California's Low Carbon Fuel Standard: What it does and why it matters

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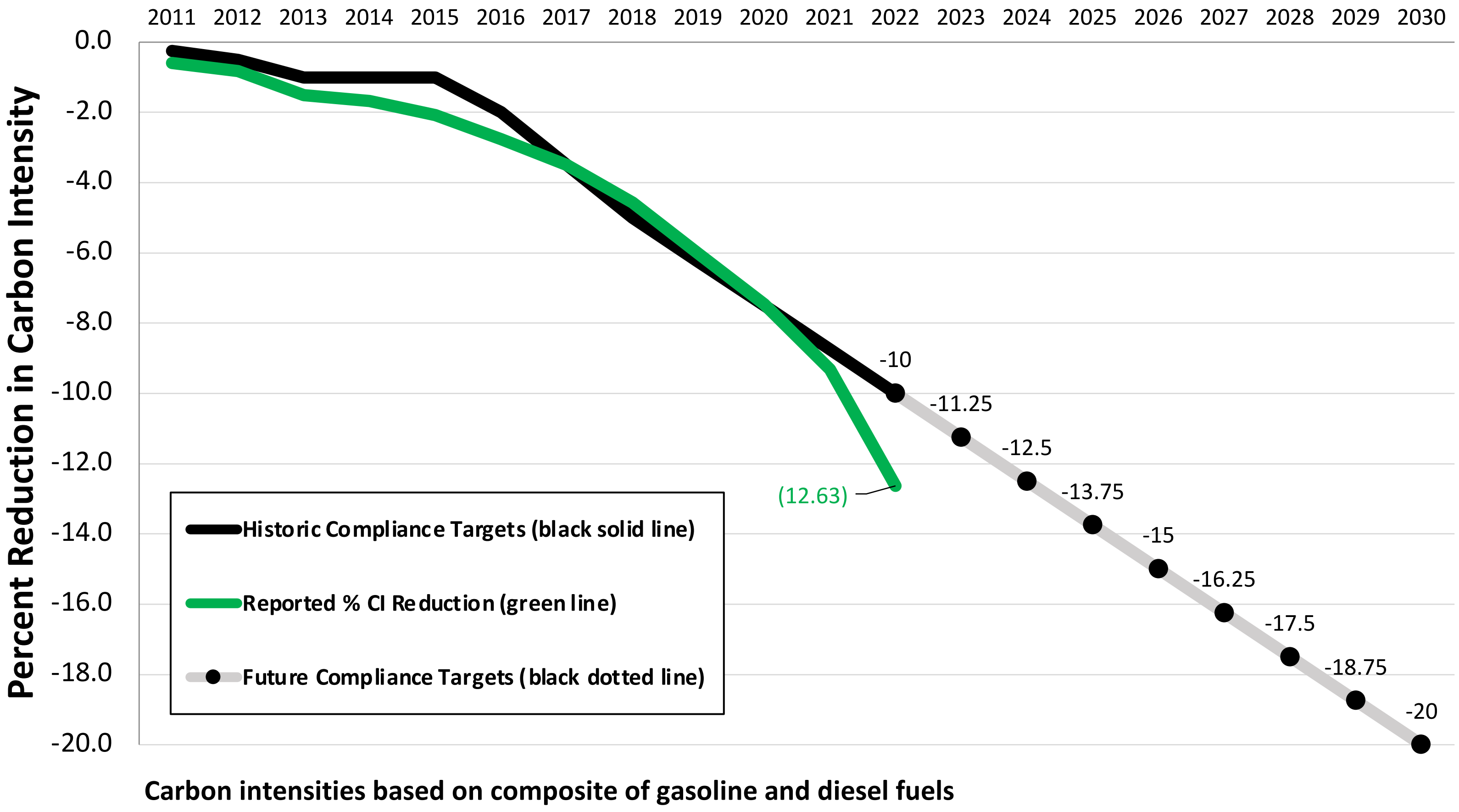
THE LCFS IN A NUTSHELL

- The LCFS requires that the average carbon intensity of California transportation fuel sales (gCO_2e/MJ fuel) decline over time
- Each fuel seller must meet the annual carbon intensity target
  - Fuels that are cleaner than the target earn credits
  - Fuels that are dirtier than the target create deficits
- CARB approves fuel pathways and their carbon intensities
  - Default carbon intensities available (a specific gCO_2e/MJ fuel)
  - Most fuel providers apply for bespoke calculations (with proprietary details)

