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Evaluation of ecoAgriculture Biofuels Capital Initiative

Final Report

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Executive Summary

In this evaluation we examined the relevance and performance of the ecoAgriculture Biofuels Capital (ecoABC) initiative. The objectives were to determine:

- whether there is a continued need to encourage farmer investment in biofuels manufacturing, and whether ecoABC is the most effective way to provide opportunities to agricultural producers to participate in the renewable fuels industry;
- whether ecoABC's objectives are clearly aligned with federal government priorities and departmental strategic outcomes;
- the extent to which the program is aligned with other federal or provincial renewable fuels programs;
- the extent to which ecoABC has achieved its expected outcomes, in an efficient and effective manner.

The work was conducted by the Office of Audit and Evaluation from April 2010 to December 2010. The evaluation is required in accordance with AAFC's Five Year Evaluation Plan. The evaluation was conducted in accordance with the Treasury Board Policy, Directives and Standards on Evaluation (2009).

It should be noted that the evaluation did not assess the need for continued capital incentives for biofuels facilities as this was beyond the scope of the evaluation.

Methodology

The evaluation was based on the following five lines of evidence: document review; literature review; key informant interviews; analysis of ecoABC database; and economic analysis.

ecoAgriculture Biofuels Capital Initiative

The ecoABC initiative was launched in April 2007 as part of the federal Renewable Fuels Strategy, announced in December 2006. The objective of the program is to assist farmers in seizing new opportunities in the biofuels sector, by providing repayable contributions towards the construction or expansion of renewable fuel facilities that use agricultural products as inputs, and that have agricultural producer equity investment. The program provides repayable contributions of up to 25% of eligible project costs (to a maximum of \$25 million per project) for projects that have a minimum agricultural producer equity investment of 5% of total eligible project costs.

Total funding for the program is \$159 million over six years (2007-08 to 2012-13). As of December 2010, a total of eight projects have been approved, with a total contribution value of \$46.82 million.

Funded projects involve the construction of new and expansion of existing transportation biofuel facilities in Canada. The initiative is intended to provide farmers and communities with an opportunity to benefit from the federal government's commitment to biofuel production in Canada.

Key Findings

ecoABC is aligned with federal priorities articulated in the Renewable Fuels Strategy, and there is no overlap or duplication with other federal or provincial programs aimed at encouraging farmer investment in biofuels manufacturing through capital incentive programs. That being said, the program rationale for the ecoABC initiative is not entirely clear from the logic model and performance measurement strategy for the program.

ecoABC was aligned with AAFC strategic outcomes of "Innovation for Growth" and "Health of the Environment" at the time of its launch in April 2007. However, given the shift in the focus on production of renewable fuels from first generation (e.g., ethanol) to second generation (cellulosic) inputs, ecoABC is now more closely aligned with AAFC's strategic outcome of "A competitive agriculture, agri-food and agri-based products sector".

While the ecoABC initiative is part of a horizontal Renewable Fuels Strategy, with programs intended to work in a complementary fashion, the implementation and eligibility criteria of these initiatives were not aligned to allow biofuel manufacturers to take full advantage of the programs under the Renewable Fuels Strategy, and as a result, this could have affected program uptake and achievement of ecoABC outcomes.

Given the nature and complexity of assessing biofuel construction and expansion project proposals, and the materiality of these proposals, ecoABC's delivery costs appear to be in line with other similar innovation programs at AAFC.

While the majority of letters of interest were processed within the program's service standard, the majority of first payments were not made within the newly established service standard of 30 days. A robust data dictionary would help the Branch to track and target where improvements need to be made to streamline processing times.

While ecoABC is making progress towards its immediate, intermediate and end outcomes, program expenditures have been significantly lower than originally budgeted, the program is unlikely to meet its targets related to total farmer equity invested, and it may fall just short of its target for the change in annual production of ethanol and biodiesel by funded facilities.

In conclusion, although the program provided opportunities for farmers to participate in the biofuels sector, there does not appear to be a continued need at this time to encourage farmer investment in biofuel manufacturing through a capital incentive program. However, the identification of future specific gaps in terms of certain sources of biofuels and biomass, and/or any future increases to the renewable content requirements for gasoline, diesel and heating oil could well require reconsideration of capital incentives.

Lessons Learned

There are a number of lessons learned through the design and delivery of the ecoABC initiative that would serve to inform the future renewal of the initiative, or similar programming under a renewed federal Renewable Fuels Strategy:

- Given the interconnected and complementary nature of federal programs launched within a horizontal initiative, such as the federal Renewable Fuels Strategy, there is a need to ensure effective collaboration between departments, as well as clear governance and accountability for the overall performance of the horizontal initiative. At the individual program level, there is a need to ensure that risk mitigation strategies take into consideration the risks associated with the achievement of horizontal objectives, and other complementary programs launched within the initiative.
- Improving the articulation of program objectives in relation to outcomes would clarify the program rationale and facilitate the assessment of progress against immediate, intermediate and end outcomes. It should be noted that issues related to the need for strengthened performance measurement and reporting on innovation programs, including the ecoABC initiative will be addressed on a broader scale through the Meta-Evaluation of AAFC's Innovation Programming.

Recommendation

Our evaluation makes the following recommendation:

- The Farm Financial Programs Branch should finalize the program's data dictionary to ensure clear and consistent interpretation, over time, of data used to track and monitor work being completed on ecoABC project files. This will support a future assessment of program effectiveness and adherence to recently implemented (April 2010) program service standards for application processing and claims payments.

1.0 Introduction

1.1 Program Background

In December 2006, the Ministers of Natural Resources, Environment and Agriculture and Agri-Food announced the federal government's Renewable Fuels Strategy with the following goals: to provide higher-value market opportunities in the agriculture sector; to reduce the environmental impact of fuel use, especially greenhouse gas (GHG) emissions; and to encourage sustainable clean energy production.

The Strategy includes the following four key elements:

- increasing the retail availability of renewable fuels through the regulation of five percent renewable content in gasoline by 2010 and two percent renewable content in diesel and heating oil by 2012 (Environment Canada);
- supporting the expansion of the Canadian production of renewable fuels through the ecoENERGY for Biofuels program (NRCan);
- assisting Canadian farmers to seize new opportunities in this sector through the ecoAgriculture Biofuels Capital Initiative (AAFC); and
- accelerating the commercialization of new technologies through an investment in the Next Generation Biofuels Fund (SDTC).

