Hazardous Substances Series

Overview Assessment:

Implementation of OSPAR Recommendation 98/1 concerning Best Available Techniques and Best Environmental Practice for the Primary Non-Ferrous Metal Industry (Zinc, Copper, Lead and Nickel Works)

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.

ISBN 978-1-905859-87-0
Publication Number: 348/2008

contents

Executive Summary....4
Récapitulatif....4
1. Introduction....5
2. Overview of compliance....6
3. Implementation Reports on compliance with OSPAR Recommendation 98/1....7
4. Assessment....10

Executive Summary

This document provides an overview and assessment of the implementation of OSPAR Recommendation 98/1 concerning Best Available Techniques and Best Environmental Practice for the Primary Non-Ferrous Metal Industry (Zinc, Copper, Lead and Nickel Works). It is based on national implementation reports from the 15 Contracting Parties which were requested to submit reports on the national measures taken and their effectiveness, to give effect to the provisions of the Recommendation in their territories. The reports show that each country is actively applying Best Available Techniques (BAT) and Best Environmental Practice (BEP) for the primary non-ferrous metal industry.

OSPAR 2008 agreed that implementation reporting could cease for all Contracting Parties because they had reported implementation and the measure was covered by the Integrated Pollution Prevention and Control (IPPC) Directive and associated descriptions of Best Available Techniques in the BREF document whose implementation ensured that the OSPAR requirements were met.

Récapitulatif

Le présent rapport comporte un récapitulatif et une évaluation de la mise en œuvre de la Recommandation OSPAR 98/1 sur les meilleures techniques disponibles et sur la meilleure pratique environnementale dans l'industrie des métaux non ferreux de première fusion (usines de zinc, cuivre, plomb et nickel). Il se fonde sur les rapports nationaux de mise en œuvre communiqués par les quinze Parties contractantes invitées à rapporter. Les rapports communiqués par chaque pays indiquent que les meilleures techniques disponibles et la meilleure pratique environnementale sont d'ores et déjà appliquées dans l'industrie des métaux non ferreux de première fusion.

OSPAR 2008 a convenu que la notification de la mise en œuvre cesse pour toutes les Parties contractantes, car ces dernières ont rapporté la mise en œuvre de la mesure et que la mesure était couverte par la Directive IPPC et la description BAT associée dans le document BREF dont la mise en œuvre garantissait que les exigences d'OSPAR étaient satisfaites.

1. Introduction

1.1 OSPAR Recommendation 98/1

Primary metallurgical industry refers to the production of one or more refined metals directly and predominantly from ores and concentrates. Environmental impact associated with this industry includes among others heavy metal compounds (e.g. mercury, cadmium and lead) in wastewater and emissions of off gases from the various furnaces in uses.

OSPAR Recommendation 98/1 concerning best available techniques and best environmental practices for the primary non-ferrous metal industry applies to the primary production and the processing of related compounds of zinc, copper, lead and nickel. It applies to new plants and existing plants that are undergoing significant transformation.

The Recommendation requires Contracting Parties to apply the best available techniques for the primary production of non-ferrous metals described by the OSPAR BAT Description for the sector published in 1996 (OSPAR publication 57/1996), and any additional techniques which can achieve equal or better environmental protection, or which are more appropriate in certain geographical situations which are also acceptable. The Recommendation recommends additional techniques and practices to reduce pollution from storage and handling of raw materials, transfer operations, traffic and roadways and recycling.

The Recommendation is complemented by descriptions of best available techniques and emission and discharge limits set out in PARCOM Recommendations 94/1 and 96/1, and OSPAR Recommendations 98/2 and 2002/1 on aluminium electrolysis plants covering also other pollutants such as PAHs and fluorides. The implementation of those measures has been separately assessed by OSPAR in 2008 and an overview assessment published (OSPAR publication 347/2008).

1.2 Implementation reporting

1.2.1 General reporting requirements

Under Article 22 of the OSPAR Convention, Contracting Parties shall report to the Commission at regular intervals on the national measures (legal, regulatory, or other) taken by them to implement the provisions of the decisions and recommendations adopted under the OSPAR Convention and on the effectiveness of these national measures. This implementation reporting forms the basis for OSPAR to assess the compliance by Contracting Parties with the Convention and ultimately to evaluate the effectiveness of programmes and measures under the Convention.

