

# 2014-2015

**Maintaining Momentum  
in Uncertain Times**

Chlorine Industry Review

Online copies (PDF files) are available at [www.eurochlor.org](http://www.eurochlor.org).

Paper copies can be easily ordered via [the contact form](#) on the same web site.

The pictures in this Review all show '**chlorine things**': this is Euro Chlor's way of illustrating that chlorine chemistry based products and applications are omnipresent and indispensable to everyday life.

Chlorine Things create real added value and benefits for each and every one of us. Check hundreds of examples on [www.chlorinethings.eu](http://www.chlorinethings.eu).

it's a  
chlorine  
thing.



*Windows treated with a special titanium dioxide coating become self-cleaning through the action of sun and rain*



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CHLORINE THING

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## Crisis - Whose Crisis?

Is there a crisis at the moment? Well I suppose it depends on who you are, where you live and what you do for a living amongst a whole number of other scenarios.

Putting aside the obvious ones of Greece, the Eurozone, global terrorism and airport queues, my personal view in the context of Euro Chlor is that there is no specific crisis affecting our industry in a singular way. For some member companies I guess there will not be agreement on this, as there is a constant pressure to ensure that the EBIT line is at least positive which means success in the constant battle for sales at a price which generates margin and cash.

There can be no doubt that for some these represent crisis conditions where the ability to control costs in a market where there is little room for price negotiation is key. In a fiercely competitive market this will certainly feel like being caught between a rock and a hard place. Added to this is the need to cover the cost of past investment in membrane technology, and for those who have yet to quit using mercury technology, to convince their boards and shareholders for the necessary investment. The past tense needs to be used here as the time has now passed when such decisions can be made in order to meet the December 2017 deadline – certainly a crisis if this means you!

We still await declarations from some of the mercury based users on what their plans to convert are. This continues to attract speculation from the industry press trying to work the crisis theme into a story which links back to financial performance and investment funding.

Market conditions and the need to convert to membrane technology have undoubtedly driven market consolidation. From the most recent confirmation of the Ineos and Solvay merger into the new company Inovyn, the joint investment project between AkzoNobel and Evonik at the Ibbenbüren site with the closure of Evonik's Lülisdorf mercury based facility, to the sale of Ercros's Huelva site to Salinas del Odiel. All this adds up to significant structural change and we don't yet know of other investment plans.



*Alistair Steel*

The question of energy policy and costs continue to be a key cost driver to the industry. Whilst the cost of oil has dropped in dollar terms it is offset to some degree by the weak euro, the savings in lower ethylene prices have been passed downstream to users which has not sparked any stimulus in demand.

Let's face it, electricity prices at their current level are here to stay with no prospect for these to reduce in the future. Indeed the strategy of the policy makers is to keep prices high in order to make the so called 'renewables' competitive. Many of us believe this to be a flawed concept leading to a crisis in maintaining our European manufacturing base. Added to this is the effect of increasing the operating costs of the base load generators who have to be held on stand-by for when the wind doesn't blow or the sun doesn't shine. Though there is much written about the need to improve European competitiveness (and this is an improvement from 3 years ago where few were prepared to acknowledge the problem) I fear that too little is being done to address the problem.

The ETS reform proposals (published on 15th July) do little to help and in any event will not become effective until 2020 anyway. There is no new thinking in addressing the negative effect on competitiveness with the old rhetoric that high energy costs will drive investment in innovation still holding sway!

Yes there is a crisis out there but it concerns the whole European manufacturing base and not just our chlor-alkali sector!

Now, changing the theme (this is certainly not a crisis), I have to acknowledge that these are the last words that I shall write as your Executive Director. The time has come for me after 9 years of service to hand over to Dolf van Wijk. It has been a pleasure to have served the membership and the industry since my arrival in April 2006. The experiences have been memorable and sometimes testing which is how it should have been, but now out with the old and in with the new (or nearly new) and over to Dolf who I have no hesitation in recommending to you!



Dolf van Wijk

I am proud and honoured to take over the helm at Euro Chlor. To a large extent I know what I am embarking on, but there are also unknowns. I have known Euro Chlor from the inside since 2001 and with Alistair's support and skilful coaching in recent

years I feel well prepared for my new role. My 'known unknowns' will be the uncharted waters in which our industry is currently sailing. As mentioned, the phase-out of mercury use is still challenging for some member companies and the competitiveness of the manufacturing industry in Europe is a major challenge

for all. Our competitiveness faces a heavy regulatory burden and high electricity costs.

Coming from a science background I have observed over the past two decades that the (eco-) toxicological and risk knowledge of our production and products has greatly improved and the potential for adverse impact greatly reduced. Paradoxically however, regulatory safety assessment of chemicals has become increasingly precautionary which unnecessarily hampers our competitiveness. Environmental leadership and innovation as endeavoured by the EU can only be successful when based on facts and sound science, not on perception.

Similar paradoxical developments can be observed in Europe's energy policy. In Germany for example, CO<sub>2</sub> emissions have increased since the policy change to support renewable energy. This is the opposite of the intended goal and moreover, it negatively impacts industrial competitiveness. In June 2015 the Boston Consulting Group assessed that manufacturing costs in the US were 16% lower than in Germany and only 5% higher than in China, expectedly reaching parity by 2018.

The threat to our industry's competitiveness is real and restoring industry's contribution to GDP back to 20% should be a real goal.

Fortunately our industry has shown flexibility and endurance in the past. Also, our products are essential building blocks for many of today's products and for solutions to the world's future challenges. Therefore, I feel we can look ahead with confidence.

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Su

SUSTAINABILITY

sustainability



*Providing enough quality food to 7.3 billion people is a major challenge.  
Chlorine derived chemistry is an indispensable support for this task*

## Enhancing the overall safety performance of the chlor-alkali industry - Together



Chairman  
Thomas Wehlage

From the year that Euro Chlor was founded, now 26 years ago, sustainability has been an integral part of the Federation's philosophy. As a logical consequence, our first sustainability programme, which started in 2001, already delivered major improvements across a broad range of our key indicators. It has also focused companies throughout the sector on the issues where further improvements could be most beneficially made.

Over the years, considerable progress has been made in areas like emissions of chlorinated substances to air and water, mercury emissions, energy consumption, chlorine transported outside industrial sites and environmental accreditation. Our first and second programmes have also delivered improvements in safety in terms of reducing lost-time injuries, process and transport incidents. But any incident is one too many and must simply be regarded as unacceptable. Although improved training and procedures and a strong safety culture have helped to avoid problems re-occurring, safety is a continuing battle which requires the ongoing focus of both management and employees.

That is why the second phase of the sustainability programme, launched in 2011, strengthened the emphasis on training as the foundation for safe and sustainable operation. Still, over the last three years the average safety performance of our industry has not shown the improvements we originally targeted. The safety results of several sites must therefore be improved. They reflect badly on our industry as a whole but are also unacceptable because improvement is possible.

This situation has been addressed by the Euro Chlor Management Committee as a priority matter. The Committee has decided to investigate ways and instruments to help improve the overall safety records of those companies concerned. Also, the Euro Chlor companies all recognize the importance of good safety governance for sustainable business. That is why we initiated, in 2014 during the General Assembly, a specific Euro Chlor Safety Initiative as part of our Sustainability Programme.

The matter (including analysis of incidents, solutions adopted to prevent repetition...) has also been discussed in the technical working groups. A task force has been set up, composed of HSE experts from a few companies. They have started exchanging experiences on safety performance improvement initiatives and programmes they have launched previously.

The task force took a first initiative to organize the Leadership Safety Workshop, organized during the 2015 Annual Meeting in Brussels. It addressed the role of top management in safety governance and improvement. It identified gaps between actual and desired safety performance and ambition. It shared learnings, experiences and best practices in safety management.

It is in the interest of all of us that our employees are healthy and our plants operate safely. Let us continue to enhance the overall safety performance of the Euro Chlor membership together. The Euro Chlor Secretariat will maintain its key role in this ongoing journey to deliver more for society. A flourishing chlorine industry and safe production are not only compatible with a sustainable future, but essential to it.

A handwritten signature in blue ink, appearing to read 'Wehlage', written in a cursive style.

# Manufacturing technology

Two mercury based units were shut down during 2014, and several organisations continue the progressive conversion to the membrane process, which now represents about 61% of the chlorine production capacity in Europe. In contrast, the mercury process now accounts for approximately 23% (22.6%) of production capacity.

The speed of conversion to the membrane process will further increase due to the implementation of the chlor-alkali BAT conclusions under the Industrial Emissions Directive. The Directive requires implementation of the chlor-alkali BAT by member states by the end of 2017.

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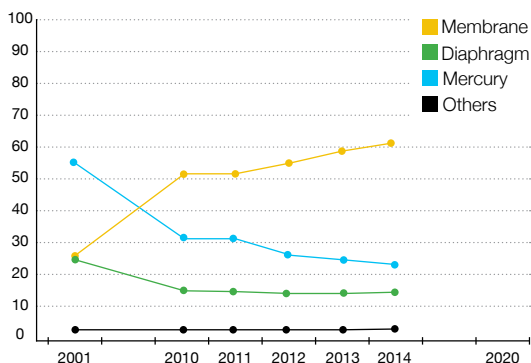


## Economic development

Within the Sustainability Programme, Euro Chlor has decided to report monthly, quarterly and annual data on European production of chlorine and caustic soda. This includes utilization rates, caustic stocks, capacity and technology by plants and applications. The aim of this openness is to enhance transparency of the chlor-alkali sector.

In 2014 and 2015, Euro Chlor continued to publish these figures on its website and on paper. Every year the Industry Review includes a map of Europe showing the location of all plants and a table indicating the location, ownership, technologies and capacity of each plant (see Chapter 3).

**Chlorine manufacturing process**  
(% of total installed capacity end of year)





## Mercury emissions

Even with the ongoing progressive phase out of the mercury process for the chlor-alkali industry, Euro Chlor continues to monitor the performance of those production units that still use it.

The absolute level of mercury emissions in Europe remained stable at 2.0 t in 2014.

