ENVIRONMENTAL AND HEALTH NGO COMMENTS TO THE EUROPEAN COMMISSION REGARDING PROPOSED LEGISLATION TO PROHIBIT MERCURY EXPORTS

3rd October 2005

Introduction and Summary of Comments

A coalition of environmental organizations respectfully submits these comments to the European Commission for its consideration. This coalition consists of the following organizations: The European Environmental Bureau,[1] Arnika Association,[2] European Public Health Alliance Environmental Network,[3] Health Care Without Harm,[4] the Natural Resources Defense Council,[5] the Mercury Policy Project,[6] and the Ban Hg Working Group.[7]

Our comments address four issues discussed at the Commission's consultation meeting of September 8, 2005 in Brussels. Those issues are: (1) Which mercury supply sources should be subject to a mandatory storage obligation once the export ban becomes effective; (2) Whether recovery of mercury from waste and products is still desirable if the mercury is no longer needed, and if so, how should the Commission ensure such recovery continues; (3) Whether the export ban should also include mercury compounds, and if so, which compounds; and (4) Whether and how the proposed legislation should address mercury imports as well. The four issues will be discussed in the order presented.

1. Scope of the Mandatory Storage Obligation

[1] The European Environmental Bureau (EEB) is a federation of 145 environmental citizens organizations based in all EU Member States and most Accession countries, as well as a few neighboring countries. The organizations range from local and national to European and international. The aim of the EEB is to protect and improve the environment of Europe and to enable the citizens of Europe to play their part in achieving that goal.

[2] Arnika Association is a Czech non-governmental organization whose mission is the improvement of the environment by preventing its toxic pollution and restoring its natural landscape in the Czech Republic.

[3] European Public Health Alliance Environment Network (EEN), http://www.env-health.org/, is an international non-governmental organization advocating environmental protection as a means to improving health and well-being. The group has a diverse membership, 29 members with 5 international organizations, 10 European networks and 14 national/local organizations, including non-governmental organizations, professional bodies representative of doctors and nurses, academic institutions and other not-for-profit organizations.

[4] Health Care Without Harm Europe (HCWH), www.noharm.org, is an international coalition of hospitals and health care systems, medical and nursing professionals, community groups, health-affected constituencies, labor unions, environmental, and religious organizations. HCWH is dedicated to transforming the health care industry worldwide, without compromising patient safety or care, so that it is ecologically sustainable and no longer a source of harm to public health and the environment.

[5] The Natural Resources Defense Council is a private, U.S. not-for-profit environmental organization that uses science, law, and the support of more than 500,000 members nationwide to protect the planet's wildlife and wild places, and to ensure a safe and healthy environment for all living things.

[6] The Mercury Policy Project, a project of the Tides Center and co-founder of the Ban Mercury Working Group, works at the local, national, and international level to promote policies and programs to indefinitely store surplus mercury; and reduce/eliminate anthropogenic mercury uses and releases, trade in mercury, and human, ecological and wildlife exposures to mercury. See www.mercurypolicy.org.

[7] The Ban Mercury Working Group (Ban Hg-Wg), is an international coalition of 27 public interest non-governmental organisations from around the world formed initially in 2002 by 2 US based NGOs, the Basel Action Network (www.ban.org) and the Mercury Policy Project (www.Mercurypolicy.org). working to end pollution from the toxic metal -- Mercury.

To ascertain the appropriate scope of the mandatory storage obligation, the Commission must first determine which sources of mercury should be used first to satisfy estimated EU demand when the export ban takes effect, then estimate the mercury demand when the mercury export ban takes effect, and finally determine which of the preferred sources will be needed to satisfy this demand. Supply sources not needed should be subject to a mandatory storage obligation to avoid excess supplies within the EU community.

Currently, EU's mercury supplies come from four primary sources. These sources, in order of least to most environmentally problematic, are:

- byproduct mercury (generated as an unintentional byproduct from the mining of other metals such as gold and zinc),
- mercury recovered/recycled from waste and products (such as those collected from pollution control devices and mercury switches in cars and appliances),
- mercury from decommissioned chlor-alkali plants, and
- primary virgin mined mercury.

