

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

**A Report to Participants in the NE Regional Bioeconomy Forum  
Wells Conference Center, University of Maine (co-hosts)  
Orono, ME  
October 18, 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 Board,<sup>1</sup> (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,”* (known as FARB) 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 arrange and convene 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](http://www.biomassboard.gov/pdfs/the_bioeconomy_initiative.pdf) ).

The rationale and strategy for these reports, and purpose for the public gatherings was published in a USDA a blog, including the Vision and the scope of 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 “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).

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<sup>1</sup> 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.

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.

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-only participants.

Forum Structure and Role of the Foundation and Co-hosts

The NE U.S. Bioeconomy Forum was moderated by Wes Jurey, CEO of the ATIP Foundation. Members of the BR&DB Operations Committee made presentations that reviewed the FARB and posed questions related to advancing the bioeconomy.

Table 1: Demographics by sector describe the demographics of invitees by sector, and the actual number that participated on October 18, 2016. As has been the case in the regional bioeconomy forum series, both industry and investment & finance have low positive response rates (or few participants) to invitation to participate.

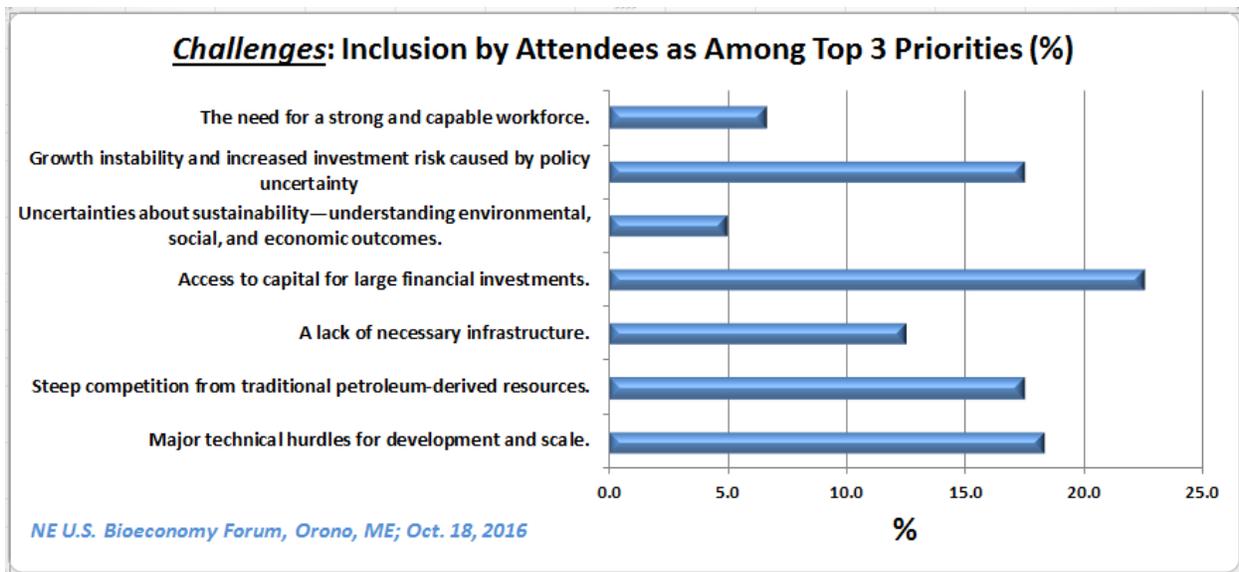
<b>Table 1. Demographics (by sector) of invitees and participants, convened by ATIP Foundation and co-host University of Maine for NE Regional Bioeconomy Forum, October 18, 2016.</b>					
<b>Sector Designation</b>	<b>Invite</b>	<b>% of invite</b>	<b>No. Participate</b>	<b>%RSVP to Attend</b>	<b>% of Attended</b>
Industry	42	51	12	29	24
State and local government	13	16	13	100	26
Economic and workforce development	4	5	4	100	8
Investment & finance	6	7	3	50	6
Academia	13	16	13	100	26
Agricultural and environmental	4	5	5	125	10
<b>Totals</b>	<b>82</b>	<b>100</b>	<b>50</b>	<b>61</b>	<b>100</b>

The agenda (Attachment 1) included welcoming comments by the ATIP Foundation, BR&DB representatives, and Mr. Fred Jarrett, Senior Deputy Executive, King County, and representatives from the offices of Senator Susan Collins, and Senator Angus King, and introductory comments also by Dr. Carl Lucero, U.S. Forest Service. Slide set presentation was made by the ATIP Foundation followed by Alison Goss-Eng (Bioenergy Technologies Office, DOE) with assistance from 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 “discussion document” questions. Notes were taken (attributed to the commenter) on the fly by Renee Kelly, Assistant Vice President for Innovation and Economic Development University of Maine, and Director of Economic Development Initiatives & Co-Director of the Foster Student Innovation Center, Orono, ME, 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 later to clarify comments.

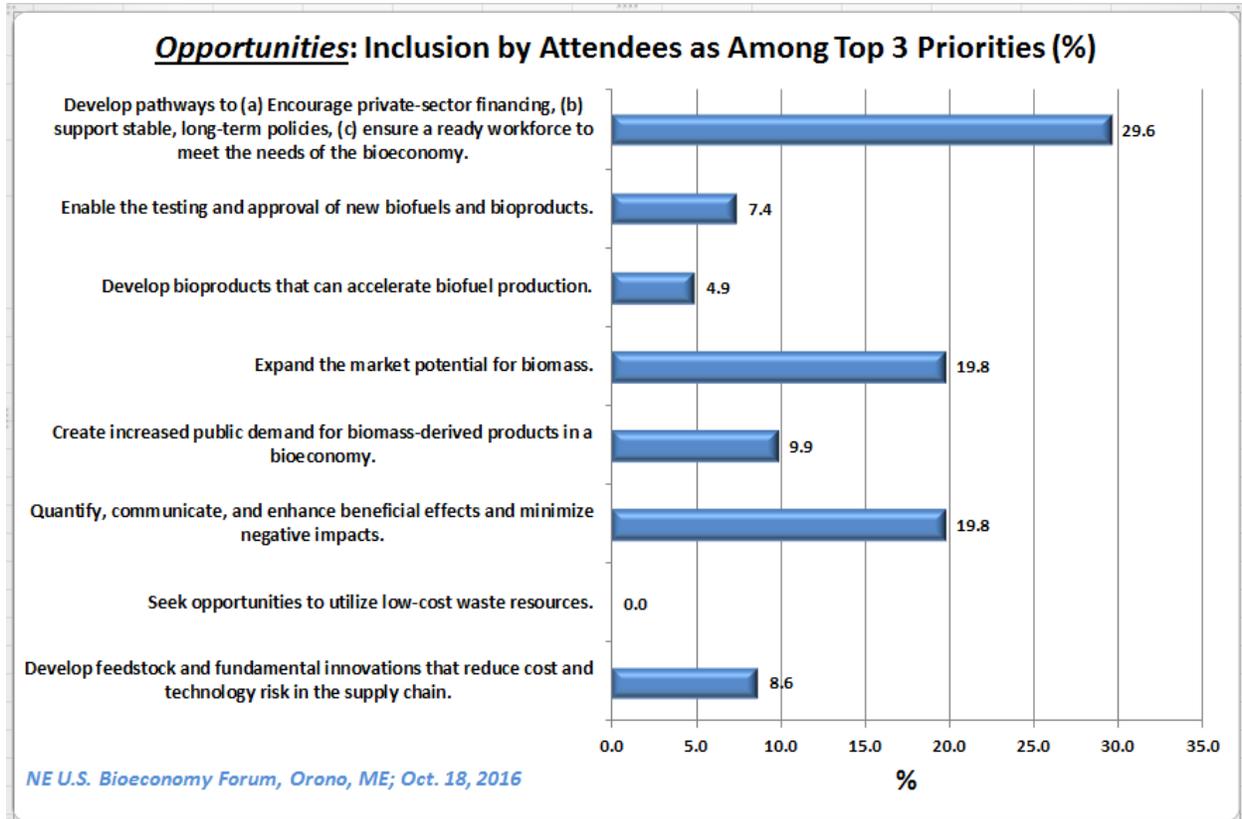
Post forum, participants received a link to a Google Document and a two-week window to edit their specific comments, or add additional comment. Thereafter, the document was closed and the ATIP Foundation reviewed comments, clarified with authors as needed, redacted all names of comment contributors (rendering the comments “non-attribute,” and annotated with comments (RJB) from the Foundation. The document is presented (Attachment 4) as a record of the forum and it includes participant prioritizations of each “challenge” and “opportunity” --- from their perspective --- to determine whether each was in the top 3 priorities of the NE U.S.

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



Having “access to capital for large financial investments” was considered to be the highest priority challenge in the NE (22.5%). Major technical hurdles for development and scale” was second (18.3%), with “growth instability & increased investment risk cause by policy uncertainty” and “steep competition from traditional petroleum-derived resources” tied for 3<sup>rd</sup> highest priority (17.5%).

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



The participants in Maine concluded that their top priority opportunities were a to develop pathways to (a) encourage private-sector financing, (b) support stable, long-term policies and (c) ensure a ready workforce to meet the needs of the bioeconomy; their score was 29.6%. Their other top two priorities were to “expand the market potential for biomass” and to quantify, communicate, and enhance beneficial effects and minimize negative impacts (19.8% each). Notably, participants had no interest to “seek opportunities to utilize low-cost waste resources,” ostensibly because of an abundance of woody biomass and the regional use for heat.

