Global Hydrogen
Mobility Alliance

Market Activation Strategy: Gearing Up for Heavy-Duty Market Activation by 2030

September 2025

CONFIDENTIAL AND PROPRIETARY

What is the Global Hydrogen Mobility Alliance?

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/

Executive summary: Gearing Up for Heavy-Duty Market Activation by 2030

Hydrogen mobility holds **strategic value for the future decarbonisation of the transport sector in Europe**, complementing battery electrification. However, the strategy applied so far for road mobility – particularly in the heavy-duty segment - has not succeeded in activating the market or overcoming the initial cost challenges.

A successful strategy for Europe must address this cost challenge upfront and offer, from the very beginning, a comparable total cost of ownership to fleet operators as existing diesel or battery alternatives. This is especially critical for the heavy-duty truck segment, which represents the first and most vital segment to scale up hydrogen adoption.

This is already feasible in Europe today, thanks to the technological readiness of the full hydrogen value chain – from supply and refueling infrastructure to vehicles. But it can only succeed if the right strategy and enabling conditions are in place.

This strategy calls for an **immediate reduction in the hydrogen nozzle price** – from over €15/kg to approximately €8/kg – through a pragmatic approach that leverages early scale, including:

- **Focused deployments** in key demand hubs near industrial basins, where large-scale, cost-competitive hydrogen sources already exist,
- **Implementation of optimized hydrogen supply chains**, transitioning as early as possible to liquid hydrogen,
- **Fully synchronized deployments** of sufficiently large hydrogen refueling stations (over 1 tonne per day, and larger where possible) alongside truck fleets to ensure rapid station utilization,
- And finally, **pragmatic public support schemes** backing both hydrogen refueling infrastructure investment and vehicle purchases, with minimal initial constraints - prioritizing viable business cases for customers and investors.

This actionable strategy should aim to deploy several thousand trucks in Europe by 2030, reaching **critical tipping points** for both hydrogen **supply chain competitiveness** (targeting €6/kg or lower in favorable regions) and truck production costs. This activation phase will be instrumental in enabling **faster deployment in the following decade** – across heavy-duty and eventually other vehicle segments – thus making a meaningful contribution to Europe's CO_2 reduction goals and to the **resilience of its automotive sector**.

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Energy and mobility are at a crossroads, facing multiple challenges in an increasingly complex market environment

Slow wind energy capacity expansion in Europe

50%

Gap to target in 2024 with 15GW of new capacity installed vs. 30GW / year needed to meet 2030 climate goals[1]

Higher industrial electricity price in Europe vs. US, CN

2.5x

€0.199/kWh in Europe vs. €0.082 in China and €0.075 in the US[2] (Avg. for 2024)

Rising ESG skepticism among investors

-18 pp.

Decline in investors considering ESG in their investment decisions since 2021[3]

Increased competition on cost and technology from China

-20%

Cost advantage of Chinese passenger car OEMs[4]

1. WindEurope (2025)
2. BusinessEurope (2925)
3. AIC ESG Attitudes Tracker (2024)
4. For passenger BEV cars compared to European and US producers

Source: AIC ESG Attitudes Tracker, SBTi progress report 2023, Eurostat, government websites, press search, expert interviews

Hydrogen in mobility is no exception; it is already a reality...

hylane
100+ H2 trucks leased to GER and NL fleets

Hysetco
700+ H2 taxis on the road in Paris

BMW i HYDROGEN FUEL CELL
Test fleet of 100+ vehicles on the road

DAIMLER TRUCK
100 LH2 powered HDT being rolled out

H2 MOBILITY
New 5t/day HRS with new efficiency / scale for HDTs

RVK
30+ H2 buses operating routes daily

… but faces scaling challenges the industry cannot solve alone

STELLANTIS
H2 LCV cancelled due to infrastructure

DAIMLER TRUCK
Series HDT delayed due to infrastructure

Taxi fleet operations ended due to H2 availability

H2 MOBILITY
30+ small, LD HRS shut down due to utilization, size

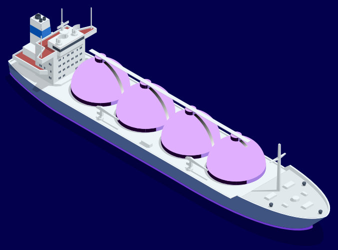
6 out of 7 Shell HRS in CA have closed

Hyzon
Bankrupt and assets liquidated

Source: Press research

There is a strong case for Hydrogen in mobility – both for mobility itself and for broader society given hydrogen's systemic role

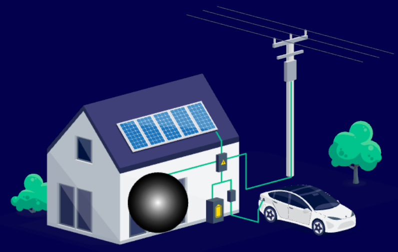
NON-EXHAUSTIVE



Energy import vector

H2 will be needed to integrate renewables and import energy as multiple industries de-carbonize and Europe faces a systemic energy gap

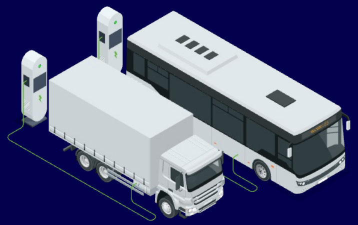
Europe will need to import a meaningful share of its energy need



Value chain lock-in

H2 vehicles reduce the reliance on the battery value chain, which may not scale fast enough

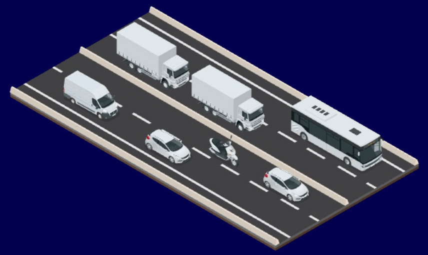
80%+ of value chain for batteries concentrated in China



Infrastructure cost

Grid limitations can delay the rollout of BEV by multiple years – H2 reduces the strain and costs

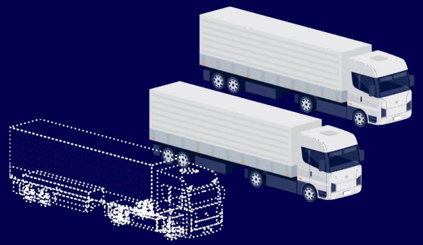
Combined infrastructure ~€6bn cheaper



Same operating patterns

Customers want to maintain current fleet operations rather than having to change due to vehicles' range and charging needs

AFIR's HRS every 200km along TEN-T by 2030



Optimized vehicle fleet

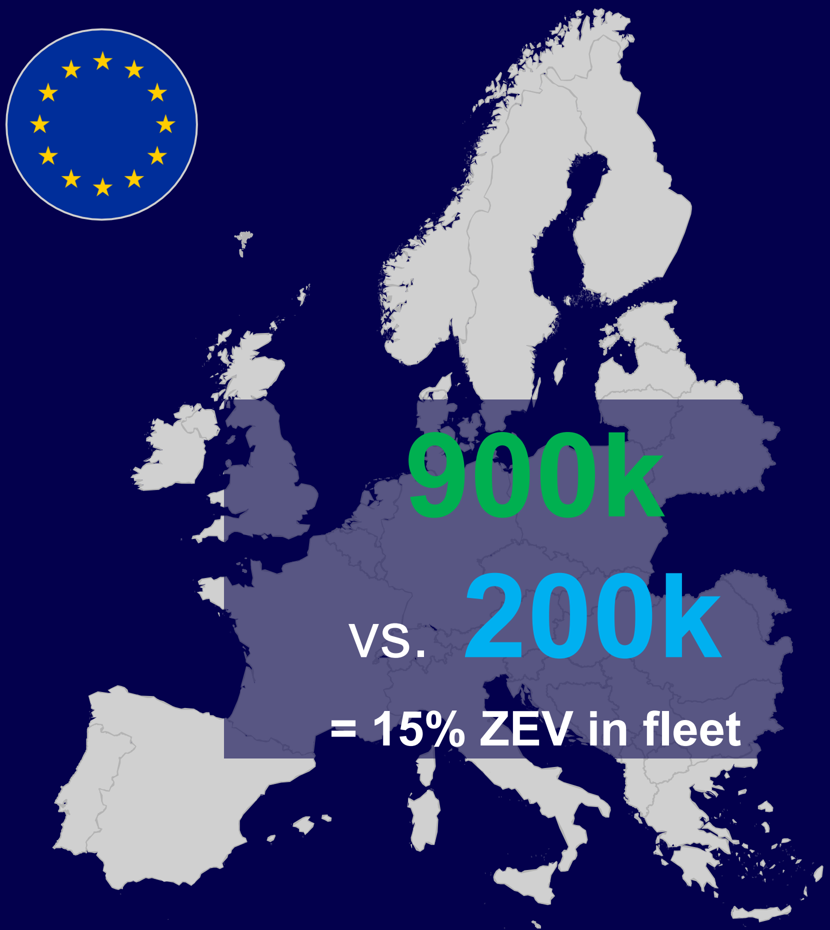
Payload benefit and greater range mean fewer / optimized vehicles are needed to transport the same freight

