

BMW HYDROGEN TECHNOLOGY

BMW Group
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HYDROGEN AS A GLOBAL TREND.

global



IEA: „The Future of Hydrogen“; 09/2019



EU: Green Deal, Corona-Recovery-Plan, EU-Wasserstoffstrategie 07/2020



D: Nationale Wasserstoffstrategie; 06/2020



BY: Bayerische Wasserstoffstrategie; 06/2020

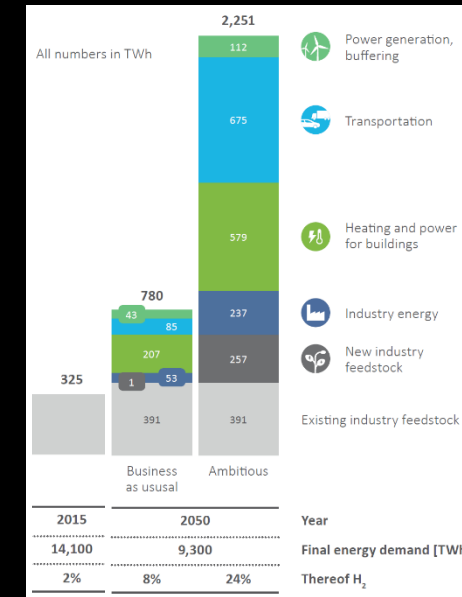
regional

Hydrogen initiatives in >30 countries:



IPCEI Hydrogen

Hydrogen strategies in 15 German federal states:

