



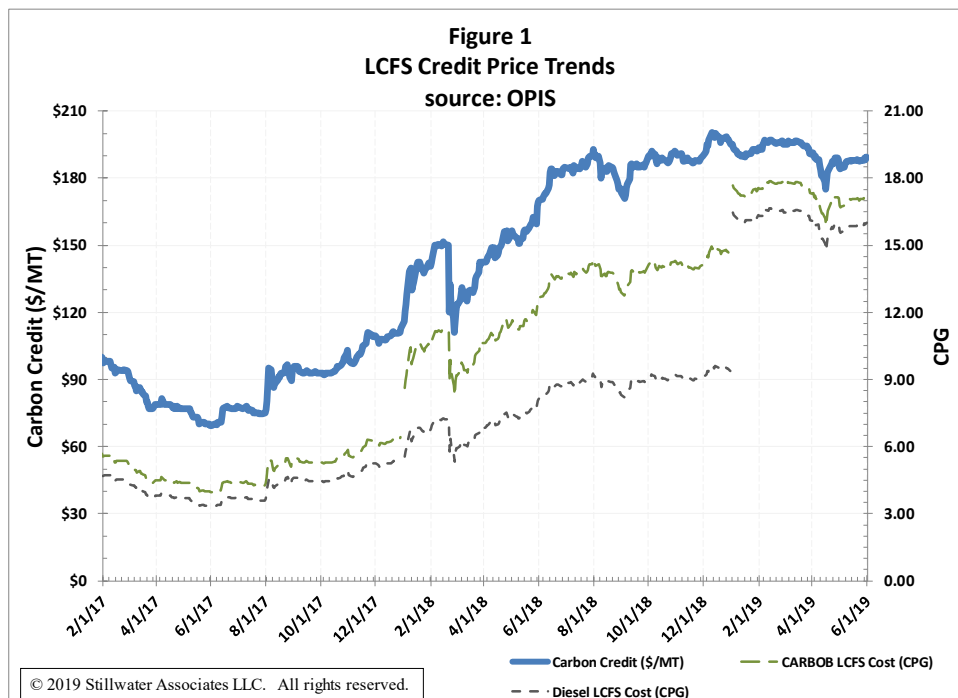
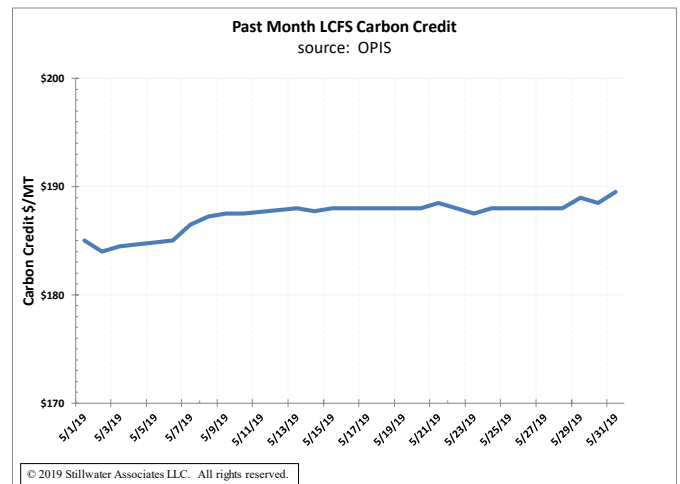
## California Low Carbon Fuel Standard (LCFS) Monthly Newsletter May 2019

### In this monthly edition...

- ⇒ Credit price remained stable throughout the month closing at \$189.50.
- ⇒ Credit trades and volumes are down more than 40%.
- ⇒ Oregon DEQ announces the first Credit Clearance Market of the Clean Fuels Program.

### LCFS Credit Price Trend

For May, LCFS credit prices ranged from \$184 to \$189.50 per metric ton (MT) of carbon dioxide equivalent (CO<sub>2</sub>e). The month closed out at \$189.50/MT – \$1.00 (0.50%) higher than the April closing price of \$188.50/MT. For May, prices averaged \$187/MT compared to an average of \$157/MT for the same month last year and an overall average of \$170.20/MT for 2018. For 2019, a credit price of \$189.50/MT correlates to 17.2 cents per gallon (CPG) for gasoline and 16.0 CPG for diesel. During 2019, LCFS credit prices have averaged \$191/MT, with a low of \$175/MT and a high of \$197/MT – that high being recorded most recently on February 14<sup>th</sup>.



