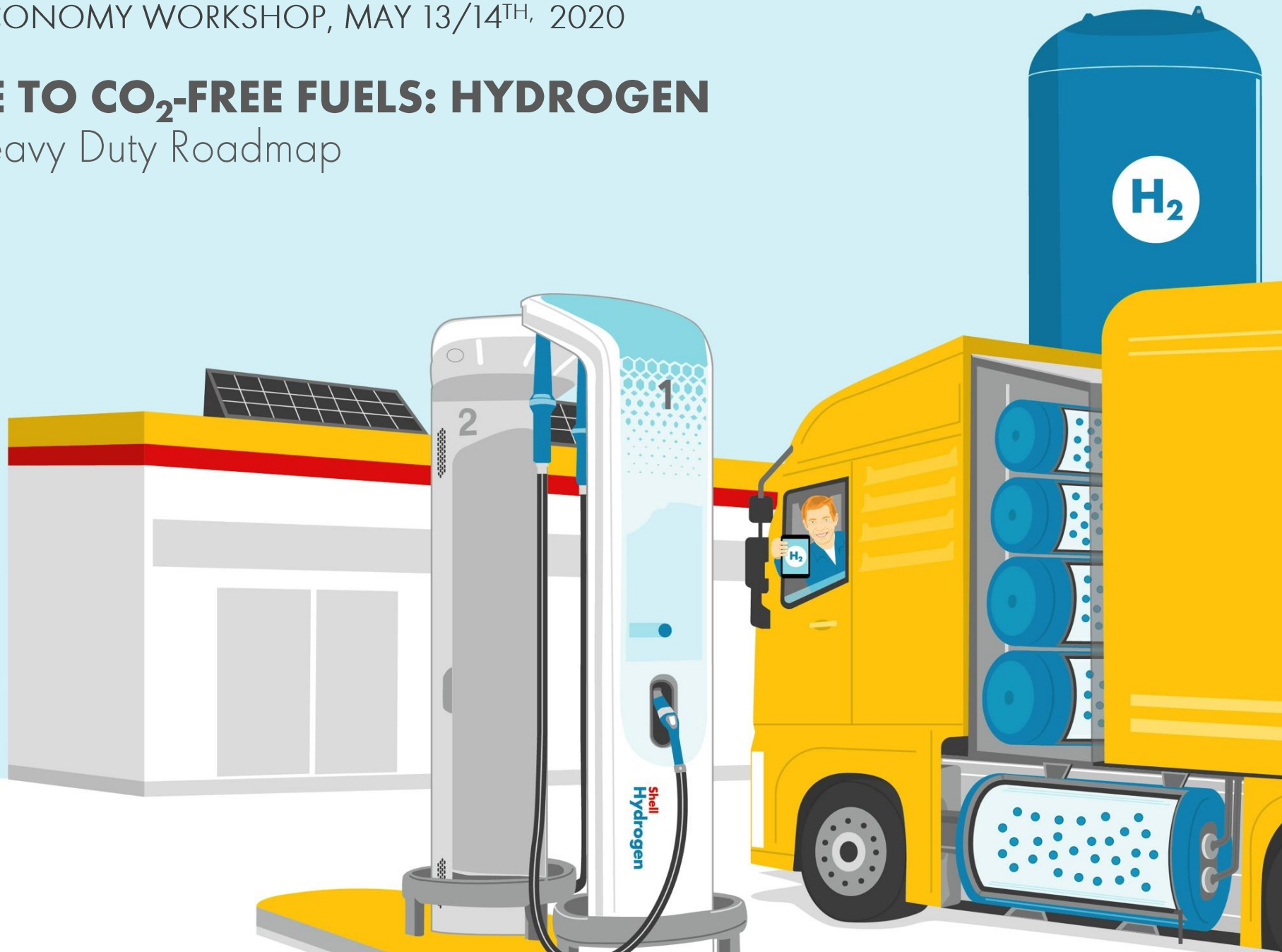
HYDROGEN ECONOMY WORKSHOP, MAY 13/14TH, 2020