The ecoABC initiative was launched in April 2007 as a four-year, \$159 million contribution program. In November 2009 the program was extended by two years, to March 2013, to allow the program sufficient time to achieve its objectives given the poor economic conditions of 2008/2009, and to allow for better alignment with other programs under the federal Renewable Fuel Strategy. It was designed to assist farmers in seizing new opportunities in the biofuels sector, and to contribute towards the federal government's targets for renewable content in Canadian transportation fuels. As a result, it was aligned with AAFC's strategic outcomes of "innovation for growth" and "health of the environment".

The objective of the program is to provide opportunities for agricultural producers to participate in the renewable transportation fuel production industry by providing repayable contribution towards new or expanding renewable fuels facilities that use agricultural products as inputs (feedstocks) and that have agricultural producer investment participation. The program funds repayable contributions of up to 25% of eligible project costs (to a maximum of \$25 million per project) for projects that use agriculture feedstock to produce biofuels, and that have a minimum agricultural producer equity investment of five percent of total eligible project costs.

While AAFC was assigned as the lead department for the federal Renewable Fuels Strategy, each department has its own authorities for programs that expire at different times. There is no requirement for a horizontal evaluation of the Renewable Fuels

Strategy. Instead, partner departments committed to conduct evaluations of their own programs in accordance with their own Departmental Evaluation Plans. Agriculture and Agri-Food Canada (AAFC)'s evaluation examines only ecoABC activities, and findings and recommendations refer only to data related to this program.

1.2 Evaluation Scope and Methodology

AAFC's Office of Audit and Evaluation (OAE) evaluated the activities of ecoABC for the period April 2007 to September 2010. The purpose of the evaluation is to assess the continued relevance and performance of ecoABC, as required by the Treasury Board Policy on Evaluation (2009).

The ecoABC program is one of four programs under the Renewable Fuel Strategy. The scope of this evaluation examined only the activities and resulting impacts of the ecoABC program. Accordingly, the evaluation did not examine broader environmental policy issues regarding the Government of Canada's activities in the area of biofuels or assess the need for continued capital incentives for biofuels facilities. Confounding factors resulting from the interrelationship of the four programs were considered in evaluating the ecoABC program but only as these affected the ecoABC program and not the wider strategy.

Similarly, health effects relating to the production and use of ethanol were outside the scope of this evaluation. The main objective of the ecoABC program was to fund facilities that provided opportunities for Canadian farmers to invest in the ethanol industry hence an assessment of health effects, or other societal impacts from the program, would not have been within the evaluation's scope.

The evaluation assessed:

- whether there is a continued need to encourage farmer investment in biofuels manufacturing, and whether ecoABC is the most effective way to provide opportunities to agricultural producers to participate in the renewable fuels industry;
- whether ecoABC's objectives are clearly aligned with federal government priorities and departmental strategic outcomes;
- the extent to which the program is aligned with other federal or provincial renewable fuels programs;
- the extent to which ecoABC has achieved its expected outcomes, in an efficient and effective manner.

The evaluation was based on the following five lines of evidence:

Qualitative methods:

Document Review – including program foundational documents and other relevant documents to develop a program profile, to help assess the alignment of ecoABC with federal and departmental priorities, and to assess the program rationale and linkages between program activities, outputs and outcomes. Documents related to the federal Renewable Fuels Strategy were also reviewed, recognizing that ecoABC is one element of the Strategy and that its success is partially dependent on interactions with other elements of the Strategy.

Literature Review – including a review of the literature of the biofuel industry in Canada and internationally in order to specifically assess whether there is a continued need to support farmer investment in biofuel manufacturing facilities, as well as the literature review and other documents developed by AAFC's Biofuels Opportunities Division at the outset of the ecoABC program. The literature review also compared other programs in Canada and internationally that have had success in obtaining similar objectives to ecoABC.

Key Informant Interviews (n=24) – with the following stakeholders:

- ecoABC Program staff (n=5) to obtain more detailed information on the project selection and approval process, progress in project development, overall program performance, and program design factors relevant to performance.
- senior staff of AAFC's Biofuels and Opportunities Division (n=3) to examine issues such as program relevance, program performance, and program design factors relevant to performance.
- federal officials involved with programming and policy development related to the federal Renewable Fuels Strategy (n=2), as well as provincial officials involved in biofuel programs (n=5) to discuss issues on program relevance.
- representatives of the ecoABC projects (n=6) to discuss the application/selection process, the progress to date of the projects, reasons for seeking funding from ecoABC, funding procedures and to assess program performance.
- representatives of key biofuels and agricultural industry organisations, and other stakeholder groups (n=3) to discuss program design or value to the industry.

Quantitative methods:

Compilation/Analysis of ecoABC Program Database - ecoABC's database provides tombstone related information – number of applications received, characteristics of the approved projects, and information related to program performance. This review provided information on program implementation, outputs and expected outcomes, for example, on the amount of fuel projected to be produced by the manufacturing facilities.

Economic Analysis – to review the economic environment since the program was announced in December 2006 to understand any changes that may have impacted on the program.

To the extent possible, individual evaluation findings are based on multiple lines of evidence.

1.3 Evaluation Limitations

The key evaluation constraint was the limited availability of information on the achievement of end outcomes by ecoABC projects. At the time of the evaluation, eight projects had been approved under the program, and five of these had been completed just within the last two years. The ecoABC program is in the middle stage of program implementation and performance information is not yet available to assess the achievement of end outcomes. Consequently, the evaluation focused primarily on assessing the relevance of the program, and achievement of immediate and intermediate outcomes, while discussing the program's potential to achieve end-outcomes.

In terms of program effectiveness, the evaluation did not assess the cost of ethanol fuel per litre relative to the costs of production by plants funded by the ecoABC program for two reasons. First, the plants have not been in operation long enough (the ecoABC program is entering its fourth year with some plants still being built) to generate such data. Second, other subsidies provided to the ethanol industry (e.g., tax incentives, blending fuel credits etc.), have an influence on the cost per litre of ethanol, making the delineation of pure production costs difficult to obtain.

The evaluation includes limited feedback from program stakeholders, in particular farmers. Contribution agreements did not include consent for AAFC officials to contact farmers who had invested in ecoABC projects to assess program impacts. This consent would have allowed evaluation officials to contact farmers directly to help better assess the relevance and performance of the program. AAFC is reviewing its contribution agreement template to ensure that future agreements include provisions to support evaluation, including consent to contact program recipients and participants, where appropriate.