## LCFS Credit Trading

Table 1 displays the number, volume, and average price of credits as reported in the California Air Resources Board (CARB) [Monthly LCFS Credit Transfer Activity Report for May](#).

**Table 1  
LCFS Credit Trading Reported by CARB**

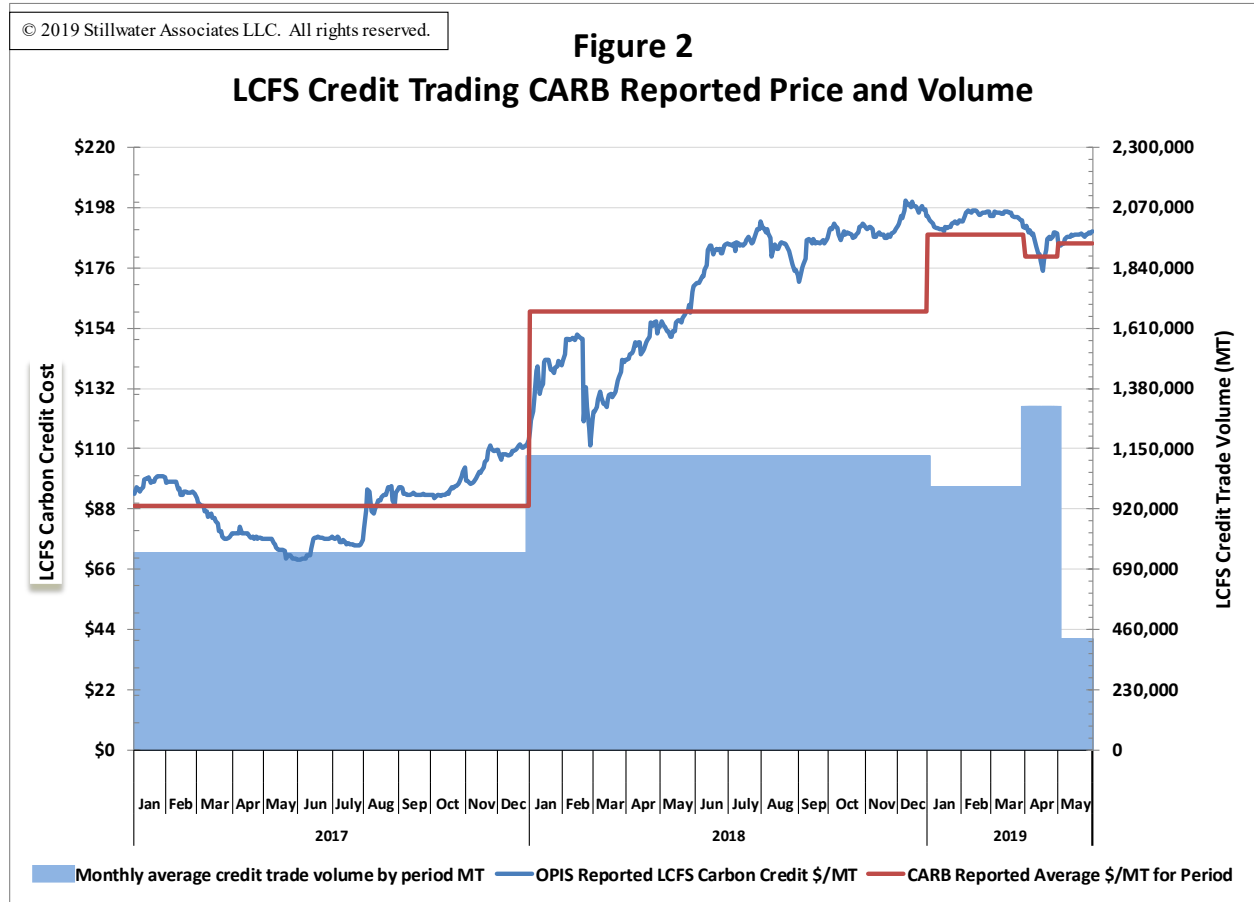
Time Period	Total Transfers (number)	Total Volume (credits-MTs)	Avg. Price (\$ per Credit) Per ARB Report	Price Range (\$ per Credit)	Ave Transaction Size - MT	Transactions per Week
CY 2012	24	164,000	\$17		6,833	0.5
CY 2013	202	887,000	\$55		4,391	3.9
CY 2014	304	1,667,000	\$31		5,484	5.8
CY 2015	578	2,852,000	\$62		4,934	11.1
CY 2016	929	5,343,000	\$101		5,751	17.8
CY 2017	1226	8,875,000	\$89		7,239	23.5
CY 2018	1725	13,334,000	\$160		7,730	33.1
Q1 2019	373	2,972,000	\$188		7,968	29.0
Apr-19	131	1,299,000	\$180	\$131 - \$199	9,916	30.6
May-19	76	408,000	\$185	\$100 - \$195	5,368	17.2
<b>TOTALS</b>	<b>5,568</b>	<b>37,801,000</b>	<b>\$122</b>		<b>6,789</b>	<b>14.4</b>