2t payload gain vs. Diesel with higher maximum ZEV weights

Source: Press research

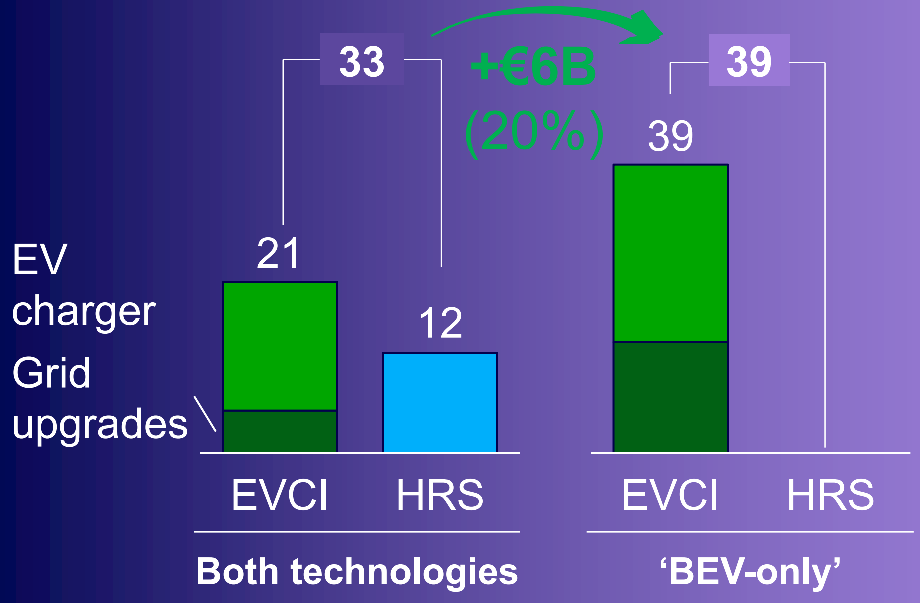
Deep dive | A BEV-only world will impose incremental costs on the transport sector compared to a scenario with both technologies

Potential HDT vehicle parc, Mid-2030s



Cumulative infrastructure costs, Mid-2030s, €B

	Both technologies: EVCI	Both technologies: HRS	'BEV-only': EVCI
# HDT	~900k	~200k	1.1m
# EV charger/ HRS	~520k	2-2.5k	~690k



BEV charging is most efficient when no grid upgrades are needed

However, Megawatt charging at e.g., highway locations will typically exceed available grid connection

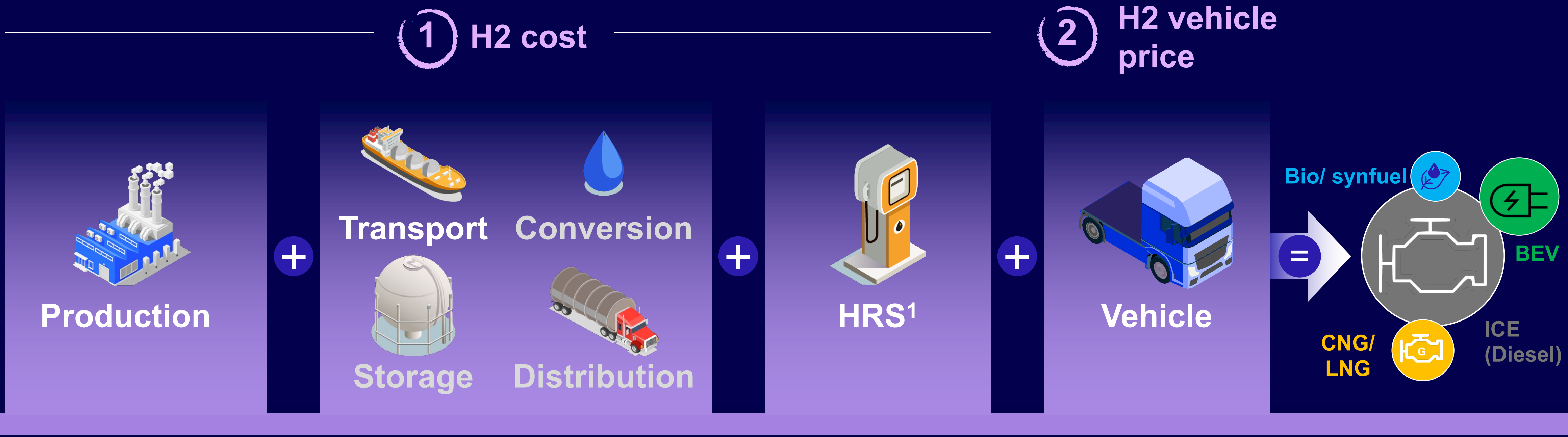
Beyond incremental costs, grid connections can take 5+ years to establish in increasingly congested areas

Converting harder to abate use cases to ZEV will exponentially increase investment

Delta for full transition to 100% BEV vehicle park including passenger cars and commercial vehicles by 2050 would lead to up to €300bn total cost increase

Source: Hydrogen Council clean team (2024)

To make Hydrogen work in mobility, the end-to-end TCO[2] needs to work for vehicle operators and value chain players



Hydrogen must be competitive for customers vs. alternative powertrains

Hydrogen must be profitable at each step of the value chain to enable the required investment

