



2018 CAAFI® Biennial General Meeting and ASCENT Symposium

December 4-6, 2018

Marriott Metro Center, Washington, DC

Meeting Highlights:

The 2018 CAAFI® Biennial General Meeting (CBGM) highlighted ongoing commercialization efforts and showcased research, tools for supply chain development, and tactical deployment approaches. The meeting also included in depth discussion on the value proposition of sustainable alternative jet fuels (SAJF), and the best means of aligning efforts to advance deployment and commercialization.

CAAFI executed the three-day meeting jointly with the FAA's Center of Excellence for Alternative Fuels and Environment, also known as the Aviation Sustainability CENTER (ASCENT), and included sessions on the following themes:

- Commercialization Progress and Value Proposition of SAJF
- Aligning Efforts to Enable Commercial Deployment
- Fuel Qualification
- Implementing Tools and Best Practices
- Global Activities

CAAFI was honored to host several special keynote and guest speakers, including the Honorable Ray Mabus of The Mabus Group (formerly Secretary of the Navy and Ambassador to Saudi Arabia), John Heimlich, Chief Economist for Airlines for America (A4A), and Carl Burleson, Acting Deputy Administrator for the Federal Aviation Administration (FAA).

Over 200 attendees had the opportunity to learn about ongoing and emerging commercialization efforts, tools and resources for newly forming supply chains, and efforts to facilitate development, qualification and deployment of SAJF in the U.S. and around the globe. Keynote speakers, panel discussions, and individual presentations provided real-world examples of how the industry is moving toward commercialization and discussed remaining challenges.

The CBGM also included a poster session and exhibit booths from companies and organizations engaged in the SAJF arena.

In addition to sharing information and fostering dialogue among SAJF stakeholders, the CBGM provided outstanding networking opportunities through extended coffee breaks, lunches and receptions, enabled by CAAFI's generous sponsors.

“The progress we’re seeing is good for aviation, good for the rural economy, and good for the environment.”

Carl Burleson, Acting Deputy Administrator for the Federal Aviation Administration



Session Highlights:

Day 1

The first part of Day 1 focused on the theme of **Commercialization and the Value Proposition of SAJF**.

In the **Value Proposition of SAJF** session, we heard from a panel that included an end user, government agencies and a non-governmental organization. Each respective organization gave its perspective on the value proposition of SAJF, how SAJF meets its goals and how they are contributing to achieving the SAJF value proposition.

“Large companies are starting to pay attention to the triple bottom line... if you don’t start thinking differently about how you use energy and procure fuel, you[r corporation] will die.”

Hon. Ray Mabus, The Mabus Group



This session was followed by **Special Remarks** from the **Hon. Ray Mabus** of The Mabus Group, who eloquently described the challenges and opportunities for SAJF and his role in getting SAJF into use in the Navy. He noted that those that have been standout performers over the last five years have “stopped buying their way out of a problem and have started buying their way into a solution” on climate change, and that there should be no further delay for climate action.

The Producer Pack highlighted the most mature SAJF producers’ current production and, in some cases, plans for near-term expansion in the U.S. The speakers provided an overview of their specific plans, but also talked about the importance of participating in multiple federal and state programs to succeed, and that compliance with such programs is similar to sustainability certification requirements, and that those efforts should be synergized.

The **Parade of Commercialization** sessions allowed companies still developing commercial-scale opportunities and concepts to introduce their plans and activities. The speakers also talked about the challenge of finding investment, leading to a discussion of the emergence and ongoing standardization of green bonds and green financing approaches under ISO standards and other mechanisms. Speakers also discussed the market signals that would shift production from diesel to jet fuel and vice versa, as well as the value of the CBGM in providing networking and information sharing opportunities.

During lunch, the members heard **Remarks** from Ed Smith of the General Aviation Manufacturers Association and Keith Sawyer of AvFuel about the Business Aviation sector’s efforts to meet parallel climate goals to those of the commercial sector, and described an SAJF demonstration at Van Nuys airport in California.



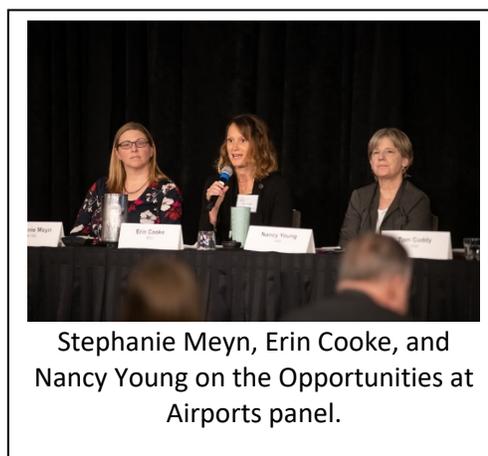
Collaboration and networking

Both CAAFI Executive Director Steve Csonka and SG Preston’s Randy LeTang made remarks mourning the loss of SG Preston’s Executive VP, Dwayne Brown, who passed away unexpectedly the weekend before the meeting.

