

Market Activation and Strategies for Commercialisation Trucks Deployment

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DAIMLER

Market activation and strategies for commercialisation – Trucks deployment

Daimler Trucks

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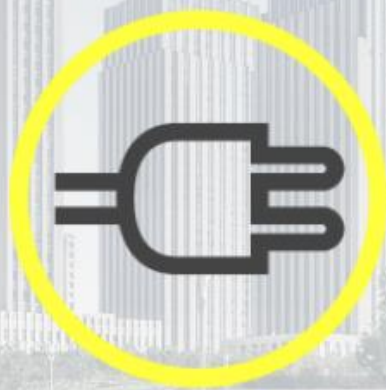
Daimler Trucks





OUR AMBITION:
ALL OF OUR NEW VEHICLES
IN EUROPE TO BE
CO₂-NEUTRAL BY 2039

ONLY TWO OPTIONS HELP US ACHIEVE OUR GOAL



BATTERY



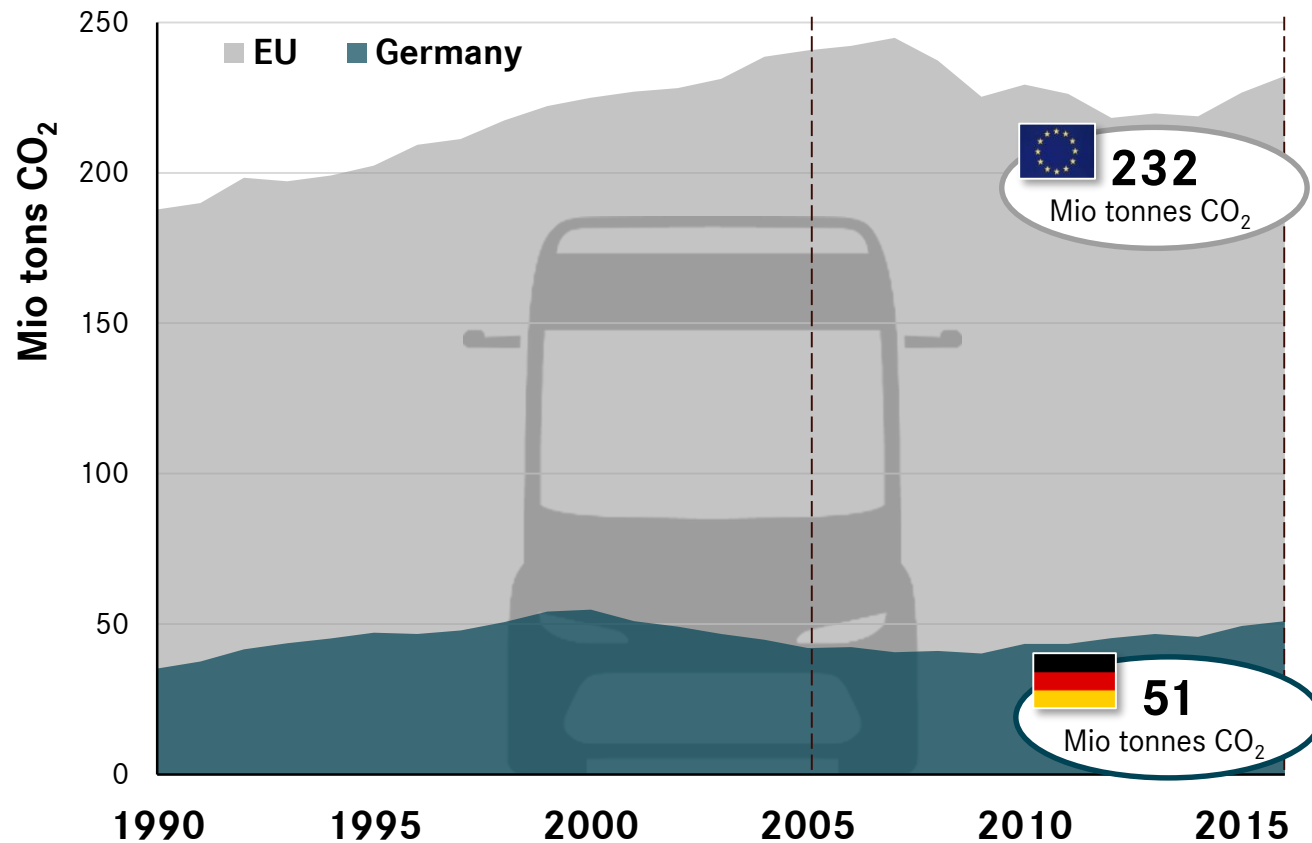
HYDROGEN



NATURAL GAS

Overview CO₂ emissions from HDVs in Germany und Europe and the recently finally decided CO₂ regulation for HDVs

CO₂ emissions from heavy duty commercial vehicles – a diverse picture throughout Europe