Detailed provisions on implementation reporting and related assessments by OSPAR are laid down in OSPAR's Standard Implementation Reporting and Assessment Procedure (reference number 2003-23, update 2005). Unless stated otherwise in the OSPAR instrument concerned, the practice has been in general that an implementation report should be submitted to the appropriate OSPAR subsidiary body in the intersessional period four years after the adoption of a measure and every four years thereafter until fully implemented. Implementation reporting does not apply to Contracting Parties with reservations (or non-acceptance) on an OSPAR measure unless and until the reservation (or non-acceptance) is lifted.

1.2.2 Reporting requirements under OSPAR Recommendation 98/1

The overview assessment of the implementation of OSPAR Recommendation 98/1 has been prepared by the lead country Spain based on national reports submitted by Contracting Parties in the 2007/2008 meeting cycle, and has been examined by the Hazardous Substances Committee in 2008.

Previous implementation reporting took place in the 2001/2002 meeting cycle. The last overview assessment, published in 2003, concluded that there had been no specific problems in the implementation of the Recommendation but that there was need for more specific information on the technical measures and their effectiveness before conclusions can be drawn.

OSPAR adopted Recommendation 2005/1 amending the reporting format for OSPAR Recommendation 98/1 and joining it with the reporting on the implementation and effectiveness of Recommendations 94/1, 96/1, 98/2 and 2002/1. All Contracting Parties were invited to report under the new format on the implementation of Recommendation 98/1 and the effectiveness of measures.

1.3 EC legislation

Under Council Directive 96/61/EC on Integrated Pollution Prevention and Control (the "IPPC Directive"), which also applies in the European Economic Area (EEA), operating permits must be issued for installations for the primary production and processing of non-ferrous metals. These must contain conditions based on best available techniques (BAT) as defined in Article 2 (11) of the IPPC Directive to achieve a high level of protection of the environment as a whole. Under Article 16 (2), the European Commission has organised an exchange of information on BAT and associated monitoring. The results of this exchange of information are presented as BAT Reference documents (BREFs), produced by the European IPPC Bureau. EC/EEA Member States are required to take these into account when determining BAT generally or in specific cases. The requirements of the IPPC Directive apply to new or substantially changed installations with effect from October 1999 and to existing installations no later than October 2007.

A BREF for non-ferrous metal processes was adopted in December 2001. In the process of its development, OSPAR reviewed the draft BREF in the light of OSPAR Recommendation 98/1 and the commitments under the OSPAR Hazardous Substances Strategy. The BREF is currently under review.

The IPPC Directive also requires EU and EEA Member Sates to report emissions of pollutants to air and water to the European Pollutant Emission Register (EPER) database every 3 years. The non-ferrous metal industry is covered by this requirement. Only those facilities need to report which exceed specified emission thresholds which have been set at a level that aims to cover about 90% of the emissions from facilities covered by the IPPC Directive.

2. Overview of compliance

All Contracting Parties were invited to submit implementation reports on OSPAR Recommendation 98/1. An overview of reports received and the reported means of implementation is included in Table 2.1. Ireland and Luxembourg did not report but informed OSPAR that the Recommendation was not applicable as they had no relevant plants in their territory. For the same reason the Recommendation is not applicable in Denmark, Iceland, Portugal and Switzerland.

Table 2.1: Overview of the implementation and associated reporting on OSPAR Recommendation 98/1 concerning Best Available Techniques and Best Environmental Practice for the Primary Non-Ferrous Metal Industry (Zinc, Copper, Lead and Nickel Works)

				MEANS OF IMPLEMENTATION		
Contracting Party	**Report available**	**Reservation**	**Applicability**	**Legislation**	**Administra-tive action**	**Negotiated agreement**
Belgium	Yes	No	Yes	X	X	X
Denmark	Yes	No	No plants			
Finland	Yes	No	Yes	X	X	
France	Yes	No	Yes	X	X	X
Germany	Yes	No	Yes	X	X	X
Iceland	Yes	No	No plants			
Ireland	No	No	No plants			
Luxembourg	No	No	No plants			
The Netherlands	Yes	No	Yes	X		X
Norway	Yes	No	Yes	X	X	
Portugal	Yes	No	No plants			
Spain	Yes	No	Yes	X	X	
Sweden	Yes	No	Yes	X	X	X
Switzerland	Yes	No	No plants			
United Kingdom	Yes	No	Yes	X	X	

3. Overview of effectiveness

Contracting Parties have been invited to report for the year 2006 the number of installations covered by OSPAR Recommendation 98/1 in their territory, the production capacity of those plants and their emissions and discharges of cadmium, mercury and lead, preferably as specific loads and alternatively as total loads. Contracting Parties have been invited to report this information using the reporting format (OSPAR Recommendation 2005/1).

