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Chlor-alkali Industry Review **2017/2018**

euro chlor 17.

The times they are a changin’

On all fronts, regulatory, technical, political and economic we are seeing continuing flux, as constant change becomes the new normal.

Mercury

The biggest change that we have addressed this year has been the phase-out of mercury in production processes. This is a big step forward in modernising our technologies and improving sustainability. The delivery of this structural change demonstrates a level of excellence and expertise across the sector that we should be proud of.

There is still work to be done, particularly around ‘stabilisation’ and safe final disposal. Euro Chlor will be active throughout that process.

Investment

A recent highlight has been the stream of investment announcements coming from our members. This demonstration of confidence is exactly what we need to attract the next generation of chemical engineers.

The massive investments underpin the vital role of the chlor-alkali industry in the European economy, both in its own right and as a provider of the essential building blocks for the manufacture of millions of products.

Euro Chlor will continue to advocate for the infrastructure, economic and regulatory environments necessary for our members to continue to invest and innovate, and to secure fair and sustainable returns.

“Let’s build on the strengths of our industry, and nurture our reputation as an informed, credible and constructive partner.”

Dolf van Wijk Executive Director

The full version of this report is available from:

chlorineindustryreview.com

Within Euro Chlor

We are in the process of appointing my successor, who will be tasked with ensuring that Euro Chlor continues to provide a strong voice for the chlor-alkali industry.

We are also preparing to move to our new headquarters in central Brussels as an even more integrated part of the Cefic organisation. The new location will place Euro Chlor within walking distance of many key influencers, which will help us to have our voice heard. We are also exploring and adapting to the new digital world. This review, presented in a 'digital first' format, is one example of how we intend to develop.

Safety

Some things remain constant, including the absolute commitment to safety. Safety must be the foremost priority of any industry. That is why we continue to carefully follow up on our safety record.

Our safety initiative has been re-invigorated through talking with employees of all levels at their sites, to gain a deeper and mutual understanding of our members' needs. As a result, we are strengthening our focus on sharing experiences through incident reporting, and using that information to identify areas where we can develop and implement new practices so that all our colleagues return home every day, healthy and able to enjoy the benefits of working in a safe and successful industry.

Energy

Chlorine manufacture is an energy intensive process and the industry has made impressive progress towards energy efficiency. However, the energy policy developments in Europe remain challenging for our competitiveness. Given the major importance of reliable and affordable energy supply, we will maintain the pressure for new and more competitive energy solutions for Europe.

Looking back

As this is my final review, I will take the opportunity to look back a little further than usual.

I came to Euro Chlor from Akzo Nobel in 2001 to manage the environmental science programme. I took on additional advocacy and regulatory affairs responsibilities, becoming Science & Regulatory Affairs Director. In 2015, I became Executive Director.

The great strength of Euro Chlor has always been the combination of two worlds. One is the deep knowledge of the science, technology and factual foundations of the industry; the other is constructive relationships with regulators.

We promote our case in a well-informed, credible and transparent manner, as this is critical to building the trust necessary to deliver long term and sustainable outcomes.

The collegiality in our chlor-alkali world is always heart-warming and motivating, and many contacts have become friends. Could there be some invisible trust, or a shared basic understanding that permeates our industry? If so, I hope that is one thing that does not change.

A 'letter on the desk'

If I were to leave a 'letter on the desk' for my successor, my advice would be to build on the strengths of our industry, and nurture our reputation as an informed, credible and constructive partner.

I am confident that my successor can rely on the strong team in Brussels to continue supporting a safe, sustainable and successful chlor-alkali industry for Europe.

Finally, I will take this opportunity to thank my colleagues and friends who made my working life so pleasant and rewarding.

Keep up the good work!

Dolf

19	34	57	65	19	58
European countries	Full members	Associate members	Manufacturing locations	Working groups	Technical Correspondents

For more information about Euro Chlor: **eurochlor.org**

Sustainability*

*For this review, 96.5% of Euro Chlor member's capacity is covered from 31 companies at 51 sites.

Manufacturing technology

In December 2017, the deadline for the phase-out of mercury technology under the Best Available Techniques (BAT) chlor-alkali conclusions as part of the EU's Industrial Emissions Directive passed.

Consequently, the share of mercury technology in chlor-alkali manufacture shows a steep decline in 2017 (see graph).

However, the phase-out did not fully complete in 2017 due to some technical challenges that extended into 2018.

Mercury emissions

2017 was the year for the phase-out of mercury technology. Despite this, Euro Chlor considers it vital to continue monitoring and reducing mercury emissions at those production sites that used mercury-based technology.

The absolute level of mercury emission declined to approximately 1.2 tonnes in 2017, a reduction of around 130 kg compared to 2016. This is mainly due to the closure of several mercury installations in 2016.

Specific mercury emissions increased from 0.63 g Hg/tonne* to 0.68 g Hg/tonne in 2017.

