California Low Carbon Fuel Standard

What is the Low Carbon Fuel Standard (LCFS)?

The California LCFS is a statewide market-based policy with the goal of decarbonizing California's transportation fuel mix. The LCFS requires providers of petroleum-based fuels to reduce the carbon intensity of their fuel mix by 20% by 2030, as compared to a 2010 baseline. Simultaneously, the LCFS creates opportunities for entities to generate and sell credits by producing low-carbon fuels and delivering them into California vehicles. The price of credits is determined by supply and demand. Unlike other state climate regulations, the LCFS measures emissions on a well-to-wheel basis, which includes "upstream" emissions from the production and transportation of the fuel.

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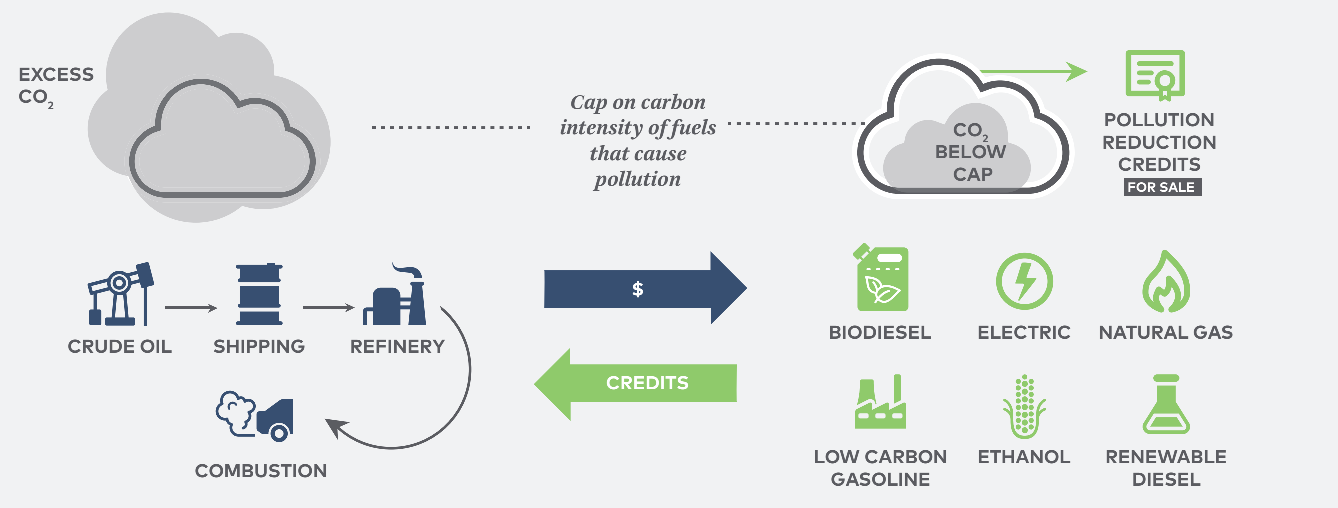
OPERATION OF CALIFORNIA'S LOW CARBON FUEL STANDARD

Businesses that sell fuel with carbon intensity **ABOVE** the benchmark must buy credits

Businesses that sell fuel with carbon intensity **BELOW** the benchmark can sell credits



What is the opportunity under the LCFS?

The LCFS incentivizes low-carbon fueling in California by allowing alternative fuels, such as electricity used to power electric vehicles or renewable natural gas used to fuel CNG vehicles, to generate credits which can then be sold in the LCFS market. Organizations already engaged in low-carbon fueling may be eligible to register those activities under what is referred to as LCFS "pathways". For organizations that have yet to transition to low-carbon fuels, the LCFS can act as a financing mechanism to help pay down the transition costs. With LCFS credit prices hovering around $190/credit, this market can provide significant value to certain low-carbon fueling activities.

An important aspect of the LCFS is the well-to-wheels approach to calculating a fuel's carbon intensity. By valuing upstream emissions, the LCFS rewards fuel producers for reducing emissions, regardless of where they fall within the fuel's lifecycle. For hydrogen used in electric fuel cells, this could mean switching the mode of hydrogen production from steam methane reformation to electrolysis powered by renewable energy. For EV charging, this could mean using renewable electricity instead of standard California grid power. Any upstream emissions reduction gets reflected in the amount of credits the fuel generates, and credits increase proportionately with emissions reductions.

