

## **H2 Mobility**

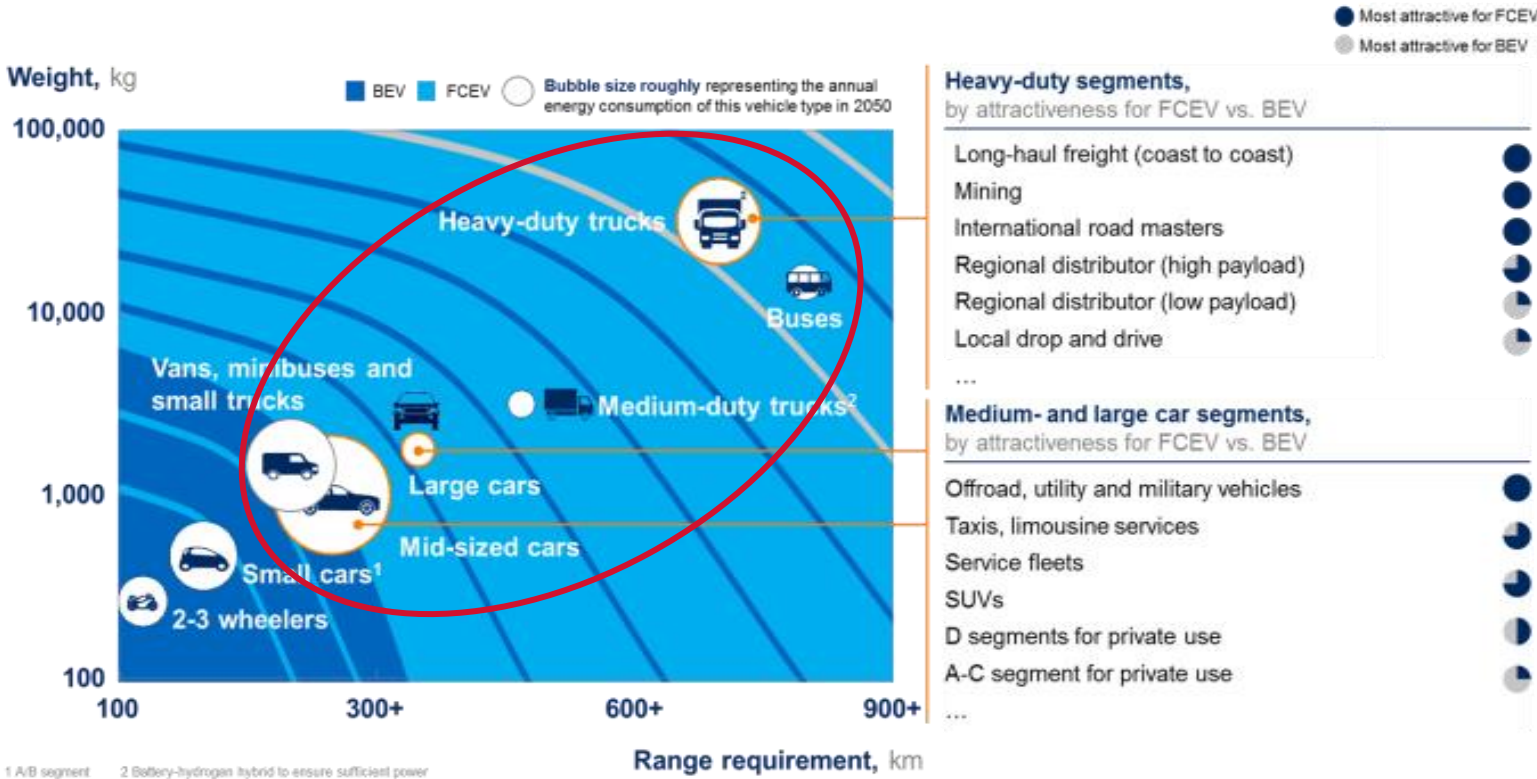
### Faurecia Hydrogen Strategy

June 14<sup>th</sup> 2019



# Faurecia believes in a **BEV/FCEV Co-Existence** with FCEV playing a key role to **decarbonize vehicles with long range and high gross-vehicle-weight**