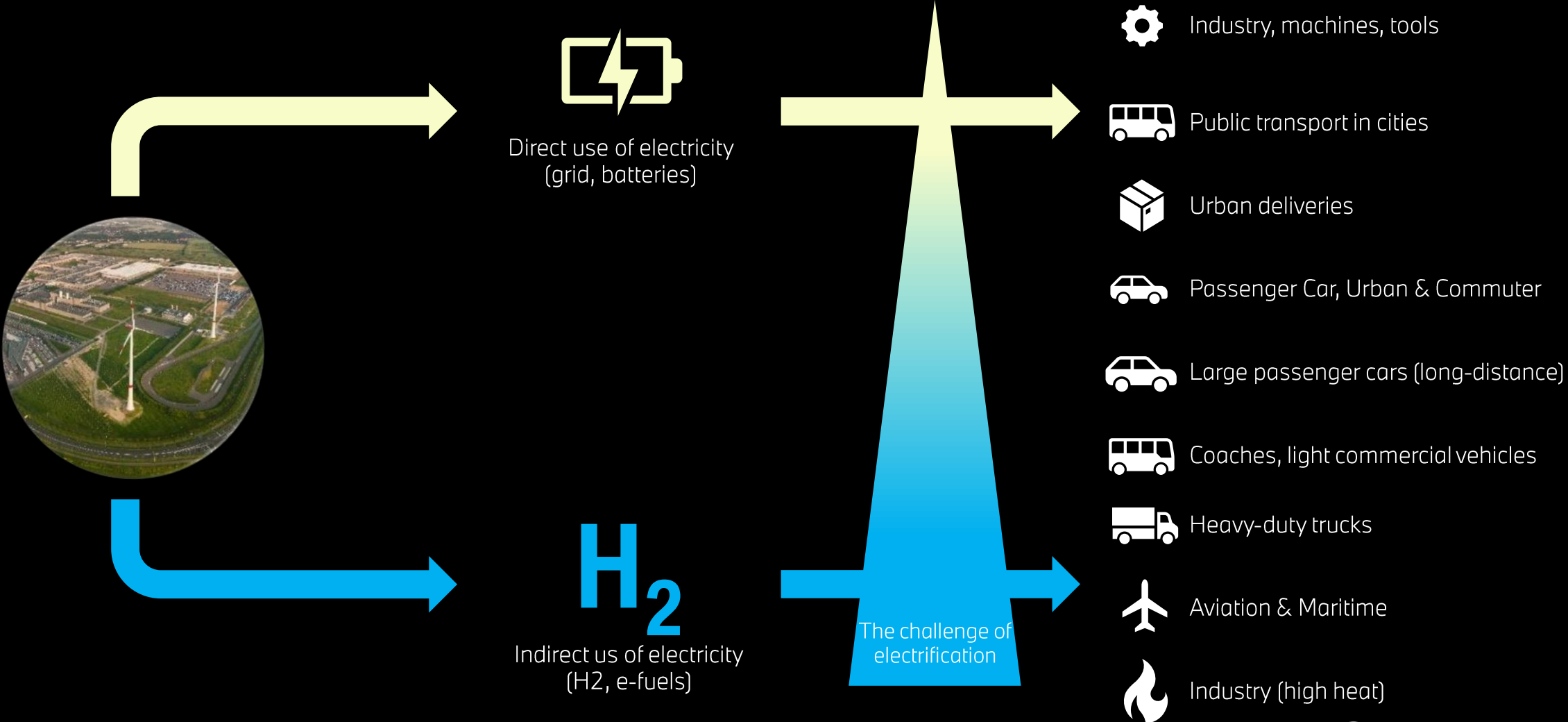



Source: Hydrogen Europe, Green Hydrogen for a European Green Deal-A 2x40GW Initiative



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DIRECT VS. INDIRECT USE OF ELECTRICITY.




Direct use of electricity
(grid, batteries)

H₂
Indirect use of electricity
(H₂, e-fuels)

The challenge of
electrification

-  Industry, machines, tools
-  Public transport in cities
-  Urban deliveries
-  Passenger Car, Urban & Commuter
-  Large passenger cars (long-distance)
-  Coaches, light commercial vehicles
-  Heavy-duty trucks
-  Aviation & Maritime
-  Industry (high heat)

FUEL CELL ELECTRIC VEHICLES PROVIDE VALUABLE FEATURES.



Long-distance
travel and
continuous
operation



For customers
without
convenient e-
charging
option



Zero-emission
option for
large / heavy
passenger
vehicles



Resource-
efficient
production
and easier
recycling



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H2 EXPERIENCE AT THE BMW GROUP.

