

# Doosan Fuel Cell

**DOOSAN**

IR Presentation

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Investor Relations



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Forecasts and projections contained in this material are based on current business environments and management strategies, and they may differ from the actual results upon changes and unaccounted variables. We make no guarantees and assume no responsibility for the use of information provided. We trust your decisions will be based on your own independent judgment.

Financial data in this presentation is on a IFRS separate basis.





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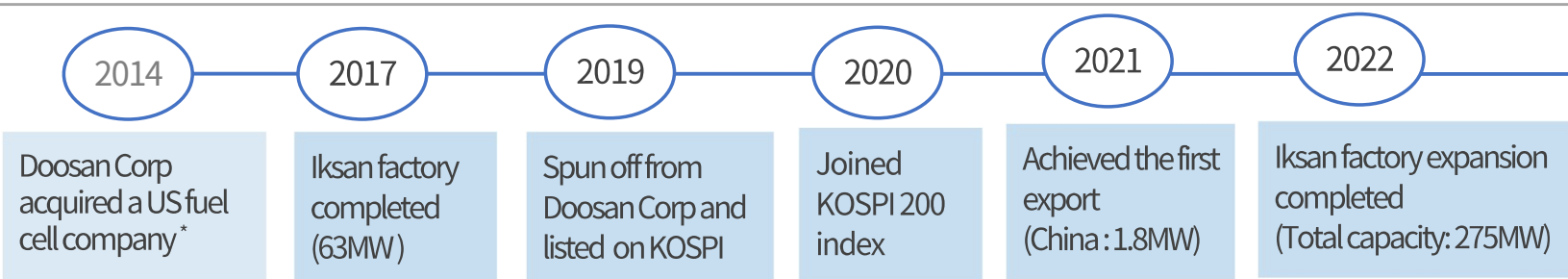
# Company at a Glance

## Overview

- Business : fuel cells, long-term service, H<sub>2</sub> generator installation & management, FCEV charging stations, mobility powerpack and fuel cells for eco-friendly vessels
- Assets : KRW 1.1 trillion
- Employees : 467

As at the end of June 2023

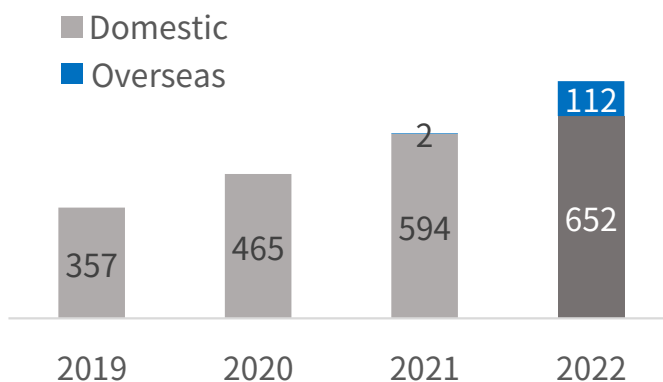
## History



\*Clear Edge Power

## Performance

### Accumulated Orders (MW)



### Accumulated Installation in Korea

525MW installed (55% market share)

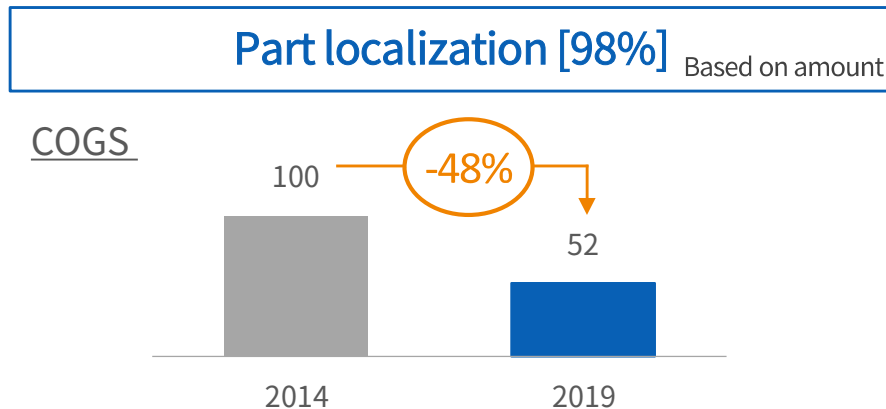


As at the end of June 2023

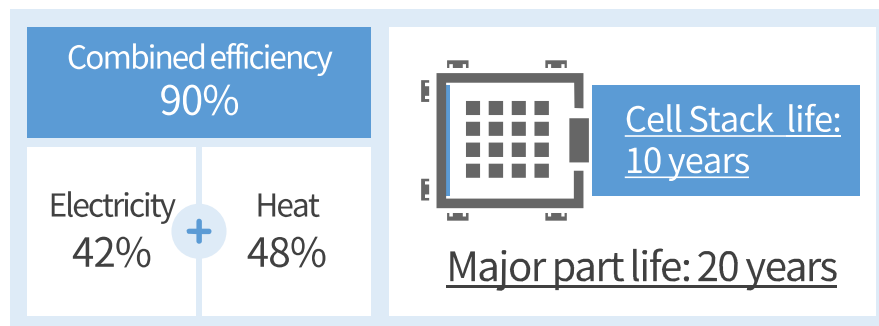
# Key Advantages of PAFC Technology

(1) Higher localization rate, (2) Higher combined efficiency and first and only H<sub>2</sub> model, and (3) load following capability to **support government policy including CHPS(1)**

