CIVITAS indicators

Estimated transport pollutant emissions (ENV_PL_PE2)

DOMAIN

Transport	**Environment**	Energy	Society	Economy

TOPIC	**Pollution**	
IMPACT	**Transport pollutant emissions** *Reducing the pollutant emissions of urban mobility*	**ENV_PL**

Category

Key indicator	Supplementary indicator	State indicator

CONTEXT AND RELEVANCE

Transport activity is a relevant source of pollution. A significant share of transport activity occurs in the urban context. Reducing the pollutant emissions generated by urban mobility is a significant contribution to sustainability.

This indicator is an estimation of the amount of urban mobility pollutant emissions. **It is a relevant indicator when the policy action is aimed at reducing the impact of urban mobility and transport on the urban air quality. A successful action is reflected in a <u>LOWER</u> value of the indicator.**

DESCRIPTION

The indicator is not a single number but **a vector** of the quantity of emissions, expressed in **tonnes/year**, for three pollutants: **Particulate Matter (PM), Nitrogen Oxides (NOx), Volatile Organic Compounds (VOC)**.

METHOD OF CALCULATION AND INPUTS

The method for the calculation of the indicator is estimating pollutant emissions building on energy use for urban transport activity. The energy use should be available by fuel type. Energy use by fuel type can be obtained from different sources. One option is collecting energy supplied at refuelling stations and energy operators (see factsheet related to the indicator ENG_EF_ED1). Another option (see factsheet related to the indicator ENG_EF_ED2) is extracting energy consumption from an urban transport model, if there is a city transport model providing energy consumption by fuel type (but not pollutant emissions, otherwise the first method can be applied). A third option is estimating energy used building on vehicle fleets, mileage and use factors (see factsheet related to the indicator ENG_EF_ED3).

If energy demand is known from one source or another, the calculation of this indicator is straightforward (furthermore, **the calculation is managed endogenously within the supporting tool**). If energy demand is unknown, the calculation of this indicator implies that one of the energy indicators mentioned above is computed. The significance level of this indicator of estimated emissions largely depends on the significance level of the indicator of energy demand.

The estimation process is explained below.

Method 1		
Pollutant emissions estimated from energy consumption by fuel type	Significance: **0.50**	
METHOD OF CALCULATION The indicator is computed **within the supporting tool** according to the following steps: • **Estimation of the pollutant emissions by mode of transport** (see equation below)		

This indicator is made of several values. In order to derive the contribution of this indicator to the overall change induced on the domain "Enviroment", an **"average"** value is required. The average, **computed within the supporting tool without the need for any input**, consists of a weighted average according to the following equation.

$$AvPollEmiss = \sum_{e}({}^{p}EstPollEmis * {}^{p}PollEmisWght)$$

Where:

$^{p}PollEmisWght$ = weight associated to emissions of pollutant p

These weights are pre-defined as follows:

PM: $^p PollEmisWght = 0.5$

NOx: $^p PollEmisWght = 0.3$

VOC: $^p PollEmisWght = 0.2$

A successful experiment corresponds to a lower value of this average.

A "normalised variation index" can be used to compute the summary impact of the pilot in the domain "Environment". For this purpose, it is required that the value index becomes larger as the pilot is successful. The index respecting this requirement is obtained **within the supporting tool without the need for any input** as:

$$NMIPollEmiss = \left(2 - \frac{AvPollEmiss[AE]}{AvPollEmiss[BAU]} \right) * 100$$

Where:

$AvPollEmiss[AE]$ = Value of the average emissions in the After-experiment condition

$AvPollEmiss[BAU]$ = Value of the average emissions in the BAU condition

ALTERNATIVE INDICATORS

If an urban transport model estimating pollutant emissions is available, an alternative indicator is ENV_PL_PE1, which is based on modelled emissions. This alternative indicator is of limited complexity (provided that a transport model exists) and provide results with a good level of significance.

This indicator refers to pollutant emissions in a certain period. Even if emissions affect the air quality, which is however better measured by the concentration of pollutants. The same amount of emissions can result in different concentrations depending on several conditions such as weather (e.g., given a certain level of emissions, air quality will be better in a windy context). The indicator ENV_PL_AQ2 refers to the air quality and can be used in alternative to this indicator. The disadvantage of the alternative indicator is that observed concentrations used for its computation is not necessarily available in all pilot areas and, even when available, they can make reference to a limited number of spots only. Furthermore, given that concentrations are affected by the weather, assessing whether a modification of the alternative indicator depends on the pilot or not can be impossible.