



An EDISON INTERNATIONAL® Company

December 9, 2022

Rajinder Sahota, Deputy Executive Officer  
Cheryl Laskowski, Branch Chief, LCFS  
California Air Resources Board  
1001 I Street  
Sacramento, CA 95814

Submitted online to the “comment docket”

**Re: Comments on the November 9, 2022 LCFS Public Workshop**

Dear Ms. Laskowski:

Southern California Edison (SCE) appreciates the opportunity to provide written comments on the November 9, 2022 Low Carbon Fuel Standard (LCFS) public workshop presenting concepts and tools for compliance target modeling.

**California Needs a Strong LCFS**

SCE appreciates the California Air Resources Board’s (CARB’s) continued leadership in setting policy to reduce greenhouse gas (GHG) emissions across multiple sectors in California’s economy to achieve the stated objective of net zero emissions by 2050. As an active participant in the LCFS program, SCE implements multiple LCFS-funded transportation initiatives and serves as the CARB-mandated California Clean Fuel Reward administrator. SCE’s customers and programs have benefited immensely from the relationship it has developed with CARB’s LCFS Staff in recent years, as both entities have worked together to accelerate the adoption of alternative transportation fuels. Light-duty electric vehicle (EV) sales have more than doubled in the last two years, now over 18% of new vehicles sales in the state;<sup>1</sup> SCE believes that LCFS has been instrumental in this effort to date and that the state will need a strong LCFS that can be leveraged and grow over time as harder-to-transition vehicles and use cases need to be converted to fuels with lower carbon intensities (CI).

**SCE Supports a Minimum 30% CI Reduction Target For 2030**

The LCFS has historically served as a driver of investment in alternative fuel production and infrastructure; however, its ability to continue to incentivize the development of additional

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<sup>1</sup> See <https://electrek.co/2022/10/27/electric-cars-reach-new-car-sales-california-compare-us/>

alternative fuel production capacity is under threat by the success of the program and by the market's willingness to respond to CARB's LCFS Regulation. For market participants to continue to invest in development – a critical condition for the state to reach its carbon neutrality goals - it must be accepted that the credits generated by the supply of alternative fuels will be tradeable in the LCFS Market. However, with several forecasts in the market predicting unrestrained growth in the cumulative credit bank, this is no longer a certainty.

During the LCFS public workshop, CARB staff proposed to address this challenge by increasing the 2030 LCFS stringency targets. CARB staff proposes to utilize the California Transportation Supply (CATS) model to analyze multiple increases in 2030 stringency from the current 20% to either 25%,30%, or 35%.

SCE strongly supports a new compliance target of at least 30% in 2030 and has provided technical support for this position in Appendix A. Specifically, SCE believes that a stepped linear path towards a 30% CI reduction target by 2030 could provide stability in the near term. SCE does not believe that a 25% target is stringent enough, given the current ability of the market to supply alternative fuels to California consumers.

SCE will demonstrate in Appendix A the significance of a 30% target in 2030 and detail how an immediate, near-term acceleration to the compliance schedule is needed for LCFS to continue to lead the market. SCE also supports extending capacity credits to 2035 for public zero emission vehicle (ZEV) infrastructure to support light-, medium-, and heavy-duty ZEVs and will show how this will not adversely impact a well-designed stringency mechanism.

### **CARB Should Adopt an Acceleration Mechanism for LCFS**

Finally, while many options have been proposed for tightening the LCFS market, such as limiting certain fuels' or vehicles' ability to participate, SCE supports the inclusion of an acceleration mechanism - a tool within the regulation that could be used to accelerate the compliance schedule based on established, clear, and transparent parameters developed through the public process.<sup>2</sup> SCE believes an acceleration mechanism will be an effective tool for providing stability and certainty for LCFS participants.<sup>3</sup> Additionally, an acceleration mechanism will help to mitigate the need for CARB to transition certain fuels out of LCFS. Of course, CARB should take steps to minimize any unintended consequences to communities or the environment specific to some alternative fuels. These should be mitigated, to the extent possible, in a way that is transparent, objective, and subject to stakeholder input and CARB Board approval, as some fuel alternatives may have real and tangible impacts on communities. These are valid reasons that should be considered, but as SCE's analysis in Appendix A will show, it is not necessary to remove fuels or vehicle types from the LCFS before 2030 solely to provide stability to the market.

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<sup>2</sup> The Credit Clearance Market in the LCFS is another example of a parameter-based mechanism that is designed to address market instability, so this precedent is already established.

<sup>3</sup> At the workshop some called the acceleration mechanism the "ratchet" mechanism or a "self-adjusting" mechanism.

## **SCE Requests that CARB Provide Clarity and Transparency on Assumptions in the CATS Model**

As SCE describes in Appendix A, many assumptions underlying CARB’s analysis have significant impacts on the future of the LCFS market. It is clear from CARB’s Draft Technical Documentation for the CATS Model<sup>4</sup> that CARB is utilizing many assumptions as it models LCFS scenarios that should be clarified as part of the public process to provide confidence in the efficacy of the CATS Model. Specifically, SCE requests that CARB provide additional details on the following assumptions in the CATS Model:

