



Funding for ZEB Deployment

ZOOM TO ZERO:
A Zero Emission Infrastructure Planning Workshop

Long Beach, California
August 15, 2019

SYNCHRONIZATION & MULTIPLE RESOURCES NEEDED

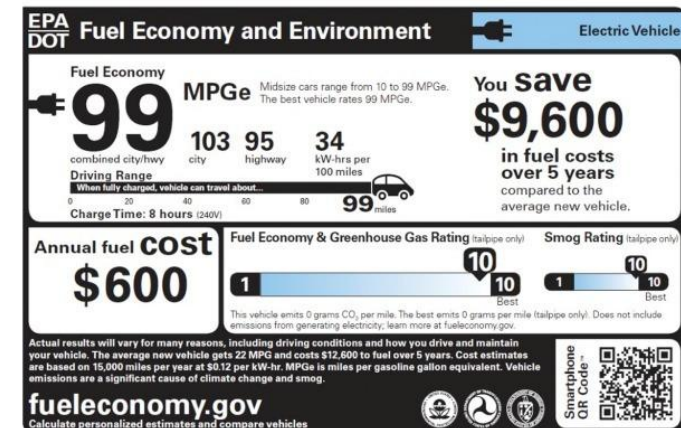
Bus Procurement



Infrastructure Installation



Fuel Cost Management



SIGNIFICANT INCENTIVES AVAILABLE

HVIP

Low NO_x engines, ZEVs,
advanced technology, &
infrastructure

FY 18-19
\$125M

VW

Zero-emission transit,
school, & shuttle bus
replacements

\$130M

Carl Moyer

Cleaner engines & ZEVs
up to \$80,000/bus plus
fueling infrastructure

FY 18-19
\$79M

AB 617

Engine replacement &
infrastructure in DAC

FY 18-19
\$245M

LCTOP

Expanded bus or rail
services, & multimodal
facilities

FY 17-18
\$146M*

TIRCP

Rail, bus, and ferry transit
improvements

FY 17-18
\$291M*

Utility Programs

Charging infrastructure
service upgrades and
electricity rates (SB350)

>\$575M

LCFS

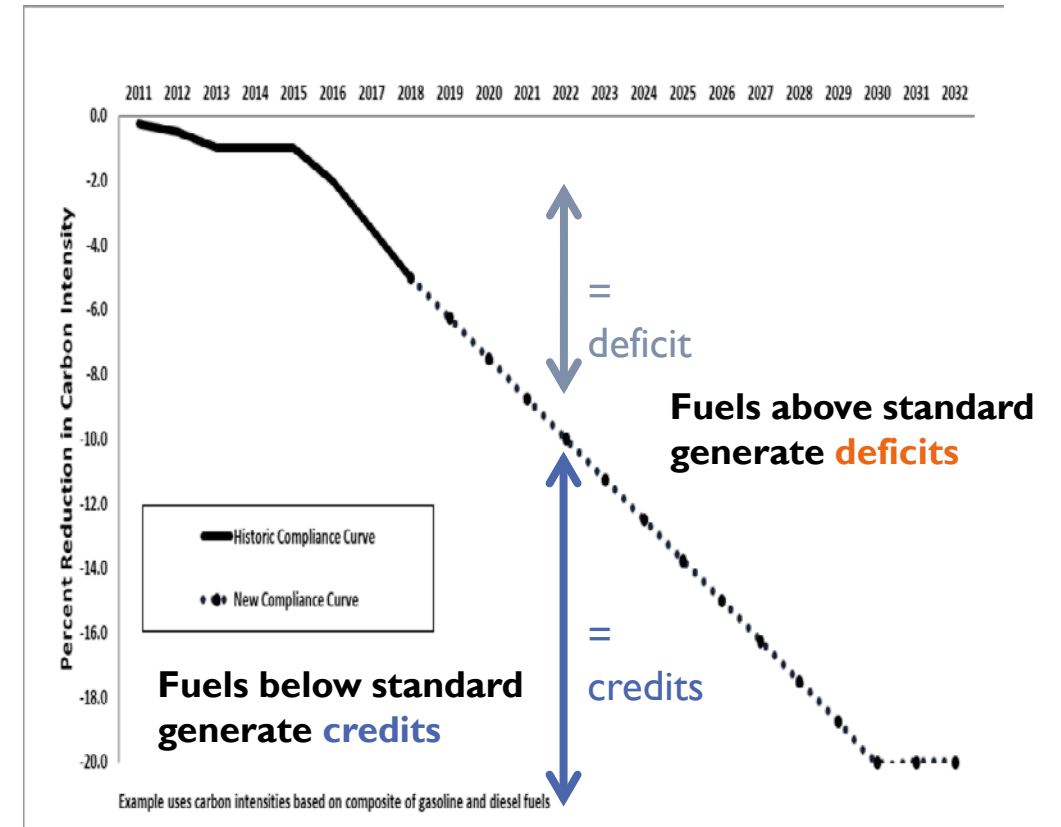
Credits for using low
carbon transportation
fuels

~\$10,000/BEB/yr

* Calculated from cap-and-trade auction proceeds listed at arb.ca.gov/cc/capandtrade/auction/aug-2018/ca_proceeds_report.pdf

LOW CARBON FUEL STANDARD (LCFS)

- Originally adopted in 2009, last amended in 2018
- Reduce carbon intensity (CI) of transportation fuel pool by at least 20% by 2030
- Transit agencies can opt-into LCFS to generate credits for using lower-carbon fuels
 - Credits do not expire, have monetary value and can be traded in the LCFS market
- Starting 2019, transit agencies that own hydrogen fueling infrastructure can also generate credits
- More information available at:
<https://www.arb.ca.gov/msprog/bus/lcfs.pdf> and
<https://www.arb.ca.gov/fuels/lcfs/lcfs.htm>



APPROXIMATE CREDIT REVENUE FOR TRANSIT BUSES IN 2019

Bus Fuel Type	Example CI* (gCO ₂ e/ MJ)	Fuel Efficiency		Credit Revenue Per Mile (LCFS credit value \$200 for illustration purpose)	Annual Credit Value (based on an annual mileage of 40,000)
BEB Using Grid Electricity	95	0.5	mile/kWh	\$0.54	\$21,649
BEB Using On-site Solar Electricity	0	0.5	mile/kWh	\$0.68	\$27,121
FCEB Using Hydrogen From Generic Lookup Table Pathway	120	6.5	mile/kg	\$0.22	\$8,702
FCEB Using Hydrogen From Electrolysis Through Zero-CI Electricity	10	6.5	mile/kg	\$0.62	\$24,949

*CIs shown here are for illustration purpose and subject to changes.

LCFS PROGRAM CONTACT AND INFORMATION

- Contact

- Jing Yuan, Staff Air Pollution Specialist

jing.yuan@arb.ca.gov

(916) 445-6017

- Program information

<https://ww3.arb.ca.gov/fuels/lcfs/lcfs.htm>