



## European Environmental Bureau initial analysis recommending a review of the European Union's Mercury Strategy

3 June 2010

The European Environmental Bureau (EEB) appreciates the opportunity to comment on the European Commission's Mercury strategy. With our comments, EEB would like to underline the importance of a continuously robust EU Mercury policy. We call upon the European Commission to not only carry out a review of the current Mercury strategy, but strongly recommend the adoption of a revised strategy with several important new actions as soon as possible.

Mercury is a global pollutant that travels long distances. Its most toxic form – methylmercury - accumulates in large predatory fish and is taken up in our bodies through eating fish, with the worst impacts on babies *in utero* and small children. Mercury is also used and traded indiscriminately around the globe, and results in pollution far from the source.

The EU's 2005 Strategy Concerning Mercury aimed to reduce human exposure to mercury by through reducing emissions, supply and demand of mercury in the EU. Many of the Strategy actions have been embraced and in the process of being implemented (e.g. *export ban by 2011 and safe storage of metallic mercury, market restrictions of certain mercury-containing measuring devices*). These initiatives, among others, have and will have great impact not only within the EU but also globally. Presently, the EU is currently still the biggest mercury exporter - mercury is exported to developing countries with very little or non-existent control measures; and mercury is haphazardly used, eventually ending up in the environment and contaminating food resources and populations.

A strong revised EU mercury strategy is imperative not only for the protection of EU citizens, but it is also fundamental to ensure that the leadership role of EU is maintained at the global level (UNEP) level towards developing a vigorous mercury treaty. The EU should lead the negotiations with its own examples, and not fall behind just following global decisions.

Since safe mercury-free alternatives are available, areas where EEB would expect further action from the strategy, include phasing out the use of mercury in the following areas:

- the chlor-alkali industry,
- the dental care sector
- in button cell batteries, and
- in polyurethane elastomers and porosimetry/pycnometry

Action is seriously needed regarding reducing emissions from combustion of fuels, in particular coal combustion plants with a thermal capacity above 20MW, since these are the biggest point sources of mercury emissions in the air – in Europe and globally.

Finally an updated mercury strategy has to be ensured that regulation 1102/2008 is implemented and measures are taken to ban exports of products containing mercury which are already prohibited for sale on the EU market.

Per the EC rules, to ensure that legislative measures can be proposed and eventually implemented by the new EU mercury strategy, the consultants should further assess relevant elements as a next step. The assessment should focus on the sectors mentioned above - chlor-alkali, dental , button cell batteries, and coal combustion, and extending the export ban to restricted mercury containing products, as well as on the use of mercury in polyurethane elastomers, and in porosimetry. For all of the above, the latest information shows that the environmental and health benefits far exceed largely potential costs for industry, justifying immediate measures to drastically reduce the use and emissions from these sectors.

Detailed observations and proposals for a new enhanced EU Mercury strategy can be found below.

Thank you in advance for considering our proposals.

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## EEB initial observations and partial proposals for a new EU Mercury strategy

### 0. Introduction

Mercury has been restricted and regulated in a number of existing directives in the European Union since the 70s. The 2005 EU Mercury Strategy, with the aim to reduce mercury levels in the environment and human exposure, especially from methylmercury in fish, gave a further boost to mercury related policies and measures at EU level. The strategy proposed 20 actions with the objective to reduce mercury emissions, cut supply and demand of mercury in society, protect against exposure, improve understanding and solutions of the mercury problem and support and promote international action on mercury.

While some of the proposed actions have now been implemented, some mercury uses still continue, releasing mercury to the environment and being a potential health and environmental risk in the European Union and globally. Furthermore, the global developments and the role of the EU in upcoming mercury treaty negotiations, make it imperative that actions at EU level are enhanced to ensure the leadership of the EU at global level.

As a result, there is a great need for a new enhanced mercury strategy at EU level. The European Union is still a key user of mercury in a variety of applications, a major exporter and releases annually more than 200 tonnes of mercury. This results in significant risks to human health, ecosystems and wildlife and the contamination of global food supplies with mercury.

### 1. Short assessment of the intra-European actions (1-13) of the 2005 EU Mercury strategy

Our comments below, follow the structure of the EU Mercury strategy.

#### Summary of assessment of actions 1-13

Action number	Related to	Assessment
1	Emissions from IPPC industries including coal combustion	☹
2	IPPC BREFs including chlor-alkali one	☹
3	Small combustion plants	☹
4	Dental amalgam waste	☹
5	Mercury export ban	☺
6	Use of mercury in dental amalgam	☺
7	Measuring and control devices	☺
8	Study of remaining products and applications , later under REACH	☺
9	Storage of mercury from chlor-alkali industry	☺
10	Study fate of products circulating in society	☺
11	EFSA will investigate dietary intakes of different types of fish and seafood among vulnerable subpopulations	☹
12	Information concerning mercury in food as new data	☹
13	Mercury to be addressed in 7th RTD FP or other mechanisms	☺

## 1.1. REDUCING EMISSIONS

### Action 1.

*The Commission will assess the effects of applying IPPC on mercury emissions, and consider if further action like Community emission limit values is needed, as data under the IPPC and EPER reporting requirements are submitted, and in a broader strategy review by the end of 2010. This will include review of the co-benefit effect of controls to be implemented by 1 January 2008 under Directive 2001/80/EC to reduce sulphur dioxide emissions from large combustion plants.*

#### Background

It is known that mercury is found naturally in coal. As a result, the highest emissions to air in Europe and globally currently come from coal combusting power plant industries. Mercury is also emitted by the use of mercury for the manufacturing of chlorine, during production/cleaning (smelting/mining) of other metals and when mercury-containing products are incinerated.

This Integrated Pollution Prevention and Control Council Directive 96/61/EC (IPPC) has been in place since 1996. Several measures have been implemented in most of the Member States since then. The directive focuses on control and prevention of pollutants like mercury to water, air and land from industrial activities. The Directive requires that all facilities and industries falling under the scope of the Directive (such as energy, mineral and steel, chemical, paper industries and tanneries) should operate subject to permit conditions that set up performance standards according to best available techniques (BAT), with the final deadline for updating all permits by 30 October 2007.

The BAT concept means that industries should opt for cleaner and more efficient production measures and technologies as set out in the BAT reference documents (BREFs). Respective permits should be issued by the local authorities. The specific permit conditions should be based on the Best Available Techniques mentioned in the BREF, but according to current legal status these documents are used as reference only. When setting the technical and performance benchmark of the installation, the permit writer should also take into account its technical characteristics, its geographical location and the local environmental conditions. It is important to note, however, that the IPPC directive does not contain emission limit values (ELVs) for any pollutant; it is up to the local authorities who grants the permits to require (or not) companies to only emit in line with the BAT associated emission levels (BAT AEL) and to comply with relevant environmental quality standards..

Best Available Techniques for each industry sector covered under IPPC are described and analysed in the respective BAT Reference Documents (BREF)<sup>1</sup> which have been developed at the European level. These also include BAT achievable emission levels for different pollutants relevant to the respective industrial sector. Therefore, the main industries that are using/emitting mercury and fall under IPPC are – the energy producing sector (large combustion plants), the chlor-alkali industry, waste incinerators, cement production and non-ferrous metals industries.

Further to the IPPC, we need to consider that other relevant pieces of legislation currently apply in the EU: the Large Combustion Plant directive 2001/80/EC, which includes emission limit values for sulphur dioxide, NO<sub>x</sub>, and dust or particulate matter (PM). It is known that by

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<sup>1</sup> <http://eippcb.jrc.ec.europa.eu/reference/>

regulating and reducing SO<sub>2</sub>, NO<sub>x</sub>, PM, mercury emissions can also be reduced (co-benefit effect). The Waste Incineration directive (2000/76/EC) also includes emission limit values for mercury, also including for co-incineration (cement plants).

For the chlorine industry, the IPPC Directive and broader supporting legislation such as the Water Framework Directive (2000/60/EC) are the only 'hard' pieces of EU law applicable to mercury releases. Despite the (mercury-free) membrane process being regarded as BAT for the chlorine industry, competent authorities still allow the mercury cell to continue operating according to current permits.

The BAT Reference document (BREF) does not clearly prohibit mercury cell chlor-alkali plants from operating. For their remaining-life, mercury-cell plants are not required to meet straightforward best performing associated emission levels for mercury releases. However the BREF document suggests that mercury cell plants dating back before 2001 could achieve mercury emission levels in the range of 0,2-0,5 g Hg/tonne of chlorine capacity as a yearly average.

*Short Assessment of Action 1*



New data on mercury emissions have been entered in the European Pollution Release and Transfer Register (E-PRTR). Nevertheless, no assessment has been carried out with respect to the effects of applying IPPC on mercury emissions. In the two IPPC implementation reports issued in 2007 (for period 2003-2005) and in 2010 (for period 2006-2008), little information is contained and relevant to mercury. The 2010 report assesses the directive on the basis of installation-specific case studies, which for this report were chosen from six industry sectors - printed circuit board manufacturing, coal and lignite-fired large combustion plants; iron and steel production; nitric acid manufacture; fertiliser manufacture and mineral oil and gas refineries.

There is no particular focus on mercury in this report and not all industrial sectors chosen are relevant for mercury. With reference to the coal-fired power plants, it is evident that the Large Combustion Plant (LCP) directive has been the main driver for defining emission limit values for SO<sub>2</sub>, NO<sub>x</sub>. No BAT AEL is indicated in the current BREF on LCPs for mercury. In the case studies included in the report, for most permits reviewed, emission limit values (ELVs) in the permits are higher than the BAT-AELs in the BREF. Furthermore, most installations from the ones reviewed did not even have mercury ELVs specified in their permits. Overall it is shown that the BREFs are not taken seriously into consideration from the permit granters - local authorities, even if consulted.

Therefore no specific and analytical assessment has been carried out to assess mercury emissions from industries under the IPPC.

Furthermore, no review of the co-benefit effect from the implementation of the LCP directive has taken place either. Currently the IPPC directive is under review, but no further measures concerning mercury were proposed by the European Commission.

In 2008 the European Environmental Bureau (EEB), carried out a specific review assessing the implementation of the IPPC directive on the chlor-alkali sector with respect to mercury (Hg), based on environmental NGOs' (ENGOs) involvement in and observation of the implementation process.<sup>2</sup> The report is based on the responses to a comprehensive questionnaire from eight countries (Belgium, Czech Republic, France, Germany, Greece, Italy, Spain and the United Kingdom), where the majority of mercury-cell chlor-alkali plants in

<sup>2</sup> [http://www.zeromercury.org/EU\\_developments/081218EEB\\_Report\\_European\\_MCCAPsDRAFTfinal.pdf](http://www.zeromercury.org/EU_developments/081218EEB_Report_European_MCCAPsDRAFTfinal.pdf)

operation in Europe were located (36 out of 44 at the time), representing 86,7% of the total mercury-cell chlorine production capacity in Europe.

Based on the outcome of the EEB survey, a number of important conclusions can be drawn:

- No local authorities have actually denied a permit to a MCCAP on the basis that the mercury-cell technique is not BAT;
- The BREF is not considered as a legally binding document which authorities have to seriously consider in the permitting process. Furthermore the BREF for chlor-alkali plants does not contain any clear BAT type indications for mercury emission prevention which need to be met, therefore it does not provide any specific benchmark or direction for local authorities;
- There is no broad and consistent level of protection of EU citizens in terms of mercury releases from MCCAPs;
- The specific characteristics of mercury – being persistent, bio-accumulative, biomagnifiable and transported long distances as a global pollutant – are not adequately taken into account, overlooking the potential negative effect that can be created at European and global level, and the fact that this industry is adding mercury to the world environment from a process for which mercury-free alternatives exist since before the 1980s;
- The aim of the EU mercury strategy, to ensure that we can eventually reduce mercury levels in fish to the point where they are safe for all to eat, is not respected since the emissions from this sector are not regulated in reality;
- No standard measuring methods exist for all plants, and those that are available are not fully used by the different operators;
- Emissions are not being accurately and fully reported, and moreover many operators of MCCAPs don't know what their total real mercury releases are;
- Air emissions from most sites are likely underreported on the basis of various research reports;
- The missing – unaccounted or – mercury releases have not been questioned by most regulators who seem to be unaware of the significance of these losses;
- It is evident that monitoring of mercury emissions is not consistent across the EU, and emission reports rely entirely on the operators' irregular measurements as well as on the authorities' documentation controls or lack thereof, which also differ drastically;
- The EU and most Member State authorities, although they are aware of the wider environmental and economic benefits of conversion, as well as the positive financial situation of the chlorine industry, have avoided setting a legally binding phase-out date for MCCAPs;
- The flexibility that was designed into the IPPC process is being seriously abused by the chlor-alkali industry in order to keep old and polluting mercury-cell plants operating for as long as they are profitable;
- No standard permit for chlor-alkali plants at EU level exists, making harmonisation, implementation and enforcement at EU level difficult to ensure;
- Permit requirements are often not ambitious enough to drive industry to better performance, rather encouraging business as usual, confirming the status quo;
- The diverse and inconsistent regulatory environment for this industry across the EU makes a level playing field for commercial competition impossible to guarantee for the chlorine producing industry.

From all of the above it can further be concluded that for the chlor-alkali sector the existing IPPC permits (limits, measurements, controls etc.) are totally inadequate to protect the environment and public health or to demonstrate EU leadership on this issue globally.

As a result, this action has not really been implemented so far, but should be. We therefore strongly urge that remedial measures be taken in response to the important points made above.

#### Action 2.

*The Commission will encourage Member States and industry to provide more information on mercury releases and prevention and control techniques, so conclusions can be drawn in BREFs helping to reduce emissions further. The second edition of the chlor-alkali BREF will include information to address the risk of releases in decommissioning mercury cells.*

#### Short assessment of Action 2



Action 2 initially refers to all industries which could be releasing mercury. It then focuses only on the chlor-alkali industry.

Industry has been reporting their emissions under the European Pollutant Release and Transfer Register's (E-PRTR) obligations. Respective data also on mercury have been updated for most of the industries/countries for 2007. Nevertheless the 2004 emissions cannot be found any more to compare level of releases. Information on mercury emissions prevention and control techniques in different industries has potentially been discussed under the revision of several BREF documents for relevant industries, but no specific action has been taken to explicitly encourage Member States and industry to do so.

