EUROPEAN ENVIRONMENTAL BUREAU

EEB proposals to ensure a robust revised EU Mercury Regulation (Eck draft report, ENVI committee)

Brussels, 4 July 2016

The European Environmental Bureau welcomes the release of the proposed European Commission regulation to implement the Minamata Convention on Mercury, but is concerned by its minimalist approach, which would create yet another area where the EU is rapidly losing its global leadership role. Despite the EU having played a leading role in the development and negotiation of the Convention, the proposed regulation appears to have fallen victim to the EU's Better Regulation agenda, following the lowest-cost approach to meeting minimal requirements rather than promoting a higher – easily achievable and still cost-effective – level of environmental protection.

Among other pathways, it is well known that mercury travels throughout the atmosphere, contaminating European and global food supplies at levels posing a major risk to human health, wildlife and the environment. We therefore recommend that several key aspects of the regulation should be strengthened beyond the requirements of the Minamata Convention, to adequately ensure protection of human health and the environment while sending a clear and unequivocal signal to the many other countries working toward the same objectives.

To that end the EEB welcomes the draft rapporteur's report (Eck draft report, ENVI Committee), proposing to substantially strengthen the Commission's proposal, making it into an ambitious EU regulation, giving clear signals to the global community and putting the EU to a leadership position towards tackling the mercury problem.

Along those lines, we strongly call for strengthening the EC proposal, as per our views below.

Given the discussions in the EU for over a decade now, our priorities into strengthening the regulation are summarised below:

I. **The export of mercury-added products that are not allowed to be marketed in the EU, shall be prohibited -** to avoid double standards and to ensure they are not reaching countries with no or less stringent regulations to manage mercury – since alternatives exist, such a measure will promote mercury-free markets and drive prices down. (p.4,point 4)

II. **The use of mercury in dentistry should be phased out;** mercury-free dental restorations are available, affordable, effective and preferred by most EU citizens. Phase out is the most cost-effective way to prevent dental mercury pollution; (p.9,point 10)

III. **The use of mercury in industrial facilities located in the EU, where mercury is used as catalyst or electrode, should be prohibited:** Mercury free processes exist since the seventies in many cases (e.g. chlor-alkali) (p.5, point 5)

IV. **Waste mercury should be solidified/stabilized before disposal in underground facilities,** providing additional safety during handling and disposal. Conditions for environmentally safe disposal of waste metallic mercury and mercury sulphide should be set, and be stricter than those for temporary storage. Given the available capacity for solidification/stabilization, only short term temporary storage should be allowed, preferably in above ground facilities (p.6-8, points 6,7 and 8)

V. **A comprehensive trade tracking system needs to be set up,** to record information from exports and imports of elemental and compound mercury between MS, between the EU and external countries and also within the industry sector, to better know where the mercury is. (p.11, point 11)

VI. **The scope of the export ban should be expanded** to include additional mercury compounds and mercury waste, to avoid cases like DELA. (p.2,point 2)

A strong EU position recognises the EU's responsibility for its share of the problem. Ensuring, among other, an EU export ban of mercury, mercury compounds and mercury-added products, is also a pragmatic acknowledgement that there is little point in simply reducing mercury demand within the EU, while allowing unwanted mercury and mercury added products to be exported to the developing world under far less stringent controls, much of the mercury released there, with the risk that it will ultimately return to Europe's atmosphere and eventually be taken up by the fish we eat.

The EU's leadership in resolving global mercury problems is an economic, health, environmental and moral imperative. Strong EU leadership will encourage other countries to reduce mercury consumption as well as engage in multilateral and global trade agreements, which are clearly needed to significantly reduce mercury as a global pollutant.

The value of a strong EU commitment to tackling mercury problems on the global stage must not be underestimated. This is a straightforward opportunity to reduce the health risks to millions of EU citizens, and many more globally, that we cannot afford to miss.

Areas where the EC proposed regulation on mercury should be strengthened

Following the order of the articles/issues presented in the proposed regulation, we therefore urge the European Parliament and Council to improve and strengthen the Commission's proposal in the following ways:

1. The regulation should be based on Art. 192(1) with regard to the Treaty on the Functioning of the European Union and allow Member States to implement stricter measures, as early as appropriate

The proposed measure is driven by the objectives of protecting the environment and human health, not by commercial policy considerations. The legal basis should therefore refer to the environment and allow Member States to adopt more stringent measures (as per Art. 192 and 193 of the TFEU).

2. The scope of the mercury export ban should be expanded.

a. All of the mercury compounds mentioned in the Minamata Convention should also be included in Annex I, namely mercury(II) sulphate, mercury(II) nitrate and mercury sulphide should be added. The now adopted TSCA reform bill in the U.S., includes an export ban for these compounds, effective in 2020. The rationale – in line with the ban on exports of commodity mercury – is to ban the export of any compound from which elemental mercury may be recovered with relative ease.[1]

- **Mercury(II) sulfate** is used as the catalyst for the production of acetaldehyde; methylmercury, the most toxic mercury form, is generated as a side product of this reaction and can present a significant health threat. Inhalation of mercury sulfate can result in acute poisoning, causing tightness in the chest, difficulty breathing, coughing and pain. Lastly, ingestion of mercury sulfate will cause necrosis, pain, vomiting, and severe purging and can result in death within a few hours due to peripheral vascular collapse.[2]
- **Mercury(II) nitrate** was used to treat fur to make felt in a process called 'carroting'. The phrase 'mad as a hatter' is associated with damage to the nervous system and psychological illness brought on by excessive exposure to mercury(II) nitrate. Mercury nitrate tends to impact the body as Hg^{2+}, a form of inorganic mercury that may be found

[1] Report to Congress: Potential Export of Mercury Compounds from the United States for Conversion to Elemental
[2] https://en.wikipedia.org/wiki/Mercury(II)_sulfate

in various applications including in skin lightening creams. If inorganic mercury is ingested, it can change the structure of important proteins within the body. If it gets into the soil, it can be absorbed and taken up by plants. Those suffering from inorganic mercury poisoning tend to experience vomiting and diarrhea as initial symptoms.[3]

- **Mercury sulphide is** a chemical compound composed of the chemical elements mercury and sulfur; one of its crystal forms is cinnabar, which is the most common form of mercury in nature.[4] Mercury sulphide can also be chemically produced or "solidified" from elemental mercury.[5]

Mercury compounds remain among the world's highest volume uses of mercury. In 2012 and 2013 the EU-28 exported 372 metric tons of mercury compounds (CN code 28520000), according to Eurostat[6]. It is not known whether any of these compounds were exported for the purpose of mercury recovery. They are often sold using trade names that do not reveal their mercury content.

b. Mercury-containing wastes should be prohibited from export to countries outside the EU.

