Implementation and Development of an Internet Based Information Exchange Network between EU-Member States, the European Commission and Small and Medium-Sized Enterprises (SME)

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Abstract

The EU-Solvent Directive (Council Directive 1999/13/EC on the limitation of emissions of VOC due to the use of organic solvents) lays down emission limit values for twenty different categories of installations using solvents. These limit values are determined depending on the applied production processes and the installation capacity. Therefore, companies are obliged to take measures in the near future to reduce emissions. Information about the way of compliance with the Directive is needed. Articles 7 and 8.5 of the EU-Solvent Directive shall ensure that an exchange of information between Member States and the activities concerning the use of organic substances and their potential substitutes takes place. The objective of a new and comprehensive information exchange forum is to provide high quality, focused information for all users affected by the Solvent Directive and to offer the possibility to up- and download specific information for each activity and Member State.

Introduction

The photochemical air pollution represents a major problem of clean air activities in most industrialised and densely populated regions. Photooxidants such as ozone are not directly emitted into the atmosphere, but formed under the influence of sun irradiation out of the components nitrogen oxides (NOx) and volatile organic compounds (VOC). A variety of VOC emitting activities is concerned such as coating, surface degreasing, dry cleaning, etc., which are mainly carried out in small enterprises, the contribution to the total emissions of which however is considerable.

The EU-Solvent-Directive 1999/13/EC is one of the measures adopted by the European Union to improve ambient air quality in Europe. It aims to reduce the

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emissions to air of VOC emissions arising from the use of solvents. Articles 7 and 8.5 of the Directive indicates that the Commission shall ensure an exchange of information between Member States and the activities concerned on the use of organic substances and their potential substitutes. In this paper the requirements for the content of an information exchange network and its implementation is described.

Requirements for an information exchange Network

Provisions of the EU Solvent Directive

The EU Solvent Directive lays down emission limits for twenty different categories of installations using solvents (table 1). These limits are determined depending on the applied production process and the installation capacity. In general, companies have to fulfil the requirements set by the EU Solvent Directive from 2001 (new installations) respective 2005 (existing installations). Furthermore each member State had to implement the requirements of the EU Solvent Directive until April 2001 into their respective national laws. However in most Member States the implementation process has not yet been completed.

<table>
<thead>
<tr>
<th>Coating Use</th>
<th>Printing and Adhesive Use</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle refinish</td>
<td>Heatset printing</td>
<td>Surface cleaning</td>
</tr>
<tr>
<td>Coil coating</td>
<td>Publication gravure printing</td>
<td>Dry cleaning</td>
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<tr>
<td>Other coating</td>
<td>Other printing</td>
<td>Wood impregnation</td>
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<td>Wood coating</td>
<td>Footwear printing</td>
<td>Coating manufacture</td>
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<td>Leather Coating</td>
<td>Wood/plastic lamination</td>
<td>Rubber conversion</td>
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<td>Coating of winding wire</td>
<td>Adhesive coating</td>
<td>Vegetable oil extraction</td>
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<td>Vehicle coating</td>
<td></td>
<td>Pharmaceutical manufacture</td>
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</table>

Table 1: Industry sectors affected by the EU’ Solvents Emissions

Consequences of the implementation of the Solvent Directive

Because solvents are important to many industrial sectors in Europe, the key consideration of the Directive has been to allow a maximum flexibility in meeting the requirements of the Directive. This flexibility will allow users to continue using solvents where they need to, by using a range of end-of-pipe abatement solutions, as well as primary measures such as product and technology substitution.

In practice more than 400 000 enterprises in the EU are concerned by the Directive. In comparison to larger companies, small and medium-sized enterprises (SME) are generally not well informed about the measures which could help them to reduce costs and emissions, because of their limited personal size and cash flow. Consequently, the diffusion of environmentally sound products and technologies is often in-
sufficient. Especially the lack of appropriate tools for measuring, recording and analysing the characteristic data hampers meaningful analyses with regard to necessary investments, costs savings and environmental benefits, induced by new processes.

