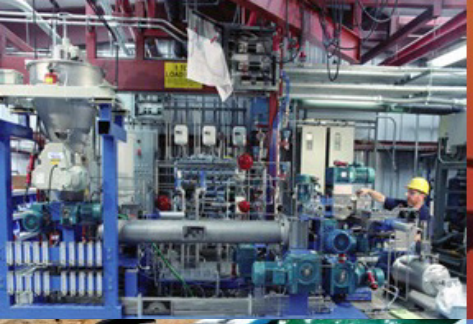




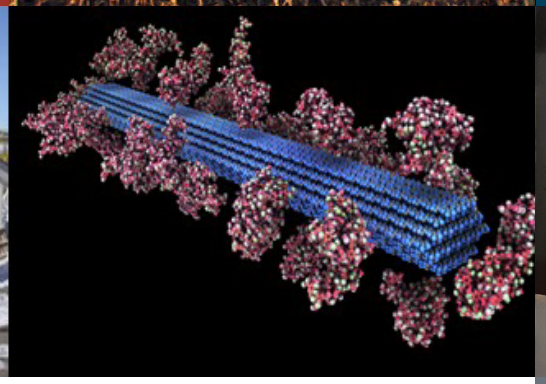


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Data, Modeling & Analysis Program Overview

March 8, 2021

Jay Fitzgerald

Chief Scientist

Program Manager

Data, Modeling & Analysis Program Overview

- The Team
- Program Goals
- Program Structure
- Budget
- Key Accomplishments
- Future Directions
- Reviewers

Analysis Team

Federal Team

Jay Fitzgerald
Chief Scientist
Program Manager

Alicia Lindauer
Technology Manager

Andrea Bailey
Technology Manager

Zia Haq
Lead Analyst

Support Team

Camryn Sorg
BGS

Seth Menter
BCS

Becca Szymkowicz
Redhorse

Feedstocks Fellows

Art Wiselogel
ORISE

Brianna Farber
AAAS

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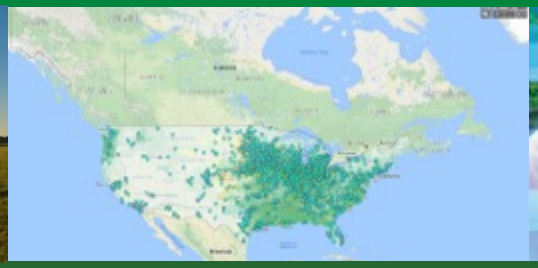
Analysis Program Strategic Goal and Approach

Strategic Goal: *Develop science-based strategies to understand and enhance the* ***environmental, economic and social benefits*** *of advanced bioenergy and bioproducts relative to conventional energy systems.*

Approaches:

- Develop tools, models, methods, and datasets
- Fund projects to publish high-quality analyses
- Explore the impact of emerging opportunities
- Develop sustainable system designs
- Ensure broad engagement with stakeholders




Bioenergy Sustainability is a Key Focus Area

SUSTAINABILITY

Greenhouse gas emissions
Water quality and quantity
Soil quality
Air quality

Economic growth and resilience
Affordability
Energy security
Process efficiency

Jobs and workforce development
Health and well being
Food security
Social acceptability

The Analysis Program Plays a Cross-Cutting Role

Analytical basis for strategic planning, decision-making, and assessment of progress to support BETO, EERE, and DOE goals

PROJECT PORTFOLIO

- Standardized methods and analytical approaches
- Development of tools and models to gain insights and improve decision-making
- Research on potential impacts and strategies for beneficial outcomes

DATA, MODELING AND ANALYSIS

PROGRAM INTERFACES

- Analyses on environmental and economic performance informed by program-generated data
- Analyses to inform R&D priorities to identify new opportunities and challenges

Interagency coordination, engagement with external experts, informing international dialogues

