



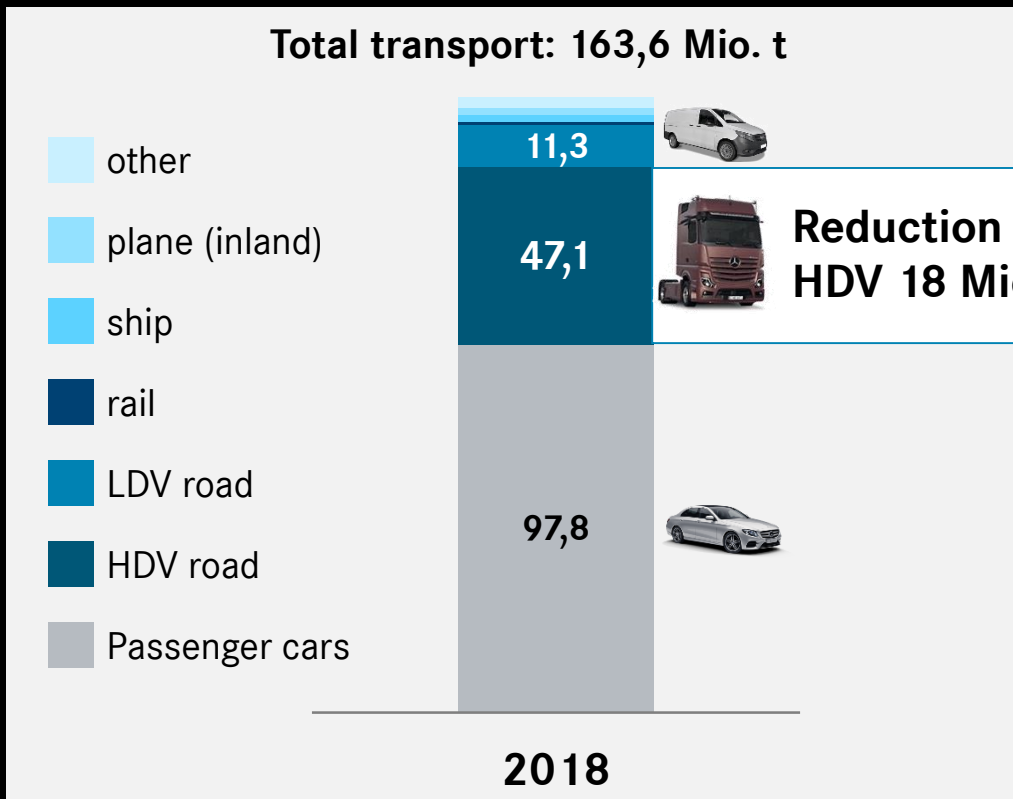
“Update on development for heavy-duty vehicles and clean fuels across Europe”

