



THE CHALLENGE OF VOC EMISSIONS INVENTORIES AND EUROPEAN OZONE

Ozone is formed in the atmosphere by photochemical reactions between volatile organic compounds (VOCs) and nitrogen oxides (NOx) in sunlight. As a secondary pollutant, it knows no international boundary. Predicting its emissions depends upon accurate emission inventories for VOCs and NOx. There are three sources of VOCs in the atmosphere: biogenic VOCs from trees and plants, VOCs from mobile sources, and solvent VOCs.

Biogenic sources have been extensively researched. Isoprene, the most reactive VOC emitted from trees, accounts for over 30% of the biogenic total, which now adds up to 13 million tonnes in Europe.

VOC emissions from mobile sources are well researched too, largely coming from the tailpipe of the petrol engine. These emissions have declined substantially over the past two decades with the advent of three-way catalysts and modern engine technology, and now total about two million tonnes in Europe.

Solvent VOC emissions used to be regarded as a mystery, and largely overestimated by EU Member States. Over the past seven years, ESIG has been calculating the VOC emissions from solvents using real solvent sales data provided by ESIG suppliers. ESIG air quality experts have set emissions factors for each of the solvent sectors to calculate the total solvent VOC emissions. ESIG's most recent calculations (2015 numbers) show that total solvent VOC emissions for the EU28 are just under two million tonnes, which means they have stabilised since 2013 and fallen by 60% since 2008. These results are published in our newest ESIG Position Paper :

[Solvent VOC Emissions in the European Union 2008 to 2015](#)

The figures show how industry has played its part in reducing man-made VOC emissions from mobile sources and solvents. Biogenic sources now dominate VOC emissions in Europe.

ESIG is also liaising with EU Member States on solvent VOC emissions to examine why their assessments sometimes differ. We found that non-solvents are often included in their inventories, including

propellants (which are gases and not solvents), heavy hydrocarbons (C14 plus), and aerosols, which might be the cause for over-estimated emissions.

ESIG's work has led to the creation of a solvent emissions factor per capita for each European country or group of countries to guide Member States as they strive to set up accurate solvent VOC emissions inventories.

As for ozone concentrations in Europe, they are expected to fall further as NOx emissions are reduced: the motor industry is cutting NOx emissions from new diesel engines and introducing more efficient hybrid engines and electric vehicles. The next decade will see further cuts in ozone levels as these improvements continue and older diesel vehicles are removed from European roads.



CEFIC BOX

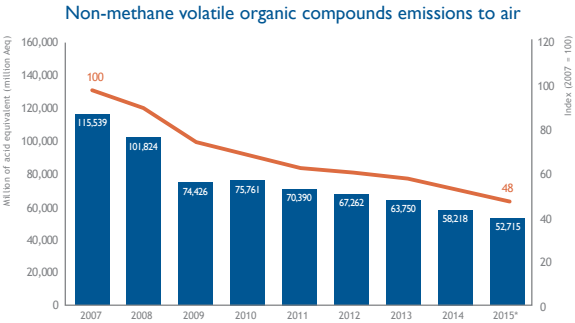
EU Chemical Industry regains confidence following the overall economic recovery

The updated Cefic Facts and Figures show that there has been a solid 3% growth of chemical output in the EU in 2017, driven by a growing demand from customer industries.

The figures also show that the chemical industry has managed to decrease its emissions of non-methane volatile organic compounds (NMVOC) by 54% between 2007 and 2015. The chemicals sector contributed to this reduction through a change from solvent-based to water-based paints, process optimization to reduce emissions, and higher levels of solvent recycling.

A slight deceleration to around 2% is foreseen for 2018. Petrochemicals still account for over one quarter of EU chemical sales and exports. Responsible for 1.1% of the EU's Growth Domestic Product and employing 1.2 million people, the EU chemical industry supplies virtually all sectors of the economy and is the third largest investor in EU manufacturing industries.

