

### Saskatchewan Transportation Company

#### **BACKGROUND**

The Saskatchewan Transportation Company (STC) was established in 1946 and is a Crown Corporation owned by the Province of Saskatchewan. STC's mandate is to provide safe, affordable and accessible bus passenger and freight service to Saskatchewan communities.



STC is one of Saskatchewan's most progressive fleets for implementing new measures to improve fuel economy, lower fuel costs, reduce emissions and ensure safe driving practices. In May 2006, a trial was initiated which entailed using a B2 blend (2% biodiesel, 98% petroleum diesel) of fuel in all buses originating from the company's Saskatoon bus garage.

#### **PROJECT DETAILS**

##### *Bus and Engine Types*

Twenty three (23) buses were operated on biodiesel for a period of 1 year, consuming approximately 18,000 litres of biodiesel. The buses ranged from 22 passenger Ford vans to 55 passenger full size motor coaches. Diesel engines in the buses varied from 7.3 litre Fords to International 466's and 4 or 6 cylinder Detroit and Caterpillars. Model years ranged from 1990 to 2006 with the average age of the fleet being 7.41 years. The buses travelled on various routes headed in all directions from the Saskatoon garage.

##### *Logistics*

A biodiesel tender was awarded to Milligan Biotech from Foam Lake Saskatchewan which produces biodiesel from canola oil. The tender required that the biodiesel meet ASTM (American Standards and Testing Methods) Standard D6751 and each shipment be accompanied by a Certificate of Analysis from an independent third party laboratory.



Biodiesel was delivered to the STC garage in Saskatoon in 1000 litre totes and stored inside the building to ensure that it did not cloud or gel during the winter season. Buses at the garage are kept and fuelled indoors.

Diesel for refuelling is stored outside the building in an above ground 50,000 litre tank; therefore diesel pumped into the buses is normally at ambient outside temperature. In order to blend the biodiesel, a splash blending method was utilized.

Subsequent to the delivery truck completing its diesel unloading process in the outdoor diesel tank, a biodiesel tote was transported outside and biodiesel pumped from the tote on top of the diesel in the 50,000 litre tank. No problems were noted from utilizing this blending method.

#### **PERFORMANCE AND OPERATIONS**

##### *Maintenance, Fuel Consumption, Engine Wear*

No modifications to the buses were implemented to operate on B2 and no additional fuel filter changes were performed outside of the normal maintenance procedures.

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STC maintains an extensive database with regard to monthly fuel consumption and economy on all the buses in its fleet. To determine whether any beneficial or negative effects were experienced from the adoption of biodiesel, fuel data from May 2005-2006 (when the buses were not running on biodiesel) was compared to data from May 2006-May 2007. Analysis indicated that fuel consumption while operating on biodiesel was similar to previous operations.

STC has also adopted a practice of collecting oil samples during changes and having them analyzed to determine levels of iron, copper, lead, aluminum and silicon. The existence and concentrations of these constituents provide information regarding the degree of wear occurring in the engine with high levels indicating possible engine damage. The levels of constituents in the oil from April 2004 – May 2007 did not display any consistent trends higher or lower but fluctuated rather randomly over the time period. Hence, there was no clear evidence that biodiesel had a positive or negative impact on engine wear.

#### *Driver Feedback*



Drivers were interviewed to determine any operational changes on the buses, to discuss customer reaction (signage regarding the trial was placed on all buses) and provide feedback on the biodiesel trial. No changes were noted; all buses started and ran normally under weather conditions ranging from +30C to -30C.

With regard to customer reaction, it was cited that customers noticed the signage on the buses, some asked questions and overall the reaction was quite positive.

Drivers were supportive of the biodiesel trial and would like to see it continue. There was recognition of the benefits in terms of positive customer perception, reduced emissions and the impact to the Saskatchewan economy.

#### *Emission Reduction*

In order to determine the total emission reduction from STC's trial, the calculator located at the [www.biofleet.net](http://www.biofleet.net) website was utilized. The GHG emission reduction from the use of 18,000 litres of biodiesel was calculated to be 52 tonnes.

### **CONCLUSION**

*"Our biodiesel trial went very well, we had no operational issues and the drivers and public responded positively. STC would like to continue to use biodiesel and be recognized as one of Saskatchewan's most progressive and green fleets." – Carl Clark, Manager, Maintenance*

### **CONTACT INFO**

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