



SOLVENT VOC EMISSIONS IN THE EUROPEAN UNION 2008-2013 and FUTURE WORK

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ACCURATE SOLVENTS INVENTORIES

- IN 2012 ESIG OBTAINED SOLVENT VOC DATA FOR EACH EU COUNTRY FOR 2008 and 2009
 - WORK INVOLVED COLLATING ALL HYDROCARBON AND OXYGENATED SALES FROM EU SOLVENT SUPPLIERS
 - TOTAL CHLORINATED SOLVENTS WERE INCLUDED
- DATA WAS REPORTED IN 18 SEPARATE END-USE SECTORS
 - THIS EXERCISE HAS BEEN REPEATED FOR 2013



VOC EMISSIONS FROM SOLVENT VOLUMES

- EMISSIONS FACTORS depend on two parameters:
 - Final end-use of Solvent
 - Type of Solvent
- FINAL END USE= Defined in REACH
- Release to air % determined from Environmental safety assessment



Examples of Final End Use

- De-icing use-all completely released to Atmosphere - 100% emission factor
- Solvents used in Drilling or Mining are not released to air- 0% emissions factor



Examples of Type of Solvent

- Not all Solvents are VOCs –depends on their BP range and Molecular Weight
- Example is Hexane (C6) –a VOC
- However, a C14-C19 hydrocarbon solvent is not a VOC
- Cosmetics end use should be released to air but cosmetics use heavy HCs so emissions factor is below 100%



Converting Solvent Data to VOC Emissions

Agrochemical uses	100% released
Use as Fuel/Combustion	0.25% released
Industrial Cleaning	70% released
Consumer Uses (household, aerosols, cosmetics)	90% released
Professional Cleaning	50% released
Pharmaceuticals	30% released



EU27 VOC SOLVENT EMISSIONS

UNITS IN KILOTONNES

	ESIG	EEA
• 2008	2159	3335
• 2009	1917	3050
• 2013	1978	2928

IMPORT/EXPORT within EU27

- Analysis of CEFIC CHEMICAL sales
- Holland, Belgium and Germany are the principal exporters of Solvents
- Some 20 countries including Austria, Poland and CZ Republic are net Importers
- UK, France and Ireland are self contained
- EU27 is assumed to consume all solvents
No net export out of or import into EU27



CHECKING ASSUMPTIONS

- In EU, no net Import/Export of Solvents
- In fact, there is a net export of Chemicals to Russia and to USA
- REACH prevents Solvent Imports into EU
- Data on Solvent Import/Exports within the EU currently being researched by CEFIC



EU Solvent VOC Emissions 2008,2009 and 2013 in ktonnes

Country	2008	2009	2013
• Belgium + Lux	77	75	51
• Germany	279	236	233
• Netherlands	57	55	66
• United Kingdom	224	203	179
• Ireland	19	16	19
• France	268	225	247

EU27 Solvent VOC Emissions 2008 2009 & 2013

Country	2008	2009	2013
Bulgaria+Romania	33	46	55
Baltic States +Finland	51	39	46
Austria+Slovenia	86	79	96
Poland	110	111	125
Hungary	24	17	14
Portugal+Spain	328	283	288
Cyprus+Greece	86	76	65
Italy	355	334	349

SOLVENT VOC EMISSIONS/CAPITA

GROUP OF COUNTRIES

- AUSTRIA + SLOVENIA 9.0
- BELGIUM+LUXEMBURG 4.8
- BULGARIA+ROMANIA 1.9
- CYPRUS+GREECE 5.9
- CZ REPUBLIC+SLOVAKIA 4.4
- DENMARK 3.5
- BALTIC STATES +FINLAND 3.9
- FRANCE 3.8
- GERMANY 2.9

VOC EMISSIONS kg/capita

- HUNGARY 1.4
- IRELAND 4.1
- ITALY 5.7
- MALTA 0.0
- NETHERLANDS 3.9
- POLAND 3.2
- PORTUGAL + SPAIN 4.9
- SWEDEN 6.0
- UNITED KINGDOM 2.8

• AVERAGE = 3.9



- **CONCLUSIONS**

TOTAL EU Solvent VOC Emissions are in decline over the 5 year period 2008-2013

Solvent VOC Emissions are available for all 18 end-use REACH Sectors for each country

Communication to EU Member States and Inventory Teams is our main objective

The distribution of Solvent VOC emissions between EU Member States will change annually relative to their individual GDPs

ESIG workshops are held regularly with Solvent Users to identify best practice in VOC reduction



FUTURE EU AIR QUALITY CHALLENGES

OZONE

Reduction of NOX remains a priority

Increasing background Ozone levels due to US and Asian air pollution needs to be addressed

ESIG supports VOC reductions in new NECD for 2020 but nothing beyond

PM

Attention will return to Secondary Organic Aerosols which will impact upon VOCs

Good science needed here- a real opportunity for the best Atmospheric Scientists



FUTURE AIR QUALITY CHALLENGES

ECONOMICS

- Legislators need to be aware of implementation costs
- A new Painting Plant in the manufacture of cars will cost 100Million€
- New NOx-controls in diesel vehicles could put some OEMs in difficulty

PARTNERSHIP

- Industry continues to give its best in reducing emissions
- Need to have a real co-operation between Industry, legislators and the scientific community



Joint Work with UK Government

COMPARISON OF DETAILED UK INVENTORY WITH REACH SECTORS

- MAIN SECTORS OF STUDY
- AEROSOLS+
- DECO PAINTS+THINNERS
- OTHER SOLVENT USE

- ARE Chemicals included?
- Are C14+ HCs included?
- Propellants are gases not Aerosol
- Only half of Aerosols are Solvents

ESIG:179kt UK: 343kt

Solvent VOC Emissions

- MAIN SECTORS OF STUDY
- 20kt vs 128kt
- 17kt vs 41kt
- 19kt vs 46kt

- Potential overestimate 159kt ?
- ESIG: 179kt UK: 184kt ?



NEW APPROACH TO EEA EMISSIONS GUIDEBOOK re SOLVENT VOC EMISSIONS

Small Team set up

- TNO
- TFEIP
- MEMBER STATES
- ESIG

Solvents Domestic Sector

- Current EEA Factor
- Average
2.7kg/capita/annum
- How has this been
calculated? What are the
constituent Sectors?
- ESIG has
1.2kg/capita/annum

