

Mercury Losses from the Chlor-Alkali Industry in 2006



**OSPAR Commission
2008**

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the “OSPAR Convention”) was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l'Espagne.

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Executive Summary

This report continues the series of annual reports on discharges, emissions and losses of mercury by all routes from mercury-cell chlor-alkali plants. The report presents the 2006 data on production capacities, atmospheric emissions of mercury, and the amount of mercury in safely deposited wastes.

Reports on the phasing-out of national mercury-based chlor-alkali production capacities, were included in this report series until 2002. From then, it was included in the "Overview Assessment of the Implementation of PARCOM Decision 90/3 on Reducing Atmospheric Emissions from Existing Chlor-Alkali Plants". OSPAR 2008 agreed that implementation reporting could cease for all Contracting Parties because this annual data collection on losses of mercury from the chlor-alkali industry provides the tool for monitoring the phase-out of mercury cells.

The data have been reported using the reporting formats and procedures agreed by OSPAR in 2003 (reference number 2003-5), which set out the requirements for data and information to be provided via Euro Chlor.

The OSPAR Hazardous Substances Committee agreed in 2005 to continue annual reporting, but with an assessment only every two years until 2009, and then to reconsider the frequency of assessments. Accordingly, this report does not include an assessment. The chlor-alkali report to be published in 2009 will include data for 2007 as well as an assessment of both the 2006 and 2007 data and the trends.

Récapitulatif

Le présent rapport prend la suite de la série de rapports annuels sur les rejets, les émissions et les pertes de mercure empruntant toutes les voies de pénétration, provenant des installations d'électrolyse des chlorures alcalins à cellules de mercure. Le rapport présente les données de 2006 sur les capacités de production, les émissions atmosphériques du mercure et la quantité de mercure dans les déchets mis en décharges sécurisées.

Les rapports relatifs à l'abandon des capacités nationales de production des chlorures alcalins à base de mercure ont figuré dans cette série de rapports jusqu'à 2002. Ensuite, ils ont été intégrés à la « Synthèse d'évaluation de la mise en œuvre de la décision PARCOM 90/3 sur la réduction des émissions atmosphériques des installations existantes d'électrolyse des chlorures alcalins ». OSPAR 2008 a convenu que la notification de la mise en œuvre pouvait cesser pour toutes les Parties contractantes, car la collecte de données annuelles des pertes de mercure provenant de l'industrie des chlorures alcalins constitue un outil pour le contrôle de la suppression progressive des cellules au mercure.

Les données ont été soumises en utilisant les formulaires de notification et les procédures convenus par OSPAR en 2003 (numéro de référence 2003-5), lesquels font état des exigences des données et des informations à fournir par le biais d'Euro Chlor.

Le comité substances dangereuses d'OSPAR a convenu en 2005 de poursuivre une notification, mais avec un rapport d'évaluation tous les deux ans, jusqu'en 2009, date à laquelle il conviendra de ré-étudier la fréquence des évaluations. Par conséquent, ce rapport ne contient pas de rapport d'évaluation. Le rapport sur l'électrolyse des chlorures alcalins devant être publié en 2009 inclura les données pour 2007 ainsi qu'une évaluation des données de 2006 et de 2007 et des tendances.

1. Introduction

Since the beginning of the 1980s, mercury discharges, emissions and losses from the chlor-alkali industry have been addressed under the former Paris Commission (PARCOM). The following Decisions and Recommendations are applicable under the OSPAR Convention:

- PARCOM Decision on Limit Values for Mercury Emissions in Water from Existing and New Brine Recirculation Chlor-alkali Plants (exit of the purification plant), 1980;
- PARCOM Decision on Limit Values for Existing Waste Brine Chlor-Alkali Plants, 1981;
- PARCOM Decision on Limit Values for Existing Brine Recirculation Chlor-Alkali Plants (exit of the factory site), 1981;
- PARCOM Decision on New Chlor-Alkali Plants Using Mercury Cells, 1982;
- PARCOM Recommendation on Limit Values for Mercury Emissions in Water from Existing Brine Recirculation Chlor-Alkali Plants (exit of factory site), 1985;
- PARCOM Decision 90/3 on Reducing Atmospheric Emissions from Existing Chlor-Alkali Plants.

In 1983, Contracting Parties to the former Paris Convention initiated an annual reporting of mercury discharges, emissions and losses from their national chlor-alkali industry. These data were compiled by the OSPAR Secretariat and, following examination by the relevant subsidiary bodies, published by the Commission in form of Annual Reports on Mercury Losses from the Chlor-alkali Industry, which comprised yearly data series from 1982 onwards.

Over time, reporting requirements and formats were regularly reviewed and up-dated in the light of the ongoing work under the Commission as regards the chlor-alkali industry. With a view to harmonising the way in which data and information are being established and reported, the Hazardous Substances Committee (HSC) of the OSPAR Commission adopted in 2003 the current reporting formats and procedures (see OSPAR agreement; reference number 2003-5) which set out the requirements for data and information to be provided via Euro Chlor. Annual data on discharges, emissions and losses of mercury from each plant operating within OSPAR Contracting Parties are reported to the OSPAR Secretariat, which, following a check and confirmation by Contracting Parties, compiles these technical data in form of a report.

OSPAR acknowledges the assistance of Euro Chlor in assembling the information and appreciates the efforts made by Euro Chlor to provide all requested information on a plant-by-plant basis and recommends continuing this procedure in future.

2. Assessment of the report on mercury losses from the Chlor-Alkali industry

The 2006 data will be assessed together with the 2007 data in 2009.

3. Evolution of mercury losses from the chlor-alkali industry (1982-2006)

The following figures give a rough indication of the evolution of mercury losses from the chlor-alkali industry in the period 1982-2006 as follows:

- Figure 1a: Chlorine Production Capacity with Mercury Cells by Contracting Party;
- Figure 1b: Total Chlorine Production Capacity with Mercury Cells;
- Figure 2a: Mercury Losses through Product, Waste Water and Air by Contracting Party
- Figure 2b: Total Mercury Losses through Product, Waste Water and Air;
- Figure 3a: Atmospheric Emissions of Mercury by Contracting Party
- Figure 3b: Total Atmospheric Emissions of Mercury.

It should be noted that these figures use data from previously published OSPAR Reports and that the way in which these data, in particular the pre-1999 data, were calculated and reported might differ:

- from Contracting Party to Contracting Party;
- within a time series of one Contracting Party.

Therefore, the interpretation of the figures is limited and any comparisons have to be carried out with extreme caution.

It should also be noted that Finland and Switzerland were not Contracting Parties to the former Paris Convention. Prior to the entry into force of the OSPAR Convention, the Contracting Parties supplied data on a voluntary basis as follows:

Finland	from 1996 onwards, atmospheric emissions from the only mercury-based chlor-alkali plant, which discharges into the Baltic Sea (i.e. outside the OSPAR maritime area);
Switzerland	from 1993 onwards, full data sets for the national mercury-based and mercury-free chlor-alkali industry.

Some information about changes in the reporting over time, as well as explanations of considerable increases or decreases in values, are given in footnotes to the OSPAR Report on Mercury Losses from the Chlor-alkali Industry (1982-1998), which was published in 2000.

A further source of information to be taken into account are the expert assessments, which were included in the publication of the Annual OSPAR Reports on Mercury Losses from the Chlor-alkali Industry from 1996 onwards.

Until 2003, data has been published in Figures 1 to 3 as total figures for each Contracting Party. Since 1998, data has been made available on a plant-by-plant basis¹. In order to improve comparability of performance, plant-by-plant data are now published in:

Table 1:	Chlorine Production Capacity with Hg-cells (tonnes)
Table 2:	Mercury Losses through Product, Waste Water and Air (kg per year)
Table 3:	Mercury Losses through Product, Waste Water and Air (g per tonne production capacity)
Table 4:	Atmospheric Emissions of Mercury (kg per year)
Table 5:	Atmospheric Emissions of Mercury (g per tonne production capacity)
Table 6:	Mercury in Safely Deposited Wastes (kg per year)
Table 7:	Mercury in Safely Deposited Wastes (g per tonne production capacity)

The presentation of these figures since 1998 will also assist in:

- a. the review of progress to moving towards the OSPAR 2020 target of the cessation of discharges, emissions and losses of mercury;
- b. the assessment of the effectiveness of the implementation of PARCOM Decision 90/3.

To this end, all locations of mercury-based chlor-alkali plants in operation in 1998 are described in Section 4.2 including when they have been decommissioned or converted.

¹ For plant codes in the tables see section 4.1.

