Chlorine Industry Review

2013-2014

European Chlor-Alkali Landscape Buoyed by Investor Confidence

Online copies are available on **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 in everyday life. They create real added value and benefits for each and everyone of us.

Cover picture: thanks to hundreds of “chlorine things”, our homes become ever more energy friendly, comfortable and long-lasting.

euro chlor 17.

25 YEARS

it's a chlorine thing.

European Chlor-Alkali Landscape Buoyed by Investor Confidence

As the starting gun went off the contestants did not so much sprint into action as flap around like a flock of geese or ducks. I refer of course to the post European Parliament elections activity where the parties eyed each other questioningly in an effort to understand what the implications of the influx of Eurosceptics were to be.

For the political students amongst us this has been an interesting period of study – for the business community this presents a new opportunity to ponder what effect it brings to the competitiveness and growth agenda. Disappointingly, the answer is probably 'nothing' – at least on its own.

Whilst all of the EP political groupings referred in their manifestos to positive commitments on jobs and growth the reality is that the Parliament on its own, despite its growing power, has not as yet come forward with a practical plan on how anything can be achieved. The issue is certainly political now and we must look to the Council to come forward with framework proposals on restoring economic prosperity for Parliament to debate and agree.

For us this means tackling the variable but nonetheless high taxation that Member States put on electricity and separately, the high cost of ethylene for the PVC industry which consumes about a third of the chlorine produced by our members.

The cost of energy can be mitigated to some extent by working ever harder on becoming more efficient and this will in turn be brought about by investment in state-of-the-art technology. During the course of the triennial Technology Conference held during April 2014 in Madrid we heard from a host of suppliers on their recent innovations in membrane technology. Against the backdrop of the publication in December 2013 of the BREF conclusions requiring the industry to have phased out mercury by December 2017, interest was considerably higher than in the past.

This phase-out issue has given rise to speculation that our industry will have to severely reduce capacity and that we can expect a deluge of imports from other parts of the world where energy costs are somewhat lower than on our home turf. I have recently been quoted as refuting these arguments and do so again here. 'Rumours of our demise have been grossly exaggerated'!

There is no denying that the PVC industry is under pressure but we should be encouraged by the recent merger decision between Ineos and Solvay to form Inovyn™, the purchase of Vinnolit by the American company Westlake, the purchase of VESTOLIT by Mexichem and the announcement of Kem One to convert to membrane technology. Other investment decisions by enterprises outside of PVC have also been made.

This is all in keeping with the notion of innovation and striving for the highest levels of efficiency. However, it is not enough! Our governments must also play their part in tackling the broader competitiveness issue. In the early part of 2014, I read an article where the writer was of the view that claims by industry that energy costs were driving closures and investment leakage was misleading. His belief was based on figures that showed energy costs in Germany only accounted for less than 3% of gross production costs. His view clearly ignores the fact that energy intensive industries like ours provide the building blocks for all other industries and if we, the foundations, are removed then the edifice itself will topple. From an advocacy point of view this demonstrates what we are up against – how can we persuade commentators like that to what is so blindingly obvious to us!

It would be wrong for me not to refer in this foreword to other regulatory matters which continue to dog our industry. First up is the need for the chlorinated solvents people to tackle a couple of quite nasty issues. I refer to efforts on the part of France to ban the use of perchloroethylene as a dry cleaning solvent. This follows on from the decision at the European level to restrict the use of methylene chloride as a paint stripper. The companies involved are fighting hard to ensure that a common sense approach is taken and that 'political' decision making is kept out of the picture.

The REACH legislation is also showing its teeth with both mid-chain chlorinated paraffins and carbon tetrachloride ending up on the CoRAP list with requests for more studies. Of course it is legitimate to be asked for more data where this enables better decision making but these requests seem to be out of all proportion to the risks that the uses of the substances pose.

Finally a word on safety which as we should all know is the pre-eminent priority for our industry. Our Management Committee became concerned some time ago that we were not making any progress with those members whose performance was significantly worse than acceptable. This is not the place to 'name and shame' but for those who are in that category we will be putting in place measures to help them tackle their issues before the problem becomes greater than at the company level. Our chairman Andreas Amling addresses this subject on the following pages.

Incidentally, 2014 marks the 25th anniversary of Euro Chlor as we know it today. I would like to offer my congratulations to all those, past and present, who have contributed to the success of our organisation and industry. We certainly have built a tradition we can all be proud of!

With a new Parliament and Commission in place then the next 12 months promises to be an interesting time. I wish all our members a successful year in dealing with their many and varied issues.

Alistair Steel
Executive Director

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 Euro Chlor Membership Together

Chairman A. Amling

The 21st century needs a sustainable chlorine industry. Our first sustainability programme, which started in 2001, has already delivered major improvements across a broad range of key indicators. It has also focused companies throughout the sector on the areas where further improvements could be most beneficially made.

We are glad to communicate that energy consumption per tonne of chlorine has consistently dropped since 2001. This improvement has been due to advances in cell technology and in more energy efficient ancillary equipment. New emerging technologies show that the energy use can be considerably further reduced and that the electrolysis process has further potential to innovate.

Another important milestone of our programme was the continuous reduction of emissions of mercury and chlorinated organic compounds, the latter now being way below the 2010 target.

Our programme has also delivered improvements in the safety field 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, this is a continuing battle which requires the ongoing focus of management and employees together.

The second phase of the sustainability programme, launched in 2011, would strengthen the emphasis on training as the foundation for safe and sustainable operation. Still, over the last two years the average safety performance of our industry has not shown the improvements we originally targeted. The results of several sites must indeed be improved because they reflect badly on industry as a whole.

This situation must be addressed as a priority matter. Therefore, the Management Committee has decided to investigate ways and instruments to help improving the overall safety records of the companies concerned.

Euro Chlor has asked the technical working groups to emphasise the discussions on safety issues (analysis of incidents, solutions adopted to prevent repetition…). A task force has been set up, composed of HSE experts from a limited number of companies. They have started exchanging experiences on safety performance improvement initiatives and programmes they have launched previously.

Several aspects are being considered, including but not limited to:

- how to introduce further schemes for improvement
- how to better involve small isolated sites
- how to challenge the representativeness of the indicators used
- how to support behavioural change both at operator and manager level

A practical action plan proposal has been developed that will help interested member companies to develop their own safety initiatives. This programme was presented to all members during the September 2014 General Assembly in Edinburgh. The task force will ensure the follow up of the programme implementation.

It is in all our interests that our employees are healthy and our plants operate safely. Let us enhance the overall safety performance of the Euro Chlor membership together.

The route towards further improving the balance to create an even more sustainable chlorine industry is charted and the journey continues. We look forward to reporting how the chlorine industry has continued to deliver more for society, from less.

Andreas Amling
Chairman of the Management Committee

it's a chlorine thing.

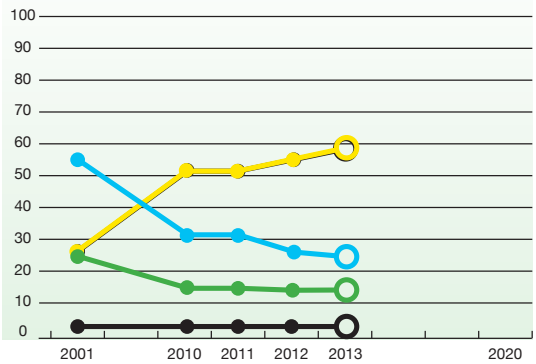
For large structures with thousands of window panes, self-cleaning glass allows the sun and rain to perform an otherwise monumental task, thanks to a titanium dioxide coating

Manufacturing technology

Two mercury based units shut down in 2013, while another one continued its progressive conversion to the membrane process, which now represents about 60% of the chlorine production capacity in Europe. The mercury process now accounts for less than 25% of production capacity.

The speed of conversions will increase due to the publication of the chlor-alkali BAT conclusions at the end of 2013, under the Industrial Emissions Directive. The mercury cell technique must now be eliminated by the end of 2017.

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



Economic development

Right from the start of 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, Euro Chlor continues to publish these figures. A map of Europe showing the location of all plants and a table indicating the ownership, technologies and capacity of each plant is included in section 3 of this Review (see pages 28-31).

