CARB staff is proposing to amend the LCFS regulation to reflect a range of objectives: from updates and revisions to improve the program’s overall implementation, to broader program design proposals that will improve accuracy of the LCFS and further support California’s long-term ability to diversify the State’s fuel pool, support demand for increasingly lower Cl fuels, and promote transformative innovation in the transportation sector. CARB staff is proposing amendments to the LCFS regulation to:

- Strengthen the carbon intensity benchmarks in order to help achieve California’s 2030 GHG reduction requirement enacted through SB 32 and discussed in the Draft 2017 Climate Change Scoping Plan;
- Expand the fuel types and qualifying activities eligible to participate in the LCFS in order to recognize and incentivize GHG reductions in additional transportation fuel sectors;
- Require third-party verification of Cl values and fuel transactions in order to enhance confidence in the LCFS program accounting;
- Update lifecycle analysis modeling tools to incorporate the most recent data and methodologies and streamline application and reporting requirements to encourage greater participation and reduce burden on participants; and
- Incorporate a protocol for carbon capture and sequestration projects that will specify the methods for both quantifying emission reductions and ensuring their permanent sequestration.

The proposed amendments are designed to increase the penetration of low-CI fuels in the California market. As such, the proposed amendments will impact the volumes of fuels sold which affects the output of fuel-producing industries including producers of: CARBBOB gasoline, diesel, conventional propane, starch ethanol, renewable gasoline, hydrogen used for transportation, biodiesel, renewable diesel, renewable propane, alternative jet fuel, conventional natural gas, dairy natural gas, landfill natural gas, and electricity used for transportation.

The proposed amendments will increase the costs to producers and importers of high carbon intensity fuels while producers of low carbon intensity fuels will see revenue increases. This will indirectly affect individuals in California that purchase transportation fuel, as staff assumes increased costs associated with production or import of high carbon intensity fuels will be passed on to consumers in the form of higher fuel prices. In 2021 and 2022, the proposed amendments are projected to reduce gasoline and diesel costs, as potentially higher LCFS credit prices are estimated for these years relative to the baseline scenario. From 2023 onwards, the proposed amendments are projected to increase the price of gasoline by $0.03 to $0.21 per gallon and potentially increase the price of diesel by $0.03 to $0.26 per gallon, based on the change in estimated annual LCFS credit price and annual deficits from 2025 through 2030.

3. Description of all costs and all benefits due to the proposed regulatory change (calculated on an annual basis from estimated date of filing with the Secretary of State through 12 months after the estimated date the proposed major regulation will be fully implemented as estimated by the agency).

Benefits:
CARB staff is proposing to amend the LCFS regulation to reflect a range of objectives: from updates and revisions to improve the program’s overall implementation, to broader program design proposals that will improve accuracy of the LCFS and further support California’s long-term ability to diversify the State’s fuel pool, support demand for increasingly lower Cl fuels, and promote transformative innovation in the transportation sector. CARB staff is proposing amendments to the LCFS regulation to:

- Incorporate a protocol for carbon capture and sequestration projects that will specify the methods for both quantifying emission reductions and ensuring their permanent sequestration.
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Costs:
CARB staff is proposing to amend the LCFS regulation to reflect a range of objectives: from updates and revisions to improve the program’s overall implementation, to broader program design proposals that will improve accuracy of the LCFS and further support California’s long-term ability to diversify the State’s fuel pool, support demand for increasingly lower Cl fuels, and promote transformative innovation in the transportation sector. CARB staff is proposing amendments to the LCFS regulation to:

- Incorporate a protocol for carbon capture and sequestration projects that will specify the methods for both quantifying emission reductions and ensuring their permanent sequestration.
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- Update lifecycle analysis modeling tools to incorporate the most recent data and methodologies and streamline application and reporting requirements to encourage greater participation and reduce burden on participants; and
- Incorporate a protocol for carbon capture and sequestration projects that will specify the methods for both quantifying emission reductions and ensuring their permanent sequestration.

4. Description of the 12-month period in which the agency estimates the economic impact of the proposed major regulation will exceed $50 million.

The proposed amendments were determined to be major due to the economic impact of the estimated generation of LCFS deficits and credits exceeding $50 million throughout all years of the assessment (2019-2030).
5. Description of the agency’s baseline:

For the baseline scenario, ARB utilized Regional Economic Model, Inc. (REMI) version 2.1.1, specific to California, to model the macroeconomic impact of the proposed amendments, which assumes the California economy absent the proposed amendments as the baseline. REMI Policy Insight Plus (PI+) is utilized to provide year-by-year estimates of the total impact of the proposed amendments, pursuant to the requirements of SB 617 and the California Department of Finance (DOF). CARB uses the REMI PI+ one-region, 160-sector model that has been adjusted to reflect forecasts dated June 2017 provided by DOF which include California population figures, U.S. real GDP forecast, and civilian employment growth numbers. In addition, the national baseline is adjusted to account for credit revenue and deficit cost that is generated by industries outside of California.