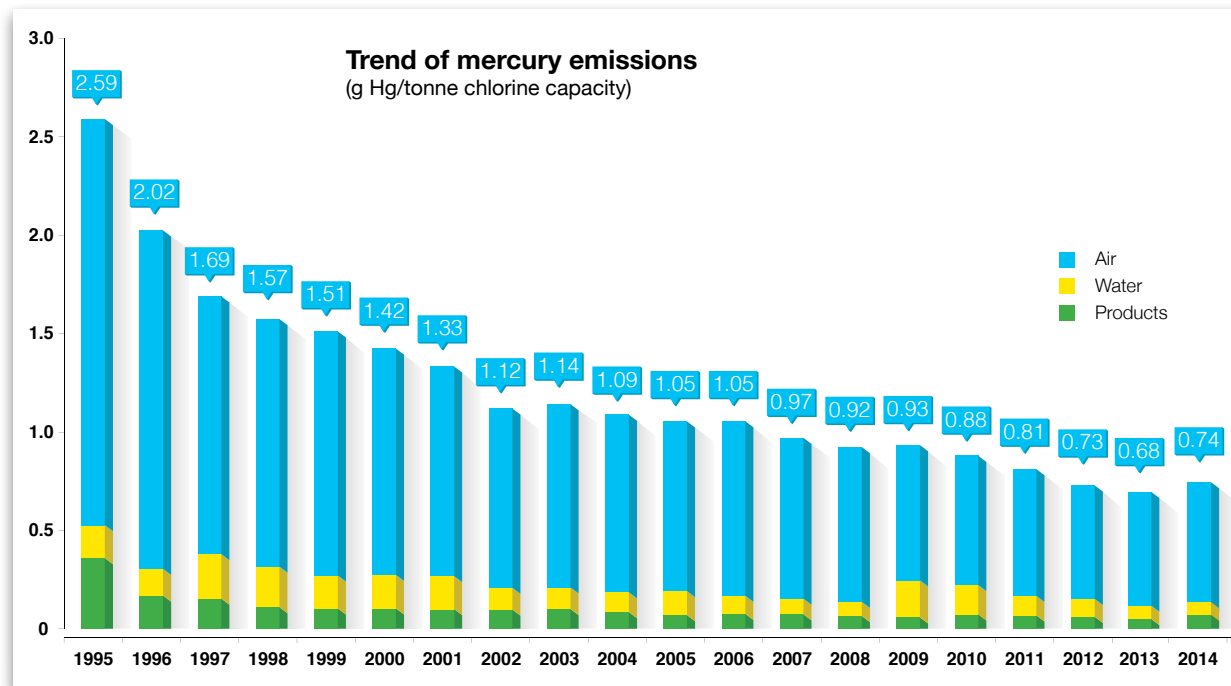
Specific mercury emissions, calculated per tonne of chlorine capacity, amounted to 0.74 g Hg/t in 2014, which is slightly above the level of the previous year (0.68 g Hg/t in 2013).



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*Paying by card or by smartphone; paying by ChlorineThings*



## Energy consumption

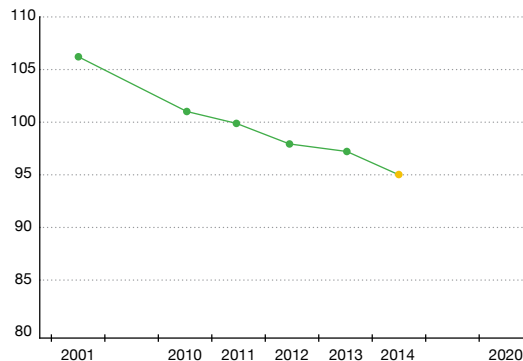
In 2014, the long year trend for reduced energy consumption continued with the index now being at 95%. Nevertheless, there still are considerable differences between the various sites.

Energy consumption is calculated as the total primary fuel needed for chlorine production; the result is expressed as a percentage compared to the 2011 value (index value 100%). The corresponding index for 2001 (the first year of the initial programme) is about 106%.

In a chlorine caustic plant, electric energy is required for the operation of the electrolysis cells and for utilities (motors, pumps and illumination). Steam is used for heating fluids and particularly for the concentration of the caustic to 50% (for diaphragm and membrane processes, where applicable). The primary fuel calculations assume the use of natural gas for all processes and are based on European average figures for electricity generators and steam boilers.

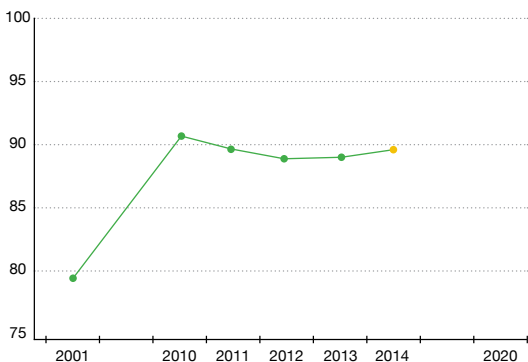
### Energy Consumption

(% with respect to 2011)



### Hydrogen use

(% of production)



## Hydrogen use

The use of hydrogen shows little variation in the period 2010 to 2014.

The electrolysis by-product hydrogen can be used as a chemical reagent in integrated production sites, for energy generation e.g. in fuel cells or in electrolyzers with depolarised cathodes.

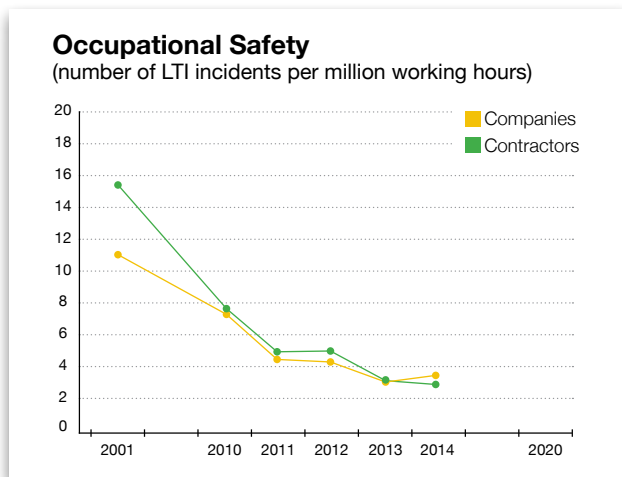
## Occupational Safety

In 2014, the safety performance of companies own workforce deteriorated a bit, whilst contractor safety performance improved.

It is the focus of the Euro Chlor Safety Initiative to further improve safety performance for **all** workers in the industry.

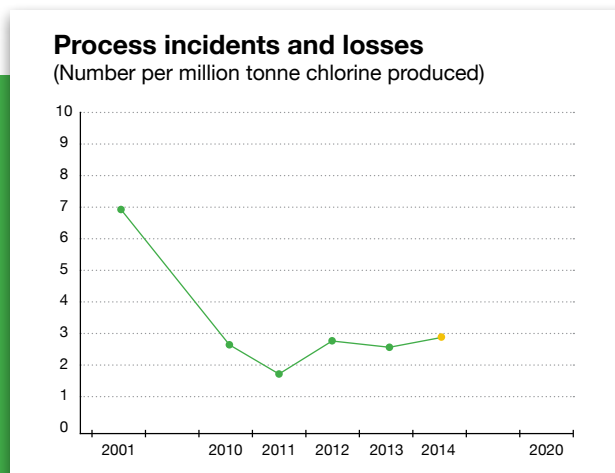
Occupational safety is measured as *lost time injuries per million working hours* (LTI rate).

Since 2011, only those accidents specific to the chlorine industry are accounted for. Examples of these *specific* accidents are injuries directly related to electric current or voltage, chlorine, caustic, hydrogen (explosion), mercury, hypochlorite, sulphuric/hydrochloric acid and other reactants used in the electrolysis unit.



## Process incidents and losses

Performance deteriorated in 2014 after the slight improvement of the previous year. There was no apparent correlation between this indicator and the lost time injuries indicator. However, an aim of the Safety Initiative is to enable member companies to improve performance.



## Time dedicated to HSE training


This indicator, introduced as part of the new programme, monitors the proportion of working time spent on formal training of the companies operators in the fields of health, safety and environmental protection (HSE).

The average figure is stable at approximately 1.5%.

However, there remains a considerable spread of values indicating that there is a need to increase training in some organisations.



**There is a need to increase training  
in some organisations**

 *ChlorineThings are found in the construction materials and solar cells used in renewable energy production*

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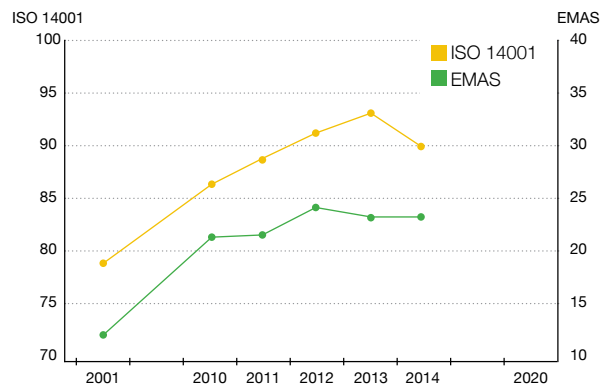
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## Environmental accreditation

Overall, the proportion of sites with ISO 14001 (environmental) accreditation decreased, due to the shut-down of several plants and change of membership, whilst the situation for the more demanding EMAS (Eco-Management & Audit Scheme) remained stable. Out of 59 chlorine production units, 53 are ISO 14001 certified and 14 have an EMAS certification. Environmental accreditations reflect the fact that organisations have, and put into practice, an environmental management system. Euro Chlor advises its members to demonstrate, via such accreditations, that their production units respect the environment.

**Environmental accreditation**  
(% of total sites)

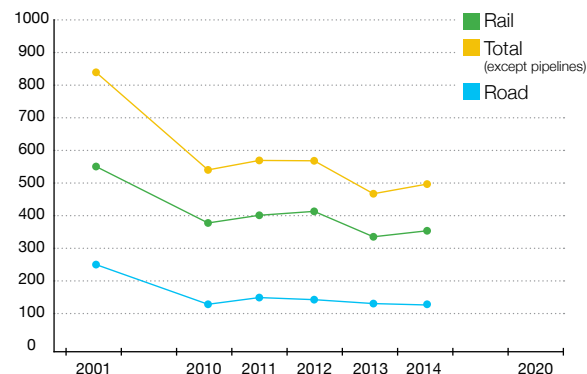


## Transportation

Most of the chlorine produced is consumed at the production sites. Only a fraction, approximately 6% of chlorine volumes produced, is transported off site by rail, road or waterways. In 2014, transported volumes of chlorine increased by 5% compared to the previous year. Whilst the quantities of chlorine transported by road and waterways decreased, transport by rail increased. Transport by rail now accounts for about 75% of volumes and transport by road for 25%.

Again, there were no transport incidents in Europe during 2014.

**Chlorine transported outside industrial sites**  
(Thousands of tonnes)





The Responsible Care® initiative is *the* international programme of the chemical industry.

It comprises a commitment through a charter for continuous improvement in the areas of environmental protection, safety and workers' health. Member companies report periodically about the progress made.

Euro Chlor, through the support of the corresponding national associations, works with its members to meet the principles and criteria of Responsible Care® and collectively report on the results.



© Photo courtesy of KAA Gent



## PVC industry moving towards a low-carbon circular economy

All major downstream chlorine users have initiated sustainability programmes. One example is VinylPlus, the European PVC industry's ten year Voluntary Commitment to Sustainable Development.

