CIVITAS indicators

Share of electric/hydrogen cars in the new registered vehicles (ENV_DC_APV1)

DOMAIN

Transport	**Environment**	Energy	Society	Economy

TOPIC	**Decarbonisation**	
IMPACT	**Zero-emission cars** *Increasing the share of zero-emissions cars in the new registrations*	**ENV_DC**

Category

Key indicator	Supplementary indicator	State indicator

CONTEXT AND RELEVANCE

Transport activity is a major contributor to pollution, significantly impacting air quality, human health, and climate change. A substantial portion of transport activity takes place in urban areas, where high population density and concentrated economic activity lead to high transport demand. The reliance on motorized vehicles powered by fossil fuels exacerbates climate change by emitting greenhouse gases, such as CO_2. By addressing urban 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) cars in the new cars 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 <u>HIGHER</u> value of the indicator.**

DESCRIPTION

The indicator is the share of Battery Electric Vehicles (BEV) and Fuel Cells Vehicles (FCEV) out of the new cars 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 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). 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 means of a **sample survey**. Asking a sample of individuals if they have registered a car in the last six months and, if yes, of which fuel technology, allows to estimate the share of zero-emission vehicles in the new registrations. On the one hand, a sampling estimation is less significant than an observed data drawn from a register. On the other hand, this method can work even if the pilot area is spatially limited as the sample can be collected among the inhabitants of the area. Organising a sample survey requires some resources and implies some complexities, but the survey can be used to collect more information than the one needed for this indicator. See the dedicated "Sample surveys guidelines" for methodological indications.

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 responses from a sample survey
Complexity	Complexity
Significance	Significance

The estimation process is explained below for both methods.

Method 1

Calculation of the share of zero-emission new registered cars using vehicles registration data	Significance: **1.00**

The following information is needed to compute the indicator:

a) **The number of new cars** registered in the pilot area by fuel technology in the last six months (considering the date the indicator should refer to)

The experiment would result in a modification of the share of technologies in the new registered cars.

METHOD OF CALCULATION

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

- **Extraction of the number of new registered cars 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).

EQUATIONS

The value of the indicator should be computed as:

$$ZrEmNewCarSh = \frac{NewCar^{<BEV>} + NewCar^{<FCEV>}}{\sum_f NewCar^f}$$

Where:

$NewCar^f$ = Number of new registered cars of fuel technology f

$RegCar^{<BEV>}$ = Number of new registered Battery Electric cars

$RegCar^{<FCEV>}$ = Number of new registered Fuel Cells cars

Method 2

Calculation of the share of zero-emission new registered cars using responses from a sample survey	Significance: **0.75**	

The following information should be collected by means of the sample survey for each respondent:

a) **If a new car has been purchased or made available to the respondent's household in the last six months.** The information concern available rather than owned cars in order to consider company cars.

b) **The fuel technology of the cars made available in the respondent's household.**

The experiment would result in a modification of the number of BEV and FCEV cars made available to the households.

METHOD OF CALCULATION

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

- **Calculation of the total number of new cars made available to the households of the sampled individuals** in the next six months (see equation below).

- **Calculation of the number of BEV cars made available to the households of the sampled individuals** in the next six months (see equation below).

- **Calculation of the number of FCEV cars made available to the households of the sampled individuals** in the next six months (see equation below).

- **Estimation of the indicator** (see equation below).

EQUATIONS

The calculation of the total number of new cars made available to the households of the sampled individuals is just the summation of the new cars reported by the sampled individuals:

$$NewAvailCar = \sum_d NewAvailCar_d$$

Where *d* is the generic component of the sample.

The calculation of the total number of new BEV and FCEV cars made available to the households of the sampled individuals is just the summation of number of these cars reported by the sampled individuals:

$$NewAvailCar^f = \sum_d NewAvailCar_d^f$$

Where *f* is either BEV or FCEV.

The indicator can be computed using the equation:

$$ZrEmNewCarSh = \frac{NewAvailCar^{<BEV>} + NewAvailCar^{<FCEV>}}{NewAvailCar}$$

ALTERNATIVE INDICATORS

This indicator provides a measure of how relevant zero-emission vehicles are in the new registrations of cars. Since many cars remain in the fleet for several years, even if zero-emissions cars 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 car 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_APV2, which has the same form but is computed on the existing car fleet rather than on the new registered cars.

While this indicator considers passenger vehicles, ENV_DC_AFV1 and ENV_DC_AFV2 illustrate the share of zero-emission **freight vehicles** among newly registered freight vehicles and over the whole fleet, respectively.