UNITED NATIONS
ENVIRONMENT PROGRAMME
CHEMICALS

Summary of supply, trade and demand information on mercury

requested by
UNEP Governing Council decision 23/9 IV

November 2006

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Executive summary

1. In 2001, through the UNEP Governing Council (GC) decision 21/5, the GC decided to initiate a process to undertake a global assessment of mercury and its compounds. The Global Mercury Assessment (UNEP, 2002) was presented to the 22nd session of the UNEP Governing Council in 2003. Based on the key findings of the report, the Governing Council concluded that there was sufficient evidence of significant global adverse impacts from mercury and its compounds to warrant further international action to reduce the risks to human health and the environment. They decided, through GC decision 22/4 V, that national, regional and global actions, both immediate and long-term, should be initiated as soon as possible, with the objective of identifying exposed populations and ecosystems, and reducing anthropogenic mercury releases that impact human health and the environment.

2. Discussions relating to the need for further measures to address the global adverse impacts of mercury on health and the environment continued at the 23rd session of the Governing Council in February 2005. The Governing Council adopted an omnibus decision on chemicals management, GC decision 23/9. With regard to mercury, the decision strengthened the UNEP mercury programme, called for partnerships between Governments and other stakeholders, and encouraged Governments, the private sector and international organizations to address the risks due to mercury in products and production processes.

3. As background material for the Governing Council's considerations at its 24th session in February 2007, it requested UNEP to provide a number of reports and documents demonstrating the implementation of decision 23/9 IV, including a report on supply, trade and demand for mercury on the global market. This document specifically responds to the request that UNEP should initiate, prepare and make public a report summarizing supply, trade and demand information for mercury, including its use in artisanal and small-scale gold mining.

4. The artisanal and small-scale gold mining sector is very important with regard to the use of mercury, adding the unique problems of poverty, the informal economy and considerable health and environmental impacts to the other challenges of dealing with mercury. Therefore, the UNIDO/UNDP/GEF Global Mercury Project has kindly contributed to the UNEP Governing Council a report on mercury issues associated with the small scale gold mining sector, including the benefit of its experience in supporting a number of developing countries, and countries with economies in transition. The Global Mercury Project report is referenced in various parts of this document, and is attached as Annex 3.

5. Many other reports and information sources have been drawn on in support of this document. These include information submitted by Governments, publicly available databases, papers, reports and publications containing national trade data, etc. These sources are identified in footnotes and references to the report. As available, peer-reviewed papers and reports have been used in support of this document. However, the number of papers on mercury supply, trade and demand that have appeared in scientific journals is rather limited in comparison to the number of papers addressing many other issues related to mercury. Fortunately, many of the reports on mercury supply, trade and demand that have not been published by scientific journals have, nevertheless, gone through an extensive review process.

6. Despite an apparent quantity of publicly available data, much of the world mercury market is private, and some of it is illegal. This adds an additional element of uncertainty even to those commercial mercury flows we believe we understand. This report demonstrates that increased scrutiny of mercury trade flows by national authorities worldwide – even if it involves only a closer inspection of statistics already collected – would bring us rapidly closer to a more effective control of the global mercury problem.

Global mercury supply

7. The five most common sources of global mercury supply in recent years include:

i. Mining and processing of primary mercury ores;
ii. By-product mercury recovered from the refining of some ferrous and most non-ferrous metals, and from the cleaning of natural gas;
iii. Recovery of mercury from mercury cell chlor-alkali plants (MCCAPs) after decommissioning (when the plant is converted to a mercury-free process, or occasionally closed due to lack of economic viability);
iv. Recycled mercury from products (such as thermometers or batteries) containing mercury, or from mercury sludges and wastes generated by the chlor-alkali industry and others;
v. Stocks of mercury accumulated over time from various sources (typically the original source would have been mined or by-product mercury, mercury from decommissioned MCCAPs, or mercury recovered from wastes).

8. Table 1 below summarises the estimated global mercury supply during 2005. Despite best efforts to clarify these data, there remain many uncertainties due to the wide range of sources, as well as the limited reporting of information with regard to most of these sources.

Table 1 Global mercury supply, 2005

Sources of mercury supply (2005)	**Mercury supply (metric tonnes)**
	Range
Mining and by-product	1,800-2,200
Recycled mercury from chlor-alkali wastes	90-140
Recycled mercury – other	450-520
Mercury from (decommissioned) chlor-alkali cells	600-800
Stocks	0-200
Total	**3,000-3,800**
Note: Further details and uncertainties are described in the full report, Sections 3.1 and 3.2.	

9. Overall, primary mining of mercury has decreased in recent years. Primary mercury mining in Spain was halted in 2003, and in Algeria in 2004. On the other hand, mining in China, primarily for domestic consumption, has increased.

10. Mercury wastes generated as a by-product of certain non-mercury mining and smelting activities are a potentially large and growing source of the metal. Mercury is extracted from these wastes depending on the specific regulatory and economic environment in which each mine operates.

11. Some Federal Government mercury stocks in the United States of America have been relegated to long-term storage for environmental reasons. Meanwhile, other stocks or inventories (Russia, 2005-6; MAYASA/Spain, yearly; Lambert Metals and other brokers, yearly), of which the ownership is not always clear, continue to move to the market, sometimes with no clear knowledge of the final destination or final user.