Eleven Contracting Parties made use of the reporting format (OSPAR Recommendation 2005/1). Six Contracting Parties reported quantified information.

In the following, all information submitted by Contracting Parties on the implementation of Recommendation 98/1 and the effectiveness of measures has been extracted from their reports and compiled here.

3.1 Belgium

Belgium referred to the national reporting under the IPPC Directive to the EPER database which holds information on the number and capacity of plants/installations and the total capacity, and on emission and discharges from those plants/installations. As the EC BREF document for the non-ferrous sector is being reviewed, this will trigger a review and update of measures taken by EU and EEA countries.

In the last reporting round 2001/2002, Belgium reported of one relevant plant (a zinc plant) in their territory in relation to which OSPAR Recommendation 98/1 had been implemented. While measures in relation to material handling had been in place for several years, new target objectives had been established to lower SO2 emissions on a single contact installation, reuse the 75% of waste associated with primary zinc production and emphasize even more on fugitive emissions. Belgium also reported that the zinc plant had developed an energy plan in order in order to have a 25% production increase without increasing the current energy consumption, what could be considered as an achievement.

3.2 Finland

Finland reported the specific loads, and alternative total loads, of emissions of cadmium, mercury and lead from both, zinc and copper plants (Table 3.1).

Table 3.1: Emissions and discharges from primary non-ferrous metal plants in Finland in 2006

Hazardous substances	Stand-alone zinc plants				Stand-alone copper plants			
	Specific loads in 2006 (kg/tonne of metal produced)		Alternatively: Total load in 2006 (kg/year)		Specific loads in 2006 (kg/tonne of metal produced)		Alternatively: Total load in 2006 (kg/year)	
	Air	Water	Air	Water	Air	Water	Air	Water
Cd	3.79E-4		107		4.26E-4		70	
Hg	1.77E-4		5		4.87E-4		0.8	
Pb	3.40E-4		96		2.13E-4		350	

3.3 France

France informed OSPAR by letter that the *Service de l'Environnement Industriel* (SEI) concentrate on the application of the best available techniques described in the IPPC BREF document for the non-ferrous metal industry rather than the BAT described by OSPAR. For that reason, no further information could be provided on the implementation of OSPAR Recommendation 98/1.

In the last reporting round 2001/2002, France reported on legal measures to reduce toxic metal pollution (cadmium and lead) and dust and diffuse emissions. For best available techniques, France referred to the IPPC BREF document for the non-ferrous industry which itself was compatible with the BAT Description for the industry published by OSPAR in 1996.

France reported in 2001/2002 that there were 2 plants in France which were covered by OSPAR Recommendation 98/1. Given that the French industrial plants had been built before the Recommendation 98/1 was developed/came into force, its implementation required negotiated agreements that took account of the economic capacity of that industries to implement progressively the Recommendation. It was expected that the IPPC objectives would be reached by end of 2006.

France reported in 2001/2002 concerning the plant METALEUROP in Noyelle-Godault, that a complementary prefectoral decree had been issued in consultation with the operator to set new emission limit values which reflected a reduction of 50% of the total emissions of lead, mercury and cadmium and addressed reductions of diffuse emissions from stocks and the handling of raw material. For the same plant, a yearly revised reduction programme for SO_2 emissions had been put in place.

3.4 Germany

On emissions and discharges in 2006 from primary non-ferrous metal plants or installations producing one or more refined metals (zinc, copper, lead, nickel) directly and predominantly from ores and concentrates as covered by OSPAR Recommendation 98/1, Germany reported seven plants and their capacities (Table 3.2).

