

ATIP Foundation Regional Bioeconomy Forums:
“Addressing the Challenges & Opportunities of Advancing the Billion Ton Bioeconomy”

A Report to Participants in the SE Regional Bioeconomy Forum
Georgia Tech co-host (Professor Valerie Thomas)
Atlanta, GA
September 16, 2016
Wes Jurey, Foundation CEO, and R.J. Brenner, Director, ATIP Foundation

Background

In late 2013, the seven agencies and the Office of the President that constitute the Biomass Research and Development Board¹ (BR&DB) began development of a vision to promote the expansion of the bioeconomy. With the projection that this nation, by 2020, will sustainably produce a billion tons of biomass annually, the “Vision” was published as the *“Federal Activities Report on the Bioeconomy,”* released by USDA Under Secretary Cathie Woteki at the 2016 Advanced Bioeconomy Leadership Conference in Washington, D.C. (February). “The goal of the Billion Ton Bioeconomy Vision is to develop and implement innovative approaches to remove barriers to expanding the sustainable use of America’s abundant biomass resources, while maximizing economic, social, and environmental outcomes.” BR&DB engaged the ATIP Foundation in September 2015 to prepare several regional listening sessions.

Separately, during the month of April, 2016 USDA and DOE co-led some informal “listening sessions” at three major conferences: 2016 International Biomass Conference and Expo in Charlotte, NC (April 11-14); World Congress on Industrial Biotechnology in San Diego, CA (April 17-20); and the Symposium on Biotechnology for Fuels and Chemicals in Baltimore, MD (April 25-28). In addition, a webinar on the Vision was conducted jointly by USDA and DOE on May 5, 2016. Input garnered from these events helped shape a subsequent document, tentatively titled *“The Billion Ton Bioeconomy Initiative: Challenges and Opportunities,”* released in November 2017 by the BR&D Board (for a copy, go to http://www.biomassboard.gov/pdfs/the_bioeconomy_initiative.pdf).

The rationale and strategy for these reports, and purpose for the public gatherings “USDA published a blog about the Vision and the listening sessions designed to “... gather information and engage stakeholders on how to build and grow the “Billion Ton Bioeconomy.” (<http://blogs.usda.gov/2016/04/27/growing-and-building-the-billion-ton-bioeconomy/>)

Regional Bioeconomy Stakeholder Forums

The federal agencies contracted with the ATIP Foundation --- a non-profit consortium of State Economic Development organizations --- to develop and co-host with a coordinating entity, a series of regional Bioeconomy Forums to garner input from a broad range of stakeholders on the Challenges & Opportunities to help shape a

¹ The Biomass R&D Board consists of representatives from the U.S. Department of Energy, U.S. Department of Agriculture, U.S. Department of the Interior, U.S. Department of Defense, U.S. Department of Transportation, the National Science Foundation, the Environmental Protection Agency, and the Executive Office of the President of the United States.

“multiyear implementation plan,” expected to be prepared by the Biomass R&D Board during the second quarter of the fiscal year 2017, submitted to the Office of Science and Technology Policy (OSTP).

Forums were convened in the SE U.S with Georgia Tech as co-host (**September 16, Renewable Bioproducts Institute, Atlanta, GA**), in the SW. U.S with the Mineral Wells Chamber of Commerce, Mineral Wells, TX, (**September 29, Holiday Hills Country Club, 4801 Highway 180 East, Mineral Wells, TX**), in PNW with Washington State University as co-host (**October 3, Sea-Tac Conference center, Sea-Tac airport**), in NE U.S. co-hosted by The University of Maine, Orono (**October 18**), and in the MW U.S. , **co-hosted by The Ohio State University (Schisler Conference Center, Wooster, OH, November 15)**. Co-hosts arranged for the meeting room, a modest noon meal, and a dedicated note taker with real-time display so the participants could verify their remarks, as necessary.

The goal of each Bioeconomy Forum was to bring together a mix of stakeholders (about 40-60 participants) from six sectors to seek their input, relative to the initiative’s vision, strategies, and implementation. These sectors are (1) industry; (2) state and local government; (3) economic and workforce development; (4) investment & finance; (5) academia; and (6) agricultural and environmental organizations. Co-hosts, with the assistance of BR&D Operations Committee, derived the list of by invitation participants.

Forum Structure and Role of the Foundation and Co-hosts

The SE U.S. Forum was moderated by co-host Professor Valerie, Thomas, Anderson Interface Professor Industrial and Systems Engineering at Georgia Tech, assisted by Richard Brenner, Ph.D. , Director of the ATIP Foundation.

Table 1 describes the demographics of invitees by sector, and the actual number able to participate on September 16.

Table 1. Demographics (by sector) of invitees and participants, convened by co-host Georgia Tech, in SE Regional Bioeconomy Forum, Atlanta, GA, September 16, 2016 .				
Sector Name	Invited	No. Participants	% RSVP to Attend	% of Attendees
Industry	60	7	12	22
State and local government	12	4	33	13
Economic and workforce development	18	3	17	9
Investment & finance	1	0	0	0
Academia	26	15	58	47
Agricultural and environmental organizations	7	3	43	9
	124	32	26	100

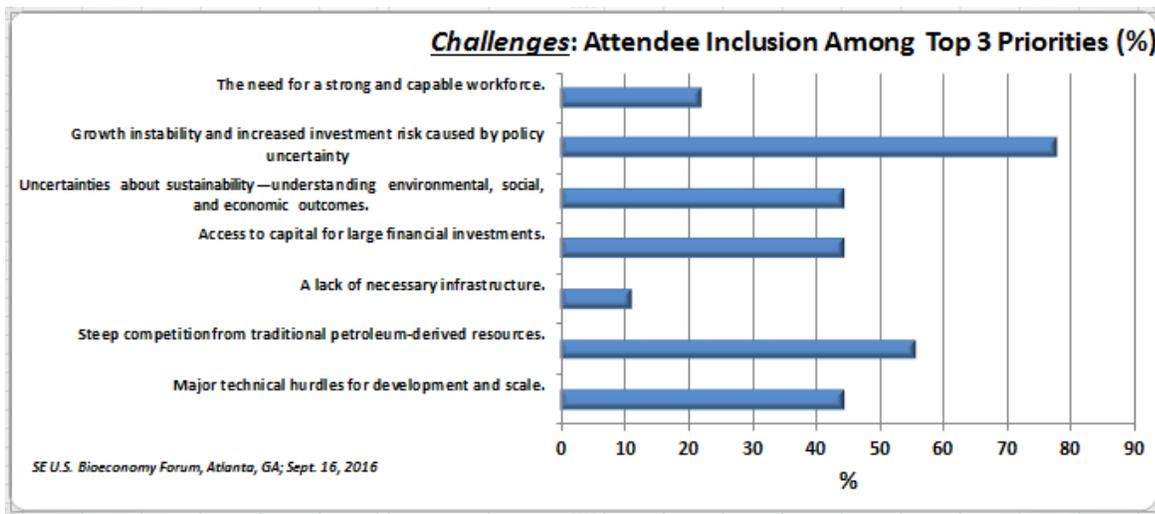
The agenda (Attachment 1) included welcoming comments by the ATIP Foundation, BR&DB representatives, and Norman Marsolan, State Host from the Renewable Bioproducts Institute. A slide set presentation was made by the ATIP Foundation and co-host, followed by Harry Baumes, Ph.D., Director, Office of the Chief Economist, USDA with assistance by Todd Campbell (USDA; Attachment 2). In addition, a “discussion document” was provided to the participants (Attachment 3). The remainder of the day consisted exclusively of stakeholder attendees from the six sectors participating in discussions on these six questions. Notes were taken (attributed to the commenter) by Ms.

Marcela Moreno, who projected these so all participants could review and correct as needed. The audio was also recorded from a laptop in case it was needed to clarify comments.

Participants of the forum received a link to a Google Document and a two week window of opportunity to edit their specific comments, or add additional comment. Thereafter, the document was closed by Dr. Brenner, who reviewed comments, clarified with authors as needed, redacted all names of comment contributors, and annotated with his comments and/or Wes Jurey’s from the Foundation (noted by “Comment#(RJB)”. The document is presented (Attachment 4) as a record of the event and it includes participant reviews of each “challenge” and “opportunity” --- from their perspective --- and their assessment as to whether each was in the top 3 priorities of the SE U.S. It should be noted that the list of “Challenges and Opportunities was not available for the “voting” exercise at this first of five regional forums. Therefore, a separate poll was taken post-forum using an online survey tool. Only about a third of the forum attendees responded.

Reporting of Participant Comments

Figure 1a (below) reflects their perspective on these “Challenges”.



Participants considered “growth instability and increased investment risk caused by policy uncertainty” as the dominant challenge faced by the bioeconomy industry, followed by steep competition from petroleum-derived resources. Access to capital for large financial investments, technical hurdles, and uncertainty of sustainability were tied for the 3rd priority.