1. *ZEV Population*– SCE has relied on its internal forecasts, which consider its interpretations of the impacts of the Advanced Clean Cars 2 (ACC2) and the Inflation Reduction Act, to estimate the number of on-road, electric-credit generating vehicles over time. However, SCE has had to rely solely on the percentage of sales targets embedded in the ACC2, as it is unaware of a CARB-published estimated number of car sales each year. Clarity should be provided here, as the number of vehicles will impact the magnitude of electricity credits generated in the future.
2. *ZEV Type* – It is also unclear what percent of the ZEV population is being assumed as battery-electric (BEV), plug-in-hybrid (PHEV), or fuel-cell electric (FCEV). These do not generate credits, nor do they consume grid electricity equally. If there are differences in assumptions amongst models about the make-up of the alternative fuel fleet, this will impact the LCFS market's perceived composition in the future. Therefore, more details should be provided to ensure that CARB and all market participants act on the same basis.
3. The CATS Model assumes that BEVs will not replace combustion vehicles on a vehicle miles traveled (VMT) basis until 2031 but that FCEV vehicles already do so<sup>5</sup>. SCE believes this is an incorrect assumption that does not match BEVs' current driving behavior, and this should be discussed.
4. Many cost inputs - such as the \$/MWh for electricity, \$/barrel for oil, and \$/bushel for corn, etc. – have fixed values into the future<sup>6</sup>. Documentation should be provided on how these values were established and to clarify if these are fixed through a specific date in the future. It may provide a more accurate “best-cost” model if more realistic, non-fixed prices are assumed for these energy inputs, given that various factors (market dynamics, climate change, competition for inputs, etc.) undoubtedly will impact these assumptions.

Finally, SCE would like to acknowledge a concern often raised when discussing increasing the LCFS compliance stringency: that this action will adversely impact Californians through higher retail gasoline prices. SCE is sensitive to this concern; however, as it will show in more detail in Appendix A, there is both minimal direct correlation between historical LCFS credit prices and California retail gasoline prices, as demonstrated by Figure 10 in Appendix A. While it is important for CARB to be aware of this potential impact when contemplating changes to

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<sup>4</sup> See <https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf>

<sup>5</sup> See <https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf>, pg. 5.

<sup>6</sup> See <https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf>, beginning on pg. 8.

the LCFS Regulation, SCE will show that even under the most accelerated updates to the compliance schedule, the potential worse case impact to consumers is less than \$0.20/gallon beyond what the current LCFS Regulation would potentially implicate. However, as fossil-derived petroleum faces competition from low-carbon fuels in the next decade, any price impact between LCFS stringency and gasoline prices will likely be further muted.

Thank you for considering our comments regarding this important regulation.

Sincerely,

/s/ Erica Bowman

Erica Bowman  
Managing Director, Regulatory Policy & Strategic Analysis  
Southern California Edison

## **Appendix A: Technical Support for SCE's Positions**

SCE is supportive of a study that is underway by CaETC to better understand control mechanisms around key indicators inside the LCFS market that are best able to provide certainty for market participants. In the following analysis, SCE has relied heavily on two such indicators – (1) the cumulative credit bank and (2) the credit bank to quarterly deficit ratio – as examples of key indicators that could be used when seeking to provide stability to the LCFS market. While SCE relies on these example metrics in this appendix, it is not claiming that these are the only or the best indicators for monitoring and controlling the program. That will be one of the primary topics of the forthcoming CaETC study, and it is probable that other market participants and observers will also weigh in with their own recommendations during the public process. It is expected that the results of that analysis will be available in Q1 of 2023. Thus, while better or additional metrics may be presented in the early part of next year, SCE will utilize the cumulative credit bank and the ratio of the bank to quarterly deficits for the purposes of this appendix to demonstrate the ability to stabilize these indicators exclusively with changes to the LCFS compliance target. Further, SCE believes that compliance stringency, rather than the removal of fuels or vehicle types from the regulation, is the only tool that is needed to stabilize the LCFS through the end of the decade. SCE's key findings are summarized below:

- Without any changes to the LCFS programs' stringency requirement on deficit generators, the credit bank could easily grow to 120 million credits even if many planned projects do not come on-line
- Increasing the stringency requirement to 25% in 2030 is insufficient
- Increasing the stringency requirement to 30% in 2030 has the biggest impact on reducing the credit bank but by itself is not enough
- Adding ZEV infrastructure credits (capacity credits) from 2024-2030 for light-, medium-, and heavy-duty ZEVs can potentially have an impact on the credit bank if fully utilized, but this is easily mitigated with marginal changes to the stringency requirement via an acceleration mechanism
- Increasing the stringency requirement to 15.5% in 2024 has a modest impact on the credit bank, is the only option that immediately stabilizes the credit bank to deficit ratio, and is necessary in combination with the other modifications
- Adding an acceleration mechanism has a modest impact on the credit market but is necessary as a fine-tuning mechanism for the stringency requirement to provide certainty to low-carbon fuel investors, consumers, and society in general that emission reduction and innovation opportunities are not missed
- The above modifications (increasing near-term and long-term stringencies, adding infrastructure credits, and adding acceleration mechanism) work well together through 2030 and further modifications, such as phasing out fuels from the LCFS, are not needed to stabilize the market
- More analysis is needed to explore modifications in the 2030s and beyond

- If other modifications are proposed (e.g., adding new segments to LCFS deficit or credit generation or staff’s proposals to limit credits for certain fuels or electric forklifts), SCE’s above recommendations on stringency would require further analysis

### **SCE’s Utilization of the BloombergNEF LCFS Tool**

Throughout this analysis, SCE has utilized the user-friendly Low Carbon Fuel Standard Scenarios Tool (v1.2) developed by BloombergNEF (BNEF) with many conservative assumptions<sup>7</sup> to explore several potential LCFS modifications from 2024 to 2030 that were raised by CARB Staff or by participants in the workshop. This tool is a spreadsheet-based model that provides forward projections on LCFS credit and deficit generation based on user-configurable inputs such as: annual gasoline and diesel demand; the annual LCFS stringency; carbon intensities for fossil and alternative fuels; mixture of biofuels into the feedstock blend; extensive configurability of renewable fuel supply based on commissioning dates of known alternative fuel projects; and others.

