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THOUGHT STARTER

International Transport of Lead and Cadmium via trade: an International concern?

Prepared by:
The Center for International Environmental Law (CIEL) in consultation with the FSC Working Group
and on behalf of the Government of Germany, lead sponsor

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1. Introduction

1.1. Background and Purpose of Thought Starter

Whether the mobility of lead and cadmium through international trade may warrant coordinated international action to protect human health and the environment

1. At the fifth session of the Intergovernmental Forum on Chemical Safety (IFCS) held in Budapest 25-29 September 2006, Forum V adopted a statement on mercury, lead, and cadmium urging IFCS participants and the International Conference on Chemicals Management (ICCM) to "consider actions at the local, national, regional and global levels for mercury, lead and cadmium, as appropriate, with particular emphasis on the needs of developing countries and countries with economies in transition."[1] The statement followed the commitment by States at the World Summit on Sustainable Development to "Promote reduction of the risks posed by heavy metals that are harmful to human health and the environment, including through a review of relevant studies, such as the United Nations Environment Programme global assessment of mercury and its compounds";[2] and the UNEP Governing Council's decision urging "Governments, intergovernmental organizations and non-governmental organizations to work with the private sector to identify effective ways of reducing exposures to lead and to strengthen monitoring and surveillance efforts and the treatment of lead poisoning."[3]

2. This Thought Starter and the Forum VI session on lead and cadmium respond to these requests by examining whether the dispersal of lead and cadmium through international trade of these metals as commodities and in products and wastes may warrant coordinated international action to protect human health and the environment. The Thought Starter analyzes whether such trade may lead to problems that cannot be addressed by countries acting alone, whether those problems may rise to the level of an international concern, and thus whether they call for a coordinated international approach to addressing them. The Thought Starter and Forum VI session are intended to complement other ongoing United Nations work on lead and cadmium by providing input to discussions on the subject that may take place in 2009 at the second International Conference on Chemicals Management (ICCM-2) and the Twenty-Fifth Session of the UNEP Governing Council.

3. This important issue is not new. The IFCS and Organisation for Economic Co-operation and Development (OECD) addressed it during the 1990s, each exploring criteria for when a chemical might warrant international action. During that time, the UNEP Governing Council requested IFCS to develop recommendations on international action for an initial list of twelve persistent organic pollutants (POPs).[4] In recommending to the Governing Council that negotiation of a legally binding instrument should commence, IFCS suggested that the "process should incorporate criteria pertaining to persistence, bioaccumulation, toxicity and exposure in different

[1] IFCS Forum V, *The Budapest Statement on Mercury, Lead and Cadmium*, para. 10, IFCS/FORUM-V/05w, Executive Summary (2006), http://www.who.int/ifcs/documents/forums/forum5/report/en/index.html.
[2] WSSD Plan of Implementation, para. 23(g) (2002), http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf.
[3] UNEP Governing Council Decision 22/4 III, *Lead* (2003), http://www.chem.unep.ch/Pb_and_Cd/GC-22-4-III-lead.htm.
[4] UNEP Governing Council, Decision 18/32, *Persistent Organic Pollutants* (1995).

regions."[5] These criteria eventually evolved into the POPs criteria adopted in the Stockholm Convention, including the criterion of long-range environmental transport. However, IFCS never developed criteria for determining whether other, non-POPs chemicals may be chemicals of international concern.[6]

4. Beginning in 1990, OECD began the pilot phase of a "Co-operative Investigation and Risk Reduction of Existing Chemicals," which included lead, cadmium, mercury, methylene chloride, and brominated flame retardants. Various principles and criteria were developed for "concerted OECD-wide action." Most of them related to the nature of measures that OECD members might take, not on criteria for deciding whether the chemical warranted concerted action in the first place. In respect to characteristics of the chemicals themselves, the chemicals should "pose significant risk" and should result in "problems of a shared, transboundary or global nature." In the specific case of lead, OECD extensively addressed, but was unable to reach consensus on, whether trade in lead throughout the world necessitated international action.[7] The OECD 1996 Ministerial Declaration on Risk Reduction for Lead among other things actively promotes the progressive phase out of lead in gasoline, the elimination of exposure to lead from products intended for use such as toys and from food packaging, the phase out of use in lead in paint, in drinking water and in occupational settings. The OECD Ministerial Declaration, did not, however, mention the transport or mobility of lead via international trade.[8]

5. Subsequent considerations of the problems caused by metals have led to a general consensus that they may give rise to a global concern if they are toxic or eco-toxic, bioaccumulate, and travel long distances after being released into the environment. For example, the UNEP Governing Council found that the "deleterious impacts on human health and the environment attributed to mercury and its capacity for global transport/cycling" provided sufficient evidence to "warrant further international action to reduce the risks to human health and the environment from the release of mercury and its compounds to the environment."[9]

6. In respect to lead and cadmium, experts have not agreed yet on their potential for long-range environmental transport, although there is agreement that these metals are toxic, bioaccumulative, and (by definition) persistent. This is why UNEP is currently conducting scientific reviews on lead and cadmium and compiling an inventory of existing risk management measures for further consideration at the twenty-fifth session of the Governing Council in 2009. The question of long-range transboundary environmental transport of lead and cadmium has also been extensively considered under the UNECE Convention on Long-Range Transboundary Air Pollution (LRTAP).

