HYDROGEN MOBILITY HYPE OR REALITY

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H2 AT TOKYO MOBILITY SHOW 2025





















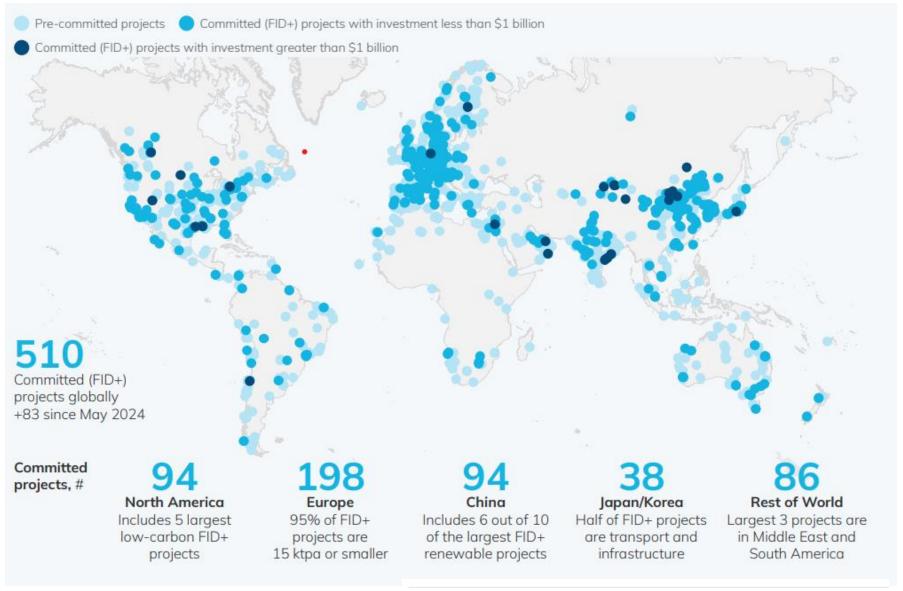






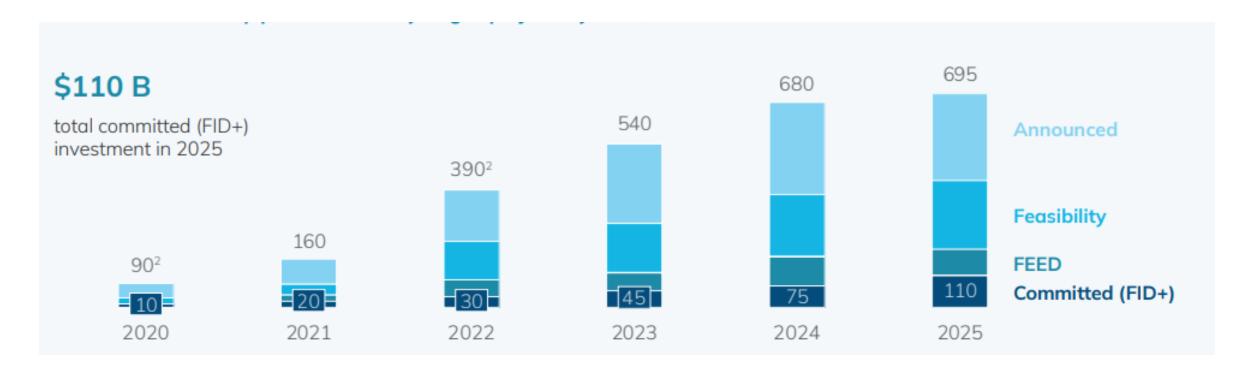
Current state of the union?