## ✓ High localization & combined efficiency

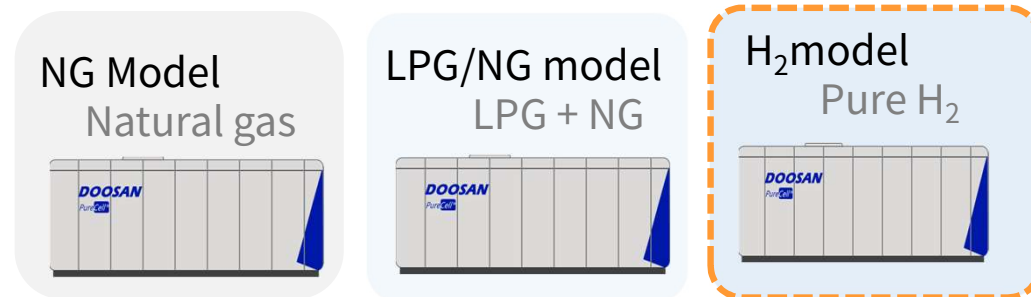


## High combined efficiency & long lifespan



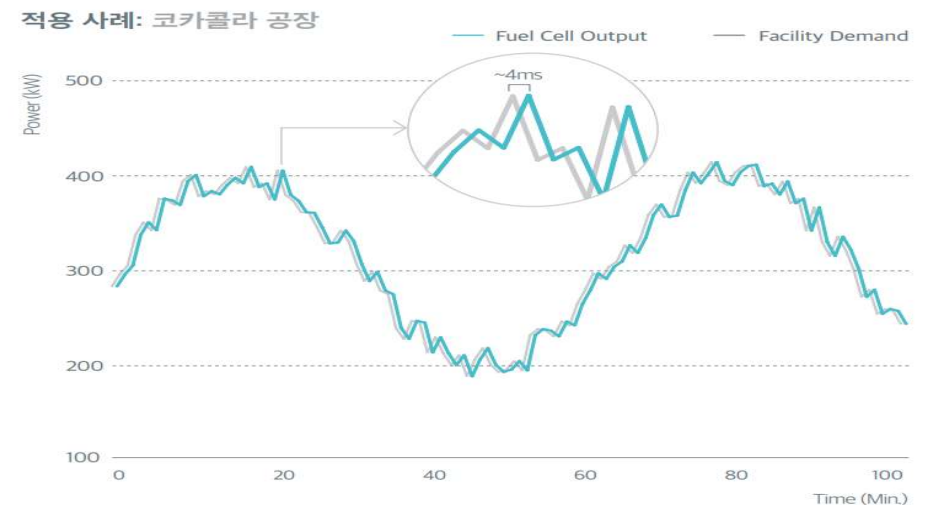
(1) CHPS: Clean Hydrogen Portfolio Standard

## ✓ Easy convert to H<sub>2</sub> model



## ✓ Road following capability

Case for the factory of CocaCola in the US





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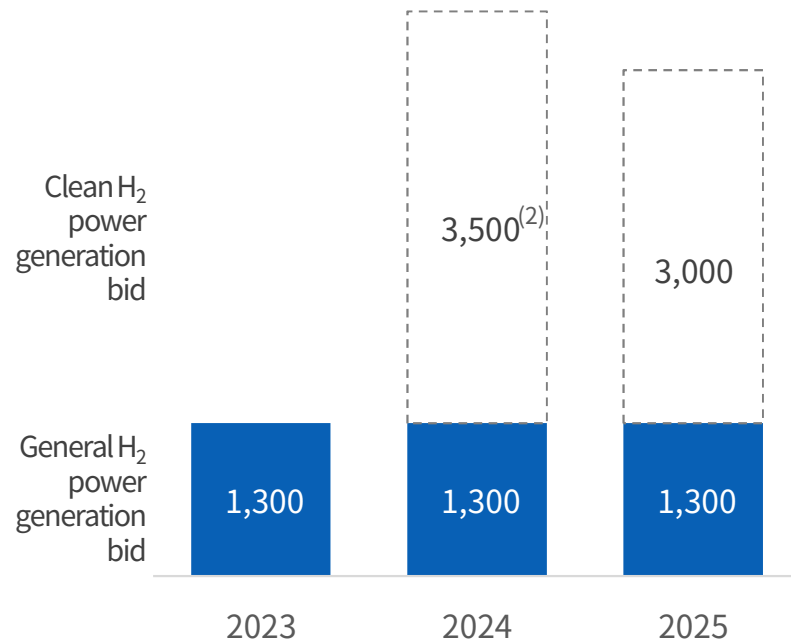
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# Korea Market: Fuel Cells for Power Generation

**With General H<sub>2</sub> Power Generation Bid Market, stable domestic demand has been secured, and there will be additional markets starting in 2024 through the implementation of the Clean H<sub>2</sub> Power Generation Bid Market and Special Act on Distributed Energy Promotion**

## CHPS<sup>(1)</sup> Bidding Market Volume

(Unit: GWh)



Source: Ministry of Trade, Industry and Energy administrative notice, based on the year of the bid market open volume

(1) CHPS: Clean Hydrogen Portfolio Standard

(2) The volume for 2024 was set at 3,500GWh, considering low mix rate of H<sub>2</sub>/ammonia, but 6,500 GWh at the normal mix rate