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[5] IFCS, Ad Hoc Working Group on Persistent Organic Pollutants Meeting, *Final Report*, IFCS/WG.POPs/Report.1, at 14, para. 56 (1996), http://www.who.int/entity/ifcs/documents/general/adhoc_en.doc.

[6] A workshop at which interested countries would discuss the issue was proposed for 1998, postponed to 2000, but ultimately never held. *See* IFCS, Third Meeting of the Intersessional Group, *Final Report*, IFCS/ISG3/98.50w, at 19, para. 70 (1998), http://www.who.int/entity/ifcs/documents/general/isg3_report_en.pdf.

[7] *See* IFCS, Forum II, *Thematic Session on Partnership: Lead Risk Reduction* (sponsored by OECD), IFCS/FORUM-II/97.05B, at 2-3 (1996).

[8] *See* OECD, C(96)42/Final (1996), http://webdomino1.oecd.org/horizontal/oecdacts.nsf/Display/9BE26CBED53C82EFC12570880057EB60?OpenDocument.

[9] UNEP Governing Council, Decision 22/4 V, *Mercury Programme*, para. 1 (2003), http://www.unep.org/gc/gc22/REPORTS/K0360710English.pdf.

LRTAP, however, has not focused on the mobility of lead and cadmium due to international trade.

1.2. Scope and Structure of Thought Starter

7. *Because these ongoing international efforts are intended to address the* long-range environmental transport *issue, this Thought Starter does not do that. Instead, the document focuses on the health and environmental problems that may be related to the international transport of lead and cadmium via trade.* If countries are unable to address those problems effectively through unilateral or bilateral action, then there may be a need for coordinated international action and support. This is particularly true for developing countries and countries with economies in transition that may have limited capacity and capability for the sound management of chemicals.

8. This Thought Starter uses the term "international concern" to describe the potential multilateral dimension of the risks to human health and the environment that may result from trade of lead and cadmium. The Thought Starter uses the concept of international transport via trade to distinguish its focus from the assessment of "long-range environmental transport" potential that is the subject of the LRTAP Convention, the Stockholm POPs Convention, and UNEP's scientific review of lead and cadmium, among other international efforts.

9. The Thought Starter focuses specifically on whether international trade in lead and cadmium may lead to problems that call for a coordinated international approach to address them. Thus, it concentrates on considerations that may be relevant to whether a global or international approach may be warranted, and not on the specific response measures that could be used to address the problems. IFCS Forum VI may wish to consider options for international activities to address the increased health and environmental risks resulting from the international trade in lead and cadmium, based on countries' experiences.

10. As the UNEP interim reviews of scientific information on lead and cadmium have acknowledged, "The substance flows as a consequence of trade and waste disposal, mainly in developing and transition countries are major causes of human exposure to cadmium. There are gaps on lead [and cadmium] flows so research in this area is necessary in order to set priorities to global action to reduce risks."[10]

11. The information put forth in this Thought Starter concurs with these assessments. Additional data and case studies in this area will be invaluable, especially in respect to trade flows in lead and cadmium throughout their life cycles to, from, and between developing countries and countries with economies in transition; the extent to which adverse effects on human health and the environment may be related to international

[10] UNEP Chemicals, *Interim Review of Scientific Information on Lead,* 164 (October 2006) [hereinafter "UNEP Interim review on lead"], http://www.unepchemicals.ch/pb_and_cd/SR/Files/Interim_reviews/UNEP_Lead_review_Interim-Oct2006.pdf; UNEP Chemicals, *Interim Review of Scientific Information on Cadmium*, 149 (October 2006) [hereinafter "UNEP Interim review on cadmium"], http://www.unepchemicals.ch/pb_and_cd/SR/Files/Interim_reviews/UNEP_Cadmium_review_Interim_Oct2006.pdf. UNEP anticipates that these Interim Reviews will be finished during the second half of 2008 and presented to the Governing Council at its 25th regular session in 2009. The Interim Reviews could be subject to further amendments in the future as new information becomes available. Information received in response to the call to fill data gaps is accessible at http://www.chem.unep.ch/Pb_and_Cd/Call_for_information.htm.

trade in lead and cadmium commodities, products, and wastes in producing and consuming countries; and the socioeconomic impacts of such trade, especially in developing countries and countries with economies in transition. The authors and the lead sponsor urge Forum participants to share such information where it is available, and to endeavor to conduct further investigation where it is not. Individual members of the Forum Working Group on Lead and Cadmium, as well as other Forum participants, are invited to prepare additional information papers for Forum VI that may supplement the information and points of view in this Thought Starter.

12. The Thought Starter is presented in five Parts:

Part 1 (the present part) is the Introduction.

Part 2 frames the issue by briefly summarizing relevant information on lead and cadmium, including toxicity and eco-toxicity, international trade flows, environmental health problems that may be related to international trade, and multilateral agreements relevant to such trade.

Part 3 responds to questions raised at Forum V by suggesting considerations that may guide discussion of whether or not the health and environmental impacts of trade of hazardous substances throughout their lifecycles may rise to the level of an international concern that warrants a coordinated international approach.

Part 4 discusses lead and cadmium in the context of the considerations presented in Part 3.

Part 5 briefly identifies potential outcomes of the Forum VI session on lead and cadmium.

13. Note that a Reference List on Lead and Cadmium is being distributed as a separate, complementary document to this Thought Starter. The Reference List includes the authorities and sources cited in the Thought Starter, as well as additional documents that may be of interest to stakeholders, including their internet addresses, where available.