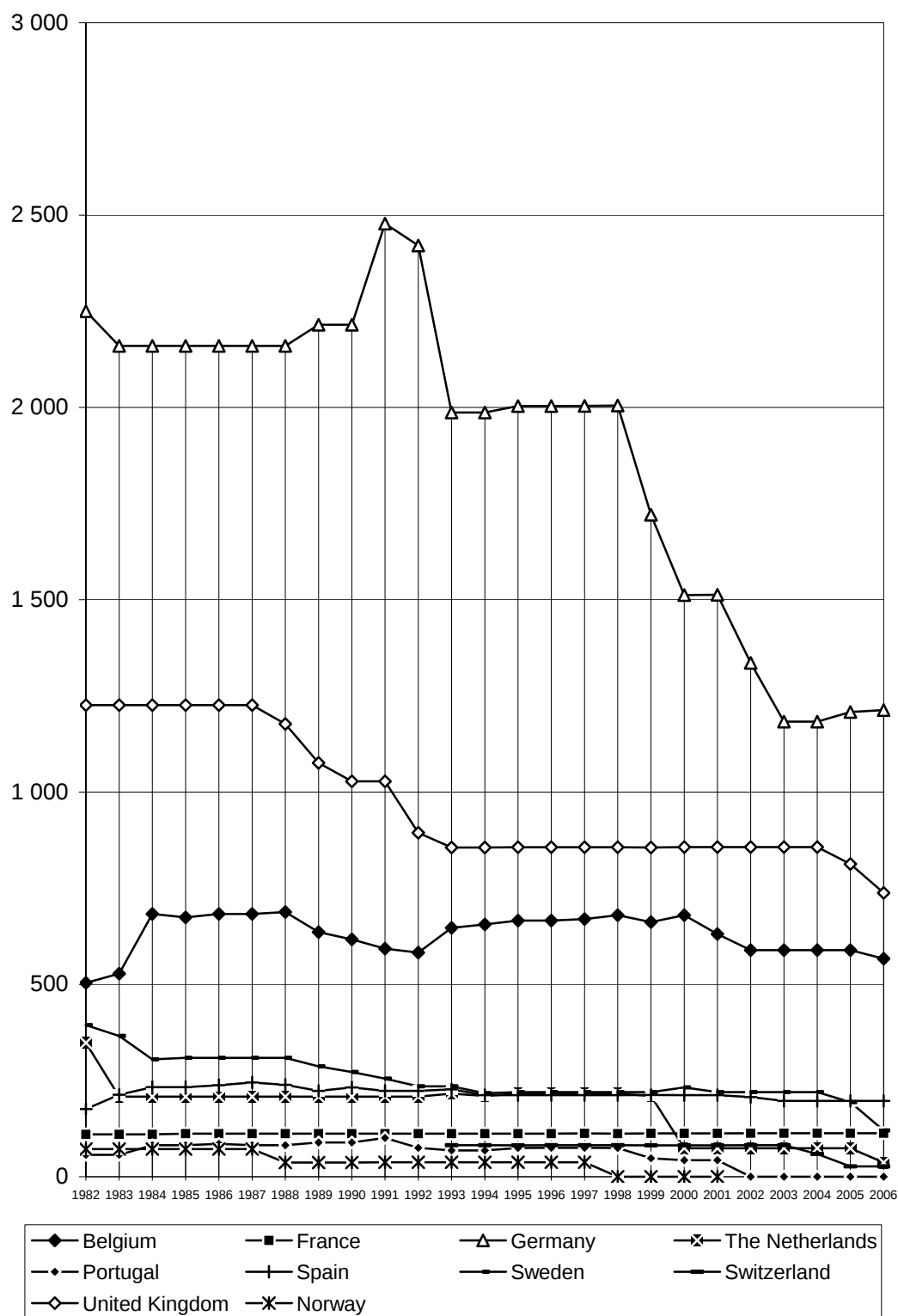


Figure 1a: Chlorine Production Capacity with Mercury Cells of plants discharging into the OSPAR catchment area by Contracting Party (in kilotonnes per year)

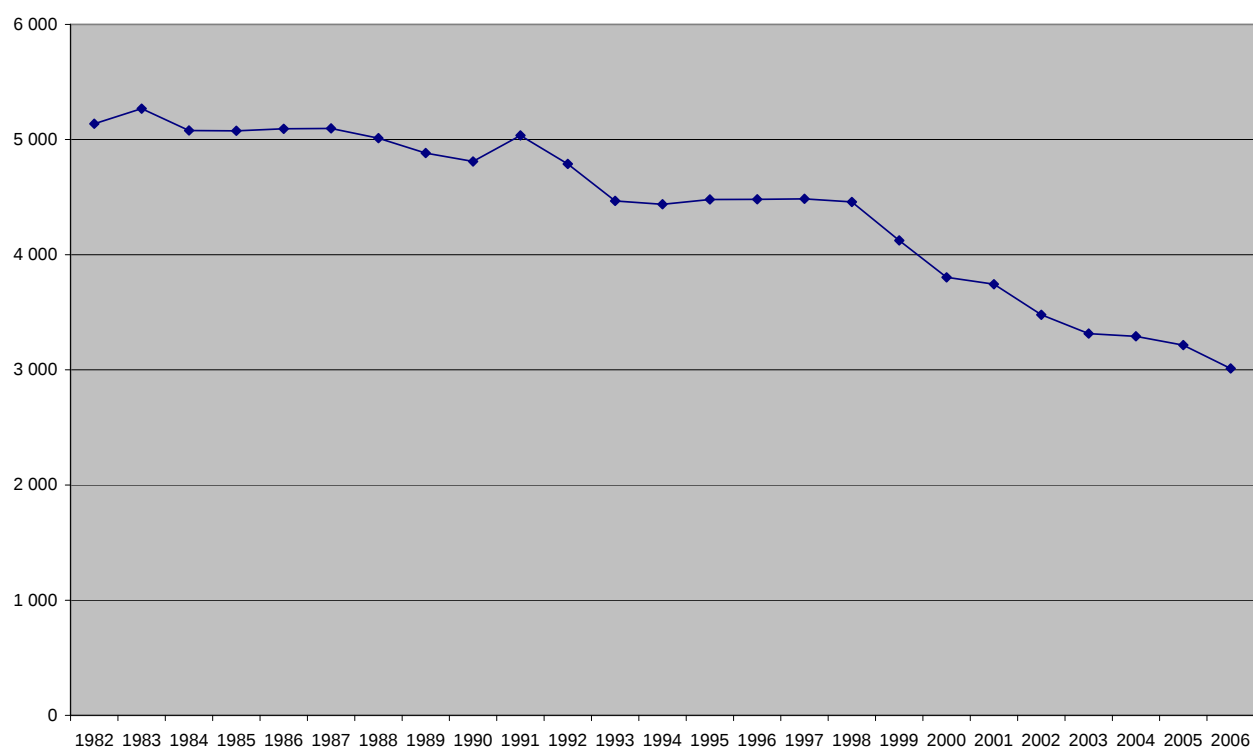


Figure 1b: Total Chlorine Production Capacity with Mercury Cells of plants discharging into the OSPAR catchment area for all Contracting Parties
(in kilotonnes per year)

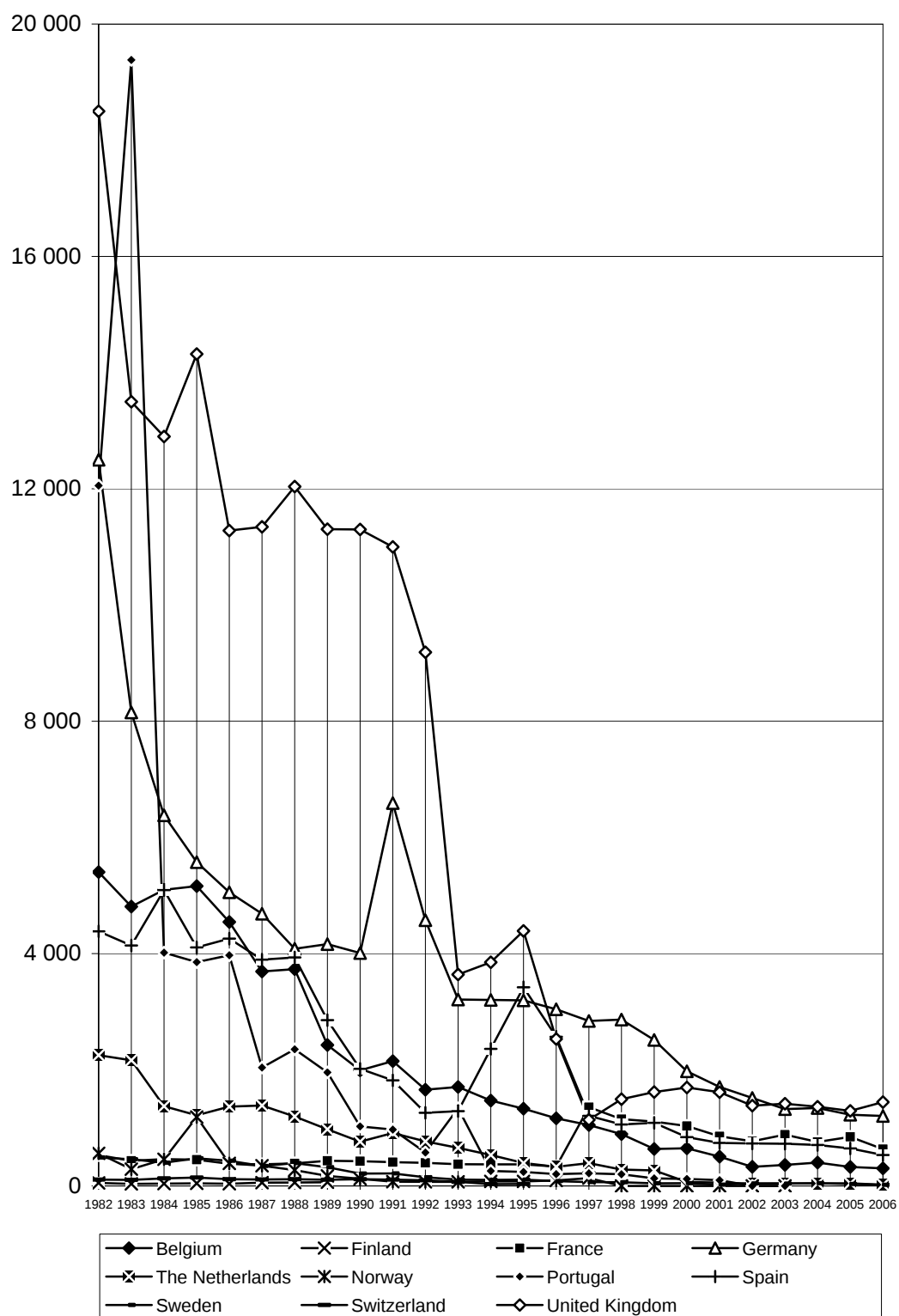


Figure 2a: Mercury Losses through Product, Wastewater and Air
(in kilograms per year, sum of mercury losses to product and wastewater from national plants discharging into the OSPAR catchment area plus atmospheric emissions from all national plants)

