DOE/IG-0513

AUDIT REPORT

FINANCIAL ASSISTANCE FOR BIOMASS-TO-ETHANOL PROJECTS

JULY 2001

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

U. S. DEPARTMENT OF ENERGY
Washington, DC 20585

July 16, 2001

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman (Signed)
Inspector General

SUBJECT: INFORMATION: Audit Report on "Financial Assistance for Biomass-to-Ethanol Projects"

BACKGROUND

The Department of Energy (Department) has the strategic objective of reducing the vulnerability of the U.S. economy to disruptions in energy supplies. As one way of meeting this objective, the Department has had a biomass-to-ethanol (biomass) conversion program for several years. Working under the Assistant Secretary for Energy Efficiency and Renewable Energy, the Office of Fuels Development manages the biomass program, which had a goal to build a full-scale commercial biomass production facility by 2000. To meet this goal, the Department awarded financial assistance to two firms during 1997 and 1998. This assistance was provided through cost-sharing cooperative agreements. One firm has received $4 million and the other has received $10.95 million. The Office of Fuels Development indicated that these were the only two awards that could have led to meeting its program goal.

During the audit, management stated that these funds were "earmarked" through the appropriations process and, as such, this matter did not involve a case of "discretionary financial assistance." Management further asserted that, because of the appropriations action, its latitude in managing these projects was severely limited. Although the timing of the award of at least one of the agreements appeared to have preceded the earmarking action, we confirmed that the pertinent appropriations bill included specific congressional direction in this matter.

Taking management's concerns into consideration, the objective of the audit was to determine whether the Department is meeting its biomass program goal.

RESULTS OF AUDIT

The Department did not meet its programmatic goal of having a full-scale commercial biomass production facility built by 2000. In fact, construction of the two facilities had not even started as of the completion of this audit; and it appeared unlikely that construction would begin in the near term because earlier design and site preparation targets have not been met. Despite assertions by the two companies that their technologies were proven and ready for commercial application, both companies have not fulfilled the representations contained in their proposals or the terms of their financial assistance agreements.

We noted that the Department had not implemented recommendations made by the merit reviewers of the firms' proposals nor had it fully evaluated both firms' financial capability prior to awarding funds. This contributed to the Department's inability to meet its biomass goal. As of this date, the Department has spent nearly $15 million on these projects and there is no biomass production facility on the horizon. Without a production facility, the Department will not meet its Fiscal Year 2001 Performance Plan target of producing 6 million gallons of ethanol from biomass. We recommended that the Assistant Secretary for Energy

Efficiency and Renewable Energy ensure that merit reviewer concerns are addressed prior to awards being made and that financial assistance be withheld, suspended, or terminated when recipients do not comply with the terms of their assistance awards.

MANAGEMENT REACTION

Management concurred with the report's recommendations. However, it disagreed with the report's conclusions regarding risk reduction and the merit review process. As noted previously, management further asserted that because of the congressional "earmark" it could not apply certain project management principles to these projects. While we recognize the complexity that the earmark adds to the management process, in our judgment, the earmark did not preclude the Department from applying basic performance conditions. A remedy was available, as awkward as it might have been. At a minimum, the Department could have advised the Congress of the failure of the firms to satisfy their obligations, and sought legislative relief. Indeed, as the Department essentially points out in its response to a draft of this report, a reprogramming action was an available remedy.

However, management did agree to examine its policies and practices relative to the award, monitoring, and termination of financial assistance. We were informed that by September 30, 2001, recommendations resulting from the review will be forwarded to the Assistant Secretary for Energy Efficiency and Renewable Energy for concurrence to ensure the program's practices adhere to all applicable Department procedures regarding the manner in which the Department awards financial assistance. Management's commitment to undertake the review of its policies and procedures is a positive action. However, there can be no final conclusion to this matter until the review is completed and positive change is taken to meet the intent of the recommendations.

