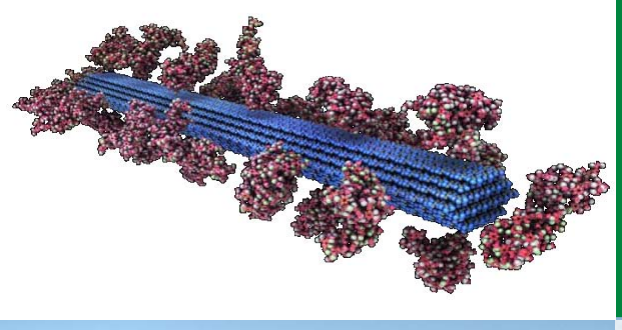







U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

2017 PROJECT PEER REVIEW

U.S. DEPARTMENT OF ENERGY
BIOENERGY TECHNOLOGIES OFFICE

The Billion-Ton Bioeconomy Initiative Overview

Alison Goss Eng

Operations Committee Liaison, Biomass Research & Development Board

The Bioeconomy Initiative Overview

- The Biomass R&D Board
- Why a Bioeconomy?
- The Bioeconomy Initiative
  - Vision and Goal
- Key Accomplishments
  - Federal Activities Report on the Bioeconomy
  - Challenges & Opportunities Report
- Upcoming Activities

The Biomass Research & Development Board

- The Biomass Research and Development Act of 2000 established the Interagency **Biomass R&D Board**, the **Technical Advisory Committee**, and the **Biomass R&D Initiative (BRDi)**.
- The BR&D Board facilitates coordination among federal government agencies that affect the research, development, and deployment of biofuels and bioproducts.

Membership

Senate-confirmed sub-cabinet officials from 8 executive branch agencies

Co-chair *Co-chair*

Biomass R&D Breakdown

- Senior federal officials from 8 agencies
- Chaired by USDA and DOE
- Coordinates R&D activities relating to biofuels and biobased products
- Provides recommendations to the points of contact concerning administration of the BRDi

Biomass R&D Board

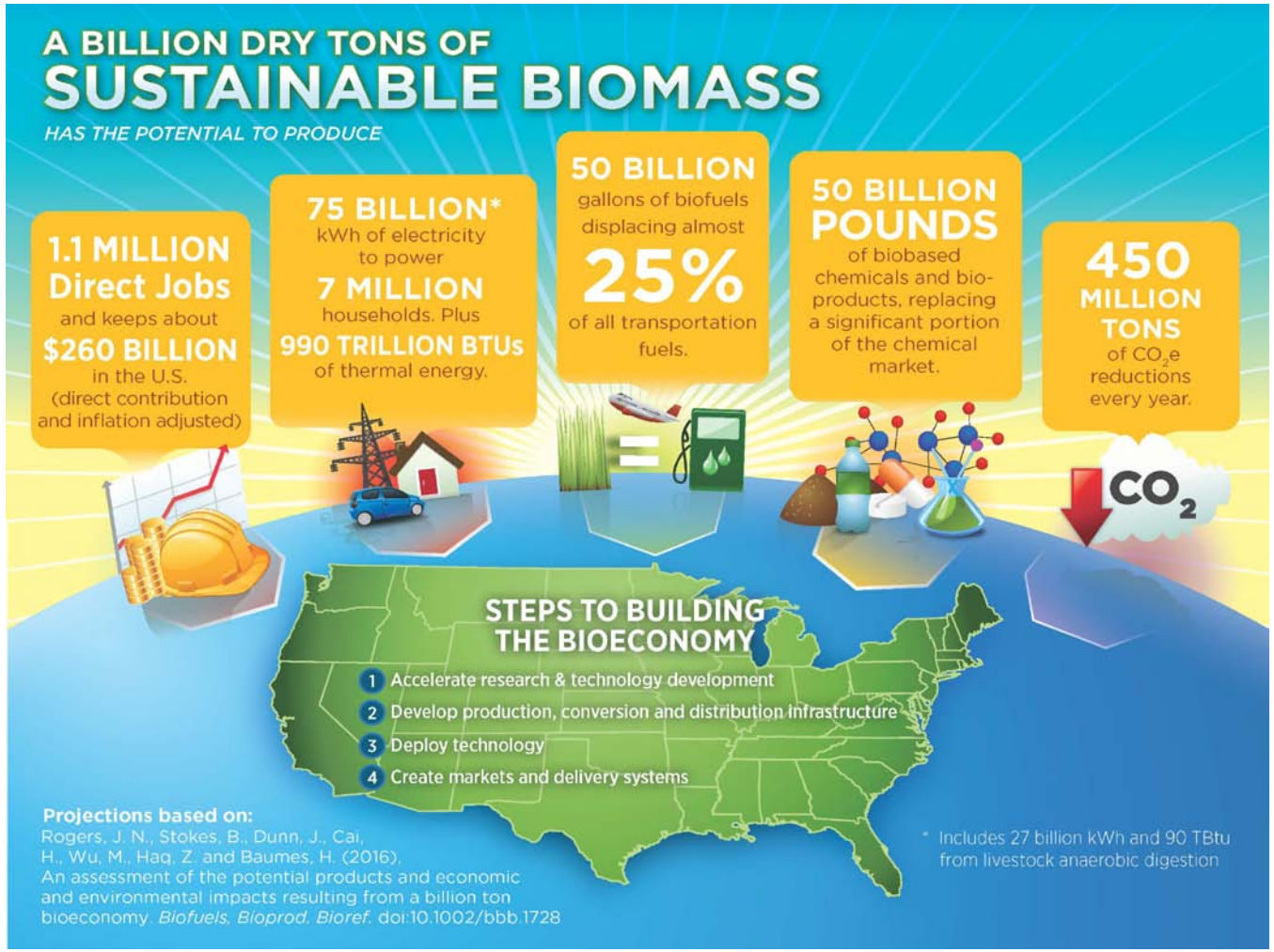
- ~30 members from academia, industry, and nonprofit organizations
- Advises the Secretaries of Energy and Agriculture on the technical focus and direction of the BRDi RFPs and procedures for reviewing and evaluating the proposal
- Evaluates and performs strategic planning on BRDi activities