## FCEV vs. BEV: Co-existence driven by Use-Case



The Fuel cell technology is especially suitable for vehicles that require

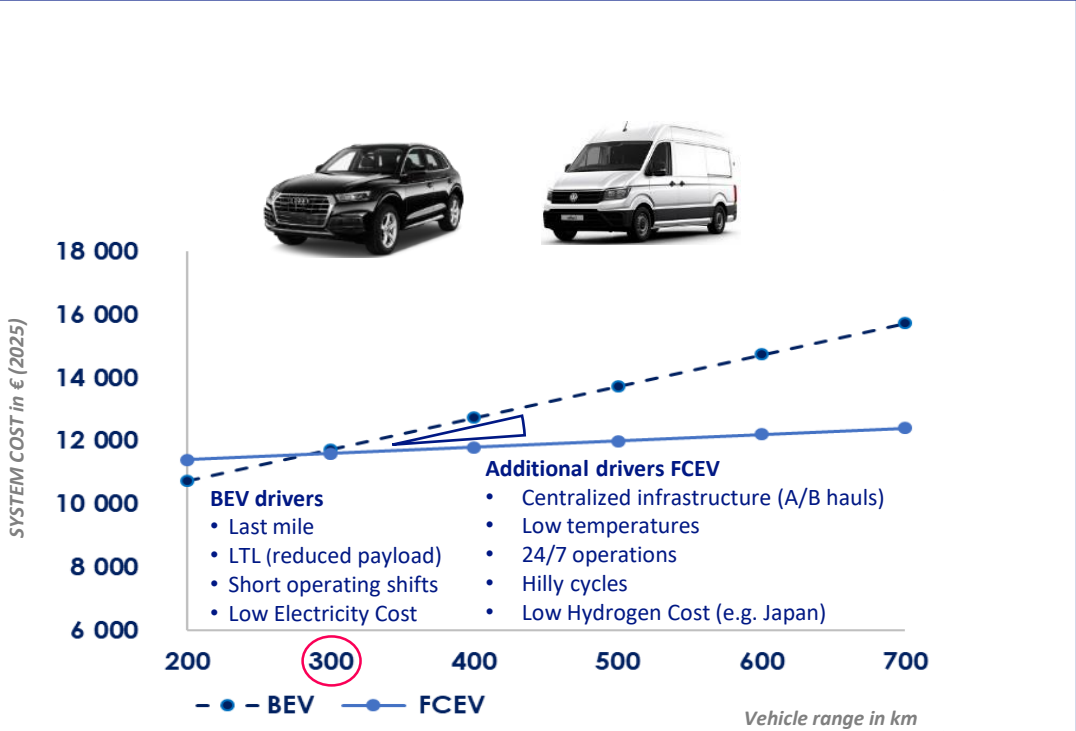
- Long driving range
- Short refueling time
- High energy demand

1 A/B segment 2 Battery-hydrogen hybrid to ensure sufficient power  
SOURCE: IEA Energy Technology perspectives, IHS, Portfolio of Power-Trains for Europe (2010); Thiel (2014), Hydrogen Council