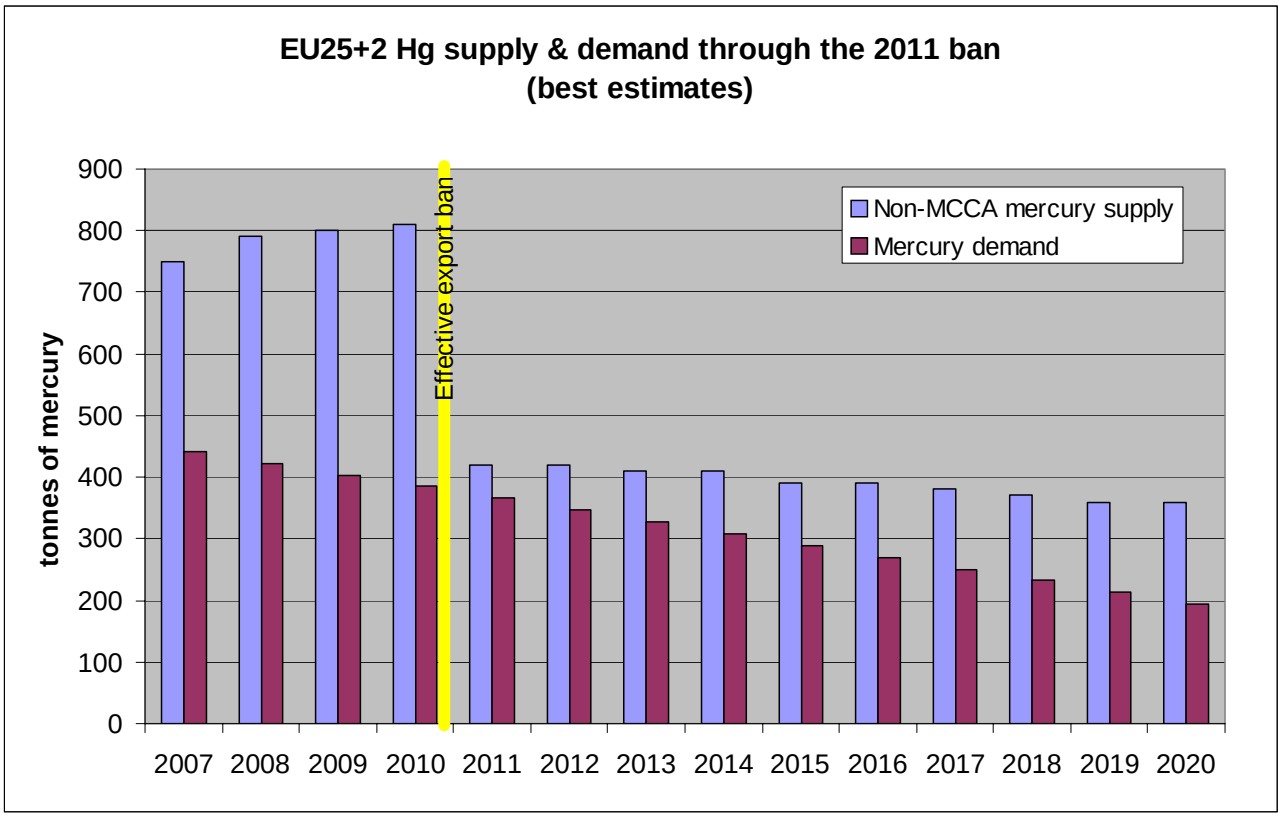
Once the export ban becomes effective, it is virtually certain that primary mining within the EU will cease (indeed, extraction and processing of virgin ore at the Almaden facility may have stopped already) due to the inability to sell the mined product globally, leaving the remaining three sources. Of the three remaining sources, byproduct mercury and mercury recovered from waste and products are preferred sources for use because they are, at least for the moment, inadvertent outputs that are impossible to avoid. Without collection, much of this mercury would be released into the environment, thus recovery is an activity warranting encouragement. Moreover, chlor-alkali industry surpluses are the most readily captured and stored before reintroduction into commerce of the remaining three sources.[8]

To estimate the EU's future mercury supply and demand outlook, we retained the services of Peter Maxson, author of Mercury Flows in Europe and the World, one of the principal background reports prepared for the Commission in support of its mercury strategy development in 2004. While Mr. Maxson's complete analysis can be found in Appendix A to these comments, his principal findings are summarized in Figure 1 below. Based upon a current mercury demand estimate for the EU 25 and the 2 Accession countries (Romania and Bulgaria) of 480 tons/yr, assuming a straight-line phase-out of mercury cell chlor-alkali plants through 2020, and assuming a straight-line reduction of demand by 50% from now through 2020 for other uses (except dental and lighting), Mr. Maxson projects mercury from decommissioned chlor-alkali plants will <u>not</u> be needed to meet EU mercury demand.

