

Emission estimation from Solvent Use

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PRE-DEFINED PROJECT
**“DEVELOPMENT OF THE NATIONAL SYSTEM FOR GREENHOUSE GAS
INVENTORY AND REPORTING ON POLICIES, MEASURES AND
PROJECTIONS”**

Nr.4.3-23/EEZ/INP-002

Sector overview

Accordance with the 2006 IPCC Guidelines:

2.D Non-energy products from fuels and solvent use:

2.D.3 Other:

Lubricant Use;

Paraffin Wax Use;

Solvent Use;

Other

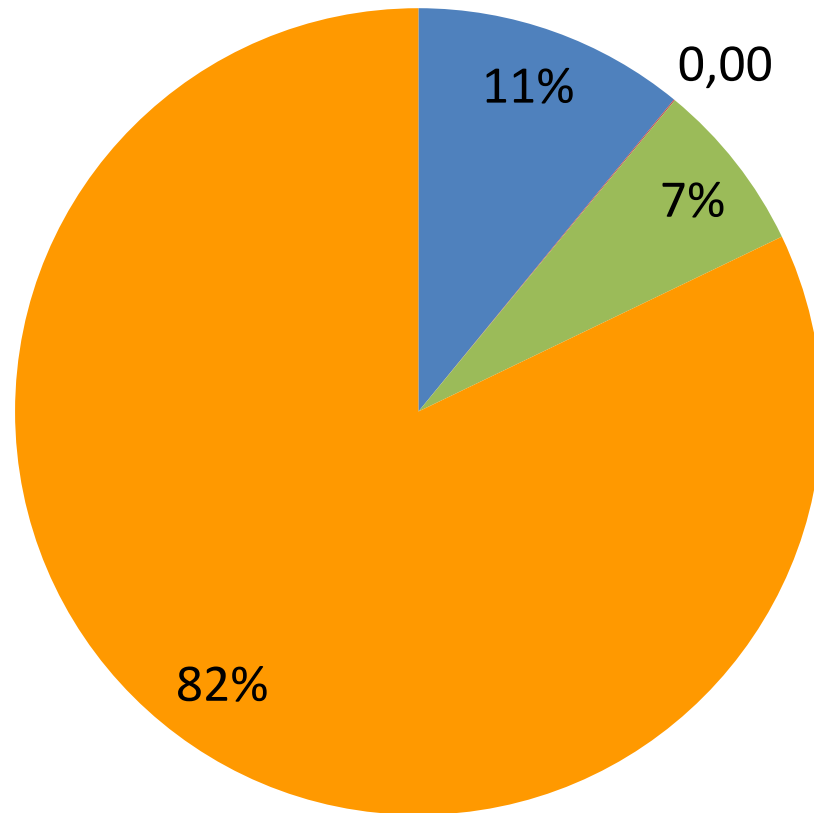
Sector overview

- The use of solvents is an important source of emissions of non-methane volatile organic compounds (NMVOC).
- The emissions of NMVOC from Solvent Use are calculated using a methodology described in EMEP/EEA emission inventory guidebook 2013.

Solvent Use subcategories

- **SNAP 0601: Coating applications** (*Including such activities as paints and varnishes from decorative, industrial and other coating applications*);
- **SNAP 0602: Degreasing, Dry cleaning** (*Degreasing includes cleaning products from water-insoluble substances such as grease, fats, oils waxes and tars. Dry cleaning refers to any process to remove contamination from furs, leather, down leathers, textiles or other objects made of fibres using organic solvents*);
- **SNAP 0603: Chemical products** (*Including the processing of polyester, PVC, foams and rubber, manufacture of paints, inks, glues and adhesives and finishing of textile*);
- **SNAP 0604: Domestic solvent use including fungicides; Printing and Other solvent and product use** (*Including such activities as `enduction` (i.e. coating) of glass wool and mineral, printing industry, fat and oil extraction, uses of glues and adhesives, wood preservation, domestic use (other than paint application) and vehicle underseal treatment and vehicle dewaxing*).

Emissions of NMVOC (%) from Solvent Use in 2013



■ Coating applications

■ Degreasing, Dry Cleaning

■ Chemical products

■ Domestic solvent use including fungicides; Printing and Other solvent and product use

Activity data

Main activity data sources for NMVOC emissions calculations in Solvent Use sector:

- ❑ data from *Chemical Register* (2006-2013);
- ❑ database *2-Air* (2006-2013);
- ❑ data from *Central Statistical Bureau*; (1990-2005).

NMVOC calculations and emissions factors (2006–2013)

According to EMEP/EEA 2013 methodology:

$$E_{\text{NMVOC}} = \text{AD} \times \text{EF}_{\text{NMVOC}}$$

The average content of NMVOC in NMVOC containing product is calculated by arithmetic average and is presented in mass percentage.

The percentage content is used as NMVOC emission factor.

