

## **A Review of Environmental Assessments of Biodiesel Displacing Fossil Diesel: *Summary***

In 2002, over 14.5 million tonnes of diesel was used in Canada for road, rail and marine transport. A renewable fuels mandate seeking 5% of that fuel to be sourced from renewable resources could be met through the use of 2 million tonnes of canola production. We evaluated the environmental impacts of displacing fossil diesel with biodiesel using nine criteria. The findings are summarised below:

- *Greenhouse gas reduction:* Combustion of biodiesel generates between 85% and 110% less greenhouse gases than the use of fossil diesel. Compared to a gasoline engine delivering the same service, the total greenhouse gas savings are 25% higher still.
- *Air quality:* Biodiesel blends generate less reactive organic gases, and less particulate emissions. NO<sub>x</sub> emissions are marginally higher with vegetable-based biodiesel in older engines. Models of air quality effects of converting all diesel vehicles to B20 in the Los Angeles air shed shows no significant change in air quality.
- *Energy security:* Biodiesel from canola produces 2.5 times more energy than is input to its production.
- *Energy efficiency:* Biodiesel has high lubricity and cetane number; blended with low sulphur diesel it can be used in vehicles whose performance is indistinguishable from gasoline engines while delivering 25% higher fuel efficiency.
- *Toxic emissions:* Biodiesel is free from toxic and carcinogenic emissions found in fossil diesel. Biodiesel blends reduce toxic emissions.
- *Agrochemicals:* Over the past decade, herbicide resistant canola has captured 95% of the planted area. This has reduced herbicide applications by 30%.
- *Water use:* Canola is grown using available moisture and does not compete for irrigation water.
- *Oil spills:* Each year there are more than 31,500 tonnes of oil and oil products spilt in Canada. Biodiesel degrades in the environment four to five times more quickly than fossil diesel. Biodiesel blends will significantly reduce the harm to the environment caused by spills.
- *Food security:* The yield in canola production has increased by 50% over the past decade. Supplying canola oil for biodiesel production will not compete with canola used in the food industry in Canada unless extreme weather conditions prevail over the majority of Western Canada.

In summary, biodiesel has an environmentally beneficial impact in all but one area examined (NO<sub>x</sub> emissions). The marginally higher NO<sub>x</sub> emissions are too small to impact air quality and health effects adversely.