FREIGHT

TRANSPORT & ENVIRONMENT

Jeppe Juul

Our focus

Cars and vans

Freight and climate

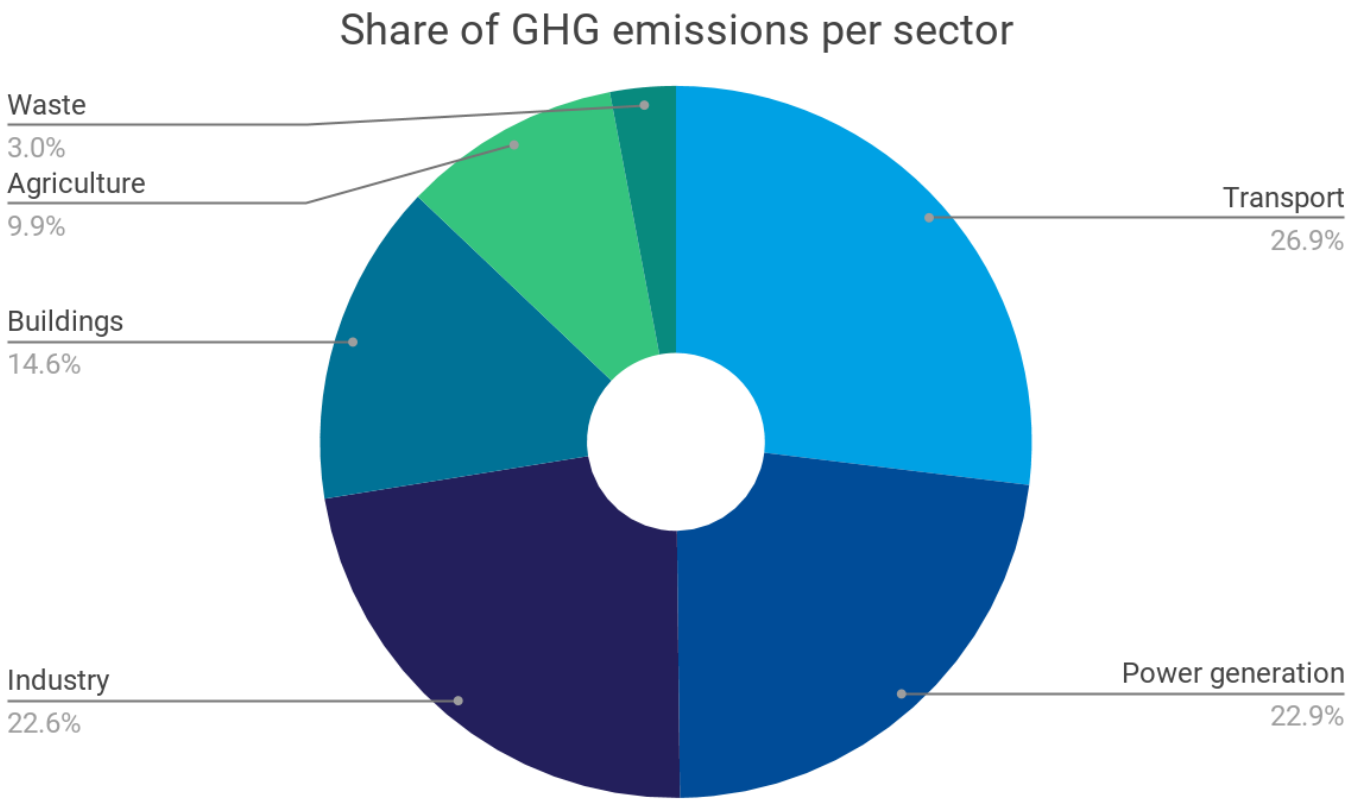
Shipping and aviation

Energy

Trade

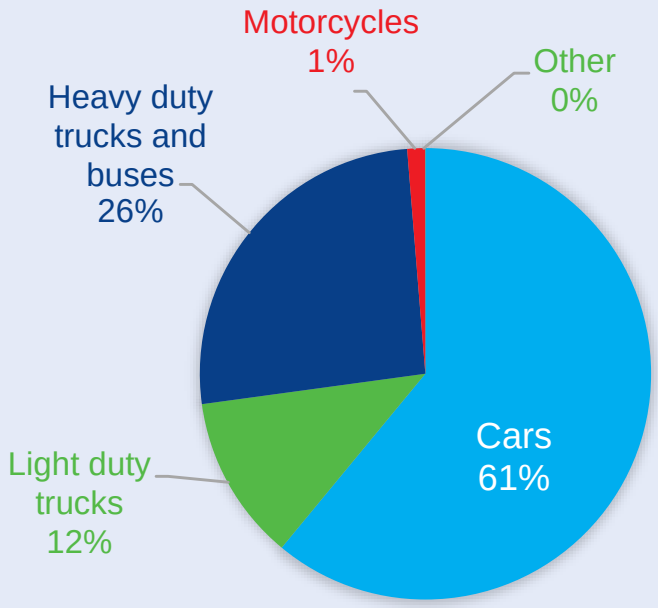
Our targets

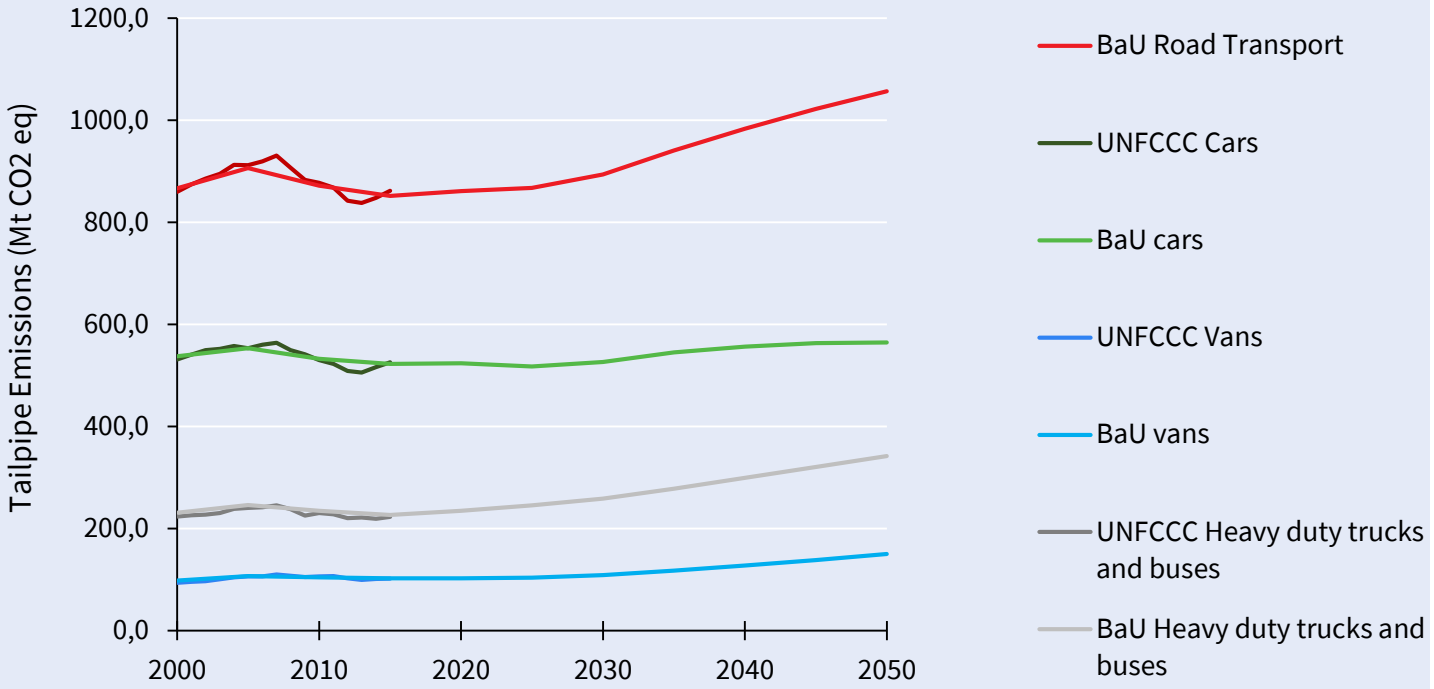