25. March 2021

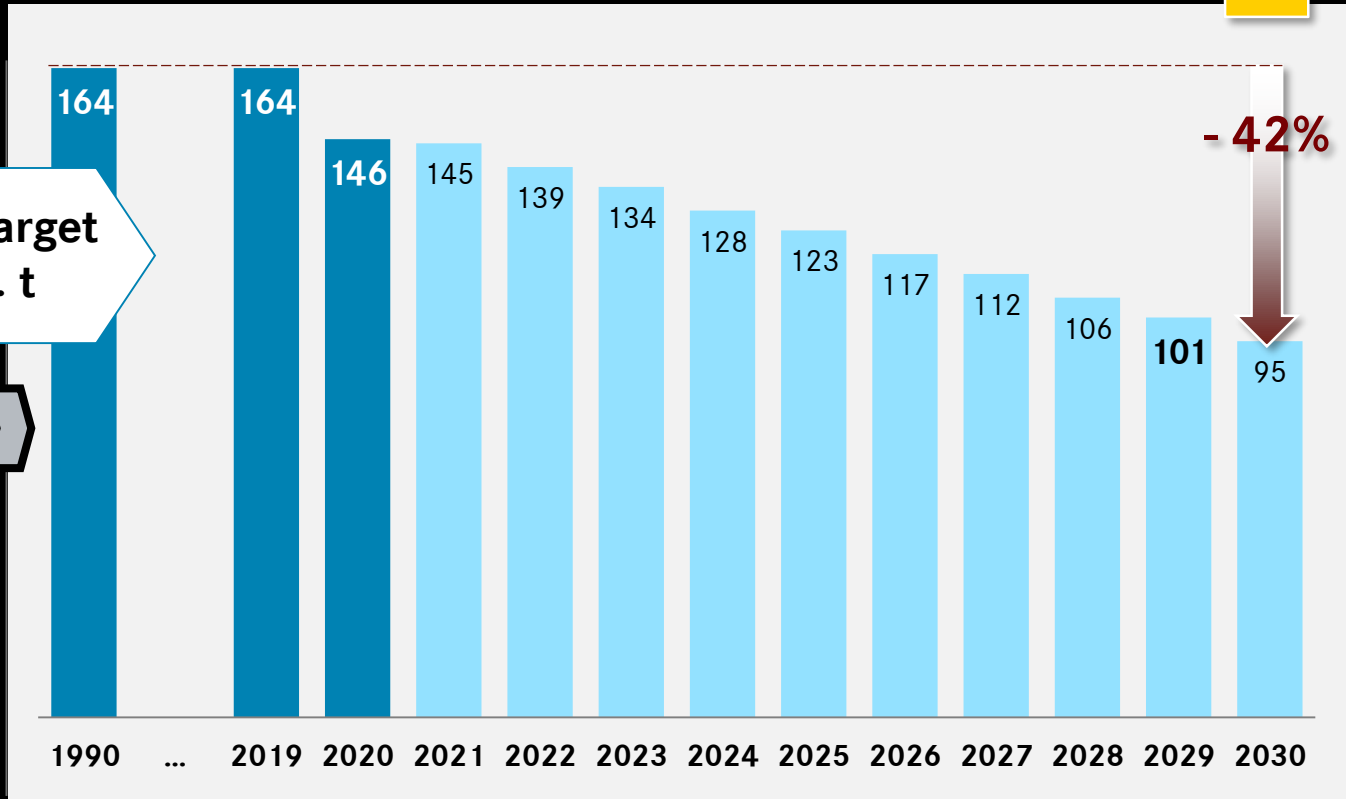


CO₂ emissions in transport sector - same level as 1990. Target: 42% reduction within 10 years .

GHG emissions traffic, Germany 2018



Ambitioned reduction targets for the next 10 years



- CO₂ fleet targets can only contribute with a small portion to overall reduction in the transport sector.
- Further national measures are needed. Renewable Fuels? Modal Shift? ZEV mandates? Driving Restrictions?

Reduction of CO₂ emissions: Comparison of technologies.

Trucks with gas engines:

ca. 5-7 % less CO₂ emissions in operation than conventional diesel trucks

2020: 1,600 vehicles promoted with ea 100.000 Euro*
→ Promoted volume: 160 Mio. Euro

* Procurement subsidies (BMVI)	12.000 €
Toll 2020-2023: 0,187€/km x 120.000km ¹⁾ x 4a	90.000 €
Energy tax (4a)	>10.000 €
Σ (2019-2023)	>100.000 €



Trucks with electric drivetrain:

No CO₂-Emissionen in operation already one E-truck reduces the equal amount of CO₂ emissions like 20 trucks with gas engines

80 E-trucks necessary for equal CO₂ saving

- ➔ Each E-truck could be promoted by 2 Mio. Euro to achieve equal CO₂ reduction
- ➔ Battery technology is far more cost efficient to reduce CO₂ emissions!