$$E_{\text{NMVOC}} = \sum(\text{AD} \times \text{EF}_{\text{NMVOC}})$$

where

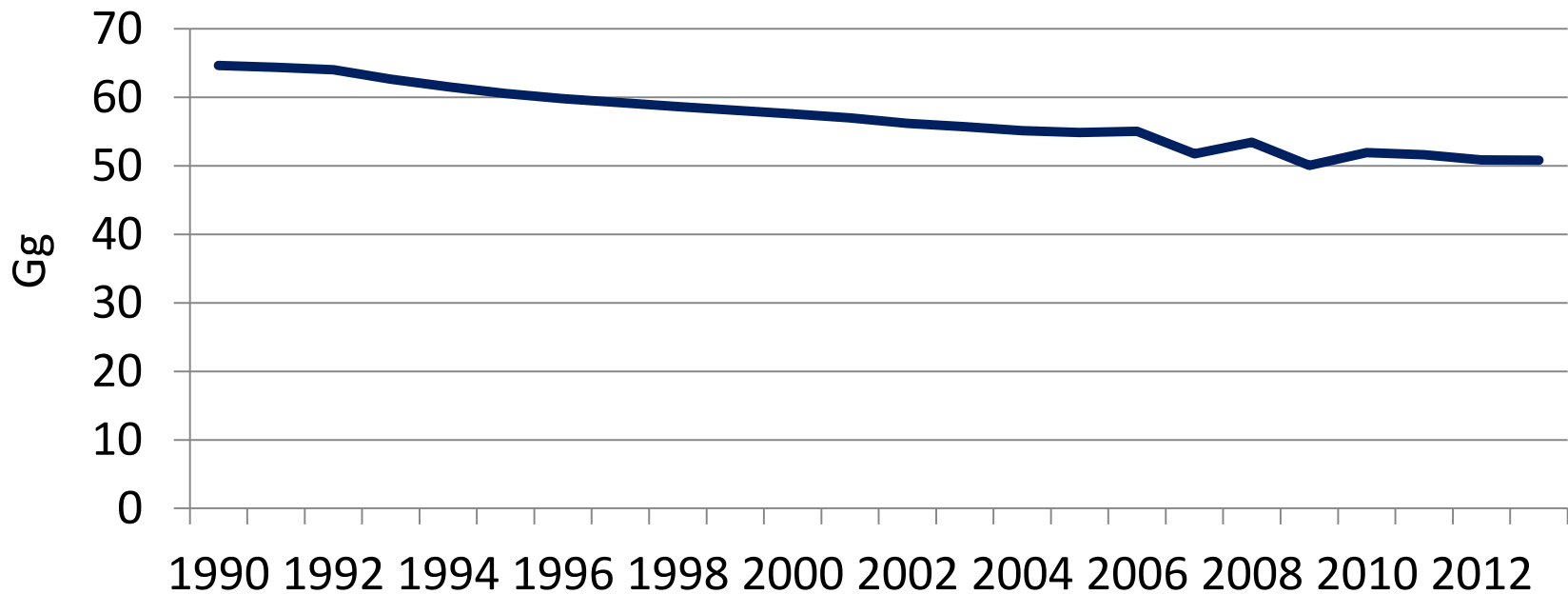
E_{NMVOC} – NMVOC emissions from solvents use (Gg);

AD – consumption of products containing NMVOC (Gg);

EF_{NMVOC} – emission factor is assumed as the average percentage of a particular NMVOC in NMVOC containing product.

NMVOC calculations and time series (1990 – 2013)

Emissions calculated proportionally (assuming that base year for NMVOC emissions is 2006) taking into account number of inhabitants.



Conversion to CO₂

EF_{NMVOC} – emission factor

$$E_{CO_2} = 0.6 \times (44.0098/12.011) \times E_{NMVOC}$$

where

E_{CO₂} – indirect CO₂ emissions (Gg);

0.6 – the average carbon content in NMVOC by mass
(accordance with the 2006 IPCC Guidelines);

CO₂ conversion factor – 2.20 kg CO₂/kg NMVOC.

Uncertainties and time series consistency

- Uncertainty of available activity data for Solvent Use was $\pm 2\%$ by expert judgment in 2013.
- Emission factor uncertainty is assumed to be $\pm 20\%$ accordance with EMEP/EEA guidebook 2013, 2.D Other solvent and product use.
- Time series consistency was ensured by using one method for all time series.

QA/QC procedures

- QA/QC check is performed according to EMEP/EEA guidebook 2013, 2.D Other solvent and product use;
- All estimations of the emissions done in the LEGMC also are checked on the logical mistakes by checking the time series of the activity data, emission factors and emissions consistency to display all significant and illogic changes in the activity data and emissions
- Emissions are checked by using time series and CRF Reporter tools (continuing).

QA/QC procedures

- Quality control check list is filled for category taking into account criteria given in QA/QC plan approved in national legislation.
- All findings were documented and introduced in GHG inventory.
- Quality manager from LEGMC has checked the data between CRF and NIR to ensure the consistency as well as QC actions were done in CRF in purpose to double check if all sub-applications are covered.
- Instruction by three experts under Industrial Processes and Product Use sector is actualized after calculations.

Archiving

- Activity data from *Chemical Register* and database 2-*Air* is archived according to requirements of LEGMC information system;
- Emission calculation database (*Excel files*) are stored on the sectoral expert`s computer;
- All electronic information is archived in centralized archiving system (common FTP folder, (user protected));
- Originals and print out copies are stored by the sectoral expert.

Thank you for your attention!

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Expert

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Issues

- Reports from producers or importers not being submitted in the time series.
- Selection of data from Chemical Register for sub-categories in Solvent Use sector using EMEP/EEA 2013.
- Improve methodology of calculation for emissions of NMVOC.

Should be excluded?

- Heat transfer fluid
- Starting gas
- Liquids for starting of the engine
- Fuel gas for starting of the engine
- Cold start; cold boot
- Unleaded petrol
- Petrol sulfur-free, winter/summer-blend
- Unleaded petrol 95 with 5% admixture of denaturing alcohol
- Propane gas of vehicles
- Liquefied petroleum gas
- Petrol of air navigation
- Gas/diesel oil
- Diesel fuel conditioning
- Diesel additive
- Grill lighter fluids
- Compressed air
- Kerosene; kerosine
- Natural gas Fuel for barbecue charcoal
- Motor oil Fuel for solid fuels
- Transmission oils
- Diesel fuel antigel with cetane boost
- Heavy resin of pyrolysis
- Butane gas for stove
- Gas lighter Bioethanol