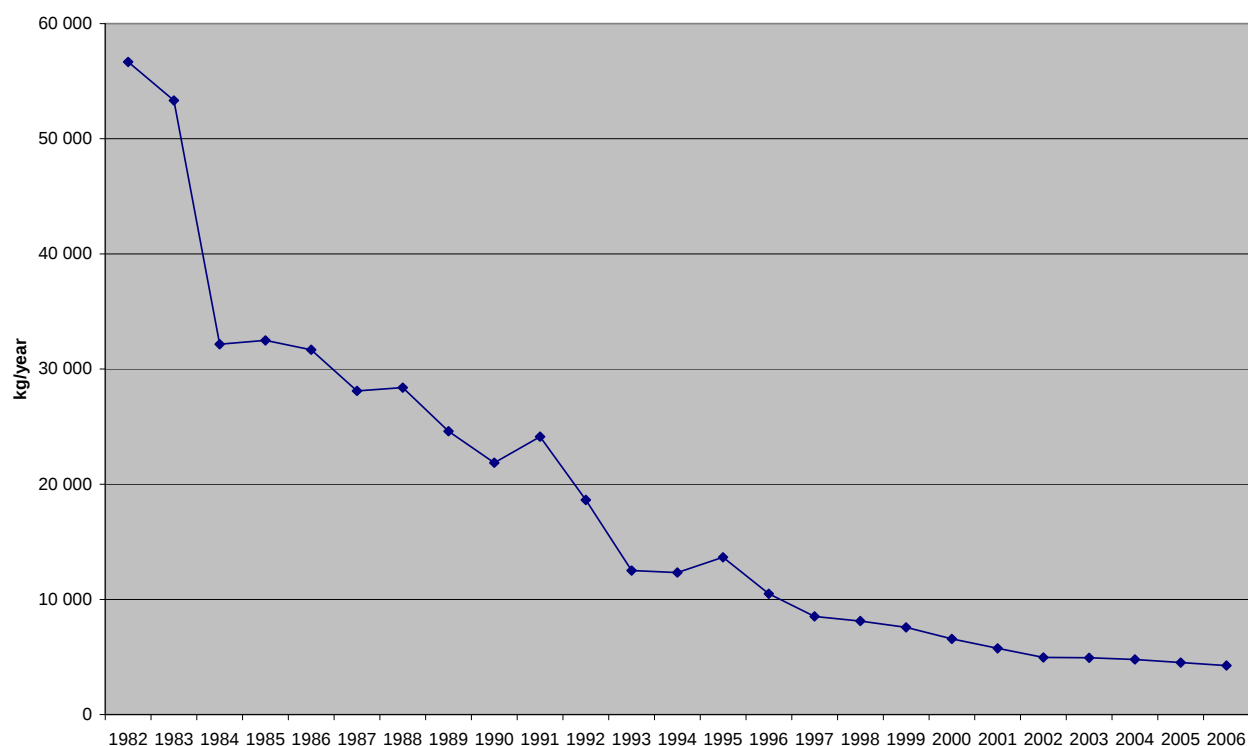


Figure 2b: Total Mercury Losses through Product, Wastewater and Air for all Contracting Parties
(in kilograms per year, sum of mercury losses to product and wastewater from national plants discharging into the OSPAR catchment area plus atmospheric emissions from all national plants)

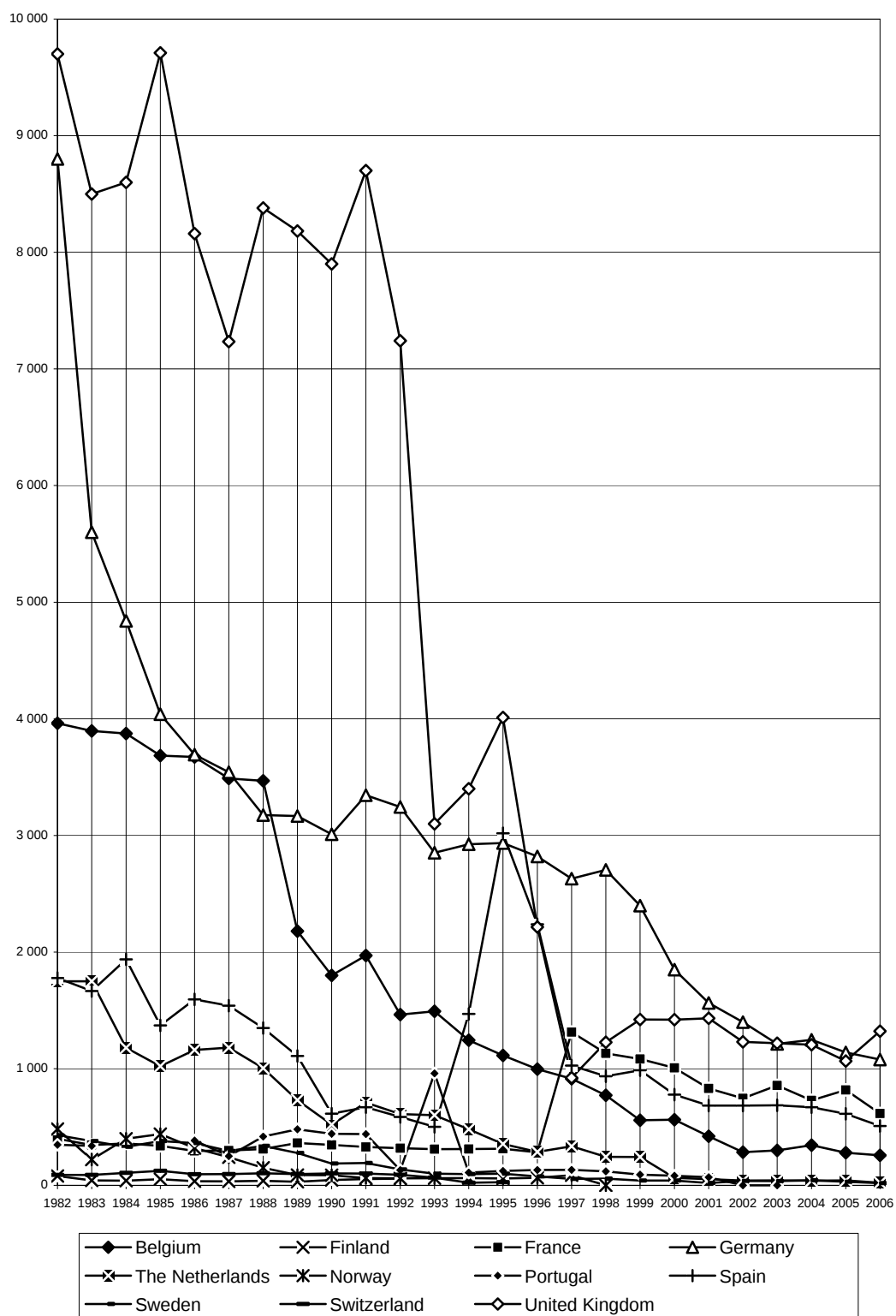


Figure 3a: Atmospheric Emissions of Mercury from all plants from Contracting Parties
(in kilograms per year, all plants)

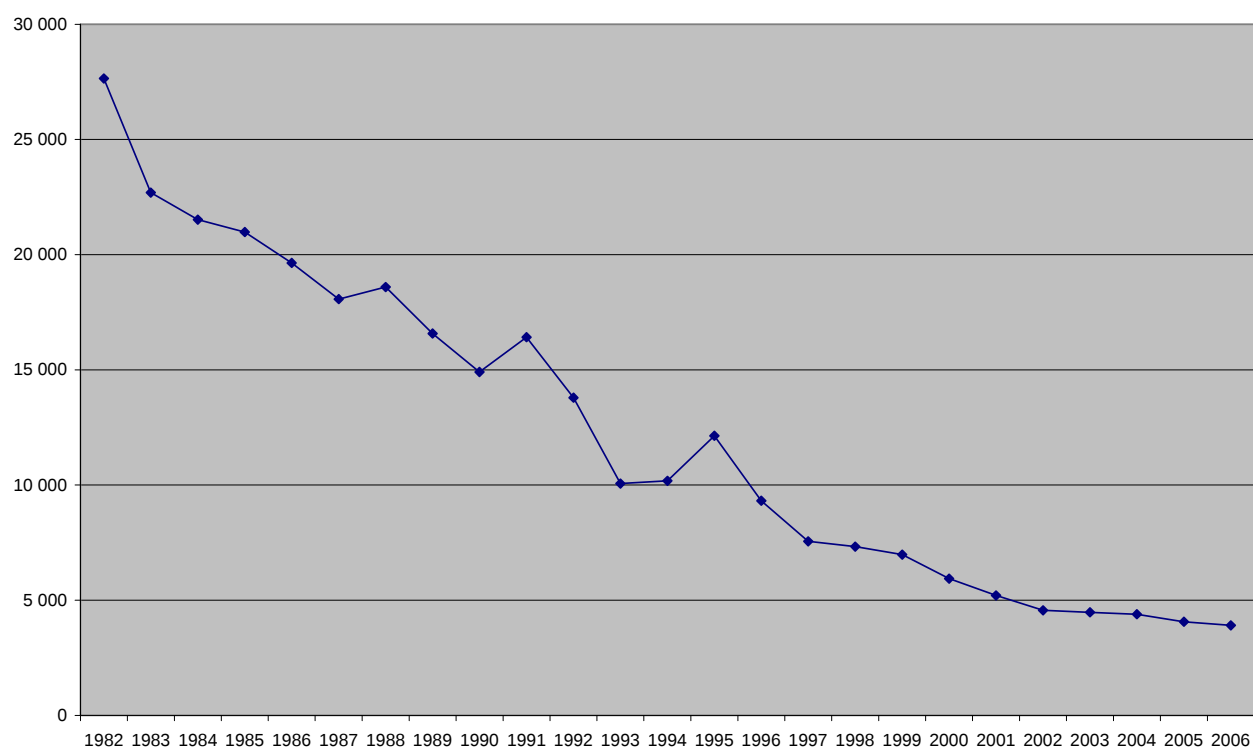


Figure 3b: Total Atmospheric Emissions of Mercury from all plants for all Contracting Parties
(in kilograms per year, all plants)

Table 1: Chlorine Production Capacity with Hg-cells (tonnes) from all plants
(* indicates plants discharging into maritime area only)