Table 3.2: Number of non-ferrous metal plants in Germany and their capacity

Number of plants	Zinc (2 plants)	Copper (1 plant)	Lead (2 plants)	Nickel (not applicable)
Plant 1	140 000 t (2006)	605 970 t (2006)	152 992 t (2005)	
Plant 2	141 430 t (2006)		118 000 t (2006)	

On the total capacity in 2006 in terms of tonnes of metal per year (tonnes of Zn/year; tonnes of Cu/year; tonnes of Pb/year; tonnes of Ni/year; tonnes/year of other metals and metal compounds) Germany reported:

Zinc: 281 430 t (2006)

Copper: 605.970 t (2006)

Lead: presumably about 271 000 t (cf. tonnages provided above for two different years)

Germany reported both specific loads and alternatively the total load of emissions and discharges of cadmium, mercury and lead from non-ferrous metal plants (Table 3.3). All data reported are based on the companies' annual reports to the regulatory authority.

Table 3.3: Emissions and discharges from primary non-ferrous metal plants in Germany in 2006.
Note that all loads are given in kilogramme but not the specific loads from the copper plant which is in gramme.

Hazar-dous sub-stance	Stand-alone zinc plants				Stand-alone copper plants				Stand-alone lead plants			
	Specific loads in 2006 (kg/tonne of metal produced)		Alternative: Total load in 2006 (kg/year)		Specific loads in 2006 (gramme per tonne of metal produced)		Alternative: Total load in 2006 (kg/year)		Specific loads in 2006 (kg/tonne of metal produced)		Alternative: Total load in 2006 (kg/year)	
	Air	Water	Air	Water	Air	Water	Air	Water	Air	Water	Air	Water
Plant 1	**Capacity: 140 000 t in 2006**				**Capacity: 605 970 t in 2006**				**Capacity: 152 992 t in 2005**			
Cd	0.00071	<0.000035	100	<5	0.154 g/t	0.01 g/t	93.1	6.2	0.00008	0.000015		
Hg	<0.00007	<0.0000035	<10	<0.5	0.02 g/t	0.001 g/t	12.1	0.58	<0.000002	<0.000001		
Pb	0.0093	<0.00007	1300	<10	3.0 g/t	0.01 g/t	1817	8.7	0.0033	0.00005		
Plant 2	**Capacity: 141 430 t in 2006**								**Capacity 118 000 t in 2006**			
Cd	0.000077	0.0000015[1]	10.9	0.4 [1]					0.000032	2)	3.8	2)
Hg	NE	<0.0000009[1]		0.2 [1]					NM	2)	---	2)
Pb	0.000195	<0.0000177[1]	28.1	4.6 [1]					0.0071	2)	842	2)

NE = no estimate; NM = not measured
1) The emission into water comprises the emissions from the Lead plant No. 2; water treatment for both plants takes place in the zinc plant
2) For Emissions into water see zinc plant no. 2

3.5 The Netherlands

The Netherlands reported one zinc plant under OSPAR Recommendation 98/1 and the total load of emissions and discharges in 2006 (Table 3.3).

Table 3.4 Emissions and discharges from the stand-alone zinc plant in the Netherlands in 2006.

Hazardous Substances	Specific loads in 2006 (kg/tonne of metal produced)		Alternatively: Total load in 2006 (kg/year) or alternatively concentration (mg/m³ or mg/litre)	
	Air	Water	Air	Water
Cd			27	18
Hg			482	28
Pb			11 885	2364

3.6 Norway

On emissions and discharges in 2006 from primary non-ferrous metal plants or installations producing one or more refined metals (zinc, copper, lead, nickel) directly and predominantly from ores and concentrates as covered by OSPAR Recommendation 98/1, Norway reported two plants and their capacities as follows:

- one mixed (integrated) plant producing nickel and copper. Total nickel and copper production in 2006 was 122 000 tonnes;
- one plant producing zinc. 2006 production was 160 000 tonnes.

Norway reported the specific loads of emissions and discharges in 2006 of cadmium, mercury and lead from those plant (Table 3.5)

Table 3.5 Emissions and discharges from primary non-ferrous metal plants in Norway in 2006.

Hazardous substances	**Stand-alone zinc plant**				**Mixed (integrated) production processes termed "installation" (nickel and copper plant)**			
	Specific loads in 2006 (kg/tonne of metal produced)		**Alternatively: Total load in 2006 (kg/year)**		**Specific loads in 2006 (kg/tonne of metal produced)**		**Alternatively: Total load in 2006 (kg/year)**	
	Air	Water	Air	Water	Air	Water	Air	Water
Cd	0 (M)	0 (M)			0.0002 (M)	0.0005 (M)		
Hg	0 (M)	0 (M)			0.000003 (M)	0.000003 M)		
Pb	0 (M)	0.0002 (M)			0.0002 (M)	0.0002 (M)		

3.7 Spain

Spain reported 2 relevant plants:

- one zinc plant, which currently expanding and had a production of 500 000 t in 2005;
- one copper plant.

