

# STRATEGIC COMMUNICATIONS

## INTRODUCTION

Strategic Communications is a vital crosscutting component of the Bioenergy Technologies Office's (BETO's or the Office's) portfolio. The bioeconomy must involve successful, coordinated operations among many industries and sectors of the U.S. economy, from biomass producers to end-use markets and finally to the consumers. Effective stakeholder collaboration and communication play important roles in addressing non-technical, cultural, and social barriers to bioenergy adoption and utilization. A strong network of coordinated, informed

individuals among public and private sectors is essential for the long-term success of the bioeconomy. BETO's Strategic Communications portfolio addresses these needs and has evolved significantly to accomplish the following:

- Help strengthen stakeholder relationships
- Improve the quality of stakeholder collaborations
- Drive the development of a well-trained bioeconomy workforce
- Increase awareness of bioenergy and BETO's role among the general public.

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## OVERVIEW

Strategic Communications consistently creates and curates relevant and valuable content to assist stakeholders to better understand and embrace new concepts, technologies, and products. Informing targeted audiences about BETO's work and promoting the benefits of sustainable bioenergy strengthens support for supplying and consuming bioenergy products to develop a thriving bioeconomy. Strategic Communications (1) engages a broad range of stakeholders in meaningful collaborations, (2) promotes the accomplishments of Office-funded advanced technologies, (3) increases consumer awareness and acceptance of biofuels and bioproducts, and (4) amplifies the expansion of bioenergy production and use across the bioenergy supply chain.

Strategic Communications promotes outcomes of research and development (R&D) technologies developed in the Office's program areas—Feedstock Supply and Logistics, Feedstock-Conversion Interface Consortium, Advanced

Algal Systems, Conversion R&D, Demonstration and Market Transformation/Advanced Development and Optimization—and in the crosscutting area of Analysis and Sustainability.

In addition, Strategic Communications focuses on identifying and addressing nontechnical barriers to bioenergy adoption and utilization in an effort to reach full-scale market penetration. This is accomplished by educating audiences and increasing awareness through a combination of internal and external communication methods. BETO aligns its messaging and outreach with the U.S. Department of Energy's (DOE's) and Office of Energy Efficiency and Renewable Energy's (EERE's) mission, strategic goals, and vision. Successful external communications will improve the flow of accurate and consistent information throughout the DOE community and ultimately result in crosscutting collaborations, increased market transformation, and mission and vision alignment with other DOE transportation programs.

Successful coordination of internal and external communications strategies will improve the following:

- Knowledge of advanced bioenergy and biomass feedstocks R&D
- Funding opportunities
- Technologies
- Policies
- Collaborative efforts to educate stakeholders and improve market penetration
- Dissemination of accurate and consistent information, which dispels inaccurate information clutter while also diffusing conflicts and conflicting messaging
- Understanding of the economic, environmental, social, and U.S. competitive advantage benefits of bioenergy as a viable alternative and complement to fossil fuels.

In response to misconceptions about bioenergy, the Strategic Communications team focuses on amplifying facts, based on sound science about bioenergy; highlighting BETO and partnership successes; and identifying and addressing market and other non-technical barriers to bioenergy adoption and utilization.

Strategic Communications activities are relevant across the full bioenergy supply chain, from biomass production to end use. For activities throughout the supply chain, BETO disseminates sound science and increases awareness of the economic, environmental, social, and cutting-edge R&D that can give the United States a competitive advantage in the bioenergy industry.

Target audiences include scientists, engineers, researchers, industry, investors across the bioenergy supply chain, policymakers at all levels of government (including members of Congress and their staff), DOE staff, educators and students, members of rural and farming communities, and the general public, who are potential users of biofuels and bioproducts. These key audiences

vary greatly in their level of understanding and opinions about the benefits of sustainable bioenergy. Strategic Communications' efforts include distributing technical and non-technical information to internal and external stakeholders through both traditional and digital channels. These channels include, but are not limited to, website content, social media (Facebook, Twitter, and LinkedIn), conferences, and other events.

## Strategic Communications Support of Office Strategic Goals

Strategic Communications supports BETO's overall goals of strengthening stakeholder relationships, improving the quality of stakeholder collaborations, and increasing awareness of bioenergy and BETO's role among the general public and new stakeholder groups.

The Strategic Communications Portfolio's strategic goal is to support and enhance the Office's mission by conducting outreach to target audiences to promote R&D successes achieved through Office funding and to promote opportunities for, and benefits of, sustainable bioenergy production. Strategic Communications highlights the role that a thriving bioeconomy plays in improving economic and community stability, spurring innovation, and achieving U.S. competitive advantage in renewable energy.