The European Commission started the review process for the chlor-alkali BREF in 2009. EEB has been following this process closely and has been contributing with input. It appears indeed, that the revised BREF will include information to address the risk of releases in decommissioning mercury cells. Discussions are still ongoing.

Furthermore, since 2005, some BREFs relevant to mercury - on cement industries<sup>3</sup>, Non-Ferrous Metals<sup>4</sup>, and Production of Iron and Steel<sup>5</sup> have been revised or are in the revision process, – and they include BAT-AEL for mercury, or total heavy metals, referred to as mercury emissions, or included as BAT-AELs which may have a co-benefit effect with respect to mercury. The revision of the LCP BREF will start in 2010. EEB expects that prevention of mercury emissions will be adequately addressed and the Commission to actively contribute to that effect.

#### Action 3.

*The Commission will undertake a study in 2005 of options to abate mercury emissions from small scale coal combustion, to be considered alongside the broader Clean Air For Europe (CAFE) assessment.*

<sup>3</sup> [ftp://ftp.jrc.es/pub/eippcb/doc/clm\\_fd\\_0509\\_public.pdf](http://ftp.jrc.es/pub/eippcb/doc/clm_fd_0509_public.pdf) , p. 181

<sup>4</sup> [ftp://ftp.jrc.es/pub/eippcb/doc/nfm\\_2d\\_07-2009\\_public.pdf](http://ftp.jrc.es/pub/eippcb/doc/nfm_2d_07-2009_public.pdf)

<sup>5</sup> [ftp://ftp.jrc.es/pub/eippcb/doc/isp\\_d2\\_0709.pdf](http://ftp.jrc.es/pub/eippcb/doc/isp_d2_0709.pdf)



A report on the "Costs and environmental effectiveness of options for reducing mercury emissions to air from small-scale combustion installations" was published in December 2005. Several recommendations are included in the report on the basis of different scenarios.

Nevertheless, the report has not further been commented or used and no additional measures have been proposed, although mercury emissions from the sector prove to be significant.

Under the CAFE assessment several air related directives merged to form the new directive 2008/50 on ambient air and cleaner air for Europe. Directive 2004/107/EC, relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air, was not included in the new directive, and no changes have been made in terms of mercury. In addition, no quality standard was set, but only monitoring is requested by Member States; the study on mercury emissions from small combustion plants does not appear to have been considered.

The Commission proposed under the review of the IPPC directive (Industrial Emissions Directive) to include small combustion plants (20-50MW) within the scope of the new directive. The impact assessment to the proposal found that the main environmental impact from combustion plants is their contribution to air pollution, "especially through emissions of particulate matter, SO<sub>2</sub> and NO<sub>x</sub> and also heavy metals (*especially mercury*) and Persistent Organic Pollutants." It also indicates that environmental benefits could not be qualified, but that the benefits clearly outweigh the costs.

However the lowering of the scope to include small combustion plants, was not supported by the majority of Member States and not maintained in second reading of the European Parliament.

According to current status, the Commission should review the need to include these types of installations and come up with a legislative proposal. Therefore, we strongly recommend that these installations need to be included in the scope of the Industrial Emissions Directive, as well as preventive measures for mercury emissions such as emissions limit values, which also need to be integrated in the minimum binding requirements for these types of installations.

#### Action 4.

*The Commission will review in 2005 Member States' implementation of Community requirements on the treatment of dental amalgam waste, and will take appropriate steps thereafter to ensure correct application.*

Under the Waste framework directive (2008/98/EC) and Decision 2000/532/EC establishing a list of wastes, waste containing mercury, and therefore dental amalgam waste, are considered hazardous and should be separately collected and disposed of accordingly. As a result all dental clinics - usual source of dental mercury waste, should have been equipped with dental amalgam separators. Nevertheless the interpretation and implementation of such a measure varies greatly within Member States. In 2005, the European Commission (EC), DG Environment, sent a questionnaire to Member States related to the environmentally sound management and treatment of dental amalgam waste. This information was presented by DG

Environment at a relevant EEB conference<sup>6</sup> organised in 2007 and commented in the COWI/Concorde SA report carried out for DG Environment in 2008 with specific focus on whether dental amalgam separators were installed and used in dental clinics. In the conference report, it is mentioned: ' *The situation may have changed in these countries during the last two years, but at the time of the questionnaire below, it was clear that no more than 30-40% of EU dental clinics had installed functioning amalgam separators*<sup>7</sup>. As a result, it is evident that no adequate measures are taken with respect to dental amalgam waste at EU level.

In September 2008<sup>8</sup> - when a relevant question was raised at the European Parliament - the EC responded that although the (above mentioned) review carried out showed that implementation of adequate measures (obligatory installation of amalgam separators and recycling schemes) were not applied uniformly throughout the Community: *'The Commission will insist on the importance of the issue in the appropriate expert groups and check that the issue of dental amalgam waste, and in particular its separation from waste water in dental healthcare facilities, is duly taken into account when the programmes of measures according to the Water Framework Directive are established.'*

The potential relevant measures through the Water Framework Directive (2000/60/EC), would refer to MS complying with the Quality Standards for mercury as defined under the Priority Hazardous Substances directive 2008/105/EC<sup>9</sup>; nevertheless the compliance with these directives is due much later, in 2015.<sup>10</sup>

In other words, instead of action towards Member States through the potential breach of the existing Waste Framework Directive (that should already be complied with by Member States), the European Commission appears to be simply postponing action related to dental amalgam waste management, to be taken later on under a directive compliance with which is not yet requested. This is clearly unacceptable and we would urge the Commission to ensure uniform compliance by Member States.

## 1.2. REDUCING SUPPLY

### Action 5

*As a pro-active contribution to a proposed globally organised effort to phase out primary production of mercury and to stop surpluses re-entering the market as described in section 10, the Commission intends to propose an amendment to Regulation (EC) No. 304/2003 to phase out the export of mercury from the Community by 2011.*

### Short assessment of Action 5



The Regulation on the banning of exports and the safe storage of metallic mercury (Regulation (EC) N° 1102/2008), was adopted on 22 October 2008. The export from the Community of metallic mercury, cinnabar ore, mercury (I) chloride, mercury (II) oxide and mixtures of metallic mercury with other substances, including alloys of mercury, with a

<sup>6</sup> [http://www.zeromercury.org/EU\\_developments/070525\\_EEB\\_Dental\\_Amalgam\\_conference.html](http://www.zeromercury.org/EU_developments/070525_EEB_Dental_Amalgam_conference.html)

<sup>7</sup> "Options for reducing mercury use in products and applications and the fate of mercury already circulating in society", p.58  
[http://ec.europa.eu/environment/chemicals/mercury/pdf/study\\_report2008.pdf](http://ec.europa.eu/environment/chemicals/mercury/pdf/study_report2008.pdf)

<sup>8</sup> <http://www.europarl.europa.eu/sides/getAllAnswers.do?reference=E-2008-3980&language=EN>

<sup>9</sup> [http://ec.europa.eu/environment/water/water-dangersub/pri\\_substances.htm](http://ec.europa.eu/environment/water/water-dangersub/pri_substances.htm)

<sup>10</sup> [http://ec.europa.eu/environment/water/water-framework/info/timetable\\_en.htm](http://ec.europa.eu/environment/water/water-framework/info/timetable_en.htm)

mercury concentration of at least 95 % by weight, shall be prohibited from 15 March 2011. Furthermore, metallic mercury from specific sources - that is no longer used in the chlor-alkali industry, gained from the cleaning of natural gas, from non-ferrous mining and smelting operations and metallic mercury extracted from cinnabar ore, shall be considered waste and be disposed of accordingly.

On the basis of the above, the primary production of mercury in Europe is indirectly prohibited.

As a result Action 5 has been successfully implemented.

However, following up on the requirements of the regulation itself, article 8 requires that the Commission organise an exchange of information between Member States and relevant stakeholders, by 1 January 2010, to examine the need for:

*(a) extending the export ban to other mercury compounds, mixtures with a lower mercury content and products containing mercury, in particular thermometers, barometers and sphygmomanometers;*

*(b) an import ban of metallic mercury, mercury compounds and products containing mercury;*

*(c) extending the storage obligation to metallic mercury from other sources;*

*(d) time limits concerning temporary storage of metallic mercury.*

*This exchange of information shall also consider the research on safe disposal options.*

*The Commission shall organise further exchanges of information when new relevant information has become available.*

The Commission, organised an information exchange in November 2009, which was focused however on a study relevant to fulfilling the requirements of Article 4 of the regulation - the need to develop requirements for storage and disposal facilities as well as acceptance criteria for metallic mercury, and review ongoing research activities on safe disposal options, including solidification of metallic mercury<sup>11</sup>.

Yet no information exchange, nor further studies are foreseen to be organised by the Commission at the time being on the above four issues.

### **1.3. REDUCING DEMAND**

#### **Action 6.**

*In the short term the Commission will ask the Medical Devices Expert Group to consider the use of mercury in dental amalgam, and will seek an opinion from the Scientific Committee on Health and Environmental Risks, with a view to considering whether additional regulatory measures are appropriate.*

*Short assessment of Action 6*



<sup>11</sup> Requirements for facilities and acceptance criteria for the disposal of metallic mercury, Final Report, 16 April 2010, BiPRO, [http://www.biopro.de/mercury/docs/Final%20report\\_100416.pdf](http://www.biopro.de/mercury/docs/Final%20report_100416.pdf)

Following the requirements of Action 6, the European Commission requested the opinion of the relevant EU Scientific Committees to consider whether additional regulatory measures would be appropriate concerning the use of mercury in dental amalgam.

As a result, the Scientific Committee on Health and Environment Risks (SCHER) was asked to respond on whether mercury releases caused by the use of dental amalgam (and from the use of mercury-free alternatives) are a risk to the environment, and whether it is scientifically justified to conclude that mercury in dental amalgam could cause serious effects on human health due to mercury releases into the environment (also in comparison to potential effects from mercury-free alternatives). In case more information would be needed, the committee was asked to provide a detailed list thereof.<sup>12</sup>

In parallel, the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), was asked to examine whether there is scientific evidence that supports a link between amalgam (and mercury free alternatives) and allergic reactions, neurological effects and other health disorders, and whether -in view of the above - the use of dental amalgam (mercury-free alternatives) is safe for patients and users, (i.e. dental health professionals, and whether certain populations are particularly at risk, e.g. pregnant women or children.) They were further asked to deliver an opinion on whether dental health is equally ensured by dental amalgam and alternatives when used for dental restorative treatment.<sup>13</sup>

The preliminary opinions of the two committees were published in January 2008 and opened for public consultation. The EEB and many other Environment, Health and Patients' Non-governmental organisations sent their comments<sup>14</sup> criticising the results of the reports. No major changes were made in the final reports by SCHER and SCENIHR regarding the opinion on health and environmental effects by mercury dental amalgams, following the public consultation; NGO's comments were not really taken into account.

In May 2008, the scientific committees published their final opinions<sup>15</sup>.

Therefore looking at the requirements of Action 6, it can be said that the EC fulfilled those successfully.

However, notwithstanding whether we agree with the outcome of the opinions, the SCHER opinion concluded among other, that *'it is clear that the information presently available does not allow (us) to comprehensively assessing the environmental risks and indirect health effects from use of dental amalgam in the Member States of the EU25/27.*

*To allow this type of assessment, the following information is required:*

- *More specific information on possible regional-specific differences in the use, release and fate of Hg originating from dental amalgam. This includes detailed quantitative information on the use and release pattern in all EU-25/27 countries, possible country-specific abatement measures, and differences in the fate of mercury due to regional-specific municipal waste water treatment and sludge application practices.*
- *A comprehensive and updated data compilation on the effects to especially (various) environmental species of Hg and methylmercury.*
- *A more comprehensive evaluation of atmospheric emissions and further deposition of mercury from crematoria, taking into account EU-wide practices and possible region-specific local scenarios.*

<sup>12</sup> [http://ec.europa.eu/health/ph\\_risk/committees/04\\_scher/docs/scher\\_q\\_050.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scher/docs/scher_q_050.pdf)

<sup>13</sup> [http://ec.europa.eu/health/ph\\_risk/committees/04\\_scenihr/docs/scenihr\\_q\\_009.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_q_009.pdf)

<sup>14</sup> <http://www.zeromercury.org/indexDental.html>

<sup>15</sup> [http://ec.europa.eu/health/ph\\_risk/committees/04\\_scher/docs/scher\\_o\\_089.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scher/docs/scher_o_089.pdf),  
[http://ec.europa.eu/health/ph\\_risk/committees/04\\_scenihr/docs/scenihr\\_o\\_016.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_016.pdf)

- *A comprehensive literature review of the bioaccumulation and biomagnification of methylmercury under different EU conditions.*
- *A detailed comparison of the relative contribution of dental Hg to the overall mercury pool - originating from intended and non-intended Hg - in the environment.'*

Although the conclusions presented above mention that they are based only on limited information and they indicate that more information is needed - no further action was taken from the European Commission. Given the lack of available information to conclusively address the above issues, we believe that the Commission must revisit it and also request an outside independent consultant to address the outstanding issues.

#### Action 7.

*The Commission intends to propose in 2005 an amendment to Directive 76/769/EEC to restrict the marketing for consumer use and healthcare of non-electrical or electronic measuring and control equipment containing mercury.*

#### Short assessment of Action 7



Directive 2007/51/EC, restricting the sale of mercury fever thermometers for consumers and in healthcare, was adopted in October 2007. It further banned the sale of other mercury-containing measuring devices for consumer use such as sphygmomanometers, barometers, manometers etc. The measures entered into force on 3<sup>rd</sup> April 2009. Furthermore, following the directive, requirements the European Commission carried out a review of the availability of reliable safer alternatives that are technically and economically feasible for mercury-containing sphygmomanometers and other measuring devices in healthcare and in other professional and industrial uses. On the basis of this review, and on the basis of the information that was collected during the review, the EC requested the European Chemicals Agency (ECHA), to make a proposal under the REACH<sup>16</sup> 'Restriction' process, and requirements of Art. 69. ECHA is expected to make the relevant proposal and eventually propose a restriction of the use of mercury sphygmomanometers in healthcare, in June 2010. Process under ECHA is on-going.

On the basis of the above this action has been successfully implemented.

