

SAF Grand Challenge (SGC)– Roadmap Execution

Participating Agencies completing an inventorying of capabilities that coincides with the 6 Action Areas, 26 Workstreams, and 140 Activities, with gap analysis in process

- * Existing and planned efforts**
- * Program monetary and human resources and capabilities under Agency control**
- * Funding and funding shortfalls – current and projected**

SGC IWG are now at the point of developing engagement concepts for Roadmap Execution (outside their remits) via public-private-partnerships

Each Workstream likely merits its own engagement concept, while some Activities will also. Some will be under the purview of Agency execution.

Keep in mind that some of these concepts will be staged into appropriate timeframes (some delayed, some sequential)

SGC – Coordinated execution

Although Action Area 6), Communicating Progress and Building Support (CP), specifically points to the need for summarizing engagement and communications, these concepts generally apply individually to all the activities of the SGC

- What:** Continue to build sustained support for the funding and execution of the SGC via broadening communications related to the need and impact, as well as progress
- How:** Engage stakeholder organizations, monitor and measure progress against SAF Grand Challenge goals, provide public information resources, and communicate the public benefits of the SAF Grand Challenge to critical stakeholders and the public.
- Why:** Government can only set the stage for enabling industry success, within the resources they are allotted. Industry, with the help of other constituents must deliver the results, in conjunction with additional governmental support for which the constituents advocate.

So, the SGC IWG is considering the use of public-private-partnerships as a key means of enabling the above types of engagement and coordinated, informed execution

Public-Private-Partnership Engagement Concepts

The following types of approaches might be used to develop/foster functional PPPs, leveraging the interests and efforts of agency Programs and efforts, academia, private entities, industry associations, existing or pending work groups, ..., e.g.,

As monthly, quarterly, annual, or as-needed activities

- * Individual outreach sessions
- * Workshops
- * Existing convening sessions / conferences
- * Strategic programs or projects
- * Sensing discussions
- * Formal RFIs
- * NIFA AFRI SAS CAPS, ARS Programs, Climate Smart
- * National Lab individual prioritization, BERCS,

As described in the earlier Agency session, some of this has started to occur, or is simply a continuation of normal Agency activities

If you feel strongly that your entity is a likely target to serve as a convener on an individual or group basis, let us know

Examples: ... Some will be complex

Workstream CT.1: “Decarbonize, diversify, and scale current fermentation-based fuel industry. Reduce the carbon intensity of the existing starch ethanol industry and increase its production capacity without requiring the planting of additional corn. This workstream will also further improve the economics and CI of ATJ processes and other pathways that utilize fermentation to make SAF molecules or precursor molecules.”

Advocates: RFA, Growth Energy, ACE, AEA, CFDC, NCGA, USGC, Corn & Soy associations, USDA, ...

Conferences: FEW, NEC, multiple state and regional, ...