## Strategic Communications Support of Office Performance Goals

Strategic Communications goals include sharing the Office's messages and technical accomplishments with a broader range of audiences, helping to increase awareness of and support for its research, initiatives, and technologies. Reaching the Office's goals also means a higher potential for new partnerships where more entities may apply for the Office's competitive funding opportunities, allowing for the advancement of existing technologies and the initiation of new, innovative technologies.

Ultimately, Strategic Communications allows for a faster, more effective dissemination of bioenergy-related information to accelerate the growth of the bioenergy industry. It also enhances government accountability by transparently sharing with the public the technical progress that the Office is making toward its goals.

Strategic Communications strives to accomplish the following performance goals:

- Increase awareness of and support for the Office’s advanced biomass R&D and technical accomplishments, highlighting BETO’s role in achieving national renewable energy goals
  - From 2016 through 2022, create and execute an annual communication strategy that incorporates synchronized messaging through the DOE national laboratories and other collaborative networks to highlight the Office’s contributions to developing of new technologies and key milestones
  - From 2016 through 2022, continually develop and implement Office messaging that provides clear, consistent, and accurate information about bioenergy and the industry. The messaging will be aligned with DOE’s and EERE’s missions and with individual Office program goals.
- Educate audiences about the environmental and economic opportunities and social benefits of biofuels, bioproducts, and a growing bioenergy industry
  - From 2016 through 2022, in conjunction with EERE sustainable transportation offices, develop and implement initiatives to raise awareness about the benefits of sustainable transportation technologies. Leverage these partnerships to educate new stakeholders on the benefits of biofuels and bioproducts.

The specific Strategic Communications milestones under investigation are:

- By 2017, develop a series of stakeholder-specific educational tools to improve understanding of the economic, environmental, and social benefits of participating in the bioeconomy within the agriculture, algae, forestry, and investment communities
- By 2017, establish at least two new channels of communication with policymakers, including notification of new state and local initiatives, informational briefings for the administration and congressional staff, and the amplification of state fact sheets detailing BETO activities
- In 2018, establish a requirement for all funding awardees to develop and implement a communications plan to disseminate results and impacts of BETO-sponsored projects
- By 2018, sponsor two to four annual stakeholder information and networking sessions for identifying challenges, barriers, opportunities, and educational initiatives
- By 2020, amplify existing initiatives and implement two new education and training programs to match the growing number of bioenergy industry workers
- By 2020, establish vibrant and effective stakeholder engagement initiative coordinated within and between DOE, the U.S. Department of Agriculture, U.S. Environmental Protection Agency, and other federal agencies to enable joint initiatives to advance and expand the U.S. bioeconomy
- By 2022, establish annual educational materials and outreach efforts to inform the general public and key stakeholder audiences about the challenges and opportunities of a thriving bioeconomy
- By 2022, enhance public awareness and market interest in advanced bioenergy by collaborating with a highly visible organization to promote a successful technical and/or communications project and its outcomes

- By 2025, assess progress on developing education and consumer behaviors and refine strategy as needed
- By 2025, have robust workforce development programs in place to support a group of well-trained workers to fill the demand created by a growing bioeconomy
- By 2025, establish three to five collaborative initiatives with corporate and nongovernmental organizations to assist in the continued growth of a sustainable bioeconomy
- By 2035, evaluate the effectiveness of unified communications and outreach efforts and refine them as needed.

## THE EVOLUTION AND FUTURE DIRECTION OF BETO'S COMMUNICATIONS PORTFOLIO

*Prepared by the BETO 2017 Peer Review Steering Committee*

The BETO 2017 Peer Review Steering Committee recognizes strategic communications and stakeholder engagement as a vital area of BETO's work. To provide an evaluation of the Strategic Communications portfolio, the Steering Committee viewed an overview presentation from the Strategic Communications director and participated in a targeted discussion with BETO leadership about the cross-cutting initiative's past experiences and future goals.

### Key Accomplishments:

- Significantly increased viewership of BETO publications, news releases, and other traditional content through digital channels, as well as improved understanding of bioenergy for non-technical members of the public via BETO's external new media platform
- Launched BETO's education and workforce development portfolio to improve the growth and competitiveness of the domestic bioeconomy workforce. Key activities include the Bioenergy Career Map and the BioenergizeME Infographic Challenge.
- Enhanced coordination among key federal, national laboratory, industry, and academic stakeholders through cooperative working groups, amplification

of events aimed at key stakeholders, and new strategic partnerships.

### Strengths

The Steering Committee appreciates the organization and thoughtful effort that is represented in the Strategic Communications portfolio. It appears that BETO is making strong efforts to partner, coordinate, and share with many audiences. Many of the products that have been developed are of high quality.