#### Action 8.

*The Commission will further study in the short term the few remaining products and applications in the EU that use small amounts of mercury. In the medium to longer term, any remaining uses may be subject to authorisation and consideration of substitution under the proposed REACH Regulation, once adopted.*

#### Short assessment of Action 8



Following this action, DG- Environment requested consultants COWI and Concorde SA to carry out a study investigating "*Options for reducing mercury use in products and applications, and the fate of mercury already circulating in society*"<sup>17</sup>.

*'This study strengthens the foundation for further policy decisions by providing:*

<sup>16</sup> Regulation on Registration, Evaluation, Authorisation and Restriction of Chemical substances, EC 1907/2006, [http://ec.europa.eu/environment/chemicals/reach/reach\\_intro.htm](http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm)

<sup>17</sup> [http://ec.europa.eu/environment/chemicals/mercury/pdf/study\\_report2008.pdf](http://ec.europa.eu/environment/chemicals/mercury/pdf/study_report2008.pdf)

- an overview of current use of mercury for processes and in products in the European Union, and of mercury accumulated in society in products, at production facilities, on the grounds of contaminated sites and within other stocks and inventories;
- an overview of the waste handling situation and recycling paths in the EU, as well as of
- national legislation that goes beyond current EU legislation; and
- an assessment of options for reducing major inputs of mercury to society in dental amalgams, measuring equipment, mercury catalysts in polyurethanes and mercury porosimetry.'

The study has quantified the mercury use for some significant applications of mercury that have drawn less attention until now, examined the level of substitution and the potential impact on manufacturers. It further carried out a more detailed review of the main impacts resulting from a range of possible further policy measures on four areas:

- Dental amalgams (including mercury input and waste management);
- Measuring devices for professional uses (including a detailed assessment of thermometers, barometers and sphygmomanometers);
- Mercury catalysts for polyurethane elastomers; and
- Mercury porosimetry.

The benefits of reduced uses of mercury and releases from these categories was discussed and options for reducing mercury input was proposed.

The overall conclusions of the report state the following: 'Of the applications for which impacts have been analysed more closely, there is a sound basis for concluding that dental amalgam and thermometers should be seriously considered for further restrictions, while measures to reduce the mercury input due to sphygmomanometers, barometers and PU elastomers may be put forward as soon as possible without major impacts on manufacturers and users.

With respect to dental amalgams, obligatory installation of high efficiency filters in dental clinics is a very cost-effective measure for reducing mercury releases to the waste water systems and may be put forward as soon as possible.'

No further action was taken so far following these conclusions.

#### Action 9.

The Commission will take action to pursue the storage of mercury from the chlor-alkali industry, according to a timetable consistent with the intended phase out of mercury exports by 2011. In the first instance the Commission will explore the scope for an agreement with the industry.

#### Short assessment of Action 9



As mentioned above, the Regulation on the banning of exports and the safe storage of metallic mercury (Regulation (EC) N° 1102/2008), was adopted on 22 October 2008. Further to the export ban provisions it foresees that metallic mercury from specific sources - that is no longer used in the chlor-alkali industry, gained from the cleaning of natural gas, from non-ferrous mining and smelting operations and metallic mercury extracted from cinnabar ore, shall be consider waste and be disposed of accordingly.

Further to that the EC adopted a decision acknowledging the voluntary agreement by the European Chlorine Council (Euro Chlor), to store safely mercury no longer used in the chlor-alkali industry.

In addition, on the basis of Art. 4 of the Regulation, the EC should develop requirements for storage and disposal facilities as well as acceptance criteria for metallic mercury. To that end, a study was commissioned to German consulting company BiPRO - who finalised the report in April 2010<sup>18</sup>, after consultation period and a workshop held where the intermediate conclusions of the report were discussed (November 2009).

On the basis of the recommendations made, the EC is still expected to develop and propose respective requirements to amend Annexes I, II and III of Directive 1999/31 on the landfill of waste.

Therefore this action has been completed successfully until now.

#### Action 10.

*The Commission will undertake further study in the short to medium term of the fate of mercury in products already circulating in society.*

#### Short assessment of Action 10



This action appears similarly to be covered by the study “*Options for reducing mercury use in products and applications, and the fate of mercury already circulating in society*” as discussed in Action 8.

#### Action 11.

*In the short term, the European Food Safety Authority (EFSA) will investigate further specific dietary intakes of different types of fish and seafood among vulnerable subpopulations (e.g. pregnant women, children).*

#### Short assessment of Action 11



EFSA has been requested by the European Commission or Member States to provide risk assessments on uranium, cadmium, mercury, lead and arsenic in food. This work is carried out by the Panel on contaminants in the food chain (CONTAM Panel).

In 2004 the CONTAM Panel adopted an opinion on mercury and methylmercury, the latter being the main mercury compound present in fish and seafood products. The opinion looked at the contribution of different foods towards overall human exposure and the risks to vulnerable groups, in particular pregnant women and children. The Panel concluded that methylmercury toxicity has been demonstrated at low exposure levels, and therefore exposure to this compound should be minimised. However, it also noted that fish constitutes an important part of a balanced diet. *'Methylmercury is particularly toxic to the nervous system and the developing brain. Exposure during pregnancy and early infancy is therefore of particular concern. Pregnant women eating up to two portions of fish per week are unlikely to exceed provisional tolerable weekly intake (PTWI) levels for methylmercury, as long as they do not consume blue fin or albacore tuna. (These species are not likely to be found in canned tuna in Europe). Other top predatory fish, such as marlin, pike, swordfish, and shark also frequently contain high levels of methylmercury. EFSA already recommended in March 2004<sup>19</sup> that women of childbearing age (in particular, those intending to become pregnant),*

<sup>18</sup> Requirements for facilities and acceptance criteria for the disposal of metallic mercury, Final Report, 16 April 2010, BiPRO, [http://www.biopro.de/mercury/docs/Final%20report\\_100416.pdf](http://www.biopro.de/mercury/docs/Final%20report_100416.pdf)

<sup>19</sup> [http://www.efsa.europa.eu/EFSA/efsa\\_locale-1178620753812\\_1178620786349.htm](http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178620786349.htm)

*pregnant and breastfeeding women, as well as young children, select fish from a wide range of species without giving undue preference to top predatory fish, such as swordfish and tuna'.*

The above mentioned opinion, was however adopted before the adoption of the EU mercury strategy.

EFSA has also provided advice on the safety and nutritional contribution of wild and farmed fish in 2005. The CONTAM Panel assessed the health risks related to human consumption of wild and farmed fish, including an overall risk assessment related to the consumption of Baltic herring. EFSA's advice concentrated on the most relevant metals and persistent organic contaminants, namely methylmercury, dioxins and dioxin-like PCBs. It also reviewed the nutritional value and benefits from consuming fish.<sup>20</sup>

Commission Regulation 1881/2006 lays down maximum levels for certain contaminants in foodstuff, including lead, cadmium, mercury and inorganic tin. Commission Regulation 333/2007 covers the methods of sampling and analysis for the official control of the maximum levels of these metals. Surveillance for residues of chemical elements in foods of animal origin is specified in Council Directive 96/23/EC.

#### Action 12.

*The Commission will provide additional information concerning mercury in food as new data become available. National authorities will be encouraged to give advice in the light of local specificities.*

#### Short assessment of Action 12



An Information note was published by DG Health and consumer affairs on 12 May 2004, mentioning among other ' *Women who might become pregnant, women who are pregnant or women who are breastfeeding should not eat more than one small portion (<100g) per week of large predatory fish, such as swordfish, shark, marlin and pike. If they eat this portion, they should not eat any other fish during this period. Also, they should not eat tuna more than twice per week. Parents should be aware that this advice also applies to young children. Consumers should also pay attention to any more specific advice from national authorities in light of local specificities.*<sup>21</sup>

In April 2008, DG Health and Consumers issued an "Information Note" concerning "Methyl mercury in fish and fishery products"<sup>22</sup>. The text is exactly the same as in the Information note of 2004 (!) apart from one paragraph.

In spite of the above conclusions - that women and young children should pay particular attention on the quantities and types of fish they eat, no relevant information was proposed to be added under the 2008 EC proposal for a the Regulation on 'Food information to consumers'<sup>23</sup>.

No special action has been taken to our knowledge in view of encouraging National authorities to give advice, thereof. However, without employment of effective risk communication

<sup>20</sup> <http://www.efsa.europa.eu/en/contamtopics/topic/metals.htm>

<sup>21</sup> [http://ec.europa.eu/food/food/chemicalsafety/contaminants/information\\_note\\_mercury-fish\\_12-05-04.pdf](http://ec.europa.eu/food/food/chemicalsafety/contaminants/information_note_mercury-fish_12-05-04.pdf)

<sup>22</sup> [http://ec.europa.eu/food/food/chemicalsafety/contaminants/information\\_note\\_mercury-fish\\_21-04-2008.pdf](http://ec.europa.eu/food/food/chemicalsafety/contaminants/information_note_mercury-fish_21-04-2008.pdf)

<sup>23</sup> [http://ec.europa.eu/food/food/labellingnutrition/foodlabelling/publications/proposal\\_regulation\\_ep\\_council.pdf](http://ec.europa.eu/food/food/labellingnutrition/foodlabelling/publications/proposal_regulation_ep_council.pdf)



strategies, including labelling of larger predatory fish known to have high mercury levels by the appropriate authorities, sensitive populations will not be made aware of the clearly avoidable risks of consumption of high mercury fish,

#### Action 13.

*Priorities for mercury research will be addressed in the 7th RTD Framework Programme and other appropriate funding mechanisms.*

#### Short assessment of Action 12



Mercury was addressed during the development of the 7th RTD Framework programme.

Two studies appear to have been funded under the 7th RTD Framework programme on mercury:

##### 1. HG-197 MEHG ASSESS

**Title:** *Evaluation of Methyl-mercury production and decomposition by using Hg-197 radiotracer produced out of mercury enriched in Hg-196 isotope*

**Research area:** *PEOPLE-2007-4-2.IIF Marie Curie Action: "International Incoming Fellowships"*

**Project start date:** *[2009-12-16]*

##### 2. MERC TIC

**Title:** *Mercury biogeochemistry in the high Arctic*

**Research area:** *FP7-PEOPLE-IIF-2008 Marie Curie Action: "International Incoming Fellowships"*

**Project start date:** *[2010-01-11]*

Furthermore a LIFE preparatory project has been funded in 2006, ' *Design, construction and validation of a prototype installation for a safe deposit of surplus mercury from the European industry* ' - MERSEDA LIFE06 ENV/ES/PREP/03; the project was foreseen to be completed by September 2009.

The LIFE project was directly relevant to ongoing discussions on metallic mercury storage options, and some of its results have already been considered in relevant discussions at EU level. However its full input to the policy work still needs to be discussed. The input from the other projects does not seem to have been used nor discussed at the time being.

## 2. **Partial proposals for new and follow up actions for the new EU Mercury Strategy**

Considering the developments at global level new and follow up actions for the new EU Mercury strategy are discussed in the order of the elements listed in Paragraph 27 of the UNEP GC 25/5 decision which are to be considered when developing a global legally binding instrument on mercury.

Given time constraints when developing these comments, the following proposals cover only part of the areas that should be addressed by the new EU mercury strategy. More information will be provided in due time.

## Summary of EEB proposed actions

### ***Reduce Supply and enhance environmentally sound storage.***

1. Consider expanding the scope of obligatory disposal of mercury from mercury containing-waste.
2. Restrict imports of mercury and mercury compounds in the EU for purposes other than storage or sequestration.
3. Set up a trade tracking system to record and provide information from exports and imports of elemental and compound mercury between Member States and between EU and external countries.

### ***Reduce the demand for mercury in products and processes***

4. A specific sunset date for all mercury-cell chlor-alkali plants, both sodium – and potassium-based should be set. The EEB has been advocating for 2010 as a phase out date for many years.
5. At EU level, the European Commission should come forward with legislation specific to the chlor-alkali industry, including not only a specific sunset date for the mercury-cell chlor-alkali plants, but also minimum requirements, reporting obligations, and mercury emission limit values for the mercury-cell chlor-alkali plants that will choose to operate until the sunset date.
6. Phase out the use of dental amalgam. Justified, time limited exemptions could be considered.
7. Take measures to ensure 100% mercury used in porosimetry - pycnometry is recycled.
8. Phase out the use of mercury in porosimetry - pycnometry, with justified, time limited exemptions.
9. Phase out the use of mercury in polyurethane elastomers.
10. Ban the production and sale of mercury containing button cells by revising as soon as possible the EU batteries directive.
11. The remaining exemptions in the battery directive must be re-examined because they too are outdated, lack specificity, and may be subject to significant abuse.
12. Restrict further the mercury use in light sources for certain categories.
13. Propose maximum limits for lamp categories which currently have a blanket exemption.
14. Ensure a Rapid Phase-out of Clinical Mercury-Sphygmomanometers sales via the REACH restriction route.
15. Take action to promote Development and Validation of an Alternative Reference Standard.
16. Phase out the use of mercury in new light houses.
17. Request obligatory safe disposal of mercury used in existing lighthouses, amending accordingly the regulation 1102/2008/EC an EU export ban and safe storage of mercury.
18. An expert assessment should be undertaken to determine the extent to which mercury can be appropriately eliminated from vaccines to better protect public health.

19. The Commission should undertake a review of vaccines, to ensure that thimerosal-containing vaccines are not in use in Europe, where alternatives are available. An agreement with manufactures should be sought to eliminate the use of thimerosal in vaccines where not necessary. Wherever needed, vaccines should be labelled to declare mercury contents. Furthermore, the EMEA should publish a comprehensive list of all vaccines licensed in Europe and their thimerosal content, as the FDA does in the United States. Further, the Commission should issue guidelines calling on the EMEA and other health organizations to work with manufacturers to reduce and/or eliminate mercury in vaccines. To that end, priority should be given on research and development of safe, mercury-free, multi-dose vaccines.