Transport: EU's biggest climate problem



INTRO

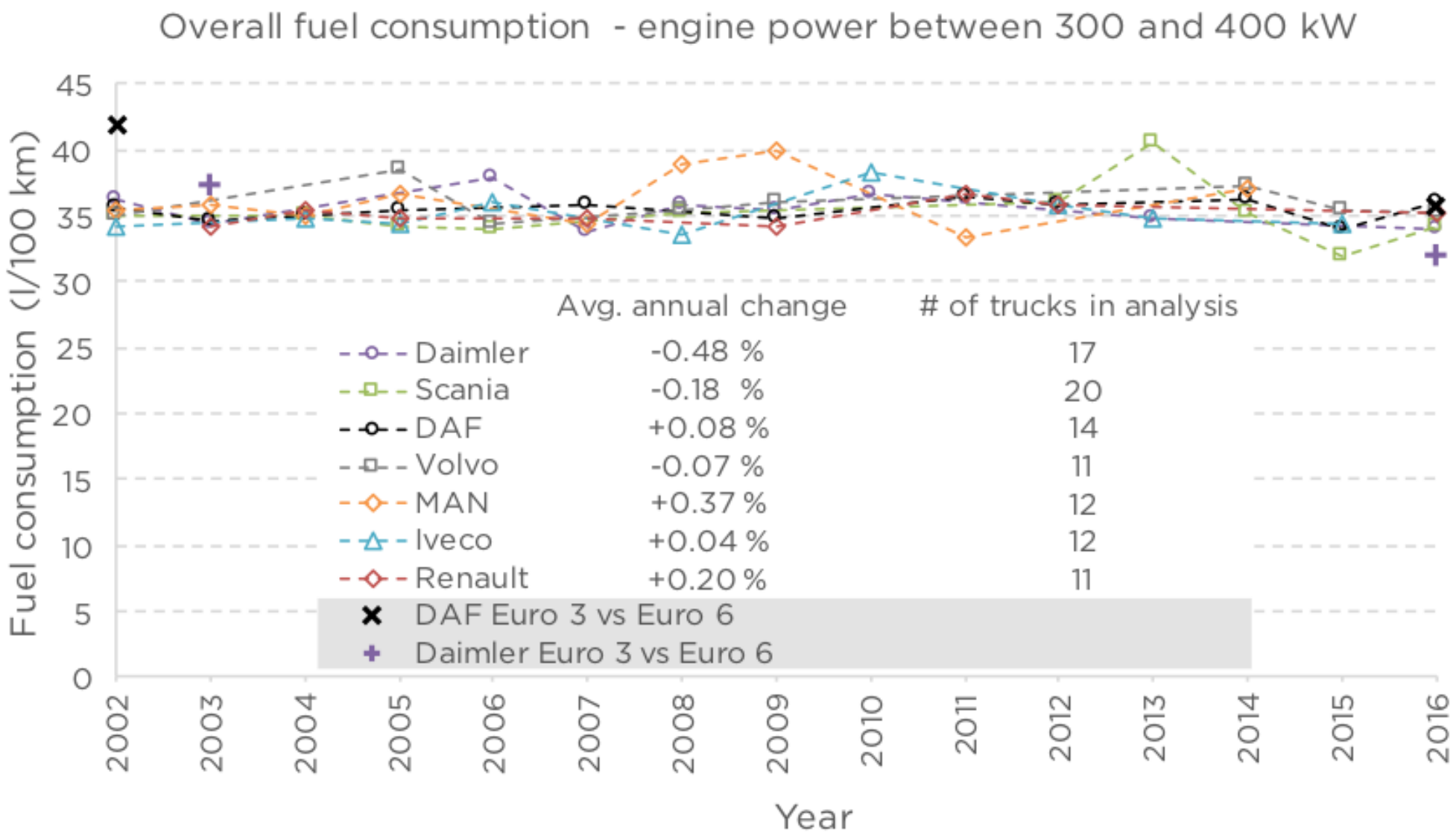
THE EU ROAD TRANSPORT IN 2015





- **5% of vehicles on the road**
- **Not regulated so far <=> cars and vans**
- **We have numbers for each Member State**

