



LOW CARBON
FUELS COALITION



NOYES LAW
CORPORATION
FUEL & CARBON LAW

SAF Southeast Working Group

July 18, 2019

Convened by Timothy Rials

Associate Dean & Director

University of Tennessee Institute of
Agriculture

Sustainable Aviation Fuel for the Southeast



Vantage Point



- Sacramento Based Fuel and Carbon Law Attorney
 - ✓ Represent Alternative Jet Fuel Producers
 - ✓ Fulcrum BioEnergy, World Energy Paramount, Neste, Red Rock Biofuels, Velocys, Gevo
 - ✓ CARB Rulemakings- Low Carbon Fuel Standard
- ✓ Executive Director, Low Carbon Fuels Coalition
 - ✓ Track, Support, and Expand low carbon fuel policies



Market and Policy Overview



- Aviation Sector Faces Fundamental Challenge
 - Consistent year-on-year growth of aviation sector and its fuel demand
 - Fuel is major cost center and market is cost competitive
 - Need to transition to lower-carbon, higher cost sustainable aviation fuels
- Policy is the Solution
 - ✓ Federal Renewable Fuel Standard applies nationally
 - ✓ State Level Policy is the Distinguishing factor- additional value
 - ✓ California is the market leader due to Low Carbon Fuel Standard



Low Carbon Fuel Standard Statutory and Regulatory Basis



State-Level Policy	Federal law pre-empts state regulation of some sectors such as jet fuel
Authorizing Legislation in California	Broadly empowers California Air Resources Board (CARB) to establish comprehensive suite of greenhouse gas reducing programs
Rulemaking Engagement	Concept papers and informal workshops with stakeholders
Rigorous Science with Peer Review	Formal rulemaking process establishes regulations, CA GREET revisions
Leading Laboratory of Greenhouse Gas Democracy	~1500 staff at CARB

California State Laws

AB 32

Reduce to 1990 levels by 2020
State met greenhouse gas
reduction requirement in 2016

SB 32

Reduce 40% below 1990 levels
2021-2030
LCFS-mandated reduction only
12.5% over same period