ON ROUTE TO CO_2-FREE FUELS: HYDROGEN

Germany Heavy Duty Roadmap

Dr. Wolfgang Warnecke,
Chief Scientist Mobility, Shell



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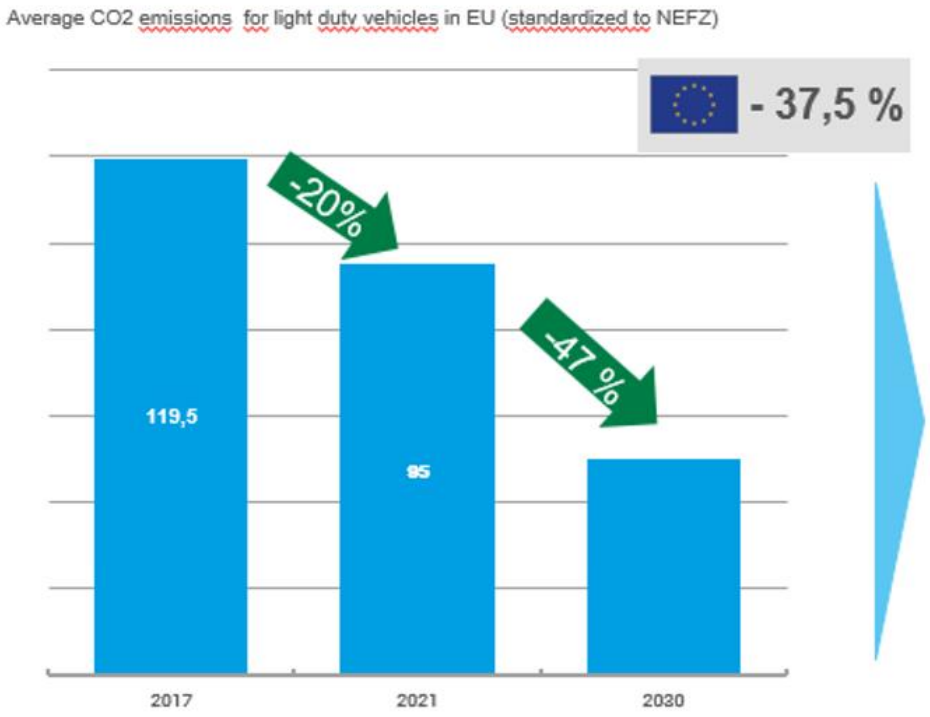
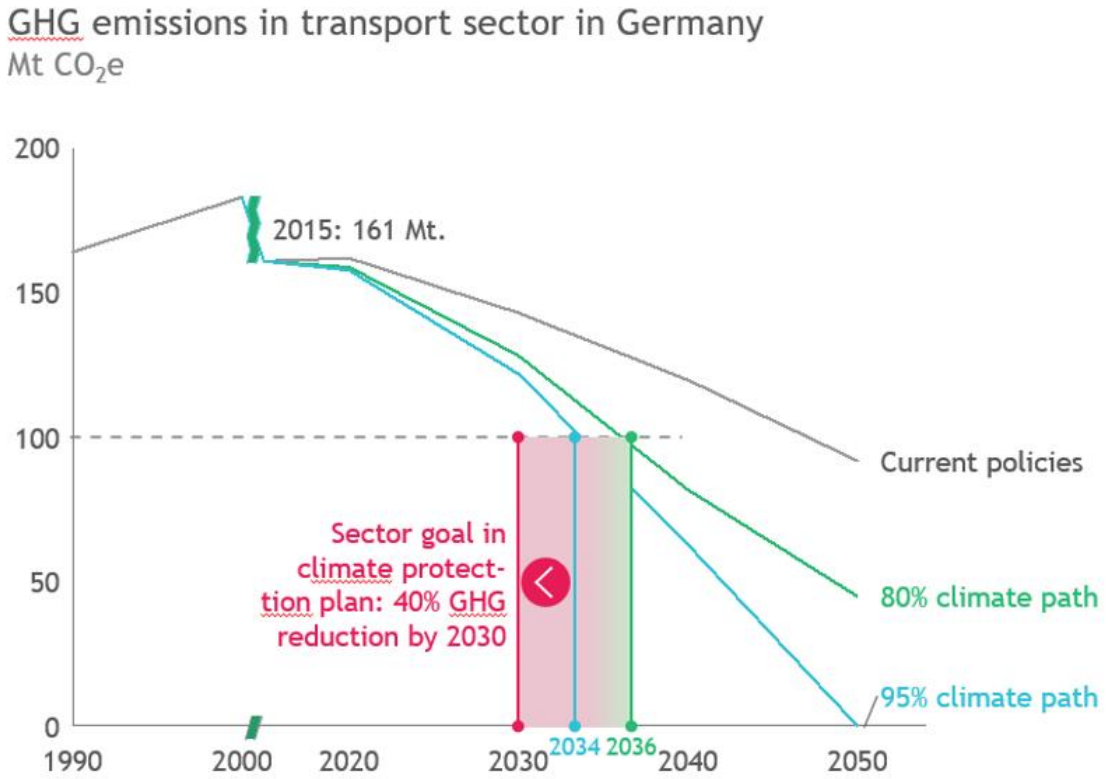
In addition to the fleet targets for new cars, there are additional sector targets for CO2 emissions in Germany

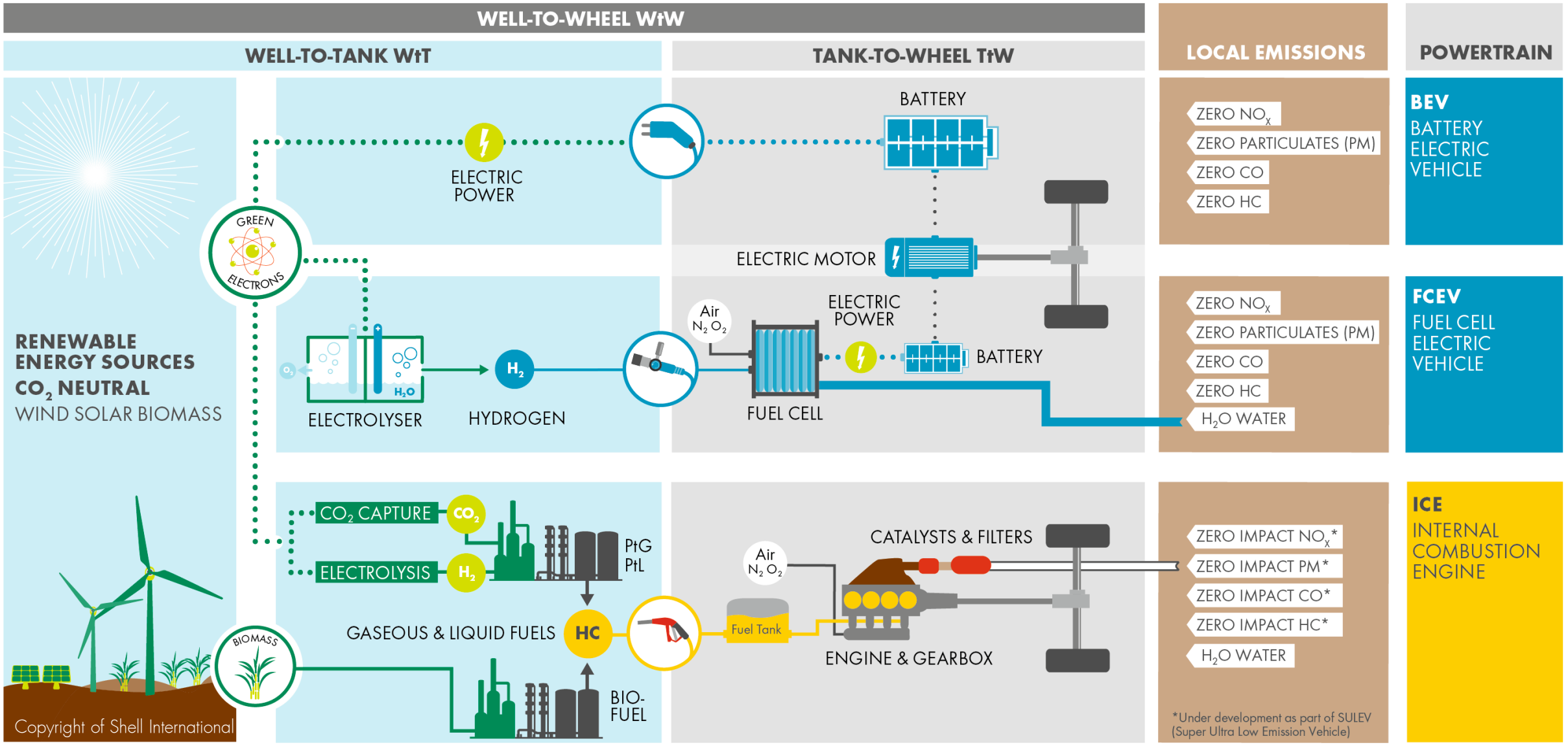
Fleet targets new cars-
37,5% von 95g bis 2030