It is also clear that the Strategic Communications team has a can-do, positive attitude, particularly in dealing with limited budgets and bureaucratic processes. A strength is that the team operates efficiently through partnerships and collaboration by working with other agencies and entities who are involved in communicating similar messages. There is additional strength within BETO derived from the great network of partners, laboratories, and performers involved in BETO's work. This network could perhaps be better leveraged if the terms of funding opportunity announcements (FOAs) or annual operating plans (AOPs) were written to encourage the use of the laboratories' or performers' communication resources to disseminate the results of the Office's investments. Laboratories are required to provide BETO with a project-related success story each reporting quarter. Successful laboratory work/advancements should be publicly communicated to the greatest extent possible.

One great strength is the foundation of knowledge and data that BETO has already developed. There is a great

story to be told, and it is one that gets better every day. The focus on myth busting is important, and BETO clearly has the objective information needed for this task. However, the amount of effort needed to refute incorrect information is an order of magnitude larger than the effort needed to disseminate it in the first place (Brandolini's Law). Therefore, a more proactive messaging effort from BETO to frame the dialogue, as opposed to reacting to it, would be a more efficient and impactful use of limited resources. Further, changing overall societal perception seems implausible given the limited resources available. As such, it may make sense to strategically target BETO's communication efforts at those who are most directly involved in potential purchasing and financing decisions within the bioenergy industry, rather than tackling misperceptions within the general public.

The expansion of the digital media portfolio in recent years is a strength. Increased email news blasts and announcements have been very well-noticed and received. The digital communication strategy for sharing success stories, FOAs, and program, industry, and partnership news is laudable and leverages the ability of social media to amplify the Office's messages to a broader audience.

The Steering Committee notes that the development of BETO's education and workforce development portfolio is a very important piece in the puzzle of developing the bioeconomy. Educating educators is a necessary focus, and a focus on jobs will resonate in the current political climate. However, as mentioned in the main Steering Committee report, it is unclear whether a technically oriented program such as BETO is properly positioned to lead this effort. We recommend that BETO works closely with appropriately experienced partners that have workforce development as a key component of their mission to ensure a successful program.

It is also noted that BETO events are high quality and well-received.

## Limitations

The major limitation of the strategy is that it lacks a focused and concise goal. The strategic goal, as documented in the *Fiscal Year 2017 Strategic Communications Plan*, is righteous and certainly something to strive toward. But, in itself, it captures the challenge—it is multi-pronged, enumerating various activities supporting various outcomes. A simpler, punchier vision is needed, and an effort to develop a "brand" might be useful in focusing the strategy. "Branding" of the bioeconomy to aid the public in recognizing the presence, strength, value, and diversity of bioeconomy activities (generally) may hold value.

The Steering Committee appreciates the difficulty in defining a clear and focused communications strategy and struggled reaching consensus recommendations as to how communication efforts should be prioritized, particularly to the extent to which BETO should focus communication resources on public education. The lack of consensus on this topic has led to individual recommendations either deemphasizing or strengthening public education projects within the overall portfolio. While the individual suggestions may be somewhat contradictory, they underscore the need for greater discussions surrounding the goals of BETO's communications strategy. The overarching recommendation for the communications portfolio is for BETO to clearly articulate (1) priorities regarding the specific audience(s) the Office wishes to reach, (2) the Office's definition(s) of success, and (3) the boundaries of what should not be included or emphasized. The Steering Committee believes that having a stronger and deliberate Strategic Communications focus will ultimately be worth the time commitment and allow the commendable efforts in this area be even more effective.

It is difficult to measure impact. However, this program must develop some better measures of whether they are achieving any of their various ambitious goals. For example, one of the stated goals is "an improved understanding of bioenergy for non-technical members of the



public.” How many members of the public have to be reached to make a difference for the bioeconomy? What is the current level of awareness, and what particular communication gaps need to be filled? How well does BETO messaging impact/affect non-technical public awareness? Without clearer measures and analysis of communication needs, the program risks being of low impact. The playbook developed by BETO BioComms is a good start in this direction, although more sophisticated statistics than just “views” would be helpful to gather and analyze.

One limitation is in getting industry to adopt BETO’s R&D findings and for the Office to show how its investments in R&D, coupled with effective communications, lead to more success in the bioeconomy. It is good that BETO has identified industry as the most important customer that is looking to have technical information summarized. The key now will be to ensure that the materials and channels will effectively target this group.

Lastly, a significant limitation is the sluggish approval process inherent in any public communications, and especially in federal contexts. In part because of this, there is less public communication than would be ideal for BETO. In particular, it is important to continue to improve outreach and education with the largest generation today: millennials. As they get a great deal of their casual information digitally, expanding digital messaging is appropriate and important in terms of public comprehension and support for this work.