Accordingly, the Commission's proposed legislation can and must impose a mandatory storage obligation on the decommissioned chlor-alkali mercury. Failure to include this mandatory storage obligation in the proposed legislation will result in substantial mercury surpluses within the EU, resulting in falling mercury prices, and severe economic disincentives against environmentally beneficial byproduct and waste mercury recovery. This, in turn, could jeopardize the future of the recycling industry, making it much more difficult and expensive for governments to promote collection programs for discarded mercury products.

[8] Extended Impact Assessment (EIA), Annex to Communication from the Commission to the Council and the European Parliament on Community Strategy Concerning Mercury, COM (2005)20 final, p. 23.

Figure 1



Mr. Maxson's analysis also indicates the issue of whether at least some of the mercury recovered from waste/products should be stored is a more difficult question to resolve at this juncture, given the relative proximity of supply and demand projections once the decommissioned chlor-alkali mercury is removed from commerce and the primary mine is closed. The question becomes one of optimal timing since demand will be continually reduced for the next several decades as chlor-alkali plants closure/convert, the already issued and anticipated product Directives have their intended effect, and global markets shrink generally.

Therefore, our recommendation to the Commission is that instead of resolving this question now, the Commission should instead propose legislation that authorizes the extension of the mandatory storage obligation beyond the chlor-alkali mercury to other mercury supply sources as well, and puts in place a review process for determining whether to exercise that authority periodically, taking into account the best supply and demand data available at the time of each review. Such a process would enable the Commission to anticipate the issue several years before the export ban is in place, and again several years after the ban has become effective, to match supply and demand based on then-current data instead of assumptions projected over 5 years or more. This opportunity to look at real-world demand is especially critical in the next five years as industry and national governments implement the IPPC directive for the chlor-alkali sector and determine the pace of closures and conversions (and thus demand reduction) for this sector. The chlor-alkali industry alone accounts for one-third or more of EU mercury demand over the relevant time frame.

2. Recovery of Mercury from Wastes/Products

As indicated above, the recovery of mercury from wastes and products is a necessary component of the EU strategy at the present time for at least several reasons. First and foremost, there are substantial quantities of mercury in discarded products and wastes that will be generated for years to come, and the collection and recovery of this mercury avoids the otherwise inevitable releases that would occur if the mercury products and wastes are not properly segregated and managed appropriately. Facilitating the recovery of mercury from these products and wastes will help maintain the collection, segregation, and recycling infrastructure necessary to minimize future mercury releases.[9]

Second, it appears that at least some of this mercury will be needed to satisfy EU demand, at least in the short-term. This source of mercury is preferred over primary mining because primary mining creates "new mercury" for the global pool, and the mining itself releases significant quantities of mercury. This source is also preferred for use over chlor-alkali mercury because of the relative ease in which the chlor-alkali mercury can be captured and stored, given the one-time nature of mercury availability at closing or converting chlor-alkali plants, and the relative simplicity of institutional arrangements and cost allocation for storage that serves only one industry.

At some point in the near future, this mercury will not be needed to meet internal EU demand. However, we are not yet at such a junction, which is why we recommend above that the proposed legislation include a process for addressing these issues at a future time.

Unless and until such a junction arrives, the Commission must be vigilant in utilizing its legal authorities in its product and waste directives to encourage mercury recovery from wastes and products so that this mercury is not released into the environment. Toward this end, the Commission should consider the proposed legislation as an opportunity to clarify that it may amend existing relevant waste and product Directives and Regulations as needed to implement the policies embodied in the mercury strategy, including but not limited to the export ban and the mandatory storage obligations.

3. Scope of the Mercury Export Ban

For several reasons, the proposed export ban must apply to mercury compounds as well as liquid mercury, and the compounds covered must include mercuric chloride and mercuric oxide at a minimum. First, since a principal purpose of the export ban is to discourage global mercury trading in mercury and thus mercury use, it makes little sense to enable EU export of these mercury compounds which are the feedstock for some of the largest global mercury uses. EU traders would simply produce the mercury compounds for export, thus the EU export ban would have little or no effect on global mercury trade or consumption.

[9] We note the U.S. Environmental Protection Agency recently examined whether to revise its current treatment standard for mercury wastes requiring recovery of the mercury, and concluded other treatment and disposal alternatives currently available were not adequately protective or sufficient. See 68 FR 4481-4489 (January 29, 2003).

For example, mercuric oxide would be exported and used to make mercuric oxide batteries in China and elsewhere in the developing world, according to the EU's own trade study.[10] These batteries could return to the EU, in many cases violating EU laws, as well as contribute unnecessarily to the global pollution problem. Similarly, mercuric chloride is used as a catalyst in the manufacture of vinyl chloride monomer in Russia and China, and perhaps elsewhere as well.[11] Global aggregate demand for these two compound uses alone may have exceeded 1,300 tonnes in 2000. While demand for these two compounds may now be somewhat reduced, there remains a ready market for substantial EU exports if they are allowed.

