U.S. DEPARTMENT OF ENERGY

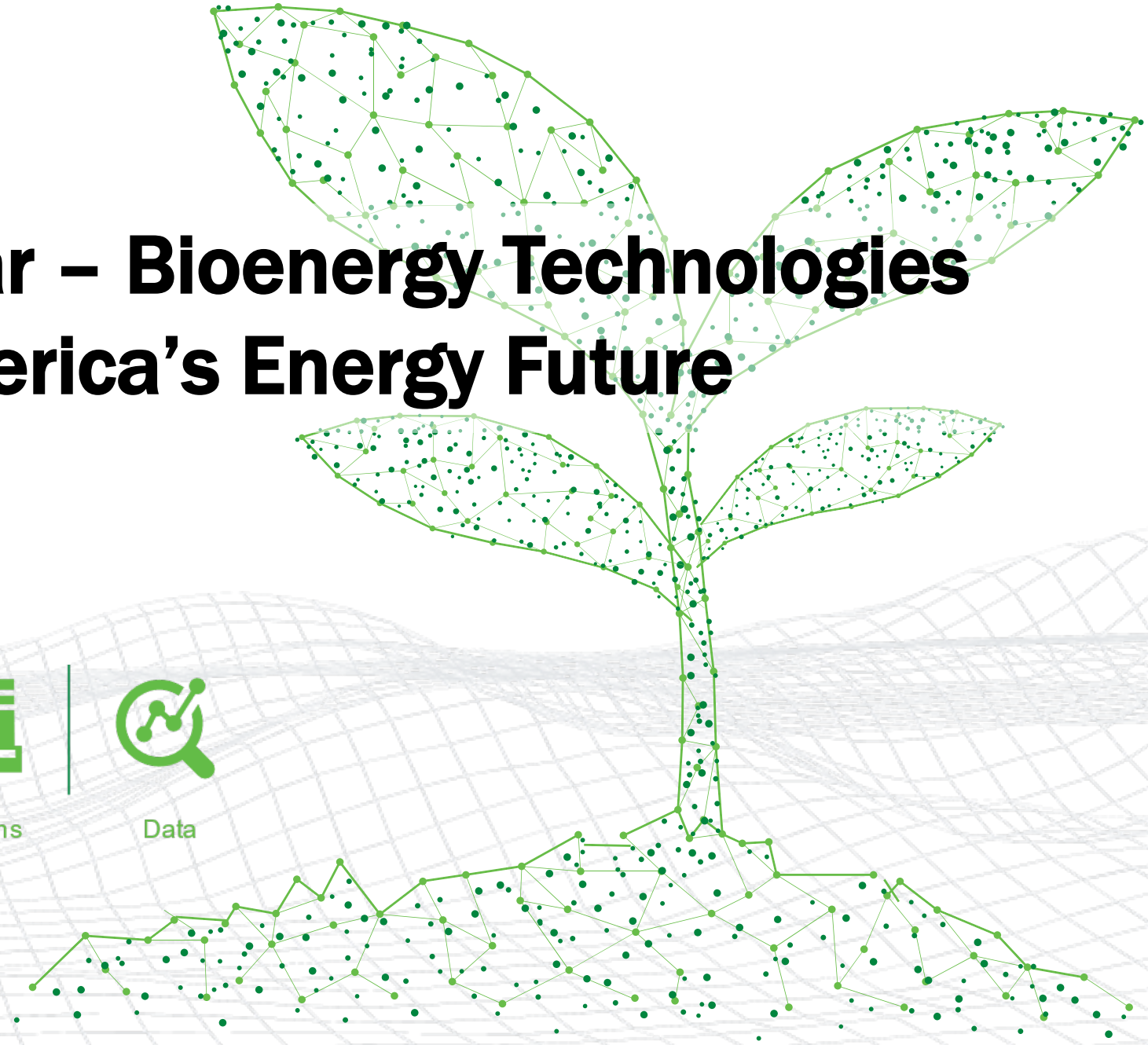
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Earth Week Webinar – Bioenergy Technologies Office: Growing America's Energy Future

Dr. Valerie Sarisky-Reed, Acting Director, BETO

Dr. Jay Fitzgerald, Chief Scientist, BETO

Dr. Reyhaneh Shenassa, Chief Engineer, BETO



April 21, 2021

Webinar Housekeeping

- Attendees will be in listen-only mode
- Audio connection options:
  - Computer audio
  - Dial in through your phone (best connection)
- Technical difficulties? Contact us through the chat section, lower right of your screen
- Polls will be conducted today
- Today's webinar will be recorded and posted to "BETO Webinars": energy.gov/eere/bioenergy/beto-webinars

