

The LCFS Credit Clearance Market: What Might Happen?

Summary

With annual Low Carbon Fuel Standard (LCFS) deficits exceeding credits this year and that trend projected to continue for at least a few years, the credit bank that was built through 2016 will need to be drawn on for compliance. The majority of the credit bank is held by a few Entities,¹ and if these Entities endeavor to maintain their respective banks, the availability of LCFS credits will tighten. If insufficient credits are made available in the market, Entities that need credits to comply may end with a net deficit position in their annual compliance report, making them subject to the Credit Clearance Market (CCM), often referred to as “the price cap.” The objective of this paper is to explain how this feature of the LCFS works.

The CCM ends each year’s compliance activities for LCFS Entities. It is designed to match Entities that have credits to offer with Entities that have a deficit in their annual compliance report by facilitating transactions with an established maximum credit price. As long as more credits are offered than the aggregate deficits, the CCM will clear all deficits. If there are more deficits than credits offered, the net deficits become Accumulated Deficits with a five percent annual interest. Accumulated Deficits must be retired within five years. The CCM’s maximum credit price is set at \$200/MT CO₂e in 2016 and inflates with the consumer price index (CPI). Entities who pledge credits into the CCM can negotiate with deficit-holding Entities but must sell if offered the maximum price.

The CCM provision has been in place for the 2015, 2016, and 2017 compliance years. It was held in 2016, as one Entity had a small outstanding deficit in its 2015 annual compliance report. The CCM was not held any other year, as there were no Entities with outstanding deficits in their annual compliance reports.

This paper reviews the specifics of LCFS compliance and the CCM, options for LCFS entities, and an outlook for the CCM and credit prices for the next few years. We find that the CCM will meet its intended purpose as long as sufficient credits are pledged to the CCM to cover all deficit positions in the annual compliance reports. As the credit bank shrinks, deficit-holding Entities will be more likely to need the CCM to achieve compliance, and, simultaneously, it may be more difficult for credit-holding Entities to pledge enough credits to cover all year-end deficits.

¹ The 2018 LCFS Amendments make changes to some program terminology. The term Regulated Party is dropped, and several other terms – Credit Generator, Deficit Generator, Fuel Reporting Entity, Opt-in Fuel Reporting Entity, and Regulated Entity – are used instead. For purposes of this paper, we will use Entities to represent the parties that hold LCFS Reporting Tool (LRT) accounts for compliance.

History of the Credit Clearance Market (CCM) Provision

The LCFS program has reached an important point in its performance. For the first time in the program's seven-year history, 2017's annual LCFS credits and deficits generated were essentially balanced. For 2018, we expect that the need for LCFS credits to cover deficits will exceed the rate of LCFS credit generation, requiring a drawdown of the credit bank that has been built up since 2011.²

One primary concern since the inception of the LCFS program has been the uncapped potential price of LCFS credits. The LCFS program was designed to build a credit bank that would carry years when credit generation was lower than deficit generation, allowing for the growth in credit generation to catch up. But what happens to the credit price if the credit bank approaches zero or if credit holders do not offer their credits into the market? In these cases, the LCFS credit price could skyrocket. If prices were to spike or if credits were unavailable for purchase, Entities would need to operate out of compliance or fossil fuel suppliers might withhold supplies from the California market to minimize deficit generation.

To address these concerns, the California Air Resources Board (CARB) staff, in its 2015 re-adoption of the LCFS Regulation, added the Credit Clearance Market (CCM) provision.³ The CCM is a mechanism through which CARB can broker a match for LCFS credits to retire outstanding deficits that parties did not acquire prior to the April 30th compliance deadline. The CCM operates with a price cap of \$200/MT, adjusted for inflation from a 2016 baseline. Parties that cannot acquire sufficient LCFS credits through the CCM carry a deficit to the next compliance period with an LCFS credit interest penalty of five percent.

