An Initiative of the Canola Council of Canada www.canola-council.org

from Farm to Fuel

Clean-burning biodiesel is used across the European Union.

Why Biodiesel?

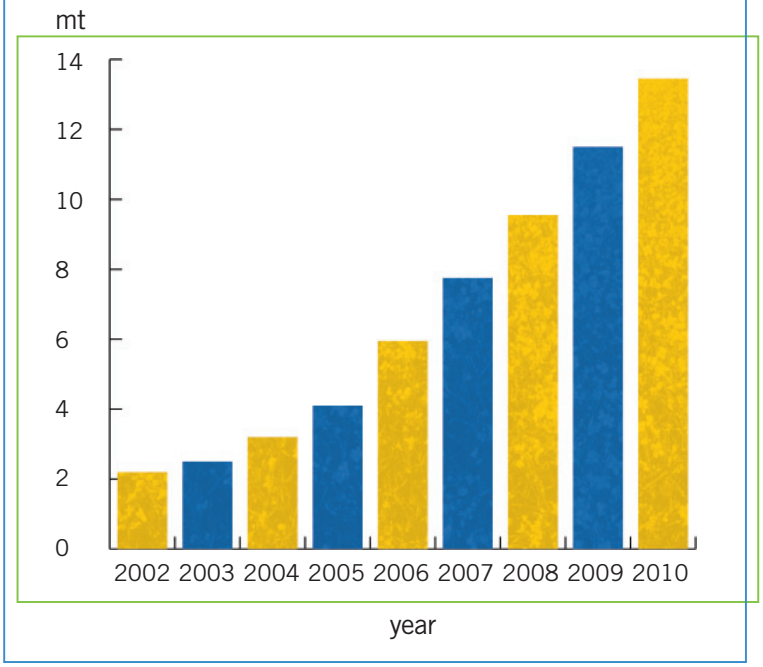
In response to rising petroleum costs and concerns about climate change, nations around the world are looking at clean fuel alternatives, including biodiesel. The European Union (EU) has been particularly active in supporting the development of a domestic biodiesel industry. The European Commission (EC) regards biofuels including biodiesel as a means of reducing greenhouse gas emissions, boosting the decarbonization of transportation fuels, diversifying fuel supply sources, developing long-term replacements for fossil oil and diversifying income and employment in rural areas[1].

The preferred feedstock for biodiesel production in the EU is rapeseed, which has similar oil yield per unit seed, fuel quality characteristics and oil extraction techniques as Canadian-grown canola. In fact, the strong demand for biodiesel in the EU is providing a new market for Canadian canola oil. In 2006, the EU is forecast to import between 100,000 to 120,000 tonnes of Canadian canola oil for use in its biodiesel production facilities[2].

Growing Production to Meet Growing Demand

Europe is currently the world's largest producer of biodiesel. In response to growing demand, production capacity is also increasing and is expected to exceed 13,450 mt by 2010. In the past several years, over €400 million (approximately C$561 million) has been invested in expanding biodiesel production capacity in Germany alone.

Existing and anticipated demand for biodiesel capacity in Europe[3]



The rise in biodiesel production has lead to increased sales of biodiesel. In 2005, more than 1.8 million tons of biodiesel were sold in Germany, offering a significant source of additional income to more than 500 medium sized, non-affiliated fuel retailing enterprises[4].

Please note: The units of measurement in this document are presented as quoted by the source.

[1] *Commission of the European Communities "An EU Strategy for Biofuels", 2006*
[2] *Oil World "Oil World Weekly" January 20, 2006*
[3] *Preusser "Promotion of BioFuels & BioProducts in Europe" 2005*
[4] *Union for the Promotion of Oil and Protein Plants (UFOP) "Current situation and prospects for biodiesel and vegetable oils as fuels: From niche products to market players" 2006*