### General H<sub>2</sub> Generation Bid

- Introduction: June 2023
- Fuel: clean and gray H<sub>2</sub> including byproduct H<sub>2</sub>
- Purpose: maximizing the role of distributed generation
- Contract terms: 20 years

### Green H<sub>2</sub> Generation Bid (proposed)

- Introduction: 2024
- Fuel: clean H<sub>2</sub>
- Purpose: introduction and promotion of clean H<sub>2</sub>
- Contract terms: 10 years or above

### Distributed Energy Promotion Special Act


- Implementation: June 24
  - enforcement decrees and enforcement rules are being built
- Mandatory use of distributed energy, etc.
- Fuel cells are defined as distributed generation



# General H<sub>2</sub> Bidding Market and Strategy

## Expand orders by developing products to comply with policies, improving localization rate and business development capabilities

### Timeline

- 
- June 9 • 1st bid notice
  - July 14 - Deadline for the bid
  - July 31 - Announcement of preferred bidders
  - August - Announcement of the winning bidders
    - ✓ After the announcement of the winners, order contracts are signed with the customers
  - Sep.~Dec. • 2nd bid notice ~ announcement of winning bidders

### Evaluation Factor

- Quantitative
  - Power generation cost (LCOE<sup>(1)</sup>)
- Qualitative
  - General evaluation: industrial & environmental contribution, etc.
  - System evaluation: generator performance, transmission and distribution linkage

(1) LCOE: Levelized cost of energy

### Company Strategy

- ✓ Developing products in line with policies
  - Strengthening competitiveness of H<sub>2</sub> model: utilizing byproduct H<sub>2</sub> and biogas fuel
  - Flexible Power: to relieve grid system burden
  - Domestic industry contribution
- ✓ Improving Biz development capabilities
  - Focus on area with energy demand and local governments with low energy independence
  - Development of businesses that can utilize heat and byproduct H<sub>2</sub>
- ✓ Securing mid- to long-term partnership
  - Securing a stable and competitive order pool through mid- to long-term partnerships with major companies, utilities, and financial companies

# Additional Market Opportunities

## Aim to secure additional business opportunities through the clean H<sub>2</sub> power generation bidding market and the Special Act on Distributed Energy Promotion

### Clean H<sub>2</sub> generation bid

#### ① Clean H<sub>2</sub> utilization

- Developing policy in progress with the target to start in '24
- Definition of clean H<sub>2</sub>: Discussion on emissions<sup>(1)</sup> calculation method and certification

#### ② Technology neutral

- Various technology, including fuel cell, H<sub>2</sub> turbine, coal · ammonia mix are applicable

✓ Securing market with the verified 'H<sub>2</sub> model'

✓ Building collaboration with clean H<sub>2</sub> producers

(1) At the clean H<sub>2</sub> certification briefing session, the greenhouse gas emissions standard was suggested as 4kgCO<sub>2</sub>eq/kgH<sub>2</sub>

### Distributed Energy Promotion Special Act

#### ① Fuel cell is defined as distributed energy

- Solar PV, wind, renewables, SMR, fuel cell, H<sub>2</sub> generation, and ESS are included

#### ② Mandatory use of distributed energy

- New housing sites and urban developers of a certain size to cover some of the energy use with distributed energy

#### ③ Building a plan every 5 years

✓ Mission Critical sectors (hospital, datacenter)

✓ Energy superstation<sup>(2)</sup>

✓ Apply electricity direct transaction (PPA<sup>(3)</sup>) and differential electricity rates by region

(2) As the transportation sector shifts to EV and H<sub>2</sub> vehicles, distributed power sources such as solar PV and fuel cells will be installed at or near gas stations to create complex charging stations that can charge EV and H<sub>2</sub> vehicles and power generation.

(3) Power Purchase Agreement



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# Overseas Business Status

## While expanding Chinese market, discussing business development with clients in Australia and the Middle East

### Progress

### Plan & Strategy

#### China

- Long-term supply agreement with ZKRG in Guangdong
  - Size: 105MW (Natural gas & H<sub>2</sub> model)
  - Period: ~ end of 2026
- Supply agreement with BEISEN in Zhejiang -
  - Size: 4.8MW (H<sub>2</sub> model)
  - Pilot project linked to electrolyzer

- Expansion of Chinese market volume
  - Diversifying cooperative partnerships : Distributor contract in 2H 2023
  - Securing opportunities by expanding sales coverage
- Targeting existing cooperation partners
  - Facilitating progress on existing projects
  - Discussion on volume increase including expansion of responsible regions

#### Australia

- MoU with South Australian government
  - Green H<sub>2</sub> infrastructure build
  - Participated with H<sub>2</sub> model in South Australian H<sub>2</sub> power generation tender

- South Australia bid result in 2H of 2023
- Expansion of partners in other regions
  - For energy companies and developers
  - Development of projects using green H<sub>2</sub> in Australia

#### Middle East

- Business model review in the Middle East
  - Forming a regional value chain as part of achieving Vision 2030
  - Large-scale clean H<sub>2</sub> project underway → Demand expected mainly arising from H<sub>2</sub> model



