

Energy—Bioenergy Grant Programs Follow Up

SUMMARY

In 2006, the Government of Alberta committed to a nine-point bioenergy plan¹ that included three bioenergy grant programs² to encourage investment in bioenergy production in Alberta and to develop Alberta's biofuel capacity and infrastructure for biofuel products distribution. Subsequently, in 2008, the government released its climate change strategy, which identified expanding the use of renewable energy sources and developing new bioenergy products in Alberta as a key component of meeting the province's emissions reduction targets.

In 2008, we audited the biorefining and infrastructure bioenergy grant programs administered by the Department of Energy. The credit program was not included as part of the original audit. Alberta's Bioenergy Policy Framework requires an assessment of the environmental impact of bioenergy products from projects that receive grants. We found that the grant applications for the biorefining and infrastructure programs did not provide any environmental impact information and the department's criteria for evaluating the projects did not include an assessment of the environmental impact. We made a three-part recommendation to the department in our October 2008 report.

What we examined

We assessed the bioenergy program systems in place to ensure that sufficient information is gathered from grant applicants and recipients to quantify positive environmental impacts—primarily carbon dioxide emissions.

What we found

While the department had taken initial steps to make improvements, we found that it had not implemented our recommendation. It still did not require biorefining and infrastructure grant applicants to demonstrate their product's positive environmental impact relative to comparable non-renewable energy products. Also, we found that the department's decision to fund projects under the two programs was not well documented. We are not repeating the original recommendation, since the two grant programs that were part of the 2008 audit are no longer accepting applications. However, based on the evidence gathered to follow up on the original recommendation, we identified areas in which the department could improve the ongoing credit program and the ongoing reports it requires for the biorefining and infrastructure programs, as they relate to emission reductions.

Why is this important to Albertans

Bioenergy is considered one of the elements within the climate change strategy that will assist in reducing emissions. If the bioenergy projects the government funds do not reduce emissions as expected, the government may have to reduce emissions in other areas to achieve its targets. Since the

¹ Alberta's Nine-Point Bioenergy Plan, 2006: <http://www.energy.gov.ab.ca/pdfs/BioE9pointPlan.pdf>.

² Biorefining and Market Development Program, Bioenergy Infrastructure Development Program and Bioenergy Producer Credit Program.

inception of the bioenergy programs in 2006 up until March 31, 2012, the Department of Energy has awarded bioenergy grants totalling approximately \$200 million.

AUDIT OBJECTIVE AND SCOPE

Our audit objective was to determine whether the department had a system in place to assess the environmental impact of the bioenergy projects funded by the program and whether the impact is less than or equal to that of existing energy products. This objective included following up on whether the department implemented our 2008 recommendation.³

To conduct this audit, we:

- interviewed department staff and members of the grant review committees for the biorefining and infrastructure programs
- examined a sample of applications and supporting documents for bioenergy biorefining and infrastructure grants
- reviewed the department's requirements for reporting environmental benefits by the grant recipient
- examined a sample of reports from grant recipients in all three programs
- examined the department's processes for tracking and reporting emission reductions from projects funded in all three programs

We conducted our field work in 2011–2012. Our audit was conducted in accordance with the *Auditor General Act* and the standards for assurance engagements set by the Canadian Institute of Chartered Accountants.

BACKGROUND

The Minister of Energy administers the bioenergy plan, based on the government's bioenergy policy framework. The framework identifies reducing emissions through the use of bioenergy products as one of the desired outcomes of the bioenergy plan. Alberta's climate change strategy identifies the nine-point plan and the bioenergy grant programs as key actions for meeting the province's emissions reduction targets.

The biorefining and infrastructure programs ended on March 31, 2011. The government has expanded and extended the credit program—which provides cash credits to manufacturers and processors of bioenergy products—until March 2016.

³ *Report of the Auditor General of Alberta—October 2008*, no. 25, page 255.

FINDINGS AND RECOMMENDATIONS

Environmental benefits—changed circumstances

Background

In 2008⁴ we recommended that the Department of Energy:

- gather and document its analysis of data to quantify the environmental benefits⁵ of potential bioenergy technologies to be supported in Alberta
- establish adherence to the government's nine-point bioenergy plan as a criterion within its bioenergy projects review protocol and require grant applicants to estimate the environmental benefits of proposed projects
- before awarding grants in support of plant construction, require successful applicants to quantify, with lifecycle assessment,⁶ the positive environmental impact relative to comparable non-renewable energy products

The bioenergy policy framework's guiding principles and funding decision criteria state that the environmental impact of biofuels must be equal to or lower than the energy products they might replace.