FUEL CELL
GASEOUS HYDROGEN
@ 70 MPa



1997 1st Fuel Cell



1999 BMW 750hL
(Auxiliary Power Unit)



2013
BMW 1st FCEV



2015
BMW 5Series GT



2022
BMW iX5 Hydrogen



Start of cooperation with Toyota

1980

1990

2000

2010

2020



1979
BMW 520h



1984
BMW 745h



1999
BMW 750hL



2001
BMW 745h



2004
BMW H2R



2006
BMW Hydrogen 7

INTERNAL COMBUSTION
ENGINE

LIQUID HYDROGEN

>40 years



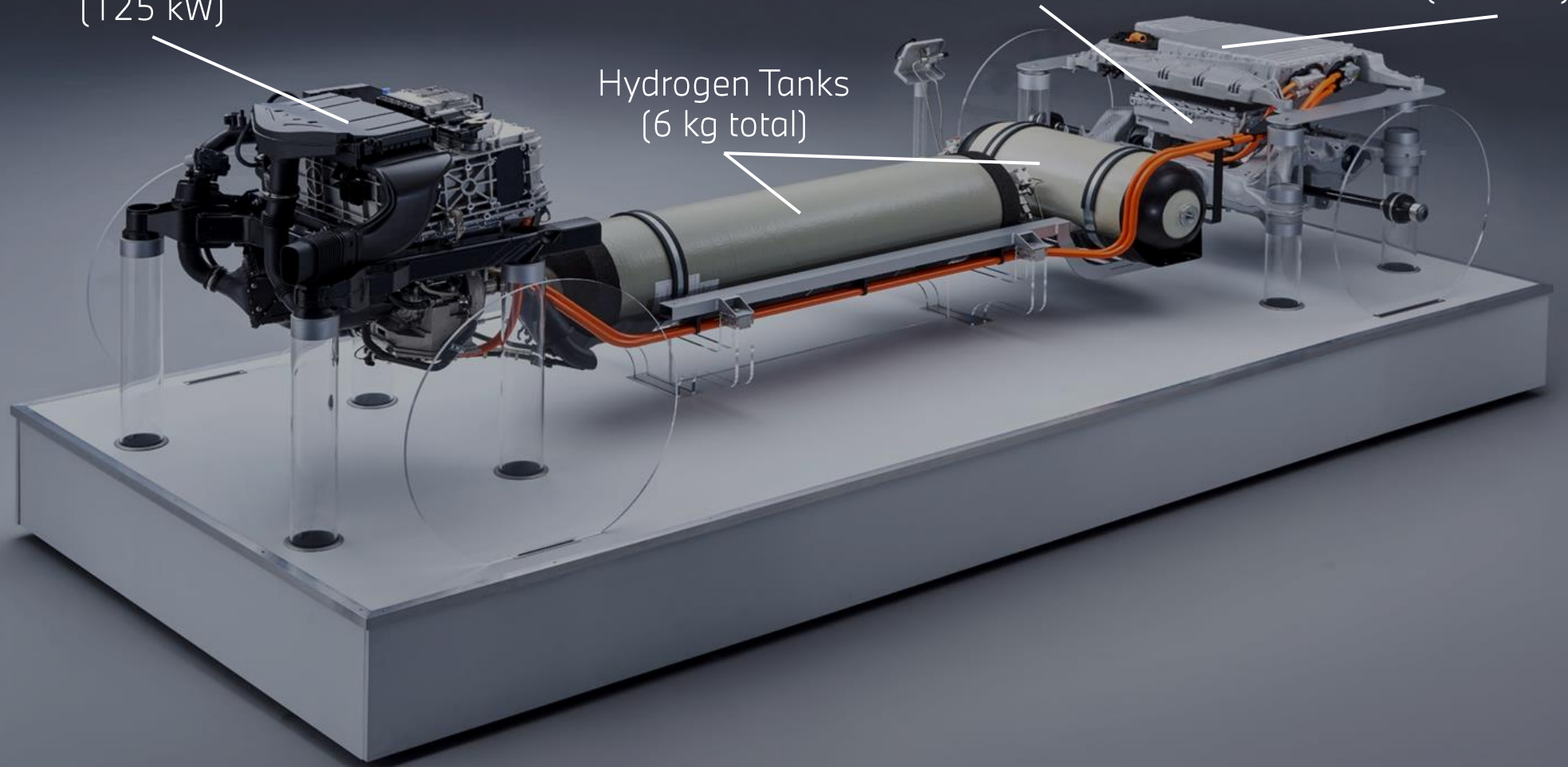
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Fuel Cell System
(125 kW)

BMW iX Electric Motor
(275 kW)