Mercury emissions declined to

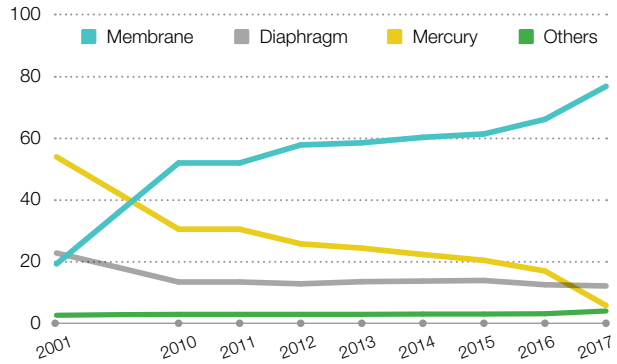
1.2

tonnes

**corrected from last year's figure of 0.68 g Hg/tonne*

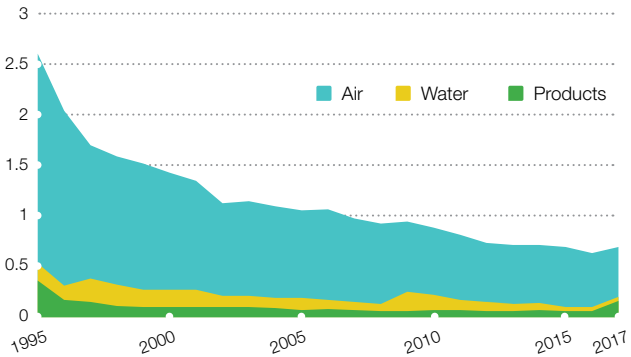
CHLORINE MANUFACTURING PROCESS

(% of total installed capacity end of year)



TREND OF MERCURY EMISSIONS

(g Hg/tonne Cl_2 capacity)



"Euro Chlor's sustainability programme was the first to be launched within the European chemical industry back in 2001. It aims to monitor and address environmental, social and economic issues by providing a snapshot of key parameters, particularly energy consumption, hydrogen use and reduced emissions".

Ton Manders, Technical Director.

Energy consumption

Energy consumption in 2017 was at 92.5% versus the 2011 reference. The decrease of 0.7% (93.2% to 92.5%) from the 2016 level is due mainly to the mercury to membrane technology conversion. This year, energy consumption is expected to drop further thanks to the phase-out of mercury technology.

Discover more on the role of energy in our industry via our new Energy webpages: **www.eurochlor.org/chlorine-industry-issues/energy.aspx**

Energy consumption decreased by

0.7%

from the previous year

Hydrogen use

The use of hydrogen has decreased since 2014. In 2017, the utilisation rate of hydrogen was 84.8%, which represents a decline of 2.7% compared to the previous year.

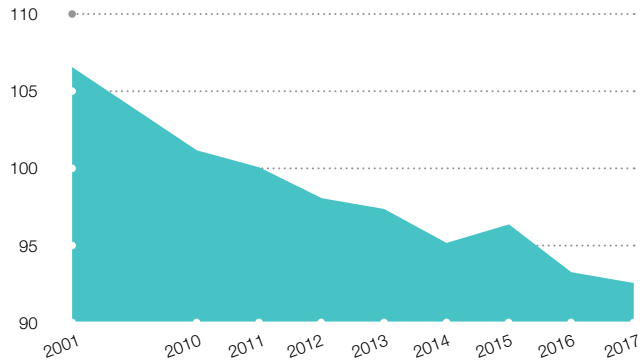
Although hydrogen is suggested to be an important chemical for the low carbon economy, there is still an ongoing decline in its utilisation rate from the chlor-alkali electrolysis plants. Further increasing hydrogen use (where different options are available) is often complicated in practice due to economic constraints.

Hydrogen use decreased by

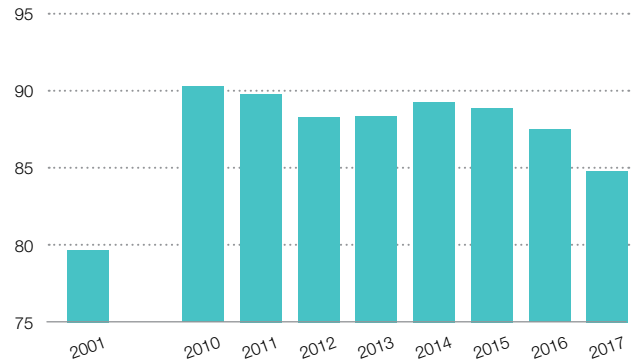
2.7%

from the previous year

PRIMARY FUEL ENERGY CONSUMPTION
(% with respect to 2011)



HYDROGEN USED
(% of production)



Sustainability

Safety

Transportation

The amount of chlorine transported from production sites increased in absolute numbers compared to 2016.

However, it remained more or less stable at a low percentage of the total production. In 2017, 3.7% of the total chlorine production was transported by rail or road.