Secondly, even assuming there is no market for the mercury compounds themselves, allowing exports of mercury compounds could create a huge loophole for escaping the reach of the export ban applicable to the liquid metal. Our information indicates the conversion of the liquid metal to a mercury compound, and then converting it back to elemental mercury after leaving the EU, would cost about $200/flask. At the current market price of $800/flask or higher, an unscrupulous trader could take advantage of the "mercury compound loophole", convert the mercury to a compound for export, arrange for the conversion back outside of the EU, and still make money (Not long ago, the price of mercury was only $200/flask.). Therefore, for the EU export ban to be effective, the proposed export ban must apply to mercury compounds as well.[12]

4. Mercury Imports

During the September 8 consultation meeting, the Commission staff expressed reluctance to restrict or otherwise address mercury imports into the EU in the proposed legislation, noting potential obstacles with global trade legislation. We urge the Commission to reconsider this position to ensure supplies of mercury within the EU are consistent with EU demand, mandatory storage obligations, and policies encouraging mercury recovery from wastes and products.

With respect to the purely legal question of confronting trade obstacles, we note the very recent promulgation of Council Regulation No. 1236/2005, restricting the trade of products used for torture and other inhuman punishment. We note specifically 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 prohibitions where it is necessary to implement important EU policies. We suggest the Commission staff investigate further the potential legal obstacles and how such obstacles may be overcome, as was apparently accomplished in Council Regulation No. 1236/2005.

[10] P. Maxson, Mercury Flows in Europe and the World: The Impact of Decommissioned Chlor-Alkali Plants, prepared for the European Commission, February 2004, pp. 48-49.

[11] Treger, Inventory of Mercury Releases from the Russian Federation – Chemical Industry (Draft Working Paper), prepared for the Arctic Council Action Plan to Eliminate Pollution of the Arctic, pp. 36-39.

[12] While not addressed at the September 8 consultation meeting, the Commission also needs to consider whether the proposed legislation should authorize an expansion of the current prohibition on the export of mercury-containing soaps (Regulation EC 304/2003.), to other mercury products, which are or soon will be subject to use and marketing restrictions within the EU. The fundamental basis for the export ban on mercury (and its compounds) is the recognition that mercury is a global pollutant, and that the EU must be cognizant of the global impacts caused by encouraging mercury uses, particularly in the developing world. The export of large quantities of mercury products that can no longer be sold in the EU raises similar concerns, particularly for products where comparable non-mercury alternatives are or could be readily available in the developing world.

In the event Commission staff continues to believe an outright ban on mercury imports would be problematic, we recommend inclusion of an alternate course of action in the proposed legislation that would not raise these legal objections. Specifically, we recommend that the proposed legislation recognize the unique concerns about mercury trade, and include tracking and reporting authorities on imports and other cross-border trades of mercury and mercury compounds into and within the EU, so that mercury imports and other transactions are well documented, transparent to the public, and can be readily assessed by Commission staff and other stakeholders as to their magnitude and impact.

We envision a tracking system where mercury import data must be provided, prior to importation, by mercury traders to the EU member state competent authority, and that such data include the identity of the exporting company and nation, the identity of the importing company and location, the quantity of mercury or mercury compounds involved, the purposes for which the imported mercury will be used, etc. We further envision the EU member states providing this information to the Commission annually so that the Commission may summarize the data for the EU as a whole, and publish the information in a publicly accessible manner.

Furthermore, such measures on trade tracking of mercury and mercury compounds to/from and within the EU should not await the export ban date, but should take effect as soon as practically possible. Until the export ban takes effect, the trade tracking should cover exports from the EU as well.

We note this legislation could build upon the system of customs declarations that is currently used for imports and exports of elemental mercury to and from the Community, but this system should be reviewed to ensure that it effectively tracks mercury flows. In order to ensure proper implementation of the mercury trade ban, a similar system needs to track elemental mercury movements between the Member states, since at present this is frequently overseen only by the transportation companies, who are supposed to (but sometimes do not) submit to their governments periodic reports of their activities.

With respect to mercury compounds, the tariff codes currently used for chemical substances, are typically quite broad, often not indicating explicitly the transport of mercury compounds such as mercuric oxide/chloride. Considering that the flows of such substances must be known for adequate control, the current tariff code system will also need to be reviewed.