Reporting of Participant Comments

*Preface from the ATIP Foundation:*

*The NE Regional Bioeconomy Forum was unique among the five regional forums in the amount of questions and discussion that followed the welcoming remarks and preceded the formal presentations on the bioeconomy by the federal agencies, and the subsequent discussion by attendees. Attachment 4 includes over 5 pages of these preliminary comments from the participants (thank you note takers!). Accordingly, the Foundation recommends careful review of these notes as a precursor to the “Critical Discussion Points” conversations that occurred subsequently and are highlighted below. Specifically, the Foundation has provided many*

*explanatory notes and internet URLs to address some of these comments raised in the preliminary comments.*

Regarding the “Critical Discussion Point” session, there were a number of comments from the NE region that characterized regional issues, but also many comments that were fairly common issues across the 5 regional forums. Below, are non-attribute comments from participants, as well as notations by the ATIP Foundation; the latter are preceded below by “[NOTE:...],” and are also reflected in Attachment 4 as “Comment[RJB#].

***“What are state/local/regional challenges to the bioeconomy and how can the federal agencies help address these regional challenges?”***

- We need help scaling up from lab and bench scale – we need public private partnerships
- The private portion of the public/private partnership need to have representation from both the demand and the supply side. How can they better manage the valley of death.
  - **Note: the ATIP Foundation can assist in either / or any of these issues described in these first 2 bullets. Email [rbrenner@atipfoundation.com](mailto:rbrenner@atipfoundation.com) for further assistance.**
- Not doing a good enough job communicating to public - difficult to find the federal dollars to do that, for example, tall wood buildings in Boston, why and how it will benefit, public health, climate change, synthesize so we can communicate the story.
- Engineered wood products are a fine example of what we should be looking at as crucial building blocks of a bioeconomy that is not only sustainable but strengthen communities and serves such an improved profile for the region’s long term economic health.
  - **Note: Opportunity to partner with state PR, Chamber of Commerce, and federal agencies on successes? Communication appears to be a common theme from the Orono forum.**
- 30% tax credit for biomass ends this year; continues for others, lack of certainty is difficult for investments.
  - **Note: Lack of stable and predictable policy and incentives have been a common theme across all 5 forums.**

***Comments on “What are state/local/regional opportunities to the bioeconomy and how can the federal agencies help leverage these regional opportunities?”***

- Consistent, identified agency point people ideally located in Maine.
- Workforce Innovation and Opportunity Act calls for alignment, Department of Labor and Education need to be here.
  - **Note: Excellent point, and both DOL and Dept. of Education are NOT part of the BR&D Board. It makes sense to pilot their inclusion. We suggest a dialogue with USDA Under Secretary for Research, Education, and Economics who co-chairs the BR&D Board; ATIP Foundation can help with that.**
- Educate public about value of bioeconomy to environment and rural economy led by marketing.
  - We need to state facts that tell the long-term story of the importance of a sound forest products industry to the region in both economic and environmental terms. For many the use of corn for fuel is not seen as an environmental problem. However ask the same question about forest

- products coming from natural forests managed under third party certification and the simple act of cutting a tree, regardless of the true sustainability is viewed as a negative outcome for many.
- Further the rural economies of so many Northern Forest towns once thrived on the woods and can again, especially when you consider the impact of multiple use and how that deepens the economic vitality of a town or region.
  - We need to develop a more effective narrative on this based on well done research and very well developed and presented marketing. The public really has to buy in to wood and any biomass feedstock use before we can move the bioeconomy forward in my view.
  - We need private public partnership to communicate benefits
  - Education for the workforce; there is an aging workforce in logging, equipment, operations. Need skills training. [Commenter's] truck drivers are all older than he is. *Need to keep kids in rural areas. Community College created program for 15 wind turbines but not for logging in Aroostook.*
  - Maine uses natural forest management, but regulators reward plantation style management because ours is harder to quantify, *agencies should look to reward natural management with higher renewable credits*

***How is the health of the venture capital in this region?***

- No shortage of capital if we come up with deals that look good, *need to work out a process to develop success stories of converting to biomass energy to show investment yields return.*
- Biomass processing should be done as close to the stump as possible to reduce transportation but shifts in how we move materials to market, *can DOT help us re-engineer?*
- Deep water port to Europe --- we have it, but how do we take advantage of that since there is no rail line there
  - **Note: Infrastructure was a key discussion in Orono because of geography, lack east-west connections, and being at the "end" of the NE corridor.**
- New diesel emissions standards EPA Tier 4 trucks aren't reliable. It's a big problem.
  - **Note: The Foundation suggests that EPA be invited into discussions on next NE Regional Bioeconomy Forum.**

***What sets the NE Bioeconomy apart from other regions of the country? What inherent advantages do you have?***

- Currently supply and a well-developed infrastructure for forest management. Likely a less impactful results, at least short-term from climate change. Think fires out west and other weather and health related impacts in the southern US. *The supply issue is driven as noted earlier by the decline in the pulp and paper industry leaving a large source of forest products available.*
- The region has a high concentration of education institutions;
- Tremendous amount of innovation and entrepreneurship;
- Natural resource management and bioproducts advantage, continual need to weed, material that gets left in the forest --- pre-commercial thinning material is an opportunity available to the bioeconomy"

***What regulatory issues (or other) constrain success?***

- Many. Upstate NY and New England are not friendly to heavy industry like big biofuels plants. *Good reasons to let the South have those and focus on small scale distributed approaches.*
- *Transportation, need a regional study, regional infrastructure policy to reduce costs*
  - *Goal here is that we need both enhanced systems for trucks and rail, but also a consistent set of regulations for transportation across the 4 Northern Forest states and Quebec.*

***“What does success look like in the MW bioeconomy?”***

- Zero use of fuel oil for heating
- Great silviculture and forest management, *with markets*
- Full employment so kids can stay in rural areas
- Connectivity of biomass into the [electric] grid
- Every landowner participating if they want to – even a small woodlot
- Double or triple enrollment in the University’s forestry school
- Would like to see that a logger can get pine logs to the mill, pulp to the paper plant, and biomass to a biomass processor.
- Respect for foresters and landowners, credit for environmental and other benefits of the bioeconomy industry in Maine.

***What incentives would help you?***

- We need some way to provide price stability. Analogy to corn, milk, cotton, and rice supports. USDA knows some things about these things. Throwing massive federal grants at investors, or conducting masses of unfocused basic research haven’t worked very well and won’t until we faced the price volatility problem squarely.
- Capital gains on forest land - current tax policy is a liability for maintenance of forest lands and promotes liquidation
- Federal tax policy is a disincentive to long-term stewardship as capital gains are not indexed to inflation. Further there are other elements of the tax code that reward short-term owners and penalize long-term ownerships. We need to integrate other government policies to create a better economic climate for the ownership, management and harvesting of timberland. ... carrots not sticks will serve this bioeconomy project very well.
- Change definition of renewable credits to allow forest biomass from naturally regenerating forests.

***Would you support a recommendation to agencies to put grants out that insists on collaborative partnerships and structures 2-3 year with outcomes then phases out?***

- Group consensus: yes
- More beneficial to filter money through existing community development organizations for impact.
- We need industry roadmap to success, legislative support, with university
  - **Note: recommendation to the BRDB.**
- The Northeast is a mega region, 20% US population; build for a regional market as an advantage. Need regional economic allies.

**What other biomass would you like to consider in the discussion of advancing the bioeconomy? Animal wastes / carcasses / concentrated animal feeding operations / seafood industry wastes? Municipal landfill biorefineries? Others?**

- Municipal wastes, dairy and forest “products” and bi-products (don’t use the word “waste” because it has a negative image). Have a broad definition, such as “anything that can be grown ....” And then work on criteria.
- Aquaculture and fisheries wastes should be considered – there are lots of these

**As a region, how can you enhance your bioeconomy through new partnerships in the region, or on a more global basis?**

- federal agencies through Maine Forest Products Council
- Integration on both sides, across federal family and long-term commitment
- Roadmap partnership with industry and university, spruce budworm task force is a model for how this could work. Also look to benchmark what the Canadians across the border have been doing (i.e. Atlantic Canada Opportunities Agency;
  - **Note: see 3 URLs on page 14 of notes from Forum.)**
- We have unique situation because of the amount of privately held land. ... We are an importer of woods, but now markets have diminished (but we are still importers of certain species of the wood). *When policies change in Massachusetts, Rhode Island, Vermont, New York change, it affects them here.* Are scrambling to fill some markets that we have here?
- Need rail in this area for infrastructure. No major national rail carriers in this area. Most are small lines that have high turnover. ... The rail system must be enhanced to address the costs of rail transport due to multiple rail carriers and the “switching” costs from one carrier to the next.
- Ports. What are the barriers? *Underutilized, from a regional standpoint. Regional transmission of electricity, northern Maine is not connected.*

**Summary Statement from ATIP Foundation**

**NE Regional Bio-Economy 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 Northeast 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 the forum, there was significant discussion on what the bioeconomy 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.

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 the forum.

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 the University of Maine and the participants in the initial forum, to expand the stakeholder base, in order to begin 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 bio economy can become a reality.

**Summary Statement from Co-Host****Northeast Bioeconomy ATIP Forum Summary****Renee Kelly****Hemant Pendse****Stephen Shaler****Regional Co-Hosts****University of Maine**

The meeting was held on October 18, 2016 at the University of Maine. Forty-five participants represented all stakeholders of the forest-based economy in Maine. Sectors represented included forest landowners, pulp and paper mills, forest and bioproducts-related trade associations, state agencies (economic development, labor), federal agencies (USDA, DOE), University researchers, consultants, biomass energy producers, sawmills, environmental and other nonprofit organizations, investment and finance organizations and federal delegation staffers. One participant was from SUNY/ESF in New York with experience in woody bioenergy crops.