#### ***Restrict international trade in mercury***

20. ***Implement fully regulation 1102/2008/EC (Mercury export ban); examine in further depth and consider all available information***

- a. ***extend the export ban to include mercury compounds and those mercury-containing products subject to EU use and marketing restrictions.***
- b. ***restrict imports of mercury and mercury compounds into the EU for purposes other than sequestration (i.e. final storage or disposal).***
- c. ***Establish an effective trade tracking and licensing mechanism for tracking imports and exports, and enforcing the trade restrictions.***

#### ***Reduce atmospheric emissions of mercury***

21. Measures designed to prevent emissions of mercury such as mass specific emissions limit values from combustion of fuels plants and mainly coal and other relevant activities under the Integration Pollution Prevention and Control (IPPC) Directive or the forthcoming Industrial Emissions Directive (IED), other existing legislation or a separate legislative instrument should be introduced and the Commission should take action as soon as possible.

22. National mass emission limits as well as local air quality limits for mercury should be set under relevant existing or a separate legislative instrument.

23. In addition to mercury emission control technologies, the use of low-mercury coal, coal cleaning, selection of coal for low-mercury emissions, or switching to a cleaner fuel should be implemented over time. Such issues should be considered when revising the respective BREFs and for research and development if necessary.

24. In light of the major contribution of the industrial sector to mercury air emissions, it is necessary to set mass specific Emission Limit Values in line with BATAEL for mercury, as minimum action, from all relevant activities – including the chlor-alkali sector, cement manufacturing, and secondary steel production.

25. A sunset date should be set for the mercury use in the chlorine sector.

26. Under the review of the BREF on chlor-alkali, the mercury-cell technique shall not be presented under the BAT chapter. For the remaining life of Mercury cell chlor-alkali plants (MCCAP) a maximum Best Achievable Emission Levels should be referred to in the BREF as 0,2- 0,5 g Hg/tonne of Cl<sub>2</sub> production capacity, as a clear guideline for permit writers . Following this, there is a need for more enforcement and follow ups of the chlor alkali plants to ensure they implement the the BREF.

27. All BREFs for relevant industries should include measures to prevent mercury emissions and BAT Associated Emission Levels for mercury.
28. The role of the BREFs in the IPPC/IED directive should further be strengthened.
29. The Large Combustion Plants Directive (2001/80/EC), the IPPC (merged in the IED Directives) should be extended to cover mercury emissions from combustion of fuels from installations with a thermal input of 20MW and above as well as residential coal combustion. A complementary legislative instrument could be developed.
30. Rather than relying on the incidental capture of mercury by pollution control technologies designed to capture other pollutants, it is imperative that binding measures on prevention such as Emission Limit Values be established, as in the case of waste incinerators, to achieve consistently high reductions in mercury emissions. In this way, pollution control measures for mercury can be integrated into retrofits to meet ELVs for SO<sub>2</sub>, PM, and NO<sub>x</sub> by 2008 under the LCP Directive and BAT in the IPPC BREF.
31. Recommendations of the 2005 study should be implemented
32. Mercury emissions from crematoria should be further investigated, including relevant technologies or other effective approaches, for eventual control at EU level. Emission limit values for this source should be proposed by the European Commission as soon as possible.

#### ***Address mercury-containing waste and remediation of contaminated sites***

33. The EC should take measures to further raise awareness and increase knowledge on the fact that certain products contain mercury, to ensure that for those products which relevant law is in place, these are collected separately and safely (e.g. lamps, batteries). Better labeling of products containing mercury will also facilitate separate collection.
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34. For products/waste the separate safe collection of which is not explicitly requested by law- e.g. for mercury thermometers, additional measures need to be taken thereof.
  35. Those EU Member States which currently lack legislative measures for amalgam separators requirements should provide a timetable for doing so to the Commission in the short term. Those failing to provide this timetable should be identified as priorities for follow-up administrative action by Commission staff.
  36. Introduce obligatory measures ensuring that highly efficient amalgam separators are installed in dental clinics. More rigorous installation and monitoring as regards separation, the introduction of devices in the wastewater system of dental offices, good record-keeping and devices that meet a high standard would be needed.
  37. In addition, the Commission should ensure that mercury-laden pipes and plumbing fixtures (i.e. nearly all wastewater systems serving dental practices) are cleaned and/or replaced since they have long accumulated mercury wastes and constitute an ongoing source of mercury release. Other dental-related activities should include: ensuring historic supplies of elemental mercury currently stored at dental offices are appropriately managed, and ensuring that mercury-laden solid wastes from dental offices are handled as hazardous waste, in accordance with law, so that they are removed from the economic cycle rather than improperly disposed of, or combusted in medical or municipal waste incinerators.

38. Contaminated sites (former mining sites and others) should be identified and classified according to the degree of contamination and urgency of remediation.
39. The contribution of mercury emissions from contaminated sites to the overall emissions should be calculated.
40. Standards and methodologies should be developed and agreed upon on a European-wide basis and harmonised with those under development in other parts of the world.
41. Harmonised and standardised protocols for estimation of emissions should also be considered in order to obtain comparable data.
42. Integrated tools for the remediation of mercury-contaminated sites should be developed.
43. Mixed exposure of humans and wildlife to inorganic mercury and organomercury (MeHg) in mercury polluted sites should further be addressed and studied, due to possible combined effects.
44. Areas contaminated by mercury (former mining sites and others) need to be further restored and brought to a reasonable condition.

#### ***Reduce emissions to water and soil***

45. Revision of the EU directive on sludge, dated from 1986 (86/278), is needed as soon as possible individually or in a package with the eventual adoption of the soil framework directive.

#### ***Protect against exposure***

46. Member states, European Parliament and the EC should ensure that consumers receive information about the presence of toxic mercury, and in particular concerning labelling of the **mercury content** of *meat from large predatory fish or foodstuffs containing meat from these fish species*. *An amendment to the regulation should be added accordingly informing that: 'contains methylmercury- not recommended for pregnant or breastfeeding women, women who might become pregnant, and children'* to be added immediately after the list of ingredients. In absence of a list of ingredients, the statement should accompany the name of the food.

## **2.1. Reduce the supply of mercury and enhance the capacity for its environmentally sound storage;**

### ***2.1.1. Reduce Supply***

On the basis of regulation 1102/2008 on a Mercury export ban - certain sources of mercury have been identified- the mercury from which shall be considered as waste and be disposed of by March 2011; these sources are

- a) metallic mercury that is no longer used in the chlor-alkali industry;
- (b) metallic mercury gained from the cleaning of natural gas;
- (c) metallic mercury gained from non-ferrous mining and smelting operations; and
- (d) metallic mercury extracted from cinnabar ore in the Community as from 15 March 2011.

Nevertheless other sources of mercury still exist as they have been identified in the 2008 study carried out from COWI, Concorde SA on behalf of the European Commission, DG Environment. These existing sources of mercury are:

- mercury recycled from mercury-containing products and waste,
- imported elemental mercury, mercury compounds and mercury containing-products
- mercury from lighthouses, laboratories, schools, etc.

On the basis of the elements included in the above mentioned study - the EC should further examine if and when mercury from these sources should also be considered waste and included in the scope of the regulation.

As discussed with the EU institutions while developing the EU mercury export ban and storage regulation, the EU should consider restricting imports of mercury and mercury compounds for purposes other than storage or sequestration in order to:

- ensure EU mercury supplies are consistent with EU demand, mandatory storage obligations, and policies encouraging mercury recovery from wastes and products.
- better protect the EU waste/mercury recyclers – avoiding low-cost mercury flooding EU market.

Such a restriction would also facilitate the development of a trade tracking system, to provide information periodically and to record all exports and imports of elemental and compound mercury between Member States, and between the EU and external countries.

- Periodical reporting will ensure transparency of the trade, and allow developments that run contrary to the intention and effectiveness of the ban to be easily assessed by the Commission and stakeholders.
- It would create a level playing field for mercury importers and traders (including recyclers), giving them an incentive to take responsibility for their commerce.
- Member States should provide information to the EC regularly, and the EC should make this information public.
- The movement of mercury within the industry sector should also be recorded and reported to the Commission.

- The tracking system data should include: companies' identity, country, location, quantities involved, purpose of use, etc.
- It shall be ensured that information from the relevant industries is submitted to the Member States regularly; the information shall include figures on the total amount of mercury still in use, recycled/recovered, sent for storage, transfers, amounts stored onsite temporarily etc.

We do not propose restrictions of imports where the mercury or mercury compounds are intended for storage or sequestration purposes. Global coordination to remove the mercury in circulation from global commerce will require substantial international cooperation and coordination. It is premature to preclude any potential roles and responsibilities for the EU and Member States in this regard.

### **Actions proposed**

1. Consider expanding the scope of obligatory disposal of mercury from mercury containing-waste.
2. Restrict imports of mercury and mercury compounds in the EU for purposes other than storage or sequestration.
3. Set up a trade tracking system to record and provide information from exports and imports of elemental and compound mercury between Member States and between EU and external countries.

#### **2.1.2. Environmentally sound storage for mercury**

At the EU level the Landfill directive 1999/31 defines the different categories of waste (municipal waste, hazardous waste, non-hazardous waste and inert waste) and applies to all landfills, defined as waste disposal sites for the deposit of waste onto or into land. Landfills are divided into three classes: landfills for hazardous waste; landfills for non-hazardous waste; and landfills for inert waste. Liquid waste however are not accepted in a landfill according to the Landfill directive. The landfill directive is supplemented by Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

On the basis of regulation 1102/2008 on the EU Export ban and safe storage of mercury, metallic mercury from certain sources is considered waste and should therefore be disposed of according to the relevant EU waste legislation as above. Because of the liquid nature of mercury, derogation from directive 1999/31 is provided in the regulation which allows metallic mercury that is considered as waste to be, in appropriate containment, (a) temporarily or permanently stored in salt mines adapted for the disposal of metallic mercury, or in deep underground, hard rock formations providing a level of safety and confinement equivalent to that of those salt mines; or (b) temporarily stored in above-ground facilities dedicated to and equipped for the temporary storage of metallic mercury. The particular risks arising from the nature and long-term properties of the metallic mercury and its containment should be considered, for the safety assessment to be covered.

Furthermore , The requirements for facilities referred to in Article 3(1)(a) and (b) of this Regulation as well as acceptance criteria for metallic mercury, amending Annexes I, II and III of Directive 1999/31/EC, shall be revised accordingly , after a relevant proposal by the

Commission by 1st January 2010. No final disposal operation can be permitted before adoption of the amended annexes.

To meet above requirements the European Commission, commissioned a study to consultant BiPRO GmbH, Germany to carry out the study “Requirements for facilities and acceptance criteria for the disposal of metallic mercury.” The study was finalised in April 2010 and contains a relevant set of proposals. The EC is now expected to take steps in view of revising the annexes and adopting relevant requirements accordingly.

According to the BiPRO study - salt mines appear to be sufficiently safe for long-term storage of liquid or solidified/stabilised mercury. Nevertheless, concerns have been raised mainly on the long-term behaviour of metallic mercury (and its solidified form) in salt mines.

To that end and as EEB has already commented during the public consultation on the issue, we would like to stress once more that potential time constraints in deciding what is the best way to store or sequester mercury, permanently, should not compromise the safety and the potential for exposure of future generations to mercury. We generally believe that, if determined viable, solidifying the liquid mercury before its final storage/sequestration could be the safest solution, as an emerging technology appears promising at this time. Yet at this time we must continue to view these emerging technologies as unproven and therefore subject to the need for additional scrutiny before we can support them. Therefore, it's clear that more studies are needed to ensure the long term safety aspects for their acceptance and respective facility requirements, and adequate time should be allocated respectively. In the meantime, safe temporary solutions should be given priority in the near term.

Considering that the EC is about to propose respective measures as per above, no further action is proposed for the new EU Mercury Strategy at this stage.

## **2.2. Reduce the demand for mercury in products and processes;**

In the EU mercury is still used in different products and processes. The biggest use at the moment is in the production of chlorine and caustic soda, followed by use in dental amalgams, in porosimetry and pycnometry, in chemicals-catalysts etc (mainly polyurethane), light sources, batteries, measuring equipment and switches and relays.<sup>24</sup>

### ***2.2.1. Mercury use in the chlorine industry***

The EU mercury strategy apart from making general reference to the chlor-alkali industry it has not addressed the problematic of continuous use of mercury and related emissions from the sector. However, this is the sector where vast information and evidence of the need to phase out mercury use has been collected.

It is therefore imperative that the new EU mercury strategy sets a phase out date of mercury use in the sector as soon as possible, for the following reasons:

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<sup>24</sup> COWI, Concorde study for DG ENV, 2008, Options for reducing mercury use in products and applications, and the fate of mercury already circulating in society, [http://ec.europa.eu/environment/chemicals/mercury/pdf/study\\_report2008.pdf](http://ec.europa.eu/environment/chemicals/mercury/pdf/study_report2008.pdf)



- In the EU more than 40% of the chlorine production is based on the mercury-cell process. Around 40 mercury-cell chlor-alkali plants (MCCAPs) are still in operation in Europe – ‘housing’ around 9.000 tonnes of mercury.
- The membrane process, which is mercury-free and consumes up to 30% less energy leading to significant cost savings, has been available since the 1980s.
- In 1990 already, OSPAR Decision 90/3 of 14 June<sup>25</sup> recommended reducing chlor-alkali mercury emissions to 2 grams of mercury per tonne of Cl<sub>2</sub> capacity and phasing out the activities of existing mercury-cell installations in chlor-alkali production plants as soon as possible, with the aim of achieving the objective of their total closure by 2010 at the latest.
- At EU level, the Integrated Pollution Prevention and Control (IPPC) Directive (96/61/EC), requires installations to operate subject to permits based on the best available techniques (BAT). The benchmarks or criteria on which BAT relies are described in the BAT Reference Documents (BREFs). According to the chlor-alkali BREF<sup>26</sup>, the membrane (mercury free) process, and not the mercury-cell process, is regarded as BAT for the chlor-alkali industry.
- As a region, the EU accounts for the greatest number of plants and the highest percentage of production capacity still using the mercury-based process. The US has only four remaining plants and are currently discussing future legislation to phase them out by 2015/18<sup>27</sup>. In India there is a voluntary agreement between government and industry, initiated by the (Indian) Central Pollution Control Board, according to which the phase-out of Indian MCCAPs will occur by 2012<sup>28</sup>. In Japan, the electrolytic cell technique has been largely phased out since the mid 1980s<sup>29</sup>.
- Industry has estimated the total cost for conversion of these MCCAPs at less than 2.400 million Euro, whereas annual turnover for this sector amounts to more than 240.000 million Euro<sup>30</sup>.
- Although the European chlor-alkali industry (Eurochlor) has agreed to convert or close down most of the mercury-cell facilities by 2020 through a voluntary agreement, each year, apart from the accounted emissions from this industry, there is an average of 40 tonnes, referred to by industry as “difference-to-balance,” which is lost every year, and no local or EU authority has ever questioned where mercury is going. This lost mercury amounts to more than five times the reported emissions.
- There are serious concerns that emissions from the sector may be under-reported. A 2006 analysis<sup>31</sup> drew on several peer reviewed research papers that support the hypothesis that the mercury emissions of chloralkali plants in the US and Europe are routinely underreported – not intentionally, but rather due to the design and complexity of the production process, equipment and structures that render any comprehensive measurement of mercury emissions virtually impossible. This conclusion is further supported by measurements and analysis published by US EPA, DG Environment, NRDC, Greenpeace, Oceana, EEB site measurements<sup>32</sup> and others<sup>33</sup> – a virtual

<sup>25</sup> [www.ospar.org/documents/dbase/decrecs/decisions/pd90-03e.doc](http://www.ospar.org/documents/dbase/decrecs/decisions/pd90-03e.doc)

<sup>26</sup> For the full BREF document : [http://ec.europa.eu/environment/ippc/brefs/cak\\_bref\\_1201.pdf](http://ec.europa.eu/environment/ippc/brefs/cak_bref_1201.pdf)

<sup>27</sup> Three company letter to US House of Representatives, Committee of Energy and Commerce, 20 October 2009

<sup>28</sup> Central Pollution Control Board, Annexure 1, Section 8, point 12, <http://www.cpcb.nic.in/Charter/status.htm>

<sup>29</sup> UNEP, Global Mercury Assessment, Overview of Existing and Future National Actions, including Legislation Relevant to Mercury. December 2002. The chlor-alkali BREF mentioned that some plants in Japan, which largely phased out the industrial use of mercury following the Minamata incident, were permitted to continue to use mercury cells to produce potassium hydroxide for many years after other uses were discontinued. Even for this use, however, the remaining Japanese plants had all been converted to mercury-free processes by 2002.