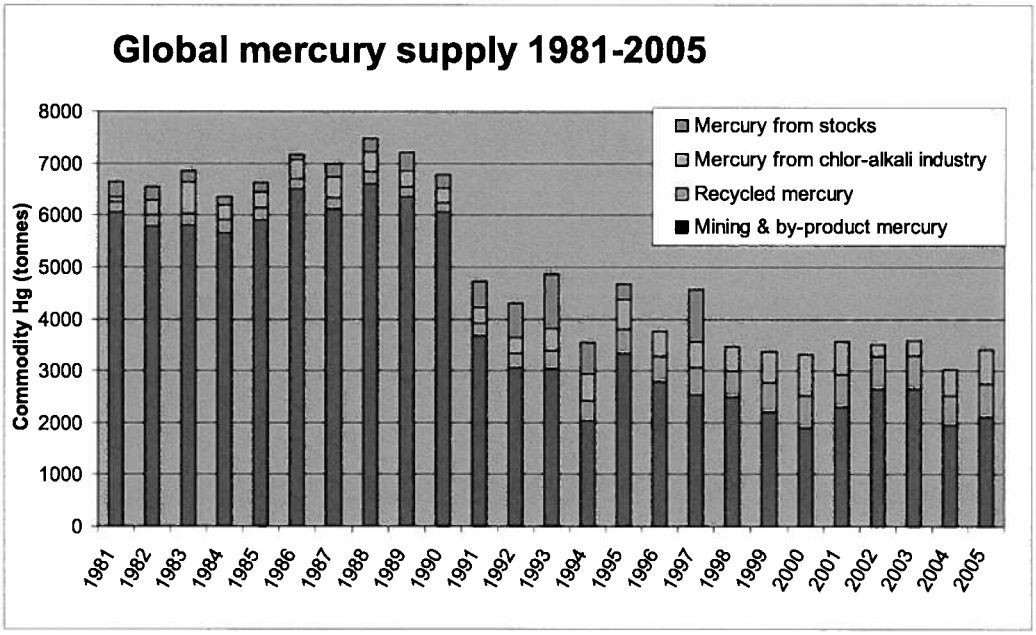
12. The greatest concentration of mercury cell chlor-alkali production remains in Europe. The European chlor-alkali industry intends to phase out most of its 40-50 mercury cell chlor-alkali units by 2020, freeing up at least 11,000 metric tonnes of elemental mercury. Some industry groups outside of Europe, such as in India, have also spoken of a voluntary transition to the economically and environmentally preferable membrane technology for producing chlorine and caustic.

13. Due in part to the large quantities of "residual" mercury that will be generated as chlor-alkali units are decommissioned, the European Commission has proposed legislation to ban mercury exports and require long-term storage of residual mercury, implying that there are specific sources that should preferably be stored rather than put on the global market. Achieving a broad consensus on which mercury sources are preferred for legitimate commercial use, and which sources should be minimized or stored, would enhance the health and environmental benefits of the desired future reductions in global mercury supply and demand.

14. In that respect, it may be argued that some mercury supply sources are more environmentally advantageous than others. To maximize the benefits of mercury demand reduction, those supply resources that are least environmentally advantageous should be seen as global priorities for supply reduction measures. From this perspective, mercury mining would be the highest priority source to be reduced, followed by mercury recovered from decommissioned chlor-alkali plants, other mercury inventories, etc. By-product mercury and mercury recycled from waste and products would be "preferred" sources in that they are, at least for the moment, inadvertent mercury sources that are impossible to avoid. Without collection, much of the by-product and waste mercury would be released into the environment.

15. Global mercury supply and demand decreased substantially during the 1980s and 1990s, but these major reductions have not continued in the first half of this decade, as seen in Figure 1 below. Significantly, however, further large reductions may be anticipated as present and planned restrictions are implemented, such as phasing out the use of various mercury containing products, storing the residual mercury from decommissioned chlor-alkali facilities, etc.

Figure 1 Global mercury supply 1981-2005



Global mercury demand

16. Demand for mercury has long been widespread, although the global mercury commodity market is small in both tonnage and value of sales. Even though mercury may routinely be traded several times before final "consumption," the available statistics suggest that global yearly transactions of mercury and its compounds are estimated to be in the range of USD 100-150 million in value. Most transactions are between private parties and are not publicly reported. The major categories of mercury demand in higher income countries include:

- Chlor-alkali production;
- Dental amalgams;
- Fever and other thermometers;
- Other measuring and control equipment;
- Neon, fluorescent tubes, compact fluorescent, HID and other energy-efficient lamps;
- Electrical switches, contacts and relays;
- Laboratory and educational uses.

17. Additional categories of mercury demand more prevalent in, but not exclusive to, developing countries and countries with economies in transition include:

- Vinyl chloride monomer (VCM) production using the acetylene process and a mercury catalyst;
- Artisanal and small-scale gold mining (ASM);
- Batteries;
- Cosmetics and skin-lightening creams;
- Cultural uses and traditional medicine;
- Paints and pesticides/agricultural chemicals.

18. Apart from the great quantities of mercury used for large- and small-scale gold and silver mining over many centuries, chlor-alkali production, batteries, paints and pesticides/fungicides have been the biggest users of mercury in the 20th century, all declining steadily since the mid- to late-1980s.

19. While continuing its long-term decline in most of the higher income countries, there is evidence that demand for mercury remains relatively robust in many developing countries, and countries with economies in transition, although detailed data may be lacking. At the same time, there are far fewer details pertaining to the end use of mercury in many nations. The main factors behind the decrease in mercury demand in the higher income countries are the substantial reduction or substitution of mercury content in regulated products and processes (paints, batteries, pesticides, chlor-alkali, etc.), and a general shift of mercury product manufacturing operations (thermometers, batteries, etc.) from higher income to lower income countries.

