CAAFI State and Regional Initiatives
Process Practices, Case Studies

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CAAFI Webinar

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East Coast State Project Lead
CAAFI State and Regional Initiatives

Process Practices, Case Studies, Expansion Goal

- Optimal Characteristics
  - Supply Chain focus
  - Embrace and Support Co–Product
  - Monetize Sustainability Value Proposition
  - Best Practice templates / tools utilized
  - Private / Public Partnership (local w/ fed support)

- East Coast Implementation Case studies

- Implementing CBGM Focused Expansion for State and Regional Projects.
State/Regional Project Formula

Strong State / Regional Teams and Local Leaders + Public / Gov’t, Private sector Engagement + High value resilient co-products suite + jet fuel + Monetized/Maximized Economic and Environmental (Air and Water) Value

Facilitate Supply Chain Development from feedstock through End Customers
Develop and implement processes to ensure that all stakeholders from growers through end users receive needed sustainable value from the outcome of commercialization opportunities in parallel with feedstock development. Seek to maximize regional economic development and job creation opportunities by filling key gaps agreed to with public / private sector team external resources.
Support Sustainable Co-products

Jet and Diesel are high volume, low price

- Animal Feed
- Fertilizer
- Soil enhancement
- Chemicals (e.g. erucic acid, anti-icing fluid)
- High value naphtha as E85 supplement
- Potable drinking water for cattle
- Advance lignin co-products

Coproducts enable Processor / Grower Resilience
Monetize Sustainability Value

Not just Carbon / GHG

- US RFS2 RINS
- California LCFS
- ICAO Goals Worldwide

But also……..

- Criteria Pollutants (PM 2.5)
- Water remediation Cost
**Water Remediation East Coast**

**Water : East Coast = Air : West Coast?**

**Sustainable Energy Cover Crops**
- Multiple options Mid-Atlantic to FL
- Max. value through landscape design
- Addresses fallow field issues

**Convert Manure to Energy and sustainable co-products**
- Supportive farmers (e.g. dairy Newtrient)
- Environmental NGO participation
- Utility interest via digester market transformation
Best Practice Tools / Templates

**CAAFI Coalition Contributions**

- Fuel and Freight Optimization Tool (FTOT) assesses distribution costs
- Feedstock Readiness Level gated Risk Management identifies research needs
- Nutrient modeling and infiltration best practice learning / landscape value
- Supply Chain development case study experience
Eight Supply Chain Scenarios from seed / processor /customers

10% to 20% of fuel sales price resident in distribution

State funded program using to establish Infrastructure needs (Alabama)

Follow up to inform supply chain components, Policy makers (processors, end customers, licensees)
FSRL Identifies Feedstock Status/Needs

**Factor in multiple Projects**

- Gated Risk Management using NASA / DOD Tech Readiness Level (TRL) principles
- Inputs from objective sources intended to identify future needs
- Common across feedstocks
- Cooperation with USDA / Residence in USDA repository

- Production
- Market
- Policy
### FSRL Sustainable Sugar Crops *

**Factor in South Florida USDA Grant**

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Species</th>
<th>Production</th>
<th>Market</th>
<th>Policy</th>
<th>Linkage</th>
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</thead>
<tbody>
<tr>
<td>Energy cane</td>
<td>Saccharum sp.</td>
<td>5.2</td>
<td>3.2</td>
<td>3.2</td>
<td>4.3</td>
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<tr>
<td>Sweet sorghum</td>
<td>Sorghum bicolor</td>
<td>6.1</td>
<td>4.3</td>
<td>5.3</td>
<td>5.2</td>
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<tr>
<td>Energy beet</td>
<td>Beta vulgaris</td>
<td>6.2</td>
<td>6.1</td>
<td><strong>2.4</strong></td>
<td>5.2</td>
</tr>
</tbody>
</table>

*Led to RFS 2 Certification Focus by RBDG*

*Source ARS Tifton GA., Bill Anderson, developed by DOT/Volpe, presented in 2014*
Local Regional Public / Private Partners

Leverage Fed Funds / Attract Private Investment
SPARC – Supply Chain Team

Southeast Partnership for Advanced Renewables from Carinata

- Project Lead - UFL (David Wright), NIFA CAP
- Key Partners - ARA, Agrisoma, USF, UGA, Auburn, DOT Volpe
- Objectives: Enable Maximize Sustainable Development in SE Partner States
- Innovative Elements -
  - Implement bottoms up FTOT
  - Engage State support
  - Monetize runoff control gain
SASSCA – Forest Industry

Southcentral Atlantic State Supply Chain Alliance

- Project Lead - Clemson (Pat Layton), NIFA Mini CAP proposal
- Key Partners - NCSU, UVA, VaTech, Regional Forest Industry
- Objectives: Facilitate sustainable fuel supplies, to east coast, fill slack demand for forest products
- Innovative Elements - Wood supply precision analysis, multiple proven process access, cellulosic ethanol / lignin co-prod

Growing sawmill waste
MSW to Fuel in CT

Initiated via USDA Rural Development.

- Project Lead – CCAT (Business Dev. Grants), Praxair, Pratt & Whitney
- Key Partners - multiple processors, CT legacy Waste to power facility MIRA
- Objectives: Facilitate conversion of aging RFD facility from electricity production. Enhance revenue 6 X
- Innovative Elements -
  - Publicly available MSW
  - Refuse Derived fuel facility
  - multiple processor interest
Dairy Waste – A 3rd 24/7 Feedstock

- Project Lead - GSR (Krivov), Todd Campbell (ex-USDA) USDA Rural Dev (RBEG and VAPG)
- Key Partners - UVM, Cornell, Newtrient, Canadian Interests,

- Objectives: Cross border technology scale up, support dairy industry, monetize value.

- Innovative Elements -
  - Strong co-product potential
  - Organized feedstock industry
  - Environmental NGO support for lake pollution mitigation
Project Lead - TCERDA (Devries)
USDA RBDG grant

Key Partner/ Customers - Amyris, Lanzatech, Gevo, Jet Blue, American, Fedex, Tropicana

Objectives: Energy Crop to replace, Citrus lost to Greening

Innovative Elements -
- Research park run / County focal
- Cattle feed co-product w/ranchers
- Citrus grower engagement
SAFE – Sustainable Ethanol

Sustainable Aviation Fuel from Ethanol

- Project Lead - GA Tech (Thomas) USDA
- Key Partners / Customers - Lanzatech, UGA, USF, UFL
- Objectives: Resilient rotation for sustainable ethanol supplies from agricultural sources for ATJ
- Innovative Elements -
  - Sustainable ethanol focus
  - Multiple southeast crop focus
  - Processor demand in place
## Growing State and Regional Initiatives

**CBGM Requested Expansion Being Implemented**

<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toby Ahrens</td>
<td>Maine</td>
<td>NIFA</td>
</tr>
<tr>
<td>Michael Baer</td>
<td>Arizona</td>
<td>American Air</td>
</tr>
<tr>
<td>Todd Campbell</td>
<td>Vermont</td>
<td>USDA</td>
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<tr>
<td>Angela Foster Rice</td>
<td>Illinois</td>
<td>United Air</td>
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<tr>
<td>Joelle Simonpietri</td>
<td>Hawaii</td>
<td>Navy</td>
</tr>
<tr>
<td>Michael Shoemaker</td>
<td>Georgia</td>
<td>Consultant</td>
</tr>
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Diverse Experience, Interests. All CAAFI veterans
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