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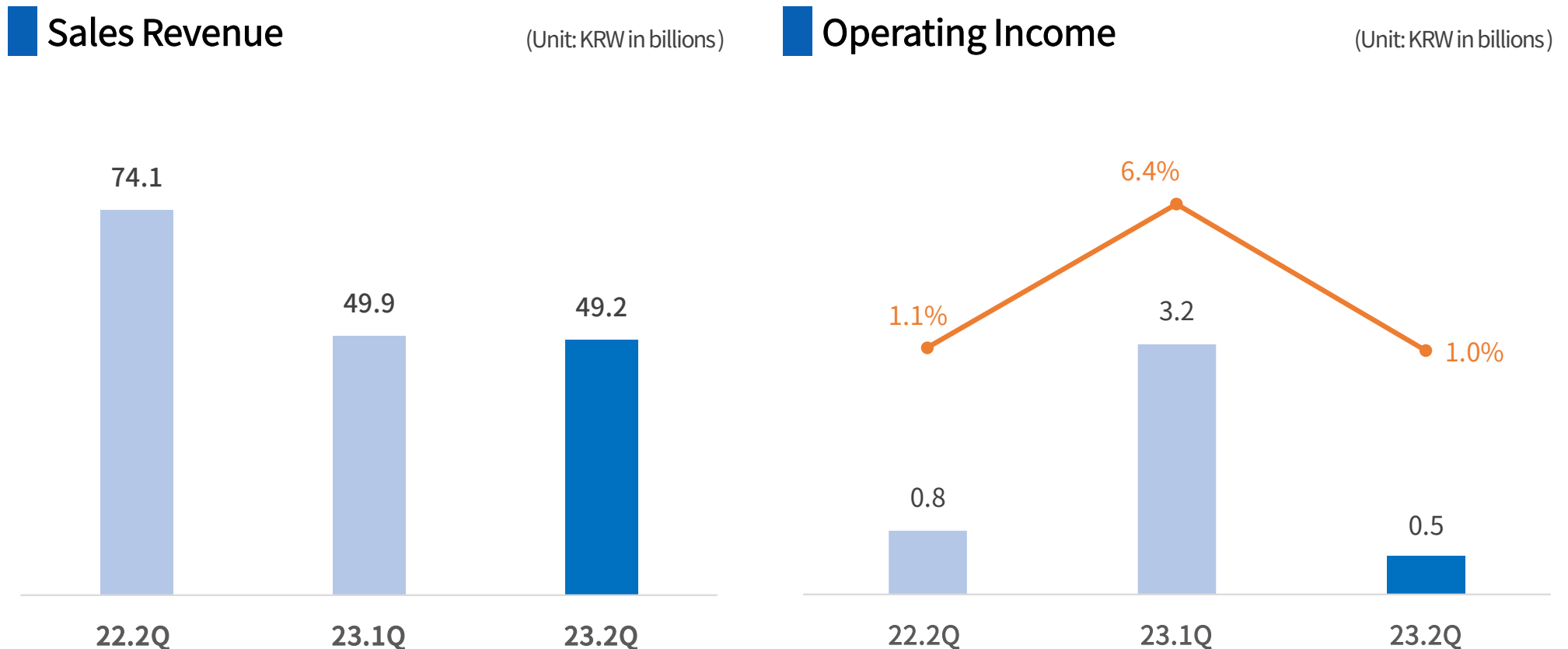
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## 2Q 2023 Earnings

### Recorded sales revenue of 49.2bn won, operating income of 0.5bn won

- Sales revenue : recognized sales of equipment and service from domestic order backlog
- Operating income : expenses increased mainly due to adjustment of factory utilization rate
- 2H forecast : earnings to improve by backlog and new orders both from domestic and overseas markets





# Q&A Session

## IR Contacts

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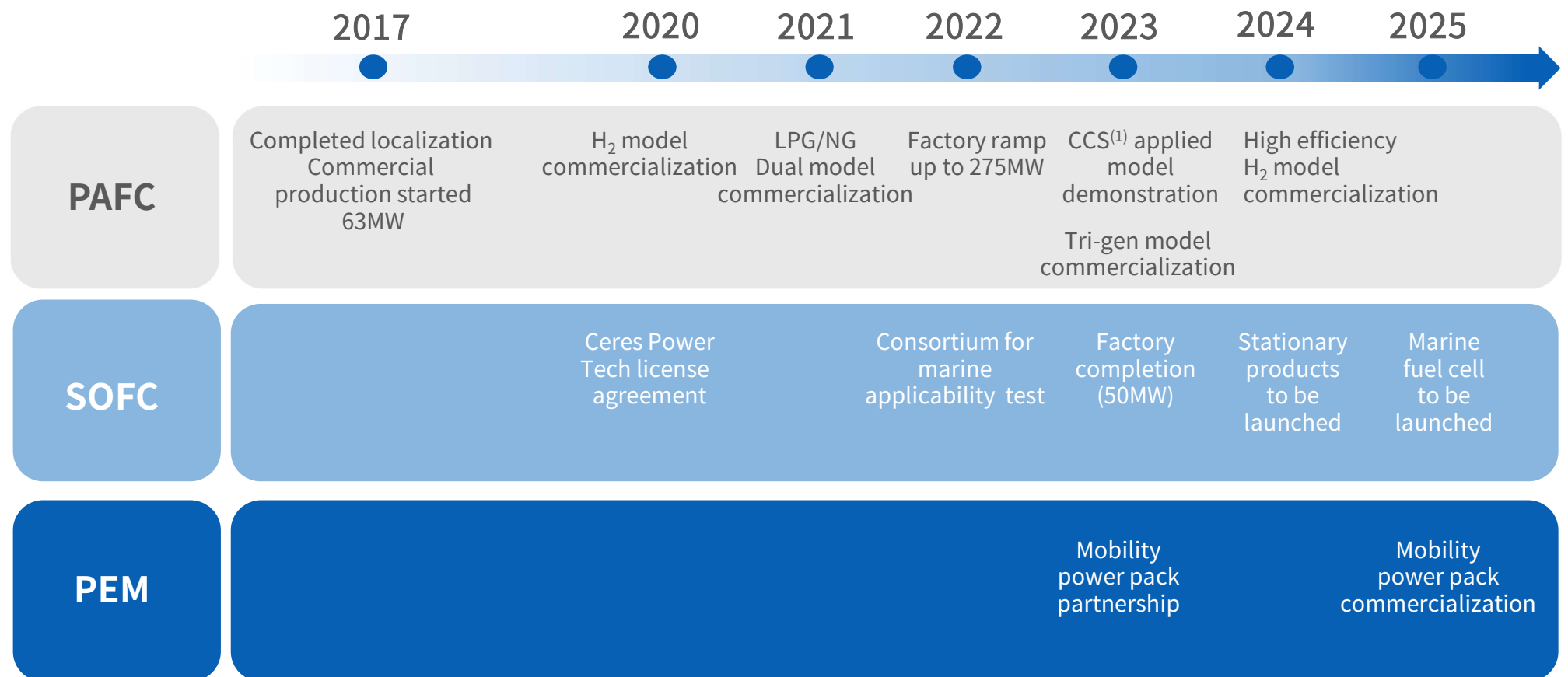
E-mail. [sukjoon.kim@doosan.com](mailto:sukjoon.kim@doosan.com), [ran.heo@doosan.com](mailto:ran.heo@doosan.com)



