BIOENERGY TECHNOLOGIES OFFICE

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

Technical Advisory Committee New Members Orientation

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May 20, 2015

Welcome New Members

- **Anna Rath** – President and CEO of NexSteppe. A pioneer in the development of the dedicated energy crop industry. Founded NexSteppe in 2010 to develop and commercialize optimized crops for the biofuels, biopower, and biobased product industries.
- **Manuel Garcia Perez** – Associate Professor with the Department of Biological Systems Engineering at Washington State University. Working on fundamental studies to understand cellulose and lignin pyrolysis mechanisms and the development of selective pyrolysis reactors and bio-refinery concepts to convert bio-oils into bio-fuels and bio-chemicals.
- **Kelly Tiller** – President, CEO, Chairman, and Founder of Genera Energy Inc. Has been repeatedly successful in identifying market needs early, understanding economic and policy drivers, analyzing alternative technologies and strategies, and creating leading growth businesses.
- **Shelie Miller** – Professor at the University of Michigan School of Natural Resources and Environment. Research interests focus on life cycle assessment (LCA) and the environmental impacts of energy systems. Currently, she focuses on the potential environmental outcomes of bioenergy policies, quantifying a variety of often underrepresented environmental metrics, such as water quality, water stress, and land use change.

Welcome New Members – Cont'd

- **Patricia Scanlan** – Director of Residuals Treatment Technologies, Black & Veatch. Lads the process evaluation and design efforts on biosolids-related technologies, including conventional and "enhanced" anaerobic digestion, co-digestion of biosolids and fats, oil, and grease (FOG), food wastes, and animal manures, digester gas cleaning and utilization, biosolids final use, thickening, dewatering, and heat drying.
- **Marina Moses** – Director of the American Academy of Microbiology. Provides leadership and direction for the honorific leadership group, recognizing scientists for outstanding contributions to microbiology. Previously served on the faculty of George Washington University School of Public Health and Health Services and held senior scientific positions with the Environmental Management Division of DOE and in the Superfund Program of the U.S. EPA in a Regional office.
- **Kimberly Ogden** – Professor of Chemical and Environmental Engineering at the University of Arizona. Brings a wealth of knowledge in the algal biofuels and bioproducts area. As Director of Engineering in the National Alliance for Advanced Biofuels and Bioproducts (NAABB), led the investigation of feasibility of producing biofuels from algae through applied research in biology, cultivation, harvesting, and production.

Departed Members and New Co-Chair

Departed:

- **Pam Contag**
  Committee Co-Chair
- **David Bransby**
  Auburn University
- **Craig Kvien**
  University of Georgia

New Co-Chair:

- **Paul Bryan**
  University of California, Berkeley

TAC Housekeeping

Travel Process

- Natalie Roberts is the point of contact for all questions related to TAC travel and reimbursement. She can be reached at: natalie.roberts@ee.doe.gov or 202-586-2325.

Future Meeting Dates

- Tentative dates for Q3 and Q4 meetings have been identified below and will be confirmed during the meeting:
  - Q3: Week of August 24, 2015
  - Q4: Week of November 16, 2015

Bioenergy Technologies Office

Mission

Accelerate the commercialization of advanced biofuels and bioproducts through targeted research, development, and demonstration supported by public and private partnerships

Strategic Goal

Develop technologies to enable the sustainable, nationwide production of biofuels compatible with today's transportation infrastructure

Authorizing Legislation

EPACT 2005

- ✓ Authorized commercial ethanol production, included incentives for production

EISA 2007

- ✓ Expanded RFS, mandated 36B gallons per year by 2022, requirements for advanced biofuels, cellulosic, bio based diesel.

ARRA 2009

- ✓ Grants to accelerate commercialization of advanced biofuels, R&D.

President's Climate Action Plan 2013

- ✓ 17% CO2 reduction by 2020. Promoted Development and Deployment of bio-based fuels

2014 Farm Bill

- ✓ Authorizes USDA, promotes collaboration with DOE on key areas including BRDI.

BETO Goals in Support of Administration Objectives

Administration CAP Goals

- Reduce net oil imports by half by 2020 from a 2008 baseline
- Reduce GHG 17% (2020) 26-28% (2025), and 83% (2050)
- Reduce CO_2 emissions by 3 billion metric tonnes cumulatively by 2030.

