

VOC monitoring issues in the Gothenburg Annex

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Proposal of EGTEI to the Working Group of Strategies and Review

Report of the WGSR on its 49th session from 12 to 16 September 2011

B 35 "The Working Group welcomed the offer of the Expert Group on Techno-economic Issues to clarify the way ELVs as contained in the technical draft annex VI, were determined or calculated"

Questions were raised indeed during the working group session, on **how to control and monitor emissions of VOCs** due to the heterogeneous nature of these compounds and the impossibility to monitor each of them.

 Develop an informal document to provide information on VOC monitoring and calculation programme. A draft document has been developed by the EGTEI secretariat and circulated in a small group of EGTEI experts. Comments are expected

Rational for the revision of the technical annex VI related to VOC (1)

The following 3 options, corresponding to 3 different ambition levels, have been formulated, as basis for the negotiation :

Option 1: ELV1, demanding but technically feasible option with the objective of achieving a high level of reduction. ELV1 is based upon a value ranging between the lower and upper BAT AEL (where available),

Option 2: ELV2, while technically demanding, pays greater attention to the costs of the measures for achieving reduction. ELV2 is based on the upper value of BAT AEL (where available),

Option 3: ELV 3, represents current practices based on the current legislation in a number of Parties to the Convention.

Rational for the revision of the technical annex VI related to VOC (2)

Just one source added compared to the existing annex (service station)

Options for ELVS proposed according to :

- ✓ existing EU directives (Directive 99/13/EC on VOC emissions from certain activities using solvents, the EU directive 94/63 on VOC emissions from storage of petrol and its distribution from terminals to service station, the EU directive 2009/126 of 2009 on service stations),
- ✓ BAT AELs available in the BREFs on "Surface Treatment with Solvent", "Fine Chemical Industry", "Common Waste Water and Waste Gas Treatment / Management Systems in the Chemical Sector"...

In the annex:

Only general indications for monitoring,

No mandatory monitoring conditions and frequency introduced for flexibility reasons.

Expression of ELVs in the technical annex VI

Four ways of expressing the ELVs for VOC:

As **total organic carbon (TOC)**, concentration of carbon in the gas stream, usually expressed in mg C per cubic meter (mg/m^3) in the standard condition of temperature and pressure (STP),

As **concentration of one or several substances assigned to the following risk phrases:** suspected of causing cancer and/or suspected of causing genetic defects, may cause cancer, may cause genetic defects, may cause cancer by inhalation, may damage fertility, may damage the unborn child), expressed in mg substances per cubic meter (mg/m^3) in the standard condition of temperature and pressure.

As a **total emission of VOC expressed in % of solvent input, or g/unit of activity** (g/m^2 , g/kg high solid, ...) for some activities using solvents or % of throughput for activities related to storage and handling of petrol,

As a **fugitive emission of VOC expressed in % of solvent input.**

Available monitoring techniques or calculation programmes

ELVc expressed as total organic carbon or substance / m³ can only be controlled by the use of **specific monitoring equipment**,

ELVt for solvent uses, expressed as % of solvent input or as g/unit of activity can be controlled by a **solvent management plan**,

ELVf can be controlled by a **solvent management plan and determination of stack emissions** with a monitoring equipment

Total emissions from petrol storages and service stations can be estimated by **calculation programmes** and compared to ELVt. Programmes such as TANKS can be used for storage.

Document developed (1)

To answer the question, a draft document elaborated and circulated in a small group of EGTEI experts:

Description of :

- ✓ Different types of ELVs according to sectors
- ✓ Methods used to monitor the concentrations and check the compliance with ELVs
- ✓ Monitoring techniques of VOC emissions as total organic carbon with references to the European standards developed by the CEN
- ✓ Monitoring techniques of individual VOC substances with references to the European standards developed by the CEN
- ✓ Solvent management plan
- ✓ Calculation programmes for estimating VOC from petrol storages and service stations

Document developed (2)

Description of:

Monitoring techniques of VOC emissions as total organic carbon

- ✓ Short description of principles of the FID, main technique used to monitor VOC.
- ✓ Other monitoring techniques not described, just cited,
- ✓ Reference to the two existing European standards:
 - EN 13526 of November 2001 : Stationary source emissions — determination of the mass concentration of total gaseous organic carbon in flue gases from solvent using processes — continuous flame ionisation detector method.
 - EN 12619 of June 1999 : Stationary source emissions — Determination of the mass concentration of total gaseous organic carbon at low concentrations in flue gases — Continuous flame ionisation detector method.