This meeting was held in juxtaposition with the current Economic Development Assessment Team (EDAT) process led by the U.S. Department of Commerce Economic Development Administration, which is focused on the forest-based economy in Maine. As such, the forum was timely and highly relevant with excellent representation from various stakeholder groups. The time frame of participant concerns and interests was predominantly immediate and near-term. The focus on forest-based aspects of the bioeconomy is particularly relevant for New England and northern New York - the landscape of which is predominantly forested.

Four themes emerged as consensus takeaways:

1. Maine's (and New England) forestland is sustainably managed and harvested, relying on natural-growth rather than plantation forestry. Sustainable biomass from Maine's forest needs to be treated fairly in federal definitions relevant to RFS2 compliance and qualification for RIN credits. This issue applies to the entire Northern Forest Region that includes Maine, New Hampshire, Vermont and New York. Tree residue from unmerchantable trees can provide sustainable biomass complementing slash, pre-commercial thinning and chipmill or sawmill wastes. The fact that naturally regenerated forests have no GMO stigma is a competitive advantage for selected markets.
2. Wood supply logistics in Maine and New England have not been globally competitive. Investment and policy changes are needed to improve rail, port, and trucking transportation infrastructure. This infrastructure is critical to sawlog, wood fiber, as well as biomass supply chains as well as to cost-competitive export of bio-based products to domestic and international markets.
3. An industrial eco-system exists for forest-based bioproducts that is characterized by extremely high utilization rates of all materials and significant business-to-business relationships. The success of new bioproducts will require an understanding of and integration within this cluster. Significant opportunity exists for co-product portfolios that include nanocellulose and/or cellulosic sugars using biomass feed. C6 or C5 sugar monomers can be used for conversion to biofuels and/or bioplastics. Cellulose nanofibers (CNF), more commonly called nanocellulose, offer emerging opportunities for use in a wide variety of applications such as polymer reinforcement, food packaging, 3D printing resins, adhesives, biocomposites, textiles, lightweight structural components, tissue implants, and foams. Targeted programs to support technology scale-up and deployments are key to de-risk new technologies and attract capital investment required for new manufacturing infrastructure.

4. With the recent loss of several pulp mills and biomass power plants, more than 3 million green tons of biomass - with an established logistics system - is available for new products/markets. A key for establishment of new manufacturing facilities will be the attraction of capital investments.

Near-term coordination with the Maine EDAT process will be very effective in providing Maine forest communities much needed economic development assistance, while laying a foundation for continued evolution of the forest bioeconomy for the Northeast region.

---- End of report ----

**Attachment 1: agenda**

**Attachment 2: slide presentations**

**Attachment 3: "discussion document"**

**Attachment 4: non-attribute notes w/ comments (RJB annotated)**

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## NW Regional Bioeconomy Forum Orono Maine Forum Agenda

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

**Date:** October 18, 2016 **Time:** 9 AM – 4 PM (local time)

**Location:** Wells Conference Center, University of Maine, Orono

**Meeting Purpose:** To introduce the “Federal Activities Report on the Bioeconomy,” and the subsequent “Bioeconomy Challenges and Opportunities for the Billion Ton Vision” report and to 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

- Dr. Susan Hunter, President, the University of Maine
- Wes Jurey, Chairman, ATIP Foundation
- Carl F. Lucero, Director, Landscape Restoration & Ecosystem Services Research, U.S. Forest Service
- Alison Goss Eng, BR&D Board, Operations Committee (Bioenergy Technologies Office, Energy Efficiency and Renewable Energy, U.S. Department of Energy)
- Todd Campbell, BR&D Board, Operations Committee (Senior Energy Adviser, US Department of Agriculture)

10:00 Overview of “Federal Activities Report on the Bioeconomy”, and “Bioeconomy Challenges and Opportunities for the Billion Ton Vision” (1 hr.)

- Presentation by Todd Campbell, BR&D Board, Operations Committee (Senior Energy Adviser, U.S. Department of Agriculture), and Alison Goss Eng, Bioenergy Technologies Office, Energy Efficiency and Renewable Energy, U.S. Department of Energy, and
  - 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

<sup>1</sup> 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.

**ATIP FOUNDATION** Agricultural Technology Innovation Partnership

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**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:**  
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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)

**NEW HOLLAND AGRICULTURE** **POET** **DSM**  
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**ATIP FOUNDATION** Agricultural Technology Innovation Partnership

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**NE Regional Bioeconomy Forum**  
 October 18, 2016, Wells Conference Center

Regional Co-hosts and Sponsors

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**NEW HOLLAND AGRICULTURE** **POET** **DSM**  
 Advanced Biofuels

[rbrenner@atipfoundation.com](mailto:rbrenner@atipfoundation.com) 410.980.1943

**The Future Forest Bioeconomy**

Carl F. Lucero  
 Director, Landscape Restoration & Ecosystem Services Research  
 U.S. Forest Service R&D HQ

**A WORKER’S DAY IN 2050**

Unfold the Future – The Forest Fiber Industry - 2050 Roadmap to a Low-Carbon Bioeconomy, CEPI 2011

10/18/2016 Northeast Bioeconomy Forum 6

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### A Forest Based Bioeconomy

- Renewable polymers from trees are performance polymers.
- There is significant use of renewable polymers based on their performance; we don't have to reinvent the wheel.
- Researchers need to demonstrate the performance of renewable polymers in order for it to become a commercial success.

10/18/2016 Northeast Bioeconomy Forum 8

### Transient Electronics

Jung et al, Nature Communications, 6:7170, 2015

10/18/2016 Northeast Bioeconomy Forum 9

### Cellulose Nanofibril Foam Board Startup

10/18/2016 Northeast Bioeconomy Forum 10

### Commercial Products Containing CNM (Japan)

10/18/2016 Northeast Bioeconomy Forum 11

### CNM Protective Coating for Fruits Oregon State University

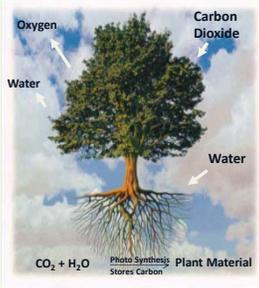
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### Potential Products from Cellulose

 Aalto University Medical Diagnosis	 ARL Electrospun Fiber	 Uni. of Queensland Super-Thin Latex	 KFRI Foldable Battery
 Pioneer Flexible Screen	 Chalmers Uni./WWSC 3-D BioPrinting	 CelluTech Ultra Thin Loudspeaker	 Luleå University of Technology Water Filtration

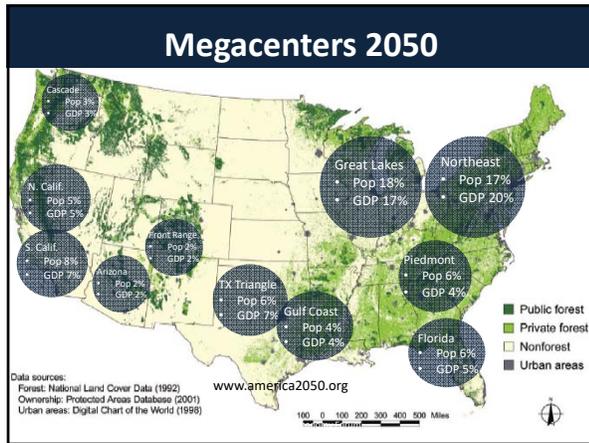
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### A Tree is a Factory Making Renewable Bio-Materials



- Trees produce renewable materials from atmospheric GHG (carbon dioxide and water) with solar energy
- Atmospheric carbon is stored in trees and woody products
- Wood based nanomaterials are recyclable.
- Net zero carbon emission on a human time scale.
- Wood based bio-materials can displace petroleum intensive materials with lower carbon footprint.

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### 2050 Will Be a Forest Based Bioeconomy

- As long as there are humans using something from the forest there will be forest products.
- Countries with established high volume forest products industry are also countries with sustained or increasing forest area.
- In 2050, everything will be a forest product.



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WE WANT TO HEAR FROM YOU

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## Cellulose Nanomaterials Development in Japan

- Inter-Ministerial coordination
- Tied-in to multiple national strategies
  - Japan's national revitalization strategy
  - National new technology development strategy
  - GHG emission reduction targets
  - The pulp and paper industry's redesign for the future
- User sectors play a major role

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

### The Bioeconomy Initiative

October 18, 2016

Alison Goss Eng  
U.S. Department of Energy

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### What is the Bioeconomy?

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

From 2014 Report: *Why Biobased? Opportunities in the Emerging Bioeconomy: Why BioPreferred*  
[biopreferred.gov/files/WhyBiobased.pdf](http://biopreferred.gov/files/WhyBiobased.pdf)

### The Bioeconomy Concept

**Feed Wood and Woody Energy Crops**

**Woody Residues**

**Solid Urban Residues and Municipal Solid Wastes**

**Herbaceous Residues and Energy Crops**

**Algae and Other Microalgae**

**Hydrolysis and Fermentation**

**Combustion**

**Gasification**

**Refining**

**Liquid Fuels**

**Chemicals**

**Ethanol**

**Electricity**

**Heat & Steam**

- 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

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### The Billion-Ton Reports and the Bioeconomy Initiative

**Billion-Ton Reports**

- 2005
- 2011
- 2016

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

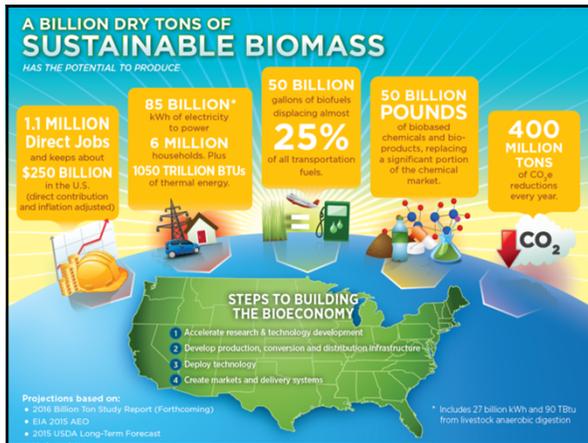
How much biomass?

