DECARBONIZING ROAD FREIGHT TRANSPORT

VEHICLES AND INFRASTRUCTURE AVAILABILITY

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ALICE

Webinar

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acea

WHO WE REPRESENT

ACEA MEMBERS

BMW GROUP

DAF

DAIMLER TRUCK

Ford

HONDA
The Power of Dreams

HYUNDAI

IVECO • GROUP

JAGUAR

LAND ROVER

GROUPE RENAULT

TOYOTA

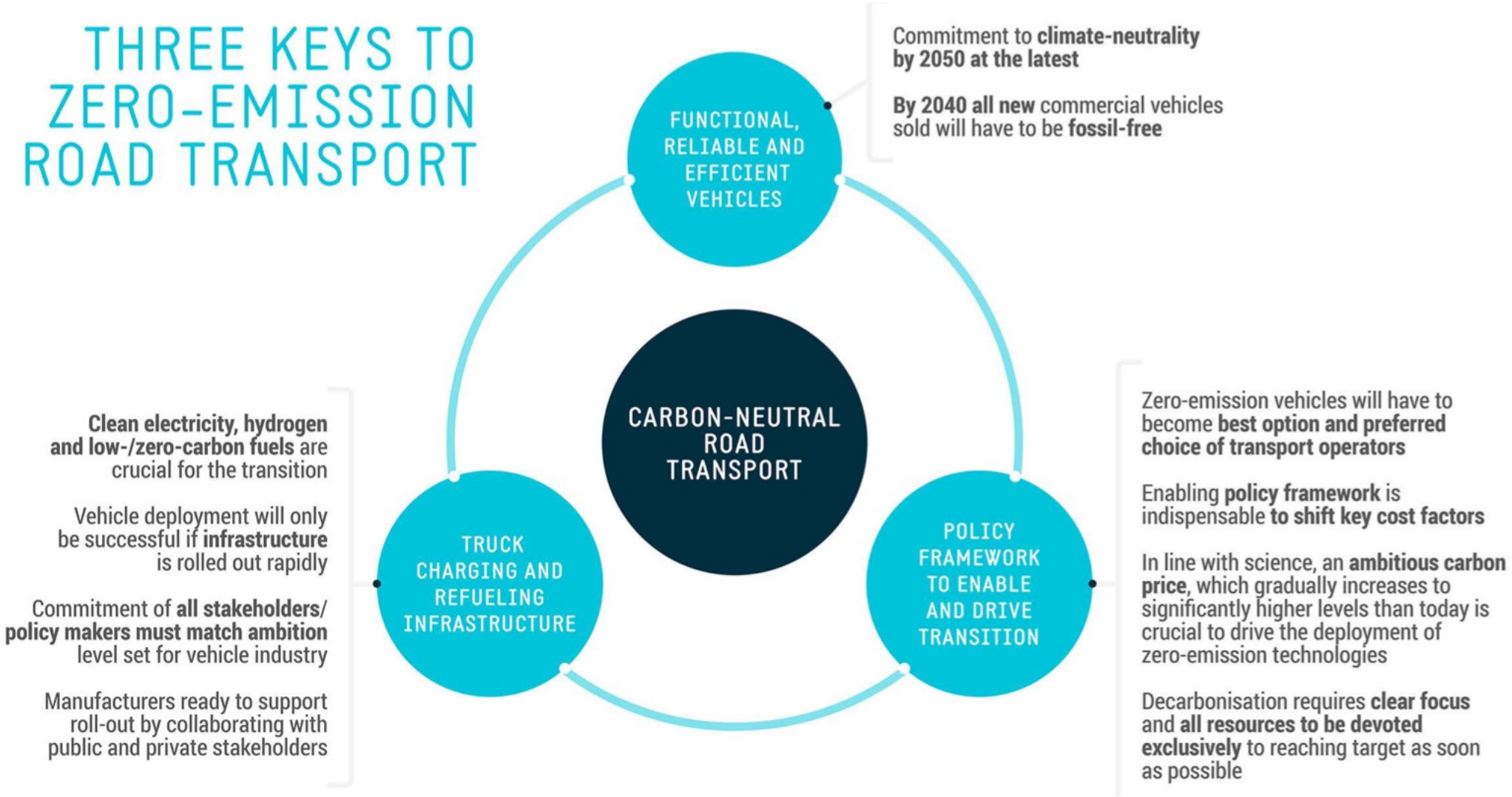
VOLKSWAGEN
AKTIENGESELLSCHAFT

VOLVO

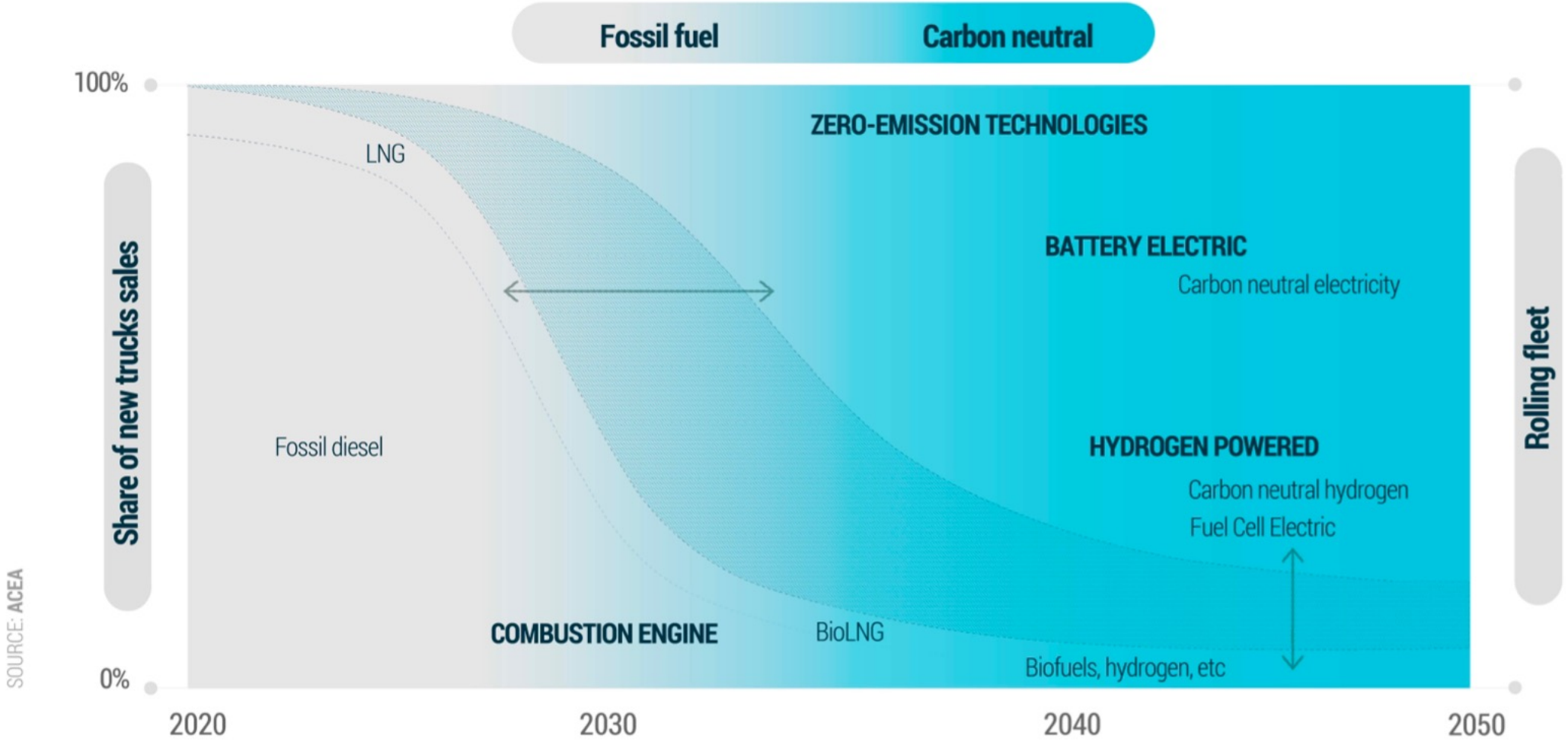
ABOUT THE EU AUTO INDUSTRY

- 13.0 million Europeans work in the automotive sector
- 11.5% of all manufacturing jobs in the EU
- €374.6 billion in tax revenue for European governments
- €79.5 billion trade surplus for the European Union
- Almost 8% of EU GDP generated by the auto industry
- €58.8 billion in R&D spending annually, 32% of EU total

DECARBONISING ROAD TRANSPORT



FOSSIL-FREE BY 2040



VEHICLES WILL NOT BE THE BOTTLENECK

Zero and low-emission heavy-duty vehicles (trucks)