Some respondents to the online poll also provided comments or some additional “challenges”:

Categorize as... ▾ Filter by Category ▾ Search responses

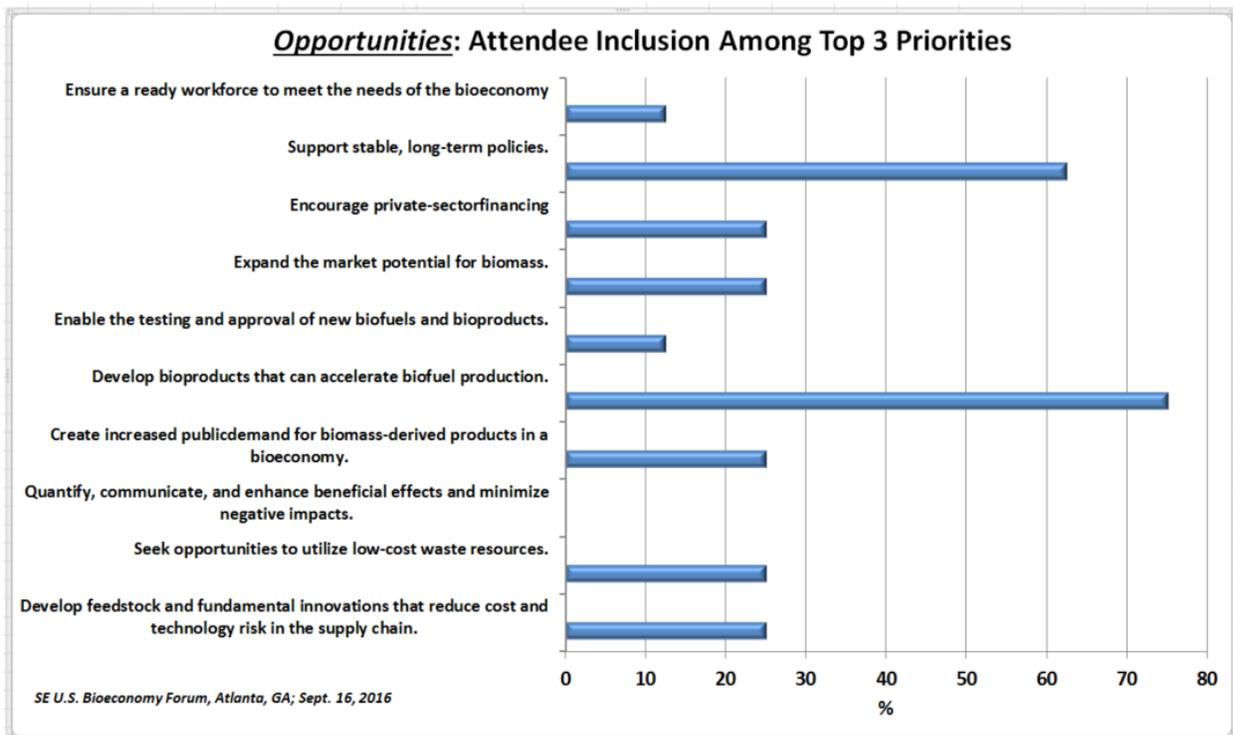
Showing 3 responses

Initiate use of biomass for high value products
10/25/2016 7:45 AM [View respondent's answers](#)

Nanolignin
10/17/2016 6:45 PM [View respondent's answers](#)

Most risks are associated with the current biomass=>biorefinery=>energy with others as co-products. Focus on developing performance properties for renewable materials because users require such performance is a better path forward.
10/17/2016 6:25 PM [View respondent's answers](#)

Figure 1b (below) reflects their priorities on “Opportunities.”



Developing bioproducts that can accelerate biofuel product was seen as the top “opportunity” (75% of respondents) for the SE Region. Stable long-term policies was a close second (62% of respondents), and all other opportunities received 25% or less in prioritization.

Using the survey tool, the following questions were also asked: **What would success look like in 5 years? >5 years?**

Seven responses were received, and are captured below:

Showing 7 responses

In each of those years and steady increase in % of chemicals and fuels that are derived from biological sources vs. fossil fuels.

10/25/2016 7:45 AM [View respondent's answers](#)

The infrastructure already exists for a bioeconomy in the paper industry. This industry needs to be stabilized and the public educated that paper is green.

10/19/2016 9:07 AM [View respondent's answers](#)

There has been market demand by the public for bioeconomy produced products. That investments have come from outside the traditional wood industry, such as partnerships between traditional oil companies and biomaterial companies to advance these products. That there are operational biofuel and products plants operating without government support. That it is a viable industry.

10/18/2016 7:44 AM [View respondent's answers](#)

a reduction in US consumption of imported oil

10/18/2016 6:52 AM [View respondent's answers](#)

5 yrs. Several success examples of economic bioproduct production and adoption. Clear understanding of sustainability, and the value of the bioeconomy, and a stable policy foundation from which to move forward. Policy decisions made on the true cost of carbon which is incorporated in the valuation of other CO2/GHG production mechanisms. 10 yrs. On the way to fully utilizing multiple bioproduct resource streams: lipids, sugars, cellulose, and "waste streams" from agriculture and other industrial processes. Ubiquitous biogas production. On the path to full conversion of all MSW. 20 yrs. Dramatic reduction or elimination of waste streams through repurposing. Fully integrated resource management of forestry, waste cellulose, dual cropping. On the path to CO2 recycling.

10/17/2016 7:15 PM [View respondent's answers](#)

Cellulosic flagship biorefineries turning profit in five years. Major companies investing in 2-nd biorefineries in the next ten years. Biorefinery will be competitive with petroleum refinery in 20 years.

10/17/2016 6:31 PM [View respondent's answers](#)

None of the opportunities in 3 are "priorities". The risk with replacing petroleum-based materials in plastics and other polymers are better understood because r&d is tasked to develop performance properties customers want and the materials will be used in existing manufacturing facilities in existing supply chain. Federal government only need to listen to what users want. In 20 years, many of the current petroleum-based materials can be replaced with renewable materials and renewable polymers. Federal government investments should shift from bioenergy/biofuel to bio or renewable materials that can replace petroleum-based materials.

10/17/2016 6:25 PM [View respondent's answers](#)

Discussion: ATIP Foundation & Co-host Assessment of Themes, Issues, Regional Challenges & Opportunities

This section illustrates highlights of actual comments, selected by the Foundation, made by forum participants.

The full non-attribute comments by participants are in Attachment 4.

On the issue of **“what are state/local/regional opportunities for the bioeconomy,”** specific comments suggested:

- Strengthening partnerships with federal agencies that were located in their region, as well as state agencies and regional stakeholders.
- Opportunity for regional production of biofuels, given the proximity of the Atlanta Hartsfield Airport, and a Gulfstream jet factory in Savannah. Currently, bioaviation fuel is trucked in from Southern California.

- Improved feedstock chains for the region utilizing many feedstocks such as those from the poultry industry, peanut industry, and woody biomass industry.
- Proximity to two oceans (Atlantic, Gulf of Mexico) meant good port facilities (infrastructure).
- With good ports, export market is strong for pellets, but should be expanded to include products for domestic markets (*enhance value proposition*).
- Strengthen research ties with universities and federal labs for product improvement (pelletizing) for more efficient transport.
- Strengthen workforce development by engaging Department of Labor and Department of Education to develop training programs that allow greater cross-over of skilled petroleum workers to biomass refiners;
- Communication plan to address health and environmental issues; workforce development to build skill sets, and to find niche markets that have environmental benefits.
- Broaden partnership network to include Government, University, Industry, Research Roundtable (GUIRR), perhaps suggesting a “bioeconomy initiative” to expand demand for biomass products.
- Clarify and strengthen both state and federal policies on biomass to favor investment and finance of projects to better utilize damaged woods (fire-damaged, diseased) and healthy woods for more efficient management of our SE forests. i.e., increase product demand from low value biomass and high value biomass (lumber) with incentives to use biomass.

There were some key points made on “how can we help create a regional demand for the bioeconomy”

- Enhance partnerships: Consider consortia and coops to provide value to production from small operations, serving as “biomass accumulators” locally for more efficient transport to local / regional biorefineries and processing plants.
- Strong consensus partner among industry players to maximize utilization of materials and make more bioproducts.
- Coordination / consortium to optimize supply chain (including logistics of transport) and provide stability for a bioeconomy market.
- Government should provide incentives that encourage small company growth in new / risky areas of the bioeconomy. Government policy can create new stable market opportunities.
- *There was strong consensus among participants that government incentives are needed to advance the bioeconomy.*

On the topic of “how can we best engage the interested public in the Southeast in the process of developing a “billion Ton Bioeconomy,” there was much discussion that focused on how best to market the bioeconomy products through some specific campaigns with industry, universities, and the Department of Education to begin getting the message to youth.

What would success look like in the coming years?

- Steadily increasing % of fuels and chemicals derived from biological sources and not fossil resources.
- There has been market demand by the public (through enhanced communication efforts), such that investments have come from outside the traditional wood industry, such as partnerships between traditional oil companies and biomaterial companies to advance these products.

