



The Sol Standard:

Key Insights into LCFS and
Clean Fuels Markets

November 2022

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California LCFS Price Trends

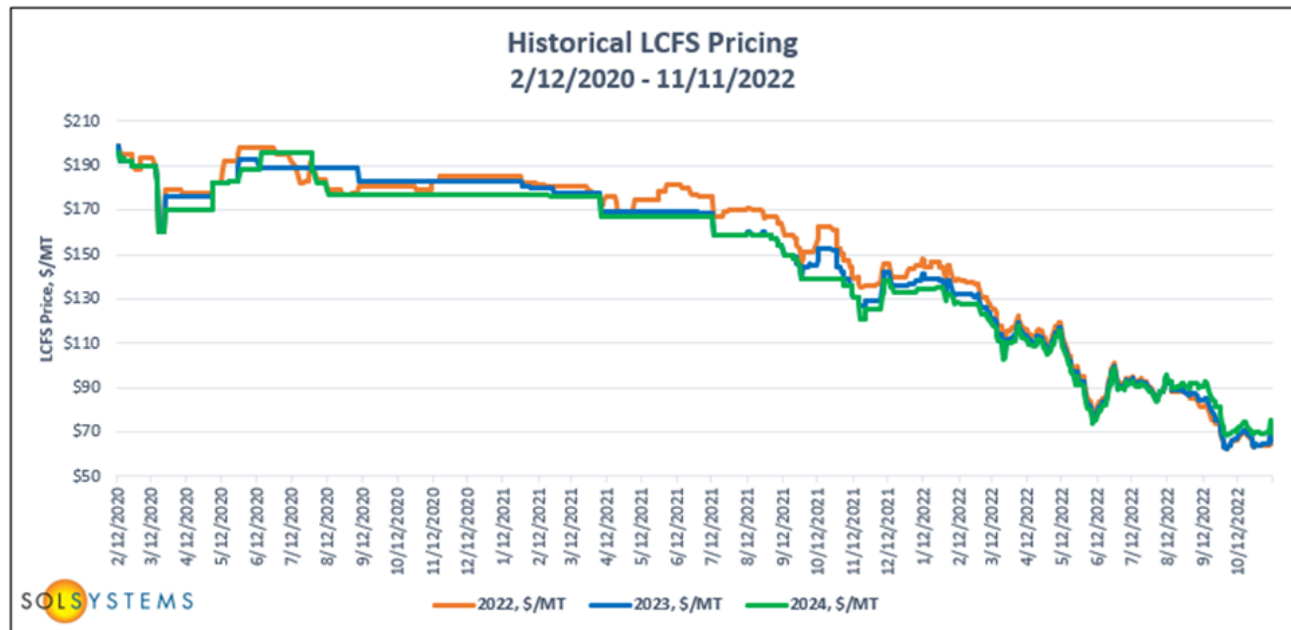
LCFS credit prices in California continue to plummet as supply outpaces demand. Current spot prices for immediate delivery are in the low to mid \$60s, a ~30 percent drop from prices last quarter.