Number of RPs	Selling	Buying	Both
	112	28	99

Source: CARB Monthly LCFS Credit Trading Activity Report for May 2019 and prior reports

The number of reported transactions decreased by 42% from 131 in April to 76 in May. The volume of credits also decreased by 69% from 1,299,000 MT in April to 408,000 MT reported in May. CARB's reports may include some related party transactions. The May volume-weighted average price reported by CARB was \$185/MT, which is 1% lower than the \$187.11/MT average calculated by daily price reports.

Figure 2 graphically illustrates the monthly average transaction values and the volume of credits traded, as reported by CARB, and shows the LCFS credit price reported daily by OPIS.



**Monthly Highlight #1: Will 2019 LCFS deficits be higher due to the 2018 Annual Crude Average CI Calculations?**

On June 17<sup>th</sup>, CARB staff posted a Preliminary Draft of the 2018 Annual Crude Average Carbon Intensity (CI) calculation. This draft is based on preliminary information from the California Department of Conservation for crudes produced in California; the final 2018 Crude Average Carbon Intensity Value will be published at a later date when final data becomes available. At that time, CARB will open a 15-day public comment period.

The preliminary draft of the 2018 calculation is based on the crude CI values in the 2016 amendments, and the 2018 weighted average crude CI comes out to 12.23 gCO<sub>2</sub>e/MJ. When the 2018 crude CI is volume-averaged with 2016 and 2017 weighted average crude CI, the three-year average is 12.10 gCO<sub>2</sub>e/MJ. This compares to the 2010 baseline crude CI of 11.91 gCO<sub>2</sub>e/MJ and represents a 0.19 gCO<sub>2</sub>e/MJ higher value for the three-year average.

According to the LCFS regulation, if the three-year average crude CI exceeds the baseline by 0.10 gCO<sub>2</sub>e/MJ or more, incremental deficits for CARBOB or diesel fuel from the increase in the crude CI will be added as incremental deficits to each affected fuel in the following year. If the 0.19 gCO<sub>2</sub>e/MJ three-year average carries through to the final calculation, application of this provision will result in a 400,000 MT increase in deficits based on 2018 CARBOB and ULSD volumes. If implemented, this will be the first time an incremental deficit will be added to petroleum fuels because the average crude CI exceeded the 2010 crude CI baseline.

The concept of measuring the average CI of crude oils processed in California and penalizing if above the baseline dates back to the inception of the LCFS. Each subsequent version of the regulation carries forward the concept that California's refineries should not process a more carbon intense crude oil mix than was processed in 2010. This provision was intended primarily to limit the potential for processing of heavy oils from Canada. Now, in the ninth year of the program, this provision may come into effect and increase the deficit pool. At current market prices for LCFS credits (\$190/MT), the additional cost for the 400,000 MT deficit increase created by the enforcement of this provision would be approximately \$76 million.