2.0 Program Profile

Overview of ecoABC

The ecoABC initiative is managed by the Biofuels and Opportunities Division (BOD) within the Farm Financial Programs Branch at AAFC Headquarters. The main activities of ecoABC are the selection, funding and monitoring of approved projects. BOD's responsibilities include monitoring all related expenditures and program activities to determine if the recipient (i.e. the biofuel company) has complied or is complying with the terms and conditions of the contribution agreement. It also includes assessing whether audits of specific agreements are required.

The application process involves assessing and screening in or rejecting letters of interest, reviewing proposals against and working with proponents towards meeting all necessary program eligibility criteria, and recommending complete project proposals for funding approval. Figure 1 (below) illustrates the key steps involved in this process.

Once a full proposal is complete and approved for funding, a contribution agreement is signed when the applicant demonstrates that the project is construction-ready. Signed contribution agreements are the main output of the ecoABC initiative.

When construction of the facility is complete, proof of production at nameplate capacity¹ is provided by a professional engineer registered in Canada. AAFC pays the recipient following receipt of the commissioning report and documentation demonstrating that the facility has incurred eligible project costs. The minimum rate of the ecoABC contribution per litre of nameplate capacity is eight cents, but increases based on the level of agricultural producer investment to a maximum of 20 cents, with 20 percent or more of agricultural producer equity investment as a percentage of eligible project costs.

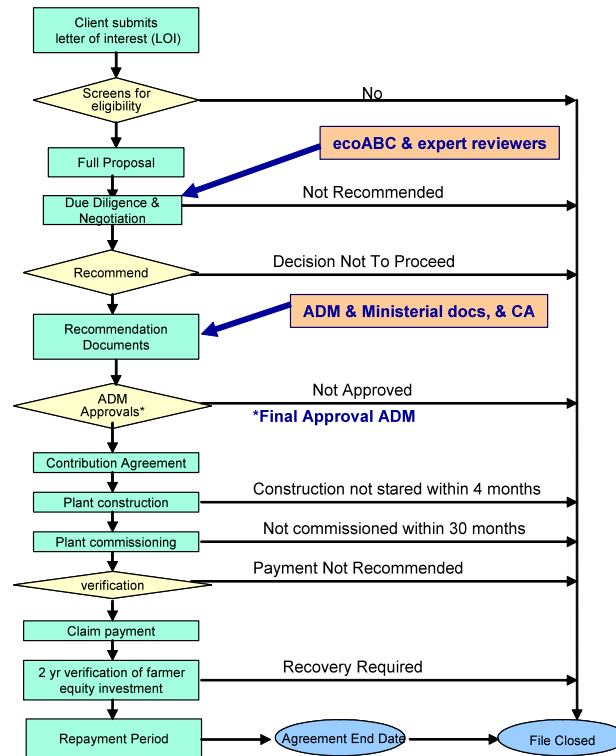
¹ Nameplate capacity refers to the volume of renewable fuels that can be produced in a year as certified by an engineer registered in Canada on behalf of the technology/construction provider or a qualified sub-contractor at the date of commissioning.

Figure 1

ecoABC Application Process / Project Life Cycle

Process

- Self screening of eligibility by client
- ecoABC screens clients LOIs for eligibility & registers project
- Client submits full investment proposal to ecoABC
- ecoABC & expert reviewers perform due diligence & make investment recommendation
- ecoABC prepares approval documents, including Contribution Agreement for review and submits to ADM for approval
- Client signs contribution agreement and begins construction within 4 months
- ecoABC verifies construction start within 4 months
- Facility commissioned within 30 months
- Client submits claims & supporting documents
- ecoABC verifies contribution agreement terms met and costs claimed
- ecoABC makes claim payment
- ecoABC performs ongoing monitoring of project & 2 year verification of farmer equity investment
- Repayment phase begins after 3 year grace period followed by up to 7 years of repayments based on project profitability



To ensure that agricultural producers have made the required commitment to the project, the successful applicant must report on levels of agricultural producer equity investment as a proportion of eligible project costs two years after the project has been commissioned, as per the program Terms and Conditions. If agricultural producer investment has declined from the levels specified in the Contribution Agreement, the applicant must repay the difference between the original contribution, and any reduction in the amount recalculated two years after the facility's commissioning. Repayment of AAFC's contribution is made over seven years following a three-year grace period after commissioning, conditional upon the recipient's level of profit from operations.

As of December, 2010, ecoABC has approved eight projects (six with signed contribution agreements) representing \$46.82 million in potential commitments, and up to 649 million litres in new biofuels production capacity annually.

The original budget for the ecoABC initiative was \$200 million (\$186 million in contribution funds and \$14 million in operating funds (please refer to Table 1 below). Following an expenditure review, the budget was reduced to \$159 million.

Table 1: ecoABC Original and Revised Budgets

	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Total
Original Budget							
Vote 1	1,941,354	1,941,354	1,941,354	7,530,228	N/A	N/A	13,354,290
Vote 10 Contributions	28,650,000	50,000,000	50,000,000	57,350,000	N/A	N/A	186,000,000
Accommodation	58,646	58,646	58,646	469,772	N/A	N/A	645,710
Total	\$30,650,000	52,000,000	52,000,000	65,350,000	N/A	N/A	200,000,000
Original Budget Adjusted for Reprofiles and ERC							
Vote 1	1,941,354	1,941,354	1,941,354	7,941,354	N/A	N/A	13,765,416
Vote 10 Contributions	350,000	29,985,930	49,765,000	65,294,070	N/A	N/A	145,395,000
Accommodation	58,646	58,646	58,646	58,646	N/A	N/A	234,584
Total	2,350,000	31,985,930	51,765,000	73,294,070	N/A	N/A	159,395,000
Revised Budget with 2-Year Extension							
Vote 1	1,941,354	1,941,354	1,941,354	1,941,354	1,941,354	3,941,354	13,648,124
Vote 10 Contributions	350,000	29,985,930	3,829,000	38,894,070	23,936,000	48,400,000	145,395,000
Accommodation	58,646	58,646	58,647	58,647	58,647	58,647	351,880
Total	2,350,000	31,985,930	5,829,000	40,894,070	25,936,000	52,400,000	159,395,000

In December 2009, the Government of Canada announced its intention to extend ecoABC for two years to March 31, 2013 to allow the program sufficient time to achieve its objectives given the poor economic conditions of 2008/2009, and to allow for better alignment with other programs under the federal Renewable Fuel Strategy. As a result of the extension, almost half of the ecoABC vote 10 budget (\$72 million) has been reprofiled into 2011/12 and 2012/13.