- Following early government incentives, that there are operational biofuel and products plants operating without government support --- evidence that it is a viable and sustainable industry.
- Dramatic reduction or elimination of waste streams through repurposing; fully integrated resource management of forestry, waste cellulose, dual cropping --- on the path to CO₂ recycling.

Can you identify other groups in the SE that support the bioeconomy?

- The participants proposed that they develop a “SE Bioeconomy Planning” organization and plan for an annual event.

What can federal agencies do to increase likelihood of private financing the SE to build the bioeconomy?

- Discussion was clear around two points:
 - Find ways to reduce financial risk --- if you don’t, you won’t get private financing in any meaningful way. Aviation is starting to see a change --- have unlocked a couple \$B from institutional finance. Why? In part, competitive price point for biofuel (long term off-take agreements, and a high capacity biorefinery repurposed / renovated from a defunct petroleum refinery.
 - Tax incentives for longer term investment. “With bioproducts on the cusp of commercialization, it is hard to get commercial investors because they don’t know how sustainable the effort will be.”

Summary Statement from ATIP Foundation**SE Regional Bioeconomy Forum Summary
Wes Jurey, CEO, ATIP Foundation**

The ATIP Foundation was established in 2011 at the request of the US Department of Agriculture (USDA), Agricultural Research Service (ARS), to serve as a third-party intermediary, engaging a variety of stakeholders with ARS research, programs, and initiatives. The initial goal of the Foundation was to enable a more collective, collaborative approach on behalf of the private sector, with each member representing one of the eight agricultural research regions in the USDA ARS infrastructure.

The fundamental premise behind this approach was the need to create greater awareness of the breadth and scope of USDA intramural research activity (and that of their federal and state partners such as Department of Energy, Department of the Interior, National Science Foundation), and possibly other collaborative agencies of USDA (e.g., Rural Development, Natural Resource Conservation Services, National Institute of Food and Agriculture), conducted in collaboration with 90 + ARS labs throughout the United States, and to foster an understanding that the federal research outcomes are available for use by business and industry, ultimately resulting in economic growth and development, in the agribusiness sector.

The Foundation was incorporated by eight state and regional technology-based economic development organizations, each individually serving as a federal partnership intermediary to USDA’s ARS, with many members also having facilitation agreements with other federal agencies, as well as their own network of in-state / regional non-federal stakeholders on many aspects of federal / private sector partnerships.

The Foundation's approach to establishing the five "Advancing the Bioeconomy" forums was premised on identifying regions within the United States whose stakeholders were receptive to the idea that each forum would serve as a springboard to launch one or more demonstration projects within the region. These projects would utilize the scope of research and related outcomes resulting from the massive amount of federal research coordination overseen by the seven federal agencies comprising the Biomass Research & Development Board, formed by statute in 1999.

The ultimate purpose of the regional projects is to demonstrate that the federal research outcomes--- combined with other federal / state / local agencies whose scope is in "implementation" of research outcomes, can result in economic growth and development, particularly in rural areas of the country, creating new businesses and enabling existing businesses to expand, resulting in job creation.

From the Foundation's perspective, based on the response from forum participants, we believe our premise is sound. At the conclusion of the SE Regional Bioeconomy Forum, participants were unanimous in support of reconvening in a year, and working to formulate a specific demonstration project tailored to their region in the interim.

It is noteworthy to the foundation that, while each of the five regional forums offered some unique perspectives, relative to their region, six common themes resonated throughout all five forums, relative to each region's ability to make use of the federal research to enhance the growth of regional economies.

First, the need for public awareness is considered a major challenge. At the beginning of most forums, there was significant discussion on what the bio economy actually was, beyond biofuel.

Second, the lack of knowledge of and about the federal resources within the seven agencies was cited. Throughout the discussion it became apparent that most attendees knew little, if anything, about the scope of research conducted; the number of federal labs that existed; or the significant number of research scientists employed. Additionally, there was little knowledge in terms of how to access the federal resources available, even if one were aware of them.

Third, the need to develop a talent pipeline for current and future workers was a strong concern. It was noted that although seven federal agencies were members of the BR&D Board, the Departments of Education & Labor were not engaged at the federal level. At the Southeast Regional forum, there was discussion on the need to include them in subsequent forums and pilot projects; none participated in this regional forum.

Fourth, development of the type of supply chain necessary to sustain the bio economy was expressed as a critical priority. It was noted that moving agricultural by-products and waste more than 100 miles was a significant inhibitor of the growth of this industry.

Fifth, the need to finance the growth of demonstration projects, establish new businesses, and expand existing businesses, by seeking federal, state, and private sector financial assistance is a critical concern. It was further noted that the financial community was the least represented in all forums (none in Atlanta).

Sixth, it was noted that federal policy is one of the most critical issues, and is an underlying issue to the first five cited. Policy uncertainty means high risk to institutions that provide financial assistance. It determines the

allocation of federal resources, the priorities of the public workforce system, discourages the establishment of a supply chain uncertain of the sectors future, and makes articulating a vision for the bio economy more challenging.

In our report to the BR&D Technical Advisory Committee in November 2016, and the BR&D Board in December, our findings, and particularly the six commonalities, were well received.

In conclusion, the Foundation looks forward to working with Georgia Institute of Technology, the Renewable Bioproducts Institute, and the participants in the initial forum, to expand the stakeholder base, in the development of a regional demonstration project.

We look forward to doing so in partnership with the seven member agencies of the BR&D Board, optimistic that the vision of a billion ton bioeconomy can become a reality.

Summary Statement from Co-Host

Southeast U.S. Bioeconomy ATIP Foundation Forum Summary

Valerie M. Thomas

Regional Host

Anderson Interface Professor

Georgia Institute of Technology

This meeting was co-sponsored by the Renewable Bioproducts Institute and the Strategic Energy Institute at the Georgia Institute of Technology.

The Southeast forum brought together representatives of the forest industry, the paper industry, the biofuel industry, the wood pellet industry, aviation, agriculture, and researchers from several southeastern states.

Key highlights and findings are summarized below.

- The pulp and paper industry is substantial and can be a springboard for growth of the bioeconomy. This industry has a basis of expertise, infrastructure, supply chains, workforce, and successful operating markets.
- The wood pellet industry is strong and could expand from its current export focused structure to also include somewhat different products for the domestic market. The wood pellet industry has developed and adapted existing wood products industry infrastructure; this approach could be successful for a wider range of products.
- A number of biofuel companies are in place in the region with potential for and interest in production activities. There have been biofuel failures in the southeast which have left many in the region cautious and negative about biofuels; however this experience also provides hard-learned lessons and a healthy skepticism in which strong programs can succeed.
- The southeast has coastline on two sides and excellent ports, rail, and air transport infrastructure. These provide a supply chain basis for domestic and international markets. The wood pellet industry is an example of successfully building industry for international markets. Other opportunities could also benefit from potential for export as well as for domestic shipping.
- Substantial progress on the bioeconomy requires either a significant policy signal or a disruptive market change. Weak policy signals have resulted in incremental change. There was discussion throughout the meeting of the need for a sustained policy, technology or economic impetus sufficient to support bioeconomy initiatives.
- There was extended discussion of a range of factors which might affect bioeconomy prospects in the southeast: current forest ownership and management patterns, workforce availability and training, competing industries, state and local policies, and others. While all of these factors have some influence, there was general consensus that these issues could be sorted out if there were sufficient impetus for bioeconomy initiatives.
- The meeting was well-received. Participants suggested that this event should become an annual meeting; this is a signal of the positive potential of engagement and commitment to the bioeconomy.

--- End of report ---

Attachment 1: Agenda

Attachment 2: Slide presentations

Attachment 3: "Discussion document"

Attachment 4: Non-attribute notes w/ comments

SE BIOECONOMY REGIONAL FORUM DRAFT AGENDA

“Garnering stakeholder perspectives and input to help shape the vision, strategic planning, and implementation to promote and expand the bioeconomy”

Date: Friday, September 16, 2016

Time: 9:30 AM – 5 PM

Location: Renewable Bioproducts Institute, 500 10th Street NW, Atlanta, GA 30332

Purpose: To outline the “Federal Activities Report on the Bioeconomy,” introduce a synopsis of the subsequent “Billion Ton Bioeconomy Initiative: Challenges and Opportunities” report (not yet formally released), and hear from stakeholders in (1) industry; (2) state and local government; (3) economic and workforce development; (4) investment & finance; (5) academia; and (6) agricultural and environmental organizations in order to accelerate the development of the bioeconomy.