2015 is a crucial year for global action in order to secure a sustainable future for all. Two of the major areas of interest are tackling climate change and fostering sustainable development; essentially mutually reinforcing sides of the same coin. Governments, institutions, NGOs, industry, public and private organisations are all involved in addressing these global challenges, and the European PVC industry also has a role to play.

'It would be too much to claim that our value chain can save the world's climate, but as our products are versatile due to their favourable footprint, durability, longevity, energy and resource conserving properties, we believe we are part of the solution and not of the problem,' said Michael Träger, VinylPlus' Chairman at this year's Vinyl Sustainability Forum 2015 in Cannes, France.

### More Vinyl, Less Carbon

The theme of this year's Vinyl Sustainability Forum, 'More Vinyl, Less Carbon', summarises the challenge ahead of PVC for the coming years, but also hints at how VinylPlus' Voluntary Commitment is already addressing climate change, improving product sustainability and moving the European PVC industry towards a circular economy.

Christophe Yvetot from the United Nations Industrial Development Organisation (UNIDO) said 'In the race for sustainability the laggards will lose. We see the VinylPlus initiative as the forerunners and the role model for a global standard of the industry', at the Vinyl Sustainability Forum 2015.

PVC is one of the most widely used plastics in the world due to its versatility; PVC is used extensively in a broad range of industrial, technical and everyday applications. PVC is intrinsically a 'low-carbon' plastic: 57% of its molecular weight is chlorine, derived from common salt, 5% is hydrogen and 38% is carbon.

Using recycled PVC also helps meet resource-efficiency targets and allows the preservation of natural resources. It has been calculated that CO<sub>2</sub> savings of up to 92% are achieved when PVC is recycled. Indeed, recycled PVC's primary energy demand is typically between 45% to 90% lower than virgin PVC production (depending on type of PVC and the recycling process). Furthermore, according to a conservative estimation, for each kg of PVC recycled, 2 kg of CO<sub>2</sub> are saved. On this basis, CO<sub>2</sub> savings from PVC recycling in Europe are now at around 1 million tonnes of CO<sub>2</sub> saved per year.

The VinylPlus annual Progress Report gives an overview of the recent initiatives toward the concrete and measurable targets. Download the VinylPlus Progress Report 2015 at <http://www.vinylplus.eu/resources/publications/progress-report>

(Picture top left)

***The Ghelamco football stadium in Ghent (B) is a real eye-catcher: impressive, fashionable in design and an architectural beauty. The stadium however, is more than just about design; it is above all, environmentally friendly. The undulating roof was made waterproof by means of reflective PVC membranes. A special protective coating on the roofing membranes ensures a high reflection of sunlight, which in summertime has a positive impact on the interior of the building. At a later stage, solar panels will be mounted on the roof, again ChlorineThings.***

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**Re**  
REGULATION

# Regulation



*Euro Chlor, Cefic and the Alliance of Energy Intensive Industries will continue to pass on the message of more growth and competitiveness*



## Emission Trading System reform post-2020

Since the establishment of the Emission Trading System (ETS) Directive, Euro Chlor has advocated that a harmonised EU-wide compensation scheme for electro-intensive industries should be put in place. Euro Chlor therefore welcomed the conclusions of the European Council in October 2014 that the EU should address the indirect costs of emissions trading to industry.

Under the current ETS Directive, member states may provide state aid to compensate for indirect CO<sub>2</sub> emission costs to industries at risk of carbon leakage. Euro Chlor's major concern is the discrepancy in implementation across the EU which disturbs the internal market. Therefore, when designing the new post-2020 system an alternative unilateral compensation system for indirect CO<sub>2</sub> costs should be established.

Adequate cost compensation could be assured by using different complementary mechanisms, such as additional free allocation of allowances to indirect emitters or harmonized financial compensation.

The eligibility assessment for such an EU-wide scheme should be based on a methodology that identifies qualified sectors on the basis of their exposure to indirect carbon costs or their total electro-intensity. Euro Chlor, in cooperation with Cefic and the Alliance of Energy Intensive Industries (AEII) will continue to pass on this message to the European institutions to restore growth and competitiveness in Europe.



**Adequate cost compensation could be assured by using complementary mechanisms such as additional free allocation of allowances to indirect emitters or harmonized financial compensation**

## Biocidal Products Regulation

The evaluation of the active substance dossiers for chlorine, sodium hypochlorite and calcium hypochlorite continues under the review programme of the Biocidal Products Regulation (BPR). Subsequently, the Evaluating Competent Authority will produce its final assessment reports, to be discussed at ECHA's Biocidal Products Committee and associated working groups in January 2016. The members of the Euro Chlor Biocides Registration Groups continue to support the process to appear on ECHA's Article 95 list of approved suppliers, to ensure that they can continue to market their active substances after the 1<sup>st</sup> of September 2015. A decision for approval of the Euro Chlor substances is expected in 2016. Euro Chlor also continues to support the process by providing letters of access to alternative suppliers and also offering training and information to those interested parties.

The BPR came into force in 2013, with ECHA taking the lead as the main administrative body. The first amendments to the regulation came into effect in March 2014. They not only clarified the scope of the biocidal product family concept but also offered the biocidal product formulators the opportunity to apply for listing on the Article 95 list. The work program for the examination of existing active substances was extended until 2024 and ECHA put in place an ambitious work plan in order to complete the work on time.

## Chlorinated alkanes still in the regulatory spotlight

While short-chain chlorinated alkanes are no longer manufactured in the EU, medium and long-chain chlorinated alkanes continue to face regulatory pressure in Europe and North America. In Europe, MCCPs have been prioritized for a REACH Substance Evaluation via the CoRAP (Community Rolling Action Plan) process. This was triggered by concerns over their potential persistent, bioaccumulative and toxic (PBT) properties.

In spring 2014, ECHA issued the MCCP REACH Consortium with a request for additional bioaccumulation and persistence tests. However, the MCCP Consortium considers the testing requirements to be scientifically unsuitable and disproportionate and have therefore lodged an appeal with the ECHA Board of Appeal to contest the substance evaluation proposal and to propose an alternative testing plan. This process is ongoing and Euro Chlor continues to monitor the situation as we await the Board of Appeal's decision which is expected in the second half of 2015. A thorough review of the available bioaccumulation data indicates that MCCP is not likely to bioaccumulate in the environment, and new persistence tests on various MCCP components show that the substance is far more degradable than previously assumed.

Euro Chlor continues to monitor the regulatory situation for chlorinated alkanes globally, and has strong ties to the Chlorinated Paraffin Industry Association (CPIA) – which is an industry body for the manufacturers and importers of chlorinated alkanes for the US market. CPIA inform us that in the US the Environmental Protection Agency (EPA) has stated that there is a possible risk to the environment from MCCPs/ LCCPs. CPIA has expressed concerns about the EPA's assessment methods, and has made various proposals regarding controls on exposures and environmental releases of MCCPs/LCCPs in order to alleviate the concerns of the EPA. The EPA is potentially looking to restrict the use of these products in the US market, and could put legislative measures in place as soon as May 2016. Euro Chlor will work closely with our North American colleagues to monitor this situation.

## Second successful global Chlorinated Paraffin conference held in Beijing

Following the first International Chlorinated Alkanes Industry Association (ICAIA) meeting in Brussels in 2012, Euro Chlor helped our Chinese colleagues from CCAIA/CCAON to organise a second ICAIA meeting that was held in Beijing in April 2015.

The well represented meeting discussed issues ranging from sharing of best practice in product stewardship, health and environmental research, socio-economic benefits of chlorinated alkanes as well as the current regulatory position of such chemicals.

Participants felt that the event was another great success. Cooperation with the global chlorinated alkanes community also continued with the publication of the third edition of the ICAIA newsletter in 2014.



© International Chlorinated Paraffins Conference

## Stockholm Convention progressed HCBD

The political endorsement of the substance review process of the Stockholm Convention took place at the seventh Conference of the Parties (COP7) in their meeting of 4-15 May in Geneva, Switzerland. The hexachlorobutadiene (HCBD) risk management report (Annex F) as prepared during POPRC9 was evaluated. The POP Review Committee (POPRC) proposed that HCBD, a minor and unintentional by-product in the manufacturing of chlorinated solvents, should be listed on Annexes A (no production) and C (elimination of emissions and releases).

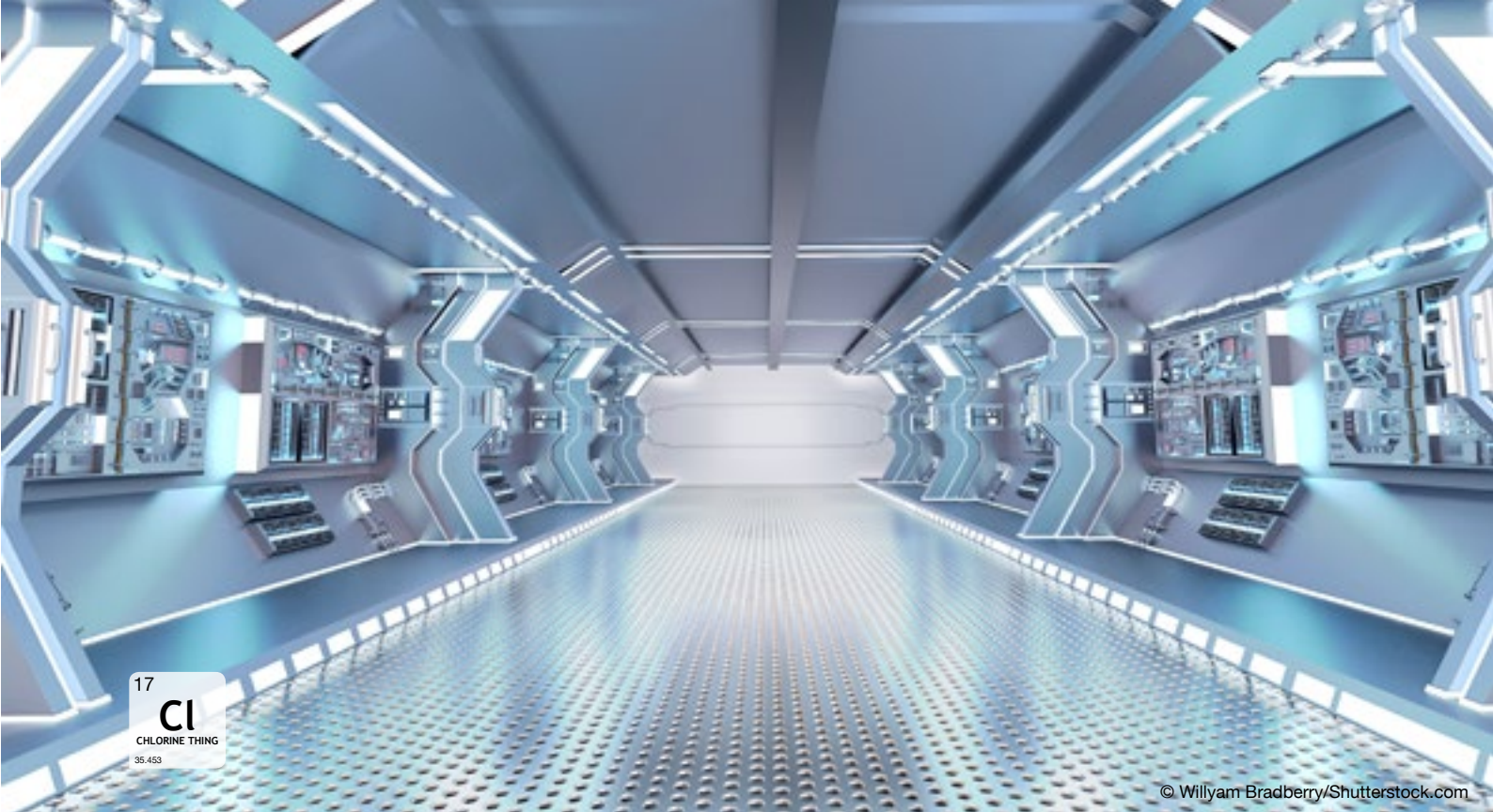
Following a range of discussions it was finally adopted for listing in Annex A; however the proposal to add it to Annex C was not accepted. It was felt by the COP that the Annex F report was inadequate for such a listing as countries were unclear as to what measures would be needed.

