The Expanding Market For Fuel Cell Vehicles

Roadmap Conference – June 19, 2019
Introduction to Fuel Cells

Fuel Cell
- Produces electric power through electrochemical reaction of hydrogen and oxygen

Fuel Cell Stack + Hydrogen Supply
- Replaces the battery in electric drive systems
Well-to-Wheel GHG Emissions by Auto Technology and Fuel Pathway – GREET 2017 Pathways + Updated Fuel Economy

*Percent reduction values are relative to 2017 Baseline Internal Combustion Engine Vehicle*
Fuel Cells – Where they are used today
Hydrogen Fueling Station

The Customer Experience
Hydrogen Fuel Dispensed and Installed Capacity
A Path to California’s Hydrogen Goals

Currently Funded Stations

- 2020
- 2021
- 2022

CHIT Determined Stations: Size
- 2023
- 2024: 200
- 2025: 350
- 2026: 600
- 2027: 900
- 2028: 1200
- 2029 Current AB 8 Stations
- 2030

Growth of H2 Infrastructure Statewide

- 8,000 Gasoline Stations (2018)
- High Density
- Low Density

- 1,000 H2 Station Proj. (2030)
- High Density
- Low Density
Long Range and Scalability to Larger Vehicles

• Maintaining acceptable range is a significant weight, cost and size challenge for BEVs because this is dependent on the battery capacity.

• However, maintaining acceptable range for FCEV is dependent only on the size of the H2 tank.
  • At longer ranges, FCEVs have a significant weight, cost and size advantage over BEVs
  • This advantage becomes more pronounced the larger and heavier the vehicle.