Average vehicles did not improve



May 2018: First fuel efficiency/CO2 standards in eu history

WHICH TRUCKS WILL BE REGULATED

Category 4
6% of CO2 emissions (all weights)

Category 5
48% of CO2 emissions (+16t)

Category 9
8% of CO2 emissions (all weights)

Category 10
18% of CO2 emissions (+16t)

1. 2025 CO2 TARGET OF AT LEAST -20% EFFECTIVE IMPROVEMENTS

B. STRONG BUSINESS SUPPORT

- - 24% target for 2025 on a 2015 baseline (i.e. 21% 2019 baseline)
- Ambitious and mandatory sales target for zero emission trucks

Dear Mr. Jean Claude Juncker, President of the European Commission

CC:

First Vice-President of the European Commission, Frans Timmermans

Vice-Presidents Maroš Šefčovič, Jyrki Katainen

Commissioners Miguel Arias Cañete, Violeta Bulc, Elżbieta Bieńkowska, Karmenu Vella, Carlos Moedas, Margrethe Vestager

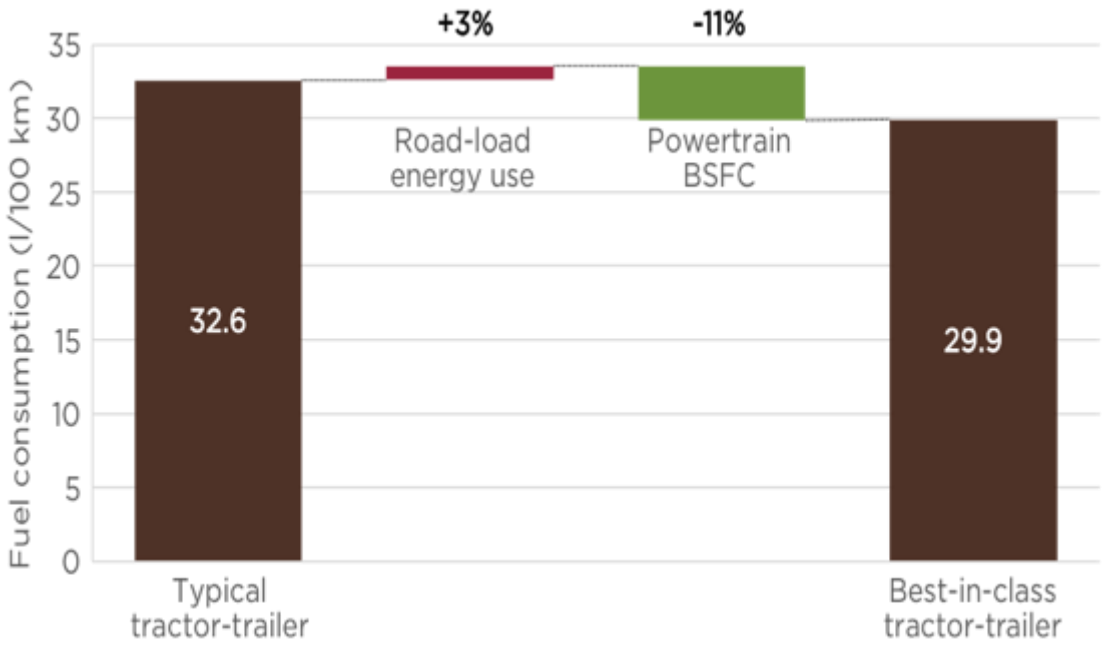
17 April 2018

During your State of the Union in September last year, you stated that Europe shall 'remain the global leader in the fight against climate change'[1]. Meeting the goals and promises of the 2015 Paris Climate Agreement of limiting global warming to well below 2 degrees will be essential in this regard. Therefore the EU has set itself a target of reducing its greenhouse gas emissions by 40% by 2030.

Europe's climate emissions cannot be tackled without addressing transport. The latest data from the European Environment Agency reconfirms that transport is Europe's biggest climate problem. Transport emissions now represent 27% of the EU's total and they have risen for the third year running. Within transport, road freight emissions are on the rise. Heavy duty vehicles already account for one quarter of road transport CO_2 emissions and this is expected to increase by 14% by 2030 in a business as usual scenario[2]. In other words, if Europe wants to deliver on its Paris Commitments, and own 2030 targets, transport and truck emissions need to be curbed urgently.

As a sector we already take many valuable initia-

MARKET NOT DELIVERING - WHAT'S ALREADY POSSIBLE TODAY



- 9% difference best vs average trucks today
- Already more what ACEA is offering (7% by 2025)