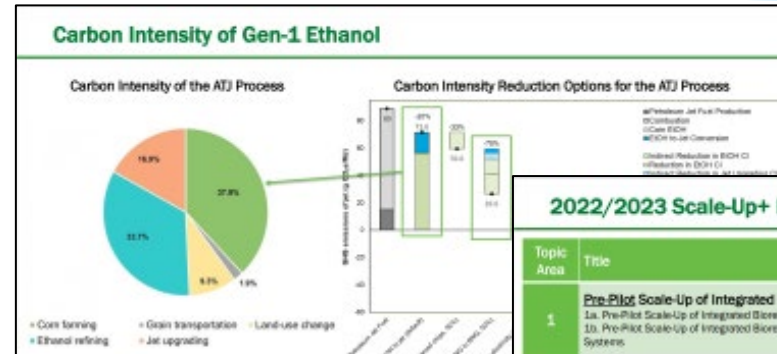
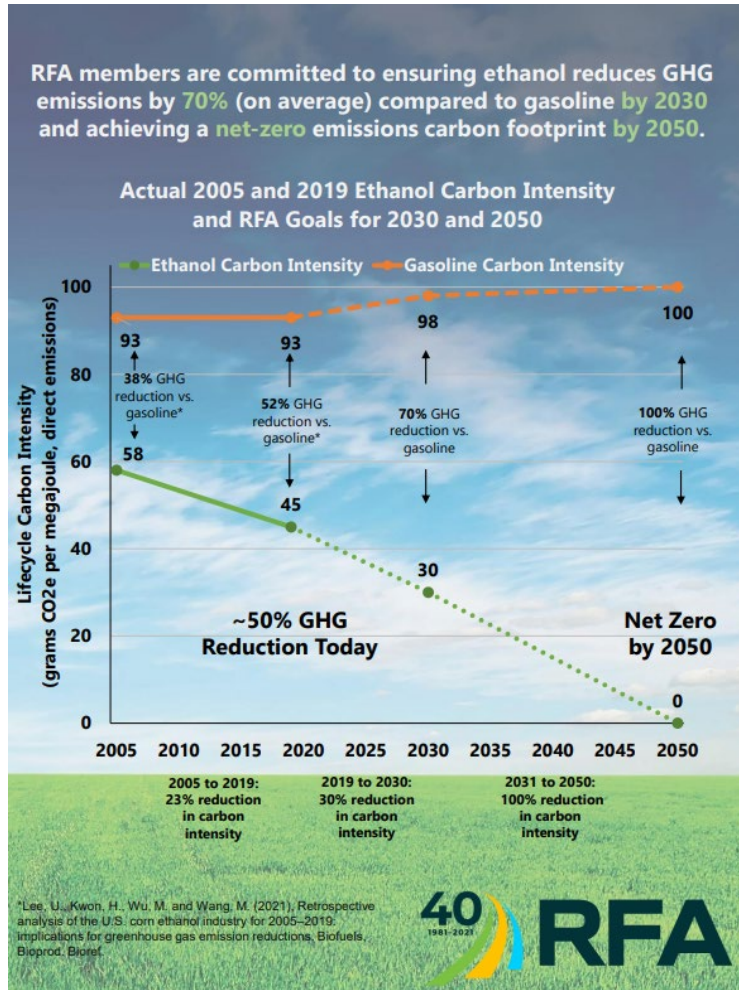
Researchers: NCERC, Universities, NREL, PNNL, ORNL, ANL, DOE BERCS, Association funded, ASCENT...

NGOs: NRDC, TNC, WRI, WWF, Sierra Club, NWF, AFT,...

Industry: farmers, ethanol producers, tech suppliers, supply chain members, ...

Regulators: EPA, CARB, ...

Synergizing Industry's pursuits with the Agencies'*



2022/2023 Scale-Up+ FOA Overview

Topic Area	Title	Max. Award Size	Min. Throughput
1	Pre-Pilot Scale-Up of Integrated Biorefineries	\$2M	0.5 tons/day
1a	Pre-Pilot Scale-Up of Integrated Biorefineries: Use of Carbon Dioxide from Ambient Air in Algal Systems		
1b	Pre-Pilot Scale-Up of Integrated Biorefineries: Preliminary Design and Phased Construction	\$15M	>20,000 gallons
1c	Pre-Pilot Scale-Up of Integrated Biorefineries: Final Design and Construction		
2	Pre-Pilot Scale-Up of Integrated Biorefineries: Preliminary Design and Phased Construction	\$100M	>1,000,000 gallons
2a	Pre-Pilot Scale-Up of Integrated Biorefineries: Final Design and Construction		
3	Pre-Pilot Scale-Up of Integrated Biorefineries: Core Ethanol Emission Reduction	\$8M	Feasibility Study or 0.5 tons/day

2023 Funding Awards for Corn Growers and Ethanol Producers

U.S. Department of Energy Awards \$118 Million to Accelerate Domestic Biofuel Production

Selectee	Partners	Feedstock(s)/ Process Input	GHG Reduction Technology	Product	Funding
Lincolnway	Flag Leaf Financial Management, Equinox, King + Fisher, Integris Energy Group Inc., PROact LLC, and ANL	Storage & Corn stover	Harvest gas off set using AD Biogas	EtOH	\$483,000
Green Plains	Tulare, 127 Energy, Savio Energy, and PNOI	1. Corn 2. Residue 3. %			
RenewCO2	Novo Ethanol LLC, Strategic Analysis Inc., and Forastri Consultants	Waste			
Pre-Pilot	Mangish, LaksoTech	Waste			

