

OFFICE OVERVIEW

June 2013

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Addressing our Nation's Energy Challenges

HOW BIOENERGY PLAYS A ROLE

1

The need to reduce dependence on foreign oil and lower greenhouse gas (GHG) emissions has renewed the urgency for developing sustainable biofuels, bioproducts, and biopower.

2

The transportation sector accounts for approximately two-thirds of U.S. oil consumption and contributes to one-third of the nation's GHG emissions.

3

In the near term, biomass is the only renewable resource that can supplement petroleum-based liquid transportation fuels, while reducing GHG emissions.



Biomass includes agricultural residues, forest resources, perennial grasses, woody energy crops, wastes (municipal solid waste, urban wood waste, and food waste), and algae, as well as other sources. Like other renewable energy resources, biomass is converted to power; however, unlike other resources, it can also be converted to fuels and chemicals.

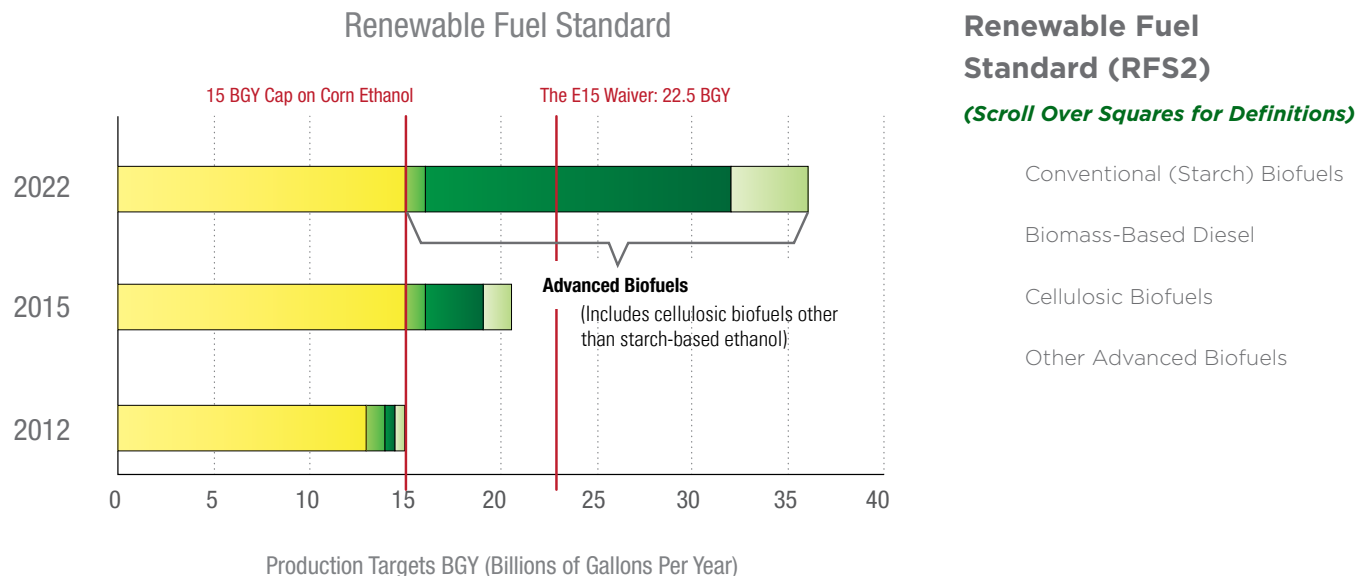


The [Energy Independence and Security Act \(EISA\)](#) of 2007 set aggressive goals to:

- Move renewable fuels into the marketplace
- Reduce the nation’s dependence on foreign sources of energy
- Reduce GHG emissions from the transportation sector.

EISA established production volumes for the [Renewable Fuel Standard Program \(RFS\)](#), since referred to as RFS2. RFS2 specifically defines categories of biofuels, sets minimum life cycle GHG reduction thresholds for these categories, and applies restrictions on the types of feedstocks and types of land that can be used to make qualifying renewable fuel.

EISA 2007 greatly expanded mandated biofuels production targets to 21 billion gallons of advanced biofuels and 36 billion total gallons of renewable fuels by 2022—a multifold increase from what the Energy Policy Act of 2005 originally set.



The Bioenergy Technologies Office focuses on the development of all of the green items outlined in this bar chart.

Utilizing biomass for fuels, products, and power is recognized as a critical component of the nation’s strategic plan to address our continued dependence on imported oil.

In President Obama’s 2013 State of the Union Address, and subsequent [Plan for a Strong Middle Class and a Strong America](#), he stated that “by investing in clean energy, we can continue to create good American jobs, reduce our reliance on foreign oil, and reduce the cost of energy for families and businesses.”

The President called on Congress to make the renewable energy Production Tax Credit permanent and refundable, as part of comprehensive corporate tax reform, providing incentives and certainty for investments in new clean energy.

The President also established an Energy Security Trust to support research into a range of cost-effective technologies such as advanced vehicles that run on electricity, home-grown biofuels, and vehicles that run on domestically-produced natural gas.

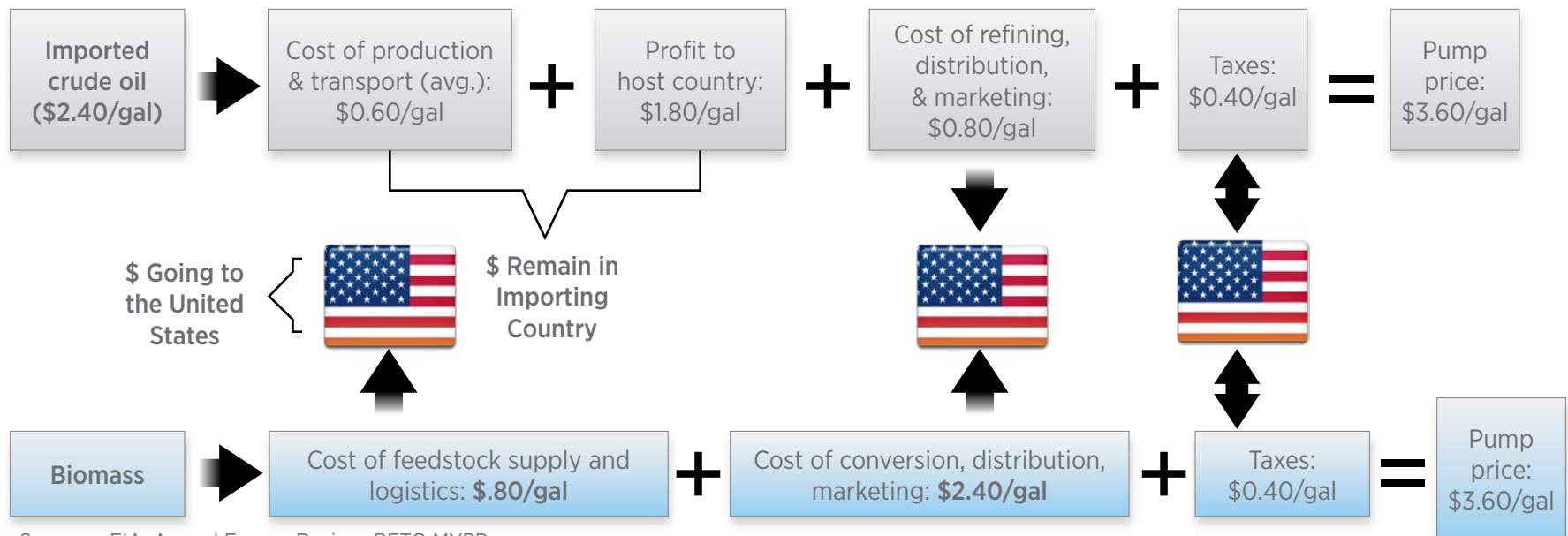


Photo courtesy of whitehouse.gov

“The path towards sustainable energy sources will be long and sometimes difficult. But America cannot resist this transition; we must lead it. We cannot cede to other nations the technology that will power new jobs and new industries—we must claim its promise.”

–President Barack Obama
2013 Inaugural Address

- [Job Creation and Balance of Trade](#) – Displacing oil imports offers massive opportunity for domestic job creation, with virtually no consequent job destruction
- Climate Change Mitigation – Sustainable biomass production can provide >50% GHG reduction vs. petroleum-based fuels on a complete life-cycle basis
- Energy Security – Domestic production decreases vulnerability to short-term economic disruption due to war, civil unrest, OPEC action, speculation, etc.



Price differential between *imported* crude oil and *domestic* biomass:
\$101/barrel x 4.2 billion barrels/year = \$424 billion/year



Addressing our Nation's Energy Challenges

THE U.S. DEPARTMENT OF ENERGY'S BIOENERGY TECHNOLOGIES OFFICE

The [Bioenergy Technologies Office](#) supports the following national priorities:



Dramatically
[reduce](#)
[dependence](#)
on foreign oil



Promote the
use of diverse,
domestic, and
[sustainable](#)
energy resources



Establish an
advanced
bioindustry
and [create jobs](#)



Reduce carbon
emissions
from energy
production and
consumption

For more information:

[Bioenergy Technologies Office Multi-Year Program Plan](#)

