



CALIFORNIA LCFS

LCFS HISTORY

MILESTONES:

- Original adoption 2009, amended in 2011, re-adopted in 2015, amended in 2018
- Goal: Reduce carbon intensity (CI) of transportation fuel pool by at least 20% by 2030

Expected benefits:

- Complement other AB 32 measures
- Transform and diversify fuel pool
- Reduce petroleum dependency
- Reduce emissions of other air pollutants

A scenic landscape at sunset with a road and two tanker trucks. The sun is low on the horizon, casting a warm glow over a field of tall grasses. A road stretches into the distance, with two tanker trucks driving away from the viewer. The sky is filled with soft, golden light and a few wispy clouds.

LCFS EXEMPTIONS

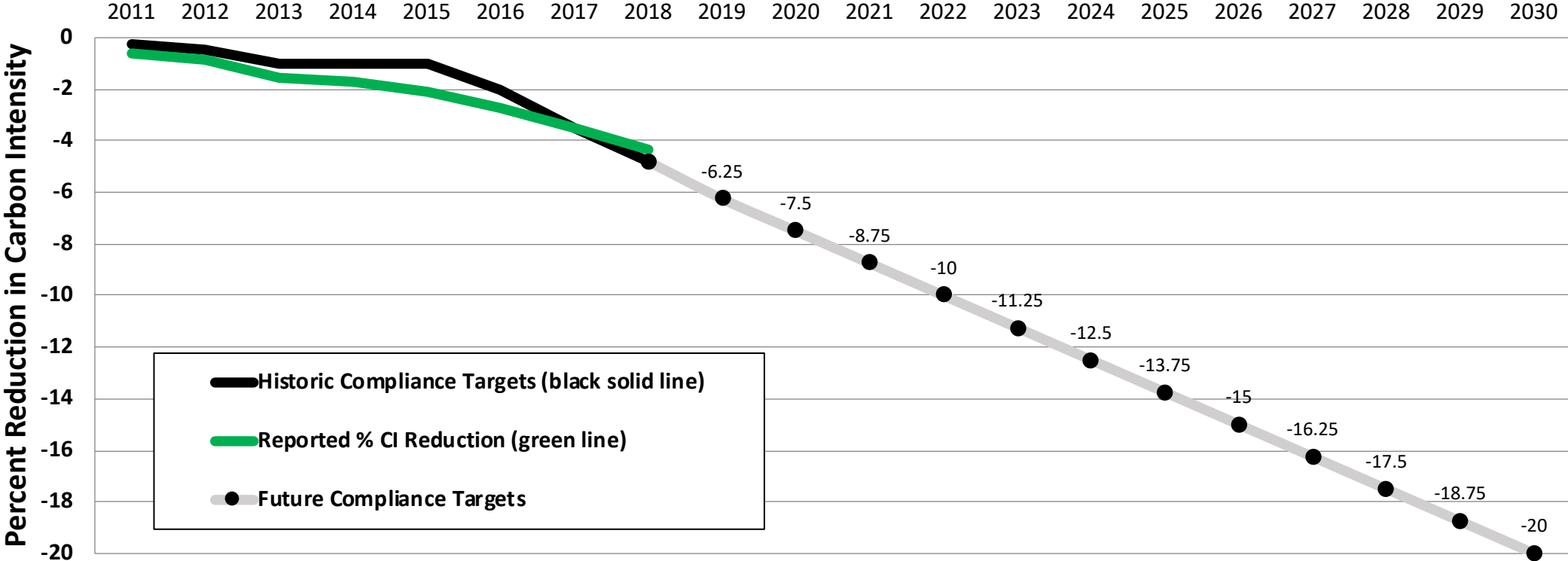
- Alternative fuel that:
 - Is not a biomass-based fuel
 - Is supplied in CA by all providers of that particular fuel for transportation use at an aggregated volume of less than 420 million MJ/year
- Military Tactical vehicles and tactical support equipment
- Interstate locomotives
- Ocean-going vessels
- Aircraft – (Alternative Jet is an opt-in fuel that generates credits but not deficits)