## Appendix. New Business Roadmap

### Utilizing various technologies to build new growth engine

- PAFC ramp up and SOFC new factory construction in 2023 will expand our business horizon
- Mobility powerpack partnership and other opportunities secures new growth engine
- Reinforcing competitiveness of PAFC H<sub>2</sub> model, development of ammonia fueled SOFC and CCS<sup>(1)</sup> applied model to achieve Carbon Neutrality



(1) CCS: Carbon Capture Storage

## Appendix. Summary of Financial Position

(Unit: KRW in billions)	22.Q2	23.Q1	23.Q2	YoY	QoQ
<b>Total Assets</b>	<b>764.6</b>	<b>1,011.9</b>	<b>1,116.0</b>	<b>351.4</b>	<b>104.1</b>
Current Assets	525.1	635.9	686.3	161.1	50.4
Non-current Assets	239.5	376.0	429.7	190.2	53.7
<b>Total Liabilities</b>	<b>249.5</b>	<b>486.5</b>	<b>590.8</b>	<b>341.3</b>	<b>104.3</b>
Current Liabilities	138.3	294.8	259.3	121.0	-35.5
Advanced Received	17.0	16.2	15.5	-1.6	-0.7
Non-current Liabilities	111.2	191.7	331.5	220.3	139.8
<b>Shareholder's Equity</b>	<b>515.1</b>	<b>525.4</b>	<b>525.2</b>	<b>10.0</b>	<b>-0.2</b>
<b>Total Liabilities and Equity</b>	<b>764.6</b>	<b>1,011.9</b>	<b>1,116.0</b>	<b>351.4</b>	<b>104.1</b>
<b>Leverage Ratio</b>	<b>48%</b>	<b>93%</b>	<b>112%</b>		
<b>Debt</b>	<b>75.0</b>	<b>309.0</b>	<b>416.5</b>	<b>341.5</b>	<b>107.5</b>
<b>Cash and Cash Equivalents<sup>(1)</sup></b>	<b>67.0</b>	<b>24.9</b>	<b>58.0</b>	<b>-8.9</b>	<b>33.2</b>
<b>Net Debt<sup>(2)</sup></b>	<b>8.0</b>	<b>284.1</b>	<b>358.5</b>	<b>350.4</b>	<b>74.3</b>

(1) Cash and cash equivalents + ST financial instruments + ST financial assets

(2) Debt- Cash and cash equivalents etc.