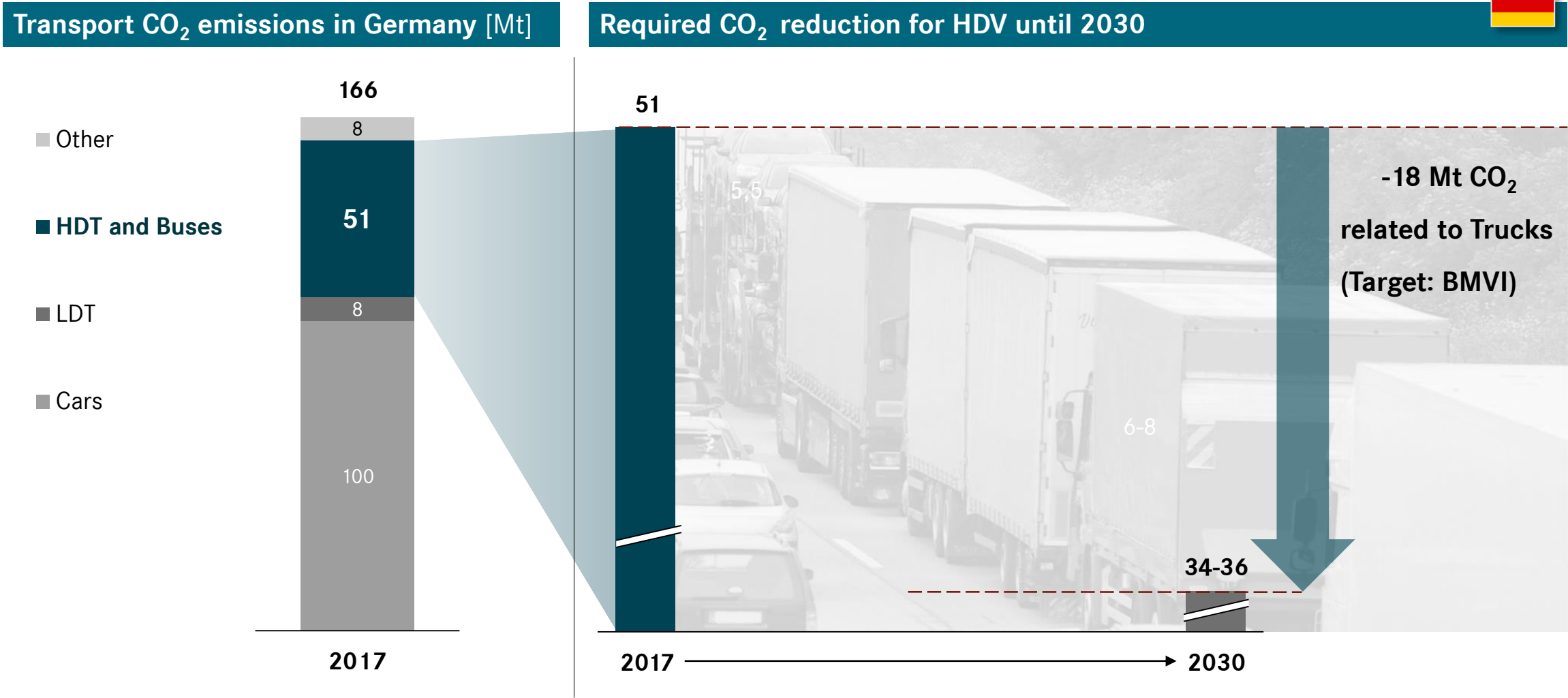


EU HDV CO₂ regulation

Reference year: 2019/2020

- Reduction targets (fleet level):
 - ➡ -15% (2025/26)
 - ➡ -30% (2030/31)
- ZEV benchmark system, counts above > 2% („Benchmark“)
- Extremely high penalties:
4,250 EUR per g CO₂/tkm per vehicle
(2030: 6,800 EUR)