As an example, the vehicle refinishing sector in Europe uses about 140 000 t/a vehicle paints. The paint industry supplies 90,000 body shops in Europe, nearly all small and medium sized enterprises (SME) (CEPE 2000). The EU Solvent-Directive includes specific requirements for Solvent Management Plans (SMP). Any vehicle refinishing body shop has to establish a solvent management plan, unless they utilise water based coating systems. By this, the defined target emission reduction and a reduction scheme for VOC emissions in Europe are aimed at. Figure 1 offers an overview on the threshold values and the alternatives for the fulfilment of the requirements set by the EU-Solvent-Directive and its transposition into national law.

Considering the high flexibility of the directive, the different national requirements and the enormous range of possible reduction strategies information about the way of compliance with the Directive for the sectors encompassed by the Directive is needed. This could be realised by forcing a transparent cooperation between Industry, national member state representatives and the European Union.

Figure 1: Reduction strategy for vehicle refinishing [Rentz et al. 2001, S.4]

**Defined Requirements for an Information Exchange Network**

Thus an information exchange network is being created based on the internet the which provides focused information for all users affected by the EU Solvent Directive. For the design and implementation of this environmental information system, the following aspects had to be considered:

- Provide generic guidance applicable to all sectors encompassed by the Directive in various languages
• Ensure that the flexibility allowed by the Directive is clearly indicated
• Establish the internet exchange forum on more technologically advanced but easier to use sites, which are accessible to all users no matter what their internet capabilities are
• Allow a decentralize structure, where documents already been developed could be provided directly by the user
• Provide a flexible content maintenance structure

The consideration of these aspects is crucial for the dissemination of guiding information to the thousands of facilities concerned (e.g. from a user in an SME to a multi-national Company).

Figure 2: Comprehensive mass and energy flow management in SME

Content of the Information Exchange Network

Guiding information as Decision Support

In the particular case of SME, a generic classification of processes is useful in order to generate more specific decision support for choosing the right measures to meet the requirements of the EU Solvent Directive. Therefore established guidelines based on mass and energy flow analysis of reference companies are provided, in order to give the possibility for SME to establish their cost-effective solvent emission reduction strategy (e.g. Möller/Rolf 1995; Blümel 2001). By imaging the way of operating, mass and energy flow models help to disseminate the consequences of new technologies and products on the whole production process. Thereby possible environmental and economic potentials can be identified. For the broader dissemination of the achieved results, practical guidelines with checklists and market analyses foster the introduction of new products. If all technically and economically feasible options for emission reduction were described, an enormous selection of VOC emission reduction options could be offered to companies (cf. figure). Thanks to the improved information the diffusion of products and processes for VOC emission reduction should be fostered.
Network structure

For each sector covered by the Directive, information about relevant environmental and economic legislative requirements, abatement options and effects of alternative production processes has to be provided. Thus, the platform includes generic guidance applicable to all sectors encompassed by the Directive. In this framework tools for the establishment of SMPs, reduction schemes, compliance checks, guidelines for the introduction and use of new products and case studies are provided (Rentz et al. 2001, p. 10).

Implementation of the information exchange Network

The area of content and Web development is changing at a rapid pace as new technologies become available. New guiding documents appear, hyperlinks become useless. Therefore the information exchange Network has been realised with the Content Management System "RedDot Solutions". This publishing system is particularly developed for maintaining and storing contents for larger projects.

In order to ensure a dynamic actualisation of information a decentralised structure of the network has been chosen: Within the internet area concerning the guiding information users can download documents on the one hand but on the other hand users can also directly provide documents on the web. This dynamic area on the network is realised by the database „MySQL“ and applying PHP-Programming language. The provided documents by the users can be published on a defined appearing date. This allows a quality control of the sites and the provided content.

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Figure 3: Overview of the modules of the information exchange network

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2 Some features of the used content management system are the easy design, production and linking in one step, user authorizations and production of templates (RedDot 2001)
Summary

Because of the high flexibility of the EU Solvent Directive and the enormous range of possible reduction strategies an information exchange between Industries, national member state representatives and the European Union is needed. In particular case SME are overstrained by the generation of cost-effective emission reduction strategies. The provision of information about the requirements of the Solvent Directive, the dissemination of existing guidelines, tools and case studies based on mass and energy flow management and the possibility of discussion about the alternative reduction strategies supports the implementation of the Solvent Directive in a cost-effective way. The content maintenance of the internet based network is realised with a content management system and a decentralised dynamic network structure.

Bibliography