510 PROJECTS REACHED FID GLOBALLY

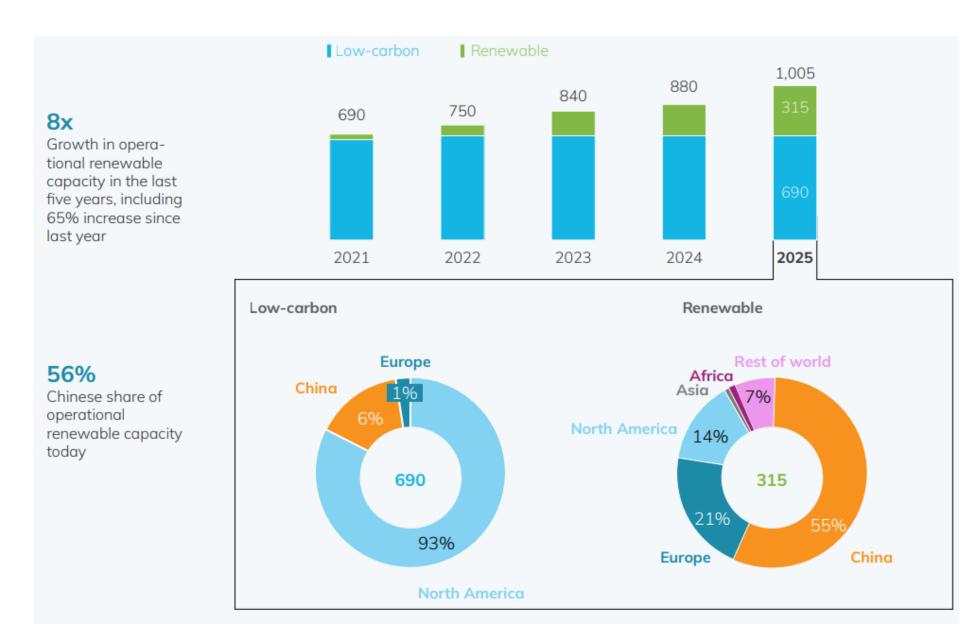


¹ Project announcements below 1 MW are excluded. Source: Hydrogen Council & McKinsey Project & Investment Tracker, as of December 2020, May 2022, May 2024 and July 2025.

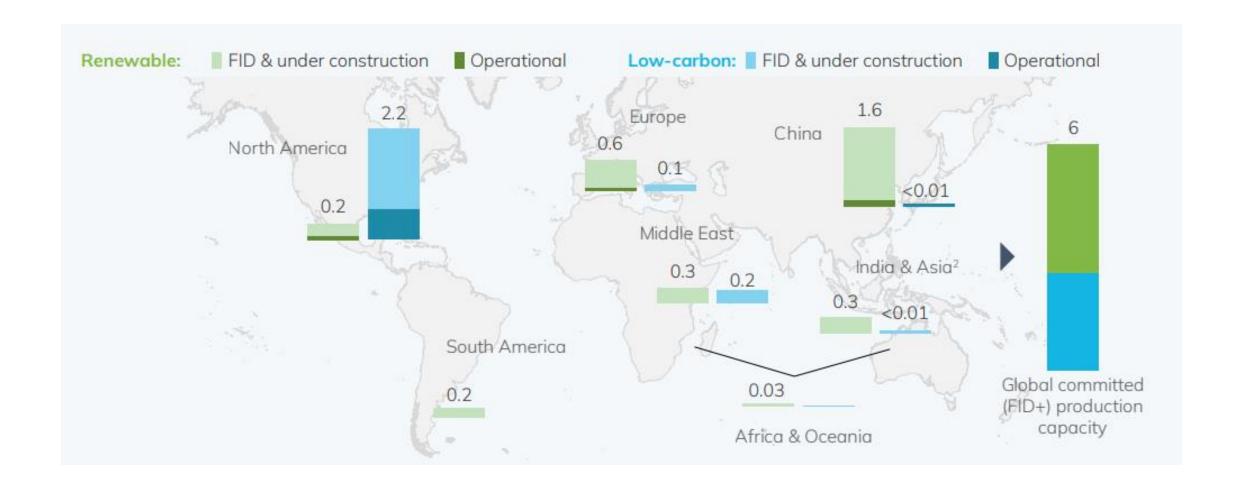
110 B \$ COMMITTED INVESTMENT PIPELINE KEEPS GROWING



