

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

**A Report to Participants in the SW Regional Bioeconomy Forum  
Mineral Wells Chamber of Commerce, (co-hosts)  
Mineral Wells, TX  
September 29, 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,”* released by USDA Under Secretary Cathie Woteki at the 2016 Advanced Bioeconomy Leadership Conference in Washington, D.C. (February). “The goal of the Billion Ton Bioeconomy Vision is to develop and implement innovative approaches to remove barriers to expanding the sustainable use of America’s abundant biomass resources, while maximizing economic, social, and environmental outcomes.” BR&DB engaged the ATIP Foundation in September 2015 to prepare several regional listening sessions.

Separately, during the month of April, 2016 USDA and DOE co-led some informal “listening sessions” at three major conferences: 2016 International Biomass Conference and Expo in Charlotte, NC (April 11-14); World Congress on Industrial Biotechnology in San Diego, CA (April 17-20); and the Symposium on Biotechnology for Fuels and Chemicals in Baltimore, MD (April 25-28). In addition, a webinar on the Vision was conducted jointly by USDA and DOE on May 5, 2016. Input garnered from these events helped shape a subsequent document, tentatively titled “The Billion Ton Bioeconomy Initiative: Challenges and Opportunities,” released in November 2017 by the BR&D Board (for a copy, go to [http://www.biomassboard.gov/pdfs/the\\_bioeconomy\\_initiative.pdf](http://www.biomassboard.gov/pdfs/the_bioeconomy_initiative.pdf)). The rationale and strategy for these reports, and purpose for the public gatherings “USDA published a blog about the Vision and the listening sessions designed to “... gather information and engage stakeholders on how to build and grow the “Billion Ton Bioeconomy.” (<http://blogs.usda.gov/2016/04/27/growing-and-building-the-billion-ton-bioeconomy/>)

**Regional Bioeconomy Stakeholder Forums**

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

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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.

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

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

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

**Forum Structure and Role of the Foundation and Co-hosts**

The SW U.S. Regional Bioeconomy Forum was moderated by Wes Jurey, CEO of the ATIP Foundation, assisted by Ryan Roach, CEO of the Mineral Wells Chamber of Commerce. Notes were taken (attributed to the commenter) by Ms. Nikki Bossaller, who projected these so all participants could review and correct as needed. The audio was also recorded from a laptop in case it was needed to clarify comments.

Table 1 describes the demographics of invitees by sector, and the actual number able to participate on September 29, 2016.

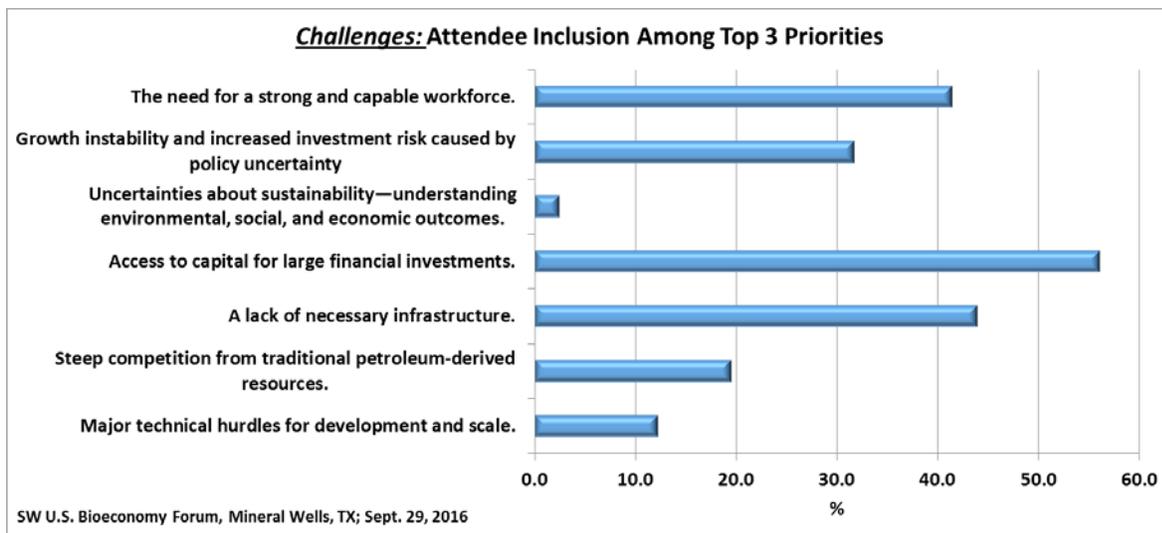
Table 1. Demographics (by sector) of invitees and participants, convened by co-host Mineral Wells Chamber of Commerce, in SW Regional Bioeconomy Forum, Mineral Wells, TX, September 29, 2016 .				
Sector	Invited	No. Participants	%RSVP to Attend	% of Attendees
Industry	41	6	15	15
State and local government	27	8	30	20
Economic and workforce development	23	15	65	37
Investment & finance	2	1	50	2
Academia	49	9	18	22
Agricultural and environmental organizations	11	2	18	5
	153	41	27	100

The agenda (Attachment 1) included welcoming comments by Ryan Roach, Mineral Wells Chamber of Commerce (state co-host); Mayor Mike Allen, City of Mineral Wells; Wes Jurey, ATIP Foundation; and Todd Campbell, Biomass Research & Development Board representative. A slide set presentation was made by the ATIP Foundation and co-host, followed by Todd Campbell (USDA; Attachment 2). In addition, a “discussion document” was provided to the participants (Attachment 3). The remainder of the day consisted exclusively of stakeholder attendees from the six sectors participating in discussions on these six questions and others posed by the Foundation.

Participants of the forum received a link to a Google Document of the “attributed” notes taken by Ms. Bossaller, and were given a two week window of opportunity to edit their specific comments, or add additional comment. Thereafter, the document was closed by Dr. Brenner, who reviewed comments, clarified with authors as needed, redacted all names of comment contributors, and annotated with his comments and/or Wes Jurey’s from the Foundation (noted by “Comment#(RJB)”. The document is presented (Attachment 4) as a record of the event, and it includes participant reviews of each “challenge” and “opportunity” --- from their perspective --- and their assessment as to whether each was in the top 3 priorities of the SE U.S.