3.0 Evaluation Findings

3.1 Relevance

3.1.1 Continued Need for the Program

Canadian biofuel production levels are not large enough for Canada to be regarded as a significant participant in the global biofuels market² and thus do not affect world biofuel supply and demand. The development of biofuel manufacturing capacity in Canada is expected to increase local feedstock prices and reduce local transportation costs³ in the

² The U.S. and Brazil produced approximately 94 percent of the world's fuel ethanol in 2009.

Canada is the 6th highest ethanol producer in the world behind the U.S., Brazil, EU, China and Thailand with 1.5% of world ethanol production in 2009)

³ In competitive markets, transfer costs — loading or handling and transportation charges — are usually the most important factors in determining spatial (i.e., location-based) price differentials. The more it costs to transport a commodity to a buyer, the less the producer will receive and vice versa. With the

short-term, but is not expected to affect overall feedstock prices over the long-term as these are set by world markets⁴. Canada is essentially a 'price-taker' when it comes to the costs associated with the domestic production of renewable fuels. As a result, the literature review and economic analysis indicate that the impact of the Canadian biofuel industry on Canadian farmers is relatively small. Furthermore, in order for the Canadian biofuel industry to compete with the larger U.S. and Brazil markets, the industry is dependent on government financial support in the form of capital and production incentives.

The evidence shows that the Canadian biofuel industry offers little economic benefit to individual farm producers beyond what it adds to the general demand for commodities, and the short-term effect on commodity prices and reduced transportation costs. These overall benefits at the local level may be largely offset by the potentially negative impacts on the Canadian livestock sector, due to the increase in the prices of feed-grain in the short-term.⁵

Interviews and the literature review indicate that the majority of farmers often cannot afford the required capital to invest in biofuel manufacturing plants and are not necessarily seeking new off-farm investment opportunities. Key informants believe that many farmers with money to invest tend to invest it in their own farm operations. They also note that producers are generally risk averse and the biofuel industry is perceived as being a high-risk investment. The economic recession further enhanced this perception, making farmers even less likely to invest outside of their farm operations.

Biofuel feasibility studies conducted under the Biofuels Opportunities for Producers Initiative (BOPI)⁶, the precursor to the ecoABC program, demonstrated that the biofuel industry was, in fact for most farmers or farmer organizations, unattractive. As a result, many of the weaker farmer-led biofuel projects chose not to continue, helping to ensure that those that did continue and apply for ecoABC funding were more likely to succeed.

The document review and interviews found that of the 503 farmers that invested in the ecoABC projects, 466 (93%) are majority owners of two separate biofuel facilities, that were significantly well along in their planning prior to the launch of the ecoABC program. Key informants stated that these particular farmers would likely have invested in these

development of the ecoABC biofuels facilities, farmers that are close to the plants are now able to sell their products locally, thus reducing the distance that they need to transport their product.

⁴ Canada and the U.S. have a relatively open market (i.e. no tariffs) in feedstocks and biofuel products and thus Canadian supply and demand is largely determined by the much larger U.S. market.

⁵ Absent an ethanol industry, Canada would be an exporter of feedgrains, and grain prices would be below the US, generally by the amount of freight cost. However, subsidized ethanol production increases the demand for grains and raises their prices above the US and other countries. For livestock producers who purchase feedgrains this means that, rather than having a small relative advantage in feed cost, they have a relative disadvantage.

⁶ BOPI was an initiative designed to help farmers and rural communities hire experts to assist in developing business proposals and feasibility and other studies that were necessary to create and expand biofuels production capacity by agricultural producers.

two projects regardless of the existence of the program. However, it is possible that the federal government's announcement of the Renewable Fuels Strategy in December 2006, which included capital and production incentive programs, influenced early business decisions on the part of these investors.

The economic conditions during the period which the program was operating likely had an impact on the level of program uptake. To date program expenditures have been significantly lower than originally budgeted (\$46.8M out of \$145.4M), and the program is unlikely to meet its targets related to total farmer equity invested.

Findings from the literature review, interviews and economic analysis suggest that AAFC should re-assess the ongoing need to encourage farmer investment in biofuels manufacturing from agricultural feedstocks through capital incentive programs. The findings indicate that the promotion of farmer investment in the industry provides minimal benefits to Canadian farmers. Furthermore, farmers do not necessarily have the means or the motivation to invest in biofuel manufacturing.

In conclusion, although the program provided opportunities for farmers to participate in the biofuels sector, there does not appear to be a continued need at this time to encourage farmer investment in biofuel manufacturing through a capital incentive program. However, the identification of future specific gaps in terms of certain sources of biofuels and biomass, and/or any future increases to the renewable content requirements for gasoline, diesel and heating oil could well require reconsideration of capital incentives.

3.1.2. Alignment with Federal Priorities and Departmental Strategic Outcomes

A review of Government of Canada publications and policy documents, such as Speeches from The Throne and Budget statements, announcements related to the federal Renewable Fuels Strategy and AAFC's foundational documents confirm that ecoABC is aligned with current federal priorities related to providing higher-value market opportunities in the agriculture sector through the domestic production of renewable fuels from agricultural inputs. In the 2006 Speech from The Throne, the Government stated:

“In support of the future competitiveness and prosperity of the industry, the Government will invest in ongoing measures, including...funding in support of a biofuels strategy.”

The rationale was that renewable fuel production was a new market opportunity for farmers and rural communities. Budget 2006 included \$365 million to assist farmers in realizing opportunities through agricultural bioproducts, including renewable fuels. ecoABC aims to support farmers and rural communities through their participation in the

biofuels manufacturing industry and, thus, is aligned with these government-wide priorities.

At the time the ecoABC initiative was launched in 2007, the production of renewable fuels from agricultural feedstock was a relatively new industry in Canada, and investments in building capacity in this area were seen as being innovative. It was expected that the increase in renewable fuels production in Canada would support innovation for growth through increased demand for feedstocks, new markets for agricultural producers, and increased prices for the grains and oilseeds sector. Agricultural producer equity investment in biofuels facilities was also expected to achieve specific economic benefits for producers through diversified off-farm revenue. It was also expected that the use of transportation biofuels that would be produced by the facilities funded under ecoABC would reduce greenhouse gas emissions. Thus, the ecoABC program originally aligned well with AAFC's strategic outcomes of "an innovative agriculture, agri-food and agri-based products sector" and "health of the environment".

When AAFC's Program Activity Architecture was revised in 2008, the ecoABC initiative was subsequently aligned with the strategic outcome of "An innovative agriculture, agri-food and agri-based products sector", under the "Science, Innovation and Adoption" program activity. Since 2007 the debate around the benefits of the production of renewable fuels from agricultural inputs has continued, with emphasis on the fact that biofuel production from agricultural inputs could potentially displace food production and that environmental benefits may not be as significant as first thought. As a result, the focus of the federal government has been shifting from first-generation (e.g., ethanol) to second-generation (e.g., cellulosic) renewable fuels, as they are perceived to have potentially greater environmental and economic benefit.