Attachment

cc: Deputy Secretary
Under Secretary for Energy, Science and Environment

FINANCIAL ASSISTANCE FOR BIOMASS-TO-ETHANOL PROJECTS

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Overview

INTRODUCTION AND OBJECTIVE

The Department of Energy (DOE) has the strategic objective of reducing the vulnerability of the U.S. economy to disruptions in energy supplies. As one way of meeting this objective, DOE has had a biomass-to-ethanol (biomass) conversion program for several years. In the biomass process, agricultural wastes, such as corn fiber, rice straw, and the unusable portions of sugar cane plants, are converted to ethanol. The ethanol can then be mixed with petroleum products, such as gasoline, to produce fuel that can be used for transportation and industrial purposes.

Working under DOE's Assistant Secretary for Energy Efficiency and Renewable Energy (EERE), the Office of Fuels Development (OFD) manages the biomass program. To leverage its resources, OFD can provide private sector firms with funding that is to be used for biomass projects unlikely to be conducted without Government support.

OFD's program goal was to build a full-scale commercial biomass production facility by 2000. To meet its program goal, OFD awarded financial assistance to two firms during 1997 and 1998. This assistance was provided through cost-sharing cooperative agreements awarded by the Golden Field Office (Golden). OFD indicated that these were the only two awards that could have led to meeting its program goal. One firm is Company A, which received $4 million under a November 1998 cooperative agreement that resulted from an earmark. The other firm is Company B, which received $10.95 million from DOE under a May 1997 cooperative agreement[1]. Although initial funding received by Company B was not earmarked, $4 million of earmarked funds was received in Fiscal Year (FY) 1999.

The audit objective was to determine if DOE is meeting its biomass program goal.

CONCLUSIONS AND OBSERVATIONS

DOE did not meet its biomass program goal to have a full-scale commercial biomass production facility built by 2000. Construction has not started. Company A and Company B have not fulfilled the representations contained in their proposals or the terms of their financial assistance agreements. Although funding was made available to these firms through Congressional earmarks, the Department was not, in our judgement, precluded from exercising basic performance conditions.

[1]The Office of Inspector General practice is not to disclose the names of subcontractors and prime contractors in audit reports, other than those operating DOE facilities. The emphasis of our reports is to address Departmental operational weaknesses and due consideration is given to these companies' involvement in work outside DOE.

OFD did not achieve its goal because it did not solicit competitive proposals before making any awards, implement recommendations made by the merit reviewers of the Company A and Company B proposals, and fully evaluate both firms' financial capability prior to awarding funds. OFD has spent $14.95 million through April 2001 and there is no production facility on the horizon. Without a production facility, OFD probably will not meet its Fiscal Year (FY) 2001 DOE Performance Plan target of producing 6 million gallons of ethanol from biomass.

The audit identified a material internal control weakness that management should consider when preparing its yearend assurance memorandum on internal controls.

_____(Signed)__________
Office of Inspector General

DOE Not Meeting Program Goal

DOE did not meet its program goal to have a full-scale commercial biomass production facility built by 2000. Construction of such a facility has not been started. It is unlikely that construction will begin soon because earlier design and site preparation targets have not been met.[2] As of December 2000, neither target had been met, despite assertions by both Company A and Company B that their technologies were proven and ready for commercial application. Both firms, from the outset, have not fulfilled the representations contained in their proposals or the terms of their DOE financial assistance awards.

Company A

In its March 1998 proposal, Company A stated that it would execute an Engineering, Procurement, and Construction (EPC) contract,[3] a contract essential to securing third-party construction financing, by September 1998, with construction financing to be secured immediately thereafter. The proposal also stated that Company A was to commence construction of a 12-million-gallon-per-year fuel-grade plant in 1999. Company A asserted that its technology was proven and ready for commercial application. By the terms of Golden's November 1998 financial assistance award, Company A was to perform engineering work and execute an EPC contract to allow financing for construction, with all award activities to be completed by June 1999.