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

What can we do with it?

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

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### Federal Activities Report on the Bioeconomy (FARB)

- In February, the Biomass R&D Board released the **Federal Activities Report on the Bioeconomy**. 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.

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### FY16 Highlights and Accomplishments

- FARB** - Released in February 2016
- Challenges & Opportunities** - Look for it on Bioenergy Day—October 19, 2016
- Action Plan** - Target release FY17 in first 100 days of next administration

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### FY16 Highlights and Accomplishments

#### ATIP Stakeholder Engagement Workshops

- Between September and November, the ATIP Foundation will co-host five Bioeconomy Forums throughout the United States, in partnership with DOE and USDA.
- The goal of each Bioeconomy Forum is to bring together a mix of stakeholders from six sectors (**industry; state and local government; economic and workforce development; investment and finance; academia; and agricultural and environmental organizations**) to seek their input, relative to the initiative's vision, strategies, and implementation.

Dates & Locations	
September 16, 2016	Atlanta, GA
September 29, 2016	Mineral Wells, TX
October 3, 2016	Seattle-Tacoma, WA
October 18, 2016	Orono, ME
November 15, 2016	Columbus, OH

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### The Importance of the Report

- ✓ Report plays vital role in the recognition of stakeholders and the challenges they see
  - No initiative and no action plan without stakeholder engagement
  - Challenges identified by stakeholders may not reflect agency-perceived challenges
- ✓ Opportunities identified are flexible
  - Agencies have a large degree of freedom to tailor actions to align with agency goals

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**Questions?**

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## The Billion Ton Bioeconomy Initiative: Challenges and Opportunities

### *Overview and Outline of Topics*

#### **Purpose of the Billion Ton Bioeconomy Initiative: Challenges and Opportunities Report:**

In February 2016, the Board released the *Federal Activities Report on the Bioeconomy* (FARB) to highlight the potential for a stronger U.S. bioeconomy, specifically some of the impacts of increasing biomass utilization three-fold by 2030.<sup>1</sup> The goal of the Billion Ton Bioeconomy Initiative (Bioeconomy Initiative) is to develop and coordinate innovative approaches to expanding the sustainable use of America's abundant biomass resources, while maximizing economic, social, and environmental benefits.

Since the release of the FARB, the Board has engaged with the bioenergy stakeholder community to further develop the Bioeconomy Initiative. The new report, *The Billion Ton Bioeconomy Initiative: Challenges and Opportunities*, is the second in a three-part series intended to lay the foundation and serve as the public communication of the Bioeconomy. This report is foundational to the Board's objective to strengthen the commitment and coordination between the U.S. Government and the bioeconomy community. Early feedback from stakeholders has underscored the importance of biofuels, bioproducts, and biopower. This report details several challenges and opportunities that stakeholders have identified as critical to the success of the Bioeconomy Initiative.

#### **Summary of Challenges and Opportunities:**

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.

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

- Create increased public demand for biomass-derived products in a bioeconomy.
- Quantify, communicate, and enhance beneficial effects and minimize negative impacts of an enhanced bioeconomy.
- Enable the testing and approval of new biofuels and bioproducts
- Encourage expansion of the market potential for biomass.
- Develop feedstock to meet market demands and potential
- Develop bioproducts that can accelerate biofuel production.

- Support fundamental innovations that reduce cost and technology risk in the supply chain.
- Seek opportunities to utilize low-cost waste resources.
- Develop pathways for:
  - private-sector financing.
  - Support stable, long-term policies.
  - Ensure a ready workforce to meet the needs of the bioeconomy.

**Disclaimer:**

*The Billion Ton Bioeconomy Initiative: Challenges and Opportunities* is a product of interagency collaboration under the Biomass Research and Development Board and does not establish any new or explicitly reflect United States Government policy. Some information is based on activities conducted by the Executive Agencies as of May 2016. However, some of the views expressed in this document reflect stakeholder perspectives and do not represent United States Government policy. This report is not a policy or budget document nor an action plan, and it does not commit the federal government to any new activities or funding.

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<sup>1</sup> [http://www.biomassboard.gov/pdfs/farb\\_2\\_18\\_16.pdf](http://www.biomassboard.gov/pdfs/farb_2_18_16.pdf)

**Critical Discussion Points  
(from Biomass R&D Board representatives)**

1. What are state/local/regional challenges to the bioeconomy?
2. How can the federal agencies help address these regional challenges?
3. What are state/local/regional opportunities to the bioeconomy?
4. How can the federal agencies help leverage these regional opportunities?
5. What is the value proposition of a bioeconomy?
6. How can you contribute to the Billion Ton Bioeconomy?

**Additional Regional Discussion Points for Consideration  
(from ATIP Foundation)**

- a) From the “Challenges” section of the above document, what would you list as the 3 highest priorities to discuss and address from the NE region?
  - From that same list, what SHOULD be added to that list from our regional perspective? Does it change your prioritization scheme?
- b) From the “Opportunities” section of the above document, is anything missing from the list, and what would you list as the 3 highest priorities to discuss and address from the NE region?
- c) What sets the NE Bioeconomy apart from other regions of the country?
  - What inherent advantages do you have?
  - What regulatory issues constrain success?
  - What incentives would help advance business opportunities to advance the bioeconomy?
  - What does success in the bioeconomy look like in NE U.S. now? In 10 years? In 20 years?
- d) What other biomass would you like to consider in the discussion of advancing the bioeconomy? Animal wastes / carcasses / concentrated animal feeding operations / seafood industry wastes? Municipal landfill biorefineries? Others?
- e) As a region, how can you enhance your bioeconomy through new partnerships in the region, or on a more global basis?

## The Billion Ton Bioeconomy Initiative: Challenges and Opportunities

Notes from bioeconomy forum, Orono, ME  
October 18, 2016

NOTE FROM THE ATIP FOUNDATION: This document has removed names of all commenters, except for moderator (Wes Jurey, ATIP Foundation), occasional comment from Rick Brenner, welcoming comments presenters, and USDA and DOE personnel who presented slides and/or served as a resource to answer specific questions posed by participants. Comments in margins label RJB# (Richard J. Brenner) reflect clarifications and comments by the ATIP Foundation, and an attempt to define common themes and unique differences among the 5 regions. The federal agencies that make up the Biomass Research and Development 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. No representatives of the BR&D Board will have an opportunity to see the non-attribute comments, Foundation's reports and recommendations ahead of the scheduled presentations by Wes Jurey in mid-November (BR&D Technical Advisory Council), and in mid-December (BR&D Board members).

General comment from a participant: Bioeconomy as defined here is so complex that trying to plan for it is really not possible. You could plan for specific components. I think this audience needs to be shown that there is actually some mechanism that could force these disparate and independent agencies to conform to such a plan. Example: in one of the backgrounders we are told that a Regional EPA office gave a southern university money to support some project or other on biomass. Ridiculous? Call this a Plan? Likely an earmark to placate some congressman, but why is a local EPA office even considering this????

Opening remarks from Dr. Susan Hunter, President U of Maine:

All of us at UMaine are happy to be hosting this forum for the northeast U.S. It demonstrates our leadership in bioproducts development, as well as forestry policy issues.

Today's event will not only inform federal policymakers who are addressing the bioeconomy, but can be useful to UMaine as we continue to work with industry and other stakeholders on the future of Maine's forest economy.

We are looking forward to the opportunity to connect what we learn here in this forum with the EDAT process. The Department of Commerce announcement in July was very welcome news for many folks in Maine. Everyone is eager to get started on the required work — the evaluation of new and existing economic strategies to address the challenges facing the forest-based economy.

Most importantly, we appreciate the efforts of so many in this room to participate in efforts that are critically important for Maine's future.

As you know, UMaine is the state's land grant institution and its only public research university. As a

**Comment [RJB1]:** See <http://www.biomassboard.gov/> both for general and specific partnerships, roles, and responsibilities. The BR&D Board is issuing 3 companion publications over a 1-year period. The first – The “Federal Activities Report on the Bioeconomy” (FARB) was issued February 27, 2016, and is considered to be the “Vision” document signed off by the 7 agencies and Executive Office of the President. A second publication tentatively titled “Challenges and Opportunities for the Billion Ton Vision” is in final stages of multi-agency clearance and lays out the strategy for developing a billion ton bioeconomy by 2020. This series of 5 regional Forums were convened at the request of BR&D Operations Committee--- and the ATIP Foundation reports from the 5 regional forums --- will be used by BR&D Board to help shape an implementation plan. Thus, the issues and concerns expressed by the forum participants will have direct influence on the Board which transcends political election.

**Comment [RJB2]:** See <https://www.epa.gov/aboutepa> . EPA has 10 Regional Offices with research addressing the issues and needs of the respective regions.

land grant we have a chartered statewide mission. It really doesn't matter what the issue is or where it is occurring — we have a responsibility to do all we can and be everyone's best partner.

