

Adriatic Action Plan 2020

Methodology for the calculation of the CO₂ indicator

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What is the purpose of the indicator?

The indicator is aimed at:

identifying the level of the local contribution to climatic change

reporting the effects of the actions aimed at reducing such contribution

evaluating the variation over time of the local contribution to climate change

The indicator is not aimed at giving an exact balance of the greenhouse gases emissions of a town or region

Which sectors are considered?

Many sectors are responsible for the emission of greenhouse gases: energy sector, industrial processes, the use of solvents, agriculture and waste management, as well as the removal (“absorption”) of carbon through forest management (also called “carbon sinks”).

The energy sector and the waste management sector will be considered: they represent the main focus for action by the local authority.

Which gases are considered?

Many gases are responsible of the geenhouse effect:

Carbon Dioxide (CO₂), Nitrous Oxide (N₂O), Methane (CH₄), Sulphur Hexafluoride (SF₆), Hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs).

One good estimate of greenhouse gases at a local level is the use of an indicator that is correlated to CO₂ emissions caused by local energy consumption and CO₂ and CH₄ emissions caused by local waste management activities.

Responsibility principle versus geographical principle

Emission inventory according to a “geographical principle”:

the activities responsible for emissions in the area are inventoried and the related emissions generated within the area are calculated.

The approach does not consider the effect that such activities can have outside the area.

Emission inventory according to a “responsibility principle”:

emissions are estimated considering both emissions generated within the area and emissions generated outside the area, wherever they are, as long as they can be traced back to activities that have been taken place within the area itself.

“Debt emissions” and “credit emissions”

A city may need to import energy (ie electricity) from outside its boundary and/or export waste to other cities.

According to the responsibility principle, the emissions associated to the electricity production and to the waste disposal should be accounted for and inventoried.

These are “debt emissions” and have to be added to domestic emissions.

A city may export energy (ie electricity) to and/or import waste from other cities.

Emissions related to these activities should be subtracted from total domestic emissions because the city is not directly responsible for it.

These are “credit emissions” and have to be subtracted from domestic emissions.

Data collection

Annual final energy consumption

Consumption (TJ)	Year				
	Residential	Tertiary	Industry	Transport	Total
Electricity					
Natural Gas					
Gasoline					
Gas/Diesel Oil					
Kerosene					
Fuel Oil					
LPG					
Petroleum Coke					
Refinery Gas					
Coal					
Biomass					
Solar Heating					
District Heating Fluid					
Total					

Data collection

Annual local electricity production

Local electricity production (TJ)	Year
From fossil fuels	
From renewable sources	

Electricity consumption from local production (TJ)	Year
Residential	
Tertiary	
Industry	
Transportation	
Total	

Annual waste disposal

Waste disposal (ton)	Year
Landfill	
Incinerator	

Data collection

Emission coefficients

Emission coefficients	Year
Fossil fuels (ton CO ₂ /TJ)	International std values
Imported electricity (ton CO ₂ /TJ)	National value
Local electricity (ton CO ₂ /TJ)	Calculated
Waste to incinerator (Kg CO ₂ /ton)	Local value
Waste to landfill (Kg CH ₄ /ton)	Local value