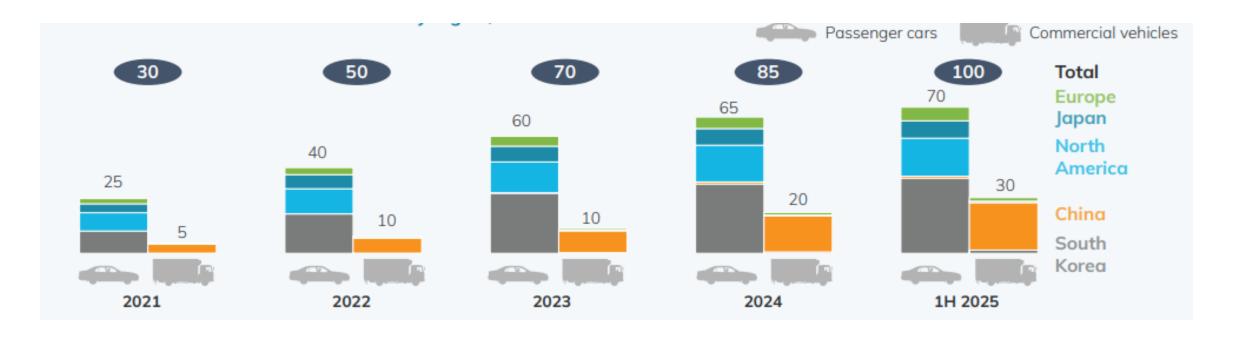
CLEAN H2 CAPACITY INCREASED 8x IN 5 YEARS



FINAL INVESTMENT DECISION BY REGION



CUMULATIVE FCEV SALES BY REGION



HYDROGEN MOBILITY DEVELOPMENT IN CHINA



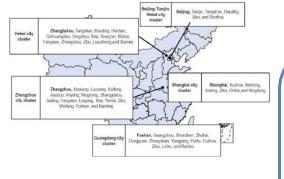
>500 hydrogen stations



Hydrogen price of below 5EUR at the pump



>15.000 FCEV in 5 large eco-systems



Large fleet of HDV



>4.000 HDV sales in 2024

Connect to green hydrogen production



(>125.000 t per year in 2024 ~50% globally

Source: SINOPEC and IHECA

EU direction?



@ Air Liquide PRODUCTS

DUMAREY EKPO

Honeywell

Hysetcc JM Johnson Matthey

MAHLE

TOYOTA

Westport

SCHAEFFLER SOLARIS

SYMBIO

Valterra

BOSCH

HEXAGON

Lhyfe

Pmobility

SVENSOO

THEZKO HYDROGEN

VOLVO

Longue Communio

Are de lais / spectraet (00

3340 to seet)

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Deal President year day says

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Hydrogen mobility: a strategic imperative for flurope

The use of hydrogen in readth an upon is vital for three key reasons

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INDUSTRY CEO'S SUPPORT H2 AND CALL FOR ACTION

CEO'S LETTER

Why

- 1) FCEV are complementing BEV
- 2) Hydrogen create up to 500.000 jobs
- 3) Hydrogen is a tool for energetic and material independency

Why now?

- China is accelerating
- Europe is still competitive

Expectably with regarda to rectall, collast

BU Grean Hydrogen (sont Universiting, 2023)

What is the Global Hydrogen Mobility Alliance?