<sup>30</sup> [http://www.zeromercury.org/EU\\_developments/081218EEB\\_Report\\_European\\_MCCAPsDRAFTfinal.pdf](http://www.zeromercury.org/EU_developments/081218EEB_Report_European_MCCAPsDRAFTfinal.pdf), p. 3,11,12

<sup>31</sup> “Status Report: Mercury cell chlor-alkali plants in Europe” ,

[http://www.zeromercury.org/EU\\_developments/Final\\_Report\\_CA\\_31Oct2006.pdf](http://www.zeromercury.org/EU_developments/Final_Report_CA_31Oct2006.pdf), EEB, October 2006

<sup>32</sup> [http://www.zeromercury.org/EU\\_developments/061110RiskyBusinessFINAL.pdf](http://www.zeromercury.org/EU_developments/061110RiskyBusinessFINAL.pdf)

<sup>33</sup> “Petition [before the Administrator, United States Environmental Protection Agency,] for reconsideration of the National

consensus among all who have made the effort to better understand chlor-alkali mercury releases.

- Member states have started realising that business as usual in the sector cannot continue: In France, following presentation of the very high emissions of mercury recorded during a monitoring of air and soil sampling exercise outside a mercury chlor-alkali plant, under the EEB campaign, the French Ministry of Environment announced further monitoring with the coordinated participation of industry, the local authorities and the NGOs, and that the agreement between the French industry and government that mercury in this industry can be used until latest 2020, will be revised for potential adoption of an earlier phase out date<sup>34</sup>. Recently (April 2010) the Ministry announced that the French chlor-alkali plant referred to above, will convert to a mercury free process by 2013<sup>35</sup>. Discussions at French level are still ongoing.

#### Actions proposed

4. A specific sunset date for all mercury-cell chlor-alkali plants, both sodium – and potassium-based should be set. The EEB has been advocating for 2010 as a phase out date for many years.
5. At EU level, the European Commission should come forward with legislation specific to the chlor-alkali industry, including not only a specific sunset date for the mercury-cell chlor-alkali plants, but also minimum requirements, reporting obligations, and mercury emission limit values for the mercury-cell chlor-alkali plants that will choose to operate until the sunset date.

#### 2.2.2. Mercury use in dental amalgam

As discussed in earlier sections, apart from asking the opinion of the EU scientific committees on the environment and health effects of dental amalgam, no other measures have been taken at EU level.

The COWI, Concorde SA 2008 report analysed extensively the issue and concluded that: *'Substitution of dental amalgam is no doubt effective as it would eliminate the total input of mercury to this sector, and thus eliminate in a few decades the adverse impacts of mercury releases resulting from this activity. As the table shows, the cost level - however roughly estimated only - indicate a rather substantial cost for the substitution of dental amalgam with composite fillings, the most widely used alternative today. This should however be consider in perspective of a number of cost elements which have not been possible to quantify within this study. Expected benefits from reduced adverse effects of mercury releases and reduced costs for mercury waste management in all associated flows in society are expected to be major*

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Emission Standard for Hazardous Air Pollutants (NESHAP): Mercury Emissions from Mercury Cell Chlor-Alkali Plants," 17 February 2004.

European Commission, Annex to the Communication from the Commission to the Council and the European Parliament on Community Strategy Concerning Mercury, *Extended Impact Assessment*, {COM(2005)20 final}.

EMECAP Project Progress Summary and Final Report, European Mercury Emissions from Chlor-Alkali Plants, carried out with the assistance of European Community research funds, DG Research, European Commission, 2006.

Quirindongo M, J Devine, A Leiter and L Greer, *Lost and Found: Missing mercury from chemical plants pollutes air and water*, NRDC Issue Paper, Natural Resources Defense Council, Washington DC, April 2006.

*La industria del cloro: contaminación silenciosa – Análisis de los vertidos al agua de las plantas productoras de cloro en España*, Greenpeace España, Madrid, Barcelona, October 2008.

Winalski D, S Mayson and J Savitz, *Poison Plants: Chlorine factories are a major global source of mercury*, OCEANA, Washington DC, January 2005.

<sup>34</sup> [http://www.fne.asso.fr/fr/pollution-au-mercure--fne-tire-le-signal-dalarme.html?cmp\\_id=33&news\\_id=314&vID=](http://www.fne.asso.fr/fr/pollution-au-mercure--fne-tire-le-signal-dalarme.html?cmp_id=33&news_id=314&vID=)

<sup>35</sup> [http://www.fne.asso.fr/fr/actualites/communiqués-de-presse-full.html?id=1646&news\\_id=1646&cmp\\_id=33](http://www.fne.asso.fr/fr/actualites/communiqués-de-presse-full.html?id=1646&news_id=1646&cmp_id=33)

*contributions. Both are however complicated to estimate. Current estimates of health benefits per gram mercury reduced are considered very uncertain and imply the risk of serious misinterpretations. The costs of emission reduction of one kg mercury in crematoria is in the same range as the lower estimate of the costs of substitution of dental amalgam.*

*It is clearly indicated that applying high efficiency filters and maintenance requirements is a quite cost effective measure, with a price per kg mercury release reduction of only 1/10 of the costs of reduction the releases from crematoria.*

*Because of the large quantities of mercury accumulated in the teeth of the population, substitution and “end-of-pipe” measures are, in the short term, not so much possible alternatives; rather both measures are necessary at the same time. Over the longer term, of course, the “end-of pipe” measures would no longer be needed as dental mercury no longer reaches any waste stream in significant quantities.<sup>36,</sup>*

Furthermore, EEB organised a conference in May 2007 'Dental sector as a source of mercury contamination'. Results of the conference<sup>37</sup> included the following:

- In the EU, mercury use for dental amalgams is estimated to be more than 90 tonnes, the second biggest use after mercury-cell chlor-alkali plants. Mercury use in the EU is significant in dental applications, most of which appears to eventually be deposited in the environment. Such releases are quite diffuse, and controlling them is costly. Once mercury is released, it may transform into methylmercury, its most toxic form.
- There are various pathways where mercury from dental amalgams may be released and where it can be controlled (dental clinics, waste water, crematoria, cemeteries etc.). Much mercury waste is sent into the solid waste stream, although a good amount goes into the waste water treatment stream including mercury in people's mouths released at home, while a certain amount ends up in sludge waste. Crematoria also release mercury into the atmosphere, although when people are buried it might end up in the soil or ground water.
- Approximately 500 million citizens (50-75% of individuals in the EU) have fillings in their mouths. The average mouth with fillings in the EU seems to contain 3 to 4 grams of mercury. A 'human inventory' of around 1,100 tonnes can be found in people's mouths in the EU, which is huge when one considers it will all end up in the environment.
- Experts estimate that the amount of mercury newly introduced into people's mouths in the EU is between 110 and 150 tonnes annually. However, this estimate does not include the mercury waste carved away by dentists. Yet, three grams per person are still released into the atmosphere by cremation or into the soil by burials every year. The cremation rate in the EU is also increasing by 1% a year.
- On the basis of different assumptions, it is estimated that the annual mercury releases which end up in various environmental outlets are distributed mainly into soil (30 tonnes), the atmosphere (23 tonnes), surface water (14 tonnes) and groundwater (10 tonnes)<sup>38</sup>. In these environmental media the mercury may be expected to continuously circulate in the biosphere, partially methylate, enter the food chain and detrimentally affect wildlife and human health.

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<sup>36</sup> p.220 of COWI, Concorde SA 2008, report for DG Environment.

<sup>37</sup> [http://www.zeromercury.org/EU\\_developments/Dental\\_Conference\\_Report\\_May07.pdf](http://www.zeromercury.org/EU_developments/Dental_Conference_Report_May07.pdf)

<sup>38</sup> Concorde SA for EEB, 2007 'MERCURY MERCURY IN DENTAL USE:

ENVIRONMENTAL IMPLICATIONS

FOR THE EUROPEAN UNION' [http://www.zeromercury.org/EU\\_developments/Maxson%20Dental%2014May2007%20-%20A5colour.pdf](http://www.zeromercury.org/EU_developments/Maxson%20Dental%2014May2007%20-%20A5colour.pdf)

- Amalgam separators, although they can recover quite a high percentage of dental amalgam waste, have not proven to be a real solution, since lack of maintenance or bad installation can reduce their efficiency, meaning that there will still be emissions of mercury into waste water through dental clinics. Moreover, as the presentation and report from the Commission made clear, the EU as a whole has a very low occurrence of separator installation in dental clinics, particularly 'retroactive' installation in existing clinics.
- Emissions from the crematoria sector increase both localised and national mercury levels through emissions and deposition. All mercury in teeth evaporates during cremation, with no traces of mercury found in the remaining ashes. Installation of filters in crematoria can be quite costly, and even then the abatement technology only removes 95% of mercury leaving the chimneys. In addition, mercury abatement is a form of end-of-pipe control and it would therefore be preferable for mercury to be controlled farther up the process chain.
- Mercury-free alternatives for dentistry exist, including composites, (resin-free) glass ionomer cements, ceramics etc. Some concerns were expressed about the potentially hazardous content of these alternatives (e.g. composites containing bisphenol-A), but hazard-free options are also available on the market. Dentists present at the conference confirmed practising amalgam-free dentistry, with the ability to restore all damaged teeth without amalgams.
- National strategies and/or advisories have been in place against the use of mercury in dental fillings (e.g. in Sweden, Denmark, Germany, Austria, France, Finland). Introduction of financial instruments (e.g. health insurance covering mercury-free amalgams only), practitioners' guidelines and awareness raising on the issue in different countries appears to have made a difference, all of which should be continued in light of the push to phase out the use of mercury in the dental sector and to stimulate a sustainable long-term solution.
- The price of an amalgam might be very low for the consumer if we compare it to the cost of alternatives; however, dental amalgams would be one of the most expensive materials if related environmental costs and (chronic) health effects caused by mercury were also taken into account. The real environmental and health costs should be included in the actual cost of the amalgams.
- Patients in Europe are not always informed about the different choices they have regarding dental fillings and what the effects or risks of one or the other material could be for their health and the environment. Some participants testified that their health deteriorated because of the use of dental amalgams and improved after their removal and detoxification therapy.
- There has been evidence that dental assistants have been seriously affected by the use of mercury while preparing dental amalgams, many reporting having children born with neurological problems. Studies presented from Norway showed dental assistants to have neurological and psychosomatic symptoms, problems with concentration, fatigue and sleep disturbance.
- There was general support for the idea that mercury use in dental amalgams can indeed be decreased or phased out in the coming years, since adequate alternatives are already available and research could provide for a wider range of even better performing materials.

In addition in March 2006, the European Parliament called on the Commission to bring forward a proposal to restrict the use of mercury in dental amalgam by the end of 2007.<sup>39</sup>

In terms of following up with the outcomes of the EU Scientific committees' opinions, since new information has been provided through the COWI, Concorde SA 2008 report, in case further information is potentially needed, action should be taken that this is collected as soon as possible.

#### **Action proposed**

6. Phase out the use of dental amalgam. Justified, time limited exemptions could be considered.

### **2.2.3. Mercury use in Porosimetry - Pycnometry**

Important information has been gathered on this issue from the COWI, Concorde SA 2008 report. This is one of the areas where policy recommendations have been put forward by the consultants. *Mercury consumption for porosimetry is substantially larger than previously expected and may be among the largest remaining uses in the EU today. Although mercury usage takes place in laboratory conditions, which tend to ensure a certain containment of the mercury, direct releases to the environment are expected, however, and due to the substantial amounts of mercury involved, the generated mercury-containing waste contributes significantly to the mercury input to waste in the EU. Alternatives to mercury porosimetry are commercially available today, though with some limitations, but unless mercury use for porosimetry is regulated, it is likely that the further development and implementation of alternatives will be slow. These preliminary findings indicate that it might be useful to investigate this mercury usage in more detail in future work, and that regulation may be warranted in the longer perspective. Also it appears that at least for some uses/types of instruments mercury use can be phased out.*

To that end and from the discussions during the recent EEB,HCWH, ZMWG conference on 'EU Mercury phase out in Measuring and Control Equipment', October 2009<sup>40</sup>, we would propose that steps should be taken to ensure that 100% of the mercury used is recycled, and to phase out mercury use in porosimetry - pycnometry where possible, creating incentives for the development of mercury free alternatives for the remaining uses. .