CALIFORNIA COMPLIANCE SCHEDULE FOR DIESEL FUEL, GASOLINE, Jet Fuel, AND THEIR SUBSTITUTES

Year	Diesel Compliance Standard (gCO ₂ e/MJ)	Gasoline Compliance Standard (gCO ₂ e/MJ)	Conventional Jet Fuel Compliance Standard (gCO ₂ e/MJ)
2016	99.97	96.50	NA
2017	98.44	95.02	NA
2018	96.91	93.55	NA
2019	94.17	93.23	89.37
2020	92.92	91.98	89.37
2021	91.66	90.74	89.37
2022	90.41	89.50	89.37
2023	89.15	88.25	89.15
2024	87.89	87.01	87.89
2025	86.64	85.77	86.64
2026	85.38	84.52	85.38
2027	84.13	83.28	84.13
2028	82.87	82.04	82.87
2029	81.62	80.80	81.62
2030	80.36	79.55	80.36

DECLINING CARBON INTENSITY CURVE

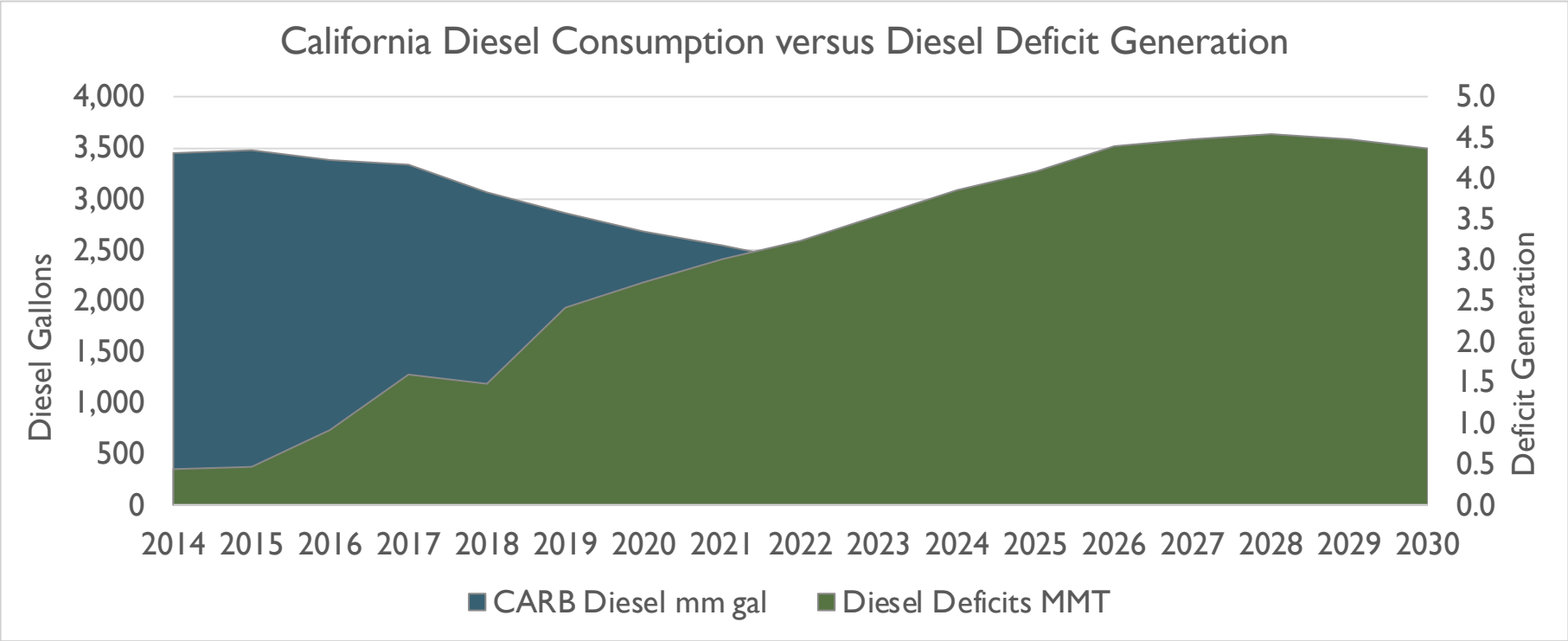
LCFS Compliance Targets 2011-2030



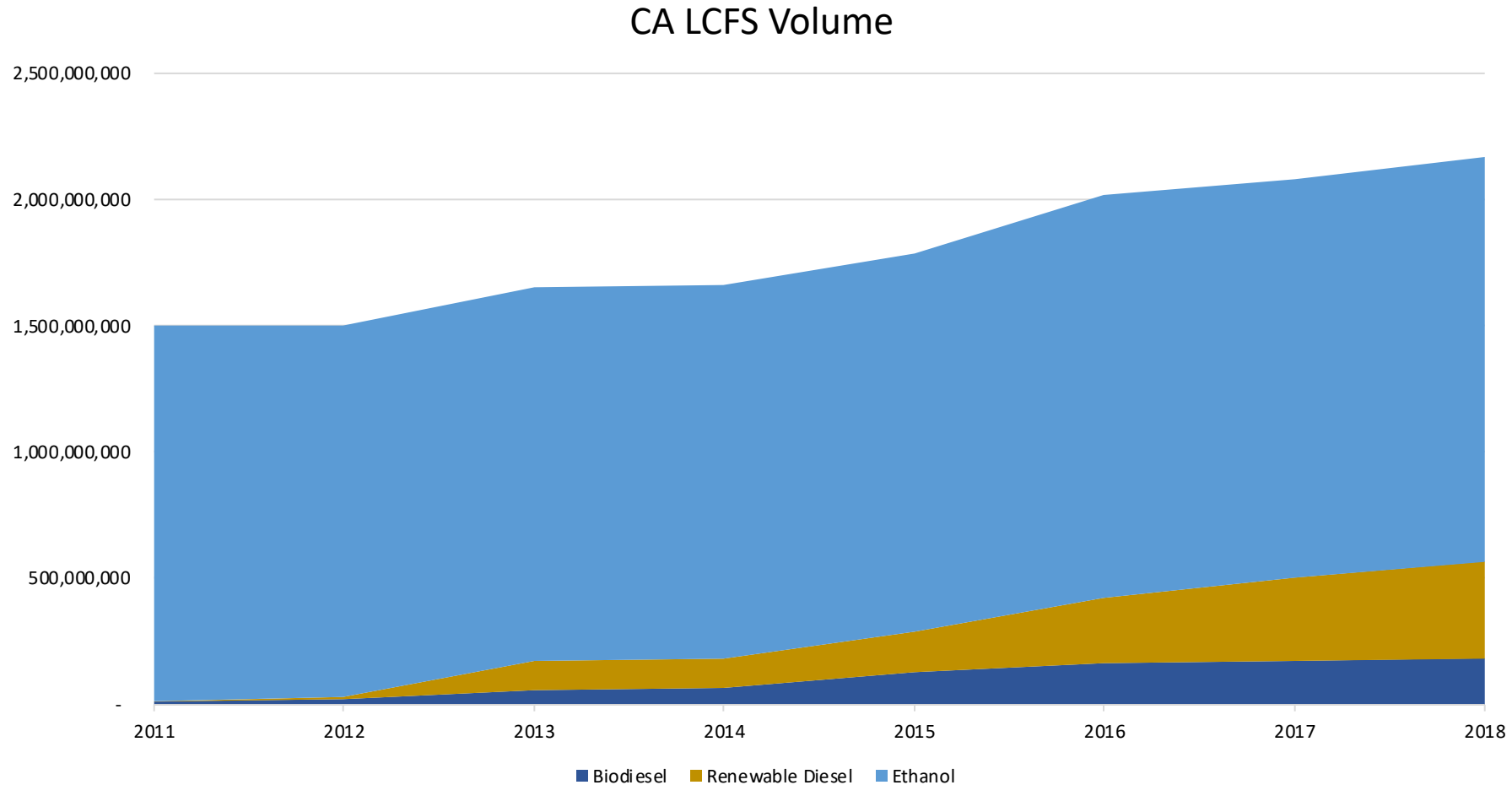
Carbon intensities based on composite of gasoline and diesel fuels