Mercury emissions

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

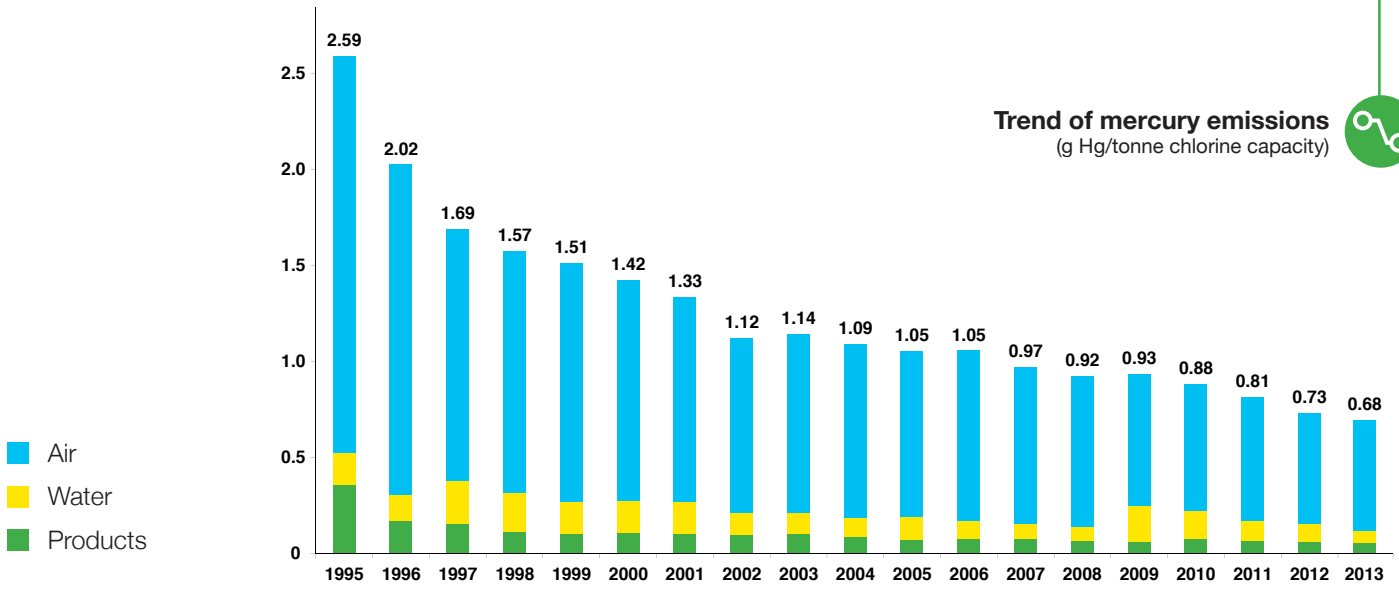
The overall European mercury emissions in 2013 amounted to 0.68 g Hg/tonne chlorine capacity.

This data continues to confirm the trend for improvement with respect to the previous years (0.73 g Hg/tonne in 2012).

As noted in the last years, the average reduction of emissions is due to the improvement shown by the lower performing plants, and there is still a margin for reduction.

One plant is still slightly above the 2007 target of 1.5 g Hg/tonne chlorine capacity for the total emissions.

Trend of mercury emissions
(g Hg/tonne chlorine capacity)



Energy consumption

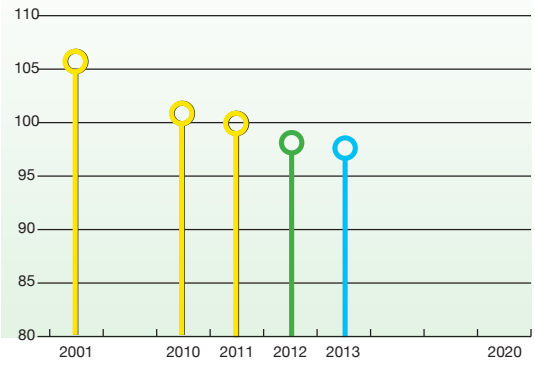
With the start of the new Sustainability Programme in 2011, we calculate the energy consumption as the total primary fuel needed for the chlorine production; the result is expressed as a percentage compared to the 2011 value (which is referred to as 100%).

This energy is not only required for the electricity consumed in the electrolysis cells and for the utilities (motors, pumps and illumination) but also for the steam used for heating fluids and particularly for the concentration of the caustic to 50% (for diaphragm and membrane processes, when 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.

To illustrate the concept, the corresponding figure for 2001 (the first year of the first programme) is about 106% of the 2011 consumption whilst 2012 and 2013 continue to show a further significant reduction. Nevertheless, there still are differences between the various sites.

Energy consumption
(% with respect to 2011)

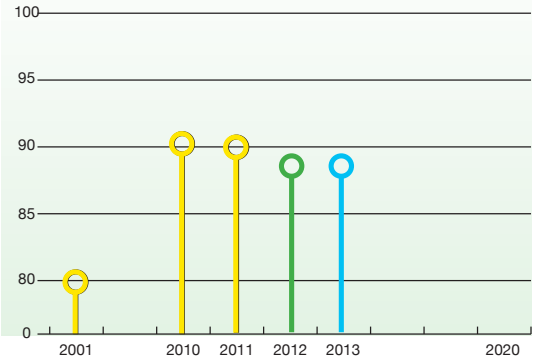


Hydrogen use

The 2013 situation shows no improvement in the hydrogen use, which is still several per cent lower than in 2010.

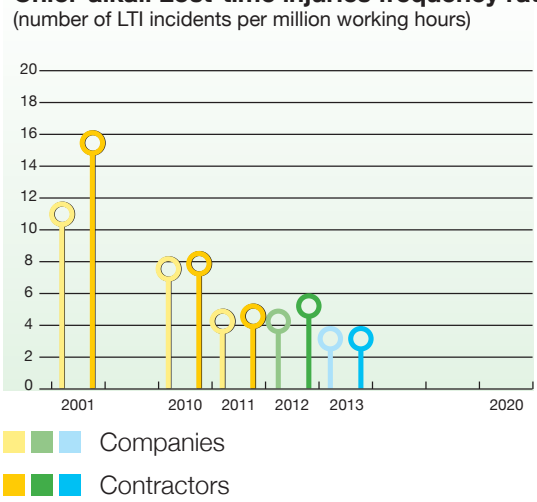
Some companies still have difficulties in finding a way to use the hydrogen by-product even though new technologies, like fuel cells or electrolysers with depolarised cathodes, are available on the market.

Hydrogen use
(% of production)



Lost-time injuries

Chlor-alkali Lost-time injuries frequency rate
(number of LTI incidents per million working hours)



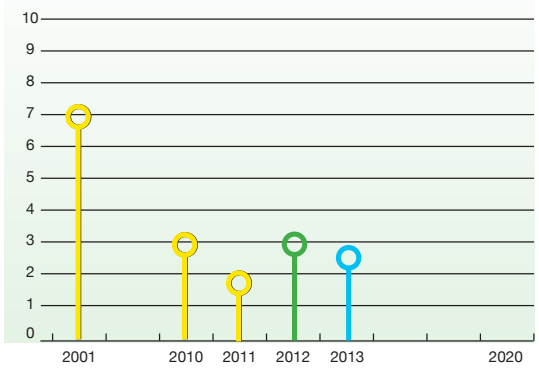
This indicator was modified with respect to the first programme. Now information is only gathered on the accidents specific to the chlorine industry, i.e. directly related to electric current/voltage, chlorine, caustic, hydrogen (explosion), mercury, hypochlorite, sulphuric/ hydrochloric acids and other reactants used in the perimeter of the electrolysis unit. It is however not certain that all companies follow the new definition and they will be reminded to check the data transmitted.

After the lack of improvement in 2012, the results of 2013 show a reduction in the frequency rate figures (number of incidents per million working hours) for own employees (3.3) and contractors (3.5).

A task force of HSE experts has developed an action plan to help member companies to achieve further improvements.

Process incidents and losses

Process incidents and losses
(Number per million tonne chlorine produced)



2013 showed a slight improvement after the large increase of the previous year.

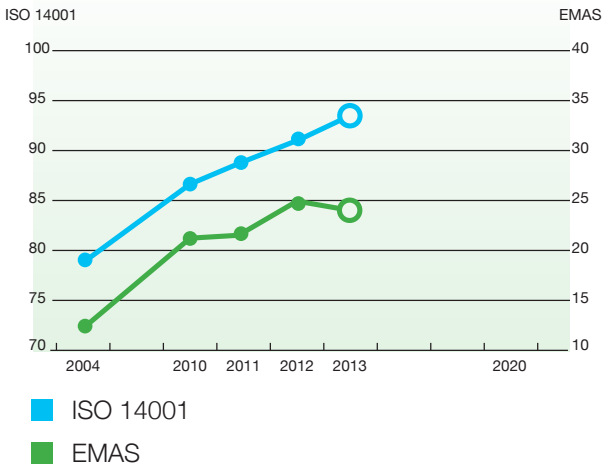
There is no apparent correlation between this indicator and the lost time injuries indicator but, within the framework of the recently launched safety improvement programme, Euro Chlor will again contact those sites showing high values and offer its support to help improve their performance.

Environmental accreditation

Environmental accreditations recognise the fact that organisations practice an environmental management system. Euro Chlor advises its members to demonstrate, via these accreditations, that their production units care for the environment.