### Funding Allocation

The first step in addressing allocation of funding should be a prioritization of goals, something which appears to currently be lacking. There is a need to prioritize efforts at three different levels:

1. What are the most-important, high-level objectives (e.g., maintain/grow funding, garner public support, or increase inflow of innovation)?
2. Which stakeholder groups are most influential in terms of the identified top-priority outcomes?

3. What activities should be prioritized to target top stakeholders to influence them to support the priority high-level objectives?

Another element of understanding and managing the Strategic Communications budgets is developing measures of cost/benefit for various activities. Without any clear metrics of impact/outcome it is very difficult to effectively manage a budget and make prioritization decisions among alternatives and to determine level of investment in any given activity. We would highly encourage the Strategic Communications team to develop robust metrics that can guide budget/investment decisions.

That said, the Steering Committee can provide some preliminary feedback on our views of current funding allocation. The area of industrial communications is absolutely critical and deserves more funding. If BETO results and findings are not widely disseminated in highly accessible forms, the investment in R&D is wasted. This area received far less coverage in the presentation than the workforce and education elements, but it is far more critical. The BioComms work is also critical. It looks like BETO is appropriately engaged in coordinating and messaging to DOE and legislative stakeholders. In the rapidly evolving federal environment, it is essential to spare no effort in documenting impact and defining key messages.

One area to consider would be an expansion of the public education effort. Buying ads on social media would be an inexpensive method of expanding educational outreach to the public. BETO does not have its own Facebook, Twitter, or Instagram presence. It may sound atypical of government, but these are important venues to consider, as they are potentially very high-traffic and free. Social media does not come without risks, however, and poorly framed messages could spread virally. Careful message management would still be important. We further recommend additions and improvements to the website and other digital media.

Adding a requirement to share the communication workload as part of the FOA grants winners is a smart idea. If grantees were required to synopsise their successes in a video or infographic and push it out on social media and their websites, this would increase BETO outreach in a rather effortless and less-cumbersome manner than is currently available. Even if it is messaging that the Office creates and they (e.g., the laboratories or universities) retweet or share it (as well as distribute your printed material), all of this has the potential to expand outreach and public knowledge of BETO's great work. One approach to put even more ownership back on the researcher/program would be to ask for a communications plan with each project and have it reviewed. Sometimes being forced to consider the communications plan at the beginning of a project will lead to changes in project design and execution, all to get a better impact at the end.

## Collaboration and Partnerships

Based on what was shared regarding the participation of the Strategic Communications team in quarterly reviews, and in working with the technology managers, it sounds like the right channels are open to allow access to the kind of communications content that is needed. There is, of course, a trade-off between efforts to integrate with other programs, and the available bandwidth to generate communication output.

If an allocation decision is needed, we would suggest that if there is one program within BETO that the Strategic Communications team should spend the greatest amount of time coordinating with, it would be Analysis and Sustainability. The output from that team gets to the key message that needs to be communicated outside the confines of BETO: What are the societal benefits of bioenergy?

That said, the near-term focus within the Strategic Communications team should be somewhat more inwardly focused: What is BETO or the bioeconomy's brand? What are the top priorities in terms of stakeholders and

outputs? Only after those questions are answered should the resources of the Strategic Communications team be deployed to gather the collateral from within BETO to support the priority messages.

One place where coordination may be enhanced is in the actual development of key messages and detailed scoping of stakeholders/audiences. These are two things that BETO program managers would have key insights into, and it was not clear that there is a process to engage them in developing messaging or helping to identify stakeholders.

One suggestion is in increasing coordination with the Clean Cities program in EERE's Vehicle Technologies Office on biofuels deployment. Clean Cities partners with MotorWeek's long-running weekly show on PBS, which is produced by Maryland Public Television. The host, John Davis, is a close ally of the Clean Cities program. The show has produced many informative segments on biofuels and bioenergy. In some cases, the episodes go beyond covering biofuel end use in vehicles and discuss fuel production. There is clearly an opportunity to develop a future segment exploring a large-scale biorefinery or discussing the Co-Optimization of Fuels and Engines initiative.

## Education and Workforce Development

Regarding science, technology, engineering, and math (STEM) education efforts, a strong communications strategy seems to reach the K–12/science educator community. The products appear to be well-defined and presented (for example, BioenergizeME). However, it is unclear how the Strategic Communications team identifies/connects to the education community. If the outreach is entirely passive (information available on a web page), then the impact may be minimal. While much of the material provides hyperlinks to other content providers, this begs the question—what is the purpose of BETO's website? Do users have a hard time finding the scattered information that has already been developed,

and therefore, the purpose is to provide a central clearing house? Or is there some gap in available material/content that needs to be filled by BETO, and therefore, the purpose is to disseminate new information? Federal STEM activities are already engaged in getting K–12 students interested in science. BETO’s investment here is unlikely to lead to any further success of the bioeconomy.