DIESEL CONSUMPTION & DEFICIT GENERATION

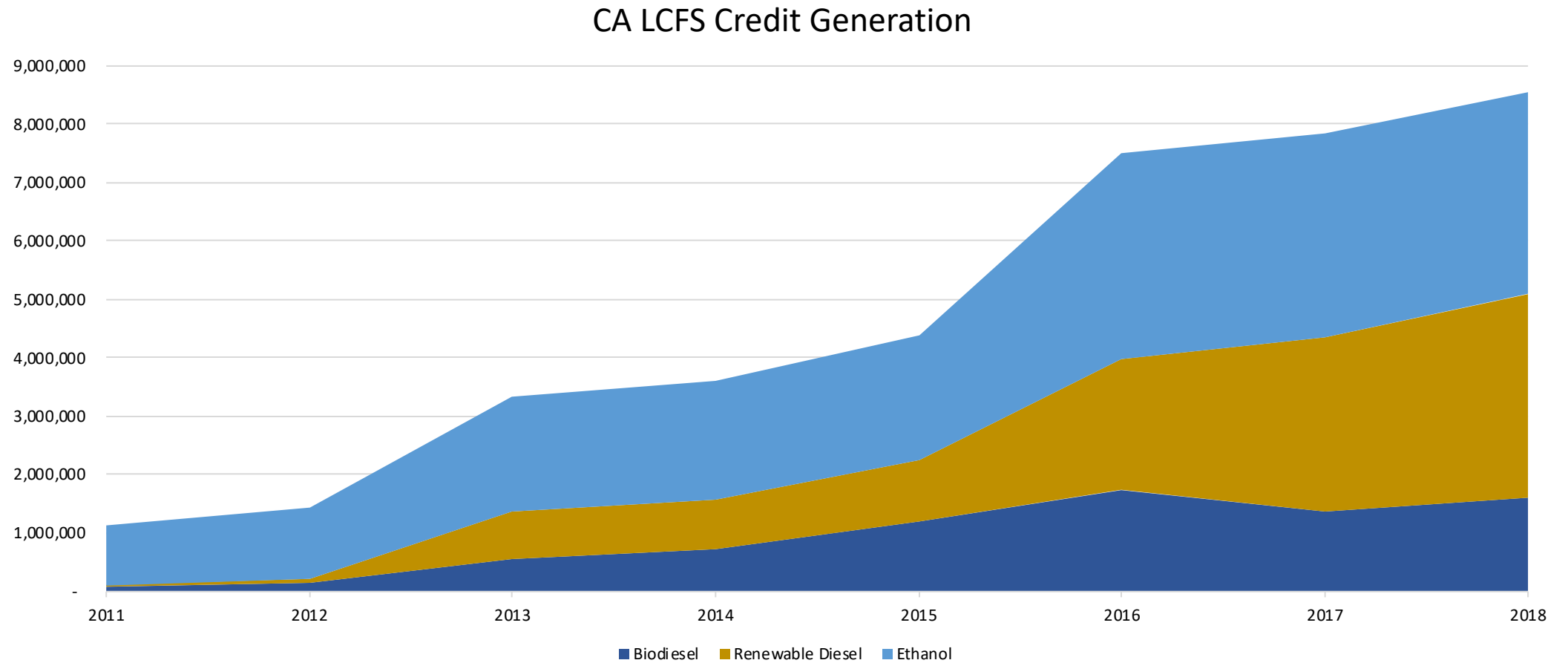
- A Declining compliance curve leads to decreased diesel usage and increased biofuel consumption
- Despite reduced diesel production, deficit generation will climb.
- As the compliance benchmark falls each year, less credits and more deficits will be created from the same fuel supply