TU Graz testing commissioned by the ICCT

lots of potential to improve diesel trucks

Daimler fuel efficiency run (2016) - 20% fuel

Volvo concept truck (2017) - 30% fuel

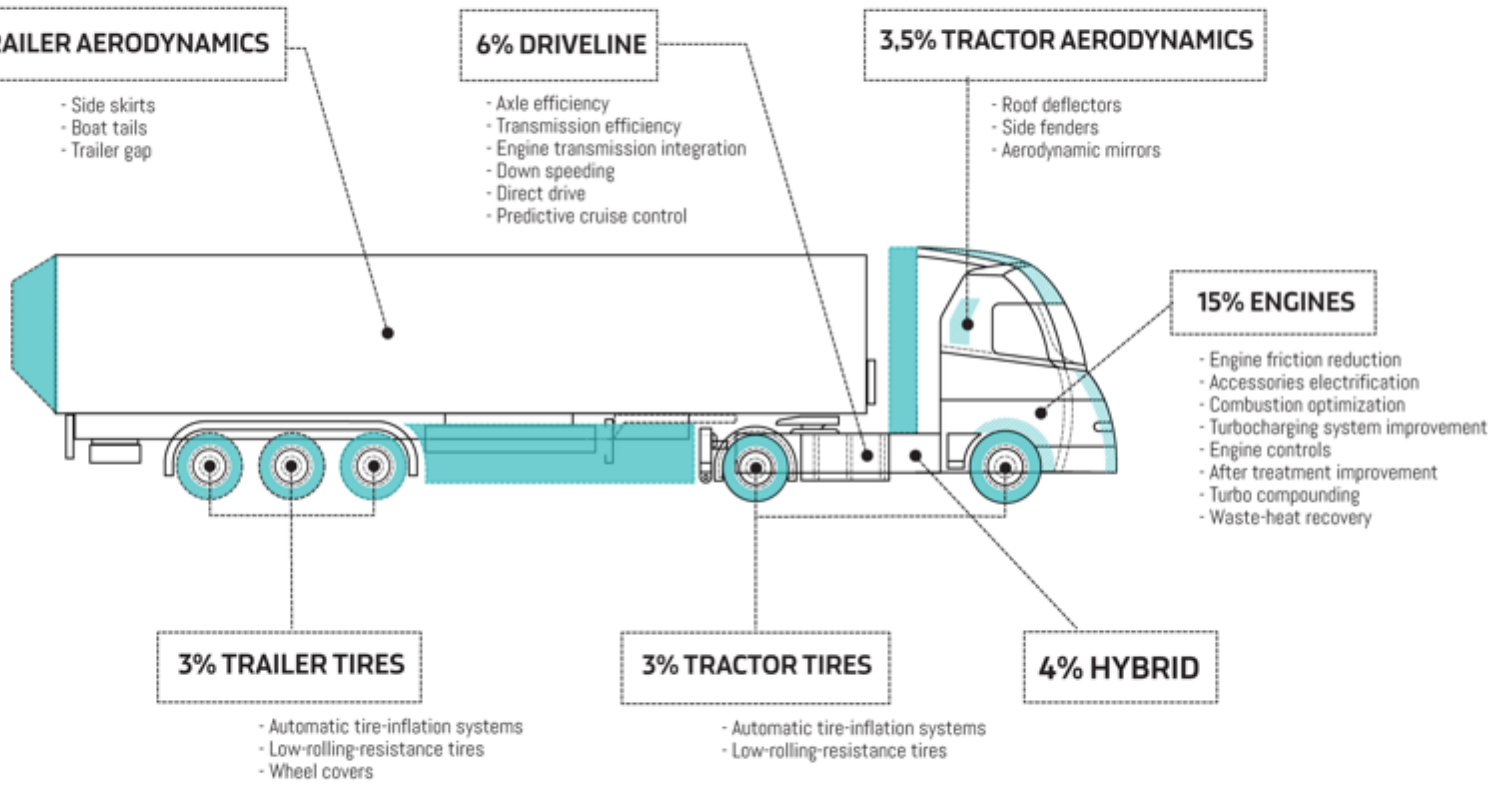
C. TECHNOLOGIES ARE AVAILABLE

- EC IA: ‘Based on the analysis of the technologies and fuel savings potentials, it appears that the full deployment into the fleet of the **first two types of technologies** listed in Table 1 would bring about 15 to 20% CO2 emission savings in 2025 compared to 2019.’
- EC should introduce a transparent **CO2 trading system** to reward early movers!

Technology types	Description	Market penetration
1. Readily available technologies	Technologies readily available that could be implemented across the whole fleet. Examples: low rolling resistance tyres, better lubricants, certain aerodynamic improvements or efficiency improvements of the engine and the pollutant after-treatment systems.	Current market penetration is limited despite net savings
2. Available technologies, which are not implemented due to legal restrictions	Technologies currently available from a technical perspective, but not implemented due to legal restrictions Examples: elongated cabins, rear-view cameras instead of mirrors.	Currently no market penetration. Implementation expected as of early 2020s.

2030 OUTLOOK – 40% efficiency (ICCT research)

POTENTIAL STRATEGIES FOR CURTAILING 40% GREENHOUSE GASES



THESE IMPROVEMENTS SAVE 11,88€ & 13,2 LITRES PER 100 KILOMETERS.

(* BASED ON ICCT PRELIMINARY RESULTS)

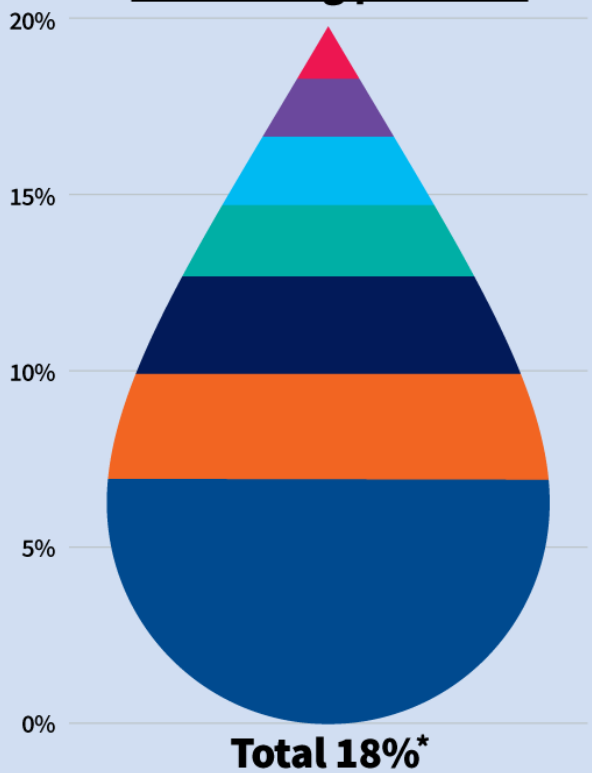
WHICH TECHNOLOGIES

Table 2: Cumulative fuel savings during first use (5 years)[20] and manufacturing costs of a series of readily available technologies, listed under the first technology type in Table 1, for reducing CO_2 emissions from HDV, and their implementation rate in 2016