The road to CO₂ neutral transportation – Daimler Trucks and Buses: CO₂-neutral commercial vehicle fleet by 2039



Climate protection – our vision:
**We shape the future of CO₂-
neutral road transportation**



For our **new commercial vehicles**,
it is our ambition to become **tank-
to-wheel CO₂-neutral in 2039 in
the triad**



**By 2022, the product portfolio in
the core regions will also include
battery electric series production
vehicles**



We build on two CO₂ neutral technologies:
battery & fuel cell



This enables us
to cover all operation tasks
of our customers

Our E-portfolio at Daimler Trucks



- We will bring in a complete portfolio of CO₂ neutral vehicles to series within the next years
- We develop E-vehicles for all Triad markets – based on global platforms

World-wide, commercial vehicles of Daimler Truck have already covered a distance of more than 10 million kilometers in daily customer operation - locally CO₂ neutral.



Battery drivetrains already quite mature

- **FUSO eCanter in small series since 2017**
- **Mercedes-Benz eCitaro in series since 2018**
- **Mercedes-Benz eActros in customer testing since 2018, series start in 2021**

Concept truck Mercedes-Benz GenH2 Truck



- Stands for a next generation of trucks based on fuel cell and H₂
- Operation range: 1,000 km and more planned
- Will be in series as efficient as our customers expect
- Customer testing from 2023 on
- Series start in the second half of the decade

A truck – fully dedicated to heavy-duty long-haul transportation

Fuel-cell system	→ 2x150 kW
HV battery	→ 400 kW (time limited) 70 kWh
H ₂ storage	→ 80 kg (LH ₂)
Voltage level	→ 800V
eMotor power	→ 2 x 230 kW (cont.) 2 x 330 kW (peak)
eMotor torque	→ 2 x 1.577 Nm (cont.) 2 x 2.071 Nm (peak)



Performance:
300 kW FCS,
HV-battery,
eAxle w/ 2x230 kW (cont.)



CO₂ Impact:
Locally emission free



Refueling time:
~ 10 minutes

Customers have the choice whether battery or fuel cell is more suitable for their operation



eActros

- Mercedes-Benz eActros in customer tests since 2018
- Range: 200 km and more
- Series production in 2021



eActros LongHaul

- Long-distance variant of our distribution transport eActros
- Range of about 500 kilometers
- Series-production ready in 2024



Mercedes-Benz GenH2 Concept Truck

- Next generation of trucks based on fuel cells and hydrogen
- Range: 1,000 km and more
- Series production in the second half of this decade