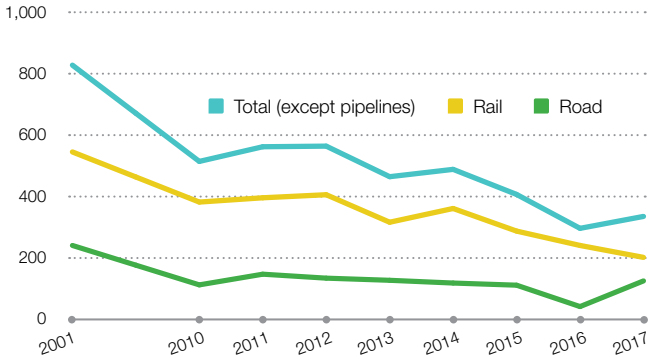
In 2017

3.7%

of total chlorine production was transported by rail or road

CHLORINE TRANSPORTED OUTSIDE INDUSTRIAL SITES

(thousands of tonnes)



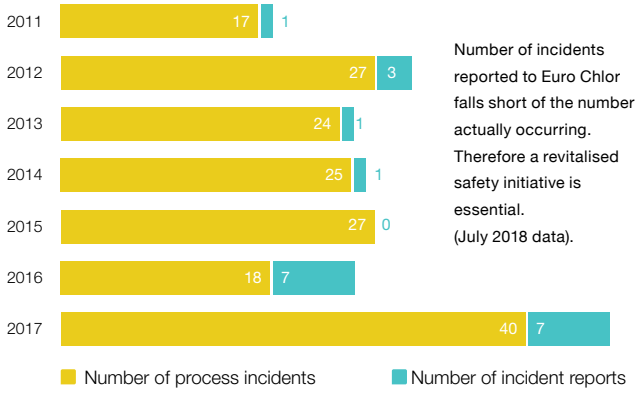
Safety initiative

In 2014, the Euro Chlor Safety Initiative was launched following stagnating and declining performance indicators. This resulted in several activities like the quarterly Safety Newsletter and discussion of incidents in all technical meetings. More recently, a workshop on incident sharing was held that included an informative poster (shown opposite).

In 2016 and 2017, members were visited by Euro Chlor experts to foster networking, obtain a better understanding of their expectations and to facilitate the sharing of process incidents. This has led to better participation in the technical workgroups, an increased number of shared incident reports and more frequent requests for support.

Several ideas on how the Euro Chlor secretariat can support the members in improving their safety performance will be followed up within the technical committees.

INCIDENT REPORTS



Number of incidents reported to Euro Chlor falls short of the number actually occurring. Therefore a revitalised safety initiative is essential. (July 2018 data).

"It is vital that we continue to maintain our colleagues' and contractors' safety as they work around our plants. Sharing knowledge from incidents, and the lessons learned, is one of the cornerstones of the continuous improvement of Euro Chlor's safety advice".

Dieter Schnepel, Chairman of the Management Committee

Incident reporting & experience sharing workshop

On 12-13th of June 2018, Euro Chlor held a successful Safety Workshop on incident reporting and experience sharing.

With 27 participants from 14 member companies, the workshop covered why incident reporting and learning from these incidents is important, based on the experiences of two of the members present.

The event also involved group work on a theoretical incident, designed to help attendees identify root causes and mechanisms to share learnings both within their companies and the wider Euro Chlor community. No chlorine valve or piping, membrane, knock-out vessel or measurement instrument remained unstudied!

Sharing knowledge from incidents, and the lessons learned, is one of the cornerstones of Euro Chlor's safety advice. Feedback from the event has identified that more work is needed to encourage incident reporting, using digital media and a task force dedicated to process safety issues and incident reporting. Ton Manders, Euro Chlor's Technical Director, praised the hard work of all participants, commenting that "it was encouraging to see people with different backgrounds working together to find safety solutions".

Safety

Process incidents

Process incidents and losses doubled in 2017 compared to 2016, from 2.16 to 4.31 incidents per million tonnes of chlorine produced.

This is the highest number for the last 16 years. As yet there are no clear reasons for this, but this is being critically evaluated. The Euro Chlor Safety Initiative continues to work on the improvement of incident and best practice sharing to improve the safety performance of our entire sector.

Process incidents doubled to

4.31

per 1,000,000 tonnes of chlorine produced

Occupational safety

In 2017, Lost Time Injuries (LTIs) for member company personnel improved quite remarkably (from 2.0 to 1.4) compared to 2016, whilst the LTI figure for contractor staff worsened (from 1.8 to 2.1). Euro Chlor members are 'aiming for zero', so there is still a lot of work to be done.

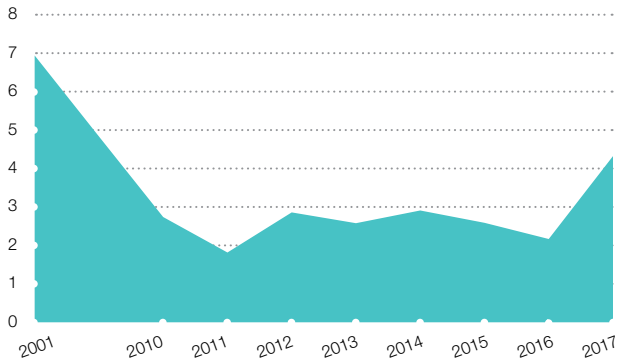
It should be noted that, since 2011, this LTI rate per million working hours only includes incidents directly related to chlorine industry specific items.