SCE intentionally did not propose phasing out any fuels or technologies from the program and rather focused on exploring the potential impact on fuel prices and possible metrics for an acceleration mechanism. The BNEF tool makes no projections about LCFS credit prices, nor does it make policy recommendations. In most cases, SCE has extracted the raw data outputs from the BNEF Tool so that it can create native charts that can overlay information not contained in the BNEF spreadsheet, such as historical LCFS credit prices and SCE-defined ratios. SCE has provided Appendix B for more details on the assumptions it used to create the baseline case (assuming the current regulation through 2030) in the BNEF tool.

### **Stability of Key Market Indicators is Crucial to Spur Continued Investment**

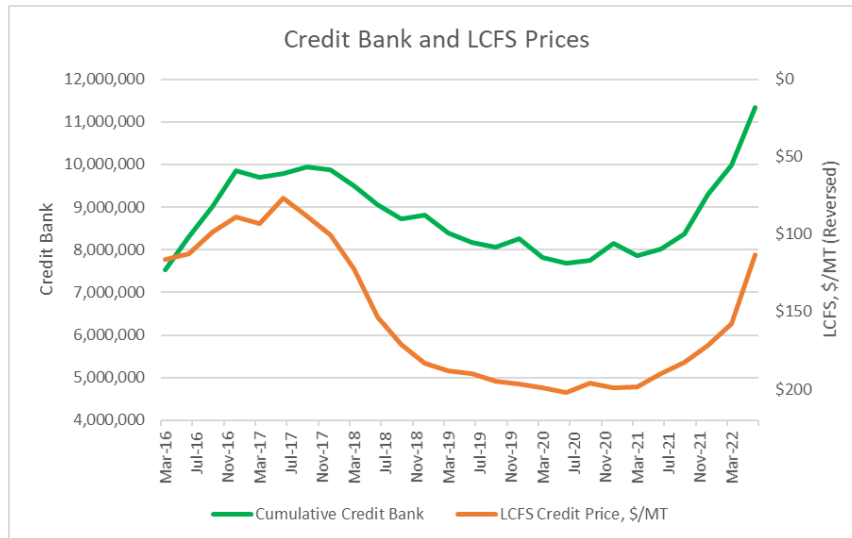
Predictability is crucial for participants in any investment as this facilitates the deployment of capital investments from the private sector that is looking to increase its mid-to-long-term balance sheets. There are many variables to consider controlling when looking to provide the stability that is needed for the LCFS to continue to be a driving force in the deployment of alternative fuel supply and infrastructure.

One such key indicator is the number of credits in the cumulative credit bank. Since LCFS credits do not expire, they can be “banked” by market participants in perpetuity for use at some future date, and it is arguable that the buildup of a large bank has a suppressive effect on credit prices. As can be seen from CARB’s public data,<sup>8</sup> the cumulative credit bank and LCFS credit prices are closely correlated with a larger bank driving lower credit prices, and vice versa.

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<sup>7</sup> For example, the letter to CARB from California Bioenergy LLC (August 8, 2022) used the BNEF tool and estimated 50% larger credit bank in 2030 than SCE (180 million vs 120 million) with a 20% in 2030 stringency requirement. This is primarily because SCE assumed less biodiesel production.

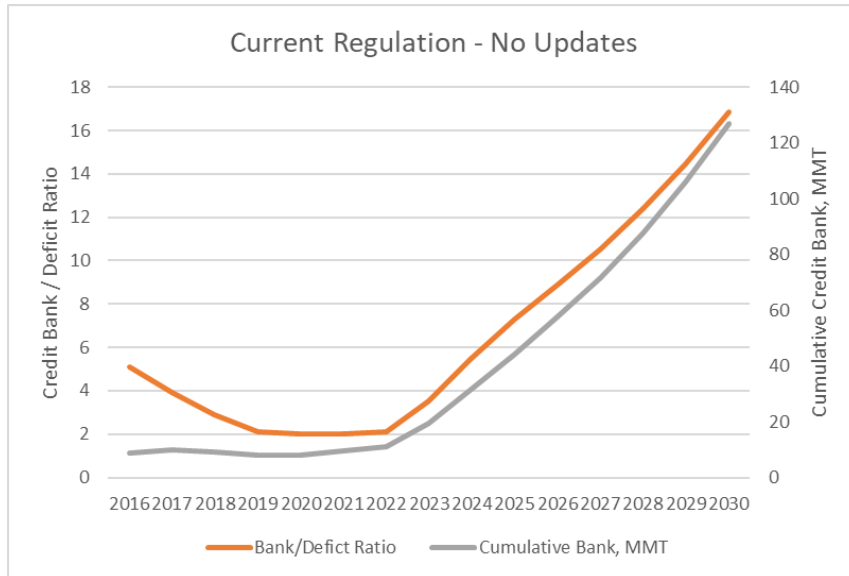
<sup>8</sup> See <https://ww2.arb.ca.gov/resources/documents/weekly-lcfs-credit-transfer-activity-reports> and <https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries>, accessed on November 22, 2022