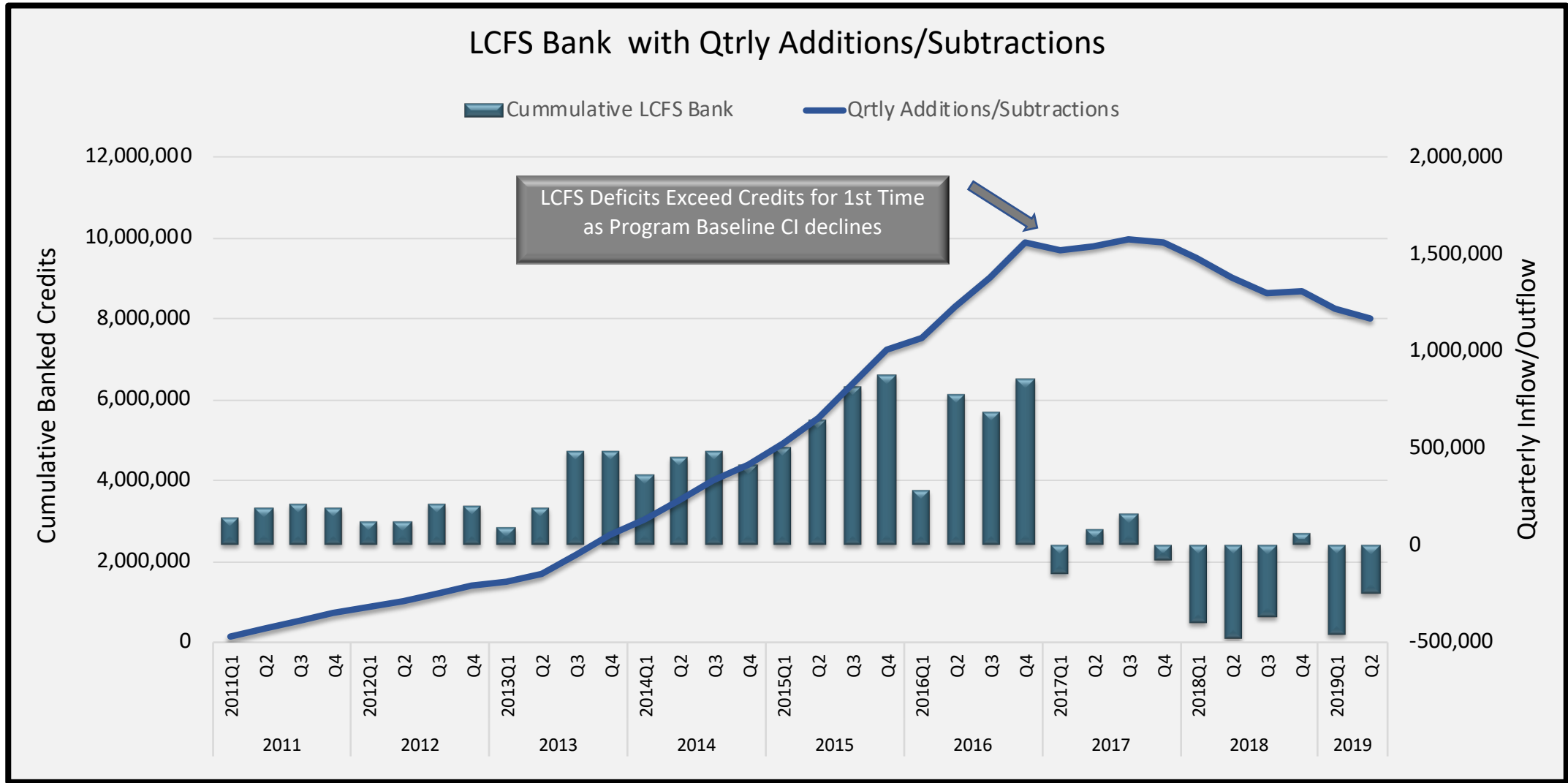
California LCFS Volume



California LCFS Credit Generation



LCFS BANKED CREDITS



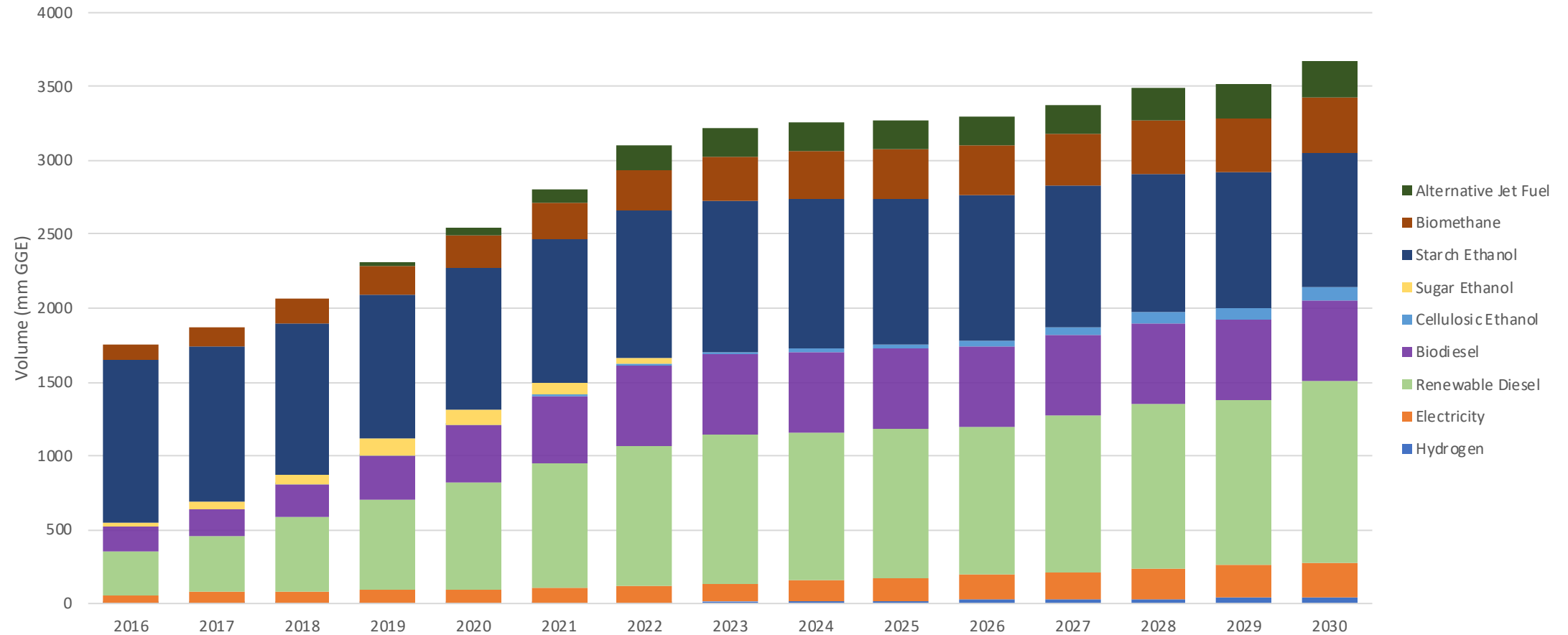
CALIFORNIA MAJOR LCFS AMENDMENT CHANGES 2018