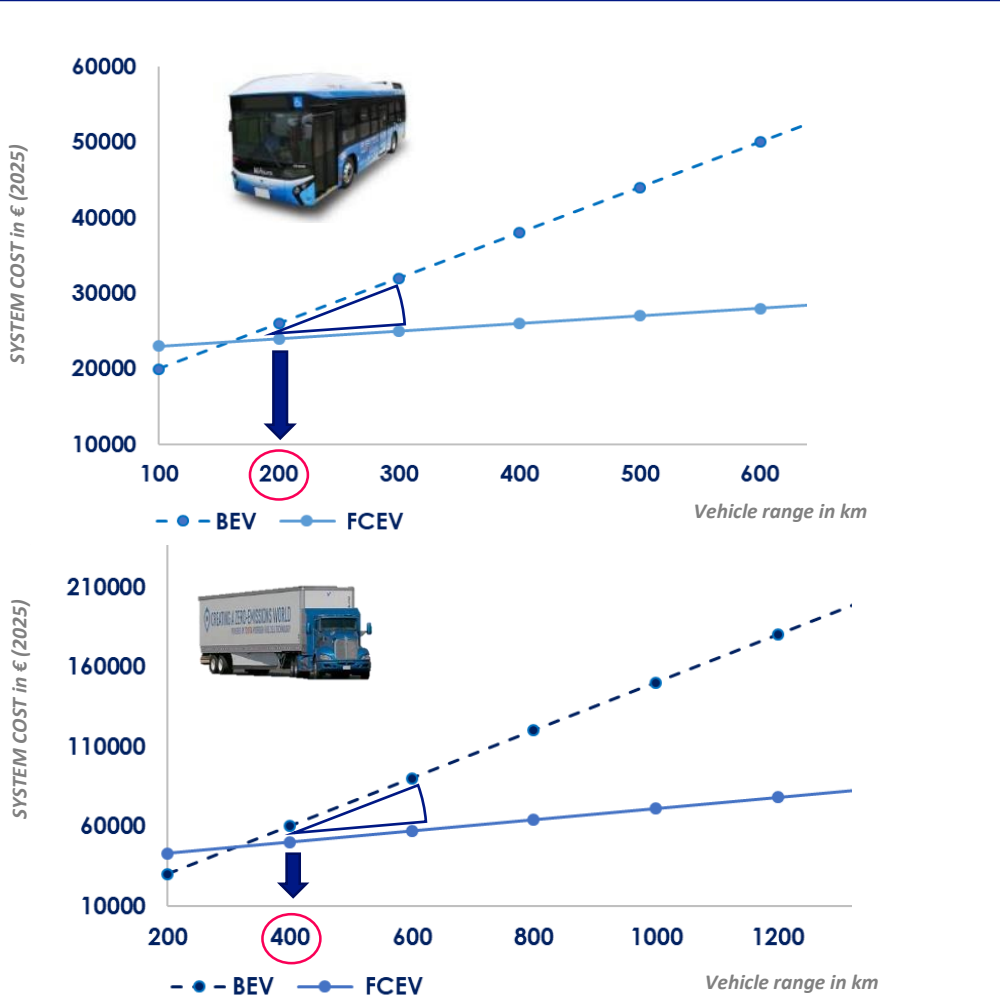
SOURCE: Hydrogen Council - McKinsey

# Technology choice based on use-case rather than traditional vehicle segmentation vehicle segment

## Premium SUV & LCV

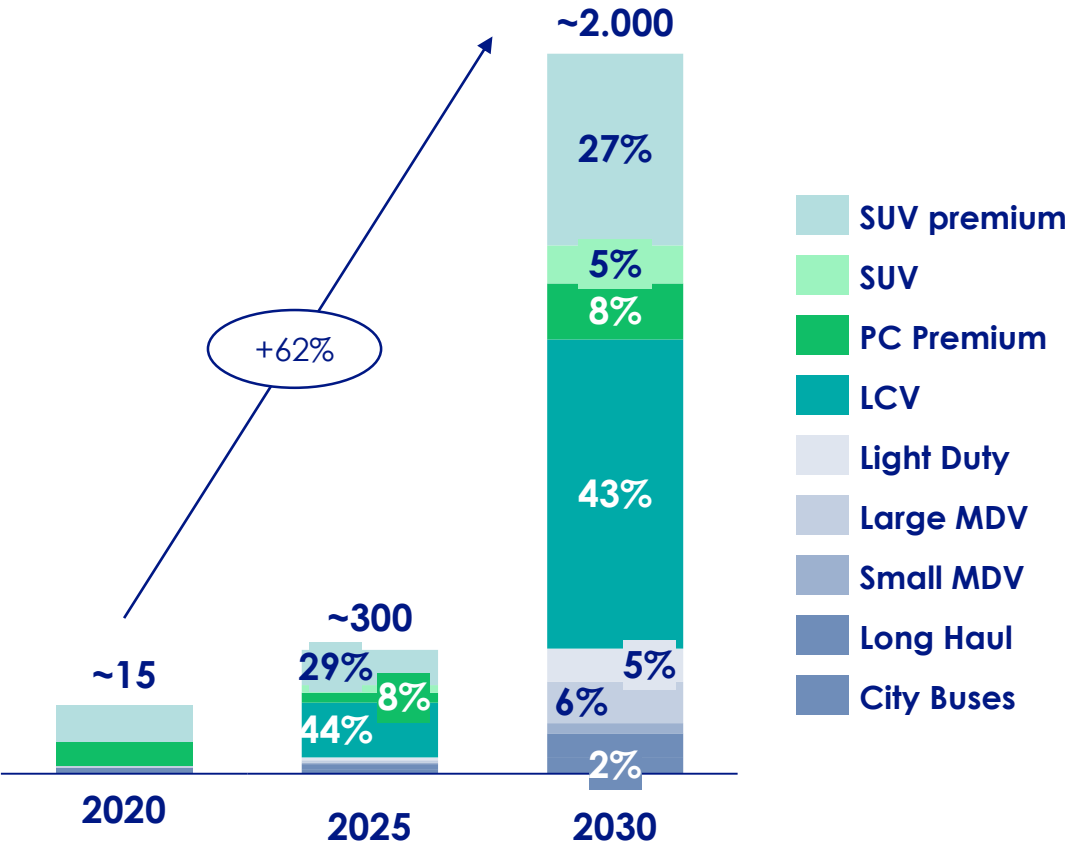


## Trucks & Buses

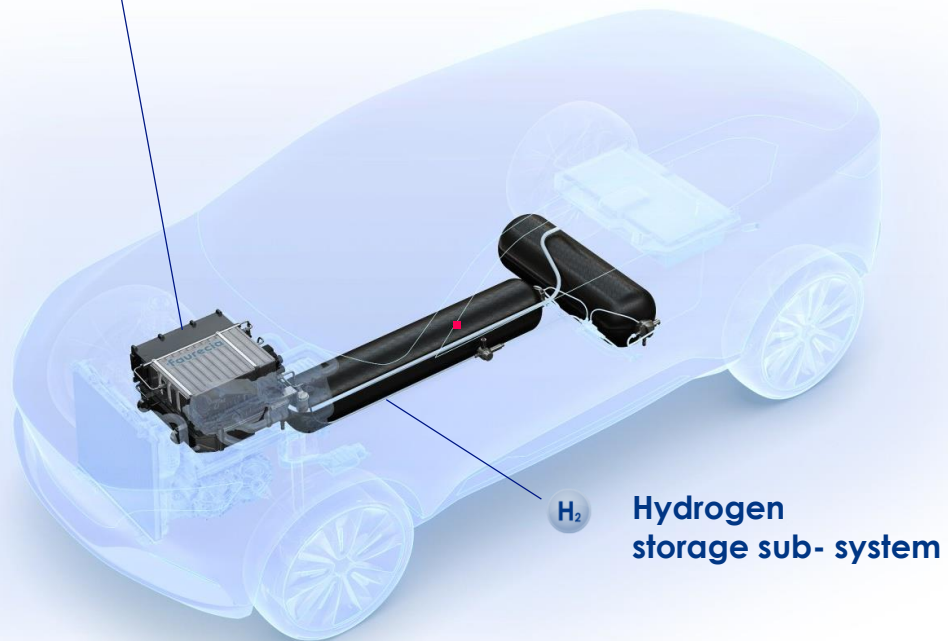


# Fuel cell will drive the electrification of approx. 2M large and premium vehicles and trucks by 2030

## Fuel Cell Vehicle Market (Thousand of vehicles)



High-performance fuel cell stack sub-system



Sources: external industry studies, Faurecia analysis

# Faurecia addresses 2 sub-systems capturing 75% of the full fuel-cell system value

## 1. TANK sub-system




→ addressed by Faurecia standalone

**Complete H2 Fuel Cell System**

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**Hydrogen Storage System (HSS)**

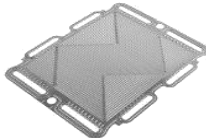
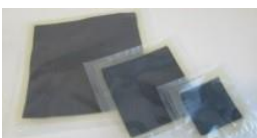
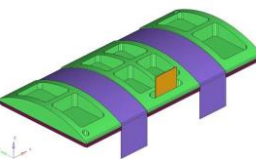
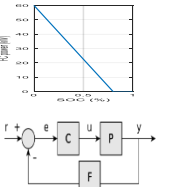


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MICHELIN
**Fuel Cell Stack system**

**Fuel cell auxiliaries**

H2 tank	Valve	Other components
H2 storage	H2 delivery at operational conditions	Piping, fixation fixtures, sensors...
Safety regulation compliance	Safety element as per regulation	
		