Technical Advisory Committee

- Administered by appointees from the Secretaries of Agriculture and Energy
- Awards competitive grants to projects that integrate science and engineering research in the following three areas: feedstock development; biofuels and biobased products development; and biofuels development analysis

Biomass R&D Initiative (BRDi)

Why a Bioeconomy?



The **bioeconomy** is a global industrial transition of sustainably utilizing renewable aquatic and terrestrial biomass resources in energy, intermediate, and final products for economic, environmental, social, and national security benefits.

1 billion tons of biomass could be sustainably produced in the United States.

Federal Activities Report on the Bioeconomy

In February 2016, the BR&D Board released the **Federal Activities Report on the Bioeconomy** in order to educate the public on the wide-ranging, federally funded activities across the biomass supply chain that are helping to bolster the bioeconomy.

Agency	Feedstock Supply	Biomass Conversion	Bioenergy Distribution	Bioenergy End Use
DOE	● ● ● ●	● ● ● ● ●	● ● ●	● ● ● ● ●
USDA	● ● ● ● ●	● ● ● ●	● ● ● ● ●	● ● ● ●
DOT	● ● ● ●	● ● ● ●	● ● ● ● ●	● ● ● ● ●
EPA	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ●
DOI	● ●	●		
NSF	● ● ●	● ● ● ●	●	
DoD		● ● ●	● ● ● ●	● ● ● ●

● Use an integrated systems approach
● Provide the science and the technology
● Public and private collaboration to overcome barriers and accelerate deployment
● Develop a workforce for the future bioeconomy
● Understand and inform policy

FARB and the Billion Ton Bioeconomy Initiative

The ***vision*** for the Billion Ton Bioeconomy Initiative is to triple the size of today's bioeconomy by 2030 and provide multiple economic, environmental, and social benefits to the US.

The ***goal*** of the Billion Ton Bioeconomy Initiative is to develop and provide innovative ways to remove barriers to expanding the sustainable use of Nation's abundant biomass resources for biofuels, bioproducts, and biopower, while maximizing economic, social, and environmental outcomes.