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Appendix A

A brief assessment of mercury supply and demand in the EU25+2 during the transition through the mercury export ban – 2007-2020[13]

Background

The author was requested to make a brief independent assessment of mercury supply and demand in the EU25 plus Accession Countries Bulgaria and Romania (hereafter referred to as EU25+2) through the period of the proposed export ban. The purpose of this note is to explain the source and justification of the assessment as presented.

Table 1 is a summary assessment of mercury supply and demand in the EU25+2 during the period before, during and after the proposed mercury export ban. Its purpose is to determine what EU25+2 sources of mercury will be available before and after the ban (specifically during the period 2007-2020), what EU25+2 demand for mercury may be anticipated, and what sources of mercury will not be needed to supply any legitimate demand, and may therefore be safely stored as they become available. In order to accommodate the various margins of error that may be inherent in such a brief analysis, the "best estimates" of Table 1 are subsequently submitted to a simple sensitivity analysis.

While the precise date of the mercury export ban remains to be formally determined, the year 2011 is assumed here since that appears to have been the basis of relevant discussions with the Spanish mercury mining and trading company, MAYASA.

Assumptions regarding EU mercury supplies

In constructing Table 1, the author has made a range of assumptions, which are discussed below.

Market price of mercury

One general but important assumption in Table 1 is that the market price of mercury remains during 2005-2020 more or less in the range of €10-20/kg for 99.99% pure elemental mercury.[14] If a situation were to arise, for example, in which a very low-cost supply of mercury (from decommissioned chlor-alkali plants, for example, or by-product mercury supplies, or even imports) flooded the EU25+2 market, this could drive mercury prices down to a level where it would be impossible for most EU25+2 mercury product and waste recyclers to stay in business. In such a case, the supplies assumed in Table 1 to be coming from mercury product and waste recyclers would dry up.

[13] This note was prepared in September 2005 by Peter Maxson, Concorde East/West Sprl, Brussels, under constraints of limited time and resources. While efforts have been made to provide the most useful analysis possible under the circumstances, the text and estimates presented here have obvious limitations, and remain the responsibility of the author. Any questions or comments are welcome by email at concorde@skynet.be.

[14] The spot price of elemental mercury at this writing in September 2005 is very close to €20/kg. Accounting for inflation, the range of €10-20/kg could become €15-30/kg or higher by 2020.

Alternatively, if for some reason mercury prices were to stay above €20/kg for an extended period of time, we would surely see additional EU sources of mercury (mostly from redoubled efforts to recover mercury from products and wastes) coming onto the market on top of those assumed in Table 1.

MCCA capacities and closures

Mercury cell chlor-alkali (MCCA) facility capacities are as given by Euro Chlor.

Plant closures of one million tonnes chlorine capacity during 2005-2007 have been given by Euro Chlor.

Other closures reflect a straight line to 2020, the voluntary phase-out date agreed by Euro Chlor member companies, and consistent with two separate studies carried out for Euro Chlor in 1998 and 2002, which predict a nearly straight-line phase-out. The residual capacity in 2020 assumes a few plants that will not close in 2020, as generally qualified by Euro Chlor when it discusses the voluntary phase-out.

Mercury recovered from decommissioned MCCAs

Euro Chlor estimates 1.8 tonnes of Hg in cells per 1000 tonnes MCCA facility chlorine capacity. The author agrees with that average, but has also demonstrated an additional 10% easily recoverable as elemental mercury from drains, sumps, etc., during decommissioning, as well as significant amounts less easily recoverable from piping, equipment, etc., during decommissioning.[15] Therefore the figures presented in Table 1 are felt to underestimate the mercury recoverable at decommissioning.

It is obvious that (some or all) mercury is not always removed from the MCCA facility during the first year of decommissioning. Therefore Table 1 assumes that the entire quantity of mercury is removed and transferred in the year following the first year of decommissioning.

It is known that each MCCA plant holds mercury in its storeroom since it needs to occasionally replenish mercury in the cellroom. While storeroom inventories of mercury may be transferred during the year or years just prior to decommissioning, it is assumed for simplicity in Table 1 that this mercury amounts to another 10% of the mercury easily recoverable from a plant at decommissioning.

Stocks of mercury at Almadén

Following a site tour and on-site discussions with Almadén officials in 2005, the author estimates mercury stocks on site at 1000-2000 tonnes. It is assumed the mining company would sell off these stocks prior to the export ban in 2011.

[15] Maxson, P., and F. Verberne, *Mercury Concerns in Decommissioning Chlor-Alkali Facilities in Western Europe*, ERM and Concorde East/West Sprl for the Dutch Ministry of Housing, Spatial Planning and the Environment (VROM), September 2000.