20. As seen in the table below, artisanal and small-scale gold mining remains the largest global user of mercury, is reportedly still increasing, is the largest source of releases, and is a serious global poverty and health issue as well.

21. The large and increasing use of mercury in the production of vinyl chloride monomer (VCM), especially in China, is another area of major concern, especially as it is not yet clear where much of the mercury goes – estimated to be several hundred tonnes – as the catalyst is depleted.

22. The chlor-alkali industry is the third major mercury user. Many MCCAP operators have phased out this use of mercury technology, others have plans to do so, and still others have not announced any such plans. In many cases governments have worked with industry representatives and/or provided financial incentives to facilitate the transition away from mercury technology. More recently, governments and international agencies have created partnerships with industry to encourage broader industry improvements.

23. The use of mercury in batteries, while still considerable, continues to decline as the scale of diffuse mercury releases has become evident, and many nations have implemented policies to deal with the problem. Nevertheless, additional management measures could facilitate the transition.

24. While mercury use has declined in many sectors, generally assisted by government/regulatory action or public awareness and encouragement, this trend has been offset in recent years by increased use of mercury in artisanal and small-scale gold mining activities, and mercury use in VCM production, as discussed in the full report. There also appears to be a modest increase in mercury use in the lighting sector, and an apparently stable use for dental amalgams. In the latter case, viable alternatives are available. While the use of dental mercury is declining in many countries, an important reduction in the global use would require management measures to facilitate the transition of this sector and reduce significant mercury releases to the environment.

25. For 2005, global demand for mercury is summarised in Table 2 below. Also included in the table are projections in line with two mercury demand reduction scenarios:

- The first scenario represents the "status quo," and assumes that few measures that are not already in place will be introduced during the next ten years. This scenario suggests approximately a 15% reduction in global mercury demand by 2015.
- The second scenario represents a more "focused mercury reduction" strategy, in which the key countries and companies involved identify mercury demand reduction as a clear priority, and adopt the more obvious measures necessary to move substantively toward that objective. This scenario suggests greater than a 30% reduction in global mercury demand by 2015.

Mercury market price

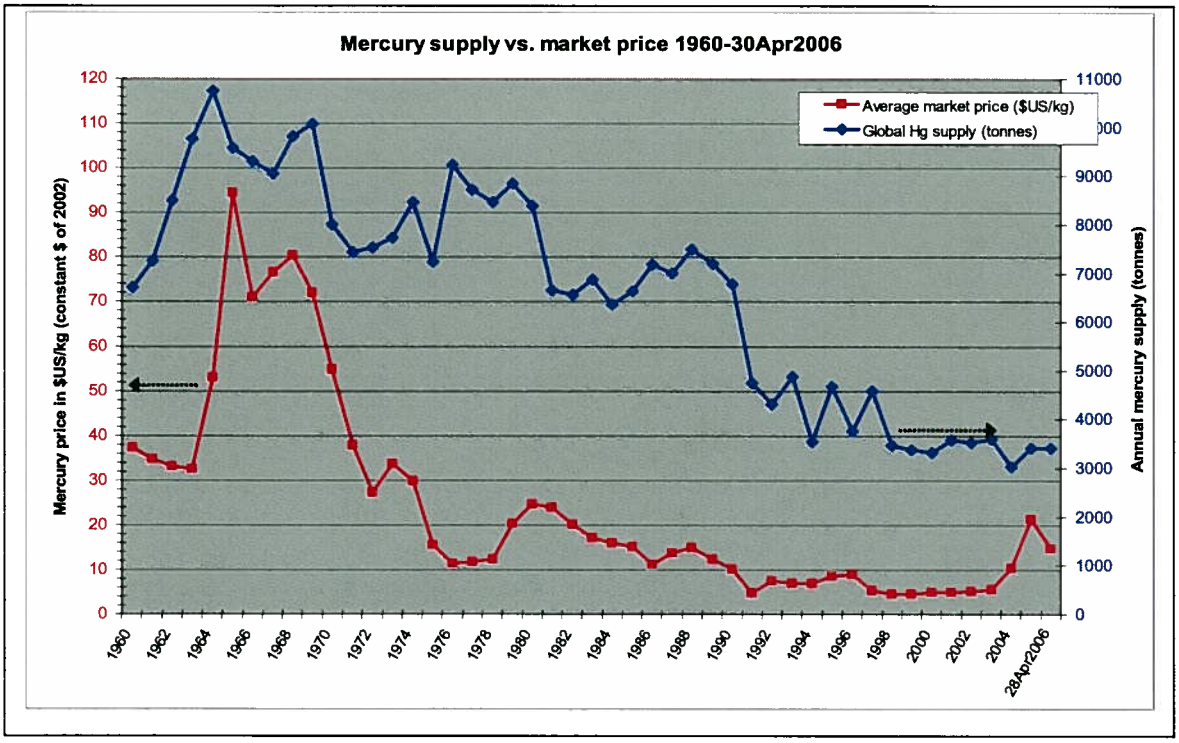
26. As evident in Figure 2 following, mercury prices decreased for most of the past 40 years. From 1991-2003 mercury prices stabilized at their lowest real levels in 100 years – in the range of USD 4-5 per kilogram of mercury. The low price reflected a plentiful supply of mercury coupled with an increasing cost of using or dealing with mercury due to regulatory pressures, e.g., to reduce industrial emissions, to organize separate collection of mercury products, and to deal with increasing restrictions and costs of mercury waste disposal by sending more wastes to recyclers.