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Belgium									
B/1*	219 000	230 000	219 000	219 000	219 000	219 000	219 000	219 000	219 000
B/2*	250 000	250 000	250 000	250 000	250 000	250 000	250 000	250 000	227 500
B/3*	120 000	100 000	120 000	120 000	120 000	120 000	120 000	120 000	120 000
B/4*	90 900	82 000	90 900	41 663	N/A	N/A	N/A	N/A	N/A
Total	679 900	662 000	679 900	630 663	589 000	589 000	589 000	589 000	566 500
Finland									
SF/1	40 000	40 000	40 000	40 000	42 485	42 485	42 485	42 485	42 485
Total	40 000	40 000	40 000	40 000	42 485	42 485	42 485	42 485	42 485
France									
F/1*	NI	18 040	18 040	18 040	18 040	18 040	18 040	18 040	18 040
F/2*	NI	72 000	72 000	72 000	72 000	72 000	72 000	72 000	72 000
F/3	NI	240 900	240 900	240 900	240 900	240 900	240 900	240 900	240 900
F/4	NI	170 070	170 070	170 070	170 070	170 070	170 070	170 070	170 070
F/5*	NI	22 500	22 500	22 500	22 500	22 500	22 500	22 500	22 500
F/6	NI	166 000	166 000	166 000	166 000	166 000	166 000	166 000	166 000
F/7	NI	184 300	184 300	184 300	184 300	184 300	184 300	184 300	NI
Total	NI	873 810	873 810	873 810	873 810	873 810	873 810	873 810	689 509
Germany									
D/1	130 000	65 000	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
D/2*	130 000	130 000	140 000	140 000	110 000	110 000	110 000	130 000	130 000
D/3*	120 000	120 000	125 000	125 000	125 000	125 000	125 000	125 000	125 276
D/4*	150 000	300 000	300 000	300 000	153 000	Shutdown	Shutdown	Shutdown	Shutdown
D/5*	180 000	150 000	160 000	160 000	160 000	160 000	160 000	165 500	170 000
D/6*	65 000	130 000	148 828	148 828	148 828	148 828	148 828	148 828	148 828
D/7*	160 000	180 000	182 000	176 000	176 000	176 000	176 000	176 000	176 000
D/8*	200 000	98 000	135 951	135 951	135 951	135 951	135 951	135 951	135 951
D/9*	150 000	150 000	160 000	167 000	167 000	167 000	167 000	167 000	167 000
D/10	300 000	248 000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D/11	50 000	60 000	9 804	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
D/12	72 000	157 000	157 000	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
D/13*	157 000	150 000	160 000	160 000	160 000	160 000	160 000	160 000	160 000
D/14	300 000	72 000	82 355	82 355	82 355	82 355	82 355	82 355	82 355
D/15	120 000	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
Total	2 344 000	2 010 000	1 760 938	1 595 134	1 416 134	1 265 134	1 265 134	1 290 634	1 295 411
Netherlands									
NL/1*	70 000	70 000	74 294	74 294	74 294	74 294	74 294	74 294	37 452
NL/2*	140 000	140 000	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
Total	210 000	210 000	74 294	74 294	74 294	74 294	74 294	74 294	37 452
Portugal									
P/1*	48 600	48 000	43 302	43 302	N/A	N/A	N/A	N/A	N/A
P/2*	26 400	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
Total	75 000	48 000	43 302	43 302					
Spain									
E/1	31 920	30 000	31 373	31 373	31 373	31 373	31 373	31 373	31 373
E/2*	14 815	15 000	14 815	14 815	9 877	PC	PC	PC	PC
E/3*	33 552	33 500	33 552	33 552	33 552	33 552	33 552	33 552	33 552
E/4	150 000	150 000	150 000	150 000	150 000	150 000	150 000	150 000	150 000
E/5*	62 745	63 000	62 747	62 747	62 747	62 747	62 747	62 747	62 747
E/6	209 200	209 000	217 871	217 871	217 871	217 871	217 871	217 871	217 871
E/7	25 000	25 000	25 000	25 000	25 000	25 000	25 000	25 000	25 000
E/8	135 000	135 000	135 004	135 004	135 004	135 004	135 004	135 004	135 004
E/9*	101 000	101 000	100 929	100 929	100 929	100 929	100 929	100 929	100 929
Total	763 232	761 500	771 291	771 291	766 353	756 476	756 476	756 476	756 475
Sweden									
S/1*	100 000	100 000	100 000	100 000	100 000	100 000	100 000	74 355	NA
S/2*	120 000	120 000	132 000	120 000	120 000	120 000	120 000	120 000	120 000
Total	220 000	220 000	232 000	220 000	220 000	220 000	220 000	194 355	120 000

Switzerland									
CH/1*	55 000	55 000	55 000	55 000	55 000	55 000	32 083	Shut down	Shut down
CH/2	26 500	22 000	26 500	26 500	26 500	26 500	26 500	Shut down	Shut down
CH/3*	27 000	26 500	27 000	27 000	27 000	27 000	27 000	27 000	27 000
Total	108 500	103 500	108 500	108 500	108 500	108 500	85 583²	27 000	27 000

UK									
UK/1*	29 000	29 000	29 413	29 413	29 413	29 413	29 413	Shut down	Shut down
UK/2*	89 872	89 000	89 872	89 872	89 872	89 872	89 872	74 855	Shut down
UK/3*	737 000	738 000	738 000	738 000	738 000	738 000	738 000	738 000	738 000
Total	855 872	856 000	857 285	857 285	857 285	857 285	857 285	812 855	738 000

Production capacity of all installations in the Convention area

	1998	1999	2000	2001	2002	2003	2004	2005	2006
tonnes	6 170 314	5 784 810	5 441 320	5 214 279	4 947 861	4 786 984	4 764 067	4 660 910	4 272 833
%	100	93,8	88,2	84,5	80,2	77,6	77,2	75,5	62,2

Production capacity of installations in the drainage area to the maritime area

	1998	1999	2000	2001	2002	2003	2004	2005	2006
tonnes	3 819 424	3 810 540	3 805 143	3 744 906	3 476 003	3 315 126	3 292 209	3 215 551	3 011 775
%	100	99,8	99,6	98,0	91,0	86,8	86,2	84,2	78,9

NI: No information

N/A: Not applicable

PC: Partly converted to membrane technology

² The Solvay chlorine production unit located in Zurzach (CH/1) was shut down at the beginning of August 2004 and, in agreement with the Euro Chlor rules, a yearly production capacity "pro rata temporis" was considered (i.e. 55 000 t/y * 7 / 12 = 32 083 t/y).

**Table 2: Mercury Losses through Product, Waste Water and Air
(kg per year)**

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Belgium									
B/1	NI	173	157	122	82	92	142	88	98
B/2	NI	178	180	175	169	186	178	179	142
B/3	NI	113	111	88	78	85	82	60	64
B/4	NI	173	201	120	N/A	N/A	N/A	N/A	N/A
Total	893	637	649	505	329	363	402	327	304
Finland									
SF/1	NI	63	43	41	44	37	56	59	63
Total	NI	63	43	41	44	37	56	59	63
France									
F/1	NI	28	29	24	15	12	25	21	13
F/2	NI	129	119	121	92	118	116	125	119
F/3	NI	345	338	226	216	245	189	202	224
F/4	NI	192	220	203	152	127	96	106	119
F/5	NI	32	32	33	34	33	32	29	29
F/6	NI	190	152	139	175	185	147	168	195
F/7	NI	281	243	237	202	282	242	290	NI
Total	1 149	1 197	1 133	983	886	1 002	847	941	699
Germany									
D/1	NI	111	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
D/2	NI	147	247	159	127	128	103	94	97
D/3	NI	49	73	75	78	80	92	86	91
D/4	NI	367	367	358	285	Shutdown	Shutdown	Shutdown	Shutdown
D/5	NI	261	166	162	157	169	173	169	160
D/6	NI	70	62	52	49	77	116	64	97
D/7	NI	313	257	199	218	289	260	194	179
D/8	NI	193	209	228	174	159	151	170	162
D/9	NI	161	165	197	199	213	244	243	207
D/10	NI	391	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D/11	NI	104	18	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
D/12	NI	132	137	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
D/13	NI	137	171	201	163	146	141	153	158
D/14	285	100	112	80	67	64	62	56	55
D/15	NI	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
Total	2 864	2 536	1 982	1 711	1 517	1 325	1 343	1 229	1206
Netherlands									
NL/1	NI	71	68	57	41	45	42	46	22
NL/2	NI	196	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
Total	282	267	68	57	41	45	42	46	22
Portugal									
P/1	NI	130	121	100	N/A	N/A	N/A	N/A	N/A
P/2	NI	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown
Total	202	130	121	100					
Spain									
E/1	NI	61	63	58	48	45	46	38	35
E/2	NI	30	29	25	16	PC	PC	PC	PC
E/3	NI	66	57	52	38	42	32	30	27
E/4	NI	287	164	114	123	137	121	121	110
E/5	NI	142	102	101	86	74	92	47	29
E/6	NI	182	182	193	185	199	205	203	154
E/7	NI	53	49	32	36	30	26	25	25
E/8	NI	251	244	176	174	174	154	139	137
E/9	123	175	95	103	132	99	94	109	68
Total	1 057	1 247	985	854	838	800	770	713	585

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sweden									
S/1	NI	27	28	29	26	22	25	14	NI
S/2	NI	18	19	18	17	19	22	20	20
Total	65	45	47	47	43	41	47	34	20
Switzerland									
CH/1	NI	82	70	64	73	67	39	Shut down	Shut down
CH/2	NI	19	20	28	19	19	11	NI	Shut down
CH/3	NI	15	19	25	17	12	22	30	32
Total	111	116	109	117	109	98	72	30	32
UK									
UK/1	NI	15	16	17	18	35	54	Shut down	Shut down
UK/2	NI	125	144	157	175	144	154	112	Shut down
UK/3	NI	1 476	1 535	1 439	1 188	1 237	1 155	1 183	1 444
Total	1 493	1 616	1 695	1 613	1 381	1 416	1 363	1 295	1 444

Total mercury losses through product, waste water and air from all installations in the Convention area (waste water discharges from installations in the drainage area only)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
kg/year	8 179	7 854	6 832	6 028	5 188	4 933	4 730	4 450	4 192
%	100	96,0	83,5	73,3	63,4	60,3	57,8	54,4	51,3