2. Framing the Issue

14. This Part frames the issue by briefly summarizing information on lead and cadmium with respect to: toxicity and eco-toxicity, international trade flows, environmental health problems that may be related to international trade, and international agreements relevant to such trade.

2.1. Toxicity and Eco-toxicity

15. Lead and cadmium can be toxic at very low exposure levels and have both acute and chronic effects on human health and the environment.

2.1.1. Lead

16. Lead is highly toxic to humans and can have a number of toxic effects at very low exposure levels. Acute and chronic effects on human health may include neurological,

cardiovascular, renal, gastrointestinal, hematological, and reproductive effects.[11] Lead is one of the most dangerous chemicals for children and developing fetuses.[12] Recent studies, along with past research, indicate there is no level of lead exposure that is "safe" for the fetal brain.[13] One study estimated that mild mental retardation and cardiovascular disease resulting from lead exposure amounted to almost one percent of the global burden from all disease, with the highest burden of disease found in developing country regions of the world.[14] Other vulnerable population groups include socially and economically disadvantaged populations and the malnourished, whose diets are deficient in proteins and calcium.[15] Lead exposures occur in most, or all, countries of the world.[16]

17. Lead has well-documented toxic effects on plants, animals, and micro-organisms. In all animal species studied lead has been shown to cause adverse effects in several organs and systems, including blood, central nervous system, kidneys, reproductive system, and immune system.[17] Lead bioaccumulates in mammals, aquatic algae, and invertebrates.[18] It can enter surface waters both as a result of erosion of lead-containing soil particles and dumping of waste containing lead products.[19]

2.1.2. Cadmium

18. Cadmium exposure can produce a wide variety of acute and chronic effects in humans, leading to a build-up of cadmium in the kidneys that can cause kidney disease.[20] For nonsmokers, food is generally the largest source of exposure.[21] The population at highest risk consists of women with nutritional deficiencies or low iron stores, people with kidney disorders, and fetuses and children with low body iron stores. Maternal exposure to cadmium is associated with low birth weight and an

[11] *See* Nordic Council of Ministers, *Lead Review*, 16 (2003), http://www.who.int/ifcs/documents/forums/forum5/nmr_lead.pdf.
[12] For example, the World Health Organization has reported that in the year 2000, about 800,000 children were affected by lead exposure, leading to lower IQ and potential mild mental retardation. A. Prüss-Üstün and C. Corvalán, WHO, *Preventing Disease Through Healthy Environments: Towards an Estimate of the Environmental Burden of Disease*, 47 (2006), http://www.who.int/quantifying_ehimpacts/publications/preventingdisease.pdf.
[13] *See* Schnaas, Lourdes, et al., *Reduced Intellectual Development in Children with Prenatal Lead Exposure*, ENVIRONMENTAL HEALTH PERSPECTIVES, 114: 791 (2006), http://www.ehponline.org/members/2005/8552/8552.pdf; *see also* Khwaja, M.A., *Effect of Lead Exposure in Children*, SCIENCE, TECHNOLOGY & DEVELOPMENT, 24: 2 (2005).
[14] Fewtrell, L.J., et. al., *Estimating the Global Burden of Disease of Mild Mental Retardation and Cardiovascular Diseases from Environmental Lead Exposure*, ENVIRONMENTAL RESEARCH, 94: 120-33 (2004), http://www.elsevier.com/locate/envres.
[15] UNEP Interim review on lead, *supra* note 10, at 12.
[16] *Id.* at 9.
[17] *Id.* at 10.
[18] Nordic Council of Ministers, *supra* note 11, at 3.
[19] UNEP, Lead and Cadmium Working Group, *Report of the first meeting of the Lead and Cadmium Working Group*, Annex 1, at 6, UNEP(DTIE)/Pb&Cd/WG.1/6 (2006).
[20] UNEP Interim review on lead, *supra* note 10, at 10; Nordic Council of Ministers, *supra* note 11, at 5-8.
[21] U.S. Environmental Protection Agency (USEPA), Technology Transfer Network Air Toxics Web Site, *Cadmium Compounds: Hazard Summary* (1992, rev. Jan. 2000), http://www.epa.gov/ttn/atw/hlthef/cadmium.html.

increase of spontaneous abortion.[22] An increased risk of lung cancer has been reported following inhalation exposure in occupational settings.[23]

19. Like lead, cadmium is toxic to plants, animals, and micro-organisms. Cadmium, like all metals, is persistent. It bioaccumulates mainly in the kidneys and liver of vertebrates. It also bioaccumulates in aquatic invertebrates and algae, which are the organisms most sensitive to it. The accumulation of cadmium by plants results in this contaminant entering the human food chain.[24]

2.2. International Trade Flows

20. The UNEP interim reviews of scientific information on lead and cadmium both note that there are significant data gaps on international flows in these metals, which necessitate additional research for decision-making and to set priorities for global action to reduce risks.[25] In particular, there is a serious lack of data in respect to international trade flows to, from, and between developing countries and countries with economies in transition.