Stocks of mercury held by mercury brokers and traders

Likewise, it is assumed that in 2005 an inventory of about 500 tonnes of mercury is held by EU mercury brokers and traders. As above, faced with an imminent export ban, it is assumed the brokers and traders would sell off their stocks prior to 2011.

Mining and processing of primary mercury ores

At the last operational EU mining site, Almadén, the mining and processing of primary mercury ores in the EU has stopped since 2003, and is not expected to restart prior to the mercury export ban.

By-product mercury from mining

By-product mercury recovered from zinc ores in Sweden and Finland has amounted to 50-100 tonnes per year for many years in the EU15. It is assumed there are additional sources associated with other zinc, copper, lead, silver and other ores in the 12 Accession Countries (new EU Member States), but these have not been formally quantified.

Recycled Hg from non-MCCA wastes & products

Non-MCCA wastes are specified here because it is known that certain quantities of MCCA wastes are retorted and the mercury recovered by industry, in which case these quantities of mercury are already included in industry calculations of annual mercury consumption (see mercury demand figures in the lower half of Table 1).

Therefore, non-MCCA wastes from which mercury is routinely recovered include natural gas sludge (possibly yielding over 20 tonnes of mercury alone in the EU25+2), catalysts, manufacturing wastes from fluorescent lamps and batteries, for example, filters and wastes from incinerators and a range of industrial processes, etc. The mercury recovered from these sources (based on work by the author for the European Commission in 2004) may be expected to increase significantly in the coming years as environmental regulations are implemented throughout the Accession Countries, and then decrease somewhat as the quantities of mercury in various processes and wastes decrease.

Likewise, recycled mercury from products such as batteries, switches, relays, lamps, dental amalgam, etc., is expected to increase from present levels as lower-priced EU supplies are restricted, and as regulations increasingly encourage recycling. After about 2012, however, recycled Hg would gradually decrease as EU supplies of mercury-containing products decrease, and EU demand for mercury continues to decline.

Table 1 adds together all of the above EU mercury sources, and presents the totals by year in such a way as to demonstrate the contribution of chlor-alkali mercury to the total.

Assumptions regarding EU mercury demand

EU15 mercury demand, as presented in Table 1, has been recently summarised in a European Commission report.[16] That summary has been revised by this author to include estimated mercury demand in the 12 Accession Countries as described below.

Accession Country mercury demand

Without any published data or even estimates of mercury consumption in the 12 Accession Countries (new EU Member States), actual figures remain open to debate. The Accession Countries bring over 100 million more people into the EU15 (already over 380 million), i.e., more than a 25% population increase, but with a purchasing power parity (PPP) per capita[17] of close to 50% of the EU15. Since there is no clear link – due to the influence of mercury related regulations and restrictions – between mercury consumption and PPP (or GDP), it makes more sense to extrapolate EU15 mercury consumption to EU25+2 on the basis of population, keeping in mind that the economic structure of the Accession Countries is older, on average, than the EU15 (consider that the Accession Countries include Poland, the Czech Republic, Romania, Hungary, Bulgaria, etc.). Just as mercury emissions to the air are significantly higher per capita in the Accession Countries than in the EU15 (e.g., see mercury consumption and emissions in the chlor-alkali sector), it is within reason to assume that mercury consumption is generally higher throughout the Accession Countries' economies. The author has therefore taken a value for the Accession Countries of three times the EU15 per capita mercury consumption, which reflects EU15 consumption about 10 years ago. Thus if the population increase from EU15 to EU25+2 is some 25%, then the increase in mercury consumption due to the Accession Countries could be estimated at some 75%. This EU25+2 total of 480 tonnes of mercury is then allocated among the various categories of demand based largely upon what we know of demand patterns in the EU15.

Evolution of EU25+2 mercury demand to 2020

As seen in Table 1, chlor-alkali mercury demand is estimated to follow the straight-line phase-out described previously, with a small amount of capacity remaining in 2020.

Most other product categories are conservatively assumed to decrease their demand for mercury by about 50% up to 2020. The actual decrease will likely be greater in most cases as increasing manufacturer awareness and new EU regulations gradually decrease mercury use in more and more products.

Two notable exceptions are dental mercury, where better dental care may actually increase mercury use in some countries, and where practitioners seem especially resilient to the prospect of changing long-standing methods of treatment; and mercury use in energy-efficient lamps, where ongoing industry efforts to reduce the amount of mercury in each lamp are countered, to some extent, by the ever-increasing number of lamps produced and consumed in the EU.