## **Monthly Highlight #2: Oregon’s First Credit Clearance Market**

On May 31<sup>st</sup>, the Oregon Department of Environmental Quality (DEQ) issued a statement explaining the need for a Credit Clearance Market (CCM) to enable deficit holders in the Clean Fuels Program (CFP) to balance their accounts for the 2018 calendar year. Six entities (ARS Fresno, Conrad & Bischoff, Costco, Pilot, Pounder Oil Service, and Tyree Oil) ended the year with a net combined total of 8,056 MT in deficits. This represents less than 1% of the nearly 900,000 deficits or 978,000 credits generated in 2018. The six entities generated deficits as regulated importers of gasoline and/or diesel and had until the end of April of 2019 to balance their 2018 accounts to avoid being automatically entered into the CCM. Four parties (BP, McCall, Portland General Electric, and SeQuential Biodiesel) pledged a total of 54,000 credits into the CCM – more credits than necessary to cover the total of deficits. As such, all six deficit holders are required to fully cover their 2018 deficits through credit purchases in the CCM.

Oregon’s first-ever CCM seems to differ from the first CCM held by CARB in 2016 to enable a single entity (Astra Oil) to balance its small net deficit for 2015. At that time, three parties pledged more than sufficient credits to meet Astra’s shortfall. The 2016 California CCM appeared to be a “test run” to demonstrate how it would work. This year’s Oregon CCM, with six deficit-holding entities participating, appears to be less of a test run and more of a necessity. Table 1 below compares credit balances in the two markets for the year in which each had its first CCM.

**Table 1. LCFS and CFP Credit Balances in Years with CCM**

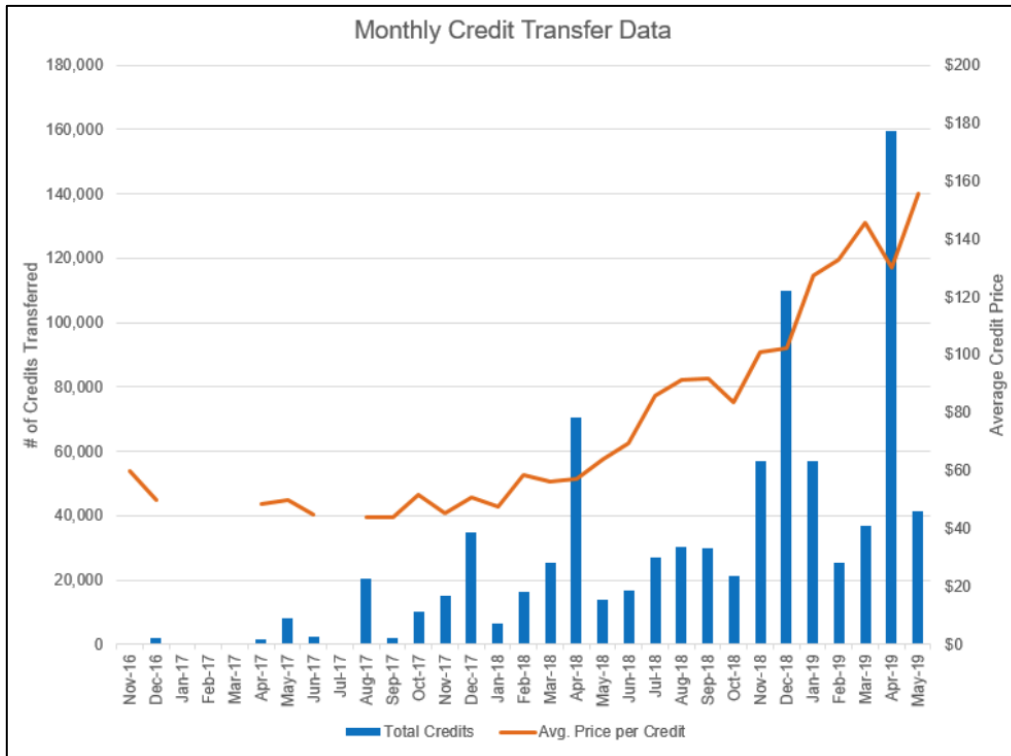
	<b>CA LCFS 2015</b>	<b>OR CFP 2018</b>
<b>Credits Generated (million MT)</b>	5.49	0.98
<b>Deficits Generated (million MT)</b>	2.63	0.90
<b>Net Credits (million MT)</b>	2.86	0.08
<b>Excess Credits (% of deficits)</b>	109%	9%
<b>Total Credits Traded (million MT)</b>	2.85	0.42
<b>Total Credits Traded (% of deficits)</b>	108%	47%

While both markets had credits generated in excess of deficits, the California market’s excess in 2015 was proportionally eleven times larger than that of Oregon in 2018, which indicates a much tighter market. In addition, as noted in prior Stillwater commentaries, the credit bank accumulated in the first few years of the California program was much larger than observed in the CFP. This is due to a combination of Oregon’s competition with the established California market for low carbon alternative fuels and a lower carbon intensity baseline in Oregon’s diesel pool which contained 5% biodiesel.