Workforce development is an interesting topic that seems to be stretching Strategic Communications into an entirely new area. Basic information about job opportunities/career paths could be a BETO Strategic Communications mission; however, developing workforce training materials, curricula, and recruitment materials seems like it is outside of BETO’s core mission. These are things that should be done by community colleges/universities and the educational/vocational training community. The Strategic Communications team should explore this part of their strategy very carefully and engage with appropriate external partners to lead these efforts. BETO’s career profiles are just mirroring the U.S. Bureau of Labor Statistics’ (BLS’) information, and BLS is the recognized go-to source for career service people, like high school counselors and job placement coordinators. BLS already has a “Careers in Bioenergy” report online. BETO’s efforts may be duplicative, and there are many other entities that also have a vested interest in addressing workforce (e.g., industry and academia). We suggest partnering with existing federally supported academic partnerships, such as the U.S. Department of Agriculture’s Coordinated Agriculture Projects on bioenergy. Coordinated Agriculture Projects already has a mandated extension/education component and could share objectives in this regard with BETO. Another possible collaborator would be the U.S. Department of Transportation’s University Transportation Centers.

Perhaps a stronger goal for BETO and workforce development is to identify and address gaps in the bioenergy workforce development sphere. For example, BLS data draw on Renewable Fuels Association and National Biodiesel Board reports on jobs as a function of units of

production. Improving these kinds of data would be a value-added BETO workforce development role.

## Communication Messaging

The Steering Committee perceives an opportunity to more clearly identify and define what key messages should be prioritized. As mentioned above, decisions around messaging need to flow from a concerted prioritization exercise; otherwise, efforts will be too diffuse and lack impact. Developing a “brand” would help define the key messages, as will focusing down to two or three messages that will stick in peoples’ minds. One challenge noted by the Strategic Communications Team is “inconsistent internal messaging,” so agreement internally as to what are the key points to get across, and to whom, is clearly a necessary first step.

The Strategic Communications plan presentation at the 2017 Project Peer Review gave some indications of effectiveness, using Facebook and Twitter views as measures of impact. The Steering Committee cautions against using simple views as a measure of impact. State-of-the-art communications practices, such as those used in commercial marketing, use big data and analytical tools, along with real-time social media data mining, to gauge effectiveness of messaging, audience adoption, and acceptance of information. Industry uses these tools to know with some certainty that its communications are reaching the intended audience *and* having the intended effect. For example, if/when BETO releases a public service ad about the benefits of the bioeconomy, how does the social media world react? Are external responses to the BETO message positive or negative? Should the initial communication be modified to enhance impact? A state-of-the-art communications/marketing strategy would employ that kind of technology to proactively manage the communications investment for maximum return. Clearly, such sophisticated and resource-heavy analyses are unlikely to fit within tight BETO budgets, but directionally the guidance and best practices are there for modelling upon.



The target audiences that were addressed in the presentation are well-thought-out. However, simplifying scientific messaging so that it is readily understood by the average public audience without compromising the veracity of the message is a difficult task. Current examples are well-thought-out and messaged, such as “One billion tons of biological material—that’s enough to fill a 16-foot flatbed truck stacked roughly up to the moon!” Some additional ideas include adding a kid’s educational page to the website that is interactive and very visual, or something teachers can use in a lesson plan along the lines of a carbon footprint calculator comparison, but with bioenergy benefits.

The creation of smart visuals for the public that compare and contrast oil and bioenergy would be useful. Such content could include benefits and problems, such as greenhouse gas impacts, jobs, domestic security (or insecurity), air pollution (or cleanliness), water pollution (or cleanliness), and health problems and costs. People in general do not see the true costs of energy—if they did, this would change some of their minds.

## Stakeholder Audiences

The six identified stakeholder groups are all appropriate. One group that might be missing is civil society thought leaders, for example, nongovernmental organizations or think tanks. This type of audience can be highly influential with policymakers and the general public.

Reaching all of the stakeholder groups effectively could be difficult, especially with limited resources. For establishing the commercial activity of the bioeconomy, the most critical stakeholder group would have to be industry. It appears that BETO focuses communications efforts on this group—an appropriate prioritization. In many ways, achieving BETO’s mission hinges on getting successful integrated biorefineries established. A stated goal of BETO Strategic Communications is to enable “greater knowledge transfer between researchers

and industry.” This bears more planning and analysis; it is a critical task, yet there do not appear to be well-defined approaches or in-depth understanding of the communications problem. Certainly, the technical information generated by the efforts of BETO-funded research is available, but although the technical content is there on some specific websites at Oak Ridge National Laboratory or the National Renewable Energy Laboratory, it would be beneficial if it were easier to find. BETO’s Bioenergy Knowledge Discovery Framework offers a powerful information portal and research collaboration platform, though not many people know about it, and its user base is small.