Although Company A has produced some results, no construction has occurred. Company A has developed process flow and piping and instrumentation diagrams for its plant. Company A has also provided DOE with reports covering its commercialization efforts, microorganism testing, filter applications, and markets for ethanol. Money spent on surveys, permits, and licenses may not have much benefit, however, because Company A no longer prefers the site for which they were purchased. As of December 2000, Company A did not have an executed EPC contract, however, it had been doing research and development work on its process. OFD has stated that Company A will not execute an EPC contract due to the poor economics of the project. DOE is in the process of closing out the Company A award.

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[2]DOE's 1998 Performance Agreement with the President had the target of completing the design of a 10-million-gallon-per-year-first-of-a-kind biomass refinery. The 1999 Performance Agreement had the target of completing site preparation.

[3]An EPC contract is entered into by the firm seeking investors, such as Company A or Company B, and a qualified engineer. The contract can provide for liquidated damages, process guarantees, performance testing, guaranteed completion dates, insurance and bonding, and other such protections that the investors may reasonably require.

Company B

In its February 1997 proposal to DOE, Company B stated that it was seeking financial assistance for commercial demonstration of its biomass technology. Company B asserted that its technology had already been proven at the pilot plant level and that process refinement would last only three months. Most importantly, the firm represented that it would have an EPC contract within 60 days of receiving DOE funding. Company B also stated that it would construct and begin operation of a 10-million-gallon-per-year biomass plant within 18 months of receiving DOE funding.

In May 1997, Golden awarded financial assistance to Company B to share in the cost of activities that needed to be completed before construction of a plant could begin. The award's Statement of Work stated that a key deliverable would be completed "when the EPC contractor accepts the validation efforts to prove the process design and provides the necessary process guarantees and warranties required by the project lenders." The project period was to end March 31, 1999.

Based on reports filed by Company B, it appeared to have made more progress toward construction of a plant than Company A had. According to the reports, construction documents had been developed such as process flow diagrams, equipment lists, and piping and instrumentation diagrams. It had also moved equipment to the site that was to be used for ethanol production. However, on August 18, 2000, Golden notified Company B that it was suspending the cooperative agreement because Company B was unable to reach financial closing.[4] EERE told us that Company B was unable to reach financial closing due to risk uncertainties related to process performance. As of December 2000, 43 months after DOE began providing financial assistance, Company B still lacked an executed EPC contract. However, on January 17, 2001, EERE's Assistant Secretary notified Company B that DOE would make $6 million available to Company B under the existing cooperative agreement, until December 31, 2001. EERE indicated in the notice that the funds would be obligated only if Company B executes an EPC contract and achieves financial closing. According to EERE, Company B has acquired $45 million in equity commitments for the project and a major underwriter is selling bonds to acquire the funds needed to achieve financial closure.

[4]Financial closing is putting together a financing package. It includes lining up investors and providing them sufficient assurances of the feasibility of a project.

Need To Manage Risk

The biomass program faces significant technological and financial risk. The program could fail because the technology is first-of-a-kind and unproven. In addition to the risk that the technology might not work, there is the financial risk that the program might fail for lack of private sector financing. OFD and Golden have cited market uncertainty regarding demand and pricing for ethanol as potentially significant barriers to attracting investor financing. Concerning demand, a DOE analysis showed that alternative fuels' share of the domestic energy market would not increase even if crude oil prices increased to $40 per barrel. Concerning pricing, the National Research Council has stated that potentially lower cost technologies being developed outside of DOE threaten the success of OFD's biomass program unless there is a significant breakthrough that markedly lowers production costs. Congress recognized these risks when enacting the *Biomass Research and Development Act of 2000*, which states that the two key challenges to be overcome are (1) finding new technology and (2) reducing biomass conversion cost.