- The addition of alternative jet fuels (AJF) as opt-in credit-generating fuels. Having opt-in status means credits can be generated without corresponding deficit generation
- Removing the opt-in status for fossil compressed natural gas (CNG), hydrogen, and the exemption for propane. These fuels are expected to become deficit generating fuels at some point over the next ten years, causing them to lose their opt-in status
- Allowing alternative fuels used in military vehicles to opt in
- Carbon Capture and Sequestration Protocol
- Promote Zero Emission Vehicle Infrastructure and Renewable Electricity to ZEVs

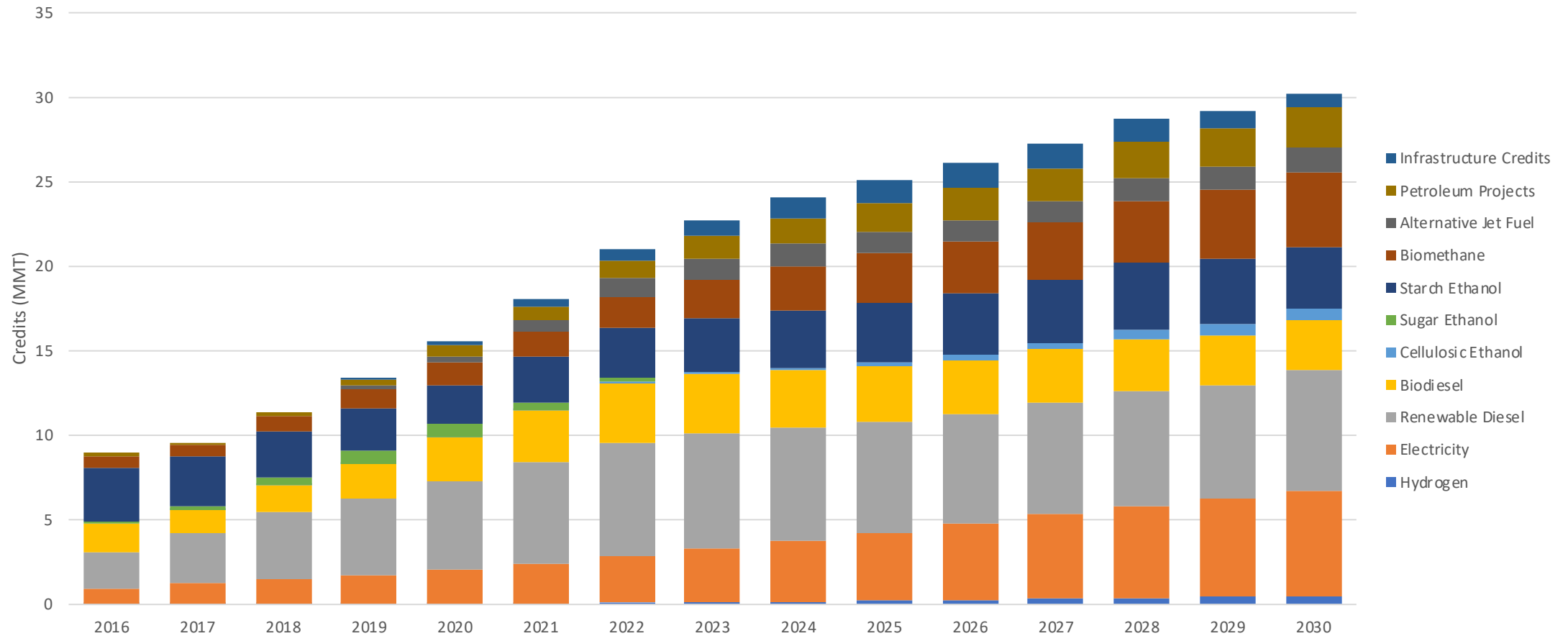
CALIFORNIA PENDING 2019 LCFS AMENDMENT CHANGES