The department's guidelines for the biorefining program defined eligible projects as those involving:

- expansion or new development of biorefining
- evaluation and adoption of new biorefining technologies
- market development

The infrastructure program guidelines defined eligible infrastructure types such as biogas upgrading and biofuel storage. Both guidelines indicated that grant applicants must submit an estimate of greenhouse gas emission reductions and other environmental benefits.

Criteria

Projects funded under bioenergy grant programs should demonstrate, using a lifecycle assessment approach, that the full environmental impact of all stages of bioenergy production and use is equal to or less than the impact of the energy products the project is replacing.

Our audit findings

KEY FINDINGS

- The department did not enforce its requirement for grant recipients to estimate greenhouse gas emission reductions from their projects.
- The department did not retain sufficient documentation to support its recommendations that the Minister of Energy approve funding for the projects.

Analysis before awarding grants

The department did not enforce its requirement for grant recipients to estimate greenhouse gas emission reductions from their projects. A 2004 study on bioenergy opportunities in the province, commissioned by the Alberta government, concluded that all potential bioenergy products and technologies will result

⁴ *Report of the Auditor General of Alberta—October 2008*, page 255.

⁵ Environmental benefits here refers to greenhouse gas emission reductions.

⁶ Lifecycle greenhouse gas emissions for biofuels include emissions from all stages of producing and distributing the fuel, from growing or extracting feedstock to distributing, delivering and using the fuel. Lifecycle estimates adjust the values for all greenhouse gases to account for their relative global warming potential. Lifecycle emissions estimates include direct and indirect emissions such as significant emissions from land use changes. Source: EPA Lifecycle Analysis of Greenhouse Gas Emissions from Renewable Fuels, May 2009. Available at: <http://www.epa.gov/oms/renewablefuels/420f09024.htm>.

in lower emissions when compared to non-renewable energy products. The department used this study to support the development of bioenergy grant programs and to develop its guidelines for the scope of eligible project and technology types.

More recent, publicly available, studies and reports (post-2004) conclude that emissions may increase as a result of biofuel production in certain circumstances; for example, when indirect land use⁷ is considered. The department did not consider this information when evaluating projects, even though it was available when the grants were approved.⁸

In deciding which projects it should fund, the department assessed proposed projects against its program criteria⁹ and focused on whether the projects were feasible from a business and financing perspective and whether they met regulatory requirements. The department asked applicants to estimate the proposed project's greenhouse gas emissions and energy inputs and outputs, and to provide information about feedstock. All applications we tested provided the required data.

The department stated that the information it required from grant applicants was sufficient to determine whether the products' lifecycle emissions were lower than those of comparable non-renewable energy products, if the department chose to complete such an analysis after funding the projects. However, the department did not complete this analysis for individual projects it funded.

In 2011, the department estimated emission reductions from all funded projects. At that time, some projects had reached production stage and had actual emissions data available. However, the department used assumptions rather than actual feedstock data available for producing facilities. Such assumptions could overestimate (or underestimate) the emissions reductions (see Recommendation 15: Clarify reporting guidelines for grant recipient reporting).

Documentation of grant approval process

A cross-ministry committee comprised of government employees assessed applications for biorefining and infrastructure grants from 2007 to 2011. The current grant approval process for the credit program does not involve a review committee. The Government of Alberta's corporate internal audit services is reviewing the grant approval process for the credit program. The department has stated that it will incorporate recommendations from that review to improve its funding process.

Based on our examination of the review committee's process for biorefining and infrastructure grants, we found that the department did not retain sufficient documentation to support its recommendations to the Minister of Energy to approve funding for the projects. The department did not maintain evaluation checklists and other supporting documents that committee members compiled to support their rating of projects. The consolidated summary record the department kept as a support for its recommendations to the minister did not contain enough detail to understand how the review committee made its decisions.

⁷ Indirect land use is when a crop grown for biofuels displaces a food crop, resulting in more land being cleared and higher emissions to grow the food crop.

⁸ Williams, P, Inman, D., Aden, A. and G. Heath. (2009). Environmental and Sustainability Factors Associated with Next-Generation Biofuels in the U.S.: What Do We Really Know? *Environmental Science & Technology*, 23:13, 4763-4775. Available at: <http://www.circleofblue.org/waternews/wp-content/uploads/2010/08/Williams-Enviro-Sustainability-of-Next-Gen-Biofuels.pdf>.

⁹ Bioenergy Infrastructure Development Program Guidelines, 2009:

http://www.energy.gov.ab.ca/BioEnergy/pdfs/BIDP_program_guidelines.pdf.

Bioenergy Commercialization and Market Development Program Guidelines, 2009: (no longer available online).