NI: No information

N/A: Not applicable

PC: Partly converted to membrane technology

**Table 3: Mercury Losses through Product, Waste Water and Air
(g per tonne production capacity)**

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Belgium									
B/1	NI	0,750	0,715	0,556	0,374	0,419	0,649	0,400	0,446
B/2	NI	0,710	0,720	0,699	0,676	0,744	0,712	0,718	0,624
B/3	NI	1,125	0,921	0,736	0,647	0,712	0,684	0,503	0,539
B/4	NI	2,110	2,212	2,890	N/A	N/A	N/A	N/A	N/A
Finland									
SF/1	NI	1,574	1,078	1,026	1,046	0,878	1,324	1,380	1,478
France									
F/1	NI	1,580	1,631	1,317	0,819	0,646	1,400	1,149	0,720
F/2	NI	1,792	1,646	1,680	1,277	1,644	1,615	1,732	1,658
F/3	NI	1,431	1,403	0,940	0,896	1,019	0,785	0,838	0,932
F/4	NI	1,131	1,292	1,197	0,896	0,746	0,567	0,621	0,699
F/5	NI	1,444	1,436	1,457	1,509	1,469	1,402	1,308	1,277
F/6	NI	1,144	0,917	0,836	1,054	1,117	0,883	1,015	1,173
F/7	NI	1,522	1,320	1,286	1,094	1,530	1,312	1,574	NI
Germany									
D/1	NI	1,707	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/2	NI	1,128	1,766	1,132	1,153	1,163	0,934	0,724	0,743
D/3	NI	0,406	0,583	0,601	0,622	0,640	0,733	0,689	0,730
D/4	NI	1,223	1,223	1,193	1,862	Shut down	Shut down	Shut down	Shut down
D/5	NI	1,740	1,040	1,010	0,980	1,060	1,083	1,020	0,940
D/6	NI	0,540	0,416	0,348	0,326	0,515	0,777	0,428	0,655
D/7	NI	1,740	1,410	1,130	1,240	1,640	1,479	1,101	1,018
D/8	NI	1,970	1,540	1,680	1,281	1,167	1,111	1,254	1,193
D/9	NI	1,070	1,032	1,182	1,189	1,279	1,464	1,455	1,238
D/10	NI	1,576	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/11	NI	1,740	1,864	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/12	NI	0,843	0,871	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/13	NI	0,910	1,069	1,259	1,019	0,911	0,884	0,956	0,985
D/14	NI	1,390	1,364	0,966	0,815	0,776	0,757	0,680	0,669
D/15	NI	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Netherlands									
NL/1	NI	1,008	0,909	0,765	0,551	0,610	0,571	0,615	0,587
NL/2	NI	1,400	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Portugal									
P/1	NI	2,700	2,800	2,300	Shut down	Shut down	Shut down	Shut down	Shut down
P/2	NI	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Spain									
E/1	NI	2,040	2,020	1,861	1,545	1,430	1,461	1,204	1,122
E/2	NI	2,020	1,948	1,667	1,626	PC	PC	PC	PC
E/3	NI	1,970	1,699	1,563	1,123	1,264	0,945	0,884	0,810
E/4	NI	1,910	1,094	0,762	0,821	0,911	0,811	0,806	0,730
E/5	NI	2,259	1,632	1,608	1,368	1,172	1,461	0,756	0,458
E/6	NI	0,870	0,834	0,885	0,848	0,914	0,944	0,933	0,708
E/7	NI	2,100	1,940	1,265	1,428	1,220	1,030	1,017	1,020
E/8	NI	1,860	1,810	1,300	1,290	1,290	1,140	1,030	1,014
E/9	NI	1,730	0,938	1,021	1,309	0,976	0,933	1,081	0,676
Sweden									
S/1	NI	0,268	0,278	0,288	0,258	0,221	0,248	0,186	NI
S/2	NI	0,154	0,144	0,154	0,143	0,161	0,188	0,167	0,165
Switzerland									
CH/1	NI	1,490	1,271	1,162	1,336	1,227	1,227	Shut down	Shut down
CH/2	NI	0,877	0,743	1,054	0,699	0,712	0,429	NI	NI
CH/3	NI	0,560	0,692	0,917	0,638	0,434	0,802	1,110	1,170

OSPAR Commission, 2008:
Mercury losses from the chlor-alkali industry (1982-2006)

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
UK									
UK/1	NI	0,525	0,538	0,574	0,606	1,180	1,852	Shut down	Shut down
UK/2	NI	1,410	1,600	1,744	1,950	1,600	1,710	1,494	Shut down
UK/3	NI	2,000	2,080	1,950	1,610	1,677	1,565	1,603	1,957

NI: No information

N/A: Not applicable

PC: Partly converted to membrane technology

Table 4: Atmospheric Emissions of Mercury (kg per year)

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Belgium									
B/1	290	156	137	106	68	74	120	67	79
B/2	176	154	157	153	153	164	160	164	129
B/3	146	101	98	74	63	62	64	49	49
B/4	160	146	172	80	N/A	N/A	N/A	N/A	N/A
Total	772	558	564	413	284	300	344	280	257
Finland									
SF/1	40	53	35	34	39	31	46	54	57
Total	40	53	35	34	39	31	46	54	57
France									
F/1	26	25	26	21	12	7	14	11	11
F/2	111	115	103	108	80	103	106	113	109
F/3	301	320	313	210	202	235	181	191	212
F/4	179	182	188	171	109	88	67	64	89
F/5	330	25	25	26	27	27	26	24	24
F/6	24	161	129	109	147	142	118	139	172
F/7	160	255	223	186	170	255	217	275	NI
Total	1 131	1 083	1 007	831	747	857	729	818	617
Germany									
D/1	173	105	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/2	92	135	235	146	114	113	98	88	88
D/3	84	39	63	68	71	74	86	80	84
D/4	255	353	353	345	274	Shut down	Shut down	Shut down	Shut down
D/5	256	255	160	155	150	163	167	162	153
D/6	105	66	58	48	45	72	111	59	48
D/7	128	301	244	187	206	276	247	181	166
D/8	280	175	171	179	141	113	114	142	141
D/9	150	149	151	185	188	203	233	232	195
D/10	354	382	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D/11	105	100	18	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/12	103	119	128	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/13	97	124	158	177	144	135	131	142	148
D/14	285	96	110	74	65	62	60	54	53
D/15	238	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Total	2 705	2 399	1 849	1 564	1 398	1 211	1 248	1 140	1 079
Netherlands									
NL/1	65	65	65	53	37	42	40	42	20
NL/2	180	178	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Total	245	243	65	53	37	42	40	42	20
Portugal									
P/1	92	91	82	69	NA	NA	NA	NA	NA
P/2	28	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Total	120	91	82	69					
Spain									
E/1	31	38	45	36	33	38	40	32	30
E/2	21	20	19	17	12	PC	PC	PC	PC
E/3	66	51	43	32	23	31	23	21	21
E/4	210	218	118	69	80	114	105	101	92
E/5	109	91	85	91	77	63	74	38	20
E/6	126	157	165	178	171	182	193	188	146
E/7	48	35	27	22	28	26	22	22	22
E/8	203	227	204	155	148	151	128	117	117
E/9	123	152	74	84	112	81	85	93	59
Total	937	989	780	684	684	686	670	613	509
Sweden									
S/1	37	25	25	27	23	20	23	13	NI
S/2	21	17	17	17	15	16	20	18	19
Total	58	42	42	44	38	36	43	31	19

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Switzerland									
CH/1	57	75	63	58	69	65	38	Shut down	Shut down
CH/2	18	19	19	27	18	18	11	Shut down	Shut down
CH/3	21	10	14	17	14	8	17	22	27
Total	96	104	96	102	101	91	66	22	27

UK									
UK/1	14	14	14	13	13	29	49	Shut down	Shut down
UK/2	106	117	137	149	169	137	147	108	Shut down
UK/3	1 107	1 292	1 269	1 270	1 048	1 053	1 010	958	1 322
Total	1 227	1 423	1 420	1 432	1 230	1 219	1 206	1 066	1 322

Total atmospheric emissions of mercury from all installations in the Convention area¹

	1998	1999	2000	2001	2002	2003	2004	2005	2006
kg/year	7 331	6 985	5 940	5 226	4 558	4 475	4 392	4 066	3 906
%	100	95,3	81,0	71,3	62,2	61	59,9	55,5	53,3

NI: No information

N/A: Not applicable

PC: Partly converted to membrane technology

Table 5: Atmospheric Emissions of Mercury (g per tonne production capacity)

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Belgium									
B/1	1,320	0,680	0,627	0,484	0,310	0,338	0,547	0,307	0,360
B/2	0,705	0,617	0,627	0,615	0,611	0,657	0,641	0,654	0,565
B/3	1,213	1,013	0,813	0,615	0,524	0,516	0,531	0,411	0,412
B/4	1,770	1,780	1,888	1,930	N/A	N/A	N/A	N/A	N/A
Finland									
SF/1	1,000	1,322	0,885	0,856	0,916	0,738	1,084	1,27	1,335
France									
F/1	1,390	1,380	1,442	1,154	0,651	0,416	0,763	0,618	0,600
F/2	1,540	1,600	1,424	1,498	1,111	1,433	1,469	1,570	1,510
F/3	1,250	1,330	1,300	0,871	0,838	0,976	0,752	0,792	0,880
F/4	1,050	1,068	1,108	1,004	0,641	0,518	0,396	0,375	0,525
F/5	1,790	1,123	1,132	1,159	1,199	1,186	1,153	1,087	1,075
F/6	1,080	0,971	0,776	0,660	0,886	0,853	0,712	0,840	1,035
F/7	0,960	1,381	1,210	1,011	0,921	1,384	1,176	1,494	NI
Germany									
D/1	1,330	1,610	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/2	0,710	1,040	1,680	1,040	1,040	1,030	0,890	0,680	0,680
D/3	0,700	0,322	0,507	0,546	0,571	0,592	0,687	0,639	0,673
D/4	1,700	1,175	1,175	1,150	1,792	NA	NA	NA	NA
D/5	1,420	1,700	1,000	0,970	0,940	1,020	1,043	0,980	0,900
D/6	1,609	0,510	0,390	0,322	0,303	0,481	0,745	0,396	0,324
D/7	0,800	1,670	1,340	1,060	1,170	1,570	1,405	1,030	0,952
D/8	1,400	1,790	1,260	1,320	1,039	0,834	0,842	1,042	1,038
D/9	1,000	0,995	0,942	1,106	1,125	1,215	1,396	1,387	1,170
D/10	1,180	1,540	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D/11	2,100	1,660	1,846	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/12	1,431	0,760	0,815	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/13	0,620	0,829	0,989	1,108	0,898	0,841	0,820	0,890	0,924
D/14	0,950	1,330	1,330	0,900	0,787	0,756	0,734	0,653	0,645
D/15	1,980	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Netherlands									
NL/1	0,920	0,927	0,873	0,716	0,501	0,560	0,542	0,559	0,546
NL/2	1,230	1,270	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Portugal									
P/1	1,893	1,900	1,900	1,600	NA	NA	NA	NA	NA
P/2	1,061	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Spain									
E/1	0,960	1,260	1,420	1,141	1,041	1,220	1,265	1,030	0,970
E/2	1,430	1,330	1,272	1,153	1,166	PC	PC	PC	PC
E/3	1,960	1,510	1,280	0,959	0,685	0,927	0,690	0,627	0,641
E/4	1,400	1,450	0,784	0,462	0,537	0,760	0,699	0,674	0,616
E/5	1,735	1,442	1,347	1,455	1,226	1,001	1,178	0,603	0,328
E/6	0,603	0,750	0,758	0,818	0,784	0,836	0,885	0,863	0,670
E/7	1,900	1,400	1,060	0,880	1,120	1,040	0,880	0,890	0,880
E/8	1,500	1,680	1,510	1,140	1,100	1,120	0,950	0,870	0,864
E/9	1,220	1,500	0,735	0,831	1,110	0,800	0,843	0,925	0,589
Sweden									
S/1	0,370	0,250	0,250	0,270	0,234	0,204	0,231	0,173	NI
S/2	0,171	0,139	0,131	0,140	0,121	0,135	0,167	0,151	0,155