According to EU legislation[7], mercury-containing wastes can be exported with the consent of the receiving country only to OECD countries[8]: Norway, Switzerland, Iceland, Australia, Canada, Japan, Korea, Mexico, New Zealand, Turkey and the United States. These countries have facilities that can extract mercury from mercury compounds or mercury containing wastes. Therefore, the proposed regulation has is a loophole whereby mercury can still be exported indirectly from the EU, as occurred with the recent illegal mercury exports of DELA.[9] This loophole needs to be closed to avoid such incidents in the future.

3. Consider prohibiting the import of mercury, mercury compounds and mixtures unless they are intended for environmentally safe disposal.

- To ensure that EU mercury supplies are reasonably balanced with EU demand, mandatory storage obligations, and policies, encouraging mercury recovery from wastes and products.
- To better protect the EU waste/mercury recyclers by avoiding lower-cost mercury flooding the EU market.
- To gain the environmental benefits from such a ban, as less mercury would be entering the EU market.

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[3] https://en.wikipedia.org/wiki/Mercury%28II%29_nitrate
[4] https://en.wikipedia.org/wiki/Mercury_sulfide
[5] REMONDIS-stabilisation facility in Dorsten (x-DELA), has a capacity of 400 tons p.a. turning pure liquid mercury into the near-natural cinnabar (HgS) for environmentally responsible disposal. (communication with Remondis, http://www.remondis-aktuell.com/en/remondis-aktuell/022015/recycling/mercury-back-to-nature/)
[6] Eurostat database: 'international trade detailed data,' as cited in Ratification of the Minamata Convention by the EU: Complementary assessment of the mercury export ban, COWI and BiPRO for DG Environment, European Commission, 9 June 2015.
[7] Regulation 1013/2006 on shipment of waste: Art. 36: exports of waste (for recovery) listed as hazardous in Annex V (mercury and mercury-containing wastes are included) are prohibited to non-OECD countries. (Therefore they are allowed to OECD countries, with the consent of the receiving country). Therefore according to EU legislation, mercury-containing wastes can be exported for recovery with the consent of the receiving country ONLY to OECD countries: therefore to Australia, Canada, Chile, Iceland, Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey and the United States.
[8] OECD countries: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland , France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
[9] A now defunct German waste recycling company, DELA GmbH, was found in recent years to have illegally exported over 1,000 tons of excess metallic mercury mostly from the EU chlor-alkali industry, circumventing the EU export ban, with the illicit mercury making its way on to the global market. DELA disguised the mercury as "waste" and exported around 500 tonnes to Switzerland, Greece, the Netherlands and other countries. DELA was reportedly able to get around the EU mercury export ban regulation by not solidifying/stabilising the mercury for storage and disposal as they were required by contractual obligation. The authorities still do not know where all the mercury went, but it is clear that many of the destination countries are known to trade with countries where there is significant use of mercury in artisanal and small-scale gold mining (ASGM). ASGM operations are among the highest emitters of mercury to the environment, as well as exposing miners and their families to this dangerous neurotoxin.

- To reduce EU and overall mercury demand, potentially speeding closure of existing primary mercury mines, with the various environmental benefits that this entails.

We would like to point out that:

- The EU has the power to undertake targeted import prohibitions where it is necessary to implement important EU policies.[10]
- The Impact Assessment (IA) has not considered this scenario, which would still allow the EU the economic benefits of environmentally safe disposal; therefore this would not entail any appreciable cost for the EU.

Together with an import ban (unless for disposal), transit of mercury and mercury compounds via the EU may also be considered for prohibition. There is no need to facilitate the trade of a substance for which the official EU policy is to reduce and, where feasible, eliminate its use.

In all cases, there is a need to improve the accuracy of reporting for mercury and mercury compounds that pass through a country that is not the final destination; some Customs agencies may record the original source of the commodity, while others may record the final country.

4. Ban the export of mercury-added products that are not or will soon not be allowed to be marketed in the EU

- The EU should avoid a double standard. Mercury-added products prohibited in the EU should not be exported to other countries, especially as many of those countries may have less stringent or no regulations to manage mercury.
- Cost effective mercury-free alternatives are available for virtually all mercury containing products.
- The economic impact from banning the export of mercury-containing products already restricted in the EU is estimated to be small, as stated in the EU Impact Assessment.[11]
- Such a measure will encourage mercury-free markets and drive down the prices of mercury-free alternatives;
- Re-location of EU businesses is unlikely, considering that mercury use is going down and equivalent measures in other countries are being implemented. Furthermore, big international markets such as India and China are following the lead of EU legislation as demonstrated below.
- Mercury containing products contribute significantly to mercury spills and releases, especially in the waste stream, and therefore result in both direct health risks and environmental contamination.
- The European Parliament (March 2006) previously called for the export ban to include mercury compounds and mercury-added products that are or will soon be subject to EU marketing and use restrictions.

With reference to the specific products listed:

- Batteries: Mercury is banned from all batteries in the EU. The European Portable Battery Association (EPBA) supports the export ban of all mercury-added batteries, and not only the ones targeted by the Minamata Convention[12].
- Lamps:
  - Regarding compact fluorescent lamps (CFLs) and linear fluorescent lamps (LFLs), the EU under RoHS already has stricter measures than those included in the Minamata Convention. There is no evidence to suggest that there will be any economic

[10] With respect to the purely legal question of confronting trade obstacles, we note the 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.

[11] Impact Assessment – accompanying document to the proposal for a regulation on the banning of the exports and the safe storage of metallic mercury COM (2006) 636 final, p.44

[12] Impact Assessment – Ratification and Implementation oby the EU of the Minamata Convention on mercury, p.27

advantage for industry to keep two different production lines for export, when the price of the lamps is the practically the same.

- The recent consultants' report assessing the RoHS exemptions on mercury in lamps recommends that low wattage CFLs as well as LFLs (T5, T8 and T12) are banned by 21 January 2018[13].
- Furthermore in relation to other international markets, India just adopted very similar standards to the EU RoHS for CFLs and LFLs, which will be in place by 1st October 2016, for all lamp manufacturing and imports. In China a non-binding lamp mercury roadmap issued by the Ministry of Industry in February 2013 includes even more stringent mercury levels than the EU (e.g., 1.5mg Hg for CFLs <30W).[14]
- Halophosphate lamps are already banned in the EU and are being rapidly replaced in other countries by triband fluorescent lamps.
- To align policies, the full listing of products with restrictions included in the RoHS concerning mercury should be banned from export.

