

Low Carbon Fuel Standard

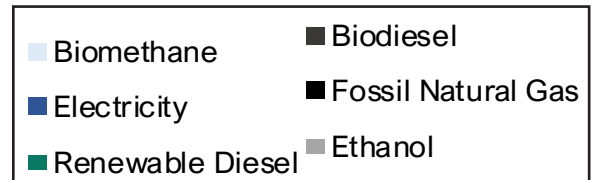
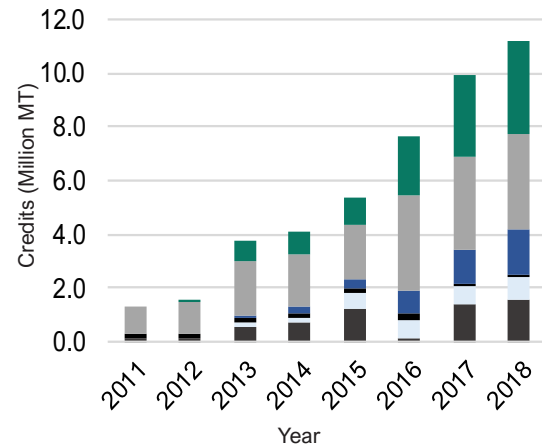
Market Background

The California Low Carbon Fuel Standard (LCFS) market for the transportation sector was implemented in 2011 and aims to reduce the carbon intensity of the state's transportation fuel pool. The reduction goals are set at 10% by 2022 and 20% by 2030. In 2019, the LCFS market was valued at almost \$3 billion with more than 14 million credits generated, each representing one metric ton of CO₂.

Key LCFS Producers

- Ethanol
- Biodiesel
- Compressed natural gas and biogas (CNG)
- Liquefied natural gas and biogas (LNG)
- Electricity for electric vehicles (EVs)
- Hydrogen

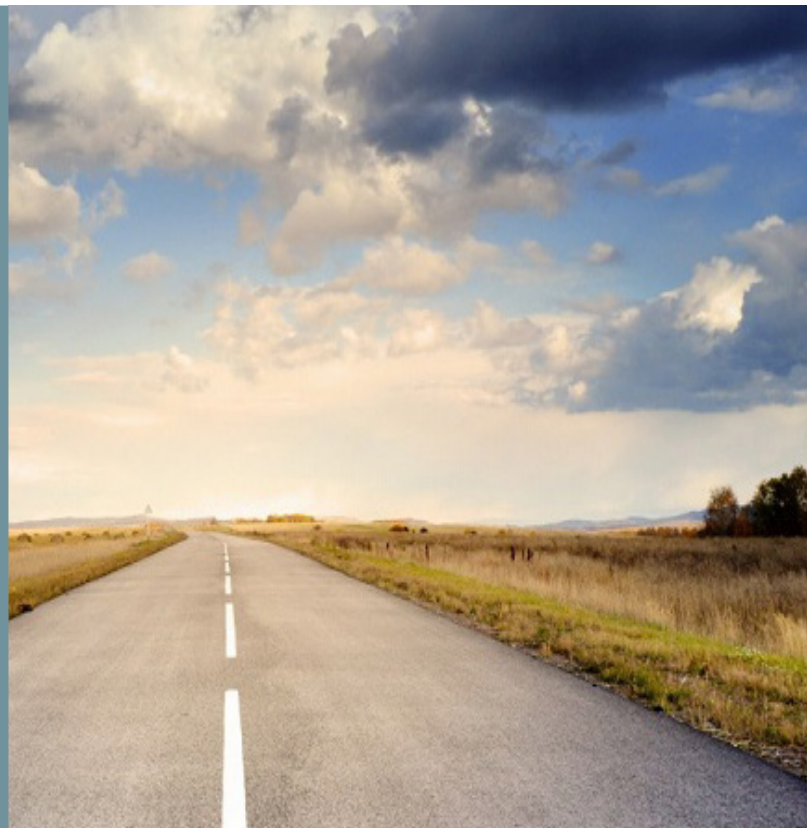
LCFS Credits Production



Source: CARB - <https://ww3.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm>