In conclusion, federal government support for first-generation renewable fuels is no longer considered to be innovative but rather, it is geared towards assisting the Canadian renewable fuels industry to be competitive in international markets. Therefore, ecoABC is now more closely aligned with AAFC's strategic outcome of "A competitive agriculture, agri-food and agri-based products sector" as opposed to "An innovative agriculture, agri-food and agri-based products sector".

3.1.3 Alignment with Other Federal Programs under the Renewable Fuels Strategy

The ecoABC initiative is part of a horizontal Renewable Fuels Strategy, with programs intended to work in a complementary fashion to increase the retail availability of renewable fuels through regulations under the *Canadian Environmental Protection Act* (Environment Canada), to support the expansion of the Canadian production of renewable fuels through a production incentive (Natural Resources Canada ecoENERGY for Biofuels program), to support the construction of new and expansion of existing biofuel facilities (ecoABC) and to accelerate the commercialization of new

technologies for next-generation renewable fuels (Sustainable Development Technology Canada). While these initiatives were part of an overall horizontal strategy, the ecoABC initiative was the first one launched in April 2007.

The first element of the strategy, led by Environment Canada, involves increasing the retail availability of renewable fuels through the regulation of five percent renewable content in gasoline and two percent renewable content in diesel and heating oil. This component of the Strategy is important as it provides the “demand” side of the biofuel industry in Canada. While the intention to introduce new regulations under the *Canadian Environmental Protection Act* was announced in 2006, the regulations for renewable content in gasoline were not enacted until December 15, 2010, and the regulations for diesel will not be enacted until 2012. As a result, the ecoABC initiative has had to operate while the demand side regulations are not in place.

The second element of the Renewable Fuels Strategy, led by Natural Resources Canada, involves supporting the expansion of the Canadian production of renewable fuels through the ecoENERGY for Biofuels program (ecoEBF). The ecoEBF program⁷, launched in 2008, was intended to provide an operating incentive to facilities that produce renewable alternatives to gasoline and diesel. The literature review, economic analysis and interviews demonstrate that without ecoEBF funding, ecoABC funding would in most cases not be sufficient to make a plant competitive. ecoEBF funding is important for the ongoing competitiveness of the biofuel industry in Canada, as it provides predictable funding for a long duration (seven year period) based on the quantity of biofuel a facility produces.

One of the barriers to investment in renewable fuels has been the cost of operation. Unlike traditional fuels, for which costs and revenues are tied to one commodity, namely crude oil, renewable fuel producers must deal with not only fuel prices but also the largely unrelated price of feedstocks. Feedstock costs represent more than 80 percent of biodiesel production costs, leaving producers vulnerable to increasing feedstock prices. Another barrier to investment is the fact that the U.S. renewable fuels industry is much more developed than the industry in Canada and can, along with other countries such as Brazil, produce renewable fuels at lower operating costs than producers in Canada. The ecoEBF program was meant to overcome these barriers by providing direct operating assistance to domestic producers for a set period (seven years of funding starting at \$.10 per litre in 2008/09 and then decreasing gradually to \$.04 in 2016/17). ecoABC projects are reliant on funding from the ecoEBF program in order for projects to remain successful once operational.

The ecoEBF program was launched one year after ecoABC⁸. The uncertainty regarding the availability of a production incentive could have made firms less likely to submit a

⁷ The program, which runs from April 1, 2008 to March 31, 2017, provides up to seven years of assistance per facility in the form of non-repayable contributions in order to boost Canadian production of ethanol and biodiesel.

⁸ ecoABC was launched in 2007 and ecoEBF was launched in 2008.

full proposal for ecoABC funding, given that both incentives (production and capital) appear to be required for biofuel production facilities to be competitive in Canada, at the present time. At the time the ecoEBF program was launched in 2008, the eligibility criteria were not initially aligned with the ecoABC initiative. As a result, projects that received funding under ecoABC were not necessarily eligible for funding under ecoEBF. The eligibility criteria for the ecoEBF program were subsequently revised in December 2009 to address this alignment issue. As a result, all production facilities currently receiving funding under ecoABC are now also eligible for the producer incentive under the ecoEBF program.⁹

The last component of the federal Renewable Fuels Strategy, led by Sustainable Development Technology Canada (SDTC), involves accelerating the commercialization of new technologies through an investment in the Next Generation Biofuels Fund. Based on information provided by the Biofuels Opportunities Division, SDTC has approved one project related to the Next Generation Biofuels Fund, but has yet to distribute any funds. This initiative has no direct bearing on the success of the ecoABC initiative as it is focused on the production of next generation biofuels, produced from materials other than agricultural feedstocks.

In conclusion, the timing and eligibility criteria of several initiatives under the federal Renewable Fuels Strategy were not aligned to allow biofuel manufacturers to take full advantage of the programs under the Strategy. This could have affected program uptake and achievement of ecoABC outcomes.

3.1.4 Alignment with other Federal and Provincial Programs

The ecoABC initiative was designed as a successor to the Ethanol Expansion Program (EEP), which was launched in 2003 by Natural Resources Canada (NRCan), as part of the Climate Change Plan for Canada. The purpose of the EEP was to increase the production and use of fuel ethanol in Canada and reduce transportation greenhouse gas emissions by providing capital incentives for the construction of new ethanol facilities.

Based on program foundational documents, the EEP, which was co-managed by Natural Resources Canada and AAFC, provided significant insights that aided in the design of the ecoABC initiative. The first related to the determination of construction readiness, and the second related to the calculation of the contribution payment. There were also similarities in the design between the EEP and ecoABC programs with regard to the definition of eligible project costs and the structure of the repayment formula.

The ecoABC initiative and the EEP were intended to complement each other in that the objective of the EEP is to promote the production of ethanol and the objective of

⁹ This may not be the case for any future ecoABC funded projects, as the ecoEBF program is now closed for applications from new biofuels facility construction projects.

ecoABC is to promote agricultural producer participation in the commercial production of renewable transportation fuels, including ethanol. Two projects did receive both EEP and ecoABC funding, however, a special stacking provision was included in ecoABC to ensure that total combined funding to any one project from the two programs could not exceed the maximum \$25 million ecoABC repayable contribution. Thus, there was no likelihood of program overlap. ecoABC was seen as a vehicle for continuing to encourage increased domestic production of ethanol, incremental to what was achieved under the EEP, to help Canada meet its target of 1.5 billion litres of new biofuels production capacity by 2010, to meet the new regulatory requirements for renewable content in gasoline.

