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Department of Energy

memorandum

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REPLY TO:
ATTN OF: Office of NEPA Oversight:Borgstrom:6-4600

SUBJECT: Adoption of the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Biomass Gasifier Facility Demonstration Project at Maui, Hawaii (DOE/EA-0849)

TO:
Robert L. San Martin
Acting Assistant Secretary
Energy Efficiency and Renewable Energy

This is response to your memorandum dated March 18, 1993, requesting adoption of the subject EA prepared by the State of Hawaii and signing the FONSI. The FONSI is based on the subject EA which received a "Negative Declaration" from the State which is the equivalent to a federal FONSI. We note that because the State prepared the subject EA, the State does not need pre-approval review of the EA.

The Office of Environment, Safety and Health has reviewed the subject EA in accordance with the Department of Energy Order 5440.1E regarding compliance with the National Environmental Policy Act (NEPA). Based on my staff's independent review and analysis and their recommendations, and after consultation with the Office of General Counsel, I have determined that the EA adequately describes the environmental impacts associated with DOE's part of the action, i.e., as a participant in the design, construction and operation of the biomass gasifier facility as a demonstration project. Further, based on the EA, I have determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA and its implementing regulations (40 CFR Parts 1500-1508). Therefore, the preparation of an environmental impact statement is not required, as described in the attached FONSI.

Accordingly, the attached EA is approved for adoption as DOE/EA-0849, subject to incorporation of the comments noted, and I have signed the accompanying FONSI. The FONSI does not need to be published in the Federal Register since this is not an action with effects of national concern. However, the public should be notified of the availability of the EA and FONSI in accordance with 40 CFR 1506.6 and DOE Order 5440.1E.



Peter N. Brush
Acting Assistant Secretary
Environment, Safety and Health

Attachments

cc: Othalene Lawrence, EE-64
NEPA Compliance Officer

Jeffrey Baker, GO
NEPA Compliance Officer

[6450.01]

DEPARTMENT OF ENERGY

FINDING OF NO SIGNIFICANT IMPACT
FOR BIOMASS GASIFIER FACILITY
DEMONSTRATION PROJECT AT MAUI, HAWAII

AGENCY: Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The Department of Energy (DOE) is proposing to jointly fund with the State of Hawaii and others the design, construction and operation of a Biomass Gasifier Facility (BGF) to demonstrate the technical and economic viability of biomass gasification, biogas generation of electricity, and biogas conversion to methanol to provide a light transportation fuel. The proposed BGF, which would be constructed at the existing HC&S Sugar Factory at Paia on the island of Maui, Hawaii, would use bagasse, the fibrous end-product of sugarcane processing, as its primary fuel source (and, briefly, wood chips).

Construction and operation of the proposed project would impact air quality, transportation, surface water, solid waste, land use, human health, and safety. Four other sites were initially considered, but the projected long term stability of the present site's supply of bagasse, which often exceeds the sugar factory's capability for on-site consumption is more desirable. Under the No Action alternative, the technical feasibility and potential economic viability of the BGF would not be demonstrated. Locations such as Hawaii would continue to be dependent on imported fossil fuels for energy production and transportation fuels.

This Environmental Assessment (EA), prepared by the State of Hawaii, has been adopted by DOE as DOE/EA-0849. Based on its independent analysis of the

EA, DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321, et seq.). Therefore, the preparation of an environmental impact statement is not required and the Department is issuing this Finding of No Significant Impact (FONSI).

COPIES OF THE EA ARE AVAILABLE FROM:

Jeffrey M. Baker, Director
Environment, Safety and Health/Operations Division
U.S. Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, CO 80401
(303) 231-1284

FOR FURTHER INFORMATION ON THE DOE NEPA PROCESS CONTACT:

Carol Borgstrom, Director
Office of NEPA Oversight
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington D.C. 20585
(202) 586-4600 or (800) 472-2756

BACKGROUND:

The DOE and the State of Hawaii are the principal participants in a jointly sponsored proposed action to design, construct and operate a Biomass Gasification Facility at the HC&S Sugar Factory on the island of Maui, Hawaii. The State of Hawaii was required to prepare an Environmental Assessment (EA) under State regulations. For this action, the Hawaiian Department of Business, Economic Development and Tourism reviewed the EA, prepared in accordance with State requirements, as the basis for the State's September 25,

1992, issuance of a Notice of Determination/Negative Declaration, which says "... that the proposed action poses no significant, short- or long-term, adverse impacts which cannot be mitigated and that no endangered or threatened species will be affected." Therefore, the State of Hawaii's Department of Business, Economic Development, and Tourism "determined that a negative declaration is appropriate and an Environmental Impact Statement is not required." DOE was involved in the production of the State EA and has independently confirmed the analyses of impacts to support adoption of the EA by DOE as DOE/EA-0849 to meet DOE's compliance obligations under NEPA.

