

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**

+

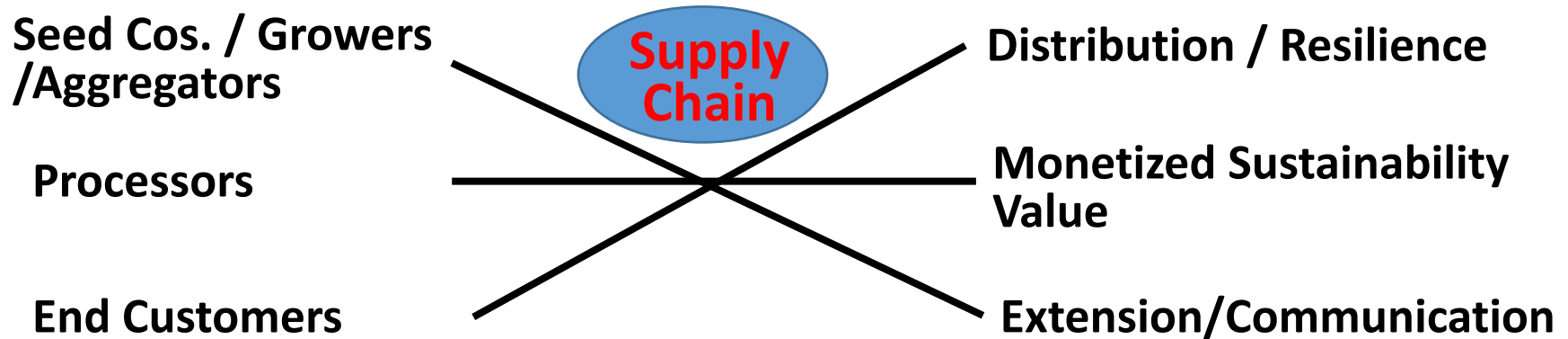
**High value resilient co-
products suite + jet fuel**

+

**Monetized/Maximized
Economic and
Environmental (Air and
Water) Value**

***Facilitate
Supply Chain
Development
from
feedstock
through End
Customers***

Supply Chain Team Organization / Goals



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.....

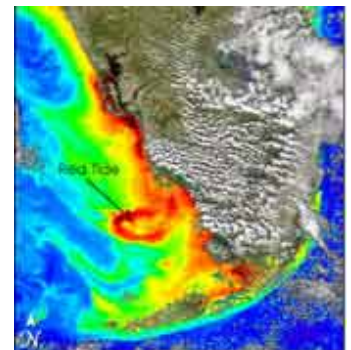
- Criteria Pollutants (PM 2.5)
- **Water remediation Cost**



Lake Champlain , Vermont



Chesapeake, Del Marva



Red Tide , Florida

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

FTOT Bottoms Up Assessment

Establishing via DOT (Volpe) / USF / SPARC



- 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



FSRL Sustainable Sugar Crops *

Factor in South Florida USDA Grant

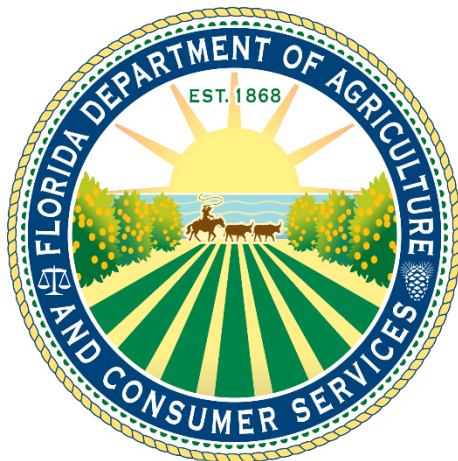
		Production	Market	Policy	Linkage
Energy cane	Saccharum sp.	5.2	3.2	3.2	4.3
Sweet sorghum	Sorghum bicolor	6.1	4.3	5.3	5.2
Energy beet	Beta vulgaris	6.2	6.1	2.4**	5.2

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

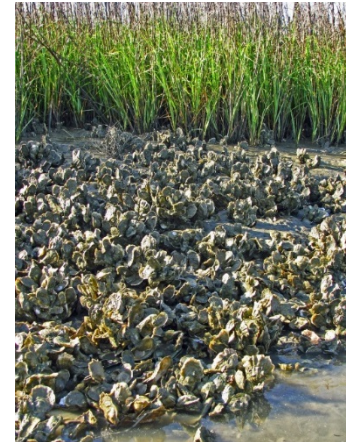




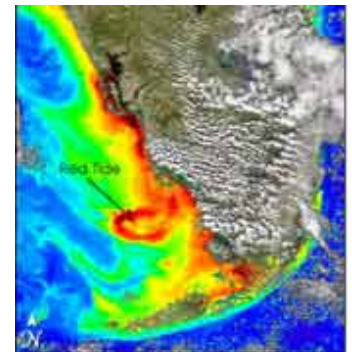
SPARC – Supply Chain Team

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**



Oyster bed water quantity



Red tide threat to water quality

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



Lignin 30% of tree

MSW to Fuel in CT

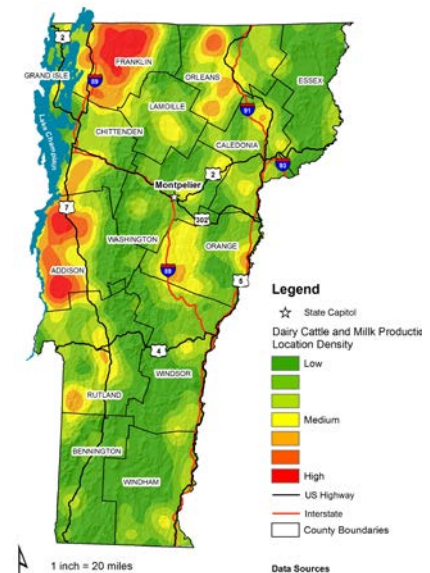
Initiated via USDA Rural Development.

- 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**



TCERDA – Citrus Replacement

Sustainable Fuels Feasibility Study

- **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**



Louisiana sweet sorghum



Energy beets winter crop

Growing State and Regional Initiatives

CBGM Requested Expansion Being Implemented

Name	State	Experience
• Toby Ahrens	Maine	NIFA
• Michael Baer	Arizona	American Air
• Todd Campbell	Vermont	USDA
• Angela Foster Rice	Illinois	United Air
• Joelle Simonpietri	Hawaii	Navy
• Michael Shoemaker	Georgia	Consultant

Diverse Experience, Interests. All CAAFI veterans

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