The Billion Ton Bioeconomy Initiative: Challenges & Opportunities

- In November 2016, the Board released **The Billion Ton Bioeconomy Initiative: Challenges & Opportunities** report.
- Includes stakeholder feedback from 5 bioeconomy listening sessions with over 400 participants:
  - 4 in-person sessions held in conjunction with major bioenergy industry events in FY16
  - 1 public webinar held in May 2016
- Incorporates stakeholder input on the **challenges to and opportunities for expanding the bioeconomy**
- Provides approaches to removing barriers
- Prepares for the Action Plan

Challenges to Expanding the Bioeconomy

- Major technical hurdles for development and scale
- Steep competition from traditional petroleum-derived resources
- A lack of necessary infrastructure
- Access to capital for large financial investments
- Uncertainties about sustainability—understanding environment, social, and economic impacts
- Growth instability and increased investment risk caused by policy uncertainty
- The need for a strong and capable workforce

Opportunities in Building a Billion Ton Bioeconomy

- Develop feedstock and fundamental innovations that reduce cost and technology risk in the supply chain
- Quantify, communicate, and enhance beneficial effects and minimize negative impacts
- Increase public education on biomass-derived products in a bioeconomy
- Enable the testing and approval of new biofuels and bioproducts
- Ensure a ready workforce to meet the needs of the bioeconomy
- Support analysis as a foundation for stable, long-term policies
- Develop bioproducts that can accelerate biofuel production
- Seek opportunities to utilize low-cost waste resources
- Expand the market potential for biomass
- Encourage private-sector financing

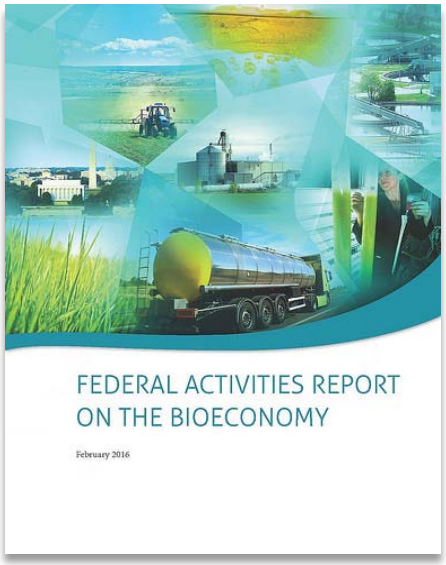
ATIP Foundation Regional Bioeconomy Forums

- **Goal**: In partnership with DOE and USDA, the ATIP Foundation Regional Bioeconomy Forums brought together a mix of stakeholders from six sectors (**industry; state and local government; economic and workforce development; investment and finance; academia; and agricultural and environmental organizations**) to seek their input, relative to the Bioeconomy Initiative's vision, strategies, and implementation.

- **Common themes across all regions:**
  - Finance (Treasury)
  - Education & Awareness
  - Policy
  - Supply Chain
  - Workforce (Dept. of Labor, Dept. of Education)
  - Federal Resources
- Report forthcoming in 2017

Dates & Locations	
9/16/2016	Georgia Institute of Technology, Atlanta, GA
9/29/2016	Chamber of Commerce, Mineral Wells, TX
10/3/2016	Washington State University, Seattle-Tacoma, WA
10/18/2016	University of Maine, Orono, ME
11/15/2016	Ohio State University, Columbus, OH

A Path Forward for the Bioeconomy Initiative



Federal Activities Report on the Bioeconomy

- Released in February 2016

Challenges & Opportunities

- Released at Q4 TAC Meeting in November 2016

Action Plan

- Target release this summer at annual conference—Bioeconomy 2017

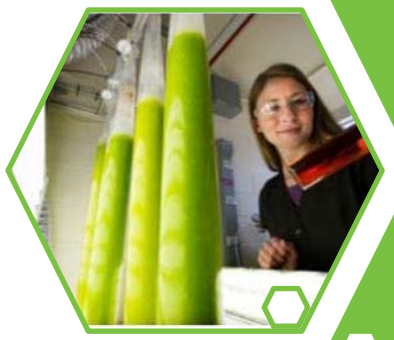
Action Plan Development

Through the Interagency Working Groups, the Action Plan will be developed will be developed with attention to:

- Technical strategies developed in the FARB.
- Critical challenges and opportunities previously identified by stakeholders (including the Federal Strategy Workshop and the ATIP Regional Forums).
- Cross-cutting activities and interagency collaborations aimed at building a national coalition in support of the Bioeconomy Initiative.