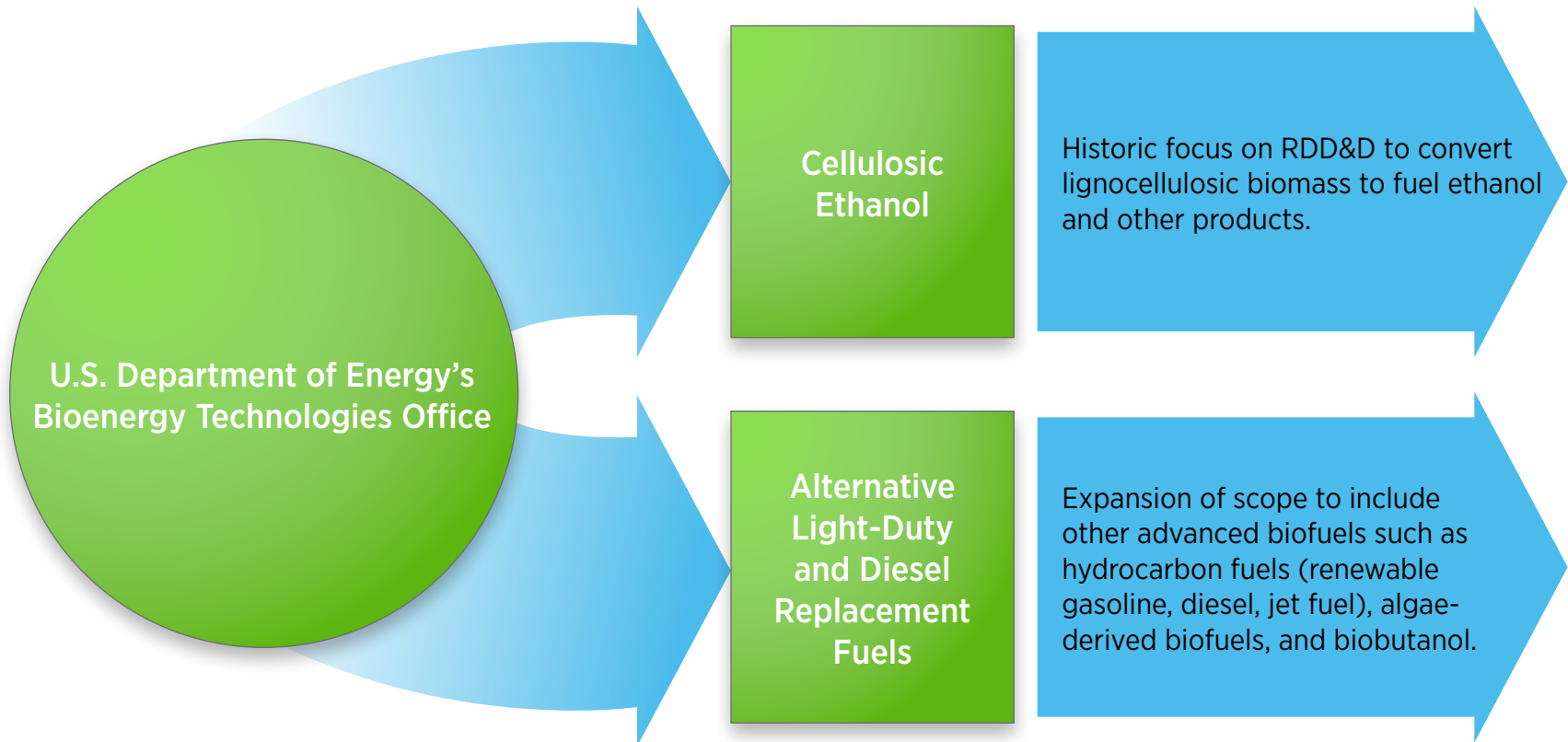
MISSION

Develop and transform our renewable biomass resources into commercially viable, high-performance biofuels, bioproducts, and biopower through targeted research, development, demonstration, and deployment (RDD&D) supported through public and private partnerships.

STRATEGIC GOAL

Develop commercially viable biomass utilization technologies to enable the sustainable, nationwide production of biofuels that are compatible with today's transportation infrastructure and can displace a share of petroleum-derived fuels to reduce U.S. dependence on oil and encourage the creation of a new domestic bioenergy industry, supporting the EISA goal of 36 billion gallons per year of renewable transportation fuels by 2022.

The Bioenergy Technologies Office forms cost-share partnerships with key stakeholders to develop, demonstrate, and deploy technologies for advanced biofuels, bioproducts, and biopower from lignocellulosic and algal biomass.



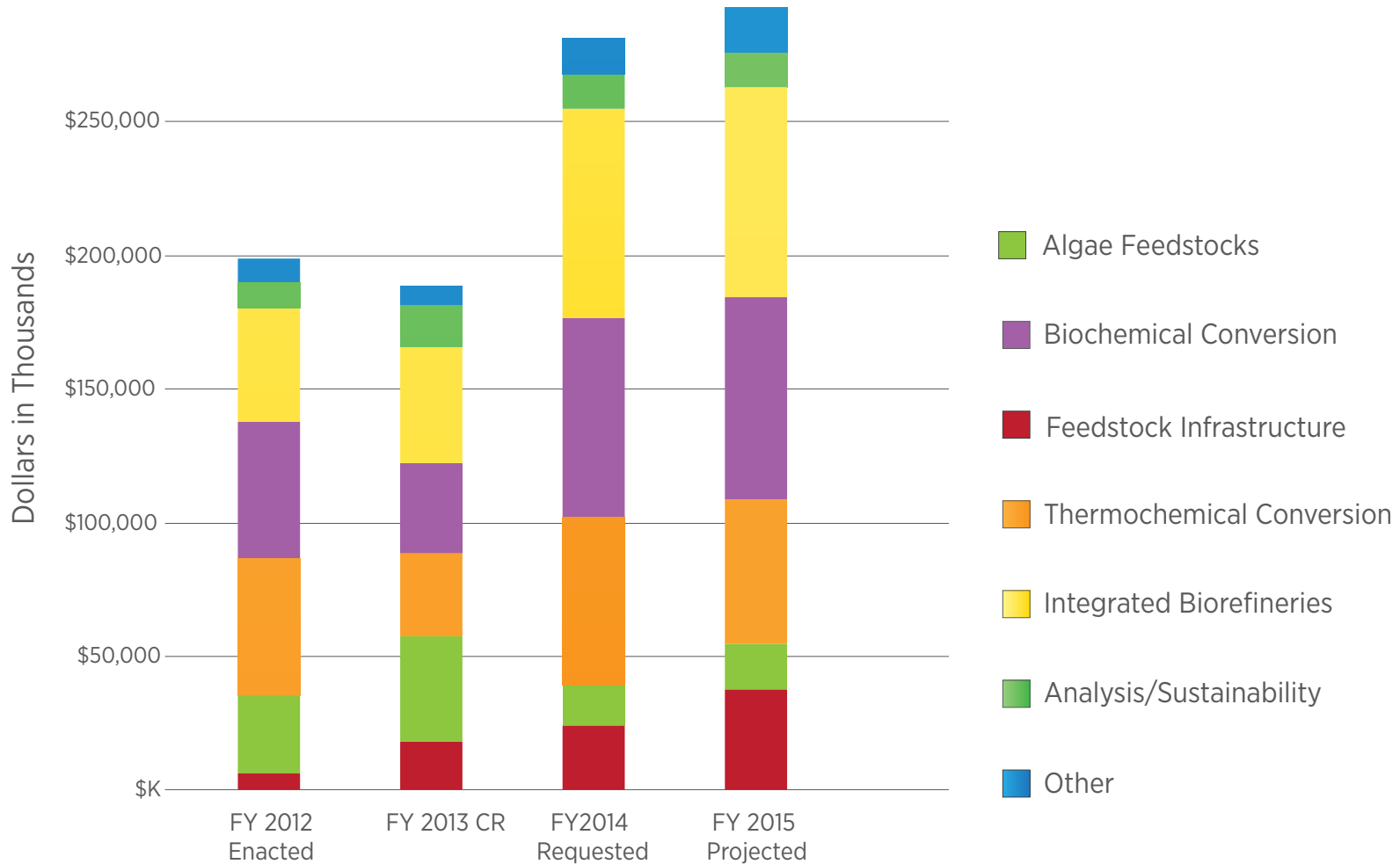


A Historical Perspective

BIOENERGY POLICIES, PRIORITIES, AND APPROPRIATIONS OVER TIME

In recent years, several legislative, regulatory, and policy efforts have expanded and accelerated bioenergy-related RDD&D.

<p>Energy Policy Act of 2005 August 2005</p>	<p>Renewed and strengthened federal policies fostering ethanol production, including incentives for the production and purchase of biobased products; these diverse incentives range from authorization for demonstrations to tax credits and loan guarantees.</p>
<p>Energy Independence and Security Act (EISA) of 2007 December 2007</p>	<p>Supported the continued development and use of biofuels, including a significantly expanded Renewable Fuel Standard, requiring 36 bgy renewable fuels by 2022 with annual requirements for advanced biofuels, cellulosic biofuels, and biomass-based diesel.</p>
<p>The Food, Conservation, and Energy Act of 2008 (Farm Bill) May 2008</p>	<p>Provided funds for grants to accelerate commercialization of advanced biofuels R&D and pilot-, demonstration-, and commercial-scale integrated biorefinery projects. Provided funds to other DOE programs for basic research and development (R&D), innovative research, tax credits, and other projects.</p>
<p>American Recovery and Reinvestment Act February 2009</p>	<p>Provided grants, loans, and loan guarantees for developing and building demonstration- and commercial-scale biorefineries; established \$1.01 per gallon producer tax credit for cellulosic biofuels; provided authorization for the Biomass Crop Assistance Program and for Biomass R&D Initiative, Biomass R&D Board, and Technical Advisory Committee continuation.</p>
<p>Blueprint for a Secure Energy Future March 2011</p>	<p>Outlines a comprehensive energy policy that cuts U.S. oil imports by one-third by 2025 through reducing the nation's dependence on oil with cleaner alternative fuels and greater efficiency. Promotes collaboration with international partners to increase bioenergy production. Includes research and incentives that aim to reduce barriers to increased biofuels use and the commercialization of new technologies.</p>



Through the American Recovery and Reinvestment Act, the Bioenergy Technologies Office was appropriated \$800 million in FY 2009. Learn more about the Office's [Recovery Act investments](#).

As biofuel technologies are developed and demonstrated, RD&D priorities adjust to bring more diverse biofuel pathways closer to commercialization.



Starch-based ethanol is a well-established commodity fuel with wide market acceptance through low-level blends in conventional vehicles and at higher blends in flex-fuel vehicles. Continued success of the ethanol industry helps pave the way for introducing cellulosic ethanol into the marketplace.



Over the last two decades, R&D has significantly lowered the cost of converting cellulosic biomass to fuel ethanol. DOE and the bioenergy community are leveraging cellulosic ethanol RD&D successes to accelerate algal and other “drop-in” biofuel technologies for the production of hydrocarbon fuels, including renewable diesel, gasoline, and jet fuel.



