Heavy-duty Fuel Cell Vehicles

California Hydrogen Coalition

Hyundai

2020-2025 Production of 1600 Class 6 trucks in Switzerland

2023 Port of Oakland Demonstration, 30 Class 8 trucks

Production of 700,000 fuel cell units by 2030

Hyzon

Demonstration project in

port of Long Beach (April)

Cummins

M/Y 2026 H_2ICE commercial

production (10s of thousands)

FCEV commercial production

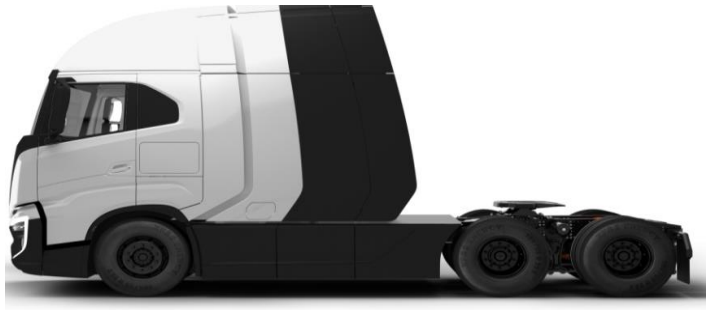
late 2020s

Mid-range and heavy-duty

Toyota/Kenworth

Commercial fuel cell powertrain production out of Kentucky plant 2023

10 drayage truck fleet operating out of the Port of LA currently



Nikola

Scale production for CA market to hundreds per quarter

Q4 2023 - sleeper cabs 2026

Fuels Cells in Transit & Off Road

California Hydrogen Coalition

Forklifts – Plug Power

3,000+ operating in CA today (Home Depot, Walmart, Amazon)

50,000 operating in US today, soon to be 80,000

Transit

CA: 76 buses in operation,

76 buses in purchase pipeline

FLEET	DIESEL (BASELINE)	DIESEL HYBRID	FUEL CELL ELECTRIC (FCEB)	BATTERY ELECTRIC (BEB)	LEGACY FUEL CELL
Series Grouping	1600	1550	7000	8000	FC
Technology Type	Diesel	Hybrid	Fuel Cell	Battery	Fuel Cell
Bus Qty	5	5	5	5	5
Manufacturer	Gillig	Gillig	New Flyer	New Flyer	Van Hool
Year	2018	2016	2019	2019	2010
Length	40′	40′	40′	40′	40′
Data Summary (July - December 2020)					
Fleet Mileage	110,293	95,383	112,233	64,648	82,710
Cost/Mile	$0.93	$1.11	$1.51	$1.39	$2.84
Cost/Mile (w/ credits)	$0.88	$1.09	$1.11	$0.78	$2.84
Emissions (CO_2 Metric Tons)	275	183	0	0	0
Fleet Availability	94%	85%	90%	57%	84%
Reliability (MBCRC)	15,226	8,033	10,406	8,109	3,024

Hydrogen Fuel & Infrastructure

Decarbonization of hydrogen fuel is heavily influenced by the ARB's

Low Carbon Fuel Standard, designed to decrease the carbon intensity of California's transportation fuel pool and provide an increasing range of low-carbon and renewable alternatives, which reduce petroleum dependency and achieve air quality benefits.

Renewable hydrogen is defined as, "hydrogen derived from (1) electrolysis of water or aqueous solutions using renewable electricity; (2) catalytic cracking or steam methane reforming of Biomethane; or (3) thermochemical conversion of biomass, including the organic portion of Municipal solid waste".

"Gasifying biomass to make hydrogen fuel and CO_2 has the largest promise for CO_2 removal at the lowest cost and aligns with the state's goals on renewable hydrogen."

- Lawrence Livermore, Getting To Neutral, 2020

Policy Recommendations

California Hydrogen Coalition

Low Carbon Fuels Standard (LCFS) – expand the Hydrogen and DCFC capacity credits to include heavy-duty refueling.

Continued and reliable funding of HVIP, ARB's heavy-duty vehicle incentive program.

Equitable distribution of state dollars to support 200 heavy-duty refueling stations by 2035, supporting 70,000 fuel cell trucks.

Equitable distribution of state dollars to support 1,000 light/medium duty stations by 2032, supporting 1 million fuel cell vehicles.

Avoid minimizing the role of fuel cell technologies & support self-sufficiency.

California Hydrogen Coalition