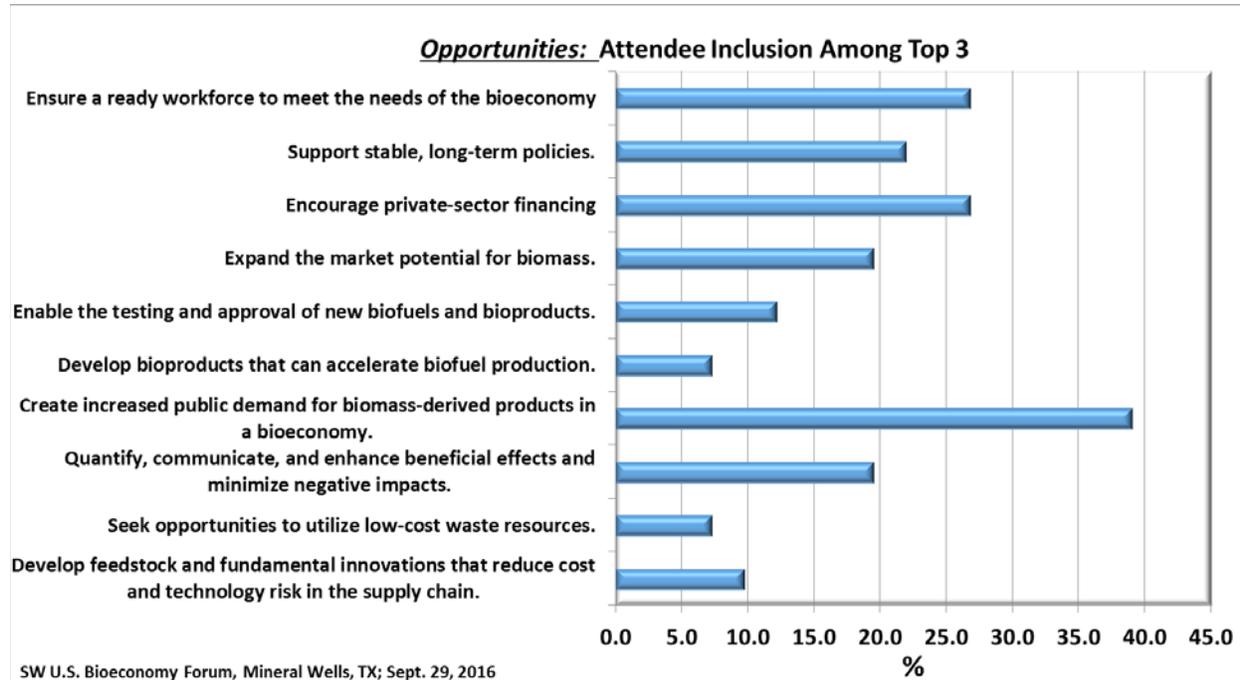
**Reporting on Participant Comments**

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



Participants considered “access to capital for large financial investments” as the dominant challenge faced by the bioeconomy industry in the region (55%), followed by “a lack of necessary infrastructure,” (42%), “the need for a strong and capable workforce,” (41%), and “growth instability and increased investment risk caused by policy uncertainty.” Of interest, only 20% of participants from this oil-rich state deemed “steep competition from traditional petroleum-derived resources” among the top 3 challenge priorities.

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



“Create increased public demand for biomass-derived products in a bioeconomy” was seen as the top “opportunity” (39% of respondents) for the SW Region, followed by “ensure a ready workforce to meet the needs of the bioeconomy,” and “encourage private-sector financing, both at 27% of respondents. “Stable long-term policies” was a close 4<sup>th</sup> at 22%.

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

This section illustrates highlights of actual comments, selected by the Foundation, made by forum participants. Items appearing as [NOTE: ...] are additional comments by the ATIP Foundation post-forum. The full non-attribute comments by participants are in Attachment 4.

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

- Logistics and supply chain: Based on cotton transport not economically feasible beyond a 50 miles radius, same theory applies to biomass. Companies want a transportable product immediately.
- Education and Awareness: There is active backlash concern over bioproducts. Education component needs to be stressed so people understand the advantages [of biobased]. What is petroleum industry going to say? The represent a formidable challenge.
- Until participant got materials for forum, didn’t know what biomass was. Education needs to go back to square 1. Woody biomass is a new word to many people. Education.
- Transportation & financial components are missing.
- Workforce [development]: In the future, this needs to start in 8th grade; stress “skills needs” to students & parents to learn skills for new jobs. If not, workforce won’t be there.
- Workforce development *overemphasizes a college education. Support is needed for strong vocation programs.* 40% better suited to vocational programs. Education system needs to rethink priorities.

- Univ. of North Texas has no ag program. [However] *we are establishing a certificate program for renewable bioproducts engineering. Lots of wood industry. Looking for engineering students to know something about agriculture so they can feed well into that job market. Bioproduct engineering.*

There were some key points made on “**How the federal agencies can help address these regional challenges**”

- One challenge is hiring practice of agencies (USDA, etc.) for graduates. Time scale is too short for window of opportunity. *Federal agencies advertise internships too late. [NOTE: this is an actionable item]*
- Training and education: Oil is in biggest bust since 2008. Lots of highly skilled workers unemployed in Texas. Bio & oil are tied at hip. Demand is down dramatically. Govt. should help more (**subsidies, tariffs, taxes, incentives, cost competitive**). Companies aren’t going to want to make the investments b/c of risks involved in oil dropping. My company has had 3 layoffs and other energy sectors companies continue to make cuts. There are many highly skilled people still looking for jobs. **[NOTE: this dovetails with other comments on training and education for cross-over training from oil refineries to biorefineries. This argues for transition training programs that Dept. of Labor, Department of Education, and State Workforce Development could do jointly. See supporting comments elsewhere in document.]**
- Cross-training for transition from oil ↔ biofuel: Half the people used to be with oil industry. Similar skills overlap. Similar industries are in bioeconomy. How do we bridge the gap to easily transition when petroleum sector has a lapse? Companies are trying to figure out that natural pivot. How do we close that gap to transition? **[NOTE: All strong arguments for a pilot program to develop transition training that works in both directions oil ↔ biofuel. Again, with Department of Labor and Department of Education]**
- In Waco, a large number of troops in Ft. Hood were getting ready to be released. The Federal government in conjunction with TWC provided training on how to transition skills from Army to civilian jobs. Many workers possess the needed skills just don’t have experience in specific market. HR professionals and potential applicants need training so they are both speaking the same language.
- Invest in research. Funding percentage is only 3%; lots of good ideas are being left on the table.
- Produces polysaccharide. Don’t have funding to scale up. Too many orders. Gap in funding. *How do you take an entrepreneur with no funding?*

Comments and suggestions from the ATIP Foundation in response to comments made:

- Opportunities for cooperative research agreements. Often at issue for industry is the high overhead structure that most universities charge.
- Perhaps a joint venture for partnerships between industry and federal scientists through CRADAs
- SBIR – each agency has mandatory funding available to prospective grantees. Check each agency for amounts and application deadlines (e.g., USDA, DOE, DOC, DOD, EPA, ...)

