National inventory for emissions from solvent use
- Germany -

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Agenda

- Introduction
- Methodology
- Results
- Conclusion
Emissions from solvent use are the largest source group of NMVOC in Germany

Solvent Use

- Application of solvents
- Application of solvent containing products
- Production of solvent containing products
- Application of Propellants (Propane/Butane)
- Extraction of fat, edible and non edible oil (n-hexane)
- Cooling agents
- Softening agents (Phthalates)
- Concrete additives
- Application of thinners
Solvent relevant Source groups

- Paint application
- Printing application
- Application of glues and adhesives
- Degreasing processes
- Plastics and rubber processing
- Manufacturing of solvent based products
- Domestic solvent use
- Frost protection and deicing agents
- Aerosolsprays
- Other applications

About 100 different solvent related activities are included in the German inventory
Emission calculation methodology

Solvent Balance

- Import solvent x
- Production solvent x
- Inland consumption solvent x
- Export solvent x

Manufacture

- Import chem. product y
- Manufacture chem. product y
- Export chem. product y

Consumption

- Emission reduction techniques
- Inland consumption chem. product y
- Other pathways

Emission = Inland consumption x solvent content x emission factor

Product-related calculation methodology – The calculation is operable on base of public available data
Product related approach

- Identification of solvent relevant source groups
- Determination of domestic consumption of solvent products on base of public available data
- Assignment to application fields
- Solvent content
- Emission factor
Example: Paint Application

1) Identification of relevant Product groups:
   • Water based paints and varnishes
   • Solvent based paints and varnishes
   • Powder varnishes
   • Thinners for application
   • Other thinners

2) Assignment of the Product groups to the Systematic of the Production statistic

3) Assignment of the systematic of the production statistic to the systematic of the foreign trade statistic

4) Linkage between Inland consumed specific product to specific application field (from German Paint Association)
Example: Paint application

GP-number of Production statistic:
- Paints for inside coating
  - GP 2430 11 501
- Paints for outside coating
  - GP 2430 11 503
- Other paints
  - GP 2430 11 505
- Varnishes, dispersion paints
  - GP 2430 11 507

WA-number of Foreign trade statistic:
- WA 3209 10 00

Inlands consumption
Example: Paint application

Inland consumption of paint and varnishes

- Solvent based
- Water based
- Powder
- Thinner for application
- Other Thinners

Application area

- Solvent content solvent based
- Solvent content water based
- Thinner for application
- Other Thinners

Application of specific solvent content

Application specific emission factor

Application specific emissions
Emission from paint application in Germany 2005
(Sum: 346 kt)

- Professional Painters
- Machine construction
- DIY
- Furniture Painting
- Carpenters
- Automobile manufacturing
- Other industrial
- Corrosion protection
- Plastics
- Car repairing
- Other application

Emissions in kt/a
Solvent emissions Germany 2005 (sum: 743 kt)

- Paint application: 45%
- Domestic Solvent use: 9%
- Printing processes: 13%
- Concrete additives: 6%
- Degreasing: 5%
- Wood protection: 4%
- Others: 16%

Total solvent emissions in Germany 2005: 743 kt
Emissions from printing processes in Germany 2005 (sum: 95 kt)

- Heatset Offset: 11%
- Screen printing: 11%
- Packaging: 17%
- Other Offset printing: 4%
- Illustration gravure printing: 8%
- Inks/Tusches: 0.45%
- artist colours: 0.33%
- Book printing: 0.2%
- Other: 30%
- Sheet fed Offset: 19%
- Book printing: 0.2%
- Other: 30%
- Sheet fed Offset: 19%
- Illustration gravure printing: 8%
- Inks/Tusches: 0.45%
- artist colours: 0.33%
- Book printing: 0.2%
- Other: 30%
- Sheet fed Offset: 19%

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NMVOC emissions from domestic solvent use (sum: 69 kt)

- Hair sprays: 25%
- Pharmaceutical agents: 4%
- Cosmetics and personal hygiene agents: 28%
- Cleaning agents: 16%
- Perfumes: 16%
- Maintenance agents: 11%
NMVOC emissions from solvent use in Germany distinguished by new Guidebook sectors

- **3 A 1 Decorative coating application**: 15%
- **3 A 2 Industrial coating application**: 24%
- **3 A 3 Other coating application**: 3%
- **3 B 1 Degreasing**: 6%
- **3 B 2 Dry cleaning**: 0.1%
- **3 C Chemical products**: 7%
- **3 D 1 Printing**: 14%
- **3 D 2 Domestic solvent use**: 10%
- **3 D 3 Other product use**: 21%
Conclusion

- NMVOC emissions from solvent use activities are the largest source group of NMVOC in Germany (743 kt from 1128 kt in 2005)
- Germany calculate the emissions from solvent use on base of a product related method, based on public available data
- The German solvent use inventory works with a product related approach with regular plausibility checks by industrial stakeholders as far as possible
- The inventory has been permanently improved and actualized over the last years
- This very detailed inventory is the base for all reporting obligations for the solvent sector which need to be fulfilled by Germany
Thank you for your Attention
### Example: Paint application

### 3A: Anwendung von Farben und Lacken

#### - Nebenrechnung

**Berechnung der Inlandsverbräuche nach Lackarten**

<table>
<thead>
<tr>
<th>Lackbezeichnung</th>
<th>Zuordnung</th>
<th>Verbrauch - Inland</th>
<th>Außenhandelssstatistik</th>
<th>Produktionsstatistik</th>
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<td>Anstrichfarben für den Innenanstrich</td>
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<td>482.553</td>
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<th>Anwendungsbereich</th>
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