8:30 AM—Registration / Check-in

9:30 AM—Welcome and Introductory Remarks

- Rick Brenner, Director, ATIP Foundation
- Jonathan Male, Biomass Research and Development (BR&D) Board¹, Operations Committee (Director, Bioenergy Technologies Office, U.S. Department of Energy)
- Todd Campbell, BR&D Board, Operations Committee (Senior Energy Advisor, U.S. Department of Agriculture)
- Norman Marsolan, State Host

10:00 AM–11:00 AM—Overview of the “Federal Activities Report on the Bioeconomy” and the “Billion Ton Bioeconomy Initiative: Challenges and Opportunities” Report

- Presentation by the BR&D Board, Operations Committee, led by Dr. Harry Baumes (Director, Office of Energy Policy and New Uses, Office of the Chief Economist, U.S. Department of Agriculture)
 - Establishes issues from the federal agencies and frames the topics for discussion

11:00 AM–3:45 PM—Stakeholder Comments and Discussion

- 12:30 PM—Working Lunch

4:00 PM–4:30 PM—Facilitator Report Out and Next Steps

- Key comments, findings, and recommendations of the 6 sectors
- Includes next steps (timeline to review, prepare, and disseminate report) and feedback on session format

4:30 PM–5:00 PM—Closing Remarks / Adjournment

¹ The Biomass R&D Board consists of representatives from the U.S. Department of Energy, U.S. Department of Agriculture, U.S. Department of the Interior, U.S. Department of Defense, U.S. Department of Transportation, the National Science Foundation, the Environmental Protection Agency, and the Executive Office of the President of the United States.

11/5/2016

ATIP FOUNDATION Agricultural Technology Innovation Partnership

**ATIP Foundation Regional Bioeconomy Forums:
Addressing the Challenges & Opportunities of
Advancing the Billion Ton Bioeconomy**

NEW HOLLAND AGRICULTURE National Sponsors

FOET | **DSM** Advanced Biofuels

Leveraging Assets: Partnership Intermediaries of USDA ARS

The Agricultural Technology Innovation Partnership (ATIP) Network

ATIP FOUNDATION
Established June 2011

ATIP FOUNDATION Agricultural Technology Innovation Partnership

**ATIP Foundation Regional Bioeconomy Forums:
"Addressing the Challenges & Opportunities of
Advancing the Billion Ton Bioeconomy"**

Venues and Regional Co-hosts

September 16, Atlanta, GA (Georgia Institute of Technology)
September 29, Mineral Wells, TX (Chamber of Commerce)
October 3, Seattle-Tacoma, WA (Washington State University)
October 18, Orono, ME (University of Maine)
November 15, Wooster, OH (The Ohio State University)

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NEW HOLLAND AGRICULTURE | **FOET** | **DSM** Advanced Biofuels

ATIP FOUNDATION Agricultural Technology Innovation Partnership

**ATIP Foundation Regional Bioeconomy Forums:
"Addressing the Challenges & Opportunities of
Advancing the Billion Ton Bioeconomy"**

SE Regional Bioeconomy Forum
September 16, Atlanta, GA

--- Regional Co-hosts and Sponsors ---
Co-host Georgia Institute of Technology

Georgia Tech | **Strategic Energy Institute** | **Georgia Tech** | **Renewable Bioproducts Institute**

--- National Sponsors ---

NEW HOLLAND AGRICULTURE | **FOET** | **DSM** Advanced Biofuels

BRDB BIOMASS RESEARCH & DEVELOPMENT BOARD

**The Bioeconomy Initiative:
A National Strategy for the Billion Ton Vision**

ATIP Foundation Regional Forum

Harry Baumes, Ph.D., Director
Office of the Chief Economist

September 16, 2016

Perspectives on the Growth of the U.S. Bioeconomy Background

- Executive Order 13134 issued in August 1999, President Clinton launched a national Bioenergy Initiative, "a national partnership...to produce power, fuels and chemicals from crops, trees and wastes." The Executive Order established a goal: to "triple the U.S. use of biobased products and bioenergy by 2010."
- The Biomass Research and Development Act of 2000, later amended by Section 9001 of the Food Conservation and Energy Act of 2008 (FCEA) and most recently reauthorized in the Agricultural Act of 2014, established the Biomass Research and Development Board (BRD). The BRD is co-chaired by the USDA and DOE with 6 other agencies servicing on the BRD. The Biomass Research and Development Board (Board) coordinates research and development activities concerning biobased fuels, products, and power across federal agencies.

Bioeconomy Definition

The BIOECONOMY is defined as:
The 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.

--From 2014 Report commissioned by USDA BioPreferred: [Why Biobased? Opportunities in the Emerging Bioeconomy](#)



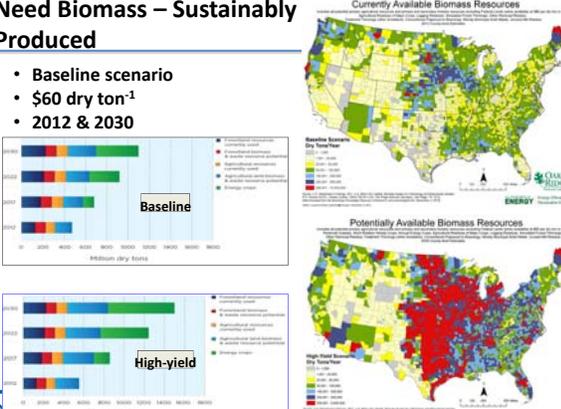
Vision and Goal of the Billion Ton Bioeconomy

The vision for the Billion Ton Bioeconomy is to sustainably reach the full potential of biomass-derived products as a way of expanding our nation's economy. In doing so, the bioeconomy will provide multiple economic, environmental, and social benefits to the Nation.

The goal of the Billion Ton Bioeconomy 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.

Need Biomass – Sustainably Produced

- Baseline scenario
- \$60 dry ton⁻¹
- 2012 & 2030



Billion Ton Studies History and Accomplishments

Billion-Ton Study (BTS), 2005

- Technical assessment of agricultural and forestry systems to supply low-valued biomass for new markets
- Identified adequate supply to displace 30% of petroleum consumption; i.e. physical availability

Billion-Ton Update (BT2), 2011

- Quantified potential economic availability of feedstocks for 20-year projection
- Publicly released county-level supply curves for 23 candidate biomass feedstocks through Bioenergy Knowledge Discovery Framework.

2016 Billion-Ton Report (BT16), 2016

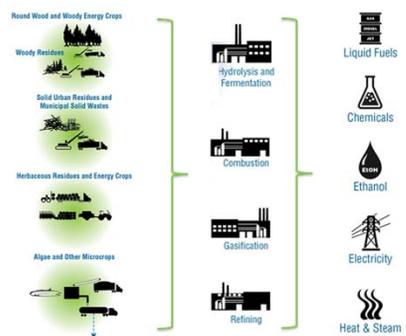
- Expansion of resource assessment to include additional feedstocks and delivered supply
- Two-volume approach



Federal Alternative Jet Fuels Research and Development Strategy



Simplified 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

Federal Activities Report on the Bioeconomy

- In February, the Biomass R&D Board released the [Federal Activities Report on the Bioeconomy \(FARB\)](#).
- This report aims to educate the public on the wide-ranging, federally funded activities that are helping to bolster the bioeconomy.
- The vision** for the Billion Ton Bioeconomy is to sustainably reach the full potential of biomass-derived products as a way of expanding our nation's economy. In doing so, the bioeconomy will provide multiple economic, environmental, and social benefits to the Nation.
- The goal** of the Billion Ton Bioeconomy 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.



Overview of Agency Activities



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

Bioeconomy Initiative Reports Plan




Planned Release Fall 2016

The Bioeconomy Initiative: Action Plan
Target completion date: Dec., 2016

- Three reports in the series: FARB – released in February, 2016
- Stakeholder engagement
 - Over 400 participants involved in 5 sessions.
 - 4 in-person Listening Sessions were held in conjunction with major bioenergy industry events.
 - 1 public webinar (May 5th).
- This report will be the second part of a staggered release of the Initiative
 - An 'Action Plan' to follow

Report Outline



- Introduction
 - Purpose of the report
 - Background of the Bioeconomy Effort
- The Bioeconomy Initiative
 - Path to building the Initiative
 - Overview of the Bioeconomy Vision as stated in the FARB
 - Highlights and Learnings from the FARB
 - Expected benefits for 2030 as defined by Analysis IWG
- Challenge Areas (as identified by Stakeholders)
- Ongoing Interagency Areas of Importance and Growth for the Initiative
- Next Steps/Path Forward
 - How to move from the Strategy Report to an Action/Implementation Plan
 - Additional Stakeholder Involvement
 - Call for partners from industry/research community to 'Join the Initiative'
- Conclusion

Key Challenges Identified

This report discusses seven of the high-priority challenges recognized by the bioeconomy stakeholder community, identified below:

- 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 environmental, social, and economic outcomes.
- Growth instability and increased investment risk caused by policy uncertainty
- The need for a strong and capable workforce.

Key Opportunities

Specific opportunities within each challenge as potential growth areas for the future of the Initiative are detailed below:

- Develop feedstock and fundamental innovations that reduce cost and technology risk in the supply chain.
- Seek opportunities to utilize low-cost waste resources.
- Quantify, communicate, and enhance beneficial effects and minimize negative impacts.
- Create increased public demand for biomass-derived products in a bioeconomy.