Our mission for 151 years has been to prepare the state's workforce, and to partner with communities, businesses and industries to innovate and turn knowledge, often developed on campus, into solutions that benefit the people of Maine. It is incumbent on us to evolve and adapt to a changing economic reality and prepare our population to embrace new opportunities.

The forest economy was a focus at UMaine that started with the historic pulp and paper industry, and forest resource management. Today, the focus on sustainable forests and the forest-based economy includes the latest research and development in biomaterials, such as nanocomposites, biofuels and other green chemicals.

Based on UMaine's nationally and internationally recognized research and academic programs, Forestry and the Environment now form one of our Signature Areas of Excellence. Research, Development and Commercialization in this arena is accomplished in unique, state of the art facilities such as the Process Development Center, the Forest Bioproducts Research Institute, the School of Forest Resources, the Advanced Manufacturing Center and the Advanced Structures and Composites Center.

But, the campus does not work in a vacuum. The best work of Maine's flagship university occurs in collaboration with its public and private partners — including our federal partners - who share our long-standing dedication to moving Maine forward. That involves responding to the needs of Maine with workforce development, R&D and community outreach.

That is an appropriate leadership role for Maine's land grant university. And it's been going on here since the late 1800s.

And that's why we were very pleased with the announcements of major federal investments to advance the forest products industry in Maine. Now, we look forward to the strategies that will be developed to foster robust economic growth and recovery — furthering the dialogue about UMaine's role in helping address the state's forest-based economic challenges, now and in the future.

Wes Jurey — opening remarks Federal Cooperative Research and Development Agreements (CRADAs) and other opportunities to partner with federal agencies.

Carol Woodcock — representing Senator Susan Collins (content of letter from Senator Collins is below)  
Dear Friends:

I commend the efforts underway to help strengthen the bioeconomy by removing barriers to the sustainable use of the nation's biomass resources. The deployment of biofuels, bioproducts, and biopower helps to support communities, the economy, the environment, and energy security.

The federal agencies participating in the Biomass Research and Development Board, co-chaired by the U.S. Departments of Energy and Agriculture, are helping to facilitate important coordination to advance the bioeconomy, and have set as a national goal a "Billion Ton Bioeconomy" by the year 2020. The four Bioeconomy Forums being held across the country will help to promote the innovation that can make that goal a reality.

The potential of biomass and biobased products is clear here in Maine, where more than 17 million

**Comment [RJB3]:** Good comment. Not unlike the mission of the USDA Agricultural Research Service. Congress authorizes and allocation about \$2B for research annually --- about half is through Land Grants, and about half to ARS and Forest Service. Federal laboratory partnerships with Land Grants are extraordinarily common and easy to establish. Thus, UMaine has unique opportunity to partner with ARS laboratories (there are about 90 in the U.S.) regardless of location. Look for common interests and complementary assets. RJB was former Assistant Administrator of USDA ARS, and formulated / fostered/ executed many such cooperative research agreements. Thus, the ATIP Foundation is positioned to assist Land Grants in partnering with federal labs. Additionally, because the Foundation is external to USDA and U.S. government, we can facilitate partnerships with other federal agencies (see note on FLC), as well as non-Land Grant and private research facilities.

**Comment [RJB4]:** ATIP Foundation's principal member organizations are technology-based economic development organizations with workforce development / training / internship programs.

**Comment [RJB5]:** See <https://www.law.cornell.edu/uscode/text/15/3710a> for a comprehensive description of the Stevenson-Wylder Technology Innovation Act of 1980 and the Federal Technology Transfer Act of 1986 (15 U.S. Code § 3710a) et. seq. and general opportunities for private sector and non-profit organizations to tap into the vast R&D capacities (over 300 laboratories) of federal agencies. Also see the webpages of the Federal Laboratory Consortium (<https://www.federallabs.org/About>) for specific access to research partnerships.

acres of forest - 89 percent of our total area - drive our state's economy. In addition to employing a strong workforce and growing our economy, the use of forest biomass reduces fuel- oil consumption and saves money.

Transitioning to an economy that is powered by sustainable and renewable energy, of which biomass is an important part, is exciting, for our forest-products industry and for our residents, as well as for our security, our economy, and our environment. Today's Forum will help to gather stakeholder perspectives to expand and accelerate the development of the nation's bioeconomy. Thank you for your willingness to share your insights and expertise.

Chris Rector -- representing Senator Angus King.senate.gov --- prepared statement

Carl Lucero, USDA FS -- [see slide set – “a worker’s day in 2050”]

Todd Campbell --- welcoming remarks; connecting with Land Grant universities  
Reviewed some of the authorities that help engage rural America, and provided the “pillars of focus” of USDA Secretary Vilsack (See attached “Factsheet\_ The Four Pillars of Agriculture and Rural Economic Development \_ USDA Newsroom.pdf”).

Some accomplishments cited on the biobased economy during the Secretary's tenure include:

- Great green fleet in Pacific (biofuels, U.S. Navy)
- Air transportation biofuels (LAX, United, Gulfstream)
- Washington State University – commercial flight with jet fuel made from wood (expected to occur in about a month)
- Wooden skyscrapers (8 stories, 12 stories) from innovative panels made from small diameter wood
- \$300M USDA research over past few years on biomass issues.
- Dedicated energy crops – poplars, ag residues,

Alison Goss-Eng – overview of documents and issues (slide set attached)

BETO is an R&D office; goal \$3 / gal biofuels; she focuses on the front end of the supply chain. Also part of BRDB Operations Committee, liaison for DOE;

- Bioeconomy definition
- “Bioeconomy concept” slide
- Billion ton reports (2005, 2011, 2016)
- Bioeconomy Initiative
- Billion tons of SUSTAINABLE BIOMASS (see slides in BR&D presentation)
- BR&DB -- table of supply chain and agency roles
- FARB release [NOTE – Alison’s presentation has some updates on the slide set].
- Challenges and Opportunities document

Some Initial questions from the participants for representatives of USDA and Department of Energy:

-- instead of reinventing the wheel, what can we take away from previous events?

A: Todd described the makeup of the various stakeholders at each of the forums.

\*\*\*I think the question was what did the other groups conclude? We would be interested to see how other regions ranked the issues/opportunities

---What are you defining as “biomass”? relationship of existing biomass and more to be produced rather than a shift in use of existing biomass.

**Comment [RJB6]:** See previous comment on trilogy of BR&D documents expected by end of year.

**Comment [RJB7]:** The Foundation purposely designed this series to provide regional independent thought to the very broad issues of the bioeconomy. For that reason, local co-hosts were entirely responsible for developing the invitation list, as they were in the best position to know who in their region had a vested interest in the bioeconomy. On average, each co-host issued about 125 invitations among the 6 sectors the Foundation had identified. We will prepare a total of 6 reports --- 1 specifically for each region that is co-edited with the regional co-host, and issued to each participant in the regional forum. A 6<sup>th</sup> report will be a summary of the 5 forums, highlighting common issues and uniqueness of each region. By late December 2016 (in about 6 weeks), all reports will be made publicly available through the ATIP Foundation website.

**Comment [RJB8]:** These are good questions. Biomass is so broad, that more refined segments of “biomass” should be developed. See response in text from World Nieh. ATIP Foundation is happy to facilitate further discussions. The second issue is critical --- does the plan intend on adding new opportunities to use biomass, or simply a redistribution of existing uses? See response in text by Alison Goss Eng.

--- You are also talking about other than woody biomass. How deep are you going on biomass?

A: Alison --- woody biomass, dedicated bioenergy crops, landfills, manure, potential micro crops on algae; ag residues; food wastes

**Comment [RJB9]:** Missing are opportunities for marine biomass that could be profoundly important in coastal, inland rivers, and Great Lakes regions.

-- anything like miscanthus and other residue crops?

--- projects looking at regional biomass opportunities such as sorghum, poplar willows, canola, miscanthus.

---- Request by participants: PLEASE GIVE US MORE SPECIFICS ON HOW WE KNOW THAT THESE CAN BE COMPETITIVE IN NORTHERN NEW ENGLAND. SEEMS A STRETCH.

--- let's focus primarily on wood fiber feedstocks regardless of the end use. As our region far better conditions for timber growth than agricultural use. We really can't afford to remove good ag lands from food production since it is so limited.

**Comment [RJB10]:** This would suggest a regional team of organizers be developed to pursue further gatherings to better explore local / regional opportunities. Unfortunately, notably absent from this forum were representatives of other NE regional states (exception, NY).

---- what about sustainability in this area with marginal lands --- what can be done on these? Commenter's point here was that "marginal;" lands in this region are generally occupied by forests not agricultural uses. Therefore we can generate biomass without conflicts with other uses and certainly in a more demonstrable sustainable fashion.

A: World Nieh, U.S. Forest Service --- there are a lot of challenges with definition of biomass and bioeconomy; happy to have conversations.

A: Carl Lucero, U.S. Forest Service – U.S. has lost 25% of small wood market; found areas where we can expand small wood opportunities.

---- Concern that we cannot sustainably triple biomass amounts and make it usable.

A: Alison -- Current use is 350M tons. New technologies making production improved as well as processing. We are not suggesting that we will use 3X the land currently producing biomass. Look at land stewardship studies the past few years. Marginal lands.

The issue is that Maine is limited in our ability to produce more tonnage. Other parts of Northeast could cut more, but availability (small owners, etc) is a limitation.

What marginal lands??? Exactly how are they to contribute? WE can't improve productivity by hand-waving... With a dramatic drop in demand for pulpwood over the last several years there is an ample and ready supply of wood fiber in the form of round wood, chips and mill by products.

