

# **Stillwater LCFS Outlook SAMPLE**

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## Abbreviated Executive Summary

In this report, Stillwater offers a forward-looking view at California Low Carbon Fuel Standard (LCFS) credit balances and prices through 2031.

In Section One, we offer an overview of the LCFS program. California's LCFS program and similar clean fuels programs aim to reduce emissions of greenhouse gasses (GHGs) by reducing the average carbon intensity (CI) of transportation fuels that are used in a particular jurisdiction.<sup>1</sup> Overall program compliance is generally achieved through the substitution of alternative, low-CI fuels for conventional gasoline and diesel fuels. Within the program, entities that supply low-CI fuels generate credits that are then purchased by entities who generate deficits by producing or supplying high-CI fuels. The LCFS establishes annual CI benchmarks (the regulatory target CIs) that decrease each year through 2030. The difference between a particular fuel's CI and the benchmark CI establishes the number of credits or deficits the fuel will generate. Under the LCFS, each fuel is assigned a CI which accounts for feedstock, manufacturing, transport and use of the fuel. The current CI reduction schedule steps down linearly from a 7.5% reduction in 2020 to a 20% reduction by 2030. The standard is currently set to continue at a 20% reduction from the 2010 baseline beyond 2030, but the California Air Resources Board (CARB) has begun the process to update and extend the schedule to greater reductions beyond 2030.

In order to understand the likely forward trajectory of LCFS credit prices, it is important to understand the levers that influenced LCFS credit prices in the first decade of the program. As such, in Section Two of this report we cover how political, legal, regulatory, and market forces have affected LCFS credit prices since the program's inception and how we expect this landscape to shift over the next ten years.

The supply and demand of LCFS credits affect the price of those credits, but those are not the only forces at play. In Section Three, we describe the approach of our analysis of LCFS credit balances and credits. Stillwater's outlook for LCFS credit prices is based on our deep historic knowledge of the LCFS program, our analysis of the demand for fossil gasoline and diesel, the supply of low-CI fuels in California, our outlook on the CI of each fuel pool, and the likely evolution of the LCFS regulation, including CARB's regulatory behavior, historical trends, and the program's impact on transportation fuels markets. For the purposes of this outlook, we assume no additional state-level LCFS type programs are added in this timeframe beyond the current programs in California and Oregon.<sup>2</sup> Our price assessment is clearer in the short-term and is very dependent on CARB's actions for the long term.

In Sections Four and Five, we offer fuel-by-fuel supply, demand, and CI outlooks for each of the deficit-generating (Section Four) and credit-generating (Section Five) fuels covered under the LCFS program. These form the basis for our credit balance outlook through 2031.

To help the reader interpret the modeling results, in Section Six we look at how the different fuel volumes combine to create an overall picture of the gasoline pool and the diesel pool. Examining each of these pools separately enables us to understand how the market is adjusting to the requirements for complying with the LCFS.

Finally, in Section Seven we offer our LCFS credit bank and price outlooks through 2031.

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<sup>1</sup> Carbon intensity (CI) is defined as the emissions of carbon dioxide and equivalents per unit of fuel energy over its full lifecycle; this includes emissions associated with production of feedstocks, transport to the fuel production facility, the production of the fuel, transport of the fuel to market, and tailpipe emissions associated with its end use. Emissions of carbon dioxide from biogenic sources are excluded from this calculation. CI is expressed in units of grams of CO<sub>2</sub> equivalent emissions per megajoule of fuel, gCO<sub>2</sub>e/MJ or, more simply, g/MJ.

<sup>2</sup> Stillwater is not able to assess the potential impact of the recently enacted Washington State program until implementing regulations are proposed by the Washington Department of Ecology. Directionally, the program will increase demand for low-carbon fuels, thus supporting credit prices. This effect is anticipated to be small at the onset of the program, expected for the start of 2023, but may become more significant as 2031 approaches. Canada's federal Clean Fuel Standard is likely to have a larger impact than Washington state's program, but we are similarly unable to assess the total potential impact of Canada's program until the regulations are finalized. As RD is currently a strong driver of the California LCFS program, to the extent that we could, we accounted for the implementation of the forthcoming Washington State and Canadian CFS programs in our RD analysis.