Table 1 also lists total credits traded during the calendar year for each program. It shows the credit volume transferred is proportionally lower by half in Oregon. While this might not be that significant, looking at the recent volume trends in Oregon might provide more insights. Figure 1 below shows DEQ data on CFP credit transfers and the prices reported

for the transfers. Notice the spike in volumes transferred each April of the last two years, the last month for entities to cover their deficits before being required to participate in a CCM. The record volume of 159,000 credits transferred in April of 2019 is more than double the average number of deficits (75,000) generated per month. These trends indicate that some deficit-generating entities need to catch up on credit purchases months after generating deficits. Corresponding volume spikes in each of the last two Decembers support this idea that some deficit-generating entities are not purchasing ratably and instead catch up on their credits balances at year end.

**Figure 1. CFP Credit Transfer Data**




Source: Oregon Department of Environmental Quality

Notice also in Figure 1 that average transaction price declined in April even though there was a record number of credits sold. Buyers did not need to “bid up” prices during that month in order to obtain most of the credits they needed. Sellers supplied the large number of credits in April at a price lower than seen in March. However, the rising price trend observed over the past 18 months continued in May, as one might expect in a balanced-to-slightly-short market with a modest credit bank and competition for lower-carbon fuels from the larger California market.

Lastly, the information DEQ provided on the entities participating in credit transfers is displayed in Table 2 below. The table provides some insight into the nature of the CFP credit market. There are more entities only buying credits (33) than those only selling (21). While it is possible some of those only buying credits might be traders building positions in a strong bull market, it is likely that most are deficit generators. Those who are only

selling probably have significant length that needs to be monetized. The last group are traders who have been making tidy profits if they bought early and have carried that length forward.

 State of Oregon Department of Environmental Quality <b>Monthly CFP Credit Transfer Report for May 2019</b> Posted on 6/4/2019			
<b>Time Period</b>	<b>Transfers (number)</b>	<b>Total Volume (credits-MTs)</b>	<b>Avg. Price <sup>1</sup> (\$ per Credit)</b>
May 2019	12	41,220	\$155.63
<b>Previous Three Months</b>			
April 2019	48	159,552	\$129.96
March 2019	14	36,999	\$145.45
February 2019	7	25,302	\$132.63
<b>Previous Three Quarters</b>			
Q1 2019	35	119,389	\$133.69
Q4 2018	54	188,266	\$100.21
Q3 2018	24	86,054	\$89.70
<b>Previous Three Years</b>			
CY 2018	134	423,957	\$84.06
CY 2017	47	93,786	\$48.09
CY 2016	2	2,300	\$51.30

<b>Price Range in May 2019 <sup>1</sup> = \$137.00 to \$165.00 per Credit</b>
<b>Entities Participation in Transfers through May 2019:</b>
<b>Number Only Selling = 21</b>
<b>Number Only Buying = 33</b>
<b>Number Selling and Buying = 19</b>
<b>Total Credits Transferred through May 2019 = 840204 MT</b>

Source: <https://www.oregon.gov/deq/aq/programs/Pages/Clean-Fuels-Data.aspx>



**In the News – May 2019**

On May 1<sup>st</sup>, CARB posted revised versions of its LCFS guidance in the areas of: Book-and-Claim Accounting for Low-CI Electricity, Cost and Revenue Reporting for Fast Charging Infrastructure (FCI) and Hydrogen Refueling Infrastructure (HRI), and Reporting for Incremental Credits for Residential Electric Vehicle (EV) Charging. The revised guidance can be found on CARB's website here: <https://www.arb.ca.gov/fuels/lcfs/guidance/guidance.htm>

On May 7<sup>th</sup>, CARB posted substitute pathways and default blend levels available for LCFS Reporting for specific fuel transaction types. According to the posting, “these must be used for reporting fuel quantities in the LCFS Reporting Tool and Credit Banking System (LRT-CBTS) when the actual Carbon Intensity (CI) or blend levels are not known.” More information is available on CARB's website here: <https://www.arb.ca.gov/fuels/lcfs/fuelpathways/subpathwaytable.htm>

The Weekly Credit Transfer Report for April 29 – May 5 was posted on CARB's website on May 7<sup>th</sup>.