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Switzerland									
CH/1	1,030	1,370	1,146	1,065	1,258	1,176	1,176	Shut down	Shut down
CH/2	0,680	0,848	0,710	1,019	0,670	0,689	0,408	Shut down	Shut down
CH/3	0,780	0,370	0,517	0,625	0,515	0,315	0,647	0,820	0,985
UK									
UK/1	0,483	0,470	0,461	0,452	0,438	1,004	1,669	Shut down	Shut down
UK/2	1,179	1,310	1,520	1,660	1,880	1,520	1,640	1,446	Shut down
UK/3	1,501	1,750	1,720	1,720	1,420	1,427	1,368	1,298	1,791

NI: No information

N/A: Not applicable

PC: Partly converted to membrane technology

Table 6: Mercury in Safely Deposited Wastes* (kg per year)

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Belgium									
B/1	NI	837	6 823	260	2 889	2 293	4 608	5 405	304
B/2	NI	5 733	3 566	4 646	358	NI	250	5 949	1 139
B/3	NI	3	5	6	67	6	5	3	6
B/4	NI	0	2	1 242	N/A	N/A	N/A	N/A	N/A
Total	8 529	6 573	10 396	6 154	3 254	2 299	4 863	11 357	1 449
Finland									
SF/1	0	0	0,16	0	0	0	0	0	0,2
Total	0	0	0,16	0	0	0	0	0	0,2
France									
F/1	NI	0	0	0	18	33	75	17	0
F/2	NI	68	2 632	9 644	8 896	6 230	7 268	7 309	10 428
F/3	NI	1 257	1 296	1 078	922	1 323	1 143	1 423	2 106
F/4	NI	54	37	43	41	34	26	34	0
F/5	NI	0	70	6	238	13	3	NI	2,5
F/6	NI	33	16	64	48	25	15	9	18
F/7	NI	24	35	8	25	24	44	32	NI
Total	344	1 436	4 086	10 843	10 188	7 682	8 574	8 824	12 555
Germany									
D/1	NI	31	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/2	NI	4	0	NI	NI	NI	138	182	120
D/3	NI	2	3	2	1	NI	NI	NI	3
D/4	NI	3 054	3 054	1 259	3 437	Shut down	Shut down	Shut down	Shut down
D/5	NI	66	576	766	5 799	10 555	10 027	4 958	1 762
D/6	NI	1 314	3 764	1034	472	1 591	1 551	496	1 386
D/7	NI	37 260	20 602	13 200	13 390	12 260	16 490	15 330	59 991
D/8	NI	1 646	2 311	NI	674	2 282	1 536	356	358
D/9	NI	2 270	4 570	4 230	6 366	5 340	4 355	3 239	3 241
D/10	NI	304	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D/11	NI	19	NI	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/12	NI	176	176	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/13	NI	2 692	5 659	9 209	4 378	2 745	2 500	2 780	2 309
D/14	NI	1 656	754	833	406	85	212	71	96
D/15	NI	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Total	26 200	50 494	41 469	30 533	34 923	34 858	36 808	27 412	63 266
Netherlands									
NL/1	NI	6	2	28	7	3	2	1	0
NL/2	NI	0	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Total	38	6	2	28	7	3	2	1	0
Portugal									
P/1	NI	0	0	0	Shut down	Shut down	Shut down	Shut down	Shut down
P/2	NI	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Total	689	0	0	0	0	0	0	0	0
Spain									
E/1	NI	1 265	4 276	495	2 027	846	408	1 297	807
E/2	NI	27	8	9	141	PC	PC	PC	PC
E/3	NI	384	599	359	472	679	402	323	370
E/4	NI	2 694	6 279	4 868	2 343	2 020	2 837	3 549	3938
E/5	NI	1 013	412	59	0	440	1 544	1 880	208
E/6	NI	604	770	1 088	2 339	2 625	622	900	1043
E/7	NI	20	10	3	13	14	NI	315	9
E/8	NI	498	432	459	552	328	506	633	551
E/9	NI	500	401	279	169	349	185	217	156
Total	657	7 005	13 187	7 619	8 056	7 301	6 503	9 114	7 082

* All mercury-contaminated materials, such as cell components, process equipment, solid wastes from sumps, pits, demercurisation units and the brine purification process, which have been sent to authorised and properly controlled toxic waste disposal sites, are to be included in the category "safely deposited waste". For the purpose of the balance, all deposits of mercury in whatever concentrations should be accounted for.

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sweden									
S/1	NI	6	6	850	5	NI	55	NI	NI
S/2	NI	1	1	1	NI	NI	NI	NI	NI
Total	42	7	7	851	5	NI	55	NI	0
Switzerland									
CH/1	NI	165	178	215	207	239	139	Shut down	Shut down
CH/2	NI	0	3	32	1	2	1	N/A	Shut down
CH/3	NI	1 084	0	1 933	NI	1 891	NI	1 859	0
Total	1 905	1 249	181	2 180	208	2 132	140	1 859	0
UK									
UK/1	NI	161	268	263	136	118	246	Shut down	Shut down
UK/2	NI	37	48	147	113	119	134	43	Shut down
UK/3	NI	3 911	3 092	2 842	10 745	21 247	6 208	6 446	15 905
Total	3 187	4 109	3 408	3 252	10 994	21 484	6 588	6 489	15 905

NI: No information

N/A: Not applicable

PC: Partly converted to membrane technology

Table 7: Mercury in Safely Deposited Wastes* (g per tonne production capacity)

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Belgium									
B/1	NI	3,640	31,155	1,188	13,192	10,472	21,041	24,680	1,389
B/2	NI	22,930	14,264	18,585	1,432	NI	1,000	23,794	5,007
B/3	NI	0,025	0,039	0,046	0,055	0,047	0,038	0,029	0,050
B/4	NI	0	0,0260	29,819	N/A	N/A	N/A	N/A	N/A
Finland									
SF/1	NI	0,003	0,004	0,006	0,003	NI	NI	NI	NI
France									
F/1	NI	0	0	0	1,024	1,810	4,130	0,953	0,000
F/2	NI	0,950	36,560	133,941	123,555	86,528	100,950	101,514	144,833
F/3	NI	5,220	5,380	4,474	3,828	5,491	4,746	5,907	8,744
F/4	NI	0,320	0,215	0,255	0,240	0,200	0,155	0,202	0,000
F/5	NI	0	3,100	0,280	10,580	0,600	0,140	NI	0,110
F/6	NI	0,196	0,094	0,386	0,292	0,148	0,092	0,052	0,110
F/7	NI	0,131	0,190	0,044	0,134	0,131	0,237	0,172	NI
Germany									
D/1	NI	0,480	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/2	NI	0,030	0	0	NI	NI	1,250	1,400	0,920
D/3	NI	0,014	0,021	0,014	0,007	NI	NI	NI	0,023
D/4	NI	10,180	10,180	4,197	22,464	Shut down	Shut down	Shut down	Shut down
D/5	NI	0,440	3,600	4,788	36,242	66	62,670	29,960	10,365
D/6	NI	10,104	25,290	6,950	3,171	11	10,422	3,330	9,315
D/7	NI	207,000	113,200	75,000	76,080	70	93,693	87,102	306,767
D/8	NI	16,800	17,000	0	4,959	17	11,295	2,621	2,632
D/9	NI	15,134	28,560	25,329	38,119	32	26,077	19,398	19,408
D/10	NI	1,225	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D/11	NI	0,310	0	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/12	NI	1,120	1,120	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
D/13	NI	17,949	35,371	57,555	27,362	17	15,628	17,378	14,434
D/14	NI	23,000	9,150	10,110	4,937	1	2,571	0,857	1,160
D/15	NI	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Netherlands									
NL/1	NI	0,082	0,027	0,382	0,100	0,043	0,029	0,008	0
NL/2	NI	0	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Portugal									
P/1	NI	0	0	0	N/A	N/A	N/A	N/A	N/A
P/2	NI	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
Spain									
E/1	NI	42,150	136,300	15,759	64,604	27	12,995	41,354	25,733
E/2	NI	1,800	0,556	0,607	14,300	PC	PC	PC	PC
E/3	NI	11,460	17,850	10,703	14,056	20	11,977	9,624	11,034
E/4	NI	17,960	41,860	32,450	15,620	13	18,910	23,662	26,255
E/5	NI	16,085	6,564	0,943	0,005	7	24,606	29,962	3,315
E/6	NI	2,890	3,533	4,994	10,737	12	2,857	4,129	4,785
E/7	NI	0,800	0,380	0,120	0,528	1	NI	12,600	0,362
E/8	NI	3,690	3,200	3,400	4,090	2	3,750	4,690	4,080
E/9	NI	4,950	3,970	2,767	1,673	3	1,830	2,150	1,546
Sweden									
S/1	NI	0,064	0,064	8,500	0,052	NI	0,553	NI	NI
S/2	NI	0,011	0,010	0,010	NI	NI	NI	NI	0,147

* All mercury-contaminated materials, such as cell components, process equipment, solid wastes from sumps, pits, demercurisation units and the brine purification process, which have been sent to authorised and properly controlled toxic waste disposal sites, are to be included in the category "safely deposited waste". For the purpose of the balance, all deposits of mercury in whatever concentrations should be accounted for.

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006
Switzerland									
CH/1	NI	3,000	3,230	3,900	3,774	4,350	4,350	Shut down	Shut down
CH/2	NI	0	0,104	1,216	0,021	0,061	0,030	Shut down	Shut down
CH/3	NI	40,910	0	71,602	NI	70,048	NI	68,835	0
UK									
UK/1	NI	5,540	9,115	8,938	4,631	4,001	8,359	Shut down	Shut down
UK/2	NI	0,420	0,530	1,640	1,260	1,330	1,490	0,573	Shut down
UK/3	NI	5,300	4,190	3,850	14,560	28,790	8,412	8,734	21,552

NI: No information

N/A: Not applicable

PC: Partly converted to membrane technology

4. 2006 data and information

4.1 Introduction

In this part of the report, data and information about the national chlor-alkali industry of each OSPAR Contracting Party is given as follows:

- a. Contracting Parties with mercury-based chlor-alkali plants:
 - (i) two overview maps showing the locations, the names and the operators of the sites;
 - (ii) tables with technical data on the annual discharges, emissions and losses, including wastes, from plants of each Contracting Party (provided via Euro Chlor);
- b. Contracting Parties with mercury-free plants or without chlor-alkali industry.