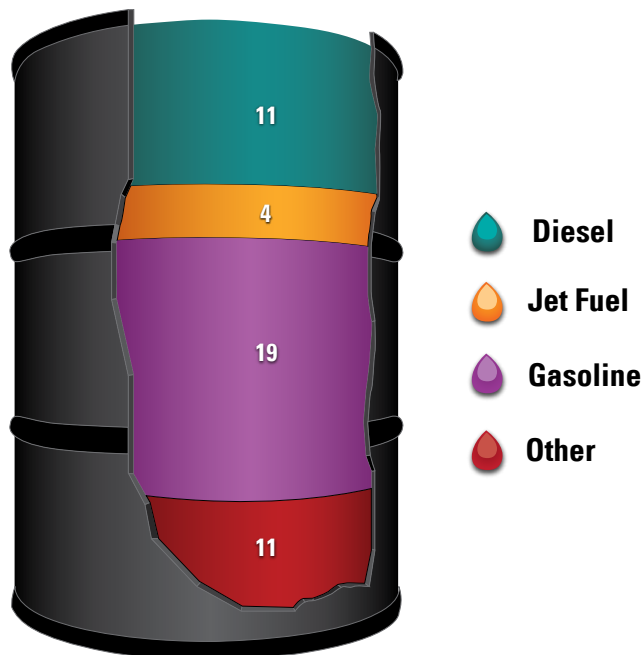


The Bioenergy Technologies Office Today

REPLACING THE WHOLE BARREL

Replacing the Whole Barrel

Products Made from a Barrel of
Crude Oil (Gallons)



A 42 gallon (U.S.) barrel of crude oil yields
about 45 gallons of petroleum products

Source: Energy Information Administration (2011)

The United States spends approximately \$300 billion/year on imported oil; that's nearly **\$1 billion/day**.

- The U.S. transportation sector accounts for more than 70% of U.S. oil consumption.
- Only about 40% of a barrel of crude oil goes toward light-duty petroleum gasoline.
- Reducing dependence on oil requires developing technologies to replace gasoline, diesel, jet fuel, heavy distillates, and a range of biobased chemicals and products.

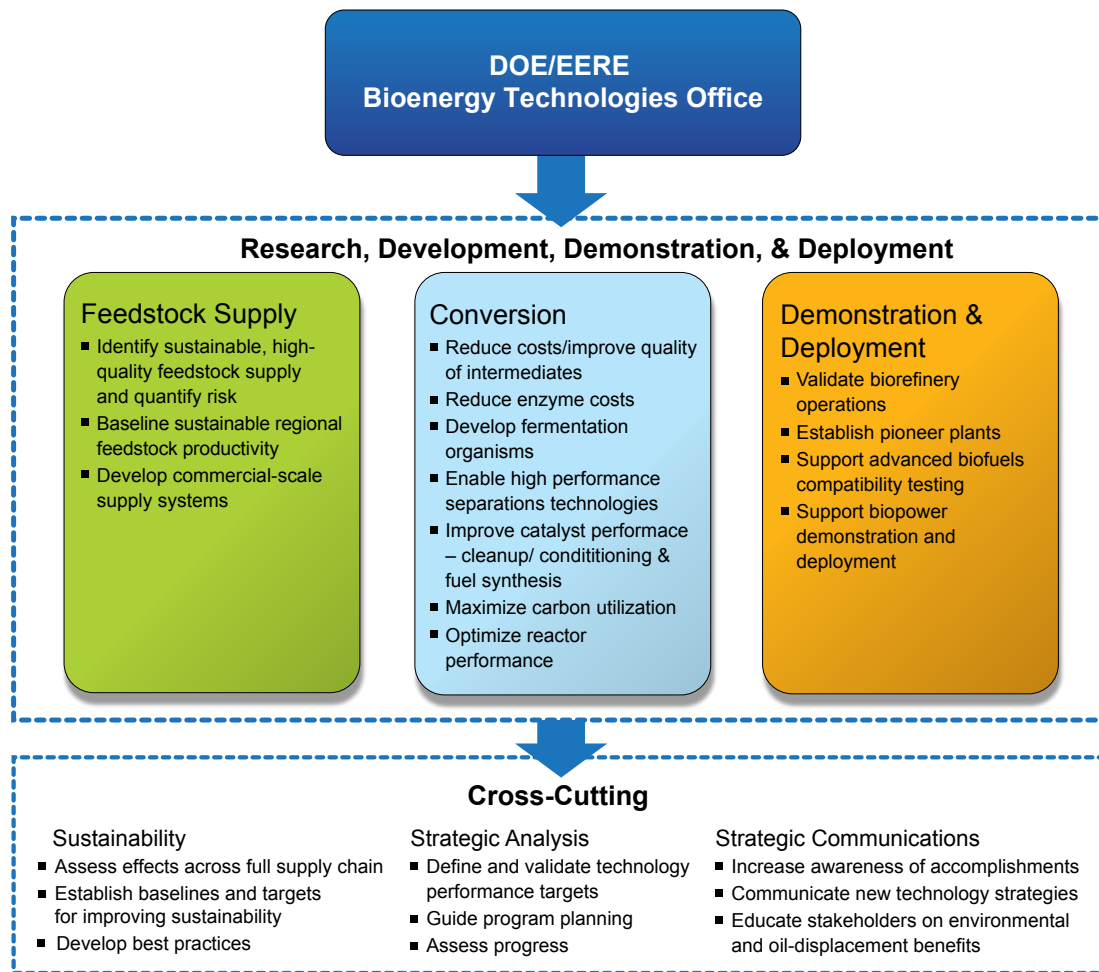




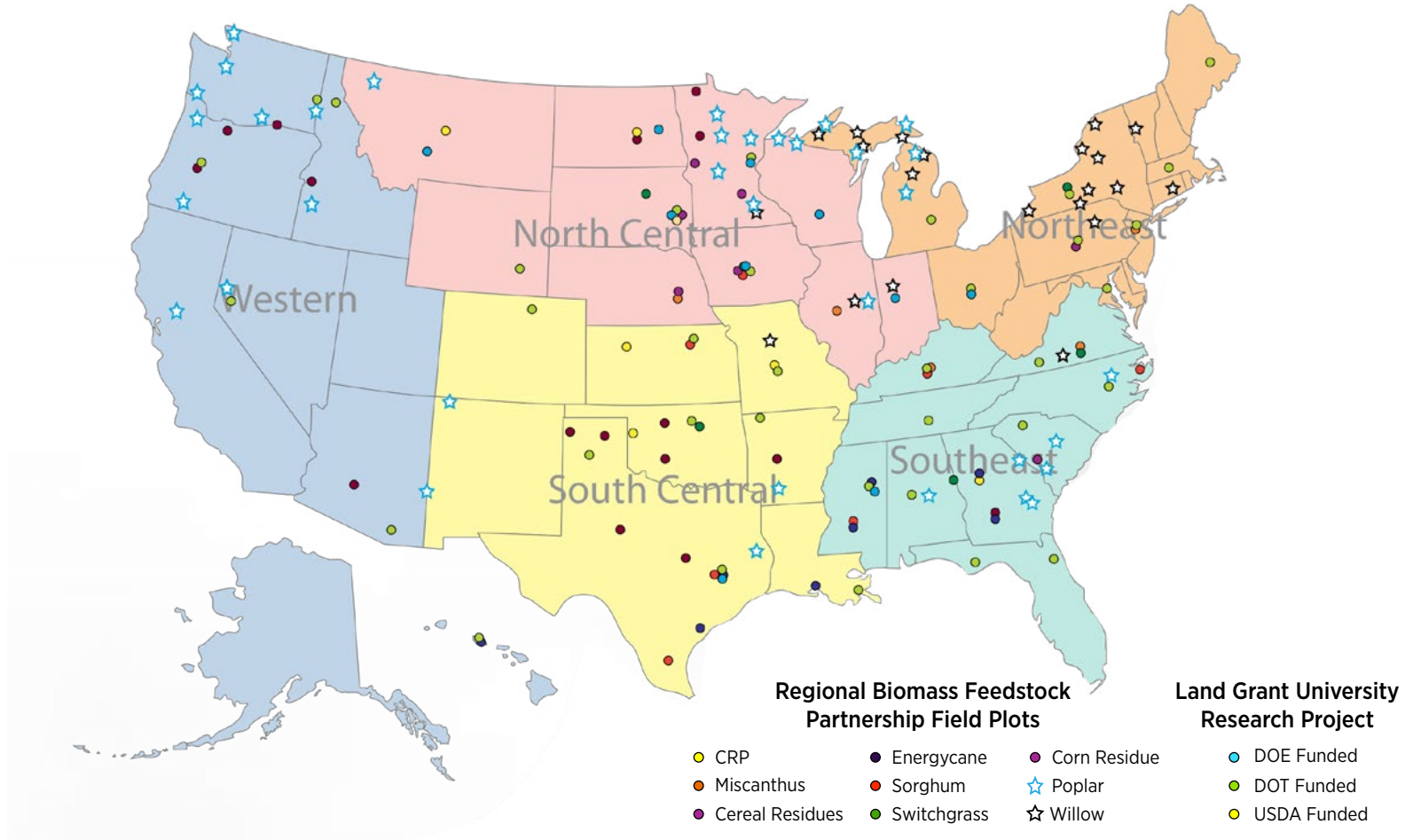
The Bioenergy Technologies Office Today

WORKING ACROSS THE SUPPLY CHAIN

The Bioenergy Technologies Office forms cost-shared partnerships with key stakeholders to develop, demonstrate, and deploy technologies for advanced biofuels, bioproducts, and biopower from lignocellulosic and algal biomass across the supply chain.

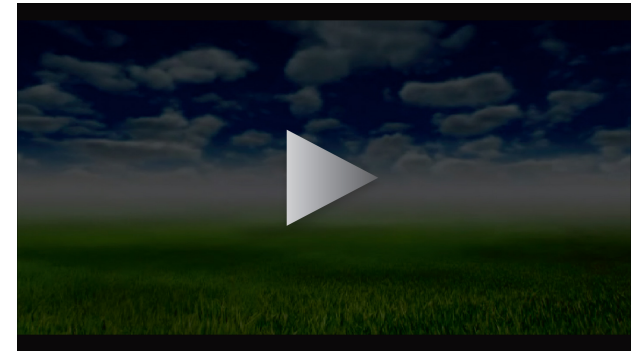


Current activities involve R&D led by the [Sun Grant Initiative](#), a network of land-grant universities, in partnership with industry, national laboratories, and the U.S. Department of Agriculture (USDA), to establish biomass feedstock productivity baselines. The 2010 regional bioenergy crop trials were located across the nation.



** scroll over for description*

Current efforts focus on logistics RD&D to develop and optimize cost-effective, integrated systems for harvesting, collecting, storing, preprocessing, handling, and transporting a range of [sustainable feedstocks](#), including agricultural residues, forest resources, dedicated energy crops, and algae. Additionally, the findings of the [U.S. Billion-Ton Update](#) report that the United States should be able to sustainably produce 1 billion tons of domestic biomass.