Member company personnel LTI incidents decreased to

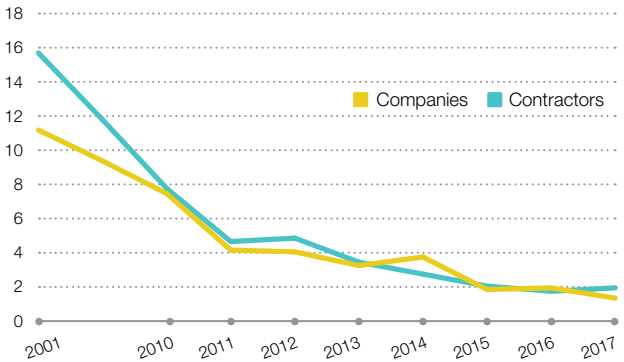
1.4

per 1,000,000 working hours

PROCESS INCIDENTS AND LOSSES
(number per million tonnes chlorine produced)



CHLOR-ALKALI LOST TIME INJURIES FREQUENCY RATE
(number of LTI incidents per million working hours)



Regulatory

Time dedicated to HSE training

This indicator, introduced during the second phase of Euro Chlor's Sustainability Programme, which runs from 2011-2021, monitors the proportion of working time spent on the formal training of member company operators in the fields of health, safety and environmental protection (HSE).

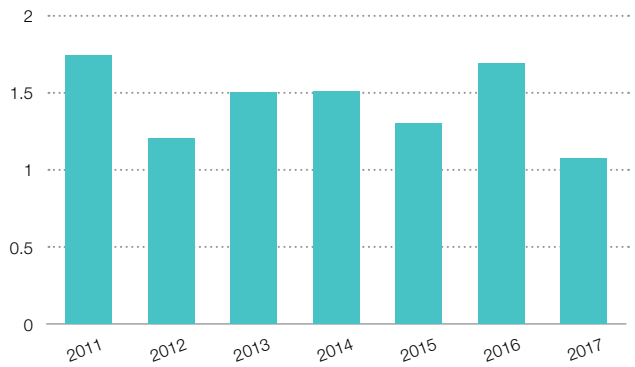
Over the last few years, this figure stabilised around 1.5%, but this year we have seen a decrease to 1.1%.

Time spent on HSE Training decreased to

1.1%

of working time

TRAINING DEVELOPMENT
(% of time on training)



ecsa

REACH

In 2017, the ChlorSolv REACH Consortium showed that methylene chloride (DCM) has no endocrine disrupting properties, refuting Italy's 2016 allegations. Concerning chloroform, new assessments also confirmed that all industrial uses are safe and unavoidable discharges into sewage treatment plants pose no environmental risk.

Montreal Protocol and the EU ODS regulation

Discussions on very short-lived substances (VSLS), which include DCM, and their predicted negative impact on ozone layer recovery, have arisen. This impact has been overestimated due to incorrect volume growth projections. ECSA prepared a Montreal Protocol meeting side event in November 2017 to raise awareness here. ECSA is a recognised stakeholder in the revision of the EU ODS[1] regulation, which implements the Montreal Protocol in the EU.

UBA PMT approach

Perchloroethylene (PER) and trichloroethylene (TRI) are suggested to be persistent, mobile and toxic (PMT) under new criteria from Germany's UBA[2]. Such criteria, UBA argues, should be used to identify substances of very high concern (SVHC) for inclusion in the candidate list for authorisation via an 'equivalent concern' mechanism. The ECSA position has been shared with national industry associations and authorities, elaborating how existing risk mitigation measures and regulation are sufficient. ECSA is also working with Cefic to develop a position on PMT substance identification.

[1] ODS: Ozone depleting substance [2] UBA: Umweltbundesamt

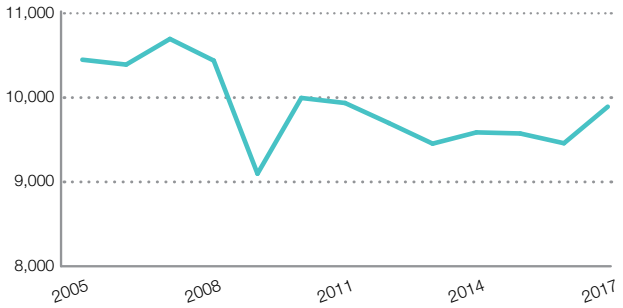
Manufacturing & Applications

Chlorine production 2017

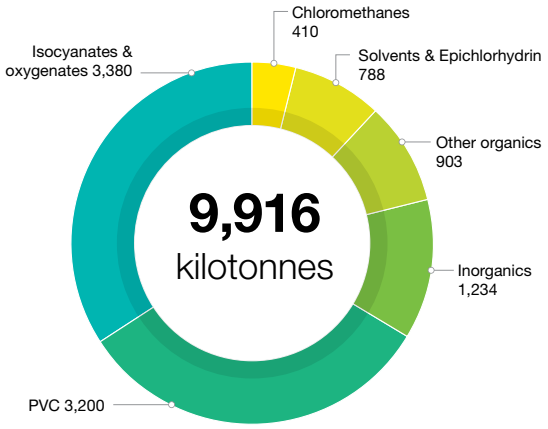
2017 chlorine production was reported at 9,895 kilotonnes, 4.6% above the 2016 level but still 7.5% below the 2007 peak level. This means that there has yet to be a recovery to pre-crisis level, but improvement has been observed. The utilisation rate was 81.4% compared to 79.1% in 2016.