Public Policy Supports An Industry

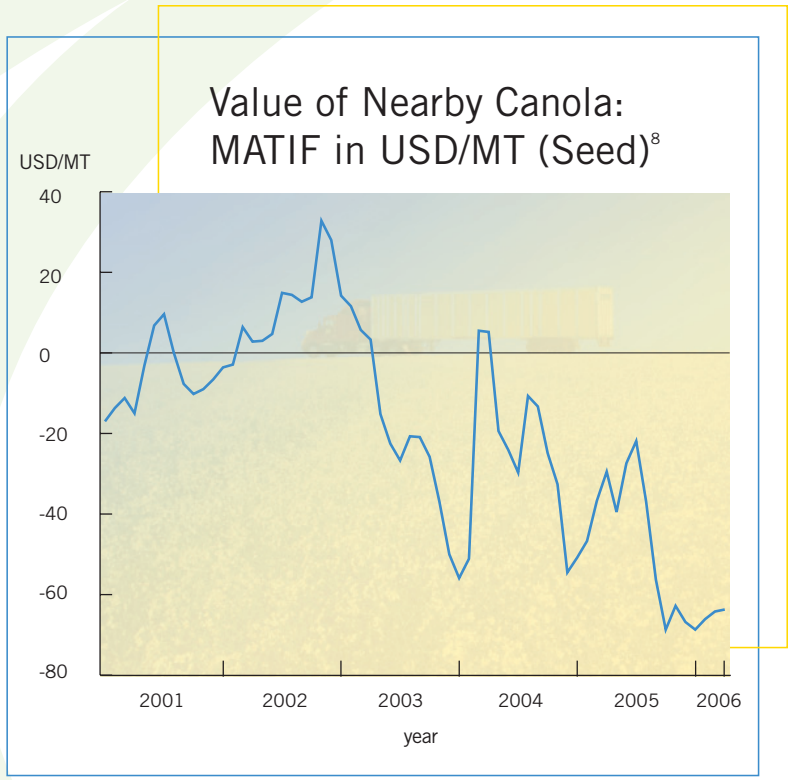
The increases in demand for environmentally friendly fuels in the EU have been triggered by a variety of programs at the state and EU Commission level. Introduced in 2003, the EU Biofuels Directive set targets for the biofuel share of all transport fuels at 2% by 2005 and 5.75% by 2010. Other policies used to varying degrees within and among nations include fuel tax incentives (to encourage use), carbon-based fuel taxes (where lower emissions result in lower tax levies), vehicle subsidies (with tax rates based on the level of CO_2 emissions), CO_2 trading (between emitters), fuel standards (to alter the fuel mix), incentives for investment in production facilities, vehicle requirements, trade policies favouring the removal of international trade tariffs and projects under the Kyoto Protocol including Clean Development Mechanism (between developed and developing nations) and Joint Implementation (between industrialized countries)[5].

Impacts of Biodiesel

Legislators in the EU believe biodiesel offers benefits that justify the public policy investments that continue to support the industry[6], including: stabilizing farm incomes, increasing confidence with mandated quality standards, reducing the environmental impact, and rural diversification.

Stabilizing Farm Incomes

Crop prices typically rise when a new demand stream is established. In the 1990s, the price for industrial rapeseed was lower than rapeseed grown for food uses. The prices have since equalized as the demand for feedstock for biodiesel has increased. In Germany, for example, the demand for rapeseed for biodiesel in 2005 required the production from 1 million hectares, with gross receipts of €0.76 billion (approximately C$1 billion)[7]. Biodiesel demand also has benefits along the value chain. Since 2004, demand attributed to biodiesel production has increased the value of EU rapeseed compared to Canadian canola by almost US$70 (C$78) per metric ton[8]. According to oilseed traders[9], the EU market for rapeseed will continue to be driven by biodiesel demand. In contrast, Canadian canola will remain undervalued until a similar demand from a domestic biodiesel industry emerges.



Increasing Confidence with Mandated Quality Standards

Biodiesel will be supported by manufacturers and adopted by users only if they are confident in the availability, performance and benefits of its use. Austria was the first Member State to develop a standard for biodiesel, which led to diesel engine tractors obtaining warranties for biodiesel use. Since then, the EU has established quality standards for biofuels covering emissions, engine wear and, most recently, fuel quality[10]. Rapid penetration in the passenger transport market has also been possible because of the ability of modern car engines to use biodiesel without modification and wide availability of biodiesel through existing fuel distribution systems.

