



Biodiesel Basics

- **Biodiesel is a renewable alternative fuel made from vegetable oils or animal fats.**
- **Biodiesel can be used either as a 100% alternative fuel or blended into petroleum-based diesel in various percentages.**
- **Biodiesel burns cleanly, reducing harmful emissions into the Earth's atmosphere.**



Biodiesel Use

- **Biodiesel reduces dependence on nonrenewable fossil fuels.**
- **Biodiesel use is mandated in the European Union.**
- **Biodiesel use is also mandated in other countries**
- **Biodiesel is gaining acceptance in the U.S.**



Reduces Emissions

- **Biodiesel significantly reduces hazardous emissions & greenhouse gases**

| Emission Type | Percent |
|-----------------------------|---------|
| Total Unburned Hydrocarbons | -67% |
| Carbon Monoxide | -48% |
| Particulate Matter | -47% |
| NO _x | 10% |
| Sulfates | -100% |
| Poly Aromatic Hydrocarbons | -80% |

Reduction in emissions compared to petroleum diesel



Improves Lubricity

- **Biodiesel can be used as a lubricant for ultra low sulfur diesel**
- **B2 (2% Biodiesel Blend) boosts lubricity of #2 diesel by 160%**
- **Lubricity properties creates demand for biodiesel as an additive**



World Energy Outlook

- **Biodiesel reduces dependence on Foreign Oil**
- **U.S. currently imports over 60% of all oil and fuels used**
- **56 billion gallons of distillates (e.g. diesel) used per year**
- **Energy consumption predicted to increase 40% to 50% by 2025**
- **Rapid growth in China and India is intensifying demand**
- **Increasing petroleum prices further depressing the economies of some third world nations**



Feedstock Driven Economics

- **Biodiesel is more expensive than diesel**
- **Costs per gallon of biodiesel**
 - Feedstock \$2.49 +
 - Other Chemicals
 - Labor
 - Production Equipment
 - Operating Costs
 - Total Cost \$2.98 +
- **Need for cheaper feedstocks**



Tax Incentives

- **Federal Excise Tax Credit**
- **\$1.00 per gallon of biodiesel blended (e.g. B20 = 20% biodiesel in petroleum diesel = 20¢ per gallon tax credit)**
- **State grants**
- **Growing number of states offer tax incentives or mandates**



Oil and Fat Feedstocks

- **Vegetable Oils**

Soybean

Peanut

Oil Palm

Corn

Canola

Mustard Seed

Cottonseed Rapeseed **Jatropha**

- **Animal Fats**

Beef Tallow Catfish

Yellow Grease

- **Others**

Trap grease

Algae (Lipids)

Fryer Oil

Pyrolysis Oils (Wood)