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California Climate Policy Fact Sheet: Low Carbon Fuel Standard

California's climate policy is framed by three greenhouse gas (GHG) emission reduction targets: to 1990 levels by 2020, to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050. California's Low Carbon Fuel Standard (LCFS), introduced by the California Air Resources Board (CARB) in 2009 and implemented in 2011, is one of a suite of programs to reduce GHG emissions and other toxic air pollutants across the state. The LCFS is designed to reduce the carbon intensity of transportation fuels (e.g. diesel and gasoline) by 20 percent by 2030 while providing a range of low-carbon and renewable alternatives. Further, the program aims to both reduce California's overall dependency on petroleum and improve statewide air quality. The LCFS complements many of the state's emissions reduction and clean transportation programs, such as Cap-and-Trade and the Advanced Clean Cars Program. This California Climate Policy Fact Sheet outlines the basic components and legal background of the LCFS.

Understanding California's Low Carbon Fuel Standard:
CARB implements and enforces California's LCFS pursuant to the broad emission reduction mandate the state legislature set in Assembly Bill 32 (Health & Safety Code § 38500 et seq.). The LCFS is designed to reduce emissions in the transportation sector, which is currently responsible for 50 percent of GHG emissions, 80 percent of nitrogen oxide emissions, and 95 percent of particulate matter emissions within California. The LCFS has been amended multiple times since its introduction in 2009 in order to better align its program benchmarks with California's 2030 GHG emission reduction target.

Low Carbon Fuel Standard Program Features:

- Scope: The LCFS aims to reduce the carbon intensity of transportation fuels sold in-state by 20 percent by 2030 through annually declining targets. Carbon intensity is a measure of the GHG emissions released by the full lifecycle of a fuel, including production, transportation, and consumption.
- Regulated Parties: Petroleum fuel importers, refiners, and wholesalers in California are required to reduce carbon intensity across their product lines under the LCFS. Other entities, such biofuel refiners and electricity and natural gas suppliers, can opt in to the program to generate valuable credits.
- Carbon Intensity Target: Benchmarks for gasoline and diesel fuel carbon intensity are calculated in each calendar year. The 2019 benchmark is a 6.5 percent reduction relative to 2010, increasing to 20 percent by 2030.
- LCFS Compliance: To ensure that the carbon intensity of its overall fuel pool meets the annual LCFS target, a regulated entity must lower the carbon intensity of its fuel pool (by substituting cleaner fuels) and/or purchase LCFS credits from other regulated entities. LCFS credits do not expire and any surplus of LCFS credits can be banked for future compliance.
- Credits: The gap between the carbon intensity target and the intensity of certain fuel types dictates the LCFS credit deficit or generation. For example, a diesel refiner will need to purchase LCFS credits to compensate for carbon intensity of the fuel above the target, whereas a biofuel refiner will generate and then sell LCFS credits for intensity of the fuel below the target. Credits are valued as dollars per metric ton of avoided carbon dioxide equivalent (CO_2e) emissions.
- Use of revenues: Electric distribution utilities that generate LCFS credits are required to sell the credits and use the revenue to benefit current or future electric vehicle customers through rebate programs. For all other credit-generating entities, the revenues are an incentive to participate in the LCFS and develop more low-carbon fuels.

Evolution of California's LCFS:

- Executive Order S-3-05 established a GHG emission reduction target for California to reduce GHG emissions to 80 percent below 1990 levels by 2050.
- AB 32 tasked CARB with developing a plan to achieve technologically feasible and cost-effective statewide GHG emission reductions of 1990 levels by 2020. The law did not require CARB to follow any specific regulatory path, instead allowing flexibility in the measures used to achieve this reduction, but it did require CARB to consult with key state energy agencies and account for equity, health, and economic considerations. Pursuant to AB 32, CARB laid out a range of GHG reduction actions in its initial Scoping Plan in 2008.
- Executive Order S-01-07 formally established the LCFS and directs CARB to determine if an LCFS can be adopted pursuant to AB 32. In 2009, CARB introduced the LCFS (17 CCR § 95480 et seq.) and it took effect in 2011.
- Senate Bill 32 (Health & Safety Code § 38566) increased and extended the emission reduction mandate to 40 percent below 1990 levels by 2030. In its 2017 Climate Change Scoping Plan, CARB emphasized developing a more ambitious LCFS as a critical part to meet the new emission reduction mandate set out in SB 32.

Key Outcomes and Next Steps for California LCFS Policy:

Since going into effect, California's LCFS has increased the statewide use of low-carbon fuels: The share of alternative fuels in transportation grew from 6.1 percent to 8.5 percent between 2011 and 2017. The vast majority of this share comes from blended ethanol, biodiesel, and renewable diesel fuels. Furthermore, fuel producers have also taken steps forward toward decreasing the carbon intensity of their fuels. The LCFS market has seen year-after-year growth, with the total value of credit transactions exceeding $2 billion in 2018. CARB's 2018 Resolution 18-34 formally extended the LCFS to 2030 and updated the design and implementation of the program. As 2030 approaches, additional sources of low-carbon fuels will be needed to generate LCFS credits and adjust to the declining target. The current high LCFS credit prices have driven the development of many facilities that are able to produce low-carbon transportation fuels. California's LCFS program has proven to be an effective way to begin reducing the carbon intensity of transportation fuels, incentivize production of low-carbon fuels, and generate revenue to spur additional investment in statewide low-carbon transportation fuel infrastructure. However, with the transportation sector responsible for nearly half of California's GHG emissions, even as the state seeks to increase vehicle electrification and reduce total vehicle miles traveled, continued development of the LCFS will be an essential strategy.