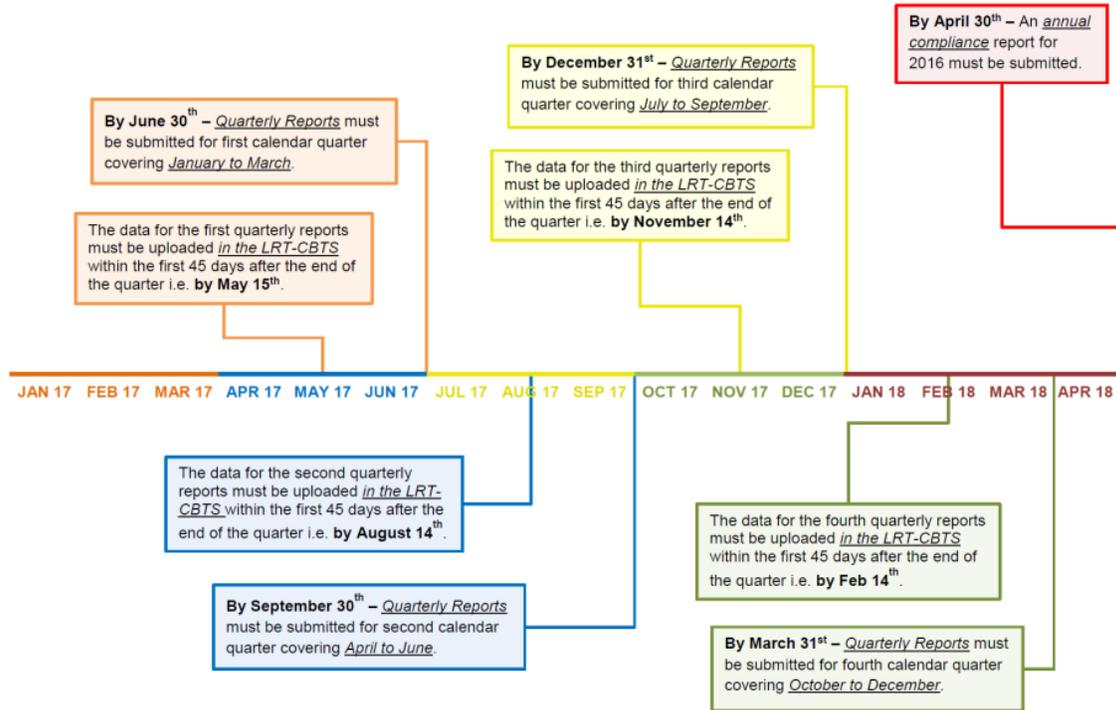
The CCM Ends the Compliance Year

CCM activities are the last part of the LCFS annual compliance calendar. Each Entity achieves annual compliance by either retiring LCFS credits equal to its deficits in the compliance year or carrying a net deficit into the next compliance period via the CCM provisions. There are five required reports for each Entity – four Quarterly Reports and an Annual Compliance Report. Data for each quarter must be uploaded into the LCFS Reporting Tool Credit Bank and Transfer System (LRT-CBS) within 45 days of the end of that quarter, and the Quarterly Reports must be submitted by the end of the following quarter. The Annual Compliance Report is due by April 30th following the compliance year. The timeline for the 2017 compliance year is shown in Figure 1.

² During the first half of 2018, 4.91 million MT of credits were generated against 5.83 million MT of deficits. This is a 0.92 million MT draw on banked credits through the first two quarters, or 1.8 million MT for the year if the second half of the year follows the first. Banked credits totaled 9.76 million MT at the end of 2017.

³ In the recently adopted 2018 amendments to the LCFS regulations, the CCM provision continued unchanged in concept and largely unchanged in details.

Figure 1. LCFS Quarterly and Annual Reporting Timeline for 2017



* If an action is due upon a holiday, it may be performed upon the next business day, with the same effect as if it had been performed upon the day appointed.