#### **Action proposed**

7. Take measures to ensure 100% mercury used in porosimetry - pycnometry is recycled.
8. Phase out the use of mercury in porosimetry - pycnometry, with justified, time limited exemptions.

### **2.2.4 Mercury use in Polyurethanes**

As on the above issue, important information has been gathered on mercury use in polyurethane elastomers from the COWI, Concorde SA 2008 report, which concludes that *'Proposing a phase-out of the use of mercury in polyurethane elastomers over a 3-5 year*

<sup>39</sup> <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P6-TA-2006-0078+0+DOC+PDF+V0//EN>

<sup>40</sup> [http://www.zeromercury.org/EU\\_developments/091104EEB-HCWH-Meas-Dev-Conf-Rep.pdf](http://www.zeromercury.org/EU_developments/091104EEB-HCWH-Meas-Dev-Conf-Rep.pdf)

*period, would appear to be preferable to other options, with overall positive impacts on the economy and society.'*

We would further want to underline the consultants' comment that *the global impact of such a phase-out will be significant. On the one hand, other countries have shown a willingness to follow the EU lead toward better mercury management and environmental responsibility. On the other hand, industry has little interest in selling a different product within the EU from that marketed outside the EU, which may not only be commercially inefficient, but also leaves industry open to criticism of applying different standards to different markets.'*

## **Action proposed**

**9.** Phase out the use of mercury in polyurethane elastomers.

### **2.2.5 Mercury use in batteries**

The current regulatory approach for restricting mercury use in batteries is outdated, and is contributing to confusion regarding the tracking and use of mercury in the battery production sector. While mercury use has been eliminated for standard primary batteries, European law still allows up to 2% mercury content in button cells, and much more than that for mercury oxide batteries used in unspecified "medical equipment" or "emergency" purposes. Based on the findings in the most recent COWI, Concorde SA 2008 these allowances for mercury use are not necessary in most cases, and may facilitate continued use of mercury in battery production both for EU consumption and export purposes.

First and foremost, mercury use in button cell production is no longer required, since a growing number of manufacturers are now producing mercury free versions of all various button cell types. Table 2-17 of the COWI Concorde report lists some of those manufacturers. Similar and additional information can be found in a recent report prepared by the State of Maine in the USA.<sup>41</sup> Indeed, Maine and Connecticut will ban the sale of mercury containing button cell batteries from mid 2011<sup>42</sup>, consistent with the US battery manufacturer association's voluntary commitment to produce mercury free button cells by 2011.

Many of the same manufacturers operate in both the EU and USA. Therefore, it is not surprising EU manufacturers like Sony are developing mercury-free button cells and making similar commitments and policy recommendations in the EU<sup>43</sup>. The revisions to the EU mercury strategy should embrace this technology advancement over the last 10 years and phase out mercury use in EU button cell production as soon as possible.

Simultaneously, the EU must carefully consider the remaining exemptions in the battery directive. The exemption for "medical equipment" is vague and overly broad, particularly if it includes hearing aid applications, since mercury free button cells are available for this application. Military applications also appear to be overly broad and ill-specified. As indicated in the COWI Concorde report, greater specificity and oversight of legitimate exemptions are desperately needed to avoid abuse of these provisions and ensure appropriate tracking of this sector.

<sup>41</sup> <http://www.maine.gov/dep/rwm/publications/legislative-reports/pdf/buttonbatteriesreportjan09.pdf>.

<sup>42</sup> [www.maine.gov/dep/rwm/publications/legislative-reports/pdf/buttonbatteriesreportjan09.doc](http://www.maine.gov/dep/rwm/publications/legislative-reports/pdf/buttonbatteriesreportjan09.doc)

<sup>43</sup> Personal communication with SONY, April 2010.

Lastly, the battery sector exemplifies why a ban on exports of mercury products restricted in the EU is warranted, as discussed further elsewhere in these comments. Without such a ban, EU mercury use in this sector could continue, particularly for mercury oxide batteries containing very high levels of mercury. These batteries will frequently be exported to the developing world where the capability for safe management during use and disposal is seriously lacking. The EU should not be contributing to the global mercury pollution problem in this way.

Moreover, without the product export ban, the EU becomes a potential transit route for the global distribution of outdated mercury products, thereby impairing the EU's ability to track mercury consumption in the EU and the effectiveness of its regulatory measures, as the COWI Concorde report vividly reveals.

#### **Action proposed**

10. Ban the production and sale of mercury containing button cells by revising as soon as possible the EU batteries directive.
11. The remaining exemptions in the battery directive must be re-examined because they too are outdated, lack specificity, and may be subject to significant abuse.

#### **2.2.6 Mercury use in light sources**

Mercury is a necessary element that is added to lamps to form a vapour which produces light when current is passed through it under a vacuum. Mercury-containing lamps are already widely used, yet sometimes consumers do not realise that they contain mercury. In the coming years millions of these lamps are expected to flood the EU consumer market and be used in homes, businesses and institutions, since a ban is planned on the incandescent lamp which uses more energy.

Mercury in light sources is regulated currently under the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive 2002/95/EC, where maximum limits of mercury have been set for certain lamp categories (e.g. for compact fluorescent lamps 5 mg Hg per lamp). The annex of this directive is currently under review and, to our knowledge, a new EC proposal has been circulated to Member States and the European parliament, which proposes new lower limits for compact and linear fluorescent lamps, and has added new lamp categories where maximum mercury content limits should be respected. Nevertheless, an unnecessary transition period has been given for the application of these maximum contents, which will prolong possibility for relatively higher mercury exposure to consumers.

The EEB considers that although progress appears to have been made, the maximum mercury content limits could have been stricter, since generally at least two manufacturers per lamp type can reach the lower limits proposed by EEB. Details on our proposals can be found at

- [NGO's Comments on the classification of CFLs and their mercury content \(\(RoHS Annex review\), 7 October 2009](#)
- [Letter to Member States Summary table](#)  
[NGOs Consolidated comments on RoHS review, concerning mercury in lamps](#)

**Action proposed**

12. Restrict further the mercury use in light sources for certain categories.
13. Propose maximum limits for lamp categories which currently have a blanket exemption.

**2.2.7 Mercury use in measuring and control devices in healthcare and professional uses**

As discussed under the assessment section - measures to control and phase out the use of mercury in measuring and control devices has already taken place under Action 7 of the 2005 EU Mercury strategy and the adopted Directive 2007/51/EC relating to restrictions on the marketing of certain measuring devices containing mercury, which restricted the use of mercury in fever thermometers, and in other measuring devices for consumer use.

With respect to the use of mercury in sphygmomanometers in healthcare - further information was provided through the COWI, Concorde SA 2008 report. In October 2009, the EU Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) published their Opinion on: Mercury Sphygmomanometers in Healthcare and the Feasibility of Alternatives.

The report finds that "mercury-free blood pressure measuring devices (when clinically validated) are generally reliable substitutes for mercury-containing sphygmomanometers in routine clinical practice." It also concludes that "there is no evidence of adverse effects on patients' health in clinical settings due to the replacement of mercury containing sphygmomanometers by validated mercury-free alternatives." The report further finds that mercury-based sphygmomanometers are "not essential" for calibration. Therefore, due to the acute toxic hazard to health care workers and chronic hazard to society, these devices have no place in clinical care. They may only be needed for validation of sphygmomanometers in specialised centers and long term epidemiological studies.

These conclusions were in line with the NGOs requests to phase out the use of mercury in sphygmomanometers in healthcare, as they were also discussed and expressed at the EEB/HCWH/ZMWG 2009 conference '*EU mercury phase out in measuring and control equipment*'<sup>44</sup>. Further to the above, and in the medium term the EU should invest the relatively small amount of resources necessary to develop a viable non-mercury reference standard for blood pressure measurement that can serve as a new mercury-free "gold" standard.

As explained before, following the 2007/51/EC directive's requirements the European Commission carried out a review of the availability of reliable safer alternatives that are technically and economically feasible for mercury-containing sphygmomanometers and other measuring devices in healthcare and in other professional and industrial uses. On the basis of this review, and on the basis of the information that was collected as above, the EC requested the European Chemicals Agency (ECHA), to make a proposal under the REACH<sup>45</sup> 'Restriction' process, and requirements of Art. 69. ECHA is expected to make the relevant proposal and

<sup>44</sup> [http://www.zeromercury.org/EU\\_developments/090618\\_Meas\\_Dev\\_conference.html](http://www.zeromercury.org/EU_developments/090618_Meas_Dev_conference.html)

<sup>45</sup> Regulation on Registration, Evaluation, Authorisation and Restriction of Chemical substances, EC 1907/2006, [http://ec.europa.eu/environment/chemicals/reach/reach\\_intro.htm](http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm)



eventually propose a restriction of the use of mercury sphygmomanometers in healthcare, in June 2010. Process under ECHA is on-going.

#### **Action proposed**

14. Ensure a Rapid Phase-out of Clinical Mercury-Sphygmomanometers sales via the REACH restriction route.
15. Take action to promote Development and Validation of an Alternative Reference Standard.

### **2.2.8 Mercury use in lighthouses**

Evidence in the use and potential impacts of mercury in lighthouses has been extensively discussed at the COWI, Concorde SA report.

The report concludes '*It would be consistent with the objectives of the regulation to include mercury that is no longer used in light houses in an amendment to the 1102/2008 regulation. The relatively large amounts of mercury stored in each light house makes it feasible to send the mercury directly for safe storage.*'

This proposal should further be pursued and included as an action to the new EU mercury strategy.

#### **Action proposed**

16. Phase out the use of mercury in new light houses.
17. Request obligatory safe disposal of mercury used in existing lighthouses, amending accordingly the regulation 1102/2008/EC an EU export ban and safe storage of mercury.

### **2.2.8 Mercury in vaccines**

The EEB together with other NGOs had discussed the need to investigate further the use of mercury in vaccines in their 2005 publication<sup>46</sup> - 'Zero Mercury: Key issues and policy recommendations for the EU Strategy on Mercury'. More information can be found in this publication.

Mercury use as a preservative in vaccines, called thimerosal or thiomersal, were not addressed in the 2005 EU Mercury Strategy; however, the Council Conclusions (June 2005) on the Commission's Mercury Strategy highlighted the need to address vaccines<sup>47</sup>.

No relevant action has taken place in the EU to our knowledge until now and since 2005. Our proposals for action since 2005 are therefore still valid.

#### **Action proposed**

<sup>46</sup> [http://www.zeromercury.org/Zero\\_Mercury\\_Policy\\_Paper\\_EN.pdf](http://www.zeromercury.org/Zero_Mercury_Policy_Paper_EN.pdf)

<sup>47</sup> Council Conclusions on the Community strategy concerning mercury, 2670th Environment Council meeting, Luxembourg, 24 June 2005.

18. An expert assessment should be undertaken to determine the extent to which mercury can be appropriately eliminated from vaccines to better protect public health.
19. The Commission should undertake a review of vaccines, to ensure that thimerosal-containing vaccines are not in use in Europe, where alternatives are available. An agreement with manufactures should be sought to eliminate the use of thimerosal in vaccines where not necessary. Wherever needed, vaccines should be labelled to declare mercury contents. Furthermore, the EMEA should publish a comprehensive list of all vaccines licensed in Europe and their thimerosal content, as the FDA does in the United States. Further, the Commission should issue guidelines calling on the EMEA and other health organizations to work with manufacturers to reduce and/or eliminate mercury in vaccines. To that end, priority should be given on research and development of safe, mercury-free, multi-dose vaccines.

### 2.3. Reduce international trade in mercury

According to the regulation's article 8, *Article 8*, The Commission shall organise an exchange of information [...] by 1 January 2010, to examine in particular the need for:

- a. *extending the export ban to other mercury compounds, mixtures with a lower mercury content and products containing mercury, in particular thermometers, barometers and sphygmomanometers;*
- b. *an import ban of metallic mercury, mercury compounds and products containing mercury;*
- c. *extending the storage obligation to metallic mercury from other sources;*
- d. *time limits concerning temporary storage of metallic mercury.*
- e. *This exchange of information shall also consider the research on safe disposal options.*

Until now, the exchange of information organised in November 2009 was concerning only storage and disposal options as well as progress in research related to the solidification/stabilisation of metallic mercury.

The elements of article 8 above have not been yet examined.

The EEB has already been discussing and urging that action should be taken on these issues.

#### 2.3.1. *The export ban should include mercury compounds*

- Compounds are among the world's highest-volume uses of mercury,
- Other compounds such as mercuric chloride and other organo-mercury compounds, are still made in the EU. Various trade names can be used for these products which conceal their mercury content. Many of these compounds may still be made in the EU and exported for mercury recovery, with an economic incentive to do so.
- During earlier discussions the European Parliament had already requested for extended export ban scope to include mercury compounds (with mercury content more than 5% w/w), cinnabar, and mercury containing products which are banned in the EU.
- Mercury compounds are still commonly used in many countries in cosmetics, batteries, pharmaceuticals, paints and biocides, according to CADTSC (2001). The compounds in most frequent use include mercury oxide, mercury chloride, and phenylmercuric acetate.<sup>48</sup>

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<sup>48</sup> Mercury flows in Europe and the world: The impact of decommissioned chlor-alkali plants prepared for DG Environment by Concorde East/West Sprl (February 2004), p.50

- In fact, the use of certain compounds, which MAYASA no longer produces in much volume, has long been promoted by a range of trade names and other descriptions that often appear to have no relation to mercury.<sup>7</sup>
- According to the US EPA (1999), the only major mercury compounds still imported by the US for use in products are organo-mercury compounds. In a recent year, U.S. imports of organo-mercury compounds were said to be 37 tonnes.<sup>7</sup>
- Nevertheless, the geographic locations of major mercury dealers are generally evident from the trade data – unless they convert the mercury to a compound (such as mercuric chloride) to better disguise the movement of raw mercury.<sup>49</sup>
- Pesticides containing mercury compounds including mercuric oxide, mercurous chloride (calomel): other inorganic mercury compounds: alkyl mercury compounds: and alkoxyalkyl and aryl mercury compounds are banned or severely restricted for use in the EU under 79/117/EEC (1991,1992)
- The U.S. Environmental Protection Agency identified additional mercury compounds that can readily be converted into elemental mercury outside of the EU, thereby undermining the elemental mercury export ban.<sup>50</sup>

#### *Mercury Chloride*

- It was formerly used in insecticides, batteries; as an antiseptic, disinfectant, preservative, in metallurgy and as a photographic fixative.<sup>51</sup>

#### *Phenylmercuric acetate*

- Used in general, in consumer products, building materials or furnishings that contribute to indoor air pollution and in pesticide products.<sup>52</sup>

#### *Organo-mercury compounds*

- Important organomercury compounds are the methylmercury cations,  $\text{CH}_3\text{Hg}^+$ ; ethylmercury cations,  $\text{C}_2\text{H}_5\text{Hg}^+$ ; dimethylmercury,  $(\text{CH}_3)_2\text{Hg}$  and thiomersal,  $\text{C}_9\text{H}_9\text{HgNaO}_2\text{S}$ . Organomercury compounds, and dimethylmercury in particular, are notoriously toxic and find use as antifungal agents and insecticides.<sup>53</sup>
- Thiomersal or thimerosal (known to many of us as “Merthiolate” in past decades) is a preservative used in a number of biological and drug products including some vaccines. Thimerosal is approximately 50% mercury by weight, in the organic form of ethylmercury.<sup>54</sup>
- Dimethylmercury is most often used in toxicology experiments as a fixed point of reference due to its extreme toxicity. It has also been used to calibrate NMR (Nuclear Magnetic Resonance) instruments for detection of mercury, although less toxic mercury salts are preferred.<sup>55</sup>

#### Summing up:

- Different trade names can be used for products which do not reveal their mercury content.
- Many of these compounds may still be manufactured in the EU and exported for mercury recovery.