If DOE is to manage these risks successfully, it must, like a venture capitalist, have controls in place that provide reasonable assurance of selecting the projects offering the best promise for success; allow for an evaluation of a potential recipient's ability to perform; ensure sharing of costs in accordance with risk indicators; and provide the ability to exit projects that fail to perform as promised. Notwithstanding the Congressional earmarks that mandated funding to Company A and B, basic performance controls could still be placed on the DOE related activities of these firms. DOE had such controls as well as the requisite authority to exercise them both before and after awarding funds when warning indicators present themselves.

Despite Risk Indicators, Controls Not Implemented

In spite of the risks associated with achieving the biomass goal of a production facility by 2000, OFD did not solicit proposals competitively because it believed that there were only two companies at the time with the technology at the stage of development needed to achieve commercial production. Since then, however, OFD and Golden have issued a competitive solicitation. Although independent technical professionals conducted a merit review of both proposals, OFD did not heed the advice of the merit reviewers or fully evaluate the firms' financial capabilities. This entire process was complicated by the Congressional earmarks, which were discussed earlier in this report.

Company A

While the merit reviewers concluded that Company A's proposed biomass project had some merit, they expressed significant concerns

about its technical and financial aspects. For instance, one reviewer wrote:[5]

> There is really very little regarding the actual process that Company A wants funded. [There are] some general sketches of the process, but almost no real substantive materials. This raises numerous questions and comes across like "just trust us, we're the good guys." [Further,] this…proposal would cost $9.3 million and after these monies are gone the results will be a paper product.

Concerning the financial side of the Company A project, a reviewer wrote:

> This [project financing] is the most important issue in the proposal and it lacks information regarding financing the project after Phase I. The financial information…dates back to 1994…. However, if there is an interest by Bank C,[6] [Company A] should provide current information to support the interest.

In spite of the signs of risk, OFD did not implement risk mitigation measures recommended by the merit reviewers. For instance, one merit review recommendation was that OFD obtain assurance that Company A would have a financing package in place within five months. Subsequently, OFD requested that Company A provide current commitment letters from investors. In response, Company A provided (1) a statement indicating that one of the investors was still interested and (2) a letter of interest, rather than letter of commitment, from an additional company. Even though Company A did not provide the commitment letters requested, OFD made the award to Company A without assurance that a financing package would be available.

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[5]All merit review comments shown here concerning the Company A proposal were taken from the comments made by individual merit reviewers. Many of the negative comments of the individual merit reviewers either did not appear in the "Merit Review Committee Summary Report" (which was the merit review report provided to the EERE selection official) or were converted to quasi-positive statements about the potential of the Company A proposal.

[6]"Bank C" has been substituted for the actual name of the bank.

There was also a merit review recommendation that DOE place "very tight constraints" on funding provided to Company A and use a 50/50 cost share throughout the award. Company A had proposed that DOE pay most of the costs for the project's first phase. Such a funding strategy placed DOE's money at risk—not Company A's—if Company A did not perform well. Ultimately, Golden established a cost share arrangement where DOE would pay 77 percent of the project's first phase and Company A would pay 23 percent.

The merit reviewers also recommended that funding to Company A be discontinued if the firm did not provide key first phase deliverables, which included the EPC contract. Instead of discontinuing DOE's funding after it became apparent that Company A would not execute an EPC contract, OFD and Golden modified the award to delete the second phase and continued to fund Company A. OFD maintained that it modified the scope of the Company A project to change the co-product to one that would have a higher return on investment and lower the technological risk, but that the market for the new co-product became depressed. The second phase was supposed to result in detailed engineering design for construction. Instead, after deletion, Company A worked on additional research and development tasks related to its biomass process and the new co-product that were added to the first phase.