Today's Agenda

I. Bioenergy Technologies Office (BETO) Overview

II. Meet BETO Leadership

III. Discussion with BETO Leadership

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BETO Leadership Presenting Today

Dr. Valerie Sarisky-Reed
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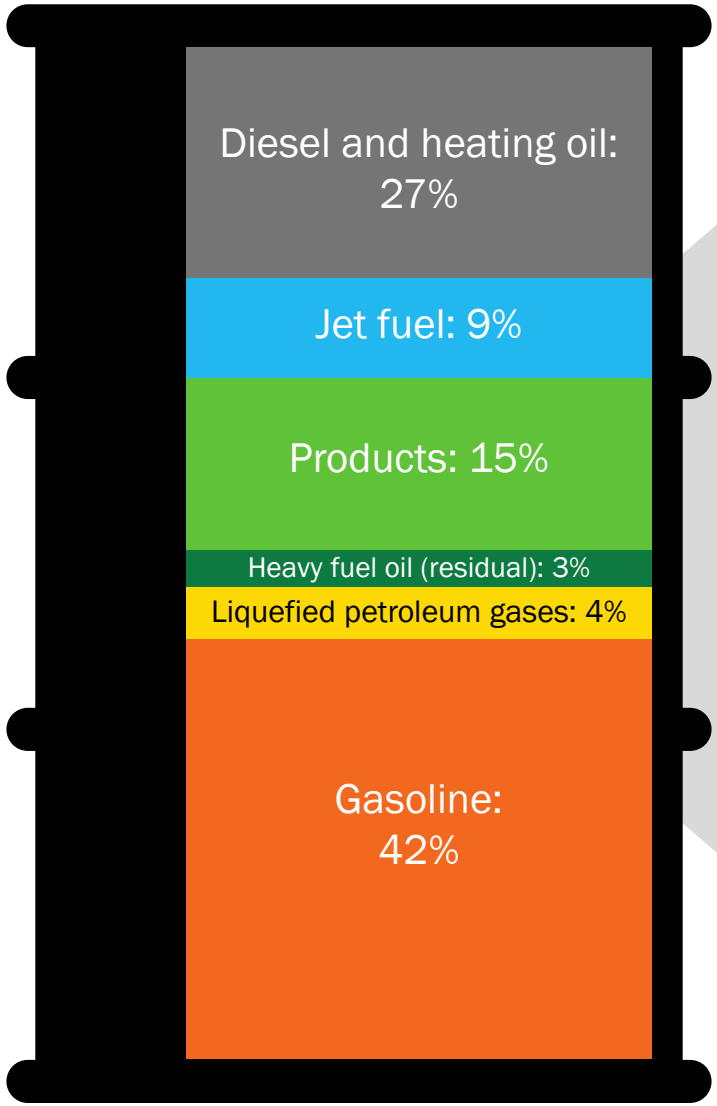
Our Economy Is Built on Carbon