Production in the EU chemicals sector grew 1.9% in 2017 (compared to 2016) according to Cefic figures. This means that chlorine production showed a stronger increase in production growth than the rest of the chemical industry in 2017. Cefic data also indicate that high-energy costs are the 'Achilles' Heel' for Europe's chemical industry on a global stage, so there is a continued need for EU policymakers to support the competitiveness of the European chemical manufacturing industry.

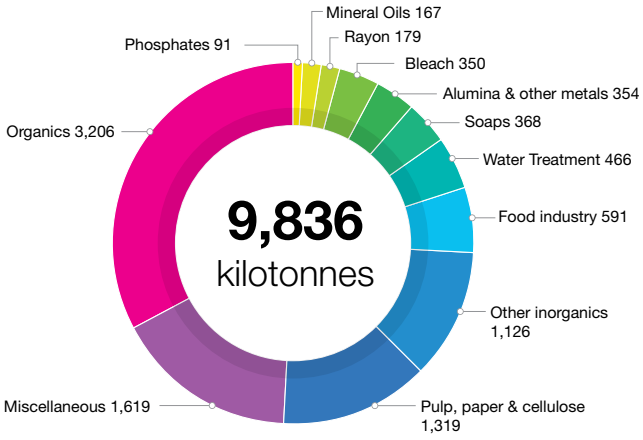
CHLORINE PRODUCTION LEVEL
(in kilotonnes/year)



EUROPEAN CHLORINE APPLICATIONS 2017
(in kilotonnes)

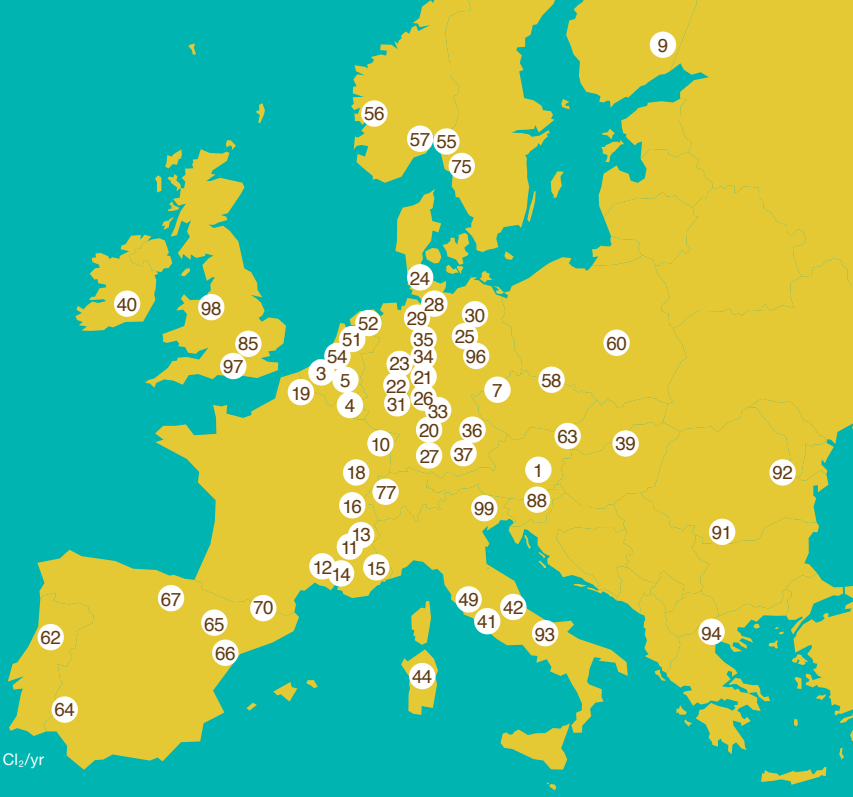


EUROPEAN CAUSTIC SODA APPLICATIONS 2017
(in kilotonnes)



Chlorine Production Plants

January 2018 capacities



Process

Hg = mercury **M** = membrane **D** = diaphragm

"Others" include HCl electrolyis, ODC, molten salt electrolyis, alcoholates

Non Euro Chlor members are indicated in italic

* Total combined production capacity of the Tessenderlo site permit = 400 kt Cl_2/yr