** LRT-CBTS stands for 'LCFS Reporting Tool and Credit Bank & Transfer System.'

Source: CARB

From January 1st to April 30th following a compliance year, Entities with a year-end deficit position may acquire credits to be used for meeting their compliance obligation for the previous compliance year. The credits acquired must have been generated in that compliance year or a prior year. Credits acquired in this period and used to meet the previous compliance year obligation are called “carryback credits.” The use of carryback credits must be identified in the Annual Compliance Report.

What is the CCM?

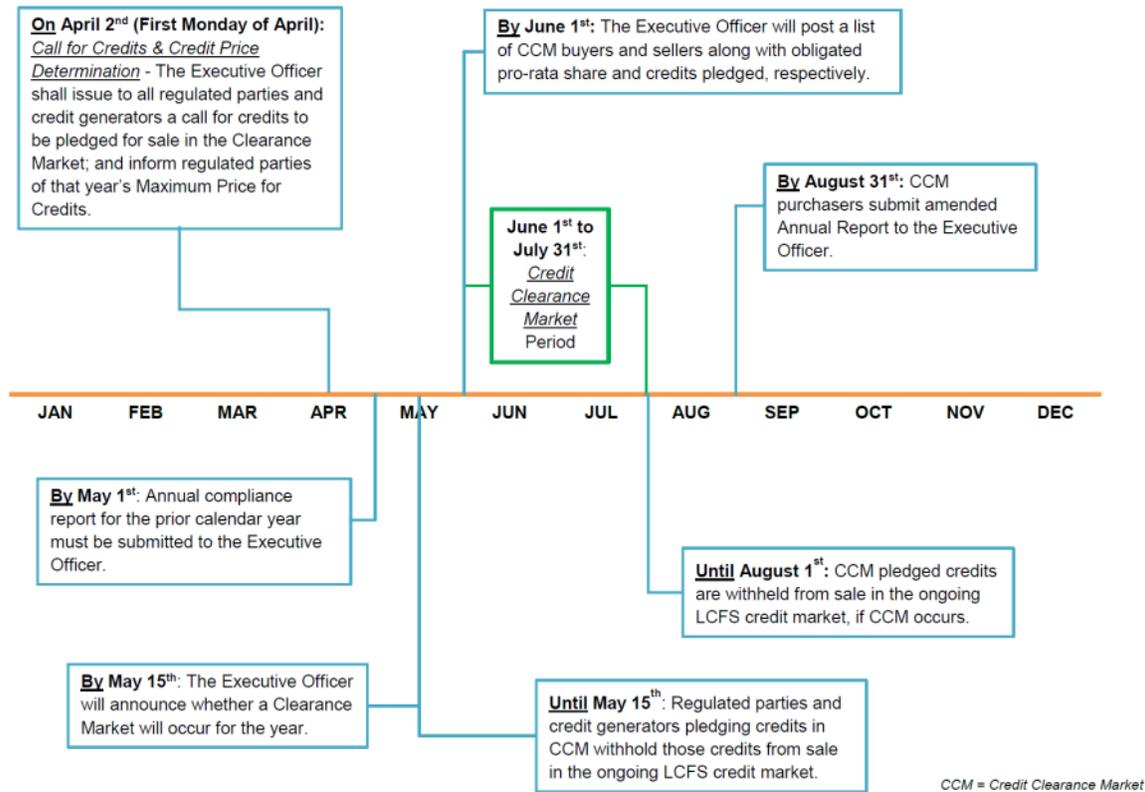
The CCM is a provision in the LCFS regulation intended to provide relief to Entities that have a net deficit position in their Annual Compliance Report. Without the CCM provision, an Entity with a net deficit position (deficit Entity) in their Annual Compliance Report would be out of compliance with LCFS. With the CCM, however, the deficit Entity must purchase credits in the CCM to clear their deficit position or, if insufficient credits are pledged, carry forward a net deficit to the next compliance period. The CCM is also intended to indirectly establish a ceiling price on LCFS credits by establishing a maximum price for credits for that year’s CCM.