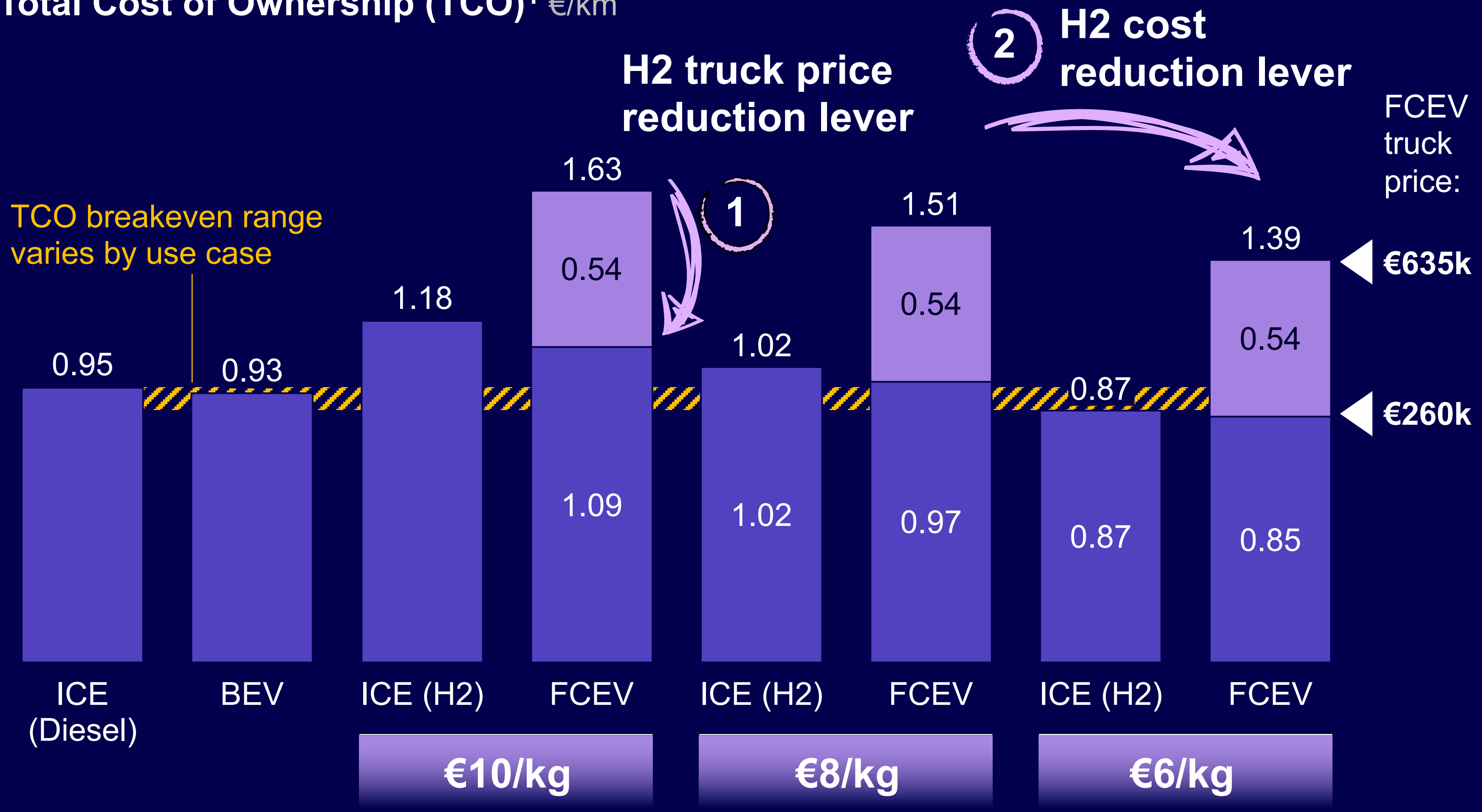
Level playing field required to achieve technology-openness
(e.g., typically strict renewable /RFNBO H2 expected for FCEV, but grid power accepted for BEV)

1. Hydrogen Refueling Stations
2. Total cost of ownership

To balance the equation, competitive truck cost and H2 cost at the pump are needed

HDT on-demand truck in Germany[2]

Total Cost of Ownership (TCO)[1] €/km



Hydrogen cost at the pump and **H2 HDT price** are the **2 main levers** ecosystem players can action **to make hydrogen vehicle competitive with BEV and ICE (Diesel)**

Compared to current levels, both **hydrogen and truck costs** need to **decrease by ~50% to achieve competitiveness**

1. BEV: € 200k / unit, ICE (Diesel): €115k / unit, ICE (H2): €205k / unit. Energy at €1.33 / l Diesel and €0.37 / kWh average prices. H2-ICE assuming low-pressure direct injection
2. Use case assuming 40t tractor; 125,000 km/year; 500 km fuel range – strong variation of relative performance of powertrains depending on use case

Today, these factors are not at the target level and both Hydrogen at the pump and vehicles are above the budget cost... (1/2)

Lack of scale is the key underlying challenge across the value chain

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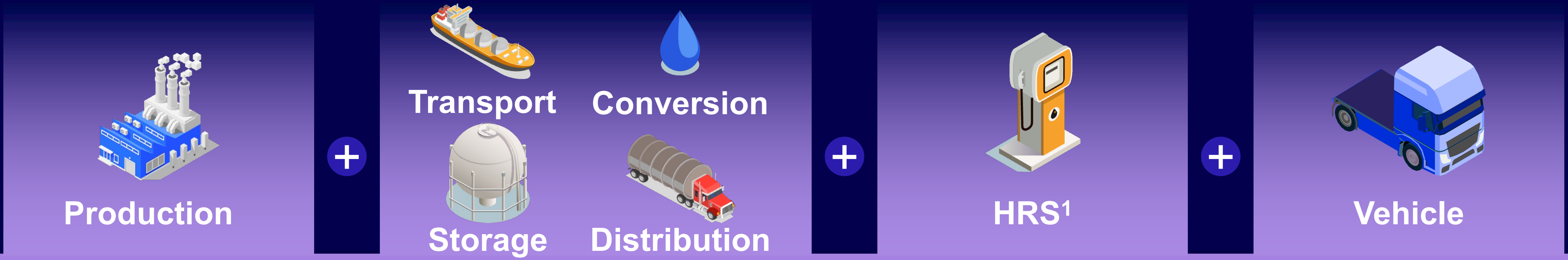


Production

- Scale only exists in **fossil-based H2**
- Electrolyser today are produced in small scale – **scale of 100s vs. 10,000s of units**
- **Electricity and NG prices very high** in EU

Transport / Conversion / Storage / Distribution

- **Low density of production locations**
- **Significant transport distances** – low density HRS network
- **Low utilization of Hydrogen mobility infrastructure** resulting in higher unit costs
- **Liquefaction** has significant **untapped scale benefits,** but requires market scale

HRS[1]

- **HRS with <0.5t/d capacity**
- **Utilisation usually <20%** daily capacity
- **High system cost** due to low level of modularization, low technology maturity, small market size
- **Limited technology readiness** (uptime challenges)

Vehicle

- **Small production scale** – 10s/100s vs. 10,000s of units
- **Unclear and changing incentive** programs
- High H2 vehicle **R&D costs**
- **Limited FCEV and H2 ICE portfolio** and higher price vs BEV / ICE alternatives

← **Missing long-term fleet offtake agreement** to enable long-term, lower cost purchasing →

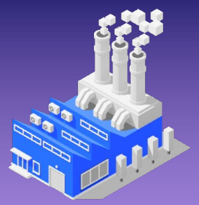
But the challenges are addressable…

See next page

...However, in the near future, significant improvements are possible with alignment along the value chain – several are actionable today (2/2)

Key short-term lever – impact potential before 2030

NON-EXHAUSTIVE



Production

Use the cheapest molecules

- **Leverage existing large-scale production capacity** and decarbonization plans
- **Co-locate end users** with production locations
- **Foster large-scale Public H2 procurement** contracts to derisk demand and stimulate supply
- **Use grid balancing oppor-tunities with renewables** for lower cost electricity

Transport

Conversion

Storage

Distribution

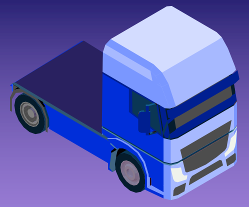
Ensure efficient use of logistics and scale up if possible

- **Optimize Hydrogen distribution networks** – e.g., larger LH2 trailer sizes, containerized value chain
- **Support up-/mid-stream value chain through strategic supplier development and forward buying of H2 at HRS** (establishment of fuel credits system)

HRS[1]

Size & loading drives cost – build large stations with 50%+ loading

- **Focus on key demand hubs** and optimize for utilization – ensure sufficient vehicles use the HRS
- **Drive interoperability** of HRS designs and align on technical standards
- **Create demand certainty** with e.g., mobility-specific H2 auctions, take-or-pay contracts or carbon contracts for difference



Vehicle

Get vehicles on the road synchronized with HRS network

- **Temporary support for ZEV truck purchases and operations** based on e.g., emissions reduction impact
- Ensure stable and long-term **regulations for useful lifetime** of the vehicle
- Ensure **equal treatment of H2 ICE and FCEV** for taxes, tolls

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

Current phase

1 Activation price & molecule flexibility

ALL COLOURS WELCOME TO KICK-START

Today

2030

Geographical focus to **drive local infrastructure development** and create **viable ecosystems with well-loaded HRS in high traffic areas**

Derisked economics and supply enabled by molecule flexibility – a cost-focused, pragmatic approach