The Global Hydrogen Mobility Alliance unites transport, energy, and industrial leaders operating in Europe to make hydrogen a core pillar of the EU's mobility strategy – driving urgent policy support for prosperity, resilience, and strategic autonomy.

https://globalh2mobilityalliance.org/



This is the time to prove hydrogen mobility works – leveraging current molecule flexibility to unlock economics and future network scaling

2030

Connect ecosystems

CREATE CORE NETWORKS

Mid-2030s

Comprehensive HRS network matching today's usability

COMPREHENSIVE NETWORKS

2040

Full deployment

Scaling H2 adoption across relevant use cases

Focus on renewable or low-carbon hydrogen, at scale

Current phase

Activation price & molecule Geog infras

ALL COLOURS
WELCOME TO
KICK-START

•

Today

Geographical focus to drive local infrastructure development

viable ecosystems with well-loaded HRS in high traffic areas

Derisked economics and supply enabled by molecule flexibility

Activation cost of €8/kg supported by targeted policies

HD (truck, bus, coach) unlock other applications (e.g., LCV, cars, maritime)

Expand geographical coverage by connecting HRS ecosystems to create core transport routes (e.g., TEN-T)

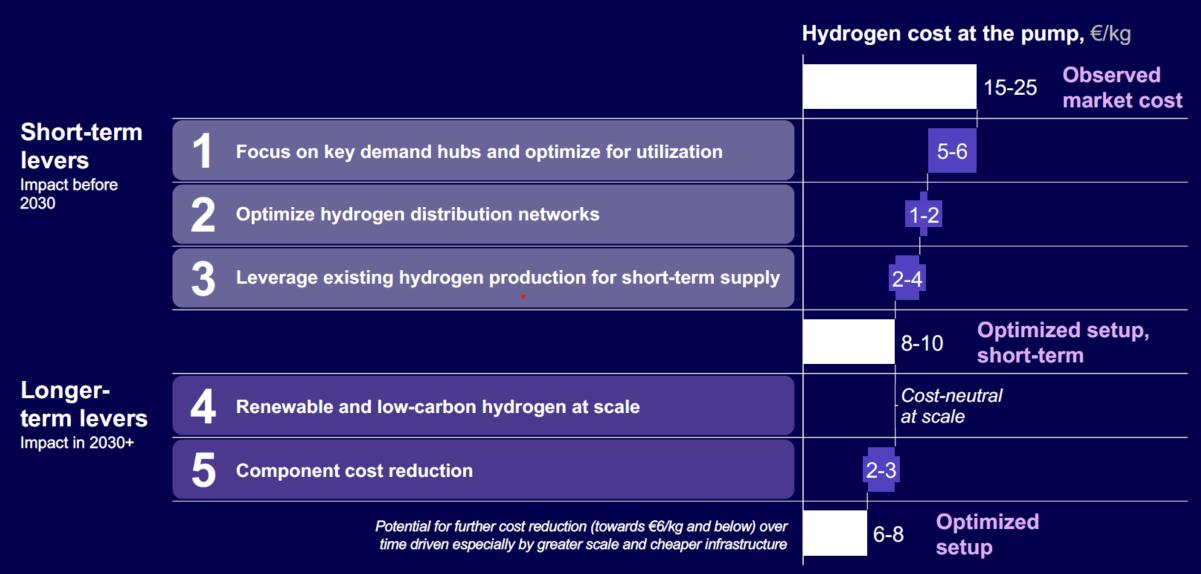
Decarbonize H2 in line with other industries and with BEV charging

Capacity payments for infrastructure decarbonization

Fleet demand and vehicle OEMs driving commercial scale

Shift towards low-carbon and renewable hydrogen, including from imports

An optimized hydrogen supply chain can already achieve meaningful cost reductions already in the short-term



If the specific tipping points of scale and demand certainty are met, hydrogen in road transport can already be competitive today

Conversion / Storage \bigoplus \bigoplus + **H2 Mobility Setup,** H2 cost at the pump² **Production** Distribution Step 0: Local sources 300 kg 250-500 kg / **Today** day 10-20% ~100 units/y 5-10 ecosystems Step 1: Mix of sources 950+ kg 1,000+ kg / day 2 of 10 HRS with 100-300 Activation 8-12 trucks around existing price & 50-60% H2 sources molecule 100-500 units/y flexibility Linked ecosystems 2,000+ kg / day Step 2: Shift to low-Shift to LH2: of 100-200 HRS with 5k-7-9 **Connect** carbon & 4,000 kg 10k trucks and ecosystems 60-70% decarbonizing H2 renewables ~5,000 units/y sources Comprehensive network Step 3: Low carbon & 4,000+ kg / day 4.000 ka 6-8 of 1.000+ HRS with Full €/ka renewable 100k+ trucks using lowdeployment further carbon / renewable H2 10,000+ units/v 60-80% **Pipelines** improvements may sources be possible in longterm