There was a further apparent increase in the proportion of sites with ISO 14001 accreditations while the situation for the more demanding EMAS (Eco-Management & Audit Scheme) remained stable. Out of 63 chlorine production units, 59 are ISO 14001 certified and 15 have an EMAS certification.

Environmental accreditation
(% of total sites)



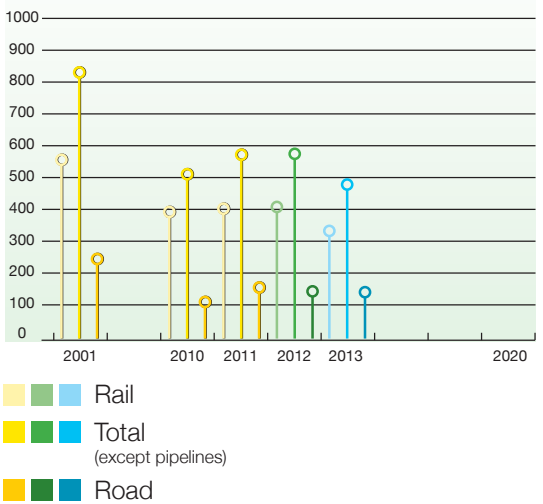
Transportation

The quantities of chlorine transported by rail, road and waterways decreased significantly in 2013 to about 5% of the production. Some rationalisations in the European chemical industry can perhaps explain this trend.

Roughly 2/3 of transport still takes place by rail and the rest by road.

Again, there were no transport incidents in Europe during 2013.

Chlorine transported outside industrial sites
(Thousands of tonnes)



Time dedicated to HSE training

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

The average figure is about 1.5% for 2013. However, there is a considerable spread of values.

Also, the definition of the dedicated time has to be further refined to ascertain the comparability of the data reported.

> **It is in all our interests that our employees are healthy and our plants operate safely.**
>
> **Andreas Amling, Chairman of the Management Committee**

Nothing as nice as rolling around on a PVC ball, dressed in polyester/spandex and wearing PVC sports shoes with polyurethane soles

Responsible Care

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.

REACH management

The administrative and financial management of the REACH consortia were successfully handed over to ReachCentrum at the end of 2012. Euro Chlor Secretariat members stayed involved in the consortium work by continuously following the subject matter.

Even though the substances were successfully registered in advance of the 2010 registration deadline, a number of issues for various substances continue to require additional and sometimes substantial work.

REACH follow-up work involves updating the chlorine Chemical Safety Report (CSR). For sodium hypochlorite a new classification for acute and chronic toxicity is awaited, while for 1,2-dichloroethane (EDC) extensive mode of action studies to refine the safe level for workers are ongoing. EDC is on the list for authorization (Annex XIV) which impacts the non-intermediate uses. Downstream users are considering application for authorization of the use of EDC as a solvent.

For HCl, skin and eye irritation studies have been performed which may lead to an update of the CSR in due course. Carbon tetrachloride and MCCP (medium-chain chlorinated paraffins) are listed on the Community Rolling Action Plan (CoRAP) and both Consortia have filed appeals to the ECHA Board of Appeal against the required testing proposals.

This may signal a broader concern that there seems to be little opportunity to discuss testing requirements with authorities on a scientific basis.

In particular authorization or restriction requirements seem to make the REACH Regulation even more costly and burdensome.

PVC industry more sustainable than ever

All major downstream chlorine users have deployed sustainability programmes.

VinylPlus is the European PVC industry's ten year Voluntary Commitment to Sustainable Development.

At the July 2014 Vinyl Sustainability Forum in Rome, VinylPlus Chairman Michael Träger said: "We are very proud to show how VinylPlus is continuously progressing toward its targets. At the heart of our Commitment's progress is the strong cooperation among PVC industry sector groups, companies, national associations and the factual contribution of our stakeholders". He added "our commitment is strong and we will continue to guarantee maximum efforts in driving the PVC industry towards a greener economy and to promote a more sustainable model of industrial production at global level".

Raising sustainability awareness is a key component of the VinylPlus programme. In November 2013, VinylPlus became a member of the Green Industry Platform (GIP), a joint initiative of the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP).

VinylPlus registered a record 444,468 tonnes of recycled PVC in 2013 – keeping the industry on track to meet the challenge of recycling 800,000 tonnes per year by 2020.

In 2013 VinylPlus registered a decrease of 81.4% in the use of lead-based stabilisers in the EU-27 compared to 2007 levels, well on target to completing their substitution by the end of 2015. In 2014, the commitment will be extended to the EU-28.

The VinylPlus annual Progress Report gives an overview of the recent initiatives toward the concrete and measurable targets. Read more about the VinylPlus initiatives on **www.pvc.org/en/p/vinylplus**.

vinyl plus

Regulation

Take hundred pharmaceuticals and nearly ninety of them have a direct link with chlorine chemistry

Chlor-alkali BREF finalised and published

The revision of the Best Available Techniques Reference Document (BREF document) for the chlor-alkali industry, required by the new Industrial Emissions Directive, was completed in 2013 and published mid-2014. The legally binding BAT conclusions were already published in December 2013. This implies that local permits have to be updated before December 2017 and installations will have to comply with the new BAT requirements.

An important conclusion in this BREF is the assertion that the mercury-cell technology to produce chlor-alkali is not considered BAT (under any circumstances). The same applies for asbestos-based diaphragm units.

Cooling fluids for new units of chlorine liquefaction have been limited in the new BREF to fluids with a maximum global warming potential of 150. This severely restricts the potential options.

The December 2017 deadline of the BAT conclusions overrules the Euro Chlor voluntary commitment to phase-out the mercury process by 2020.

Overall the chlor-alkali industry considers the final BREF document is reasonable and workable

The 'ChlorineThing' titanium dioxide, applied on jeans and worn in the sunlight, converts harmful pollutants NOx and VOCs into harmless molecules

Emission Trading System (ETS) - carbon leakage revision

Euro Chlor also contributed to the revision of the list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage for the period 2015 to 2019. This list was endorsed by the EU Climate Change Committee in July 2014 and will be adopted by the Commission during the autumn. As expected, the chlor-alkali industry is considered an exposed sector. Euro Chlor now focuses on the discussion related to the post-2020 carbon leakage provision under the ETS which the Commission launched in May 2014. Euro Chlor's objective is that a harmonised EU-wide compensation scheme for electro-intensive industries should be put in place.

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. The members of the Euro Chlor Biocides Registration Groups will do the necessary to appear on ECHA's Article 95 list of approved suppliers, to ensure that they can continue to market their active substances after the 1st September 2015.

A decision for approval of the Euro Chlor substances is expected in 2015 or 2016.

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 programme 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.

International Chlorinated Alkanes Industry Association

Cooperation with the global chlorinated alkanes community continues with the publication of the third edition of the International Chlorinated Alkanes Industry Association (ICAIA) Newsletter in 2014. A second meeting of the major global CP producers is tentatively scheduled to take place in China in 2015, following the first successful ICAIA meeting in Brussels in 2012.

Chlorinated paraffins in the regulatory spotlight

While short-chain chlorinated paraffins are no longer manufactured in the EU, medium and long-chain chlorinated alkanes continue to face regulatory pressure in Europe. In particular, MCCPs have been through the REACH Substance Evaluation process which 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 to contest the decision with the ECHA Board of Appeal.

Throughout the REACH Substance Evaluation process, the Chlorinated Paraffin's Sector Group has supported the MCCP REACH Consortium in carrying out new persistence and bioaccumulation studies in order to generate relevant data where uncertainties still exist. They are convinced that more suitable testing methods are available and therefore continue to explore new testing and analytical methods suitable for assessment of CPs. A thorough review of the available bioaccumulation data indicates that MCCPs are not likely to bioaccumulate in the environment, and new persistence tests on various MCCP components showed that the substance is far better degradable than previously assumed.

Protection of workers exposed to electromagnetic fields

Rules to ensure the safety of workers exposed to electromagnetic fields (EMF) have been adopted by the European Parliament and Council. Euro Chlor welcomed the Directive which addresses the short term impact, stipulates maximum exposure limits and identifies protective measures for workers. The transposition of the Directive into national law by the Member States should be done by latest July 2016. Euro Chlor will continue to contribute to the development of guidelines for interpreting and applying the Directive.

Fine PVC cling film keeps the bugs out and freshness in

Chlor-alkali metallic mercury reporting to the Commission

On an annual basis, Euro Chlor is gathering from the member companies utilising the mercury electrolysis process data which include:

- The total amount of metallic mercury present on each site, regardless of whether the chlorine unit has been shut down
- The solution adopted for elimination of the excess mercury from shut down units.

These data can be consulted on the Euro Chlor website, are reported to the Commission and are publicly available on DG Environment's website **(http://ec.europa.eu/environment/chemicals/mercury)**.

In line with the progressive phase out of the mercury process, the overall trend shows a continuous decrease in the amount of metallic mercury.