Click to view a video from Idaho National Laboratory about transforming biomass into feedstock for bioenergy. Right click the video to view in full screen mode.

A new uniform format advanced supply system design will achieve these properties by improving the capacity and efficiency of each feedstock logistics unit operation.

Current activities deal with the major RD&D challenges associated with developing a logistics system that is capable of supplying biorefineries with high-density, aerobically stable, and high-quality biomass material.

Click on the buttons below to view the logistics system concept:

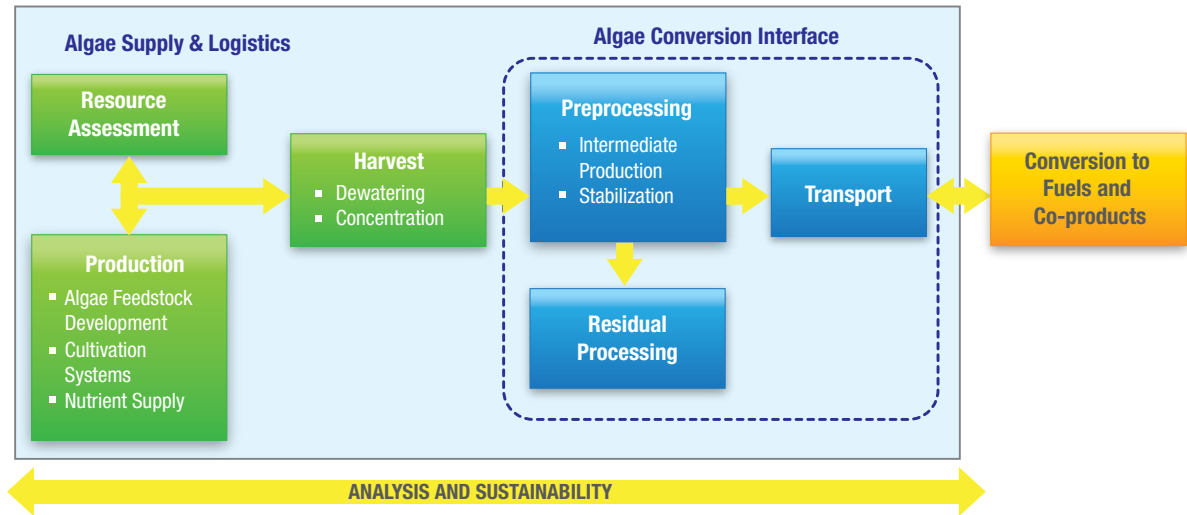
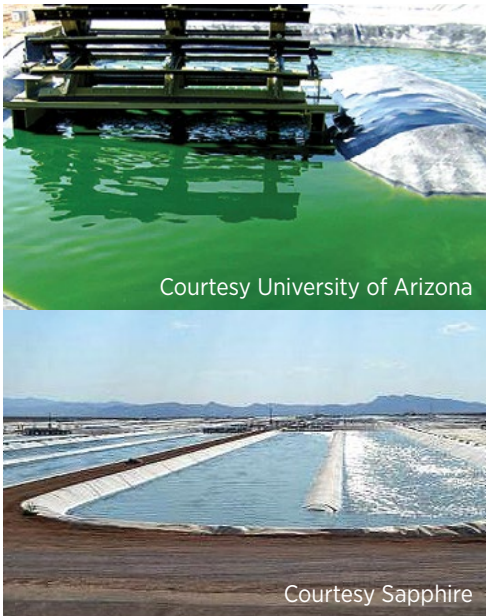


Existing Supply Systems	Depot Supply Systems
Nearer term focus	Longer term focus
Access to a niche or limited feedstock resource	Access to a broader resource
Based on a dry supply system design (field-dried feedstocks)	Allows higher moisture feedstocks into supply systems
Designed for a specific feedstock type (dry corn stover)	Design addresses multiple feedstock types



Activities include R&D on [algal feedstocks](#) and issues related to the sustainable production of algae-derived biofuels.

Benefits	Challenges
High productivity expands domestic biomass potential	Affordable and scalable algal biomass production
Adds value to unproductive or marginal lands	Feedstock production and crop protection
Ability to use waste and salt water	Energy-efficient harvesting and drying
Potential recycling of carbon dioxide	Extraction, conversion, and product purification
Production of a range of biofuel feedstocks suitable for diesel and aviation fuels	Siting and sustainability of resources



In 2012, the Algae Technology Area opened the Advancements in Sustainable Advancements in Algal Production funding opportunity and selected the ATP³ to receive \$15 million in DOE funds to manage a regional network of algae testbeds.

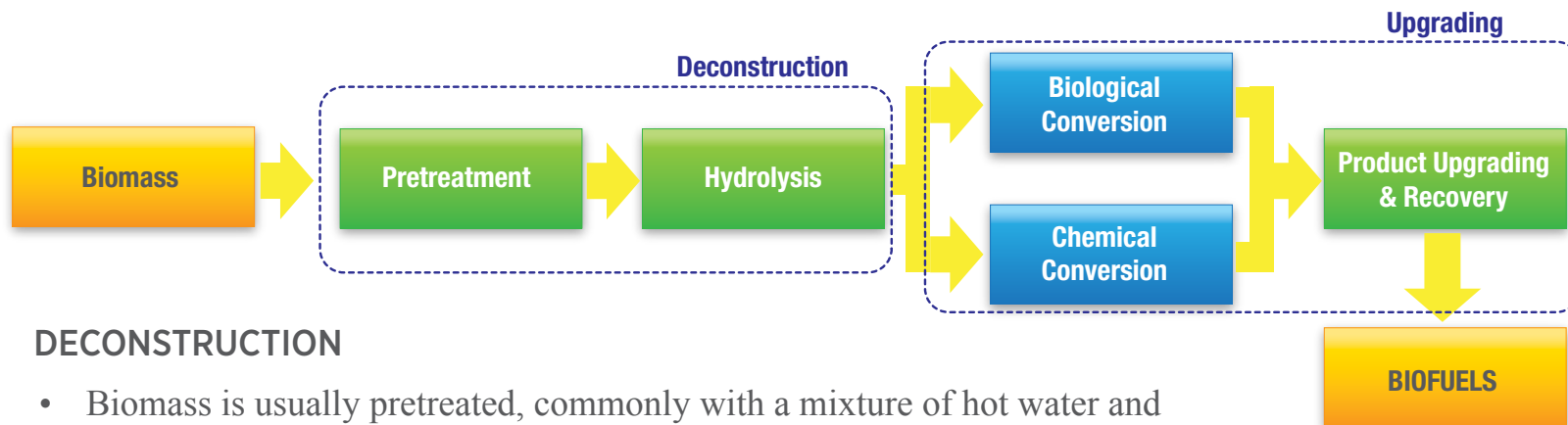


AzCATI Facility at ASU

The ATP³ project will establish a network of regional testbeds to empower knowledge creation and dissemination within the algal research community, accelerate innovation, and support growth of the nascent algal fuels industry. ATP³ sites will increase access to high-quality cultivation facilities, downstream process equipment, and analytical facilities, along with world renowned technical expertise and proactive management structure. ATP³ personnel will design, validate, and execute long-term cultivation trials to produce standardized data that will enable the comparison of promising production strains, algal culture systems, and processes at a meaningful scale across different regional, seasonal, environmental, and operational conditions.



RD&D projects are improving the [biochemical conversion](#) of cellulosic biomass to biofuels and chemicals. These processing routes entail breaking down biomass to make the carbohydrates available for conversion into sugars that microorganisms and other catalysts can use to create biofuels and bioproducts.

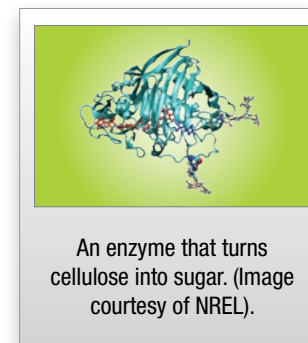


DECONSTRUCTION

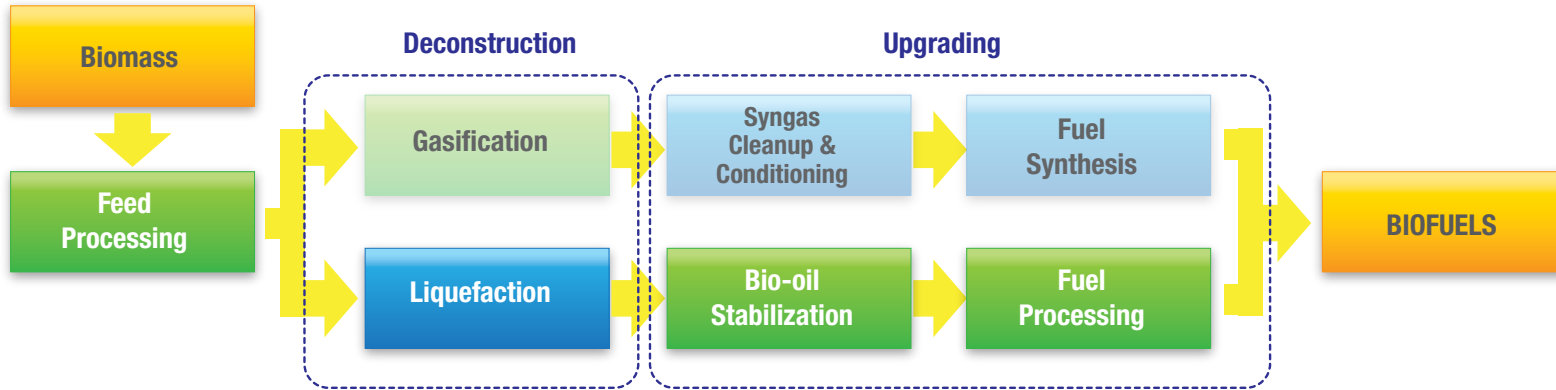
- Biomass is usually pretreated, commonly with a mixture of hot water and chemicals to make it amenable to hydrolysis.
- The pretreated biomass can be exposed to enzymes, which unlock and release (hydrolyze) the biomass sugars.
- Alternately, biomass can be completely deconstructed into sugar and carbohydrate streams using non-enzymatic processing technologies.