Hydrogen Refueling Stations

Without incentives or credits Source: Hydrogen Council clean team (2024)

Key policy asks

Enabling conditions BEV = H2

Recognise the complementarity of BEV and H2 mobility



Level playing field for BEV and H2 on the upcoming EU policy from the Automotive Action Plan

- Eurovignette amendment
- Transport corridors
- Greening of corporate fleets

Flexibility to use whatever H2 is available to kickstart H2 mobility



Independent measures to activate H2 mobility and decarbonize H2 (BEV approach)

- The target is to meet 8€ per kg at the nozzle (and below)
- Gradual adoption of lowcarbon and renewable H2

Bridge the cost gap

SWiM type of funding for HRS and vehicles



Specific program for H2 mobility & flexible granting conditions

- "Consortias" HRS + Fleets
- Secure 50% min loading (coupled with capacity payment for HRS in corridors)
- Techno neutral approach H2, HRS and vehicles

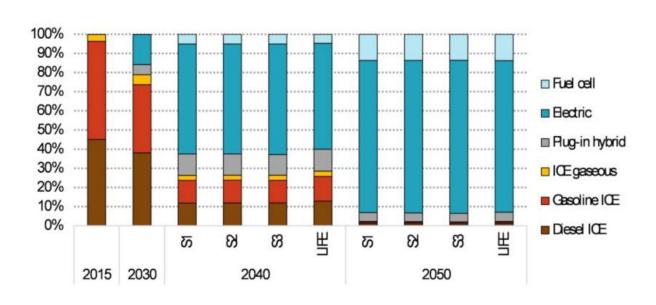
Swift implementation of ETS and Eurovignette



Swift Implementation of existing EU policy and extended longevity

- Eurovignette free tolls for ZEV
- ETS2 fossil fuel tax for road transport and ETD exemption for H2 ICE
- Other enabling elements: clean ports and public procurement

THE EU WILL NEED H2 HDV & LDV TO REACH CLIMATE GOALS



100% 90% 80% 70% Blectric Blectric Blectric Blectric Blectric Blectric Blectric Bleed Blectric Bleed Bleed

Figure 69: Distribution of the EU HGV stock by type of drivetrain

2040

2015

2030

Note: *Diesel hybrid vehicles include plug-in hybrids. **Hydrogen vehicles include fuel-cell vehicles and hydrogen ICE vehicles.

2050

Source: PRIMES.



