

Biodiesel

A WHOLE NEW ENERGETIC GENERATION

What is Biodiesel ?

Biodiesel is a renewable fuel that allows reductions in GHG (Greenhouse Gas) of about 97% compared to conventional diesel and also reduces tailpipe emissions. This is a clean, non-toxic and biodegradable, made from renewable resources biofuel (oil plant, recycled cooking oil or animal fat) and serves as a substitute for petro diesel in diesel engines.

More specifically, it is a methyl ester obtained by chemical reaction (according to a method called transesterification) with a light alcohol and fats. It can be used 100% pure (B100) as an alternative fuel or blended with petro-diesel in concentrations of 2% (B2), 5% (B5) and 20% (B20). Unlike some other biofuels, there requires no modification or adjustment, either in the engine system components power system or fuel storage.



1. Obtain Oil
2. Biodiesel Production
3. Biodiesel Transportation
4. Fleet Biodiesel Truck

Vegetable Oil in the Engine. Is Biodiesel?

No. Biodiesel is a fuel that is not well known. It is often confused with other biofuels, even with ethanol-blended gasoline. The most common confusion however remains with vegetable-oil fuel because of their obvious relationship. Although manufactured from the same raw materials, biodiesel differs from vegetable oil fuel because it results from a chemical process that allows it to be safely used in diesel engines.

Company Description

Purthanol Resources Ltd is a public company in the biofuels sector (production and distribution of biodiesel and ethanol soon). Purthanol holds currently owns 100% of a biodiesel production plant with a production capacity current 40 million liters / year.



**PURTHANOL
RESOURCES**

Corporate Strategy Development

- **Lipid production** 'in house'.
- **Increase** production of biodiesel.
- **Securing** raw material supplies.
- **Implement** production units near sources of supply.
- **Develop and promote** national and international business partnerships.
- **Enter** the corporation in the Canadian public market (stock exchange)
- **Integrating** ethanol production in our manufacturing facilities.



Benefits of Biodiesel

• **Product less GHG emissions than petro diesel.** The extent of the reduction, however, depends on the biomass used and waste diversion. Using GH Genius (Resource Natural Canada), pure biodiesel made from:

- Animal fat is equivalent to a 97.7% reduction of CO₂ compared to petro diesel.
- Oil recycled frying is equivalent to a 87.9% reduction in CO₂ compared to petro diesel



According to the Conseil Québécois Biodiesel (<http://www.biodieselquebec.org>) and studies in the Biobus by STCUM project:

- **Light solvent**, cleans and keeps clean the tank, piping and the injection system of vehicles.
- **Reduces engine wear** due to its smoothness (the lubricity of the fuel), which is much higher than that of petroleum diesel.
- **Cetane number (for gasoline octane) significantly higher than petroleum diesel** (better combustion and ability to power on).
- **Promotes recycling** of used oils and unlimited biological renewal in comparison with limited oil resources.
- **Biodegradable**, biodiesel great respect for the environment.
- **Significantly reduces particulate emissions** and other pollutants that threaten human health (see table).

The positive effects are not limited to CO₂. Here are some figures from the United States Environmental Protection Agency (EPA) regarding emissions of bio-diesel over conventional diesel.

Types of emissions	B100	B20*
Total unburned hydrocarbons	-67%	-20%
Carbon Monoxide	-48%	-12%
Particulate Matter	-47%	-12%
Nitrogen Oxides	+10%	+2%
Sulfates	-100%	-20%
Polycyclic Aromatic Hydrocarbons (PAH)	-80%	-13%
Nitrates PAH	-90%	-50%
Ozone	-50%	-10%

* **Blend of 20% biodiesel and 80% diesel.**



ASTM 6751 NORM

Flash Point (closed cup) °C	(°C)	130
Methanol content (% mass)	(% Mass)	0,2
Water and Sediment	(Vol %)	0,05
Kinematic Viscosity, 40 °C	(cSt)	1,9-6,0
Sulfated Ash	(wt %)	0,02
Sulfur (S15)	(ppm)	15
Copper Strip Corrosion	(rating)	3A
Cetane		47
Cloud Point	(°C)	***
Carbon Residue (100% Sample)	(wt %)	0,05
Acid Number	(mg KOH/g)	
Free Glycerin	(mass %)	0,02
Total Glycerin	(mass %)	0,24
Phosphorus Content	(ppm)	10
Ca and Mg (Combined)	(ppm)	5
Na and K (Combined)	(ppm)	5
Oxydation Stability	(hrs)	3
Distillation Temp.	(°C)	360

***Cloud point

Purthanol

Ecologic, affordable and powerful

Our biodiesel meets the **ASTM D6751 Canada**. The application of this standard allows users to preserve all operational issues related to the use of that fuel.