For more information, please read: [Cefic's Chemical Industry Profile](#)



— EU specific NMVOC** emissions (per production unit)
■ EU NMVOC** emissions (tonnes)

Sources

E-PRTR and Cefic Chemdata International
* Emission data in Italy are not available for 2015
** NMVOC = Non-methane volatile organic compounds

Unless specified, chemical industry excludes pharmaceuticals
Unless specified, EU refer to EU 28

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DOWNSTREAM USERS BOX - INFORMATION FROM FEICA

Harmonised reporting obligations for hazardous mixtures in Europe

In March last year, the Official Journal of the European Union published a new annex to the Classification, Labelling and Packaging (CLP) Regulation of substances and mixtures. The publication of Annex VIII effectively sets deadlines for notifying hazardous mixtures to appointed bodies in a harmonised way across the EU. The first deadline for the reporting of hazardous mixtures supplied to consumers is 1st January 2020.

This is no small task. ECHA is setting up technical and scientific guidance tools for companies in the EU, with the support and feedback from industry representatives of the main affected sectors.

Much is being done already. FEICA (the Association of the European Adhesive & Sealant Industry) is pleased to be involved in the preparation of the guidance document, which will help companies comply with the new obligations, including the printing of Unique Formula Identifiers (UFI) on labels. It will also become mandatory to use a harmonised Product Categorisation System (PCS) and Poison Centre Notification (PCN) format in industry notifications.

Any importers or downstream users placing mixtures classified as hazardous for human health or with physical hazard on the EU market are subject to these new requirements hence it would be advisable for them to start identifying mixtures that require notification. This should go hand in hand with an early data collection such as the product identifier, UFI, contact details, hazard identification, information on mixture components, and even additional information such as type of packaging, product category and intended use. As there will also be new online tools, FEICA advises users to start considering the resources necessary for IT changes or updates within the organisation.

More on poison centres is available on the ECHA website: <https://poisoncentres.echa.europa.eu/>.



SOLUTIONS

Summer 2018



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Dear reader,

It is my pleasure to introduce this new edition of our Solutions newsletter.

Over the first few months of 2018, we have launched new activities, moved ahead with existing actions, and finalised several projects, which Solutions will tell you more about.

Let me just point out one example of a new activity: ESIG has signed up as a partner for the new EU-OSHA (European Agency for Health and Safety at Work) campaign. The topic 2018/2019 is 'Managing Dangerous Substances' and we look forward to sharing ESIG's best practices, initiatives like the Introduction to the Solvents Industry Training, and our multiple materials at several occasions throughout the next months.

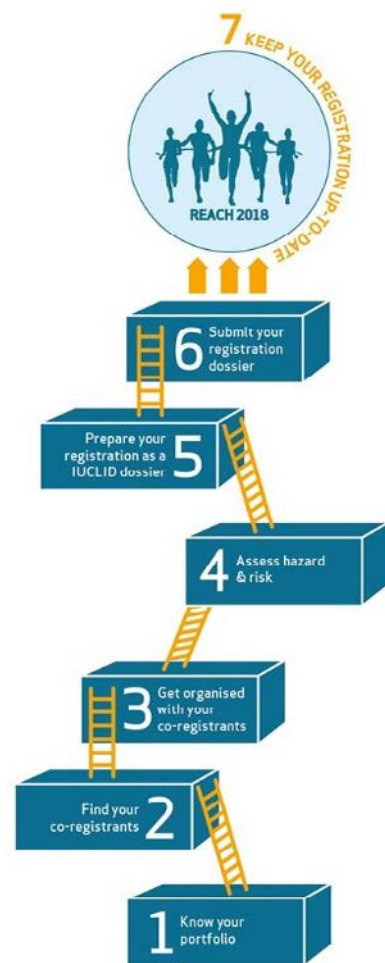
As a highlight, we have updated the Technical Position Paper on our Solvents Inventories with the most recent numbers (2015). It shows that solvent VOC emissions have stabilised in the EU28 since 2008 at just under two million tonnes. This is about a third less than EU Member States' estimates for VOC emissions.