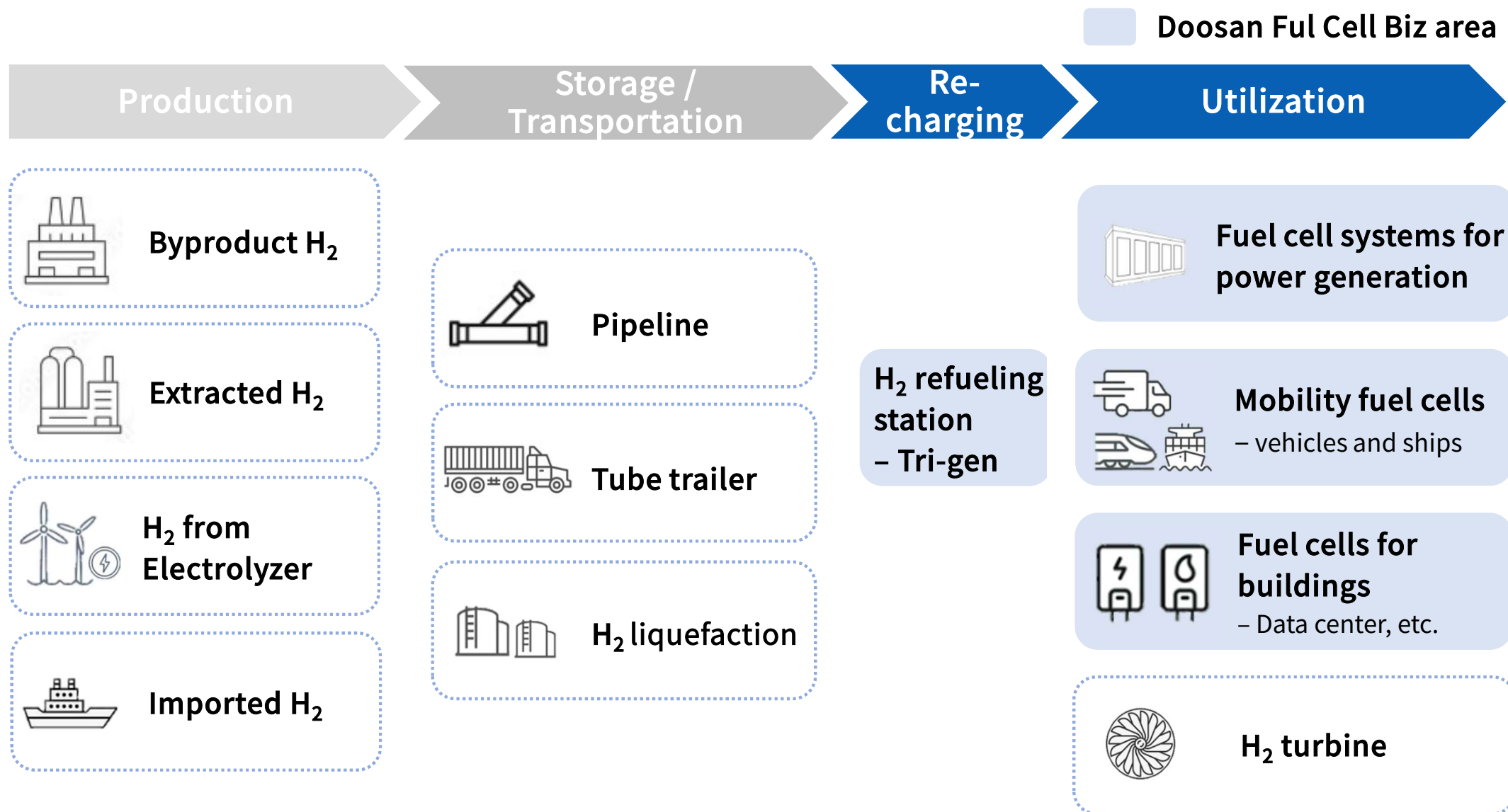
## Appendix. Summary of Income Statement

(KRW in millions)	22.2Q	23.1Q	23.2Q	YoY	QoQ
Sales Revenue	74,121	49,895	49,180	-33.6%	-1.4%
Operating Income	810	3,178	487	-39.9%	-84.7%
Margin(%)	1.1%	6.4%	1.0%		
EBITDA	3,566	6,956	4,407	23.6%	-36.7%
Margin(%)	4.8%	13.9%	9.0%		
Income before Tax	-515	1,777	-2,168	-	-
Net Income	81	1,868	-285	-	-



# Appendix. Doosan Fuel Cell's Role in H<sub>2</sub> Economy

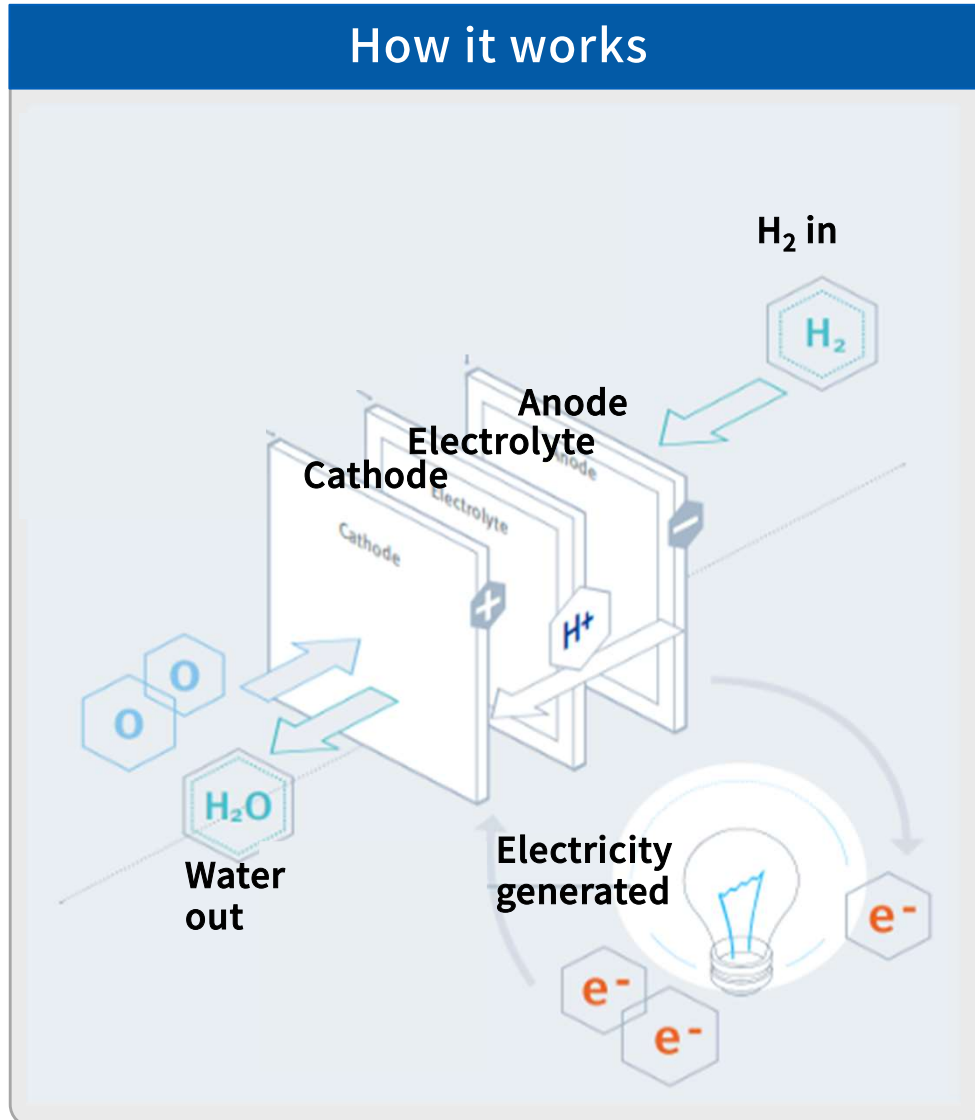
## Manufacturing and supplying **fuel cell equipment**, the core of H<sub>2</sub> use