Agreed reduction goals within Climate Protection Regulation 2030 - target on -18 Mio. tons CO₂ for road transportation until 2030

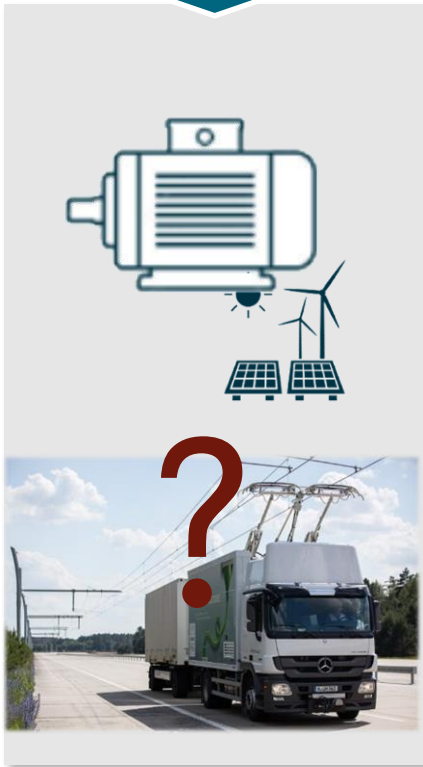


Source: UNFCCC GHG Inventory Data

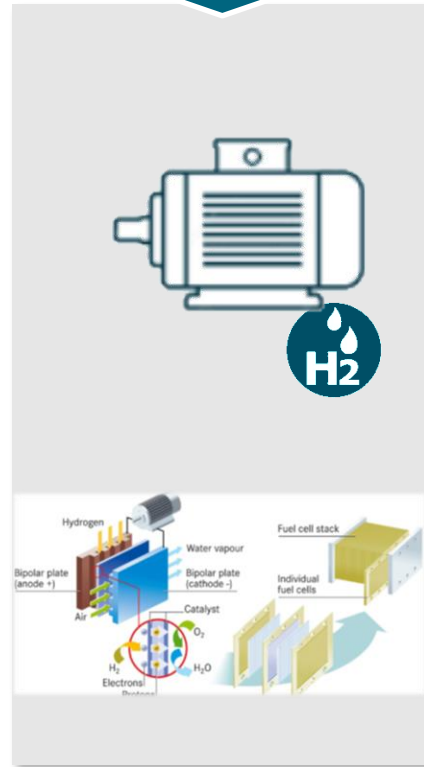
Source: DAI Simulation, assumption: 0.5%/a growth of road transportation mileage