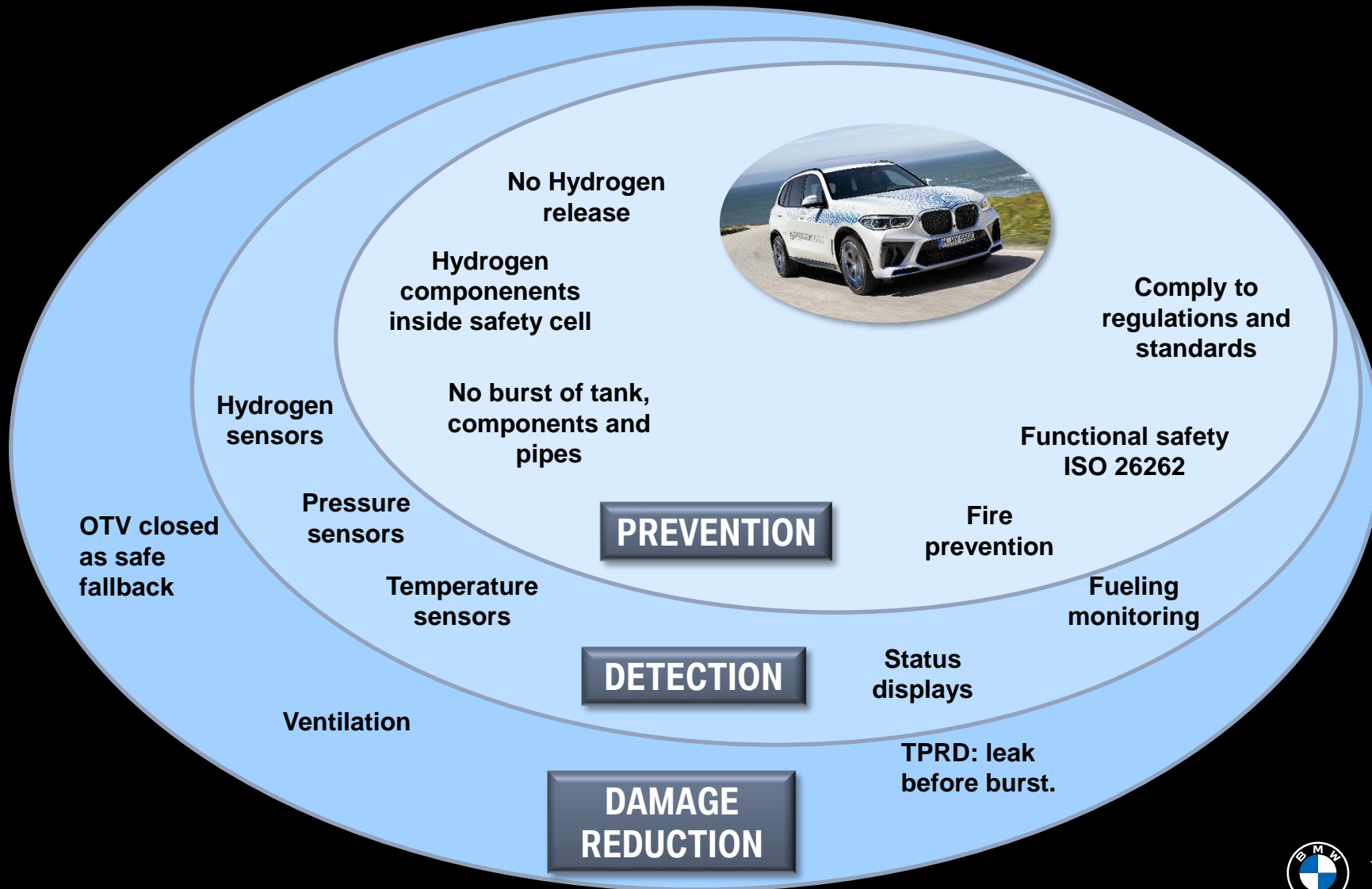
Power Battery
(150 kW)

Hydrogen Tanks
(6 kg total)



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BMW HYDROGEN SAFETY STRATEGY.



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CURRENT SAFETY TOPICS IN FOCUS.

1. Safety always is a priority topic with all Hydrogen related activities.
2. Current focus topics with international context.
 - CEP in Germany (case by case)
 - GTR13 Phase2, among others: conformable tanks, material compatibility, fire tests, fueling interface
 - Standardization boards: Several activities (ISO TC197, SAE, CEN TC 268 WG5)
 - Hydrogen Council: Project team
3. We`re happy to join any activities that make Hydrogen technologies even more safe !