Key Opportunities Continued

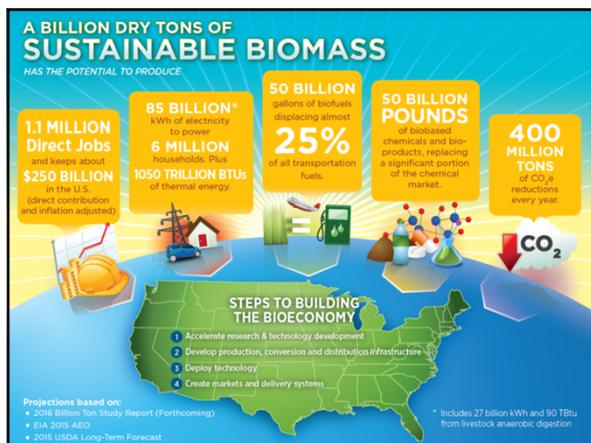
- Develop bioproducts that can accelerate biofuel production.
- Enable the testing and approval of new biofuels and bioproducts.
- Expand the market potential for biomass.
- Encourage private-sector financing
- Support stable, long-term policies.
- Ensure a ready workforce to meet the needs of the bioeconomy

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Purpose for this meeting:

- This workshop series is intended to focus on regional issues and their specific bioeconomy-related industries through the various state partnerships.
- The feedback gathered from these formal workshops will be used to solidify and support the Action Plan that is planned for release in December of 2016.

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Critical Discussion Points

- What are state/local/regional challenges to the bioeconomy?
- How can the federal agencies help address these regional challenges?
- What are state/local/regional opportunities to the bioeconomy?
- How can the federal agencies help leverage these regional opportunities?
- What is the value proposition of a bioeconomy?
- How can you contribute to the Billion Ton Bioeconomy?

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Bioeconomy Initiative:

A National Strategy for the Billion Ton Vision

THANK YOU!

Critical Discussion Points

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- What are state/local/regional opportunities to the bioeconomy?
- How can the federal agencies help leverage these regional opportunities?
- What is the value proposition of a bioeconomy?
- How can you contribute to the Billion Ton Bioeconomy?

What are specific regional barriers that need to be addressed to grow a bioeconomy?

How can we help create a regional demand for the bioeconomy?

Where do you perceive, if any, a lack of workforce readiness to support the bioeconomy?

How can we best engage the interested public in the Southeast in the process of developing a Billion Ton Bioeconomy?



What would success look like?

In the short term (<5 years)

In the long term (>5 years)

What can federal agencies do to increase likelihood of private financing in the Southeast to build the bioeconomy?

How do biomass-derived feedstocks benefit the Southeast region?

What is the potential for these benefits to grow?

Can feedstock commoditization help reach this potential?



What are the challenges faced by the biomass producers in the Southeast in growing dedicated biomass crops?

Critical Discussion Points

SE U.S. Bioeconomy Forum
Atlanta, GA
September 16, 2016

Non-attribute notes, with comments by ATIP Foundation

What are state/local/regional challenges to the bioeconomy?

How can the federal agencies help address these regional challenges?

What are state/local/regional opportunities to the bioeconomy?

- —opportunities that they are well established industries, great infrastructure, lots of technical knowledge and need to tap into that. Blend industries together...the env. Issues, heat, humidity affects the supply chain. Starting out at a great place
- —Another opportunity is for the federal agencies to collaborate at a regional basis as well, be flexible to support a regional economy in a way that may be unique region to region. DOE, USDA could somehow leverage their programs, expertise and programs to support the region.
- —opportunity in the SE is that the labor has high productivity which is why manufacturers locate in the SE. Not taking the full opportunity to take the biomass to turn into a final product. Lots of opportunities there
- —An area that hasn't been touched on is of waste...so much waste that has not been thought about on how to bring it into feedstocks. E-waste being sent overseas...where does that come into the equation
- —In Europe, lots of effort + interest to use biofuels in the cruise industry because of sulfur...have had international agreements, is there possibility for this in U.S.?
- Maritime looking at CNG and large engineers, ferries looking at battery packs.
- -- Opportunities—happening all over, all of these industries are working to reduce GHG footprint. In airlines, looking at biofuels...looking to reduce, collectively they add up and make an impact
- —here in support of aviation fuels, Gulfstream burning renewable fuel since May. Started 5-6 years ago...looking for the supply, wasn't there. A small user, but customers do and industry does. As an OPM, burn hundreds of thousands of gallons—have taken on a leadership role, invested into the industry, willing to pay a price premium to help move the industry along but not a huge price premium. Now down to close to price parity—engage customer base, if the fuel was in Savannah, would you buy it? Had a higher price point last year and customer was not too keen, now with a different price point, 30% said yes which is a step forward. Have to take small measured steps to

Comment [RJB1]: Partnership should include federal agencies as well as state agencies and regional stakeholders.

demonstrate proficiency in growing markets, most conversations around pulp + paper... have significant resources in GA. The fuel we buy is in California and then need to rail it across the USA. CAAFI doing great work to bring aviation community together but there is more involved. Partnerships—EFAA trying to have this conversation at a higher level across the US

Comment [RJB2]: Opportunity for regional production of biofuels.

- —What could have Gulfstream getting further with biofuels?
- —More supply! At the right price point.
- —beef tallow in California, have the same feedstocks (but chicken) here
- —but how do we get the conversation going in the SE, but perceptions from the past fuel projects in GA.
- —just came from Macon from aviation biofuel workshop, person from SW here. Want to minimize risk, technology scale up, need to continue with technology. Needs to make money but not specific ROIs. Have money and will finance
- —biggest opportunities is the paper industry, getting them on board/ their involvement would be very useful and give us a jump start
- —business isn't the logistics of getting the fuel to us, had to find someone to supply. Had to find the right player + right willingness. Continuing to do that and looking to next steps, Gulfstream isn't a big user, Delta is a big user. Another possible approach is...have you talked to airports?
- —on the commercial side, airports themselves are not major players in the process because they do not buy fuels. Airlines buy fuels but use infrastructure at airports. Most fuels looking at provide air quality improvements. Airports showing interest but not easy for them to contribute tangibly—concept goes across industry. Bioeconomy can deliver environmental services (water quality, waste remediation, etc.), not monetized. Markets work because x has value, when free market mechanisms aren't working, the policy can intervene including the pursuit of R&D. All these things need to come together to make something work. CAAFI working on many projects, banner weeks..a large supply agreement announcement on Monday, supply Atlanta Hartsfield directly. Things missing to have this activity be more robust is a lack of feedstock supply chain systems, inappropriate lvls of tech to take adv of available feedstocks for a reasonable price point. Lots of project development. Start with fundamentals of large # of feedstocks avail, appropriate tech, see if the business case can close and bootstrap project development getting business + govt together in absence of major policy game changer. Believer in forestry based options. Certain solutions can work, leveraging these things in the SE including poultry fat and litter, peanuts (valuable opp, created by policies not working very well, price floor protection for peanut farmers), forestry. 1.2 mil tons of peanuts are warehoused. Need large solutions that go across multiple feedstocks
- —SE has Atlantic Ocean + Gulf of Mexico, one opportunity might be is to put more emphasis on ocean related biomass production as well as biomass to make sure water quality in oceans are good based on strategies to use biomass to remediate. One USDA program—how can it be leveraged for variety of purposes- USDA facilitates people getting access to capital to invest in rural enterprises—the SE regional concept into play, may be a way for state govt and private investors for a regional rural business investment. Rather than burden an airline producer with risk, may be possible that this

Comment [RJB3]: Feedstock for SE regional biofuel production opportunity.

Comment [RJB4]: SE Regional issue.

Comment [RJB5]: Unique geography adds some potential opportunity

Comment [RJB6]: Suggested realignment of USDA RD services.

investment entity can take on risk that makes transactions happen that would otherwise not. Govts can benefit in more ways than stock or interest rates. Talking to the military for purchases in the region...as a govt related entity

- —viable problems to understand the big pic, on the table we don't have the people who directly touch the feedstock or machinery, may not be able to afford to be here because when taking their time, they're losing money. There is a community there that has a strong tie with the success of the supply chain who is not at the table. This group is not always very sustainable—turnover after someone is trained. Question of whether we have the workforce and their contribution to the conversation, but what is the quality of the workforce? As a general rule of the supply chain, the slowest node is the speed of the supply chain
- —Risk is the quality of the workforce, talking about extreme rural areas. Drax worked with SW Miss Comm College and started an internship program on our plants to work closely and tap into quality workforce in the area. Army bases looking at renewable energy (Fort Hood, TX, Fort Drum, NY), General Motors said they would go to 100% renewables in future, Proctor and Gamble recently announced installing a biomass boiler in Albany, GA. Just several examples of companies saying they want to unplug from grid or get into more renewable energy where biomass is a piece of that
- —Entire pellet industry has done well in the SE, newly created biomass supply chain with a new product, new customers, talking about growing. Are there opportunities to grow different bioproducts as part of your (Pete's) companies, aren't you an opportunity?
- —Pellets are easy to transport by compressing and drying the moisture out of the biomass. If there is a way to modify the supply chain for a plant up the road, could ship it without forming into pellet. Supply chain needs to invest in fire suppression and dust mitigation, etc. Currently millions of tons of wood chips are being shipped out of NC to Turkey for the Medium Density Fiberboard (MDF) panel industry now.
- How can the federal agencies help leverage these regional opportunities?