	Country	Company	Site	**Total** (000 tonnes chlorine)	Hg	D	M	Others
1	Austria	Donau Chemie	Brückl	74			74	
Austria Total				**74**	**0**	**0**	**74**	**0**
3	Belgium	INOVYN	Antwerp	500			500	
4	Belgium	INOVYN	Jemeppe	174			174	
5	Belgium	Vynova	Tessenderlo *	400 *	205		325	
Belgium Total				**1,074**	**205**	**0**	**999**	**0**
7	Czech Republic	Spolchemie	Usti	82			82	
Czech Republic Total				**82**	**0**	**0**	**82**	**0**
9	Finland	Kemira	Joutseno	75			75	
Finland Total				**75**	**0**	**0**	**75**	**0**
10	France	PPChemicals	Thann	43			43	
11	France	VENCOREX	Pont de Claix	112		21	91	
12	France	Kem One	Fos	333		178	155	
13	France	Arkema	Jarrie	72			72	
14	France	Kem One	Lavera	341			341	
15	France	Arkema	St Auban	20			20	
16	France	MSSA	Pomblière	42				42
18	France	INOVYN	Tavaux	360			360	
19	France	PC Loos	Loos	30			30	
France Total				**1,354**	**0**	**199**	**1,113**	**42**

	Country	Company	Site	**Total** (000 tonnes chlorine)	Hg	D	M	Others
20	Germany	BASF	Ludwigshafen	385	170		215	
21	Germany	Covestro	Dormagen	480			400	80
22	Germany	Covestro	Leverkusen	390			390	
23	Germany	Covestro	Uerdingen	260			260	
24	Germany	Covestro	Brunsbuttel	210				210
25	Germany	Dow	Schkopau	250			250	
26	Germany	Vinnolit	Knapsack	250			250	
27	Germany	CABB GmbH	Gersthofen	52			52	
28	Germany	Dow	Stade	1,500		1,000	500	
29	Germany	Neolyse Ibbenbüren GmbH	Ibbenbüren	75			75	
30	Germany	AkzoNobel	Bitterfeld	99			99	
31	Germany	Evonik Industries	Lülsdorf	77				77
33	Germany	AkzoNobel	Frankfurt	250			250	
34	Germany	INOVYN	Rheinberg	220		110	110	
35	Germany	VESTOLIT	Marl	260			260	
36	Germany	Vinnolit	Gendorf	180			180	
37	*Germany*	*Wacker Chemie*	*Burghausen*	*55*			*55*	
96	Germany	LEUNA-TENSIDE	Leuna	15			15	
Germany Total				**5,008**	**170**	**1,110**	**3,361**	**367**
94	Greece	Kapachim	Inofita Viotias	10			10	
Greece Total				**10**	**0**	**0**	**10**	**0**
39	Hungary	Borsodchem	Kazincbarcika	419	131		192	96
Hungary Total				**419**	**131**	**0**	**192**	**96**
40	Ireland	MicroBio	Fermoy	9			9	
Ireland Total				**9**	**0**	**0**	**9**	**0**
41	Italy	Altair Chimica	Volterra	55			55	
42	Italy	Società Chimica Bussi S.p.A.	Bussi	18			18	
44	Italy	Ing. Luigi Conti Vecchi	Assemini	25			25	
49	Italy	INOVYN	Rosignano	150			150	
99	*Italy*	*Halo Industry Spa*	*Torviscosa*	*24*			*24*	
93	Italy	Fater	Campochiaro	20			20	
Italy Total				**292**	**0**	**0**	**292**	**0**
51	The Netherlands	AkzoNobel	Botlek	637			637	
52	The Netherlands	AkzoNobel	Delfzijl	121			121	
54	*The Netherlands*	*Sabic*	*Bergen op Zoom*	*89*			*89*	
The Netherlands Total				**847**	**0**	**0**	**847**	**0**

Process

Hg = mercury

M = membrane

D = diaphragm

"Others" include HCl electrolyis, ODC, molten salt electrolyis, alcoholates

Non Euro Chlor members are indicated in italic

* Total combined production capacity of the Tessenderlo site permit = 400 kt Cl_2/yr