There is much more to talk about, so please enjoy discovering more about our industry and its commitments on the next few pages.

I would also like to invite you to share any comments or to contact us should you wish to receive more information on specific topics.

With my best personal regards,

Cornelia Tietz
Secretary General

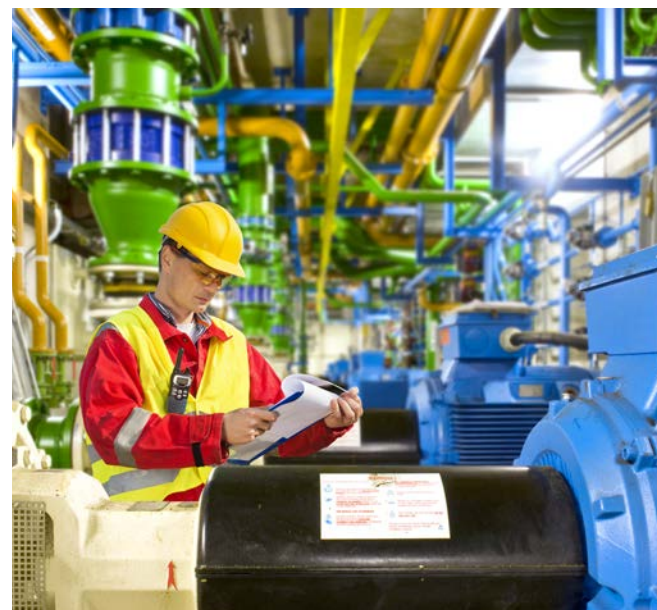


REACH DEADLINE?

The last REACH deadline for registrations above one tonne was fast approaching and has passed now: 31st May 2018.

For this low tonnage band deadline, many registrations were co-registrations of substances registered under the higher tonnage band deadlines.

However, this last registration deadline is not the end of the story, as it marks only the end of the 'R' phase of REACH. Dossier updates will continue through the REACH processes in the years to come whenever new information becomes available – and there will be ongoing evaluations and authorisations initiated by the regulators. One example, already mentioned in an earlier newsletter, is the Petroleum and Coal stream Substances (PetCo) Working Group organised by ECHA, a collaborative stakeholder initiative in which the solvents industry is participating. This joint platform should facilitate the work of industry, which is mainly focusing on improving registration to enable substances to be efficiently identified for further work and on generating the necessary hazard data, whether directly (e.g. testing proposal) or through compliance check or substance evaluation where needed. Last but not least, it should then help the work of authorities in identifying whether and what regulatory risk management is needed on PetCo substances.



UPDATING THE RECIPROCAL CALCULATION PROCEDURE (RCP)

The Hydrocarbon Solvents Producers Association (HSPA) actively supports the safe use of hydrocarbon solvents (HCS) by developing tools that help users comply with occupational exposure levels (OEL). Because HCS have complex compositions, a proposed approach is to calculate OELs using a simple mixture formula in which "group guidance values" are assigned to similar constituents.

This approach is called the reciprocal calculation procedure (RCP) and is supported by robust toxicological studies of hydrocarbon solvents and their constituents. Group guidance values (GGV) are based on the principle that HCS have similar and additive toxicological effects. Where toxicological differences exist, the RCP assesses these exceptional constituents separately by their so called 'single substance values' which are in practice the single substance specific OELs.

The RCP has two principal aims:

- To harmonise the setting of OELs for hydrocarbon solvents so that manufacturers can provide consistent advice for compositionally similar products
- To ensure that existing national OELs for individual constituents are not exceeded by respecting the calculated RCP value of the hydrocarbon solvent

The methodology was first published in 2005, and then updated in 2017. The update took account of new information available for REACH registrations, the review of the current OELs for typical HCS constituents, and an in-depth review of the available toxicological information.

The RCP background and update was presented in a workshop at ESIG's offices on 5th February 2018. It included practical demonstrations with a simple RCP calculator developed by HSPA on how to use these recommendations to develop occupational exposure advice in different situations (from simple complex solvents to blends of complex solvents). The demonstration also showed

how to calculate OELs for solvent blends where the components have differing vapour pressures, which may create substantial differences between the liquid and vapour phase compositions.