**Figure 1: Cumulative Credit Bank and LCFS Prices since 2016**

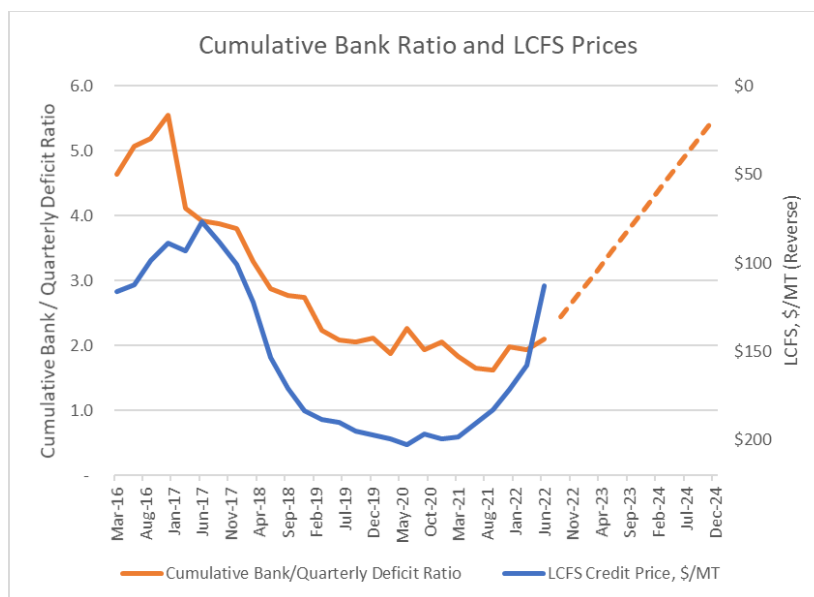
Indeed, California Bioenergy LLC (CalBio) provided comments to this effect in their LCFS workshop letter dated August 8, 2022, where it stated that “the credit bank reaches over 180 million credits by 2030” if the LCFS Regulation is not updated, and that is “a clear indicator that the market can support significantly more stringent CI targets.”<sup>9</sup> The basis for CalBio’s assessment was the Low Carbon Fuel Standard Scenarios Tool (v1.2) developed by (BNEF); SCE has also utilized this tool and, while it believes that some of CalBio’s assumptions overly inflate the 2030 cumulative credit bank, SCE agrees directionally and notes that the cumulative credit bank will easily be headed to over 120 million credits if no action is taken based on its use of the BNEF tool. Indeed, even if one assumes that half of the renewable fuel capacity that is projected in the BNEF tool comes online in the next decade, the cumulative credit bank will continue to grow exponentially to approximately 38 million credits by 2030; when only half of current planned new production already over supplies the market, there is little reason to develop even more alternative fuel supply.

<sup>9</sup> See <https://www.arb.ca.gov/lists/com-attach/2-lcfs-wkshp-aug18-ws-VDcAZwBtV2ZQP1U6.pdf>



**Figure 2: Cumulative Credit Bank / Quarterly Deficit Projections: No Changes**

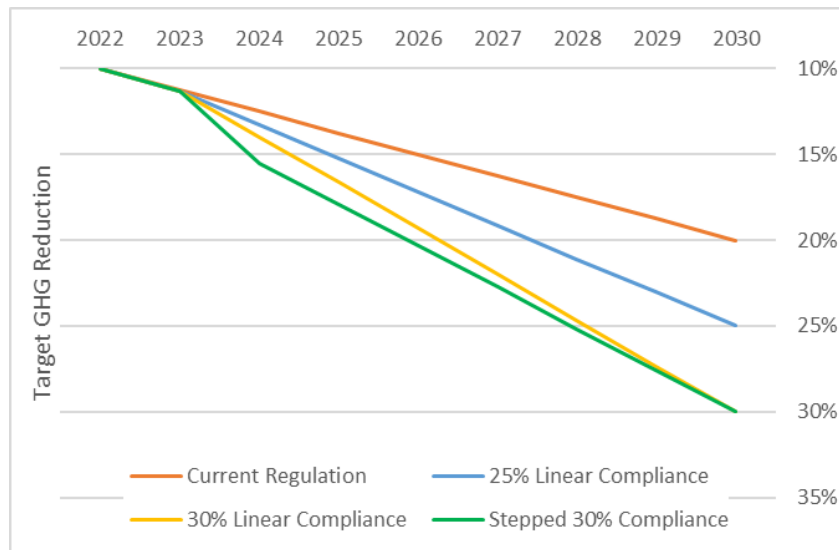
As mentioned above, many have looked to the volume of the cumulative credit bank as a weathervane for the health of the market however, which is a good indicator but may overlook some operational functions that the credit bank serves. As the LCFS become more stringent, the volume of deficits that are generated each year will increase and may or may not require a larger total credit bank to smooth out and simplify operations in the LCFS market, meaning that one may also want to consider the ratio of the cumulative credit bank to the total quarterly deficits, or similar. As an example of this ratio metric, Figure 3 below uses CARB’s public data for historical tracking of this ratio and LCFS credit prices, and then uses the BNEF tool to project the ratio of the cumulative credit bank to quarterly deficits into the future (as indicated by the dashed line) though SCE makes no forecast on the impact this trajectory may have on future credit prices.





**Figure 3: Cumulative Credit Bank / Quarterly Deficits and LCFS Prices since 2016**

SCE will examine three scenarios below to demonstrate the need for aggressive near-term action by CARB to stabilize these potentially key market indicators: (1) a linear compliance schedule to achieve a 25% reduction target by 2030; (2) a linear compliance schedule to achieve a 30% reduction target by 2030; and (3) a stepped linear compliance schedule for achieving a 30% reduction target by 2030 which makes a single, near-term adjustment to bring compliance back in line with market capability. These are graphically shown in Figure 4. SCE will additionally consider a fourth scenario where externalities could arise that would necessitate a tool within the regulation that could be used to accelerate the compliance schedule based on established, clear, and transparent parameters developed through the public process (i.e., the proposed acceleration mechanism). Note that the Credit Clearance Market in the LCFS is another example of a parameter-based mechanism that is designed to address market instability.