Table 2 Global mercury demand by sector (2005), and reduction scenarios

Global mercury demand, by sector (metric tonnes)	**Present (2005)**	**"Status quo" scenario (2015)**	**"Focused Hg reduction" scenario (2015)**
Small-scale/artisanal gold mining	650-1000	650	400
Vinyl chloride monomer (VCM) production	600-800	1,000	1,000
Chlor-alkali production	450-550	350	250
Batteries	300-600	200	100
Dental use	240-300	270	230
Measuring and control devices	150-350	125	100
Lighting	100-150	125	100
Electrical and electronic devices	150-350	110	90
Other (paints, laboratory, pharmaceutical, cultural/traditional uses, etc.)	30-60	40	30
Total	**3000-3900**	**2,870**	**2,300**

Note: "Demand" may also be termed "gross consumption," and is here defined as total annual throughput of mercury for each of these sectors. In each of these sectors some mercury recycling takes place, involving the recovery of mercury from products or wastes. Therefore, "net consumption" of mercury in any of these sectors may be significantly lower than "gross consumption." Further details and uncertainties are described in the full report, Sections 5.1, 5.2 and 5.3.

Figure 2 Global mercury supply and spot market price, 1960-2006



27. The subsequent and sudden 2004-2005 increase in the mercury price may be explained largely by the significant tightening of mercury supplies during 2004, mainly related to the closure of both the Spanish and Algerian mercury mines. Other contributing factors included increased demand for mercury by a growing number of artisanal and small scale gold miners, speculative activity by brokers, etc. Responding in part to the price rise, increased supplies of mercury appeared on the market in 2005 and 2006 , leading to a rapid fall-off in the mercury price, although still well above the levels of the last 10-15 years.

Global mercury trade

28. A solid appreciation of country and regional commercial mercury flows is a vital foundation upon which Governments can build effective strategies and promote specific measures to address national and global mercury challenges. A full understanding of commercial flows of mercury begins with the details of flows inside a specific country, proceeds to a larger and more complete picture by examining flows between different countries, and generates a still more aggregated picture by investigating flows between different regions.

29. Some of the main objectives of more closely examining commercial flows of mercury would be:

- To better understand the specific sources and uses, the trade routes, the main stakeholders involved, etc.;
- To better inform not only those countries and regions that have established plans and targets for reducing mercury supply and demand, but also international agencies mandated to take a broader approach to addressing mercury problems;
- To support the national and regional initiatives addressing mercury supply and demand – those already in place and those being developed – to be as effective as possible; and
- To provide a tool to measure progress toward national and international objectives of reducing mercury flows in the biosphere through reductions in mercury supply and demand.

30. The details of commercial flows of mercury **inside individual countries** are, in most cases, not very well known. Following the "mercury trail" is not especially difficult, but few countries have systems in place that would collect and centralize information on domestic commercial transactions of mercury.

31. Mercury transactions **between countries**, on the other hand, are more easily tracked through tariff codes by Customs authorities, and are typically reported to centralized databases such as the UN Statistics Division's (UNSD) "Comtrade" database. UNEP was granted unrestricted access to all of the trade statistics in the Comtrade database as a resource for this report, and would like to express its appreciation to its colleagues at UNSD for their interest in, and support of, this effort.

32. Table 3 provides an example of the Comtrade data summarized by UNEP for transactions of elemental mercury for each country whose statistics have been reported to Comtrade during the last 10 years. Brazil was selected for this example because the data reflect, to some extent, the strong demand for mercury (typically 50-90 tonnes per year) during the well-known gold rush of artisanal and small-scale miners. As miners depleted the main deposits in Brazil in the late 1990s, it was observed that mercury imports by Brazil either declined or were diverted to similar activities in neighbouring countries. This and other country trade summaries are available online, along with a detailed explanation of the table, on UNEPs mercury program website:
http://www.chem.unep.ch/mercury/Trade-information.htm.

Table 3 Example of mercury trade summary for a single country (Brazil)

BRAZIL **Elemental mercury imports and exports**

Data source: UN DESA/ESD/UNSD - Comtrade statistics - downloaded 11Apr2006
Tarif system: SITC rev.2
Tarif code: 52216
Filter: Trade value ≥ $US 0
Comments:

Period	Exporting partner countries			Target country: Brazil				Importing partner countries		
		Reported exports to target country		Reported imports from partner country (on left)		Reported exports to partner country (on right)		Reported imports from target country		
Year	Country name	Kg mercury	Value ($US)	Kg mercury	Value ($US)	Kg mercury	Value ($US)	Kg mercury	Value ($US)	Country name
1995	Areas, nes			1	10	13	49			Areas, nes
1995	Germany	97	2000	3	885			93	1860	French Guiana
1995	Netherlands			35812	159343					
1995	Spain	4000	18497	4000	19024					
1995	Switzerland			2750	17399					
1995	United Kingdom			7812	37266					
1995	USA	4937	28580	4125	30276					
1996	Areas, nes			12	69	1	6			Areas, nes
1996	Germany	183	2657	519	4636	132	692			Bolivia
1996	Mexico	4000	19720							
1996	Russian Federation			61617	313375					
1996	Spain	6000	29397	5000	25477					
1996	United Kingdom	2062	10535							
1996	USA	3375	16000	8250	62570					
1997	Algeria			3437	17802	10	225			Areas, nes
1997	Central African Rep.			1750	8466	171	1818			Bolivia
1997	Finland			3437	17791					
1997	Germany	699	9804	62	5381					
1997	Mexico			4000	20647					
1997	Netherlands	10000	23076							
1997	Russian Federation			20597	104046					
1997	Spain	28425	140755	19082	97281					
1997	USA	5125	33727	4125	33600					
1998	Algeria			14812	74029	57	812			Areas, nes
1998	Areas, nes			3375	16373	28	731			Lebanon
1998	Central African Rep.			6875	33660					
1998	Finland			5125	24729					
1998	Germany	132	2000	890	7043					
1998	Netherlands	5312	29289	199	3044					
1998	Russian Federation			16835	80078					
1998	Spain	15937	79506	27156	139970					
1998	Switzerland	19	553	2	618					
1998	United Kingdom			3375	16917					
1998	USA	2500	14874	3562	28233					
1999	Algeria			3437	17500	48	819			Areas, nes
1999	Central African Rep.			1750	8032	17250	76309	17250	79328	Argentina
1999	Germany	97	7619	43	2413			47	1135	Bolivia
1999	Netherlands	500	48332	148	49768					
1999	Russian Federation			41402	186960					
1999	Spain	3062	14559	2937	15219					
1999	Switzerland	3	505	2	581					
1999	USA	1312	9970							

BRAZIL **Elemental mercury imports and exports**

Data source: UN DESA/ESD/UNSD - Comtrade statistics - downloaded 11Apr2006
Tarif system: SITC rev.2
Tarif code: 52216
Filter: Trade value ≥ $US 0
Comments:

Period	Exporting partner countries			Target country: Brazil				Importing partner countries		
		Reported exports to target country		Reported imports from partner country (on left)		Reported exports to partner country (on right)		Reported imports from target country		
Year	Country name	Kg mercury	Value ($US)	Kg mercury	Value ($US)	Kg mercury	Value ($US)	Kg mercury	Value ($US)	Country name
2000	Areas, nes			2	438	68	742			Areas, nes
2000	Finland			1750	8149	7187	41985	2437	10709	Argentina
2000	France	0	1123					1125	863	Paraguay
2000	Germany	398	27782	410	30813					
2000	Kyrgyzstan			3437	15000					
2000	Mexico	109	9899	89	10646					
2000	Netherlands	62320	318370	3687	121716					
2000	Russian Federation			18492	86727					
2000	Spain			10812	51203					
2000	USA			1875	13562					
2001	Algeria			2562	12375	24	187			Areas, nes
2001	Finland			10375	48901			49	895	Netherlands
2001	Germany	796	17906	687	19007					
2001	India	17500	34649							
2001	Netherlands	11562	94041	3562	85712					
2001	Russian Federation			3437	16313					
2001	Trinidad and Tobac	5812	28013							
2001	Spain			41886	208962					
2001	USA	3562	139199	13	517					
2002	Algeria			4500	22136	0	108			Areas, nes
2002	Belgium	5187	13354							
2002	Finland			27531	81292					
2002	France			1	578					
2002	Germany	296	14560	3687	33220					
2002	Netherlands	18519	336379	191	120011					
2002	Russian Federation			2500	12499					
2002	Spain			2000	5291					
2002	United Kingdom			7562	37559					
2002	USA	2000	22500	18917	31630					
2003	Algeria			2750	15495	1	55			Areas, nes
2003	Belgium			3437	19117			140	18100	Netherlands
2003	Finland			7750	42225					
2003	Germany	398	26000	367	28763					
2003	Netherlands	11250	179972	156	165511					
2003	Spain	19421	43594	26175	83822					
2003	United Kingdom			31222	101634					
2003	USA	7187	50149	8875	53488					
2004	Algeria			1750	15212					
2004	Areas, nes			3	41					
2004	France	0	7407							
2004	Germany	199	5000	261	24587					
2004	Japan			6187	53576					
2004	Netherlands	10375	156771	109	199024					
2004	Russian Federation			17250	85298					
2004	Spain	20000	122227	8625	74740					
2004	USA	1750	19949	3625	39938					

Source: UNDESA/SD Comtrade (2006) export statistics – UN Commodity Trade Statistics Database, United Nations Department of Economic and Social Affairs—Statistics Division, at http://www.unstats.un.org/unsd/comtrade

33. It is difficult to determine how much country-to-country trade in elemental mercury may not have been reported. For the 163 countries and protectorates that have reported mercury imports or exports during at least one year since 1995, the Comtrade database appears reasonably comprehensive for many countries, and not very complete for a number of others, based on indications of experts working with artisanal and small-scale miners, and separate estimates of regional mercury consumption. According to the Comtrade data, the total quantity of elemental mercury traded/sold between countries (some of it clearly traded several times during the course of a year or two) amounted to some 60,000 metric tonnes during the ten years from 1995 to 2004, or an average of approximately 6,000 metric tonnes per year. The trend since 2000 has clearly been below that average. It should be noted that these data do not include commercial transactions inside individual countries – only between countries.

34. Using the same Comtrade statistics, the total value of the elemental mercury transactions between countries that reported to Comtrade comes to some USD 250 million for the period 1995-2004, or about USD 25 million per year. Again, this value does not include transactions within individual countries, commercial transactions of mercury compounds, etc., which would give a substantially higher number for the overall mercury "market."