2023 Funding Opportunities for Corn Growers and Ethanol Producers

DOE Announces \$25.5 Million to Improve Biofuels and Bioproducts

Reducing Agricultural Carbon Intensity and Protecting Algal Crops (RACIPAC) FOA

- Topic Area 1: Climate-Smart Agricultural Practices for Low Carbon Intensity Feedstocks**
 - 1a:** Climate-Smart Agricultural Practices to Produce Low CI Feedstocks Derived from Agricultural Residues
 - 1b:** Biochar Strategies to Increase Soil Carbon Levels and Agronomic Benefits of Crops for Energy Production
- Topic Area 2: Algae Crop Protection**

Topic Area	Anticipated Number of Awards	Anticipated Minimum Award Size	Approximate Total Federal Funding Available for all Awards	Period of Performance
1	3-4	\$4M-\$5M	\$15.5M	Up to 84 months
2	4-5	\$3M-\$2M	\$10M	Up to 36 months

Examples: Some are perhaps much easier

Workstream FI.5: Increase reliability of feedstock handling systems. Acquire a deep understanding of the behavior and characteristics of solid feedstocks, and enable development of computational models that inform R&D to increase the reliability of feedstock handling operations..

Suggest leaving this to the purview of the INL BFNUF and team, and a more consolidated set of researchers and practitioners, many of which are already in their network.

Or ...

Workstream EU.2: Enable use of drop-in unblended SAF and SAF blends up to 100%. Lead a coordinated approach to enable drop-in SAF that can be used at up to 100%, beyond the current maximum blend limit of 50% by volume.

A work in progress by ASTM D02.J0, and its associated efforts (CRC Aviation, UK MOD AFC) with introduction of proposals in the fall semester of 2023. However, the work may be sequential, requiring completion of EU.2.3, .2.4, and .2.5 to address any remaining concerns on the part of the OEMs, but such work is straightforward. Depending on what/how things are learned, EU.2.6 may become a moot point.

SGC Action Area 6 (CP) – Roadmap Execution

Action Area 6) Communicating Progress and Building Support (CP)

What: Continue to build sustained support for the funding and execution of the SAF Grand Challenge via broadening communications related to the need and impact, as well as progress

How: Engage stakeholder organizations, monitor and measure progress against SAF Grand Challenge goals, provide public information resources, and communicate the public benefits of the SAF Grand Challenge to critical stakeholders and the public.

Why: Government can only set the stage for enabling industry success, within the resources they are allotted. Industry, with the help of other constituents must deliver the results, in conjunction with additional governmental support for which they advocate.

...A natural role for CAAFI to continue providing its convening functions on behalf of the entire group of entities with vested interests in SAF & aviation

CP: Four workstreams

Framing, Assessment, Measurement, Reporting

6. Communicating Progress and Building Support (CP)

WORKSTREAM CP.1: Stakeholder outreach and engagement on feedstock sustainability.

Consultations will be held with NGOs and other stakeholder groups to exchange information about best practices to reduce life cycle GHG emissions from agricultural- and forest-derived feedstocks.

WORKSTREAM CP.2: Conduct benefits assessment/impact analysis of SAF Grand Challenge. Develop analysis of SAF Grand Challenge impacts (e.g., jobs, fuel, and environment).

WORKSTREAM CP.3: Measure progress of the SAF Grand Challenge. Track progress against the SAF Grand Challenge goals and publish information on progress and outcomes on a regular basis.

WORKSTREAM CP.4: Communicate public benefits of the SAF Grand Challenge. Maintain public support via a communication plan, including education on sustainability and jobs.

CP.1 General Observations

- * **Special callout of agricultural and forestry derived feedstocks, but not exclusively**
 - * **CP.1 will likely be the home for sustainability discussions generally, and any other specific feedstock approaches going forward, since we are in a continuously developing field of effort and continued discovery**
 - * **At present, entails sustainability of feedstock systems which are not included in other specific sections of the Roadmap (e.g. FOG in FI, Starches and Sugars in CT)**

Workstream CP.1: Framing Sustainability

Three Activities

WORKSTREAM CP.1: Stakeholder outreach and engagement on feedstock sustainability.

Hold a series of consultations with NGOs and other stakeholder groups to exchange information about best practices to reduce life cycle GHG emissions from agricultural- and forest-derived feedstocks and minimize other environmental and social impacts.

DELIVERABLE: Reports and other publications on lessons learned and potential for reducing carbon intensities. Disseminate best practices for key activities necessary for building the sustainable aviation fuel industry.

IMPACT: Continued and expanded support and access to information. Ensure approaches are environmentally and socially sustainable.

KEY THEMES: Enhance sustainability.