New Recommendations

RECOMMENDATION 14: ESTABLISH ADHERENCE TO NINE-POINT BIOENERGY PLAN – BIOENERGY PRODUCER CREDIT PROGRAM

We recommend that the Department of Energy require bioenergy producer credit grant program applicants to demonstrate their product's positive environmental impact relative to comparable non-renewable energy products.

Background

The credit program is the only bioenergy program that continues to accept applications. Credit program grants are for producers of bioproducts such as liquid biofuels and electricity produced from burning biogas and biomass. Program applicants request funding based on their estimated annual production, subject to a maximum set by the department.

The department does not require applicants to estimate environmental benefits or provide emissions reduction data with their application. The credit program guidelines state that the program encourages investment in bioenergy production in Alberta, to:

- reduce reliance on fossil fuels
- support Alberta's renewable fuels standard
- create economic benefits

A lifecycle assessment examines the full environmental impact of a product, from producing the feedstock, manufacturing and distributing the product to using and disposing of the product.

Criteria: the standards for our audit

Projects funded under the credit program should be sufficiently analyzed to determine the positive environmental impacts (i.e., lower emissions) relative to the energy products they might replace.

Our audit findings

KEY FINDING

The department does not require bioenergy producer credit program applicants to demonstrate that their products result in lower emissions in comparison to non-renewable energy products.

The department requires credit program grant recipients to calculate project emissions on a lifecycle basis and submit this information in annual reports to the department. However, it does not require grant recipients to demonstrate their products result in emissions lower than those from comparable non-renewable energy products, even for facilities that have also received biorefining and infrastructure grants. Without this information, there is a risk that the department has awarded, and will continue to award, grants to facilities that generate more emissions on a lifecycle basis than producers of non-renewable energy products.¹⁰

¹⁰ The Alberta Bioenergy Policy Framework's guiding principles and policy decision criteria include the requirement that the environmental impact of bioproducts must be equal to or lower than existing energy products.

Implications and risks if recommendation not implemented

Without an assessment of the environmental impact of these projects, the department cannot know if the projects contribute to Alberta's climate change strategy. The environmental costs of some projects may exceed their benefits.

RECOMMENDATION 15: CLARIFY REPORTING GUIDELINES FOR GRANT RECIPIENT REPORTING

We recommend that the Department of Energy clarify its guidelines for annual reporting by bioenergy grant recipients to ensure it has the information required to appropriately assess and estimate bioenergy project emissions.

Background

Recipients of the biorefining, infrastructure and credit program grants must report annually to the department on project results, including greenhouse gas emissions and environmental benefits. The grant recipients must use the department's annual report templates to report.

Criteria: the standards for our audit

Guidelines for grant recipient annual reporting should clearly state the requirements for reporting environmental benefits such as lower emissions.

Our audit findings

KEY FINDING

The department has not specified requirements for emissions reporting by grant recipients.

Annual reporting by grant recipients

The biorefining and infrastructure grant agreements we reviewed include a requirement that grant recipients report to the department annually, for five years, on the project's greenhouse gas emissions and environmental benefits. The department does not specify the method that project owners should use to measure project emissions. Also, the department does not define "environmental benefits" or whether emissions should be reported on a lifecycle basis. The department is reviewing its template for annual reports for all three bioenergy programs.

The credit program grant agreement says that annual reports must include lifecycle calculations of greenhouse gas emissions associated with bioenergy production. The agreement does not specify the method for calculating lifecycle emissions. As a result, the department may not obtain the data it requires; further, the data received may be inconsistent among project owners.

Department's analysis of emission reductions from bioenergy grants

Starting in 2011, the department has estimated the annual total emission reductions from projects funded by the three grant programs. The department used actual or estimated production volumes and did not differentiate between types of feedstock when estimating emission reductions. The emission reduction differences could be significant between projects using food feedstock, such as corn, and projects using non-food feedstock, such as waste. This distinction would not be captured by the department's current method for estimating emissions.

Using assumptions rather than actual feedstock data available for producing facilities could overestimate (or underestimate) the emissions reductions. It also precludes the department from ranking projects based on emission reductions achieved. The department has not used the emissions data from the grant recipients' annual reports in preparing its estimate.

The department does not have a formal process to report emission reductions from the bioenergy programs to the Department of Environment and Sustainable Resource Development. ESRD stated that it is determining:

- what data it needs for projects funded by bioenergy grants
- the appropriate calculation method to use for calculating emission reductions
- whether the Department of Energy's assumptions are reasonable

ESRD is working with the Department of Energy to implement a formal process for obtaining the data required for Alberta's climate change strategy.

Implications if recommendations not implemented

Without clear guidance to project developers, the department may not obtain the data it needs to appropriately assess greenhouse emissions.