Company B

Regarding Company B, two reviewers wrote:

> There is not enough data to make a detailed evaluation, including economics, of the project. There is enough information to raise very serious questions of its success. It appears to have serious defects from feedstock procurement to the final state of processing.
>
> The amount of research and development that needs to be done before the plant becomes operational will be significantly larger, more time consuming, and more expensive than anticipated by Company B. [However,] if Company B is successful in raising the majority of the project funding from private investors, I recommend that the DOE consider assisting in this effort, but should keep a watchful eye on the progress made. If weaknesses in the execution of the proposal

> become apparent, a mechanism should be in place that will allow DOE to have a say, similar to provisions that venture capitalists require (instead of a "blank check").

Merit reviewers pointed out that the success of Company B's technology was very much in doubt, that OFD should closely monitor Company B's progress, and that OFD and Golden should respond to problems in project execution as a venture capitalist would. We noted that although OFD took action to address merit reviewer comments, such as providing Company B with a list of questions, OFD and Golden could have done much more, such as ensuring that the award contained controls commensurate with the level of project risk identified by the merit reviewers.

Additionally, OFD could have withheld, suspended, or terminated Company B's funding when it became apparent that it would not fulfill the terms of its financial assistance awards. OFD, however, continued to fund Company B after DOE reached its original funding ceiling, even though Company B had not executed an EPC contract. At the time of award, DOE's stated intent was to pay 15 percent of costs and Company B 85 percent. In July 1998, as DOE reached its 15 percent cost share ceiling, Company B submitted its final invoice for reimbursement and stated, "No further Federal cost share will be requested." Nevertheless, OFD later provided an additional $5 million to Company B in Amendment 4 of the award. According to OFD, it was directed to provide the $5 million by the FY 1999 appropriation covering biofuels programs. OFD provided the $5 million for financial closing, which never occurred. However, instead of directing Company B to return the $5 million as required by the award terms, OFD allowed the firm to keep the money—which, according to Company B reports was spent on activities that were not authorized by the statement of work at the time the money was awarded—and retroactively authorized the activities that the money was spent on.

Firms' Financial Status

Readily available financial data indicated that both firms might have difficulty meeting their share of project costs. For example, reports we obtained from Dun & Bradstreet showed that Company B had net losses in 1997 and 1998, with a positive net worth of $1.1 million in 1997 and a negative net worth of $2.2 million in 1998. Company A had a negative net worth of about $3.5 million prior to the DOE award. However, DOE did not adequately evaluate the applicants' financial ability to meet the negotiated cost share. For example, DOE may not

have been aware of Company A's negative net worth since it failed to obtain financial statements from Company A prior to the award.

DOE's Explanation

OFD and Golden defended the awards made to Company A and Company B on several grounds. OFD stated that Congress had earmarked $4 million for the Company A project and $4 million for the Company B project and noted that such earmarking limited DOE's flexibility with regard to funding the projects. OFD and Golden stated that they had addressed Company A merit review concerns by incorporating special provisions into the award, such as requiring support documents for DOE payments, increasing DOE's involvement in the project, and by providing an overall 50/50 cost share for the entire project. Project documents showed that Golden had notified Company A and Company B of concerns including significant delays in securing non-DOE financing and the lack of an executed EPC contract. OFD and Golden stated that financial assistance would not be discontinued if a project were addressing DOE program objectives unless there were indications of fraud, waste, or abuse. EERE stated that if Company B's financial plans are realized, EERE's total project leveraged cost share would be greater than nine-to-one. Finally, EERE stated that while it has not met its program goal in terms of timing, it is likely to meet its more important objective to build a first-of-a-kind biomass production facility.

This explanation is not persuasive for several reasons. Although OFD may have felt it was obligated to begin making earmarked funds available to the firms, it had no obligation to continue providing funds, whether earmarked or otherwise, once it became clear that those firms were not fulfilling award terms. Although there may not be a regulatory level of due diligence for evaluating applicants, good business judgment would argue against placing millions of dollars of taxpayer money into projects that have been identified by merit reviewers as risky, without implementing the basic safeguards recommended by those reviewers.

The earmarks do not prelude the Department from applying basic performance conditions. At a minimum, the Department could have notified Congress of the failure of the firms to satisfy their

obligations, and sought legislative relief. Indeed, as the Department essentially points out in its response to a draft of this report, a reprogramming action was an available remedy.

