
Biofuels: Ethanol and Biodiesel

Alternatives to petroleum based fuels in
the Commonwealth.

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What is Biodiesel (B5, B20 and B100)?

- Biodiesel is a fuel made from vegetable oil or animal fats that can be used in conventional diesel vehicles without modification.
 - Biodiesel can be used in either pure form (B100) or a blend with conventional diesel, such as B5 or B20.
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What is Ethanol (E10 and E85)?

- Ethanol is a fuel additive produced from crops, such as corn, that is blended with conventional gasoline.
 - Ethanol as a 10% blend (E10) can be used in any gasoline vehicle manufactured today.
 - Ethanol as an 85% blend (E85) can be used in any Flexible Fuel Vehicle (FFV)- there are currently more than 4 million FFV's on the roads today.
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Benefits of Biodiesel and Ethanol

- **Environmental:**

- Reduces most harmful vehicle emissions

- **Economic:**

- Provides new market for farmers
- Fuel prices linked to feedstock availability, not OPEC

- **Energy Security:**

- Reduces demand for imported oil
 - Fuels derived from renewable resources
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Energy Balance

- Biodiesel

- For every one unit of energy needed to produce biodiesel, 3.24 units are gained (best among alternative fuels).

- Ethanol

- For every one unit of energy needed to produce ethanol, 1.34 units are gained.
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Cost Comparison: National Averages

- Biodiesel (B2-B5)
 - \$2.81 per gallon
- Biodiesel (B99-B100)
 - \$3.40 per gallon
- Diesel
 - \$2.81 per gallon
- Ethanol (E85)
 - \$2.41 per gallon
- Gasoline
 - \$2.77 per gallon



Ethanol: Drawbacks and Barriers to Implementation

- Most automobile manufacturers limit warranty coverage to E10 (10% ethanol, 90% gasoline).
 - Lower energy density and therefore users experience a small drop in power output.
 - Increased emission of Volatile Organic Compounds (VOCs), a major contributor in smog formation.
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Biodiesel: Drawbacks and Barriers to Implementation

- Most older diesel vehicles (pre-1994) need to be retrofitted with different fuel lines.
 - Biodiesel blends of greater than 20% (B20) gel or cloud in cold weather ($< 5^{\circ}\text{F}$).
 - Most manufacturers limit warranty coverage to B5 (5% biodiesel, 95% diesel).
 - Lower energy density and therefore users experience a small drop in power output.
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Comments and Questions?