**On the topic of “What are state/local/regional opportunities to the bioeconomy?” ...**

- Use of marginal lands. Lots of areas that don’t have a lot of rain. Need to be able to produce vegetation specific for needs of that land.
  - Curious about marginal land development & development of algae. Any way to use prickly pear cactus? [Note from ATIP Foundation: <http://gizmodo.com/this-humble-cactus-could-help-power-our-drought-stricke-1715966241> ]
- Arlington Independent School District has a \$663 million bond being used for partnership with Tarrant County College & their certification programs. Career and Technical Higher Education Investigations course to see if they could communicate opportunities available in areas of vocation.
- We have coastline to look at algae production. Microalgae research. Different from other regions of the US. Look further into. Marginal lands & prime lands in eastern Texas. Terraces in forests had cotton at one time. Those forest thinning could be used as biomass & then replanted as other crops for energy. Good opportunities for east Texas.
- Identify skilled workforce-College Credit for Heroes. Vets can look at their skills set & how they translate to civilian jobs. Can complete program or degree faster b/c of skills credits. Program will help cover the training costs. Helping businesses train workforce with new technologies. *Better education is needed why communities are green.* Career networking-anyone looking for bioeconomy job & identifying where those jobs are. Better build that data set. Tends to be clearing house for that type of information. [Note: <http://www.twc.state.tx.us/jobseekers/college-credit-heroes>]
- UNT is establishing labs; <https://www.unt.edu/search-results?search=bioeconomy&sa=Search>
- Guayule is a natural rubber crop that fits well for the southern region (southern Texas, new Mexico and Arizona). I am currently working at Arid Land Agricultural Research Center (ALARC), Maricopa, Arizona to improve rubber production, and adaptation to grow in desert area. [Note: <https://search.usa.gov/search?utf8=%E2%9C%93&sc=0&query=Guayule&m=&affiliate=agriculturalresearchservice&commit=Search> ] As well I am working on improving the industrial oil crops, camelina and brassicas, for non-food, bioenergy purposes including biodiesel and Hydrotreated Renewable Jet Fuels to grow in stress conditions (drought and hot conditions) [Note: <https://search.usa.gov/search?utf8=%E2%9C%93&sc=0&query=hydrotreated+renewable+jet+fuel&m=&affiliate=agriculturalresearchservice&commit=Search> ] . In general we are looking for crops that can be accommodated in this area (marginal, semi-arid and arid land). We need to think out of the box for these crops. Arid lands will be good for non-food non-traditional crops. Cotton uses lots of water.
- Wild pig problem in Texas. Develop land into farms & use pigs for something other than shooting practice.

**Comments on the issue of “What impact does the Texas oil industry / economy have on advancing the bioeconomy? How might that shape your implementation of expanding the bioeconomy in this region.**

- They are distributing product for any fuel product we produce. Embrace as partner.
- When the booms are happening in Oil & Gas, those companies are a competitor for resources (steel, labor).
- Water transportation for irrigation of bioproducts and removal of process water are large expenses. Why not create a pipeline system to transport water. This system could help reduce long-term droughts and pump water away from flood zones along the Mississippi. Between the government and insurance

companies billions of dollars are spent each year on natural disasters. Money that is currently being budgeted for those disasters could be used to repay loans for the construction of the pipeline system.

- Additional note from participant post-forum: “The comments concerning produced water from active oil and gas wells and water returned to the surface after fracturing, are not correct. Pipelines and transport trucks are expensive and time consuming. Our company has developed mobile equipment that treats this water at the location so that it may be used for agricultural or other useful purposes. There are several companies working on similar technologies that will yield useable water at the wellsite. Shortly, it will no longer be necessary to move these large quantities of water. **[Note from Foundation: <http://www.buzzfile.com/business/Pump-and-Coil-Tubing-940-327-8189> ]**

### Summary of Challenges and Opportunities for SE Bioeconomy

- Education customers & stakeholders what biomass is.
- Need a viable bioproduct enterprise available. Economic climate has to be available to move forward.
- Needs incentive, research, financing, policy (dysfunctional energy policy). Hard to get investment if new administration that is going to turn everything upside down.
- Predictability in policy needed. Establish fed task force to establish regional bioproduct project. No red tape. Put structure in.
- Federal government can help the bioeconomy industry by providing tax credits that will create equity needed to finance the projects. To finance any project, the lenders require 30-40% equity. If tax credits were structured similar to the New Market Tax Credit and the Renewable Energy Certificates, then the bioeconomy industry would be able to obtain the needed equity to fund the projects.
- Federal agencies must put biomass info on their websites. Can’t be advertised on TV . Very eye catching verbiage to make people aware of bioeconomy.
- DOE & requests for proposals that come out that deal with development to prove scale of what you need. Proposals need 50% match. Companies don’t have that much. That is a huge hurdle that smaller companies. Reduce or eliminate match. **Actionable.**
  - **[Note from Foundation: One approach would be to form public-private partnerships where private sector can contribute funds toward matching requirements. If done under a CRADA, then private sector contributor also has first right of refusal to negotiate an EXCLUSIVE license to any technology (intellectual property) developed under the partnership without Federal Register Notice.]**
- Bring Small Business Development Centers (SBDC) in as partnerships. Bioeconomy is a new concept to those offices; however, they have the resources available to connect experts in the industry for them to be consultants in the development and growth of any project.
  - **[Note from Foundation: Mineral Wells participants should consider adding this dimension to a pilot. Bringing in Department of Commerce, along with Department of Labor, and Department of Education would be the most comprehensive partnership among federal agencies, given that BR&D Board includes 7 other agencies plus the Office of the White House.]**
- We need to separate between the use of food & non-food (bioenergy and industrial) crops, and where we can grow each group. Southern region has the high potential to grow new non-traditional, non-food, bioenergy crops in its marginal land.

- The region is a preferential bioenergy crops (east TX to LA) & across the south. SE quad of US is best location for bioenergy crops.

*Participants all agreed it would be good to reconvene in a year*

#### **Summary Statement from ATIP Foundation**

##### **SW Regional Bioeconomy Forum Summary Wes Jurey, CEO, ATIP Foundation**

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

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

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

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

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

From the Foundation's perspective, based on the response from forum participants, we believe our premise is sound. At the conclusion of the Southwest 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 bio economy actually was, beyond biofuel.

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

Third, the need to develop a talent pipeline for current and future workers was a strong concern. It was noted that although seven federal agencies were members of the BR&D Board, the Departments of Education & Labor were not engaged at the federal level, although the US Department of Labor, the Texas Workforce Commission, and representatives of local workforce boards were active participants in the Southwest forum.

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

Fifth, the need to finance the growth of demonstration projects, establish new businesses, and expand existing businesses, by seeking federal, state, and private sector financial assistance is a critical concern. It was further noted that the financial community was the least represented in 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 Mineral Wells Chamber of Commerce 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

**SW Regional Bioeconomy Forum Summary**  
**Ryan Roach, President**  
**Mineral Wells Area Chamber of Commerce**  
**November 7, 2016**

The Mineral Wells Area Chamber of Commerce hosted the Southwestern Regional Advancing the Bioeconomy Forum in Mineral Wells on September 29, 2016. Forty-one individuals attended the event held at the Holiday Hills Country Club that included representatives from various sectors from across the area and beyond to participate in a discussion about advancing the Bioeconomy. The Chamber along with the City of Mineral Wells is grateful for the opportunity to host the Forum and looks forward to establishing a presence related to developing and enhancing this initiative.