The workshop also looked at the particular situation of RCP in Germany. The Technical Rules for Hazardous Substances (TRGS) 900 workplace exposure limits for Germany have been updated, but they are not consistent with the rest of the EU and the United States. This is because the group guidance values (GGV) endorsed by the new TRGS 900 introduce adjustments that are toxicologically justified in a different way. This approach was objected, criticised and refuted by HSPA toxicologists at the time when the TRGS 900 discussions took place. Unfortunately, and contrary to the RCP aims for harmonised OEL advice, Germany will have to adhere to a different OEL. To help our members comply with TRGS 900, the RCP calculator has a special feature, in which the "German RCP" value can be calculated.

HSPA will continue to advocate science-based policy and promote tools that ensure safe use of HCS.



NEW STUDY ON THE EFFICIENCY OF RISK MANAGEMENT MEASURES

Under the REACH Regulation, chemical safety assessments (CSAs) need to be developed as part of the registration for hazardous substances. The CSA must include an assessment for workers, consumers and the environment covering the exposures arising from all uses of a substance. The exposure assessment considers those controls or risk management measures (RMMs) that need to be in place to limit exposure to acceptable levels.

Solvents are chemical substances found in almost all sectors of everyday life and their safe handling typically requires the implementation of RMMs to control exposure. In order to verify the effectiveness of these controls for solvent users, ESIG worked with the Fraunhofer Institute for Toxicology and Experimental Medicine (ITEM) to study the efficiency of RMMs used during the transfer of solvents. For this study, a series of laboratory simulations were conducted to determine the reduction in airborne vapour levels that might be afforded by different combinations of workplace exposure controls typically encountered when handling volatile solvents.

Each of the typical control measures or combination of control measures used (containment, extract ventilation and drum pump), were confirmed to reduce average emissions by more than 90% under experimental conditions. The study was published in the Annals of Work Exposures and Health: <https://academic.oup.com/annweh/article/62/1/112/4638323?guestAccessKey=6282fca9-87c9-4682-b72c-beee0723ff16>.

Recently, ESIG has embarked on a new study together with ITEM to identify the potential inhalation (vapour and aerosol) and dermal exposure levels that may occur during industrial and professional spraying activities without exposure controls in place. This study should shed more light on the performance of the European Centre For Ecotoxicology and Toxicology of Chemicals (ECETOC) Targeted Risk Assessment (TRA) model that has been applied to estimate exposure for many of the substance CSA's carried out under REACH.

EU-OSHA CAMPAIGN

The *Healthy Workplaces* Campaigns are a major awareness-raising activity organised by the European Agency for safety and Health at work (EU-OSHA). The campaigns are the largest of their kind in the world, and ESIG has been a partner for many years. On 24th April, OSHA launched the 2018/2019 campaign entitled 'Healthy Workplaces - Manage Dangerous Substances': <https://healthy-workplaces.eu/> and we signed up as a campaign partner again for the next two years. Our ambition is to be actively involved: not just by promoting the campaign but by reaching out with our industry expertise, sharing best practice and materials such as the Best Practice Guidelines, the safety films on handling and transport of solvents and so on.

Be sure to read more about it in the Winter Newsletter!



INTRODUCTION TO THE SOLVENTS INDUSTRY

Another well-attended training course on solvents took place on 24th April 2018 hosted by Total Fluides SAS in Paris.

This training is an introductory course to the solvents industry. It is designed for newcomers to the sector and other professionals looking to refresh their knowledge about solvents, particularly for those in commercial or administrative areas. The course is run with the UK-based Solvents Industry Association (SIA) and is purposely kept small (no more than 15 places) to ensure dynamic discussions.

A second training will be held on 21st November 2018 in Brussels. Please check out our website for further information and online registration: <http://www.esig.org/product-stewardship/training/>.

