

2005 Emission Inventory

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Aggregated pollution indicators

In the Emission Inventory data for some aggregated pollution indicators are available, obtained from combination of the emission data of single pollutants.

- *CO₂eq: total emissions of greenhouse gases expressed as CO₂ - equivalent*
- *Tot. acidif. (H⁺): total emissions of acidifying substances*
- *Precurs. O₃: total emissions of ozone precursors*

CO₂eq: total emissions of greenhouse gases expressed as CO₂ - equivalent

"CO₂eq" emissions represent total emissions of greenhouse gases, weighted basing on their own contributions to greenhouse gas effect.

The estimate of greenhouse gases aggregated emissions is based on the following relation:

$$CO_{2eq} = \sum_i GWP_i \times E_i$$

where

CO₂eq = CO₂ equivalent emissions in kt/year

GWP_i = "Global Warming Potential", IPCC coefficients equal to 1, 0.021 and 0.31 respectively for CO₂, CH₄ and N₂O (IPCC, 2001)

E_i = CO₂ (in kt/y), CH₄ and N₂O (in t/y) emissions.

Example:

If CO₂ emissions are 100 kt/y, CH₄ emissions 50 are t/y and N₂O emissions are 10 t/y, then CO₂eq emissions are:

$$CO_{2eq} = 100 * 1 \text{ kt/y} + 0.021 * 50 \text{ kt/y} + 10 * 0.31 \text{ kt/y} = 104.2 \text{ kt/y}.$$

Tot. acidif. (H⁺): total emissions of acidifying substances

"Tot. acidif. (H⁺)" emissions represent total emissions of substances able to contribute to rain acidification.

The estimate of aggregated emissions of acidifying substances is based on the following relation:

$$Tot.acidif. (H^+) = \sum_i AP_i \times E_i / 1000$$

where

Tot. acidif. (H+) = total emissions of acidifying substances expressed as kt/y of H+ equivalents

AP_i = acidifying potential factors, equal to 31.25, 21.74 and 58.82 respectively for SO₂, NO_x and NH₃ (De Leeuw et al., 2002)

E_i = SO₂, NO_x and NH₃ (in t/y) emissions

Example

If SO₂ emissions are 10 t/y, N₂O emissions are 50 t/y, NH₃ emissions are 1 t/y, then Tot. acidif. (H+) emissions are:

Tot. acidif. (H+) = (31.25 * 10 t/y + 21.74 * 50 t/y + 58.82 * 1 t/y)/1000 = 1.46 kt/y.

Precurs. O₃: total emissions of ozone precursors

"Precurs. O₃" emissions represent total emissions of pollutant substances able to promote the formation of tropospheric ozone.

The estimate of aggregated emissions of ozone precursors is based on the following relation:

$$\text{Precurs. O}_3 = \sum_i \text{TOPP}_i \times E_i$$

where

Precurs. O₃ = emission of ozone precursors in t/y

TOPP_i = "Tropospheric Ozone Formation Potentials", formation coefficients of tropospheric ozone, equal to 1.22, 1, 0.014 and 0.11 respectively for NO_x, VOC, CH₄ and CO (De Leeuw et al., 2002)

E_i = NO_x, VOC, CH₄ and CO emissions (in t/y).

Example

If NO_x emissions are 10 t/y, NMVOC emissions are 5 t/y, CH₄ emissions are 5 t/y and CO emissions are 50 t/y, then Precurs. O₃ emissions are:

Precurs. O₃ = 1.22 * 10 t/y + 1 * 5 t/y + 0.014 * 5 t/y + 0.11 * 50 t/y = 22.77 t/y.

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