Delays And Increased Costs To DOE

As a result of not mitigating the risks inherent in the Company A and Company B awards, DOE is likely to be delayed in meeting its commitment to reduce oil imports and the vulnerability of the Nation to energy supply disruptions. The goal of a production plant in 2000 is unmet. Further, it is unlikely DOE will achieve its FY 2001 Performance Plan target of producing 6 million gallons of ethanol from biomass.

DOE's cost share for both projects has grown significantly. DOE continued to pay nearly all cost share contributions for the Company A project, even though OFD has acknowledged that it would likely receive no value from the project toward achieving its production goal. According to the most recent amendment to the Company A award, DOE's cost share has remained constant at about $4 million, while Company A's decreased from $4.39 million to $1.33 million. DOE's overall negotiated cost share has increased from 48 percent to 75 percent, while Company A's share has decreased from 52 percent to 25 percent.

According to the amended Company B award, DOE's paid cost share has nearly doubled from $5.95 million to $10.95 million and Company B's estimated cost share has decreased from $33.91 million to $18.76 million. Even with a lower cost share, Company B was still supposed to pay more than half of the project costs. However, as of May 2000, DOE had paid 58 percent of actual project costs.

To some degree, the goal of a production plant in 2000 may not have been met because of market conditions. For example, EERE cited an unacceptable rate of return and high estimated costs as among the reasons Company A would not execute an EPC contract. Conversely, EERE must accept responsibility for the $14.95 million of taxpayer funds that have been provided to Company A and Company B without any construction resulting. Financial assistance for alternative fuels projects needs to be better controlled if situations similar to Company A and Company B are to be avoided.

RECOMMENDATIONS

We recommend that the Assistant Secretary for Energy Efficiency and Renewable Energy ensure that alternative fuels project officials:

1. Prior to award, address merit reviewer concerns and recommendations, and verify the ability of financial assistance applicants to meet project financial commitments; and,

2. Restrict project funding when recipients do not comply with award terms, including withholding, suspending, or terminating funding.

MANAGEMENT REACTION

Management concurred with the recommendations however, it disagreed with the report's conclusions regarding commercialization and risk reduction, earmarks, and the merit review process. EERE did agree to examine its policies and practices relative to the award, monitoring, and termination of financial assistance. By September 30, 2001, recommendations resulting from the review will be forwarded to EERE's Assistant Secretary for concurrence to ensure the program's practices adhere to all applicable DOE procedures regarding the manner in which DOE awards financial assistance.

AUDITOR COMMENTS

Although management concurred with the recommendations, until the review is completed and positive action is taken to meet the intent of the recommendations, the problems with financial assistance awards will continue to exist. Management's commitment to undertake the review of its policies and procedures is a positive action.

Appendix

SCOPE

The audit was performed at Golden and EERE from January 2000 to April 2001. The audit was limited to DOE financial assistance for biomass projects. We reviewed two cooperative agreements awarded by Golden from inception through April 2001.

METHODOLOGY

To accomplish the audit objective, we:

- Interviewed Golden and DOE Headquarters personnel regarding financial assistance regulations, policies, procedures, and guidance;
- Analyzed the award files for the two cooperative agreements;
- Reviewed award decision documents and the extent of DOE's review of project progress;
- Reviewed *Government Performance and Results Act* performance objectives, commitments, goals, and targets related to the audit objective; and,
- Discussed the results of the work performed with Golden and DOE Headquarters personnel.

The audit was performed in accordance with generally accepted Government auditing standards for performance audits, and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. We examined the internal controls regarding OFD's program goal, including preaward and postaward funding, and administrative controls. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not conduct a reliability assessment of computer-processed data because we did not rely upon such data during the audit. An exit conference was held with cognizant Golden and DOE Headquarters officials on May 24, 2001.

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