Source: SWD EU 2040 climate goals proposal

TOYOTA - STRATEGY

MULTI-PATH FOR ENERGY AND MOBILITY

OFFERING A VARIETY OF VEHICLES







PLANT CAPTURED CO₂



INDUSTRIALLY CAPTURED CO₂



CRUDE OIL NATURAL GAS



WATER







E-FUEL

















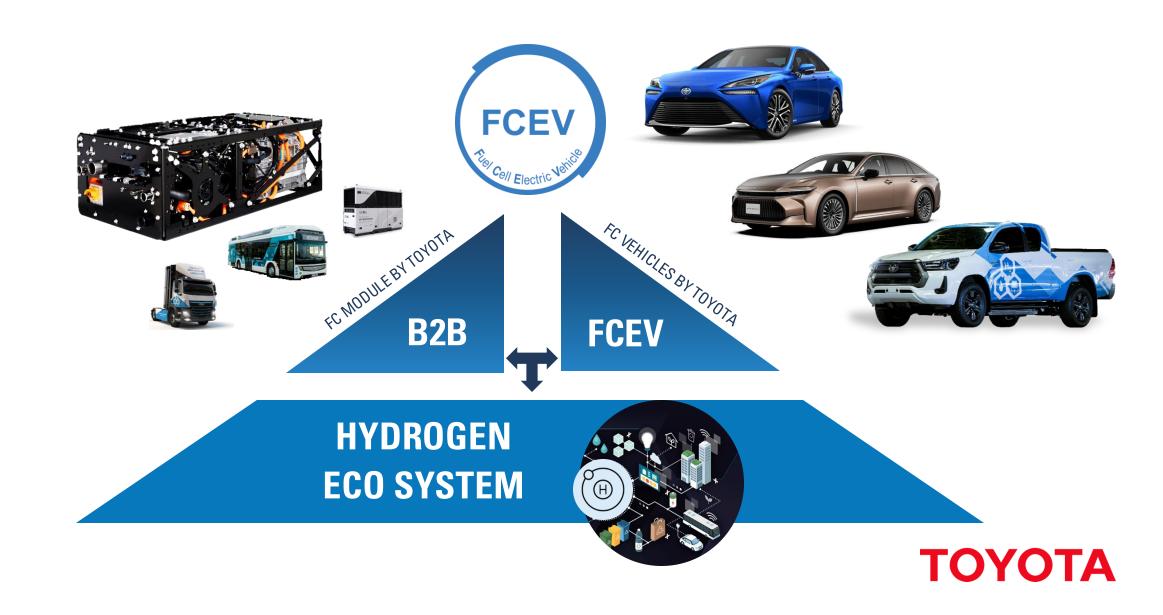
ELECTRICITY

CARBON NEUTRAL FUEL

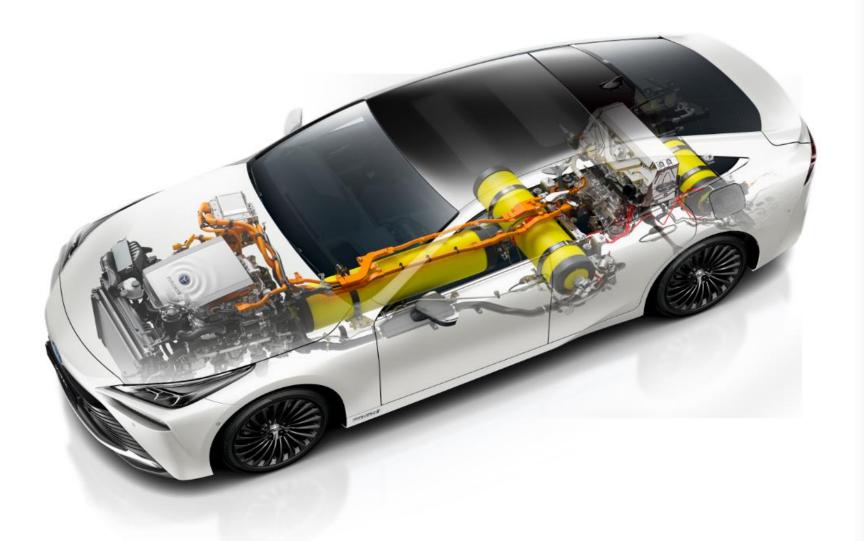
HYDROGEN

TOYOTA

HOW TOYOTA SUPPORT HYDROGEN DEVELOPMENT?



TOYOTA MIRAI COMPONENTS



OVER 20

ACTIVE PARTNERSHIPS

PC



BMW

STATIONARY





MARITIME





BUS





Mercedes-Benz

TRUCK





Hyliko

TRAIN



FCH2Rail









TOYOTA

TOYOTA IS WALKING THE TALK ON FC TRUCKS

WE ARE REPLACING DIESEL TRUCK WITH NO COMPROMISE ON OPERATIONS



> 80,000 km driven by 4 trucks since May 2025

4 logistics partners covering routes across 4 countries

Based on real life data the range is > 400 km

9 Hydrogen refueling stations used across various routes to test the network

> 80,000 kg CO₂ emissions avoided compared with diesel