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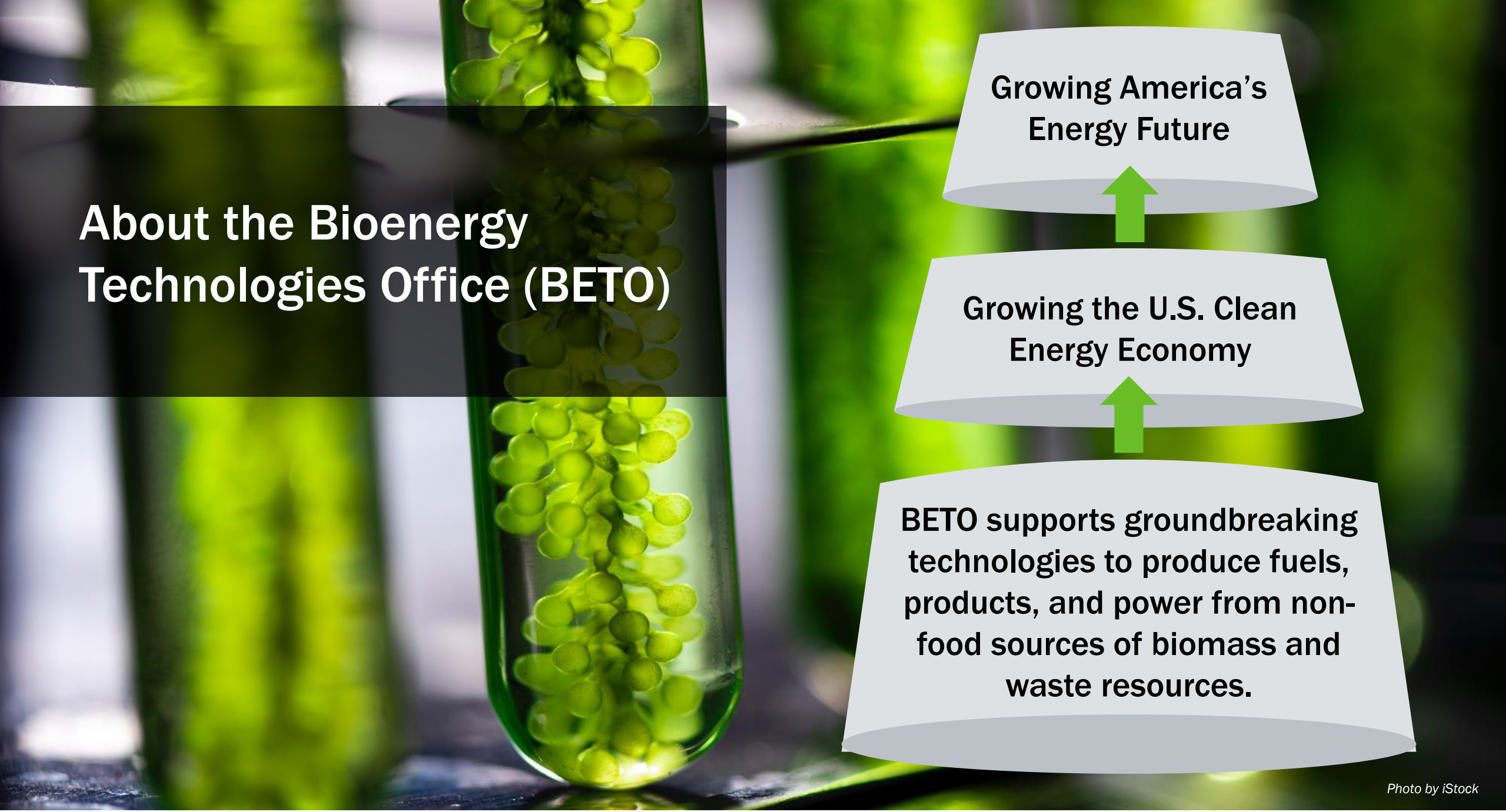
Bioenergy Delivers Unique Value

Photo by iStock

BETO research and development (R&D) enables:

- National security
- Jobs
- Economic growth
- Investment
- Competitiveness
- Resources
- Quality of life

About the Bioenergy Technologies Office (BETO)



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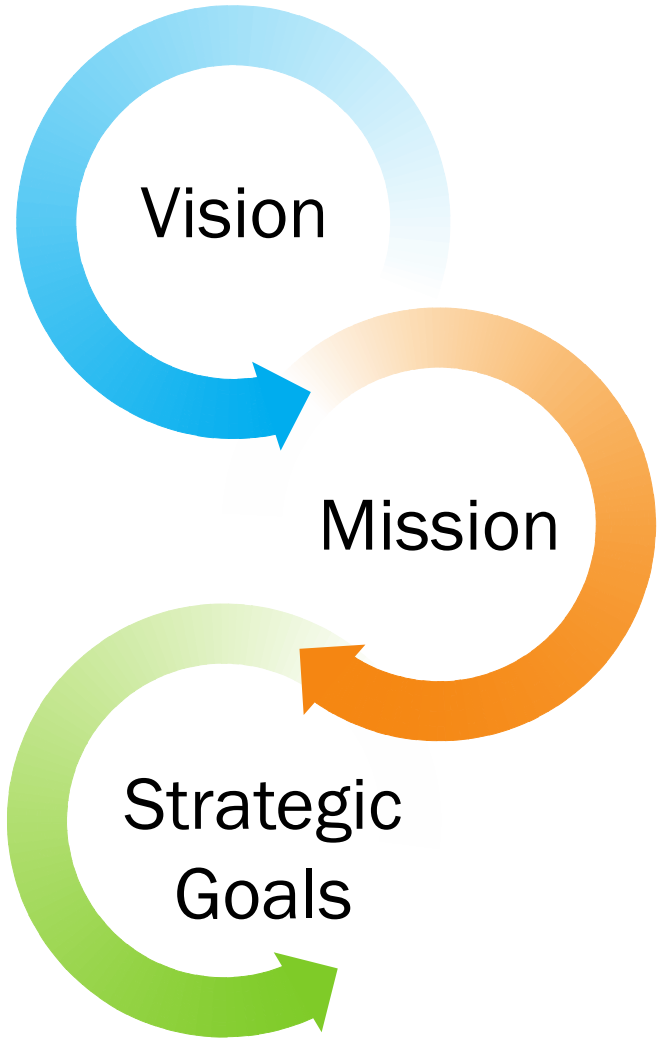
BETO Mission, Vision, and Strategic Goals



