable products. There will be no air emissions, no hazardous waste generated and there will be no discharge of water. All of the water needed to grow the algae will come from Stoltze's storm water detention pond. The project area is not located in a floodplain. All construction will occur in a previously disturbed area.

Montana DEQ water quality, air quality and waste management specialists also reviewed the project and determined no permits are needed. Stoltze will provide an updated Storm Water Pollution Prevention Plan to Montana DEQ prior to construction of the green house and trenching for the piping.

The initial completion of the GPH will produce or save 8 jobs immediately and an additional 7.5 jobs will come online when four additional GPHs are installed on-site when more funding becomes available.

Based on the information provided by the State and the applicant, DOE has determined that the work outlined is consistent with activities identified in Categorical Exclusion B5.1, Actions to Conserve Energy.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

This EF-2a was prepared by Chris Paulsen.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Date: 10/20/10
NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____
Field Office Manager