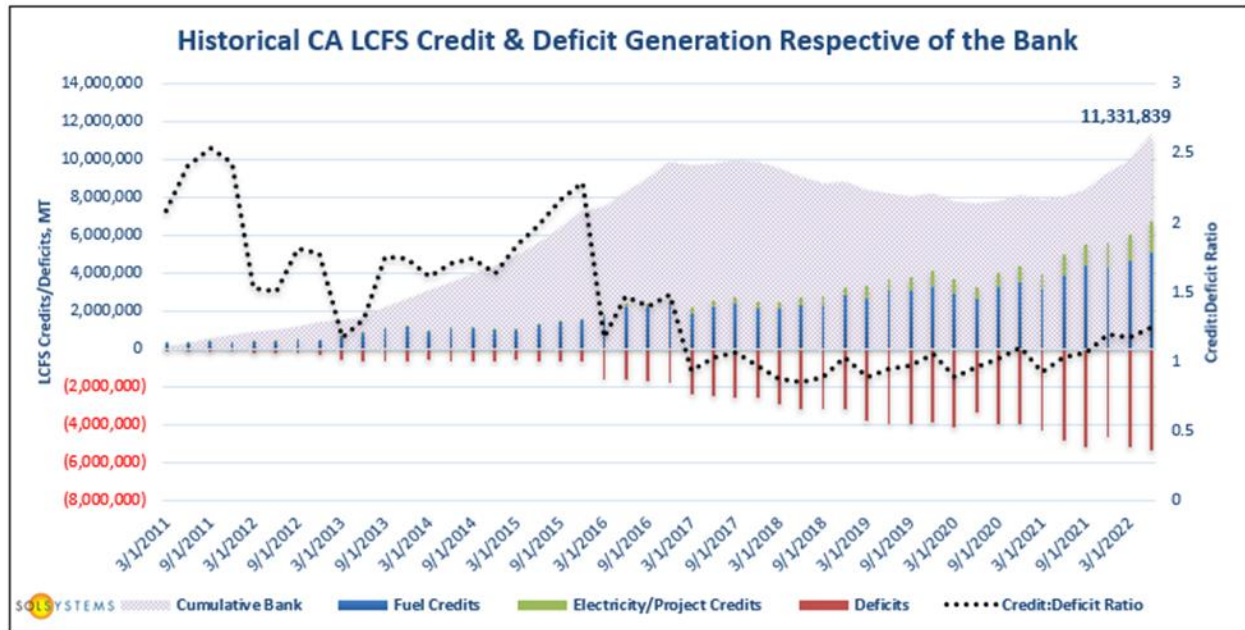
Similar to past quarters when the California Air Resources Board ("CARB") held stakeholder convenings, the market did see a slight uptick on pricing following CARB's November 9, 2022 meeting when pricing was around the \$63-69 range. However, the uptick was short lived.

CARB's Q2 2022 data posted on October 31, 2022 shows an all-time high of credits outpacing deficits with a surplus of 1.35 million metric tons of credits generated in Q2. The credit bank now sits at 11.3 million metric ton credits.

CA LCFS Pricing November 17, 2022

| Delivery Schedule | Bid | Ask |
|--------------------|------|------|
| Immediate Delivery | \$57 | \$61 |
| Q1 2023 Delivery | \$59 | \$63 |
| Q2 2023 Delivery | \$58 | \$62 |
| Q3 2023 Delivery | \$59 | \$62 |
| Q4 2023 Delivery | \$59 | \$65 |





The downward spiral of LCFS pricing over the past year has impacted many stakeholders' infrastructure development plans as well as LCFS credit monetization strategies. With regards to project buildout, developers and investors have been taking a more cautious approach, either delaying or halting projects altogether. For LCFS monetization, many market participants, particularly those in the electricity pathway, are re-thinking the cost-benefit analysis of utilizing renewable energy credits ("RECs") to lower carbon intensity ("CI") scores. In the past, there has been no question of whether purchasing RECs was worth it as the delta between REC purchase costs and LCFS revenue was large enough to make the REC investment pay for itself in multiples (i.e. despite the added REC procurement costs, market participants would generate enough additional LCFS credits from the purchase to come out ahead). As the delta shrinks, purchasing RECs may no longer be worth it. Where that threshold is will differ from participant to participant based on the vehicle type utilized, the energy economy ratio, and other factors. Sol Systems can work with clients to answer any REC related questions and determine what the optimal REC procurement strategy may be. This market dynamic may also put a downward pressure on REC pricing in CA.



Policy Tracker

Existing Markets

California

CARB is continuing to host public workshops to discuss potential changes to the LCFS that would make the program more stringent and accelerate carbon intensity reduction targets. The most [recent workshop](#), held on November 9, 2022, focused on discussing the results of various modeling scenarios. The California Transportation Supply (“CATS”) Model was developed by CARB staff to evaluate potential fuel market and policy assumptions and outcomes. During the workshop, CARB walked through three scenarios that would achieve 90 percent CI reductions by 2045 - increasing interim the CI targets to 25, 30, or 35 percent by 2030. CARB also discussed how other assumptions around crop-based fuel, biomethane crediting, medium and heavy-duty emission vehicle refueling infrastructure, electric forklift crediting, jet fuel, and petroleum crediting were incorporated into the model.