Vision

A thriving and sustainable bioeconomy fueled by innovative technologies

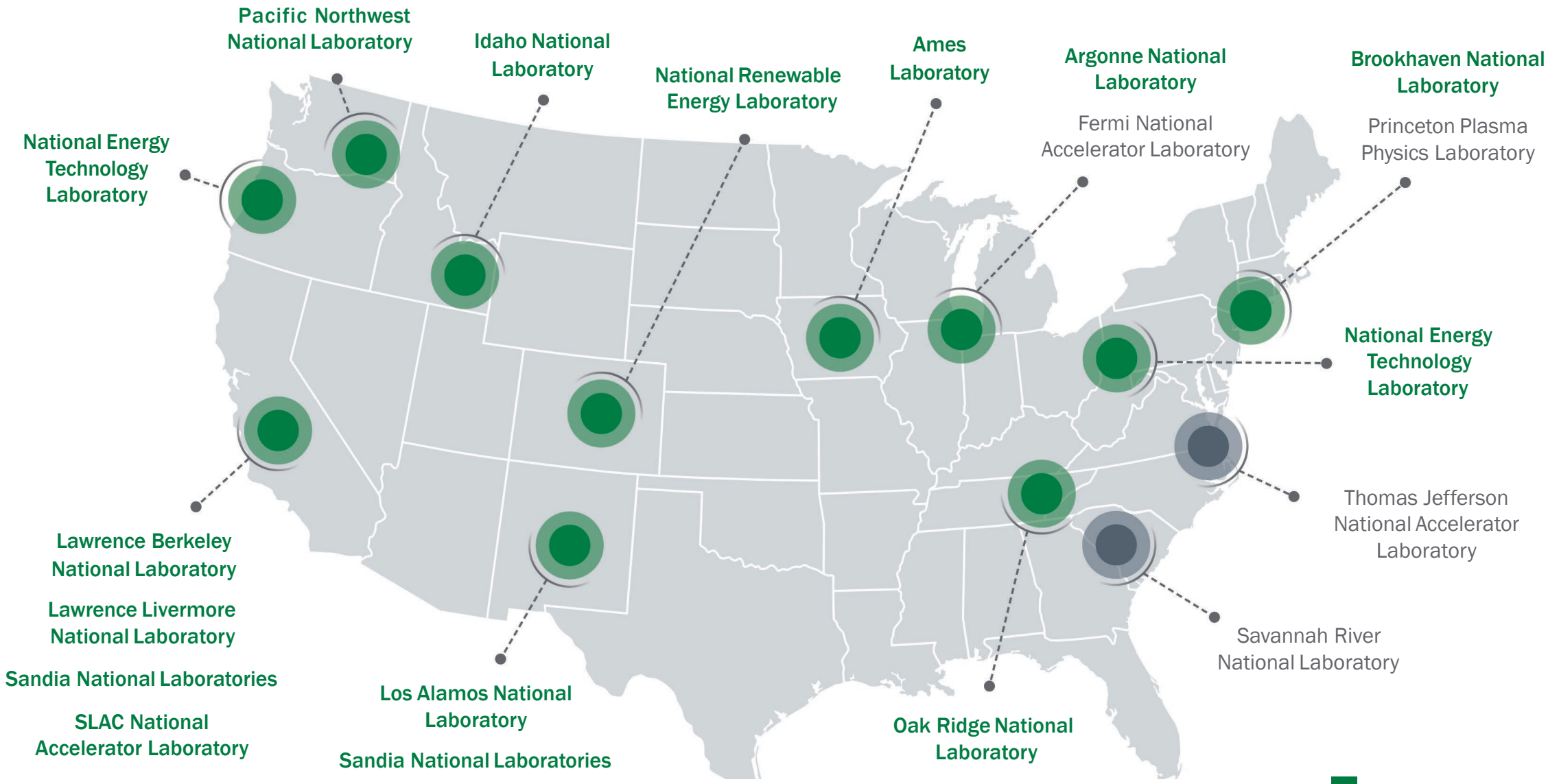
Mission

Developing transformative and revolutionary sustainable bioenergy and coproduct technologies for a prosperous nation

Strategic Goals

Develop industrially relevant technologies to enable domestically produced biofuels, biopower, and coproducts

DOE National Laboratories



BETO Critical Program Areas

Production and Harvesting

Feedstock Technologies

Lower cost, improve quality, and increase types of renewable carbon feedstock intermediates available for conversion.