Manufacturer's warranties

Chart using biodiesel depending on the brand and according to month

Months	Dec-Mar	Apr-May Oct-Nov	June -Sept
Models	4 months	4 months	4 months
Chrysler, Mercedes, Audi, Perkins, Peterbilt, Volkswagen, Kenworth and BMW under guarantee.	B5	B5	B5
Arctic Cat, Buhler, Case IH, Cummins, Caterpillar, John Deere, Toro, Detroit Diesel, Kubota, Ferris, Tomcar, Thomas, Blue Bird, Isuzu, Mack, Ford, Volvo, Freightliner, GM, Hino, International and Western Star under guarantee.	B5	B20	B20
Fairbanks Morse, New Holland and DeutzAG under guarantee and all others under no guarantee.	B5	B20	B100



The BIOFUELS Market

Legislation and government guidance

- The American President set in March 2011, the goal of reducing by one third (33%) the crude oil imports within 10 years.
- Directive 2009/28/EC of the European Commission have set a very ambitious target of 10% of renewable energy in transport by 2020.
- In Canada, the federal government requires 2% biodiesel in diesel.
- In Quebec, the government has adopted a regulation on the cap and trading of greenhouse gas emissions (GHG) - based on the rules established by the Western Climate Initiative (WCI).

Market diesel and heating oil

Québec

6.6 billion liters/year.

Ontario

9.3 billion liters/year.

Maritimes

14.0 billion liters/year.

America

240.0 billion liters/year, including 88 billion gallons/year on the east

World

(see table next page)

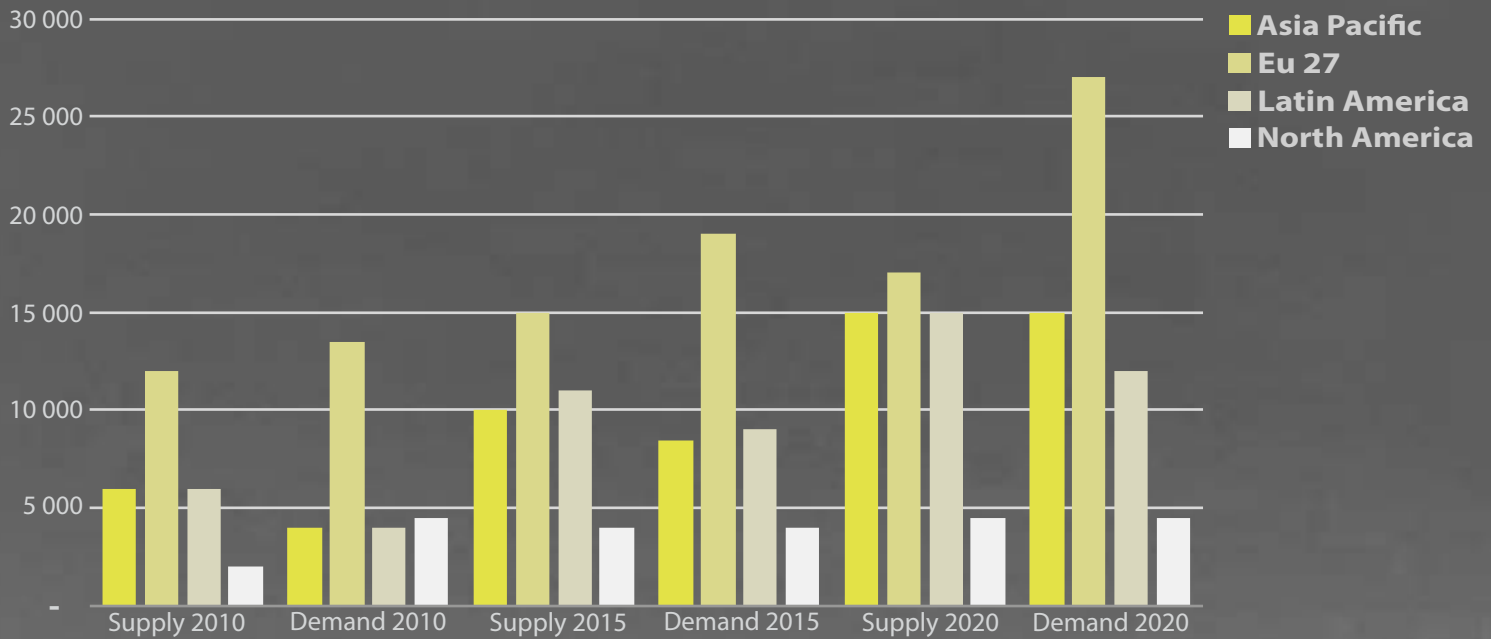
Within 650 kilometers of Sherbrooke: 104 billion liters/year. The need for a blend of biodiesel with diesel oil or heating is:

5.2 billion liters/year for 5% biodiesel in diesel (B5).

20.8 billion liters/year for 20% biodiesel in diesel (B20).



Biodiesel Growth by Region, 2010-2020



Partnership Opportunities

WE WANT TO INSTALL SERVICE STATION

We want to develop partnerships to install service stations that sell biodiesel in addition to other standards products. Purthanol comes to agree with banks on financing the implementation of service stations under its own banner.

WE SEEK CLIENTS

Our clients include truck fleets running on diesel or distributors of diesel. We seek to develop partnerships with owner of the fleet truck.

WE SEEK USED OIL FROM RESTAURANTS

Used oil from restaurants is used to produce biodiesel. However, percentage of water and free fatty acids vary considerably between suppliers. So there is a relationship quality / price we are looking for.

WE HAVE SIGNED AGREEMENTS

We have signed agreements with Madagascar and Ghana to develop our own oilseed crops to feed vegetable oil our biodiesel plant and at a lower cost to the price of oil currently on the market and the benefit of our partners.

WE ARE LOOKING FOR WIN/WIN PARTNERSHIPS

Transport logistics is a major component of the cost of the biodiesel. We are looking for win partnerships / win with carriers or distributors of diesel.

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