Two mercury based units were shut down during 2013 and another one continued its stepwise conversion to the membrane process.

Occupational Health: we take up the challenge

In these times of decommissioning, the Euro Chlor Health Working Group is strongly preoccupied with the reported mercury in urine measurements from the workers and the potential solutions for avoiding elevated exposure levels. Guidance and assistance is offered upon request.

As far as chlorine is concerned, a detailed analysis of 114 reported adverse incidents covering a 10-year period was performed. The data were introduced in a newly designed database. Even though 200 incidents are needed to generate statistically significant results, some trends can already be identified. A first important finding is that adverse effects of chlorine inhalation in the chlor-alkali industry appear to be restricted in severity and time. The most commonly occurring symptoms are coughing and shortness of breath and they disappear within 24 hours.

The database also allows us to obtain an indication of the most appropriate curative measures which is of interest to the member companies' medical departments. Skin and eye burns may not occur frequently, but their severity certainly justifies the careful attention dedicated to them. Finally, the Euro Chlor health experts aim at identifying the best choice of treatment in cases of caustic burns.

Stockholm Convention progressed HCBD

The risk management evaluation of hexachlorobutadiene (HCBD) according to Annex F of the Stockholm Convention was reviewed at the ninth meeting of the POP (Persistent Organic Pollutants) Review Committee in October 2013. HCBD is a minor and unintentional by-product in the manufacturing of chlorinated solvents.

During various working sessions, the World Chlorine Council (WCC) was able to make considerable improvements to the final text, in particular by removing several inappropriate references to substitution of chlorinated solvents. The final version, as adopted by the Review Committee, was acceptable to WCC. The political endorsement of the evaluation is expected at the first upcoming Conference of the Parties which is expected to take place in May 2015.

As part of an effectiveness review of the Convention WCC contributed significantly to an industry letter summarizing many suggestions to improve the quality of information contained in draft risk management evaluations and risk profiles. This letter was submitted on behalf of the International Council of Chemical Associations (ICCA), representing yet another attempt to improve the lack of scientific rigour and procedural shortcomings of the assessments under the Convention.

New ECSA website and logo

ECSA has followed the initiative launched by Euro Chlor to facelift its corporate design and has developed a new modern logo that fits in nicely with the Euro Chlor brand.

In order to improve its visibility to downstream users, users associations and authorities, ECSA has also developed a new website, **www.chlorinated-solvents.eu**.

DCM is readily biodegradable

A new study conducted by ECSA on biodegradation of dichloromethane (DCM) in a closed bottle test according to OECD guidelines resulted in this finding. The study was required after an international agreement was reached by the OECD Cooperative Chemicals Assessment Programme on the hazard assessment of dichloromethane, which led to intense discussions on the available data on biodegradation for the substance.

DCM in paint stripping

Since 2009 the use of DCM in paint stripping for consumer use is forbidden and no member state implements derogations for experienced professional paint strippers. In 2014, the UK authorities launched a public consultation that concludes that the use of DCM by well-trained professionals is of interest for the UK. A training program accepted by the UK authorities will be put in place for professionals. They will have to pass a test prior to using DCM in paint-stripping.

Use of DCM-based paint strippers in closed systems is still permitted provided that emissions and exposure of workers are well controlled.

REACH

Chlorsolv Consortium is in charge of the REACH activities of the 5 chlorinated solvents substances (carbon tetrachloride, chloroform, dichloromethane, trichloroethylene, and perchloroethylene).

Trichloroethylene is included in Annex XIV and submitted for authorisation.

Perchloroethylene is part of the CoRAP (Community Rolling Acrtion Plan) evaluation process by the reporting country, Latvia. The rapporteur assessed that no extra studies were required as the dossier contains sufficient information for evaluation.

Carbon tetrachloride is also part of the CoRAP process by the rapporteur, France. This country has issued, despite the already very high regulatory pressure, a disproportionate request for a reprotoxicity extended one generation study via inhalation.

Chlorsolv Consortium has filed an appeal to the ECHA Board of Appeal to contest this decision.

UNEP Mercury Partnership activities

Euro Chlor, representing the World Chlorine Council (WCC), is an active contributor to the UNEP Chlor-Alkali Partnership. The task of the Partnership is to collect and share relevant information on specific subject areas. WCC shares guidance and best practices on handling of mercury during normal operation, maintenance and decommissioning.

This year WCC started to reorganise the available information to make it more accessible. In the course of this calendar year this process should lead to a user-friendly portal of the information on the WCC website, linked to the UNEP Partnership page. Other information shared by WCC on the Partnership website is a report on 'Cost of Conversion' and a yearly detailed update on use and releases of mercury by our industry. As of 2013, this information is complemented with listing of intended closures or conversions and specific data on amounts of mercury released from decommissioned mercury cells.

Completion of the Minamata Convention on Mercury

In October 2013, the final formal meeting of the UNEP Convention on Mercury took place in Kumamoto, Japan. The Minamata Convention will enter into force when 50 ratifications have been deposited. Ratification is expected to take at least two years after which a COP (Conference of the Parties) meeting will be organised. A further negotiation meeting (INC6) is scheduled for November 2014 to further develop the text of the Convention. For issues such as waste handling, storage, etc. a technical working group will be set up.

WCC will continue to follow these developments. It is possible that the guidance already available for our sector might be considered adequate. Dolf van Wijk, Euro Chlor's Science and Regulatory Affairs Director and leader of the WCC delegation during the negotiating process, commented: "practically this means that the control over the decommissioning and conversion activities needed for our sector is covered by the voluntary actions under the Convention". This demonstrates the trust the WCC delegation has built during the process which is rewarded by respecting the self-regulating ability of our sector. The extensive contributions to the UNEP Mercury Partnership have also contributed to this success.

For the chlor-alkali industry in Europe the Convention is not expected to have an impact. The mercury cell technology is now regulated by the Chlor-Alkali BREF and the published BAT conclusions under the IED (Industrial Emissions Directive), as described on page 17 in this Review.

UNEP - Chlor-Alkali Partnership mercury reporting

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

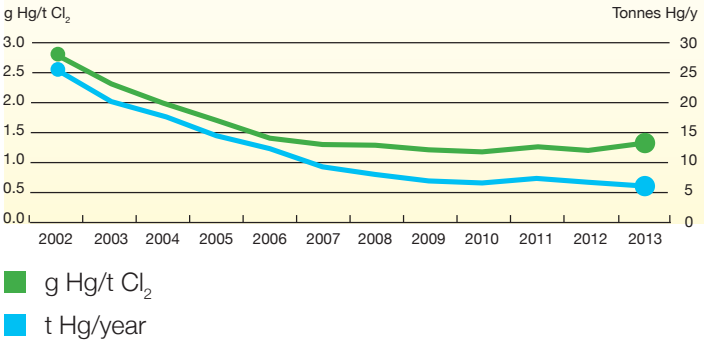
As foreseen, the number of plants and their mercury cell-based production capacity continue to show a worldwide decrease: the number of plants went down from 91 to 45 over the period 2002-2013 (-50%) and the mercury cell-based capacity from 9.1 million tonnes to 4.1 million tonnes (-55%).

Global mercury emissions have been substantially reduced in the period 2002-2013. They went down from 24.6 tonnes per year to about 5.8 tonnes per year, a decrease of more than 76%. The specific emissions expressed in g mercury/tonne annual chlorine capacity again showed a slight increase in 2013 to about 1.4 g Hg/t Cl_2 capacity.

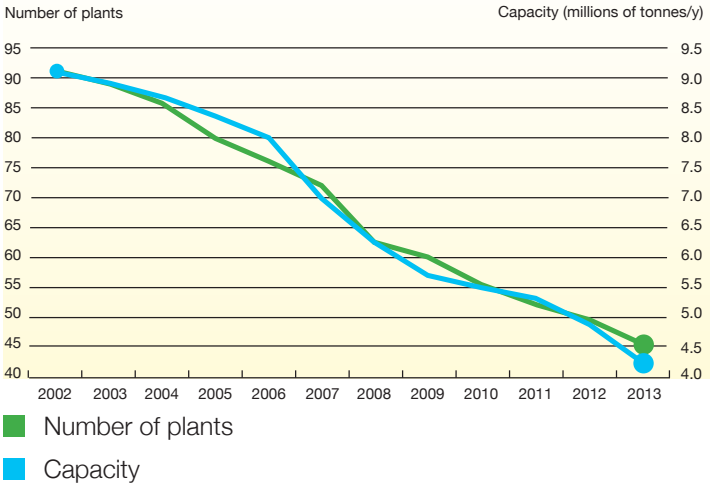
To complement the information from WCC members, UNEP also gathers data from the national authorities on:

- 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.