[5] *OECD "Biofuels for Transport" 2004*
[6] *Commission of the European Communities "An EU Strategy for Biofuels: Impact Assessment" 2006*
[7] *Union for the Promotion of Oil and Protein Plants (UFOP) "Current situation and prospects for biodiesel and vegetable oils as fuels: From niche products to market players" 2006*
[8] *MATIF, 2006*
[9] *Canola Council of Canada, personal communication 2006*
[10] *Commission of the European Communities "Promoting Biofuels in Europe" 2004*

Reducing the Environmental Impact

The feedstock for biodiesel is renewable and contributes to alternative energy source commitments. Studies in Germany indicate that biodiesel made from rapeseed supplies three times the energy expended in its manufacture[11].

Rural Diversification

The EU believes unproductive farmland could produce up to 5% of Europe's transportation fuel needs[12]. An estimated 45,000 to 75,000 new jobs, mainly in rural areas, result from every 1% adoption of biofuels for transport. The high protein feedstock for livestock produced as a result of the oilseed crushing operation is reducing the need for soy meal imports[13], making livestock production more economical.

The Future

The EU is focused on increasing demand via public policy, increasing investments in technological advances including new engine types and ensuring policy provisions continue to support the production of feedstock supply. The goal of 5.75% renewable energy for transportation by 2010 would require between 4–13% of the total agricultural area in the EU25 being used for biofuel production[14].

Recognizing the need for research to sustain biodiesel production and encourage wider adoption, efforts are underway to investigate the direct use of vegetable oils in petroleum refining, as well as processes other than transesterification that would generate different co-products.

Lessons for Canada

The experiences with biodiesel in Europe provide valuable insights into the potential of a domestic biodiesel industry. For example, the success of the biofuel industry in France is attributed to its large agricultural land base, early participation of stakeholders in agriculture and industry and government strategies to support domestic production and consumption—factors that are very similar to the approach advocated by the Canadian canola industry.

[11] *Union for the Promotion of Oil and Protein Plants (UFOP) "Biodiesel Facts, Arguments, Tips", 2003*
[12] *Commission of the European Communities "An EU Strategy for Biofuels", 2006*
[13] *Union for the Promotion of Oil and Protein Plants (UFOP) "Current situation and prospects for biodiesel and vegetable oils as fuels: From niche products to market players" 2006*
[14] *USDA Foreign Agricultural Service "Oilseeds and Products: Biofuels situation in the European Union" 2005*

Case Study: Impact of Biodiesel Production in Germany

The Canadian canola industry believes a production goal of 1.5 billion litres of biodiesel from 2.5 million tons of canola in 2015 is achievable and will have benefits along the canola value chain. This optimism is supported by the experience with rapeseed-based biodiesel in Germany. In 2002, over 189 million litres of biodiesel was sold in Germany[15] and a macroeconomic evaluation demonstrated significant direct, indirect and value chain impacts[16], including:

- C$703 million in employment income
- 18,230 new jobs
- C$273 million in new state taxes
- C$747 million in infrastructure investments
- Co-production of 86,000 tons of pharmaceutical grade glycerin
- C$70 million reduction in farm subsidies formerly used to support exports
- Substitution of 1.0 million tons of imported soy meal with high protein rapeseed meal

The model did not quantify additional benefits, including:

- Increased employment and investment in transport and commercial services from marketing biodiesel
- Infrastructure investments in service stations
- Investments and jobs in motor and car performance testing and manufacturing
- Improvements to the soil, water and air from choosing more environmentally friendly fuel

[15] *Union for the Promotion of Oil and Protein Plants (UFOP) "Status Report: Biodiesel Production and Marketing in Germany 2005", 2005*
[16] *Institute for Economic Research "Macroeconomic evaluation of rape cultivation for biodiesel production in Germany" 2002*