UPGRADING

- The sugar-rich media is then fed to organisms, like yeast and E. Coli, which transform the sugars into biofuels and chemicals.
- Chemical catalysis can also be employed to transform the sugars into biofuels and chemicals.



RD&D projects are improving the thermochemical conversion of cellulosic biomass. These processing routes use heat and chemistry to convert biomass into a liquid or gaseous intermediate, such as syngas or bio-oil. Customized processing of intermediates produces biopower or biofuels such as gasoline, diesel, and jet fuel.



DECONSTRUCTION

- Ground and dried biomass is heated in reactors to produce gas, solid, and liquid intermediates.
- Gasification efforts are being de-emphasized after 2012 demonstration.

UPGRADING

- Synthesis gas is cleaned (inorganics and CO₂ removal) and conditioned (tar reforming) and converted into biofuels and chemicals.
- Bio-oils are stabilized and upgraded (O₂ removal) to produce biofuels and chemicals.

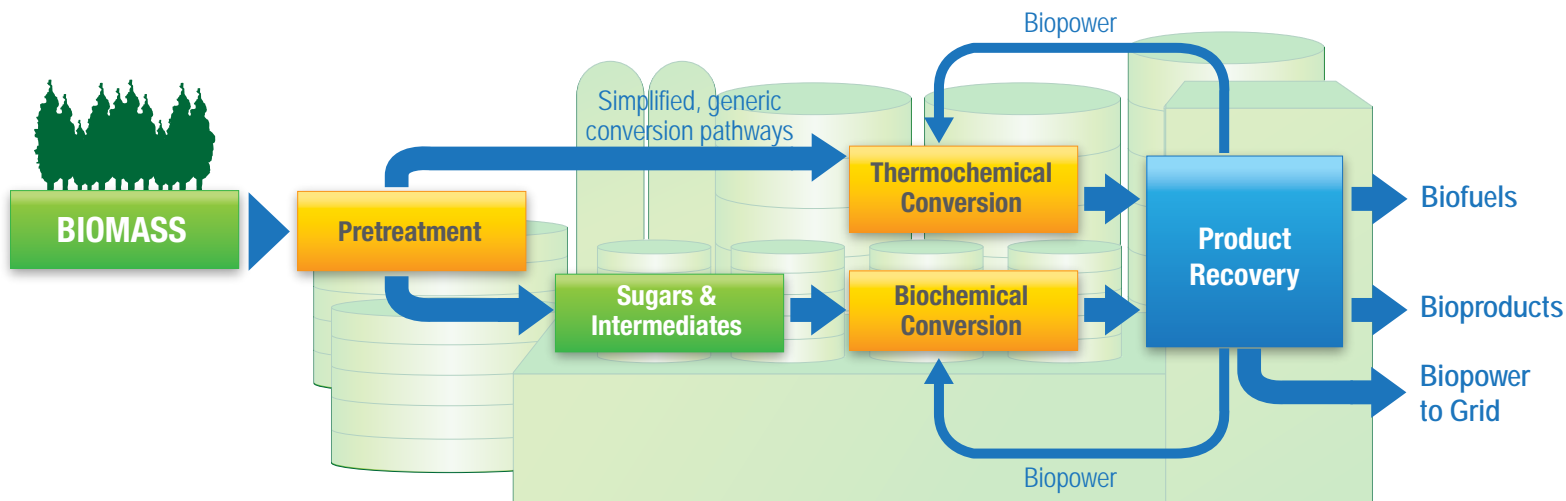


An F/A-18 Green Hornet Fighter plane operating on a 50/50 biofuels blend. (Photo courtesy of the U.S. Navy.)

Click the play arrows below to learn more about each bioenergy conversion route.



Current efforts include working through public-private, cost-sharing partnerships to address critical challenges of technology deployment for [integrated biorefineries](#) (IBRs). These biorefinery projects prove the viability of various feedstock and conversion pathways and reduce technical and financial risks by following a progression from pilot- to demonstration- to commercial-scale.



Biomass Key Challenges	Pretreatment Key Challenges	Conversion Key Challenges	Product Key Challenges
<ul style="list-style-type: none"> Reliable supply Consistent quality Affordable delivery 	<ul style="list-style-type: none"> Biomass feeding Biomass sizing and moisture Solids handling 	<ul style="list-style-type: none"> Products yields Construction materials Catalysts Fermentation organisms 	<ul style="list-style-type: none"> Separations Catalytic upgrading Recycle loops

** scroll over "Meeting the Challenges" for description*

Current IBR project investments will accelerate U.S. bioindustry growth and ramp up production of a range of biofuels and bioproducts.

Click image to view video of the groundbreaking



- DOE investment has enabled equity investments, initial public offers, venture capital funding, joint ventures, and joint development agreements.

A groundbreaking in March 2012 at the POET-DSM commercial IBR, Project LIBERTY. (Photo courtesy of POET-DSM Advanced Biofuels).

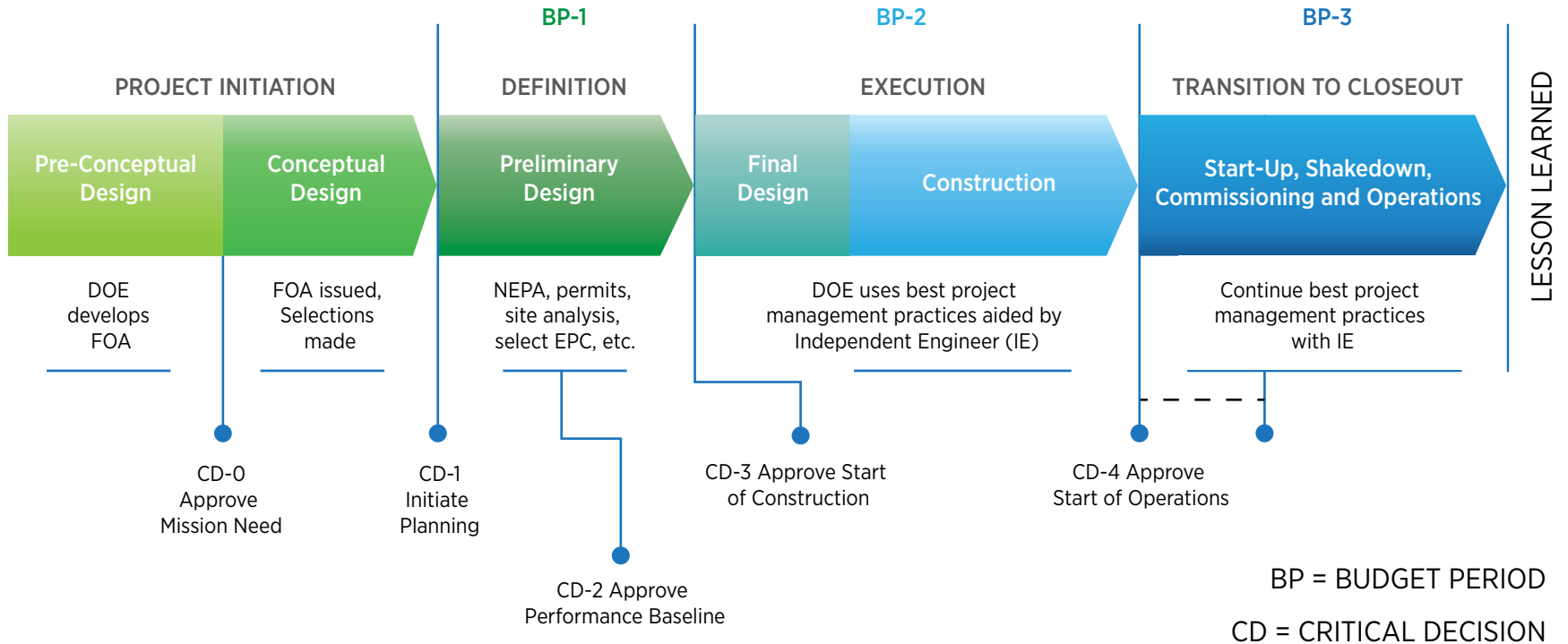
Current Status of the IBR Portfolio (as of July 2013)

A total of 33 IBR projects have been awarded to date:

- | | |
|--|---|
| <ul style="list-style-type: none">• 5 Complete (two still compiling final report)• 19 Active• 4 New Awards Under Negotiation• 5 Mutually Terminated | <ul style="list-style-type: none">• 16 produce Cellulosic Ethanol• 12 produce Renewable Hydrocarbons• 3 produce Algae Oil• 2 produce Bioproducts |
|--|---|



DOE's Key Role: Through investment in first-of-a-kind technologies at scale, reduce the risk such that the return on investment can be demonstrated as attractive to private investment, especially related to scaling up new technology. The process of bringing an IBR online takes time and careful planning. This framework is divided into four main sections that correlate contractual Budget Periods (BP) to the Critical Decision Points identified in the DOE Order.





Sapphire Energy algae demonstration plant



American Process Inc. integrated pilot plant



Logos/EdeniQ pilot plant

OF THE 19 ACTIVE IBR PROJECTS:

- 7 are in operations phase
- 2 semi-works plants are in commissioning phase
- 5 are in construction
- 2 still in Front-end Engineer Design (FEED) phase
- 3 trying to finalize financing

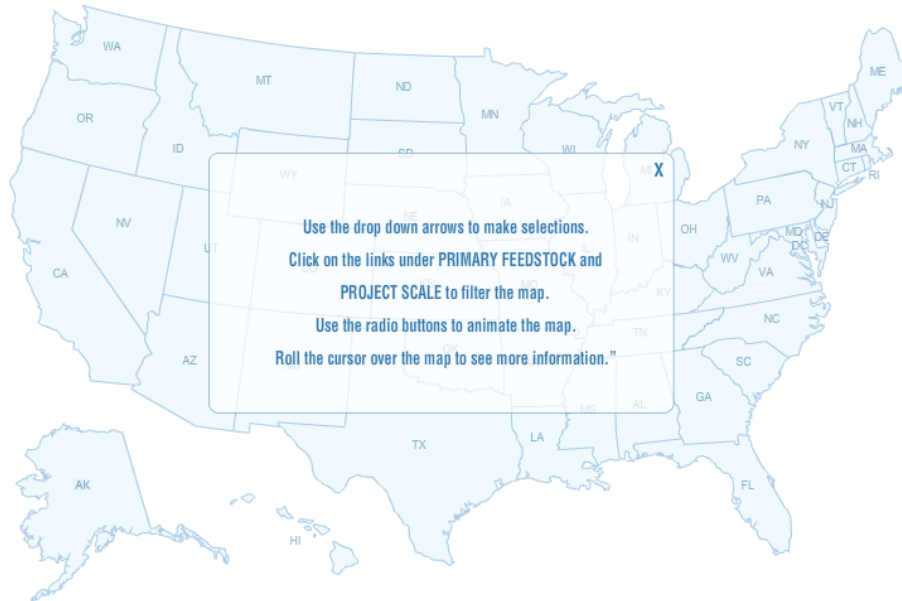
OF THE 19 ACTIVE AND 4 IN NEGOTIATION:

- 4 Commercial scale
- 5 Demonstration scale
- 14 Pilot scale

Bioenergy Technologies Office (BETO) *Integrated Biorefinery Platform*

IBR PROJECTS

Click on the project locations to see more information and locations are approximate



CONVERSION TECHNOLOGY

▼ Select one...