Technologies	Fuel savings	Technology costs		Net savings		Payback period in years	Implementation rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Improved lubricants	€1,910	€23	*0.02%*	€1,887	*1.1%*	0.1	2%
Improved SCR and optimised SCR heating methods	€3,979	€105	*0.10%*	€3,874	*2.2%*	0.1	10%
Aerodynamic mud flaps	€2,880	€135	*0.12%*	€2,745	*1.6%*	0.2	0%
Tire pressure monitoring systems (TPMS) on truck	€459	€149	*0.14%*	€310	*0.2%*	1.3	20%
Closable front grille	€2,531	€150	*0.14%*	€2,381	*1.3%*	0.2	25%
Cooling fan	€825	€180	*0.16%*	€645	*0.4%*	0.9	31%
Friction reduction + improved water and oil pumps	€3,148	€200	*0.18%*	€2,948	*1.7%*	0.3	5%
Air compressor	€2,728	€250	*0.23%*	€2,478	*1.4%*	0.4	2%
Reduced losses (lubricants, design)	€2,978	€250	*0.23%*	€2,728	*1.5%*	0.3	50%

Tractor-trailers: market adoption trends

Fuel saving potential

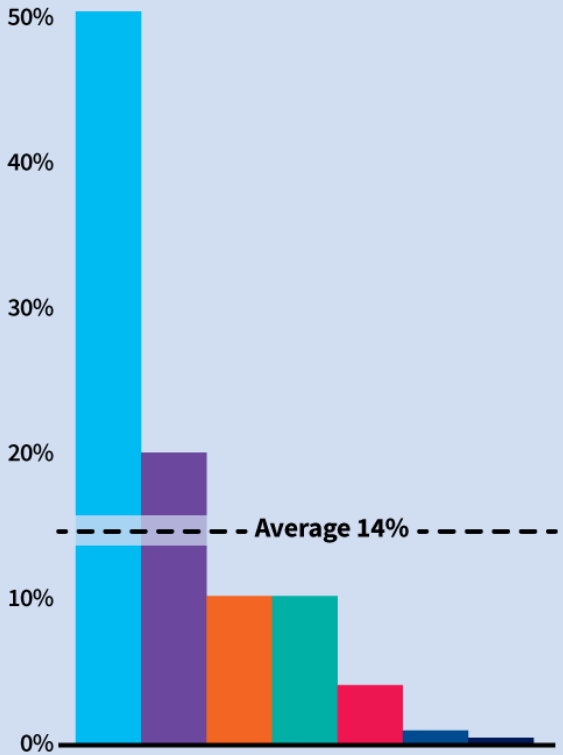


Total 18%*

- 1% TPMS
- 1.5% Predictive cruise control
- 1.9% Adaptive cruise control
- 2% Trailer side skirts
- 2.8% Turbocompounding
- 3% High efficiency selective catalytic reduction
- 7% Low rolling resistance tires

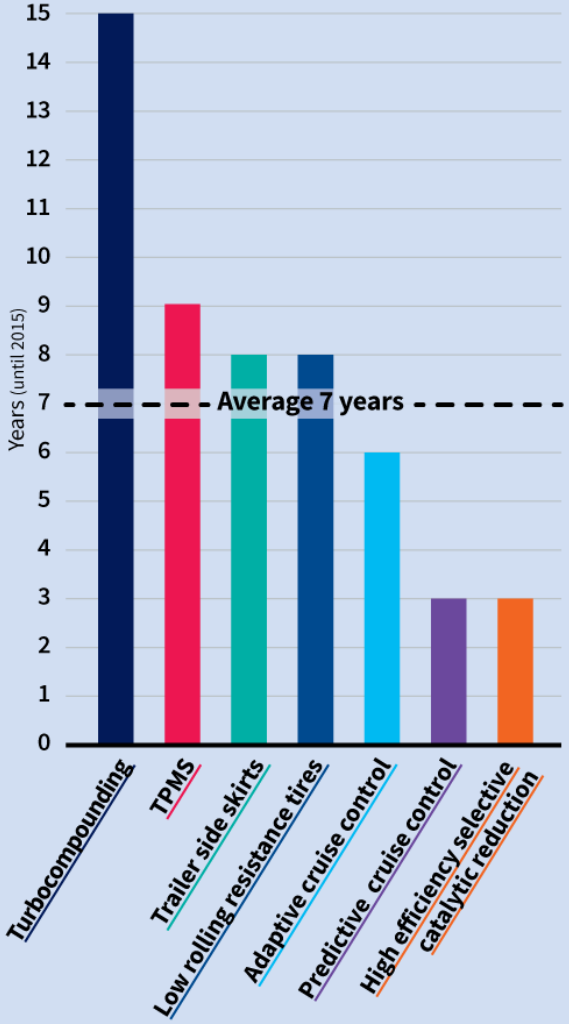
* The total savings of the respective technologies is not the sum of the different innovations but rather the sum of the different contributions each innovation makes

Market penetration (2015)



- 50% Adaptive cruise control
- 20% Predictive cruise control
- 10% High efficiency selective catalytic reduction
- 10% Trailer side skirts
- 4% TPMS
- 1% Low rolling resistance tires
- 0.24% Turbocompounding