LCFS TARGETS AND OUTCOMES

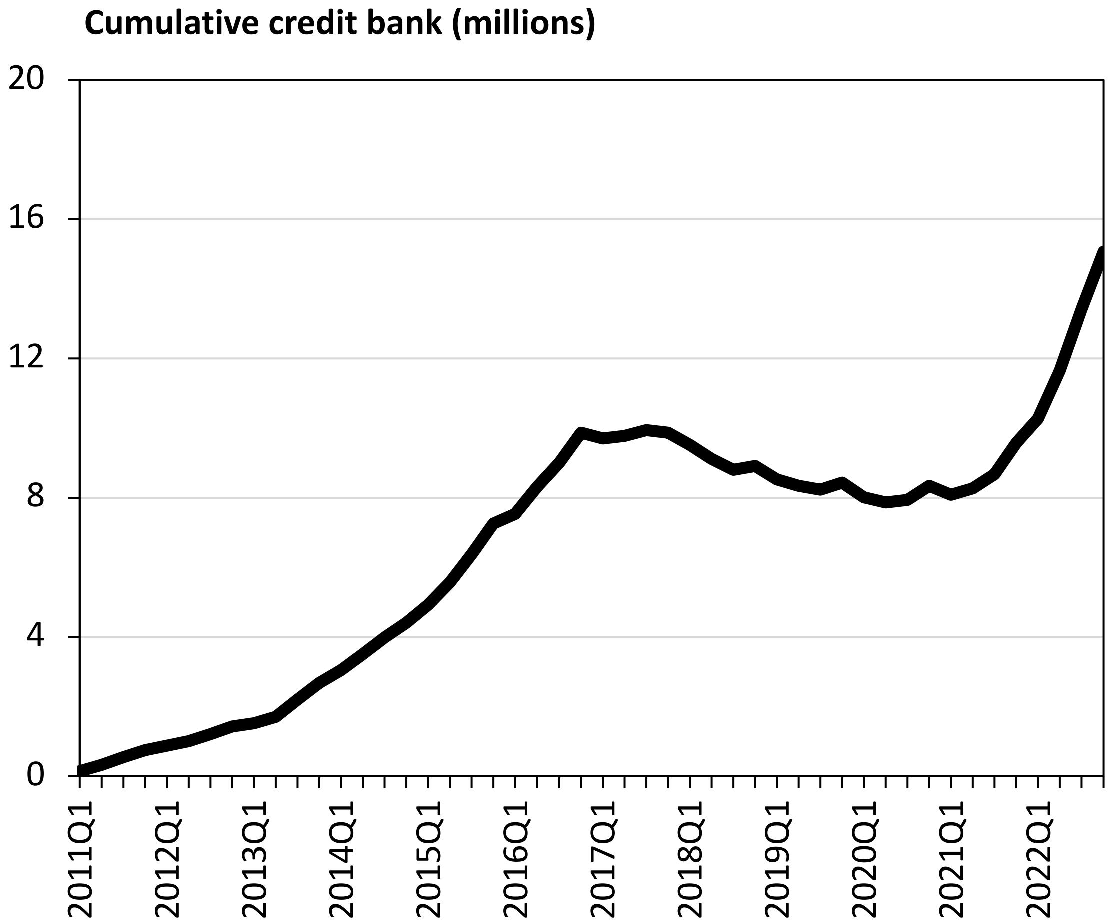


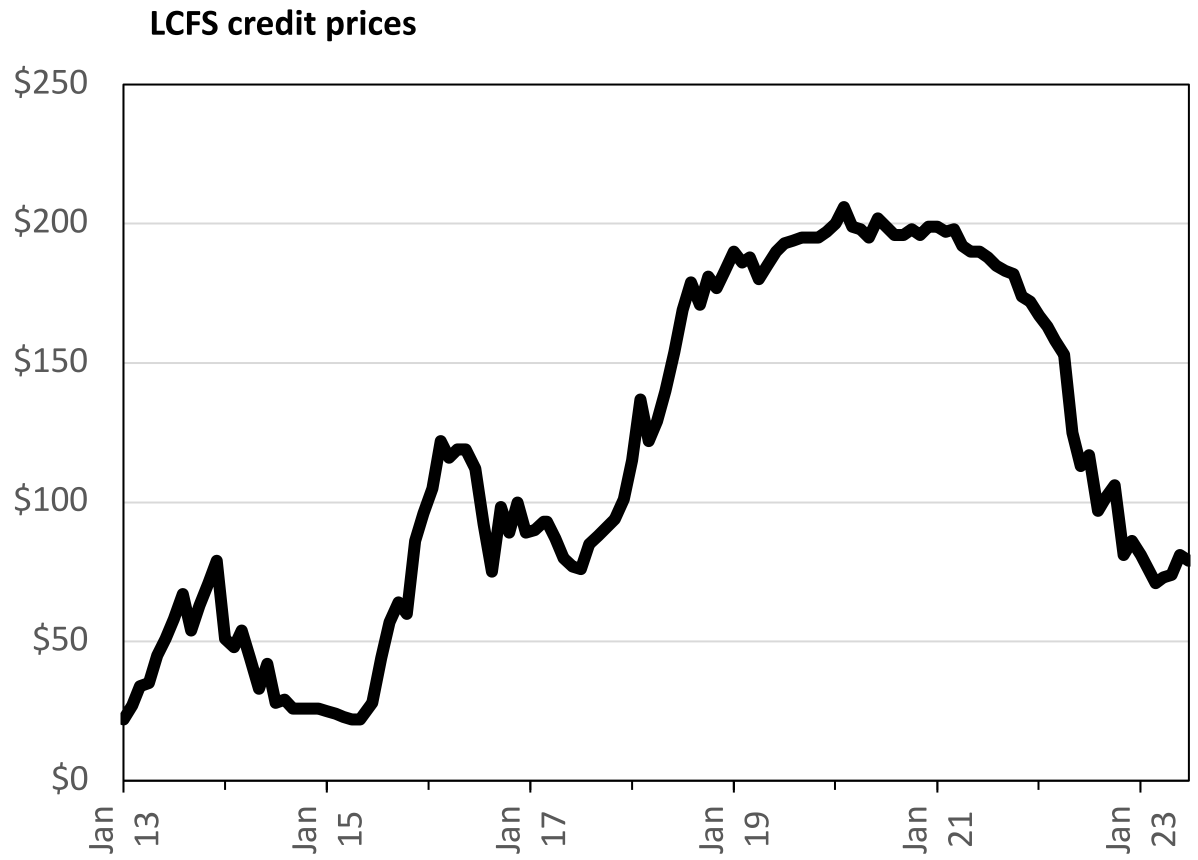
Source: [CARB LCFS dashboard]

RECENT CHALLENGES

- Stable, higher prices may be necessary to support ambitious outcomes
- However, LCFS credit prices are uncertain and can range from zero to (about) \$200/tCO_2e; credit prices can also be volatile
