SOLUTIONS
THE NEWSLETTER OF THE EUROPEAN SOLVENTS INDUSTRY GROUP

SOLVENTS: SIMPLY ESSENTIAL

SOLVENTS AND OUR CULTURAL HERITAGE; THE OZONE DEBATE; TEN YEARS OF PROGRESS FOR ESIG; SOLVENTS STEWARDSHIP AWARD 2007.

How do YOU interpret the SOLVENT EMISSIONS DIRECTIVE?

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RESTORING AND PRESERVING OUR CULTURAL HERITAGE

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The Mazarin Chest (late 1630/ early 1640); a unique and valuable object.

Time and tide wait for no man. On the subject of museum artefacts, man's only tools for resisting time are efficient preservation techniques, good maintenance and conservation.

Solvents play an essential role in cleaning and preserving these valuable objects.

The Victoria and Albert Museum in London has one of the world's largest collections of decorative art.

In 2004, the Victoria and Albert Museum began a conservation project to restore the Mazarin Chest, a piece of furniture which the V&A's conservation department found in state of significant deterioration, with the colours fading and decorative elements coming unstuck.

The chest was in urgent need of stabilisation and treatment as the poorly adhered lacquer and decoration belied much of the artistic, aesthetic, historical and technical value of this object.

The chest had in the past been treated with wax and, on another occasion, a non-drying oil. Therefore, the solvent had to be carefully matched to the material that needed to be removed, while avoiding interaction with the original substrate.

Conservators all over the world use different kinds of solvent-based mixtures to soften and remove previous layers of grime, wax or resin and to apply and enhance certain properties of new coatings. ESIG members continue to develop and improve their products based on society's needs while always bearing in mind environmental and health impacts.

To see an extended version of this story, visit www.esig.org

© Victoria and Albert Museum

The detail on the Mazarin Chest is extraordinary; a whole range of different decorative techniques is used, from mother-of-pearl inlays to metal fittings.

ESIG AWARD 2007

The European Solvents Industry Group (ESIG) has launched its sixth Solvents Stewardship Award to showcase and reward examples of best practice within the solvents industry.

Any company that is able to demonstrate health, safety and environmental improvements in the handling and use of solvents is eligible to enter this year's award. Applications need to be submitted to the ESIG Secretariat by no later than 15th May, 2007 and the relevant form can be found at www.esig.org.

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ESIG RUNS PROJECTION MODELS TO ASSESS FUTURE EUROPEAN GROUND LEVEL OZONE

The Solvents Industry is committed to the improvement of air quality in Europe, and has been closely following scientific developments on air pollution. The European Commission issued a Thematic Strategy on Air Pollution in 2005, calling for further emission reductions by 2020 of about 340kt of Volatile Organic Compound (VOC) emissions from industrial solvents use based on modelling projections.

In response to this, in 2006, ESIG commissioned two model runs and examined the results of a third independent model (the Harwell Trajectory model by Derwent), to project ozone levels following certain VOC regulatory measures. These two models were:

- the Chimere Model developed by L'Institut National de l'Environnement Industriel et des Risques (INERIS) and used in French Government scenarios, and
- the LOTOSEUROS Model developed by Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek (TNO) in the Netherlands.

The model runs calculated ozone reductions by way of two theoretical scenarios: one based on VOC reactivity (where high reactivity solvents are replaced by low reactivity ones) and one based on "mass-based" VOC reduction (where all VOCs are considered to react equally).

The results

Further VOC emission reductions only have minor effects on ozone

The results from the models show that any additional reduction of VOC from solvents within the boundaries of what is technically feasible will deliver only minor improvements on ozone level: < 1% ozone reduction expressed as micrograms per cubic metre (ug/m3).

The work of both INERIS and TNO showed that removing all solvent emissions from industrial applications, a non-realistic scenario tested as a sensitivity case, would have an average reducing effect on ground level ozone of only 5%! In some urban areas with high nitrogen oxide levels (NOx levels), the reduction could be higher, but in some remote areas, hardly noticeable at all. Real effects on ground level ozone are also closely linked to NOx reduction.