2.2.1. Lead

21. The production and consumption of lead ore, metals, compounds, and lead-containing products is a global enterprise, in which each of the many steps along the lifecycle of a product often is conducted in a different country.[26] Lead is mined in more than forty countries, including developed and developing countries and countries with economies in transition.[27] There is extensive global trade of lead raw materials. Lead is also used and traded globally as a metal in various products. The major use of lead in recent years has been in lead batteries, accounting for 78 per cent of reported global consumption in 2003.[28] Other major application areas are lead compounds, lead sheets, ammunition, alloys, cable sheathing, petrol additives, and paint.[29]

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[22] UNEP Interim review on cadmium, *supra* note 10, at 46 (citing Piasek, M. and Laskey, J.W., *Effects of in vitro cadmium exposure on ovarian steroidogenesis in rats*, JOURNAL OF APPLIED TOXICOLOGY, 19: 211-17 (1999); Johnson, M.D. et al., *Cadmium mimics the in vivo effects of estrogen in the uterus and mammary gland*. NATURE MEDICINE, 9: 1081-84 (2003); Frery, N., Nessmann, et al., *Environmental exposure to cadmium and human birthweight*, Toxicology, 79: 109-18 (1993); Schoeters, G., et al., *Cadmium and children: Exposure and health effects*, Acta Paediatrica, 95 (Suppl.): 50-54 (2006)).

[23] *Id*. at 41 (citing Nordberg, G.F., *Cadmium and health in the 21st century: Historical remarks and trends for the future*, Biometals, 17(5): 485-89 (2004)); *see also* USEPA, Cadmium compounds, *supra* note 20. The International Agency for Research on Cancer (IARC) classifies cadmium as a human carcinogen group I; the U.S. Environmental Protection Agency has classified cadmium as a probable human carcinogen, Group B1.

[24] UNEP Interim review on cadmium, *supra* note 10, at 8.

[25] UNEP Interim review on lead, *supra* note 10, at 164; UNEP Interim review on cadmium, *supra* note 10, at 149.

[26] UNEP Interim review on lead, *supra* note 10, at 81.

[27] *Id.* at 80.

[28] *Id.* at 7.

[29] *Id.* at 79 (citing Ayres, R.U., Ayres, L.W. and Råde, I., *The life cycle of copper, its co-products and by-products*, International Institute for Environment and Development (IIED) and World Business Council for Sustainable Development (WBCSD) (2002)); s*ee also* Kumar, A., Toxics Link, *A Brush with Toxics: An Investigation on Lead in Household Paints in India* (2007), http://www.toxicslink.org/ovrvw-prog.php?prognum=4&area=2.

22. The global consumption of lead increased from 4.5 to 6.8 million tons during the period of 1970 to 2003.[30] China, for instance, is the world's major producer and user of lead. Consumption there more than doubled from 510,000 to 1,180,000 tons between 1998 and 2005.[31] As of 2004, the major exporters of lead concentrates and ores to China were Australia, Peru, and the United States. Based on available data, the major importers of refined lead from China were the Republic of Korea, Taiwan, and Thailand.[32]

23. Recycling of electronic waste (e-waste) has added another link to the global lead enterprise.[33] Vast quantities of e-waste are sent to developing countries such as China, India, Nigeria, and Kenya.[34] Coming full circle, lead has been found in high levels in cheap jewelry imported into the United States from China. Some of the lead alloy used by the Chinese toy manufacturers is derived from electronic waste exported from the United States and other western countries.[35]

2.2.2. Cadmium

24. Cadmium is also used and traded globally as a metal and as a component in various products and wastes. Production and consumption of cadmium, cadmium compounds, and cadmium-containing products are carried out on a global scale. Cadmium-containing concentrates are extracted all over the world, mainly as a by-product of zinc production.[36] The locus of cadmium primary production shifted between 1995 and 2005, with production in Asia increasing sharply and production in Europe decreasing correspondingly.[37] Overall, global primary production of cadmium appears to be decreasing, while global secondary production (mainly related to zinc production) is increasing.[38]

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[30] UNEP Interim review on lead, *supra* note 10, at 83; *see also* Rand Merchant Bank, RMB Fixed Income, Currency & Commodities Base Metals: Base Metals Weekly Report, 25 July 2007, (stating global refined lead consumption totaled 3.431m tons in the first five months of 2007, up from 3.315m a year earlier, and refined lead production rose to 3.432m tonnes from 3.389m over the same five month period), http://www.randmerchantbank.com/web/rmb-online.nsf/Online/comms2007July/$FILE/RMB%20Base%20Metals%20Weekly%2020070725.pdf.

[31] UNEP Interim review on lead, *supra* note 10, at 85 (citing ILZSG, *Principal uses of lead and zinc*, International Lead and Zinc Study Group, Lisbon, Portugal (2005)).

[32] *Id.* at 82 (citing ILZSG, *Lead and zinc statistics*, Monthly Bulletin of the International Lead and Zinc Study Group, Lisbon, Portugal (2006)).

[33] *See* San Diego E-Waste LLC, *Problems Caused By Electronic Waste*, http://www.sdewaste.com/ewaste.html. A typical computer monitor may contain more than six percent lead by weight.

[34] Associated Press, *American Consumers Unwittingly Fuel Toxic Trade in Electronic Waste*, International Herald Tribune, 17 Nov. 2007, http://www.iht.com/bin/printfriendly.php?id=8373931.