- A large bank of LCFS credits has developed
  - CARB helpfully tracks and reports supply-demand data, including banking metrics
  - Program compliance has outpaced policy targets
  - Market prices have fallen as a result

LCFS BANKING AND CREDIT PRICES





Source: [CARB LCFS dashboard]

POLICY REFORM AREAS

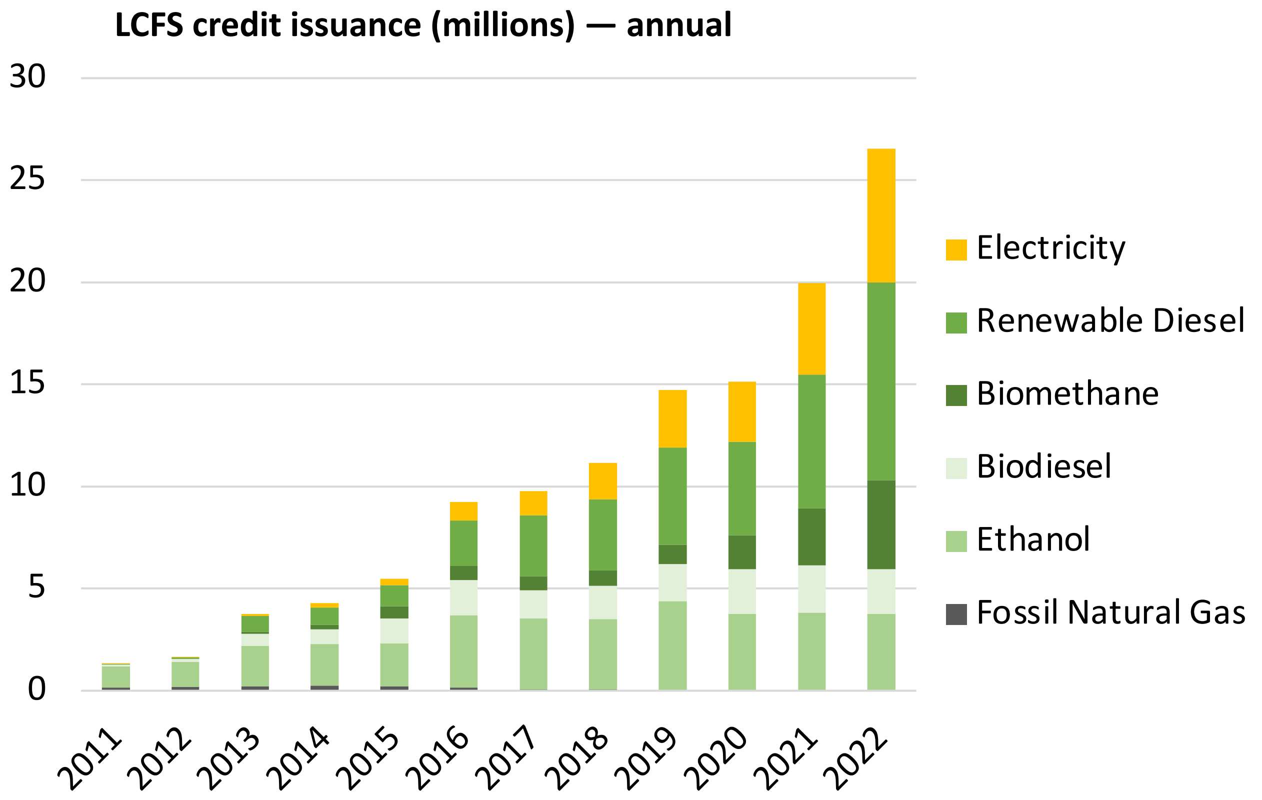
Credit demand — what overall reductions do we seek?