We analyze all long-term options for long-haul low/zero emission trucks

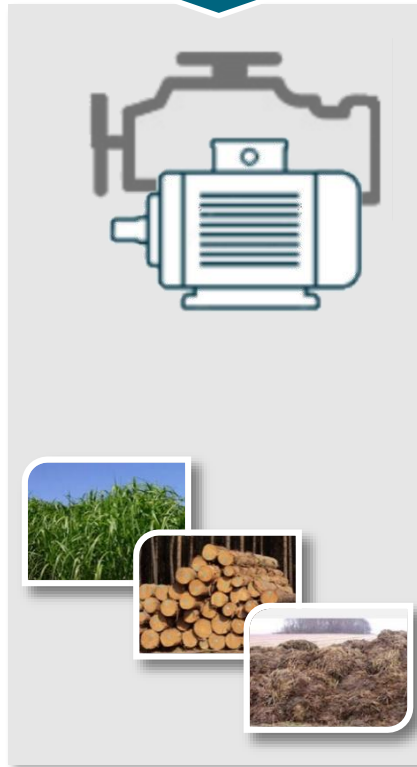
Overhead Catenary



Fuel Cell, H₂



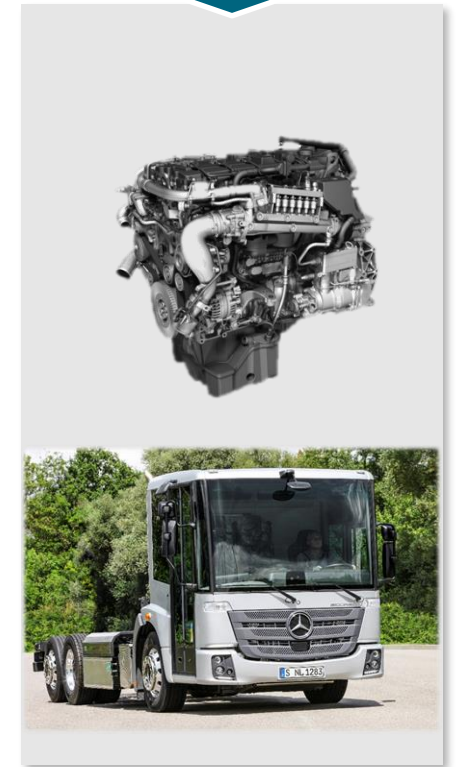
Biofuels/e-fuels



BEV



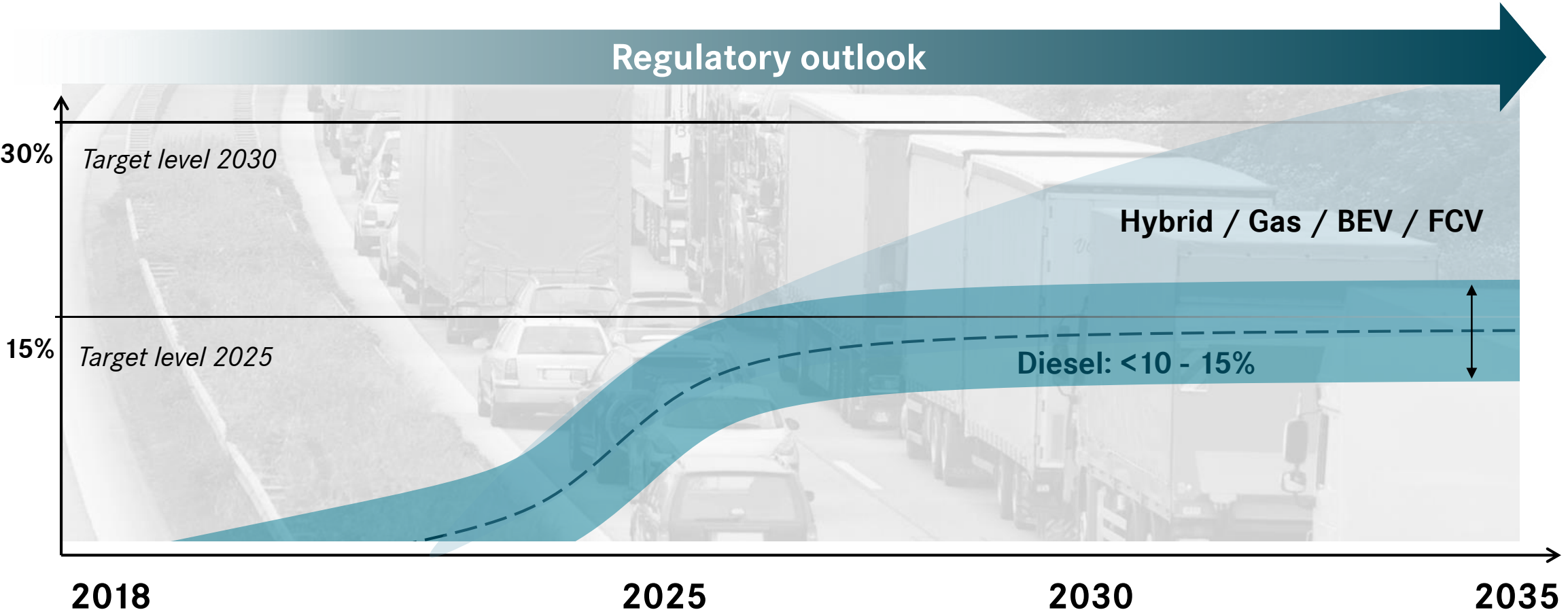
Natural Gas Vehicles



- What will be the best strategy with regard to customer needs, profit requirements and political wishes ?

Conventional measures are not sufficient to achieve 2030 target

Zero/Low Emission Technologies are required to reach challenging targets



Today: Our Gen1 Projects

Strong investment in emission free trucks & busses world-wide



Technical data

<i>Perm gross weight:</i>	18 t/25 t
<i>Vehicle application:</i>	heavy distribution traffic
<i>Drivetrain:</i>	electric
<i>Output:</i>	252kW (2x126kW)
<i>Chassis:</i>	4x2, 6x2 (current version)
<i>Operation range:</i>	Up to 200 km
<i>Torque:</i>	torque per drive motor 485 Nm (2 pieces)
<i>Batteries</i>	270 kWh installed battery capacity, thereof 240 kWh usable battery voltage 750 V