Lighter load,
shorter distance

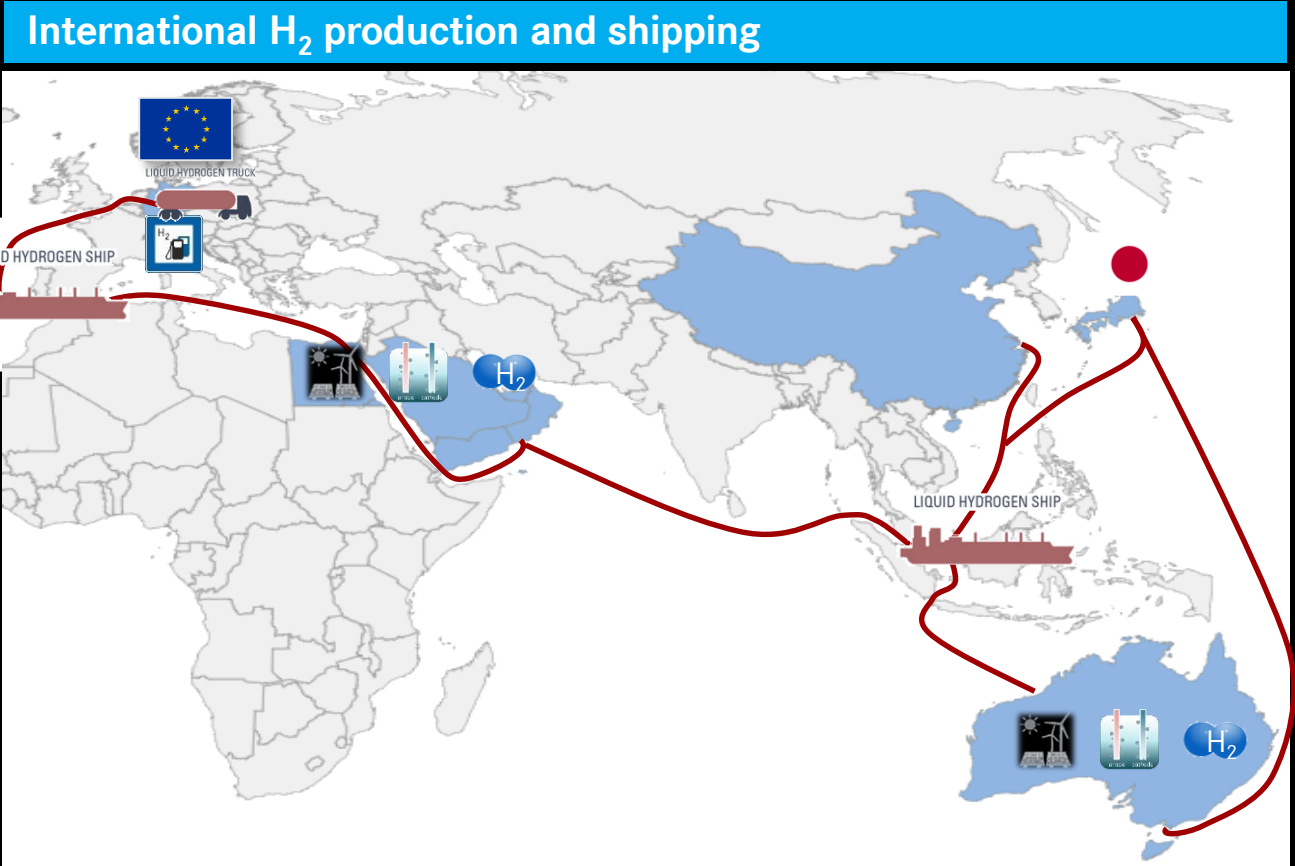
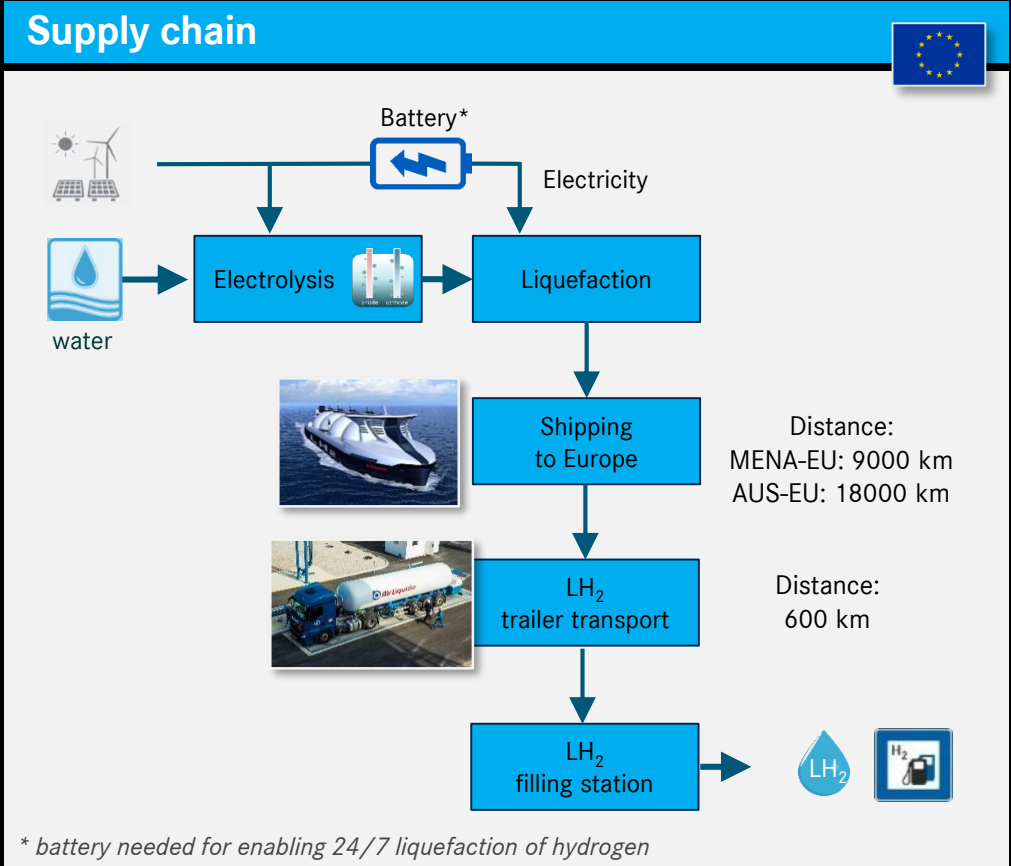
Heavier load,
longer distance