The CCM is designed to function as follows:

1. The first Monday in April following the end of a compliance year, the Executive Officer calls for pledges from all fuel-reporting Entities and credit generators with a positive credit position to pledge for-sale credits and sets the Maximum Price for Credits based on \$200 per MT in 2016 inflated with the consumer price index (CPI). Entities are not required to pledge credits.
2. Entities pledging credits for sale in the CCM must report their pledge in their Annual Compliance Report due by April 30th. If a clearance market is held, the pledging Entities agree to sell or transfer at or below the Maximum Price until the CCM closes on July 31st.
3. By May 15th, the Executive Officer announces whether a CCM will be held.
4. On or before June 1st, each Entity that failed to retire enough credits to meet its year-end obligation in its Annual Compliance Report is informed of its pro-rata share of offered credits to a maximum of its outstanding deficit.
5. Also, on or before June 1st, the Executive Officer publishes a list of Entities participating in the CCM, the deficit Entities with the number of credits they are obligated to acquire, and the Entities that pledged credits with the number of credits pledged.
6. The market operates from June 1st to July 31st. The Entities that have voluntarily pledged credits into the CCM cannot reject an offer for pledged credits at the maximum price.
7. Entities that purchased credits during the market operation must submit an Amended Annual Compliance Report for the acquisition and retirement of their pro-rata share of credits. Any remaining deficits are carried to the next compliance period as Accumulated Deficits.
8. If no CCM occurs, any Entity that failed to retire enough credits in its Annual Compliance Report will be deemed in compliance but will carry forward an Accumulated Deficit.
9. Accumulated Deficits are charged 5% annual interest in the form of added deficits. An Accumulated Deficit, including interest, must be repaid within five years.
10. Accumulated Deficits can be repaid with a subsequent Annual Compliance Report. However, Accumulated Deficits cannot be repaid unless all the Entity's current compliance obligations are met.

From the regulatory point of view, the CCM is a mechanism to match credit holders with those who do not have enough credits to meet their obligation at the end of the compliance year, and to use the CCM price cap to establish a maximum reference value on LCFS credit prices. Figure 2 below illustrates the CCM timeline for 2018 covering the 2017 compliance year.

Figure 2. LCFS CCM Timeline (2018)



Source: CARB

The 2015, 2016 and 2017 CCMs

The provision for the CCM was part of the re-adoption of the LCFS regulation in October 2015. It came into effect in 2016 and applied to the 2015 compliance year and beyond. As required, CARB reported on the CCM for each of these years. Table 1 below summarizes what was reported for the three years. Only in the first year, 2015, was a CCM held. Information on the subsequent transactions during the CCM operating period are not published.

Table 1. CCM Parties for 2015, 2016, and 2017

Compliance Year	2015	2016	2017
Total Parties Reporting	174	224	282
Parties generating deficits	52	54	55
Parties that met compliance obligation	51	54	55
Parties not in compliance/deficits	Astra Oil 337 deficits	none	none
Parties Pledging Credits/ number	BP Products 10,000 credits GFP Ethanol 5,000 credits Titan El Toro 242 credits	BP Products 5,000 credits Long Beach Public Transportation 3,408 credits	BP Products 5,000 credits Long Beach Public Transportation 3,408 credits Neste US, Inc 15,000 credits
Notes		CCM not held	CCM not held
<i>Source: CARB LCFS Credit Clearance Market reports</i>			

What are the Choices for Entities?

Entities have choices regarding participation in the CCM between the close of the compliance year and completion of their annual compliance report by April 30th.

1. Entities with a net positive credit position at the end of a compliance year may:
 - a) Choose to pledge credits into the CCM with their Annual Compliance Report by April 30th.
 - b) Sell credits generated in the compliance year or prior during the January 1st to April 30th carryback period for potential use as carryback credits
 - c) Hold the credits for future sale or compliance.
 - d) Employ a combination of the approaches above.