- Measuring Devices:
  - As compared to the Minamata Convention, more categories of mercury-added measuring devices are prohibited in the EU market as per Directive 847/2012, because mercury-free alternatives are available. The EU export ban should be aligned with this Directive, whose economic impact was carefully studied before the Directive was implemented.
  - The use of mercury-added measuring devices for calibration of sphygmomanometers is not allowed in the EU, and therefore their export should also be banned, for similar reasons as above.

5. Ban altogether the use of mercury in EU industrial facilities where mercury is used as a catalyst or as electrode[15].

- It should be clearly confirmed that the mercury cell chlor-alkali process is banned from 11 December 2017. The relevant 2013 BAT conclusions establishing Best Available techniques (BAT) for the production of chlor-alkali[16] were published in the Official Journal of the European Union on 11 December 2013. The Industrial Emissions Directive requires the operators to comply with these standards within a maximum of four years after publication date. This means that the closure or conversion of mercury cells for the remaining installations should be undertaken by 11 December 2017 at the latest. Alternative mercury-free technologies have been in use since the 1970s.

- A phase out provision for the alcoholate industry (concerning two plants in Germany) should be included as per the requirements of the Minamata Convention. The current EC proposal appears not to meet the minimum requirements regarding this sector, which are covered by Minamata Convention provisions:
  - Annex B, Part II(i) – "Measures to reduce the use of mercury aiming at the phase out of this use as fast as possible and within 10 years of the entry into force of the Convention;" and/or
  - Annex B, Part II(v) – "Not allowing the use of mercury five years after the Conference of the Parties has established that mercury-free processes have become technically and economically feasible."

  Mercury free technologies are also commercially available for the production of sodium methylate and sodium ethylate. Therefore the use of mercury for these substances should be phased out as soon as possible.

[13] Assistance to the EC on Technological Socio –Economic and Cost Benefit Assessment Related to Exemptions from the Substance Restrictions in Electrical and Electronic Equipment, 7 June 2016, http://rohs.exemptions.oeko.info/fileadmin/user_upload/RoHS_Pack_9/RoHS-Pack_9_Part_LAMPS_06-2016.pdf
[14] http://www.miit.gov.cn/n11293472/n11295091/n11299314/n15219389.files/n15219357.pdf.
[15] Mercury is used as a catalyst for the production of acetaldehyde, VCM and polyurethanes. Mercury is used as electrode in the chlor-alkali and alcoholates' production.
[16] See CAK- BAT conclusions of 9 December 2013, OJEU L 332/34 of 11 December 2013

Since potassium methylate can also be produced commercially with mercury-free processes, and potassium ethylate can be produced mercury-free at laboratory scale, more time can be allowed until a phase out, to ensure the availability of quantities and quality of these products – if indeed market demand remains. Previous industry arguments about potential scarcity of these substances have not been confirmed based on available information.[17]

- A ban by 10 October 2017, should be clearly confirmed for the use of mercury as a catalyst for the production of polyurethane elastomers. While EU directive 848/2012 foresees the ban (by 10 October 2017) of the 5 organic mercury compounds that have most often been used as catalysts, it has come to our attention that other mercury compounds (e.g. mercury diphenyl-tetrapropenyl succinate - CAS Nº 272236-65-3), are also used in this sector, circumventing the intention of the legislator, which was to effectively phase out this application, for which mercury-free alternatives are available.[18]
- We welcome the proposed prohibition of the use of mercury or mercury compounds in vinyl chloride monomer (for PVC) and acetaldehyde production processes.

6. Temporary storage of mercury waste should be allowed for a short period of time (3-5 years maximum), preferably in appropriate above ground facilities.

- Around 6000 tonnes of liquid metallic mercury are expected to be available for disposal after the decommissioning of the EU chloralkali facilities (latest by 2017). The sooner this mercury is disposed of definitely, not to enter any more into circulation, the better.
- As per our view point (7) below, the best way to dispose of such mercury would be to first solidify/stabilize it and then dispose it in underground salt mines.
- The capacity for solidification of the above mentioned quantity of waste mercury, is or soon to be, available:
    - Remondis (x-Dela) (D), are currently operational, with capacity of 400 tonnes per year[19]
    - MAYASA (ES) have developed a stabilization technique, which could be available within 4 months, since all permits have been obtained. Capacity of this plant is around 600 tonnes / year.[20] [21]
    - EconIndustries (D)(company which has actually developed x DELA process), will be constructing one (or two) mobile solidification units February 2017; capacity foreseen can reach 6tns/day (therefore around 1300 tonnes /year); the unit being mobile can go on the industrial site, solidify the mercury waste and avoid transport of liquid mercury[22]
- As a result temporary storage of liquid mercury waste may be needed for 3-5 years maximum.
- Given the relatively short period of temporary storage needed, it is suggested that mercury waste are stored preferably in appropriate above ground facilities only, under specific conditions.

7. Waste mercury should be solidified/stabilized before disposal in salt mines

[17] IA, p32
[18] S.E. Special Engines Srl (Italy), Information to consumers, 28/4/2014 , Information to the market 10/7/2014
[19] REMONDIS-stabilisation facility in Dorsten (x-DELA), has a capacity of 400 tons p.a. turning pure liquid mercury into the near-natural cinnabar (HgS) for environmentally responsible disposal. (communication with Remondis, http://www.remondis-aktuell.com/en/remondis-aktuell/022015/recycling/mercury-back-to-nature/ and email exchanges.
[20] Ministerio de agricultura, alimendtacion y medio ambiente, Spanish technology for the stabilisation and micro encapsulation of metallic mercury and certain mercury containing wastes.
[21] MAYASA, 2014, Mercury Stabilisation Plant and additional technical explanations from the company, http://mayasa.es/comercializacion-mercurio.aspx
[22] EconIndustries, On site mercury stabilisation, www.econindustries.com