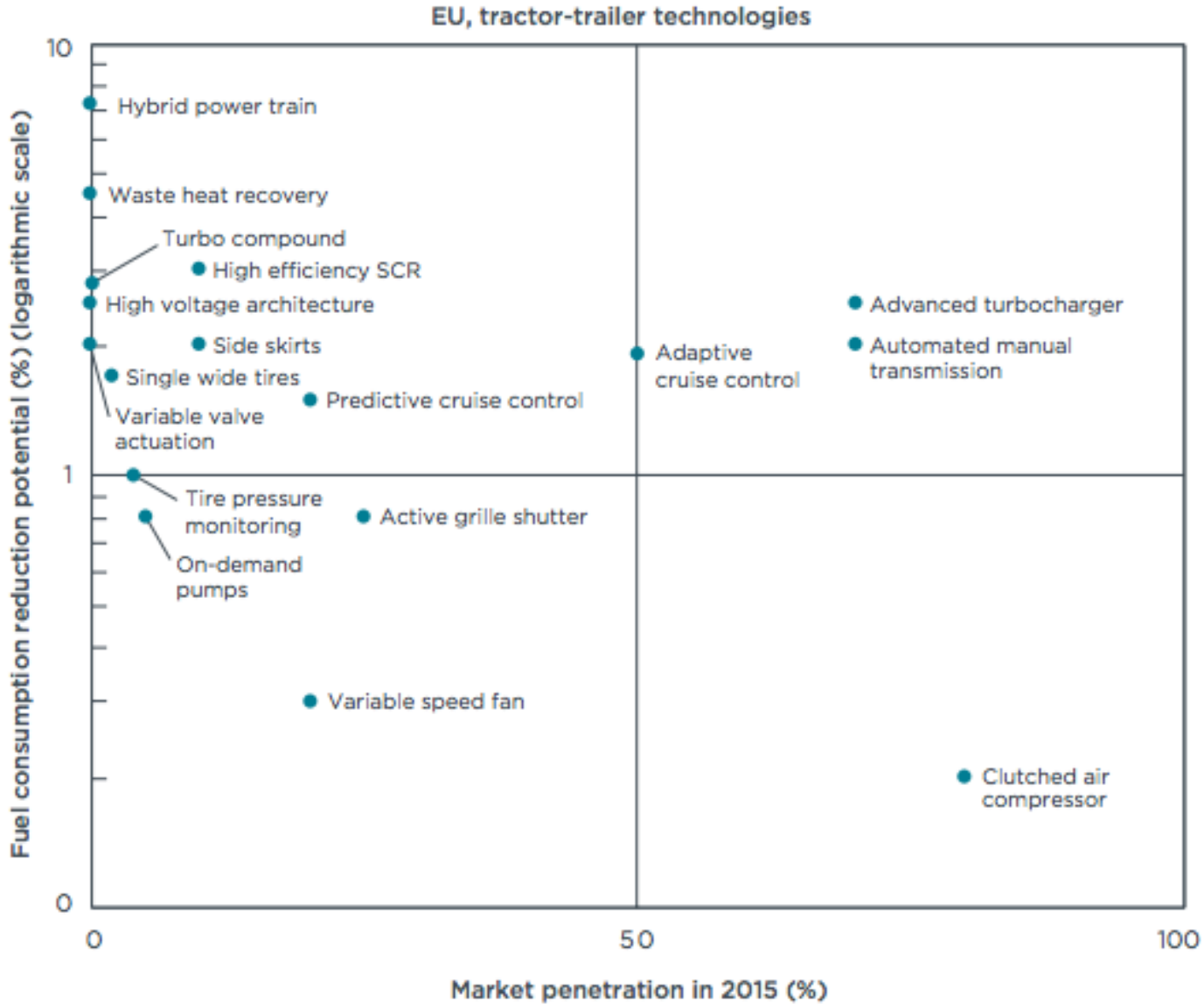
Time on the market



TRANSPORT & ENVIRONMENT @transenv @transenv transportenvironment.org

Source: Transport & Environment

Market is not delivering



A. 20% TARGET IN 2025 BRINGS MOST SAVINGS FOR TRANSPORT SECTOR

Table 15: Net economic savings from a first use (5 years) perspective in 2025 and 2030 (EUR/lorry)

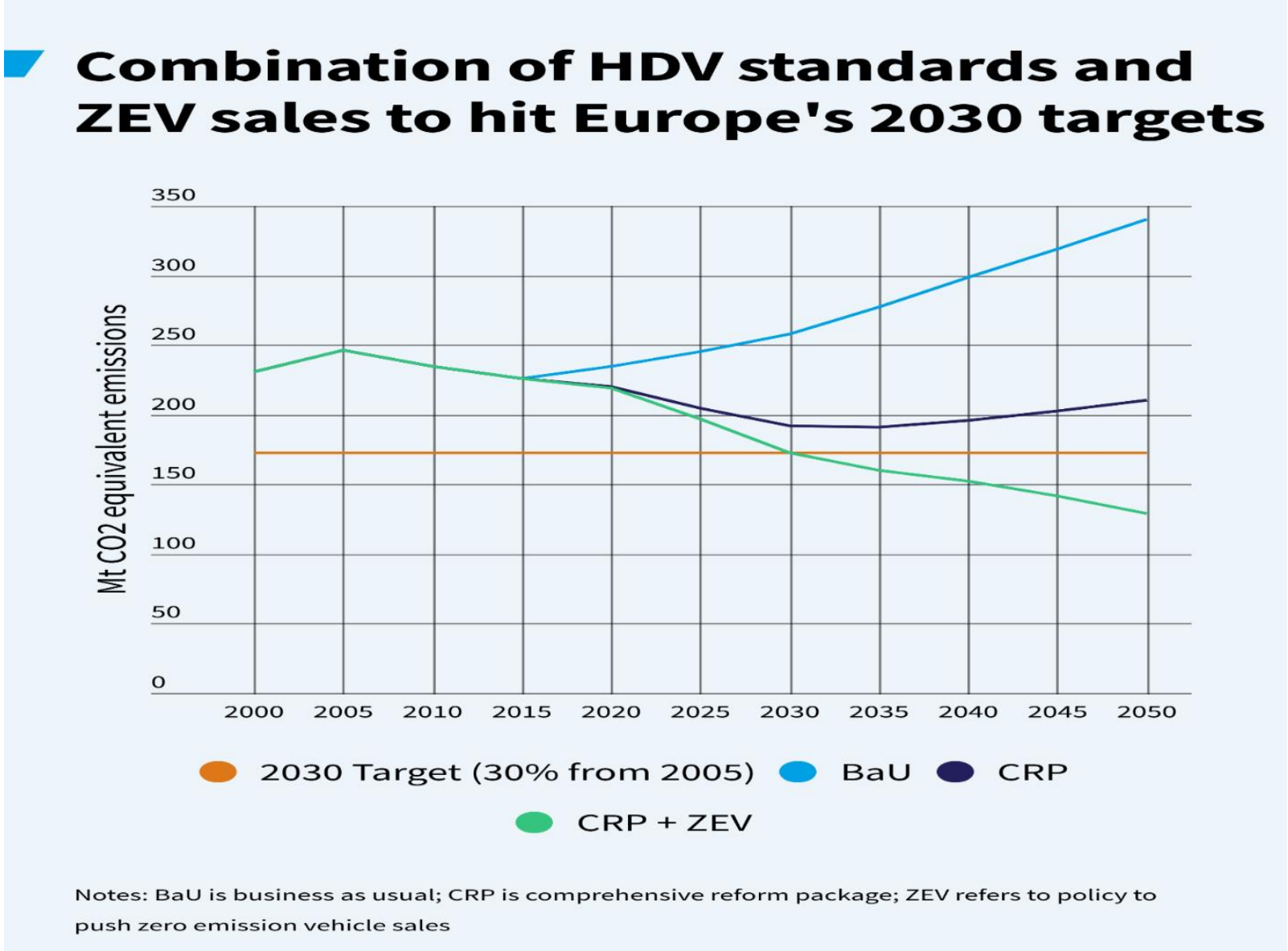
2025 (EUR/lorry)	Cost assumptions	TL20 (10%)	TL30NL (12.5%)	TL30 (15%)	TL32 (17.5%)	TL35 (20%)
Capital cost [1]	*Base*	481	991	1,729	2,516	4,110
	High	1,723	3,553	6,048	9,923	15,566
Fuel Savings [2]	*Base*	7,804	15,655	25,167	32,175	41,699
	High	14,480	24,424	32,385	40,920	48,568
Net Savings [2] - [1]	***Base***	**7,323**	**14,664**	**23,438**	**29,659**	**37,589**
	High	**12,757**	**20,871**	**26,337**	**30,997**	**33,002**