- California Air Resources Board. Weekly LCFS Credit Transfer Reports. May 7, 2019. <https://www.arb.ca.gov/fuels/lcfs/credit/lrtweeklycreditreports.htm>

On May 8<sup>th</sup>, CARB posted revised new temporary carbon intensity (CI) values for renewable propane. More information can be found on CARB's website: [https://www.arb.ca.gov/fuels/lcfs/fuelpathways/comments/tier2/tier2\\_comments.htm](https://www.arb.ca.gov/fuels/lcfs/fuelpathways/comments/tier2/tier2_comments.htm)

On May 9<sup>th</sup>, CARB posted a new draft LCFS guidance document that summarizes and describes the requirements for registration of Fueling Supply Equipment (FSE) for reporting Natural Gas, Electricity, Propane and Hydrogen in the LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS). Reporting templates were also made available with this guidance. More information can be found on CARB's website: <https://www.arb.ca.gov/fuels/lcfs/guidance/guidance.htm>

On May 9<sup>th</sup>, CARB also posted a 15-day Notice of Public Availability of Modified Text and Availability of Additional Documents and Information for the Proposed Amendments to the Zero-Emission Airport Shuttle Regulation. The notice can be found on CARB's website: <https://www.arb.ca.gov/regact/2019/asb/15daynotice.pdf>

On May 10<sup>th</sup>, CARB posted a new draft guidance document that summarizes and describes the reporting and recordkeeping requirements for natural gas used as a transportation fuel, and the use of book-and-claim accounting for biomethane. The draft guidance can be found on CARB's website: <https://www.arb.ca.gov/fuels/lcfs/guidance/guidance.htm>



The Weekly Credit Transfer Report for May 6-12 was posted on CARB’s website on May 14<sup>th</sup>.

- California Air Resources Board. Weekly LCFS Credit Transfer Reports. May 14, 2019. <https://www.arb.ca.gov/fuels/lcfs/credit/lrtweeklycreditreports.htm>

On May 15<sup>th</sup>, CARB announced that the LCFS had achieved full (100%) compliance for 2018. No Credit Clearance Market (CCM) will be held in 2019 as all Entities met their 2018 compliance.

- California Air Resources Board. 2018 LCFS Compliance Information and Credit Clearance Market Information. May 15, 2019. [https://www.arb.ca.gov/fuels/lcfs/2018compliance-ccm\\_051519.pdf](https://www.arb.ca.gov/fuels/lcfs/2018compliance-ccm_051519.pdf)

On May 17<sup>th</sup>, CARB announced that it will host a public workshop on the Fiscal Year 2019-2020 Funding Plan for Clean Transportation Incentives. The workshop will take place on June 13<sup>th</sup> in Sacramento. More information can be found on CARB’s website: <https://www.arb.ca.gov/msprog/mailouts/msc1912/msc1912.pdf>

On May 19<sup>th</sup>, The Business Telegraph reported that Power Ledger completed a trial implementation of a blockchain solution for tracking and monetizing renewable electricity for electric vehicles. Power Ledger’s streamlined platform tracks LCFS credit generation from solar panels, electrical vehicle charging infrastructure, and credit trading on the blockchain. The company’s chairman, Dr. Jemma Green, says that the project has “established a template for a blockchain-enabled solution for the measurement, reporting and verification of carbon credits, replacing a manual collection process that could often take months to validate.” Furthermore, Dr. Green states that Power Ledger’s trial “demonstrated a potential use case for creating a secondary market with digital exchange for tokenising and trading LCFS credits.”

