

# Fuel Cell Electric Vehicle (FCEV) for Transport

Fuel Cell Electric Vehicle (FCEV) for transport is an eco-friendly vehicle based on a fuel cell system that generates electricity from hydrogen to power its operation.

FCEV for transport is a zero-emission vehicle that does not emit air pollutants, offering advantages over electric buses with a longer driving range of over 500km and shorter refueling time of less than 20 minutes.



▲ Seoul has introduced eco-friendly hydrogen buses on regular city bus routes

## Issues to Tackle

- ☑ Carbon emissions from internal combustion engine vehicles are a major cause of global warming.
  - \* Compared to passenger cars, internal combustion engine buses emit approximately 30 times more greenhouse gases and 43 times more fine dust annually.

## Expected Benefits

- ☑ Converting internal combustion engine buses to hydrogen buses results in the reduction of air pollutants and greenhouse gases
- ☑ Operating one FCEV for transport for one year reduces carbon dioxide emissions by 72 tons.
  - \* Equivalent to the amount of carbon dioxide absorbed by approximately 2,700 pine trees in one year.

## 💡 Key Services

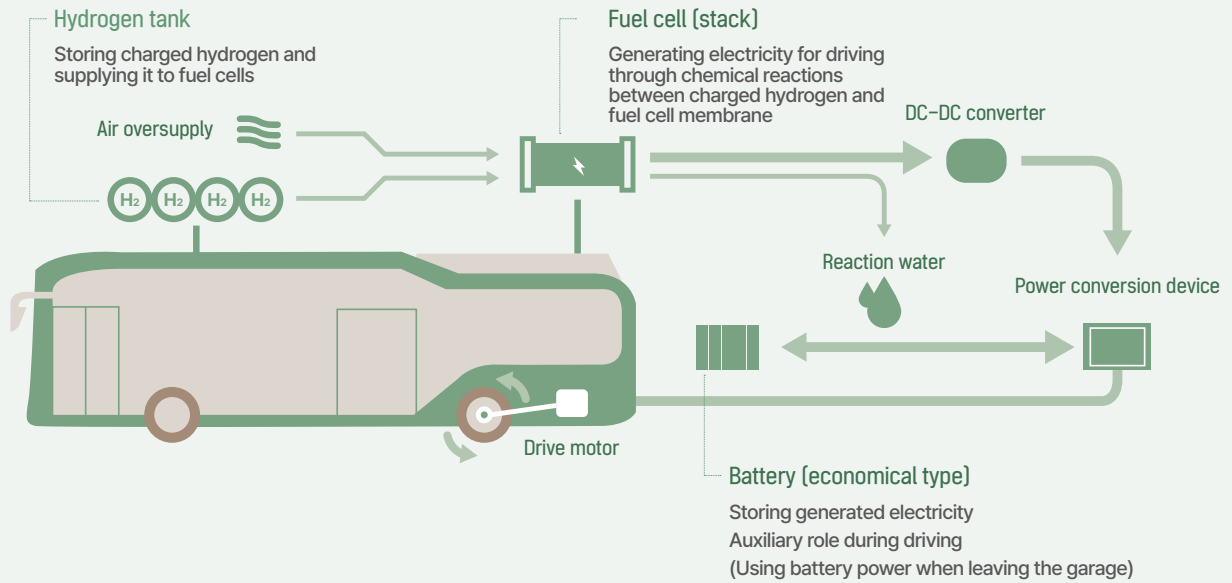
- Refueling with gaseous hydrogen or liquefied hydrogen
- Gaseous hydrogen is cooled to  $-253^{\circ}\text{C}$  to create a liquid form for safe mass storage and transportation, purifying intake air and releasing clean air during operation through an equipped hydrogen fuel cell system.
- Providing comfortable rides with approximately 60% less noise and 40% less vibration compared to diesel buses.

## ⚙️ Use Cases

- In June 2019, the first hydrogen bus was registered in Changwon City, Gyeongsangnam-do, and by July 2024, 1,000 hydrogen buses were registered in Korea.
- In 2024, Incheon Metropolitan City leads the hydrogen bus transition policy by operating 505 hydrogen buses and 13 hydrogen refueling stations, including liquid hydrogen charging stations.
- In 2024, Jeju Island is operating 11 green hydrogen buses on two routes and plans to expand the fleet to 300 buses by 2030.

## Key Components

## Configuration



## Technology

## 1. Hydrogen tank

- Storing compressed hydrogen received from charging stations and transferring it to the power generation unit during operation.

## 2. Fuel cell

- Generating electricity during the chemical bonding process of hydrogen and oxygen using onboard oxygen/hydrogen supply systems and catalysts such as PEM (Polymer Electrolyte Membrane: using polymer membrane as electrolyte).

## 3. Drive system

- Distributing electricity generated by the stack and stored in high-voltage batteries to the motor through converters and inverters.

## 4. Thermal management system

- Optimizing reaction temperature through cooling water lines, pumps, and temperature sensors



## Specifications of Domestic Supply Hydrogen Buses

## Low-floor (city) bus

## High-floor (express) bus



Vehicle name	Electricity FCEV	Universe Hydrogen Electric Bus
Fuel capacity	About 34 kg	About 34 kg
Release	2019~	April 2023
Government subsidy	KRW 210 million	KRW 210 million
Energy consumption efficiency	21.9km/kg	26.08km/kg
Length x Width x Height (m)	11x2.5x3.4	11.75x2.5x3.7

## Technology Companies

DOOSAN FUEL CELL  
www.doosanfuelcell.com

HYUNDAI MOTORS  
www.hyundai.com

WOJIN INDUSTRIAL SYSTEMS  
www.wjis.co.kr