These sources of feedstocks often are being produced on 3rd party certified lands that fit the model of renewable resources produced in a very sustainable and multi-use platform of forests. If the bioeconomy can generate values that fit the needs of landowners and producers then Maine and the remainder of the Northern Forest could produce a great deal of bioeconomy feedstocks.

A: other issues are water use from forests (drinking watershed); precision ag using GPS for fine granularity down to sq. yard and what is needed / not needed specifically for land management / crop production. Good for water, air, food, maximizing land value; environmental conservation; 400M tons of CO2 reductions per year (greenhouse gases); replacing fossil carbon with renewable carbon. Alison -- Creating new markets for small diameter wood, for example.

I like the idea of using small diameter wood -- in the round for solid products, not to chip the stuff.

--- commenter thinks DOE estimates are a bit conservative, better to look at on the state level. Serious look at sustainability issues, and real numbers might actually be higher.

A: Alison – the volume 2 challenges and opportunities addresses some of these issues on sustainability that began with the FARB.

**Comment [RJB11]:** note --- "volume 2" not yet released. See my earlier explanatory comment.

--- Need to get away from energy crops and instead use residues, etc. that exist. Need markets for low-grade wood.

--- commenter: I want to again emphasize that the wood fiber available for the bioeconomy is primarily

forest products not residues. Yes there are some but even sawmill wastes have become economically rewarding forest products that often contribute significantly to the facilities bottom line. We must get developers away from looking at their raw material as a very low cost by product or residue that is looking for a home to dispose of it. No it needs to be sold and sold for the right price.

----- I [another commenter] agree -- the burden of proof is on those advocating dedicated energy crops at least for N New England and upstate NY. If it can be met, show us.

---- What are the lessons learned from the ethanol issues in Midwest?

A: Alison – oil prices drive a lot of this. at \$100/barrel, stimulated first generation fuels (ethanol).

A: Todd --- air quality benefits, multiple product streams such as DDGS from corn; ethanol plants cell CO2 and sell that; corn oil extraction; wet mill products; biochar and nanomaterials from biomass; Coca Cola spending a premium for plant bottles, but good societal benefit and marketing fact that they are using these bottles (less GRG emissions); ethanol plants becoming more efficient, high value products being made, etc.

A: World Nieh --- start with biggest pieces of wood for boards, then down to fibers and their uses, then down to microfibers and nanotechnology. Key is bringing costs down --- need many products from wood, not just the simple ones. Free market will decide what products are supported – use biorefineries. Ultimately, products need to perform!

A: Rick Brenner -- adding to World's comment as an example --- LignoTech LLC is a new joint venture between Rayonier Advanced Materials and Borregaard (Norwegian) that just announced their new facility will be built in Fernandina Beach, FL (Amelia Island) adjacent to Rayonier's biorefinery plant. Currently, lignin is a waste product of Rayonier's plant that is used as fuel for the plant. Borregaard has proprietary technology to create advanced manufacturing of high purity, natural lignin-based products. Thus, this partnership takes advantage of low value locally-derived biomass "waste" to expand high value products for an existing market.

---- Problem here: when oil is cheap, the cost of replacing the lignin as fuel is low. When oil is expensive, the lignin has energy value. It's not a "waste".

--- Anyway, let see how this plant actually works instead of touting it as any kind of evidence -- we've seen this movie before -- is there a single instance to report as an operational, unsubsidized success with a track record???

--- wants to know what the conversations were like in Atlanta, because that will have a bearing on our conversations here. Paper industry is in trouble here --- but FIBER is the new hope. But are we practicing sustainable forestry in Maine to keep up with current and projected demand.

--- There is no doubt in my mind and a good deal of data that demonstrates that despite Maine's active forest industry that its forests have been able to produce forest products in a natural and sustainable setting for centuries. It is even more sustainably managed now than at any time in the region's history. Further the bar on sustainability is constantly being raised due to certification and the need to maintain the social license to own, manage and harvest timberland. Again due to a massive drop in demand there is available fiber to provide bioeconomy feedstocks without increasing harvest levels to any degree at all.

The problem with seeing fiber as hope is that it returns little to the logger/truckers, and almost nothing for the landowner. This is not going to change. Notice that one of the scenarios we were shown has delivered fiber cost going down... how will this be achieved? Not likely if successful to make landowners or loggers any more prosperous... As a number of participants noted the value of bioproducts feedstocks must be suitable to allow for a solid economic base for the production of these forest products. Landowners must receive suitable stumpage so that these products contribute appropriately to the cost of long-term ownership and stewardship. Further the total value at the end user must cover in addition to a suitable stumpage rate all COP costs. Far too often the modelers for bio plants have utilized assumed values that are insufficient to produce the wood let along pay stumpage to the landowner.

**Comment [RJB12]:** Agreed. But the comment by RJB was intended to provide example of PPP partnering (2 private sector companies, one local government partner) to develop new high value products from low value usage of wastes --- in the context of World Nieh's comment "Ultimately, products need to perform!". We will see what / if products are developed and their value. In the meantime, there will be 50 new "permanent" jobs plus the construction jobs ---- all derived from a bioeconomy.

**Comment [RJB13]:** New opportunity based on new technology!

**Comment [RJB14]:** Any thoughts on possibility of forging partnership (e.g., coop) with landowner / producers of wood, transporters, and refineries / processors?

– Maine Forest Products Council. They look at annual harvests at about 15M tons of wood per year sustainably. Where Maine is in biomass and energy, about 20% of energy is produced from biomass --- usually at the mills, but there is also stand-alone energy production. Low oil prices hurt these efforts. Have lost about 1.8M tons of biomass markets, have 1.5M residuals from saw mills; paper went from 8.5\$ industry, had dropped, now is back up a bit. Softwood pulp is 2M tons to 6M tons of wood biomass depending on size.

--- seems there is a vision for biomass, and a vision for 1B ton initiative. Need overarching plan that is comprehensive for low-grade material through high-grade material. How do we solve the round wood issues?

A: Alison, the biomass vision does look at all the feedstocks coming in to create the most value for all of this. Developing new technologies to take advantage of these materials.

A: Todd --- biomass valuation studies are trying to get from \$100/ton to \$60/ton; looking for new markets for low value biomass.

Please, throughout, be specific about whether costs per ton are green or dry.

**Comment [RJB15]:** Argues for CRADAs and other cooperative research agreements to develop technologies to

**In this section, how about rank the points according to votes rcvd within each section.**

Note: in many (most?) instances the comments recorded do not correspond to the subject of the section.

#### **Summary of Challenges and Opportunities:**

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

- Major technical and economic hurdles for development and scale (22).
- Steep competition from traditional petroleum-derived resources (21).
- A lack of necessary infrastructure (15).
- Access to capital for large financial investments (27).
- Uncertainties about sustainability—understanding environmental, social, and economic outcomes (6).
- Growth instability and increased investment risk caused by policy uncertainty (21).
- The need for a strong ( what does this mean? Give them lots of exercise?) and capable workforce (8).

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

Many of these are not in fact opportunities. Some are tasks to be done, which is a different thing.

- Create increased public demand for biomass-derived products in a bioeconomy (8).
- Quantify, communicate, and enhance beneficial effects and minimize negative impacts of an enhanced bioeconomy (16).
- Enable the testing and approval of new biofuels and bioproducts (6).
- Encourage expansion of the market potential for biomass (16).
- Develop feedstock to meet market demands and potential (7).
- Develop bioproducts that can accelerate biofuel production (4).
- Support fundamental innovations that reduce cost and technology risk in the supply chain (20).
- Seek opportunities to utilize low-cost waste resources (0).

- Develop pathways for (24):
  - private-sector financing.
  - Support stable, long-term policies.
  - Ensure a ready workforce to meet the needs of the bioeconomy.

**Critical Discussion Points  
(from Biomass R&D Board representatives)**

**1. What are state/local/regional challenges to the bioeconomy and how can the federal agencies help address these regional challenges?**

---- EPA and FERC requirements for dams are costing millions of dollars

--- we need help scaling up from lab and bench scale – we need public private partnerships

**Comment [RJB16]:** ATIP Foundation can assist, or refer you to others as well.

--- The private portion of the public/private partnership need to have representation from both the demand and the supply side. You can they better manage the valley of death.

**Comment [RJB17]:** Wes --- I would recommend you author a reply to this, based on your years of experience.

Wes Jurey - Pilot at what scale?

-- With nanocellulose development, for example, private companies should help fund pilot scale with public funds added to help with pre-competitive proof of concept -- to a 1 ton per day scale . With 20-100 tons per day scale and likely market development occurring we need to find a way for public funds to be better targeted....this is where the job creation happens.

Wes - Gaps where programs are needed?

Discussion above needs, perhaps not here but somewhere, a lot more clarification. This is clearly a major issue here. Major reasons for past failures may have been the temptation to skip key steps and run to production level plants too fast (Why not, it's Uncle Sam's money?)

**Comment [RJB18]:** How about developing a scaled multi-year partnership with milestones and deliverables to go to next step. There are some programs that may warrant further consideration. For example, SERDP is the "Strategic Environmental Research and Development Program" (<https://www.serdp-estcp.org/About-SERDP-and-ESTCP>) that funds R&D and demonstration projects that can develop and deliver products to the Department of Defense, EPA, and Department of Energy (identified by "statement of need" by agencies). When you consider that DoD is the 5<sup>th</sup> largest land owner in the U.S., and their needs--- and compliance to EPA --- are no different than any community, this may be a fertile partnership. After all, a DoD facility is a town/city/community --- the only difference is that they don't elect a mayor. ATIP Foundation personnel have solid experience with SERDP. Any interested party in discussing this further should contact Rick Brenner or Wes Jurey.