- The Business Telegraph. Power Ledger to Transform Electric Cars into Mobile ATMs – ICO Examiner News. May 19, 2019. <https://www.businesstelegraph.co.uk/power-ledger-to-transform-electric-cars-into-mobile-atms-ico-examiner-news/>

On May 21<sup>st</sup>, CARB published a press release announcing that its final 2018 data on the LCFS program showed that “nearly 3.3 billion gallons of petroleum diesel have been displaced by clean, low-carbon alternatives” and that the LCFS “continues to drive production of a growing volume of cleaner transportation fuels for California consumers.”

- California Air Resources Board. CARB: Cleaner fuels offset 3 billion gallons of diesel under LCFS. Ethanol Producer Magazine. May 21, 2019. <http://www.ethanolproducer.com/articles/16220/carb-cleaner-fuels-offset-3-billion-gallons-of-diesel-under-lcfs>

On May 21<sup>st</sup>, CARB posted a new draft LCFS guidance document that provides an example of modifications that could be made to a Simplified CI Calculator for biomethane to determine the CI of biogas-to-electricity pathways as part of a Tier 2 pathway application. More information can be found on CARB’s website: [https://www.arb.ca.gov/fuels/lcfs/guidance/lcfsguidance\\_19-06.pdf](https://www.arb.ca.gov/fuels/lcfs/guidance/lcfsguidance_19-06.pdf)

The Weekly Credit Transfer Report for May 13-19 was posted on CARB’s website on May 21<sup>st</sup>.

- California Air Resources Board. Weekly LCFS Credit Transfer Reports. May 21, 2019. <https://www.arb.ca.gov/fuels/lcfs/credit/lrtweeklycreditreports.htm>

On May 28<sup>th</sup>, Globe Newswire reported that bio-based diesel is delivering the largest portion of the GHG-emissions reductions under the LCFS. According to Allen Schaeffer, executive director of the Diesel Technology Forum: “The pairing of biofuels with new-generation diesel engines is, hands down, one of the most effective – and underrated – ways to reduce greenhouse gas emissions from heavy-duty transportation sources.” Schaeffer says that electric cars may dominate headlines, but those cars and trucks only contribute a third of the emissions reductions of diesel biofuels.

- Globe Newswire. Bio-based Diesel Fuels Deliver the Biggest Reductions in Transportation-Related Greenhouse Gas Emissions in California – Ever. Yahoo Finance. May 28, 2019. <https://finance.yahoo.com/news/bio-based-diesel-fuels-deliver-100500080.html>

The Weekly Credit Transfer Report for May 20-26 was posted on CARB’s website on May 28<sup>th</sup>.

- California Air Resources Board. Weekly LCFS Credit Transfer Reports. May 28, 2019. <https://www.arb.ca.gov/fuels/lcfs/credit/lrtweeklycreditreports.htm>

On May 29<sup>th</sup>, Yale’s Clean Energy Finance Forum published an article looking at whether the LCFS is successfully incentivizing electric vehicle deployment. According to Sola Zheng of Yale’s Center for Business and the Environment, “research and interviews with stakeholders in the EV industry suggest the LCFS program design of capacity-based credits has the potential to increase EV deployment.” Zheng continues: “However, this research indicates some unanswered questions need to be addressed before the point-of-sale rebate program can do the same.”

- Zheng, Sola. Is California’s Low Carbon Fuel Standard Incentivizing Electric Vehicle Deployment? Clean Energy Finance Forum. May 29, 2019. <http://cleanenergyfinanceforum.com/2019/05/29/is-californias-low-carbon-fuel-standard-incentivizing-electric-vehicle-deployment>

The Weekly Credit Transfer Report for May 27-June 2 was posted on CARB’s website on June 4<sup>th</sup>.

- California Air Resources Board. Weekly LCFS Credit Transfer Reports. June 4, 2019. <https://www.arb.ca.gov/fuels/lcfs/credit/lrtweeklycreditreports.htm>

**LCFS News Beyond California**

Democratic presidential hopefuls are incorporating climate change policies, including a federal clean fuel standard akin to California's LCFS, into their platforms. The first week of May, two such candidates – Governor Jay Inslee of Washington and former congressman Beto O'Rourke of Texas – outlined their plans to curb climate change. Both Inslee and O'Rourke support a federal clean fuels program in addition to other approaches to emissions reductions.