**Figure 4: Modeled Compliance Scenarios**

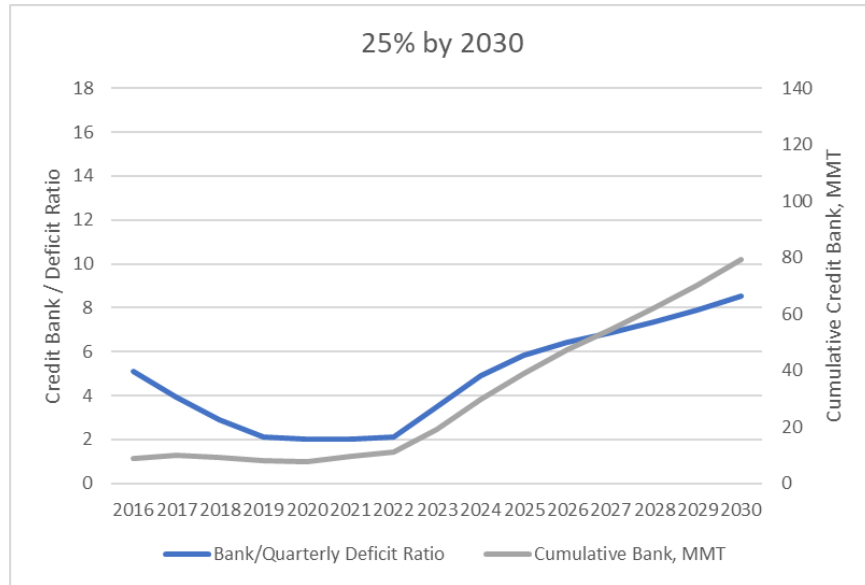
**Table 1: Modeled Compliance Scenarios**

	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Current Regulation</b>	10.0%	11.3%	12.5%	13.8%	15.0%	16.3%	17.5%	18.8%	20.0%
<b>25% Linear Compliance</b>	10.0%	11.3%	13.3%	15.2%	17.2%	19.1%	21.1%	23.0%	25.0%
<b>30% Linear Compliance</b>	10.0%	11.3%	14.0%	16.6%	19.3%	22.0%	24.7%	27.3%	30.0%
<b>Stepped 30% Compliance</b>	10.0%	11.3%	15.5%	17.9%	20.3%	22.8%	25.2%	27.6%	30.0%

**Scenario 1: Achieving 25% Stringency by 2030 Leaves Too Much on the Table**

As previously mentioned, CARB staff has proposed analyzing an update to a 25% reduction target by 2030. SCE echoes comments made during many of the 2022 workshops by various stakeholders that 25% is not stringent enough given the current ability of the market to

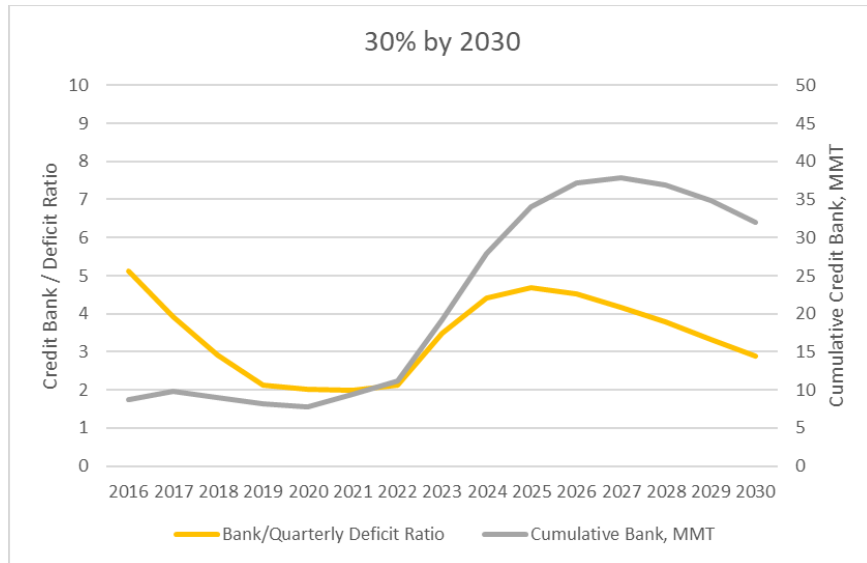
supply alternative fuels to California consumers. Quantitatively, SCE believes the metrics it has outlined above support this shared viewpoint, with a 25% target still resulting in cumulative credit bank values and credit bank to deficit ratios higher than any seen since the maturity of the program and a credit bank to deficit ratio that never stabilizes, which will fail to provide certainty for market participants.



**Figure 5: Scenario 1 – Linear Compliance to 25% by 2030**

**Scenario 2: A Linear Compliance Schedule to 30% by 2030 May Still Be Insufficient**

CARB staff also indicated they will analyze a 30% compliance target by 2030. As these next two scenarios will demonstrate, how that target is reached is significant. For scenario 2, SCE assumed that the new compliance schedule would simply draw a straight line from the compliance target of last effective year of the current regulation (assumed to be 2023) to 30% in 2030. This action would provide meaningful changes to the LCFS market by slowing and eventually reversing some of the growth in both the cumulative credit bank as well as the credit bank to deficit ratio. However, there will still be years in middle of the decade, notably 2024-2027, where the credit bank to deficit ratio fluctuates, which could lead to uncertainty for both credit and deficit generators in the near-term.