LCFS 3.0 + CA GREET 3.0

3-4 year amendment cycle

Clean Fuel Standard Policy Design Fundamentals

Key Metric

Carbon Intensity of Transportation Fuels

Greenhouse Gas
emissions per mile

Approach

1%
per year

10-20
years

Market-Based and Fuel-Neutral

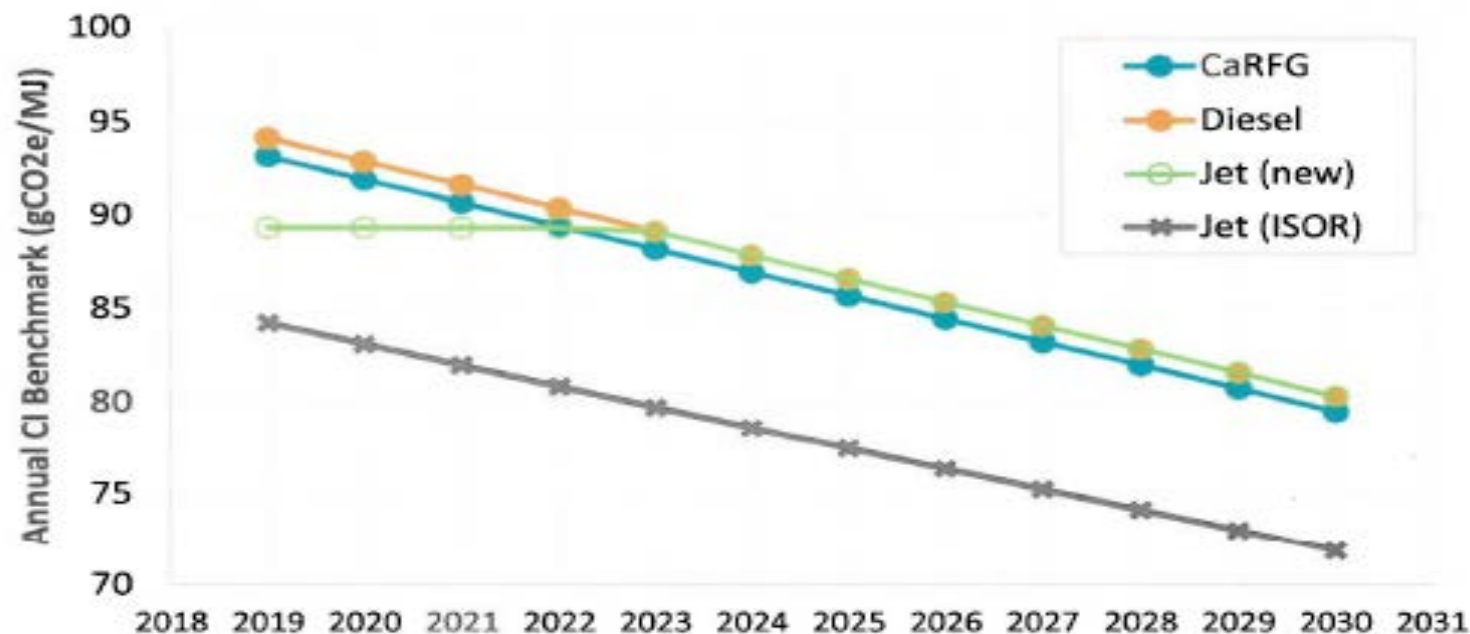
NO REVENUE is collected by the state

Reductions are provided by lowest cost available fuels and vehicle technologies

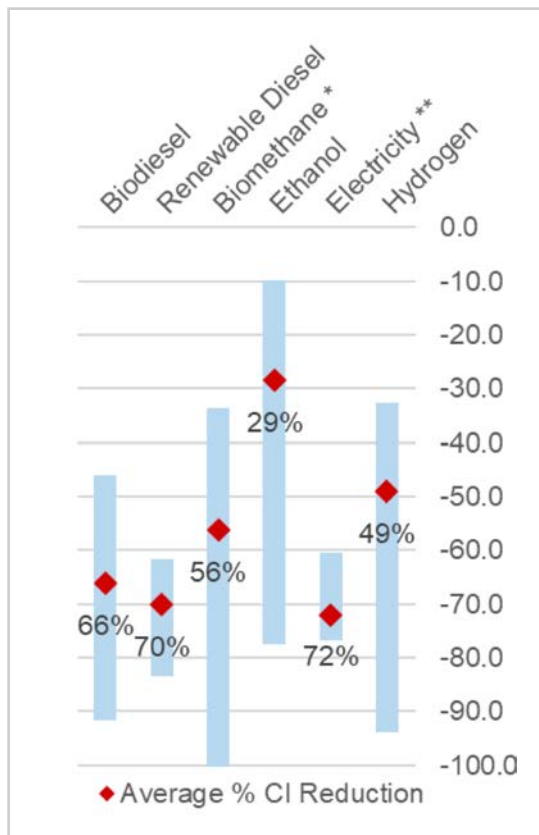
Sustainability is addressed via Indirect Land Use Change (ILUC) factors, e.g. palm oil