<sup>49</sup> Mercury flows in Europe and the world: The impact of decommissioned chlor-alkali plants prepared for DG Environment by Concorde East/West Sprl (February 2004), p.43

<sup>50</sup> <http://www.epa.gov/hg/pdfs/mercury-rpt-to-congress.pdf>.

<sup>51</sup> [http://en.wikipedia.org/wiki/Mercury\(II\)\\_chloride](http://en.wikipedia.org/wiki/Mercury(II)_chloride)

<sup>52</sup> [http://www.scorecard.org/chemical-profiles/consumer-products.tcl?edf\\_substance\\_id=62%2d38%2d4](http://www.scorecard.org/chemical-profiles/consumer-products.tcl?edf_substance_id=62%2d38%2d4)

<sup>53</sup> [http://en.wikipedia.org/wiki/Organomercury\\_chemistry](http://en.wikipedia.org/wiki/Organomercury_chemistry)

<sup>54</sup> <http://en.wikipedia.org/wiki/Thiomersal>

<sup>55</sup> <http://en.wikipedia.org/wiki/Dimethylmercury>

- It would be economically beneficial to manufacture mercury chloride and oxide and then recover the mercury after export.<sup>56</sup>

### **2.3.2 Mercury-containing products, which are subject to EU use and marketing restrictions should also be covered by the ban.**

- Mercury-containing products make a major contribution to mercury spills, release at disposal, and hence both direct health risks and environmental contamination
- Cost-effective mercury-free alternatives to virtually all mercury-containing products are available
- The EU must avoid double standards. Mercury-containing products which are banned in the EU should not be exported to countries where they may not yet be regulated, and where their disposal is often poorly handled
- In March 2006, the European Parliament called for the export ban to include mercury compounds and products containing mercury which are, or will soon be, subject to EU use and marketing restrictions<sup>57</sup>.
- During earlier discussions the European Parliament had already requested for extended export ban scope to include mercury compounds (with mercury content more than 5% w/w), cinnabar, and mercury containing products which are banned in the EU

### **2.3.3 Restricting imports of mercury and mercury compounds**

Imports of mercury and mercury compounds should be restricted, with the exemption of imports of mercury destined for final storage or disposal. Member States importing mercury or mercury compounds through this exemption process must develop a licensing system for ensuring the mercury will be safely managed and eventually disposed of, and must report relevant data requested to the Commission to track the EU movement of elemental mercury and specified mercury compounds. The licensing system should also include periodic inspections of recyclers and traders of elemental mercury and the specified mercury compounds. Minimum licensing and reporting requirements will also need to be developed to ensure valid and consistent trade data are provided among Member States.

Such measures will be needed to:

- ensure EU mercury supplies are consistent with EU demand, mandatory storage obligations, and policies encouraging mercury recovery from waste and products
- better protect EU waste/mercury recyclers – preventing low-cost mercury from flooding the EU market
- The EU could impose highly-targeted import prohibitions where it is necessary to implement important EU policies<sup>58</sup>

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<sup>56</sup> P Maxson personal communication with B Lawrence, President, Bethlehem Apparatus mercury recyclers, 2005

<sup>57</sup> <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P6-TA-2007-0267&language=EN&ring=A6-2007-0227>

<sup>58</sup> With respect to the purely legal question of confronting trade obstacles, we note the very recent promulgation of Council Regulation No. 1236/2005, restricting trade in products used for torture and other inhuman punishment. We specifically note the import prohibition of equipment that can only be used for capital punishment, torture, or other similar purposes in Article 4 of this regulation. This import prohibition suggests the EU can undertake very targeted import bans where it is necessary to implement important EU policies.

- An import ban of metallic mercury, cinnabar and mercury compounds (with mercury content more than 5% w/w) was also proposed by 1 December 2010 by the European parliament during earlier discussions.

#### **Actions proposed**

#### **20. Implement fully regulation 1102/2008/EC (Mercury export ban); examine in further depth and consider all available information**

- extend the export ban to include mercury compounds and those mercury-containing products subject to EU use and marketing restrictions.**
- restrict imports of mercury and mercury compounds into the EU for purposes other than sequestration (i.e. final storage or disposal).**
- Establish an effective trade tracking and licensing mechanism for tracking imports and exports, and enforcing the trade restrictions.**

### **2.4. Reduce atmospheric emissions of mercury;**

#### **2.4.1 Atmospheric emissions from industrial sectors covered by the IPPC directive**

As discussed in the earlier assessment section, no specific action has been implemented focusing on reduction of atmospheric emissions of mercury. Some reduction in emissions from other pollutants such as NO<sub>x</sub>, SO<sub>2</sub> and dust, even if achieved, has not been analysed in detailed to show whether some co-benefit effect in mercury emissions reduction has been achieved. Therefore most of our earlier 2005 comments are still valid<sup>59</sup>.

Emissions from the following sectors are relevant in terms of mercury emissions

- Large combustion plants
- Smelting- non ferrous metals operations
- Cement industry
- Waste incinerators
- Chloro – alkali industry
- Other industries under IPPC

Mercury emissions from combustion of fuels, in particular **coal** are the largest source of combustion-related emissions. Implementation of existing instruments such as Directive 2001/80/EC to reduce sulphur dioxide will bring some reductions to mercury emissions. However, elemental mercury in particular (with a lifetime in the atmosphere of up to one year), which can travel globally, will still be released to the environment, thereby contributing to global pollution.

<sup>59</sup> [http://www.zeromercury.org/Zero\\_Mercury\\_Policy\\_Paper\\_EN.pdf](http://www.zeromercury.org/Zero_Mercury_Policy_Paper_EN.pdf)

Sector	2005 emissions tonnes	% of 2005 emission
Fossil fuel combustion for power and heating	878	45.6
Metal production (ferrous and non-ferrous excluding gold)	200	10.4
Large scale gold production	111	5.8
Artisanal and small-scale gold production	350	18.2
Cement production	189	9.8
Chlor-alkali industry	47	2.4
Waste incineration , waste and other	125	6.5
Dental amalgam (cremation)	26	1.3
<b>TOTAL</b>	<b>1930</b>	<b>100</b>

Source: UNEP 2008 report 'The Global Atmospheric Mercury assessment: sources emissions and transport' p. 17

Beyond emission limit values, it should be considered that there is no direct relation between concentration rates of emission (as represented by ELVs) and the mass of emissions (total amount emitted). Thus, while coal-fired plants would be subject to controls on their rates of mercury emissions under ELVs, increased coal-fired production in the face of increased gas prices and concerns about the security of gas supplies (as is currently happening) could still lead to an increasing mass of emissions. ELVs also take no direct account of the concentration of coal-fired activity in any particular area – increased economic activity could comply with ELVs while still leading to pollution hotspots.

The co-benefit from the reductions of other pollutants is not enough. Reduction at source of mercury emissions could be achieved when technologies to control other pollutants are used, but this may not exceed 50% of mercury removal capability. Combinations of such technologies could reach higher percentages of mercury removal, but such multiple measures are not widely used.

Methods for preventing mercury pollution before coal is even burned are available, and given that BAT must lead towards “measures designed to prevent emissions and the impact on the environment as a whole”, pre-combustion techniques should be promoted within the strategy to control mercury emissions to the atmosphere. The use of activated carbon injection (ACI), in which a powdered activated carbon (PAC) sorbent is injected into the flue gas should also be further promoted.

Most of the industries contributing to mercury emissions to air fall within the scope of the IPPC directive and relevant BAT reference documents have been developed. However, although the large majority of the Member States take into account the developed BREFs, this is not systematically addressed in all of the relevant legislation and as a result, “remarkable variations in implementation” have been noted. NGOs are concerned that mercury emissions to air from at least three important sources – **the chlor-alkali industry, the cement industry and secondary steel production** – are underestimated.

Regarding the **chlor-alkali industry**, as discussed in separate section, given that the magnitude of emissions is likely to be much greater than currently estimated, it should be a

high priority to phase out reliance on mercury at these plants, in accordance with established and recommended deadlines.

Monitoring of mercury emissions from all relevant industries and good record-keeping are necessary. Technologies preventing the use of mercury and eventually reducing mercury emissions are available and should be adopted. The respective BREFs should be revised and/or separate legislative instruments should be set to consider mercury emissions control, including mercury-free fuel when possible.

#### **Action proposed**

- 21.** Measures designed to prevent emissions of mercury such as mass specific emissions limit values from combustion of fuels plants and mainly coal and other relevant activities under the Integration Pollution Prevention and Control (IPPC) Directive or the forthcoming Industrial Emissions Directive (IED), other existing legislation or a separate legislative instrument should be introduced and the Commission should take action as soon as possible.
- 22.** National mass emission limits as well as local air quality limits for mercury should be set under relevant existing or a separate legislative instrument.
- 23.** In addition to mercury emission control technologies, the use of low-mercury coal, coal cleaning, selection of coal for low-mercury emissions, or switching to a cleaner fuel should be implemented over time. Such issues should be considered when revising the respective BREFs and for research and development if necessary.
- 24.** In light of the major contribution of the industrial sector to mercury air emissions, it is necessary to set mass specific Emission Limit Values in line with BATAEL for mercury, as minimum action, from all relevant activities – including the chlor-alkali sector, cement manufacturing, and secondary steel production.
- 25.** A sunset date should be set for the mercury use in the chlorine sector.
- 26.** Under the review of the BREF on chlor-alkali, the mercury-cell technique shall not be presented under the BAT chapter. For the remaining life of Mercury cell chlor-alkali plants (MCCAP) a maximum Best Achievable Emission Levels should be referred to in the BREF as 0,2- 0,5 g Hg/tonne of Cl<sub>2</sub> production capacity, as a clear guideline for permit writers . Following this, there is a need for more enforcement and follow ups of the chlor alkali plants to ensure they implement the the BREF.
- 27.** All BREFs for relevant industries should include measures to prevent mercury emissions and BAT Associated Emission Levels for mercury.
- 28.** The role of the BREFs in the IPPC/IED directive should further be strengthened.

#### **2.4.2 Atmospheric emissions from small combustion plants**

A special study concerning mercury emissions from small combustion plants was carried out under the 2005 EU Mercury strategy<sup>60</sup>. The inventory estimates that small combustion installation (SCI) sources account for 16% of total European emissions. This compares to an

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<sup>60</sup> [http://ec.europa.eu/environment/chemicals/mercury/pdf/sci\\_final\\_report.pdf](http://ec.europa.eu/environment/chemicals/mercury/pdf/sci_final_report.pdf)

estimation of 25% in earlier studies. Regardless of this difference and the apparently high level of uncertainty within the inventory, mercury emissions from SCIs remain a large component of the EU inventory, and a source for which controls may be available. Different scenarios are identified and recommendations are made respectively. None of these has currently been implemented and the report has not been discussed further.

#### **Actions proposed**

- 29.** The Large Combustion Plants Directive (2001/80/EC), the IPPC (merged in the IED Directives) should be extended to cover mercury emissions from combustion of fuels from installations with a thermal input of 20MW and above as well as residential coal combustion. A complementary legislative instrument could be developed.
- 30.** Rather than relying on the incidental capture of mercury by pollution control technologies designed to capture other pollutants, it is imperative that binding measures on prevention such as Emission Limit Values be established, as in the case of waste incinerators, to achieve consistently high reductions in mercury emissions. In this way, pollution control measures for mercury can be integrated into retrofits to meet ELVs for SO<sub>2</sub>, PM, and NO<sub>x</sub> by 2008 under the LCP Directive and BAT in the IPPC BREF.
- 31.** Recommendations of the 2005 study should be implemented

#### **2.4.3. Atmospheric Emissions from crematoria**

Emissions from crematoria are not covered by Community law, but are regulated in several Member States, and are also the subject of OSPAR Recommendation 2003/4. Although mercury emissions from crematoria was discussed at the Extended Impact Assessment carried out for the 2005 EU mercury strategy, no actions were proposed and implemented at EU level.

Our comments from our 2005 publication are still relevant<sup>61</sup>.

It has been estimated that there are between 2 and 3.5 tonnes of mercury released annually from crematoria. In the UK crematoria are responsible for 16% of mercury emissions and, without controls, will be the largest source of mercury pollution by 2020. Legislation on crematoria is already in place in Denmark, the Netherlands, Germany and the UK and should be compared and evaluated as part of this investigation. The relevant OSPAR recommendation covers only 12 of the 25 EU Member States and no sanctions are foreseen in cases of non-implementation<sup>62</sup>. Reports on emissions from crematoria, from the OSPAR parties were due by September 2005 but we have not been able to find any relevant reports.