EERE Goals

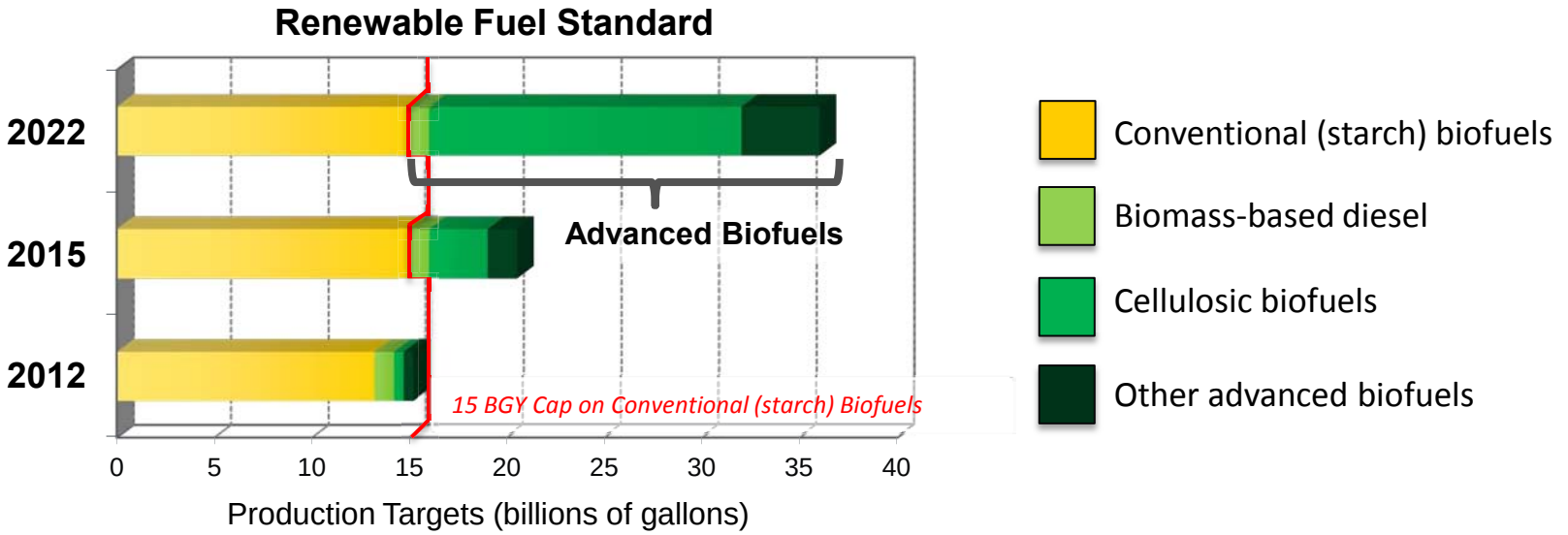
- Create and sustain American leadership in the global transition to a clean energy economy
- Accelerate high-impact Research, Development, and Demonstration to make clean energy as affordable and convenient as traditional forms of energy

BETO Goal

- Through RDD&D, make drop-in hydrocarbon fuels competitive with petroleum-based fuels at a modeled price of mature technology of $3/gge ($2011), with GHG emissions reduction of 50 % or more compared to petroleum-derived fuel.

Key Policy Driver: Renewable Fuel Standard (RFS)Program

- The Energy Independence and Security Act (EISA) of 2007 sets aggressive goals:
  - 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), increasing the supply of renewable fuels to 36 billion gallons by 2022.
- The U.S. Department of Energy's (DOE) Bioenergy Technologies Office focuses on developing advanced biofuels to help meet the RFS goals.
- EPA has committed to propose the 2015 RFS mandate by June 1, 2015, and to finalize the 2014 and 2015 RFS mandates by November 30, 2015.



The Challenge and the Opportunity

THE CHALLENGE

- U.S. gasoline consumption is 8.5 million barrels/day
- 67% of U.S. petroleum consumption is in the transportation sector