This tallied with comments made by WCC over the years such as the minor HCBD emission levels associated with solvent production, declining environmental levels and the sectors demonstration of BAT/BEP to emission streams. In light of this, HCBD will be sent back to the POPRC for further work. This is the first time that such a request has been made and it is encouraging that the COP is critical of POPRCs work as it means that the process allows for corrective action at POPRC.

 *High speed trains rely on chlorine based chemistry for the bodywork, windows, interior and electronics*

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 *Even our future space ships will be ChlorineThings, with a use of light materials like aluminum and PVC illuminated by LED interior lighting*

## Evaluation of SCCPs under the Stockholm Convention

The risk profile for SCCPs under the Stockholm Convention was updated during the intersessional period (January – June 2015). However, the sector operating under the World Chlorine Council (WCC) highlighted a major lack of scientific rigor in the editing of the assessments under the Convention.

Letters have therefore been sent to the UNEP Secretariat and Secretary General to try to encourage the development of a more scientifically robust approach to the risk profile.

The SCCP risk profile evaluation (Annex E) was paused between 2012 and 2015 and in light of the issues, WCC are looking to consult with the scientific community to improve the profile and encourage open discussion about the review process as a whole.

## ECSA membership & statistics

ECSA membership has faced some very important changes in 2015. For example, from the 1<sup>st</sup> of July, Ineos and Solvay have their Joint Venture fully operational resulting in INOVYN becoming the newest member of ECSA. Secondly, Dow has sold its Chlorinated Solvents Business Unit to Olin with the final stages of the deal being planned for the last quarter of 2015. As a result of these, the ECSA membership will total 4 from the 1<sup>st</sup> of July but, as per Cefic rules, most of the data collection and statistical analysis has ceased due to insufficient sample size.

## REACH

The Chlorsolv consortium is in charge of the REACH activities of the 5 chlorinated solvents substances (carbon tetrachloride, chloroform, dichloromethane, trichloroethylene and perchloroethylene) with the management of the Consortium being transferred to ReachCentrum (ERM), effective as of 1<sup>st</sup> of September 2015.

Trichloroethylene is currently under Annex XIV and has been submitted for authorisation whilst carbon tetrachloride has been through the CoRAP process of evaluation by the rapporteur, France. As part of this process, ECHA has issued, despite the already very high regulatory pressure, a request for an extended one generation reprotoxicity study via inhalation. In light of this, the Chlorsolv consortium has decided to go to the ECHA Board of Appeal to petition against this decision. An oral hearing was organised by the ECHA Board of Appeal in May with a final decision expected by 3<sup>rd</sup> quarter of 2015.

## Application of 'Arrêté' 2345

France has introduced an 'arrêté' (2345) that forbids the use of dry cleaning machines using perchloroethylene as of the 1<sup>st</sup> of September 2014 for all machines older than 15 years. This impacts a large number of machines on the market. Results communicated in an 'association of dry-cleaners' workshops, revealed that 1/3 of users effectively ceased operation, 1/3 changed their activities whilst 1/3 moved to alternative solvents: half of them uses water/detergents, another half hydrocarbons despite several incidents reported with these products. ECSA will keep reporting on the latest developments in the French situation via [www.chlorinated-solvents.eu](http://www.chlorinated-solvents.eu).

## DCM in paint stripping

As of 2009, the use of DCM in paint stripping for consumer use is forbidden. Since then, no member state has implemented derogations for professional paint strippers. In 2014, UK authorities launched a public consultation that concluded that DCM should be used by well-trained professionals. A training program, which is accepted by UK authorities has been put in place and is obligatory for professionals using DCM in paint-stripping. The use of DCM based paint in closed systems is still permitted, provided that emissions and exposure of workers are well controlled.

WORLD chlorine council™



## UNEP Mercury Global Partnership

In their meeting of 31 October 2014, the Partnership discussed the highlights with the various Partnerships during the past period as well as the future planning. The progress and activity within the various Partnerships demonstrated major differences, such as the Cement Partnership which was still struggling to get the sector organized and the Coal Partnership lacking funding for the basic Partnership activities. As usual the Chlor-Alkali Partnership chaired by the US EPA was recognized as a good example with strong support from the sector - through WCC.

In addition there was a lot of discussion on financial support of the Convention and Partnership activities and NGOs played a significant role.

WCC will continue reporting on the mercury use and emissions of the chlor-alkali sector under the UNEP Mercury Global Partnership and on the WCC website <http://www.worldchlorine.org>.

## Minamata Convention on mercury takes a next step

The Minamata Convention to eliminate major anthropogenic releases of mercury was established after the fifth negotiating session of Parties and a Diplomatic Conference in October 2013. A sixth International Negotiating Conference (INC6) was held in November 2014 to negotiate and complete elements of the treaty that need to be in place by the time the 50<sup>th</sup> ratification by a signatory country is made. At that point, the Convention will come into force and be legally binding on all signatories and a 'Conference of the Parties' (COP) will be established as the decision-making body. This COP will then negotiate the remaining elements of the treaty operating process.

At INC6, the World Chlorine Council (WCC) was represented by D. van Wijk of Euro Chlor and A. Jones on behalf of the Chlorine Chemistry Division of ACC (American Chemistry Council). From a WCC perspective, there were two primary areas of interest. These were the financing and Article 3, paragraph 5b of the treaty which restricts mercury from chlor-alkali plants entering the marketplace. It was of importance in the hard-fought treaty language that the Party (not the Convention) makes the decision on when mercury is declared 'excess' to the needs of the chlor-alkali sector. Practically, this means that mercury from decommissioned plants can still be re-used within the sector, taking into account existing export restrictions.

The 'financing' topic caused heated debate. The UN Global Environmental Facility (GEF) reported to have \$400 million for the chemicals and waste sector over the next 4 years, of which \$141 million is to be allocated to the Minamata Convention. A funding group (the Ad Hoc Working Group of Experts) will meet to develop the financing proposal further before INC7 (2016). WCC had an opportunity to speak on the importance of financing mechanisms to assist the conversion from mercury-cell production at a side event hosted by the GEF.

## WCC participated in Side Event

A side event was organized with the title: 'A conversation with the private sector on cooperating in the global effort to reduce and eliminate mercury pollution from industrial sources and the role of the Global Environmental Facility'.

The session was moderated by Dr. Rolph Payet, recently appointed as the UNEP Executive Secretary of the Basel, Stockholm and Rotterdam Conventions.

In the forum Dr. van Wijk participated on behalf of WCC and the chlor-alkali sector. The other participants were from the coal sector, the waste handling and recycling sector and the PVC sector in China.

The essential points from the WCC/Partnership report 'Cost of Conversion' were explained to the participants and public.

The report underlines the key and sole dependence of conversion on solving the challenges of long-term investments. Both the chair, Dr. Payet and the GEF CEO Ms. Ishii showed a clear interest in studying further the 'Cost of Conversion' report.

Check the document online:

<http://www.ow.ly/QO92G>

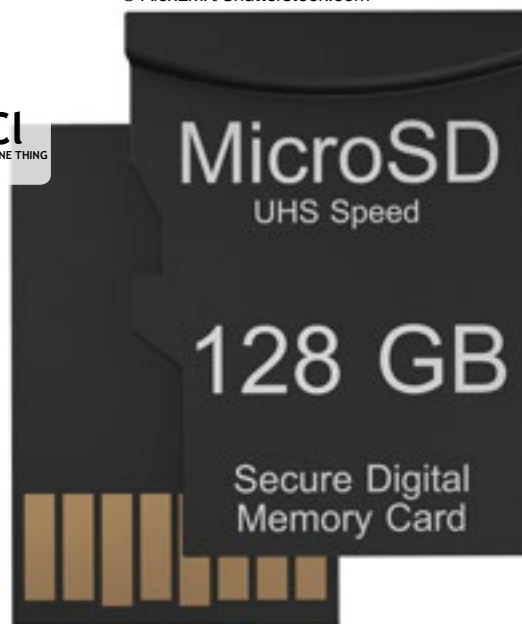
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CHLORINE THING

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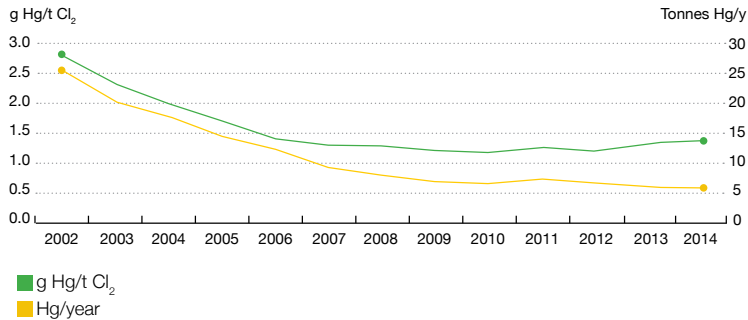


*The storage capacity of even the smallest data carriers improves continuously thanks to the use of ever more sophisticated ChlorineThings inside*

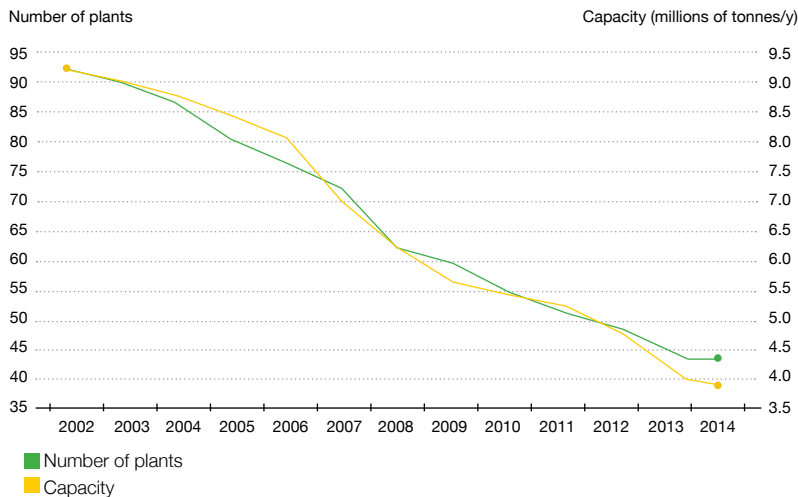


## Chlor-Alkali Partnership mercury reporting

**WCC - Chlor-Alkali Industry**  
**Total mercury emissions (air + water + products)**  
 in USA/Canada, Europe, India and Brazil/Argentina, plus 1 Uruguayan and 3 Russian plants from 2005 onwards



**WCC - Chlor-Alkali Industry**  
**Number of plants and capacity of mercury electrolysis units**  
 in USA/Canada/Mexico, Europe, Russia, India and Brazil/Argentina/Uruguay



The World Chlorine Council continues to gather mercury emissions data from its members and reports them annually to the UNEP Chlor-Alkali Partnership.