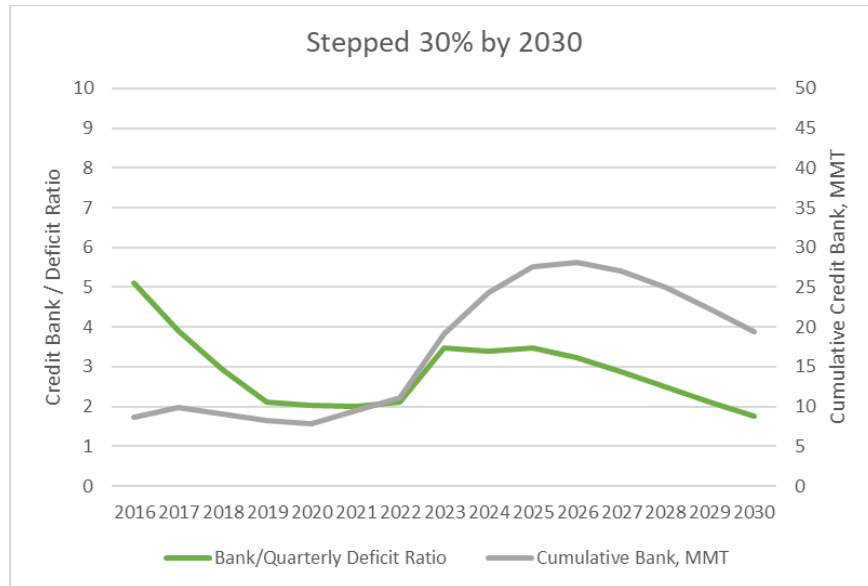


**Figure 6: Scenario 2 – Linear Compliance to 30% by 2030**

**Scenario 3: A Stepped Linear Path to 30% by 2030 Could Provide Stability in the Near Term**

As indicated above in Scenario 2, how 30% is achieved in 2030 significantly impacts the trajectory of investment in the supply of alternative fuels. Scenario 2 assumes even steps each year towards the 2030 target post-2024; in Scenario 3, the year-to-year stringency increases approximately 10% less than in Scenario 2, but this scenario assumes a larger, accelerated catch-up stringency increase during the first year of enactment. This has several benefits in that it a) recognizes the current ability of the market to supply ample levels of alternative fuels into California and b) decreases the incremental compliance burden on fuel suppliers by marginally reducing the annual stringency increase in the second half of the decade.

Comparing Scenario 3 along the same proposed metrics as the others, this scenario is the only option that immediately stabilizes the credit bank to deficit ratio, essentially flattening the ratio through 2026. It is worth noting, again, that this change was facilitated solely with adjustments to the rate-of-change to the compliance target (no market participants were added or removed) and that the end-state is still 30% in 2030.



**Figure 7: Scenario 3 – Stepped Linear Compliance to 30% by 2030**

**Scenario 4: Externalities Can Upset Stability and Necessitates an Acceleration Mechanism**

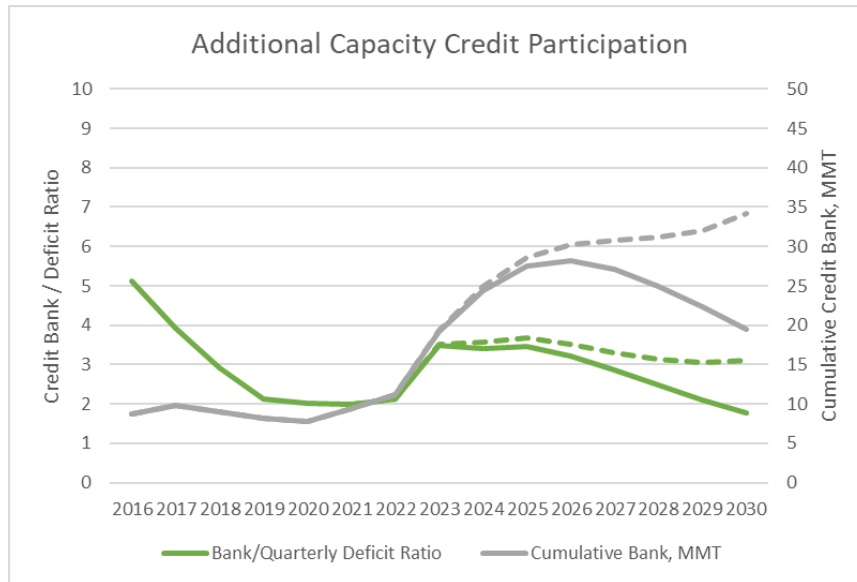
The above scenarios assume consistent participation in the market but, as recent years have shown, alternative fuel supply is often delivered in large chunks as projects come online and this is not a trait that is exclusive to alternative liquid fuel production. While there is currently a 5% limit on light-duty infrastructure capacity credits only about 1%, less than half, are currently claimed. There are also few, if any, participants receiving project-based credits. These additional credit streams are entirely voluntary and can come online at any time. With a possible increase in the capacity credit limit to incorporate heavy-duty fueling infrastructure on the table, and with the incentives included in the Infrastructure Investment and Job Act and the Inflation Reduction Act, it is conceivable that a 10% limit on total capacity credits could be reached by 2030. This assumes capacity credits for both public hydrogen and direct current fast charge stations (ZEV infrastructure) for light-, medium- and heavy-duty ZEVs.

Building on Scenario 3 above, consider a scenario where nothing changes other than participation in the capacity market that grows over time to reach the full 10% by the end of the decade:

**Table 2: Capacity Credit Participation**

Year	2024	2025	2026	2027	2028	2029	2030
Capacity Market Participation	1%	2%	3%	4%	6%	8%	10%