- Establish a maximum tradable price for LCFS credits
- Supply additional credits to the CCM (Credit Clearance Market) through credit borrowing
- Require Compliance Plans for deficit generators participating in two or more consecutive CCMs
- Remove buyer liability for entities purchasing credits in the CCM
- Use revenues from holdback credits to support GHG and criteria pollutant reductions in disadvantaged communities
- Clarify how base electricity credits will be reallocated from service areas of utilities that do not receive such credits
- The pending amendments are currently on schedule to become effective July 1, 2020

PROJECTED LCFS COMPLIANCE VOLUMES THROUGH 2030



PROJECTED LCFS COMPLIANCE CREDITS THROUGH 2030



LCFS EXPANSION

**OREGON CLEAN
FUELS PROGRAM**

**BRITISH COLUMBIA
LCFS**



OREGON EXPANSION & INTERCONNECTIVITY

- Through Executive Order 20-04, Oregon doubled down on its clean fuel program, increasing the CI reduction requirements from 10% below 2015 levels by 2025 to 20% below by 2030 and a 25% reduction by 2035
- If the fuel has a carbon intensity value approved by the California Air Resources Board, the business can adjust GREET for the difference in the transportation distance to Oregon and submit it to DEQ.
- If the fuel does not have an approved carbon intensity value from CARB, then the business must apply for a carbon intensity value from DEQ.
- There are also some temporary carbon intensity values that can be used for up to two quarters, until DEQ can approve an individual carbon intensity value.