Reach **activation cost** of €8/kg supported by targeted policies

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

2 Connect ecosystems

CREATE CORE NETWORKS

Mid-2030s

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

Secure **fleet demand** and enable **vehicle OEMs to drive commercial scale**

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

3 Full deployment

COMPREHENSIVE NETWORKS

2040

Comprehensive HRS network matching today's usability

Scaling H2 adoption across relevant use cases

Focus on renewable or low-carbon hydrogen, at scale

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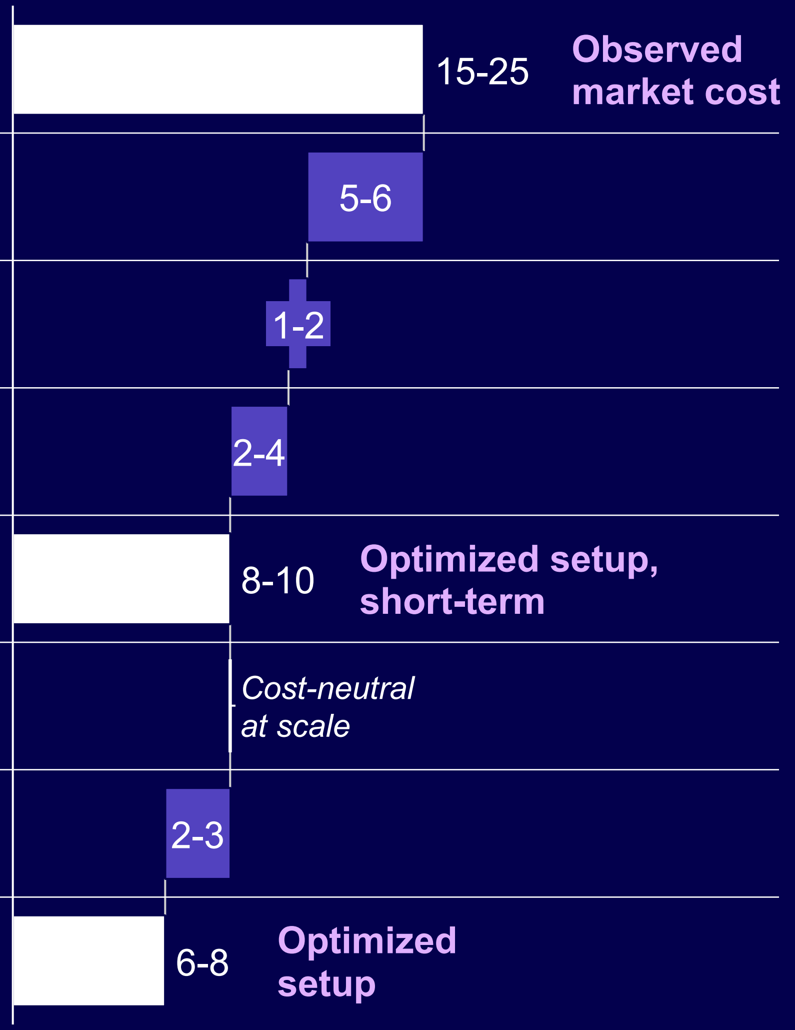
An optimized hydrogen supply chain can already achieve meaningful cost reductions already in the short-term

Hydrogen cost at the pump, €/kg



Short-term levers
Impact before 2030

1 Focus on key demand hubs and optimize for utilization
Coordinated development of hydrogen supply, HRS networks and FCEV fleets to meet tipping points of cost curves

2 Optimize hydrogen distribution networks
Transition to larger trailer sizes incl. liquid H2, link HRS to new renewable H2 producers

3 Leverage existing hydrogen production for short-term supply
Currently not considered towards RFNBO targets

Longer-term levers
Impact in 2030+

4 Renewable and low-carbon hydrogen at scale
Convert any unabated sources to renewable and low-carbon as scale brings cost down for domestic and imported clean hydrogen

5 Component cost reduction
CAPEX reduction in e.g., electrolyzer and HRS from clean team analysis

Potential for further cost reduction (towards €6/kg and below) over time driven especially by greater scale and cheaper infrastructure

Note: Excluding subsidies, incentives and credits by 2030
Source: Hydrogen Council clean team (2024)

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

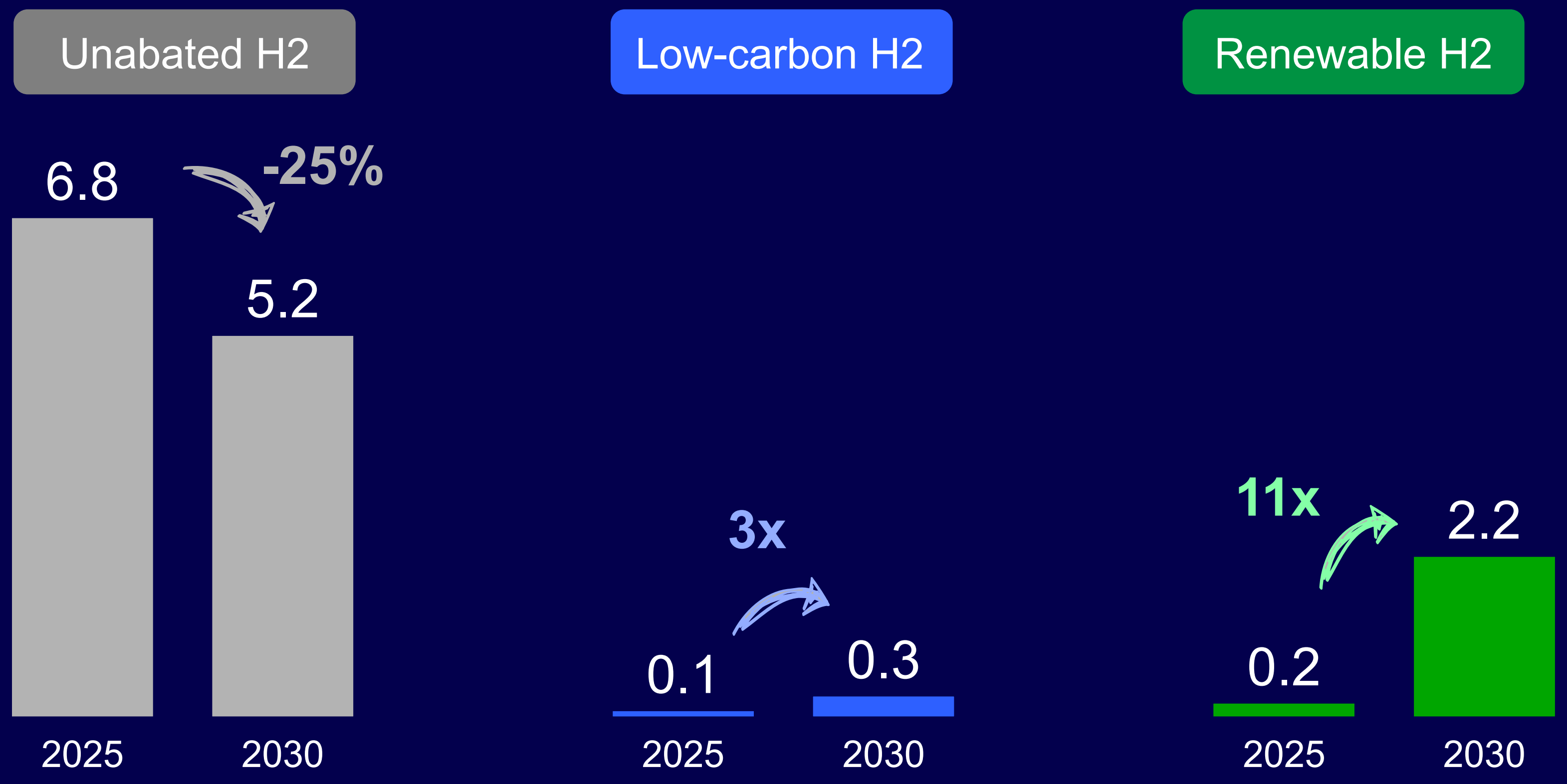
H2 Mobility Setup, H2 cost at the pump[2]			Production	+ Conversion / Storage Distribution	+ HRS[1]	+ Vehicle
Step 0: **Today**		15-25 €/kg	**Local sources** unabated, low carbon, or renewable hydrogen supply, depending on local availability	**300 kg** Limited HRS loadings lead to high distribution cost, scaling with distance	**250-500 kg / day** Existing refueling network (with a few larger outliers) **10-20%** Limited utilization driving up fixed-cost allocation per unit	**~100 units/y** Production run rate by OEM in pilot phase
Step 1: **Activation price & molecule flexibility**	5-10 ecosystems of **10 HRS** serving **100-300 trucks** around **existing H2 sources**	8-12 €/kg	**Mix of sources** Leverage mix of unabated / low carbon / renewable hydrogen supply, with pragmatic focus on cost	**950+ kg** Higher HRS loadings allows more cost-efficient use of GH2 trailers	**1,000+ kg / day** For growth of refueling network **50-60%** Average utilization increased through targeted deployment	**100-500 units/y** Production run rate by OEM to initiate market deployment
Step 2: **Connect ecosystems**	Linked ecosystems of **100-200 HRS** serving **5k-10k trucks** **decarbonizing H2 sources**	7-9 €/kg	**Shift to low-carbon & renewables** Plug into existing H2 sources from industry and energy – decarbonize as scale compensates cost	**Shift to LH2: 4,000 kg** LH2 trailer capacity to unlock cost-competitive distribution; alongside GH2 supply chain	**2,000+ kg / day** Larger capacity to reduce cost **60-70%** Average utilization increased by targeted fleet deployment	**~5,000 units/y** Production run rate by OEM to scale market deployment
Step 3: **Full deployment**	Comprehensive network of **1,000+ HRS** serving **100k+ trucks** using **low-carbon / renewable H2 sources**	6-8 €/kg *Further improvements may be possible in long-term*	**Low carbon & renewable** As H2 supply becomes ubiquitous (domestic + imports + backbone), leverage scale from much larger market	**4,000 kg** Trailer capacity to unlock cost-competitive distribution **Pipelines** For large-scale clusters; along-side LH2 and GH2 supply chain	**4,000+ kg / day** High capacity to leverage scale benefits **60-80%** Average utilization to bring down CAPEX allocation	**10,000+ units/y** Production run rate by OEM to allow for cost-efficient production, esp. at H2 cost levels towards €6/kg and below

