Executive Summary

Federal government support for the Canadian next generation biofuels industry is critical to economic vitality, environmental sustainability, and technological innovation in Canada. Support in the early stages of commercialization is crucial to help attract private investment to finance the first plants and to support the operating economics of the pioneering plants during the first years. **Enerkem recommends creating a federal near-term operating or refundable tax incentive on a per-litre basis for the next generation biofuels sector. The ecoEnergy for Biofuels Program was instrumental in supporting ethanol and biodiesel production by providing operating support until 2017. The funds for this program have all been allocated and there are presently no operating incentives available for the next generation of biofuels.** It is realistic to say that the production of next generation biofuels in Canada over the next five years could reach 250-300 million litres. A producer incentive of $0.15 per litre could represent a cost of approximately $150-200M. The outcome of this new incentive would be continued economic growth via new job creation, significant capital investment, associated economic activity, greenhouse gas reductions and clean technology export opportunities.

Context

Over more than the last ten years, a number of government initiatives have been employed to build the Canadian biofuels capacity, including the *Ethanol Expansion Program*, the *ecoABC Program*, the *ecoEnergy for Biofuels Program* and the *Renewable Fuel Standard*. These initiatives have stimulated investment in the industry resulting in:

- $2.3 billion in capital investment towards the construction of new facilities generating almost 2 billion litres of capacity
- Over 1,000 manufacturing jobs created to support ongoing plant operations.
- Over 14,000 new direct and indirect created in construction of new facilities
- $3 billion in economic activity during construction and $1.5 billion increase in tax base (municipal, provincial and federal) during construction phase
- A net economic benefit to the Canadian economy of $2 billion per year

The first generation of biofuels plants plays an important role in our economy and future growth in this sector will come from innovation and next generation technologies. Next generation biofuels technologies make it possible to produce ethanol from biomass (forest and agriculture residues, urban waste) instead of sugar-rich crops like corn. Building on the success of the first generation of biofuels, next generation transportation fuels (often referred to as cellulosic biofuels) can offer Canada new economic opportunities and contribute to:

- Positioning Canada at the forefront of clean technologies
- Stimulating regional economic development
- Reducing GHG emissions
- Reducing oil imports and diversifying our energy mix
- Transitioning to a green economy
- Providing opportunities to export technologies

Challenge

While the first wave of biofuels plants was constructed in Canada, technology developers of next generation biofuels were working on the development of new technologies that would make it possible—technically and commercially—to produce biofuels from biomass. Over the last ten years, these new technologies were developed, tested and validated. R&D support in Canada has been very effective. The *TechFund* from Sustainable Technology Development Canada for example has been instrumental in supporting a number of developing biofuels technologies through their pre-commercial demonstrations stage. A number of these innovators have proven their technologies and are now poised to commercialize their first full-scale commercial plants. During this commercialization phase, it is critical to have predictable, competitive and enduring government policy in order to attract private investment and ensure success in the first years of operations. The commercialization of next generation biofuels faces three main challenges that require targeted government initiatives:

1. **Technology risk**: Challenge to finance plants → Government action: Capital support
2. **Market risk**: Need to create demand and stimulate market access for biofuels → Government action: Renewable fuels standard (RFS)
3. **Competitive risk**: Challenge to compete effectively in the first years → Government action: Operating support

In summary, both operating and capital programs are required to help attract private investment to finance the construction of these pioneering plants in Canada while the RFS mandate is essential in creating the demand and market access for renewable fuels.

Current Situation

The *NextGen for Biofuels Fund* from Sustainable Development Technology Canada provides capital assistance for a first-of-a-kind next generation biofuels plant. This program is essential to finance the first commercial advanced biofuels plants in Canada. On the operating incentive side, no support is available to the next generation biofuels producers as the funds for the *ecoEnergy for Biofuels* program have all been allocated to the first wave of biofuels plants. First generation ethanol producers benefit from this program while next generation ethanol producers cannot. Unfortunately, this creates a competitive disadvantage for next generation biofuels.

Enerkem is therefore asking the federal government to provide a near-term operating support to the next generation biofuels sector via the creation of an operating incentive program or a refundable tax incentive for the development and deployment of next generation biofuels commercial facilities. This would ensure the success of the commercialization phase for these new technologies and consequently stimulate the economy. It is essential to build on the success of the first generation ethanol and to provide comparable support to the next generation of biofuels.

