

Summary of Economic Impacts of Establishing a Canola-Based Biodiesel Industry for Canada

Report Prepared by:
BBI Biofuels Canada
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Implementation Scenarios - Combined Crush/Biodiesel Plants

- Using a 80 km radius feedstock draw zone, there would be a need for 22 plants, of varying sizes, across the Prairie Provinces to fill a 5% biodiesel RFS
- Using a 150 km radius feedstock draw zone there would be a need for 9 plants, of various larger sizes, across the Prairie Provinces to fill a 5% biodiesel RFS
- To fill a 2% biodiesel RFS, three larger scale plants would be required on the Prairies

Feedstock Supply and Pricing

- Assuming a 2% biodiesel RFS, approximately 500 million litres of biodiesel would be required, while a 5% biodiesel RFS would result in production of 1.3 billion litres of biodiesel.

From Bushels to Litres....

Figures are rounded and do not account for small processing losses

$$1 \text{ bushel} = 50 \text{ lbs/bu} \times .42 \text{ oil} = \frac{21 \text{ lbs of canola oil}}{2.4 \text{ lbs/litre of biodiesel}} = 8.75 \text{ litres biodiesel}$$

$$44 \text{ bushels/tonne} \times 8.75 \text{ litres} = 385 \text{ litres produced per tonne of canola seed}$$

$$1 \text{ acre} \times 30 \text{ bu/acre} \times 8.75 \text{ litres} = 262.5 \text{ litres of canola oil}$$

If canola fills 70% of the 2% biodiesel RFS (approx 500 million litres) we would require:

$$\frac{500,000,000 \text{ litres}}{385 \text{ litres/tonne}} = 1.299 \text{ million tonnes of canola seed} \times .70 = 909,000 \text{ tonnes of canola}$$

If canola fills 70% of the 5% biodiesel RFS (approx 1.3 billion litres) we would require:

$$\frac{1,300,000,000 \text{ litres}}{385 \text{ litres/tonne}} = 3.377 \text{ million tonnes of canola seed} \times .70 = 2.363 \text{ million tonnes}$$

- Canola price used for projections is \$372 per tonne (\$8.37/bu) including a \$15/tonne basis adjustment beyond the 5 year average.

Product and By-Product Markets

- Price of diesel fuel has average 80 cents per litre over the past three years and has been increasing at an average annual rate of 5% since 2001. The 3 year average wholesale price for diesel fuel is 48 cents per litre. With the elimination of provincial taxes, the projected biodiesel selling price would be 66 cents per litre.
- For every tonne of canola oil, the biodiesel manufacturing processes creates .1 tonne of glycerine. Glycerine prices have fallen and will likely continue to fall. The impact study

uses a crude glycerol price of C\$495 per tonne compared to a mid-2005 price of approx \$600. At lower pricing points new market segments become more attractive.

- Significant quantities of canola meal will be produced. This, in conjunction with new renewable fuel-driven supply of soy and DDG's, will result in lower prices. The study assumes canola meal prices fall from their 10-year average of \$198/tonne to \$181/tonne.

Individual Plant Economics

- The impact study assumes that crush and biodiesel will be combined. Crush costs are based upon the use of solvent extraction but do not include the costs of refining.
- Larger plants have more ability to weather downturns in biodiesel prices, increases in canola prices, reduction in meal and glycerine prices. Greater resiliency is obtained with plants in excess of 150 MMLY.
- The study's financial analysis demonstrates that a canola-based biodiesel industry can be viable if canola prices remain at or near \$368/tonne and if the biodiesel selling price is at least 72 cents/litre.
- Capital cost is important but not the overriding factor in viability. Capital grants will not be sufficient alone if biodiesel prices remain at 66 cents per litre.
- Using the US incentive program of \$1.00 per gallon for virgin oils implies financial returns approaching 80% to 100% for larger scale plants, although the higher cost of construction and operations in the Canada versus the US will reduce this return, as will higher feedstock prices and/or reduced finished product prices.

Incentives

- With extremely attractive incentive-driven returns in the US, the economic comparative of producing biodiesel in Canada is unattractive. Trade law prohibits the closure of borders to US produced biodiesel.
- In order to create a "made in Canada" biodiesel industry it is necessary to achieve parity with the US returns. Although neither state incentives nor labour costs differentials which do not favour Canada are factored in the study, it is estimated that the equivalent of \$.29/cents per litre (\$.04 Federal Excise Tax Exemption and \$.25 additional exemptions/credits) would be required to establish and/or maintain a Canadian biodiesel industry.

Economic Impact of a 5% RFS 9 Plants, ranging in scale from 78 MMLY to 227 MMLY

Capital Investment Required	\$620 million
Annual Plant Revenues	\$1.36 billion
Annual Plant Expenditures	\$1.12 billion
Value of Canola Seed Required	\$1.1 billion annually
Incremental Farm Income due to Higher Prices	\$229 million
Federal Tax Revenue Generated	\$18.6 million
Provincial Tax Revenue Generated	\$5.8 million
Spin-off Services (transportation, product marketing, etc.)	\$17 million
Direct Employment	170 people
Indirect Jobs	12,000 people

Source: BBI Fuels Canada, July 2006