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



Competitiveness

The breath-taking kitesurf, made possible thanks to chlorine chemistry based polymer materials

Commission recognises competitive threats to chlorine industry

Earlier this year the Commission published a number of documents in preparation for the Competitiveness Council in February and the Heads of State Summit Meeting in March. The documents made recommendations on the 2030 climate goals and for the future of shale gas, as well as an allusion to the review of the carbon leakage list. Of particular interest to manufacturing industry was the Report on Energy Prices and Costs. Mixed conclusions are made but it clearly states that "The results confirm the vulnerability of energy intensive industries in particular those that are exposed to foreign competition, such as metals and chemicals". More specifically based on input from Euro Chlor member companies via a report carried out by CEPS on behalf of DG Enterprise, the report concludes that "Electricity price is a crucial driver for chlorine production costs, affecting the competitiveness of the industry" and that "[chlorine] plays a fundamental role in the chemical value chain".

Competitive issues still weigh heavily with high prices of energy being of major concern

it's a chlorine thing.

Polycarbonate goggles provide a crisp and clear, safe view in many sports

EUR. CHLORINE PRODUCTION 2013	KTONNES	%
GERMANY	4,271	45.2%
BELGIUM + THE NETHERLANDS	1,527	16.1%
FRANCE	1,024	10.8%
FI+NO+SE+PL	752	8.0%
PT+CH+GR+RO+UK	758	8.0%
SPAIN	481	5.1%
CZ+SK+HU+AT	412	4.4%
ITALY	229	2.4%
TOTAL EURO CHLOR	9,454	100.0%

9454 kilotonnes
European Chlorine production in 2013

EUR. CHLORINE APPLICATIONS 2013	KTONNES	%
PVC	3,157	33.0%
ISOCYANATES & OXYGENATES	2,873	30.0%
INORGANICS	1,434	15.0%
OTHER ORGANICS	909	9.5%
EPICHLOROHYDRIN	477	5.0%
CHLOROMETHANES	440	4.6 %
SOLVENTS	271	2.8 %
TOTAL	9,561	100.0%

9561 kilotonnes
European Chlorine applications in 2013

EUR. CAUSTIC SODA APPLICATIONS 2013	KTONNES	%
ORGANICS	2,875.3	31.0 %
MISCELLANEOUS	1,491.5	16.1 %
PULP PAPER CELLULOSE	1,257.2	13.6 %
OTHER INORGANICS	1,094.3	11.8 %
ALUMINIUM AND METALS	500.9	5.4 %
FOOD INDUSTRIES	504.3	5.4 %
WATER TREATMENT	451.1	4.9 %
SOAPS	363.8	3.9 %
BLEACH	348.9	3.8 %
MINERAL OILS	138.6	1.5 %
RAYON	125.8	1.4 %
PHOSPHATES	116.0	1.3 %
TOTAL	9,267.0	100.0%

9267 kilotonnes
European Caustic Soda applications in 2013

Chlorinated solvents sales 2013

Sales of chlorinated solvents in 2013 were 139,200 tonnes (combined sales of dichloromethane, perchloroethylene and tetrachloroethylene, a small growth of 0.8% compared to 2012 what can be considered as a rather flat evolution after previous two years of volumes decrease.

The situation is quite similar in both solvents: sales of dichloromethane went up to 104,600 tonnes (+0.6% compared to previous year), while for perchloroethylene the increase was +1% for a volume of 34,700 tonnes, both products showing positive but close to flat evolution from one year to another.

Dichloromethane is mainly used in the industry and remains the most widely-used chlorinated solvent because of its unique properties.

ECSA supports the safe and sustainable use of perchloroethylene as the solvent of choice for textile dry-cleaning and metal degreasing applications.

In Europe sales of trichloroethylene can no longer be reported given of the small number of producers.

Competitive issues still weigh heavily

Production in 2013 was reported at 9,454 kt of chlorine which is 2.5% lower than in 2012. This compares poorly to the USA where a decrease of only 0.6% is evident. Latin America and China also experienced suppressed production levels. For Europe this is 11% down compared to the last pre-crisis full year (2007) and about 10% in the USA.

However, 2014 data indicate a certain improvement with a very small increase reported both in Europe and the USA.

2013 economic growth in the chemical sector was stagnant in Europe with some countries doing better than others. The UK surprised many by leading an exit from the recession posting full year GDP growth of 1.8% with Germany achieving 0.4%.

Use of chlorine for PVC has felt the greatest impact particularly in the construction sector with house builds significantly below pre-crisis levels. Passenger car sales dropped in 2013 across Europe by 1.7% though commercial vehicle registrations increased by 1.1%. All registrations continue below pre-crisis levels (Source: European Automobile Manufacturers Association).

Of course there are other uses for chlorine apart from PVC (see table at left) and these appear to have been more resilient to economic pressures with exports playing an important part.

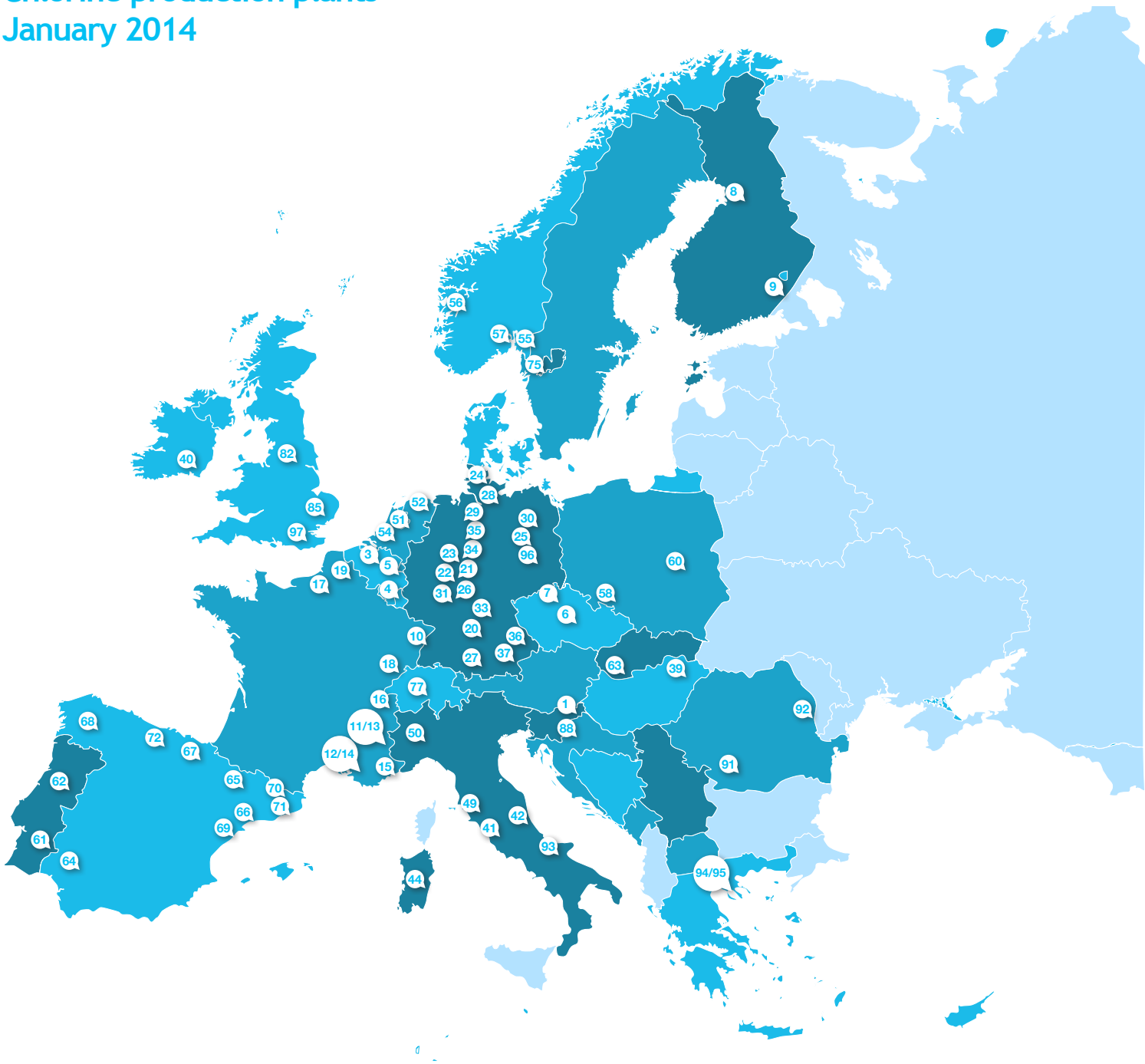
On the caustic side, the numbers show that stocks in the final quarter of the year were some 18% higher than the previous year. Market commentators suggest this is due to increased competition from imports in the Mediterranean area and a rise in production rates during the 4th quarter.

2014 has started better with output growth in the first 4 months compared to 2013 reported at 2.8% (Source: Cefic).