ACTIVITY	DELIVERABLE	IMPACT	BEGIN	END
ACTIVITY CP.1.1: Hold consultations and listening sessions with NGO community about best practices to reduce life cycle GHG emissions from agriculture- and forest-derived feedstocks.	Reports and other publications on lessons learned and potential for reducing carbon intensities.	Improved coordination and support with NGO community; better-informed decision-making.	2023	2025
ACTIVITY CP.1.2: Hold consultations and listening sessions with agricultural and forestry communities to understand needs to improve sustainability.	Reports and other publications on lessons learned and potential for reducing carbon intensities.	Improved support with feedstock producers and on-the-ground knowledge of feedstock producer needs to improve sustainability.	2023	2030
ACTIVITY CP.1.3: Hold consultations and listening sessions as identified by NGOs and other stakeholder groups (e.g., impacts of retrofitting or repurposing existing refining infrastructure).	Development of best practices and identification of key pollutants and other sustainability indicators of concern.	Dissemination of best practices to ensure social and environmentally sustainable buildout of the SAF industry.	2023	2030

Activity CP.1.1

Example of this in yesterday's virtual meeting

Stakeholders

- * Congress, Public, Supply chain members

Approach

- * Type of collaboration
- * Venues

Execution

- * Who
- * What
- * Capabilities
- * How

Deliverables

This is the current focus of ICAO Sustainability Certification Scheme certifiers (SCS's) – RSB, ISCC, and others, as well as the remit of technical teams of various policy makers

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WORKSTREAM CP.2: Conduct benefits assessment/impact analysis of SAF Grand Challenge.
Develop analysis of SAF Grand Challenge impacts (jobs, fuel, and environment).

DELIVERABLE: Coordinated analysis of economic, social, and environmental costs and benefits of SAF production and use.

IMPACT: Support analyses for development of SAF feedstock production and conversion facilities.

KEY THEMES: Enhance sustainability, expand production, reduce cost.

ACTIVITY	DELIVERABLE	IMPACT	BEGIN	END
ACTIVITY CP.2.1: Quantify SAF economic and environmental benefits and costs.	Public tools that evaluate regional economic and environmental impacts of SAF production (supports Building Supply Chains Action Area outreach activities).	Better-informed decision-making for state/local feedstock production and SAF-related projects.	2023	2024
ACTIVITY CP.2.2: Identify and address social challenges related to SAF production.	Socioeconomic analysis of impacts of SAF production to identify where additional efforts are required to limit negative effects and promote equitable distribution of resources across communities.	Mitigates potential negative impacts on communities and ensures equitable distribution of resources to maintain wide public support.	2023	2030

- * **Tool suite and replicable analysis already performed by ASCENT**
- * **Consider extending to each state for communication of SAF build-out impact**
 - * **Per feedstock of prevalence: Jobs (Direct, Indirect, Induced), SAF volume, supply-chain definitions & optimization exercises. Links to Action Area SC.**

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CP.3 Measuring Progress

Need highlighted by GAO report in all 3 of its recommendations:

The [Agency Secretaries] should coordinate with [one another] to develop and incorporate into the Grand Challenge Roadmap, performance measures that enable the agencies to evaluate their actions and the effect of policy on SAF production and communicate the extent to which SAF is poised to contribute to larger aviation greenhouse gas emissions reduction goals.

Agencies developing approaches for:

- 1) Projecting and Tracking supply chain demonstration activities**
- 2) Tracking and projection of SAF production and associated GHG reductions**
- 3) Informed projections of future SAF production volume w.r.t. SGC goals**
- 4) Other resulting economic factors**
- 5) Continuation of GAP analysis, policy analysis, and reporting as necessary to inform policy makers of approaches necessary to achieve goals**

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CP.4 Reporting Progress

- * Will likely be a key role of CAAFI working collaboratively with the Agencies and the broader SAF community:
- * Leveraging, coordinating, amplifying communications, specifically those of CP.2, but others as well
 - * Creating appropriate linkages from dedicated SGC website - to agency efforts - to CAAFI site
 - * Creating robust engagement approach – website, Social Media, activities of sponsors,
 - * Creating annual North American SAF Conference and Expo
 - * Working with other conference entities to leverage their events which more closely align with a specific Action Area
 - * Work to align messaging for other’s lobbying activities
 - * New venues with key stakeholders and constituents

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