PRIMARY FEEDSTOCK *(Click to select)*

- Agricultural Residues
- Algae
- Energy Crops
- MSW
- Forest Resources
- All

● Grey markers signify projects that are no longer active with BETO

PRIMARY PRODUCT

▼ Select one...

PROJECT SCALE *(Click to select)*

- Research and Development
- Pilot
- Demonstration
- Commercial
- All

BETO BIOREFINERY INVESTMENTS BY STATE
U.S. Dollars, in millions



DISPLAY PROJECT NAME

Use the drop down menu to find projects specific to that selection. Use the radio button to shade states by selected category.

Mouse over map or dots to see related data. Click on the links under PROJECT SCALE and FEEDSTOCK to filter the map.

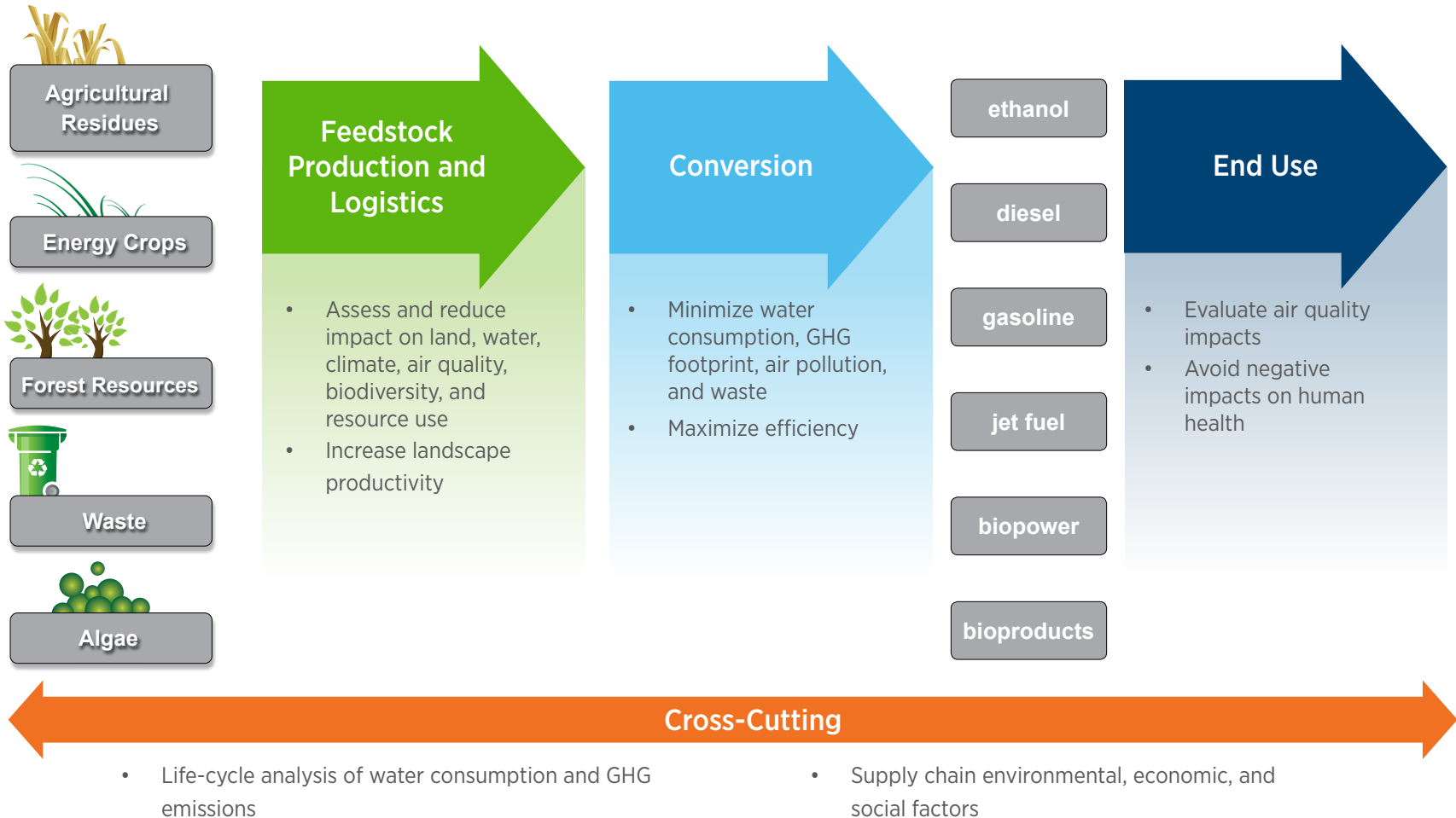




The Bioenergy Technologies Office Today

PROMOTING SUSTAINABILITY, LEVERAGING STRATEGIC ANALYSIS

BETO’s sustainability activities include identifying and addressing the challenges for sustainable bioenergy production through field trials, applied research, capacity building, modeling, and analysis.



Current activities involve identifying and addressing the challenges for [sustainable bioenergy production](#) by working with research partners.

Climate Changes and Air Quality



Ongoing analyses by the National Renewable Energy Laboratory are [assessing the potential](#) of advanced hydrocarbon and drop-in biofuels for GHG emissions reductions.

Soil Health and Agronomics



Argonne National Laboratory is [developing a model](#) to aid in the design of biomass production fields to integrate best soil management and landscape engineering practices.

Land Use



In conjunction with the national labs, the Office coordinates with the environmental and scientific communities to assess the [model assumptions](#); to assess available and needed global data sets; and to research needs.

Water Quantity and Quality



Oak Ridge and Argonne National Laboratories are [conducting watershed-level analyses](#) on the Arkansas-White-Red, Ohio, Tennessee, and Upper Mississippi River Basins.

Biological Diversity

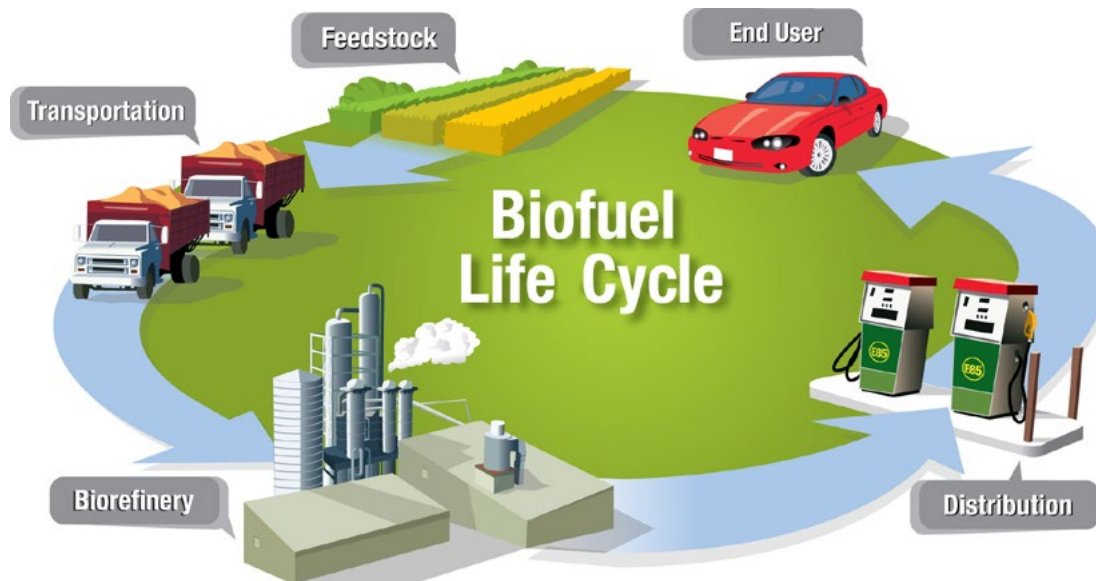


The Office has partnered with Conservation International to [identify critical habitat areas](#) where bioenergy crops should not be produced and to identify more suitable areas for bioenergy crops.

Current activities provide the analytical basis for Office planning and progress assessments, define and validate performance targets for biomass technologies and systems, review and evaluate external analyses and studies, and contribute engineering analyses.

[State-of-technology assessments](#) conducted by Idaho National Laboratory, National Renewable Energy Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, and Sandia National Laboratories

[Land-use change model development](#) conducted by Argonne National Laboratory, National Renewable Energy Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Purdue University, and the University of Minnesota



GIS-based [assessment of algal resource potential](#) conducted by Pacific Northwest National Laboratory

Well-to-wheels analysis and expansion of [Greenhouse Gases Regulated Emissions and Energy Use in Transportation \(GREET\) model](#) for emerging biofuels production pathways conducted by Argonne National Laboratory

Current efforts provide context and justification for decisions at all levels by establishing the basis of quantitative metrics, tracking progress towards goals, and informing portfolio planning management.



**Annual internal reviews of all IBR projects*

In 2012, eight [technology pathways](#) to hydrocarbon biofuels were selected based on the following criteria:

- Feasibility of achieving cost goal of \$3/gal
- Near/mid/long-term techno-economic potential
- Potential national impact
- Feedstock availability/flexibility
- Data availability across the full pathway
- Co-product economics
- Environmental sustainability.

TECHNOLOGY PATHWAYS

[Biological Conversion of Sugars to Hydrocarbons](#)

[Catalytic Upgrading of Sugars to Hydrocarbons](#)

[Ex-Situ Catalytic Pyrolysis](#)

[In-Situ Catalytic Pyrolysis](#)

[Fast Pyrolysis and Upgrading](#)

[Syngas to Mixed Alcohols to Hydrocarbons](#)

[Whole Algae Hydrothermal Liquefaction](#)

[Algal Lipid Extraction Upgrading to Hydrocarbons](#)

Next Steps: Identify cost goals and technical targets and develop design case reports for each pathway.

