VOLVO

VECTO HOW IT IS DEVELOPED AND HOW IT IS USED

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EU CO2 performance regulation for HDVs

General description

The EU CO2 regulation for HDVs

EU CO2 regulation

Twofold strategy

- Drive market forces towards lower CO2
  - Declared CO2 values for HDVs are generated by VECTO
    - VECTO – Vehicle Energy Consumption Calculation Tool, a tool provided by EC
  - Can give customers preliminary CO2 declarations to compare truck models and specifications
  - CO2 values can be used for other incentives and purposes, e.g. differentiation of road tolls in Germany
- Tool for setting industry baselines and legal reduction targets
  - All OEMs send all VECTO declarations to EEA – European Environmental Agency
    - EEA calculate industry baselines
    - EEA publish all VECTO declarations and calculate OEMs' annual CO2 performance

NOTE

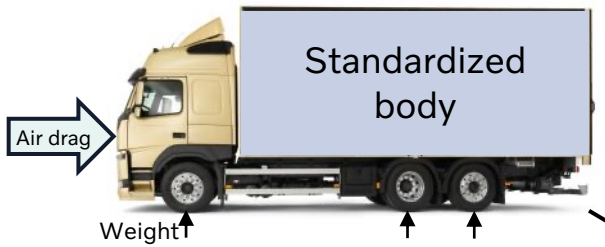
Results should be used for relative comparison

Payload, duty cycle etc will not exactly reflect individual use

But: A truck with lower specific CO2 value will in most cases be better in all different real use cases

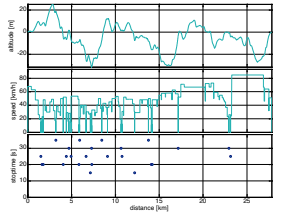
Measurement of components and calculation of CO2

Air drag, weight and general configuration



Rolling resistance and size

Duty cycle (5 truck and 5 bus cycles)

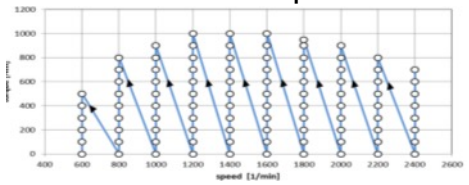


Axle efficiency and ratio

Gearbox efficiency and ratio

VECTO Simulation

Fuel map



Auxiliaries

FC/CO_2 values calculated at end of the production line

VECTO declaration

CO_2 emissions
- g/tonkm
- g/m3km
- g/passkm

Fuel consumption
- litre/100km

Average speed
- km/h

Default values
- Payload
- Standard body
- Standard semitrailer etc.

All registered trucks 2019 form the baseline

- One average baseline value per subgroup
- The big differences in absolute values mainly depends on the duty cycle and the payload used in VECTO
- The yearly OEM target vary depending on subgroup sales share
- Same reduction effort independent of the sales mix
  - A new OEM target is calculated every year based on the sales mix

Subgroup	Description	2019 baseline (g/tkm)
4-UD	4x2 rigid	307.2
4-RD		197.2
4-LH		106.0
5-RD	4x2 tractor	84.0
5-LH		56.6
9-RD	6x2 rigid	111.0
9-LH		65.2
10-RD	6x2 tractor	83.3
10-LH		58.3

Truck groups and targets

Truck sub-groups and targets						
Vehicle group	**Description**	**Baseline**	**2025-2029**	**2030-2034**	**2035-2039**	**As from 2040**
1s	4x2 >7.4-7.5 ton	2021		-43%	-64%	-90%
1	4x2 >7.5-10 ton					
2	4x2 >10-12 ton					
3	4x2 >12-16 ton					
4	4x2 rigid >16 ton	2019	-15%	-43%	-64%	-90%
5	4x2 tractor >16 ton					
9	6x2 rigid					
10	6x2 tractor					
11	6x4 rigid	2021		-43%	-64%	-90%
12	6x4 tractor					
16	8x4 rigid					

EU CO2 performance regulation for HDVs

Inclusion of Extra Heavy Combination lorries

Provided CO2 declarations

Conducted since 2019/2020

Payload increased by ≈37%

Provided CO2 declarations

Description		Duty cycles						
Vehicle configuration	Group	Long haul	Long haul EMS	Regional delivery	Regional delivery EMS	Urban delivery	Municipal utility	Construction
4x2 >7.4-7.5 ton	1s			Decl		Decl		
4x2 >7.5-10 ton	1			Decl		Decl		
4x2 >10-12 ton	2	Decl		Decl		Decl		
4x2 >12-16 ton	3			Decl		Decl		
4x2 rigid >16 ton	4	Decl		Decl		Decl	Decl	
4x2 rigid >16 ton	4v						Decl	Decl
4x2 tractor >16 ton	5	Decl	Decl	Decl	Decl	Decl		
4x2 tractor >16 ton	5v							Decl
6x2 rigid	9	Decl	Decl	Decl	Decl		Decl	
6x2 rigid	9v						Decl	Decl
6x2 tractor	10	Decl	Decl	Decl	Decl			
6x2 tractor	10v							Decl
6x4 rigid	11	Decl	Decl	Decl	Decl		Decl	Decl
6x4 tractor	12	Decl	Decl	Decl	Decl			Decl
8x4 rigid	16							Decl

New EHC truck groups will be included

Extra Heavy Combination lorries

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Extra heavy combination (tbd)		2025		-43%	-64%	-90%

Amendment of vehicle sub-groups for EHC lorries

EHC – Extra Heavy Combination lorries

- EHC sub-groups will be added to the EU27 CO2 regulation
  - Main reason is that “EHC lorries” may show very low CO2 emissions per mileage travelled and payload transported, expressed in gCO2/t·km
- An Extra Heavy Combination lorry or ‘EHC lorry’ is:
  - A N3 vehicle
    a) having three axles or more;
    b) with an engine rated power of at least 400 kW;
    c) designed with a technically permissible maximum mass of the combination of more than 60 tonnes

- Plan is to create three new subgroups
  - 11 EHC (6x4 rigid)
  - 12 EHC (6x4 tractor)
  - 16 EHC (8x4 rigid)
- EHC subgroups will get baselines from 2025 reporting period
  - Proposal is to use ”EMS” payloads and LH duty cycles
- EHC subgroups will get same reduction targets as all other subgroups from 2030 onwards
  - 43%, 64% and 90%

Summary

- VECTO results with higher payloads ”EMS” are since 2019 part of the CO2 declaration
- The payload used in VECTO has a very small impact on the OEM performance
  - Higher or lower sales volumes of trucks adapted to HCT (so far in group 4, 5, 9, 10) normally only have a small impact on the OEM CO2 performance
- Proposal for EHC sub-groups is to use similar duty cycles and weighing factors as for trucks in 9-LH and 10-LH but with EMS payloads
- Introduction of EHC subgroups is good, because duty cycles and payloads will reflect HCT usecases better than the current specific CO2 results in group 11, 12 and 16 that are Construction oriented
  - Volvo Group has proposed to use higher payloads than ”EMS” to even better reflect actual use

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