PROPOSED ACTION:

The proposed BGF would be located on a site immediately adjacent to the existing HC&S Sugar Factory at Paia on the island of Maui, Hawaii, under terms of an easement agreement with HC&S. The adjacent sugar factory and the surrounding sugar plantation began operations in 1880 and the factory was completely rebuilt in 1905. Today it has a sugarcane processing capability of 3,800 tons of sugarcane per day. The factory currently produces electrical power from conventional combustion of 1000 tons of bagasse per day.

The proposed BGF Project would consist of three phases. In Phase I, biomass conversion into low to medium British thermal unit (Btu) biogas would be demonstrated. In Phase II, the biogas would be used to produce electric power using a combustion turbine generator and in Phase III, the biogas would be converted to methanol. At the present time, funding, primarily from the DOE and the State of Hawaii, is available only for Phase I. If the goals of

Phase I are met, then Phases II and III would likely proceed. The goal of the entire project is to demonstrate the technical feasibility of these emerging technologies at commercial scale.

Phase I. Phase I would utilize a fluidized bed gasifier operating at approximately 1650 degrees Fahrenheit to oxidize and pyrolyze biomass to form a hot gas mixture of hydrogen, carbon monoxide, carbon dioxide, hydrocarbons, nitrogen and water. Two different types of biomass feed would be processed in the gasifier system during Phase I: a primary biomass feed of bagasse and a secondary feed of whole tree chips. The gasifier would have a processing capability of up to 100 dry tons per day (tpd) of bagasse or wood chips. Phase I of the project is currently proposed to be conducted from 1993 through 1994, including design, construction, and operation of the gasifier. Actual operations would be expected to last one year, including acceptance testing, initial startup, and an operational period. Dried bagasse would be the primary fuel for this demonstration supplied by the adjacent HC&S Sugar Factory under a contract for both the site easement and the supply of bagasse from existing surpluses. HC&S Sugar Factory operations and power production would not be affected by supplying the proposed action with 100 tpd of bagasse. For two weeks of the demonstration year, wood chips could be used in place of the bagasse. Wood chips would be acquired from existing commercial suppliers and would not require project-specific timber harvesting.

Phase II. In Phase II, the produced biogas would be used in a commercially available gas turbine to produce electricity. The gas turbine would be designed to use the low Btu gas produced by the gasifier. A number of power cycles are under current evaluation. These include a simple cycle,

steam-injected open cycle, as well as combined cycle concepts. Phase II is proposed to be operational during 1994 to 1996 and could produce between 3 to 5 MW of electricity.

Phase III. In Phase III, the medium Btu biogas which contains carbon monoxide and hydrogen (together referred to as "syngas"), would be used to produce methanol via a catalytic process. A methanol production unit would be installed as part of this phase. The scale of the methanol demonstration program has yet to be determined, but for this EA it is assumed that all of the biogas produced would be used for methanol synthesis. Ancillary facilities, such as an oxygen plant, are also proposed to be constructed during this phase. Phase III of the project is proposed to be operational from 1996 to 1997 and could produce up to approximately 4,000 gallons of methanol per day.

ENVIRONMENTAL IMPACTS:

The analyses in the EA for the proposed BGF technology demonstration project establish that the action would not significantly impact onsite workers or the adjacent offsite public. Further, the EA analyses demonstrate that the proposed action would neither impact the area immediately surrounding the proposed site nor the Haleakala National Park, a Class I air quality area located 20 miles southeast. The DOE has, as part of its administrative record, documentation of the National Park Service's concurrence in this no impact determination, and the State of Hawaii's Notice of Determination/Negative Declaration. As a demonstration program, the bagasse

needs of the BGF would be met from HC&S surpluses without affecting the normal operations of the sugar factory or the power normally produced from bagasse combustion. The Maui Electric Company is committed to utilization of power which may be generated during Phase II.

Transportation. Transportation and utilization systems currently exist for the methanol which may be produced during Phase III. When operational, the proposed BGF would not generate any significant amount of increased traffic in the vicinity. Impact of construction related traffic would be insignificant and temporary because work would be scheduled so as not to conflict with peak periods of heavy traffic.