One of the key differences between the EEP and ecoABC is the focus on farmer investment. The ecoABC contribution is contingent on the level of equity investment by agricultural producers compared to eligible project costs. The *Department of Agriculture and Agri-Food Act* provides the Minister of Agriculture and Agri-Food with very wide latitude to act in matters relating to agriculture, products derived from agriculture and research related to agriculture or products derived from agriculture.¹⁰ Assisting farmers to seize new opportunities in the biofuels sector is consistent with AAFC's mandate, given the use of agricultural inputs in the production of renewable fuels, and in supporting a competitive agriculture, agri-food and agri-based products sector that proactively manages risk. That being said, the program rationale for the ecoABC initiative is not entirely clear from the logic model and performance measurement strategy for the program, which includes outcomes related to construction of new or expansion of existing biofuels facilities, and the resulting contribution to ethanol and biodiesel production in Canada, as opposed to outcomes that measure the opportunity created for farmers.

Evidence obtained through the document review, interviews with program officials and recipients all confirm that ecoABC does not overlap or duplicate either AAFC or other federal programs. At the present time, there are no other federal programs in Canada that encourage farmer investment in biofuels manufacturing from agricultural feedstocks through capital incentive programs.

In terms of potential overlap and duplication with Provincial/Territorial programs, SaskBIO, funded by the Government of Saskatchewan is modelled on the ecoABC program.¹¹ This program encourages farmer investment through capital funding in the province of Saskatchewan. The SaskBIO program has a more open definition of "farmer investment" than the ecoABC program, including not only farmers but the general public residing in rural communities. There has been no overlap between ecoABC and the SaskBIO program, as ecoABC includes a stacking limit such that total assistance towards capital costs of the ecoABC funded biofuel facility from all federal, provincial/territorial, and municipal government sources may only represent up to 50% of eligible project costs.

¹⁰ *Department of Agriculture and Agri-Food Act (R.S., 1985, c. A-9). Section 4.*

¹¹ <http://www.agriculture.gov.sk.ca/SaskBIO>.

In conclusion there has been no overlap and duplication between the ecoABC initiative and other federal and provincial/territorial programs that encourage farmer investment in the biofuels sector by providing capital funding arrangements to renewable fuels facilities that use agricultural products as inputs. That being said, improving the articulation of program outcomes in relation to program objectives would clarify the program rationale and facilitate the assessment of program impacts over the short to long-term. In this regard, it should be noted that issues related to the need for strengthened performance measurement and reporting on innovation programs, including ecoABC, will be addressed on a broader scale through AAFC’s Meta-Evaluation of AAFC’s Innovation Programming.

3.2 Performance

This section summarizes the findings of the evaluation with respect to the performance of the ecoABC program, in terms of achievement of intended outcomes, efficiency and economy.

3.2.1. Achievement of Program Outputs and Outcomes

The following are findings regarding the extent to which ecoABC is meeting targets identified in its performance measurement strategy.

Outputs

The ecoABC has identified one key program output: the review and approval of contribution agreements (CAs) as outlined in Table 2.

Table 2: ecoABC Progress toward Outputs

Performance Area	Indicators	Targets	Performance Results
Output			
Contribution Agreements (CAs)	Number of CAs signed Dollar amount committed	8 to 12 CAs (based on an average of \$20 to \$25 million per contribution and \$186 million in total spending)	6 projects with signed CAs and 2 project approved, representing \$46.82 million in total requested contribution funds 2 projects likely to be approved, would represent an additional \$32.5 million in requested contribution funds

As of December 2010, six contribution agreements have been signed, and two projects have been approved for funding. Program officials report that the two remaining projects should result in signed contribution agreements within a few months. In addition to the eight projects already approved, the program anticipates approving at least two more applications in the coming months. The program will continue processing new applications for projects that will be completed by September 30, 2012 and all recipient projects must be completed and costs incurred by March 31, 2013.

With the program extension, ecoABC is likely to meet its target output of eight to twelve signed contribution agreements.

Immediate Outcome

The objective of the ecoABC initiative is to assist farmers to seize new opportunities in the biofuels sector. There is a challenge in defining how to appropriately measure the creation of an opportunity.¹² It could be measured through a variety of indicators, including the number of farmers who are aware of the program, the number of farmers who participate in the program, and the amount of farmer equity invested. The program chose to measure progress towards its immediate outcome by the amount of leveraged capital, based on farmer equity invested, and bridge financing leveraged.

To date, ecoABC financial commitments have been considerably less (69%) than originally budgeted. Only \$46.82 million in potential commitments have been approved under the program. Factors external to the program, primarily the economic recession, many have had a significant impact on the program’s ability to meet its targets. These also include the low price of oil, the high price of feedstocks, limited access to credit, but also the poor alignment with the other programs involved in the federal Renewable Fuels Strategy, particularly with NRCan’s ecoENERGY Biofuels program.

As of December 2010 total farmer equity investment and AAFC program expenditures both fall below program targets, as outlined in Table 3.

Table 3: ecoABC Progress toward Immediate Outcomes

Performance Area	Indicators	Targets	Performance Results
Immediate Outcome			
Leveraged Capital	Farmer equity invested	\$100 million (assuming 16% farmer investment and 1 to 1.2 billion litres in new biofuel capacity)	\$42.27 million in farmer equity is represented in the 6 contracted projects.
	Bridge	Up to \$145.4 million in	6 projects with signed CAs

¹² It should be noted that under the ecoABC Terms and Conditions, “farmer investors” can be individuals or farm corporations.

	financing leveraged	ecoABC contributions over 6 years	and 2 project approved, representing \$46.82 million in total requested contribution funds 2 projects likely to be approved, would represent an additional \$32.5 million in requested contribution funds
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It does not appear that risks associated with innovation projects of this nature and complexity (e.g., reliance on other programs in the federal Renewable Fuels Strategy, effects of an economic downturn) were considered in establishing the program’s targets. That being said, program managers did attempt to mitigate the impact of these risks through reprofiling of funding over future fiscal years, working to obtain an extension to allow for achievement of program objectives, and cash management across fiscal years for delayed projects.

In conclusion, total farmer equity invested and AAFC program expenditures both fall below set targets. It is unlikely the program will meet these targets by March 2013, even when including an additional four projects that are currently being assessed for program funding.

