

An Investigation into the Use of Higher Blends of Biodiesel and
Renewable Diesel in the Vancouver Municipal Fleet

-Executive Summary-

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The carbon intensive and geopolitical complexity of fossil fuel resources have sparked a need for bio economic diversification and has promoted the drive towards renewable fuels. Needless to say, curbing emissions has become imperative, and is a civil responsibility at all levels; individuals, corporations, and government must participate. As a result, the City of Vancouver (City) has put forth ambitious goals to reduce community and operation based carbon emissions through the introduction of a Greenest City Action Plan (GCAP).

In order to achieve these goals in the City's operations, the City of Vancouver has turned to renewable fuels, and recently biodiesel and renewable diesel have garnered specific interest. Currently, within the 3.8 million liters of diesel fuel used by the municipal fleet, 5.8% represents bio-derived content from the use of B5 and B20 blends of biodiesel. However, in order to increase fuel emission savings, a transition needs to be made to higher blends of renewable fuels.

Biofuels are produced from biomass, which in theory means they should be carbon neutral/negative as their combustion only releases carbon sequestered during plant growth, and some carbonous material is left in the ground. While these fuels are a “greener” option over petrol based fuels, not all biofuels are created equal. Due to emissions associated with the industrial farming and processing of biomass, the net carbon footprint is inherently variable, ranging from near zero, to the same as petroleum. As well, because of the difference in chemical properties, fuels such as biodiesel, which are fatty acid methyl esters, are rarely blended above 20%, as higher concentrations cause filter clogging and fuel line complications, and are not usually warranted by the original engine manufacturer. Renewable diesel circumvents these issues, as it is chemically identical to petroleum diesel, though it is produced from biomass. It is a completely fungible fuel, and therefore can be blended or used neat, which allows for highly scalable emission savings.

As a part of the Greenest City Scholar project, research was prepared regarding the production and operability of biodiesel and renewable diesel, with specific focus on their potential further implementation in the City of Vancouver fleet. Interviews were conducted with fleet managers in Oakland CA, San Francisco CA, and Seattle WA. As well, fuel suppliers such as Chevron, Shell, Golden Gate Petroleum, and Next Step Renewable Energy were contacted to gain a better understanding of the renewable fuel market.

A fleet analysis was done to gain a better understanding of the current fuel distribution in the city using an SQL based Equipment Services fleet software. This included identification of B20 compatible vehicles, site specific fuel distribution, and yearly departmental trends in emissions and fuel use. Emission values were calculated using current GHG Genius carbon intensity indices, City of Vancouver accepted values, and 2015 fuel volumes. Transition plan pricing was calculated by referencing current and past market trends for renewable diesel, and an average sampling of OPIS regulated prices in conjunction with the current fuel contract cost scheme for biodiesel. A total of five optional transition plans were created with this data, with a range of risks and benefits. For further information regarding the implementation of this report, please contact Shuh Chan (shuh.chan@vancouver.ca; 604.326.4793).

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