6. For each alternative that the agency considered (including those provided by the public or another governmental agency), please describe:

a. All costs and all benefits of the alternative

b. The reason for rejecting alternative

Alternative 1: CI Reduction of 25 Percent in 2030

Alternative 1 provides additional GHG emissions reductions and additional improvements in local air quality compared to the proposed amendments, which lead to additional health benefits. Staff expects cumulative GHG emission reductions for Alternative 1 to be 103.6 MMT C02e above the baseline. Compared to the proposed amendments, this is an increase in anticipated cumulative GHG reductions of 52.8 MMT C02e. The cost of compliance for Alternative 1 is calculated by multiplying the projected LCFS credit price by the number of deficits generated and subtracting the same multiple for the baseline scenario. Cumulative compliance costs for Alternative 1 are estimated at $27.9 billion (relative to the baseline). The cost of Alternative 1 is $19.2 billion more expensive than the proposed amendments.

Alternative 2: CI Reduction of 25 Percent in 2030

Alternative 2 provides similar CI reduction targets, cumulative GHG reductions, and criteria pollutant reductions as the proposed amendments, but it does not permit the use of alternative jet fuels, propane, or CCS projects for credit generation. Staff expects the cumulative GHG emission reductions for Alternative 2 to be 47 MMT C02e from 2019 through 2030. The cost of compliance for Alternative 2 is calculated by multiplying the projected LCFS credit price by the number of generated deficits and subtracting the same multiple for the baseline scenario. Cumulatively the cost of compliance under Alternative 2 is expected to be $12.6 billion more expensive than the baseline, and $3.4 billion more expensive than the proposed amendments.

b. Requiring a 25 percent CI reduction will result in increased GHG emission reductions and improvements in air quality, but at a cost much greater than the proposed amendments. The cost effectiveness of this alternative is more than double that of the proposed amendments.

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b. Requiring a 25 percent CI reduction will result in increased GHG emission reductions and improvements in air quality, but at a cost much greater than the proposed amendments. The cost effectiveness of this alternative is more than double that of the proposed amendments.

7. A description of the methods by which the agency sought public input. (Please include documentation of that public outreach).

Since the LCFS re-adoption in 2015, staff has been in frequent contact with stakeholders. Recently, the outreach has focused on clarifying certain provisions of the LCFS regulation and working together to gather public feedback on proposals being considered for future target setting, pathway certification, and verification amendments. In 2016, staff conducted eight public workshops and stakeholder working meetings, and as of September 2017, staff has hosted an additional twelve public workshops and working meetings, with more workshops slated this fall to further discuss proposed regulatory language.

CARB has also sought public input regarding the alternatives for the proposed amendments analyzed for this SRIA including:

- July 24, 2017: Staff posted a notice for the August 7, 2017 Public Workshop, which included a solicitation for alternatives as well as a Pre-Rulemaking concept paper describing each of the amendments under consideration.
- August 7, 2017: Staff hosted a public workshop focused on the proposed amendments, which also included a solicitation from stakeholders for alternatives to the staff proposal.

8. A description of the economic impact method and approach (including the underlying assumptions the agency used and the rationale and basis for those assumptions).

The proposed amendments are simulated in REMI by employing the production cost policy variable to account for a change in operating costs for industries that generate LCFS credits or credits. The NAICS code representing petroleum and coal products manufacturing (324) is used to represent the credits generated by CARB's gasoline and diesel and for credits generated by conventional propane, refinery investment, refinery renewable hydrogen, and incremental crude credit. The carbon intensity of gasoline and diesel projects and the carbon intensity of refinery investment projects are estimated based on the weighted average of the carbon intensities of the projects. The carbon intensity of the refinery investment projects is estimated based on the weighted average of the carbon intensities of the projects. The changes in the production costs to the waste management and remediation service industry are modeled as an increase in production cost to the three industry NAICS codes anticipated to bear these costs: petroleum and coal products manufacturing (324), basic chemical manufacturing (325), and natural gas distribution (221). Changes in the production costs to the natural gas distribution industry are modeled as an increase in production cost to the three industry NAICS codes anticipated to bear these costs, petroleum and coal products manufacturing (324), basic chemical manufacturing (325), and natural gas distribution (221). Demand for verification services will also grow as a result of the proposed verification requirements. This demand is modeled as an increase in expected final demand for management, assessment, and technical consulting services (NAICS 8113).