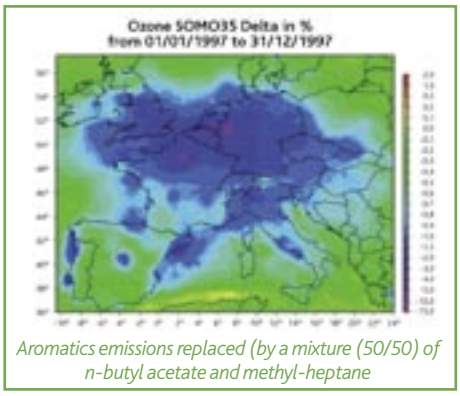
Reactivity could deliver a greater ozone reduction than mass-based VOC reduction

When comparing the selected reactivity scenario and the mass-based scenario, the Chimere Model used by INERIS demonstrated that the hypothetical 'aromatics substitution' scenario delivered more ozone reduction related to human health indicators, such as SOMO35, than a pure mass-based VOC emissions reduction. This model also showed that ozone is not increasing in downwind ozone areas as a result of using less reactive VOCs - a concern that has been expressed occasionally. The independent Harwell Trajectory Model confirmed that a reactivity strategy might be more effective, although technical feasibility of the proposed substitution is still to be established. The LOTOSEUROS Model was inconclusive on reactivity, as it is based on less detailed chemistry.

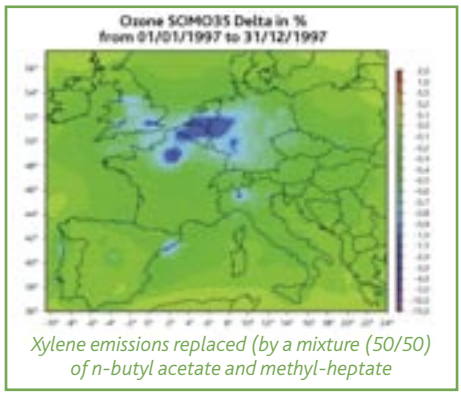
INERIS MAPS: three scenarios

The key finding from this modelling exercise was that neither mass-based nor reactivity-based VOC emission reductions will deliver further sizeable ozone reduction once current legislation is fully implemented.

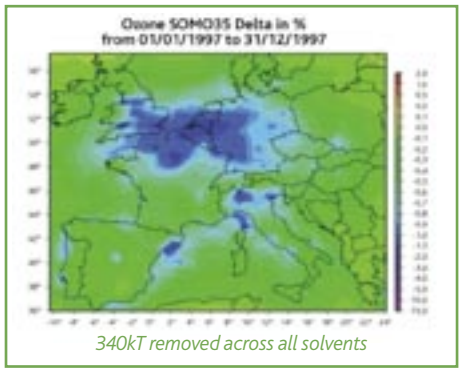
The priority of legislators and of industry should, therefore, remain focused on implementing existing legislation; this will be a more effective method of reducing ozone than introducing additional VOC legislation.



Aromatics emissions replaced (by a mixture (50/50) of n-butyl acetate and methyl-heptane



Xylene emissions replaced (by a mixture (50/50) of n-butyl acetate and methyl-heptate



340kT removed across all solvents

Model: Chimere

Relative differences (in %) for SOMO35 ozone indicator between 2010 base case (existing legislation fully implemented) and the VOC control scenario indicated on each map (also in 2010).

Transboundary air pollution has a huge impact on air quality in Europe

According to recent modelling work done by the International Institute for Applied Systems Analysis (IIASA) for the United Nations Economic Commission for Europe (UN ECE), emissions from non-EU countries are expected to contribute to the ozone levels in 2010 by some 3 ppb, in addition to the current ozone background level.

A major concern is the transboundary pollution from other regions of the Northern hemisphere, Asia in particular. Previous work (see Solutions, summer 2005) has shown that background ozone is increasing by 0.5 ppb per year in Europe due to non-European emissions.

External emissions will have a substantial impact on European ozone levels. There is even a risk that future EU27 ozone reduction efforts will be completely wasted, in terms of health effects improvement, by increasing emissions from other regions.

European industry has played its part and emissions of ozone precursors now have to be addressed at international level. ESIG is urging the EU to consider the global impact of emissions on European ozone by working with the UN ECE and Asian countries to contribute to substantial emissions reductions.

ESIG CELEBRATES TEN YEARS OF PROGRESS

Last November, the European Solvents Industry Group (ESIG) hosted a special cocktail event to celebrate its tenth anniversary.

Held at the prestigious Musee Bel Vue in Brussels, the event brought together existing and former ESIG members as well as a variety of people with whom ESIG has worked closely during the last decade. Key figures from this period included the first ESIG chairman, Peter Hudson, subsequent chairs Bert Fokkema and Nigel Sarginson, regulators and representatives from trade associations. All of these people have helped to build ESIG's reputation as the well-renowned voice of the solvents industry.