1. Hydrogen Refueling Stations
2. Without incentives or credits

Source: Hydrogen Council clean team (2024)

Production | Molecule flexibility enables lower costs to start with, before a switch to lower carbon & renewable sourcing as those costs come down

H_2 production overview in Central Europe,
Volume[1] in Mtpa H2



1. Europe as region of origin

Source: McKinsey Global Hydrogen Trade Model 2025 Perspective

Key Observations

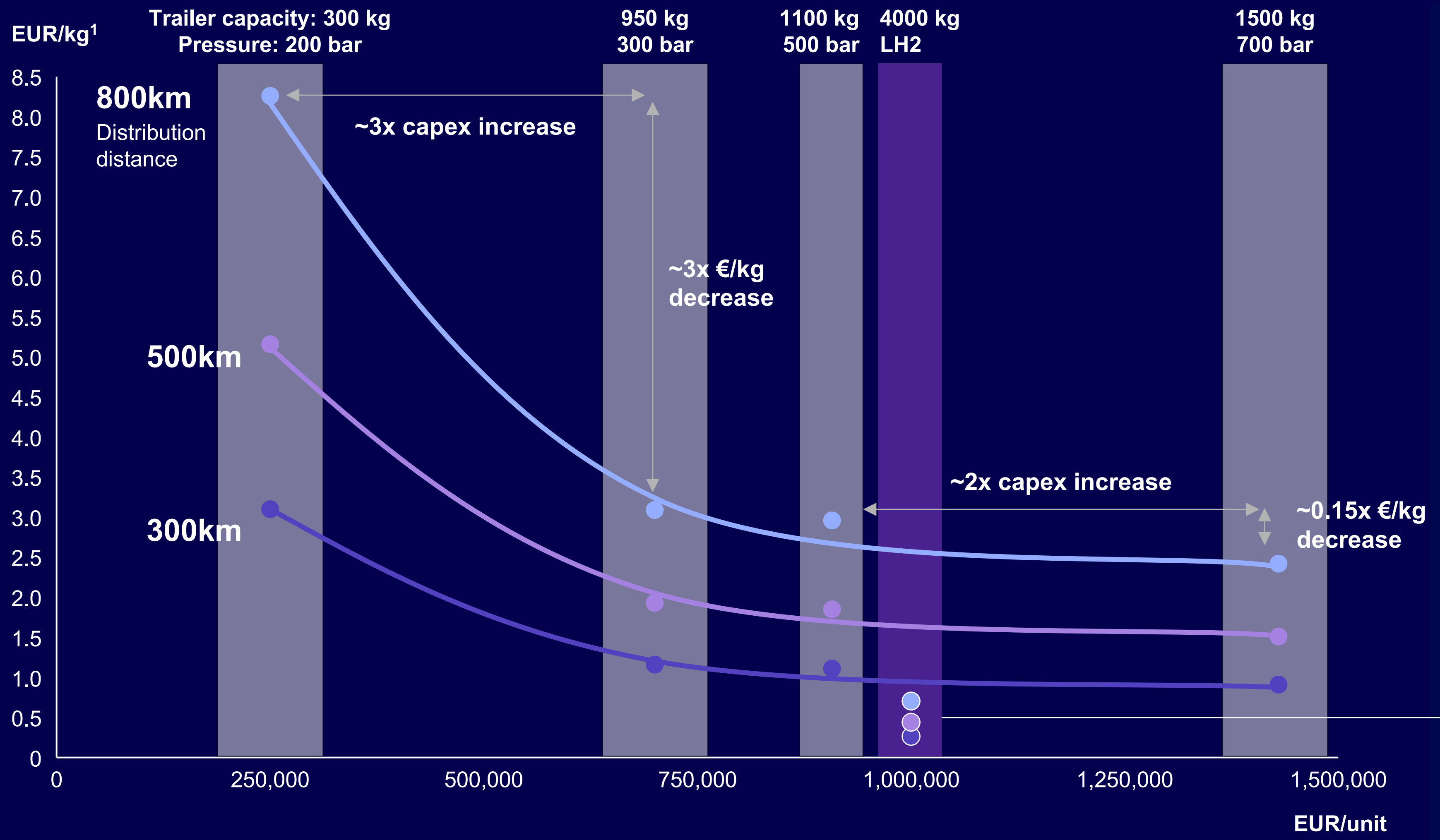
Low-carbon H2 production volumes are expected to remain low in Europe

Renewable H2 production is expected to increase 10x over the next 5 years, as renewable electricity and electrolyzer costs decline and plant capacities grow

Near-term sourcing flexibility can significantly improve mobility's cost position and sourcing reliability

Distribution | ~1t trailer capacity and <300 km distribution distance to create cost efficiency, LH2 with significant cost advantage at scale

Unitary CAPEX vs resulting unitary cost of distribution



Key Observations

Trailer capacities of ~1 ton represent an inflection point in €/kg performance for a given route distance

Further increasing trailer capacity requires an increase in pressure which drives CAPEX up disproportionately

Further innovation required in 700 bar to drive down CAPEX

LH2 trailers represent significant cost improvement potential, but making efficient use of 4,000 kg trailers requires large-scale infrastructure and liquefaction cost must be added

1. Exclusively cost of distribution – it does not include cost of other steps (e.g., liquefaction or compression costs are not included)

Source: Hydrogen Council clean team (2024)

HRS | Stations above 4 t/day have better CAPEX to capacity ratio

CAPEX factor
CAPEX per kg/day capacity

HRS CAPEX, €M

On-site H_2 storage
In addition to main H_2 trailers

Compressor unit(s)
700 bar compressors

Dispensers (700 bar)

Other operational capex
Cooling units, measurement, control units, tubing etc.

Trailer swap equipment

EPC costs
Building, land preparation, transport to site, planning, etc.