The overview given during the Project Peer Review identified in general terms why some groups were important to engage, but details were necessarily lacking. For example, in developing effective communication to industry there are wide differences among various segments (e.g., operations/management and R&D). Technology blogs seemed to be the primary product offered to meet all these needs, which may not be the most impactful tool for all industry interests. Marketing strategies are usually based on thorough market/customer analysis and segmentation. It seems that more information about your various stakeholder groups is needed. However, at the Program Management Review, more details were provided on the tools that will be used, including Bioprose and BioComms. This specificity is good to see, although further details need to be elucidated on the specific messages that are to be communicated through these channels.

There are two stakeholder groups that should not be overlooked, even as a focus on industry audiences is made. The general public and policymakers are two forms of BETO’s key constituency, providing the license to operate and the means to operate, respectively. If BETO is unable to directly advocate to the policymakers, then a clear strategy to work indirectly through partners or target political constituencies is needed.

## STRATEGIC COMMUNICATIONS PROGRAM RESPONSE

### Strengths

The BETO Strategic Communications team recognizes and appreciates the value of enhanced coordination and collaboration among the key federal, national laboratory, industry, and academic stakeholders that are working to develop the bioeconomy. Collaboration creates a fuller understanding of the challenges and potential of this industry among stakeholder groups while maximizing funding and available programmatic resources. The federal agencies and industry partners involved in the bioenergy space have a long tradition of working together. One prominent example is the Biomass R&D Board, an interagency collaborative composed of senior decision makers from federal agencies and the White House, co-chaired by the U.S. Department of Agriculture and DOE.

In February 2016, the Biomass R&D Board released the Federal Activities Report on the Bioeconomy, which outlined the vision for increasing biomass utilization three-fold by 2030, while also maximizing economic, environmental, and social benefits. Soon after followed development of the Biomass Research and Development Initiative, whose goal is to address challenges to and opportunities for achieving this vision. Through the joint efforts of the participating agencies, the federal government has substantially improved the dissemination of information relating to the emerging bioeconomy by adopting a comprehensive, common federal approach to craft a concise, consistent narrative, rather than relying on isolated releases of information by each office. The Strategic Communications team has capitalized on these efforts, using these narratives to frame the dialogue surrounding the bioeconomy. These key messages have been shared widely with our larger partner network (e.g., national laboratories, nonprofits, and industry partners) to help communicate a shared vision of the benefits of the bioeconomy.

This network has also been instrumental in sharing information on new, commercially relevant BETO-funded technologies that can help de-risk industry investments, as well as the potential socioeconomic impacts of publicly funded research (e.g., creating new useful products, new jobs, and sometimes new companies). However, we agree that we can continue to enhance efforts to leverage these resources using a more standardized approach. Future FOAs and national laboratory AOPs could contain additional guidelines on utilizing their own in-house communication resources to disseminate the results of the Office's investments.

In addition to enhancing collaboration and coordination, we are proud of our digital media efforts—which encompass websites, email, blogs, mobile communications, video, and social media. Advances in digital media infrastructure and capabilities over the last decade have changed how stakeholders communicate and gather information. Now more than ever, people want on-the-go access to engaging information that piques their interest, as well as the opportunity to participate in the conversation as it evolves. Adopting an integrated digital media platform is, therefore, an essential component of our overall strategy. In fact, the use of digital and social media has increased the reach of our communications efforts, allowing us to target specific audiences and develop more meaningful interactions with BETO stakeholders. As digital and social media are increasingly more accessible to individuals working in the bioeconomy and as policymakers and industry are increasingly more engaged with and paying attention to these mediums, stories of innovative technological breakthroughs have the opportunity to be heard. Moving forward, we will continue to learn and improve how we use digital media to share information.

Lastly, education and workforce development has emerged as a priority area for developing the bioeconomy, and BETO's Strategic Communications team has begun to address this need. In 2016, the Biomass R&D Board's Operations Committee held five bioeconomy

listening sessions in which over 400 stakeholders across the United States identified the need for a strong and capable workforce as one of the primary challenges to expanding the bioeconomy. We appreciate, however, that as an organization primarily dedicated to R&D, efforts to expand education and workforce development should not rest solely on BETO's shoulders. Working strategically with partners who are invested in building a pipeline for sustained job growth, we will continue to determine the most impactful role BETO can play in this space. We will also continue to share our tools and resources (e.g., the Bioenergy Career Map) to increase awareness of the varied career opportunities available across the bioeconomy value chain.