Shaping CO₂ neutral transport is a task for the society as a whole

- **We take responsibility as reliable technology partner with**
 - ✓ **early customer testing**
 - ✓ **first series vehicles**
 - ✓ **future E-portfolio**
- **Efficiency and infrastructure are needed besides the right vehicle technology**

H₂ could become the energy carrier of the future especially in the HDV sector, but international liquefaction chain key to reach low cost



- International sunbelt regions provide a fully renewable-based cost-efficient way to produce liquid hydrogen with abundant solar energy resources

Hydrogen supply chains – TCO focused analysis as major basis

Supply chain options for the transport of hydrogen

Potential production places

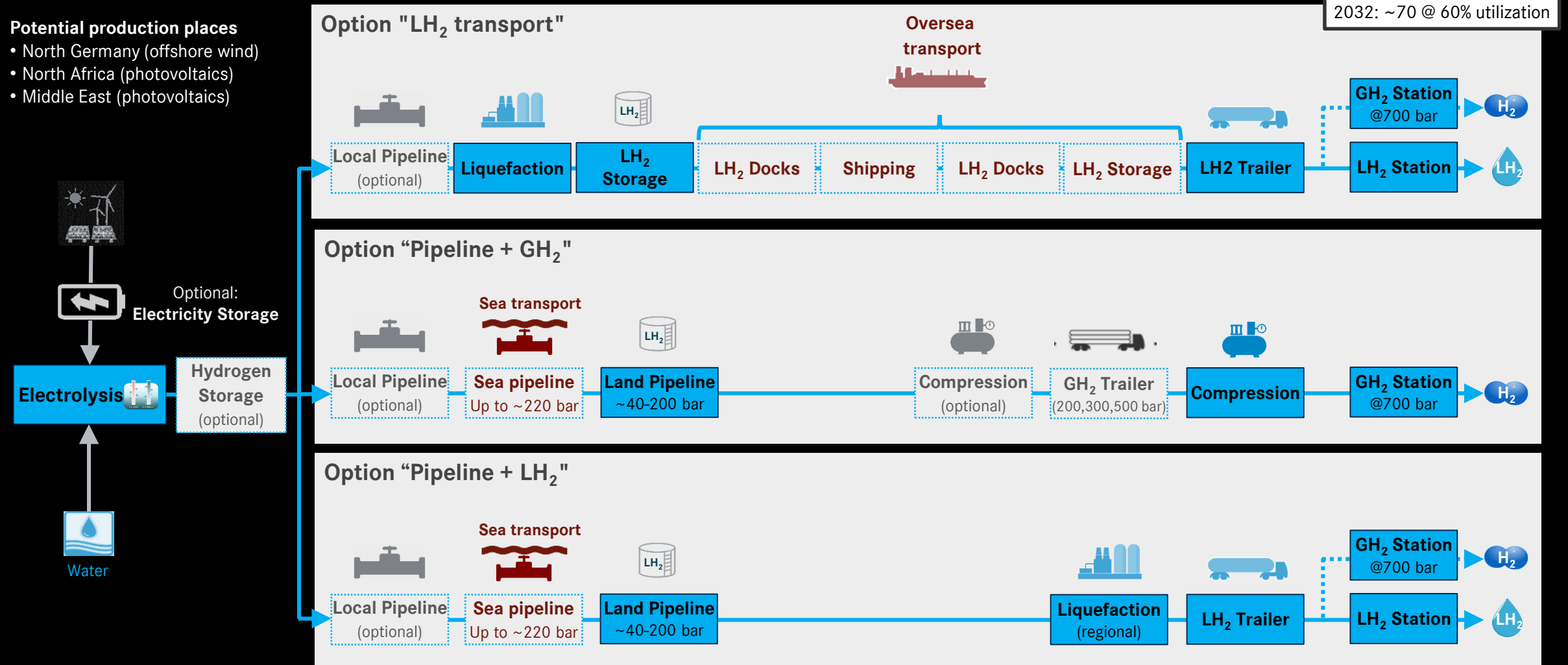
- North Germany (offshore wind)
- North Africa (photovoltaics)
- Middle East (photovoltaics)