Much of the day focused on allowing participants the opportunity to preview the research and vision behind the Bioeconomy as well as presenting potential challenges and opportunities to be considered as the project moves forward into further development and implementation. The questions asked to the attendees focused on a variety of topics, however much of the time focused on issues related to the regional issue of relying on a qualified and reliable workforce. While this issue is highly regarded as a major issue locally, the needs for strong labor exists across the state of Texas and even the country. Skilled workers are in high demand in many areas of our region because of the focus on everyone needing a college degree. In developing a new industry, such as the bioeconomy, that the jobs created will be technical and derived from an emphasis in STEM (Science, Technology, Engineering, and Math). Issues must be addressed beyond skills and education that include overcoming soft skills deficiencies.

The highest priority among attendees was that of financing and capital available to businesses who potentially would consider becoming engaged in the bioeconomy. Other considerations related to acquiring capital is identifying, what currently exists in the market, is there a demand, what is the potential for profits to commodity producers and end-product manufacturers? How static or volatile are the markets for these commodities, and will investors and/or lending institutions be willing to take a risk on supporting the development and growth of the Bioeconomy industry? These types of questions are valid concerns and should be addressed in determining the success of advancing the bioeconomy.

Another topic of discussion revolved around educating the masses on what the bioeconomy is. Most citizens are already familiar with bio-fuels and their uses, but other bio-products and the potential uses are highly unknown. Education was a major component of the groups focus and must be very strategic to include overcoming emotions related to the competition with oil and gas, educating investors, businesses, and consumers to the benefits of bio-products. Awareness will be a crucial element in overcoming doubts and skepticism related to the industry and its advancement.

While many different questions were posed to the attendees and a variety of responses were given, the event proved to be worthwhile in acquiring the needed information to continue to develop the initiatives for advancing

the bioeconomy. One of the recommendations determined was considering regional pilots as a basis for exploring and developing the markets necessary to support the bio-industry. Mineral Wells is supportive and willing to assist in implementing a pilot program to further the Bioeconomy. The area has many assets to support this industry and looks forward to being a leader in advancing the Billion Ton Bioeconomy.

--- End of report ---

**Attachment 1: agenda**

**Attachment 2: slide presentations**

**Attachment 3: "discussion document"**

**Attachment 4: non-attribute notes w/ comments**

**SW Regional Bioeconomy Forum  
Mineral Wells, TX**

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

**Date: September 29, 2016      Time: 9 AM – 4 PM (local time)**  
**Location: Holiday Hills Country Club, 4801 Highway 180 East**

**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

- Wes Jurey, Chairman, ATIP Foundation
- Dr. Cathie Woteki, USDA Under Secretary for Research Education and Economics, and Co-chair, Biomass Research and Development (BR&D) Board<sup>1</sup>
- TBD, State Host

10:00 AM – 11:00 AM Overview of “Federal Activities Report on the Bioeconomy”, and the “Billion

Ton Bioeconomy Initiative: Challenges and Opportunities” Report

- Presentation by Todd Campbell, BR&D Board, Operations Committee (Senior Energy Advisor, U.S. Department of Agriculture)
  - Establishes issues from the federal agencies and frames the topics for discussion

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

- 12:30 PM—Working Lunch

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

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

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

<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.

September 29, 2016

**ATIP FOUNDATION**  
Agricultural Technology Innovation Partnership

**ATIP Foundation Regional Bioeconomy Forums:  
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Billion Ton Bioeconomy**

**NEW HOLLAND AGRICULTURE** | **POET** | **DSM**  
National Sponsors | Advanced Biofuels

**Leveraging Assets: Partnership Intermediaries of USDA ARS**

**The Agricultural Technology Innovation Partnership (ATIP) Network**

**ATIP FOUNDATION**  
Established June 2011

**ATIP FOUNDATION**  
Agricultural Technology Innovation Partnership

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

Venues and Regional Co-hosts

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

**NEW HOLLAND AGRICULTURE** | **POET** | **DSM**  
National Sponsors | Advanced Biofuels

**BRDB**  
BIOMASS RESEARCH & DEVELOPMENT BOARD

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

**ATIP Foundation Regional Forum**

Todd Campbell, Senior Advisor for Energy and the Biobased Economy  
USDA Rural Development

September 29, 2016

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

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

**Bioeconomy Definition**

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

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

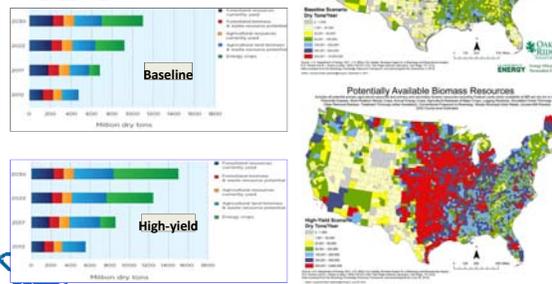
### Vision and Goal of the Billion Ton Bioeconomy

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

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

### Need Biomass – Sustainably Produced

- Baseline scenario
- \$60 dry ton<sup>-1</sup>
- 2012 & 2030



### Billion Ton Studies History and Accomplishments

#### Billion-Ton Study (BTS), 2005

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



#### Billion-Ton Update (BT2), 2011

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

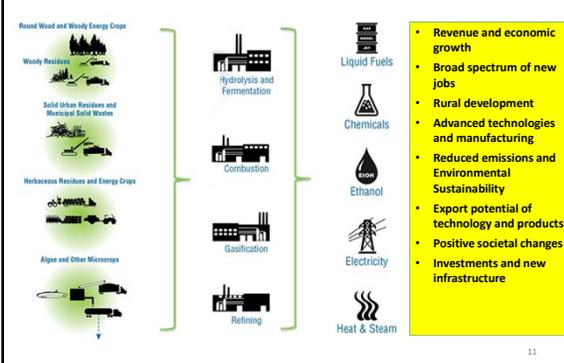
#### 2016 Billion-Ton Report (BT16), 2016