Spain reported that Asturiana de Zinc S.A. (AZASA), a primary zinc producer company, is expanding one of its plants. It takes account of all the provisions and requirements of OSPAR Recommendation 98/1 by means of administrative actions (EIA and ulterior permit). One of the stages of that expansion is the use of a new technique that transforms the jarosite slurry into another solidified, neutralised and stabilised residue that can be used for backfilling of exhausted quarries.

The application of this new technique also allows the company to reduce the production of dangerous wastes (jarosite wastes) to zero t/y.

Spain reported the total load of emissions and discharges in 2005 of cadmium, mercury and lead and related compounds from the non-ferrous metal plants from the two relevant plants in their territory (Table 3.6).

Table 3.6 Emissions and discharges from primary non-ferrous metal plants in Spain in 2005.

Hazardous substances	Stand-alone zinc plant				Stand-alone copper plant			
	Specific loads (kg/tonne of metal produced)		Alternatively: Total load in 2005 (kg/year)		Specific loads (kg/tonne of metal produced)		Alternatively: Total load in 2005 (kg/year)	
	Air	Water	Air	Water	Air	Water	Air	Water
Cd and compounds				303			140	
Hg and compounds				32.3			70	1.12
Pb and compounds				38.9			2000	

3.8 Sweden

Sweden reported one mixed (integrated) plant with a production of 292 000 tonnes of products (copper, lead, zinc and nickel) in 2006. Sweden reported the total load of emissions and discharges of cadmium, mercury and lead from this plant in 2006 (Table 3.7).

Table 3.7 Emissions and discharges from a mixed non-ferrous metal production plant in Sweden in 2006.

Hazardous Substances	Specific loads in 2006 (kg/tonne of metal produced)		Alternatively: Total load in 2006 (kg/year) or alternatively concentration (mg/m³ or mg/litre)	
	Air	Water	Air	Water
Cd			90	40
Hg			60	12
Pb			3200	220

3.9 United Kingdom

The UK reported of one plant of nickel production where nickel emissions are measured but not emissions of cadmium, lead and mercury.

4. Assessment

Contracting Parties did not submit information on the type of technical measures that are being applied by their industries. There is a need for more information on most of the reports.

The information received does not allow general qualitative conclusions to be reached nor can deductions be made as to whether there are special problems in addressing the measures contained in Recommendation 98/1.

It would be useful to have more information on:

- New metallurgical plants and existing plants which are going to be transformed significantly.
- Information on provisions for the environmental update of existing plants.
- Measures applied and difficulties encountered.
- Development of energy plans and waste plans.

Only six Contracting Parties submitted quantitative information on production capacity, specific loads and/or total loads of emissions and discharges (Table 4.1). Germany has provided full quantitative information.

Table 4.1 Overview of number of plants and quantitative information reported by Contracting Parties

	Information reported on			Reported number of plants				
	Production capacity (t/y)	Specific load (kg/t)	Total load (kg/y)	Mixed plants	Zinc plants	Copper plants	Lead plants	Nickel plants
DE	Yes	Yes	Yes		2	1	2	
ES	Yes (partial)	No	Yes (partial)		1	1		
FI	No	Yes (partial)	Yes (partial)		1	1		
NL	No	No	Yes		1			
NO	Yes	Yes	No	1	1			
SE	Yes	No	Yes	1				

Since there is neither enough quantitative information from the Contracting Parties nor quantitative criteria in the recommendation such as limit values from discharges and emissions of hazardous substances, it is not possible to draw quantitative conclusions on the actual effectiveness of measures taken.

The primary non-ferrous metal industry (zinc, copper, lead and nickel works) has to comply with the IPPC Directive and should be based on Best Available Technique (BAT) following the IPPC BREF document for the non-ferrous metal industry, which is currently under review. The IPPC Directive also requires reporting of emission data that will be published through the E-PRTR register.

OSPAR 2008 agreed to publish the overview assessment and agreed that implementation reporting on OSPAR Recommendation 98/1 could cease for all Contracting Parties because they had reported implementation of the measure and because the requirements of OSPAR Recommendation 98/1 was covered by the IPPC Directive and associated BAT description in the BREF document whose implementation ensured that the OSPAR requirements were met.