As foreseen, the number of plants and their mercury cell-based production capacity continue to show a worldwide decrease: the number of plants went down from 91 to 44 over the period 2002-2014 (-52%) and the mercury cell-based capacity from 9.1 million tonnes to 4.0 million tonnes (-56%).

Global mercury emissions have been substantially reduced in the period 2002-2014. They went down from 24.6 tonnes per year to about 5.6 tonnes per year, a decrease of more than 77%. The specific emissions expressed in g mercury/tonne annual chlorine capacity also decreased in this period from 2.7 to about 1.4 g Hg/t Cl<sub>2</sub> capacity.

To complement the information from WCC members, UNEP also gathers data from the national authorities on:

- List of closed mercury-based chlorine units (with capacities) and forecast of announced closures
- Quantity of mercury still in possession of chlorine units
- Solution adopted to deal with the excess mercury.

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3

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COMPETITIVENESS

Competitiveness



*In highly competitive sports, such as sailing, chlorine derived chemistry plays a key role*

## Flat growth for Chlor-Alkali in 2014

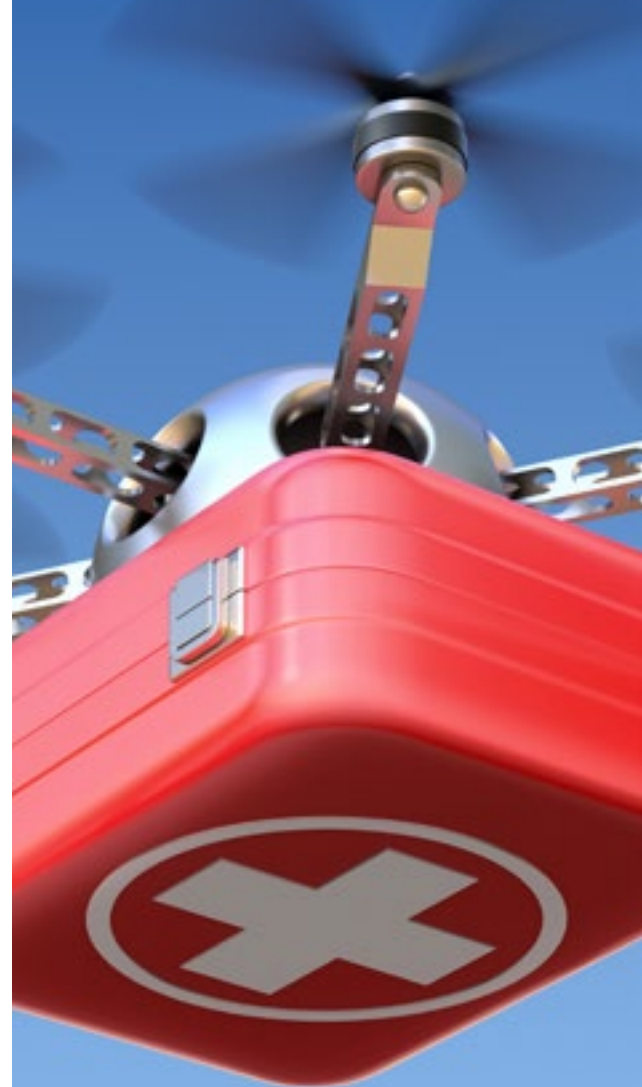
European chlorine production in 2014 was reported at 9,612 kt which, whilst 1.7% above the level of 2013, is still 9.4% below the peak level registered in pre-crisis 2007. Europe continues to show a painfully slow recovery from pre-crisis levels but there are at least encouraging signs of low level growth. Data from Cefic's economic department show that overall the growth was flat (+0.2%) for the EU chemicals industry in 2014.

Cefic Director General, Hubert Mandery, commented that 'the lack of growth in 2014 was partly due to falling exports. Though the price of oil has fallen here in Europe, lowering producer costs, long- term problems persist, especially the challenge of securing affordable energy supplies.'

Economic growth across the EU was variable and the Eurozone economic outlook clearly remains uncertain for most countries. For example, although the UK was still showing elevated growth levels with a 2.6% increase in 2014 there was a slight slow-down trend in the last quarter. Germany experienced a 1.5% growth in 2014, the strongest rate since 2011.

Looking at other parts of the world, China's economic growth slowed to 7.4% in 2014 and the economic outlook for South America worsened again. Economic activity continued to expand in 2014 in the US although the oil price developments had a knock-on impact on their economic growth. In our sector, the US did better than Europe in 2014 with a production at 10,776 kt of chlorine which is 4.7% higher than in 2013, probably reflecting the differing economic recovery rates widely reported in the press.

The profile of chlorine uses remained broadly unchanged compared to 2013. PVC was flat with a very small increase evident in chloromethanes. Isocyanates and oxygenates usage dropped marginally. On the caustic side, stock figures in the final quarter of 2014 were 8.9% lower than in the same period in 2013, suggesting stronger trading activity.



## EUR. CHLORINE PRODUCTION 2014

	KTONNES	%
<b>9612</b>		
<b>kilotonnes</b>		

	KTONNES	%
GROUP 1 - SOUTHERN EUROPE	1,899	19.8%
GROUP 2 - NORTHERN EUROPE	6,808	70.8%
GROUP 3 - CENTRAL/EASTERN EUROPE	905	9.4%
<b>TOTAL EURO CHLOR</b>	<b>9,612</b>	<b>100.0%</b>

Due to new Cefic statistics rules, the European chlorine production is now divided into three zones:

GROUP 1 SOUTHERN EUROPE	GROUP 2 NORTHERN EUROPE	GROUP 3 CENTRAL & EASTERN EUROPE
France	Belgium & Luxembourg	Austria
Italy	Netherlands	Liechtenstein
Greece	Germany	Switzerland
Portugal	United Kingdom	Poland
Spain	Ireland	Czech Republic
Faroe Islands	Denmark	Slovakia
Andorra	Sweden	Hungary
Gibraltar	Finland	Romania
Vatican City	Iceland	Croatia
Malta	Norway	
San Marino		
Svalbard Archipelago		

## EUR. CHLORINE APPLICATIONS 2014

	KTONNES	%
<b>9731</b>		
<b>kilotonnes</b>		

	KTONNES	%
PVC	3,196	32.8%
ISOCYANATES & OXYGENATES	3,077	31.6%
INORGANICS	1,406	14.4%
OTHER ORGANICS	890	9.1%
EPICHLOROHYDRIN	494	5.1%
CHLOROMETANES	403	4.1%
SOLVENTS	265	2.7%
<b>TOTAL</b>	<b>9,731</b>	<b>100.0%</b>

## EUR. CAUSTIC SODA APPLICATIONS 2014

	KTONNES	%
<b>9358</b>		
<b>kilotonnes</b>		

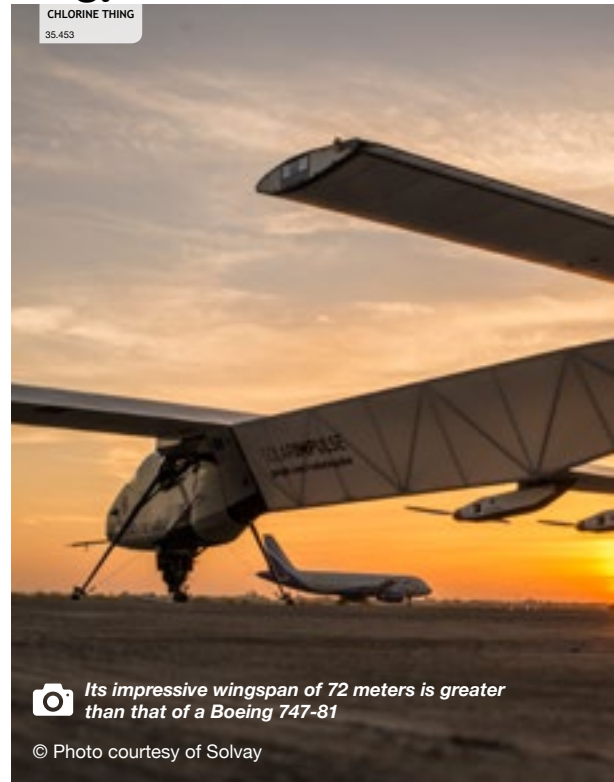
	KTONNES	%
ORGANICS	2,951	31.5%
MISCELLANEOUS	1,505	16.1%
PULP PAPER CELLULOSE	1,255	13.4%
OTHER INORGANICS	1,133	12.1%
FOOD INDUSTRIES	492	5.3%
WATER TREATMENT	466	5.0%
ALUMINIUM AND METALS	449	4.8%
SOAPS	356	3.8%
BLEACH	345	3.7%
MINERAL OILS	142	1.5%
RAYON	138	1.5%
PHOSPHATES	126	1.3%
<b>TOTAL</b>	<b>9,358</b>	<b>100.0%</b>



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CHLORINE THING  
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Its impressive wingspan of 72 meters is greater than that of a Boeing 747-81

© Photo courtesy of Solvay

## Solar Impulse 2: the only airplane of 'perpetual endurance'

Made of carbon fibre and propelled by four electric motors fed by lithium batteries – more than 600 kilos of them – the Solar Impulse 2 airplane has virtually unlimited autonomy, without using one drop of fuel. The innovative and lightweight plane is equipped with 17,000 solar cells that power its four propellers and at the same time charge the batteries. At night, the plane flies on the battery-stored electricity.