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

### Federal Alternative Jet Fuels Research and Development Strategy



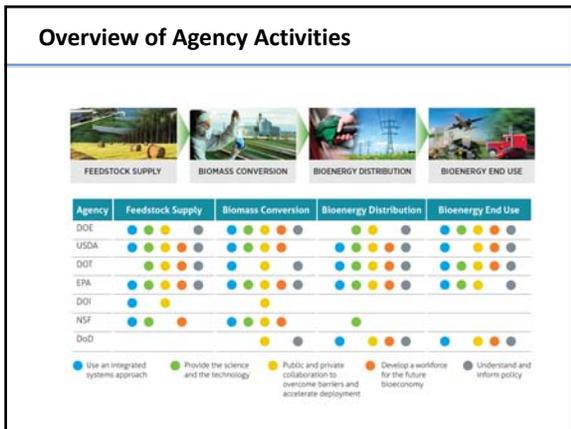
### Simplified Bioeconomy Concept



### Federal Activities Report on the Bioeconomy

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





### Bioeconomy Initiative Reports Plan

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

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

### Report Outline

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

### Key Challenges Identified

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

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

### Key Opportunities

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

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

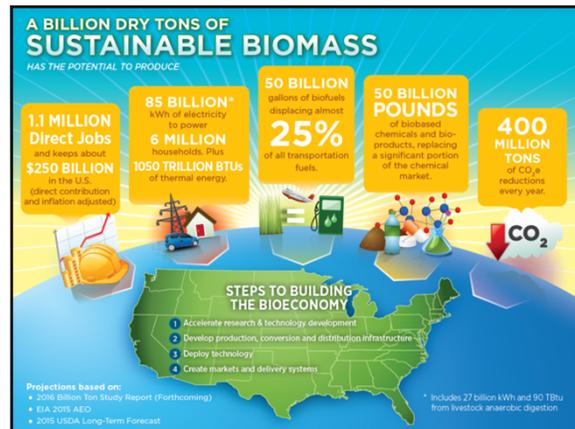
### Key Opportunities Continued

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

**Purpose for this meeting:**

- This workshop series is intended to focus on regional issues and their specific bioeconomy-related industries through the various state partnerships.
- The feedback gathered from these formal workshops will be used to solidify and support the Action Plan that is planned for release in FY2017.

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**Critical Discussion Points**

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

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**Thank you!**

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

[todd.campbell@osec.usda.gov](mailto:todd.campbell@osec.usda.gov)

## 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:

- Develop feedstock and fundamental innovations that reduce cost and technology risk in the supply chain.
- Seek opportunities to utilize low-cost waste resources.
- Quantify, communicate, and enhance beneficial effects and minimize negative impacts.

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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)

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

**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.

Not for Distribution

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

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

The Billion Ton Bioeconomy Initiative:  
Challenges and Opportunities  
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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. **5**
- Steep competition from traditional petroleum-derived resources. **8**
- A lack of necessary infrastructure. **18**
- Access to capital for large financial investments. **23**
- Uncertainties about sustainability—understanding environmental, social, and economic outcomes. **1**
- Growth instability and increased investment risk caused by policy uncertainty. **13**
- The need for a strong and capable workforce. **17**

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

- Develop feedstock and fundamental innovations that reduce cost and technology risk in the supply chain. **4**
- Seek opportunities to utilize low-cost waste resources. **3**
- Quantify, communicate, and enhance beneficial effects and minimize negative impacts. **8**
- Create increased public demand for biomass-derived products in a bioeconomy. **16**
- Develop bioproducts that can accelerate biofuel production. **3**
- Enable the testing and approval of new biofuels and bioproducts. **5**
- Expand the market potential for biomass. **8**
- Encourage private-sector financing. **11**
- Support stable, long-term policies. **9**
- Ensure a ready workforce to meet the needs of the bioeconomy. **11**

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**Critical Discussion Points**  
**SW U.S. Bioeconomy Forum**  
**Mineral Wells, TX**  
**September 29, 2016**

**1. What are state/local/regional challenges to the bioeconomy?**

--- Root stock comes from rural, what strategy will keep it local?

--- USDA RD does allow urban areas to apply for loans, but give preference to rural areas. Can you add value to the field? Lower the cost of transportation. Processing

plant want to centered around center of feedstock. Rural job creations will be added. Farming is dying.

--- There are opportunities for farmer community ownership & how they score for loan guarantees.

--- Lot of work for companies mentioned. Based on cotton transport 50 miles radius. Same theory applies to biomass. Companies want a transportable product immediately.

**Comment [RJB1]:** Could be lack of logistic infrastructure for biomass. Commenter cites issues with cotton, that should not go further than 50 miles because of high cost to transport.

--- Cotton goes to gin, baled, shipped & sold & shipped all over US. Not staying local.

**Comment [RJB2]:** Petroleum industry is powerful, especially in TX.

--- There is active backlash concern over bioproducts. Education component needs to be stressed so people understand the advantages. What is petroleum industry going to say? The represent a formidable challenge.

**Comment [RJB3]:** Need to inform the public on advantages of biobased.

--- The waste product stays local & applied to field. Trash being used to convert to electricity back to the grid. Challenge of is this an economically feasible track to take? Need to do research. Do they jump in?

---- Until participant got materials for forum, didn't know what biomass was. Education needs to go back to square 1. Woody biomass is a new word to many people. Education.

**Comment [RJB4]:** Need for public campaign to inform on bioeconomy.

---- USDA Research & movement has been tremendous. Best at producing & feeding world.

**Comment [RJB5]:** High degree of trust by participants that USDA research solves problems.

--- transportation & financial component missing. Our ability to move food makes it possible to feed the world.

**Comment [RJB6]:** Insufficient financial structure to obtain funds for new venture (e.g., biomass )

--- regarding public circumventing objectives of bioenergy products, such as, stations selling gasoline without ethanol; this was done to resolve the damage done to small engines (chainsaws, etc.) Lesson to be learned is research needs to identify and prepare for unintended consequences of new products.

--- Petroleum ---2 attitudes in big oil-how to lose as little money as possible with bio? Most oil company adopting those strategies. Importance of CO2. Big oil needs CO2 program. Big oil not enemy. Millions of dollars spent on biofuels. Ethanol not all for bio fuels. 2<sup>nd</sup> generation Isobutene possible alternative.

**Comment [RJB7]:** Reference is to reduce CO2, and biofuels help.

**Comment [RJB8]:** Other liquid fuel possibility.

--- Improves air quality for urban areas. Beef tallow being used. Flew jet with 100% with biofuel. Sec of Navy went up in flight. 50% blend. Drop in replacement & can be interchanged with petroleum. Same molecules.

**Comment [RJB9]:** Value of biofuels is in reduction in carbon emissions, as drop in fuel for Navy, no problems on reliability.

--- Funding for agencies come from federal govt. A lot in play going forward. Something to watch.

**Comment [RJB10]:** Audience anticipates research opportunities.

--- Workforce in the future starts in 8<sup>th</sup> grade. Stress skills needs to students & parents to learn skills for new jobs. If not, workforce won't be there.

**Comment [RJB11]:** Workforce development must start earlier in education process, not wait until secondary school or later.