--- we need the connections for someone who is looking for our good ideas, who will buy so we can sell.

--- level the playing field for biomass - EPA. Need political will, a message from collaborative group about sustainable forest practices.

--- My point here is that at present we do not have a level playing field for forest products in this bioeconomy. If there was a carbon tax or even a carbon equation that reflected on the full economic and environmental costs of other fuel or feedstocks, even agricultural, wood would be valued much higher for these uses. There needs to be research and marketing done to facilitate this narrative so that forest products can be assessed on equal footing to fossil or other sources of raw materials.

--- Bigger is not always better, need small scale that fits - CHP, not monster plants making liquid fuel out of federal money. If we focus on technology to pursue a distributed system, would have the following advantages:

- a. Not betting on a few huge projects.
- b. Resilience against policy changes or volatile gas/oil markets
- c. likelihood for wider positive impact on rural communities
- d. More minds at work, more people trying to innovate, more likelihood of breakthroughs.
- e. So far the big breakthroughs on monster biofuels plants have been ever-more impressive success in burning federal money. (why not just fire biomass plants with cash?)

--- USDA working with private industry on sawn timber, biomass has a negative story, RECS markets loss, no consistency with sustainability story, need to provide the science to back it up, because the negative story is holding back investments

---- We excel at managing the natural forest naturally, EPA definitions to obtain credits for RINs, how do we ensure our products qualify for credits?

---- Carbon neutrality and biomass policy that doesn't disqualify materials with >7 year rotation age is needed. The benefits of using biomass from a sustainably managed forest "should be uncontroversial"

---- Biorefinery investment, 606 page application for funding and \$50,000 cost plus attorneys. We have the feedstock supply and we can't find investors with the money they need to apply, which is frustrating.

----- Seems like we are not learning effectively from our failures, what do we know and lessons from what we did, would like to see that from the federal agencies.

If we don't start doing this fast, this effort will be wasted. It needs to be done by tough -minded independent and qualified individuals and groups.

**Comment [RJB19]:** Building from a community of past participants.

---- Not doing a good enough job communicating to public - difficult to find the federal dollars to do that, for example, tall wood buildings in Boston, why and how it will benefit, public health, climate change, synthesize so we can communicate the story.

--- Engineered wood products are a fine example of what we should be looking at as crucial building blocks of a bioeconomy that is not only sustainable but strengthen communities and serves such an improved profile for the region's long term economic health.

**Comment [RJB20]:** Opportunity to partner with state PR, Chamber of Commerce, and federal agencies on successes? Communication appears to be a common theme from the Orono forum.

#### **Wes - What needs to be communicated?**

Commenter --- Good question. This needs a lot more thought.

--- What's sustainable? USDA rural development and producer payments to the wood pellet industry, price of oil/natural gas and warm winters, producers shut down, we want that industry to grow and Senator Collins work to support fuel neutrality so biomass producers get more, issue of enough money in the program 9005.

---- Foresters are more sustainable than farmers, don't call it woody residues, call it forest product. --- --- when one considers all of the biological factors forestry and the trees landowners grown and foresters manage is the most sustainable option for the production of consumable products of all kinds from nano products up to dimension lumber, let alone sustainable space heating. But again the wood fiber landowners and managers desire to find additional markets for are critical forest products both from a management and economic perspective. To enhance overall economic sustainability while practicing the highest order long-term silviculture we need markets that can absorb large amounts of low grade forest products. This process leads to better and more sustainable outcomes that outshine all the other sources of feedstock.

---- Marketing the bioeconomy, a model to look to would be the Commodity check off Program running within the AP&PA. May find methods to better market the story of sustainable choices and biomaterials in general.

**Comment [RJB21]:** See previous comment on communication.

--- -- Naiveté about delivered feedstock costs among many people proposing projects. Get any 2 or 3 people who work in the field of fiber supply analysis and they can spend half a day telling you stories of the ridiculous ignorance of many of these people on what their feedstocks are going to cost. Few have bothered to read the BTU and similar materials. Where they get their ideas, nobody knows -- children's books? If we could get wider recognition of the supply and cost realities it would save a lot of wasted effort and money. One so-called "biorefinery" pilot was hauling wood up to 100 miles to feed it. In some

alternative universe this might work, but not in this one. Ever. Think how far they'd be hauling if they ever reached scale?

**Comment [RJB22]:** Does this argue for a regional team and pilot project to address logistics, regional / local accumulators, and processors to move intermediate products to final processing plants.

---- Too often government picks losers and winners, need to get rid of bark, would like to see more across the board policies

---- 30% tax credit for biomass ends this year, continues for others, lack of certainty is difficult for investments

**Comment [RJB23]:** Important issue in terms of incentives to advance the bioeconomy. Suggest that political leaders be brought into the discussion for guidance and buyin.

**2. What are state/local/regional opportunities to the bioeconomy and how can the federal agencies help leverage these regional opportunities?**

--- Consistent, identified agency point people ideally located in Maine.

---- Workforce Innovation and Opportunity Act calls for alignment, Department of Labor and Education need to be here.

**Comment [RJB24]:** Excellent point, and both DOL and Dept. of Education are NOT part of the BR&D Board. It makes sense to pilot their inclusion. I suggest a dialogue with USDA Under Secretary for Research, Education, and Economics who chairs the BR&D Board. ATIP Foundation can help with that.

---- Educate public about value of bioeconomy to environment and rural economy led by marketing.

--- ---We need to state facts that tell the long-term story of the importance of a sound forest products industry to the region in both economic and environmental terms. For many the use of corn for fuel is not seen as an environmental problem. However ask the same question about forest products coming from natural forests managed under third party certification and the simple act of cutting a tree, regardless of the true sustainability is viewed as a negative outcome for many. Further the rural economies of so many Northern Forest towns once thrived on the woods and can again, especially when you consider the impact of multiple use and how that deepens the economic vitality of a town or region. We need to develop a more effective narrative on this based on well done research and very well developed and presented marketing. The public really has to buy in to wood and any biomass feedstock use before we can move the bioeconomy forward in my view.

---- how can we talk about triple or sustainable without knowing what we're using now? USFS - FIA needs to focus on measuring forest biomass production and consumption annually and keep up with the reporting. You'd be surprised how much flimflam and Kentucky windage underlies all these numbers we glibly throw around. Truth is, not a soul anywhere knows how much residential fuelwood is used in the North. Same true of all the other classes of forest biomass.

--- - private public partnership to communicate benefits

**Comment [RJB25]:** Relevant to above 3 comments.

---- Market to foreign investors, tell our story, connect investors and innovation with US, bring them to Maine

---- Education for the workforce, aging workforce in logging, equipment, operations. Need skills training. His truck drivers are all older than he is. Need to keep kids in rural areas. Community College created program for 15 wind turbines but not for logging in Aroostook.

--- - Maine uses natural forest management, but regulators reward plantation style management because ours is harder to quantify, agencies should look to reward natural management with higher renewable credits

---- Maine forest products industry has identified priority issues in a report, which should be part of the record. For instance, one need is to project forest models into the future and resources to fund that research.

**Wes - Research funding should align with economic opportunity?**

--- Yes

--- What's the bioproducts niche for Maine, global assessment of opportunities?

**Wes - Agencies should provide global connection?**

--- Yes

---- Financing, difficult for contractors to get financing to expand

**Wes - Rural development has guaranteed loans under \$10 million, relationships with lenders.**

---- trend that financial institutions choose not to invest in certain industries, in South, packagers/consultants have relationships with willing banks to put together deals in these industries.  
Rural development can also do revolving loan funds for electric co-ops

**Wes – What is the health of venture capital in this region?**

--- No shortage of capital if we come up with deals that look good, need to work out a process to develop success stories of converting to biomass energy to show investment yields return.

---- Biomass processing as close to the stump to reduce transportation but shifts in how we move materials to market, can DOT help us re-engineer?

---- New diesel emissions standards EPA Tier 4 trucks aren't reliable. It's a big problem.

**Comment [RJB26]:** I suggest we pull EPA into discussions on next NE Regional Bioeconomy Forum.

---- Tier 4 chippers do not work well, price has gone up and people can't afford

---- Deep water port to Europe and how do we take advantage of that, no rail line there

**3. What sets the NE Bioeconomy apart from other regions of the country?**

- What inherent advantages do you have? Not many.

--- Currently supply and a well developed infrastructure for forest management. Likely a less impactful results, at least short-term from climate change. Think fires out west and other weather and health related impacts in the southern US. The supply issue is driven as noted earlier by the decline in the pulp and paper industry leaving a large source of forest products available.

**Comment [RJB27]:** These are advantages, despite first comment (not highlighted).

- What regulatory issues constrain success? Many. How much time have you got??? Upstate NY and New England are not friendly to heavy industry like big biofuels plants. Good reasons to let the South have those and focus on small scale distributed approaches.

- What incentives would help advance business opportunities to advance the bioeconomy?

--- We need some way to provide price stability. Analogy to corn milk, cotton rice supports. USDA knows some things about these things. Throwing massive federal grants at investors, or conducting masses of unfocused basic research haven't worked very well and won't until we faced the price volatility problem squarely.

**Comment [RJB28]:** Issue here seems to be either price supports or other incentives.

- What does success in the bioeconomy look like in NE U.S. now? In 10 years? In 20 years?

--- - Advantage of private forest, better at getting wood out sustainably, and we have a great workforce, just need more of them

--- Transportation, need a regional study, regional infrastructure policy to reduce costs

---- goal here is that we need both enhanced systems for trucks and rail, but also a consistent set of regulations for transportation across the 4 Northern Forest states and Quebec.