	Country	Company	Site	**Total** (000 tonnes chlorine)	Hg	D	M	Others
55	Norway	Borregaard	Sarpsborg	46			46	
56	*Norway*	*Elkem*	*Bremanger*	*11*			*11*	
57	Norway	INOVYN	Rafnes	280			280	
Norway Total				**337**	**0**	**0**	**337**	**0**
58	Poland	PCC Rokita	Brzeg Dolny	150			150	
60	Poland	Anwil	Wloclawek	214			214	
Poland Total				**364**	**0**	**0**	**364**	**0**
62	Portugal	CUF	Estarreja	142			94	48
Portugal Total				**142**	**0**	**0**	**94**	**48**
91	*Romania*	*Oltchim*	*Rimnicu Valcea*	*105*			*105*	
92	Romania	Chimcomplex	Borzesti	96			96	
Romania Total				**201**	**0**	**0**	**201**	**0**
63	*Slovak Republic*	*Fortischem*	*Novaky*	*76*	*76*			
Slovak Republic Total				**76**	**76**	**0**	**0**	**0**
88	*Slovenia*	*TKI Hrastnik*	*Hrastnik*	*16*			*16*	
Slovenia Total				**16**	**0**	**0**	**16**	**0**
64	Spain	Electroquimica Onubense	Huelva/Palos	44			44	
65	Spain	Ercros	Sabinanigo	30			30	
66	Spain	Ercros	Vilaseca	120			120	
67	Spain	Electroquimica de Hernani	Hernani	30			30	
70	Spain	Quimica del Cinca	Monzon	45			45	
Spain Total				**269**	**0**	**0**	**269**	**0**
75	Sweden	INOVYN	Stenungsund	120	120			
Sweden Total				**120**	**120**	**0**	**0**	**0**
77	Switzerland	CABB AG	Pratteln	47			47	
Switzerland Total				**47**	**0**	**0**	**47**	**0**
98	UK	Runcorn MCP	Runcorn	430			430	
85	UK	Brenntag	Thetford	7			7	
97	UK	Industrial Chemicals Ltd	West Thurrock	15			15	
UK Total				**452**	**0**	**0**	**452**	**0**
GRAND TOTAL				**11,225**	**702**	**1,309**	**8,790**	**553**
PER PROCESS					**6.2%**	**11.5%**	**77.4%**	**4.9%**

Process

Hg = mercury

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D = diaphragm

"Others" include HCl electrolyis, ODC, molten salt electrolyis, alcoholates

Non Euro Chlor members are indicated in italic

* Total combined production capacity of the Tessenderlo site permit = 400 kt Cl_2/yr

Full Member Companies

AkzoNobel Industrial Chemicals BV
Altair Chimica SpA
Anwil SA
Arkema S.A.
BASF SE
Borregaard AS
BorsodChem Zrt.
CABB AG
CABB GmbH
CHIMCOMPLEX SA
Covestro AG
CUF-Químicos Industriais SA
Donau Chemie AG
Dow Deutschland Anlagengesellschaft mbH
Electrochímica del Noroeste S.A. (ELNOSA)
Electroquímica de Hernani SA
Electroquímica Onubense S.L.
Ercros SA
Evonik Performance Materials GmbH
International Chemical Investors Group
Ing. Luigi Conti Vecchi S.p.a.
Inovyn
Kemira Oyj
KEM ONE
MSSA SAS
PCC Rokita SA
Produits Chimiques de Loos SAS (Tessenderlo Group)
Química del Cinca, SA
Societa Chimica Bussi S.p.A.
Spolana as
Spolchemie, a.s.
VENCOREX
VESTOLIT GmbH
Vinnolit GmbH & Co KG

Associate Member Companies

Adama Makhtshim Ltd
Alchemist International Ltd.
Angelini A.C.R.A.F. S.p.A.
AQUAGROUP AG
Arch Chemicals S.A.S.
Asahi Kasei Chemicals Corp.
Asociación Nacional de Electroquímica (ANE)
Association of Chemical Industry of the Czech Republic (SCHP ČR)
ATANA
Axiall LLC
Banner Chemicals Ltd
Barchemicals S.r.l.
Biomca Quimica SL
Bochemie Inc
Brenntag UK & Ireland
BWT AG
Caffaro Brescia S.r.l.
CBee Europe Ltd (CLOROX)
Chemical Industries Association Ltd (CIA)
Chemieanlagenbau Chemnitz GmbH
Chemoform AG
De Nora Deutschland GmbH
essencia ASBL
EU Salt
Fater S.p.A.
FEDERCHIMICA - Assobase
GHC Gerling, Holz & Co Handels GmbH
Haixing Eno Chemical Co. Ltd.
Helm AG
Hungarian Chemical Industry Association (MAVESZ)
Industrial Chemicals Limited
Innovation and Chemical Industries in Sweden (IKEM)
Inquide S.A.
K+S Entsorgung GmbH
Kapachim S.A.
LEUNA-TENSIDE GmbH
LOMBARDA H S.r.l.
Lonza AG
MicroBio (Ireland)
Nankai Chemical Industry Co., Ltd.
NCP Chlorchem (Pty) Ltd
NIPPON SODA CO., Ltd.
Novacid
Olin (Blue Cube Operations, LLC)
Polish Chamber of the Chemical Industry (PIPC)
SINOPEC JIANGHAN SALT & CHEMICAL COMPLEX
Sojitz Europe plc
Swiss business association for the chemical, pharmaceutical and biotech industries (scienceindustries)
Syndicat des Halogenes et Derives (SHD)
Syngenta Crop Protection Monthey SA
Syngenta Ltd
Teijin Aramid BV
ThyssenKrupp Uhde Chlorine Engineers
Tosoh Corporation
Unilever R&D Vlaardingen
Van den Huevel Watertechnologie bv
Veltek Associates Inc
Verband der Chemischen Industrie e.V. (VCI)
Vereniging van de Nederlandse Chemische Industrie (VNCI)
Vinyl Vegyipari KFT