Already in 1999, after his balloon flight around the globe, Bertrand Piccard wanted to continue his family tradition of exploring the planet, but would pursue these challenges by using clean technologies. His vision found immediate resonance in business and political circles. The project was officially launched in November 2003.

In 2010, the Solar Impulse prototype started its first test flights. The first night flight in the history of solar aviation lasted more than 26 hours and 10 minutes, a record time. Another record was the maximum altitude reached: 9,235 meters! Promotional flights included the Paris-Le Bourget aircraft show and Morocco, where the world's largest thermo-solar power plant was built.

Solar Impulse 2 was presented to the public in April 2014. Among the partners are the well-known chemical companies Solvay, Bayer and Air Liquide. Its Mission Control Center is hosted in Monaco. When flights are in progress, the flight parameters are recalculated twice a day in order to capture sufficient sunlight, ensuring that there is enough on-board stored energy to fly at night.

Solar Impulse 2 has a wingspan of 72 meters, larger than that of a Boeing 747-81 and weighs 2,300 kg, more than a large car.

In March 2015, the revolutionary aircraft took off from Abu Dhabi, capital of the United Arab Emirates, where it would start for a trip around the world. First stops were made in Oman, Myanmar and China. An unplanned stop was made in Japan, after heavy winds caused wing damage. The transatlantic crossing had to be stopped in Hawaii because batteries were overheating. But this temporary drawback will not end the long journeys this innovative chemistry driven craft will keep us surprising with.

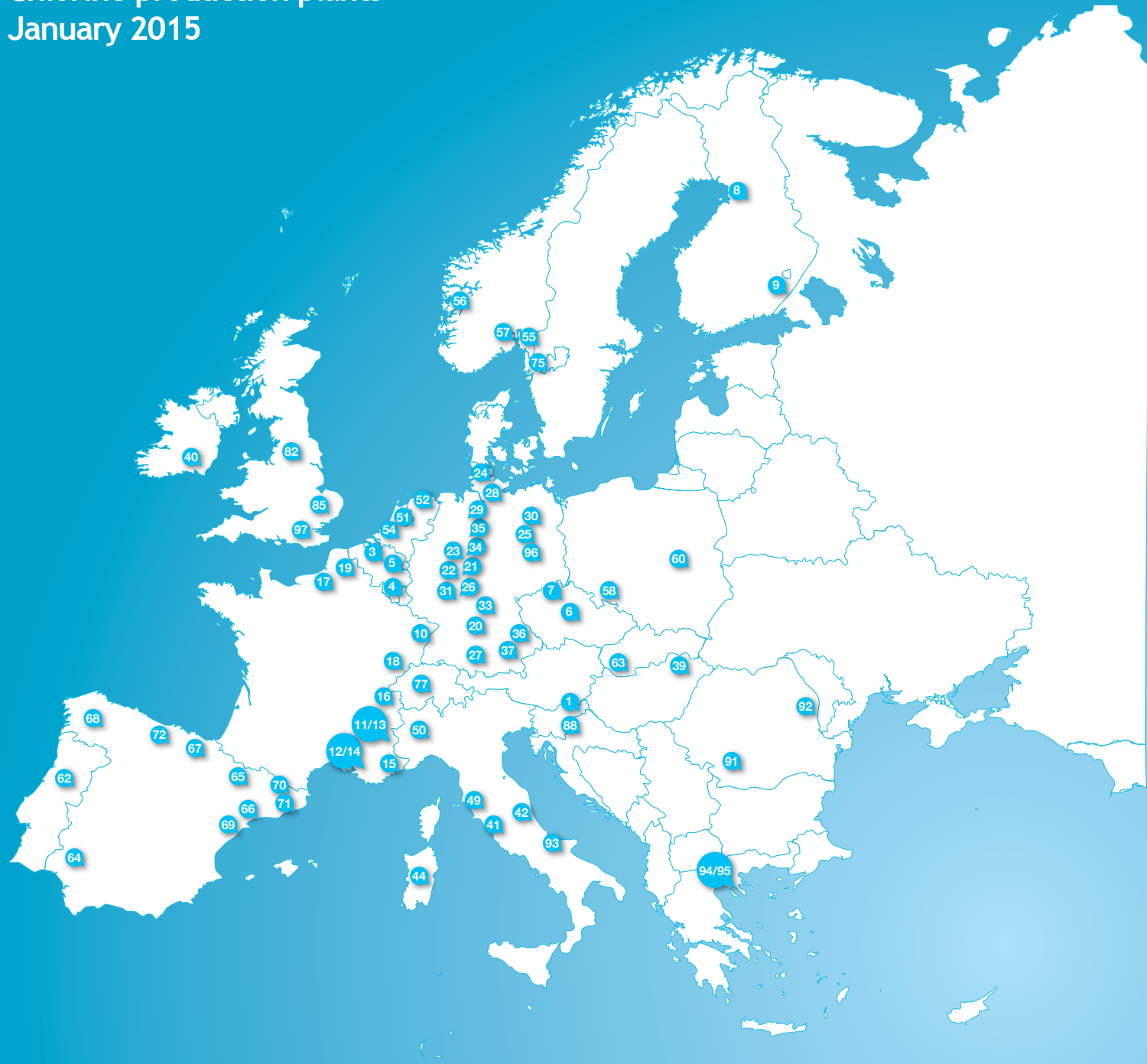


No lack of sun above the beautiful  
Abu Dhabi, capital of the United Arab Emirates

© Photo courtesy of Solvay



# Chlorine production plants January 2015



COUNTRY	NUMBER ON MAP	COMPANY	SITE	NAMEPLATE CAPACITY (000 TONNES CHLORINE)	Hg	D	M	OTHERS
Austria	1	Donau Chemie	Brückl	70			70	
<b>AUSTRIA TOTAL</b>				<b>70</b>	<b>0</b>	<b>0</b>	<b>70</b>	<b>0</b>
Belgium	3	Solvin	Antwerp	460	110		350	
Belgium	4	Solvic	Jemeppe	174			174	
Belgium	5	INEOS ChlorVinyls	Tessengerlo *	400	205		270	
<b>BELGIUM TOTAL</b>				<b>1,034</b>	<b>315</b>	<b>0</b>	<b>794</b>	<b>0</b>
Czech Republic	6	Spolana	Neratovice	135	135			
Czech Republic	7	Spolchemie	Usti	61	61			
<b>CZECH REPUBLIC TOTAL</b>				<b>196</b>	<b>196</b>	<b>0</b>	<b>0</b>	<b>0</b>
Finland	8	AkzoNobel	Oulu	40	40			
Finland	9	Kemira	Joutseno	75			75	
<b>FINLAND TOTAL</b>				<b>115</b>	<b>40</b>	<b>0</b>	<b>75</b>	<b>0</b>
France	10	PPChemicals	Thann	72	72			
France	11	Vencorex	Pont de Claix	170		170		
France	12	Kem One	Fos	340		179	161	
France	13	Arkema	Jarrie	72	0		72	
France	14	Kem One	Lavera	363	164	199		
France	15	Arkema	St-Auban	20			20	
France	16	MSSA	Pomblière	42				42
France	17	PC Harbonnières	Harbonnières	23	23			
France	18	Solvay	Tavaux	360			360	
France	19	PC Loos	Loos	18	18			
<b>FRANCE TOTAL</b>				<b>1,480</b>	<b>277</b>	<b>548</b>	<b>613</b>	<b>42</b>
Germany	20	BASF	Ludwigshafen	385	170		215	
Germany	21	Bayer MaterialScience	Dormagen	480			400	80
Germany	22	Bayer MaterialScience	Leverkusen	365			365	
Germany	23	Bayer MaterialScience	Uerdingen	280			280	
Germany	24	Bayer MaterialScience	Brunsbüttel	210				210
Germany	25	Dow	Schkopau	250			250	
Germany	26	Vinnolit (Westlake)	Knapsack	250			250	
Germany	27	CABB GmbH	Gersthofen	55			55	
Germany	28	Dow	Stade	1,585		1,030	555	

COUNTRY	NUMBER ON MAP	COMPANY	SITE	NAMEPLATE CAPACITY (000 TONNES CHLORINE)	Hg	D	M	OTHERS
Germany	29	AkzoNobel	Ibbenbüren	125	125			
Germany	30	AkzoNobel	Bitterfeld	99			99	
Germany	31	Evonik Industries	Lülsdorf	137	137			
Germany	33	AkzoNobel	Frankfurt	167	167		0	
Germany	34	Solvay	Rheinberg	220		110	110	
Germany	35	Vestolit	Marl	260			260	
Germany	36	Vinnolit (Westlake)	Gendorf	180			180	
Germany	37	Wacker Chemie	Burghausen	50			50	
Germany	96	Leuna-Harze	Leuna	15			15	
<b>GERMANY TOTAL</b>				<b>5,113</b>	<b>599</b>	<b>1,140</b>	<b>3,084</b>	<b>290</b>
Greece	94	Kapachim	Inofita Viotias	4			4	
Greece	95	Unilever Knorr	Marousi	20			20	
<b>GREECE TOTAL</b>				<b>24</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>0</b>
Hungary	39	Borsodchem	Kazincbarcika	323	131		192	
<b>HUNGARY TOTAL</b>				<b>323</b>	<b>131</b>	<b>0</b>	<b>192</b>	<b>0</b>
Ireland	40	MicroBio	Fermoy	9			9	
<b>IRELAND TOTAL</b>				<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>
Italy	41	Altair Chimica	Volterra	39			39	
Italy	42	Solvay	Bussi	25			25	
Italy	44	Syndial	Assemini	25			25	
Italy	49	Solvay	Rosignano	150			150	
Italy	50	HydroChem Italia	Pieve Vergonte	42	42			
Italy	93	Fater S.p.A.	Campochiaro	20			20	
<b>ITALY TOTAL</b>				<b>301</b>	<b>42</b>	<b>0</b>	<b>259</b>	<b>0</b>
The Netherlands	51	AkzoNobel	Botlek	637			637	
The Netherlands	52	AkzoNobel	Delfzijl	121			121	
The Netherlands	54	Sabir	Bergen op Zoom	89			89	
<b>THE NETHERLANDS TOTAL</b>				<b>847</b>	<b>0</b>	<b>0</b>	<b>847</b>	<b>0</b>
Norway	55	Borregaard	Sarpsborg	46			46	
Norway	56	Elkem	Bremanger	10			10	
Norway	57	INEOS ChlorVinyls	Rafnes	260			260	
<b>NORWAY TOTAL</b>				<b>316</b>	<b>0</b>	<b>0</b>	<b>316</b>	<b>0</b>
Poland	58	PCC Rokita	Brzeg Dolny	131	77		54	