Program Structure

Models & Analysis

Strategic Analysis, Carbon Dynamics and Life Cycle Analysis

Landscape Design

Land Use and Landscape Design, Quantifying Ecosystem Services

Sustainability Analysis

Sustainability and Environmental Effects Analysis

Stakeholder Engagement

Data Collection Dissemination, Outreach, and Stakeholder Engagement

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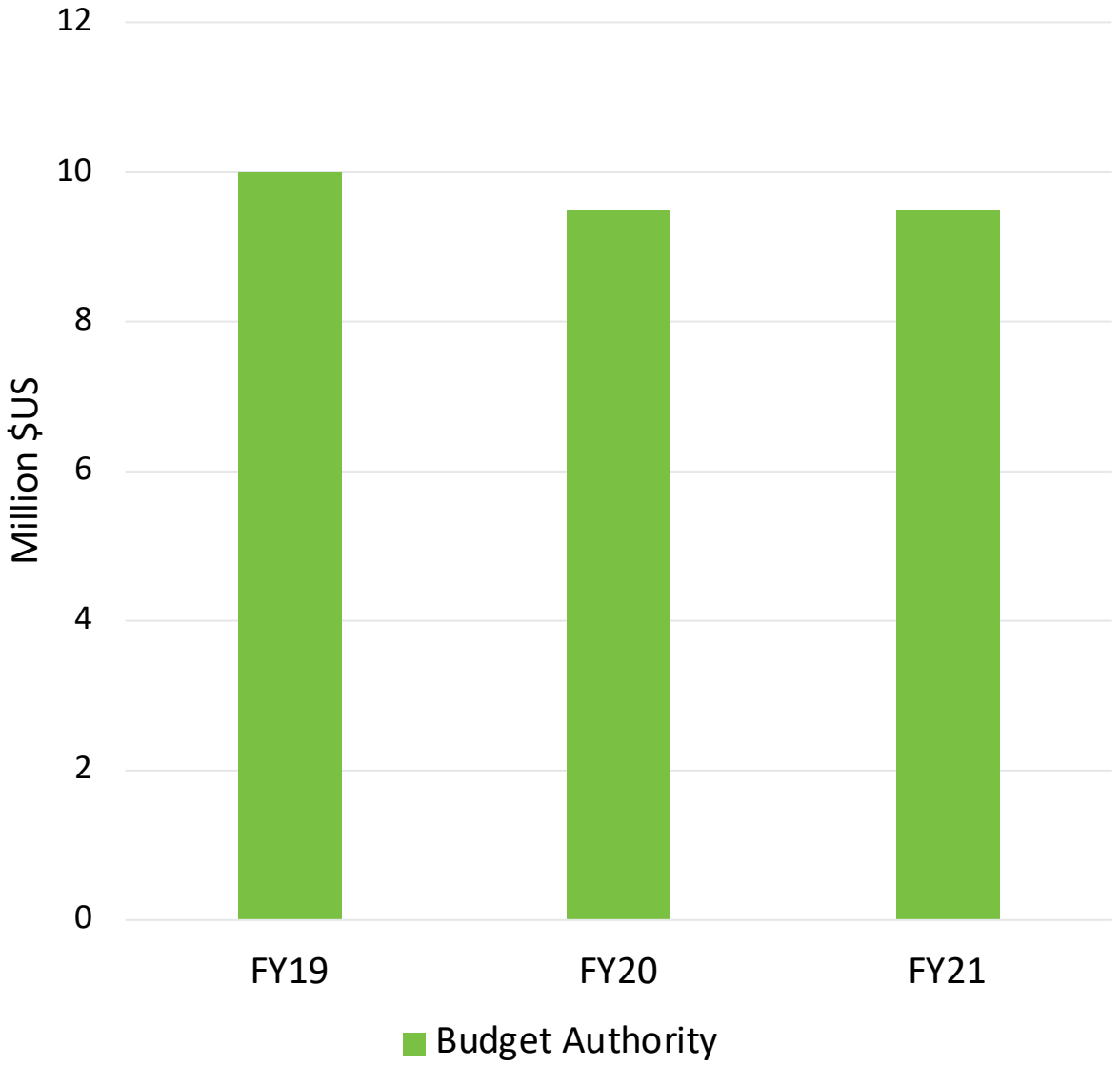
Analysis Program Budget



Analysis 2021 Peer Review session includes:

- 21 National Laboratory Projects
- 3 Competitive Projects

- Project and pathway-specific analysis is performed by the R&D Programs
- The Analysis Program works with the R&D Programs to harmonize methods and focuses on cross-cutting analysis

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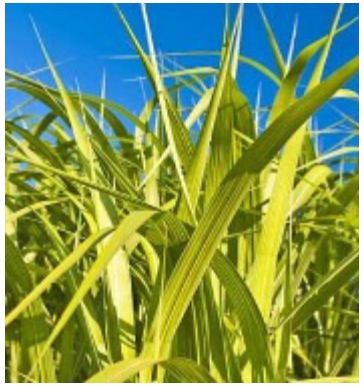
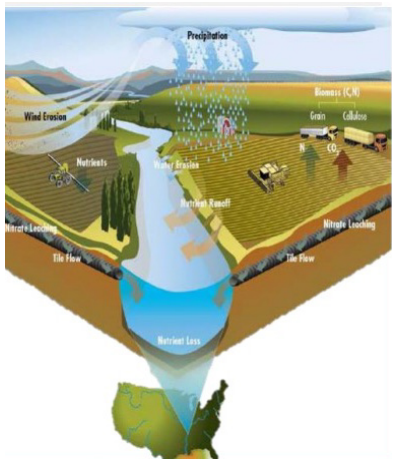
FY21 Analysis Program Priorities