Competitive issues still weigh heavily of course with high prices of energy being of major concern (see foreword by A. Steel).

Fresh and safe water thanks to chlorine is a blessing for billions

Chlorine production plants
January 2014



COUNTRY	NUMBER ON MAP	COMPANY	SITE	NAMEPLATE CAPACITY (000 TONNES CHLORINE)	Hg	D	M	OTHERS
Austria	1	Donau Chemie	Brückl	70			70	
AUSTRIA TOTAL				**70**	**0**	**0**	**70**	**0**
Belgium	3	Solvin	Antwerp	460	110		350	
Belgium	4	Solvic	Jemeppe	174			174	
Belgium	5	INEOS ChlorVinyls	Tessenderlo *	400	205		270	
BELGIUM TOTAL				**1109**	**315**	**0**	**794**	**0**
Czech Republic	6	Spolana	Neratovice	135	135			
Czech Republic	7	Spolchemie	Usti	61	61			
CZECH REPUBLIC TOTAL				**196**	**196**	**0**	**0**	**0**
Finland	8	AkzoNobel	Oulu	40	40			
Finland	9	Kemira	Joutseno	75			75	
FINLAND TOTAL				**115**	**40**	**0**	**75**	**0**
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	73	73			
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			
FRANCE TOTAL				**1481**	**350**	**548**	**541**	**42**
Germany	20	BASF	Ludwigshafen	385	170		215	
Germany	21	Bayer MaterialScience	Dormagen	480			400	80
Germany	22	Bayer MaterialScience	Leverkusen	360			360	
Germany	23	Bayer MaterialScience	Uerdingen	260			260	
Germany	24	Bayer MaterialScience	Brunsbuttel	210				210
Germany	25	Dow	Schkopau	250			250	
Germany	26	Vinnolit (Westlake)	Knapsack	250			250	
Germany	27	CABB GmbH	Gersthofen	45			45	
Germany	28	Dow	Stade	1585		1030	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			
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*	
GERMANY TOTAL				**5078**	**599**	**1140**	**3049**	**290**
Greece	94	Kapachim	Inofita Viotias	4			4	
Greece	95	Unilever Knorr	Marousi	20			20	
GREECE TOTAL				**24**	**0**	**0**	**24**	**0**
Hungary	39	Borsodchem	Kazincbarcika	323	131		192	
HUNGARY TOTAL				**323**	**131**	**0**	**192**	**0**
Ireland	40	MicroBio	Fermoy	9			9	
IRELAND TOTAL				**9**	**0**	**0**	**9**	**0**
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	
ITALY TOTAL				**301**	**42**	**0**	**259**	**0**
The Netherlands	51	AkzoNobel	Botlek	637			637	
The Netherlands	52	AkzoNobel	Delfzijl	121			121	
The Netherlands	*54*	*Sabic*	*Bergen op Zoom*	*89*			*89*	
THE NETHERLANDS TOTAL				**847**	**0**	**0**	**847**	**0**
Norway	55	Borregaard	Sarpsborg	45			45	
Norway	*56*	*Elkem*	*Bremanger*	*10*			*10*	
Norway	57	INEOS ChlorVinyls	Rafnes	260			260	
NORWAY TOTAL				**315**	**0**	**0**	**315**	**0**
Poland	58	PCC Rokita	Brzeg Dolny	125	77		48	

COUNTRY	NUMBER ON MAP	COMPANY	SITE	NAMEPLATE CAPACITY (000 TONNES CHLORINE)	Hg	D	M	OTHERS
Poland	60	Anwil	Wloclawek	214			214	
POLAND TOTAL				**339**	**77**	**0**	**262**	**0**
Portugal	61	Solvay	Povoa	26			26	
Portugal	62	CUF	Estarreja	116			72	44
PORTUGAL TOTAL				142	0	0	98	44
Romania	*91*	*Oltchim*	*Rimnicu Valcea*	*291*	*186*		*105*	
Romania	92	Chimcomplex	Borzesti	93			93	
ROMANIA TOTAL				**384**	**186**	**0**	**198**	**0**
Slovak Republik	*63*	*Fortischem*	*Novaky*	*76*	*76*			
SLOVAK REPUBLIK TOTAL				**76**	**76**	**0**	**0**	**0**
Slovenia	*88*	*TKI Hrastnik*	*Hrastnik*	*16*			*16*	
SLOVENIA TOTAL				**16**	**0**	**0**	**16**	**0**
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	88	88			
Spain	70	Quimica del Cinca	Monzon	31	31			
Spain	71	Hispavic	Martorell	218	218			
Spain	72	Solvay	Torrelavega	63	63			
SPAIN TOTAL				**717**	**617**	**0**	**100**	**0**
Sweden	75	INEOS ChlorVinyls	Stenungsund	120	120			
SWEDEN TOTAL				**120**	**120**	**0**	**0**	**0**
Switzerland	77	CABB-AG	Pratteln	27	27			
SWITZERLAND TOTAL				**27**	**27**	**0**	**0**	**0**
UK	82	INEOS ChlorVinyls	Runcorn	707	277		430	
UK	85	Brenntag	Thetford	7			7	
UK	97	Industrial Chemicals Ltd	West Thurrock	15			15	
UK TOTAL				**729**	**277**	**0**	**452**	**0**
GRAND TOTAL				**12418**	**3053**	**1688**	**7301**	**376**
PER PROCESS					**24.6%**	**13.6%**	**58.8%**	**3.0%**

Process: Hg = mercury M = membrane D = diaphragm Others = electrolysis of HCl to Cl_2 or molten salt electrolysis
Euro Chlor members are indicated in non-italic
* Total combined production capacity of the Tessenderlo site Permit = 400 kt Cl_2/yr

Communication and education

Superfast world-wide communication would be impossible without chlorine chemistry

9th Technology Conference and Exhibition very successful

The 9th triennial Euro Chlor Technology Conference and Exhibition was organised in Madrid, Spain, during the first week of April 2014. While the previous events had shown a progressive increase in participation, this time the organisation welcomed about 15% more attendees than three years ago in Budapest! There were also many more exhibitors than previously (47 instead of 35), coming from all the parts of the world, including USA, Canada and even Australia, presenting different types of equipment and services supporting our industry.

The content of the presentations reflected all technical aspects dealt with in the different Euro Chlor technical working groups, and several external speakers brought interesting views on topics related to safety, health and environmental protection in the chlorine industry. Manufacturers also had the opportunity to present their recent technology developments.

Euro Chlor also enjoyed the presence and focused attention of eight international media representatives. During the conference and the special press dinner, they asked questions on topics ranging from energy price problems, over mercury phase-out to the economic strengths of the European chlor-alkali sector.

This was the third and last time that Technical Director Jean-Pol Debelle (photo) led the team that organised the Euro Chlor Technical Conference. Mr Debelle retired at the end of June 2014.

Euro Chlor Technical Director Jean-Pol Debelle at the 2014 Technology Conference in Madrid

Benefits Communications Plan

The Euro Chlor “Chlorine Benefits Communication Plan” has been put fully into action. The Federation has developed a number of communications tools aiming to convey numerous messages about the benefits of chlorine-based chemistry in particular to MEPs and other influencers in “the Brussels Bubble” and the public at large. These include the new ChlorineThings website, advertiments in specialised media and the launch of viral videos on YouTube and other sites.

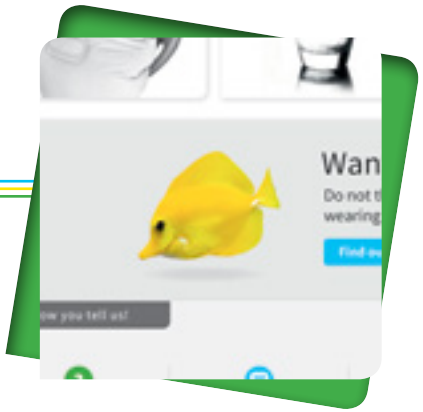
The new ChlorineThings website

By launching a completely new website about the many advantages and benefits of chlorine-based chemistry, Euro Chlor reinforces its communication activities by illustrating the unique position of chlorine as a basic chemical. The website describes chlorine-chemistry based applications in ten areas of everyday life, from feeding the planet to transportation solutions and home comfort.

It is a fact that apart from the appreciated applications in disinfecting drinking water and swimming pools, the variety of other uses of chlorine chemistry is relatively unknown. So Euro Chlor has created this website showing and describing many dozens of other chlorine chemistry applications.

The visitors of the site learn about chlorine things in our stomach, how to swim faster than a fish, the way solar cells are produced and how pavements can clean polluted air. You can watch videos about how chlorine reacts with metals, and how virtually all communication technologies have links with chlorine chemistry. You can even enjoy our famous animated recipe for producing real chlorine in your own kitchen! Interactive buttons on the homepage offer different possibilities for dialogue with the Federation. Visitors can post links to chlorine-related videos or just ask any chlorine-related question and… win a nice gift in the process!