COUNTRY	NUMBER ON MAP	COMPANY	SITE	NAMEPLATE CAPACITY (000 TONNES CHLORINE)	Hg	D	M	OTHERS
Poland	60	Anwil	Wloclawek	214			214	
<b>POLAND TOTAL</b>				<b>345</b>	<b>77</b>	<b>0</b>	<b>268</b>	<b>0</b>
Portugal	62	CUF	Estarreja	122			78	44
<b>PORTUGAL TOTAL</b>				<b>122</b>	<b>0</b>	<b>0</b>	<b>78</b>	<b>44</b>
<i>Romania</i>	91	<i>Oltchim</i>	<i>Rimnicu Valcea</i>	105	0		105	
Romania	92	Chimcomplex	Borzesti	96			96	
<b>ROMANIA TOTAL</b>				<b>201</b>	<b>0</b>	<b>0</b>	<b>201</b>	<b>0</b>
<i>Slovak Republik</i>	63	<i>Fortischem</i>	<i>Novaky</i>	76	76			
<b>SLOVAK REPUBLIK TOTAL</b>				<b>76</b>	<b>76</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Slovenia</i>	88	<i>TKI Hrastnik</i>	<i>Hrastnik</i>	16			16	
<b>SLOVENIA TOTAL</b>				<b>16</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>0</b>
Spain	64	Ercros	Huelva/Palos	48	48			
Spain	65	Ercros	Sabinanigo	30			30	
Spain	66	Ercros	Vilaseca	190	135		55	
Spain	67	Electroquimica Hernani	Hernani	15			15	
Spain	68	Elnosa	Pontevedra/Lourizan	34	34			
Spain	69	Ercros	Flix	78	78			
Spain	70	Quimica del Cinca	Monzon	31	0		31	
Spain	71	Hispanic	Martorell	218	218			
Spain	72	Solvay	Torrelavega	63	63			
<b>SPAIN TOTAL</b>				<b>707</b>	<b>576</b>	<b>0</b>	<b>131</b>	<b>0</b>
Sweden	75	INEOS ChlorVinyls	Stenungsund	120	120			
<b>SWEDEN TOTAL</b>				<b>120</b>	<b>120</b>	<b>0</b>	<b>0</b>	<b>0</b>
Switzerland	77	CABB-AG	Pratteln	27	27			
<b>SWITZERLAND TOTAL</b>				<b>27</b>	<b>27</b>	<b>0</b>	<b>0</b>	<b>0</b>
UK	82	INEOS ChlorVinyls	Runcorn	707	277		430	
UK	85	Brenntag	Thetford	7			7	
UK	97	Industrial Chemicals Ltd	West Thurrock	15			15	
<b>UK TOTAL</b>				<b>729</b>	<b>277</b>	<b>0</b>	<b>452</b>	<b>0</b>
<b>GRAND TOTAL</b>				<b>12,171</b>	<b>2,753</b>	<b>1,688</b>	<b>7,429</b>	<b>376</b>
<b>PER PROCESS</b>					<b>22.6%</b>	<b>13.9%</b>	<b>61.0%</b>	<b>3.1%</b>

Process: Hg = mercury M = membrane D = diaphragm Others = electrolysis of HCl to Cl<sub>2</sub> or molten salt electrolysis  
 Euro Chlor members are indicated in non-italic

\* Total combined production capacity of the Tessenderlo site Permit = 400 kt Cl<sub>2</sub>/yr

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**Ed**

COMMUNICATION  
AND EDUCATION

# Communication and education

## The ChlorineThings website

By launching a completely new website about the many advantages and benefits of chlorine-based chemistry, Euro Chlor has reinforced its communication activities.

The website illustrates the unique position of chlorine as a basic chemical as well as the chlorine-chemistry based applications, across ten areas of everyday life, from feeding the planet to transportation solutions and home comfort.

It is a fact that apart from the appreciated, well known applications such as disinfecting drinking water and swimming pools, the variety of other uses of chlorine chemistry are relatively unknown.

The visitors to the site view 15,000 pages annually to learn about chlorine things in our stomachs, how to swim faster than a fish, the way solar cells are produced and how street pavements can clean polluted air in our cities.

They can watch videos about how chlorine reacts with metals, and how virtually all communication technologies have links with chlorine chemistry. They can even enjoy our famous animated recipe for producing real chlorine in their own kitchen! Interactive buttons on the homepage offer different possibilities for dialogue with Euro Chlor.

Just visit <http://www.chlorinethings.eu> and start a fascinating journey through the chlorine universe!

## Communications Strategy continues according to plan

The Euro Chlor 'Chlorine Benefits Communications Plan' has progressed as intended. The Federation has developed a number of communication tools aiming to convey numerous messages about the benefits of chlorine-based chemistry to MEPs, influencers in 'the Brussels Bubble' and the public at large. These include the ChlorineThings website, advertisements in specialised media and the launch of short videos on YouTube.



The ChlorineThings site - the discovery site

## Intense new activity on Twitter

In order to further develop the Euro Chlor presence on social media, Euro Chlor hired the services of a young communications specialist. Portuguese trainee, Roger Costa has been helping us on this matter for six months.

He has developed a social media strategy, describing how and on which platforms the Euro Chlor social media presence could be enhanced.

A systematic and well documented series of tweets has resulted from this work. Furthermore, Roger has organised training for those Euro Chlor staff members wishing to make their own personal steps on Twitter.



Roger Costa helped Euro Chlor to further develop social media activity



## Science communication

The Euro Chlor Environmental Working Group has carried out an assessment of the potential risks to the aquatic environment, including secondary poisoning of arctic marine predators, posed by current exposure levels of hexachlorobenzene. It was published as a Science Dossier entitled 'Aquatic Environmental Risk Assessment of Hexachlorobenzene', as a case-study demonstrating that also for PBTs and POPs environmental risks can be assessed.

A Focus on Chlorine Science (FOCS) leaflet on 'Assessing the Risks of Persistent Organic Pollutants of Top Predators' was also published last year. The Euro Chlor FOCS documents are intended to provide a brief and easy to understand introduction to a specific scientific topic.


## The 17 Pin Invasion Continues

It started in August 2013. After having had a continuous but gentle flow of 3 to 5 requests per month for a free '17' pin, in the summer of 2013, an invasion of more than 300 requests reached the Euro Chlor mailbox in ONE weekend! It seemed that a bunch of British students had played a 'forward to friends' game with the internet page about the 17 pin.

A few months later, similar waves of hundreds of e-mails reached Euro Chlor, this time from the Russian Federation, Belarus and Ukraine. Communications had the leaflet 'Produce your own chlorine' translated into Russian by a particularly motivated Ukrainian young man.

© Co-mana



 *This cute green 17 pin continues its viral voyage through Europe, Africa and Russian speaking countries.*

The power of the 'like' and 'forward' social media buttons led to continued 'invasions' of our website and mailbox from countries like Morocco and Tunisia.

It is likely that these are from websites promoting 'free gifts', which are shared at a very high frequency. All these contacts are kept happy by a nice reply mail.

## Eye-catching videos on YouTube and in social media

In 2014, Euro Chlor started producing short videos translating the 'chlorine benefits messages' into powerful, peppy visual messages. These extremely compact videos (less than one minute) all start with *'Haven't you heard? It's a Chlorine Thing! – What is?'* and then the story builds up from there. Last year, three videos were produced: *Communication*, *Food and water for the planet* and *Your good health*.

A fourth video has completed the series: ***Energy saving***.


In this concept, Euro Chlor builds in factual data as well as humour whilst combining animated images, video images and old-and-new style pictures into fascinating video cocktails.

These videos are spread through several channels; you can view them on YouTube, we promote them via Twitter, put advertisements on the Corporate home page, advertise them in typical 'Brussels Bubble' media and of course share them with member companies if they want to promote the videos themselves.

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CI  
CHLORINE THING  
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© Black Jack/Shutterstock.com



 *ChlorineThings contribute considerably to home automation and energy saving*

## Occupational Health: passing on the torch

Improving the occupational health performance in a chemical plant is a very ambitious and sometimes unappreciated goal. Nevertheless, Dr. Jan Sije Huismans (AkzoNobel Industrial Chemicals) has successfully devoted a significant part of his career to it. Euro Chlor has been proud to have him participating for more than 20 years in its Health Working Group, consisting of highly respected physicians and toxicologists. Jan Sije started attending the meetings as an active member before he was elected as the Chairman of the group. It is certainly fair to say that Jan Sije's charismatic and unique approach has allowed him to leave his personal mark on many of the group's achievements.

A first example is the compilation of a set of so-called 'Health Documents', translating the occupational physicians' experience into proposed best practices for the membership. Whilst the first edition was written about 10 years ago, Jan Sije personally invested a lot of effort in them, including a comprehensive review process to tailor the documents to the members' current needs. The practical work continues to take some time as expected, but the result will be worth the effort. The document review process has also allowed Euro Chlor to evaluate its self-assessment audit questionnaires which are crucial in maintaining awareness.

In the second instance, Jan Sije insisted on the importance of the detailed review of the mercury-in-urine measurement data, provided on a yearly basis by the Euro Chlor plants. These give a first indication as to the success of the group's efforts to improve occupational health. In addition, they allow the

identification of plants that could use some direction in this area. In current decommissioning times, as the risk of exposure to mercury increases, particularly amongst decommissioning workers, the mercury-in-urine data collection remains important. In relation to exposure to chlorine, the Health Working Group has set up a database, gathering information from more than 120 adverse incident reports over the years. This gives the members a good picture of the type of incidents that occur and of the optimal treatments to be advised.

Thirdly, Jan Sije repeatedly highlighted the importance of dialogue between members and a good communication to all levels within the organisation. Under his leadership, the group not only redacted posters for the 'shop-floor'

and training presentations to be given by health professionals to the workers, but also organised workshops on the reduction of mercury exposure and drew up clear, working advice for plant managers.



Jan Sije Huismans

During every meeting or congress, in- or outside Euro Chlor, Jan Sije never failed to deliver his plea for improved health performance loud and clearly. A memorable

moment was the display of an internal AkzoNobel movie in which a victim of a caustic burn in a chlor-alkali plant explained the impact of the injury on his professional and personal life highlighting the importance of a good safety culture in a chemical plant. Never has the audience of a Euro Chlor General Assembly been more silent than during those 5 minutes!



*Our wrist watch will change profoundly thanks to clever materials and intelligent programming*

17

Cl

CHLORINE THING

35.453

From a purely scientific point of view, Jan Sije insisted on an annual literature review on the potential health effects of chlorine, mercury and electromagnetic fields. Also the developments related to the potential health effects caused by the use of chlorine in swimming pools were carefully followed up. This gave an extra dimension of scientific soundness to the advice provided by the group.