Market Background

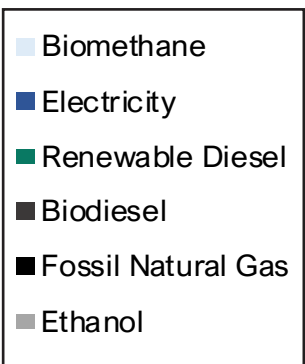
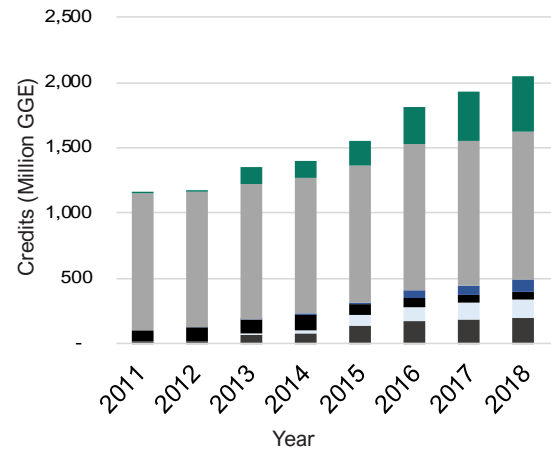
- The LCFS program places life-cycle carbon intensity targets on all transportation fuels sold in California and aims to diversify the fuel mix and reduce petroleum use
- California's transportation sector accounts for 50% of its greenhouse gas emissions, 80% of NO_x emissions and 95% of particulate matter emissions
- The LCFS program complements California's carbon cap-and-trade program, aimed at reducing gas emissions from fixed emission sources
- Oregon launched an LCFS program in 2014. Canada, New York, Washington, Colorado and other states are implementing or considering similar programs.



How LCFS Program Works

- CARB sets annual CI targets for gasoline and diesel.
- Fuels with a lower CI than the target generate credits. Fuels that are higher than the CI target create deficits. Fuel producers with deficits acquire enough credits to achieve compliance.
- Fuels that generate credits include: ethanol, biodiesel, renewable diesel, compressed natural gas and biogas (CNG), liquefied natural gas and biogas, hydrogen, and electricity for electric vehicles.
- Fuel producers known as Regulated Parties can use credits they've banked or buy credits from either another Regulated Party or from credit generating firms on the market.
- CARB set a price cap in November 2019 on all LCFS credit transfers at \$200 in 2016 US dollars, adjusted for inflation.
- The LCFS Reporting Tool (LRT) tracks each fuel transaction with the corresponding credit or deficit for each participant in the program.
- Credits do not have a vintage and do not expire.

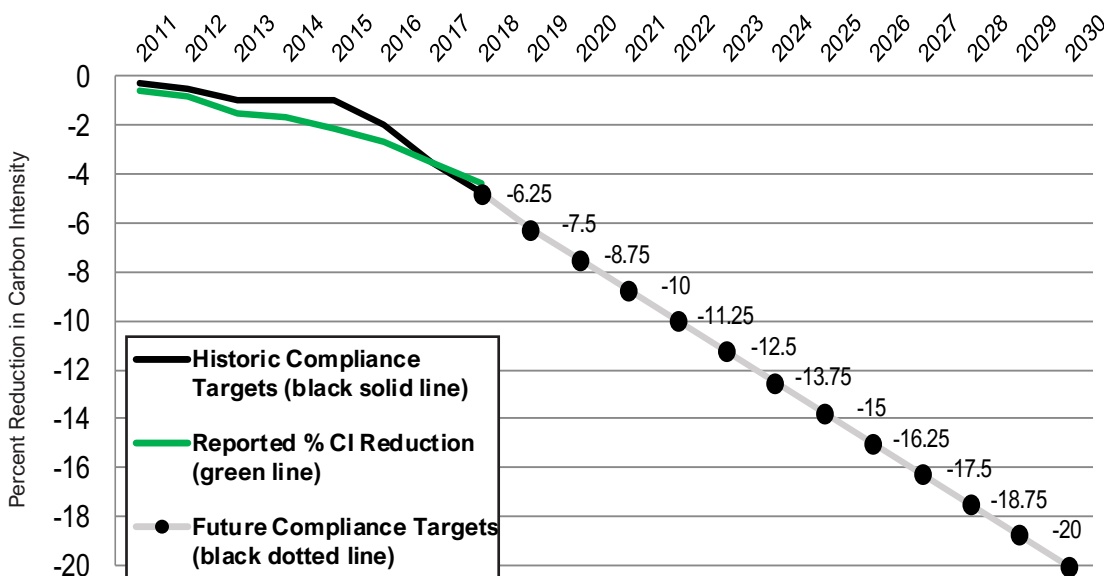
LCFS Fuel Volumes Generated



Qualifying fuels generate different amounts of LCFS credits based on each fuel's carbon intensity score.

Source: CARB - <https://ww3.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm>

Carbon Intensities Based on Composite of Gasoline and Diesel Fuels



Source: CARB - <https://ww3.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm>

Contact

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