Comment [RJB7]: Workforce development

Comment [RJB8]: Increasing market demand

Comment [RJB9]: Export market; what about domestic markets?

What is the value proposition of a bioeconomy?

- —long-term, value and faster we get there, the faster we can solve problems of the future. Eventually oil will be expensive and we will need alternatives
- —short-term, we need a coproduct + biofuels
- —building on [another's] comment...talked about creating a higher energy pellet so every boat load to Euro would be more efficient. Pellet process—grind, dry, compress only to get ground up again. What if there was a different handling system where a compressed package the size of a shipping container dense with the dust and ship like a shipping container, attach to a utility so the dust can flow into the system and you don't need to put it together just to tear it apart.
- —Dept of Labor + Edu...would be great to have more incentives for workers to learn about the jobs they're in. DoL- people gaming the system going in and out of unemployment—need a stable workforce.

Comment [RJB10]: Research partnership opportunity

Comment [RJB11]: Includes suggestion that DOL and Dept. of Education should be at the table on the bioeconomy to develop a workforce training program.

- —different problem in TN, due to the regulations of workman's comp for businesses with 5+ employees, businesses would hire 4. Low rates of insurance, workmen's comp...still a worker related issue, but no incentive to have enough employees because you're gaming the system
- Addressing loopholes in federal/state/general policy?

Comment [RJB12]: Policy issue?

How can you contribute to the Billion Ton Bioeconomy?

- —educating people on the bioeconomy. Amazing how Euro is very tapped into the green economy. Not doing a great job educating people on the benefits of the green economy in the U.S.

Comment [RJB13]: Communication on benefits of green economy.

What are specific regional barriers that need to be addressed to grow a bioeconomy?

- (NE U.S. participant): infrastructure problem to get natural gas to run paper mills... running on fuel. Paper industry already bioeconomy, trying to keep sustainability. Entire infrastructure is not great. Infrastructure of nat gas stops in Manhattan—Maine @ tailend. Pipelines will shut off when it's too cold. Employ 200/8000 in local region—since infrastructure can't support industry, they leave
- —is natural gas a top issue?
- --- It's the top cost \$200-300K total gas bill, Highly specialized paper company...lots of implications for specialized technical uses
- —looking at goal slide: already have 900K jobs, pulp + paper already creates tons of products, need to include all industries related to bioeconomy. Canada/EU existing pulp + paper industry is key to bioeconomy but in the US is forgotten
- --- Ag researcher—SE, warm temp, high humidity and more susceptible to environmental conditions and have more challenges especially with sugar crops
- -- Our [company] strategy is to site the pellet plants near permanently closed paper or panel mills that no longer need the fiber. Examples include International Paper in Bastrop, LA and Pineville, LA and Courtland, Alabama. GA Pacific closed panel plant in Gloster, MS. There are many forested areas in the South where demand is permanently going away and the logging & hauling supply chain is still hanging on.. We anticipate that there will be more pulp & paper mills in South US closing down in the next 10 years.
- —pulp + paper...like two distinct industries..those grades will continue to decline. Pulp + paper in the US is fairly healthy, Southern Pine will be a viable business for a long time (corrugated). Big piece of the industry that should grow in the South
- — agencies are not looking at entire bioeconomy, focus has been on pushing policy of liquid fuels. Not opposed to liquid fuels but when designing a bioeconomy start w/ policy limitations, will have irregularities. Missing an opportunity to help them—interesting what you're paying for gas versus market. Is there a biogas alternative? SE trying to reduce

Comment [RJB14]: Major infrastructure challenge for NE region.

Comment [RJB15]: Challenge

Comment [RJB16]: Opportunity

use of coal, but have not come up with mechanisms that focus on coal areas and put investment to replace the jobs that are being lost. Opportunity to cleaning up the coal areas using biomass as a mechanism to make it happen. No animosity to companies using pellets but inefficient to take a resource being made in the US and sending abroad- using biomass energy in coal systems to help wean off coal

- — I have written many proposals, but for bioproducts persons, there is hardly any funding in bioproducts because very competitive. I used to work for Louisiana Pacific...40 years of research lignin as an adhesive. Not using anymore because losing cost advantage due to variation in polymer—not saying that it's not possible but #1 reason not using biobased polymers in wood industry
- —background in forestry (GA Pacific), what hit Drax that it was biggest carbon emitter in Northern England. Govt intervention—Drax did not need to switch to biomass renewables, we could shut down the coal plant. Govt placed carbon tax which stair stepped up over the years, along with a govt incentive to place investment in retrofitting infrastructure. Can't be cost competitive with coal and needs an incentive mechanism to offset the cost of conversion. Drax is annually saving 80-85% in carbon emissions from burning biomass instead of burning coal. If we can take wood pellets from Louisiana over to the UK, then we can just as easily take them to Arkansas or Kentucky, etc. Why can't the US get on board? Carbon tax, incentives, etc. can be put in...would help to grow U.S. domestic business. Drax transformed and now looking at what's next? The opportunity is much larger than 1 power station, and we are talking to other countries that want to reduce their carbon emissions from burning coal. The domestic challenge is having access to relatively inexpensive natural gas, why convert if natural gas is so affordable for U.S. power utilities?
- —Supply chain for biomass established in past 50 years in lumber, established pecking order. If you take one piece out, then there is a void and increase cost for all players and causing risk for loggers/saw mills. Need to figure out what can be replaced when one player disappears—building paper mills, can also build other plants if you find the right product and value in marketplace. Need to build scale and find players willing to put money and take risk to build facilities that can compete against pellets/paper. Govt cannot do it alone, smaller companies are developing...if there were the right incentives, there will be players who would put forth capital
- —economically driven decisions (lumber supply chain), policies to change/shift that. When tons of bark is created and sent somewhere to be chipped, etc...when the pellet mill closes, the saw mill doesn't have a place to put displaced material. Barrier is ignoring commercial facilities that are currently available that can convert tons of biomass, very big economic opportunity
- —getting govt out of the way, groups trying to get this commercialized, but let people do what they need to do. To create products like bulletproof glass, new types of paper, baking sheets (FDA in the way). Costing millions of \$\$ to go through regulatory agencies.
- —really need partnerships, horrendous questions on health +env, have seen consequences of that in 10-20 years. Really need partnerships to move forward, also need to have an educated workforce. Hear about pulp + paper being ignored, a little guilt

Comment [RJB17]: Research challenge

Comment [RJB18]: Policy issues and carbon tax drove process in UK

Comment [RJB19]: Policy issue

Comment [RJB20]: Regulatory issues

on both sides. Some companies backing away from research, think in terms of writing a grant..both sides need to come together and find opportunities to leverage each other's skill sets. Find market niches that are good. Both sides—want people to make money in the bioeconomy but also leave the world a better place.

- —public private partnerships? This is a valuable mechanism to bring relevant federal / state agencies to the table along with the private sector. For example, the ATIP Foundation, over the past 3 years, has formed public-private partnerships (PPP) to address common issues of “Resilient Economic Agricultural Practices” (REAP) for sustainable land management practices for multiple land use of producing animal feed, food (crops for humans), fuel (bioenergy), fiber, and wildlife habitat / management. The advantage is that the 3 sectors (federal / state / private sector) have a vested interest in managing lands for multiple uses. Our experience is that having representative stakeholders at the table builds a network conducive of finding common ground and developing actionable processes of optimizing land use.
- Would argue a federal/state with organizations that are already working with industry that have long term tailored programs to have short term benefits to industry but benefits you can incorporate. One shortcoming of industry as a whole is making products that the consumer wants..projects in pulp + paper can become daunting because of the complexity of issues. Needs partnership with govt to get to next stage
- —Is anyone involved in Govt Industry – consortium that might be worthwhile to seek, has a bioeconomy dock. The group is called GUIRR, that stands for Government University, Industry Research Roundtable. I recommend that we reach out to them to establish a “bioeconomy initiative,” and begin the process of forging alliances among the 3 sectors that can address the complexity of these sector-integrated approaches.
- —As a nation have a great capacity to team together, if someone championed and had a great vision to ‘solve my industry and make it more dynamic’ that contributes to low carbon fuels and brings it further than where it would naturally evolve to...people will partner. Fed govt, greater emphasis on justifying investments by econ dev, opportunities are truly there.
- —come from forest operations linkage to supply chain. Problem is that we are extremely good at assessing resources and the final product, but not great at looking at the workforce that will be supplying the feedstock. Looking at feedstock that wants to increase by 2030 but depreciated equipment, there is a key note in the supply chain to make it move seamlessly. Many countries are taking better care of their operators whether it's health or insurance—just published a paper out of TN discussing workers comp and insurance and equipment...operators are way underconsidered when it comes to their health and safety. Need to pay more attention to the workforce but that also means having a sustainable mech that gets them involved in long term contracts. How do you link between the forest operations, for example, and ecosystem services and supply chains, market. Looking at product market, and energy market from biomass..very complex design to look at supply chain and should be careful.
- —operator cannot successfully harvest, research needed on the operators (missing link in supply chain). Problem in VA, has had 3-4 pellet mills put in. Long term viability of

Comment [RJB21]: Partnerships to address health and environmental issues; workforce development to build skill sets; find niche markets that have environmental benefits.