However, all good things must come to an end and in June this year, Jan Sije stepped down from his role as Chairman of the Euro Chlor Health Working Group. His unique, professional approach and important contributions were honoured in the heartfelt retirement wishes presented at his last Health Working Group meeting in May. Jan Sije will be replaced by Dr. Marc Boeckx, M.D. (INOVYN). We congratulate Marc, and wish him all the best with this new appointment!

As for Jan Sije himself, we are glad to say that he will still provide some assistance to Euro Chlor in a consultant capacity before beginning his well-earned, complete retirement. We wish him every success for his future!




## Chlor-Alkali industry present at biggest European scientific congress

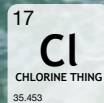
Every year, Euro Chlor represents the Chlor-Alkali industry at one of the biggest environmental science conferences in Europe: SETAC. This year's 25<sup>th</sup> edition was organised in Barcelona, Spain with the overall theme of environmental protection in a multi-stressed world: challenges for science, industry and regulators. Particularly of note this year was the session on chemical exposure in a regulatory setting, as well as one of the keynote presentations on science-driven solutions for cooperative and effective management of chemical risks; something which sits very high on the Euro Chlor agenda.

Interest continued in persistent organic pollutants and ECHA presented several sessions detailing their work as well as an update on their progress to date. Other important topics were highlighted by the platform sessions, which included Bioaccumulation, Hydrophobic Contaminants and Mixture Risk Assessment.

As a sustaining member of SETAC, Euro Chlor representatives attended the conference in order to monitor current trends in environmental chemistry and toxicology as well as to display Euro Chlor science literature from our booth. A selection of Science Dossiers and Focus on Chlorine Science leaflets were distributed to congress attendees. The two Science Dossiers on mercury continue to be of noticeable interest year after year, attracting several discussions at the booth.

The 25<sup>th</sup> SETAC Europe Congress attracted 2,700 participants from academia, industry and government, representing the tripartite nature of the Society. The participants included environmental scientists, chemists and ecotoxicologists and the congress took the form of daily platform presentations and poster sessions, focusing on multidisciplinary approaches to solving environmental problems. We look forward to supporting the event in Nantes next year.

 The Euro Chlor documentary clearly illustrates that the origine of chlorine lies in the sea



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## Chlorine Documentary 'A world of opportunities' unexpectedly popular

In parallel to the [www.ChlorineThings.eu](http://www.ChlorineThings.eu) website, the film 'A world of opportunities' documents areas of daily life in which chlorine-based chemistry plays a crucial role.

This video has proven to be very popular on the internet, which is rather unexpected for a ten minute video.

Indeed, it is even more popular than some of the shorter videos that we also have on YouTube.





## Advertisements

Part of the Chlorine Benefits Communications Plan is a series of advertisements. They show and describe objects or processes where the input from chlorine-based chemistry is mostly unknown, like modern insulation foams, waste water treatment or the processor in your smartphone. Yes, they too are chlorine things.

These advertisements are systematically published in important European print and electronic media like European Voice (now Politico) and viEUws. We also published an advert in the most popular European office 2015 calendar.



The documentary starts and ends with nice shots of the cute lady narrator walking bare foot in the sea at the Belgian coast. These images clearly illustrate where the origin of chlorine lies: in good oldfashioned sea salt.

In order to further enhance its popularity, the film has been cut into five shorter videos, each one documenting a specific chlorine chemistry application field and its benefit to mankind: eating well, staying healthy, being comfortable, keeping fit and having fun.

The audience for this video varies from politicians to teachers, from member company workers to young people visiting YouTube.

Member companies are invited and encouraged to use this documentary actively in their communication activities.

## Cleaning Waste Water is a Chlorine Thing.



We all know that chlorination makes drinking water safe and healthy. But industrial and household waste water purification also uses chlorine chemistry. Chlorinated chemicals are essential for making waste water fit for its return to nature.

it's a  
chlorine  
thing.

## Revamped Euro Chlor corporate website to boost online mobile communication

With 249,000 page views in 96,000 visits per year, the Euro Chlor corporate website confirms itself as an excellent tool for communication. On average, visitors stayed on the site for 2.4 minutes and they consult 3.2 pages. However, these figures decreased considerably over the last year, indicating that the site needed revamping. Indeed, in 'web world', a five year old site is a 'pretty old lady'.

Our new corporate site ensures that the vibrant Euro Chlor visual identity and that user-experience is **tailored to the visitors whether they arrive at the site via desktop computer, tablet or mobile.**

No less than 45% of all visitors are newcomers, which means that the site ranks highly in searches for 'chlorine' and related key words but also that the site has a loyal public that regularly returns (55%). The majority are American visitors, followed by British, German and French web browsers.

The most popular pages are found in 'The chlorine universe' chapter (125,000 page views/year) which would be of interest to teachers where the animations of the three production process technologies are extremely sought after. That is why we have also linked these to the ChlorineThings website. The safety/technology chapter is the second most consulted (17,000 views/year), and the chlorine industry issues pages rank



© Landmarks

## www.eurochlor.org

third (16,500 page views/year). More than 10,000 documents and publications are acquired every year via the Download Centre.

Every month, nearly 190 visitors want to know how they can produce small quantities of chlorine in their home kitchen. They can do this by watching the instructive animations on the dedicated page which, by the way, also comes in French and Russian due to the continued huge interest in North-Africa and Russian-speaking countries, combined with the power of the Internet and social media such as Facebook.



© Landmarks

# 3.2

pages viewed per visit

# 70%

of the visitors are newcomers

# 10,000

Euro Chlor publications downloaded each year

# 190

visitors/month view the animation about how to produce chlorine in their kitchen

# 249,000

pages viewed each year

# 2.4

minutes per visit

# 60-70%

of the visitors are younger than 34 years

euro  
**chlor** 17.

**365**

days working  
with & for you

**64**

Manufacturing  
locations

in **21**  
countries

**33**

Full members

**56**

Associate  
members

**52**

Technical  
correspondents

**28**

Working  
groups

**12**

Management  
Committee  
members



## The Euro Chlor Federation

In Europe, **33 Members of Euro Chlor produce chlorine at 64 manufacturing locations in 21 countries.** Almost 2,000,000 jobs are directly or indirectly related to chlorine and its co-product caustic soda when the numerous downstream activities are also taken into consideration (PVC, PUR, aluminium...)

Apart from the producers, Euro Chlor also has **56 Associate Members** and **52 Technical Correspondents**, including national chlorine associations and working groups, suppliers of equipment, materials and services as well as downstream users and producers outside Europe.

Euro Chlor was founded 62 years ago (1953) as a production-oriented, technical organization. The association was restructured and officially named 'Euro Chlor' in 1989 in order to provide the sector with strengthened scientific, advocacy and communications capabilities. Since then, a strong focus has been placed on sound science coupled with continual health, safety and environmental improvements, which are complemented by open and transparent communications with key stakeholders.

One of Euro Chlor's major objectives is to obtain the full **recognition** by Europe and the rest of the world **of the benefits of chlorine chemistry to society.** For the last three years, the Communications Plan has systematically contributed to support this core message.

## Management Committee

(6<sup>th</sup> of August 2015)

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- Baune, Jürgen  
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- Berges, José  
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*Chlorine derived chemistry has enabled the revolutionary breakthrough of 3D printing*



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[www.garlock.eu.com](http://www.garlock.eu.com)
- Health and Safety Executive  
[www.hse.gov.uk](http://www.hse.gov.uk)
- Huntsman (Europe) BVBA  
[www.huntsman.com](http://www.huntsman.com)
- ISGEC  
[www.isgec.com](http://www.isgec.com)
- IXOM  
[www.ixom.com](http://www.ixom.com)
- Kronos Europe N.V.  
[www.kronostio2.com](http://www.kronostio2.com)
- KSB-SISTO Armaturen SA  
[www.sisto.lu](http://www.sisto.lu)
- Lubrizol Advanced Materials Europe BVBA  
[www.lubrizol.com](http://www.lubrizol.com)
- MERSEN PGY SAS  
[www.mersen.com](http://www.mersen.com)
- Micro Bio Ireland Ltd.  
[www.micro-bio.ie](http://www.micro-bio.ie)
- Nirou Chlor Co.  
[www.nirouchlor.com](http://www.nirouchlor.com)
- Nuberg Engineering Limited  
[www.nubergindia.com](http://www.nubergindia.com)
- Occidental Chemical Belgium BVBA  
[www.oxy.com](http://www.oxy.com)
- PERMASCAND AB  
[www.permascand.com](http://www.permascand.com)
- Pfeiffer Chemie-Armaturenbau GmbH  
[www.pfeiffer-armaturen.com](http://www.pfeiffer-armaturen.com)
- Phönix Armaturen-Werke  
[www.phoenix-armaturen.de](http://www.phoenix-armaturen.de)
- Powell Fabrication and Manufacturing Inc.  
[www.powellfab.com](http://www.powellfab.com)
- PROFILCO BV  
[www.profilco.nl](http://www.profilco.nl)
- R2  
[www.r2000.com](http://www.r2000.com)
- Richter Chemie-Technik GmbH  
[www.richter-ct.com](http://www.richter-ct.com)
- National Institute for Public Health and the Environment (RIVM) – Centre for External Safety (CEV)  
[www.rivm.nl](http://www.rivm.nl)
- Sasol Polymers  
[www.sasol.com](http://www.sasol.com)
- Senior Ermeto  
[www.senior-aerospace-ermeto.com](http://www.senior-aerospace-ermeto.com)
- SIEM - SUPRANITE  
[www.siem.fr](http://www.siem.fr)
- SITA REKEM  
[www.sita.fr](http://www.sita.fr)
- STEULER-KCH GMBH  
[www.steuler-kch.de](http://www.steuler-kch.de)
- TaylorShaw Valves, a Division of Blackhall Engineering Ltd.  
[www.shawvalves.co.uk](http://www.shawvalves.co.uk)
- Technip France  
[www.technip.com](http://www.technip.com)
- Technip Germany  
[www.technip.com/en/entities/germany](http://www.technip.com/en/entities/germany)
- Tronox Pigments (Holland) BV  
[www.tronox.com](http://www.tronox.com)
- VICHEM  
[www.vichemgroup.com](http://www.vichemgroup.com)
- WL Gore & Associates GmbH  
[www.gore.com/sealants](http://www.gore.com/sealants)
- W.T. Armatur GmbH – CRANE ChemPharma Flow Solutions  
[www.wt-armatur.de](http://www.wt-armatur.de)





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Euro Chlor provides a focal point for the chlor-alkali industry's drive to achieve a sustainable future through economically and environmentally sound manufacture and use of its products. Based in Brussels, at the heart of the European Union, the federation works with national, European and international authorities to ensure that legislation affecting the industry is workable, efficient and effective. Euro Chlor communicates in a transparent way with all stakeholders and systematically highlights chlorine chemistry benefits.

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