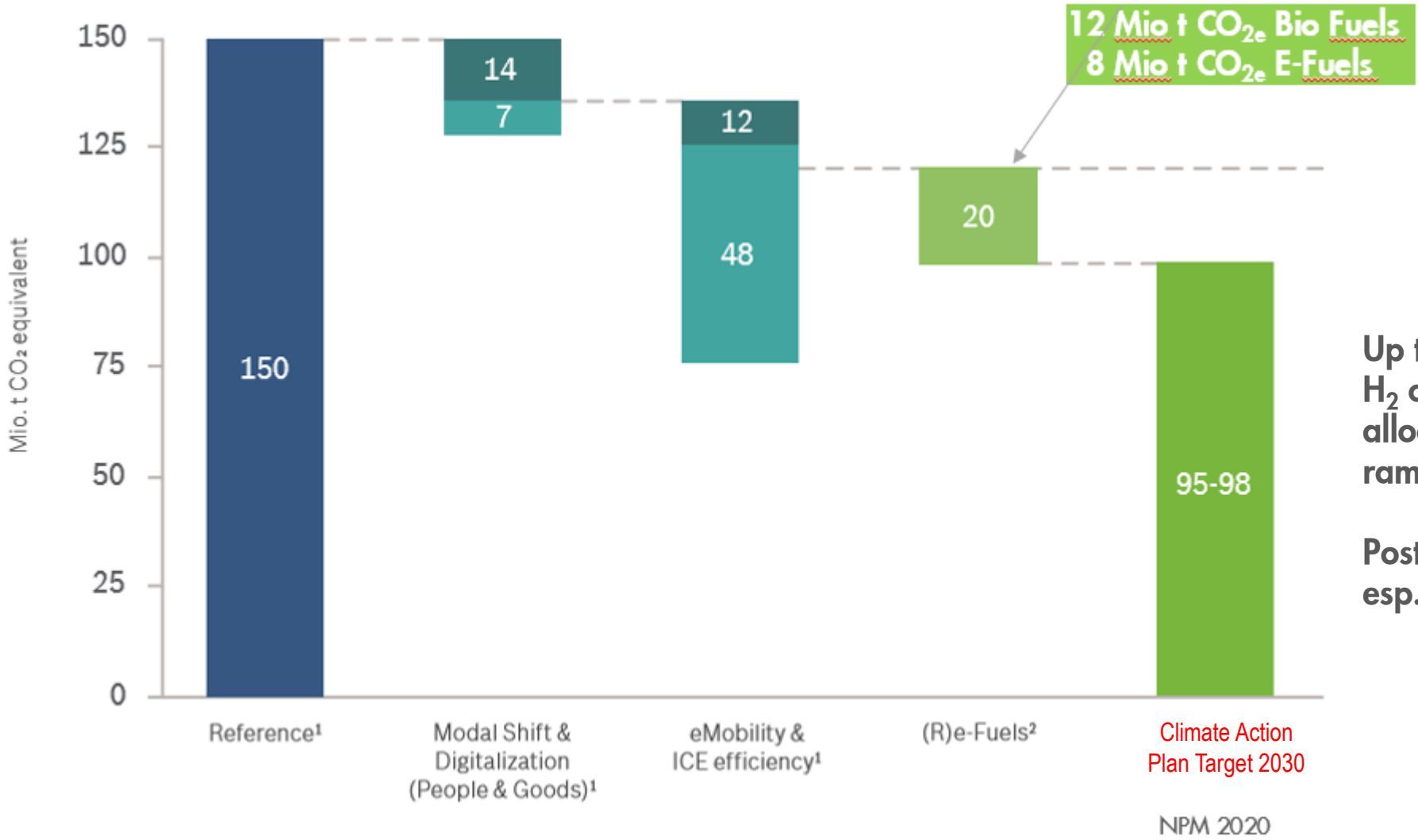
Climate Protection Plan Federal Government
Sector target traffic-40%



PATHWAYS TO ULTIMATELY CLEAN VEHICLE DRIVETRAINS



National German Platform Mobility for the Future (NPM) - Target achievement with high degree of tension in electrification