Technical Correspondents

AGC Chemicals Europe Ltd.
www.agcce.eu.com
Applitek NV/SA
www.applitek.com
BATREC INDUSTRIE AG
www.batrec.ch
BELL-O-SEAL VALVES P. LIMITED
www.bellowseal.com
Blackhall Engineering Limited
www.shawvalves.co.uk
Bluestar (Bejing) Chemical Machinery Co Ltd.
www.bcmc.chemchina.com/bhjen
Carburos Metálicos, S.A.
www.carburos.com
Chemtec UK Limited
www.rmarmstrong.com
CHLORAN CHEMICAL PRODUCTION CO. (CCPC)
www.classco.it & www.chloran.com
CONVE & AVS INC.
www.conveavs.com
Coogee Chlor Alkali Pty Ltd.
www.coogee.com.au
Descote
www.descote.com
DSD Chemtech Projects & Services GmbH
www.dsd-chemtech.com
DuPont Asturias, S.L.
www.dupont.com
Econ Industries GmbH
www.econindustries.com
ERAMET SA
www.eramet.fr
Eynard Robin
www.groupe.eynardrobin.com
Fariman Petrochemical Industries
FIKE
www.fike.com
F.M.I. SPA UNIPERSONALE
www.fmi-spa.com
Garlock GmbH
www.garlock.eu.com
Hunt and Mitton Valve Company Ltd
www.huntandmitton.net
Huntsman (Europe) BVBA
www.huntsman.com
ISGEC Heavy Engineering Limited
www.isgec.com
IXOM (formerly ORICA Chemicals)
www.ixom.com
Jiangsu Ancan Technology Co., Ltd.
www.ancan-cn.com
JORDAN BROMINE COMPANY (JOC)
www.jordanbromine.com
Kronos Europe NV
www.kronostio2.com
KUROTEC-KTS Kunststofftechnik Stade GmbH
www.kurotec-kts.de
Lubrizol Advanced Materials Europe BVBA
www.lubrizol.com
MERSEN PGY SAS
www.mersen.com
Micro Bio Ireland Ltd.
www.micro-bio.ie
NEELTRAN, INC
www.neeltran.com
Nirou Chlor Co.
www.nirouchlor.com
Nuberg Engineering Limited
www.nubergindia.com
Occidental Chemical Belgium BVBA AZ
www.oxy.com
PERMASCAND AB
www.permascand.com
Pfeiffer Chemie-Armaturenbau GmbH
www.pfeiffer-armaturen.com
Phönix Armaturen-Werke
www.phoenix-armaturen.de
Powell Fabrication & Manufacturing Inc.
www.powellfab.com
PRINCE RUBBER & PLASTICS CO., INC.
www.princerp.com
PROFILCO BV
www.profilco.nl
R2
www.r2000.com
Remondis QR GmbH
www.remondis-qr.de
RESTORE
www.restore.energy
Richter Chemie-Technik GmbH
www.richter-ct.com
National Institute for Public Health and the Environment (RIVM) – Centre for External Safety (CEV)
www.rivm.nl
SALCO PRODUCTS INC.
www.salcoproducts.com
Sasol Chemicals
www.sasol.com
SAVINO BARBERA SRL
www.savinobarbera.com
Senior Ermeto
www.senior-aerospace-ermeto.com
SGL CARBON GMBH
www.sglgroup.com
SIEM - SUPRANITE
www.siem.fr
STEULER-KCH GMBH
www.steuler-kch.de
STEULER-KCH GMBH
www.steuler-kch.de
TechnipFMC France
www.technip.com
Tronox Pigments (Holland) BV
www.tronox.com
W.L. Gore & Associates GmbH
www.gore.com/sealants
Xomox International GmbH & Co. OHG – CRANE ChemPharma & Energy
www.cranecpe.com

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Euro Chlor supports a safe, sustainable and successful chlor-alkali industry for Europe.

Chlorine is an essential building block for the manufacture of numerous products that we rely on every day. Across Europe, millions of jobs are dependent on the availability of competitively priced chlorine supplies.

Chlorine chemistry is also vital for the development of the innovative materials we will need in the future.

Euro Chlor's 34 producer members operate 65 manufacturing locations in 19 European countries, representing 97% of all European production capacity.

Euro Chlor represents the interests of chlorine producers in Europe; encourages best practices in safety, health and environmental protection: and promotes the economic and social benefits of chlor-alkalis and the many industries that rely on them.

Based in Brussels, Belgium, Euro Chlor is a sector group of Cefic (European Chemical Industry Council), which represents chemical companies across Europe, directly providing 1.2 million jobs and accounting for 14.7% of world chemical production.

Euro Chlor is a member of the World Chlorine Council, a global network of regional organizations that represents producers accounting for more than 80% of worldwide chlor-alkali production capacity.

it's a chlorine thing.

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A sector group of Cefic
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Cover: Silicon chloride computer chips use chlor-alklai chemistry to keep us connected. All data are sourced from Euro Chlor and VinylPlus.