In the afternoon session of Day 1, we began our focus on **Aligning Efforts to Enable Commercial Deployment**.

In the **Policy Discussion: Updates on International, U.S. Federal, and State Approaches** session, speakers involved in the development of the International Civil Aviation Organization’s Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) spoke about the overall CORSA structure and how SAJF fits into the system, and what an airline’s obligations will be under the scheme. Other speakers elucidated the changes that will enable SAJF incentivization under the pending California & Oregon Low Carbon Fuel Standards (LCFS). The need for effective policy to support the aviation industry’s desire to change was a theme of the session and of the meeting as a whole. The potential layering of incentives and eligibility for various schemes was also identified as a key topic of consideration for SAJF producers and buyers.

We then heard about **Opportunities at Airports – Fostering Collaboration**, with a focus on how airports can enhance opportunities for on-site use of SAJF while abiding by U.S. restrictions and requirements on use of airport revenues. One of the key challenges at airports is that revenues and grants have substantive restrictions on how they can be used. Furthermore, we heard that airports must bear in mind that airlines are the actual fuel buyers and that airports can enable but cannot require SAJF usage; therefore, collaboration between airports and airlines is essential to successful integration of SAJF into the airport setting.



Day 1 closed with **Recognition and Awards**. CAAFI honored John Gardner, an agronomist, academician, great friend and colleague from Washington, who passed away in 2018. We also gave awards to Stan Seto (ex-GE Aviation), Randy Williams (ex-Honeywell), Cliff Moses (ex-SWRI) and Joanna Bauldrey (Shell) all of whom are retiring and have made tremendous contributions to the fuel qualification process for SAJF. For their constant and invaluable contributions to industry support and recognition, CAAFI gave awards to Mike McAdams (Advanced Biofuels Association) and Jim Lane (Biofuels Digest). John May (May Assoc.), Mark Riedy (Kilpatrick Townsend), and Cindy Thyfault (Global Biofuture Solutions) received awards for their work enabling finance of the SAJF industry. Lastly, Barbara Bramble (National Wildlife Federation) received a CAAFI award for her long-term contributions to driving a focus on sustainability, ensuring that SAJF truly earns its “S.”

The participants celebrated Day 1 with a wonderful reception sponsored by Airlines for America (A4A).

Day 2

Day 2 reconvened with a continued focus on **Aligning Efforts to Enable Commercial Deployment**, including multiple ASCENT activities. The sessions included many tools and resources that CAAFI members are invited to engage for supply chain projects.

The **Introduction to ASCENT** provided a general overview of research activities underway by this broad academic consortium.

In the **Future Production Potential of SAJF in the U.S.**, the members heard about analyses relating to future feedstock availability and the potential for conversion to SAJF, modeling of the impacts of policies and incentives on future deployment trajectories out to 2050, and geospatial modeling of where fuels could be produced and delivered cost-effectively in 2030.



CAAFI's Executive Director moderated a session on **Enabling Lipid-based Fuel Production** to explore the challenges of scaling up the many lipid-focused efforts and how those could be supported by current and future lipid availability. As we head toward over a billion gallons of lipid-based fuels (including biodiesel, renewable diesel, and jet fuel plans), we expect considerable pressure to expand lipid production. Speakers addressed the potential for lipid production nationally and regionally, and highlighted the "acute shortage of low carbon fuels" for the California market due to the LCFS.

The three following sessions focused on **Real World Supply Chain Development**. First, we explored the **ASCENT and CAAFI Regional Analyses**, with the principal investigators and CAAFI's Executive Director Emeritus describing the groundwork being accomplished to enable specific tactical deployments. Then attendees heard from **USDA NIFA AFRI Coordinated Agriculture Project** grant recipients about SAJF-focused projects enabling the use of three unique feedstocks: beetle-killed trees (BANR), carinata cover crop (SPARC), and guayule bagasse (SBAR).

The third session in this cluster introduced attendees to an extensive array of **Supply Chain Tools** and resources created by the ASCENT Project 1 teams to aid development of real-world SAJF supply chains. The tools presented included life cycle greenhouse gas accounting and induced land use change modeling, community asset modeling to assess social acceptability of projects, technoeconomic modeling, *pro formas* for risk reduction across the supply chain, environmental services analysis, and geospatial transportation modeling.

CAAFI sought input from members to direct future focus areas and activities through a **2019 Goals Prioritization Activity**. Members ranked a variety of potential focus areas and/or wrote in their own. CAAFI also asked for feedback on what CAAFI is doing well versus what it should stop doing. The input from these sessions will help guide strategic decision-making about goals and priorities for 2019 and beyond.

An extended Networking Break including a Poster and Expo Session on the afternoon of Day 2 allowed members a chance to check out additional information and talk with colleagues.