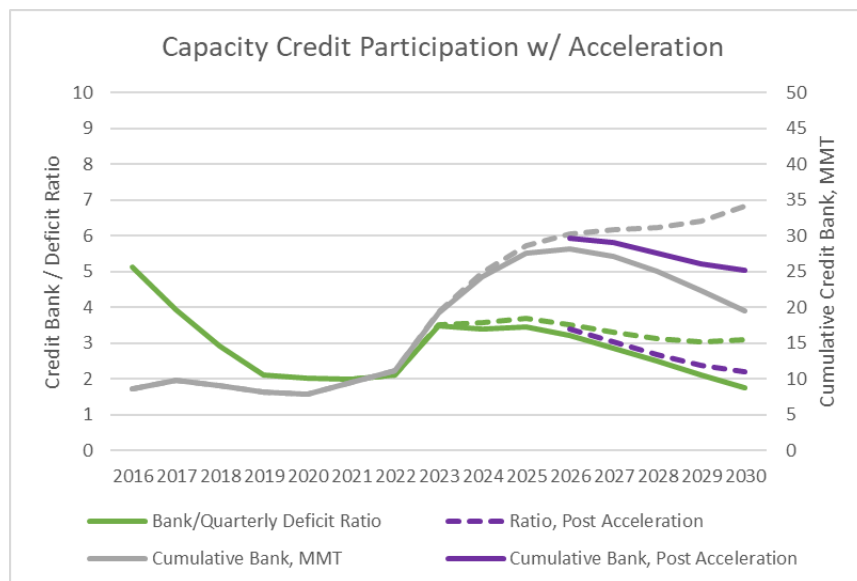
This subtle change in the generation of credits, less than 10% of total deficits per year, accumulates ripple effects on the market as shown by the dashed lines in Figure 8 below:



**Figure 8: Capacity Credit Participation Impacts on Scenario 3**

Other analysis performed through the public process will determine if this is or is not a desirable movement; the point SCE is highlighting is that the impact of this voluntary market mechanism can impact key market metrics by more than 50% over the course of several years.

While it may be tempting to recommend limiting the capacity credit pool to mitigate this outcome, SCE believes that incremental and permanent adjustments to the compliance stringency via an acceleration mechanism will accomplish the same goal while still encouraging the development of critical infrastructure. By simply adding 0.25% to the incremental annual stringency increase each year beginning in 2026 and carrying through to 2030, the impacts of the additional capacity credit participation are nearly negated as shown by the purple lines in Figure 9:



**Figure 9: Demonstration of an Acceleration Mechanism**

Table 3 shows the LCFS compliance schedules for Scenario 3, the Stepped Linear Path to 30%, and Scenario 4, the Acceleration Mechanism, side-by-side:

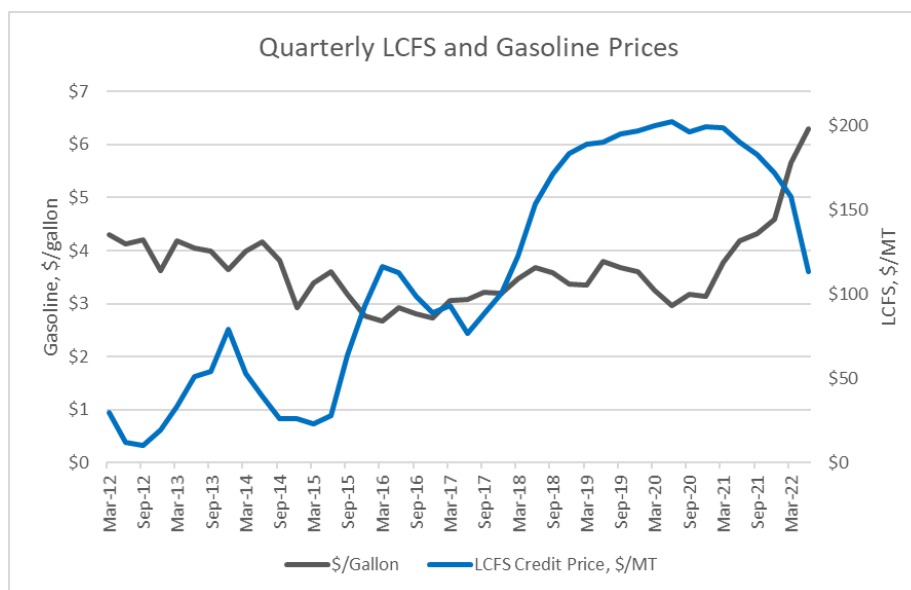
**Table 3: Comparison of Scenario 3 and Acceleration Mechanism Compliance Targets**

	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Stepped 30% Compliance</b>	10.0%	11.3%	15.5%	17.9%	20.3%	22.8%	25.2%	27.6%	30.0%
<b>Acceleration Mechanism</b>	10.0%	11.3%	15.5%	17.9%	20.6%	23.3%	25.9%	28.6%	31.3%

SCE is not suggesting that this scenario will occur, nor is it suggesting what parameters should be established that would trigger these types of accelerated adjustments to the compliance schedule (this is the focus of the previously mentioned CalETC analysis); rather, Scenario 4 demonstrates that, even if the voluntary credit generators respond in such a way that credits flood the market, the acceleration mechanism can be used to return stability to the system.

### Changes in the LCFS Stringency Have Little Direct Impact on Consumers

A concern that is often raised when discussing increasing the compliance stringency, an action that could result in higher LCFS credit prices, is that this could adversely impact Californians through higher retail gasoline prices. SCE is sensitive to this concern however, historically there is minimal direct correlation between LCFS credit prices and California retail gasoline prices as can be seen in Figure 10:



**Figure 10: Historical Data on LCFS Credit Prices and Retail Gasoline Prices<sup>10 11</sup>**

<sup>10</sup> Quarterly LCFS Prices are weighted sales averages from CARB’s public data, available at <https://ww2.arb.ca.gov/resources/documents/weekly-lcfs-credit-transfer-activity-reports>

<sup>11</sup> Quarterly retail gasoline prices averaged from data available through the U.S. Energy Information Administration (EIA) at [https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM\\_EPM0\\_PTE\\_SCA\\_DPG&f=M](https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPM0_PTE_SCA_DPG&f=M)

While there has been little direct historical correlation between the two, theoretically the total deficits generated in a year could be spread out over the number of gallons sold to create a “deficits per gallon” number that, when multiplied by the LCFS price, might represent the “cost” of LCFS at the pump. It is not clear that this is how the accounting is practiced, but SCE is utilizing this method to demonstrate the potential for worse-case fuel price impacts even though there is no evidence of a direct correlation between gasoline and LCFS credit prices. As Table 4 shows, at an assumed LCFS price of \$125/MT (double current prices) the price per gallon impacts from even the most stringent scenario SCE has considered – the Acceleration Mechanism to 32% in 2030 – are less than \$0.20/gallon beyond what the current 20% by 2030 Regulation would potentially implicate. While these are real costs, they are marginal compared to the gasoline price increases seen in 2022 during a time of unprecedented LCFS price collapse.