The column headings and abbreviations (e.g. C, E1, E2 etc) used in the tables correspond to the reporting requirements set out in the current formats:

Sea Area - Sea area in which liquid wastes from the plant is discharged, or is likely to be discharged

OSPAR maritime area

A - Atlantic

Areas not covered by the OSPAR Convention

Baltic - Baltic Sea

Bl Sea- Black Sea

M - Mediterranean Sea

Brine W - waste brine plant

R - brine-recirculation plant

Values are expressed in continental notation.

4.2 Locations of mercury-based chlor-alkali plants

The two following maps give an overview of the locations of the mercury-based chlor-alkali plants indicated below and their operators:

Country/Code	Company	Location	Status
Belgium			
B/1	Solvin	Lillo	
B/2	Tessenderlo	Tessenderlo	
B/3	Solvin	Antwerpen	
B/4	Solvay	Jemeppe	Replaced its mercury technology in 2001
Finland			
SF/1	Eka Chemicals	Oulu	The permitted discharges and emissions have been increased on the basis of a revised authorisation in 2002
France			
F/1	PC de Loos	Loos	
F/2	Albemarle PPC	Thann	
F/3	Solvay	Tavaux	
F/4	Arkema	Jarrie	
F/5	SPC Harbonnières	Harbonnières	
F/6	Arkema	Lavera	
F/7	Arkema	St Auban	
Germany ³			
D/1	ECI	Bitterfeld	Ceased operation in 1999
D/2	Bayer	Uerdingen	Converted to membrane
D/3	Akzo Nobel	Ibbenbüren	
D/4	Bayer	Leverkusen	Shut down in 2002
D/5	BASF	Ludwigshafen	
D/6	Ineos	Wilhelmshafen	
D/7	Vestolit	Marl	Shut down of some cells in 2001
D/8	Degussa - Hüls	Lülsdorf	
D/9	Lil	Frankfurt	The permitted discharges and emissions have been increased on the basis of a revised authorisation in 2001
D/10	Bayer	Dormagen	Ceased operation in 1999
D/11	Clariant	Gersthofen	Shut down in 2000
D/12	Wacker Chemie	Burghausen	Shut down in 2000
D/13	Vinnolit	Knapsack	
D/14	Vinnolit	Gendorf	
D/15	BSL Olefinverbund	Schkopau	Shut down in 1998
The Netherlands			
NL/1	Akzo Nobel	Hengelo	
NL/2	Solvay	Linne-Herten	Decommissioned in 1999
Portugal			
P/1	Uniteca	Estarreja	Has been replaced by membrane cells in January 2002
P/2	Solvay Portugal	Póvoa de Santa Iria	Shut down in 1998

³ Germany advised that 7 plants have been converted. 5 more plants are to be converted.

Country/Code	Company	Location	Status
Spain			
E/1	Quimica del Cinca	Monzon	
E/2	Electroquimica de Hernani	Hernani	Partly converted to membrane technology
E/3	Elnosa	Lourizan	
E/4	Ercros	Flix	
E/5	Solvay	Torrelavega	
E/6	Solvin	Martorell	
E/7	Ercros	Sabinanigo	
E/8	Ercros	Vilaseca	
E/9	Ercros	Huelva/Palos	
Sweden			
S/1	Akzo Nobel	Bohus	
S/2	Hydro Polymers	Stenungsund	Verified value
Switzerland			
CH/1	Solvay	Zurzach	This plant was shut down in 2004
CH/2	Syngenia	Monthey	This plant was shut down in 2005
CH/3	SF-Chem	Pratteln	
United Kingdom			
UK/1	Rhodia	Staveley	This plant was shut down in 2005
UK/2	Albion Chemicals	Sandbach	This plant was shut down
UK/3	Ineos	Runcorn	

4.3 Other OSPAR Contracting Parties

Denmark

Denmark has no chlor-alkali plants.

Iceland

Iceland has no chlor-alkali plants.

Ireland

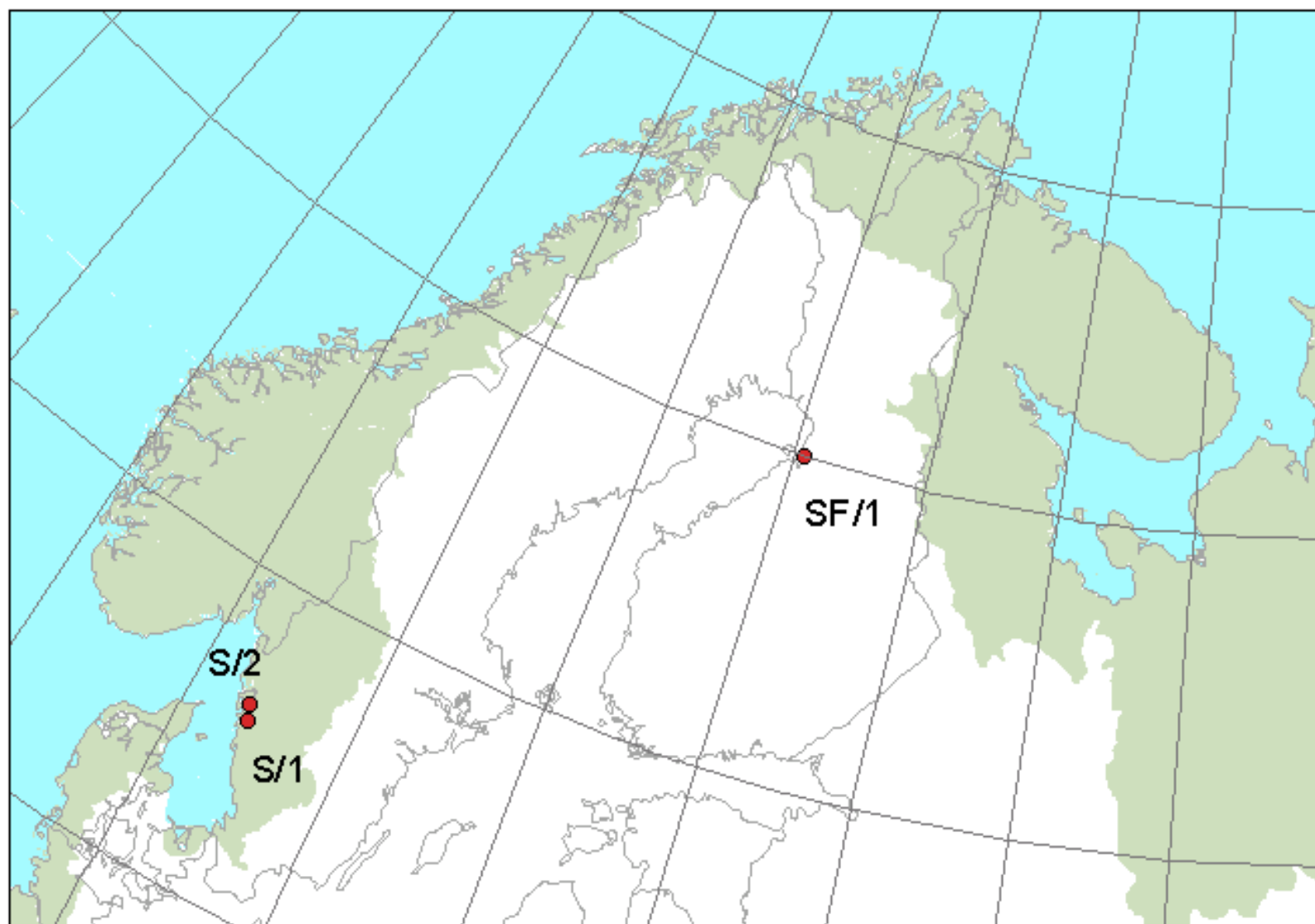
Ireland has only one chlor-alkali plant, which operates mercury-free.