Special measures have been taken with respect to mercury emissions from crematoria in the UK<sup>63</sup>. Best Available technique measures appear to be implemented. Furthermore industry itself created the Crematoria Abatement Mercury Emissions Organisation (CAMEO) scheme, a crematoria abatement system scheme<sup>64</sup>. This is a burden-sharing scheme where all members pay per cremation, then receive payment per abatement. This scheme also enabled

<sup>61</sup> [http://www.zeromercury.org/Zero\\_Mercury\\_Policy\\_Paper\\_EN.pdf](http://www.zeromercury.org/Zero_Mercury_Policy_Paper_EN.pdf), p.59

<sup>62</sup> Belgium, Denmark, Germany, Finland, France, Ireland, Iceland, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and European Union, <http://www.ospar.org/fr/html/cp/welcome.html>

<sup>63</sup> [http://www.zeromercury.org/EU\\_developments/Dental\\_Conference\\_Report\\_May07.pdf](http://www.zeromercury.org/EU_developments/Dental_Conference_Report_May07.pdf)

<sup>64</sup> <http://www.fbca.org.uk/cameolink.asp>



a phased approach which was not in government recommendations with targets: by 2008, 10% of cremations abated, by 2010, 20% and by 2012, 50%.

Further to that mercury emissions from crematoria are discussed in the COWI, Concorde SA 2008 report which concludes that *'the costs of emission reduction of one kg mercury in crematoria is in the same range as the lower estimate of the costs of substitution of dental amalgam. It is clearly indicated that applying high efficiency filters and maintenance requirements is a quite cost effective measure, with a price per kg mercury release reduction of only 1/10 of the costs of reduction the releases from crematoria. Because of the large quantities of mercury accumulated in the teeth of the population, substitution and "end-of-pipe" measures are, in the short term, not so much possible alternatives; rather both measures are necessary at the same time. Over the longer term, of course, the "end-of-pipe" measures would no longer be needed as dental mercury no longer reaches any waste stream in significant quantities.'*

#### **Action proposed**

32. Mercury emissions from crematoria should be further investigated, including relevant technologies or other effective approaches, for eventual control at EU level. Emission limit values for this source should be proposed by the European Commission as soon as possible.

### **2.5. Address mercury-containing waste and remediation of contaminated sites;**

#### **2.5.1 Mercury containing-waste**

Mercury containing-waste are generally discussed by the COWI, Concorde SA 2008 (p.192) report; separate collection rates are rather low resulting in secondary emissions from landfills and waste incinerators. To that end several recommendations are provided and should be considered for the new EU Mercury strategy.

#### **Action proposed**

33. The EC should take measures to further raise awareness and increase knowledge on the fact that certain products contain mercury, to ensure that for those products which relevant law is in place, these are collected separately and safely (e.g. lamps, batteries). Better labeling of products containing mercury will also facilitate separate collection.
34. For products/waste the separate safe collection of which is not explicitly requested by law- e.g. for mercury thermometers, additional measures need to be taken thereof.

Considering the relevant emissions caused, special attention is needed on dental amalgam waste.

#### ***Dental amalgam waste***

A significant proportion of mercury release into the environment still comes from European dental clinics in the form of waste or directly into the waste water system.<sup>65</sup> As discussed earlier on under the assessment of Action 4 of the 2005 EU Mercury Strategy, when looking at the contribution of mercury pollution from mercury waste from dental clinics the EC report shows that many if not all Member states may be in breach of the requirements of the directives on waste as discussed earlier. Nevertheless no further measures have been taken from the Commission.

Transposition of EU legislation to the Member State level, not to mention enforcement, has not been consistent. In 2004 the Commission notified the UK that amalgam filters, as a minimum, are necessary to comply with Article 4 of the Waste Framework Directive. This followed an investigation that “revealed weaknesses in the UK’s implementation of the Waste Framework and Hazardous Waste Directives in relation to this type of waste,” and in which the Commission discovered that dental amalgam was not being treated as a hazardous waste in the UK, but rather released directly into the environment by most dental clinics. The Commission’s Mercury Strategy consultation document indicated that many other Member States were similarly lax in addressing the collection and disposal of amalgam waste at dental practices<sup>66</sup>

Dental amalgam waste were also discussed by the COWI, Concorde SA 2008 study.

For the time being, the EC appears to rather be postponing the solution of the problem by mentioning that it will be followed up under the EU water regulations.

Following above comments and recommendations from the 2008 study we would propose the following actions:

#### **Action proposed**

- 35.** Those EU Member States which currently lack legislative measures for amalgam separators requirements should provide a timetable for doing so to the Commission in the short term. Those failing to provide this timetable should be identified as priorities for follow-up administrative action by Commission staff.
- 36.** Introduce obligatory measures ensuring that highly efficient amalgam separators are installed in dental clinics. More rigorous installation and monitoring as regards separation, the introduction of devices in the wastewater system of dental offices, good record-keeping and devices that meet a high standard would be needed.
- 37.** In addition, the Commission should ensure that mercury-laden pipes and plumbing fixtures (i.e. nearly all wastewater systems serving dental practices) are cleaned and/or replaced since they have long accumulated mercury wastes and constitute an ongoing source of mercury release. Other dental-related activities should include: ensuring historic supplies of elemental mercury currently stored at dental offices are appropriately managed, and ensuring that mercury-laden solid wastes from dental offices are handled as hazardous waste, in accordance with law, so that they are removed from the economic cycle rather than improperly disposed of, or combusted in medical or municipal waste incinerators.

<sup>65</sup> Dental sector as a source of mercury contamination, European Environmental Bureau, May 2007, page 7

<sup>66</sup> [http://www.zeromercury.org/EU\\_developments/Maxson%20Dental%2014May2007%20-%20A5colour.pdf](http://www.zeromercury.org/EU_developments/Maxson%20Dental%2014May2007%20-%20A5colour.pdf)

### **2.5.2 Remediation of mercury-contaminated sites**

No relevant action was proposed from the 2005 EU Mercury strategy. Once more the information provided in the COWI, Concorde SA 2008 study should be considered. In addition our 2005 comments are still relevant<sup>67</sup>.

#### **Action proposed**

- 38.** Contaminated sites (former mining sites and others) should be identified and classified according to the degree of contamination and urgency of remediation.
- 39.** The contribution of mercury emissions from contaminated sites to the overall emissions should be calculated.
- 40.** Standards and methodologies should be developed and agreed upon on a European-wide basis and harmonised with those under development in other parts of the world.
- 41.** Harmonised and standardised protocols for estimation of emissions should also be considered in order to obtain comparable data.
- 42.** Integrated tools for the remediation of mercury-contaminated sites should be developed.
- 43.** Mixed exposure of humans and wildlife to inorganic mercury and organomercury (MeHg) in mercury polluted sites should further be addressed and studied, due to possible combined effects.
- 44.** Areas contaminated by mercury (former mining sites and others) need to be further restored and brought to a reasonable condition.

### **2.6. Increase knowledge through awareness-raising and scientific information exchange;**

Gaps in knowledge on the mercury problem and its possible solutions can be filled by further research, development and pilot projects.

The 7th Research Framework Programme or other EU programmes should promote projects which contribute to filling in those gaps which have been identified by this present document, EU studies - COWI, Concorde SA 2008, and other.

Consumers are not well informed about the hazardous content of products they use, and as a result may dispose them inadequately increasing the risk for pollution and further exposure.

Special attention is needed in separate collection and treatment of mercury-containing waste. In the area of waste electrical and electronic equipment, although relevant legislation is in place since 2003 - collection rates are generally low in particular for energy efficient mercury-containing lamps<sup>68</sup>.

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<sup>67</sup> [http://www.zeromercury.org/Zero\\_Mercury\\_Policy\\_Paper\\_EN.pdf](http://www.zeromercury.org/Zero_Mercury_Policy_Paper_EN.pdf)

<sup>68</sup> see presentations from Mr. Rob Koppejan, ELC - Philips, and Mr. Pascal Leroy, Secretary General, WEEE Forum from 2008, EEB conference - "Mercury-containing lamps under the spotlight", [http://www.zeromercury.org/080627\\_EEB\\_conf\\_lamps.html](http://www.zeromercury.org/080627_EEB_conf_lamps.html)

With respect to non-electric and electronic devices containing mercury - awareness raising and special programmes to safely collect and treat/dispose those devices should be established - such as mercury thermometer collection , and exchange with mercury free products if possible. Examples of such exchanges have already taken place in France<sup>69</sup>, Austria, and Germany<sup>70</sup>.

## **2.7. Reduce emissions to water and soil**

Important sources of mercury emissions to water and soil are dental clinics, industrial processes, waste landfills and application of sewage sludge.

Issues related to dental clinics have been covered under 2.2.2 and 2.5.1 .

Emissions from industrial processes are mainly covered under the atmospheric emissions section. References to IPPC are also valid with respect to emissions of pollutants to water and soil. Furthermore, directive on Priority substances 2008/105 has been adopted setting limits of concentrations in surface waters of 33 priority substances, including mercury and 8 other pollutants. The environmental quality standards for the priority substances and other pollutants listed in Annex I of this directive should be met by 2015.

### ***2.7.1 Emissions from sewage sludge***

The presence of mercury in sewage sludge makes it more difficult to use sludge as an agricultural fertilizer. In 1999 the average mercury content of sludge used in agriculture was 1.5 mg/kg of dry matter, leading to the introduction of 4.3 tonnes of mercury to EU agricultural land<sup>71</sup>. Sludge is regulated by Directive 86/278/EEC of June 1986. Member States must prohibit the application of sewage sludge to soil where the concentration of one or more metals in the soil exceeds the limit values laid down in the first annex. For mercury the soil limit value is 1 to 1.5 mg/kg of dry matter for soils with a pH higher than 6 and lower than 7. Member States must also regulate the use of sludge so that the accumulation of heavy metals in soil does not exceed the limit values, in two ways: a) by laying down the maximum quantities of sludge which may be applied per unit of area per year while observing limit values for heavy metals concentration in sludge set in accordance with a second annex - for mercury this limit value is 16 to 25 mg/kg of dry matter; or b) by observing limit values for the quantities of metals introduced into the soil per unit of area and unit of time as specified in a third annex – for mercury this limit value is 0.1 kg/ha/yr.

Sweden uses another set of standards, for which the level of mercury in sludge must not exceed 2.5 mg/kg of dry matter to be used as a fertiliser on arable land. The Swedish Environmental Protection Agency has proposed reducing the limit to 1.8 mg/kg of dry matter as from 2005<sup>72</sup>.

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<sup>69</sup> <http://www.contaminations-chimiques.info/?2007/11/08/171-collecte-de-mercure-a-paris-avec-le-cniid>

<sup>70</sup> personal communication with DNR

<sup>71</sup> EU Legislation and Policy Relating to Mercury and its Compounds. Working Document, June 2004. Prepared to inform the development of an EU strategy on mercury, p. 12/42.

<sup>72</sup> KEMI - Swedish Chemical Inspectorate. Mercury – Investigation of a general ban

The high mercury content in sewage sludge has led treatment facilities to search for other recipients willing to buy it, as mercury removal from sludge is not cost effective and combustion of sludge in waste incineration plants or special incineration plants for sewage sludge is expensive<sup>73</sup>. In some cases, it is sold to combustion plants to be burned in conjunction with coal, but this leads to higher mercury emissions to air, as discussed above, often involving additional pollution control measures.

The Commission adopted a Soil Thematic Strategy (COM(2006) 231) and a proposal for a Soil Framework Directive (COM(2006) 232) on 22 September 2006 with the objective to protect soils across the EU. The Strategy and the proposal have been sent to the other European Institutions for the further steps in the decision-making process. Despite the efforts of several Presidencies, the Council has been so far unable to reach a political agreement on this legislative proposal due to the opposition of a number of Member States constituting a blocking minority. The upcoming Presidencies will need to resume the discussions in order to make progress on this file.

#### **Action proposed**

**45.** Revision of the EU directive on sludge, dated from 1986 (86/278), is needed as soon as possible individually or in a package with the eventual adoption of the soil framework directive.

### **2.8. Protect against exposure**

The EU Commission Extended Impact Assessment on Mercury noted evidence of continuing exposures at or above the recommended 'safe' levels among some of the European population, especially in Mediterranean countries and the Arctic<sup>74</sup>. In the USA, where exposure levels may be comparable, a study<sup>75</sup> estimates that between 300,000-600,000 babies born each year suffer from intelligence loss due to methylmercury exposure, which costs an estimated 8.7 billion dollars a year in lost earnings to the economy<sup>76</sup>.

The European Commission has adopted in 2008 a proposal for a regulation on the provision of food information to consumers, (COM(2008)40). Currently this proposal is following the decision making process in the EU institutions.

Providing health information to fish consumers regarding the presence of methylmercury in certain fish should be a priority to help women and people caring for children to make informed decisions. Targeted consumer safety labelling is an appropriate approach in this case.

#### **Action proposed**

**46.** Member states, European Parliament and the EC should ensure that consumers receive information about the presence of toxic mercury, and in particular concerning labelling of

<sup>73</sup> Integrated Pollution Prevention and Control, Reference Document on Best Available Techniques for Large Combustion Plants LF/EIPPCB/LCP\_BREF\_FINAL, May 2005, p. 507.

<sup>74</sup> Extended Impact Assessment – Communication from the Commission to the Council and the European Parliament on Community Strategy Concerning Mercury, SEC(2005) 101, p.5

<sup>75</sup> Mount Sinai study: Public health and economic consequences of Methyl Mercury Toxicity to the Developing Brain, February 28, 2005 <http://ehp.niehs.nih.gov/members/2005/7743/7743.pdf>

<sup>76</sup> US EPA <http://www.epa.gov/waterscience/fish/advice/mercupd.pdf>

the **mercury content** of *meat from large predatory fish or foodstuffs containing meat from these fish species*. An amendment to the regulation should be added accordingly informing that: '*contains methylmercury- not recommended for pregnant or breastfeeding women, women who might become pregnant, and children*' to be added immediately after the list of ingredients. In absence of a list of ingredients, the statement should accompany the name of the food.

The US, several Member States and other countries, have already issued specific advice to vulnerable groups to limit or abstain eating certain species of fish in order to reduce methylmercury intake. This proposed amendment is in line to the EU Strategy on mercury (January 2005), aiming to reduce mercury levels in the environment and human exposure, especially from methylmercury in fish<sup>77</sup>.

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<sup>77</sup> EU Strategy on mercury, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52005DC0020:EN:NOT>