Recommendation: A near-term operating or tax incentive for Next Generation Biofuels

Enerkem believes that an operating incentive or a refundable tax incentive of $0.15 per litre of advanced ethanol produced would be responsive to the market conditions to make Canadian next generation biofuels competitive. It would provide the missing support needed by the next generation biofuels sector in this crucial commercialization phase. This phase is key to generate the economic and environmental benefits expected for our country. Most importantly, this incentive would allow next generation biofuels to compete on the same level playing field with the first wave of biofuels (first generation) which are benefiting from an operating incentive until 2017. The amount of $0.15 per litre is appropriate because:

- First generation ethanol is currently receiving an operating incentive declining from $0.10 per litre to $0.03 per litre until 2017. In jurisdictions where a next-generation biofuels incentive exists, it is higher than the one offered to first-generation biofuels due to the higher costs of capital and the technology risks associated with the first years of commercialization of new technologies. The incentive for next generation biofuels therefore needs to be higher than $0.10 per litre.
- A federal incentive of $0.15 per litre as a basis would match the support level for next generation already being offered by provinces like Alberta at $0.14 per litre and Quebec at up to $0.15 per litre.
- For projects in provinces where there is a provincial incentive, the combination of a $0.15 per litre federal incentive and the provincial incentive for next-generation biofuels would provide a support that is comparable to the US federal incentive for cellulosic ethanol which is at $1.01 per gallon i.e. approximately $0.27 per litre.

A preliminary analysis of the potential cost of this government initiative is estimated at approximately $150-200M. The net cost of this initiative is reduced by the fact that the incentive could serve to increasing the chances of success of the next generation biofuels producers eligible to the *NextGen Biofuels Fund* hence accelerating the repayment of SDTC capital funding in these pioneering projects. Also, by potentially considering a refundable tax measure rather than a program, it may offer more flexibility to the government. Finally, another way to finance this initiative is to consider reducing the support to the country's oil industry and transfer the money into this emerging green sector.

Enerkem – A Next Generation Biofuels Technology Developer and Producer

Enerkem is a Canadian waste-to-biofuels technology company. It invented a unique clean technology to efficiently and sustainably create biofuels. The company is leading the next wave in renewable transportation fuels and is changing the landscape of the world's landfills while creating clean energy.

The company currently operates two facilities in Quebec (a pilot plant and a demonstration plant). In 2010, Enerkem began construction of a municipal waste-to-biofuels plant in Alberta. In 2011, Enerkem expects to break ground on a similar facility in Mississippi for which it is receiving financial support from the U.S. Department of Agriculture and U.S. Department of Energy.

Enerkem is an active member of the Canadian Renewable Fuels Association and of the cleantech cluster Écotech Québec. It has also recently joined the Energy Policy Institute of Canada.

Annex - Types of government initiatives for the biofuels industry

The table below provides an overview of the government initiatives in North America that stimulate both the demand and the supply for clean transportation fuels.

Types of Initiative	Support it provides	Examples	Comments & Recommendations
Renewable Fuel Standard (RFS) Mandate	Creates the demand for cleaner fuels and gives them a market access.	• 5% ethanol RFS (Canada) • Volume-based RFS (US) • NextGen / Cellulosic Biofuels RFS mandate (US)	With current ethanol production capacity, Canada is almost achieving its 5% mandate. This means that there new market opportunities for the next generation ethanol sector are limited. The federal RFS should therefore be increased to 10% in order to ensure that there is a market for next generation ethanol or be modified in order to create a carve-out for next generation ethanol.
Capital Program	Helps finance the first projects by attracting private capital investment (risk sharing)	• Grants (SDTC NextGen Fund) • Cost-share grant (US DOE) • Loans • Loan guarantees (USDA)	The SDTC NextGen Fund is only available for one project. This will limit the growth of the next generation biofuels sector in Canada. A new program should therefore be created in order to stimulate the construction of new plants.
Operating / Tax Incentive	Helps finance the first projects by attracting private capital investment (risk sharing)	• Operating incentive with program envelope (EcoEnergy) • Operating incentive with a cap (Alberta model, proposed model for next US Cellulosic Ethanol Producer Credit) • Refundable Tax Credit • Refundable & Variable Tax Credit based on ethanol price (Quebec model) Non-refundable tax credit (current US Cellulosic PTC)	There is currently no operating or tax incentive available for the next generation biofuels sector. This limits the ability to commercialize the technologies and puts this sector in a competitive disadvantage with first generation (corn) ethanol and with US cellulosic biofuels. It is urgent to find a solution. An operating incentive or a refundable tax credit would be the way to achieve our objective.
Infrastructure development	Creates the demand for cleaner fuels and gives them a market access.	• Incentive for blenders pumps (E30, E85) • Increase blend levels (15% in U.S.) • Incentives for Flex-Fuel Vehicles (FFV) • FFV mandates	These initiatives will be critical to the future of the Canadian transportation fuels mix.
Government Procurement	Increases the demand for the clean fuels and gives market access.	• FFV fleet purchase policy • Biofuels purchase policy	These initiatives should be considered by the federal government.
Carbon-based initiatives	Helps create the demand for the low carbon fuels	Cap-and-trade	A carbon-based economy would provide a market incentive for cleaner fuels like next generation biofuels.