2. Entities with a net deficit position at end of a compliance year may:
 - a) Purchase carryover credits to cover the deficit generation at market prices even if that price exceeds the CCM's Maximum Price for Credits.
 - b) Allow the compliance year to end with a deficit position and become subject to the CCM. The outcome will either be that enough credits will be purchased through the CCM at or below the CCM price ceiling to retire the deficit or a deficit will be carried forward to the next compliance period with 5% interest assessed.
 - c) Employ a combination of the approaches above.

Reasons Why Entities May Choose to Become Part of the CCM

An Entity may have any number of reasons to pledge credits or allow themselves to be exposed to the CCM by having an outstanding deficit position in their Annual Compliance Report. Among these reasons are:

1. Reasons to pledge credits
 - a. Directly identify buyers for their credits without use of brokers or exchanges.
 - b. Establish a potential for receiving the CCM maximum price.

2. Reasons to end compliance year with a deficit and enter the CCM
 - a. Capping the price of credits at the CCM maximum price.
 - b. Establish certainty of either covering their deficit or carrying an Accumulated Deficit.

Reasons Why Entities May Choose not to Become Part of the CCM

An Entity may also have any number of reasons not to pledge credits or allow themselves to be exposed to the CCM by having an outstanding deficit position in their Annual Compliance Report. Among these reasons are:

1. Reasons to not pledge credits
 - a) Holding credits for a future compliance period.
 - b) Holding credits to sell at a future date.

2. Reasons to cover deficits prior to April 30th
 - a) Avoid the public disclosure of a deficit position.
 - b) Not wanting to create a potential unfunded liability position.
 - c) Avoid potential purchases from parties considered risky from a credit validity standpoint.
 - d) Avoiding interest - with the 5% interest penalty, the real cost of an Accumulated Deficit position is potentially 105% of the Maximum Price if cleared in one year.
 - e) The unknowns of the CCM and holding Accumulated Deficits.

When aggregated, the choices made by individual Entities will define how well the CCM performs in providing credits to deficit-holding Entities and acting as a cap on credit prices. To understand how the future may play out, we examine the dynamics of credit and deficit generation, the pattern of trading as recorded in the LCFS Reporting Tool (LRT), and the distribution of the credit bank.