Trucks per station per day

2025: ~12 @ 30% utilization









2030: ~20 @ 50% utilization

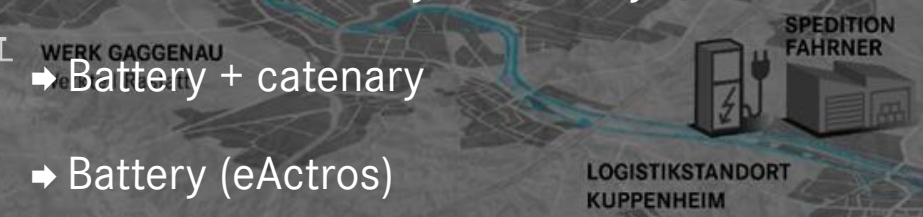
2032: ~70 @ 60% utilization



Overhead Catenary Concept evaluation from 2023: Pilot project eWayBW

Comparison of drivetrain concepts

-    → ICE + small battery + catenary
-   → **WERK GAGGENAU**
Battery + catenary
-  → Battery (eActros)
-   → Fuel cell



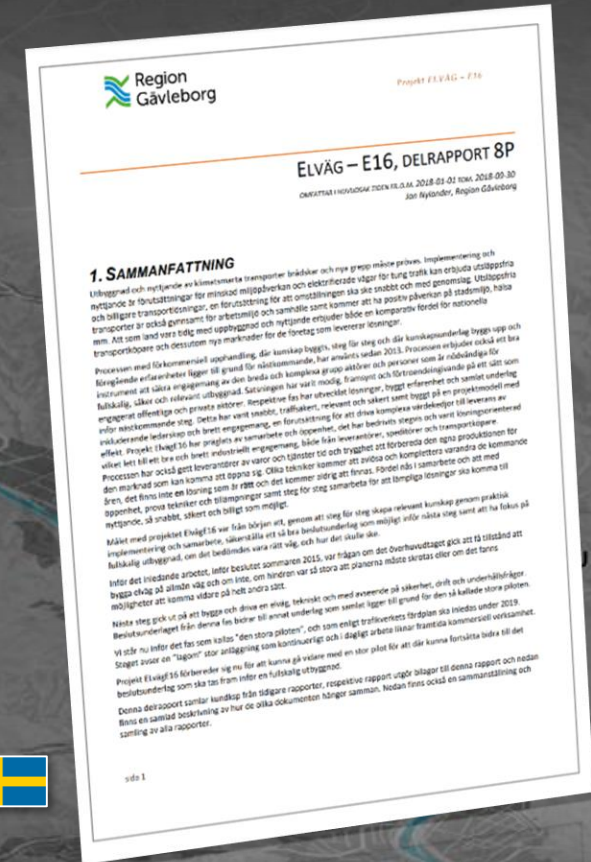
Germany 

So far promoted by the German government:
155 Mio. Euro for projects with catenary trucks



Sweden 

Catenary:
further development open
due to lacking cost efficiency*



* Source: https://www.trafikverket.se/globalassets/dokument/elvagsdokument/reg-gavle_e16_rapport.pdf

Further developed, close to series prototype of the eActros for Schmitt Logistics



- Delivery in summer 2021
- Operation range clearly above 200 kilometers