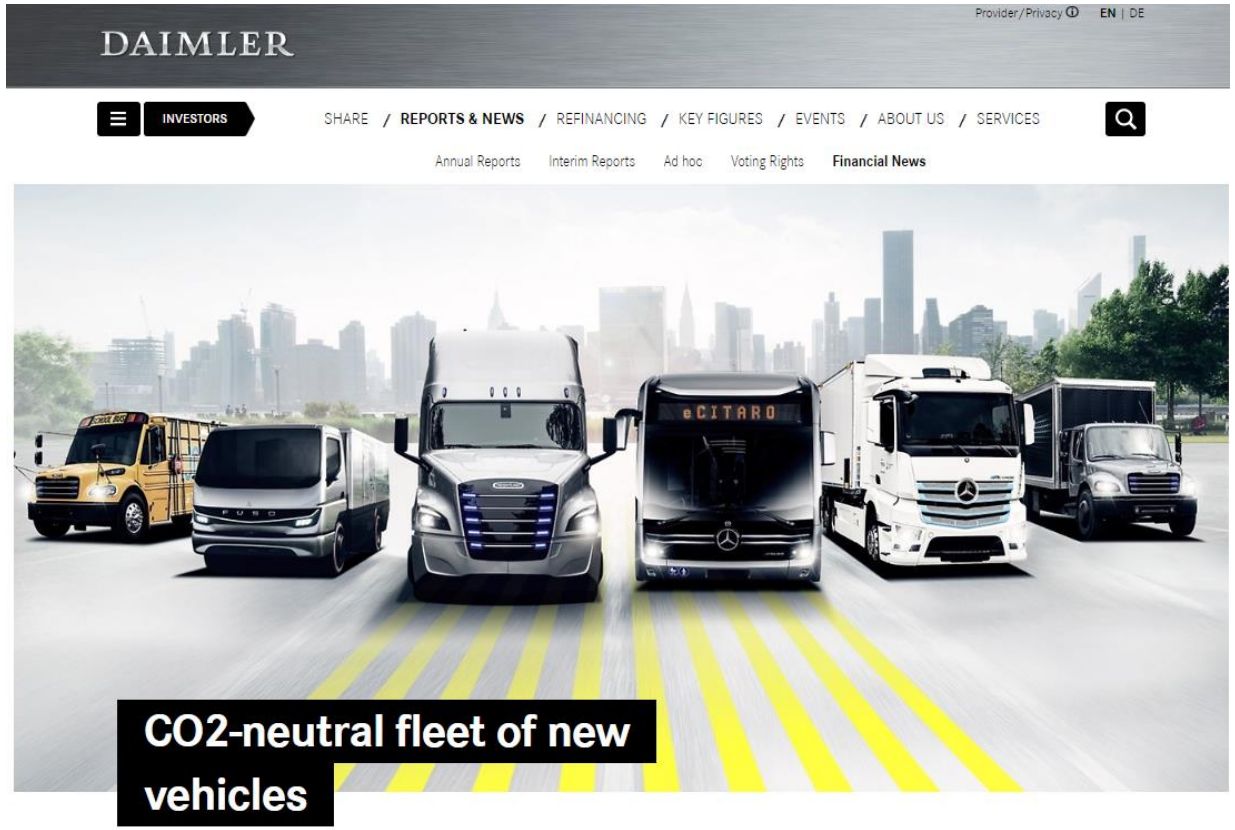
Up to 2030 no major H_2 contribution allocated – Need to ramp up Fleet.

Post 2030 major plan esp. in Truck Transport

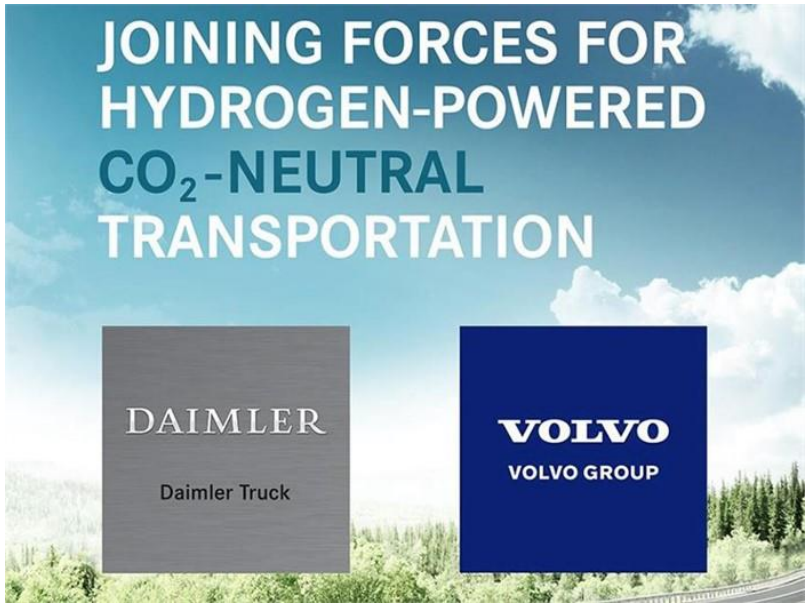
Passenger Cars will be Electricfied further (PHEV/BEV/FCEV)

Key Question:

What will be THE Drivetrain for Commercial Vehicles?



October 25, 2019 - Daimler Trucks & Buses targets completely CO2-neutral fleet of new vehicles by 2039 in key regions

