

Idaho

Idaho is a leader in U.S. renewable energy, generating 85% of its electricity from renewable sources. The Bioenergy Technologies Office (BETO) enables the development of novel technologies that can be used to establish Idaho as a leader in renewable transportation fuels.

In 2012, Idaho's transportation sector consumed nearly 80% of all petroleum used in the state. Increased use of biofuels can boost local economies, reduce environmental problems, and decrease dependence on foreign petroleum.



Economy

The Idaho transportation sector spent **\$3.8 billion** on petroleum in 2013. With limited fossil fuel reserves of its own, Idaho can expand its production of biofuels to **keep those dollars in the state**, stimulate economic development, and add to Idaho's **24,000+** jobs in green goods and services.



Energy

In 2012, Idaho produced **1.2 million barrels of ethanol** and **120,000 barrels of biodiesel**. The energy content of these fuels exceeded that of the **750,000 barrels of jet fuel** consumed by Idaho that year. Investments in **bio-based jet fuel** production in Idaho could advance **sustainable aviation** in the Northwest.



Environment

In 2011, petroleum use in Idaho's transportation sector released **8.4 million metric tonnes of carbon dioxide** (54% of Idaho fossil fuel emissions). On a life-cycle basis, advanced biofuels can **reduce greenhouse gas emissions by ≥ 50%** compared to petroleum—helping to reduce environmental impacts.



Feedstocks

Idaho produces over **2.5 million metric tonnes of wood waste** from forests, mills, and urban sources. These and other renewable resources in Idaho, including **sorted municipal solid waste, agricultural residues, and animal waste**, can be leveraged for the sustainable production of **advanced biofuels**.

Strategic policies and investments help *bridge the gap* between promising research and large-scale production of advanced biofuels.

The **Idaho Bioenergy Program** provides technical assistance, educational workshops, and cost sharing to help the citizens and companies of Idaho take advantage of locally grown, renewable biomass energy resources.

Since 2005, the U.S. Department of Energy (DOE) has awarded more than **\$77 million** to national laboratory, university, and industrial partners in Idaho to research, develop, and deploy sustainable bio-based fuels and products.

Idaho research universities have the capabilities to develop advanced biofuels, like the **University of Idaho's** project to increase the utilization of cellulose from straw for biofuel and bioproducts.

Idaho National Laboratory (INL) works at the cutting edge of technology to advance the economic production of bioenergy.

Bioenergy — The INL Bioenergy Program works with government, industry, and academia to transform biomass into high-value, commodity feedstocks.


Feedstock Process Demonstration Unit (PDU) — This flexible pilot-plant scale applied research facility allows bioenergy developers to evaluate novel feedstock processing technologies to enable biofuels production.

Why Idaho?

Abundant forests and wood products industry could sustainably provide 2.5 million metric tonnes of woody biomass annually for biofuel production. 

Robust agricultural industry could provide 6.4 million metric tonnes of locally sourced, cellulosic feedstocks annually for advanced biofuels. 

Existing non-cellulosic ethanol facilities can be upgraded to utilize non-food-based feedstocks and contribute to advanced biofuels production.* 

Developing in-state resources will reduce dependence on imported petroleum products, enhancing Idaho's energy security. 

* Idaho ranks 20th (51 million gallons/year) among 25 ethanol producing states in the U.S.



Idaho National Laboratory (INL)

INL's Bioenergy Program focuses on optimizing supply system logistics and reducing biomass feedstock variability to help biorefiners develop reliable, sustainable supply systems of high-quality feedstocks. INL's studies include a variety of biomass resources, such as perennial grasses, wood, agricultural residues, and municipal solid wastes that can be used to produce biopower, renewable transportation fuels, and other bioproducts.

The **Biomass Feedstock National User Facility (BFNUF)**, managed by the INL Bioenergy Program, assists companies in moving their bioenergy business ventures from the laboratory to commercial-scale. At a capacity that mimics commercial production, companies using the BFNUF can have large volumes of biomass preprocessed into feedstocks that have the characteristics needed for their specific conversion process. This helps them validate their feedstock supply and handling processes cost-effectively, and identify and address potential challenges before they implement their feedstock supply system designs in the industrial setting.

University of Idaho (U of I)

U of I is one of the pioneers of biodiesel research, having over 30 years of experience working with biodiesel fuel. The U of I Biodiesel Education Program's farm-scale production facility makes biodiesel from a variety of feedstocks.

The **Intermountain Forest Tree Nutrition Cooperative (IFTNC)** at U of I is studying the use of forest biomass to produce energy products. Their biomass-to-biofuels project is developing a forest management option to help reduce forest fire fuel loads on public lands while producing a sustainable source of bioenergy. U of I is also exploring the use of portable pyrolysis units, located near the forest, to convert biomass into bio-oil. A byproduct of pyrolysis is biochar, which can be used as a soil amendment or in other technologies that use charcoal.

For example, U of I's **Environmental Chemistry and Toxicology Department** is promoting the university's N-E-W Tech™ Water Treatment Technology, a reactive filtration water treatment technology that binds mineralized nutrient phosphorus and nitrogen to biochar, where it can be recovered from the water. This technology can treat many dirty waters thoroughly enough that they qualify for unrestricted reuse and recycling. The nutrient-laden biochar also can be recovered and pelletized for use as agricultural fertilizer.

Center for Advanced Energy Studies (CAES)

The Center for Advanced Energy Studies (CAES) is a research and education consortium between Boise State University, INL, Idaho State University, U of I, and University of Wyoming. CAES bioenergy researchers are working with private investors to verify and validate a new design that could greatly improve the amount of energy or fuel gleaned from the anaerobic digestion process. The city of Meridian, Idaho, is providing space for a pilot project of the new anaerobic digestion system.

For more information on the economic and energy security benefits of biofuels for Idaho, visit: eia.gov/state/analysis.cfm?sid=ID
energy.idaho.gov/renewableenergy/bioenergy.htm
acore.org/files/pdfs/states/Idaho.pdf (jobs data based on 2011 survey by the Bureau of Labor Statistics)
eia.gov/state/seds/sep_prod/pdf/P4.pdf
eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_jf.html
energy.gov/eere/bioenergy/about-bioenergy-technologies-office-growing-americas-energy-future-replacing-whole

For more information on the environmental benefits and diverse feedstocks of biofuels, visit: epa.gov/oaq/fuels/renewablefuels/documents/420f12078.pdf
eia.gov/environment/emissions/state/state_emissions.cfm, maps.nrel.gov/biofuels-atlas
For more information on clean energy initiatives and DOE partnerships, visit: energy.gov/eere/bioenergy/financial-opportunities
energy.gov/eere/bioenergy/articles/farm-fly-20-energy-department-joins-initiative-bring-biofuels-skies
inportal.inl.gov/portal/server.pt/community/bioenergy/421/transforming_biomass
U.S. ethanol production: eia.gov/state/seds/sep_prod/pdf/P4.pdf, eia.gov/petroleum/ethanolcapacity/