Carbon Intensity (CI) Benchmarks for Aviation Fuel

Proposed Annual CI Benchmarks



Carbon Intensity (CI) Ranges, and Values



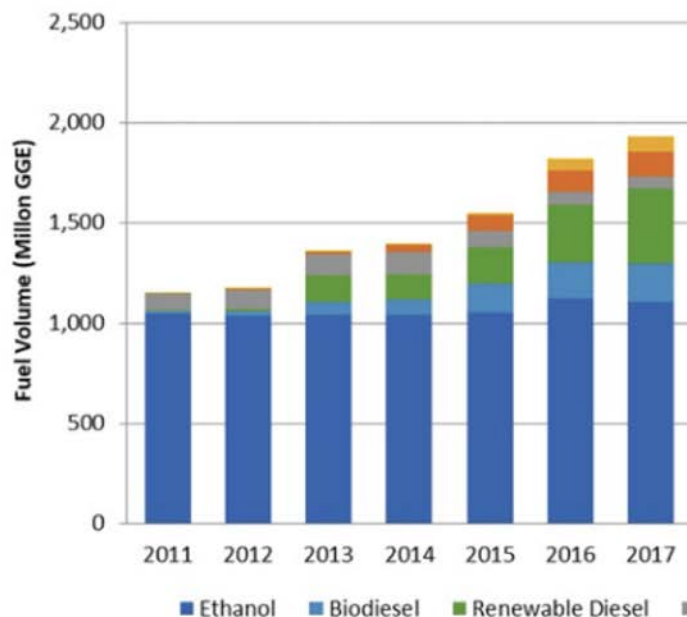
CI Values

Fuel	CI	California	Oregon	RIN
Renewable Diesel	20	\$1.88/gal	\$1.49 /gal	.39
Canola Biodiesel	55	\$0.96/gal	\$0.61/gal	.39
Corn Ethanol	70	\$0.37/gal	\$0.29/gal	.16
Sugarcane Ethanol	45	\$0.77/gal	\$0.61/gal	.33
Dairy RNG	-255	\$71.84 mmbtu	\$57.10 mmbtu	\$27
Solar LD EV	0	\$0.22/kWh	\$0.18/kWh	
Landfill Hydrogen	-12	\$5.73/kg	\$4.56/kg	

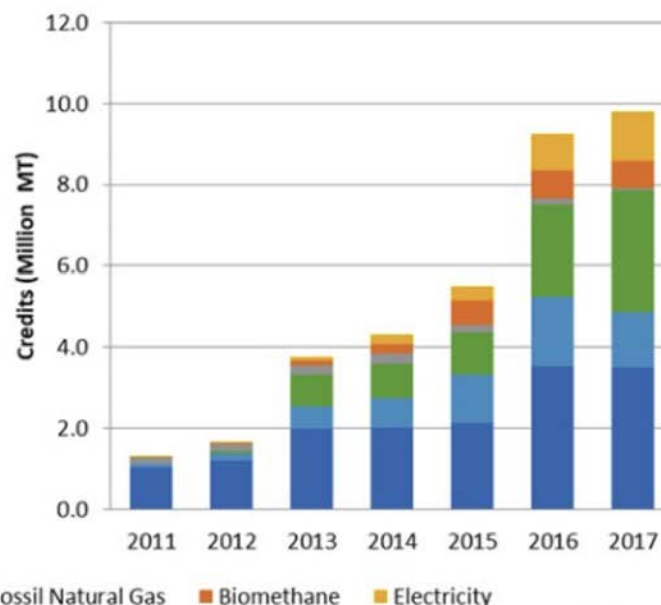
Policy Results in California

Innovation and Fuel Diversification

Volumes



Credits



Last Updated 04/25/2018

Highlights

- 50%** Decarbonization of Ethanol
- 4-5x** National Rate of Electric Vehicle Adoption
- 10%** Low Carbon Diesel Fuels
- \$195/ton** Market Driver

Results to Date

2011 – 2018 Q1

38,000,000

tons of carbon pollution avoided... and growing



Petroleum

13.7 billion gallons
avoided



Clean Fuels

74% increase in use



Market Value

\$2.8 billion invested in
clean fuels production



Health

\$1.84 million in avoided
public health impacts



Rewind Policy Landscape to 2018 To Discuss SAF Advocacy



- Renewable Fuel Standard
 - ✓ Alternative Jet Fuel as Additional= Opt-In Fuel
 - ✓ Conventional Jet Fuel does not create obligations
 - ✓ Private forestlands= Southeast Advantage
- No Crediting Under Low Carbon Fuel Standard (LCFS)
 - ✓ Jet Fuel Outside Scope of State Authority
 - ✓ Jet Fuel Exempted from LCFS Program

