BIODIESEL™

Fuel Facts

National Biodiesel Board
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Completed Projects and Reports Available *(as of Feb. 1996)*

- **Booz-Allen & Hamilton**
  Economics/Technology — Assessment of biodiesel technology and economics relative to other alternative fuels.

- **Institute for Local Self-Reliance**
  Energy Balance — Life cycle analysis to document biodiesel's positive energy balance.

- **Interchem Environmental, Inc.**
  - Cetane — Documented higher cetane number for biodiesel and blends relative to petroleum diesel.
  - Pour Point — Evaluation and optimization of pour point and use of winterizers for biodiesel and biodiesel blends.

- **ORTECH/FMD**
  - Emissions/Performance — Evaluation of biodiesel blends with DDEC II 6V-92TA engine using EPA Transient Test Procedures.
  - Emissions/Performance — Evaluation of biodiesel blends with an engine timing delay with DDEC II 6V-92TA engine using EPA Transient Test Procedures.

- **Worldwide**
  Global biodiesel research, especially in Europe, draws similar emissions, performance and safety conclusions. *(Reports available.)*

- **FEV of America**
  Emissions/Performance — Evaluation of optimum performance of biodiesel blends with a Navistar 7.3 Liter HEUI engine.

- **MARC-IV**
  Related Parts Compatibility — Evaluation and comparison of positive effects of lubricity and differences between biodiesel blends and low-sulfur diesel.

- **Southwest Research Institute**
  - Emissions/Performance — Evaluation of biodiesel blends with DDC 6V-92 engines.
  - Emissions/Performance — Evaluation of biodiesel blends with DDC Series 60 engines.
  - Engine emissions testing with biodiesel blends and DTBG.
  - Testing of NOx-reducing additives.

- **University of Georgia**
  Economics — Assessment of each alternative fuel under federal energy and clean air regulations.

- **University of Idaho**
  Production and testing of ethyl and methyl esters, including toxicity and degradibility studies.

- **U.S. Department of Interior**
  Bureau of Mines — Testing of biodiesel in neat and blended forms for use in underground mining equipment.

- **ORTECH/Detroit Diesel Corp./FMD**
  - Emissions/Performance — Evaluation of biodiesel blends with a fresh DDC MUI 6V-92TA Coach Upgrade mechanical fuel injection engine.

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- **ORTECH/Detroit Diesel Corp./FMD**
  - Emissions/Performance — Evaluation of biodiesel blends with a fresh DDC MUI 6V-92TA Coach Upgrade mechanical fuel injection engine.
  - Emissions/Performance — Optimization of engine timing and evaluation of DDC exhaust catalyst on a fresh DDC MUI 6V-92TA Coach Upgrade mechanical fuel injection engine to evaluate NOx reductions.
  - Engine emissions testing on a DDC 6V-71 engine.

- **Market Assessments**
  Summaries completed outlining biodiesel potential and guidelines for future activities in:
  - mining market
  - marine market

- **University of Wisconsin**
  - Fermentation — Conversion of glycerol from biodiesel production to 1.3 propanediol.

- **Environment Canada**
  Two studies investigating potential exhaust emission reduction through the use of methyl soyate as a low level blend additive with highway diesel fuel in heavy-duty diesel engines: 1988 DDECII 6V92TA and DDC 8V71.

- **Engineering Test Services**
  Transient emission testing of biodiesel fuel in DDC 6V92TA engine/Cummins L10 mechanical engine.

- **NIPER/West Virginia University**
  Emissions evaluation of catalyst equipped DDC 6V92TA engines.

- **Teall's Guides**
  - Introducing biodiesel into the marine market Phase I: Florida Keys.

- **Spark's Companies, Inc.**
  - Potential biodiesel use in United States' school bus fleets.

Active Projects *(as of Feb. 1996)*

- **NIPER/U.S. Department of Energy**
  - Emissions Optimization — Evaluation of biodiesel blends on Cummins 5.9L and Cummins L10 engines and exploration of alkylate blendstock.
  - Durability/Emissions — 1,000-hour test and evaluation and FTP transient emissions characterization on a Cummins L10 engine.

- **University of Idaho**
  Production and testing of ethyl and methyl esters, including toxicity and degradability studies.

- **USDA/U.S. Department of Defense**
  - Biodegradability — Advanced materials program research at Army Natick RD&E Lab, University of Idaho and University of Pittsburgh.
  - Toxicology — Advanced materials program research at University of Idaho.
  - Materials compatibility
  - Lubricity
  - Storage life.

- **University of Tennessee**
  - Evaluate and optimize the performance of a 110-hp Volvo diesel outboard engine fueled with biodiesel for operation in environmentally-pristine waters.

- **University of Missouri**
  - Physical characteristics — Analyze fuel related variables and determine if fuel analysis yields linear response.
  - Investigate long-term, real-world effect of fueling modern, direct injected, on-road diesel engines with neat biodiesel.

- **USDA-Agricultural Research Service**
  Determine performance of biodiesel-fueled engines for electrical generation used in remote areas.

- **Development Systems/Applications Int'l**
  Identifying and Evaluating Non-Fuel Products that can be made from Biodiesel.