

# Hyundai Fuel Cell Electric Commercial Vehicles



Hyundai America Technical Center

Jerome Gregeois – Director Commercial Vehicles Development [jgregeois@hatci.com](mailto:jgregeois@hatci.com)

November 2023

# 54

## Affiliate Companies

## Full Line up of passenger and commercial vehicles

<b>AUTOMOBILE</b>	
<b>CONSTRUCTION</b>	
<b>STEEL</b>	
<b>PARTS</b>	
<b>FINANCE</b>	
<b>OTHERS</b>	





# 2020 Switzerland – 4x2 & 6x2 FCEV Rigid Trucks



- Grocery delivery application
- Rigid cargo truck with full trailer (both refrigerated)
- Driving range up to 250 mi between hydrogen refueling
- Initial delivery of 50 units in 2020 with an additional 6x2 variant (cargo) in '21

Technical Specification	4x2 Cargo
Fuel Cell (FC) System	2 Fuel Cell Power Units (Stack+BOP) for 180kW gross power output (Mobis)
Station Nozzle	H35 1 receptacle
Vehicle Range	250 miles
H <sub>2</sub> Onboard Storage	34.5 kg [~32 kg useable], (Faurecia)
Pressure	350 bar (5,000 psi)
Curb Weight	21,605 lbs. (without upfit)
Motor	Centrally mounted PMSM 350kW peak at 613V 295kW continuous power
Motor Output	6-speed AT
Transmission	
Battery	73 kWh, Li-polymer (Mobis)
Truck Length & Wheelbase	OAL 384", wheelbase 202"





# Green Hydrogen Electrolysis

Hydroelectric power plant  
Residual/renewal energy for H<sub>2</sub> production

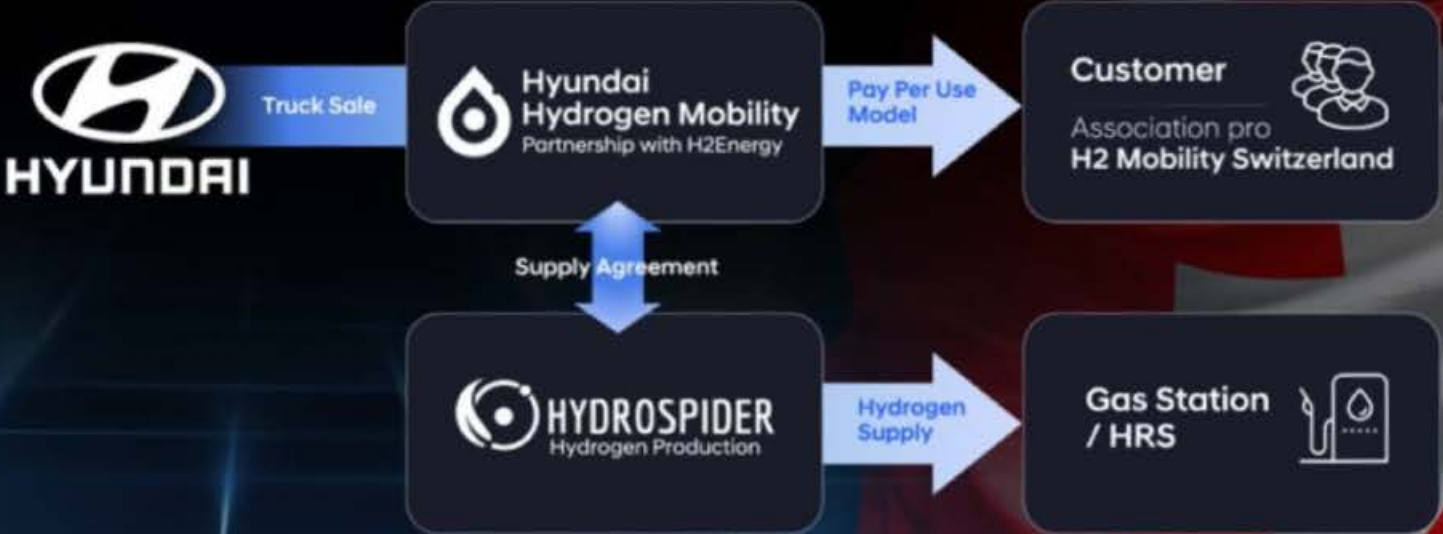


Hydrogen production & container  
H<sub>2</sub> production nearby power plant and