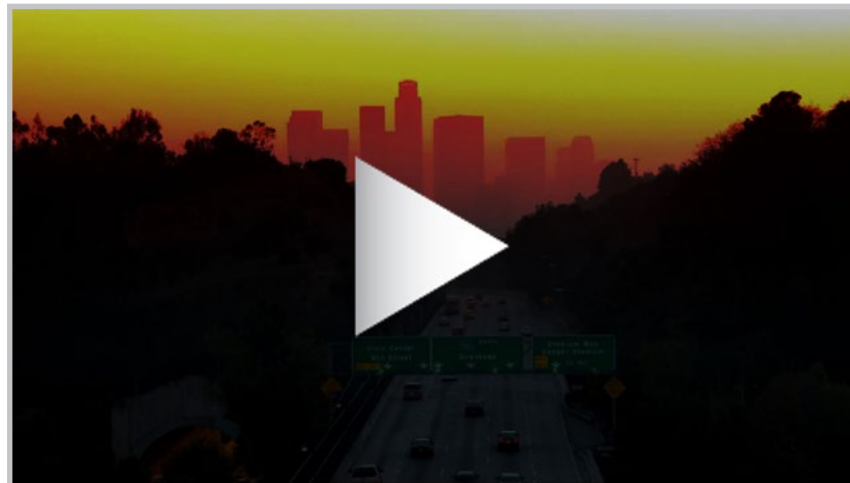
Current efforts facilitate informed decision making by providing a means to synthesize, analyze, and visualize vast amounts of information in a spatially integrated manner.



BIOENERGY KNOWLEDGE DISCOVERY FRAMEWORK

U.S. DEPARTMENT OF ENERGY

The [Bioenergy KDF](#) is an online collaboration and geospatial analysis toolkit that allows researchers, policymakers, and industry to explore and engage the latest bioenergy research. The KDF harnesses Web 2.0 and social networking technologies to build a collective knowledge system that facilitates collaborative production, integration, and analysis of bioenergy related information.



Click the play arrow to view a demonstration of the KDF. To view additional demonstrations of the KDF, please click to the next page.

Connect with the Bioenergy KDF





BIOENERGY

KNOWLEDGE DISCOVERY FRAMEWORK

U.S. DEPARTMENT OF ENERGY



Watch these short videos demonstrating the [U.S. Billion-Ton Update](#) and routing tools in the Bioenergy KDF.

COMING SOON: Look for enhancements to the KDF's spatial data analysis tools, additional data sets, and user interface improvements. Specifically,

- New field trial data
- Algae biomass visualization tool
- Web links to the Biomass Characterization Library
- New Legislative Library chronicling bioenergy legislation in Congress.

Connect with the Bioenergy KDF





BIOENERGY

KNOWLEDGE DISCOVERY FRAMEWORK

U.S. DEPARTMENT OF ENERGY



Watch these short videos demonstrating the [U.S. Billion-Ton Update](#) and routing tools in the Bioenergy KDF.

Connect with the Bioenergy KDF





The Bioenergy Technologies Office Today

COORDINATING WITH A NETWORK OF STAKEHOLDERS

- Share and learn from valuable insights and perspectives that can help identify the most critical challenges
- Better define and employ strategies with partners from industry, national labs, academia, and non-profit organizations to overcome challenges in effectively deploying biofuels, biopower, and bioproducts.

Bioenergy Technologies Office



PROJECT PERFORMERS

- National Laboratories
- Industry, Academia, and Nonprofit
- State and Local Entities

DOE INTERNAL COLLABORATION

- Office of Advanced Research Projects-Energy (ARPA-E)
- Office of Science (OS)
- Other Energy Efficiency and Renewable Energy Program Offices

FEDERAL COLLABORATION

Biomass Research & Development Board, including offices and programs within the following:

- Department of Defense (DOD)
- Department of the Interior (DOI)
- Department of Transportation (DOT)
- Environmental Protection Agency (EPA)
- National Aeronautics and Space Administration (NASA)
- National Science Foundation (NSF)
- Office of Science and Technology Policy (OSTP)
- U.S. Department of Agriculture (USDA)

NON-FEDERAL COORDINATION AND COLLABORATION

- Biomass R&D Technical Advisory Committee
- State, Local, and International Agencies and Research Institutions
- Trade and Professional Associations
- Non-governmental Organizations
- Investment and Financial Communities

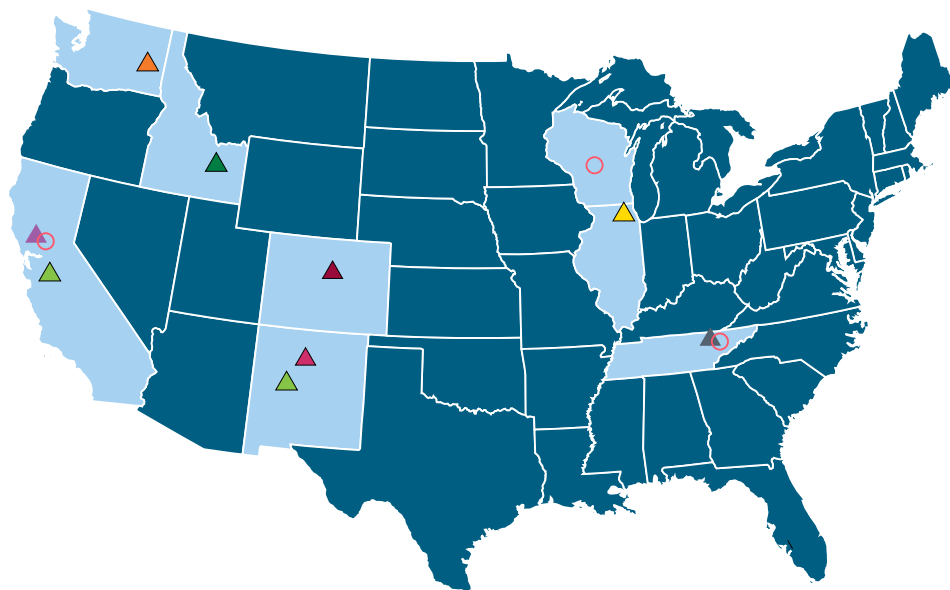
PROJECT PERFORMERS



PROJECT PERFORMERS



PROJECT PERFORMERS: DEPARTMENT OF ENERGY NATIONAL LABORATORIES AND RESEARCH CENTERS



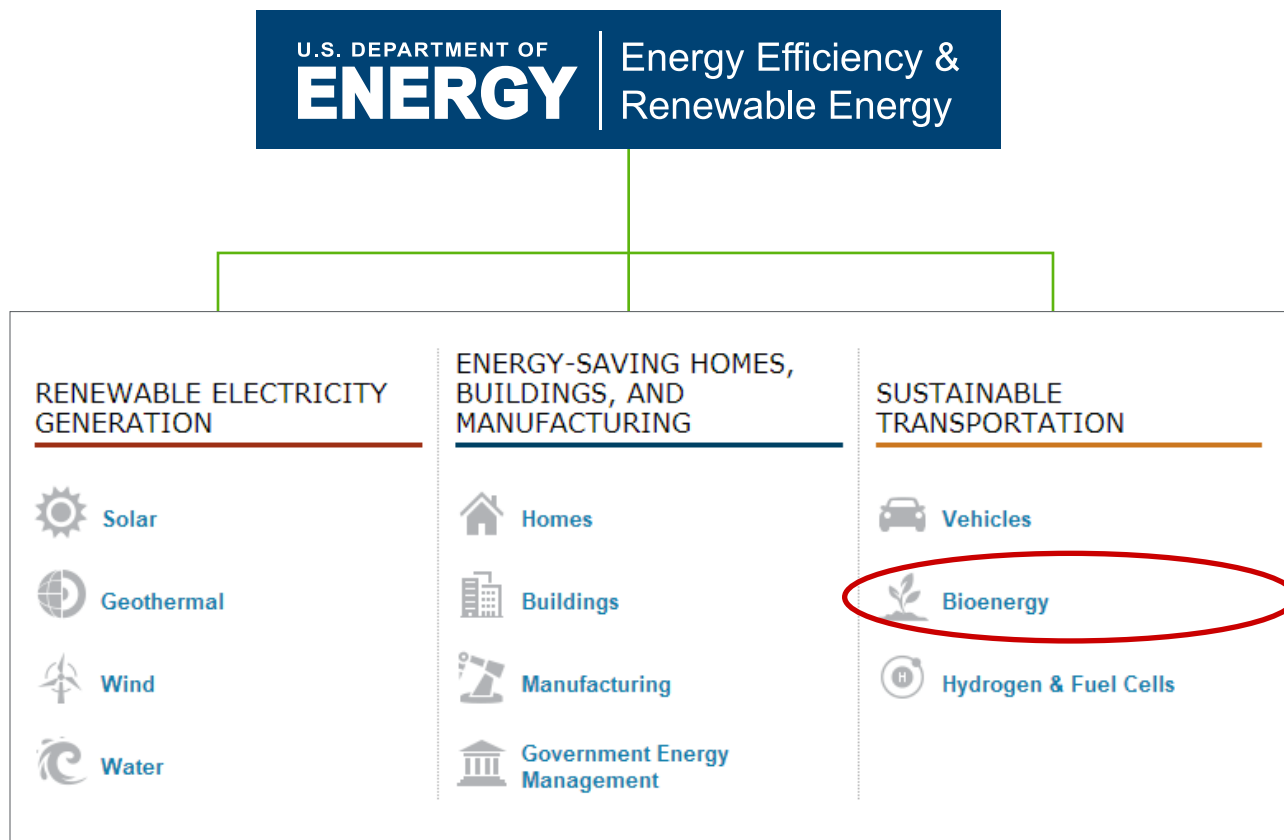
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| ▲ Argonne National Laboratory | ▲ Oak Ridge National Laboratory |
| ▲ Idaho National Laboratory | ○ Office of Science Bioenergy Centers |
| ▲ Lawrence Berkeley National Laboratories | ○ <i>Great Lakes, Madison, WI</i> |
| ▲ Los Alamos National Laboratory | ○ <i>Joint Bioenergy Institute, Berkeley, CA</i> |
| ▲ National Renewable Energy Laboratory | ○ <i>Bioenergy Science Center, Oak Ridge, TN</i> |
| | ▲ Pacific Northwest National Laboratory |
| | ▲ Sandia National Laboratories |

DOE national laboratories' RD&D activities are fully integrated in the Office portfolio.

