

# Biodiesel

In order to reduce carbon dioxide emissions, low blend diesel was introduced in the early 1990's. For Australia to realise its 2050 emission targets, a significant proportion of road and other vehicles will have to be electric-run, be powered by biofuels or biofuel blends such as biodiesel by 2050.

Blends of 20% biofuels with 80% diesel are used to create B20 fuel. Because these fuels can generally be used in unmodified diesel engines significant emission reductions can be achieved, assuming the biofuel production is climate neutral. Availability of biodiesel is currently limited within South Australia.

## Producing Biodiesel

Despite the entry of some biodiesel, important barriers remain unresolved. Firstly, the source of the biodiesel stock is critically important in determining the actual emission outcome. The best yielding biofuel crop is palm oil (5,000L per hectare)<sup>1</sup>. A 2007 report from the CSIRO provided estimates of the full lifecycle emissions of biodiesel from a range of sources. Depending on the source, greenhouse gas outcomes for biodiesel range from up to 87% superior to fossil diesel (used cooking oil) to 8-21 times worse (palm oil from cleared rainforest or cleared peat swamp forest). An Australian-grown canola source was estimated to provide approximately 50% benefit over fossil diesel.

Following that lower percentage blends of biodiesel deliver a minimal greenhouse benefit an excellent outcome might therefore be achieved with low emission producing tallows and used cooking oils in high percentage blends, but this introduces the challenge of scale. Australia used 19 GL of diesel in 2009 and "the CSIRO has estimated that converting all used cooking oil, tallow exports and oilseed exports to biodiesel could potentially replace 4-8% of petro diesel consumption"<sup>3</sup>. While a welcome contribution, it is clear that this is far from a complete solution, and it would pose considerable logistics challenges.

## In Context

Within Australia at the moment, Toll have been trialling biodiesel blends (derived from agricultural and waste products). Their trials have examined the impacts of B20 blends on fuel efficiency and emissions performance. Tolls results found that B20 blends were as energy efficient as diesel in their vehicles and that it produced insignificant tailpipe emissions<sup>4</sup>. As a result, biodiesel from climate neutral biofuels can reduce their emissions by 20% with no loss of engine efficiency.

Toll's trials highlight the potential emission savings biodiesel can make to the industry as it becomes more widely available in the coming years and when higher blends are advanced.

- 1) The Biofuels Association of Australia (2010)
- 2) Beer, Grant and Campbell (2007)
- 3) The Biofuels Association of Australia (2010).
- 4) Toll (2013)