Interagency Working Groups

Feedstocks Production & Genetic Improvement



Conversion

Feedstock Supply and Logistics

Analysis

Algae

Feedstocks Production & Management

Transport & Distribution Infrastructure

Sustainable Bioeconomy

Upcoming Activities

Bioeconomy Initiative: Action Plan Workshop

- **Date:** April 5-6, 2017
- **Location:** DOE HQ
- **Goal:**
  - To develop a roadmap of cross-cutting federal activities and collaborative actions to catalyze the expansion of a sustainable domestic bioeconomy

Thank you!

Questions?

Alison Goss Eng

Program Manager, Advanced Algal Systems | Feedstock Supply and Logistics

Biomass Research and Development (BR&D) Operations Committee

Liaison to the BR&D Board

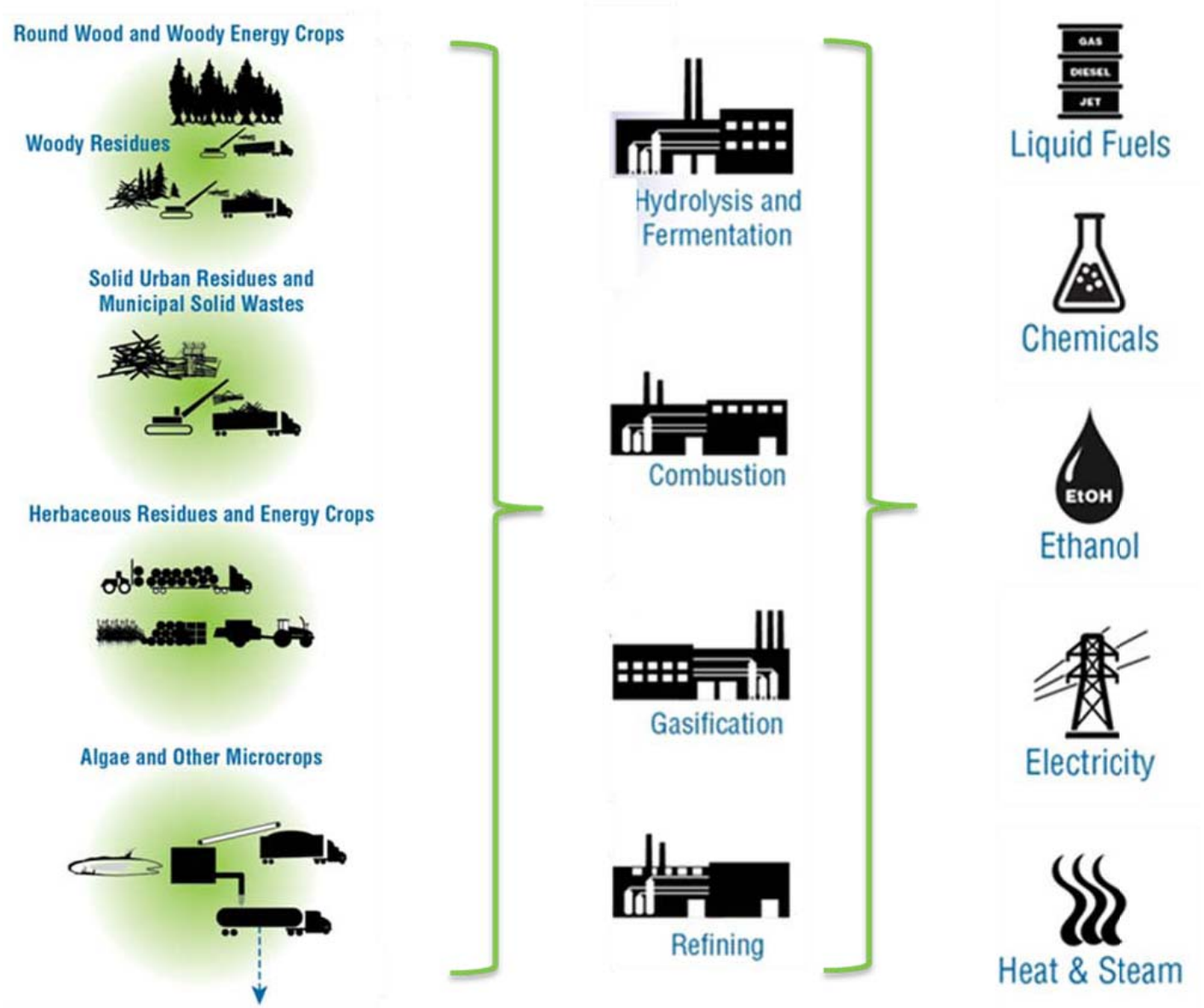
Bioenergy Technologies Office

Office of Energy Efficiency and Renewable Energy

U.S. Department of Energy

Back-up

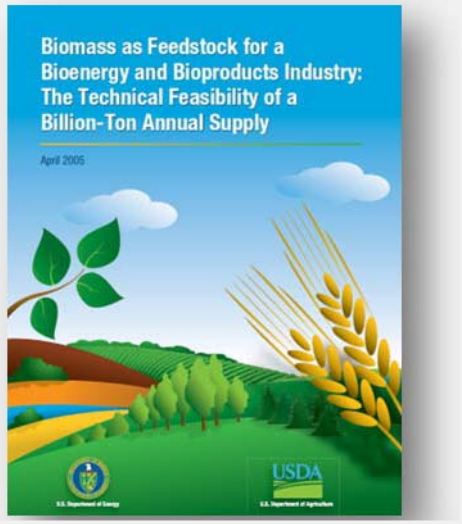
The Bioeconomy Concept



- Revenue and economic growth
- Broad spectrum of new jobs
- Rural development
- Advanced technologies and manufacturing
- Reduced emissions and Environmental Sustainability
- Export potential of technology and products
- Positive societal changes
- Investments and new infrastructure

The Billion-Ton Reports

2005



Resource Assessment

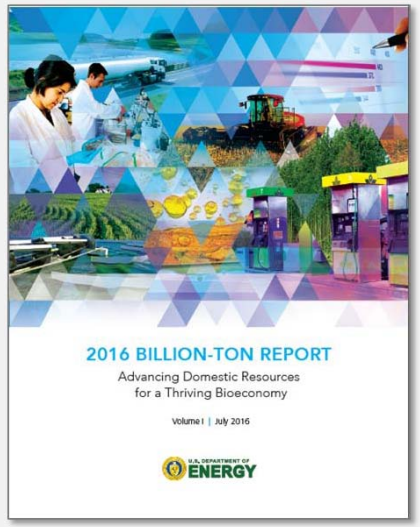
- Is 1 billion tons of biomass available in the U.S.?
- Does this land biomass have the potential to produce a sustainable supply of biomass that can displace 30% of the country's current petroleum consumption?

2011

Resource Assessment + Economic Analysis

- Timeline to 2030
- County-level biomass feedstock availability estimates
- Broad energy crop definitions and estimates
- Harvesting biomass only (not delivering biomass)

2016



Resource Assessment + Economic Analysis

- Extended timeline
- Updated agricultural projections
- Detailed cost analysis
- Algae and energy crops
- Regional analysis
- Environmental sustainability analyses

The Billion-Ton Reports and the Bioeconomy Initiative

Billion-Ton Reports

- 2005
- 2011
- 2016

Resource Assessments – biophysical, economic, and sustainable availability of biomass resources under given assumptions and modeling capabilities

How much biomass?

BIOECONOMY INITIATIVE

Bioeconomy – expanded economy/market sector of various products under estimated feedstocks levels and given scenarios

What can we do with it?

Ensure that current demands for food, feed, industrial uses, and exports continue to be met.

Analysis Interagency Working Group

- The technical paper uses the *2016 Billion-Ton Report* to evaluate a range of possible products and economic and environmental impacts.
- This is a demonstrative analysis – not predictive or a roadmap.