Solvent VOC Emissions for the European Union

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European Solvents Industry Group

TFEIM Istanbul May 2013
ABOUT ESIG

• Joint Activity of Oxygenated and Hydrocarbon Solvent Producers (28 Members)
• Two Sector Groups of the European Chemical Industry Council (CEFIC)
• Promotes best practice in solvent usage including HSE protection
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
  • EXAMPLES include INDUSTRIAL CLEANING and PHARMACEUTICALS
2008 HC SOLVENTS DATA

- TOTAL 2.3 Million tonnes for EU27
- OTHER category 1.7%
- Industrial Coatings 13.8%
- Use as Fuel/Combustion 11%
- De-Icing 0.4%
2008 OXY SOLVENTS DATA

- TOTAL 1.6 Million Tonnes for EU27
- OTHER category 3.8%
- Industrial Coatings 25%

- 2008 CHLORINATED SOLVENTS
  - Total 154000 tonnes
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 HC 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

- ESIG SOLVENT VOC EMISSIONS are 63-65% of those of the official EEA Inventories
IMPORT/EXPORT within EU27

- Official CEFIC CHEMICAL sales show:
- Holland, Belgium and Germany export
- 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
## EU27 Solvent Emissions 2008

<table>
<thead>
<tr>
<th>Country</th>
<th>EEA</th>
<th>Emissions (after export)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium + Lux</td>
<td>57</td>
<td>154, 77</td>
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<tr>
<td>Germany</td>
<td>669</td>
<td>685, 279</td>
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<tr>
<td>Netherlands</td>
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<td>140, 57</td>
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<td>United Kingdom</td>
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<td>224, 224</td>
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<td>Ireland</td>
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<td>19, 19</td>
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<tr>
<td>France</td>
<td>386</td>
<td>268, 268</td>
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</tbody>
</table>
### EU27 Solvent Emissions 2008

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<th>Country</th>
<th>EEA</th>
<th>Emissions</th>
<th>(after Import)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria+Romania</td>
<td>80</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>Baltic States +Finland</td>
<td>68</td>
<td>25</td>
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<tr>
<td>Austria+Slovenia</td>
<td>101</td>
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<tr>
<td>Cyprus+Greece</td>
<td>59</td>
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<tr>
<td>Italy</td>
<td>466</td>
<td>208</td>
<td>355</td>
</tr>
</tbody>
</table>
SPREADING THE MESSAGE

AIM TO INFORM ALL EU27 IN 2013

- German UBA 11/12
- UK Government 1/13
- French Authorities 2/13
- Irish Government 2/13
- IIASA-GAINS April 2013
- EMEP April 2013
- EEA-TNO April 2013
- Belgium May 2013
- TFEIM- May 2013

- Full inventory for EU27 Solvent VOCs about to be communicated on EMEP website
CONCLUSIONS

- Solvent VOC Emissions have been assessed for each EU27 country
- The data have been broken down into 18 separate end-use sectors
- The exercise has been carried out for the years 2008 and 2009
- Communication to Prime Movers and EU27

Total Solvent Emissions are between 63 and 65% of the official EEA data

- Full details available for each EU country of HC & Oxygenated Solvents
- ESIG will provide regular updates for future years
- Continue to communicate