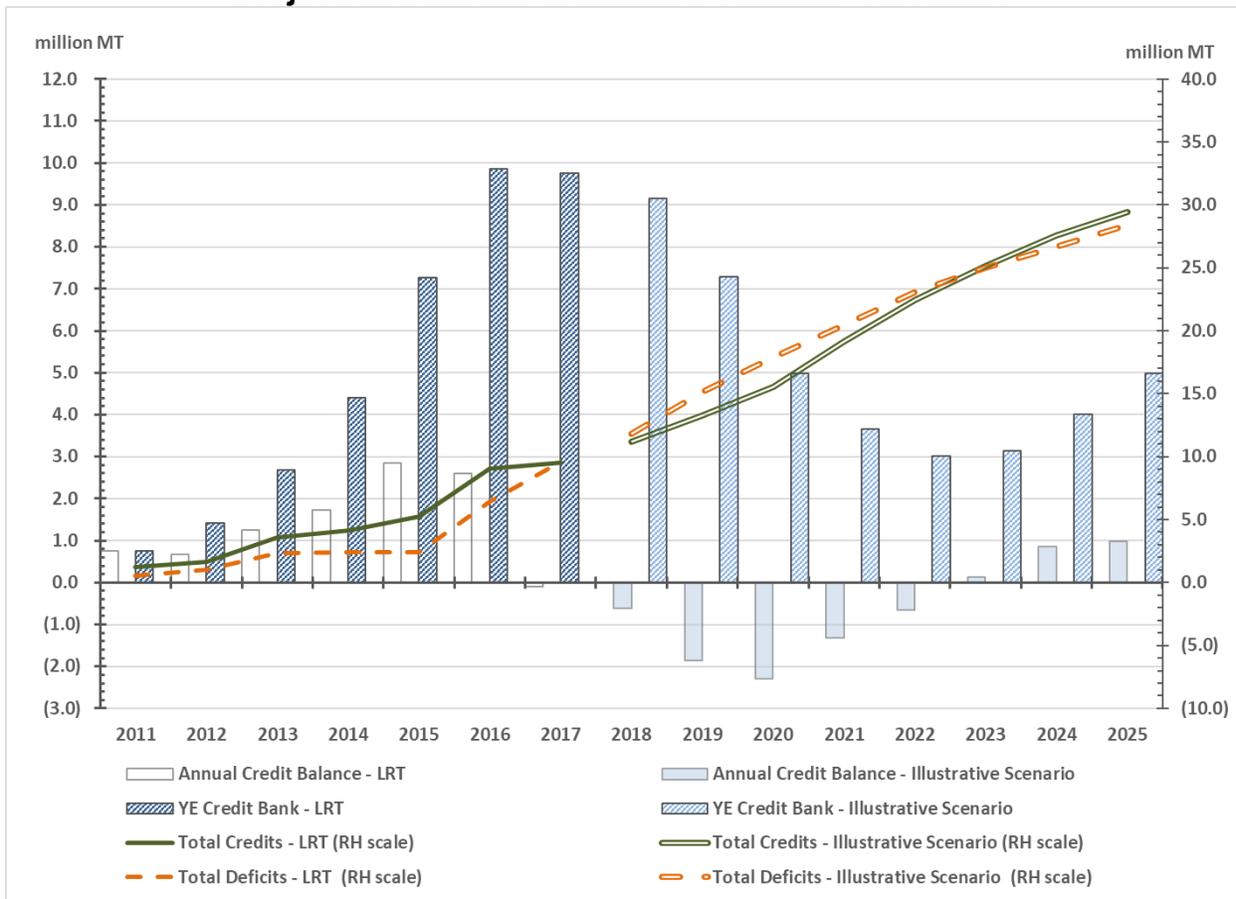
What is required for the CCM to be successful?

A successful CCM acts as a clearing house for credit holders and deficit Entities to connect and cover outstanding deficits at or below the CCM Maximum Price, thus establishing that Maximum Price as the “market” price of credits and keeping Entities from carrying an Accumulated Deficit position. The key to this success is to have the number of credits pledged into the CCM exceed the number of deficits.

Credits, Deficits, and Credit Bank Trends

The LCFS Program has reached a pivotal point. The program generated roughly 100,000 MT less credits than deficits in 2017 and has generated 920,000 MT less credits than deficits in the first half of 2018. Figure 3 illustrates the actual LCFS credits and deficits generated by year and the accumulated bank at the end of the year through 2017. For 2018 through 2025, the values are taken from the Illustrative Scenario Calculator that was released as part of the recent 2018 amendment rulemaking.

Figure 3. LCFS Credit, Deficit, and Credit Bank Trends and Projection from The Illustrative Scenario Calculator



Source: LCFS Quarterly Data Spreadsheet & Illustrative Compliance Scenario Calculator - August 15, 2018