35. Despite the official sources and general quality of the existing trade data, they reveal some weaknesses with regard to the objectives indicated in paragraph 29 above. Certain weaknesses could be reduced if the agencies collecting and reporting the data were better aware of how these data may be used to improve our understanding of mercury trade and use throughout the world. Other weaknesses can only be addressed through a modest increase in the types of data collected. For example:

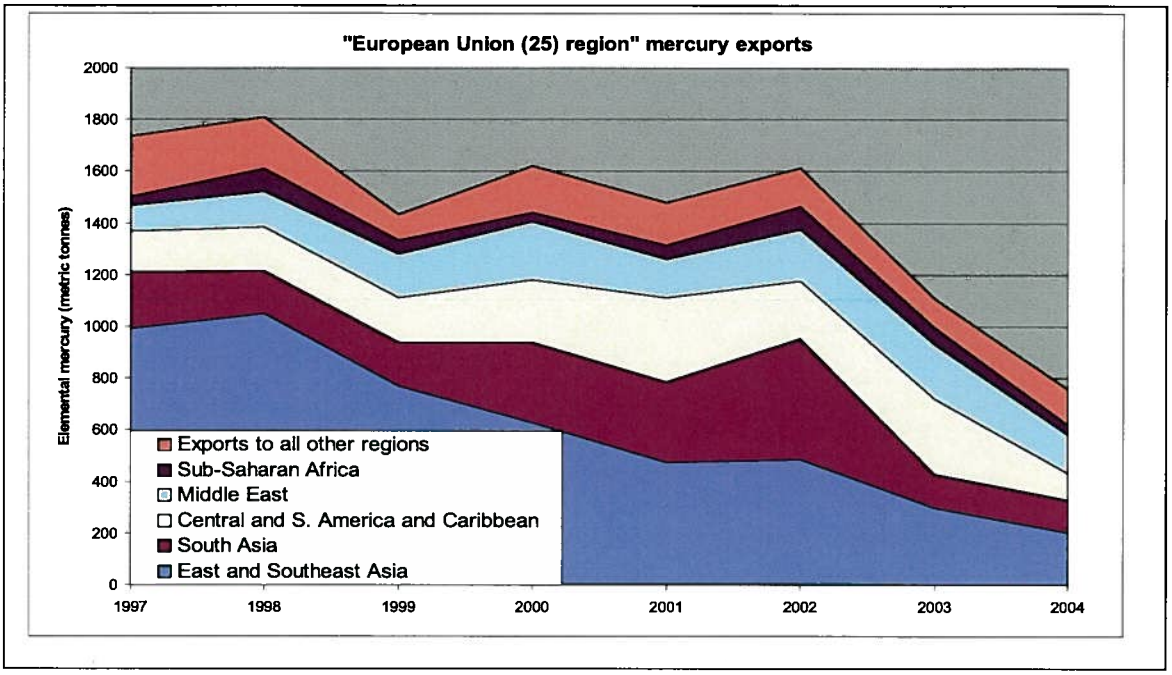
- There are some inconsistencies and gaps in the data, as demonstrated in Annex 1 – Discrepancies in trade statistics (1) and Annex 2 – Discrepancies in trade statistics (2);
- There is some understandable confusion of tariff codes, such as the difficulty of determining, in some cases, whether a shipment consists of elemental mercury, a mercury compound or mercury waste; or whether a shipment of batteries ("primary cells") contains mercuric oxide batteries or other batteries;
- For obvious reasons, the mercury trade data reported to Comtrade is consolidated into a single entry (quantity and value) for any given year – one entry for imports and one for exports between any two trading partners; for policy purposes a greater level of detail could be useful;
- The data most widely and consistently reported is for elemental mercury transactions, whereas the data on trade in mercury compounds is not as commonly reported; or the tariff code (e.g., non-ferrous metal compounds) is so broad as to include non-mercury compounds as well;
- Likewise, the tariff codes used by most countries do not differentiate between mercury products (e.g., thermometers) and mercury-free products, except in the case of certain lamps;
- As mentioned, most countries do not have very good information on commercial transactions and uses of mercury after it enters a country; such domestic statistics may be useful not only as a check on country-to-country trade statistics, but also in determining the effects of various policies on different sectors dealing with elemental mercury, mercury compounds or mercury containing products;
- Finally, goods and materials passing through Customs Free Zones (also known as Free Trade Zones) are subject to very different Customs procedures, or none at all. It could be useful to review any reporting requirements for transactions to and from these zones involving certain hazardous substances.

36. Overall, since some countries do not report their trade statistics routinely to UNSD, the Comtrade data may be considered to provide a low-end approximation of the global market in elemental mercury. However, there is very little reporting of trade in mercury compounds and products. More standardised, comprehensive and timely reporting of international (and domestic, to the extent possible) trades would improve the quality and value of future assessments.

37. The Comtrade data on trade in elemental mercury between individual countries may be further analyzed to show commercial transactions **between different regions** of the world, and their evolution in recent years. This analysis may especially be valuable to authorities involved in regional policy deliberations.

