

# Fuel Cell Electric Vehicle (FCEV) for Transport

**Fuel Cell Electric Vehicle (FCEV) is an eco-friendly vehicle powered by a fuel cell system that generates electricity from hydrogen.**

Hydrogen buses emit no air pollutants and have a longer driving range of about 500 km compared to electric buses. Additionally, they have the advantage of a short refueling time of under 20 minutes.



▲ Seoul City has adopted eco-friendly hydrogen buses for regular city bus routes.

## Issues to Tackle

- ☑ Internal combustion engine (ICE) buses significantly contribute to carbon emissions, a major factor in global warming.
  - \* ICE buses emit 30 times more carbon dioxide and 43 times more fine dust annually per passenger compared to hydrogen buses.
- ☑ Hydrogen buses face adoption barriers such as high initial costs and a lack of charging infrastructure.

## Expected Benefits ☒

- ☑ Replacing ICE buses with hydrogen buses will reduce air pollution and greenhouse gas emissions.
- ☑ Hydrogen buses are highly efficient for long-term operation on fixed routes, with minimal energy loss and no emissions during refueling.
- ☑ A single hydrogen bus reduces approximately 72 tons of carbon emissions annually.
  - \* This equates to the absorption capacity of 2,700 trees over a year.

## 💡 Key Services

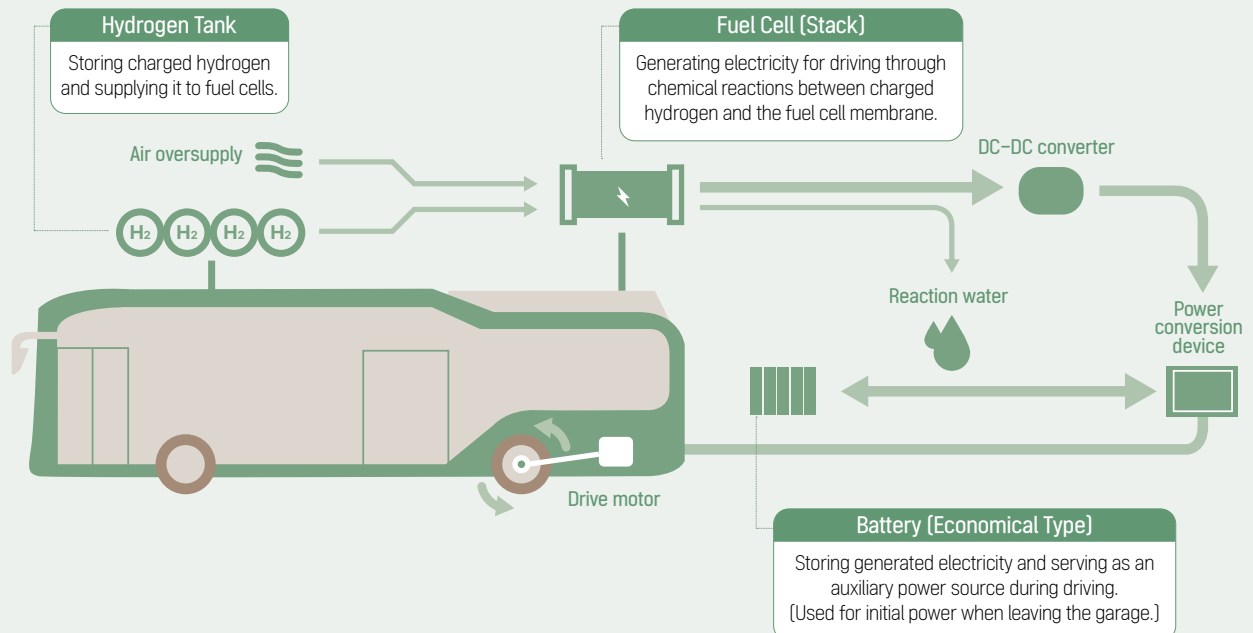
- Refueling with compressed or liquid hydrogen as fuel.
  - \* Liquid hydrogen can be stored and transported safely by cooling it to -253°C to convert it into a liquid state.
- Equipped with a hydrogen fuel cell system to purify intake air and minimize emissions, ensuring clean air during operation.
- Reduces noise by 60% and vibration by 40% compared to diesel buses, offering a quieter and more comfortable ride.

## ⚙️ Use Cases

- In June 2019, South Gyeongsang Province registered Korea's first hydrogen bus in Changwon City. By July 2024, 1,000 hydrogen buses were registered nationwide.
- In 2024, Incheon City plans to lead the hydrogen bus adoption policy by operating 505 hydrogen buses with 13 hydrogen refueling stations.
- In 2024, Jeju Island began operating 11 green hydrogen buses across two routes, with plans to expand to 300 buses by 2030.

## Key Components

## Configuration



## Key Technologies

## 1. Hydrogen tank

- Stores compressed hydrogen supplied at refueling stations and delivers it to the power generation system during operation.

## 2. Fuel cell

- Utilizes catalysts such as PEM (Polymer Electrolyte Membrane) to generate electricity through chemical reactions between hydrogen and oxygen.

## 3. Drive system

- Distributes the electricity generated and stored in the high-voltage battery to the inverter and motor.

## 4. Cooling System

- Optimizes the system's response by using cooling lines, pumps, and temperature sensors.

## Domestic Hydrogen Bus Specifications

## City Bus (Low-Floor)

## Coach Bus (High-Floor)



Model Elec City FCEV

Universe Hydrogen  
Electric Bus

Fuel Capacity	~34kg	~34kg
Launch Date	Since 2019	April 2023
Energy Efficiency	21.9km/kg	26.08km/kg
Dimensions (L x W x H)	11 x 2.5 x 3.4	11.75 x 2.5 x 3.7

## Technology Companies

DOOSAN FUEL CELL  
www.doosanfuelcell.com

HYUNDAI MOTORS  
www.hyundai.com

WOOJIN INDUSTRIAL  
SYSTEMS  
www.wjis.co.kr