Comment [RJB22]: Public Private Partnerships based on common goals of broad stakeholders

Comment [RJB23]: Recommendation: approach GUIRR on establishing a “bioeconomy initiative”

Comment [RJB24]: Comment supports notion that GUIRR may have great value as facilitator

Comment [RJB25]: Workforce development

Comment [RJB26]: Partnership / consortium of stakeholders with a vested interest in various bioeconomy products.

resource..on hardwood side, growing more than harvest but lots of public concern on the mapping. SW VA is a vertical. Growing stock not viable for harvest

- Questions —what would get in the way of the availability of the feedstock?
- IF they cannot harvest economically, they won't harvest it
- —Bioeconomy...identified the major factors that can affect..economics, market competition from other sectors, policy and finance related. If you look at whole supply chain, accounting for 50% of chain, to make it successful, need to see how you use the whole logistics cost. Policy and uncertainty is a major factor. Competition with natural gas...these factors are very important
- —3 barriers in the SE 1) underutilizing land resources, from the forestry side..most forestry land is under natural forest. Not saying to turn natural forests into plantations but big underutilization esp. in the SE. 2) practices of farmers in the SE—underutilization 5-6 months, where landowners manage their land in a more forestry manner to produce more wood, if have more use of farmlands. SE has a bad history of cellulose economics, go to Soperton, GA, try and sell 'snake oil'. Historic problem in the SE US has left a bad public perception of bioenergy/economy 3) forestry main feedstock/land use..not a well established supply chain. Loggers becoming an 'endangered species'. Do not have an idea how to harvest/transport/etc. feedstock
- —underutilization, esp of forest land. Lots of private ownership in relatively small tracts that leads to underutilization...that landowner would underutilize land (because that's not their commercial purpose)
- ---Healthy forests are depending on healthy markets; forest lands have underutilized resources due to absence of healthy markets for product. If a landowner does not have healthy markets they may choose to sell their land and redeploy their capital elsewhere.
- —Markets have proven that...hard to sell bioeconomy in SE US (esp South GA). Pellets are successful because technology is there, new cellulose technology are still in the labs and not commercially avail. If tech is there, landowners will have confidence and use their land more productively. Problem is commercially proven technology where people can have a level of confidence
- —are there co-ops for biomass? Similar to small farmers coops for commodity production. Many local biomass production operations could feed into a biomass co-op and gain economy of scale. That might solve supply side for small land owners wanting to produce biomass, but don't have enough to meet demands of bioproducts manufacturer.
- —extension service group at a land grant university might be helpful since they can touch every component in the supply chain
- —sugar industry has coops
- —using wood processing plants as a lab or platform in which new initiatives for biomass use. SC have a lease of 15 acres within a lumber company, from a strategy matter, might make sense to incentivize people trying to innovate. Waiting for the plant to close and figure out what to do, but urge DOE and USDA to consider trying to encourage collaboration between wood processing and other processing plants to innovate new bioproducts
- —Example of what happened in GA and also Mississippi

Comment [RJB27]: Absence of local demand for low quality feedstocks

Comment [RJB28]: Policy and incentives

Comment [RJB29]: Barriers to advancing the bioeconomy in SE U.S.

Comment [RJB30]: Lack of healthy markets for products results in repurposing land for better ROI

Comment [RJB31]: Value of R&D on improving technologies for cellulose to create high value products.

Comment [RJB32]: Addresses idea of consortia and coops to provide value to production from small operations.

Comment [RJB33]: Suggestion that USDA and DOE develop pilot program of collaboration between biomass processing operations and product producing plants to generate profitable bioproducts.

- — The SE U.S. does not have a forest fire problem like the West Coast. Figuring out what kinds of products can be made from fire damaged trees would be a good use of time + money
- — more collaboration between state/fed/local govt. California example not well coordinated between diff govt sides
- — question about small land tracts: NE has land trusts and active management that lowers tax burden...is that something that happens in SE?
- Yes, there are land trusts in the SE
- — there are examples in other parts of the country where companies who have plantation trees have worked with state legislature to be taxed differently to keep trees on the ground and get more value. Getting taxed as a farm instead of a forest

Comment [RJB34]: Suggests a partnership project to focus on utilizing fire-damaged (or diseased?) trees ---- possible a research topic for funding agencies.

Comment [RJB35]: Comment supports concept of GUIRR projects

Comment [RJB36]: State & Local policy development. How can federal government construct policy to encourage such actions?

How can we help create a regional demand for the bioeconomy?

- — sugar industry...Louisiana/FL/TX, no incentive to make biofuels because of policy. Don't like researchers working on biofuels to secure the sugar price. Can make syrup which is a great source...big problem is the price of gas. Reverting to food grade syrup/whiskey because there is money there. Sorted technological problems, will be ready to create other products but all in all, biggest problem no incentive
- — double the question along with a regional supply—demand is there and subject to many market dynamics but part of the work done in forestry is that there are many different perspectives on the forestry supply. Biomass Utilization Strategies (publication) --- key outcome is that we lack an integrated management plan to tie resources into an integrated supply. So many treatment + management objectives that constrains supply of biomaterial—from the supply side
- — industries to be integrated with each other. If you have two industries working together, can create demand from existing infrastructure
- — for example, whiskey makers demanding sugar supplies are working together
- — biggest problem with company in CT, until there is a change in thinking on the creation/use of energy...\$1 to clean energy fund, end up buying light bulbs. Energy companies need to decide this is important or they won't change. No incentive to change—want centralized power where they control the price. The govt needs to step in. When small companies creating something that is a paradigm shift, going against strong companies and lobbies that do not have an incentive to change
- — technological disruption or policy to create new economics—small niche markets can be technologic disruptors. On the policy side, in Italy, banned plastic bags but allowed plastic bags made from sugar and created an industry over night. The govt can create new industries through drastic change, not incremental. Same with tech, you need something that is significantly better like nanotechnologies that can replace traditional products with better properties and performance
- — create may not be the best verb—industries are already created...how do we enhance/change the industry or the bioeconomy
- — Shell oil + biodiesel...look at people with lots of money. Look outside traditional realms for expanding the market

Comment [RJB37]: Lack of federal incentives

Comment [RJB38]: Coordination / consortium to optimize supply chain and provide stability for a bioeconomy market.

Comment [RJB39]: Partnerships among industry players; maximize utilization.

Comment [RJB40]: Government should provide incentives that encourages small company growth in new / risky areas.

Comment [RJB41]: Supports idea that government policy can create new stable market opportunities.

- —using the same mechanism to create biooil to produce renewable fuels, **partnerships** along those lines
- —in UK, govt put a mandate that coal would be off by 2025. The capacity margin in the US is the margin between peak electricity demand and what capacity is available, ranges from state to state 15-25% but in the UK it's less than 4%. The UK does not want to see brownouts and therefore the govt realizes they are in a tight spot so they are putting in incentives to work alongside with the utility industry to come up with a **solution**.
- --- how does the supply relate changing from coal to wood?
- --- Low capacity margin with renewable energy targets means need they need a solution and they will not look to increasing use of fossil fuels.
- --- **It sounds like the answer to how we get to a better bioeconomy—govt incentives**
- —Georgia One: many arms of the state env, taxes, logistics, forestry to come together. Small businesses (3-8 people) interested...small businesses do not have the capacity to ask the questions on how to grow their company. Should be able to bring the resources of the state/fed resources and see what the limitations are. Role for that—need a champion like **Jill**
- —If you want a regional economy, you need to create more regional cooperation. SE economy is not limited to Georgia/NC, companies work across state boundaries. Not a mechanism to bring together those people in the regional bioeconomy.
- —Petroleum is cheap so need expensive products or...have a big poultry, peanuts industry. **Gather low cost co-products like poultry/cow manure for biogas, even though those feedstocks are small in overall flow to the ultimate capacity of the bioeconomy, could start to have a track record of many successes and initial layer of supply chain that could grow. Would that work, and how could we do that?**
- —build biomass plant in a coal mine to get an economy of scale, port of Savannah/gulf ports that could use same mindset
- —supply of energy resources is better exploited on a regional basis. SE talking to NREL, DOE to advance the efforts on a regional basis. GeorgiaTech working with partner unis around SE, utilities may not agree on the right path forward. Have nuclear, adopt natural gas and 2x national rate and bioenergy capability...resource location, policy location, economics to region...trying to develop that story for energy and parallel efforts are happening in the bioeconomy. **Potential for collaboration, need to think at this scope** (regional). Constraint—energy efficiency, if that's the only metric..businesses thinking at economic efficiency.
- —figure out a way to link the complex feedstocks into one integrated plan, the overarching problem is scale and time. To have an efficient supply chain, need to build and provide a certain amount within certain area that makes the operation profitable for whoever is working with it. Trying to build a seamless between crop/manure/etc industry to be able to utilize the infrastructure to get to a particular point at a certain time. Need to think about making it socially acceptable, environmentally sustainable and economically efficient. W/ diff feedstock providers at the table, can create an objective on the same page

Comment [RJB42]: Again, promoting a theme of partnerships

Comment [RJB43]: Example of UK policy to avoid brownouts – situation may not be relevant in U.S.