THE OPPORTUNITY

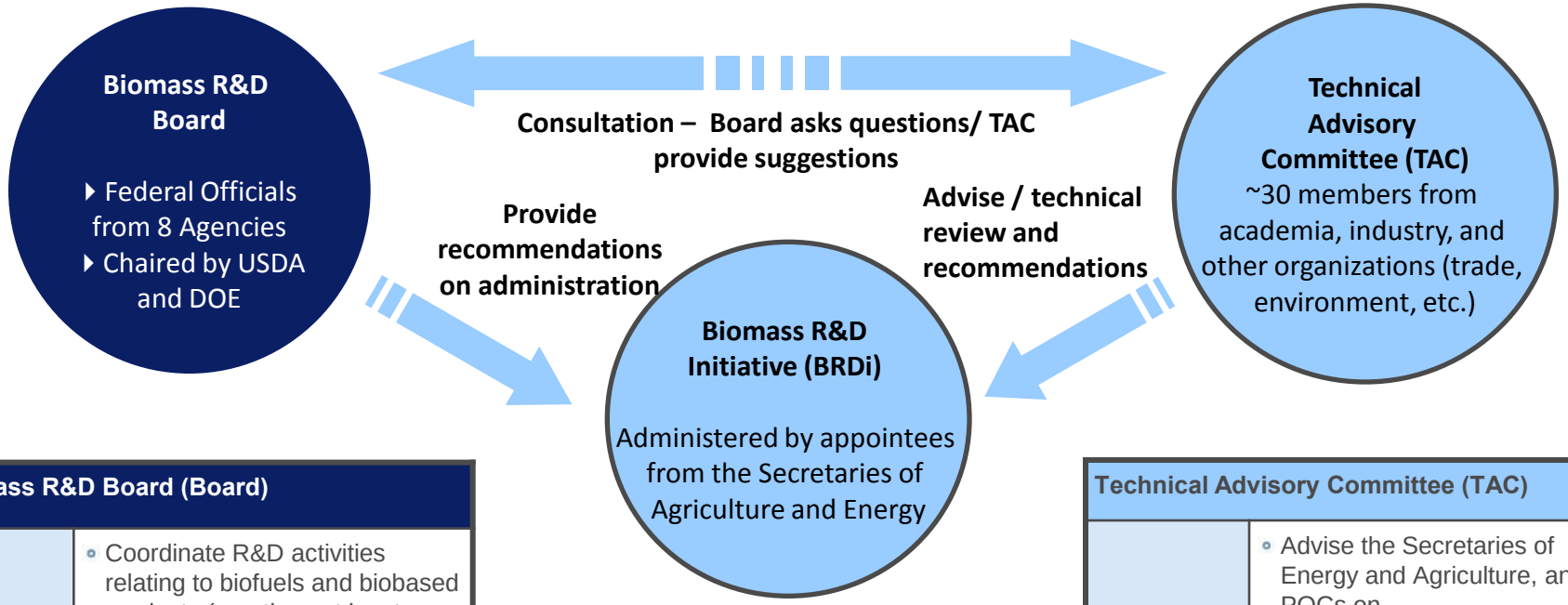
- More than 1 billion tons of biomass could be sustainably produced in the U.S.
- 1 billions tons of biomass could displace 30% of U.S. petroleum use by 2030, and reduce 400M tonnes of CO_2e.

Biofuels could displace 30% of liquid transportation fuels

Biomass R&D Act and Authorizations

- The Committee was established by the Biomass Research and Development Act of 2000 (Biomass Act). This has since been amended by the Food, Conservation and Energy Act of 2008 (FCEA). The revised Biomass R&D Act outlines the Committee's objectives, membership requirements, and duties.
- The recent Agricultural Act of 2014 (Farm Bill) reauthorized the Committee. The Initiative was also reauthorized, however the annual mandatory funding amount was cut to $3M mandatory/year.
- The Biomass R&D Act also established the Interagency Biomass R&D Board and the Biomass R&D Initiative.

Biomass R&D Breakdown



Biomass R&D Board (Board)	
Roles	◦ Coordinate R&D activities relating to biofuels and biobased products (meetings at least quarterly) ◦ Provide recommendations to the points of contact concerning administration of the BRDi
Public Document	◦ The Board released the National Biofuels Action Plan (NBAP) in October 2008 and an update is currently pending. ◦ Other Board documents are located on the BiomassBoard.gov website

Biomass R&D Initiative (BRDi)	
Purpose	◦ Award competitive grants, contracts, and financial assistance are provided to, or entered into with, eligible entities to carry out research on and development and demonstration of biofuels and biobased products
Public Document	◦ The BRDI publishes at least 1 request for proposal (RFP) each year

Technical Advisory Committee (TAC)	
Roles	◦ Advise the Secretaries of Energy and Agriculture, and the POCs on - The technical focus and direction of the BRDi RFPs - Procedures for reviewing and evaluating the proposals ◦ Evaluate and perform strategic planning on BRDi activities ◦ Facilitate partnerships
Public Document	◦ All TAC meetings (at least quarterly) are public