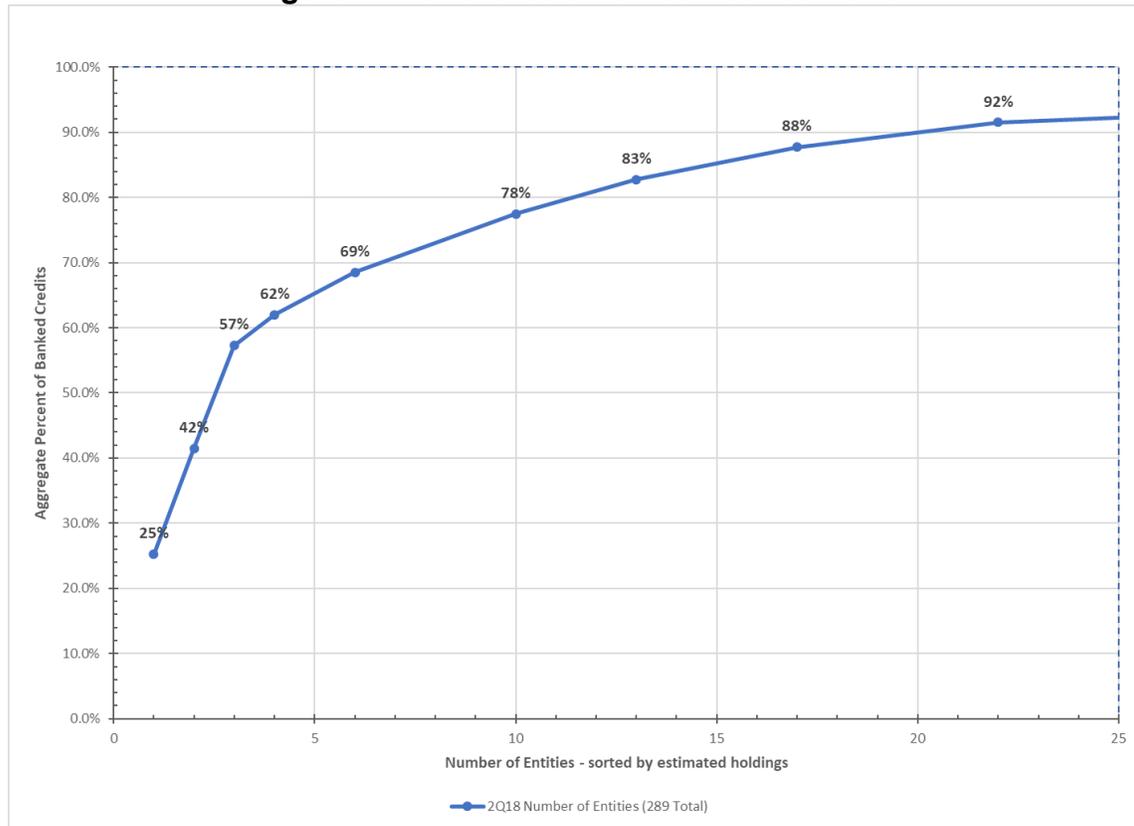
The trends illustrated in Figure 3 set a backdrop for the potential credit balance scenario under which Entities will be making their choices of whether to pledge credits to the CCM, or whether to allow themselves to report a deficit in their annual compliance report. Some important trends to note in Figure 3 are:

1. The credit bank has peaked and is declining, demonstrating the change in annual credit balances.
2. The credit bank will be drawn on through 2022, so short term relief does not appear imminent.
3. Deficits in 2025 will be about ten times the deficits in 2017, which indicates the change in magnitude of credits that deficit-generating Entities will have to acquire.
4. The credit bank will be depleted to 5.0 million MT at the end of 2020 and 3.0 million MT by the end of 2022, which is a third of the total banked credits at the peak in 2017.
5. The Illustrative Scenario Calculator shows a 0.6 million MT net deficit balance for 2018. The second quarter data shows a 0.9 million MT net deficit balance for the first two quarters, illustrating some optimism in the Illustrative Scenario Calculator.

The Structure of the Credit Bank

Another data point Entities may consider when choosing whether or not to become part of the CCM is the concentration of credit bank holdings. More concentrated bank holdings may indicate that the amount of pledged credits will be decided by fewer Entities. Figure 4 illustrates the concentration of the credit bank based on data provided by CARB in their LCFS Credit Market Net Position Histogram. The figure shows that at the close of the second quarter of 2018 one Entity holds 25% of the credit bank, the top four Entities hold 62% of the credit bank, the top ten Entities holds 78% and over 90% is held by the top 22 Entities. The shape of the curve illustrates that after the top three Entities with 57% of the bank, there is a flattening of the curve that indicates a less concentrated distribution of the remaining 43% of the credit bank. For the second quarter of 2018, 57% of the credit bank represents about 5 million MT of credits.