Approx 25 000 euro

Approx 35 000 euro

The net savings by far outweigh the costs! Big difference between 15% (EC proposal) and 20% (maximum potential)

3.5 We need e-trucks to meet our 2030 targets



CRP:

- MHDVs and HHDVs - 24% (2025) and - 40% (2030)
- 43% of all buses BEV
- Modal shift (18% - 23%)
- Logistics efficiency (truck emission -5%)

ZEV mandate of 5-10% 2025 & 20-30% 2030 is required for meeting the targets.

E-TRUCKS WILL COME FAST - NOW WE NEED RIGHT INCENTIVE

DAF – First deliveries in 2018

Mercedes Daimler – Series production 2021

Volvo – Start sales in 2019

MAN – Series production 2021

TARGET FOR ZERO EMISSION TRUCKS

10% of sales by 2025 is realistic!

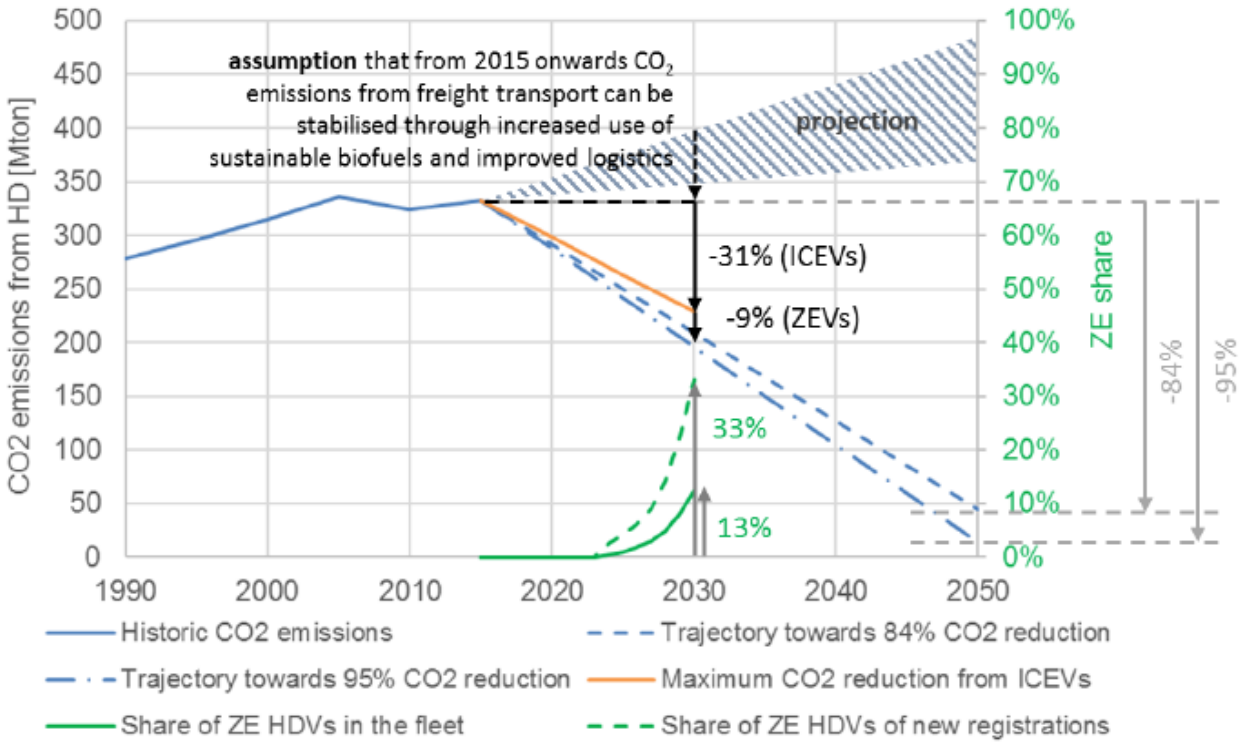
Typical use cases could spark the electrification of trucks.