--- Pyrolysis of biomass mainly has three product streams: Solid (biochar), liquid (bio-oil), and gases (how to use them). Bio-oil needs to be higher quality. High oil price, how to justify to use the biofuel? High temperature pyrolysis, the gas is mainly CO & H2 which are good feedstocks for methanol. Use those gases for methanol.

**Comment [RJB12]:** Attendee favors pyrolysis of biomass because bi-products are high value as methanol feedstocks.

--- Workforce development overemphasizes a college education. Support is needed for strong vocation programs. 40% better suited to vocational programs. Education system needs to rethink priorities.

**Comment [RJB13]:** Focus on earlier ages.

--- State officials stated recently college & strong vocational skills are both important.

--- Last week 60 by 30 Summit-listened to state partners. Mayors, supers, business communities. Promoting CTE. He comes from TSTC. Personal background is in career & technology. Listening to supers. During LAR, created apprenticeship, working with school districts to identify someone who can go service area for career & technology. Someone in district that can be a counselor in field of trades. Supers need to do a better job of apprenticeships & trades. Kids don't see a light at the end of the tunnel. Trade schools are meant to be an option, like a college or anything else. Great option would be trade school kids going to apprenticeship schools, 2-year community school & then a degree. Office focused on making college affordable for many kids.

**Comment [RJB14]:** Sent email to Julian Alvarez requesting clarification of acronyms.No response.

--- Texas is non-union state. There is a bias toward union terminology. Utilization of the term “apprentice” can bring out that bias. So state needs to educate HR community or use a different term for the labor training program.

--- 8 school districts on Johnson County, Texas. Only 2 have CTE (Career and Technical Education) programs.

**Comment [RJB15]:** Lack of attention in school system for trade school instruction.

--- UNT has no ag program. We are establishing a certificate program for renewable bioproducts engineering. Lots of wood industry. Looking for engineering students to know something about agriculture so they can feed well into that job market. Bioproduct engineering.

**Comment [RJB16]:** University of North Texas is expanding training to create certificate program for renewable bioproducts engineering.

--- How do we make sure employees are prepared for using bio products? How do we connect with those workforce training programs? What needs to be focused on? How do we support?

## 2. How can the federal agencies help address these regional challenges?

---- One challenge is hiring practice of agencies (USDA, etc.) for graduates. Time scale is too short for window of opportunity. Federal agencies advertise internships too late. Lots of universities are very international culture. Students go into advanced studies. Can't apply for federal jobs because they aren't US citizens. Can't even apply.

**Comment [RJB17]:** This could be better managed by federal agencies --- **Actionable**

**Comment [RJB18]:** Federal hiring authorities are not likely to change. These are driven by Office of Personnel Management.

---- USDA-ARS is aware of these problems & are working on them. ARS is committed to a diverse workforce. I was not a US citizen when I started at ARS as a post-doctoral scientist, but was able to get a position after becoming a citizen. Will mention & are aware. Task force trying to work out in ARS to streamline applications etc.

---- Oil is in biggest bust since 2008. Lots of highly skilled workers unemployed in Texas. Bio & oil are tied at hip. Demand is down dramatically. Govt. should help more (subsidize, tariffs, taxes, incentives, cost competitive). Companies aren't going to want to make the investments b/c of risks involved in oil dropping. My company has had 3 layoffs and other energy sectors companies continue to make cuts. There are many highly skilled people still looking for jobs.

**Comment [RJB19]:** This has been a common theme among forum participants.

**Comment [RJB20]:** This argues for transition training programs that Dept. of Labor, and State Workforce Development could do jointly. See supporting comments elsewhere in document.

---- Not all tariffs & taxes are viable solutions.

---- with requirements for Refining, producing, filtering, transporting etc. Biomass energy products, it does not appear that the job requirements are going to be any

different than those that currently exist in the energy sector. The type of energy workforce and skill sets needed now are the same or very similar that will be required for future bioenergy positions. HR has to be more open minded to see potential of workforce as it does exist and recognize the minimal training required to repurpose skilled workers. Job descriptions can frequently eliminate people that have transferable expertise in other industries, which takes qualified people out of job market.

**Comment [RJB21]:** Opportunity for developing a bridge program

--- Half people used to be with oil industry. Similar skills are overlap. Similar industries are in bioeconomy. How do we bridge gap to easily transition when petroleum sector has a lapse? Companies are trying to figure out that natural pivot. How do we close that gap to transition?

---- In Waco, a large number of troops in Ft. Hood were getting ready to be released . The Federal government in conjunction with TWC provided training on how to transition skills from Army to civilian jobs. Many workers possess the needed skills just don't have experience in specific market. HR professionals and potential applicants need training so they are both speaking the same language.

**Comment [RJB22]:** All strong arguments for a pilot program to develop transition training that works in both directions oil←→biofuel.

---- Invest in research. Funding percentage is only 3%. Lots of good ideas being left on table.

**Comment [RJB23]:** Perhaps a joint venture for partnerships between industry and federal scientists through CRADAs.

---- No one hired in firm is coming from renewable energy. Pulling people with basic mechanical skills, programs skills, etc. Degrees are not required. They can be trained & learned. Products compete b/c consumers want them. Ikea wants bioplastics.

**Comment [RJB24]:** Opportunity for increased demand for products.

---- Spent \$200,000 on bioenergy project that was not awarded. ROI is 1 in 100. Very frustrating. Would rather work with private sector than federal government.

**Comment [RJB25]:** Opportunities for cooperative research agreements. Often at issue for industry is the high overhead structure that most universities charge.

---- Produces polysaccharide. Don't have funding to scale up. Too many orders. Gap in funding. How do you take an entrepreneur with no funding?

**Comment [RJB26]:** SBIR – each agency has mandatory funding available to prospective grantees. Check each agency for amounts and application deadlines (e.g., USDA, DOE, DOC, DOD, EPA, ...

---- Funding is available. What can you create from anything bio? Think more broadly about bioproducts.

**Comment [RJB27]:** See above comment.

---- Can waste product be used to replace antibiotics?

---- Likes to use the word “bioproducts” which encompasses biofuels, bioenergy, biochemical, and biomaterials. There are no profits in ethanol production right now because of low oil prices. This could change easily when oil prices go up. We plan on going into it when technology is available.

---- He is newer to system. Kids would love to stay in rural home area if possible as they become adults. Simple form is communication. Get info out & invest money.

Make it a part of the CTE curriculum. Come back, work and home. Simplify. In Texas, people love where they come from. Identifying where you can go.

---- Major market for wood industry. North America homes are made from 90-95% wood and wood based products. Thinking about agriculture fiber; ag fibers are as strong as wood. Utilize to replace veneer. Make structural panel to use in building. That is a direction that needs to be worked on.