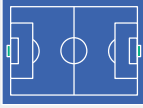



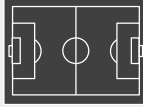
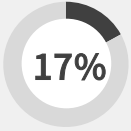

## Appendix. How Fuel Cell Works and Benefit

**Fuel cell is an eco-friendly distributed energy source with high capacity factor and load following capability**

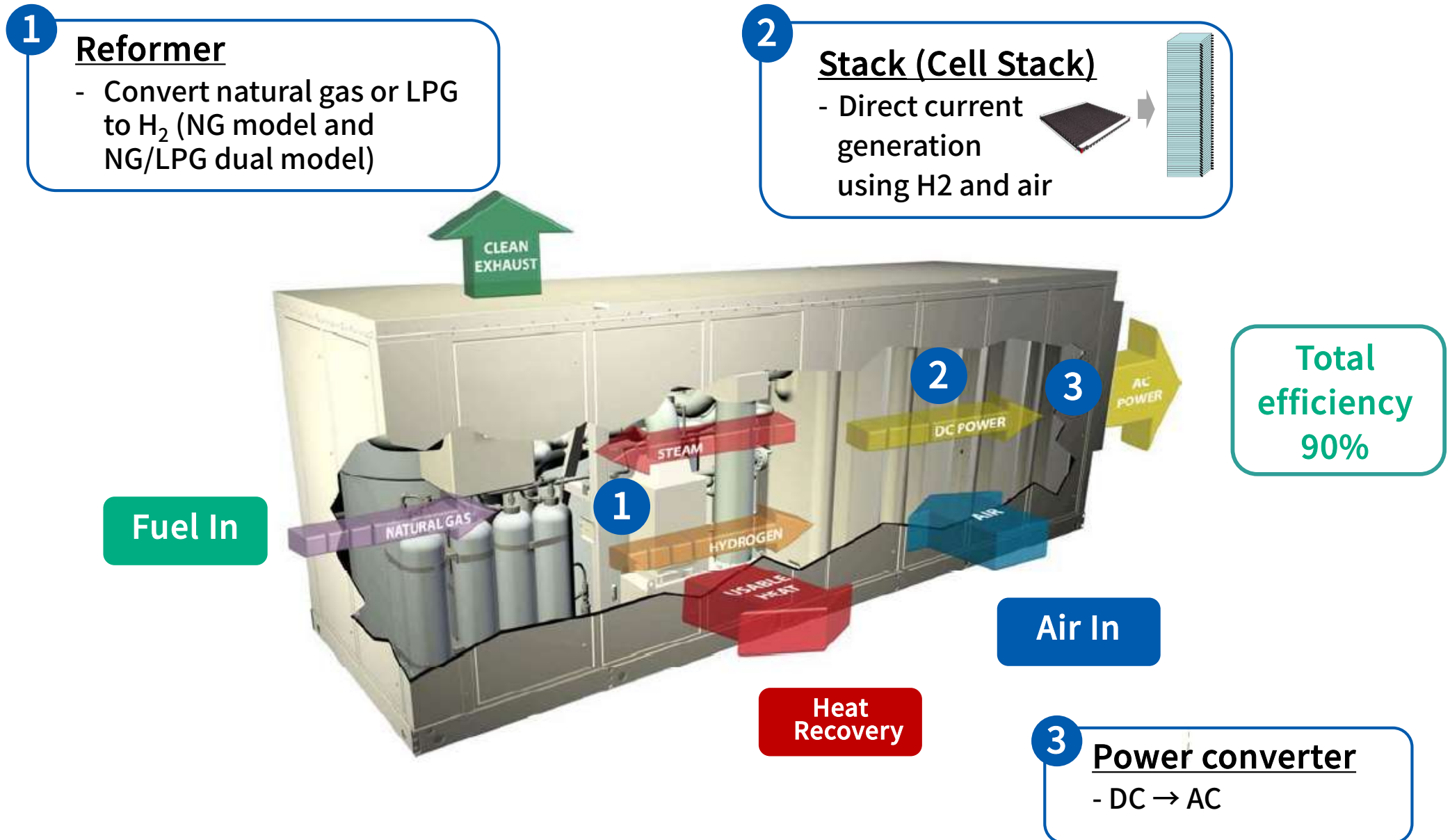
### How it works



### Benefits

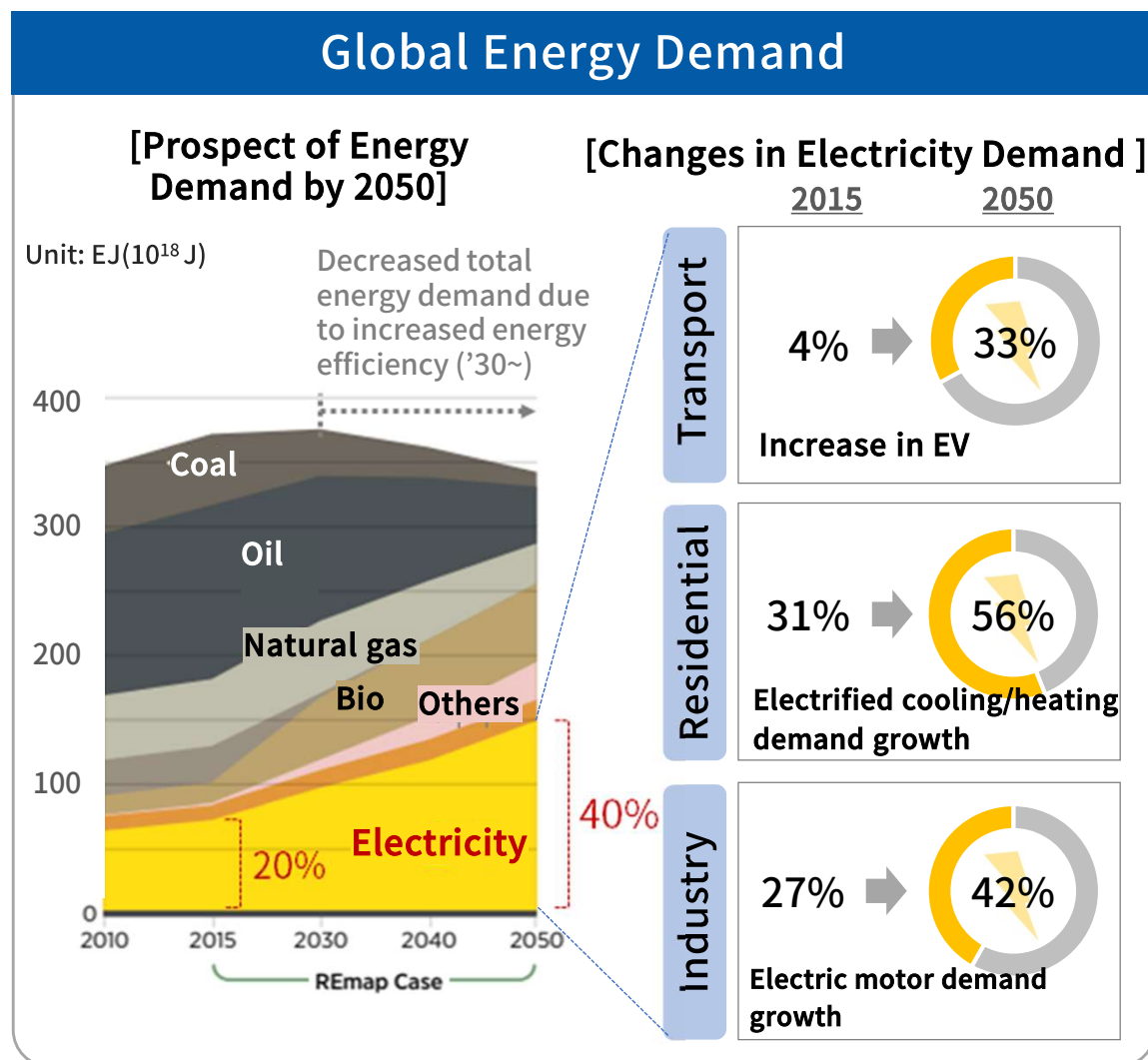
	Footprint	Capacity factor	Generation per year
 Fuel Cell	 88 MW	 95%	 732,336MWh
 Solar PV	 0.5 MW	 17%	 744MWh
<ul style="list-style-type: none"><li>• Solution to complement intermittent renewable energy</li><li>• Easy siting with high efficiency and high output, reducing transmission and distribution network costs</li><li>• Increased importance of energy security due to climate change, war, and increased data usage</li></ul>			

# Appendix. Fuel Cell Structure and Principles



# Appendix. Necessity of Fuel Cell

Increase in global electricity demand, limitations in transmission and distribution networks → **The only clean distributed power solution**



Source: IRENA\_Global Energy Transformation  
\*REmap : Renewable energy roadmap predicted by IRENA

- Significant electricity demand growth for electrification for achieving carbon neutral, demand increase of constant power supply
  - However, the expansion of large-scale transmission and distribution networks are limited due to economic/social cost.
- As a result, the importance and policies of small-scale distributed/independent power generation are expanding.
  - The distributed fuel cell market is divided into ① power generation and ② mobility.