Just visit **www.chlorinethings.eu** and start a fascinating journey through the chlorine universe!



Want to swim faster than a fish?
Check this story on
www.chlorinethings.eu

New Health documents will be alive and kicking soon

With the issue of a fully renewed ‘Main Health document’, the Health Working Group will send the common parts of its existing Health guidelines 2, 6 and 9 to the historical archives. Applicable to chlorine, caustic and mercury, the new edition provides the plant manager with a detailed overview of all aspects to cover when putting in place a sound and functional health management system.

The drafting of substance-specific annexes is in full progress. This will generate a set of electronic documents the reader will be able to combine with the main document into a personalized version adapted to his/her own interests.

A new annex on decommissioning is also available. It is based on the results of the 2nd Euro Chlor Workshop on mercury exposure and the experiences of sites that have gone through the decommissioning process. This practical guidance is assembled to assist plants that are still facing the decommissioning exercise in the years to come.

Together with the available training presentations on the safe handling of chlorine and mercury, the above documents represent an optimal toolkit for the plant management to keep its workers safe.

Chlor-alkali industry present at biggest European environmental science congress

Every year, Euro Chlor represents the chlor-alkali industry at the biggest scientific conference in Europe: SETAC. This year's 24th edition was organised in Basel (Switzerland). A special session on Environmental challenges under REACH after the second registration deadline was a key topic of interest to industry attendees. The session was chaired by ECHA and addressed topics such as environmental data quality and knowledge gaps in current REACH registration dossiers. Other important topics were highlighted by the platform sessions, which included exposure, bioavailability and bioaccumulation; environmental fate and analytical chemistry; life-cycle analysis.

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. The Euro Chlor Science library, which assembles all Euro Chlor science publications in one collection, was also popular.

The 24th SETAC Europe Congress attracted over 2,000 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.

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 has been published as a Science Dossier entitled "Aquatic Environmental Risk Assessment of Hexachlorobenzene".

Another new Science Dossier on the human health effects of chlorinated disinfection by-products is also in preparation and is expected to be finalized in 2014.

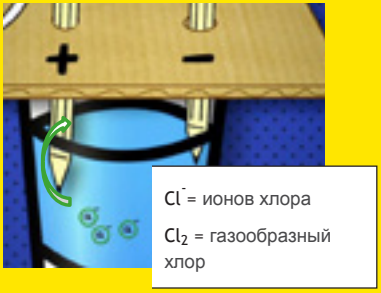
A Focus on Chlorine Science (FOCS) leaflet on "Assessing the Risks of Persistent Organic Pollutants of Top Predators" was also published this year. The Euro Chlor FOCS documents provide a brief introduction to a specific scientific topic.

The 17 pin Invasion

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 gadget, in the summer of 2013 an invasion of more than 300 requests reached the Euro Chlor mailbox in ONE weekend! And they all originated in the United Kingdom. This was not normal. So Communications contacted the senders telling them that Euro Chlor was invaded by mails and consequently, the action was stopped. But a few dozen of them received this enigma: **“ju’t b dimpsjof sijoh!”**. Those who could decipher it would receive a bonus gift. A lively ping-pong of e-mail traffic started and some of the (mostly student) respondents returned happy and peppy comments.

This small but cute green 17 pin started a viral voyage through Europe and Africa

A few months later a similar wave of hundreds of e-mails reached Euro Chlor, this time from the Russian Federation, Belarus and Ukraine. In order to keep these correspondents in the right mood, Communications had the leaflet “Produce your own chlorine” translated into Russian by one of the senders themselves: a particularly motivated young man. He helped us create a new web page with a chapter in Russian.



Thanks to Russian and French translations, thousands of kids all over Eastern Europe, Russia and Northern Africa have produced “swimming pool water”

The mighty power of the “like” and “forward” buttons in social media created a third invasion starting in January 2014, this time from Morocco and Tunisia, in French or Frenglish. We applied the same solution to keep them happy: selected super-friendly requests were honoured and did receive a 17 pin, whilst all the others receive a standard mail with a link to the “Make your own chlorine” experiment, but this time in French. The corresponding Euro Chlor web page, now a trilingual English/French/Russian forum teaching youngsters the essence of the chlor-alkali electrolysis, has become famous in all these countries inside Europe and out.

By the time you read this, more than 3,500 “pin” requests have been processed by Communications. All these contacts were kept happy and spread the word further. And, in case you have not deciphered the enigma yet, apply the key “alphabet minus 1” and you will see that **“ju’t b dimpsjof sijoh!”** means **“it’s a chlorine thing!”**: the Euro Chlor logo baseline.

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 microprocessor in your smartphone. Yes, they too are chlorine things. These advertisements are systematically published in important European print and electronic media like European Voice and viEUws. We also 'bought' the month November in the most popular European office 2014 calendar.

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. So far, four videos have already been produced:

- Communication
- Food and water for the planet
- Your good health
- Energy saving (this video is currently being prepared).

In this concept, Euro Chlor builds in factual data as well as humour while 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 these videos themselves.

Euro Chlor corporate website more popular than ever

With 258,000 page views in 81,000 visits per year, the Euro Chlor corporate website remains a premium communication tool. On average, visitors stay on the site for more than three minutes and they consult 3.2 pages. 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 returns regularly (55%). The majority are American visitors, followed by British, German and French citizens.

The most popular pages are found in "The chlorine universe" chapter (115,000 page views/year) which is of high interest to teachers and in which the animations of the three production process technologies are extremely sought after. The safety/technology chapter is the second most consulted (18,000 views/year), and the chlorine industry issues pages rank third (16,500 page views/year). Although chlorinated solvents only represent a limited product family, their web pages are consulted nearly 9,000 times per year.

More than 11,000 documents and publications are acquired every year through the Download Centre. Every month, nearly 100 visitors want to know how they can produce small quantities of chlorine in… their kitchen. They can do this by watching the instructive animation on the dedicated page which, by the way, also comes in French and Russian due to a sudden huge interest in North-Africa and Russian-speaking countries (and the power of Internet and Facebook! See also page 36).

Chlorine Documentary "A world of opportunities"

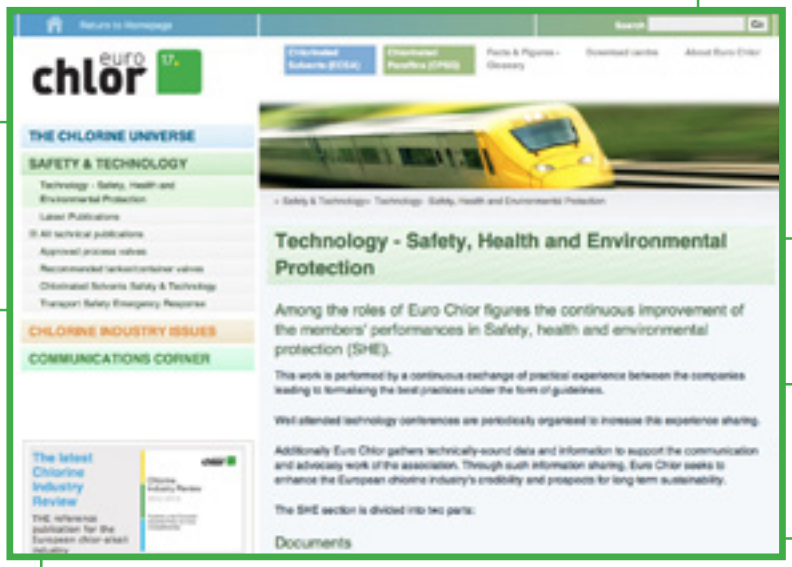
Take a more in-depth look at the fascinating world of ChlorineThings and chlorine chemistry benefits. In parallel with the **www.ChlorineThings.eu** website, the film documents areas of daily life in which chlorine-based chemistry plays crucial role: feeding the world, keeping healthy, building the future, staying fit, entertainment. The film discusses chlorine chemistry applications that are usually not known to the broad public: the audience for this video will vary from politicians to schools, from member companies to youngsters visiting YouTube.

In all modern sports stadiums, high tech materials like polycarbonate, PVC and polyester play a major role

120
visitors/month view the animation about how to produce chlorine in their kitchen

11,000
Euro Chlor publications downloaded each year

3.2
pages viewed per visit



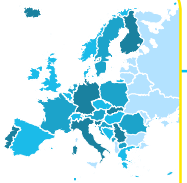
3.15
minutes per visit

www.eurochlor.org

258,000
pages viewed each year

61%
of the visitors are younger than 34 years

45%
of the visitors are newcomers



in 21 countries

34 Full members

13 Management Committee members

66 Manufacturing locations

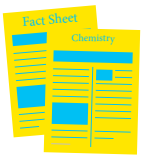
euro chlor 17.