Biomass Board - Federal Composition

- **The Board is a panel consisting of senior-level representatives from these agencies:**
  - U.S. Department of Agriculture: Co-Chair
  - Department of Energy: Co-Chair
  - National Science Foundation
  - Environmental Protection Agency
  - Department of Interior
  - Office of Science and Technology Policy
  - Office of the Federal Environmental Executive
  - Department of Transportation
  - Department of Defense
- **Board Co-Chairs**
  - Cathie Woteki, Under Secretary for REE, USDA
  - David Danielson, Assistant Secretary for EERE, DOE

Co-chair *Co-chair*

Duties of the Committee Regarding BRDI

- To advise the Secretaries of Energy and Agriculture through the points of contact with respect to the Biomass R&D Initiative.
- To evaluate and make recommendations in writing to the Board to ensure the following:

  (A) funds authorized for the Initiative are distributed and used in a manner that is consistent with the objectives, purposes, and considerations of the Initiative;

  (B) solicitations are open and competitive with awards made annually and that objectives and evaluation criteria of the solicitations are clearly stated and minimally prescriptive, with no areas of special interest;

  (C) the points of contact are funding proposals under this title that are selected on the basis of merit, as determined by an independent panel of scientific and technical peers predominantly from outside the Department of Agriculture and Energy; and

  (D) activities under this title are carried out in accordance with this title.

- The Committee Charter specifically calls for the TAC to make recommendations related to the BRD Initiative.

TAC Ground Rules

- TAC conforms to all Federal Advisory Committee Act (FACA) requirements: http://www.gsa.gov/portal/content/101010
- TAC members set aside corporate interests in favor of the national interests.
- Co-Chairs are the spokespersons for the TAC – refer press inquiries to them.
- Meetings are announced in Federal Register and open to public.
  - Subcommittees are permitted to work in closed sessions.
- Final recommendations are formed by majority consensus.

TAC Subcommittees

- ❑ **Conversion**
- ❑ **Sustainable Feedstocks, Production and Logistics**
- ❑ **Products Markets, and Systems Group**

Subcommittee Work Areas:

- Define Problem Statements: Identify issues/challenges that must be addressed.
- Initiate Recommendations: Technical or R&D strategies that address the identified problem statements.
- Identify Information Requests: Requests for speakers, data, reports, or other information that can be given or presented to the committee that assists them in developing their thinking.

Committee Recommendations and Annual Report

DOE and USDA General Counsel have advised that a broader biomass R&D scope is permissible. The 2015 TAC recommendations should be written to address the findings and needs of the Committee in the following areas:

- Specific Committee Reporting Obligations- BRDI
- Information Requests from the Board
- Subcommittee Recommendations
  - -Feedstock Recommendations
  - -Conversion Recommendations
  - -Logistics, Storage, Handling, and Infrastructure Recommendations

– Recommendations are used to inform the Biomass R&D Board and provided to DOE and USDA Programs.

– A report of recommendations, which frame the TAC Annual Report

Online Resources for TAC Members

The Board website contains numerous resources for TAC members

- Meetings
  - Previous meeting agendas
  - Previous presentations
- Work Plans
  - Work plans for the last 10+ years
- Reports
  - Bioenergy roadmaps
  - Workshop summaries
  - DOE and USDA reports and portfolio analyses
  - Previous TAC recommendations
- TAC Library
  - Outlined in next slide

Online Resources for TAC Members

TAC Library:

- BRDI Materials
  - Solicitations and Awards
  - Annual Reports
  - Prior TAC Recommendations
- Related Solicitations and Awards
  - DOE FOAs
  - ARPA-E FOAs
- Additional Information
  - DOE and USDA factsheets
  - DOE and USDA roadmaps and research
  - BETO's Multi Year Program Plan

Work of the Biomass R&D TAC can be Found Online

http://www.biomassboard.gov/

http://www.biomassboard.gov/committee/committee.html

- Find info on:
  - Previous work and recommendations;
  - Meeting summaries;
  - TAC membership list; and
  - Key “library” documents and referenced materials.

Bioenergy Knowledge Discovery Framework (KDF)

What is the Bioenergy KDF?

It's an information-sharing network, an online collaboration toolkit, and a data resource that facilitates informed decision making. The KDF provides a full range of stakeholders with a means to access, contribute, synthesize, analyze, and visualize vast amounts of bioenergy information in a spatially integrated manner.