## Limitations

As the BETO Strategic Communications portfolio evolves, we will continue to fine tune our strategic goal to be more concise, outcome-oriented, and inclusive. Given limitations in resources, the Strategic Communications team is currently revising its strategic plan to focus on areas where stakeholder engagement can have the biggest impact on BETO's overall strategy and operations. Our goal moving forward is to streamline our process to enable more cost-effective stakeholder engagement activities. Learning from our previous communications efforts, we will reevaluate our performance indicators to measure the value of investing in specific engagement activities to help focus the current strategy. We also plan to work in close concert with the Biomass Research and Development Initiative to map out and prioritize stakeholder groups, delineate agency strengths in the communications sphere—based on internal priorities and available resources—and identify the right mix of engagement tactics for specific target audiences.

Establishing clear, specific, attainable, relevant, and timely measures of success has and will continue to be an integral part of this process. As a government entity, there are certain limitations inherent to evaluating success (e.g., limits to number of surveys or collecting

certain types of data). However, BETO's Strategic Communications team developed a Communications and Outreach Tracker as a workaround. This tool captures how and where communications products are disseminated, the high-level demographics of BETO's readers, which outlets pick up certain topic areas, and the response that BETO communications elicit in the digital landscape. This ultimately allows the team to examine each communications product individually and use the tool to prioritize stakeholders and understand their needs and interests, define the activity metrics, determine the outcome metrics, and finally, use the data to make strategic decisions.

The BETO Strategic Communications team also agrees that there is a clear need to “brand” the bioeconomy to help aid the public in recognizing the presence, strength, value, and diversity of bioeconomy activities. Efforts are already underway to strengthen general awareness among consumers who contribute to the bioeconomy. We are also exploring ways we can brand the bioeconomy with our in-house team of public relations and legal specialists.

## Budget

The BETO Strategic Communications team operates on a shoestring budget. As such, we must be strategic in selecting areas to prioritize funding. Most of our resources are directed toward high-impact projects managed through the national laboratories' AOPs. BioComms, the Bioenergy Career Map, and the BioenergizeME Infographic Challenge are several examples of projects that enable us to increase and expand communications pipelines by leveraging laboratory communications resources.

- BioComms is a collaboration of national laboratory and BETO communications professionals and laboratory relationship managers to streamline resources and knowledge, share information, and promote successes. It has served as a vehicle through which key BETO communications messages are amplified

and shared with important stakeholders, as well as a network to receive and share high-level impacts of BETO-funded work. Since many of the laboratories work and partner with industry professionals directly, this project has also enabled BETO to have greater access to this key stakeholder group.

- The BioenergizeME Infographic Challenge and the Bioenergy Career Map AOPs provide a similar function. Both have been leveraged to increase awareness of the bioeconomy more broadly. The Challenge engages students, educators, and the general public to be better consumers of energy information and to dispel myths they may encounter. The Bioenergy Career Map also engages a broad range of stakeholders to provide awareness of the diverse career pathways that are available in the bioeconomy.

Our internal analysis indicates that there has been significant interest and impact with these projects. For example, several rounds of the BioenergizeME Infographic Challenge have demonstrated a greater understanding of the evolution of the industry, even among new participants. The student-designed infographics that we received during the 2017 Challenge also reflect the messaging that the Strategic Communications team disseminated over the past year.

Moving forward, we will continue to prioritize our efforts based on the limitations of our budget, focusing on the areas that will highlight the role the Office plays in achieving national goals (e.g., job growth and energy independence), inform stakeholders of the latest cutting-edge science and technology to stimulate the trajectory to market, and educate the public about the many facets of bioenergy and bioproducts across the supply chain.

## Internal and External Collaboration

BETO's Strategic Communications team works closely with the Office's program areas—Feedstock Supply and Logistics, Feedstock-Conversion Interface Consortium,

Advanced Algal Systems, Conversion R&D, Demonstration and Market Transformation/Advanced Development and Optimization—and with the crosscutting area of Analysis and Sustainability to inform target audiences about Office accomplishments, strategies, and technologies. Together, we identify the highest-value media and audiences and set strategies, goals, and metrics for targeted outreach. In addition to in-house collaboration, we also work alongside the national laboratories to promote success stories each quarter.

Our team targets the public sector for engagement, which includes a strong sector of educators due to the volume of students these educators reach—on average 3,500 students during each educator's tenure—and the crucial role they play in securing the STEM career pipeline. Career motivation begins at the K–12 level, with the top influences being parents and K–12 educators. Thus, educators serve as an important piece of the puzzle, both increasing energy literacy among future consumers and generating interest in careers that will support the bioeconomy. Given that BETO's primary function is not education but, rather, R&D, we designed educator-focused activities to complement the overall communications goal of reducing non-technical barriers to the bioeconomy.