Other (miscellaneous)

HRS capacity
Dispensing pressure

Key Observations

Significant decrease of cost per unit as station size increases, with a 2.5x cost increase for 8x larger capacity station

Majority of scale benefits expected to come from compressors and on-site storage installation, currently representing ~40% of station cost

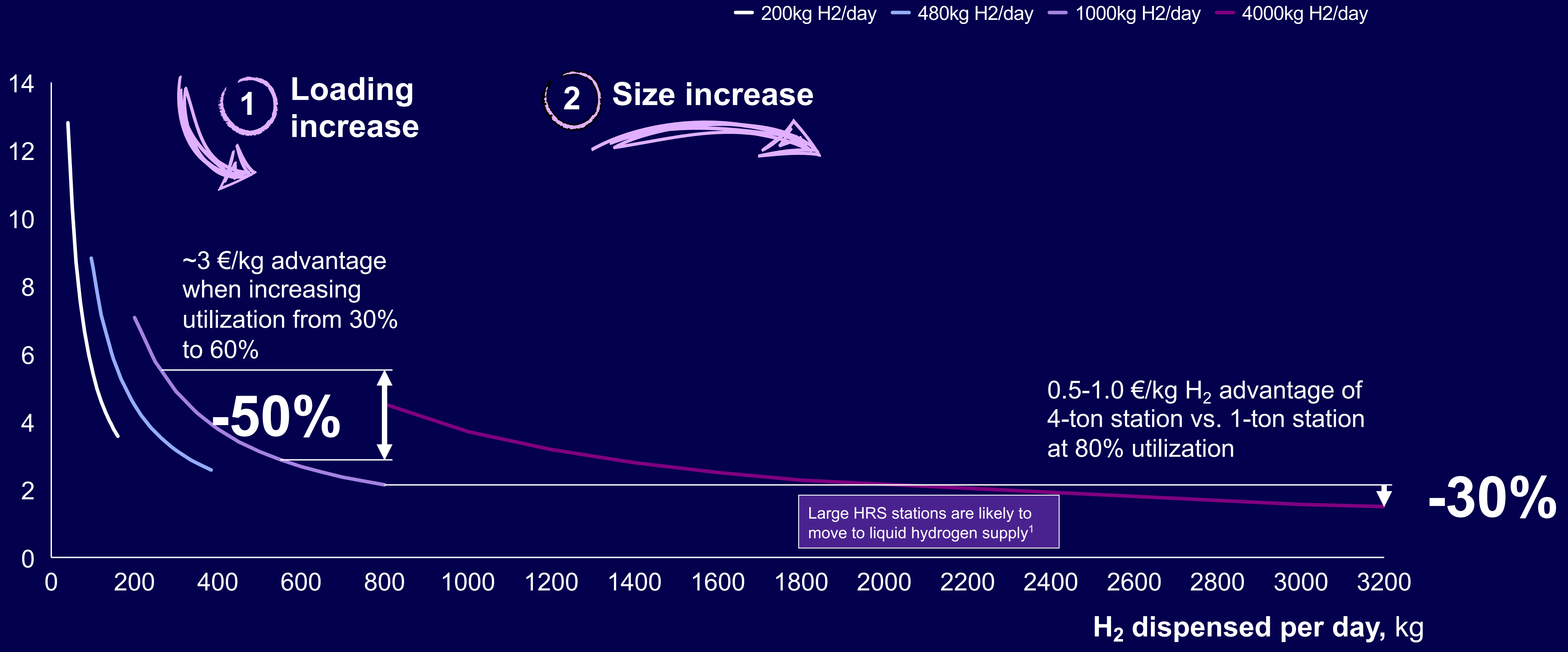
Additional 25%+ cost reduction opportunity expected in mature market, with further opportunity through liquid-to-liquid dispensing (vs. 700 bar)

Source: Hydrogen Council clean team (2024)

HRS | Scale and utilization are essential to reduce H_2 cost at the pump, with most competitive cost position reached above 2t per day

Hydrogen Refueling Station cost per H_2 dispensed

€/kg, excluding other value chain steps

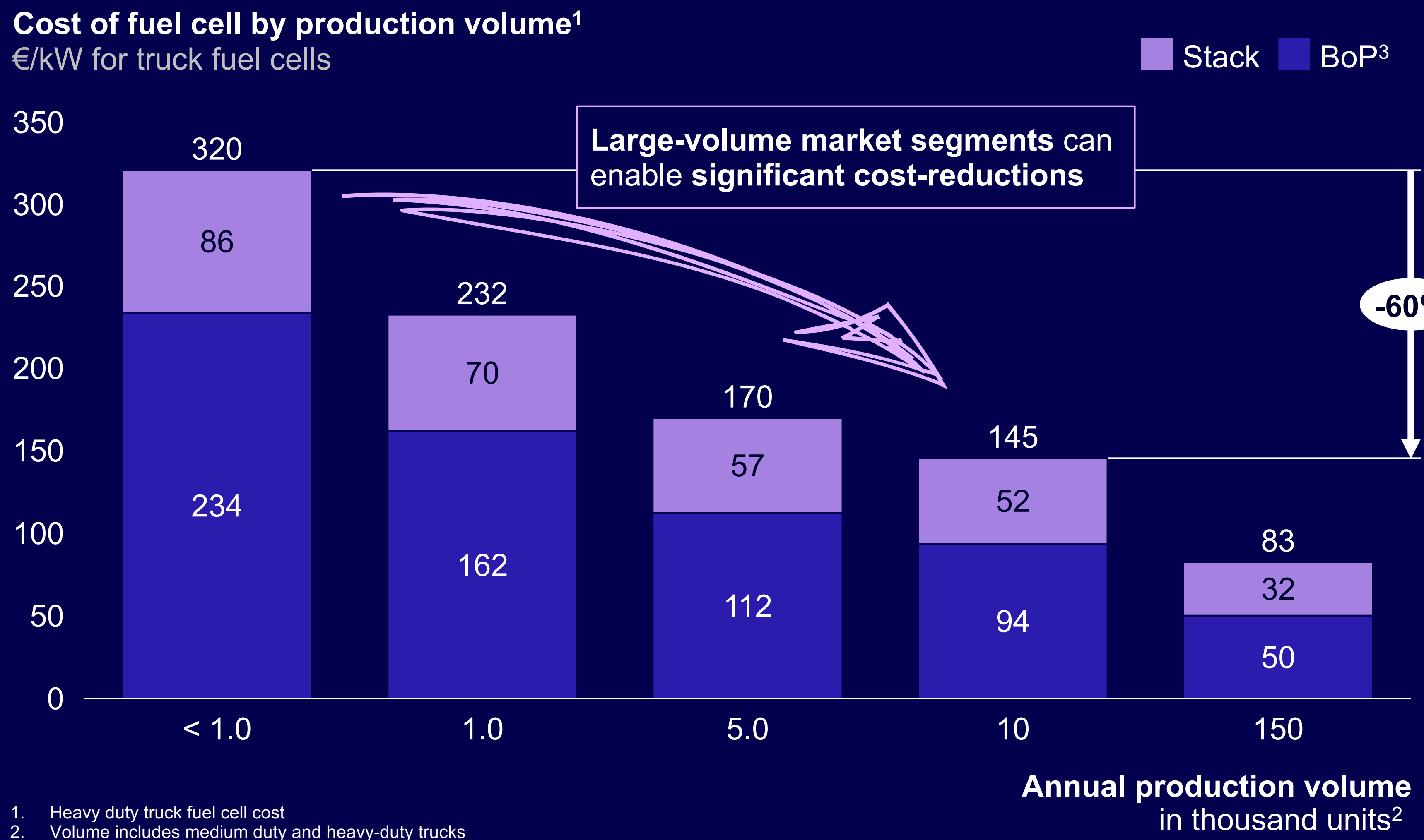


1. Cost data for liquid-to-liquid stations not available from Hydorgen Council clean team 2024

Source: Hydrogen Council clean team (2024)

Vehicle | Scale matters – an increase to 10,000 FC units p.a. reduces costs by 60% compared to today