---- The region has a high concentration of education institutions

Comment [RJB29]: A big advantage.

---- Maine is a small state; we all know each other. You can call someone to get things done quickly. We have a high percentage of large ownership private forests (allows us to move quickly).

--- - Tremendous amount of innovation and entrepreneurship

Comment [RJB30]: Another big plus.

---- Natural resource management and bioproducts advantage, continual need to weed, material that gets left in the forest - pre-commercial thinning material is an opportunity available to the bioeconomy

Comment [RJB31]: Opportunity.

---- This is a challenge: national manufacturing institutes are huge. A more regional center to focus on regional advantages, a northeast hub for the bioeconomy would be a good idea. Sappi has made investments in pilot facilities in Europe - because of hub and spoke structures with supply and demand companies participating.

Comment [RJB32]: Expand beyond Maine for regional advantage.

---- This region has a high dependence on heating fuels and look at possibilities for small district heating with locally produced pellets. Also: Other places have deepwater ports, Better ones. Or soon will.

Comment [RJB33]: Opportunity.

--- For energy production through biomass, should invest in microgrids in rural areas

#### **What does success look like?**

--- Zero use of fuel oil for heating

---- Great silviculture and forest management, with markets

---- Full employment so kids can stay in rural areas

---- Connectivity of biomass into the grid

---- Every landowner participating if they want to – even a small woodlot

--- Yes -- too much of our forest is simply lying fallow, producing very little of value. How to unlock this is a big challenge.

---- Double or triple enrollment in the University's forestry school

---- Would like to see that a logger can get pine logs to the mill, pulp to the paper plant, and biomass to a biomass processor.

---- Respect for foresters and landowners, credit for environmental and other benefits of the bioeconomy industry in Maine.

---- SFI 800 number and no complaints this year

**What incentives would help you?**

---- Capital gains on forest land - current tax policy is a liability for maintenance of forest lands and promotes liquidation

**Comment [RJB34]:** Policy and tax incentive opportunity to propose to BR&D.

---- MY point here was that currently Federal tax policy is a disincentive to long-term stewardship as capital gains are not indexed to inflation. Further there are other elements of the tax code that reward short-term owners and penalize long-term ownerships. We need to integrate other government policies to create a better economic climate for the ownership, management and harvesting of timberland. The key is that forests serve so many ecosystem and economic functions simultaneously and with rapid changes coming from climate change and global economic issues supporting the ability of landowners through carrots not sticks will serve this bioeconomy project very well. Forests have been managed for centuries and while we can always improve practice the reality is there is not a more sustainable land use.

**Comment [RJB35]:** Policy and tax incentive opportunity to propose to BR&D.

---- Change definition of renewable credits to allow forest biomass from naturally regenerating forests

**Comment [RJB36]:** Interesting proposal. State Senators' thoughts on this?

---- Grants and financing to put puzzle together for the supply chain to end use.

**Wes - Would you support a recommendation to agencies to put grants out that insists on collaborative partnerships and structures 2-3 year with outcomes then phases out?**

- Yes

**Comment [RJB37]:** Recommendation

Allison – But, it also leads to longer applications, longer process

---- Accountability, outcomes and results, meaningful partnerships are desirable but in reality here is what “partnership” means in practice: you give me money, then get out of my way, I’ll do what I want.

---- More beneficial to filter money through existing community development organizations for impact

---- For DOL grants, states receive funding based on population and unemployment and Maine is at a competitive disadvantage since it is a smaller state

---- We need industry roadmap to success, legislative support, with university

**Comment [RJB38]:** A recommendation for the report.

---- Need to find alternative ways for industry to participate in partnerships

--- The Northeast is a mega region, 20% US population, build for a regional market as an advantage. Need regional economic allies.

**d) What other biomass would you like to consider in the discussion of advancing the bioeconomy? Animal wastes / carcasses / concentrated animal feeding operations / seafood industry wastes? Municipal landfill biorefineries? Others?**

--- lots of biomass definitions, but it is a problem not having one definitive definition.

---- perhaps isn't better to have a “wall” around the definition; use broad definition but have criteria for subcomponents.

---- Municipal wastes, dairy and forest “products” and bi-products (don’t use “waste” because it has a negative image. Have a broad definition such as “anything that can be grown ....” And then work on criteria.

--- Reiterating my point that the words used on describing the forest products that will be considered in the bioeconomy matter. We want growers, buyers and the public to understand these are valuable resources and that there is a cost of owning land, growing trees, harvesting, trucking and processing that must be considered in this equation of growing the bioeconomy.

--- This industry is really integrated to the extent that they used to take different parts of the tree to various places. Have lost some markets, where they used to have a market for everything (sawdust, bark, chips). There is a sense of urgency - bioproducts are integral to future and trying also to fill immediate needs

---- Aquaculture and fisheries wastes should be considered – there are lots of these.

**Comment [RJB39]:** Good example of a region-specific opportunity.

***e) As a region, how can you enhance your bioeconomy through new partnerships in the region, or on a more global basis?***

---- federal agencies through Maine Forest Products Council

---- Integration on both sides, across federal family and long-term commitment

---- Roadmap partnership with industry and university, spruce budworm task force is a model for how this could work. Also look to benchmark what the Canadians across the border have been doing (i.e. Atlantic Canada Opportunities Agency):

- Investments in Forest Industry Transformation (IFIT):  
<http://www.nrcan.gc.ca/forests/federal-programs/13139>
- Expanding Market Opportunities program:  
<http://www.nrcan.gc.ca/forests/federal-programs/13133>
- Maine Spruce Budworm Taskforce:  
<http://www.sprucebudwormmaine.org/>  
[http://www.sprucebudwormmaine.org/docs/SBW\\_full\\_report\\_web.pdf](http://www.sprucebudwormmaine.org/docs/SBW_full_report_web.pdf)

---- help us learn from each other, what are they doing in other states that are a success, lessons learned

---- within industry, from competitors to partners with some competition, but federal partners still seems siloed, need a new structure going forward

---- forest products in Canada is a larger part of national GDP, so private sector should also look to partner with Canada as part of the regional bioeconomy; makes sense to include them in partnerships.

---- do we think regionally?

---- we have unique situation because of the amount of privately held land. We are new to the catastrophe issues. There have been big problems in past two years. We are an importer of woods, but now markets

have diminished (but we are still importers of certain species of the wood. When policies change in Massachusetts, Rhode Island, Vermont, New York change, it affects them here. Are scrambling to fill some markets that we have here?)

Comment [RJB40]: Challenging issues.

---- Some of Canada wants certain certifications of some wood products; Quebec does a better job of collaborations. We have been siloed in part by various regulations on certain products. Need rail in this area for infrastructure. No major national rail carriers in this area. Most are small lines that have high turnover.

Comment [RJB41]: Perhaps we should loop in DOT

--- Clarification of these points. There are mills in Canada that require certification for furnish, some FSC and some SFI or both. That is growing in the US as well. There is far better collaboration in Quebec between business and government. Long-term strategic planning and financial support to maintain rural communities and a strong forest products industry. Yes a more socialistic model but one that has supported forests and forest products very well. The silo comment has to do generally with the view that the general public and until recently government had on the forest products industry. We need to develop more collaborative model so that financing is available and that the development of programs has a broader planning base that does not address a single entity but communities and regions. The rail system must be enhanced to address the costs of rail transport due to multiple rail carriers and the "switching" costs from one carrier to the next.

Comment [RJB42]: Ditto

--- ports, what are the barriers? Underutilized, from a regional standpoint. Regional transmission of electricity, northern Maine is not connected.

---- Eastport is challenged by rail, connection requires an expensive bridge, which prevents port from being fully utilized.

---- natural resource industries that can contribute biomass, are there valuable cross industry conversations?

---- improve partnerships with environmental groups to tell story

---- Sugarloaf "french fry express" is an example to look at. They fuel shuttle buses with used french fry oil. Much more sensible than hauling that stuff to some distant monster high tech plant. What new technologies and partnerships can develop on site systems at a scale that fits, distributed, rather than monster plants?

---- industry group, government, and university has all come together today (very positive) because of inclusion of various sectors.

---- Heating issue in Northeast, is a regional issue and opportunity. Need better regional coordination instead of have each state do things separately that aren't communicated. Need some showcase examples of collaboration.

---- Northern Region Border Commission is one potential funding source with a regional focus - but does it promote collaboration?

#### **Wrap up comments from USDA, DOE, FS, etc.**

Todd – tomorrow is national bioenergy day; there are several events in NE. Montpelier is giving tour tomorrow. There should be a number of success stories that can be gleaned.

--- RFPs from agencies need to be more balanced between biomaterials & bioenergy/fuels

Alison --- Wants POC for aquaculture – Can be obtained from Maine Technology Institute.

Todd -- USDA.gov has a lot info

Alison – BR&D B website will have a number of documents available (including this report).

Next Steps ---

Wes --- This group was selected to represent the various stakeholders and should be the first step of broadening networks, agencies, etc. How do we move forward from here? Univ. of Maine convened this group, role of ATIP Foundation is as facilitators to help as 3<sup>rd</sup> party facilitator with federal agencies, universities, industry.

----- many in this room have invested a lot of time with the EDAT process in spring. From the federal agencies, how are they willing to integrate EDAT (Dept. of Commerce) and bioeconomy initiative. THERE IS STRONG GENERAL AGREEMENT OF AUDIENCE THAT THESE NEED TO BE INTEGRATED / LINKED MORE STRONGLY.

--- What will happen with transition of administrations? This will take some time as congressional offices also transition.