Therefore, the education and workforce development arm of the communications portfolio has bolstered high-level communications efforts rather than detracted from them. These efforts were not passive, but rather attuned to understanding the educators' perspectives and guided by experts with the knowledge needed to effectively engage educators. After extensive evaluation, we found that these efforts have a high impact among educators and the general public and feed into important internal goals. Using the BioenergizeME Infographic Challenge as an example, metrics indicate nearly 60,000 unique viewers have learned about bioenergy through this program, with many more that are not represented in this figure but have been captured anecdotally. This Challenge is also the primary tool through which we



identify common bioenergy misconceptions and outlets where misinformation persists. This helps us craft key messaging strategies and partner with organizations to help update their information. Ultimately, this feeds into our efforts to brand the bioeconomy, giving consumers access to consistent, factual information.

Another important component of BETO's workforce development efforts is the Bioenergy Career Map. As mentioned, feedback from the listening day sessions indicates that workforce development is a key priority for expanding the bioeconomy. In addition, DOE's 2017 U.S. Energy and Employment Report found that in many energy sectors—including renewable fuels—over 70% of all employers surveyed found it “difficult or very difficult” to hire new employees with needed skills. This feedback indicates that the issue requires further analysis and coordination among key players in the bioeconomy.

Along the continuum of career development (i.e., awareness, exploration, preparation, skills training, and education), BETO is focused on the first level: awareness. The Bioenergy Career Map fulfills this need and allows individuals to discover career opportunities available in the bioeconomy throughout a wide range of sectors. This tool is not simply a carbon copy of BLS' Occupational Outlook, as it provides context on how specific academic concentrations relate to specific needs throughout the bioeconomy value chain. We recognize the capacity of our strong network to provide additional needs throughout the career development continuum and will continue to work with them to serve as a key piece of the puzzle.

## Communications Messaging

There is clear consensus among the internal BETO team on the key messages that need to be prioritized. As mentioned previously, these messages have been shared with the Communications team in EERE's main office and throughout our partner networks. This has led to the development of communications products that deliver

a uniform message without compromising the unique story being shared. This consistency has enabled our network to better define the socioeconomic benefits of the bioeconomy. However, there are still many opportunities to share these messages with audiences that can directly impact the bioeconomy. As we move forward, we will prioritize those key audiences to ensure they understand the value and opportunity of this industry.

Although state-of-the-art commercial marketing tools are highly effective for gauging the effectiveness of messaging, audience adoption, and acceptance of information, the team has limited resources to invest in such technology. As mentioned, the Communications and Outreach Tracker provides us with good baseline data to determine whether our communications efforts are effective. Although we do report Facebook and Twitter views, our tracking tool provides us with much more useful information than a simple metric devoid of any strategic feedback. When we use social media platforms to share important messages, we not only track the views, but also how this content is subsequently disseminated and by whom, as well as external responses to the content. We use these data to inform the direction of future releases and to identify potential communications outlets that may be willing to collaborate with us. We see this tool as a good starting point for continuing to build a strong and effective Strategic Communications portfolio.

There is significant value in crafting engaging articles and visuals that pique the interest of a broad mix of stakeholders. Our digital media platform continues to explore new ways to provide information that is easily digestible and impactful. Office videos, interactive content, and infographics have had a very positive reception within the digital community, as well as short communiques that feature a human interest piece or a little-known fact list. Given that this content is highly trafficked and received, we will continue to leverage novel “new media” strategies to engage our stakeholders, even in light of our limited resources.

## Stakeholder Audience

We appreciate that our communications strategy is ambitious; however, the BETO Strategic Communications team leverages our wide partner network to engage these diverse groups. We understand and value the diverse roles and strengths of each organization within our network and work with them to target key audiences that are closely linked with their missions and visions. We too have prioritized stakeholder groups that have the potential to be greatly impacted by BETO's R&D goals (e.g., industry). At the same time, we recognize the inherent role that policymakers and the general public have in removing socioeconomic barriers to the bioeconomy. To this end, BETO Strategic Communications will continue to prioritize industry, policymakers, and the general public moving forward. We also recognize the value that nongovernmental organizations can play in reaching the latter two stakeholder groups—considering our limitations—and hope to develop strong and enduring relationships with these entities in the future.

We agree that more thought and effort must be placed in communicating with our industry partners. The communications needs of this particular stakeholder group must be well-defined, and marketing strategies used to reach diverse segments should be based on thorough analysis. This will require continued coordination between the Strategic Communications team and the technical program areas. Input from industry listening days and workshops will also become a critical component of this effort. Our immediate goal moving forward is to improve access to information that is of critical use to our industry partners and increase awareness of the national laboratory assets that are available to help them overcome critical barriers to commercialization. Continued planning and analysis that yields an in-depth understanding of industry communications needs, as well as well-defined approaches for engagement, will be a critical mid- to long-term priority.