365 days working with & for you

50 Associate members

28 Working groups

56 Technical correspondents



The Euro Chlor Federation

In Europe, 34 Members of Euro Chlor produce chlorine on 66 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 taken into account.

Apart from producers, Euro Chlor also has 50 Associate Members and 56 Technical Correspondents. These include 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 more than 60 years ago (1953) as a production-oriented technical organization called "Bureau International Technique du Chlor" (BITC). The association was restructured and officially called "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 complemented by open and transparent communications with key stakeholders.

Euro Chlor underlines that one of its major objectives is the full recognition of the benefits of chlorine chemistry to society. The Communications Plan has been systematically designed to underline this core message.

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Euro Chlor Full Members

AkzoNobel Industrial Chemicals BV
Stationsstraat 77
3811 MH Amersfoort
THE NETHERLANDS
Switchboard: +31 33 4676767
General fax: +31 33 4676108
www.akzonobel.com

Altair Chimica SpA
Via Moie Vecchie, 13
56047 Saline di Volterra (PI)
ITALY
Switchboard: +39 0588 9811
General fax: +39 0588 98181
www.altairchimica.com

Anwil SA
ul. Toruńska 222
87-805 Włocławek
POLAND
Switchboard: +48 54 236 30 91
General fax: +48 24 367 76 34
www.anwil.pl

Arkema
420, rue d'Estienne d'Orves,
92705 Colombes Cedex
FRANCE
Switchboard: +33 1 49 00 80 80
General fax: +33 1 49 00 83 96
www.arkema.com

BASF SE
Carl-Bosch-Str. 38
67056 Ludwigshafen
GERMANY
Switchboard: +49 621 60-0
General fax: +49 621 60-42525
www.basf.com

Bayer MaterialScience AG
Building K12
Kaiser-Wilhelm-Allee
51368 Leverkusen
GERMANY
Switchboard: +49 214 30-1
General fax: +49 214 30-96 38810
www.bayermaterialscience.com

Borregaard
P O Box 162
1701 Sarpsborg
NORWAY
Switchboard: +47 69 11 80 00
General fax: +47 69 11 87 70
www.borregaard.com

BorsodChem Zrt.
Bolyai tér 1
3700 Kazincbarcika
HUNGARY
Switchboard: +36 48 511-211
General fax: +36 48 511-511
www.borsodchem-group.com

CABB AG
Düngerstrasse 81
4133 Pratteln 1
SWITZERLAND
Switchboard: +41 61 825 31 11
General fax: +41 61 821 80 27
www.cabb-chemicals.com

CABB GmbH
Otto-Volger-Straße 3c
65843 Sulzbach
GERMANY
Switchboard: +49 6196 9674-0
General fax: +49 6196 9674-199
www.cabb-chemicals.com

CHIMCOMPLEX S.A. BORZESTI
Str. Industriilor nr. 3
Onesti 601124, jud. Bacau
ROMANIA
Switchboard: +40 234 302400
General fax: +40 234 302002
www.chimcomplex.ro

CUF-Químicos Industriais S.A.
Lagoas Park – Edifício 6, 2º
2740-244 Porto Salvo
PORTUGAL
Switchboard: +351 210 058 600
General fax: +351 210 05 86 98
www.cuf-qi.pt

Donau Chemie AG
Am Heumarkt, 10
1030 Wien
AUSTRIA
Switchboard: +43 1 711 47-0
General fax: +43 1 711 47-5
www.donau-chemie.com

Dow Deutschland Anlagengesellschaft mbH
Am Kronberger Hang 4
65824 Schwalbach/Ts.
GERMANY
Switchboard: +49 6196 566-0
General fax: +49 6196 566-444
www.dow.com

Electroquímica de Hernani, S.A.
Avenida de Madrid, 13 - 1°
20011 Donostia - San Sebastian
SPAIN
Switchboard: +34 943 451 140
General fax: +33 943 453 965

Electroquímica del Noroeste, S.A. (ELNOSA)
Marisma De Lourizan, s/n
36910 Pontevedra
SPAIN
Switchboard: +34 986 85 37 50
General fax: +34 986 86 41 32
www.elnosa.es

Ercros, S.A.
Avenida Diagonal 595
08014 Barcelona
SPAIN
Switchboard: +34 934 393 009
General fax: +34 934 308 073
www.ercros.es

Evonik Industries AG
Rellinghauser Straße 1-11
45128 Essen
GERMANY
Switchboard: +49 201 177-01
General fax: +49 201 177-3475
www.evonik.de

HydroChem Italia S.r.l.
Via Mario Massari 30-32
28886 Pieve Vergonte (VB)
ITALY
Switchboard: +39 0324 8601
General fax: +39 0324 86694
www.weylchem.com

INEOS ChlorVinyls Limited
Runcorn Site HQ
South Parade
PO Box 9
Runcorn
Cheshire, WA7 4JE
UNITED KINGDOM
Switchboard: +44 1928 516512
General fax: +44 1928 516636
www.ineoschlor.com

Kemira Oyj
Porkkalankatu 3
P.O. Box 330
00101 Helsinki
FINLAND
Switchboard: +358 10 8611
General fax: +358 10 862 1119
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MSSA S.A.S.
Pomblière
73600 Saint Marcel
FRANCE
Switchboard: +33 4 79 24 70 70
General fax: +33 4 79 24 70 50
www.metauxspeciaux.fr

PCC Rokita SA
ul. Sienkiewicza 4,
56-120 Brzeg Dolny,
POLAND
Switchboard: +48 71 794 2000
General fax: +48 71 794 2197
www.rokita.com.pl

PPC S.A.S.
95 rue du Général de Gaulle
BP 60090
68802 Thann Cedex
FRANCE
Switchboard: +33 3 89 38 46 00
General fax: +33 3 89 38 46 01
www.ppchemicals.com

Produits Chimiques de Loos S.A.S.
Tessenderlo Group
Rue Clemenceau
59120 Loos
FRANCE
Switchboard: +33 320 22 58 58
General fax: +33 320 93 59 80
www.tessenderlo.com

Química del Cinca, S.A.
Avenida Diagonal 352, entresuelo
08013 Barcelona
SPAIN
Switchboard: +34 934 584 000
General fax: +34 934 584 007
www.qcinca.es

Société des Produits Chimiques d'Harbonnières (S.P.C.H.)
BP 50001
80131 Harbonnières
FRANCE
Switchboard: +33 3 22 85 76 30
General fax: +33 3 22 85 76 31
www.spch.fr

Solvay SA
Rue de Ransbeek 310
1120 Brussels
BELGIUM
Switchboard: +32 2 264 2111
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Solvic SA
Rue de Ransbeek 310
1120 Bruxelles
BELGIUM
Switchboard: +32 2 264 2822
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www.solvay.com

Spolchemie, a.s.
Spolek pro chemickou a hutní výrobu, a.s.
Revoluční 86
400 32 Ústí nad Labem
CZECH REPUBLIC
Switchboard: +420 477 161 111
General fax: +420 477 163 333
www.spolchemie.cz

Syndial SpA
Piazza Ezio Vanoni 1
20097 San Donato Milanese (MI)
ITALY
Switchboard: +39 02 52 01
www.eni.com

VENCOREX
196 allée Alexandre Borodine
69800 Saint-Priest
FRANCE
Switchboard: +33 4 26 22 38 05
General fax: +33 4 26 22 38 45
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VESTOLIT GmbH
Chemiepark Marl
Paul-Baumann-Str. 1
D-45772 Marl
GERMANY
Switchboard: +49 2365 49-05
General fax: +49 2365 49-40 00
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Vinnolit GmbH &Co. KG
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Alistair Steel
Executive Director
T+32 2 676 73 50

Dolf van Wijk
Science & Regulatory Affairs Director
Chlorinated Paraffins Manager
T+32 2 676 73 70

Jean-Pol Debelle
Technical Director
Retired end of June, 2014

Fritz Näumann
Technical Director
T+32 2 676 73 36

Sébastien Gallet
ECSA Manager
T+32 2 676 72 28

Dirk Clotman
Communications Manager
T+32 2 676 73 51

Marleen Pauwels
Science Manager
T+32 2 676 72 47

Caroline Andersson
Senior Counsellor
Regulatory Affairs
T+32 2 676 72 48

Martina Salvioni
Assistant
T+32 2 676 72 23

Chantal Peeters
Assistant
T+32 2 676 74 01

Nina McGrath
Science Counsellor
T+32 2 676 73 61

Françoise Minne
Assistant
T+32 2 676 73 54

Isabelle Coppens
Assistant
T+32 2 676 73 91

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Euro Chlor
Avenue E. Van Nieuwenhuyse 4, box 2 • B-1160 Brussels • Belgium
T +32 2 676 72 11
www.eurochlor.org • www.chlorinethings.eu

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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 transparant way with all stakeholders and systematically highlights chlorine chemistry benefits.

it's a chlorine thing.

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