Name		GVW (t)	GTW (t)*	Application	Range (km)**	Availability
Iveco						
Nikola Tre	BEV	40t		General Haulage	up to 550	2022
Nikola Tre	FCEV	40t		General Haulage	>800	2023
DAF						
LF Electric	BEV	19t.		Urban/National distribution	240-270km	Series production
CF Electric	BEV	20t	37t	Urban/National distribution	200-230km	Series production
CF Electric	BEV	29t	37t	Urban/ National distribution	200-230km	Series production
CF Hybrid	HEV	20t	40t	National distribution	50km electric	Field trial
XF Hydrogen	ICE H2	20t	44t	National distribution/ long-haul	600-800km	prototype
Daimler Truck						
eCanter	BEV	7.49t		Urban delivery	100 km	Series production since 2017
eActros 300	BEV	19t - 27t	40t	Regional delivery	300 km	Series production since 2021
eActros 400	BEV	27t		Regional delivery	400 km	Series production since 2021
eEconic 300	BEV	27t		Municipality / urban delivery	100 - 150 km	2022
eActros LongHaul	BEV		40t	Regional delivery/long haul	500 km	Series announced for 2024
GenH2	FCEV		40t	Long haul		Prototypes
GenH2	FCEV		40t	Long haul	up to 1,000 km	Series announced for 2027
MAN						
eTGM	BEV	26		Distribution	up to 180 km	Short Series
eTruck	BEV	tbd	tbd	Distribution	tbd	Series Production announced for 2024
Bayernflotte	FCEV	tbd	tbd	Long Haul	tbd	Customer demo fleet 2024
Scania						
	HEV		36	Long haul / distribution	15	Series Production
	PHEV		36	Distribution	60	Series Production
25L or 25P	BEV	19		Distribution	100	Series Production
25L or 25P	BEV		29	Distribution	250	Series Production
R- or S-	BEV	29	64	Regional	Up to 420	Sales start 2022
	BEV	29	64	Distribution/ Regional/ Long haul/ Construction	Up to 490	Series production 2024
Volvo Trucks						
FH Electric	BEV		44	Regional	300	Sales start 2021
FM Electric	BEV		44	Regional	380	Sales start 2021

Zero and low-emission heavy-duty vehicles (buses and coaches)

Name		GVW (t)	Application	Range (km)*	Availability
Iveco					
EWAY	BEV	20/30 t	City bus		Series production
CREALIS	Trolleybus	30 t	City bus BRT	unlimited	Series production
CROSSWAY LE	BEV	20 t	City bus		2023
CROSSWAY LE	BEV	20 t	Intercity bus		2023
Daimler Truck					
eCitaro Solo	BEV	20t	City Bus	200 - 320	Series production
eCitaro Artic.	BEV	20t	City Bus	180 - 220	Series production
eO500U	BEV		City Bus	up to 250	announced 2022
MAN					
Lion's City 12 E	BEV		City Bus	up to 350 km	Series Production
Lion's City 18 E	BEV		City Bus	up to 350 km	Series Production
Lion's City 12 E	BEV		City Bus	up to 350 km	Series Production
Scania					
Citywide	HEV	20t	City Bus		Series Production
Citywide	BEV		City Bus	250	Series Production
Volvo Trucks					
7900 Electric	BEV	19,5	City bus		
7900 Electric Articulated	BEV	30	City bus		
7900 S-Charge	HEV	19	City bus		
7901 S-Charge Articulated	HEV	29	City bus		
BZL Electric	BEV	19,5			

* Currently, there is no official methodology how the range of alternatively powered vehicles should be determined. Figures are based on the manufacturers' individual assessment.

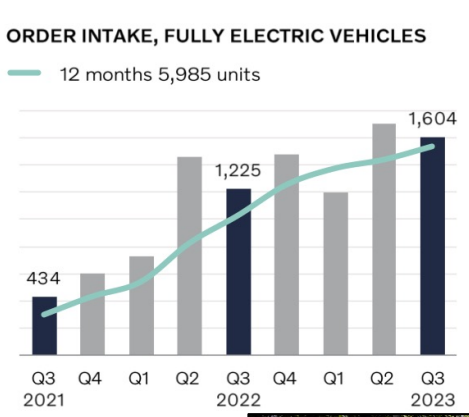
https://www.acea.auto/files/ACEA-position-paper-2022_HDV-CO2-Review.pdf