LCFS Initiative

- Joint Effort
 - ✓ Alternative Jet Fuel Producer Group
 - ✓ Airlines for America (A4A)
 - ✓ Airlines, particularly United Airlines
 - ✓ Airports, particularly SFO
- AJF Producer Group
 - ✓ World Energy Paramount
 - ✓ Fulcrum BioEnergy
 - ✓ Gevo
 - ✓ Neste
 - ✓ Red Rock
 - ✓ Velocys



Business Supports California's LCFS

150+ companies supported the LCFS in letter to policymakers

- Including multinational companies, energy utilities, vehicle manufacturers, fleet managers, and petroleum marketers (May 12, 2017)





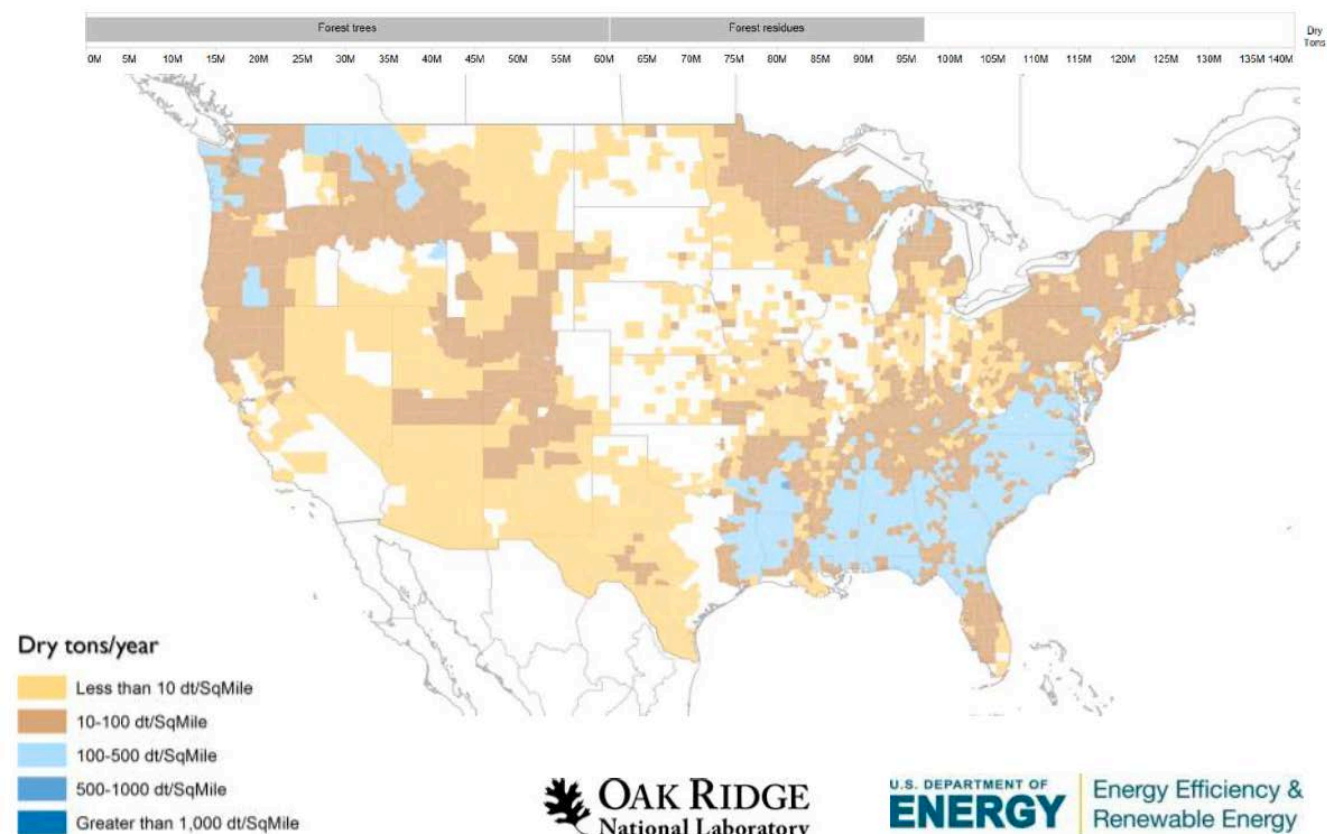
Oregon Clean Fuels Program (CFP)