Advanced Algal Systems

Increase algae productivity through algal strain improvement and efficient cultivation.

Conversion and Refining

Conversion Technologies

Reduce costs of deconstructing feedstock into intermediate products (such as sugars, intermediate chemicals, bio-oils, or gaseous mixtures)

Upgrading intermediates into liquid biofuels, bioproducts, and biopower

Distribution and End Use

Systems Development and Integration

Systems research to combine tech components, unit operations, or subsystems developed by R&D programs into integrated processes.

Integrated processes tested (pre-pilot to demo scale) to identify further R&D needs or verify readiness for scale-up and commercialization.

Crosscutting

Data, Modeling, and Analysis

Track technology progress and identify opportunities and challenges related to economic/environmental impact of advanced bioenergy systems.

BETO Leadership Presenting Today

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Acting Director, BETO

Dr. Jay Fitzgerald
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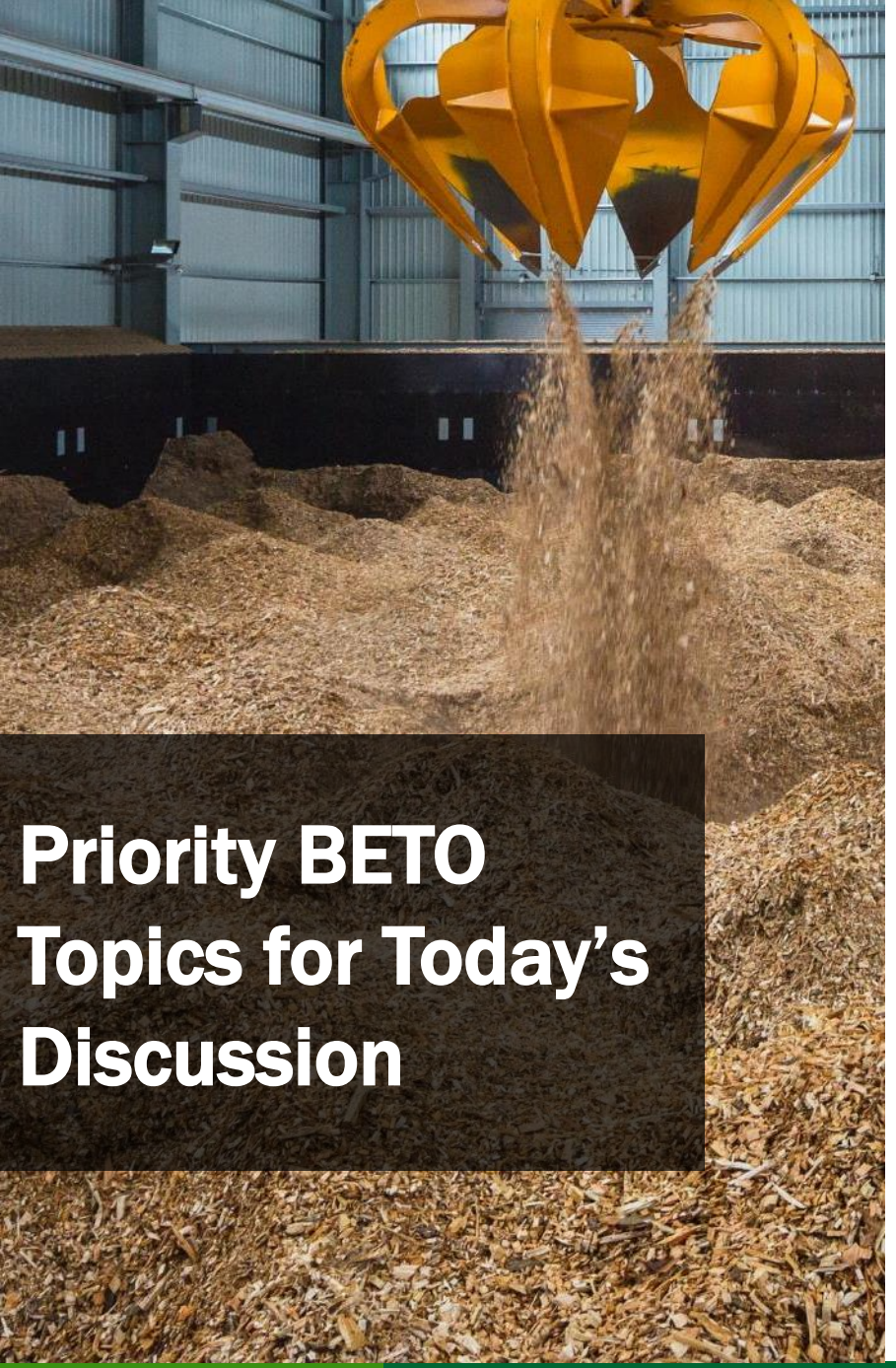
Chief Engineer, BETO