---- Recently visited Forest Product lab (USDA, Forest Service, Madison, WI) & another using fiber from dairy renewal. No odor at all. Take what farmers grow & add value to them. Protein from cotton seed to show adhesive properties with a company in Mississippi. Better properties, no off gasses, better performances (mobile homes). Scientists are figuring out at [ARS lab](#).

### 3. What are state/local/regional opportunities to the bioeconomy?

---- Use of marginal lands. Lots of areas that don't have a lot of rain. Need to be able to produce vegetation specific for needs of that land.

---- Arlington Independent School District has a \$663 million bond being used for partnership with Tarrant County College & their certification programs. Career and Technical Higher Education Investigations course to see if they could communicate opportunities available in areas of vocation.

---- [We have coastline to look at algae production. Microalgae research. Different from other regions of the US. Look further into. Marginal lands & prime lands in eastern Texas. Terraces in forests had cotton at one time. Those forest thinning could be used as biomass & then replanted as other crops for energy. Good opportunities for east Texas.](#)

---- [Identify skilled workforce-College Credit for Heroes.](#) Vets can look at their skills set & how they translate to civilian jobs. Can complete program or degree faster b/c of skills credits. Program will help cover the training costs. Helping businesses train workforce with new technologies. Lives in Austin. Better education is needed why communities are green. Not just warm & fuzzy. Career networking-anyone looking for bioeconomy job & identifying where those jobs are. Better build that data set. Tends to be clearing house for that type of information.

---- Funding activity opportunities there to address it. [UNT establishing labs.](#) Challenges still not fully functional b/c of lack of funds. Transfer info from lab to outside. Hard time finding support. Writing proposals.

---- Works directly w/ stakeholders & try it out at their facilities. Try to tag up with stakeholders. Indicate what money you are going to need --- piques industries interests.

**Comment [RJB28]:** [www.ars.usda.gov](http://www.ars.usda.gov); <https://search.usa.gov/search?utf8=%E2%9C%93&affiliate=agriculturalresearchservicears&query=fiber+research&btnG.x=0&btnG.y=0&btnG=Go%21>

**Comment [RJB29]:** This appears to be a unique opportunity to TX and the adjacent states. Contact ATIP Foundation if assistance is needed to facilitate this issue and explore opportunities.

**Comment [RJB30]:** <http://www.twc.state.tx.us/jobseekers/college-credit-heroes>

**Comment [RJB31]:** <https://www.unt.edu/search-results?search=bioeconomy&sa=Search>

---- Curious about marginal land development & development of algae. Any way to use prickly pear cactus?

**Comment [RJB32]:** <http://gizmodo.com/this-humble-cactus-could-help-power-our-drought-stricke-1715966241>

---- Mesquite & invasive species hard to get rid of, but not economical. Could create a market for that biomass. Doesn't have to make a lot of money. Sorghum is drought tolerate. ARS in California is looking at desert shrub & dandelion to commercialize very low water use. Makes natural rubber required by aviation jets for high performance tires.

---- Guayule is a natural rubber crop, that is fits well for the southern region (southern Texas, new Mexico and Arizona). I am currently working at Arid Land Agricultural Research Center (ALARC), Maricopa, Arizona to improve rubber production, and adaptation to grow in desert area. As well i am working on improving the industrial oil crops, camelina and brassicas, for non-food, bioenergy purposes including biodiesel and Hydrotreated Renewable Jet Fuels, to grow in stress conditions (drought and hot conditions). In general we are looking for crops that can be accommodated in this area (marginal, semi-arid and arid land). We need to think out of the box for these crops. Arid lands will be good for non-food non-traditional crops. Cotton uses lots of water.

**Comment [RJB33]:** <https://search.usa.gov/search?utf8=%E2%9C%93&sc=0&query=Guayule&m=&affiliate=agriculturalresearchservicears&commit=Search>

**Comment [RJB34]:** <https://search.usa.gov/search?utf8=%E2%9C%93&sc=0&query=hydrotreated+renewable+jet+fuel&m=&affiliate=agriculturalresearchservicears&commit=Search>

---- 30 million acres of mesquites in this part of Texas. How do you economically harvest it? Problem. Look at the practicality of that. Do it in a sustainable fashion. Need a return on the energy inputs we put in it.

---- Cooperative research & development encouraged.

#### 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 SW region?

From that same list, what SHOULD be added to that list from our regional perspective? Does it change your prioritization scheme? (1=most important)

b) From the “Opportunities” section of the above document, is anything missing from the list, and how would you prioritize these issues (1=most important)

c) What sets the Southwest / Southcentral 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?

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

---- Wild pig problem in Texas. Develop land into farms & use pigs for something other than shooting practice.

---- Lignocellulosic bioenergy crops & pulpwood

---- By-products of processes from, e.g., sweet sorghum processing for bioproducts. Many, of the by-products area rich in starch or protein, and can add value to many other products. It is very important to to add value in any part of the supply chain that is amenable.

---- Anything that leaves your house as waste should be on the list.

---- What can we do with waste that improves product?

---- Oklahoma is going to prohibit the injection of produced water from fracking b/c of seismic activity.

e) What impact does the Texas oil industry / economy have on advancing the bioeconomy? How might that shape your implementation of expanding the bioeconomy in this region.

---- They are distributing product for any fuel product we produce. Embrace as partner.

---- When the booms are happening in Oil & Gas, those companies are a competitor for resources (steel, labor).

---- This is going to have to be an incredibly inclusive approach. Have you seen ads for cars that are driving themselves? DOD has unmanned vehicles already & now it's moving into what we're doing. Doing concepts that general public is unaware of. Where is this research going to take us? Be an early adapter. Is what we're doing in alignment with agencies?

**Comment [RJB35]:** A measure of the marketplace reality on fossil fuels and renewable carbon fuels and bioproducts.

**Comment [RJB36]:** Describing a role of a neutral 3<sup>rd</sup> party (non-government) intermediary to facilitate partnerships.

---- Every industry moves everything from point a to b. All industry clusters. Who has the pipelines & trucks to move stuff? You can make it here, but you've got to get it there to sell it.

---- Water transportation for irrigation of bioproducts and removal of process water are large expenses. Why not create a pipeline system to transport water. This system could help reduce long-term droughts and pump water away from flood zones along the Mississippi. Between the government and insurance companies billions of dollars are spent each year on natural disasters. Money that is currently being budgeted for those disasters could be used to repay loans for the construction of the pipeline system.

---- Has product that cleans water in place.

**Comment [RJB37]:** <http://www.buzzfile.com/business/Pump-and-Coil-Tubing-940-327-8189>

The comments concerning produced water from active oil and gas wells and water returned to the surface after fracturing, are not correct. Pipelines and transport trucks are expensive and time consuming. Our company has developed mobile equipment that treats this water at the location so that it may be used for agricultural or other useful purposes. There are several companies working on similar technologies that will yield useable water at the wellsite. Shortly, it will no longer be necessary to move these large quantities of water.