[35] Fairclough, G., *China: Lead Toxins Take a Global Round Trip*, The Wall Street Journal, 12 July 2007. Note that electronic waste represents two percent of trash in U.S. landfills, but it equals seventy percent of overall toxic waste. Lead can be found in circuit boards and monitor cathode ray tubes (CRTs). Puckett J. et al., *The Digital Dump: Exporting Re-use and Abuse to Africa*, Basel Action Network (2005), http://www.ban.org/BANreports/10-24-05/documents/TheDigitalDump.pdf.

[36] UNEP Interim review on cadmium, *supra* note 10, at 79.

[37] *Id.* at 78 (citing U.S.G.S, *Mineral commodity summaries 2006*).

[38] *See* U.S. Geological Survey, *Mineral Commodity Summaries*, 42-43 (2008), http://minerals.usgs.gov/minerals/pubs/mcs/2008/mcs2008.pdf; Cooper, Moungar E. and Peter H. Kuck, "Cadmium," *USGS 2005 Minerals Yearbook*, http://minerals.usgs.gov/minerals/pubs/commodity/cadmium/cadmimyb05.pdf.

25. The trend in global cadmium consumption over the last two decades has been a steep increase in the use of cadmium for batteries and a decrease in use for nearly all other applications. Nickel-cadmium (NiCd) batteries represented 82 percent of world consumption in 2005.[39] NiCd batteries are manufactured in a global chain: raw materials originate in one country, batteries are produced in another, the batteries are incorporated into products in yet another, and consumers purchase and use the products in still another country.[40]

26. A report prepared for the International Cadmium Association in 2005 notes both the continued growing domestic Chinese market and export market, as well as the potential for growth in other emerging and transitional markets such as India, Russia, and Brazil.[41] Cadmium, like lead, is a component of electronic waste, found in chip resistors, infrared detectors, and semiconductors.[42]

2.3. Exposures to Lead and Cadmium Resulting from International Trade

27. This section identifies some of the risks to human health and the environment that may be directly traced to international trade and export-related demand in lead and cadmium commodities, compounds, products, and wastes. The dramatic expansion of global trade has led to the globalization of many public health and environmental problems.[43] According to the UNEP Executive Director, "Accelerating trade in goods and materials across borders and across continents is one of the defining features of the early 21st century."[44] While acknowledging that there are data gaps on lead and cadmium flows that require additional research, each of the UNEP interim reviews of scientific information on lead and cadmium states that the "substance flows as a consequence of trade and waste disposal, mainly in developing and transition countries, are major causes of human exposure."[45]

2.3.1. Primary production and exports

28. International demand for products containing lead and cadmium stimulates continued mining, refining, and production of lead and cadmium metals, compounds, and products, especially in developing countries and countries with economies in transition that have little capacity to prevent, reduce, or mitigate the severe environmental health risks that such activities often entail. Because environmental health costs are rarely reflected in the prices consumers in other countries pay for such goods, they represent damage to human and ecological health for which the producing countries and their citizens are usually not compensated.

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[39] UNEP Interim review on cadmium, *supra* note 10, at 81 (citing International Cadmium Association, *Cadmium consumption by end uses*, (2006)).
[40] *Id.* at 79.
[41] Morrow H., International Cadmium Association, *Cadmium Markets and Trends* (Sept. 2005), http://www.chem.unep.ch/pb_and_cd/SR/Files/Submission%20NGO/ICdA/MARKET%20Review%20Sept2005-1.pdf.
[42] Puckett, *supra* note 35.
[43] Bettcher D., Yach D., and Guindon G.E, *Global trade and health: key linkages and future challenges*, Bulletin of the World Health Organization (2000), www.who.int/docstore/bulletin/pdf/2000/issued4/bu0215.pdf.
[44] BBC News, *UN warning on e-waste "mountain,"* 27 Nov. 2006, http://news.bbc.co.uk/2/hi/technology/6187358.stm.
[45] UNEP Interim review on lead, *supra* note 10, at 165; UNEP Interim review on cadmium, *supra* note 10, at 149.

29. In the case of lead, one documented example is the Doe Run multi-metal smelting facility in La Oroya, Peru, which has caused widespread lead poisoning and was considered to be one of the world's ten most contaminated sites of 2006. According to a 1999 study by Peru's Ministry of Health, 99.1 per cent of the children in La Oroya suffered from lead poisoning. Studies conducted since the late 1990s have found that "virtually all" of the children younger than 6 years old, and many older children and adults, have blood-lead levels exceeding the WHO limit of 10 µg/dL.[46] A 2007 study reports that air levels of lead remain four to seven times higher than allowed under Peruvian standards.[47] Driven by export-related demand, Peru is a significant source of the world's lead.[48]

30. Primary production of cadmium has shifted to Asia, where it is now five times the production level in Europe.[49] China, Korea, and Mexico rank among the major producers of primary cadmium metal, and China is a main producer of portable NiCd batteries.[50] Soils contaminated with cadmium are a serious problem in many Asian countries, where cadmium enters the food supply, especially rice; more than ten percent of China's arable land is contaminated with cadmium.[51]

2.3.2. Imported products

31. While many industrialized countries have adopted complex regulatory approaches to address the health and environmental risks of lead and cadmium, they have not been able effectively to control releases and exposures that result from traded goods. For example, both the United States and Denmark have NiCd battery collection and recycling programs. Nevertheless, "a significant part of the batteries will be disposed of with municipal solid waste."[52]

32. In 2007 the U.S. toy maker Mattel recalled millions of Chinese-made toys across the globe that were discovered with paint containing lead levels exceeding safety standards. The recall took place in both developed and developing countries.[53] Public

