








CIVITAS indicators

Share of electric/hydrogen road freight vehicles in the new registered vehicles (ENV_DC_AFV1)

DOMAIN

 Transport	 Environment	 Energy	 Society	 Economy
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TOPIC

Decarbonisation

IMPACT

Zero-emission cars

Increasing the share of zero-emissions freight vehicles in the new registrations

ENV_DC

Category

Key indicator	Supplementary indicator	State indicator
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CONTEXT AND RELEVANCE

Transport activity is a major contributor to pollution, significantly impacting air quality, human health, and climate change. A substantial portion of freight transport activity takes place in urban areas, where high population density and concentrated economic activity lead to high freight demand. The reliance on motorized vehicles powered by fossil fuels exacerbates climate change by emitting greenhouse gases, such as CO₂. By addressing urban freight transport emissions, cities can enhance air quality and reduce carbon footprints.

This indicator is an estimation of the share of zero-emissions (electric and hydrogen) freight vehicles in the new road freight vehicles registered in the experiment area. **It is a relevant indicator when the policy action is aimed at reducing the impact of urban mobility and transport on climate. A successful action is reflected in a HIGHER value of the indicator.** Since there is a limited correlation between the place where a commercial vehicle is registered and where it is used, this indicator can be meaningful when the pilot area is a whole city but is insignificant when the pilot area is just part of an urban area.

DESCRIPTION





The indicator is the share of Battery Electric Vehicles (BEV) and Fuel Cells Vehicles (FCEV) out of the new road freight vehicles registered in the urban area in the last 6 months. Being a share, the indicator is **dimensionless**.

METHOD OF CALCULATION AND INPUTS


There are two methods for the calculation of the indicator. One method consists of computing the share of BEV and FCEV new commercial vehicles using the **data of new registrations of vehicles**. This method is straightforward and fully significant. **The requirement for its application is that data on new vehicles registrations is available at the required spatial and temporal level of detail.** Often data on new registered cars is published only at a level of spatial aggregation coarser than the pilot area (e.g. NUTS 3 regions) and for one period (e.g., at the end of the year). This issue is especially relevant if the pilot area is just one part of a municipality. Furthermore, data on new registrations might be published for the whole year, without further detail.

An alternative method is estimating the share of new BEV and FCEV vehicles registered by collecting data from (a sample of) dealers in the pilot area (as mentioned above, this indicator is not meaningful if the pilot area is just one part of an urban area). Dealers can be asked about the number of commercial vehicles sold in the last six months and about the share of zero-emission ones. On the one hand, an estimation based on data provided by dealers is less significant than a data drawn from a register because, even if the number of dealers in the pilot area is limited enough that all of them can be contacted, some vehicle could be purchased outside of the pilot area. On the other hand, this method can provide results if data from registrations is not available. Organising the data collection from dealers requires some resources and implies some complexities.

Whatever the method used, the share of zero-emission new registered cars should be computed exogenously and then coded in the supporting tool.

METHOD 1	METHOD 2
Calculation of the indicator using vehicles registration data	Estimation of the indicator using data collected from dealers
Complexity 	Complexity 
Significance 	Significance 

The estimation process is explained below for both methods.

Method 1	
Calculation of the share of zero-emission new registered commercial vehicles using registration data	Significance: 1.00 
<p>The following information is needed to compute the indicator:</p> <p>a) The number of new commercial vehicles registered in the pilot area by fuel technology in the last six months (considering the date the indicator should refer to)</p> <p>The experiment would result in a modification of the share of technologies in the new registered commercial vehicles.</p>	
<p>METHOD OF CALCULATION</p> <p>The indicator should be computed exogenously according to the following steps:</p> <ul style="list-style-type: none"> • Extraction of the number of new registered commercial vehicles in the pilot area in the last six months (considering the date the indicator should refer to) classified according to fuel technology. • Estimation of the indicator (see the following equation). 	
<p>EQUATIONS</p> <p>The value of the indicator should be computed as:</p> $ZrEmNewTruckSh = \frac{NewTruck^{<BEV>} + NewTruck^{<FCEV>}}{\sum_f NewTruck^f}$ <p>Where:</p> <p>$NewTruck^f$ = Number of new registered commercial vehicles of fuel technology f</p> <p>$RegTruck^{<BEV>}$ = Number of new registered Battery Electric commercial vehicles</p>	

$RegTruck^{<FCEV>} = \text{Number of new registered Fuel Cells commercial vehicles}$

Method 2

Calculation of the share of zero-emission new registered cars using data collected from dealers

Significance: **0.75**



The following information should be collected by contacting commercial vehicles dealers in the pilot area:

- a) **Number of commercial vehicles sold in the last six months by fuel technology.**

The experiment would result in a modification of the number of BEV and FCEV commercial vehicles sold in a six month period.

METHOD OF CALCULATION

The indicator should be computed **exogenously** according to the following steps:

- **Calculation of the total number of new commercial vehicles sold** in the next six months (see equation below).
- **Calculation of the number of BEV new commercial vehicles sold** in the next six months (see equation below).
- **Calculation of the number of FCEV new commercial vehicles sold** in the next six months (see equation below).
- **Estimation of the indicator** (see equation below).

EQUATIONS

The calculation of the total number of new commercial vehicles sold is just the summation of the vehicle sold reported by the sampled dealers:

$$SoldTruck = \sum_l SoldTruck_l$$

Where l is the generic sampled dealer.

The calculation of the total number of new BEV and FCEV commercial vehicles sold is just the summation of the number of these vehicles reported by the sampled dealers:

$$SoldTruck^f = \sum_l SoldTruck_l^f$$

Where f is either BEV or FCEV.

The indicator can be computed using the equation:

$$ZrEmNewTruckSh = \frac{SoldTruck^{<BEV>} + SoldTruck^{<FCEV>}}{SoldTruck}$$

ALTERNATIVE INDICATORS

This indicator provides a measure of how relevant zero-emission vehicles are in the new registrations of commercial vehicles. Since many commercial vehicles remain in the fleet for several years, even if zero-emissions commercial vehicles are a significant portion of the new registered vehicles, their share on the total fleet can remain quite small if compared after some months. This indicator helps to quantify the speed at which zero-emission vehicles are entering the commercial vehicles fleet, but it does not say anything on how significant these vehicles are in the existing fleet. This latter information is provided by the indicator **ENV_DC_AJV2**, which has the same form but is computed on the existing commercial vehicle fleet rather than on the new registered commercial vehicles.

While this indicator considers freight vehicles, ENV_DC_APV1 and ENV_DC_APV2 illustrate the share of zero-emission **passenger vehicles** among newly registered cars and over the whole car fleet, respectively.