Comment [RJB44]: Conclusion that government incentives are needed to advance the bioeconomy.

Comment [RJB45]: <http://www.onegeorgia.org/programs>

Comment [RJB46]: Opportunity for regional resource development in the bioeconomy.

Comment [RJB47]: partnerships

- —supply chain is a big issue—we have enough biomass, infrastructure + cost, not getting there. Working logistics and supply chain...very hard, in the SE, lots of residue, how can we create demand?
- —The majority of developed fuel conversion technologies are specific to a feedstock (not robust enough to handle multiple feedstocks or types of biomasses). Fuel conversion technology which can use multiple feedstocks can have economic benefits from multiple segments of bioenergy supply chains such as low cost of logistics (storage and transportation). It improves risks related to severe weather or climate and biomass supply availability by diversifying feedstocks.

Comment [RJB48]: market to increase demand

Where do you perceive, if any, a lack of workforce readiness to support the bioeconomy?

How can we best engage the interested public in the Southeast in the process developing a Billion Ton Bioeconomy?

- —Looking at homes and the process in England, local/regional/federal, it can be at every level
- —Swedish students + F-150's—culture difference between America + Europe—people like being green if it doesn't cost more
- —organic food is selling more in U.S. now, super trendy (but more expensive)
- —fundamental difference in US where there's a technological solution for everything and Europe there's a conservation-related solution
- —in Euro, people don't know what we do for sustainability...perception. Do not sell the sustainability efforts in the US elsewhere.
- —trying to say that American public could do a better job of explaining the bioeconomy
- --Can put the facts out there, looking at organics, niche market that is not going to move the market. Think its starts with school and education, need to teach kids to make change. Cultural bias, not going to have 100% advocates but need to start with the younger generation
- —oil + gas industry commercials talking about their industry, looking at successes like Dasani's plant bottle. What is the industry doing? Marketing—isn't that one more revenue stream that is not being captured? Govt doesn't do marketing—they do education, but could partner and help with marketing. Would be interested to see if there are any marketing campaigns in industry—why is this the feedstock of the future?
- -- You have to start by formulating product where performance is up to the expectations of the consumer—once you do that you can talk about marketing and telling people what the extra value is in being green
- —that would not be the case with Dasani...was not improved product, just a “plant” bottle.
- —but I would argue there is value for Coca Cola

- —plant bottle for example, needed to make sure performance was good, because Coca Cola needs more containers to deliver their products
- —maybe the campaign needs to start somewhere like the Dept of Education.
- — marketing is because people feel good when thinking of trees, had nothing to do with bio products of the bottle but had to do with the tree they saw in their minds
- —those dealing with the feedstock is not here, and neither are the marketing people. Don't want to deceive the consumers but they're good at marketing and selling things to people by studying their reactions and preferences. Needs to be done carefully so we're enlightening them on how the process is working

What would success look like in 5 years? >5 years?

Showing 7 responses

In each of those years and steady increase in % of chemicals and fuels that are derived from biological sources vs. fossil fuels.

10/25/2016 7:45 AM [View respondent's answers](#)

The infrastructure already exists for a bioeconomy in the paper industry. This industry needs to be stabilized and the public educated that paper is green.

10/19/2016 9:07 AM [View respondent's answers](#)

There has been market demand by the public for bioeconomy produced products. That investments have come from outside the traditional wood industry, such as partnerships between traditional oil companies and biomaterial companies to advance these products. That there are operational biofuel and products plants operating without government support. That it is a viable industry.

10/18/2016 7:44 AM [View respondent's answers](#)

a reduction in US consumption of imported oil

10/18/2016 6:52 AM [View respondent's answers](#)

5 yrs. Several success examples of economic bioproduct production and adoption. Clear understanding of sustainability, and the value of the bioeconomy, and a stable policy foundation from which to move forward. Policy decisions made on the true cost of carbon which is incorporated in the valuation of other CO2/GHG production mechanisms. 10 yrs. On the way to fully utilizing multiple bioproduct resource streams: lipids, sugars, cellulose, and "waste streams" from agriculture and other industrial processes. Ubiquitous biogas production. On the path to full conversion of all MSW. 20 yrs. Dramatic reduction or elimination of waste streams through repurposing. Fully integrated resource management of forestry, waste cellulose, dual cropping. On the path to CO2 recycling.

10/17/2016 7:15 PM [View respondent's answers](#)

Cellulosic flagship biorefineries turning profit in five years. Major companies investing in 2-nd biorefineries in the next ten years. Biorefinery will be competitive with petroleum refinery in 20 years.

10/17/2016 6:31 PM [View respondent's answers](#)

None of the opportunities in 3 are "priorities". The risk with replacing petroleum-based materials in plastics and other polymers are better understood because r&d is tasked to develop performance properties customers want and the materials will be used in existing manufacturing facilities in existing supply chain. Federal government only need to listen to what users want. In 20 years, many of the current petroleum-based materials can be replaced with renewable materials and renewable polymers. Federal government investments should shift from bioenergy/biofuel to bio or renewable materials that can replace petroleum-based materials.

10/17/2016 6:25 PM [View respondent's answers](#)

Can you identify other groups in the SE that support the bioeconomy?

- One for biofuels and sustainability instead of smaller state orgs. Need more federal government collaborating on a regional basis
- Academic institutions are into this area with multi disciplinary foci
- I think we need to develop a SE Bioeconomy Planning organization
- —pulp wood is less expensive to take out from forestry and have higher than any other woody biomass. Cull trees are more expensive, unless you're going for gasification...you're going to wait for your wood to be high value like pulp wood. The FARB report is good but pulp wood is the primary feedstock for emerging biorefineries...pulp wood will be consumed first before any other woody biomass
- —can we have an annual SE U.S. Bioeconomy conference?
- -- From a federal perspective—whether a national plan...regional plans that are integrated together. Should not constrain the borders when consider the bioeconomy
- —bioeconomy or energy?
- -- Bioeconomy! Need both the bioeconomy + energy
- —fed govt gets electric power generation capacity as a testbed for new biofuels/coal etc.

Comment [RJB49]: proposed

Comment [RJB50]: this group agreed that this would be warranted and a good idea; self organization in the SE U.S. would be recommended.

What can federal agencies do to increase likelihood of private financing in the Southeast to build the bioeconomy?

- —need to reduce risk--- if you don't, you won't get private financing. Aviation is starting to see a change. Last couple of weeks, unlocked a couple \$B from institutional finance
- —You are saying the risk is lower?
- — There is now a competitive price point..also, policy looks somewhat stabilized. Offering long term offtake agreements to bring more pathways
- Industry promotion—general, two major things paper industry is doing. Paper and packaging board...out of USDA, running commercials and doing things to show people how paper impacts their lives. Funded by tax that producers have agreed to pay. Paper is also using "Two Sides", funding the advantages of print media and reading something on paper as compared to reading the same thing electronically.
- —Not all are motivated by carbon intensity / density..one clear benefit of wood products is that they are renewable. Don't see any marketing on carbon intensity of products, which should be shown as a positive societal benefit.
- —EnergyStar rating on fridge, want to talk about education, involved at VirginiaTech. ...much more sustainable/environmental oriented that needs to be going on at the high school level. Can market in the future to the environmental impact of products.
- -- Agenda2020, active in cellulose nanomaterials. Key material for advancing the bioeconomy, can be thought of as a primary product or produced as a co product along

Comment [RJB51]: Recommendation for federal agencies: reduce risk

with fuels and chemical. Other applications for material are not as far along. Even as competitors, we can work together to advance the issues and perceptions.

- —Lignin will be part of the bioeconomy
- —Cusp of commercialization, hard to get commercial investors to invest because they don't know how sustainable the effort will be, and no clarity on short term ROI. People want to invest, but it is hard to convince people to be patient. Things need to change from the investment side to get things off the ground.
- —Are the perceived benefits helping to unlock investor reluctance, or is it only the short term ROI?
- —unproven technology / nascent technology is the driver; risk from technology not proven (uncertainty).

Comment [RJB52]: tax incentives?

How do biomass-derived feedstocks benefit the Southeast region?

What is the potential for these benefits to grow?

Can feedstock commoditization help reach this potential?

What are the challenges faced by the biomass producers in the Southeast in growing dedicated biomass crops?