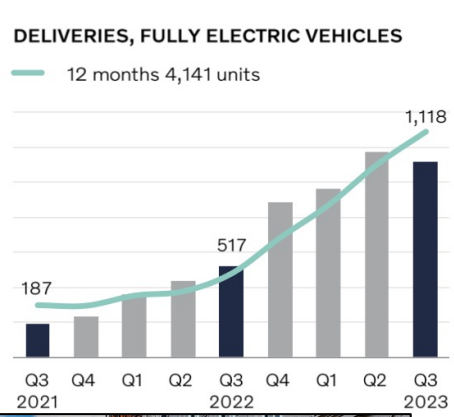
Sales start this year/ series production planned for end 2024

Mercedes-Benz Trucks celebrates world premiere of the battery electric long-haul truck eActros 600

Volvo Group

Electrification progress





Including Designwerk and Nova Bus

Scania brings new energy by offering next level BEVs

2023-10-18

Sales start first markets end of October ‘23

09-10-2023

MAN Truck & Bus launches e-offensive for trucks

Celebrating the ground-breaking ceremony for the large-scale production of batteries for electric commercial vehicles at the MAN Nuremberg plant (from left): Dr. Ingo Essel, Plant Manager MAN Nuremberg, Markus Wansch, Chairman of the Works Council MAN Nuremberg, Michael Kobriger, Executive Board Member for Production and Logistics MAN Truck & Bus SE, Marcus König, Mayor of the City of Nuremberg, Dr. Andrea Heilmaier, Economics and Science Officer City of Nuremberg, Barbara Fuchs, Economic Policy Spokesperson for the Green Party in the Bavarian State Parliament, Ulrich Zimmer, Site Manager MAN Nuremberg.

Ceremonial first drive of the new MAN eTruck in MAN's plant logistics (from left): Florian Hagemann, Managing Director LoadFox Transport Solutions GmbH, Dr Andrea Heilmaier, Economics and Science Officer City of Nuremberg, Marcus König, Lord Mayor City of Nuremberg, Ulrich Zimmer, Site Manager MAN Nuremberg, Michael Kobriger, Executive Board Member Production and Logistics MAN Truck & Bus SE, Barbara Fuchs, Economic Policy Spokesperson of the Green Party in the Bavarian State Parliament, and Markus Wansch, Works Council Chairman MAN Nuremberg.

Artic 4x2 configuration first in Q4/ 2023

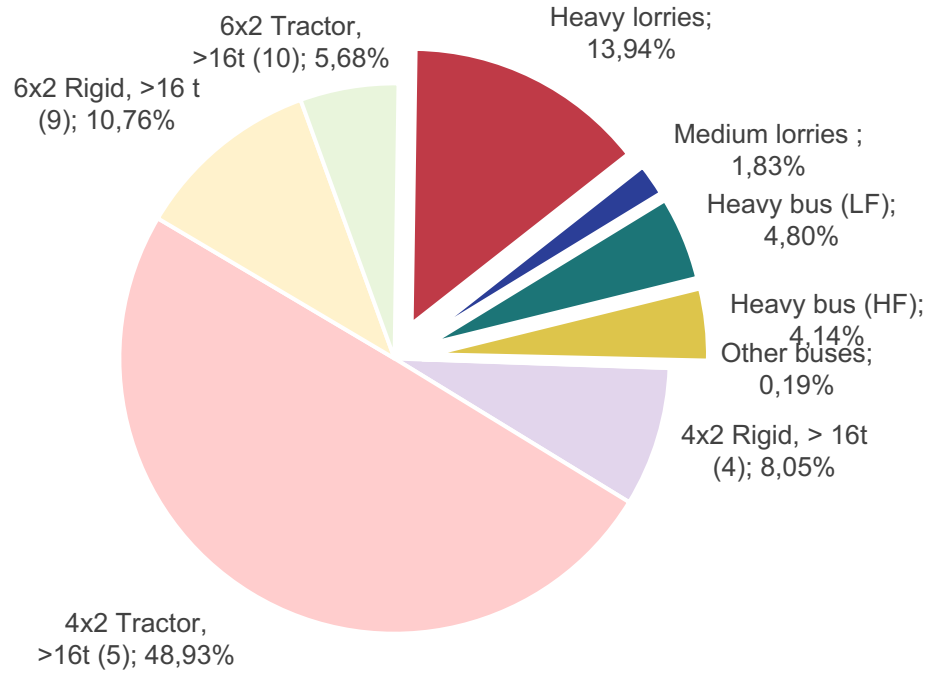
HDV CO2 TARGETS

COM Proposal (Feb 2023)