---- How do we access labs USDA has? How do we locate product we know there is a need for?

---- License & patents & publications are available about technology. Research outcomes.

---- The federal resources are immense, but it is a challenge.

**Comment [RJB38]:** Partnership intermediaries function to facilitate cooperative interactions toward common goals.

---- Perhaps this a pilot for this region. Assemble products available. GA group decided to meet yearly. Might involve agencies that have a piece of this.

--- Valuable? Or not? Almost all in group agreed. Hopefully will bring more people back.

**Comment [RJB39]:** Attendees in the Mineral Wells, TX, bioeconomy forum should consider self organizing to develop an action plan for further engagement and development of functional partnerships. ATIP Foundation can assist, if Mineral Wells participants would like to purpose options for engaging federal / state entities toward advancing the bioeconomy in the SW U.S.

---- Any similarities of difference from GA?

---- Don't want one to influence another. More economic development here. More paper & pulp industry there. Aviation biofuel was better represented there.

**Comment [RJB40]:** Notes from all 5 regional forums will be available to participants in all forums by end of November. [www.atipfoundation.com](http://www.atipfoundation.com).

--- Regions are very different. Pulp & paper a major focus there. Seattle will be different. They are going to need to take advantage of the resources there.

---- Forum similar to “Bake to the Future”. Garbage make the car run. Chicken soup out of chicken poop.

---- Chinese companies using bamboo to make pipe. UNT is currently working on a winding process.

## SUMMARY OF CHALLENGES & OPPORTUNITIES

--- Education customers & stakeholders what biomass is.

**Comment [RJB41]:** A primary recommendation.

--- Need a viable bioproduct enterprise available. Economic climate has to be available to move forward. Needs incentive, research, financing, policy (dysfunctional energy policy). Hard to get investment if new administration that is going to turn everything upside down. Predictability in policy needed. Establish fed task force to establish regional bioproduct project. No red tape. Put structure in.

**Comment [RJB42]:** Attendees suggest a pilot project with the White House and BR&D agencies, and adding Departments of Labor and Education to pilot a project of training / retraining oil/biofuel workers, defining incentives needed to advance the bioeconomy, and

--- Federal government can help the bio-economy industry by providing tax credits that will create equity needed to finance the projects. To finance any project, the lenders require 30-40% equity. If tax credits were structured similar to the New Market Tax Credit and the Renewable Energy Certificates, then the bio-economy industry would be able to obtain the needed equity to fund the projects.

**Comment [RJB43]:** 2<sup>nd</sup> specific recommendation.

--- Identify what the infrastructure will need to be. Before we have capital or workforce for that matter.

---- Federal agencies must put biomass info on their websites. Can't be advertised on TV. Very eye catching verbiage to make people aware of bioeconomy.

**Comment [RJB44]:** Authorization restrictions – dissimilar from NASA authority where expenditure of federal funds to advertise are allowed.

--- DOE & requests for proposals that come out that deal with development to prove scale of what you need. Proposals need 50% match. Companies don't have that much. That is a huge hurdle that smaller companies. Reduce or eliminate match. Actionable.

**Comment [RJB45]:** One approach would be to form public-private partnerships where private sector can contribute funds toward matching requirements. If done under a CRADA, then private sector contributor also has first right of refusal to negotiate an EXCLUSIVE license to any technology (intellectual property) developed under the partnership.

--- Bring Small Business Development Centers (SBDC) in as partnerships. Bio-economy is a new concept to those offices; however, they have the resources available to connect experts in the industry for them to be consultants in the development and growth of any project.

**Comment [RJB46]:** Mineral Wells participants should consider adding this dimension to a pilot. Bringing in Department of Commerce, along with Department of Labor, and Department of Education would be the most comprehensive partnership among federal agencies, given that BR&D Board includes 7 other agencies plus the Office of the White House..

--- We're lacking the info in the community in order to grow a business.

--- Dealing with generation that environmentally conscious. Look at where opportunities are for field they are interested in. Fed agencies think about how to convey information.

--- Industry that is along coast, discussed programs re: industrial waste feeding algae ponds, but co doesn't want to open permits for research project. EPA to agree to partner with research in earlier stage.

--- Bring DOL in now. Get national office in during emerging opportunities.

**Comment [RJB47]:** See previous comments by RJB of ATIP Foundation.

--- Chief of Staff w/ DOL wasn't aware of forums. Education & communication critical to implement this plan? Fair statement? Yes.

--- Difficult for hospitals to find staff to manage labs basically because of regulatory job experience requirements. Yet lab manager duties in other industries are very similar and the regulations eliminate otherwise qualified candidates. Bioenergy will be highly regulated industry so it will be important to get the regulators involved early on so that they do not unnecessarily restrict the labor pool for these new industries.

--- People love to see successes. Start a pilot project? You have to do more. USDA & agencies USDA has discretionary funds available. Different mechanisms are available, but leadership needs to know about it.

**Comment [RJB48]:** This highlights importance of forum series by ATIP Foundation in assisting to establish a unique pilot project with many federal agencies in the SW U.S. area.

--- Looking for partners early on in this process.

--- Shuttered biogas facility in Stephenville. Produced lots of BTUs. Company went bankrupt. Lots of plants like that across US. What makes it a profitable business again? How to be more cost effective? Can we use infrastructure already in place?

--- Worked with a project related to biofuel, was cutting edge. Unheard of at that time. Project fell apart based on finance. \$17 million plant for 1 purpose. Consumers needs to be educated. Lender going to have a hard time with viability startup of new product. Needs to be very clear education of product & value. Needs access to capital. Partners needs to understand.

## SPECIFIC OPPORTUNITIES

--- All are important & interlinked.

This Region---

--- Level of fossil fuel (energy sector) business is greater than anywhere else.

--- We need to separate between the use of food & non-food (bioenergy and industrial) crops, and where we can grow each group. Southern region has the high potential to grow new non-traditional, non-food, bioenergy crops in its marginal land.

--- The word south means hot & humid. Should be more careful b/c of heat. Stabilize feed stock.

--- The region is a preferential bioenergy crops (east TX to LA) & across the south. SE quad of US is best location for bioenergy crops.

Comment [RJB49]: Compliments of latitude, sunshine, warmth, and precipitation.

#### NEXT STEPS

Draft summary will be sent. Input requested. Want to be as accurate as possible. Time frame to respond will be given.

Make sure we have accurately collected thoughts & comments. Coming in raw state. Please add & edit. Final report will not include names with comments.

ATIP Foundation: How many will be willing to reconvene in a year? All agreed.

Todd Campbell: Thank you for coming. Appreciate ATIP & local host to bring group together. We want this to be an honest discuss back & forth. We are trying to go through this in a deliberate back & forth. Want an honest look at different regions. Feedback has been great. Interested in seeing final report.