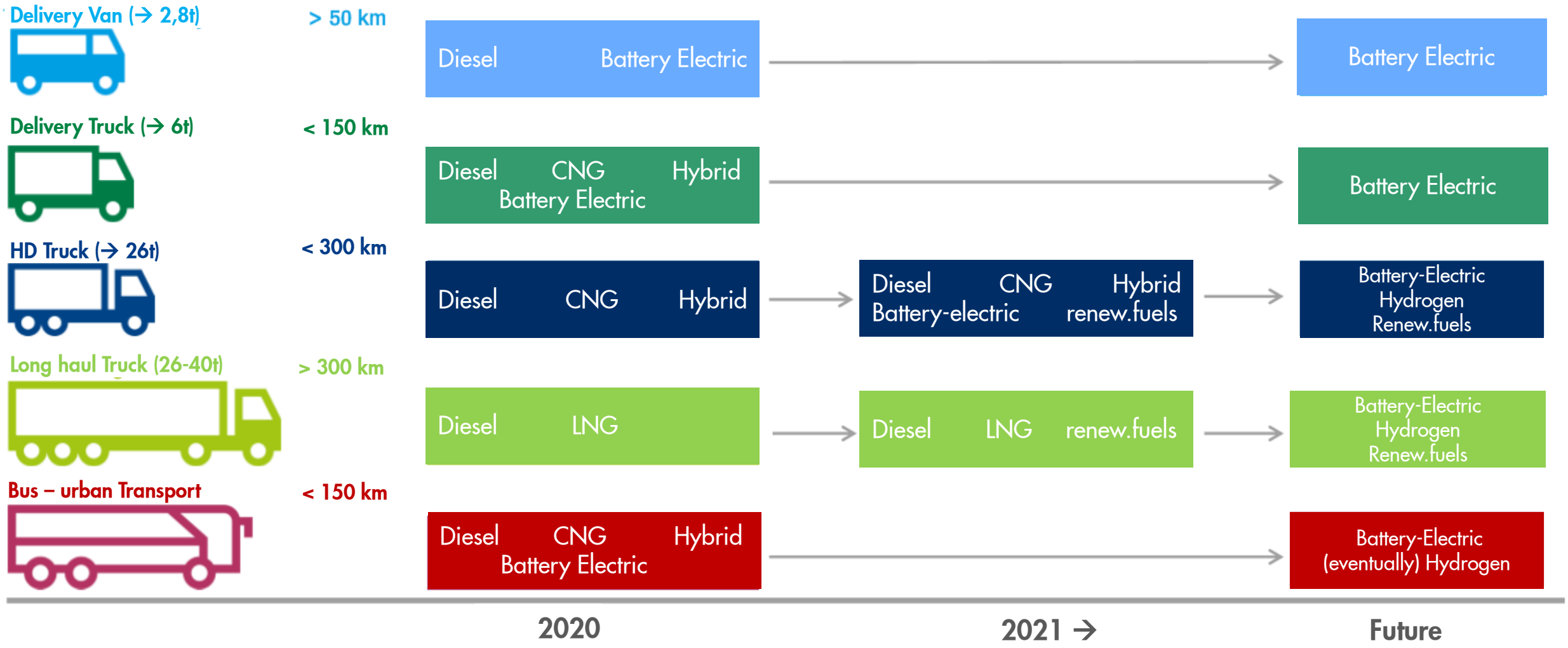


April 2020:

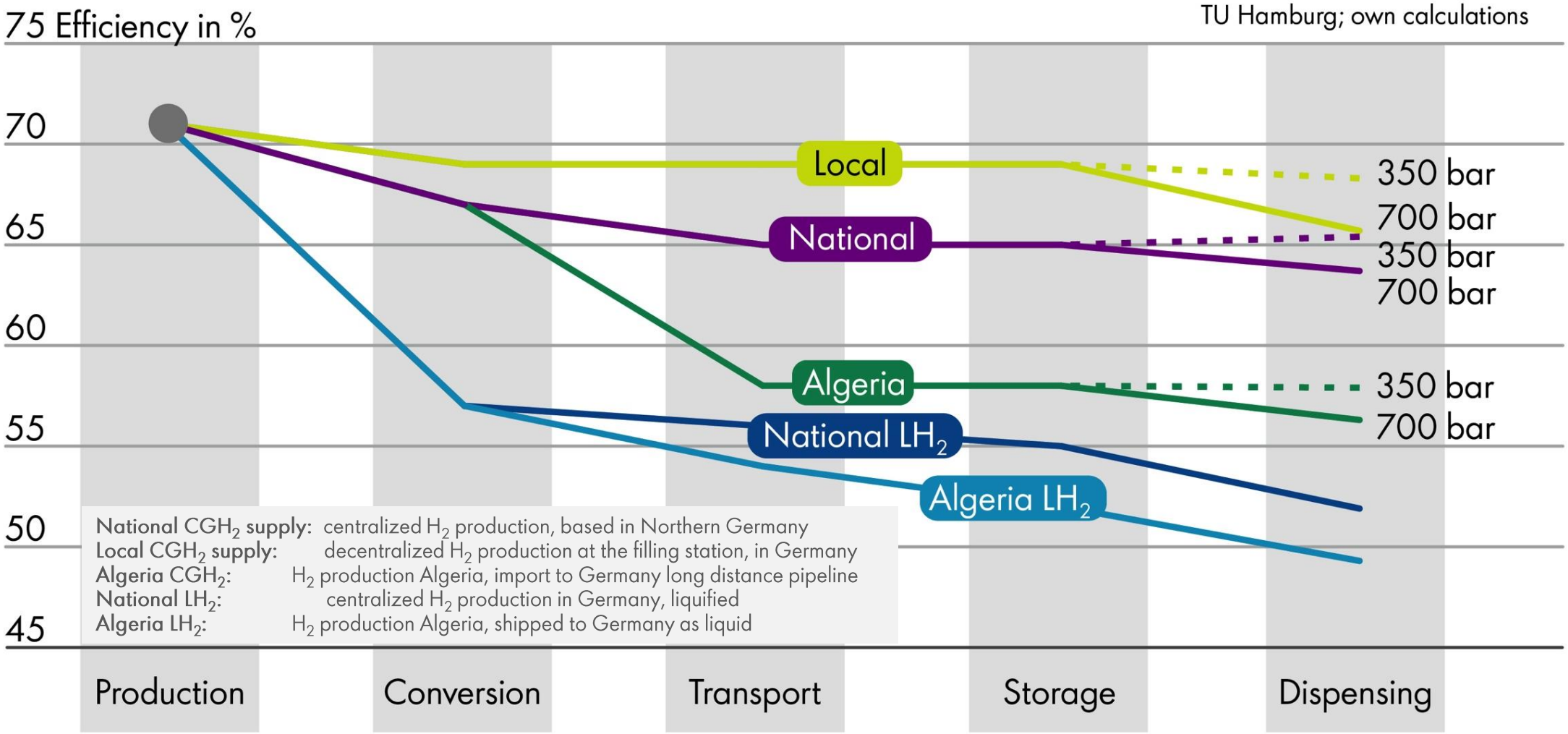
Daimler & Volvo Trucks formed a 50:50 JV to develop & produce fuel cells for heavy duty application

- Jointly covering 50% of EU truck marketshare
- Daimler Scenario: to sell 10.000 FC trucks pa. as Mercedes in 2030 in EU