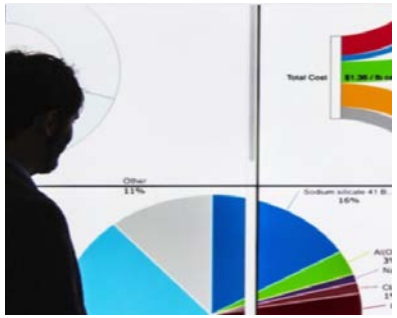


Begin to identify the greatest opportunities for bioenergy to achieve greenhouse gas reductions

Work with BETO R&D Programs to harmonize assumptions in State of Technology analyses



Develop tools and analyses to understand and quantify potential ecosystem services from bioenergy



Develop, maintain, and conduct outreach for interactive models and visualizations

Communicate and inform stakeholders about new developments

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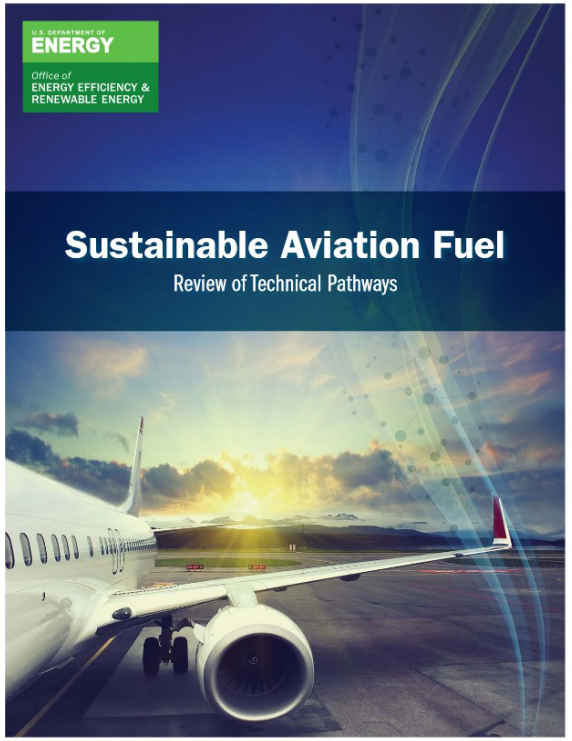
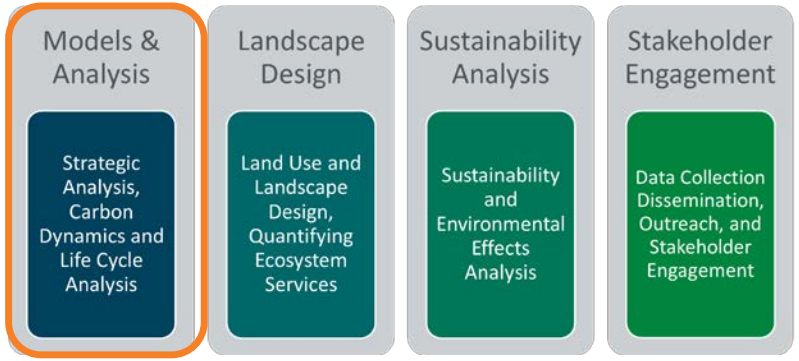
Reports to Enable Sustainable Aviation Fuels