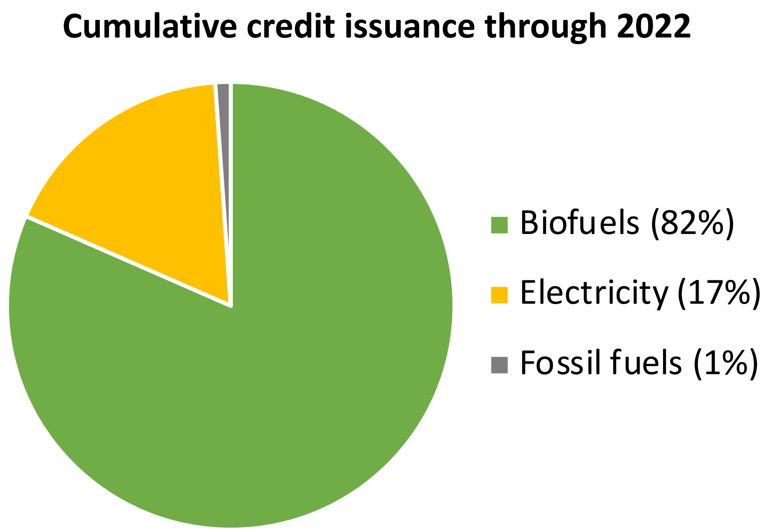
- Lowering carbon intensity targets (→ more demand)
- Extending program timelines (→ more demand) (e.g. through 2045)

Credit supply — who can earn valuable LCFS credits?

- Adding new pathways (→ more supply) (e.g. electricity/hydrogen for trucks, aviation)
- Removing or constraining pathways (→ less supply) (e.g. avoided methane emissions)

LCFS CREDIT ISSUANCE





(2022 issuance is 75% biofuels, 25% electricity)

Source: [CARB LCFS dashboard]

KEY CONCLUSIONS

- CARB staff have proposed to strengthen and extend the LCFS carbon intensity targets, which should increase program ambition.
- CARB staff determine which LCFS “pathways” are eligible and direct the flow of billions of dollars per year on that basis. (Compare with GGRF allocation, which is part of the budget and appropriations process.)
- Biofuels have earned 82% of credits through 2022, while electricity only earned 17%. In 2022, those shares were 75% and 25%, respectively.
- Growth in credit issuance is concentrated in (1) renewable diesel, (2) electricity, and (3) methane capture from dairies and other operations.

KEY QUESTIONS

- Which pathways should CARB make eligible for credit and why?
- What kind of transportation fuel system does the state want by 2045, and what investments are needed to create that system from where we are today?
- How should CARB incorporate concerns around:
  - Environmental justice impacts (e.g. CAFOs, refineries)?
  - Food competition and land use considerations (e.g. biofuel feedstocks)?
  - Infrastructure lock-in?