- Liquid mercury waste disposal is prohibited under the EU Landfill Directive, owing to the risks these wastes entail.
- Mercury in solidified/stabilised form provides additional safety not only during disposal but also during handling, which is much easier. It is solid and does not exhibit relevant mercury vapour pressure.[23]
- The quality of the solidified/stabilised product is near natural cinnabar (mercury sulphide) (reddish powder) (Remondis, EconIndustries)[19,22], virtually insoluble in water[24]; or mercury sulphide microencapsulated in a sulphur polymer matrix, a compact product (monolith) with very low porosity, high impermeability, highly resistant to corrosion and environmental degradation (MAYASA)[21].
- The Basel Technical Guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with mercury or mercury compounds advises that: "*Wastes consisting of mercury or mercury compounds should be stabilized and/or solidified before final disposal.*"[25]
- The signal the EU sends to the world is important – higher risks related to final disposal may exist outside Germany/Europe considering that the geological formations and disposal conditions at the salt mines in Germany may be rather unique.
- The potential for retrieving solidified mercury from final disposal and putting it back on the market in liquid form would be rather low.
- Solidification/stabilisation processes are already available as discussed above, and the further development of this market will create new jobs.
- Responsibility for safe final disposal should remain with Member States and industry as appropriate.
- Disposal of liquid metallic mercury in salt mines raises serious environmental safety concerns over the very long-term.[26] The 2014 German study on the behaviour of mercury in salt mines, although it considers *"permanent storage of metallic mercury in underground storage in salt mines regarded as technically feasible and acceptable from a safety perspective,"* also mentions that *"Stabilised mercury has the advantage over metallic mercury in that it is solid and has no significant vapour pressure. Thus fewer additional safety measures and changes to the present operating mode are required."*
- Salt mines are dry solid structures, but serious accidents can happen – in the German salt mine in Asse, where they were storing nuclear waste, water started leaking in the mine but this was discovered only 15 years later(!).The weight of the mountain mass on the galleries or cavities in the mine exerted sufficient pressure to make the salt deform like viscous plastic. The rock covering the salt mine descended by 5 meters and opened the way for groundwater to infiltrate the galleries.[27][28] Other cases where salt mines collapsed have been reported.[29]

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[23] Behaviour of mercury and mercury compounds at the underground disposal in salt formations and their potential mobilisation by saline solutions, July 2014, Umwelt Bundesamt, Federal Republic of Germany.

[24] https://en.wikipedia.org/wiki/Mercury_sulfide

[25] Basel Technical Guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with mercury or mercury compounds (May 2015), paragraph 186, http://www.basel.int/Implementation/MercuryWastes/TechnicalGuidelines/tabid/5159/Default.aspx

[26] EEB Conference report " EU mercury surplus management and Mercury-use restrictions in measuring and control equipment", October 2006, p.23

[27] Der Spiegel, (17/2007) - 23.04.2007 http://service.spiegel.de/digas/find?DID=51292029 – full article in FR and DE in annex.

[28] Asse II: Went in operation as a potash mine 1906. Two "sister" mines Asse I and Asse III flooded in 1906 and 1923. Started operation as a "research disposal facility" for nuclear waste in 1967. Out of operation since 1978 because of missing license, Water intrusion since 1988, in danger of collapsing. Documentation by Greenpeace Germany: http://www.greenpeace.de/fileadmin/gpd/user_upload/themen/atomkraft/asseii.pdf

[29] 1.Teutschenthal (a so-called Backfill Mine or Disposal Mine) used for storing hazardous waste since 1995 partially collapsed in 1996 (after similar incidents in 1916 and 1940): Official documentation by the mining company: http://www.grube-teutschenthal.de/versatz.htm, http://www.grube-teutschenthal.de/historie.htm

2.Morsleben: The underground repository for low level nuclear waste started operation in 1981 as the one and only disposal facility for low level nuclear waste in the former German Democratic Republic. Morsleben was re-licensed for waste disposal only in 1991(after the re-unification) but was closed in 1998 because of the danger of partially collapsing. Partly collapsed in 2001.

Coverage in the Newspaper WELT:
http://www.welt.de/print-welt/article460884/Atommuell-Endlager_Morsleben_droht_der_Einsturz.html
Documentation by Greenpeace Germany:
http://www.greenpeace.de/fileadmin/gpd/user_upload/themen/atomkraft/morsleben.pdf

- Salt mines can collapse even after 100 years of operation, because of natural causes such as earthquakes, even of low magnitude.[30] Flooding can also occur - which could lead to potential collapse, but also increases the risk of environmental pollution since flasks could eventually corrode.[31],[32]
- In March 2006, the European Parliament called for legally-binding measures to ensure safe storage of excess mercury in secure, continuously-monitored sites, located so as to allow immediate intervention if necessary. It also underlined the importance of the 'polluter-pays' principle regarding surplus mercury storage.

8. Strengthen conditions for environmentally safe disposal of mercury waste;

In the proposed regulation, proposed conditions for permanent disposal are the same as the ones currently foreseen for temporary storage, yet the risks may be higher. The risks are analysed and additional requirements are recommended for the permanent storage of waste metallic mercury and mercury sulphide in the 2014 German study, and these should be incorporated in the EU proposal at a minimum.[33]

Key points include:

- Acceptance control/Certification of mercury purity by an independent expert (in order to avoid situations like the pseudo-Hg waste shipped by DELA to Switzerland)
- Use of crash/impact and fireproof double wall containers to transport and permanently store elemental mercury/ stabilized mercury (considering that an underground fire on a transport vehicle is the most serious accident, containers must withstand the thermal impact until the fire can be extinguished by the fire brigade of the mine)
- Disposal in separate areas of the underground storage, organized in stages, after which the storage cells or galleries are finally closed.
- Open storage cells/galleries have to be inspected at least daily (for corrosion/ damage of containers, Hg concentration in air, etc.).

9. Any country with artisanal small scale goldmining (ASGM) should develop a national action plan (NAP), which includes steps towards eventually phasing out mercury use in ASGM; commitments for technical assistance to help with the transition should be ensured.

Artisanal and small-scale gold mining (ASGM) is estimated to be responsible for over 700 tonnes per year of mercury emissions to the atmosphere and an additional 800 tonnes per year of mercury releases to land and water, making it the largest anthropogenic source of mercury pollution (AMAP/UNEP 2013). Measures to reduce and eventually eliminate the use of mercury in this sector therefore are of primary importance.

To help with this transition, the development of a national action plan (NAP) at country level, with planned mercury reductions tied to an intensive commitment of technical assistance to miners, becomes a crucial step towards the above objective. As a result, Member States should firmly commit to such assistance in order to reduce mercury demand in the sector.

Beyond the content described in Annex IV of the proposed regulation, the NAP should also include, as per Annex C of the Treaty, "additional national strategies to achieve the county's objectives, including the use or introduction of standards for mercury-free artisanal and small scale gold mining, and market based mechanisms or marketing tools"... e.g., to promote sales of gold that is mined and refined without the use of mercury.

[30] http://pubs.usgs.gov/fs/FS-032-96/, http://ny.water.usgs.gov/pubs/fs/fs01798/FS017-98.pdf
[31] http://www.springerlink.com/content/07u1k0137txue72m/
[32] Example: Asse mine. Water intrusion since 1988. Reason: Too extensive mining. Distance between overlying rock formations and the mined potash layers was too small. The creeping of the salt lead to the opening of new water-leading paths. - Institut für Gebirgsmechanik (2007) Gebirgsmechanische Zustandsanalyse des Tragsystems der Schachtanlage Asse II. http://www.helmholtz-muenchen.de/fileadmin/ASSE/PDF/News/Kurzbericht-Zustandsanalyse-V-4.pdf (Scientific report requested by the operator of the mine)
[33] Behaviour of mercury and mercury compounds at the underground disposal in salt formations and their potential mobilisation by saline solutions, July 2014, Umwelt Bundesamt, Federal Republic of Germany, page 105-106 ,Table 17.