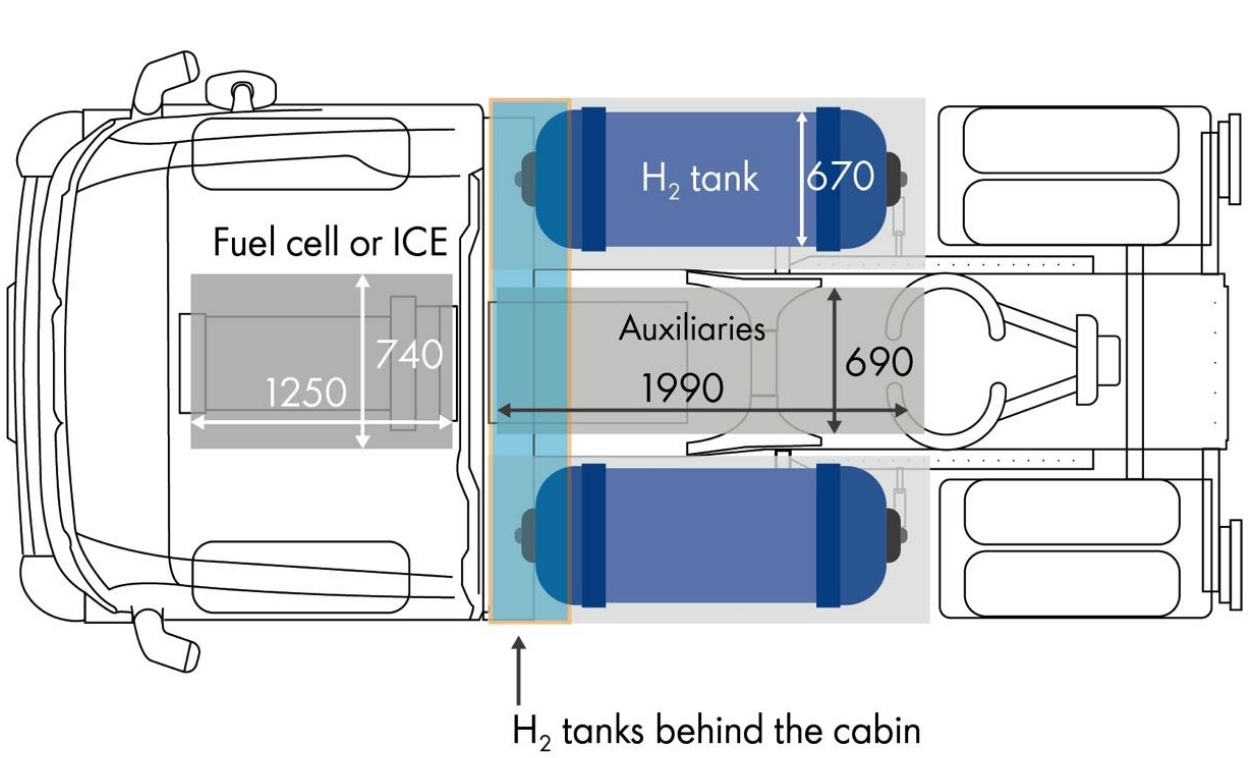
Sustainability Goals: Alternative Drives for commercial vehicles