Example heavy truck fuel cell cost



1. Heavy duty truck fuel cell cost
2. Volume includes medium duty and heavy-duty trucks
3. Excl. tank

Source: Hydrogen Council clean team (2024)

Key Observations

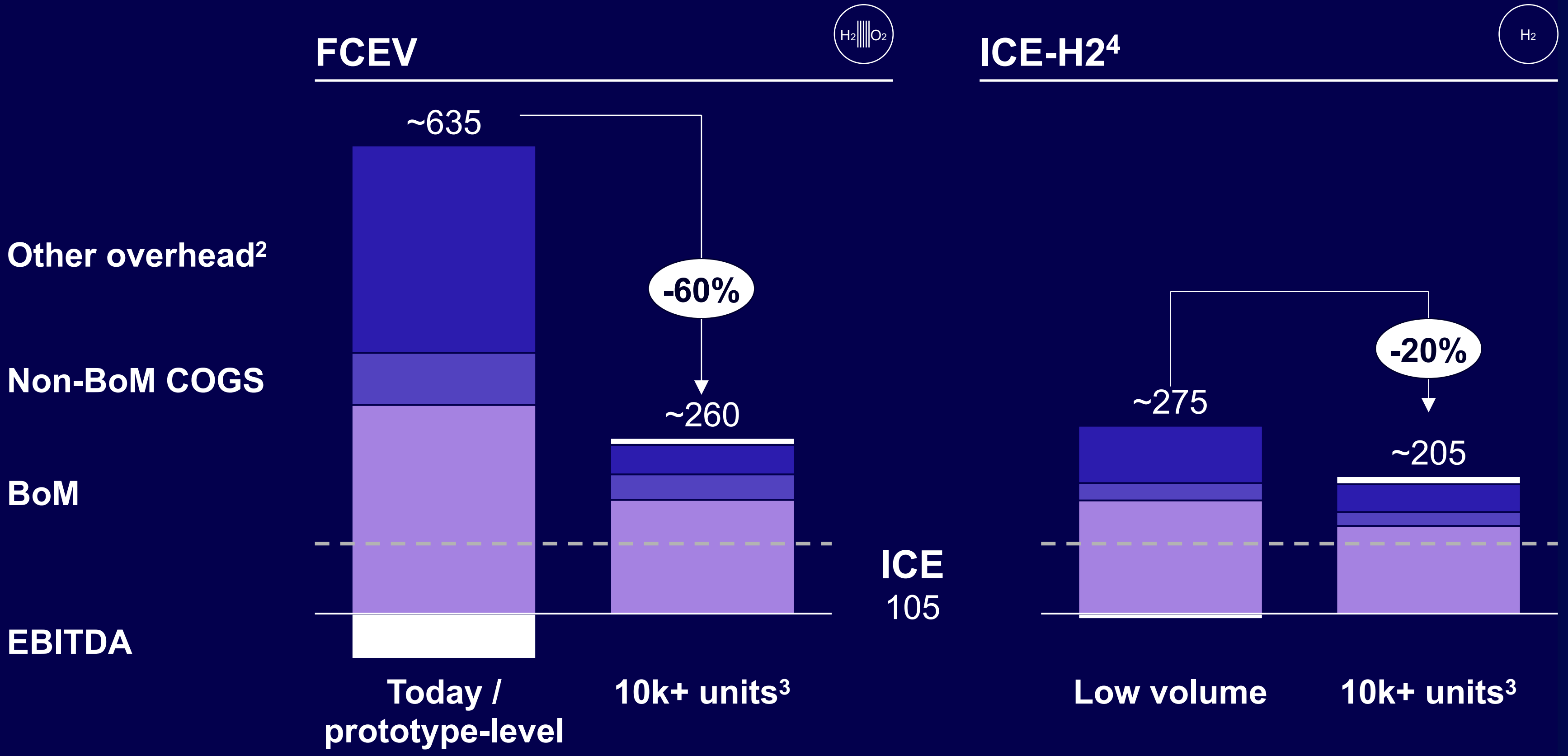
An **increase** in **production** to **~10,000 trucks per year** results in a **cost decline** of **~60%** compared with today's levels

Cost competitiveness in niche segments will benefit by winning in large, mainstream segments with **large volumes**

Vehicle | If scale-up is achieved, significant price-down can be achieved for FCEV / ICE-H2 trucks

CURRENT TRAJECTORY

Est. transaction price for fleets for HDT on-demand[1] (500km range), € '000



Key Observations

BoM reduction driven by cost decrease in key components through technology advances and production scale-up

Overhead reduction in response to production scale-up, as overheads can be distributed across larger volumes

1. Class 8 tractor with ~350kW motor power; ~500km range between refueling stops (FCEV: ~103kg H2 tank in 2023 to ~88kg by 2030; ICE-H2: ~121kg H2 tank in 2023 to ~112kg by 2030); FCEV with ~70kWh auxiliary battery and ~2x 150kW FC system
2. Overhead includes R&D, SG&A, and dealer margins; Non-BOM COGS include direct labor, production support (engineering, quality), transport and duties, warranty
3. Production run-rate by OEM
4. Assumes low-pressure direct injection

Source: Hydrogen Council clean team (2024)

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H2 can already be successful in multiple use cases / geographies, showing meaningful pockets of value

Five criteria to create the conditions for early adoption of H2 mobility use cases

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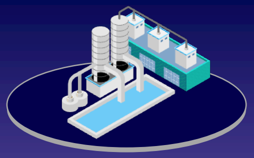


Hydrogen molecules

1 Low local cost of hydrogen
- Ample availability of H2 supply
- High infrastructure utilization

2 Lack of feasible alternatives to H2
- Off-grid locations
- EV charging infra not feasible

Hydrogen vehicles

3 Sufficient vehicle utilization
- Driving distances
- Payload
- Initially consistent routes, later more flexible

4 Adequate vehicle availability / cost
- Local vehicle subsidies
- Vehicle supply availability

HRS network

5 Positive HRS economics
- Utilization >50%
- Station size >1t
- Consistently high uptime

Driving TCO reduction for H2 mobility vs alternatives

Typical use cases that win across these factors

- Back-to-base or base-to-base with high payloads
- Fleets with depots in areas that struggle to electrify due to grid connections
- Flexible long-haul with drivers sharing the vehicle
- Co-location of H2 production with end-use sites
- End customers where transport is a lower share of the cost base

Deep dive | Initially identified use case and geography combinations

Overview of potential use cases / geographies for H2 mobility early adoption

NON-EXHAUSTIVE

Details to follow

Across the world, **numerous pockets of value exist** – i.e., **combinations of geographies and use cases where the Hydrogen mobility equation works**

Among these pockets of value, some have been **already been tapped into** (e.g., co-location in Chinese coal / industrial regions); **while others**, especially in Europe and North America, are **new development opportunities**

Deep dive | China already demonstrates that a number of these use cases work in practice

AS OF JULY 2025 PRELIMINARY & NON-EXHAUSTIVE

Localization of select H2 mobility deployment

Key Observations

- Low-cost hydrogen and subsidies contributed to the success – largest success where low-cost H2 (any color) is available near use cases with high payload and captive fleets driving utilization of large stations
- More difficult in cities where vehicles and infrastructure are not sync'd
- BEV and H2 coexistence is demonstrated in China – largest BEV market and accounting for 90%+ of FCEV HDT / Coach parc