10. Phase out dental amalgam by 2020, with time limited specified exemptions, taking into account that mercury-free dental restorations are available, affordable, effective and preferred by most EU citizens. Phase out is the most cost-effective way to prevent dental mercury pollution[34]

The Minamata Convention requires each party to "phase down the *use* of dental amalgam."[35] The EC mercury package, on the other hand, proposes merely to require amalgam separators and encapsulated amalgam – two measures that fail to phase down European amalgam use for three reasons. First, ensuring that the mercury for dental amalgam is delivered in capsules, and implementing end-of-pipeline waste control measures does not lessen the amount of amalgam in *use*. Second, these measures have already been largely implemented – and, as expected, they have failed to result in a reduction in amalgam use. Third, these measures run the risk of increasing, and not decreasing amalgam use in the EU as many dentists may be led to believe that capsules and separators somehow make their mercury "safe". To avoid these pitfalls, the EC mercury package should be amended to include at least the following effective measures to fulfil the Minamata Convention's amalgam requirements:

1. Amalgam use should be phased out in the EU by 2020 with time limited, specified exemptions (e.g. health reasons of the patient)

2. In the interim, and in addition to the measures proposed by the EC,

    a. Advise that for the first treatment of primary teeth in children and for pregnant women, alternative materials to amalgam should be the first choice.
    b. Phase out mercury use in dentistry for children and pregnant women as soon as possible, and by 2018 at the latest.
    c. Ensure that every dental patient and parent learns that (1) amalgam is 50% mercury, (2) the use of amalgam restorations is not indicated in primary teeth, in patients with mercury allergies, and persons with chronic kidney diseases with decreased renal clearance, and (3) mercury-free dental fillings are available.

Consuming at least 90 tonnes of mercury in 2010, the European Union is the largest user of dental mercury in the world.[36] In order to provide a responsible example for other countries, the EU must phase out its own major application of mercury - dental amalgam - for the following reasons:

- ***The EC's independent consultant urged an amalgam ban:*** The European Commission's independent consultant BIOIS has examined all the policy options and related costs, and urged the EU to "ban the use of mercury in dentistry" because – among other reasons – it is "necessary to achieve mercury-related requirements of EU legislation on water quality."[37] BIOIS explicitly rejected policy options that only required separators because that "is not sufficient in itself to address the whole range of mercury releases from the dental amalgam life cycle (it does not address mercury releases from the natural deterioration of amalgam fillings in people's mouths, from cremation and burial, and residual emissions to urban WWTPs)."[38]

- ***SCHER confirmed that amalgam poses environmental risks:*** SCHER has confirmed that dental amalgam in the environment can methylate (forming the most toxic form of mercury,

[34] This position on dental amalgam phase out, is supported by over 10 NGOs/networks, 26 May 2016, http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=210%3Angos-letter-to-ms-phase-out-dental-amalgam-from-the-eu&Itemid=15
[35] *Minamata Convention* (2013) (emphasis added)
[36] AMAP/UNEP, *Technical Report for the Global Mercury Assessment* (2013), http://www.amap.no/documents/doc/technical-background-report-for-the-global-mercury-assessment-2013/848, p.103
[37] BIO Intelligence Service (2012), *Study on the potential for reducing mercury pollution from dental amalgam and batteries*, Final report prepared for the European Commission-DG ENV, http://ec.europa.eu/environment/chemicals/mercury/pdf/final_report_110712.pdfpage 20
[38] BIO Intelligence Service (2012), *Study on the potential for reducing mercury pollution from dental amalgam and batteries*, Final report prepared for the European Commission-DG ENV, http://ec.europa.eu/environment/chemicals/mercury/pdf/final_report_110712.pdf page 19

methylmercury), that as a result "the acceptable level in fish is exceeded" under some circumstances, and thus there is "a risk for secondary poisoning due to methylation."[39]

- ***SCENIHR recommended amalgam restrictions:*** In 2015, SCENIHR concluded that "The use of amalgam restorations is not indicated in primary teeth, in patients with mercury allergies, and persons with chronic kidney diseases with decreased renal clearance....To reduce the use of mercury-added products in line with the intentions of the Minamata Convention (reduction of mercury in the environment) and under the above mentioned precautions, it can be recommended that for the first treatment of primary teeth in children and for pregnant patients, alternative materials to amalgam should be the first choice."[40]

  Contrary to its expert consultants' conclusions, the EC proposed only encapsulated amalgam and separators – a proposal that does not focus on phasing down mercury use. Furthermore the EC practically ignored the results of its online consultation as well as other relevant developments around Europe.

- ***The public consultation supports phasing out amalgam use:*** The European Commission launched an online public consultation that asked EU citizens: Should amalgam use be phased down…or phased out? 88% of answering respondents voted to phase out amalgam use.[41] This question reached the highest scores of participation in the survey in terms of responses (3.518 – almost double the numbers reached in other questions) as well as comments (2.117), demonstrating the high public concern[42]. Of all the phase down measures, promoting the use of mercury-free alternatives received the most support, while merely restricting amalgam to its encapsulated form received the least public support.[43]

- ***Many dentists prefer mercury-free fillings:*** As one European dental researcher explains, the "tooth-friendly features of resin based composites make them preferable to amalgam, which has provided an invaluable service but which, we believe, now should be considered outdated for use in operative dentistry."[44] [45]

- ***Experts show phasing out amalgam use will lower costs:*** As one study explains, due to the high costs of dental mercury pollution, amalgam is now recognized as "more expensive than most, possibly all, other fillings when including environmental costs."[46] Another study, conducted by Concorde East/West, concluded that an amalgam filling can cost up to $87

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[39] SCHER, *Opinion on Environmental Risks and Indirect Health Effects of Mercury from Dental Amalgam* (2014), http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_165.pdf, page 4