LCFS OR LCFS LIKE PROGRAMS CURRENTLY UNDER CONSIDERATION

Canada

Brazil

Washington State

Puget Sound

New York

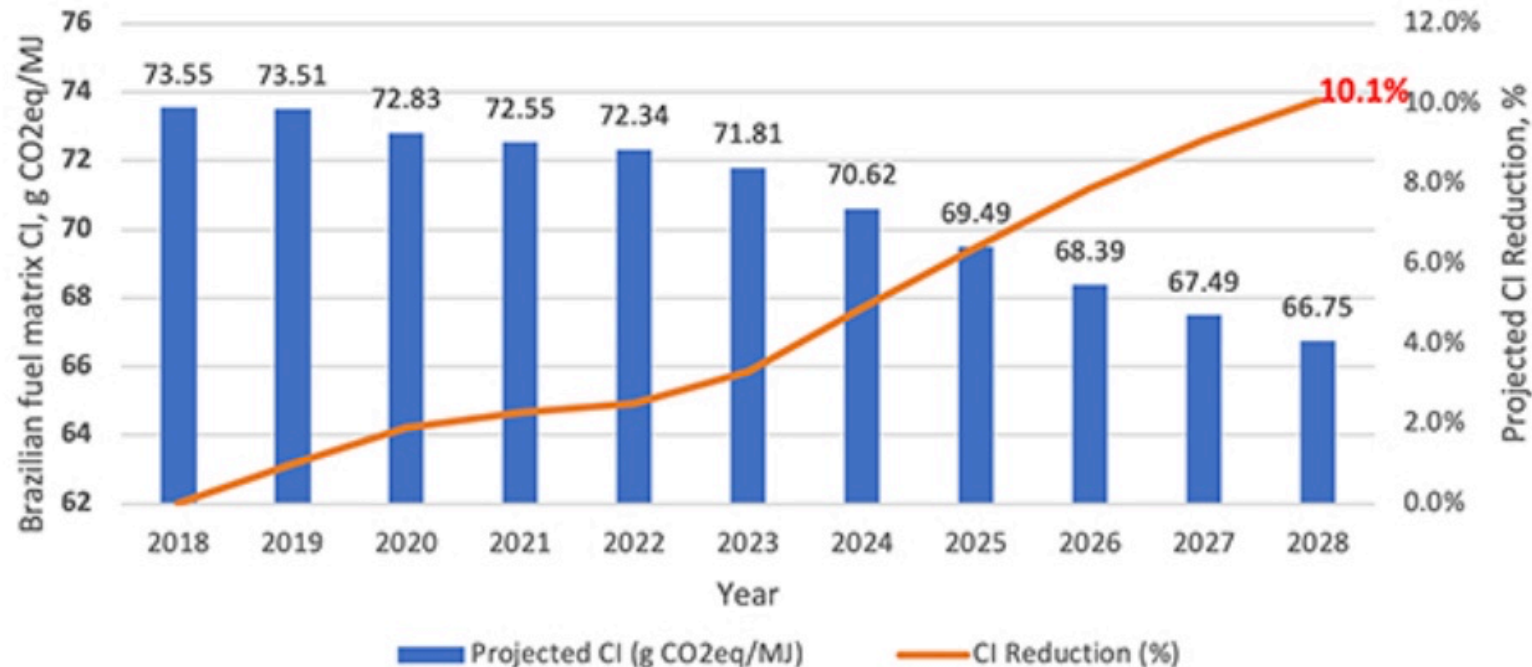
Colorado

Utah



Brazil's Biofuels National Policy (RenovaBio)

- Program became official on Dec 24, 2019
- Ratifies the Brazilian Gov's commitment to the Paris Agreement from 2016
- Expects to reduce the carbon intensity from transportation fuels 10% by 2028



Canada's Clean Fuel Standard

- Canada's Clean Fuel Standard (CFS) remains a work in progress
- Currently has a Renewable Fuels Regulation (RFR) in place, which is to be replaced by the CFS
- CFS will separate requirement for liquid, gas, and solid fossil fuels – unique to the Canadian program
- Carbon intensity (CI) limits for liquid fossil fuel will start in 2022 and become more stringent over time, capping at a CI reduction of 10 g of CO₂e per MJ in 2030
- A 10% to 12% CI reduction below 2016 levels by 2030

Washington State/Puget Sound Clean Fuel Standard

- Washington State attempted to pass a state-wide Clean Fuel Standard (CFS) in 2019 & 2020. Both failed to clear the legislative process, dying in the Senate
- The CFS may try again in 2021 or a special session. The CFS was expected to limit GHG emissions 10% below 2017 levels by 2028 and 20% below 2017 by 2035

Puget Sound CFS:

- Has been waiting in the wings if the state-wide program failed
- Will likely face additional legal challenges if passed
- More ambitious than the California program. Proposes to reduce CI of transportation fuels 25% below 2016 levels by 2030. Emissions reductions would begin in 2022

New York Low Carbon Fuel Standard

- Wheels were set in motion Feb 8, 2019 when HB 5262 passed and established a LCFS program in New York
- The measure was amended and referred to the Department of Environmental Conservation Jan 8, 2020
- The New York LCFS claims to be the most ambitious in the country due to its climate goal of reaching net-zero emissions by 2050
- The NY LCFS is intended to reduce carbon intensity from the on-road transportation sector 20% by 2030

Colorado Low Carbon Fuel Standard

- Launched a feasibility study in November of 2019 and completion of study is expected by June 30, 2020
- Preliminary conclusions could be used to shape policy in the spring of 2020
- Colorado's Climate Action Plan aims to reduce greenhouse gas emissions by at least 26 % by 2025, at least 50% by 2030, and at least 90% by 2050 from levels that existed in 2005

Utah “Roadmap”

- 37-person technical advisory committee prepared the Utah Roadmap to assist with legislative policymaking to improve air quality and address causes and impacts of a changing climate
- Seven strategies, called mileposts, are suggested areas of focus
- The first recommendation is to reduce criteria pollutant air emissions below 2017 levels 50% by 2050. Reduce CO2 emissions statewide 25% below 2005 levels by 2025, 50% by 2030, and 80% by 2050
- Public comment on the Roadmap ended January 27, 2020
- Legislation has yet to begin on any aspect of the Roadmap

Midwest Clean Fuel Policy Initiative

- The Great Plains Institute has put forth a White Paper that explores the possibility of creating a market-driven approach that could lead to a Midwest low carbon fuel program
- The coalition has spoken with the California Air Resources Board regarding potential
- Minnesota, Iowa, and South Dakota are some of the states believed to be considering participation

QUESTIONS?

THANKS!

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