ESIG was established in 1996 to support the sustainable and responsible use of solvents through dialogue, information-sharing and solutions that address health, safety and environmental issues. The cornerstone of ESIG's work has been to help industry reduce Volatile Organic Compound (VOC) emissions for the benefit of society and the environment.

ESIG represents Europe's major solvents manufacturers including BASF, Dow Chemical, ExxonMobil Chemical Europe, Ineos, Shell Chemicals and Total. ESIG's key audiences include regulators, solvent-using industries and the media.

In addition, ESIG member companies also participate in the work of the European Solvents VOC Coordination Group (ES-VOC-CG), which represents the views of the European solvent-using industries.

Guests celebrate ESIG's achievements.

The event was highlighted by keynote speeches from current chairperson, Sylvie Lemoine, and other senior figures from industry and the European Commission.

The general opinion of delegates was that the event marked ten years of progress for ESIG. Sylvie Lemoine said: "Since 1996, ESIG has been trying to educate key stakeholders that solvents are simply essential to everyday life and that they can be used responsibly and safely within the existing legislative framework".

SOLVENTS USERS' INPUT ON SOLVENT EMISSIONS DIRECTIVE NEEDED

The European Commission has launched a project to update the existing interactive information exchange forum with practical guidance on the implementation of the Solvent Emissions Directive (SED).

The Commission is now asking industry to submit guidance documents that they feel are relevant and useful. ESIG has been contacted and is cooperating in this process.

ESIG is also working on its own Questions & Answers study on the implementation of the SED. Solvent-using industries have asked numerous questions on the definitions and correct interpretation of the SED. These will now be compiled and an industry expert will attempt to incorporate answers within the Q&A document.

For the purpose of both studies, solvent-using companies are being invited to submit their questions and comments via the ESIG website.

Designed to limit emissions from volatile organic compounds (VOCs) into the environment, the deadline for compliance for the SED is 31st October, 2007.

The new updated Commission exchange forum is the perfect opportunity for solvent-using companies to exchange information and best practices. ESIG fully supports this initiative and will contribute with its own research and documentation. Industry believes that a fully implemented SED will effectively contribute to the reduction of ozone levels in Europe.

Contributors should submit their questions before 1st March by visiting www.esig.org and clicking on the relevant link.

ESIG AWARD 2007

Group shot of award winners from 2004

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Entries will subsequently be considered by an independent expert panel of judges and the winner will be invited to a glittering ceremony in autumn, 2007.

The award was first created by ESIG in 1999 to promote and share best practice and allow for continuous improvement in the use of solvents.

John Greenhough of Shell Chemicals and chairperson of the ESIG Product Stewardship group, said: *"The high-profile Solvents Stewardship Award will once again bring deserved recognition and credit to companies and organisations that can best demonstrate improvements in the responsible, safe use of solvents. It gives all solvent users the perfect opportunity to highlight their commitment to product stewardship and the Responsible Care® programme."*

SOLVENT-USING INDUSTRIES GIVE STRONG INPUT IN IPPC BREF PROCESS

The European Integrated Pollution Prevention and Control (IPPC) Bureau in Seville has prepared the first Best Available Technique Reference document for Surface Treatment using Solvents – the "STS-BREF". For further details, see Solutions, issue 15.

ESIG and ES-VOC-CG have given strong input by providing details on technologies, feasibility of abatement techniques and costs. 'Industry cooperation along the process has worked very smoothly and numerous sector organisations have been actively contributing detailed and thorough technical information', commented Paul Verspoor, the chairman of the ES-VOC-CG IPPC working group.

The IPPC Bureau in Seville has been particularly pleased and Luis Delgado, acting head of the Bureau, stated: 'I was very pleased by the high level of expert input and preparation by the majority of industries, as well as their suppliers [...] due in large part to the role of ES-VOC-CG'.

Industry was asked by the IPPC Bureau to calculate how much money it has spent during the two years in the BREF preparation process. The current estimate runs to around 2 million euros.

The document has been approved by the IPPC Information Exchange Forum (final stage in the process) on 7th December and will be used for permitting from 2007. ESIG believes that this BREF will further contribute to the reduction of VOC emissions from solvent use already regulated via the Solvent Emissions Directive, and therefore effectively contribute to ozone reduction.

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