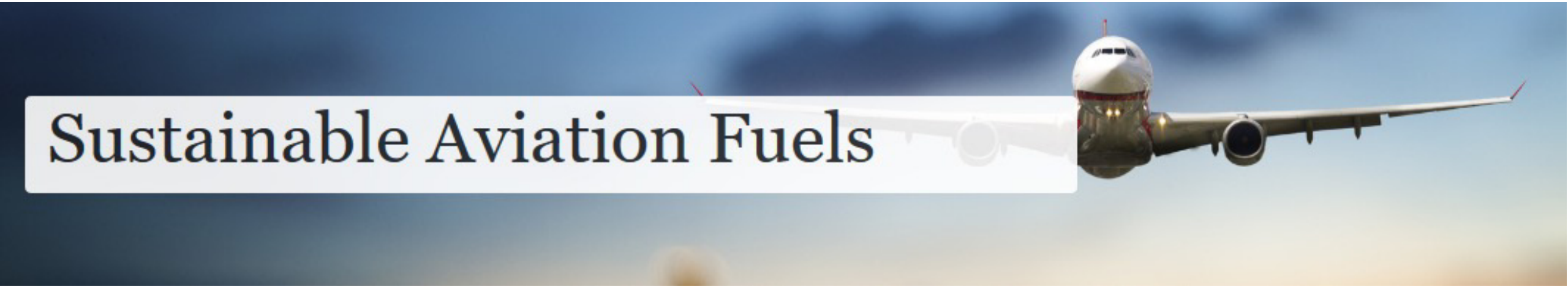
U.S. Airport Infrastructure and Sustainable Aviation Fuel

Kristi Moriarty and Allison Kvien





Airport Infrastructure: https://www.nrel.gov/docs/fy21osti/78368.pdf
Review of Technical Pathways: https://www.energy.gov/sites/prod/files/2020/09/f78/beto-sust-aviation-fuel-sep-2020.pdf



Landscape Design: Quantifying Ecosystem Services

Goal: Quantifying the value of ecosystem services from bioenergy

- **FY20 Bio-Restore FOA topic**
  - 3 projects selected to develop and employ new methods to quantify the environmental and economic benefits associated with growing energy crops on marginal land with a focus on restoring water quality and soil health.
- **ASEC**
  - The Advanced & Sustainable Energy Crops (ASEC) project is evaluating the environmental performance of advanced switchgrass cultivars for bioenergy in marginal croplands of the Midwest. Preliminary data suggest a variety of native birds are using switchgrass plots on the study site.
- **National Laboratory Research**
  - Other projects at the national labs have made progress on improving water quality monitoring, examining the tradeoffs between bioenergy, wildfire, water and economic sustainability; and quantifying the impact of perennial bioenergy crops on various ecosystem benefits.

Grasshopper Sparrow
ebird.org

Acoustic sensor at the Illinois ASEC project site

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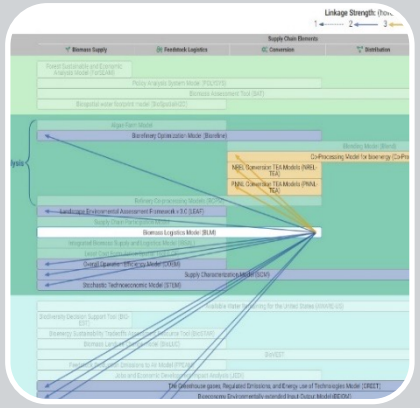
Models & Analysis: Prioritizing Access to Data, Tools, and Results



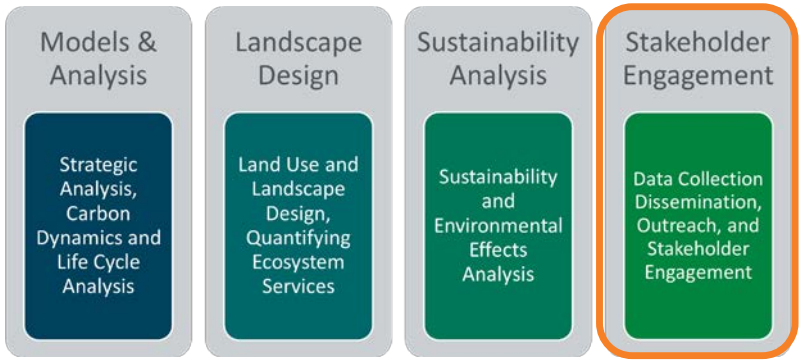
An inventory of interactive bioenergy and bioproducts models and tools improves understanding of technical challenges and potential impacts

Bioenergymodels.nrel.gov

The Bioenergy KDF provides access to a variety of data sets, publications, and visualization tools that support bioenergy research, analysis, and decision making

https://bioenergykdf.net

The Biofuels TEA Database promotes transparency and ease-of-access to BETO-supported public studies involving techno-economic analysis



A suite of models and tools inform research efforts and help quantify the economic and environmental value of bioenergy.