[40] European Commission Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), *Final opinion on the safety of dental amalgam and alternative dental restoration materials for patients and users* (29 April 2015), http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_046.pdf, p.75 (Furthermore, SCENIHR withdrew the claim that amalgam is safe. Similar to its earlier 2008 opinion, SCENIHR's preliminary opinion in 2014 claimed in section 4.1 that amalgam is "a safe and effective restorative material." But after reviewing the evidence, SCENIHR explained in its response to experts' comments, "The word 'safe' has been deleted in 4.1." So SCENIHR's 2015 final opinion states that amalgam is merely "an effective restorative material." European Commission Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), *Preliminary opinion on the safety of dental amalgam and alternative dental restoration materials for patients and users* (26 August 2014), p.66; European Commission, *Results of the public consultation on SCENIHR's preliminary opinion on the safety of dental amalgam and alternative dental restoration materials for patients and users*, http://ec.europa.eu/health/scientific_committees/emerging/docs/followup_cons_dental_en.pdf, p.97; European Commission Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), *Final opinion on the safety of dental amalgam and alternative dental restoration materials for patients and users* (29 April 2015), http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_046.pdf, p.71)

[41] https://ec.europa.eu/eusurvey/publication/MinamataConvention

[42] *Impact Assessment* (2 February 2016), http://ec.europa.eu/environment/chemicals/mercury/pdf/20151218MercuryPackageIA.pdf, p.60

[43] *Impact Assessment* (2 February 2016), http://ec.europa.eu/environment/chemicals/mercury/pdf/20151218MercuryPackageIA.pdf, p.73

[44] Christopher D. Lynch, Kevin B. Frazier, Robert J. McConnell, Igor R. Blum and Nairn H.F. Wilson, *Minimally invasive management of dental caries: Contemporary teaching of posterior resin-based composite placement in U.S. and Canadian dental schools*, J AM DENTA ASSOC 2011; 142; 612-620, http://jada.ada.org/content/142/6/612.abstract (emphasis added)

[45] Letter singed in June 2016 by 87 German dentists

[46] Lars D. Hylander& Michael E. Goodsite, *Environmental Costs of Mercury Pollution*, SCIENCE OF THE TOTAL ENVIRONMENT 368 (2006) 352-370.

more than a composite filling after costs to the environment and society are taken into account.[47]

- ***Industry is already prepared for amalgam's demise:*** The dental industry is already anticipating the phase-out of amalgam use in the EU. At the 2013 European Dental Materials Conference, dental manufacturers devoted an entire day to discussing "The Demise of Amalgam Use".[48]

- ***Member nations are already phasing out amalgam use:*** Amalgam is already used for 0% of fillings in Sweden[49], 3% in Finland[50], 5% in Denmark,[51] and less than 10% in the Netherlands.[52] These nations have successfully implemented restrictions and bans on amalgam use, demonstrating that other EU nations can too. Many have already expressed their willingness to do so. For example, the United Kingdom announced that it can "support a ban on the use of dental amalgam from 2016 with agreed exemptions" (essentially the narrow exemptions used in Denmark).[53]

Additional information on the technical advantages of mercury free dentistry can be found here[54].

11. Set up a trade tracking system to record information from exports and imports of elemental and compound mercury between MS, between the EU and external countries and also within the industry sector, to better know where the mercury is.

- Improved mercury production and trade data are necessary to understand the current global mercury supply situation and trends over time. This essential information is necessary for the Conference of the Parties (COP) and national governments to implement the Minamata Convention and measure progress in reducing the global mercury supply. The production data will also facilitate the understanding of illegal mercury trade, through better accounting of the legal materials flow. Addressing illegal mercury trade will also be a critical component of reducing mercury use in ASGM.
- Incidents like the illegal DELA mercury exports from Germany to Switzerland should not be repeated, and lessons learned should be applied to the development of a "cradle to grave" tracking system.[55]
- The tracking system will ensure transparency of the trade, and allow developments that run contrary to the intention and effectiveness of the mercury export ban to be addressed by the Commission and stakeholders.
- Establishment of such a system would create a level playing field for mercury importers and traders, giving them an incentive to take responsibility for their commerce.
- There is a need to improve the accuracy of reporting for mercury and mercury compounds that pass through a country that is not the final destination; some Customs agencies may

[47] Concorde East/West, *The Real Cost of Dental Mercury* (March 2012), http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=158%3Athe-real-cost-of-dental-mercury&Itemid=70, pp.3-4

[48] http://www.euro.addisondental.co.uk/Programme/

[49] World Health Organization, *Future Use of Materials for Dental Restoration* (2011), http://www.who.int/oral_health/publications/dental_material_2011.pdf, p.21

[50] BIO Intelligence Service (2012), *Study on the potential for reducing mercury pollution from dental amalgam and batteries*, Final report prepared for the European Commission-DG ENV, http://ec.europa.eu/environment/chemicals/mercury/pdf/Final_report_11.07.12.pdf, p.190

[51] *Ibid.*, p.190

[52] World Health Organization, *Future Use of Materials for Dental Restoration* (2011), http://www.who.int/oral_health/publications/dental_material_2011.pdf, p.21

[53] Letter, Department of Health to British Dental Association (23 May 2012).

[54] http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=211%3Aeeb-wa-memo-on-technical-advantages-of-mercury-free-dentistry&Itemid=15

[55] A now defunct German waste recycling company, DELA GmbH, was found in recent years to have illegally exported over 1,000 tons of excess metallic mercury mostly from the EU chlor-alkali industry, circumventing the EU export ban, with the illicit mercury making its way on to the global market. DELA disguised the mercury as "waste" and exported around 500 tonnes to Switzerland, Greece, the Netherlands and other countries. DELA was reportedly able to get around the EU mercury export ban regulation by not solidifying/stabilising the mercury for storage and disposal as they were required by contractual obligation. The authorities still do not know where all the mercury went, but it is clear that many of the destination countries are known to trade with countries where there is significant artisanal small-scale gold mining. This industry straight-pipes mercury to the environment, also exposing miners and their families to this dangerous neurotoxin.

record the original source of the commodity, while others may record the final country. In our view the information of country of origin should be retained in all transactions.

