

# Illinois

Illinois can leverage its extensive biomass resources and existing infrastructure to increase advanced biofuels production. The Bioenergy Technologies Office (BETO) enables the development of novel technologies that can be used to establish Illinois as a leader in the growing bioeconomy.

Illinois is among the top 10 petroleum-consuming states. In 2012, Illinois consumed 25 times more petroleum than it produced. Investing in the advanced bioeconomy will boost economic development, improve energy security, reduce carbon emissions, and create jobs.



## Economy

Illinois spent **\$25.5 billion** on petroleum-based fuels for transportation in 2013. Additional production of domestic biofuels could **keep more of those dollars within the state** to stimulate economic growth and add to the **136,000+ jobs** in green goods and services in Illinois.



## Energy

Illinois consumed **225.9 million barrels** of petroleum in 2012. The state is #3 in the nation for ethanol production capacity and #2 for biodiesel. Expanding **local biofuel production** to utilize cellulosic and algal feedstocks can **improve Illinois' energy security and resilience**.



## Environment

In 2011, petroleum use in the Illinois transportation sector released **62.7 million metric tonnes of carbon dioxide**. On a life-cycle basis, advanced biofuels can **reduce greenhouse gas emissions by ≥ 50%** compared to petroleum—helping to reduce environmental impacts.



## Feedstocks

Illinois' first-generation biofuel facilities can be upgraded to convert **cellulosic agricultural residues**, such as **corn stover**, into advanced biofuels and high-value products. **Algae, energy crops, and woody and urban wastes** are among the **12.3 million metric tonnes** of sustainable biomass resources available for use in Illinois annually.

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

The **Renewable Fuels Development Program** and other alternative fuel initiatives in Illinois recognize the social, economic, and environmental benefits of biofuel production.

**Argonne National Laboratory** conducts research to accelerate the sustainable production of renewable transportation fuels. Argonne's publicly available **Greenhouse Gases Regulated Emissions and Energy Use in Transportation (GREET)** model evaluates energy and emissions impacts of vehicles and transportation fuels.

The U.S. Department of Energy (DOE) has awarded more than **\$99 million** to university, national laboratory, and industrial partners in Illinois to research, develop, and deploy sustainable bio-based fuels and products since 2005.

## Why Illinois?



**Robust agricultural industry** can provide **9.9 million metric tonnes** of locally sourced, cellulosic feedstocks annually.



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



**Developing in-state resources** reduces dependence on imported petroleum products.



**Favorable geographic location** facilitates distribution of products to new markets.



\* Illinois ranks 3<sup>rd</sup> (1.24 billion gallons/year) among 25 ethanol producing states in the U.S.

DOE (often in partnership with the U.S. Department of Agriculture) has supported **basic research and development at Illinois universities**. This basic research improves the productivity of bioenergy feedstocks and maximizes the benefits of biofuels and bioproducts while minimizing negative impacts. DOE seeks to promote promising biofuel and biotechnologies research with the greatest chance of impact on commercial biofuel and bioproducts production.

### Integrated Biorefinery Projects in Illinois

Operated by:	Gas Technology Institute (GTI) and Haldor Topsoe, Inc.	Solazyme	UOP LLC	LanzaTech	ADM	GTI – IH2
Location:	Des Plaines	Peoria	Des Plaines	Skokie	Decatur	Chicago
Stage:	Lab-scale	Demonstration/commercial-scale	Research and development (R&D)	R&D	Pilot	Pilot
Primary product:	Renewable gasoline	Renewable oils (fuel, food, and products)	Renewable gasoline, diesel, and jet fuel	Low-carbon fuels and chemicals	Ethanol	Renewable gasoline and diesel
Feedstock:	Wood waste	Algae	Biomass and algal residues	Waste gases and bio-gases, and waste wood	Corn stover	Wood waste

### BETO Projects with Universities

Participant:	Southern Illinois University	University of Illinois	University of Illinois, Urbana-Champaign		
Research area:	Expanded ethanol production and impacts	Genetic improvement of sorghum	Quantifying and improving miscanthus	Studying genetics of Andropogoneae feedstocks	Analysis of development of sorghum
Stage:	R&D	R&D	R&D	R&D	R&D
Primary product:	Ethanol	N/A	N/A	N/A	N/A
Feedstock:	N/A	Bioenergy sorghum	Miscanthus	Andropogoneae feedstock grasses	Bioenergy sorghum

For more information on the economic benefits of biofuels for Illinois, visit: [eia.gov/state/analysis.cfm?sid=IL](http://eia.gov/state/analysis.cfm?sid=IL), [energy.gov/eere/bioenergy/about-bioenergy-technologies-office-growing-americas-energy-future-replacing-whole-core.org/files/pdfs/states/illinois.pdf](http://energy.gov/eere/bioenergy/about-bioenergy-technologies-office-growing-americas-energy-future-replacing-whole-core.org/files/pdfs/states/illinois.pdf) (based on 2011 survey by the Bureau of Labor Statistics). For more information on Illinois biomass resources and environmental benefits, visit: [epa.gov/olag/fuels/renewablefuels/documents/420f12078.pdf](http://epa.gov/olag/fuels/renewablefuels/documents/420f12078.pdf), [eia.gov/environment/emissions/state/state\\_emissions.cfm](http://eia.gov/environment/emissions/state/state_emissions.cfm), [eere.energy.gov/bioenergy/pdfs/billion\\_ton\\_update.pdf](http://eere.energy.gov/bioenergy/pdfs/billion_ton_update.pdf), [maps.nrel.gov/biofuels-atlas](http://maps.nrel.gov/biofuels-atlas)

For more information on Illinois clean energy initiatives and DOE partnerships, visit: [afdc.energy.gov/laws/all?state=IL](http://afdc.energy.gov/laws/all?state=IL), [anl.gov/energy/renewable-energy\\_greet.es.anl.gov/main](http://anl.gov/energy/renewable-energy_greet.es.anl.gov/main), [energy.gov/eere/bioenergy/financial-opportunities](http://energy.gov/eere/bioenergy/financial-opportunities), [solazyme.com](http://solazyme.com), [eere.energy.gov/bioenergy/pdfs/ibr\\_arra\\_haldortopsoe.pdf](http://eere.energy.gov/bioenergy/pdfs/ibr_arra_haldortopsoe.pdf), [gastechology.org/news/Pages/High-Octane-Renewable-Gasoline-Wood-Biomass-Production.aspx](http://gastechology.org/news/Pages/High-Octane-Renewable-Gasoline-Wood-Biomass-Production.aspx). U.S. ethanol production: [eia.gov/state/seds/sep\\_prod/pdf/P4.pdf](http://eia.gov/state/seds/sep_prod/pdf/P4.pdf), [eia.gov/petroleum/ethanolcapacity/](http://eia.gov/petroleum/ethanolcapacity/)