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[16] Commission Staff Working Paper, *Extended Impact Assessment*, Annex to the Communication from the Commission to the Council and the European Parliament on Community Strategy Concerning Mercury, COM(2005)20 final.

[17] In other words, GDP per capita expressed in terms of local purchasing power in the countries concerned.

All of these groups of EU25+2 mercury demand have been added together in order to show the likely trend in mercury demand during the period 2007 to 2020.

Conclusions

Basic finding

The purpose of this exercise, as mentioned, is to determine whether there is an excess of mercury supply over demand in the EU during the period in question, in order to justify possibly storing the mercury from some of the sources so that it does not lead to market imbalances.

In fact, Table 1 demonstrates that using the best estimates noted previously, it may reasonably be anticipated that **sufficient mercury supplies will be available from within the EU to provide for all anticipated EU demand, even without making recourse to the mercury recovered from decommissioned chlor-alkali facilities.**

Sensitivity assessment

Finally, the sensitivity of the preceding analysis was tested by considering the unlikely case in which the EU mercury supply could, under special circumstances, be even less than the estimates, while the EU mercury demand could, at the same time, be even greater than the estimates. In this case, it was assumed that the minimum EU mercury supply could be 20% below the best estimate, and the maximum EU mercury demand, already incorporating conservative assumptions, could simultaneously be another 10% greater than the best estimate.

Under these exceptional conditions, as demonstrated in Table 1, one might in fact observe a mercury supply deficit of 60-70 tonnes in the year the export ban takes effect, decreasing steadily during the subsequent 4 years. This deficit is small enough and unlikely enough that no special precaution would be warranted, especially as mercury imports or chlor-alkali sources could be made readily available in an emergency.

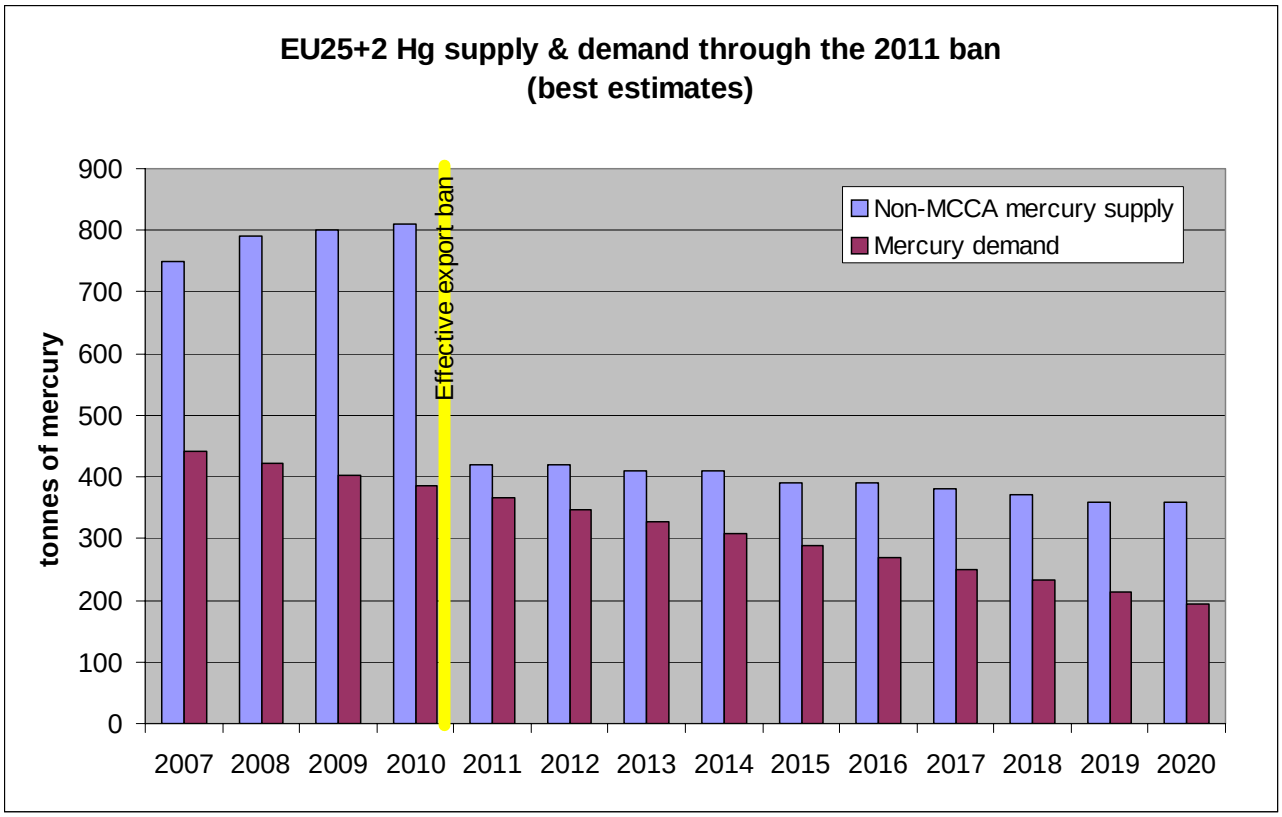
Table 1 – Availability of mercury in the EU25+2, 2007-2020