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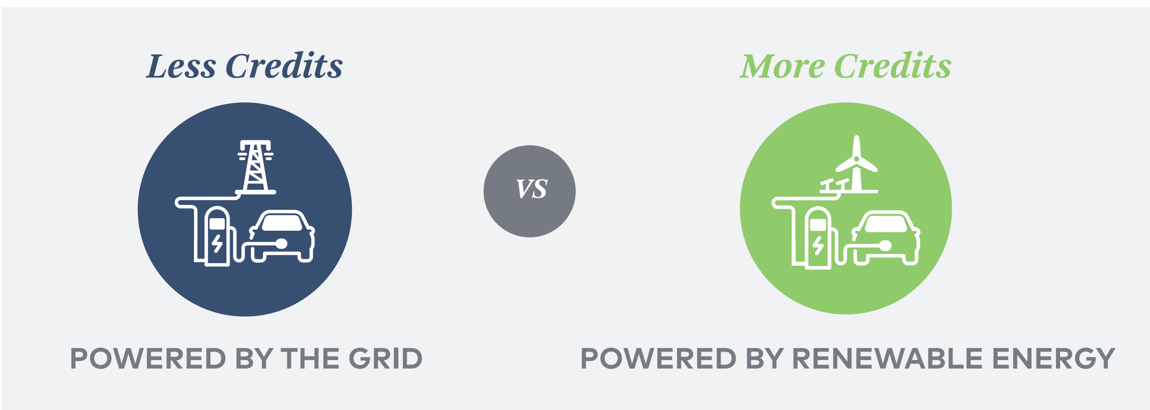

How to get started

1 ***Assess fuel eligibility and carbon intensity***

The first step to generating credits under the LCFS is to assess your fuel eligibility and calculate the carbon intensity of the fuel. As referenced above, there are hundreds of approved pathways under the program and this list is not exhaustive. This is also the step where any opportunities to reduce upstream emissions should be taken advantage of in order to reduce your fuel's carbon intensity.

HOW 3DEGREES CAN HELP

Assess, qualify, and value low-carbon fueling opportunities under the LCFS, calculate a fuel's carbon intensity using the California GREET model, and manage each pathway application through to approval. 3Degrees can also supply eligible green power to reduce a fuel's carbon intensity and augment LCFS revenue.

2 ***Fuel reporting***

Following approval of a pathway under the LCFS, approved entities must fulfill ongoing fuel reporting requirements in the LCFS Reporting Tool (LCFS LRT). These reports must be submitted by quarterly deadlines in order for credit generation to occur.

HOW 3DEGREES CAN HELP

Manage all ongoing reporting requirements under each pathway, provide assurance that all data is verifiable and meets ARB's quality standards, and ensure mandatory reporting deadlines are met.

3

Credit monetization

Once a pathway has been approved for credit generation and satisfies all ongoing reporting requirements, the pathway owner will begin generating credits on a quarterly basis. Credits are issued directly into the entity's LCFS LRT account for sale by the account holder.

HOW 3DEGREES CAN HELP

By leveraging our extensive experience in environmental markets, 3Degrees can advise optimal sales strategies, and structure custom offtake agreements to hedge market risk and provide a more predictable revenue stream.

EXPANDING LCFS COVERAGE

California, Oregon, BC

Existing LCFS or LCFS-like programs

Washington, New York

Legislation has been proposed for a state-wide LCFS-like program

Canada

LCFS-like regulation under development

Conneticut, Delaware, Maine, Maryland, New Hampshire, D.C., Massachusets, New Jersey, Pennsylvania, Rhode Island, Vermont and Virginia

Cap and trade policy for transportation sector under development (Transportation and Climate Initiative)

The transportation sector is now the highest GHG emitting sector in California and the US as a whole. In response to this, states outside of California have or are in the process of adopting LCFS-like programs. By taking advantage of these programs, fleet owners, alternative fuel providers, and infrastructure operators can access financial incentives that can help speed the transition to low-carbon transportation.

[1] Compressed natural gas

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