The Alaska Biodiesel Demonstration Project is showing that biodiesel can be produced from fish oil widely produced as a byproduct of the Alaska seafood processing industry.

What is Biodiesel?

Biodiesel is an engine fuel manufactured from renewable sources, such as vegetable oils, recycled cooking greases or oils, or animal fats rather than from fossil petroleum. Biodiesel is a U.S. EPA-approved substitute fuel manufactured to stringent industry standards.

Advantages

- Biodiesel is a renewable fuel that is largely "carbon neutral"–burning it recycles carbon fixed by plants.
- It's non-toxic, biodegradable, and produces less smoke, volatile hydrocarbons, and carbon monoxide than diesel when burned.
- Biodiesel blended with diesel increases fuel lubricity, even at levels as low as 1-2%, a potentially important point as new requirements for "drier" ultra low sulfur diesel fuels come into effect.
- Biodiesel is easy to use, since it requires few if any changes to standard diesel-fueled engines.

Disadvantages

- Fish oil biodiesel contains 6% less energy per gallon than #2 diesel, decreases in engine output are rarely observed.
- Nitrogen oxide emissions increase slightly under some conditions.
- Fish oil biodiesel's "cloud point" (the temperature below which wax crystals that can plug filters form) is 34˚F (1°C), near the freezing point of water. The cloud point of #2 diesel is much lower, around 10°F. Potential biodiesel cold flow issues may be addressed by warming the fuel in winter or blending with other fuels, common practices for using #2 diesel.

CONTRIBUTORS

A number of organizations are working together to test & develop biodiesel in Alaska:

Alaska Energy Authority with Steigers Corporation is providing overall direction for biodiesel development and arranged for biodiesel to be produced and transported to test sites.

University of Alaska Fairbanks is analyzing air emission and other characteristics of biodiesel blends in a Detroit Diesel Series 50 engine generator at its Arctic Energy Technology Development Laboratory.

The National Park Service is fueling a 50kW generator supporting a work camp and a portion of its truck fleet with biodiesel and biodiesel blends while evaluating real-life engine performance and fuel handling logistics.

Alaska Department of Environmental Conservation is proving funding and technical assistance to the project.

Industry Partners Include:
Pacific Biodiesel, Inc.
APL, Ltd.

For more information:
Check out Alaska Energy Authority's Website

www.akenergyauthority.org

Photographs provided by:
Steigers Corporation, Alaska Energy Authority
and the National Park Service

Fish Oil & Biodiesel in the Park

Powered By ALASKA BIODIESEL

How do you make biodiesel?

Biodiesel is made by converting natural oils into fatty acid methyl esters (FAMEs), in a process called “transesterfication”. This simple process reacts the raw oil with alcohol, usually methanol, in the presence of a catalyst such as potassium hydroxide.

Since there are currently no production-scale biodiesel plants in Alaska, the fish oil biodiesel being tested in Alaska was processed at Pacific Biodiesel, a commercial facility near Honolulu, Hawaii. A major goal of the program is to provide industry with the information it needs to develop a viable biodiesel production capacity in Alaska.

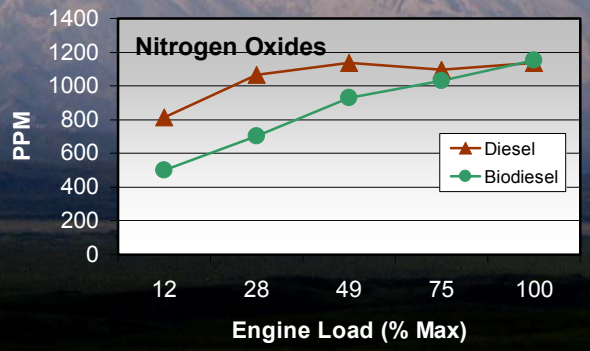
UniSea Inc. uses over one million gallons per year of 50-50 raw fish oil and diesel blend in their Unalaska power system.

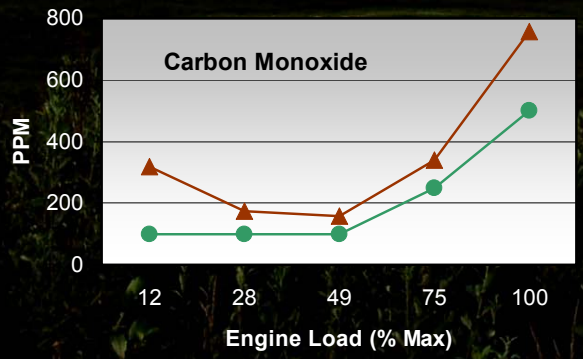
How can Alaska benefit from biodiesel?

The potential benefits of creating an economical source of biodiesel in the state are substantial. A clean-burning renewable alternative to petroleum diesel could be very valuable in minimizing impacts to Alaska's pristine natural areas, such as Denali National Park. Reduction of problem exhaust pollutants in Alaska's urban areas is possible. Jobs and relatively low cost renewable fuel could be provided to remote Alaskan communities that have an existing fish processing industry by starting up modular biodiesel production facilities.

National Park Service dump truck fueled with biodiesel

Emissions from a Diesel Engine





How much fish oil is there in Alaska and where does it come from?

Roughly 8 million gallons of fish oil is currently produced each year from byproducts of shore based and floating Alaska seafood processors. Most of the oil is used as boiler fuel for drying the fish meal, while smaller quantities are blended with diesel and used for power production. The remaining is marketed in the Pacific Rim as livestock and aquaculture feed supplements and other uses. Later in 2005 Alaska Energy Authority plans to conduct a statewide assessment of ground fish and other oil resources for biodiesel, such as salmon waste and waste cooking oil from larger communities.