

UC Davis

Policy Briefs

Title

Modeling 2030 LCFS Targets

Permalink

<https://escholarship.org/uc/item/85b37613>

Author

Murphy, Colin W

Publication Date

2022-12-01

Modeling 2030 LCFS Targets

Issue

The Low Carbon Fuel Standard (LCFS) has successfully reduced GHG emissions from transportation fuels in California. In 2023, CARB will open a rulemaking to update several aspects of the program, most notably the carbon intensity (CI) reduction target for 2030.

LCFS credit prices have declined significantly since 2020, due to several factors including COVID-19 pandemic effects, interactions with the Federal RFS program, and anticipated growth in renewable diesel production. Raising the LCFS CI reduction target is the primary tool CARB uses to strengthen credit prices to incentivize critical investments in low carbon fuel production capacity and fueling infrastructure. This brief will discuss key considerations relating to the 2030 LCFS target (a CI reduction relative to 2010 levels), and the range of alternatives presented by CARB at the Nov 9th workshop.

Key Findings

UC Davis Policy Institute researchers used the Fuel Portfolio Scenario Model (FPSM) to evaluate 2030 target scenarios, based largely on those presented for discussion by CARB. This model was originally developed as part of the work that went into the *Driving California's Transportation Emissions to Zero* report.

A 25% target in 2030 is unlikely to significantly raise credit prices. This target trajectory resulted in large and persistent net credit surpluses through the 2020's.

The feasibility of a 30% target rests on five key areas of uncertainty.

1. **In-state EV deployment rates.**
2. **VMT and fuel consumption trends.**
3. **Renewable diesel and sustainable aviation fuel (SAF) carbon intensity.**
4. **Project-based credit growth.**
5. **Livestock renewable natural gas (RNG) growth trends.**

Attaining the 30% target would require each of these areas of uncertainty to perform at the upper half of their plausible range.

Overperformance in one could compensate for underperformance in another; however, if more

than one underperform projections, persistent deficits may be likely in the late 2020's.

A 35% target requires extremely high performance from all categories and would limit flexibility for program adjustments. As CARB staff noted at the Nov. 9th workshop on this topic, a 35% target would not be compatible with limitations on crop-based biofuels, or reductions in livestock RNG credits.

Additional modeling is needed to better inform target-setting decisions. ITS Davis researchers are currently updating fleet and vehicle activity projections to reflect recent policy developments. These will be used to inform new FPSM runs for a better-calibrated evaluation of potential targets, forthcoming in January, 2023.

Proposals for an “auto-ratchet” target increase mechanism deserve careful consideration. Low credit prices over the last two years show the need for mechanisms to preserve a functional incentive for investment. Triggered target increases could fill this role, though should be carefully targeted and calibrated. Yearly credit balance, rather than cumulative credit bank size, may be a more appropriate indicator for triggering any such increases.

Table 1 – Projected LCFS credits by category in 2030, under a 30% target (no other program changes)

Credit Category	Credits (millions)
LD Electricity	15.8
RNG	6.3
HD Electricity	4.1
Renewable Diesel	3.5
Sustainable Aviation Fuel (SAF)	3.4
Total Hydrogen	3.3
Projects, Infrastructure, CCS	2.7
Ethanol	2.3
Other (off-road) Electricity	2.1
Other Liquid Gasoline Substitute	1.1
Biodiesel	0.9
Total Credits	45.5
Total Deficits	44.1

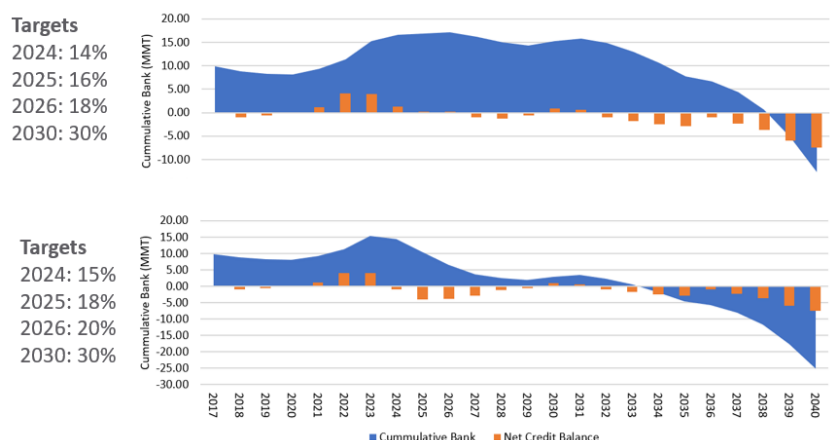


Figure 1: Impact of different target acceleration schedules on LCFS credit balance and bank.

The timing of near-term target increases greatly changes their impacts. Figure 1 shows the impact of different schedules that both result in a 30% target in 2030. Slight changes in target level can result in rapid depletion of the credit bank, with impacts that last well into the next decade.

LCFS targets must rise rapidly post-2030 to keep pace with rapid EV deployment. By the mid 2030's, the majority of vehicles in the state will likely be EV, but prior to that, LCFS target increases will result in increased gasoline prices for the majority of CA drivers. Moderating pre-2030 ambition could shield drivers from some of these impacts.

A 2035 CI target should be set as soon as possible and will likely need to be at least 20% higher than the 2030 one. Investments in low carbon fuel production capacity and infrastructure require long payback periods. Current models appear suitable for informing target-setting decisions in an approximate fashion through 2035. CARB might also choose to set a conservative 2035 target to indicate commitment to the program, and raise it later this decade, either through rulemaking or an auto-ratchet mechanism.

FPSM shows generally good agreement with CARB's CATS model. Based on the Nov. 9th presentation and subsequently released material, the two models share some, though not all, structural elements, and arrive at similar high-level conclusions regarding trade-offs involved in 2030 target setting.

Policy Recommendations

Additional modeling is needed to confirm target selection.

- **Achieving a 30% target requires several uncertain fuel categories to perform at the upper end of their potential range.**
- **Future modeling should focus on the 25% to 30% range, as well as different schedules of target increase.**
- **A 25% target probably does not sufficiently strengthen credit prices.**
- **A 35% target would limit the program's flexibility to take actions to improve sustainability or equity outcomes.**
- **Most consumers will be driving gasoline vehicles until the mid-2030's, so early ambition could result in significant price impacts.**

Further reading

[Driving California's Transportation Emissions to Zero by 2045](#)

[LCFS Workshop Page, with staff presentation and CATS model materials.](#)

FPSM Modeling Paper expected early 2023.

Authorship

This policy brief was prepared by Dr. Colin Murphy.