Air Quality. The emission of air contaminants from the proposed action would not individually or collectively with ambient conditions exceed either Federal or State Ambient Air Quality Standards. At a maximum rate of 100 tpd, the daily consumption rate of biogas by the proposed action would be 10 percent of the daily consumption by the mill. However, on an annual basis, there likely would be no net increase in the combustion of bagasse because that used by the proposed action would have been consumed by the mill boilers even if the BGF had not been built. Therefore, air emissions would be essentially the same.

Additionally, the analyses in the EA demonstrate that the emissions from the proposed action would not be sufficient to be classified as a major stationary source to which the provisions of the prevention of significant deterioration (PSD) of air quality regulations would apply. However, even

though the PSD limits would not apply to the proposed action, the EA demonstrates that emissions would not exceed the PSD Class I limits at the Haleakala National Park, located 20 miles southeast of the proposed site. Further, in formal consultation with the Haleakala Park Administrator and the National Park Service (NPS), Western Region, Air Quality Division, Denver, Colorado, a formal visibility impact analysis was conducted that demonstrated that no visibility impact screening criteria would be exceeded by the proposed action. The NPS reviewed the results of these analyses and on October 27, 1992, provided a formal determination that the proposed action would not impact visibility at the Haleakala National Park.

Surface Water. The proposed action would have no releases of water to offsite surface water bodies. Small quantities may be discharged during Phase III to the existing HC&S pond for irrigation use. Sewage requirements during operation would be met by an onsite permitted septic system.

Solid Waste. The largest component of the proposed action's solid waste stream would be the ash and char resulting from the conversion of bagasse to biogas. It has been demonstrated in the EA that this residue would not be hazardous and thus viable for use as either compost, a soil amendment, or as landfill cover. The County supports utilization of this waste stream in their planned composting program. Other solid wastes would be subject to recycling or reclamation or would be suitable for land disposal as non-hazardous wastes without further treatment.

Land Use. The proposed site has been under sugarcane production for

almost 100 years and has been used for bagasse storage for the last decade. The site does not provide critical habitat for threatened or endangered species, is not prime farmland, does not contain cultural or archaeological resources, and is not in a floodplain or designated wetland. Although some HC&S structures have been identified as historical, they would not be impacted by the proposed action according to the State Historic Preservation Office. The County of Maui granted a State Land Use Commission "Special Use Permit" for the proposed action on February 9, 1993.

Human Health and Safety. Health and safety impacts from human exposure to atmospheric releases of hazardous air emissions during construction and operation of the BGF are discussed. The EA evaluated the consequences of a flame-out incident involving the biogas flare and found that gas concentrations reaching ground level would not exceed levels hazardous to human health or explosive limits. A fire involving either the propane tank or the methanol storage tank would have impacts limited to the proposed site and would likely be controlled by the available onsite fire suppression capability.

No negative impacts from noise above those now caused by the existing mill operations are anticipated during construction or operation of the proposed action. Noise control measures for noise elicited by operation of the proposed project would be placed between the equipment and impacted areas.

Short-term Use and Long-term Productivity. The short-term utilization of bagasse surpluses during this demonstration project could lead to the

increased efficiency in the long term utilization of bagasse as an energy source. Successful demonstration of the proposed technologies could enhance the likelihood of commercial applications and lead to increased viability of sugarcane production and a decreased dependency on imported fuels.

ALTERNATIVES CONSIDERED:

No Action. Under this alternative, the technical feasibility and potential economic viability of the proposed gasifier technology would not be demonstrated and there would be potential for negative environmental impacts. Without commercial scale demonstration, the deployment of this technology is unlikely and, therefore, the potential economic benefits would not be realized. Locations such as Hawaii would continue to be dependent upon imported fossil fuels for energy production and transportation fuels.

Alternative Sites. Four other sites in Hawaii, with a supply of biomass and drying facilities, were initially considered. The present site was found to be most desirable based on the projected long-term stability of the supply of bagasse, which often exceeds the HC&S Sugar Factory's capability for on-site consumption. Because the success of the proposed BGF project depends critically on its ability to demonstrate the viability of the technology over a period of time, the stability and availability of the bagasse supply was a discriminating criteria among the alternatives. Additionally, as demonstrated in the EA, the operating parameters of the proposed action are not unique to the HC&S site, and therefore, it can be assumed that the environmental

consequences of the proposed action would be the same at any other site.

DETERMINATION:

Based on the information and analyses in the EA, DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act. Therefore, an environmental impact statement for the proposed action is not required, and DOE is issuing this FONSI.

Issued in Washington D.C., this 28th of June, 1993.

A handwritten signature in black ink, appearing to read "Peter N. Brush", written over a horizontal line.

Peter N. Brush
Acting Assistant Secretary
Environment, Safety and Health