Hydrogen refueling in a typical Gas Station  
~8 minutes to refuel in Switzerland (21kg of H<sub>2</sub>)

# Pay per use Structure





# 6x4 Tractor operating in California – specifications HYUNDAI

Scope	30 US certified 6x4 tractors
Fuel Cell (FC) System	2 Fuel Cell Power Units (Stack+BOP) from Mobis
Station Nozzle	H70 1 receptacle
Vehicle Range	400-500 miles
H <sub>2</sub> Onboard Storage	70 kg [~67 kg useable]
Pressure	700 bar (10,000 psi)
Motor	Centrally mounted PMSM
Motor Output	350kW peak at 613V 295kW continuous power
Transmission	6-speed AT
Battery	Li-polymer (Mobis)
Truck Length & Wheelbase	OAL 343", wheelbase 196"





# 2023 NorCal Zero: Pilot Program



Drayage Truck and Infrastructure Pilot Program

➤ Demonstration of commercial viability of FCETs to Fleet Operators

## Program Overview

- 30 Xcient Fuel Cell Drayage Trucks
- Hydrogen Fueling Station at Port of Oakland
  - ~20 min 60kg fills; capable of supporting up to 60 trucks

## Operations Timeline



CARB and CEC: Primary Grants



Grant Recipient &  
Project Manager



**GLOVIS**

Operations Team

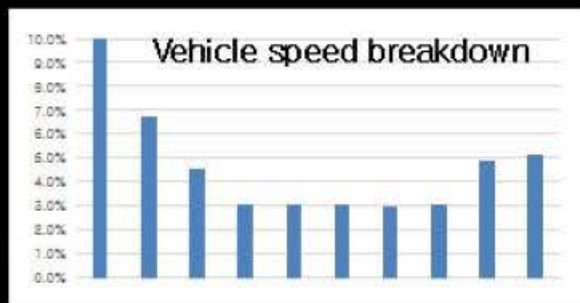
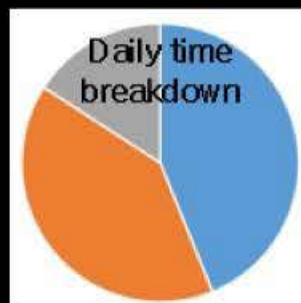




# 2021~23 US operators & drivers' feedback / data



## Duty cycles:

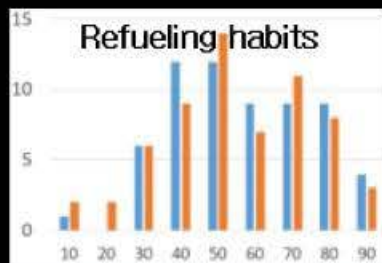


## Drivers & operators:

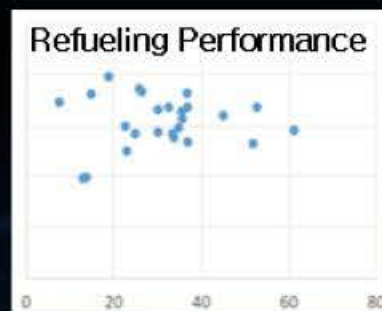
### Universal driver appreciation of **electric drivetrain**

- Immediate high motor torque ( >CNG & Diesel)
  - Freeway merging / passing
  - intersection crossing
- powertrain quietness
  - cabin NVH & HVAC are great

## H2 eco system:



### Sufficient range for “daycab” operation



### Limited H2 infrastructure and 2023 pricing are cause for stress

- Possible wait and refueling time longer than diesel with current generation station and vehicle.

# Groceries in Switzerland, Drayage in California...



Xcient Fuel Cell tractor in Oakland, CA