Priority BETO Topics for Today's Discussion

- Advancements in aviation and marine biofuels
- Plastics recycling initiatives
- Engaging farmers as clean energy partners
- Waste-to-energy efforts
- CO_2 utilization

Discussion: Advancements in Aviation and Marine Biofuels

Questions for Leadership:

- Why is BETO specifically targeting aviation and marine fuels?
- What makes aviation fuel different from fuels that we are more familiar with like gasoline and diesel?

Further Reading:

- BETO's Aviation Fuels website
- Sustainable Aviation Fuel: Review of Technical Pathways Report

Poll:
What percentage of fuel is used for aviation in the United States?

A. 6%
B. 9%
C. 15%
D. 25%
E. None of the above

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Discussion: Plastics Recycling Initiatives

Questions for Leadership:

- What is plastic waste made from and why is it like biomass and other carbon-based wastes?
- We know that BETO is researching the redesign of plastics for superior end-of-life properties. What does that mean and how will it help to address the problem of plastic waste?

Further Reading:

- Plastics Innovation Challenge website
- Plastics for a Circular Economy Workshop: Summary Report

Poll:
What percentage of plastics gets recycled in the United States?

A. 5%
B. 9%
C. 15%
D. 25%
E. None of the above

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Discussion: Engaging Farmers as Clean Energy Partners

Questions for Leadership:

How can farmers grow crops to help combat climate change by fixing carbon in the soil? Are some crops better than others at fixing carbon and why?

Further Reading:

- 2016 Billion-Ton Report
- Bioenergykdf.net

Poll:

How many tons of sustainable biomass is the United States capable of producing on a yearly basis according to DOE estimates?

A. 1 million
B. 100 million
C. 500 million
D. 1 billion
E. None of the above

Photo from Dan Myers, unsplash.com

Discussion: Waste-to-Energy Efforts

Question for Leadership:

- What do wet waste, solid waste, and gaseous waste streams have in common that make them useful feedstocks for bioenergy?

Further Reading:

- BETO's Waste-to-energy website
- Advancing the Bioeconomy: From Waste to Conversion-Ready Feedstocks Workshop Summary Report

Poll:
Which waste feedstocks can be transformed into fuels and chemicals using BETO technologies?

A. Municipal solid waste (paper, plastic, food scraps)
B. Manure
C. Fats, oils, and greases
D. Steel mill off-gas
E. All of the above

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Discussion: CO_2 Utilization

Questions for Leadership:

- Why is BETO interested in CO_2 conversion to biofuels and bioproducts?
- What are the advantages and disadvantages of using CO_2 as a feedstock versus biomass?

Further Reading:

- BETO's CO_2 Utilization website
- Rewiring the Carbon Economy: Engineered Carbon Reduction Listening Day Summary Report

Poll:

What is the concentration of CO_2 in fermentation off-gas from an ethanol biorefinery?

A. 410 parts per million
B. 10%
C. 33%
D. 99%
E. None of the above

Photo from X Y, unsplash.com

BETO Funding Opportunities

U.S. Department of Energy announces $61 Million for Biofuels Research to Reduce Transportation Emissions

- DE-FOA-0002396: FY21 BETO Scale-Up and Conversion
- Concept Papers due April 30, 2021
- Full applications due June 21, 2021

Apply:

- eere-exchange.energy.gov
- grants.gov

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Thank you!

Questions for the BETO team?

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Learn more about BETO: energy.gov/bioenergy
BETO Webinar Recording: energy.gov/eere/bioenergy/beto-webinars

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