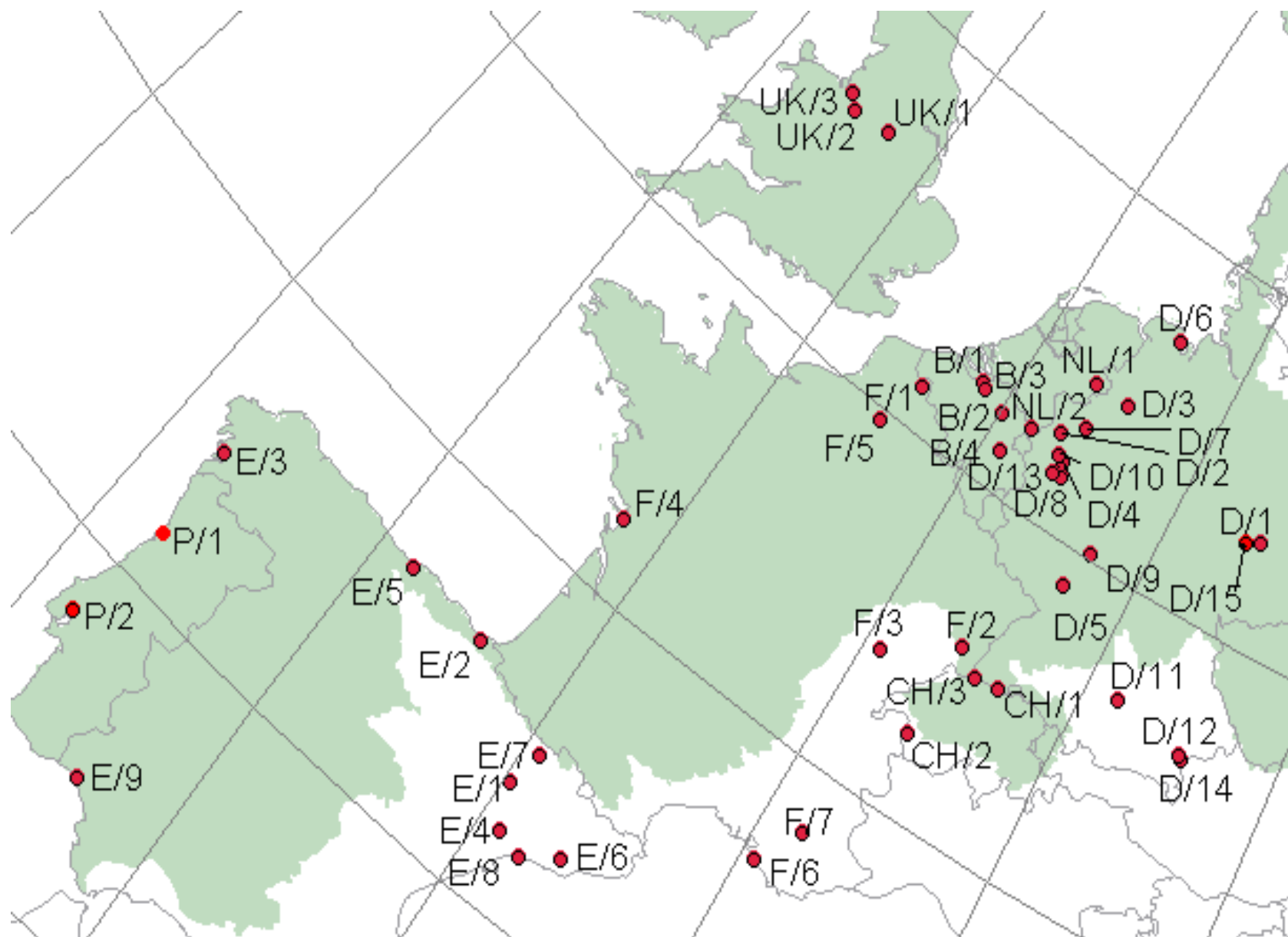
Luxembourg

Luxembourg has no chlor-alkali plants.

Norway

The last Norwegian plant with mercury cells ceased its mercury-based operations in September 1997.





Belgium

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption	Losses via Products	Discharges via Waste Water	Emissions to the Atmosphere			Total Emissions Discharges Losses	Mercury in Wastes					Difference to Balance
				C (g/t)	E1 (g/t)	E2 (g/t)	Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)	(g/t)	Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	DB (g/t)
B/1	219000	A	R	0,089	0,051	0,035	0,133	0,227	0,360	0,446	1,389	-2,999	0,000	0,000	-13,694	11,948
B/2	227500	A	R	19,494	0,049	0,010	0,002	0,563	0,565	0,624	5,007	1,127	2,027	0,000	13,864	0,000
B/3	120000	A	R	5,175	0,040	0,086	0,012	0,400	0,412	0,539	0,050	0,000	0,000	0,000	0,000	4,587
Total	566500															

Finland

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption	Losses via Products	Discharges via Waste Water	Emissions to the Atmosphere			Total Emissions Discharges Losses (g/t)	Mercury in Wastes					Difference to Balance DB (g/t)
				C (g/t)	E1 (g/t)	E2 (g/t)	Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)		Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	
SF/1	42485	Baltic	R	-1,318	0,055	0,088	0,003	1,332	1,335	1,478	0,004	0,120	0,000	0,000	2,825	-5,624
Total	42485															

The permitted discharges and emissions have been increased on the basis of a revised authorisation in 2002.

France

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption	Losses via Products	Discharges via Waste Water	Emissions to the Atmosphere			Total Emissions Discharges Losses	Mercury in Wastes					Difference to Balance
				C (g/t)	E1 (g/t)	E2 (g/t)	Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)	(g/t)	Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	DB (g/t)
F/1	18040	A	R	72,063	0,025	0,095	0,014	0,586	0,600	0,720	0,000	0,680	0,000	0,000	37,696	33,648
F/2	72000	A	R	99,847	0,115	0,033	0,000	1,510	1,510	1,658	144,833	-1,957	-1,558	0,000	-48,819	2,175
F/3	240900	M	R	8,164	0,050	0,002	0,005	0,875	0,880	0,932	8,744	-0,871	0,291	0,000	-2,408	0,896
F/4	170070	M	R	10,931	0,037	0,137	0,006	0,519	0,525	0,699	0,000	0,024	0,000	0,000	0,141	10,091
F/5	22500	A	R	15,333	0,201	0,002	1,070	0,005	1,075	1,277	0,110	0,224	0,000	0,000	9,956	3,990
F/6	166000	M	R	10,500	0,050	0,088	0,000	1,035	1,035	1,173	0,110	0,000	0,000	0,000	0,000	9,217
F/7		M	R													
Total	689509															

Germany

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption	Losses via Products	Discharges via Waste Water	Emissions to the Atmosphere			Total Emissions Discharges Losses (g/t)	Mercury in Wastes					Difference to Balance DB (g/t)
				C (g/t)	E1 (g/t)	E2 (g/t)	Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)		Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	
D/2	130000	A	R	11,923	0,060	0,003	0,030	0,650	0,680	0,743	0,920	-0,300	-0,100	0,000	-3,077	13,337
D/3	125276	A	R	-0,589	0,056	0,001	0,018	0,655	0,673	0,730	0,023	-0,301	0,133	0,000	-1,341	-0,001
D/5	170000	A	R	-8,059	0,030	0,010	0,000	0,900	0,900	0,940	10,365	-1,600	0,000	0,000	-9,412	-9,952
D/6	148828	A	R	12,598	0,324	0,007	0,000	0,324	0,324	0,655	9,315	0,000	0,769	0,010	5,232	-2,603
D/7	176000	A	R	160,227	0,060	0,006	0,024	0,929	0,952	1,018	306,767	0,000	6,352	0,000	36,091	-183,648
D/8	135951	A	R	-12,978	0,130	0,025	0,039	0,999	1,038	1,193	2,632	-2,032	0,027	0,000	-14,741	-2,062
D/9	167000	A	R	10,365	0,055	0,013	0,086	1,084	1,170	1,238	19,408	0,000	0,000	-2,294	-13,736	3,456
D/13	160000	A	R	24,181	0,053	0,008	0,018	0,906	0,924	0,985	14,434	0,712	0,000	0,000	4,450	4,312
D/14	82355	BI Sea	R	-24,795	0,024	0,000	0,035	0,610	0,645	0,669	1,160	-2,640	-0,002	0,000	-32,081	5,456
Total	1295411															

The Netherlands

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption	Losses via Products	Discharges via Waste Water	Emissions to the Atmosphere			Total Emissions Discharges Losses (g/t)	Mercury in Wastes					Difference to Balance DB (g/t)
				C (g/t)	E1 (g/t)	E2 (g/t)	Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)		Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	
NL/1	37452	A	R	-35,912	0,026	0,015	0,120	0,426	0,546	0,587	0,000	-1,367	0,000	0,000	-36,509	0,010
Total	37452															

Spain

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption	Losses via Products	Discharges via Waste Water	Emissions to the Atmosphere			Total Emissions Discharges Losses	Mercury in Wastes					Difference to Balance
				C (g/t)	E1 (g/t)	E2 (g/t)	Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)	(g/t)	Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	DB (g/t)
E/1	31373	M	R	21,802	0,137	0,015	0,002	0,968	0,970	1,122	25,733	0,000	0,315	0,000	10,040	-15,093
E/3	33552	A	R	13,457	0,157	0,012	0,049	0,592	0,641	0,810	11,034	0,000	0,005	0,000	0,149	1,464
E/4	150000	M	R	21,333	0,074	0,040	0,008	0,608	0,616	0,730	26,255	0,000	-0,080	0,000	-0,533	-5,118
E/5	62747	A	W	8,064	0,091	0,039	0,010	0,318	0,328	0,458	3,315	-0,084	0,000	0,000	-1,339	5,630
E/6	217871	M	R	26,217	0,027	0,011	0,108	0,562	0,670	0,708	4,785	0,000	2,946	0,024	13,630	7,094
E/7	25000	M	R	19,600	0,132	0,008	0,010	0,870	0,880	1,020	0,362	0,367	0,000	0,000	14,680	3,538
E/8	135004	M	R	22,718	0,090	0,060	0,004	0,860	0,864	1,014	4,080	1,107	0,000	0,000	8,200	9,424
E/9	100929	A	R	13,158	0,076	0,011	0,010	0,579	0,589	0,676	1,546	0,090	-0,026	0,320	3,807	7,129
Total	756475															

Sweden

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption C (g/t)	Losses via Products E1 (g/t)	Discharges via Waste Water E2 (g/t)	Emissions to the Atmosphere			Total Emissions Discharges Losses (g/t)	Mercury in Wastes					Difference to Balance DB (g/t)
							Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)		Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	
S/1																
S/2	120000	A	R	23,850	0,006	0,004	0,000	0,155	0,155	0,165	0,000	1,882	0,000	0,000	15,683	8,002
Total	120000															

Switzerland

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption	Losses via Products	Discharges via Waste Water	Emissions to the Atmosphere			Total Emissions Discharges Losses (g/t)	Mercury in Wastes					Difference to Balance DB (g/t)
				C (g/t)	E1 (g/t)	E2 (g/t)	Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)		Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	
CH/1*																
CH/2																
CH/3	27000	A	R	35,556	0,155	0,030	0,000	0,985	0,985	1,170	0,000	0,000	0,928	0,000	34,386	0,001
Total	27000															

* The Solvay chlorine production unit located in Zurzach (CH/1) was shut down at the beginning of August 2004 and, in agreement with the Euro Chlor rules, a yearly production capacity "pro rata temporis" was considered (i.e. 55 000 t/y * 7 /12 = 32 083 t/y).

** The Syngenta chlorine production unit located in Monthey (CH/2) was shut down in January 2005.

United Kingdom

Site	Chlorine Production Capacity with Hg- cells (tonnes)	Sea Area	Brine W or R	Mercury consumption C (g/t)	Losses via Products E1 (g/t)	Discharges via Waste Water E2 (g/t)	Emissions to the Atmosphere			Total Emissions Discharges Losses (g/t)	Mercury in Wastes					Difference to Balance DB (g/t)
							Process Exhaust 2.3.1 (g/t)	Cellroom 2.3.2 (g/t)	Total E3 (g/t)		Disposed off D (g/t)	Awaiting recovery c (tonnes)	Awaiting disposal f (tonnes)	Awaiting decision l (tonnes)	Temporarily stored F (g/t)	
UK/2																
UK/3	738000	A	W	43,065	0,062	0,104	0,187	1,604	1,791	1,957	21,552	15,804	0,000	0,000	21,415	-1,858
Total	738000															

UK/2 was shut down.