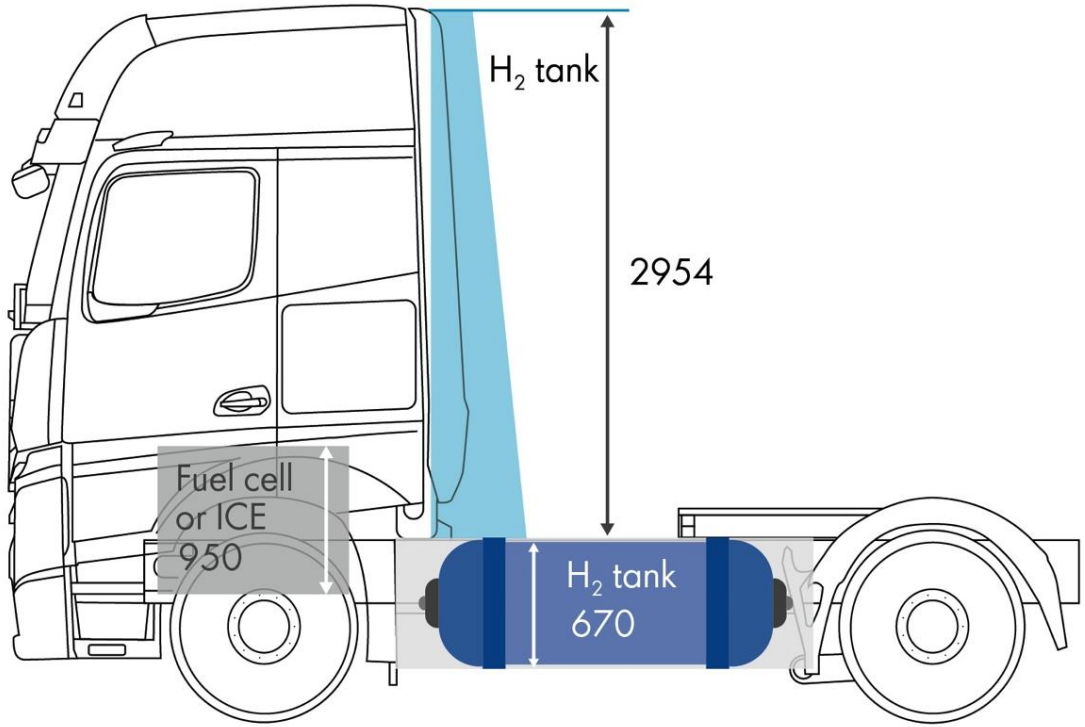


EFFICIENCY LOSSES OVER HYDROGEN SUPPLY CHAIN - DIFFERENT SCENARIOS



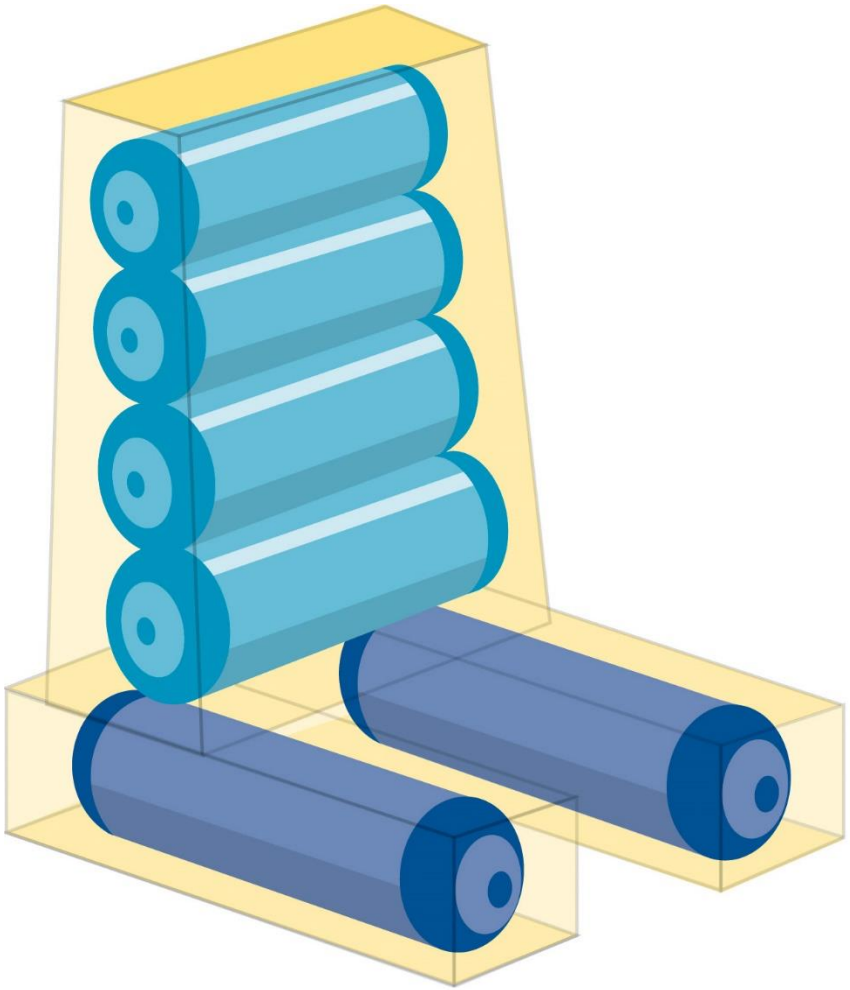
OPTIONS FOR HYDROGEN TANK SYSTEMS IN TRUCKS – A TYPICAL 4x2 LONG-HAUL HD TRUCK

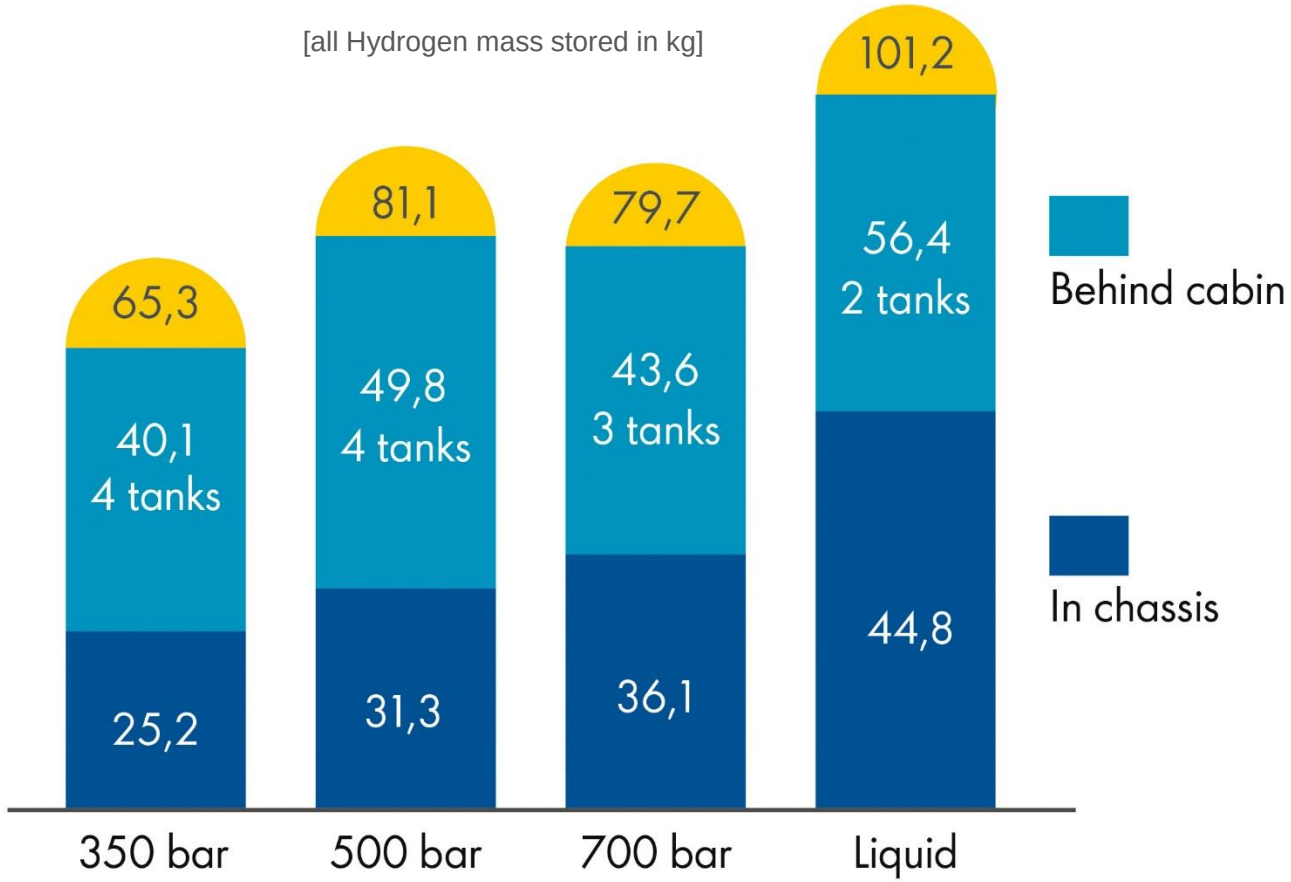




[all Dimension in mm]