Application segment	Segment perspective	Example use cases	Range of TCO parity,[1] year
Regional light-duty-truck (LDT) hub-and-spoke delivery	First truck segment to reach total-cost-of-ownership (TCO) parity, lowest entry barrier for battery electric vehicles (BEVs)	Regional grocery delivery for shops and restaurants	2017
Urban LDT stop-and-go delivery	Second truck segment to reach TCO parity due to low share of battery cost	Urban last-mile distribution with central hub and many stops	2017–21
Regional medium-duty truck hub-and-spoke delivery	Third segment to reach TCO parity due to balanced capital and operating expenditure	Grocery store chain with logistics center for several branches	2017–23
Urban heavy-duty city bus	In China and US, buses reach earlier TCO parity than truck segments due to lower share of battery cost in total capital expenditure	Typical city bus or school bus with dozens of stops	2020–23
Long-haul heavy-duty truck point to point	Parity for average users around 2030, due to large battery need, but up to 7 years earlier in beneficial use cases	International or continental freight logistics	2023–31

[1]Depending on region; example shown: Europe.

McKinsey&Company | Source: McKinsey Center for Future Mobility

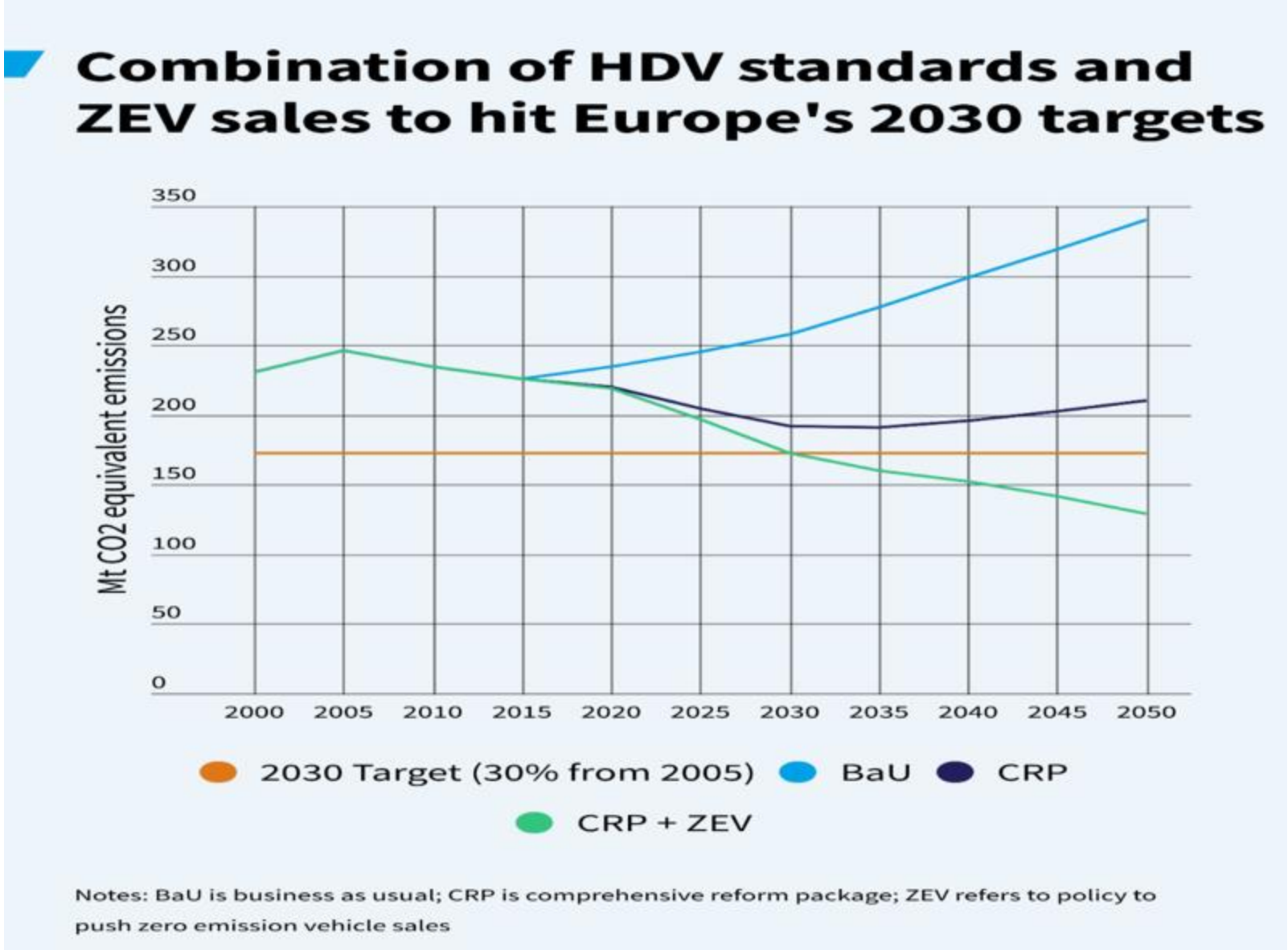
10% is necessary (2050 targets)



Assuming aviation and shipping also reduce 95%...

Need a mandate or benchmark with bonus AND malus to achieve this

We need e-trucks to meet our 2030 targets



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HDV STANDARDS PROPOSAL

EC proposal

- Binding target of **-15% by 2025 (2019 baseline)**
- Indicative target of at least **- 30% by 2030 (2019 baseline) and review in 2022**
- **Supercredits** for low and zero emission vehicles
  - Multiplier up to 2
  - Cap of 3%
- **Banking of CO2 credits** for meeting 2025 target but you cannot carry them over

T&E views

- **2025 target of at least 20% effective reductions**
- Get rid of supercredits!
- **Introduce a benchmark (with malus) or zero emission vehicle mandate of 10% by 2025**
- Buses should not be part of supercredits but regulated seperately
- Protect banking & borrowing. No carry over from 2020-2025 period for period after (2025-2030) and cap banking

=> Get this adopted before elections to protect 2025 target!!!