[46] Fraser, B., *Peruvian Mining Town Must Balance Health and Economics*, THE LANCET 367: 889-90 (2006), http://www.thelancet.com/journals/lancet/article/PIIS0140673606683633/abstract.
[47] Carlos Abanto Kcomt, Asociación Civil Labor, *Segundo Informe sobre Evolución de la calidad de Aire en La Oroya* (May 2007) (reporting data from Censo Hemático del Centro de Salud La Oroya-DIRESA-2007), http://www.aida-americas.org/templates/aida/uploads/docs/Cond_CalidadLaOroya_varios_07-05.pdf; *see also* Salazar, M., *PERU: Pollution Emergency Plan Instead of Real Action Plan for La Oroya*, INTER PRESS SERVICE, 10 Aug. 2007 (reporting main chimney at Doe Run complex emits average of 1.5 tons of lead every twenty-four hours), http://ipsnews.net/news.asp?idnews=38854
[48] U.S. Department of State, Bureau of Western Hemisphere Affairs, *Background Note: Peru*, July 2007, http://www.state.gov/r/pa/ei/bgn/35762.htm.
[49] UNEP Interim review on cadmium, *supra* note 10, at 78.
[50] *Id.* at 79.
[51] Greenwire, *TOXICS: Cadmium batteries sickening workers, environment in China*, 15 Jan. 2008.
[52] UNEP Interim review on cadmium, *supra* note 10, at 125 (citing Maag, J. and Hansen, C.L., *Collection potential for nickel-cadmium batteries in Denmark*, Environmental Project no. 1004, Danish Environmental Protection Agency, (2005); *see also* INFORM, *Community Waste Prevention Toolkit: Battery Fact Sheet* (noting that industry's Rechargeable Battery Recycling Corp. collected and recycled only ten percent of the 28 million pounds of recyclable Ni-Cds that the RBRC expected to enter the waste stream during 2000), http://www.informinc.org/fact_CWPbattery.php#rbrctopic.
[53] BBC News, *Third recall for China-made toys*, 5 Sept. 2007, http://news.bbc.co.uk/2/hi/business/6979151.stm; Reuters, *China targets toy and drug manufacturers*, 9 Aug. 2007, http://www.reuters.com/article/email/idUSPEK9266020070809; Mattel Consumer

health officials in the United States have not been able to screen imported children's toys effectively for lead content. Tests conducted by a coalition of U.S. environmental health groups found that 35 percent of 1,200 tested children's products contained lead, many with levels far above the federal recall standard for lead paint.[54] High levels of lead have recently been found in inexpensive jewelry exported to the United States from China. Some of the lead in the jewelry was traced to lead salvaged from computers and other electronic goods discarded in western countries and exported to China. A child was reported to have died in 2006 in the United States from acute lead poisoning after swallowing a piece of Chinese-made jewelry.[55]

33. Imported products containing lead and cadmium that can cause exposure through normal use are also a growing problem in developing countries and countries with economies in transition.[56] For example, India imports an estimated 70 per cent of plastic toys on its market. Eighty-eight of 111 PVC toys and other soft toys sampled from Delhi, Chennai, and Mumbai contained lead and cadmium in varying concentrations. India does not have any enforceable standard for the total content of lead, cadmium, or other toxic metals in toys.[57]

2.3.3. Wastes

34. E-waste is the fastest growing component of municipal waste worldwide, with 20-50 million tons generated annually.[58] Electronic equipment traded as "used" is often obsolete or non-operational, i.e., it is really e-waste. Much of this waste is exported to developing countries such as China, India, Nigeria, and Kenya, where uncontrolled burning of wastes and improper processing of toxic components—often extracted using hammers, gas burners, or bare hands—causes serious occupational health and safety and environmental problems.[59] Exports of obsolete electronic equipment effectively shift the costs of environmentally sound recycling and disposal from industrialized to poor countries, which often do not have the capacity to manage the lead and cadmium waste in an environmentally sound manner.[60] Accordingly, some of the lead and cadmium in this equipment "will be released to the environment, the extent of which depends on disposal methods, control technologies applied and other factors."[61]

35. Improper disposal of e-waste can lead to the release of significant amounts of lead and cadmium into the air, water, and soil, including from open dumps and poorly maintained landfills, which are the rule in most developing countries and countries with economies in transition. Products containing lead and cadmium are "not typically

Relations, Lead Paint Hazard Recall, http://service.mattel.com/uk/recall/recall_info_paint.asp (visited 25 March 2008).

[54] Associated Press, *Lead found in toys in stores*, Los Angeles Times, 5 Dec. 2005, http://www.latimes.com/business/la-fi-toys5dec05,1,2369615.story?coll=la-headlines-business.

[55] Fairclough G., *supra* note 35.

[56] UNEP Interim review on cadmium, *supra* note 10, at 6.

[57] Kumar, A., Pastore, P., Toxics Link, *Toying with Toxics: An investigation of lead and cadmium in soft plastic toys in three cities in India* (2006), http://www.toxicslink.org/docs/06161_Toying_with_Toxics_full_report.pdf.

[58] Nakagawa L., EarthTrends, *Toxic Trade: The Real Cost of Electronics Waste Exports from the United States* (2006), http://earthtrends.wri.org/features/view_feature.php?theme=3&fid=66.