Intermediate Outcomes

The intermediate outcome for ecoABC is the construction of new and expansion of existing biofuel facilities in Canada (see Table 4 below).

To date five of the six contracted projects have completed their new facilities while the sixth project is set for completion by March 2011. Two more projects have been approved, and it is expected that contribution agreements will be signed in the near future.

Table 4: ecoABC Progress toward Intermediate Outcomes

Performance Area	Indicators	Targets	Performance Results
Intermediate Outcome			
Biofuel facilities are expanded and built in Canada	Signed contribution agreements and funding for a number of new facilities built or expanded in	8 to 12 new facilities built or expanded in Canada (assuming different sizes of projects from small to large)	Five of the six contracted projects have completed their new facilities. The sixth project will complete its expansion by March 2011. Two projects have been

	Canada		approved, but do not have CAs signed.
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It should be noted that there is no intermediate outcome to track the progress in providing opportunities for farmers. The intermediate outcome is focused on the construction or expansion of biofuels facilities in Canada, on the assumption that the construction or expansion of biofuels facilities will lead to diversified off-farm revenues for producers in the future.

While the current number of facilities built or expanded falls below the target, with the program extension and the anticipated number of additional projects that will be approved and completed before March 2013, the program is expected to meet its target for the number of facilities built or expanded in Canada.

End Outcomes

The expected end outcomes for ecoABC are:

- progress towards targets for renewable content in Canadian transportation fuel;
- broadened economic base of communities where funded facilities are located; and
- increased and diversified off-farm revenues (see Table 5 below).

Table 5: ecoABC Progress toward End Outcomes

Performance Area	Indicators	Targets	Performance Results
End Outcomes			
Progress towards targets for renewable content in Canadian transportation fuel	Change in annual production of ethanol and biodiesel (in litres) by funded facilities	Overall annual production increase of 1 – 1.2 billion litres of renewable fuel by funded facilities (assuming 3-5 large projects and 5-9 small projects)	<p>It is estimated that the 6 contracted projects when completed, will represent an annual increase in biofuel production of 599 million litres.</p> <p>The two projects that are approved, but have not yet received funding (no signed contribution agreements) could represent an additional 50 million litres.</p> <p>Two projects that the program deems are likely to be approved represent a further 280 million litres</p> <p>This would represent an</p>

Performance Area	Indicators	Targets	Performance Results
End Outcomes			
			estimated total of 929 million litres.
Broadened economic base of communities where funded facilities are located	Number of new jobs in funded facilities	180 – 240 new jobs (assuming 6 to 10 employees on average per small facility and 25 to 40 for a large facility)	The 5 of 6 projects completed employ approx 146 people. The 6th project is expected to add 40 new jobs to this total.
	Increased spending by facilities in communities where facilities are located	Target can only be determined after the results of 2009-10 are available.	Performance data is incomplete. The program expects confirmation of approximately \$150 million annually for 5 of the 6 projects in operation.
Increased and diversified off-farm revenues	Change in primary producers' revenue from investment	\$5 million annually (based on return on investment)	Performance reporting to date indicates no change in producers' revenue from their investment in the facilities. It is likely too early in the life of these projects to expect any change.

The six contracted projects together with the two projects that have yet to sign contribution agreements would increase capacity by 649 million litres. Two projects that the program states are likely to be approved represent a further 280 million litres. Thus, if all future projects that are expected to be approved are actually approved, this would represent an increase of 929 million litres of addition biofuel capacity, which is slightly below the program's target of 1-1.2 billion litres of renewable fuel. As discussed above, factors external to the program, primarily the economic recession in the U.S., may have had a significant impact on the program's ability to meet its targets.

It is too early in the lifecycle of ecoABC projects to evaluate the economic impact of the program on communities where funded facilities are located. It is generally recognized that end outcomes for capital investment/innovation programs take time to achieve results for several reasons, including normal market growth rates, impact of economic cycles and availability of financing. Other international programs similar to ecoABC were found to have 5-10 year timeframes for achieving outcomes. The ecoABC initiative is in the middle stage of program implementation. Based on performance data to date, the program is on track to meeting its job creation targets. However, increased spending by facilities in communities can only be determined once all of the biofuel facilities have been operating for at least a year.

In terms of the impact on producer revenues, it is too early in the life cycle of these projects to expect any change in producers' revenue from investment in biofuels

facilities. According to the literature review and economic analysis, because of the current difficulties in the biofuel industry, as discussed above, it is unlikely that there will be any significant change in producers' revenue from their investment in the foreseeable future. Further, it will be difficult to attribute any change in revenue to investment made by producers as a result of the ecoABC program.

In conclusion, while progress is being made towards end outcomes and the program may fall just short of its target for increasing renewable content in Canada transportation fuel prior to the program ending, it is not possible to assess the impact of the program on communities and agricultural producers at this time.

3.2.2 Program Efficiency and Economy

Efficiency

Based on the program financial information, ecoABC delivery costs are 12% of total program costs, taking into account actual and estimated expenditures to March 31, 2011. These costs include the cost of screening Letters of Interest for some 87 proposals, reviewing and evaluating eight full proposals and several partial proposals. It also includes the staff time to manage projects and to manage the program as a whole.

This ratio of delivery costs to total program costs is similar to other AAFC grant and contribution programs. For example, Agri-Opportunities incurred program delivery costs of 8.3%, the national component of AAFC's Advancing Canadian Agriculture and Agri-Food (ACAAF) program (now the Canadian Agricultural Adaptation Program), which is delivered by AAFC's National Headquarters, incurred program delivery costs of 12%. The costs for the delivery of the regional components of the ACAA program, which were delivered by Industry Councils in each province, were 13%.

Given that the ecoABC initiative is a repayable contribution program, there will be administrative costs associated with recovering ecoABC repayments for up to 10 years after the termination of the program (to 2023). Program funding to cover these administrative costs ceases when the program expires in March 2013. As a result, without an identified source of funds, AAFC will have to cover these costs through its existing A-base. AAFC senior management has suggested that the repayable contributions could serve as a potential source of funds to offset these ongoing administrative costs. However, negotiations with Central Agencies would be required in this regard.

In general, from the wider government perspective, the potential of conditionally repayable programs such as ecoABC to offset their administration costs (in addition to recovery of a significant portion of Vote 10 funding) through contribution repayments deserves recognition as an economical way to provide government incentives.

In conclusion, given the nature and complexity of assessing biofuel construction and expansion project proposals, and the materiality of these proposals, ecoABC’s delivery costs appear to be in line with other similar innovation programs at AAFC.