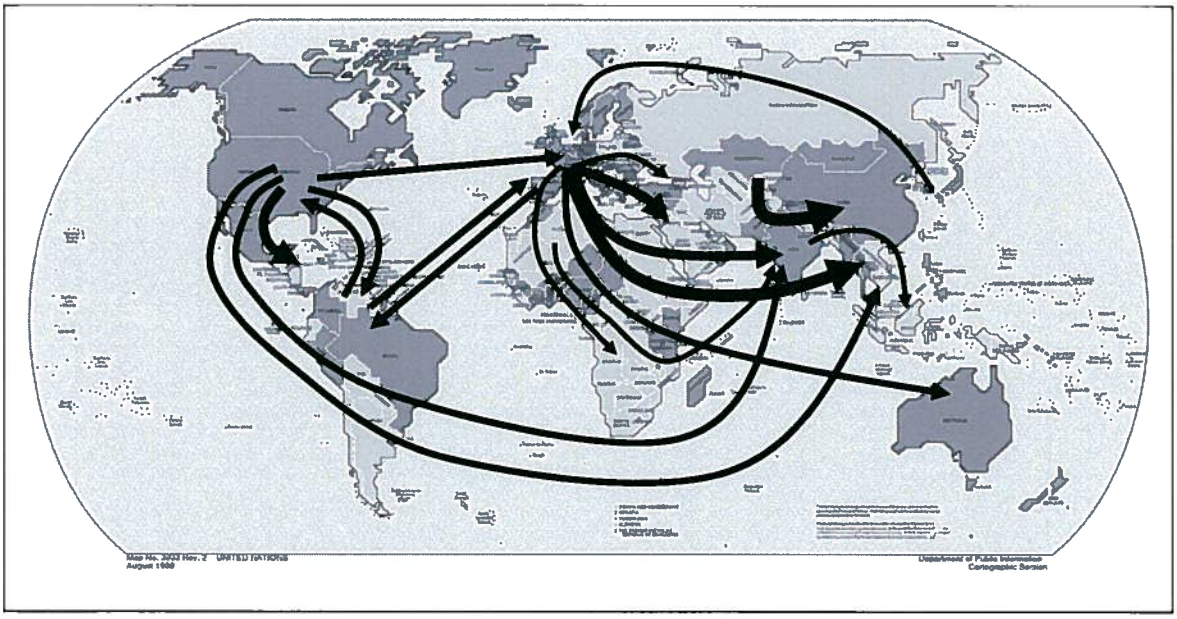
38. As an example, the following Figure 3 shows the 1997-2004 elemental mercury exports from the European Union to all other regions of the world. The figure also shows the main regions that were recipients of European Union exports during those years.

Figure 3 Exports of elemental mercury from the European Union, 1997-2004



39. In order to put the European Union regional exports into the larger context, Figure 4 indicates the major trade flows between regions for the year 2004. This figure shows the main exporters of mercury in 2004 to be the region that includes primarily the CIS countries, and Western Europe. In fact, according to the Comtrade statistics, the largest regional activity in 2004 consisted of over 750 tonnes of worldwide mercury exports from the European Union (EU), including more than 300 tonnes the EU had received in 2004 from Switzerland. The CIS region also exported over 700 tonnes of mercury, which included over 400 tonnes exported from Kyrgyzstan to China, and some 200 tonnes from other CIS countries to the European Union.

Figure 4 Commodity mercury shipments among world regions, 2004



40. Summaries of mercury exports and imports for 1997-2004 among all regions may be found in Annex 5. In general, it may be seen that the volumes of mercury traded globally have declined since the late 1980s; however, during the last 10 years that decline has been less evident.

41. As part of a larger regulatory strategy to reduce the amount of mercury available to the biosphere, a number of countries have already implemented policies with the express purpose of restricting or regulating mercury trade, supply and demand. In other countries such policies are under discussion. Focussing primarily on trade issues in this analysis, the following relevant examples of mercury trade restrictions may be noted:

- China has officially restricted mercury imports since 2002;
- The European Union has agreed a mercury strategy that calls for a ban on mercury exports from 2011, and is now in the process of adopting relevant legislation, including a long-term storage requirement for mercury removed from decommissioned chlor-alkali plants;
- The United States Government has stored over 4000 metric tonnes of surplus mercury in order to keep it from the marketplace; in addition, a bill has been recently introduced to the United States Senate proposing legislation to ban mercury exports from 2010, among other restrictions on mercury;
- Sweden and Denmark have banned the export of elemental mercury, among other restrictions on mercury in products, etc.;
- Some mercury compounds are subject to the procedures of the 1998 Rotterdam Convention (also known as the Prior Informed Consent (PIC) Convention). According to action 16 of the European Union Mercury Strategy, the European Community should promote an initiative to make elemental mercury subject to the PIC procedure, as Sweden has, in fact, recently proposed.

Artisanal and small-scale gold mining

42. As mentioned above, due to the scale and global impact of mercury use in artisanal and small-scale gold mining, it is given special attention in this report.

43. The Global Mercury Project (GMP) is an initiative of the U.N. Industrial Development Organization. The GMP was launched in 2002 with financial support from the U.N. Development Program and the Global Environment Facility, co-financed by partner countries and civil society. The GMP works with governments, NGOs, industry and community stakeholders, building capacity to monitor factors related to mercury use and pollution in artisanal and small-scale gold mining (ASM), and developing policy and institutional capacities to remove barriers to the adoption of cleaner technologies of mineral extraction. Several countries are participating in this pilot program, with primary field activities taking place in Brazil, Indonesia, Lao People's Democratic Republic, Sudan, Tanzania and Zimbabwe.

44. The Global Mercury Project has kindly submitted a report in response to the UNEP Governing Council's request (*Decision 23/9 IV*) for information on mercury supply, trade and demand in artisanal and small-scale gold mining. The GMP report is included in this document as Annex 3. All of the information in this section is drawn very closely from the GMP report, which highlights some of the project's findings and outlines some major policy implications for nations worldwide – particularly nations exporting, importing and/or using mercury, as well as all countries affected by global pollution and/or involved in providing assistance to populations involved in ASM.