[59] Associated Press, *American Consumers Unwittingly Fuel Toxic Trade in Electronic Waste*, International Herald Tribune, 17 Nov. 2007, http://www.iht.com/bin/printfriendly.php?id=8373931.

[60] Renckens, S., *A Network and Flows Perspective on E-waste Trade and Its Governance*, IIEB Draft Working Paper (Feb. 2007).

[61] UNEP Interim review on cadmium, *supra* note 10, at 5.

collected separately from the general waste stream in developing countries."[62] Uncontrolled burning and indiscriminate dumping of such waste may be an important source of local and regional cadmium emissions to the atmosphere and to land and aquatic systems.[63] Lead that is stockpiled in landfills and other waste deposits represents a significant potential source for future releases to the environment.[64] The Indian National Center for Lead Poisoning reports that dumping and unsupervised recycling of e-waste has led to high blood levels in half the children in cities like Bangalore, possibly resulting in lowered IQs.[65] In both India and Zambia, wastewater contaminated with lead and cadmium has been documented as a source of elevated levels of these metals in locally grown food crops.[66]

2.4. International Agreements that Apply to Trade in Lead and Cadmium

36. Few international agreements directly apply to, or take into account, international trade in lead and cadmium or materials containing them. Those that do include the Rotterdam and Basel Conventions. The Basel Convention broadly covers all types of wastes that contain lead and cadmium, while the Rotterdam Convention's present coverage of lead products is very narrow, and it does not cover cadmium at all.

2.4.1. Rotterdam Convention

37. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998) has two objectives: (1) to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and (2) to contribute to the environmentally sound use of those chemicals by facilitating information exchange about their characteristics, providing for a national decision-making process on their import and export, and disseminating these decisions to Parties.[67] The Convention currently has 119 Parties.[68]

38. The heart of the Convention is its PIC procedure. Certain banned or severely restricted chemicals and severely hazardous pesticide formulations appear in Annex III, the "PIC list." Parties may export listed substances to other Parties only if the prospective importing Party first provides its informed consent. Exporting Parties must provide importing Parties with an export notification that includes specified information when they (or an entity in their territory) wish to export a chemical that is banned or severely restricted in their own territories, but not yet included in Annex III.

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[62] *Id.* at 5.
[63] *Id.* at 4-5; UNEP Interim review on lead, *supra* note 10, at 6-7.
[64] Nordic Council of Ministers, *supra* note 11, at 3.
[65] Simmons, D., *India's poor tackle toxic e-waste*, BBC News, 14 Oct. 2005, http://news.bbc.co.uk/1/hi/programmes/click_online/4341494.stm.
[66] University of Sussex, Science and Technology Policy Research Bulletin, *Contaminated irrigation water and food safety for the urban and periurban poor: Appropriate measures for monitoring and control from field research in India and Zambia* (Dec. 2005), http://www.sussex.ac.uk/spru/documents/bulletin_dfid.pdf.
[67] *See* ROTTERDAM CONVENTION ON THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE (1998), http://www.pic.int/en/ConventionText/ONU-GB.pdf.
[68] Rotterdam Convention, "Ratifications," http://www.pic.int/home.php?type=t&id=63&sid=17 (visited 20 Feb. 2008).

Importing Parties may require additional information about the chemical related to occupational safety or environmental or human health.

39. Tetraethyl lead and tetramethyl lead, two anti-knocking agents for gasoline (petrol), are on the PIC list. Of the many lead compounds and products containing lead in international trade, only trade in these compounds (which is declining as leaded gasoline is phased out worldwide) is subject to the PIC procedure. Cadmium is not listed, and thus not covered.[69]

2.4.2. Basel Convention

40. The fundamental aims of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal are to control and reduce transboundary movements of hazardous and other wastes, prevent and minimize their generation, support the environmentally sound management of such wastes, and actively promote the transfer and use of cleaner technologies. The Basel Convention covers toxic and eco-toxic wastes, including lead and cadmium. It sets up a framework for controlling the transboundary movement of hazardous wastes, allowing such movements only upon prior written notification by the State of export to the competent authorities of the States of import and transit. The Basel Convention currently has 170 Parties.[70]

41. The Convention defines "environmentally sound management" of hazardous or other wastes as "taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes."[71] The Convention requires Parties to cooperate in developing technical guidelines to improve and achieve environmentally sound management of wastes. Over the years, a number of voluntary technical guidelines related to various kinds of wastes and waste streams have been developed to assist Parties, especially developing country Parties, in their efforts to achieve environmentally sound management of wastes. Among these is "Draft technical guidelines on the environmentally sound recycling/reclamation of metals and metal compounds (R4)," which focuses mainly on the recycling and reclamation of twelve metals and metal compounds (including lead and cadmium) that are listed in Annex I to the Basel Convention.[72] The Convention in 2003 adopted "Technical guidelines for the environmentally sound management of waste lead-acid batteries."[73]

[69] The Rotterdam Secretariat has received notifications of final regulatory actions taken by Latvia on industrial cadmium compounds and Thailand on cadmium arsenate as a pesticide. Unless and until at least one country from a different PIC region reports taking similar action on each of these uses, they cannot be considered for listing in the Rotterdam Convention. *See* PIC Circular XXVI, app. V, at 333 (Dec. 2007), http://www.pic.int/en/Circular/CIRC-26-EN.pdf.