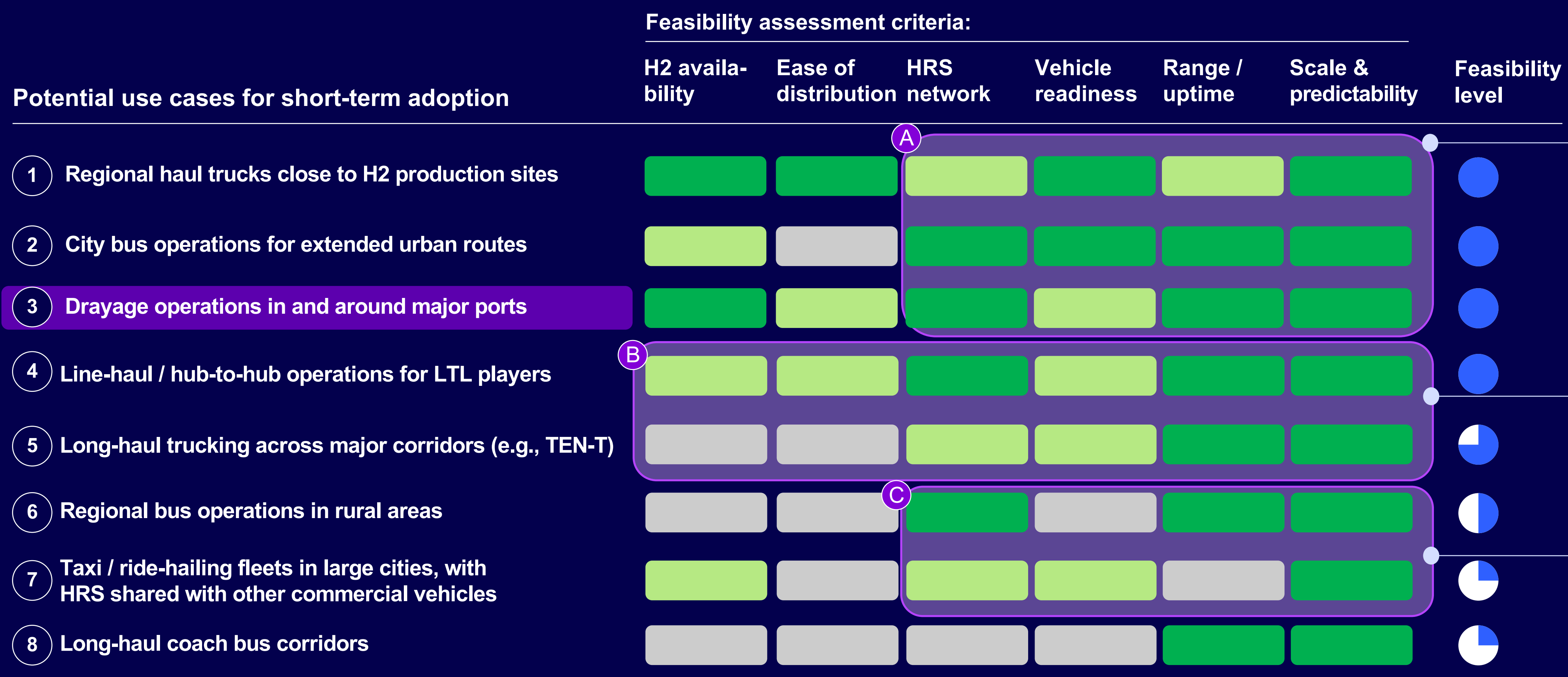
H2 mobility deployments characteristics

	Example project	Description	Location
1	Meijin Energy's HDT for coke transport	100 H2 trucks to transport coking coal along three H2 logistics demonstration routes	Liupanshui, Guizhou
2	Jiaxing Port's H2 container trucks	H2 Energy (Lingniu) operating 100 H2-powered container trucks for Jiaxing Port Authority	Jiaxing, Zhejiang
3	Ordos' Renewable H2 subsidies	30% investment in HRS development from municipality; 1.8-3.0 €/kg to HRS owners	Ordos City, Inner Mongolia
4	Sinopec Guangzhou FC supply center	Largest H2 FC Supply Center – Sinopec established 11 supply centers and 140+ HRS	Guangzhou, Guangdong

Source: team analysis; Hydrogeninsight.com; hinahydrogen; Shainghai metal market;

Already today, 8 key use cases are feasible to implement – and they are already being activated around the world

High | Low | High / already available | Partial availability | Possible, some additional development or investment required | Example – details to follow



A Regional distribution, city bus, and drayage operations show high levels of readiness especially due to high HRS network availability, range / uptime, and scale

B Both line-haul and long-haul trucking distribution trucks have promising economics and a high degree of feasibility already today

C Regional bus and taxi / ride-hailing are already implemented in pilot locations across geographies – H2 availability remains the primary challenge

[Example] Use Case 3: Drayage operations in and around major ports

Feasibility: 🟢 High / already available 🟡 Possible, but additional development or investment required 🔴 Challenging, with significant investment required

What is the opportunity?

Truck operations in and around major ports come with a large captive fleet with high uptime requirements, including slip-seat operations

What does it take to make hydrogen mobility work?

	Feasibility	
Hydrogen supply	🟢	Ports will be entry points for H2 imports and can also be production locations (e.g., Rotterdam)
Hydrogen distribution	🟡	Distribution via short pipeline possible at future import hubs
H2 Refueling infrastructure	🟢	Ready to deploy in context of clear demand
Vehicle availability	🟡	Both on-road HDT and terminal tractors are available, but high vehicle price point
Operating pattern	🟢	Significant benefits for H2 due to 24h operations at ports with high requirement for vehicle availability
Scale & predictability	🟢	Captive demand of significant fleet to enable bankability of implementation

How large is the opportunity?

30 ktpa H2 demand

1k H2 truck sales p.a.

Realization is possible across major European ports and intermodal hubs (airport, rail), including:

- a Port of Rotterdam
- b Port of Antwerp
- c Port of Hamburg
- d Port of Valencia
- e Port of Southampton

Contents

Equation for H2 attractiveness

Inflection points of scaling H2 (based on clean room data)

Breakthrough use cases

Conclusion: What does it take?

What does it take to successfully establish hydrogen in mobility?

Key elements for scaling:

Scale is the key ingredient

Without scale, the industry cannot reach profitability

Stability matters

Benefits need to be provided for vehicle and infra. lifetime

H2 is different than charging

Lower-risk, small pilots that start and scale are not possible for H2, unlike for EV charging

Bankability is critical

Support should focus on enabling bankability of investments in infrastructure and vehicles, thereby unlocking private capital

Concrete asks

Build for profitability from day 1

Stations that start small can never reach a sustainable cost base – modular systems can offset this

→ Support focused on HRS with min. 1t/day and greater support for >2t/day stations

Commitment to Hydrogen supply and offtake

2-sided projects with secured H2 supply and HRS offtake are key to attract investment

→ Take-or-pay contracts, capacity payments, carbon contracts for difference or gov't. guarantees

LH2 needs to be planned in today

Reaching attractive distribution costs and enabling large-scale HRS in practice will require LH2 distribution chains

→ Provide support for LH2 distribution, linked to minimum sizes of HRS.

Ecosystems first, networks follow

Large networks cannot yet reach sufficient utilization, spread resources too thin and increase distribution costs

→ Subsidies focused on ecosystems with 50+% utilization, 10+ HRS of size between 1-4 t / day

Open sourcing with a pathway to clean H2

Start with cheapest H2 source to improve pricing and availability, but with a clear plan to convert to decarbonized H2

→ No initial restrictions on carbon intensity, but requirement for decarb. pathway

Standards and requirements

Faster permitting is needed with synchronized standards across value chain / countries, to reach scale and reduce deployment costs

→ Accelerate standard-setting together with the industry

Bringing everything together – scaling Hydrogen in mobility

Commercial vehicle production

Clean mobility experience on a par with diesel today

1 Activation price & molecule

By 2030

Install viable infrastructure and get vehicles on the road

Avoid unloaded stations
- Synchronised subsidies

Minimise TCO
- Flexibility on H2 sourcing

Create level playing field
- Understand complementarity of BEV + H2 vehicles, as well as use case differences

2 Connect ecosystems

By mid-2030s

Link ecosystems into networks and scale up

Add connecting refuelling infrastructure
- Capacity payments

Decarbonize
- Mandate phase out of unabated H2

Secure fleet demand – enable OEMs to drive commercial scale

3 Decarbonize & scale

By 2040

Comprehensive network

Scale H2 adoption across use cases

Full commercial offer of vehicles, including LCVs, cars, etc.

Low-carbon and renewable hydrogen only

Global Hydrogen
Mobility Alliance