EU25+2 mercury supply	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
EU25+2 + Switz. MCCA chlorine capacity (thousand tonnes)	6500	6300	5900	5500	5100	4700	4300	3900	3500	3100	2700	2300	1900	1500	1100	700	**300**
Easily recoverable Hg (tonnes)	13000	12600	11800	11000	10200	9400	8600	7800	7000	6200	5400	4600	3800	3000	2200	1400	600
EU25+2 MCCA closures 2005-07 (thousand tonnes)		200	400	400													
EU25+2 MCCA closures 2008-20 (thousand tonnes)					400	400	400	400	400	400	400	400	400	400	400	400	400
Hg recovered from EU25+2 MCCA closures (tonnes)			400	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Existing chlor-alkali industry stocks in storeroom (10% of recovered Hg)			40	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Total MCCA (easily recoverable) supply				**880**	**880**	**880**	**880**	**880**	**880**	**880**	**880**	**880**	**880**	**880**	**880**	**880**	**880**
Existing stocks (Almaden 1500 t in 2005)			**300**	**300**	**300**	**300**	**300**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Existing stocks (EU Hg brokers 500 t in 2005)			**100**	**100**	**100**	**100**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Primary mining, ore processing		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
By-product Hg from zinc ores, etc. (EU25+2)			**100**	**100**	**120**	**120**	**120**	**120**	**120**	**120**	**120**	**120**	**120**	**120**	**120**	**120**	**120**
Recycled Hg from non-MCCA wastes & products	EU15	EU25+2															
- non-MCCA (industrial, etc.) wastes	**50**	**75**	**80**	**90**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**90**	**90**	**90**	**80**	**80**	**80**
- products	**100**	**150**	**150**	**160**	**170**	**180**	**190**	**200**	**200**	**190**	**190**	**180**	**180**	**170**	**170**	**160**	**160**
Total non-MCCA supply (best estimate)				**750**	**790**	**800**	**810**	**420**	**420**	**410**	**410**	**390**	**390**	**380**	**370**	**360**	**360**
Total non-MCCA supply (minimum estimate)				600	632	640	648	336	336	328	328	312	312	304	296	288	288
Total annual mercury supply (best estimate)				**1630**	**1670**	**1680**	**1690**	**1300**	**1300**	**1290**	**1290**	**1270**	**1270**	**1260**	**1250**	**1240**	**1240**
Total annual mercury supply (minimum estimate)				1480	1512	1520	1528	1216	1216	1208	1208	1192	1192	1184	1176	1168	1168

EU25+2 mercury demand	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
	EU15	EU25+2															
Chlor-alkali demand, net of Hg recovered by industry from MCCA waste	105	180	169	157	146	134	123	111	100	89	77	66	54	43	31	20	9
Batteries	10	20	19	19	18	17	17	16	15	15	14	13	13	12	11	11	10
Dental	70	110	107	105	102	99	97	94	91	89	86	83	81	78	75	73	70
Electrical & electronic	22	40	39	37	36	35	33	32	31	29	28	27	25	24	23	21	20
Measuring & control	22	40	39	37	36	35	33	32	31	29	28	27	25	24	23	21	20
Lighting	21	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Other	25	50	48	47	45	43	42	40	38	37	35	33	32	30	28	27	25
Total annual mercury demand (best estimate)	**275**	**480**	**461**	**442**	**423**	**404**	**385**	**365**	**346**	**327**	**308**	**289**	**270**	**251**	**232**	**213**	**194**
Total annual mercury demand (maximum estimate)				486	465	444	423	402	381	360	339	318	297	276	255	234	213

Excess of EU25+2 mercury supply over demand:																	
- including MCCA sources (best estimates)				1188	1247	1276	1305	935	954	963	982	981	1000	1009	1018	1027	1046
- if MCCA sources are stored (best estimates)				308	367	396	425	55	74	83	102	101	120	129	138	147	166
- if MCCA sources are stored (worst case)				114	167	196	225	-66	-45	-32	-11	-6	15	28	41	54	75

“Best estimates”



“Worst case”