Figure 4. LCFS Credit Market Net Positions



Source: LCFS Credit Market Net Position Histogram – October 31, 2018

We expect the top gasoline and diesel suppliers to be represented in the top five (and perhaps all of the top ten) credit holders, as they would be incentivized to hold a bank for future compliance and reduce their reliance on the LCFS credit markets for compliance. In effect, the credits held by deficit generators may not be available to the LCFS credit market going forward. Conversely, having banked credits reduces the need for these Entities to acquire credits if they chose to use their banked credits. The extent to which credit generators (rather than deficit generators) are represented in the top credit bank holders may lessen concerns of credit availability in the market.

The implication of the distribution of the credit bank is that the actions of the top ten (and particularly the top three) holders may heavily impact the volume that the CCM transacts in each year.

What is the outlook for LCFS credit prices?

At its peak in July 2018,⁴ the LCFS credit price approached the estimated \$210/MT 2018 CCM Maximum Price even though there appeared to be ample liquidity in the market with over 9 million MT in banked credits. This scenario begs the questions: Why did prices continue to rise even with such market liquidity? Could uncertainty around the behavior of the top credit bank position holders be a driving force behind these rising prices? If the top credit bank holders try to maintain or even grow their banks, the credits available for others will shrink as 2018 credit generation has fallen behind deficit generation.

Given the prospect of a shrinking bank, shrinking real liquidity, an automatic five percent interest penalty on Accumulated Deficits, and the numerous reasons for deficit Entities to avoid participation in the CCM, we expect LCFS credit prices may well exceed the CCM ceiling price. In such a case, we doubt that credit holders will offer many credits into the CCM at the CCM Maximum Price unless they have a large credit position that is not earmarked for future compliance.

Although the CCM is intended to establish a soft limit on credit prices, Entities may choose to buy credits at prices higher than the CCM Maximum Price from others during the carryover period or even earlier. That price may take into account the impact of the interest penalty on any Accumulated Deficit. As long as deficits are projected to exceed credits annually, causing the credit bank to draw down, credit prices should remain near the CCM Maximum Price.

CCM Prospects for the 2018, 2019 and 2020 Compliance Years

As the credit bank shrinks with each passing year, there is growing potential for more Entities to enter the CCM as deficit holders. This will likely result in fewer credits being available to deficit-generating Entities without a credit bank. Perhaps the key to the CCM is how Entities with deficits view their prospects for covering all their deficits through the CCM. If such an approach is viewed favorably, that methodology would cap credit prices at the CCM Maximum Price, as intended by the CCM provision. If these Entities do not view their prospects favorably, they may be willing to buy credits at prices higher than the CCM maximum prior to April 30th to avoid exposure to the interest penalty. Bottom line, the key to the CCM's success in capping credit prices is the amount of credits pledged into the CCM. The 2019 CCM process will be revealing as we will see if the number of credits pledged rises appreciably from the nominal amounts of the past three years. A significant increase in credits pledged would give deficit holders confidence in the CCM's viability as a mechanism to cover deficit positions in future years. This confidence in the CCM's efficacy is increasingly important, given that 2018 will likely be the first year in which the credit bank will be drawn down. Stillwater will continue to follow and analyze the credit bank in the coming months as the 2018 compliance period comes to an end and during the run-up to a potential CCM in 2019.

⁴ In July of 2018, the price of LCFS credits exceeded \$190/MT with the record price of \$193 recorded on July 31st. Since then, the credit price has settled in at about \$190/MT at the end of October.

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