Document developed (3)

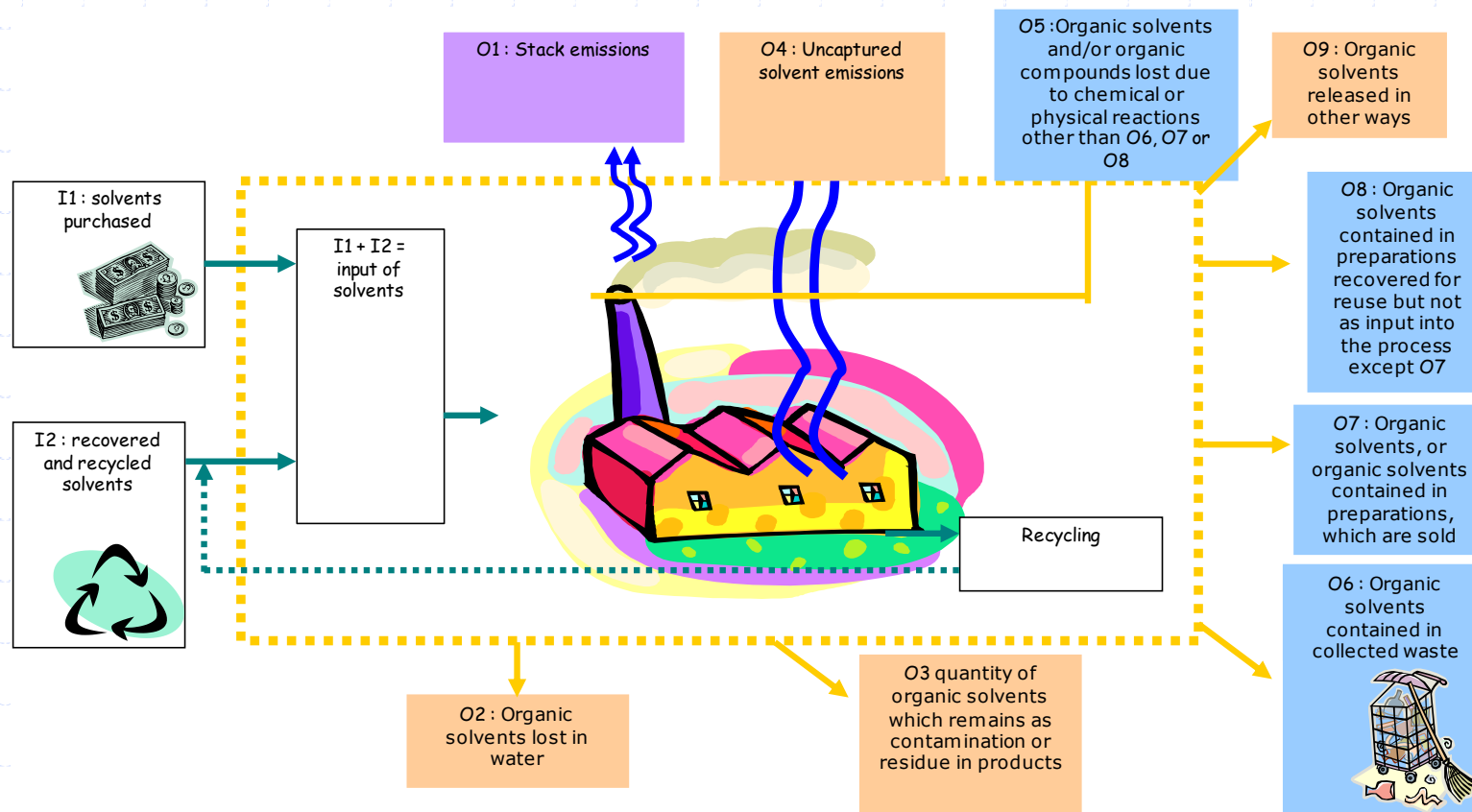
Description of:

Monitoring techniques of individual VOC substances

- ✓ Short description of principles of sampling and gas chromatography (adsorption on solid adsorbants or absorption in liquid media)
- ✓ Other monitoring techniques not described, just cited (NDIR, FTIR...),
- ✓ Reference to the existing European standard:
 - EN 13649 of 2002 : Stationary source emissions — Determination of the mass concentration of individual gaseous organic compounds: activated carbon and solvent desorption method.

Document developed (4)

Description of: Principles of the solvent management plan which was already included in the guidance document



Document developed (5)

References to :

Calculation programmes for estimating NMVOC from petrol storage and service stations

For petrol storages : Tanks - Emission calculation software provided by the US EPA.

For service stations:

- ✓ EMEP EEA Emission Inventory Guidebook – TFEIP – March 2009 – Part b chapter “NFR 1.B.2.a.v - distribution of oil products”
- ✓ CONCAWE : Air pollutant emission estimation methods for E-PRTR reporting by refineries - 2009

Remaining work

- ✓ Draft document circulated in a small group of EGTEI experts
- ✓ Comments received from one expert, other comments expected.
- ✓ Delivery of the document as an informal document to the next EB meeting in December and the next WGSR in April 2012.
Translation into Russian if possible (need for financial support)