The Bioenergy Technologies Office works with national laboratories and the Office of Science Bioenergy Research Centers to:

- Reduce common biofuels R&D barriers
- Complete techno-economic, life cycle, sustainability, and other analytical work
- Partner with industry and universities on bioenergy technology demonstrations.

While Bioenergy Research Centers' lead institutions are identified on the map, the centers work with numerous partner institutions across the United States.



The Vehicle Technologies Office partners with the Bioenergy Technologies Office to support fuel characterization and combustion testing for novel biofuels and biofuel blends, including work with [Clean Cities](#).

The Bioenergy Technologies Office also works with the Advanced Manufacturing Office on the [Clean Energy Manufacturing Initiative](#) in support of Carbon Fiber production from biomass.

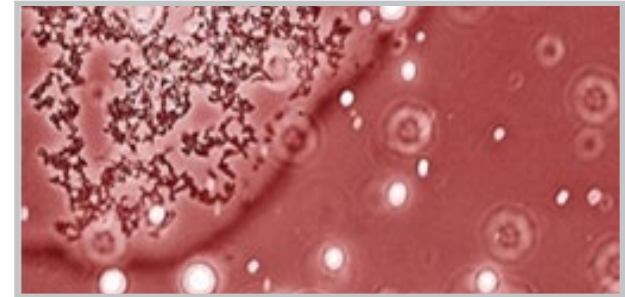
OFFICE OF SCIENCE

Office of Biological and Environmental Research and Office of Basic Energy Sciences

- Regularly coordinate on fundamental and applied biomass and biofuel research activities
- Partner in supporting Biomass R&D Board
- Share information about new partnerships, major research efforts at Bioenergy Research Centers, conversion- and feedstock-related activities and user facilities, and possible joint funding requests

ADVANCED RESEARCH PROJECTS AGENCY-ENERGY (ARPA-E)

- Regularly coordinate by sharing information on relevant projects, especially those from ARPA-E's [PETRO](#) (Plants Engineered to Replace Oil) biomass-based fuels and [Electrofuels](#) Programs
- Complementary missions to fund projects that will:
 - Develop transformational technologies that reduce the nation's dependence on foreign energy imports
 - Reduce U.S. energy-related emissions, including GHGs
 - Ensure the United States maintains its leadership in developing and deploying advanced energy technologies



Engineered E. coli cells secreting hydrocarbons with similar fuel characteristics to gasoline. In this optical image, cells are shown naturally sequestering themselves from secreted “oils,” thereby facilitating fuel recovery. Image by Eric Steen, Joint BioEnergy Institute.



PETRO projects include research on Sorghum and Camelina crops to supply the transportation sector with cost-competitive biofuels which do not affect the U.S. food supply.

PRIMARY INTERAGENCY PARTNERS

[Biomass Research and Development Board](#)

Coordinates federal government biofuels and biobased products efforts

Biomass R&D Resources:

[TAC Library](#) | [Biomass R&D Timeline](#)



NON-FEDERAL COORDINATION, COLLABORATION, AND PARTNERING

[Biomass R&D Technical Advisory Committee \(TAC\)](#)

State, local, and international agencies and research institutions

Trade and professional associations

Nongovernmental organizations

The Office Communications Team conducts strategic outreach by promoting the benefits of sustainable biomass and biofuels to the public and key stakeholders and highlighting the role bioenergy plays in the creation of green jobs and energy security.

OFFICE RECOGNITION



Public Recognition – The subscribers of *Biofuels Digest* selected the U.S. Department of Energy as number 5 of 40 in their list of “Hottest Partners in Bioenergy and Bio-Based Materials ” and 4 BETO staff members made Biofuels Digest’s “Top 100 People in Bioenergy.”



Congressional Recognition – The House Appropriations Committee declared that BETO’s research into next-generation biofuels has the potential to “dramatically” lower the impact of future high gas prices on Americans.

Web Efforts: Maintaining an easily accessible portal for sharing the most relevant and up-to-date materials.

New and Social Media: Reaching out to new demographics and engaging in two-way conversations with audiences instantaneously.

Publications: Providing tangible and in-depth descriptions and accounts of technologies, activities, and accomplishments.

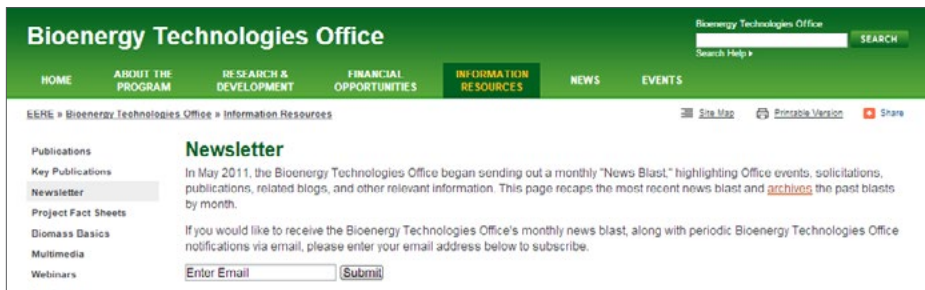
Presentations: Producing audience-specific overviews that allow BETO staff to highlight programmatic activities at events.

Multimedia: Creating dynamic and interactive communications products that make advanced research topics easily digestible and visually engaging.

Press Releases: Promoting high-level and timely information about important BETO topics to increase visibility.

Webinars Series: Enabling remote participants to take part in program discussions.

Sign up for the BETO Newsletter!



The screenshot shows the Bioenergy Technologies Office website. The header includes navigation links: HOME, ABOUT THE PROGRAM, RESEARCH & DEVELOPMENT, FINANCIAL OPPORTUNITIES, INFORMATION RESOURCES (highlighted), NEWS, and EVENTS. A search bar is located in the top right. The main content area features a 'Newsletter' section with the following text: 'In May 2011, the Bioenergy Technologies Office began sending out a monthly "News Blast," highlighting Office events, solicitations, publications, related blogs, and other relevant information. This page recaps the most recent news blast and [archive](#) the past blasts by month. If you would like to receive the Bioenergy Technologies Office's monthly news blast, along with periodic Bioenergy Technologies Office notifications via email, please enter your email address below to subscribe.' Below the text is a form with an 'Enter Email' input field and a 'Submit' button.

Follow BETO on Social Media!





The Bioenergy Technologies Office Today

PUBLICATIONS AND INNOVATIONS

Project and Program Peer Review meetings are biennial reviews that provide DOE an opportunity to obtain meaningful feedback from stakeholders on current federally funded projects. The information is useful for the Bioenergy Technologies Office to consider future funding and portfolio balance decisions. This is also an opportunity for interested stakeholders to learn about state-of-the-art biomass energy technology development activities.

Reports from 2011 Platform and Program Peer Reviews are available to the public and can be found by clicking on the titles to the right.

Information on the 2013 Peer Review including project presentations can be found at https://www2.eere.energy.gov/biomass/peer_review2013/Portal/

Integrated Biorefineries Platform	➔
Infrastructure Activities	➔
Analysis Platform and Sustainability Activities	➔
Feedstock Platform	➔
Algae R&D Activities	➔
Thermochemical Platform	➔
Biochemical Platform	➔
Program Peer Review Meeting	➔



BETO develops a number of publications that outline, highlight, and report on its strategy for research, development, and deployment of various biomass technologies.



[Replacing the Whole Barrel to Reduce U.S. Dependence on Oil](#)
May 2013



[Feedstock Supply and Logistics: Biomass as a Commodity](#)
May 2013



[Social Aspects of Bioenergy Sustainability Workshop Report](#)
May 2013



[8 Technology Pathway One-Pagers](#)
November 2012



[Bioenergy Technologies Office Multi-Year Program Plan](#)
May 2013



[Renewable Diesel from Algal Lipids](#)
June 2012



[Technical Information Exchange on Pyrolysis Oil](#)
May 2012



[U.S. Billion-Ton Update](#)
August 2011

Additional Office publications can be found at
[Bioenergy Technologies Office Publication and Product Library.](#)

[READ ABOUT EERE SUCCESSSES](#)

The EERE Successes page highlights the positive impact of its work with businesses, industry partners, universities, research labs, and other entities to increase the use and effectiveness of affordable renewable energy and energy efficiency technologies.

EERE Successes

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Solar
Water
Wind
Energy Efficiency
Buildings
Federal Energy Management

This collection of the Office of Energy Efficiency and Renewable Energy's (EERE) successes highlights the positive impact of its work with businesses, industry partners, universities, research labs, and other entities to increase the use and effectiveness of affordable renewable energy and energy efficiency technologies. EERE's successes are organized by category into milestones, community-focused successes, and research successes. Browse successes by topic below.

EERE Milestones and Awards

Department of Energy Delivers on R&D Targets around Cellulosic Ethanol
EERE Bioenergy Technologies Office demonstrates a broad series of R&D advancements.
[Read the full story](#)

EERE in Your Communities

Alaska Gateway School District Adopts Combined Heat and Power
Tok School's use of a biomass combined heat and power system is helping the school to save on energy costs.
[Read the full story](#)

[READ ABOUT EERE WORK IN YOUR STATE](#)

The EERE State Summaries educate policymakers and the public about EERE investments and their positive impacts in individual states and across the country.

Clean Energy in My State

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State Summaries: A Snapshot of Our Work in States
The EERE State Summaries educate policymakers and the public about EERE investments and their positive impacts in individual states and across the country. The EERE portfolio consists primarily of competitively selected projects with the largest potential to help achieve national economic, strategic, environmental, and energy goals. EERE helps create the United States' clean energy economy today, developing and delivering innovative, market-driven solutions for the following:
• Sustainable transportation

FEATURES

[Learn about EERE's Successes](#)

Quick Links to States
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Visit Energy.gov and the BETO Blog for regularly posted articles written by BETO staff about developments and events within the biomass industry and community.



[Subscribe](#) to the blog to receive updates when new posts are published.

Thank you for taking the time to learn about the Bioenergy Technologies Office! Please feel free to [contact](#) the Office with any remaining questions you may have.