- Jenkins, Austin. Inslee unveils aggressive plan to cut the nation's greenhouse gas emissions in half by 2030. Northwest News Network. May 03, 2019.  
<https://www.kuow.org/stories/inslee-unveils-aggressive-plan-to-cut-the-nation-s-greenhouse-gas-emissions-in-half-by-2030>
- Tolan, Casey. How would presidential candidates fight climate change? California offers a roadmap. The Times-Herald. May 3, 2019.  
<https://www.timesheraldonline.com/2019/05/03/presidential-election-climate-change-inslee-orourke-california/>

On May 8<sup>th</sup>, the Oregon Department of Environmental Quality (DEQ) published a number of updates, reports, and data on the Oregon Clean Fuels Program (CFP), as listed below:

- [Annual cost of the Clean Fuels Program for 2018](#)
- [Q4 2018 quarterly data summary](#)
- [April 2019 monthly credit transaction report](#)
- [OR-GREET 3.0 Tier 1 Calculator user manual](#)
- [2018 report and audit and 2019 workplan for the Backstop Aggregator](#)
- [Updated list of registered parties](#)

On May 13<sup>th</sup>, the Supreme Court chose not to review a Ninth Circuit Court of Appeals decision rejecting the American Fuel and Petrochemical Manufacturers' challenge to Oregon's CFP. The Supreme Court's decision allows Oregon's CFP to continue to be implemented. Freight Waves reported on what this decision means for the Oregon program while also exploring how much programs like Oregon's CFP and California's LCFS add to the price of a gallon of fuel at the pump.

- Kingston, John. Oregon's path to lower carbon fuels is clear; what does that mean for the price at the pump? Freight Waves. May 14, 2019.  
<https://www.freightwaves.com/news/oregons-path-to-lower-carbon-fuels-is-clear-what-does-that-mean-for-the-price-at-the-pump>

On May 15<sup>th</sup>, Oregon's Department of Environmental Quality (DEQ) announced by e-mail that it will hold a Credit Clearance Market (CCM) beginning June 1<sup>st</sup> for participants in the Clean Fuels Program (CFP) that have not yet met the 2018 credit compliance deadline. This will be the first CCM held by either California's LCFS or Oregon's CFP. DEQ states that "More than 99 percent of obligations have been met, but the Market will support the remaining regulated parties offering a last opportunity to reconcile accounts." Additionally, DEQ assures that "Currently, there are more credits pledged to the Market than what are needed to meet outstanding compliance obligations. Leftover credits will be returned to parties that pledged them after the Market closes." Additional details on the CCM will be issued prior to the market's launch on June 1<sup>st</sup>.

On May 31<sup>st</sup>, Oregon’s Department of Environmental Quality (DEQ) published more information about its upcoming Credit Clearance Market (CCM). The CCM began June 1<sup>st</sup> for Clean Fuels Program (CFP) participants who had not yet met the 2018 credit compliance deadline. Regulated parties with uncovered compliance obligations are required to buy credits in the CCM to cover their outstanding deficits. For 2019, 8,056 deficits must be covered. More credits have been pledged than are needed; as such, each regulated party must purchase its full compliance obligation as designated in their 2018 annual report. DEQ does not disclose deficit balances or purchase requirements of regulated parties, but it does offer a list of participating entities. The regulated parties required to participate in the 2019 CCM are: ARS Fresno, Conrad & Bischoff, Costco Wholesale Corporation, Pilot Travel Centers, Pounder Oil Service, and Tyree Oil. The parties pledging credits to sell into the 2019 CCM are: BP Products North America (40,000 credits pledged), McCall Oil and Chemical (4,000 credits pledged), Portland General Electric (9,000 credits pledged), and SeQuential Biodiesel (1,000 credits pledged). More information is available on DEQ’s website: <https://go.usa.gov/xmsQY>.

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The California Low Carbon Fuels Standard (LCFS) Monthly Update is a publication of Stillwater Associates LLC. It is scheduled to be published the third Tuesday of every month. Stillwater Associates is a transportation fuels consulting firm specializing in helping our clients navigate the confluence of traditional and renewable fuels.

Stillwater Associates LLC also publishes weekly and quarterly on LCFS covering credit trading and analysis, and program trends respectively (subscription required). For more information, please visit our website <http://www.stillwaterpublications.com>.

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