Effectiveness and Economy

It is not possible to assess cost-effectiveness in terms of comparing ecoABC’s achieved outcomes in relation to the cost of program inputs and outputs, as the ecoABC program is in the middle stage of implementation and end outcomes have yet to be realized.

In terms of program effectiveness, the median processing time was 109 calendar days from the date the Full Proposals were received from project proponents, to the date the Contribution Agreements (CA) were signed for successful project proponents. Please refer to Table 6 (below) for a breakdown of the time in AAFC hands versus the time in client hands for each successful ecoABC project.

Table 6: Application Processing Time in AAFC Hands Versus Client Hands

EcoABC Project	Days in AAFC Hands	Days in Client Hands	Total # of Days
Integrated Grain Processors Inc.	45	40	85
Northwest Terminal Ltd.	18	36	54
Western Biodiesel Inc.	15	26	41
Suncor Energy Products Inc.	43	90	133
City Farm Biofuel Ltd.	140	330	470
GreenField Johnstown Limited Partnership	57	300	357

The lengthy processing timelines for two of the ecoABC applications may be attributed in part to the complexity of these particular projects.

The majority of letters of interest (72%) were processed within the program’s service standard of 30 days. In terms of processing payment claims, it took an average of 159 calendar days to process 1st payments and 17 days to process 2nd payments; however, the service standard of 30 days for processing payment claims was not set until April 2010. The program database does not support a more robust assessment of program effectiveness due to the fact that a data dictionary¹³ was not finalized to ensure clear and consistent interpretation of data to track and monitor work being completed on ecoABC project files.

¹³ A data dictionary is a reference document containing the definitions of key terms and variables (e.g., project start and end dates, performance indicators, data sources) used by programs to manage data holdings effectively, to ensure that the meaning of each variable in the dataset is consistently understood by those who collect, manage and use it.

In conclusion, while the majority of letters of interest were processed within the program's service standard, the majority of first payments were not made within the newly established service standard of 30 days. A robust data dictionary would help the Branch to track and target where improvements need to be made to streamline processing times. The Biofuels Opportunities Division has been taking steps to complete a data dictionary for program officials and to update its program database to support a future assessment of program effectiveness and adherence to program service standards for application processing and claims payments.

4.0 Conclusions and Recommendations

4.1 Conclusions

Although the program provided opportunities for farmers to participate in the biofuels sector, there does not appear to be a continued need at this time to encourage farmer investment in biofuel manufacturing through a capital incentive program. However, the identification of future specific gaps in terms of certain sources of biofuels and biomass, and/or any future increases to the renewable content requirements for gasoline, diesel and heating oil could well require reconsideration of capital incentives.

ecoABC is now more closely aligned with AAFC's strategic outcome of "A competitive agriculture, agri-food and agri-based products sector" as opposed to "An innovative agriculture, agri-food and agri-based products sector". While ecoABC is aligned with current federal priorities related to increasing the domestic production of renewable fuels from agricultural inputs, as a result of the shift in government focus towards research in second generation biofuels, and the fact that ecoABC is focused on supporting a competitive biofuels industry in Canada, the ecoABC initiative is more closely aligned with AAFC's strategic outcome related to competitiveness.

The timing and eligibility criteria of several initiatives under the federal Renewable Fuels Strategy were not aligned to allow biofuel manufacturers to take full advantage of the programs under the Strategy. As a result, this could have affected program uptake and achievement of ecoABC outcomes.

There has been no overlap and duplication between the ecoABC initiative and other federal and provincial/territorial programs that encourage farmer investment in the biofuels sector by providing capital funding arrangements to renewable fuels facilities that use agricultural products as inputs. That being said, improving the articulation of program outcomes in relation to program objectives would clarify the program rationale and facilitate the assessment of program impacts over the short to long-term.

Based on the performance information available, the ecoABC initiative is making progress towards its immediate, intermediate and end outcomes. The ecoABC initiative is likely to meet its target output of eight to twelve signed Contribution Agreements (CAs) for biofuel facilities built or expanded in Canada, however the program is unlikely to meet its targets related to total farmer equity invested, and bridge financing leveraged. Furthermore, the program may fall just short of its target for the change in annual production of ethanol and biodiesel by funded facilities. It is too early in the lifecycle of ecoABC projects to evaluate the economic impact of the program on agricultural producers and the communities where funded facilities are located, at this time.

Given the nature and complexity of assessing biofuel construction and expansion project proposals, and the materiality of these proposals, ecoABC's delivery costs appear to be in line with other similar innovation programs at AAFC. However, there will be administrative costs associated with recovering ecoABC repayments for up to 10 years after the termination of the program (to 2023) that AAFC will have to absorb from its A-base, given that program funding sunsets in March 2013.

While the majority of letters of interest were processed within the program's service standard, the majority of first payments were not made within the newly established service standard of 30 days. A robust data dictionary would help the Branch to track and target where improvements need to be made to streamline processing times. The Biofuels Opportunities Division has been taking steps to finalize the data dictionary and to update its program database to support a future assessment of program effectiveness and adherence to recently implemented (April 2010) program service standards for application processing and claims payments which were not in effect during the administration of the currently approved and contracted projects.

Lessons Learned

There are a number of lessons learned through the design and delivery of the ecoABC initiative that would serve to inform the future renewal of the initiative, or similar programming under a renewed federal Renewable Fuels Strategy:

- Given the interconnected and complementary nature of federal programs launched within a horizontal initiative, such as the federal Renewable Fuels Strategy, there is a need to ensure effective collaboration between departments, as well as clear governance and accountability for the overall performance of the horizontal initiative. At the individual program level, there is a need to ensure that risk mitigation strategies take into consideration the risks associated with the achievement of horizontal objectives, and other complementary programs launched within the initiative.
- Improving the articulation of program objectives in relation to outcomes would clarify the program rationale and facilitate the assessment of progress against immediate, intermediate and end outcomes. It should be noted that issues related to the need for strengthened performance measurement and reporting on innovation programs, including the ecoABC initiative, will be addressed on a broader scale through the Meta-Evaluation of AAFC's Innovation Programming.

4.2 Recommendations

- The Farm Financial Programs Branch should finalize the program's data dictionary to ensure clear and consistent interpretation, over time, of data used to track and monitor work being completed on ecoABC project files. This will support a future assessment of program effectiveness and adherence to recently implemented (April 2010) program service standards for application processing and claims payments.

Management Response and Action Plan

FFPB is in the process of finalizing the ecoABC data dictionary and refining the program database; service standards have been established and are being tracked. (*Responsibility*: Rita Moritz, *Date*: March 31, 2011)