The EU needs to enact relevant regulatory changes.

i. A trade monitoring system, including reporting requirements in a timely manner for the generator (including strict enforcement with severe penalties) needs to be established to record mercury trade information for exports and imports from/to the EU, within Member States and also within the industry sector.
ii. The tracking system data should include: companies' identity, country, location, quantities involved, figures on the total amount of mercury still in use, recycled/recovered, sent for storage, purpose of use, transfers, amounts stored onsite temporarily, etc., and would require disclosures of the movement of mercury, mercury compounds and waste, from "cradle to grave."
iii. Member States and the respective industries operating in their territory should provide information on the mercury and mercury compounds used and produced by:
    - the chlorine industry,
    - the by-product production from oil/gas production and non-ferrous metals processing/mining,
    - the waste recycling facilities
    - the alcoholate, vinyl chloride monomer and polyurethane elastomer production
    - the manufacturing of mercury added products
iv. The movement of mercury and mercury compounds within the industrial sector and within MS should also be recorded and reported to the Commission.
v. When reporting on stocks and sources of mercury and mercury compounds generating annual stocks, Member States would also need to consider the potential accumulative aspects of the individual stocks and sources leading to stocks in the country, and include them in the reported information. So if several individual stocks or sources of mercury and mercury compounds leading to stocks exist in the country, and are below the defined thresholds, but lead accumulatively to higher volumes than these thresholds, they would need to be reported (see proposed regulation Art. 15 1.d).
vi. Member States/Industries should also report on mercury waste and their mercury content (e.g. via the E-PRTR)
vii. Information should be provided by MS to the EC, and a public register developed, on the amount and location of disposed mercury waste, and the assurances that these have been managed in an environmentally sound manner.
viii. Member states should further report on the implementation measures relevant to Article 8 of the Convention on emissions from all relevant sources, including on the implementation of BAT/BEP Guidelines on mercury emissions for new sources.
ix. Member States should provide information to the EC regularly, and the EC should make this information public, by posting it online in an open and transparent manner.
x. The European Parliament previously called for a mercury trade tracking system to be in place even before the export ban was implemented (March 2006).

Additional proposals

This revised EU Mercury regulation should also include provisions covering areas of mercury use and emissions that were studied at EU level at an earlier stage and during the review of the EU Mercury strategy. Considerations relevant to these areas can be found in the 2010 EEB position paper on the review of the EU Mercury strategy,[56] including those highlighted below:

12. Contaminated sites (former mining sites and others) should be identified, assessed and classified according to the degree of contamination and urgency of remediation. The polluter pays principle should apply; areas contaminated by mercury need to be further restored and brought to a reasonable condition in an environmentally sound manner.

Such a measure is also relevant to the provisions of the Minamata Convention, article 12.

The following elements should also be considered when the EC is developing appropriate strategies for the management of contaminated sites:

- The Industrial Emissions Directive requires a "baseline report" to be established (see Article 12 (1)(e) and Article 22(2). These baseline reports should be mandatory and publicly available online for industrial sites where mercury has been/is used.
- Relevant information has already been provided at EU level in the COWI, Concorde SA 2008 study.
- Elements that may be covered by Directive 2006/21/EC on the management of waste from extractive industries, which requires Member States to draw up an inventory of closed, including abandoned, waste facilities, by 1 May 2012 (article 20).
- Relevant requirements should also be set in the BREF on Management of waste from extractive industries, which is currently under review.
- Our 2005 comments are still relevant[57].

13. Set limits for mercury emissions to air/releases to water from the main point sources (i.e. Large Combustion Plants, Iron and Steel, Cement and Lime, Non-ferrous metals production)[58]

- Annual mercury emissions from large industrial activities are very high, as reported under the European Pollutants Release and Transfer Register (E-PRTR)[59]: 25.1 tonnes to air, 4.45 tonnes to water in 2013. Large coal/lignite combustion plants (LCP) are the biggest air emissions source in the EU (55%), followed by iron and steel (15%) and cement and lime production (11%). The main contributors to direct mercury discharges into water are the energy sector (1.44 tonnes) waste(water) management plants (1.87 tonnes) and the chemical industry (663kg).
- For these sectors there are Best Available Techniques Reference Documents (BREFs) at EU level which set out emission ranges achievable under economically and technically viable conditions with BAT (so-called BAT-AEL). However, long implementation deadlines and excessive flexibilities set in those frameworks would not ensure a level playing field for industry, nor necessarily reduce the mercury emissions from these industries. For most cases the upper BAT-AEL correspond to negotiated emission levels that are already met by the majority of EU installations, not what is actually technically feasible to achieve under acceptable costs. This is also due to the fact that no dedicated mercury techniques have been implemented across the sector when the BREFs where reviewed (e.g. LCP BREF, Iron and Steel and Cement plants). In order to provide for legal certainty and to deliver

[56] EEB comments on the BIO draft final report on the Review of the EU Mercury Strategy, 16 July 2010, http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=65%3A-eeb-comments-on-the-bio-draft-final-report-on-the-review-of-the-eu-mercury-strategy&start=10&Itemid=15

[57] http://www.zeromercury.org/Zero_Mercury_Policy_Paper_EN.pdf

[58] More resources are available here
http://www.eeb.org/index.cfm/death-ticker/
http://www.eeb.org/index.cfm/library/explaining-the-death-ticker/
http://www.eeb.org/index.cfm/news-events/news/report-weak-eu-coal-pollution-standards-could-cause-71-000-avoidable-deaths/

[59] http://prtr.ec.europa.eu/#/pollutantreleases

mercury reductions from these sectors in a timely manner, the proposed regulation should incorporate adequate BAT benchmarks for the most relevant emission sources the permit writers should implement across the EU, since mercury emissions travel long distances:

- Under the revised Large Combustion Plants (LCP) BREF, it has been agreed that a level of <1µg/Nm³ (yearly average) to air can be achieved with the use of BAT for coal and lignite LCPs. This level should be set as an EU-wide Emission Limit Value to be met at the latest by mid-2021. The proposed upper ranges of 7µg/Nm³ for lignite and 4µg/Nm³ negotiated in the final meeting do not represent BAT; rather they reflect what is already achieved through co-benefit only (without dedicated mercury abatement techniques). Based on 2010 data, 80% of the lignite plants already meet these levels. Costs of meeting a level of <1µg/Nm³ would not exceed 0.02-0.05 cent/kwh (i.e. less than 1% of generation costs), depending on techniques chosen.[60] The maximum allowable wastewater release is set in the range of 0.2 - 3µg/l (daily average). The EEB is aware that a level of <0.2µg/l is met with the membrane filtration technique, which is used in German LCPs already, where the permit limit is set at 0.75µg/l. In the US, the maximum allowable discharge to water is set at 0.788µg/l in the US EPA rule. Mercury is a priority hazardous substance under the Water Framework Directive for which a phase out obligation exists. The discharge limit for mercury to surface water should therefore be set at 0.75µg/l, to be met by mid-2021 at the latest.
- The Iron and Steel industry is the second highest mercury emission source in the EU. The allowable emission levels set in 2012 do not correspond to what is achievable with BAT (as for LCPs). The main emitters are sinter plants, where **a** maximum emission limit of 10µg/Nm³ should be set for Hg, which corresponds to the German emission limit value (annually averaged) applied as from 2019 for combustion plants. Furthermore, an emission limit of <5mg/Nm³ should be set for dust for these sources. Bag filters are effective in capturing mercury and various other highly hazardous pollutants such as dioxins and furans, and can easily cope with dust emission levels up to 5mg/Nm³, which corresponds to the level of emissions set for electric arc furnaces. The same level of maximum water discharge of mercury (0.75µg/l) should be set, since membrane filtration can also be implemented in this sector.
- Cement and Lime production also releases a large amount of mercury to air. Yet the BAT-AEL proposed for metal emissions from kiln firing are extremely high (<50µg/Nm³) and there is only a vague requirement to "limit the content of mercury" in relevant input fuels (waste), but without setting maximum content thresholds. Similar to the Iron and Steel sector, a maximum emission level to air of 10µg/Nm^3 for mercury should be set. Emission data from a recent study[61] indicate that these levels have already been met by German cement and lime production installations since 2012, even without dedicated mercury control techniques.
- The Non-Ferrous Metals Production also releases a large amount of mercury to air. Achievable levels depend on the mercury content in the inlet prior to abatement. The recent BAT/BEP guidance suggests that emission levels <10µg/Nm³ are achieved with various techniques configurations, which corresponds to the (daily averaged) lower range set in the revised NFM BREF from pyrometallurgical process using raw materials containing mercury. This level would also provide for a level playing field with other industry sectors.