In series



**Mercedes-Benz
eCitaro**



**FUSO
eCanter**

Prototypes running



**Thomas Built Buses
Jouley**

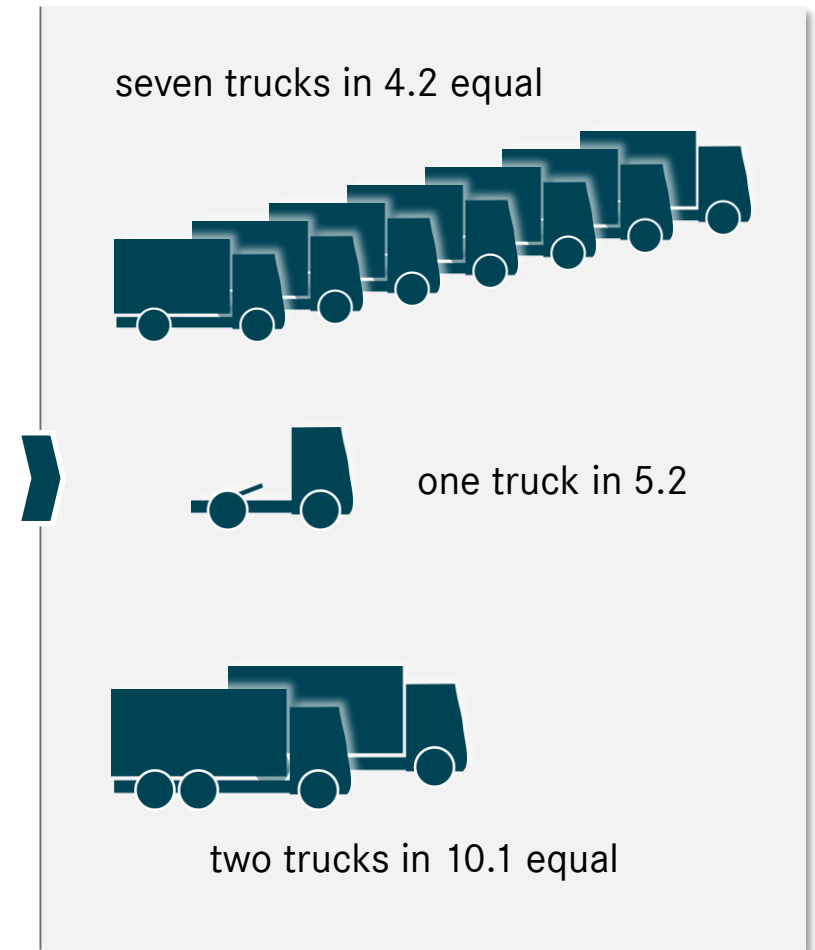


**Freightliner eCascadia
& eM2**

The EU CO₂ HDV regulation is reflecting the transport performance of various vehicle segments: Trucks in category 5.2 count the most

Determining OEM specific target value 2025 each sub-group

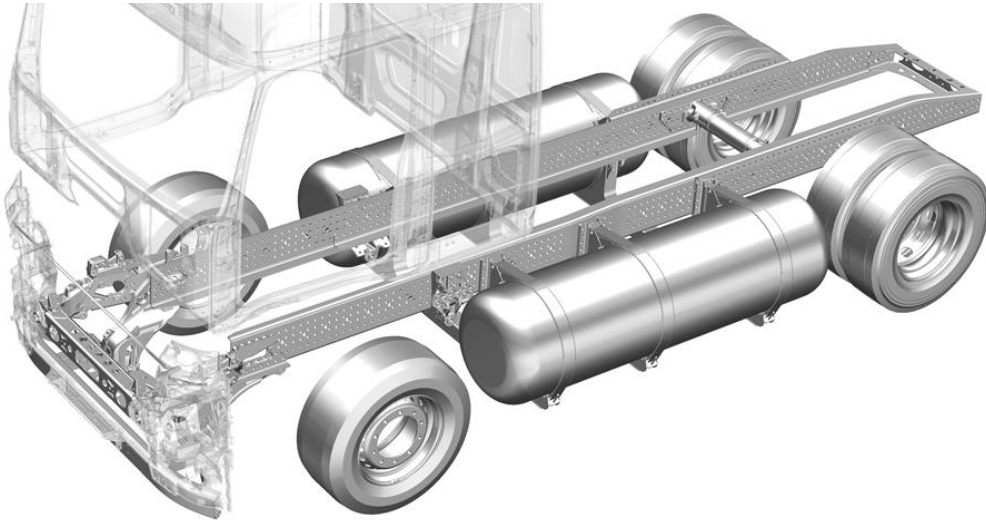
...	Vehicle sub group	Annual mileage [km]	Average payload [t]	MPW factor
5.1	4.1-UD	60.000	2,7	10%
5.2	4.2-RD	78.000	3,2	15%
9.1	4.3-LH	98.000	7,4	45%
...	5.1-RD	78.000	10,3	50%
	5.2-LH	116.000	13,8	100%
	9.1-RD	73.000	6,3	29%
	9.2-LH	108.000	13,4	90%
	10.1-RD	68.000	10,3	43%
	10.2-LH	107.000	13,8	92%



*MPW: Mileage/Payload-Factor normalized on group 5 LH

CO₂ regulation with focus on the Semi-tractor segment. Focus on ZEVs with an daily operation range >600km

Use of H₂ in HDV



H₂ options

CGH₂

- 35 MPa (buses)
- 70 Mpa (passenger vehicles)

LH₂

- Use of cryogenic liquid hydrogen

LOHC

- Use of LOHC in on-board H₂ storage system

Challenges

CGH₂

- Vehicle range
- High cost for H₂ storage system

LH₂

- Challenging handling of LH₂
- Storage design (boil-off)

LOHC

- On-board dehydrogenation necessary

- Hydrogen in HD trucks would be ideal to satisfy customer requirements