In the latter part of Day 2, the focus was on **Fuel Qualification**. Members heard about progress of different fuels through the ASTM process, including the IH² process, and got a better understanding of the D4054 Clearinghouse effort to streamline fuel qualification. A session on the **National Jet Fuels Combustion Program Activities** provided an overview of the extensive research currently being done

within ASCENT to better understand how fuel composition can predict fuel performance. A key benefit of the National Jet Fuel Combustion Program is the improved understanding of how fuel attributes affect combustor operability.

Day 2 closed with another bustling reception sponsored by the Boeing Corporation.

Day 3

The focus of the first half of Day 3 was on **Implementing Tools and Best Practices**,

The day began with an illuminating session on **SAJF Benefits: Air Quality and Other Atmospheric Research**, covering a range of topics including particulate and contrail formation reductions. The data show that SAJF provides more than just greenhouse gas benefits, also enabling significant reductions of tailpipe emissions including particulate matter, unburned hydrocarbons, sulfur oxides, and carbon monoxide.



Collaboration and networking

The CAAFI Administrative Leadership Team then provided an overview of **CAAFI Fuel, Feedstock and Commercial Maturity Tools**. These included the in-development Commercial Engagement Readiness Level, which will be used in conjunction with a new committee of airline participants to help streamline initial introductions of SAJF producers and help ensure their due diligence to risk and other issues. The team also showcased the Feedstock Readiness Level repository and provided a tour of the recently revamped CAAFI website.

CAAFI Executive Director Steve Csonka then provided a **Report Back on the 2019 Goals Prioritization** input received and led an **Open Discussion** on commercialization and the value proposition of SAJF. A key topic related to value proposition was the idea that there may be multiple environmental benefits and synergies to SAJF production (e.g., addressing water quality/runoff, reducing fuel for wildfires by utilizing wood waste, etc.).

At lunch, Shell **announced a partnership** with SkyNRG and World Energy to initiate the supply of SAJF to three major airlines, KLM, SAS, and Finnair, operating from San Francisco International Airport (SFO). CAAFI was then pleased to host **FAA Acting Deputy Administrator Carl Burleson**, who spoke about the inception of CAAFI, of which he was part, as well as the importance of SAJF for the future of aviation. He noted that CAAFI is a tremendous success story for public-private partnership between government, academia and industry.

The afternoon of Day 3 focused on the **Global Scene**, including highlights of efforts to build **Public Private Partnerships and Deployment Activities** to establish SAJF in Australia, the Dominican Republic, Germany, Mexico, Spain, and the UK. Canada's SAJF activities were also highlighted, including news about Canada's Clean Fuels Standard, the ongoing "Sky's the Limit" competition, and a report from Forge Hydrocarbons about their work in Canada.

CAAFI Executive Director Steve Csonka provided the **Closing Remarks**, thanking the participants, commenting on the many wonderful speakers, and outlining the road ahead.

Outcomes & Next Steps:

In line with CAAFI's purpose, the meeting strengthened the alternative jet fuel community by providing attendees the opportunity to exchange knowledge, network with peers, and build partnerships. CAAFI received a variety of suggestions on focus areas, as well as feedback on past and ongoing effectiveness of our efforts. Following the discussions, prioritization feedback, and speaker perspectives, CAAFI will work to expand on our activities in the coming year.

In Conclusion:

The 2018 CBGM was an invigorating gathering of stakeholders across the SAJF supply chain. Our flagship meeting exemplifies what we see as CAAFI's role as a convener of stakeholders, enabler of information sharing, and facilitator of progress for the development and deployment of SAJF. We hope that CAAFI stakeholders will take advantage of a renewed perspective on what is happening across the industry to help them move forward. The CAAFI leadership team also appreciates the feedback members provided on the CBGM meeting and CAAFI's goals and priorities for 2019. We will take your input into account in charting our efforts for this coming year. Overall, we see tremendous progress in the SAJF arena, we find ourselves energized by the enthusiasm of all of you who attended the CBGM, and we look forward to playing a key role together with you in future advancement of SAJF.

"Excellent integration of technology developers & industry. GREAT JOB!!"

"Doing great bringing all entities together to educate across disciplines!"

"Meeting format and focus was excellent--quickly covering a broad range of topics."

"The biennial meeting is excellent and well worth the time and travel."

– Feedback from attendees of the 2018 CBGM

The 2018 CBGM was made possible by the generous support of our sponsors, and we thank them for their contributions:

Champions: *Airlines for America
Boeing
FAA*

Allies: *ACI-NA
Airbus
JetBlue
Neste
SG Preston /
Offit Kurman*

Advocates: *AIA
Shell
United
World Energy*

Supporters: *Aerion
Avfuel
GAMA
The Mabus Group*

CAAFI expects to uphold the tradition of the Biennial General Meeting and convene again in 2020.

CAAFI is sponsored by the U.S. Federal Aviation Administration, Airlines for America (A4A), Aerospace Industries Association (AIA) and Airports Council International-North America (ACI-NA).

Presentations, photographs, further meeting details, and additional information are provided on CAAFI's website: http://www.caafi.org/resources/CAAFI_Events.html#general.