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.

- *CO_2eq: total emissions of greenhouse gases expressed as CO_2 - equivalent*
- *Tot. acidif. (H+): total emissions of acidifying substances*
- *Precurs. O_3: total emissions of ozone precursors*

CO_2eq: total emissions of greenhouse gases expressed as CO_2 - equivalent

"CO_2eq" 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:

$$\mathbf{CO_2eq = \#_i GWP_i \times E_i}$$

where

CO_2eq = CO_2 equivalent emissions in kt/year

GWP_i = "Global Warming Potential", IPCC coefficients equal to 1, 0.021 and 0.31 respectively for CO_2, CH_4 and N_2O (IPCC, 2001)

E_i = CO_2 (in kt/y), CH_4 and N_2O (in t/y) emissions.

Example:

If CO_2 emissions are 100 kt/y, CH_4 emissions 50 are t/y and N_2O emissions are 10 t/y, then CO_2eq emissions are:

$CO_2eq = 100 * 1 kt/y + 0.021 * 50 kt/y + 10 * 0.31 kt/y = 104.2 kt/y.$

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:

$$\mathbf{Tot.acidif.\ (H+) = \#_i AP_i \times E_i / 1000}$$

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 SO_2, NO_x and NH_3 (De Leeuw et al., 2002)

E $_i$ = SO_2, NO_x and NH_3 (in t/y) emissions

Example

If SO_2 emissions are 10 t/y, N_2O emissions are 50 t/y, NH_3 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. O_3: total emissions of ozone precursors

"Precurs. O_3" 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:

Precurs. O_3 = # $_i$TOPP $_i$ x E $_i$

where

Precurs. O_3 = 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, CH_4 and CO (De Leeuw et al., 2002)

E $_i$ = NO_x, VOC, CH_4 and CO emissions (in t/y).

Example

If NO_x emissions are 10 t/y, NMVOC emissions are 5 t/y, CH_4 emissions are 5 t/y and CO emissions are 50 t/y, then Precurs. O_3 emissions are:

Precurs. O_3 = 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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