**Table 4: Potential Gasoline Price Impacts from Modeled Scenarios<sup>12</sup>**

		2024	2025	2026	2027	2028	2029	2030
<b>Scenario 1</b>	<b>Linear Compliance to 25%</b>	\$0.01	\$0.02	\$0.03	\$0.04	\$0.05	\$0.06	\$0.07
<b>Scenario 2</b>	<b>Linear Compliance to 30%</b>	\$0.02	\$0.04	\$0.06	\$0.09	\$0.11	\$0.13	\$0.15
<b>Scenario 3</b>	<b>Stepped Compliance to 30%</b>	\$0.05	\$0.07	\$0.08	\$0.10	\$0.12	\$0.13	\$0.15
<b>Scenario 4</b>	<b>Acceleration Mechanism to 32%</b>	\$0.04	\$0.06	\$0.08	\$0.10	\$0.13	\$0.15	\$0.18

Given the above findings on gasoline prices and LCFS, CARB should use the LCFS to achieve California’s ambitious climate objectives and strengthen the LCFS stringency requirements.

## Summary

While SCE has relied on two example metrics in this appendix, it is not claiming that these are the only, or even the best, indicators for monitoring and controlling the program. That will be one of the primary topics of the forthcoming CalETC study, and it is probable that other market participants and observers will also weigh in with their own recommendations during the public process.

Therefore, SCE strongly supports a new compliance target of at least 30% in 2030 based on the technical information it has provided in this appendix. Because it is important how this 30% is achieved, SCE supports an immediate, near-term acceleration to the compliance schedule, the increment of which is best determined once the parameters for the acceleration mechanism are established. SCE also supports extending capacity credits to 2035 for public ZEV infrastructure to support light-, medium-, and heavy-duty ZEVs. Finally, while many options have been proposed for tightening the LCFS market, such as limiting certain fuels’ or vehicles’ ability to participate, SCE supports an acceleration mechanism - a tool within the regulation that could be used to accelerate the compliance schedule based on established, clear, and transparent parameters developed through the public process – as the best and only tool needed to provide stability and certain for LCFS participants.

<sup>12</sup> Using data on Gallons of Gasoline supplied in the BNEF LCFS Tool.

## **Appendix B: Assumptions Used by SCE in the BNEF LCFS Tool**

Throughout this letter, SCE has made extensive use of the BNEF tool, but has converted data outputs into a native format for the ease of showing BNEF and public data side-by-side. In order to establish a base case scenario, where no changes are made to the current LCFS Regulation, SCE had to make a few modifications to the default settings for the BNEF model. These are described below:

1. The BNEF Model, by default, assumes that biodiesel is blended into the California feedstock at a rate of 7.9% based on 2021 data and that this is held constant through 2030. SCE maintains this assumption.
2. The BNEF tool utilizes a Carbon Intensity for Gasoline of 99.44 gCO<sub>2</sub>/MJ. SCE believes this should be 100.85 gCO<sub>2</sub>/MJ based on CARB's LCFS Quarterly Fuel Summary Data<sup>13</sup> and has updated accordingly.
3. The BNEF tool assumes a fixed EER-adjusted carbon-intensity for electric light-duty and heavy-duty vehicles through the end of the decade which does not consider that the California grid will become less carbon-intense over time. The result is that electric vehicles generate fewer credits in 2030 than they will with the default BNEF tool settings. SCE has updated these to align with a linear decrease in the average grid carbon-intensity to 51.2 gCO<sub>2</sub>/MJ by 2030, which is derived from assumptions used in SCE's Pathway 2045 Whitepaper.<sup>14</sup>
4. The BNEF tool calculates credits from electric vehicles by assuming that California maintains a share of national electricity demand from its electric vehicle fleet. SCE finds that this overestimates credits from electric vehicles in 2030. Relying on its own internal forecasts, which include the implications of the Advanced Clean Cars 2 Regulation and the Inflation Reduction Act, SCE estimates there will be between 6.5M and 7.5M EVs on the road in California in 2030. Making an assumption that the average electric vehicle charges approximately 3,140 kWh/year at home, SCE has modified the California share of US electric demand from EVs from the default value of 37% to 22% in order to align the BNEF tool's prediction of electricity credits with SCE's own projections.
5. The BNEF tool provides very detailed inputs for the volume of renewable diesel that will be made available to the state by determining when known projects will be commissioned. This is selectable in the BNEF tool by opting for the "Projects" based Renewable Diesel supply however, the default assumption in the BNEF tool is that California will continue to absorb 70% of the nation's supply of renewable diesel, which was the case in 2021. With several other states and Canada currently or imminently implementing their own LCFS Regulations, SCE believes that some of this supply will be diverted, especially considering that California only absorbed 43% of domestic supply in 2016. Thus, SCE assumes this share reduces linearly beginning in 2024 to 61% in 2030.

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<sup>13</sup> See <https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries>

<sup>14</sup> See

[https://download.newsroom.edison.com/create\\_memory\\_file/?f\\_id=5dc0be0b2cfac24b300fe4ca&content\\_verified=True](https://download.newsroom.edison.com/create_memory_file/?f_id=5dc0be0b2cfac24b300fe4ca&content_verified=True)