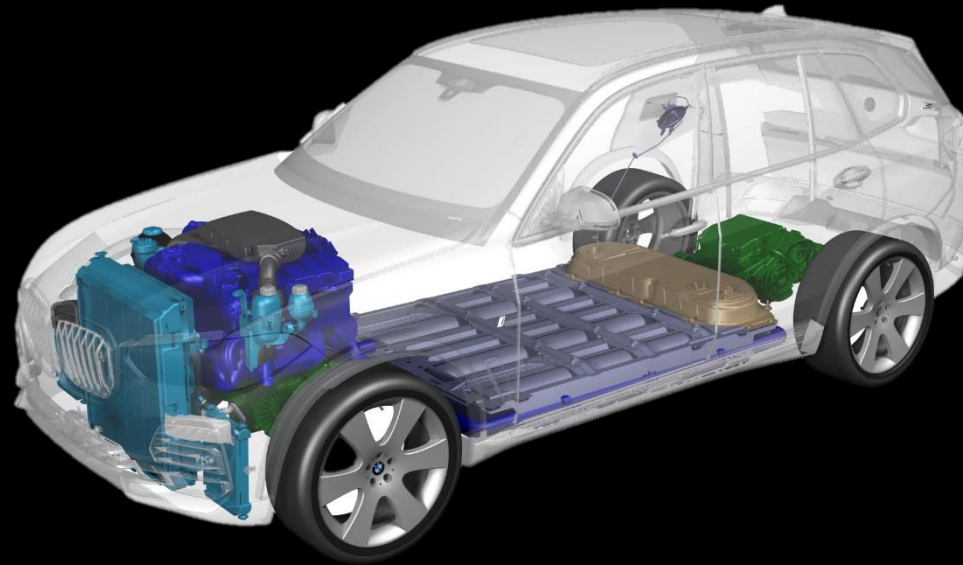


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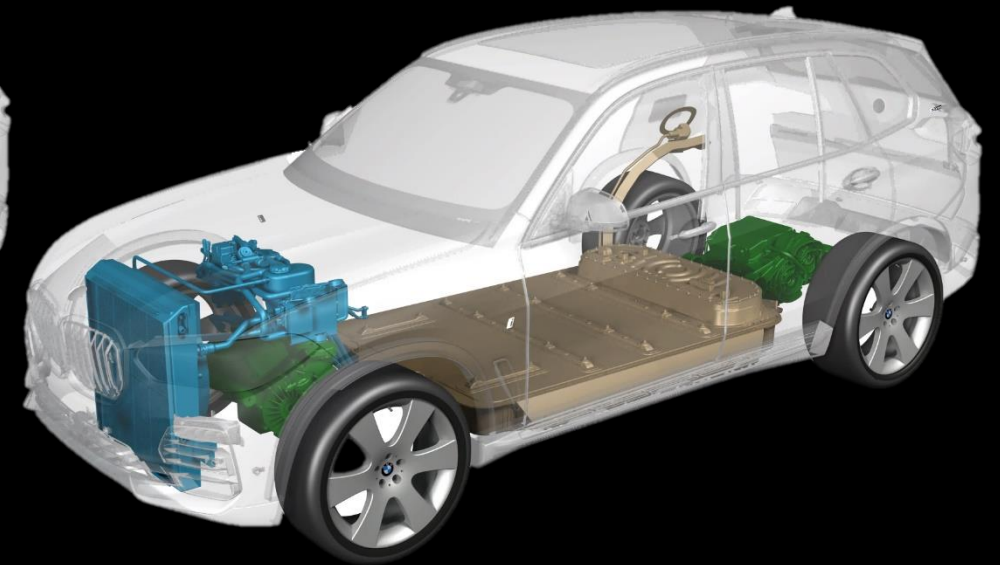
THE SAME VEHICLE ARCHITECTURE FOR DIFFERENT ELECTRIC DRIVE TRAINS.

*schematic illustration

Fuel Cell EV



Battery EV



Front electric motor

Fuel cell system

H2-Tanks

Battery

Rear electric motor



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Thank you for
your attention.



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