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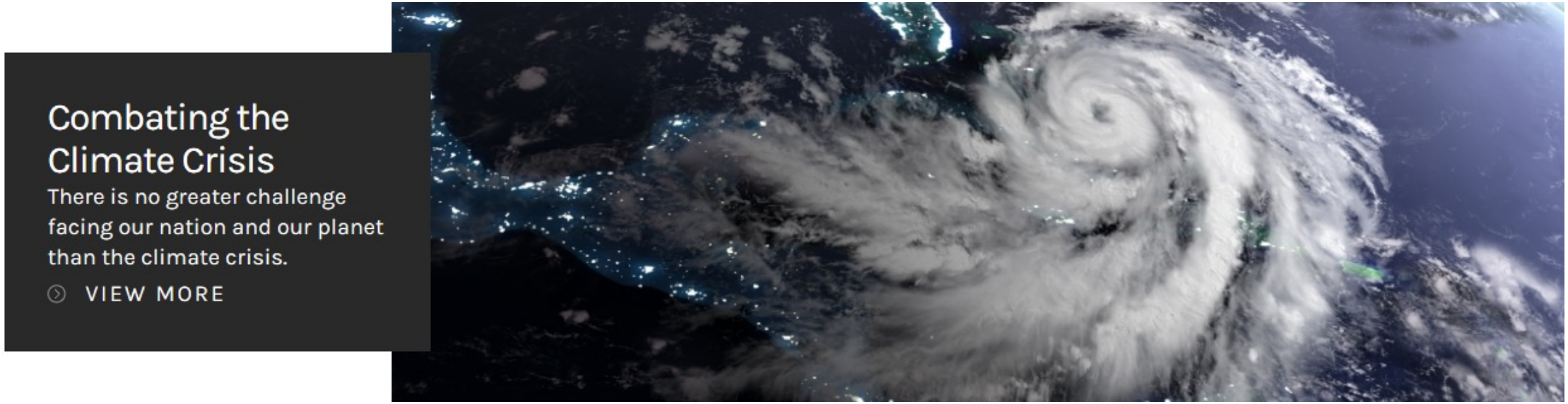
Opportunity to Think Big on Climate

Jan 27th, 2021 Executive Order "…puts the United States on an irreversible path to a net-zero economy by 2050"



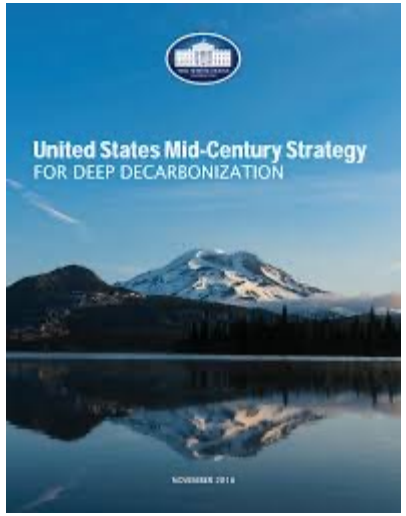
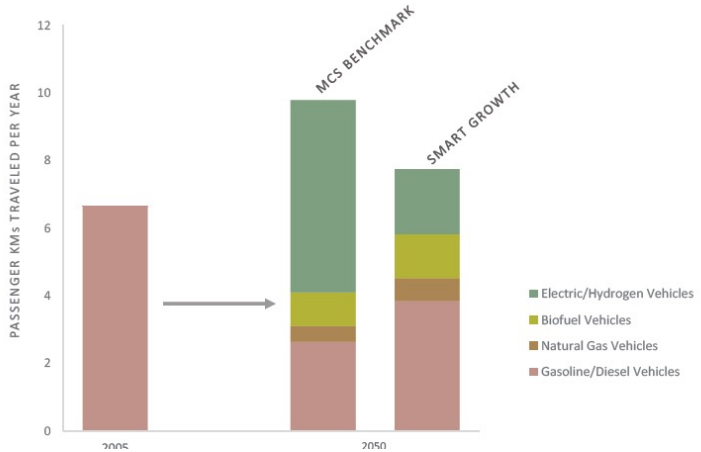


FIGURE 4.12: U.S. LIGHT-DUTY PASSENGER VEHICLES KILOMETERS TRAVELED IN THE MCS



What is the right role for bioenergy in a net-zero economy by 2050?

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https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/27/fact-sheet-president-biden-takes-executive-actions-to-tackle-the-climate-crisis-at-home-and-abroad-create-jobs-and-restore-scientific-integrity-across-federal-government/

Reviewers

Reviewer	Affiliation
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Kristin Lewis	DOT-Volpe National Transportation Center
Max Broad	Independent Consultant
Nikita Pavlenko	International Council on Clean Transportation
Amy Landis	Colorado School of Mines
Katherine Goodall	Independent Consultant

THANK YOU, REVIEWERS!