Next steps include another public comment period on the model, scenarios, and assumptions. Stakeholders may [submit feedback](#) through December 2, 2022.

Oregon

Following a series of workshops and public comment periods, Oregon’s Environmental Quality Commission (“EQC”) unanimously approved an expansion of the state’s Clean Fuels Program (“CFP”) on September 23, 2022. The program expansion accelerates the existing carbon intensity reduction targets of 10 percent below 2015 levels by 2025 to 20 percent by 2030 and 37 percent by 2035. Full implementation of the program expansion is slated to begin January 1, 2023.

Washington

Despite Washington’s Clean Fuel Standard (“CFS”) set to begin in less than two months on January 1, 2023, the Washington State Department of Ecology (“WSDOE”) is still finalizing the program’s rules. The WSDOE is expected to release the final rulemaking by the end of November 2022.

In the meantime, however, WSDOE released a [fuel supply forecast](#) for the upcoming compliance period running January 1, 2023 – December 31, 2024. The forecast, which is required as part of the CFS, was completed by a third-party firm, BRG. The report estimates the potential volume of various fuels available to Washington, banked and carried over deficits by regulated parties and market participants, and the number of credits needed to meet the CFS in the first compliance period. BRG’s analysis indicated that Washington’s fuel volume demand can be met by the available production capacity of Washington and neighboring states and regions. In addition, the report forecasted a significant credit bank balance to be built up for the years 2023 and 2024.

Canada

No major activity this past quarter. Please see [Sol’s August Standard](#) for the most up to date information.

British Columbia

While there are still no updates to the [Low Carbon Fuels Act \(Bill 15\)](#) introduced on May 9, 2022 which would expand the province's LCFS program, British Columbia has been working in other ways to further decarbonize its energy footprint. In October 2022, Bruce Ralston, the Minister of Energy, Mines, and Low Carbon Innovation announced the establishment of the BC Energy Regulator, which would replace the BC Oil and Gas Commission and have expanded responsibilities including over hydrogen. The aim is to unify various patchwork energy programs under one umbrella and create more cohesion around project development, permitting, and other processes. With this move, British Columbia hopes to expedite the production and use of hydrogen within its boundary lines.

Emerging Markets

Q3 followed in Q2's footsteps with very little activity at the state level focused on adoption of new low carbon fuel standards. Please see [prior Sol Standard newsletters](#) for activity in previous quarters.

Delaware

While an LCFS is unlikely in the near future, we can expect to see more activity around clean car regulations in Delaware in the coming year. The state's Department of Natural Resources and Environmental Control and Department of Transportation are working together on efforts to develop an Electric Vehicle Infrastructure Plan as well as adopting California's Advanced Clean Cars II Program.

Public meetings are currently being held to discuss both strategies between November 14, 2022 and November 17, 2022. More information on the meetings and registration links can be found [here](#).

New York

Talk of an LCFS in New York has resurfaced once again in meetings of the state's Climate Action Council ("CAC"). The latest version of the CAC's climate transportation scoping plan recommends the evaluation and adoption of a clean fuel standard. While there has been strong support over the years for a clean fuel standard in New York and several attempts at passing regulation, efforts have thus far been halted due to concerns raised around environmental justice and impact on lower-income communities. However, advocates for a clean fuel standard have highlighted pathways for an equitable transition to cleaner transportation fuels, including the reinvestment of proceeds from a clean fuel standard into low-income communities. The CAC is expected to finalize and vote on the scoping plan before year's end.

While the future of an LCFS is still up in the air, Governor Hochul is making a push to reduce the state's transportation emissions via other avenues. She commemorated National Drive Electric Week in September by directing New York's Department of Environmental Conservation to take major regulatory action that will require all new passenger cars, pickup trucks, and SUVs sold in New York to be zero emissions by 2035. The initiative builds on the Advanced Clean Trucks Rule that New York adopted in December 2021 which requires manufacturers of vehicles greater than 8,500 pounds to sell an increasing number of zero-emission vehicles in New York starting in 2025 with a goal to achieve a full fleet turnover to EVs by 2035.