- In addition, we propose a general requirement for operators to either switch to inherently cleaner fuels (gaseous / liquid) and/or ensure that fuel/waste combusted do not exceed a maximum mercury concentration threshold which should be set at a maximum 25µg/kg. If Hg content is high in the input fuel, the operator should achieve a mercury reduction at source e.g. by input fuel selection, fuel washing, blending and mixing in order to reduce high input concentrations of mercury.

[60] EEB/Greenpeace May 2015 study available on request

[61] See Mercury Study for North-Rhine Westphalia, Christian Tebert (Oekopol), Peter Gebhard and Peter Kremer of 26 March 2016 "Quecksilber Minderungsstrategie für Nordrhein Westfalen".

14. **Phase out the use of mercury in porosimetry with justified, time limited exemptions. In the interim, take measures to ensure 100% of the mercury used in porosimetry is recycled.**

Important information was gathered on this issue in the COWI/Concorde 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.*

Based on earlier research,[62] we would strongly recommend that steps should be taken to ensure that 100% of the mercury used is recycled, and to phase out mercury use in porosimetry as soon as and where possible, creating incentives for the development of mercury free alternatives for the remaining uses.

15. **Phase out the use of mercury in new lighthouses. 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.**

Evidence on the use and potential impacts of mercury in lighthouses has been extensively discussed in the COWI/Concorde 2008 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 be further pursued and included as a provision of the new EU mercury regulation.

16. **Mercury added products still circulating in society for which relevant laws are in place should be collected separately and safely; better labeling of such products will also facilitate separate collection, and awareness should be raised thereof.**

For products/waste the separate safe collection of which is not explicitly required by law (e.g., for mercury thermometers), additional measures need to be taken.

This was also one of the conclusions of the 2011 REACH Socio Economic Analysis and Risk Assessment Committees while evaluating the ban of mercury added measuring devices,[63] which stated that ”a proper collection system for these devices may also be necessary to avoid mercury emissions into society from these devices.”

Mercury containing wastes are also generally discussed in the COWI/Concorde 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 mercury regulation.

[62] from the discussions during the EEB,HCWH, ZMWG conference on 'EU Mercury phase out in Measuring and Control Equipment', October 2009

[63] SEAC and RAC opinion on an Annex XV dossier proposing restrictions on mercury in measuring devices http://echa.europa.eu/documents/10162/13641/compiled_rac_and_seac_opinions_mercury_en.pdf

17. An expert assessment should be undertaken to determine the extent to which mercury can be appropriately eliminated from vaccines to better protect public health.

The EEB, together with other NGOs, have discussed the need to investigate further the use of mercury in vaccines in their 2005 publication, "Zero Mercury: Key issues and policy recommendations for the EU Strategy on Mercury."[64] More information can be found in this publication.

Mercury use as a preservative in vaccines, called thimerosal or thiomersal, was 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.[65]

No relevant action has taken place in the EU to our knowledge between 2005 and the present. Our proposals for action since 2005 are therefore still valid. Note that the kinds of vaccines covered should not only include childhood disease vaccines but seasonal flu vaccines given to women before and during pregnancy and during breastfeeding.

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 any mercury content. 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. In addition, 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 to the research and development of safe, mercury-free, multi-dose vaccines.

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

Emissions from crematoria are not covered by Community law, but are regulated in several Member States, and are also the subject of OSPAR Recommendation 2006/2 amending Recommendation 2003/4 on controlling the dispersal of mercury from crematoria which applies only to the OSPAR countries. Although mercury emissions from crematoria were discussed during 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 therefore still relevant.[66]

It has been estimated that there are between 2 and 3.5 tonnes of mercury emitted 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-compliance.[67] Reports summarizing the OSPAR parties efforts to control emissions from crematoria are to be compiled every 5 years. The most recent report summarizes country submissions using information from 2007 to 2010, depending on the country, and estimates that on average about 20% of cremations were "abated" in these countries during this period.[68]The quality of reported information leaves much to be desired, e.g., the emissions per cremation in crematories without controls (some 60-70% of the total) vary widely.

[64] http://www.zeromercury.org/Zero_Mercury_Policy_Paper_EN.pdf
[65] Council Conclusions on the Community strategy concerning mercury, 2670th Environment Council meeting, Luxembourg, 24 June 2005.
[66] http://www.zeromercury.org/Zero_Mercury_Policy_Paper_EN.pdf, p.59
[67] 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
[68] Overview assessment of implementation reports on OSPAR Recommendation 2003/4 on controlling the dispersal of mercury from crematoria, ISBN 978-1-907390-73-9, Publication Number: 532/2011, OSPAR Commission, 2011.

The UK reported that special measures have been taken with respect to mercury emissions from crematoria in the UK.[69] Best Available technique measures are encouraged. Furthermore, industry itself created the Crematoria Abatement Mercury Emissions Organisation (CAMEO) scheme.[70] This is a burden-sharing scheme where all members pay per cremation, then receive payment per abatement. This scheme also enabled a phased approach which was not in government recommendations with targets: by 2008, 10% of cremations were to be abated, 20% by 2010, and 50%by 2012. Actual progress appears to be somewhat slower as the UK reported to OSPAR that 23% of cremations were abated in January 2011.

Mercury emissions from crematoria are discussed in the COWI/Concorde 2008 report which concluded 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 reducing 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.'*

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[69] http://www.zeromercury.org/EU_developments/Dental_Conference_Report_May07.pdf
[70] http://www.fbca.org.uk/cameolink.asp