	Targets set in 2019	New targets proposed
2025	-15%	-15%
2030	**-30%***	**-45%***
2035	No	**-65%***
2035	no	**-90%***

* 2019/ 2020 baseline
** New vehicle segments 2025 baseline

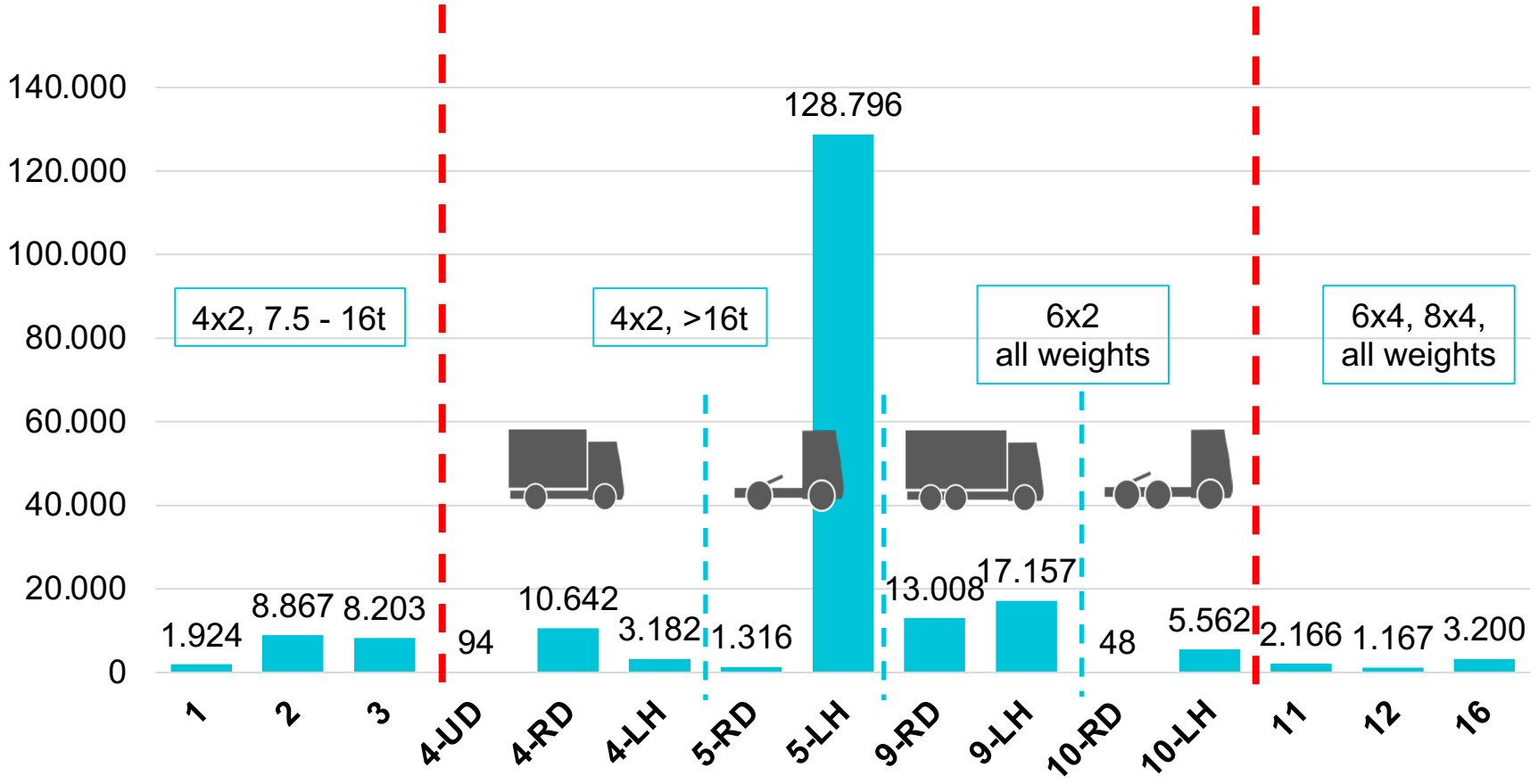
CO2 emission share per subgroup



>73% CO2 emissions already today
~25% CO2 emissions with new scope

NUMBER OF VEHICLES PER VECTO SUB-GROUP

BASELINE (07/2019 - 06/2020)