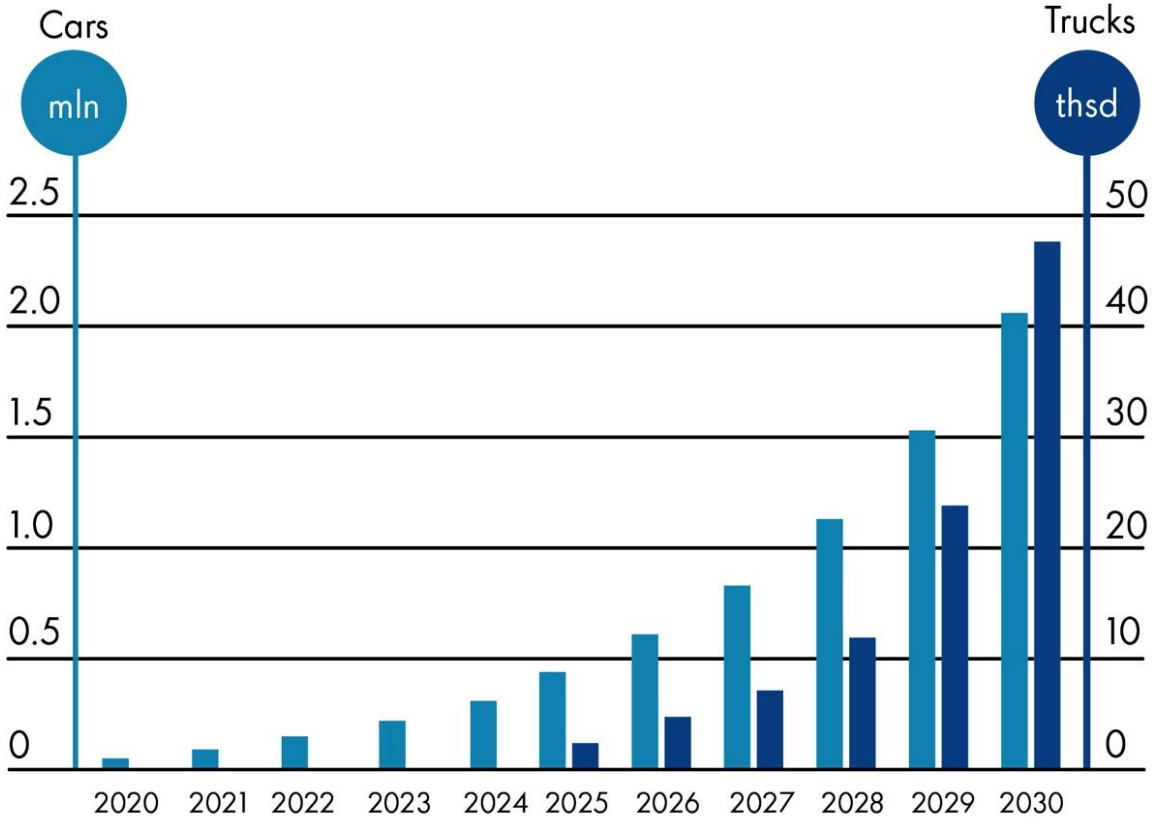
HEAVY DUTY TRUCK: TOTAL HYDROGEN STORAGE CAPACITY OPTIONS

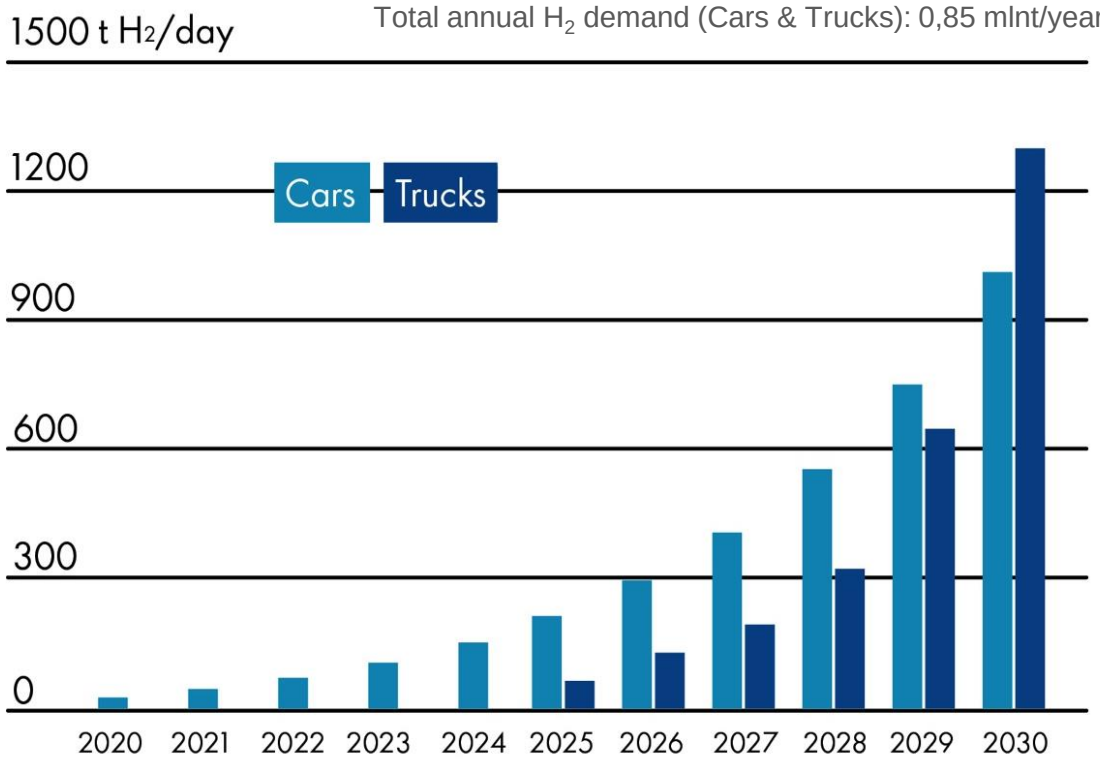




HYDROGEN TRANSPORT DEMAND – EU SCENARIO 2030

Fleet of Cars and Trucks in EU and resulting Hydrogen Demand





Scenario assumptions:

By 2030 2% of all new passenger cars entering EU market would be fueled with H_2 (FCEVs), 1.2kg/100km – 15.000km/a

By 2030 about 1/3 of all long-haul trucks (mostly semi-trailer trucks, some rigid trucks) sold in EU would be fueled with H_2, 8kg/100km – 125.000km/a

Ramping up from 2020 (Cars) & 2025 (Trucks)

Vision and Limitation of Electrification in Transport
Hydrogen a key Energy Carrier