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Biodiesel in Victoria

This Agriculture Note provides information on biodiesel, biodiesel production and biodiesel markets in Victoria. Refer to Agricultural note AG1314 for information on bioethanol in Victoria.

What is Biodiesel?

Biodiesel is a liquid biofuel made from the transesterification of vegetable oils and animal fats.

It is almost colourless and has similar properties to petroleum diesel. Liquid biofuel primarily refers to the production of ethanol (bioethanol) and biodiesel from grains and oilseeds, respectively. Ethanol and biodiesel are the dominant liquid biofuels, accounting for more than 90% of total usage.

Benefits of biodiesel include:

- Biodiesel is an ecological fuel produced from renewable materials
- Biodiesel is biodegradable
- Biodiesel has superior lubrication capabilities and can often be used in diesel engines with little or no engine modification necessary.

Production

Biodiesel production in Victoria utilises a variety of feedstocks, including canola oil, tallow, used cooking oil, and imported oils such as palm oil, depending on availability and seasonal conditions. Feedstocks can account for up to 75% of the cost of production for biofuels.

Animal Tallow is currently the most commonly used raw material for the production of biodiesel because of its price and energy content once converted into a fuel. Total Australian production of tallow is ~ 600,000 tonnes. The production volume of tallow is unlikely to increase in Australia because it is a by-product of meat production, and does not represent a significant percentage of revenue as a percentage of the total animal.

Australia on average produces between 2 to 3 million tonnes of oilseed crops each year. This has been as high as 3.7 million tonnes in 1999-00. Canola and cottonseed are the major oilseed crops (accounting for 57 and 36% of total oilseed production, respectively), with soybeans and

sunflower accounting for a smaller proportion (3 and 4%, respectively).

Annual availability of used cooking oil is ~ 50,000 tonnes.

The industry economics for biodiesel favour low cost feedstocks such as palm oil grown in the tropics, when compared with the cost of oilseeds grown in temperate regions. Palm plantation yields more vegetable oil and is cheaper to process than canola (although it produces an inferior biodiesel to canola feedstock).

The relative flexibility of biodiesel plants to alternate between feedstocks (the ability to use a variety of vegetable oils and animal fats), makes it difficult to calculate increases in demand for particular feedstocks as the industry continues to expand.

Biodiesel from tallow and waste vegetable oils is commercially viable in Victoria, but is constrained by domestic feedstock availability rather than cost of production. Production costs for biodiesel range from around 28 cents per litre (cpl) using waste oil to more than 100 cpl using commercially grown oil seed crops.

Biofuel production requires a considerable volume of water. If the drier conditions experienced in Victoria in the past few years become the norm, agriculture and biofuel producers will need to accommodate water scarcity and increased prices for water. The production of one litre of biodiesel requires ~ 0.4L of water.

Biodiesel production, even with 1st generation technologies, is competitive as a substitute fuel, and can provide new opportunities for rural and regional manufacturing clusters, which deliver some protection in terms of energy security for rural Australia.

Currently in Victoria there are several small-scale producers of biodiesel and two large-scale metropolitan based biodiesel production facilities. There are future plans for a large-scale regional production facility.

Marketing

Europe produces most of the world's biodiesel, although production is increasing rapidly in the USA and China.

Biodiesel is a major market for oilseeds, such as canola, in the EU.

Biofuels in Australia's transport fuel market is still in its early stages and consumer demand is low. A key barrier to uptake of biofuels in the market, cited by both oil companies and biofuel producers, is the high level of commercial risk associated with market entry.

The risk is associated with low levels of consumer confidence (and therefore a lack of consumer demand for the product).

To maintain consumer trust and investment returns, clear and actively enforced quality standards are required for the biofuels industry, especially in regard to biodiesel.

Biodiesel quality control is critical to manage cold flow properties, storage stability and acidity. Quality control is critical in the emerging biofuels markets, as poor quality products can damage consumer confidence for years to come.

The Commonwealth Government has regulated the transport fuels industry, since 1 January 2002, via the Fuel Quality Standards Act (2000) and the Fuel Quality Standards Regulations (2001), which provide a framework for enforcing national fuel quality standards. These regulations cover the supply of fuel to consumers, reduce toxic vehicle emissions and ensure that, by using clean fuels, modern vehicles fitted with advanced emissions control technologies operate at peak performance. The fuel standards are prescribed in the Fuel Standard (Petrol) Determination 2001, and the Fuel Standard (Diesel) Determination 2001.

Biofuel producers must manage the commercial risks associated with juggling fluctuating commodity prices for both their raw materials (grains, tallow, vegetable oils) and their biofuel outputs (which are dictated by the global crude oil prices). Current high global canola prices preclude its widespread use in the production of Australian biodiesel, as it would not be competitive with conventional diesel fuel at the pump.

Successful development of commercial biofuel refineries in Australia may produce regional benefits including additional employment, increased economic activity and sustainability of some agricultural activities.

Biodiesel delivers more substantive greenhouse gas reductions than fuel/ethanol blends. Air quality remains an issue for all developed nations in regard to their transport sector, and is perhaps the strongest environmental argument in favour of biofuels.

Independent service stations are the main retailers of biodiesel. Australian Farmers Fuel (SAFF) began retailing pure biodiesel (B100) in South Australia in 2001 and now also sells B20 (marketed as "Premium Diesel") at some 52 service stations across 4 states. SAFF currently sells B100 at 14 service stations in Victoria.

The term B100 refers to 100%, unblended biodiesel fuel (the number refers to the percentage of biodiesel blended with petroleum diesel).

Several councils across Australia are using biodiesel blends (including Townsville, Adelaide, Sydney and Newcastle City Councils). In Adelaide, all metropolitan trains and most metropolitan buses operate on a B5 blend.

The South Australian Government has stated that it will soon move to B20 or possibly higher blends.

There are five key factors critical to the success for a company in the transport fuel industry biofuel sector, namely:

1. Feedstock availability and reliability of supply and quality.
2. Enhanced customer acceptance and demand for biofuel products through effective marketing and education.
3. Infrastructure and logistical readiness to produce, distribute and market biofuel products.
4. Enhanced analysis of trends in production, sales and stocks of biofuel for continuous improvement.
5. Minimising the cost of biofuel production, as government subsidies are projected to reduce over time.

Further info

1. Driving Growth - A Road Map & Action Plan for the Development of the Victorian Biofuels Industry.

Regional Development Victoria, Melbourne. April 2007.

2. Biofuels Taskforce (2005) Report of the Biofuels Taskforce to the Prime Minister, Commonwealth of Australia. Available on-line: www.pmc.gov.au/biofuels.

3. DITR (2006). Biofuels Background Information. Department of Industry Tourism and Resources Fact Sheet. Available on-line: <http://www.industry.gov.au>

4. RIRDC (2007). Biofuels in Australia –an overview of issues and prospects, June 2007. Publication No. 07/070 project no. CSW – 44A. Available online: <http://www.rirdc.gov.au/reports/EFM/07-071sum.html>.

5. Renewable Fuels Association (United States) – promotes policies, regulations and research and development initiatives: <http://www.bioethanolrfa.org/>

Reference

1. Allinson G, Griffin D, McCutcheon A, Paech A, Shelley B (2007). The Energy Millennium: Bioenergy in Victoria. Final Report. A report prepared for Agriculture Development Division. Department of Primary Industries Queenscliff, 2007.

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