- Comparable Program
- Statutory Basis
- Department of Environmental Quality (DEQ)- small staff
- Began Five Years Later
- Leverages California Program
- Pathways are Comparable
- Also brought AJF into the CFP on opt-in basis
- Effective January 1, 2019

Feedstock Advantage: Southeast

Base-case scenario, \$60 roadside, forestry resources, year 2040



2019 LCFS Policy Expansion

Any Southeastern States?

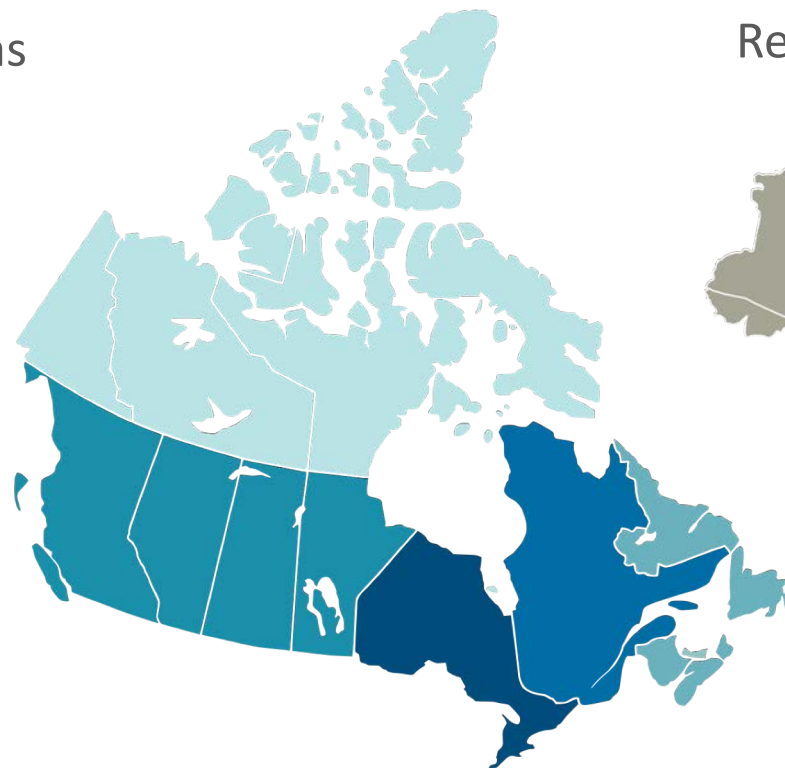
Washington State



Regional Greenhouse Gas
Initiative (RGGI) States



Canadian Provinces



RenovaBio in Brazil



Midwestern States



Key Policy Debate Issues

- Need to establish new LCFS- not just expand it.
- GHG Reduction Program-
 - ✓ Is the wildfire hot enough?
 - ✓ Is the water high enough?
- Recurring Policy Debate Issues
 - ✓ Impact to consumers at the pump
 - ✓ Air Quality improvement= Health Benefits
 - ✓ Jobs and Economic Development
- Policy levers to pull
 - ✓ Speed of GHG Reduction
 - ✓ Scope of Policy- Petroleum Provisions

Contact Information



LOW CARBON
FUELS COALITION



Executive Director
Low Carbon Fuels Coalition
980 Ninth Street, 16th Floor
Sacramento, CA 95814
graham@lcfcoalition.com
www.lcfcoalition.com
(530) 264-7157

Managing Attorney
Noyes Law Corporation
401 Spring Street, #205
Nevada City, CA 95959
graham@noyeslawcorp.com
www.fuelandcarbonlaw.com
(530) 264-7157