Federal Update

Industry Waits on E-RIN Clarity as the EPA Delivers RFS Program Rulemaking Updates to the White House

On November 9, 2022, the Environmental Protection Agency (“EPA”) delivered the proposed renewable volume obligations (“RVOs”) for the Renewable Fuel Standard (“RFS”) to the White House Office of Management and Budget (“OMB”). Once OMB reviews, the RVOs will be released for public comment. The EPA is required to release the RVOs by November 30, 2022 and finalize them by June 14, 2023.

One aspect of EPA's rulemaking that is making headlines is how the agency will handle an electric renewable identification number (“e-RIN”) pathway which would allow electric vehicles (“EVs”) utilizing renewable fuels to generate and monetize credits as part of the RFS. If included, this additional revenue stream to EV carmakers and charging network operators would help accelerate EV growth. [Several news outlets](#) have reported that e-RINs are expected to be included in EPA's latest proposal. The EPA has not confirmed any of the speculation, but more information should be available in the coming weeks when the rulemaking is released to the public.



THE SOL STANDARD



SOL'S LCFS MANAGEMENT & MONETIZATION SERVICES

Sol Systems provides 100 percent turnkey LCFS management and monetization services to make LCFS market participation as simple and streamlined as possible. Our team provides hands-on, dedicated customer support, a client dashboard for real-time status updates, and transparent & low fees all while offloading the following administrative responsibilities from our clients:

- Fuel pathway certifications
- Fuel equipment registrations
- Reporting
- Compliance filings
- Invoicing & payments
- Carbon intensity ("CI") score optimization / book-and-claim services
- Marketing to buyers
- Inventory management

Sol Systems LCFS management & monetization services help save our clients hundreds of hours and thousands of dollars in cost each year.

Contact Sol Systems to Learn More
lcfs@solsystems.com

Book-and-Claim Services

LCFS and clean fuels programs reward market participants for lower CI scores – the lower the CI of a fuel type, the more LCFS credits will be generated, thereby boosting revenue. While there are a few ways to lower CI scores, one of the faster routes is to purchase and retire renewable energy credits via a process called book-and-claim. Doing so can boost LCFS generation and revenue by 20-40 percent (depending on the client type).

Sol Systems has come across many LCFS market participants that are leaving valuable revenue on the table by not utilizing book-and-claim.

Sol Systems can help clients take advantage of book-and-claim and will manage all of the nuanced requirements associated with the process.

Monetization Options

Sol Systems has pioneered several monetization options for environmental commodities. Whether clients are looking for short-term spot solutions or long-term hedged products, **Sol Systems can help.**

Sol Brokerage

A spot solution that allows clients to take advantage of current market rates.

Sol Annuity

A fixed-price, fixed-term strip that reduces market risk. Clients receive a steady stream of payments regardless of fluctuations or volatility in the market.

Sol Upfront

An upfront, lump-sum payment that helps offset initial capital investment costs and eliminates regulatory risk

Sol Profit Share

A hybrid product that allows clients to lock in a fixed-floor price for a set period, mitigating market risk, while receiving an agreed-upon percentage of upside above a **strike price**. As an added bonus, Sol Systems donates 5 percent of its share to nonprofits working to support renewable energy and sustainability.

Linking LCFS to Impact



Sol Systems has always been a mission-oriented company and we strive to work with our clients so their renewable energy investments have broader community and social impact. In the LCFS market in California, CARB requires that credit proceeds be used to further EV adoption in the state. While there is flexibility in how credit generators comply with this requirement, Sol Systems enjoys working with clients to identify and execute on unique ideas that achieve both transportation decarbonization goals as well as other corporate social responsibility commitments. Examples of programs that Sol can work with clients on include deployment of EV chargers in low-income communities, establishment of EV ride share programs, EV fleet deployment for schools, EV workforce development programs, and more.





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