Sub-group	Baseline 2019/2022 [g CO2/ tkm]
4-UD	307,23
4-RD	197,16
4-LH	105,96
5-RD	84,00
5-LH	56,60
9-RD	110,98
9-LH	65,16
10-RD	83,26
10-LH	58,26

Industry baseline	**52,75 g/ tkm**

CO2 TARGETS: ZERO-EMISSION VEHICLES AND INFRASTRUCTURE NEEDED

CO2 targets			-30%	-40%	-50%
Zero-emission vehicles needed in operation on EU roads (minimum)			280,000	390,000	465,000
	Battery electric vehicles (BEVs)		230,000	320,000	380,000
	Fuel-cell electric vehicles (FCEVs)		50,000	70,000	85,000
Infrastructure					
	Charging points	Total	34,000–42,000	48,000–59,000	53,000–65,000
		of which MCS chargers (>800 kW)	20,000–25,000	28,000–35,000	31,000–39,000
	H2 refueling stations	6 tons/day, or	500	650	700
		2 tons/day	1,500	2,000	2,200

Source: https://www.acea.auto/fact/fact-sheet-co2-standards-for-heavy-duty-vehicles/

Proposed target (-45%) requires:

- More than 400,000 ZEV to be in operation within less than seven years (total EU fleet ~6.2 mln (>3.5t), ~2.0 – 2.5 mln heavy trucks)

- Close to 100,000 ZEV to be registered annually from 2030
  - ie >1/3 of all annual registrations across the Union

HDV INFRASTRUCTURE REQUIREMENTS

ASSUMPTIONS

- All BEV will require (mostly private) depot charging stations
- In addition – depending on mission their profiles – public/ semi-public charging stations will be needed:
  - Medium-duty vehicles will use public charging stations *every fifth day* of operation during the *daytime*
  - Heavy-duty vehicles (for regional delivery) will use public charging points *every second day* during *daytime*;
  - Heavy-duty vehicles (for long-haul) will charge *daily (daytime)* and *every fifth day (during the night)* at public charging stations.

HDV INFRASTRUCTURE

ASSUMPTIONS/ CALCULATIONS

- Avg charging power: 80%

		Charger	CP Power	Charge events CP/ day	Public/ Depot Charging	Occupancy time (hrs/ day)
3.5 – 6t	RD	CCS	150 kW	4	13%/ 87%	2.2
6t – 16t	RD	CCS	150 kW	4	10%/ 90%	3.3
>16t	RD	CCS	300 kW	5.5	27%/ 73%	4.5
>16t	LH	MCS	500 kW	5.5	34%/ 66%	3.0
>16t	LH	MCS	500 kW	5.5	34%/ 66%	3.0
>16t	LH	Overnight	75 kW	1	16%	

AFIR – OUTCOME HDV

	2025	2027	2030
Charging infrastructure			
TEN-T core	>15% length (120 km)	>50% length (120 km)	60 km (max)*
total power output	≥1,400 kW*	≥2,800 kW*	≥3,600 kW*
individual chargers	at least 1 x ≥350 kW	at least 2 x ≥350 kW	at least 2 x ≥350 kW
TEN-T comprehensive	-	-	100 km (max)
total power output	≥1,400 kW*	≥1,400 kW*	≥1,500 kW*
individual chargers	at least 1 x ≥350 kW	at least 1 x ≥350 kW	at least 1 x ≥350 kW
Truck Parking (SSTPA)	-	at least 2 x ≥100 kW	at least 4 x ≥100 kW
Urban nodes	at least 900 kW (@ ≥150 kW)	-	at least 1,800 kW (@ ≥150 kW)
Hydrogen refueling stations (HRS)			
TEN-T core	-	-	200 km (max), 700 bar @ ≥ 1t/d capacity
Urban nodes	-	-	at least 1 in each HRS

* Derogations apply: on TEN-T roads with <2,000 HDVs per day on an annual average, the total power output may be reduced by up to 50%. On TEN-T core network roads with <800 HDVs per day the maximum distance between recharging pools may be increased to up to 100 km.

CONCLUSION

- ZEV offering grows quickly
  - ICE will not disappear
  - Decarbonising all energy carriers (electricity, H2, fuels) is crucial
- Market adoption largely depends on additional factors outside the OEM's control
  - Infrastructure (public and private)
  - Cost parity (TCO)
- Regulatory framework must be (a lot more) coherent on European, national and regional/ local level

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REPRESENTING EUROPE'S 15 MAJOR CAR, VAN, TRUCK AND BUS MANUFACTURERS

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