<b>~ 70 %</b>	<b>~ 30 %</b>	
<b>~ 40 %</b>		

## 2. STACK sub-system

→ addressed through future JV Faurecia - Michelin

Bipolar plates	MEA Membrane Electrode Assembly	Endplate + other components	Interfaces and controls laws	Electric & Electronics	Supply unit
Plates for FC elementary cell to feed the cell with H2/O2 and to collect electricity	Proton Exchange Membrane + Catalyst ink + Gas diffusion layer	Housing, strapping, fixation, sensors...	Software : incl control and Diagnostic Interfaces : Fluidics / electric / mechanic	Electronic Control Unit Sensor, wiring, connectors DC/DC	Hydrogen loop, Air loop (compressor), Cooling loop (pump)
					
<b>~ 15 %</b>	<b>~ 80 %</b>	<b>~ 5 %</b>	<b>~ 35 %</b>		
			<b>~ 25 %</b>		

Faurecia will support OEMs from **component** to **system development** and **vehicle integration**. **faurecia**  
CLEAN MOBILITY

# Symbio, a Faurecia-Michelin Hydrogen Company: A global leader in H2 stack and systems

## Forming Of The Future JV



### Michelin contributions:

- Low power stacks
- Pilot production site
- MEA expertise
- Ecosystem presence
- Access to CV fleets



### Faurecia contributions:

- Light commercial vehicle Stack
- Intellectual property (CEA)
- Assembly Industrial know-how
- Purchasing power (steel)
- Strategic relationships with car manufacturers (incl. China)

### Symbio existing assets:

- 300 vehicles field experience
- High power stack (Commercial Vehicle)
- People and know how
- **Full vehicle system** Know How

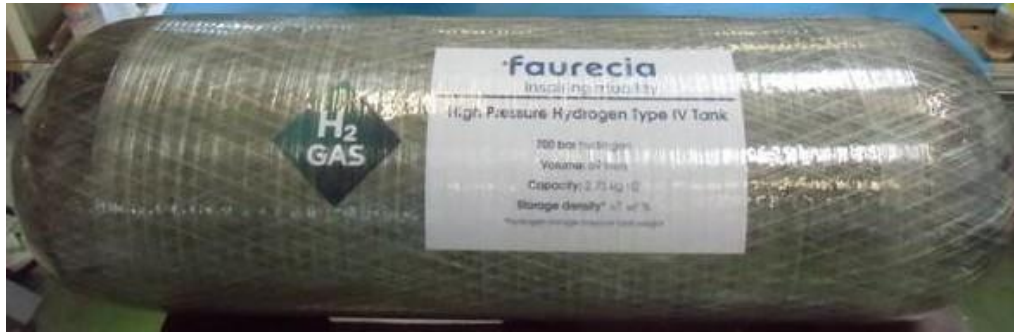
>10 fuel cell systems developed and integrated

## Process Update

- **MoU signature March 11, 2019**
- **Scope: Fuel Cell stacks & systems for automotive applications**
- **Ownership: 50% Faurecia, 50% Michelin**
- **JV launch in H2 2019**



# Hydrogen Storage System (HSS): pilot line up and running, benchmark performance design



## 700 Bars H2 tank

Length	1100mm
Diameter	350mm
Volume	69l
H2 Capacity	2,75kg
Weight/Tank	37,5kg
Efficiency (gross)	> 7 wt%
Permeation	< 0,5 Ncm <sup>3</sup> /L/h (EC79 limit 6 Ncm <sup>3</sup> /L/h)
Lifetime	20yrs / 5000 fills (EC79)
Homologation	EC79 baseline (07/2019) GTR testing S1 2019

# Ambition: 25% market share driving €2-3 bn sales by 2030

## KEY SUCCESS FACTORS

- ✓ **Leading technology** in-house and through partnerships / JVs
- ✓ **Cost competitiveness** through purchasing power & Capex optimization capabilities
- ✓ **Brand and OEM customer portfolio** in both light and commercial vehicles

- **Faurecia credibility confirmed by tank awards, stack JV with Michelin**
- **First SOP planned in Q1 2021**



**▪ faurecia**  
inspiring mobility