45. At least 100 million people in over 55 countries depend on ASM for their livelihood, mainly in Africa, Asia and South America. ASM produces 20-30% of the world's gold production, or approximately 500-800 tonnes per annum. It involves an estimated 10-15 million miners, including 4.5 million women and 1 million children. This type of mining relies on rudimentary methods and technologies and is often performed by miners with little or no economic capital, who operate in the informal economic sector, often illegally and with little organization. As mercury amalgamation is an inexpensive, quick and simple way to extract gold particles, it is currently the method most commonly used in ASM.

46. As a consequence of poor practices, mercury amalgamation in ASM results in the release of an estimated 650 to 1000 tonnes of mercury per annum, equivalent to perhaps one-third of all global anthropogenic (human-caused) mercury releases into the environment. This makes ASM the single largest intentional-use source of mercury pollution in the world. In addition to the severe occupational hazards associated with mercury use, ASM has generated thousands of polluted sites with impacts extending far beyond localized ecological degradation, often presenting serious, long-term environmental health hazards to populations living near and downstream of mining regions.

47. Though large-scale gold mine operations have phased out mercury use by adopting alternative technologies, mercury demand in ASM continues to increase. With the spot market price of gold rising from US$260/oz in March 2001 to US$725 in May 2006, a gold rush involving poverty-driven miners is being observed in many countries. This increase in mining activity is compounded by escalating poverty due to factors such the failure of subsistence economies, displacement of populations in areas of conflict, and the ravages of diseases such as HIV/AIDS.

48. The highest ASM mercury consumption levels appear to be in China (with 200 to 250 tonnes consumed and released), followed by Indonesia (100 to 150 tonnes), and between 10 and 30 tonnes in each of Brazil, Bolivia, Colombia, Ecuador, Ghana, Peru, Philippines, Venezuela, Tanzania and Zimbabwe. Mercury may be used to varying degrees in as many as 40 other countries as well. Mercury releases primarily depend on the nature of mining technology employed, which is influenced by cultural, social and economic factors.

49. Various location-specific GMP training programs and assessments have demonstrated that when mercury is less available and/or more expensive, less mercury is consumed as miners switch to more efficient practices, sometimes eliminating mercury use entirely.

50. At present, the unregulated trading of mercury from industrialized countries means that mercury often enters ASM countries legally, i.e. for use in dental amalgams or the chlor-alkali industry. However, there is evidence that in many developing countries and countries with economies in transition, most of the mercury imported ends up being used in ASM. In most countries, mercury is readily available and relatively inexpensive to miners at ASM sites. In some cases it is given for free, contingent on the recovered gold being sold to the mercury provider. GMP assessments have found that monitoring and regulating imports and domestic trade of mercury in ASM countries is generally significantly more difficult than regulating mercury supply at the export stage, particularly exports from developed countries.

51. Global commitments are critically needed to address challenges – from community-level issues such as technologies and gender inequities, to broader policies such as international mercury export controls and policies to improve regulation and assistance in the ASM sector. The GMP asserts that it could be possible to achieve at least a 50% reduction of mercury consumption (demand) in ASM by 2017. As called for by the GMP, this goal can be achieved if the main stakeholders support strategies that will help ASM communities to:

- eliminate amalgamation of "whole ore" by introducing a mercury-free concentration process prior to amalgamation;
- reduce mercury use in the amalgamation of concentrates through closed circuit process, so that mercury is always recycled;
- eliminate the burning of mercury without the use of a retort; the retort serves to contain emissions and thereby allow recycling;
- introduce completely mercury free techniques where feasible, beginning with "alluvial" ores, from which gold may be readily recovered without the use of mercury.

Key observations

52. In order to effectively reduce the quantities of mercury circulating in the biosphere, it is widely agreed that there is an urgent need to reduce simultaneously both the supply of, and demand for, mercury worldwide. That objective is increasingly being pursued through a range of policies and instruments that deserve to be far more widely diffused. Commercial transfers of mercury comprise the critical link between mercury supply and demand.

53. Country-to-country and region-to-region commercial ("trade") flows of mercury are now understood well enough to show the consistent transfer of mercury from higher to lower income countries. However, some countries still lack a reliable system for recording cross-border transactions of mercury; therefore, the picture is not yet complete. Better information can only lend itself to more effective policies, both nationally and globally.

54. Further emphasis on improving and expanding the information collected on commercial mercury transactions would bring benefits as policies are further developed. However, it must be kept in mind that, based on the extensive information already available, immediate and longer term actions were called for by the Governing Council in 2003, following their adoption of the key findings of the Global Mercury Assessment.

55. The report prepared for UNEP by the UNIDO/UNDP/GEF Global Mercury Project estimates artisanal and small-scale gold mining activities in more than 50 countries, and puts mercury consumption (and releases) in the ASM sector at some 650-1000 tonnes annually. That is equivalent to about 25% of global consumption, and most of that mercury originates in or transits through industrialized nations. The GMP report arrives at a similar conclusion to that in the previous paragraph, confirming the great importance of reducing the global mercury supply through export controls and other mechanisms, in order to increase the cost of mercury and pressure the ASM sector to greatly reduce demand. The GMP report also stresses that parallel measures in the field are critical to provide miners with the necessary information about alternatives to the present excessive and often inefficient use of mercury. With such measures in place, even for such a diverse and seemingly intractable sector, the GMP makes a serious case for reducing mercury consumption by the ASM community by some 50% over the next 10 years – largely by focusing on the elimination of mercury use in processing "whole ore."