[70] Basel Convention, "Parties to the Basel Convention," http://www.basel.int/ratif/convention.htm (visited 20 Feb. 2008).

[71] BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTE AND THEIR DISPOSAL, art. 2.8 (1989).

[72] Conference of the Parties to the Basel Convention, Seventh Meeting, *Draft Technical Guidelines on the Environmentally Sound Recycling/Reclamation of Metals and Metal Compounds (R4)*, UNEP/CHW.7/8/Add.3 (2004).

[73] *See* Basel Convention Secretariat, *Technical guidelines for the environmentally sound management of waste lead-acid batteries*, series/SBC No. 2003/9 (2003), http://www.basel.int/pub/techguid/tech-wasteacid.pdf.

The Secretariat has also released a training manual for the preparation of national management plans for lead batteries in the context of Basel implementation. [74]

42. The Convention is also promoting development of partnerships and programmes of activities on the environmentally sound management of e-waste, including from mobile phones, computers, and other sources.[75] One of the challenges of the process is how to distinguish between waste and non-waste in international trade, and how to characterize these trade flows under international law, because a great amount of e-waste may be moved across borders under the guise of used, non-waste products.

2.4.3. Other agreements

43. The Aarhus Protocol on Heavy Metals is one of the eight protocols to the UNECE Convention on Long Range Transboundary Air Pollution (LRTAP).[76] Any State may ratify LRTAP and the Aarhus Protocol; however, only States in the UNECE region have done so.[77] The Protocol requires parties to reduce their releases of cadmium, lead, and mercury with the objective of cutting emissions from large, stationary sources, including industrial sources (iron and steel and non-ferrous metal production), combustion processes (power generation and road transport), and waste incineration. The Aarhus Protocol also promotes technology exchange and other forms of cooperation between the parties. With respect to waste incineration, the Protocol provides guidance on "product management measures" such as substitution and labeling to reduce the amount of metals in the waste stream.[78] These provisions are non-binding and do not regulate imported products. Nevertheless, their effectiveness may be undercut by imported products that contain lead and cadmium.

44. Other regional agreements such as the OSPAR and Helsinki Conventions also address lead and cadmium emissions that harm the marine environment in the north-east Atlantic and the Baltic Sea, respectively. Like the Aarhus Protocol, they do not cover international trade in lead or cadmium, or in products containing these metals.

3. Considerations for Whether Trade in a Hazardous Substance May Present an International Concern

45. This Part suggests considerations that may guide discussion of whether the trade in hazardous substances such as lead and cadmium throughout their lifecycles may increase risks to human health and the environment to the level of an "international concern" warranting a coordinated international approach. International law does not provide a definition of "international concern." However, relevant criteria for determining whether a chemical may constitute an international concern, such that an

[74] Basel Convention Secretariat, *Training Manual for the Preparation of National Used Lead Acid Batteries Environmentally Sound Management Plans in the Context of the Implementation of the Basel Convention*, series SBC No 2004/5 (2004), http://www.basel.int/meetings/sbc/workdoc/tm-ulab/techdocs.html.
[75] Open-ended Working Group, *Report on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, Part XII D: Workplan for 2009–2010, UNEP/CHW/OEWG/6/29 (2007), http://www.basel.int/meetings/oewg/oewg6/docs/29e.pdf.
[76] THE 1979 CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION (1998), http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf
[77] The members of UNECE include the countries in Europe, the United States of America, Canada, Israel and the Central Asian republics, including the Russian Federation.
[78] THE 1998 AARHUS PROTOCOL ON HEAVY METALS, Annex VII (1998).

international coordinated approach is warranted, may be derived from international chemicals law and other areas of international law and agreement.

46. Three common considerations underlie the development of most multilateral chemicals and environmental agreements that have trade-related provisions. They relate, respectively, to questions of risk, responsibility, and remedy:

(i) The international community perceives that certain substances or activities present an unacceptable risk to human health or the environment.

(ii) An action (or failure to act) by one or more countries may increase the risk of harm to other countries from the substances or activities.

(iii) These third countries find it difficult or impossible to protect themselves unilaterally from the increased risk.

3.1. Certain Substances or Activities Present an Unacceptable Risk to Human Health or the Environment

47. This is an obvious consideration for all of the chemicals and trade-related environmental conventions. The international community has undertaken numerous assessments to ascertain the hazards and risks associated with substances of possible international concern. IFCS substantially undertook the international assessment that ultimately led to adoption of the Stockholm Convention; UNEP's global assessment of mercury and its compounds has provided the basis for the Governing Council's ongoing consideration of whether there should be an international framework or instrument for addressing the risks of mercury. In the case of lead and cadmium, UNEP has developed interim reviews of scientific information on these metals, focusing especially on long-range environmental transport with the objective of filling scientific gaps to inform Governing Council discussions on the need for global action. While these assessments are essential to inform policy makers about the nature of the risk, the question of whether the risks are acceptable or not—and thus whether they may or may not warrant international action—must ultimately be answered by States through the political process. Moreover, the scope of the assessment (e.g., to examine risks associated with long-range environmental transport or international transport via trade) may make a substantial difference in the nature and degree of the risks that may be identified as issues for further political decision-making.

48. In determining that particular substances or activities present an unacceptable risk, stakeholders may be influenced by several lines of inquiry. These may include:

- Is harm from the substance or activity occurring now? Is there a high level of confidence that it will occur in the future if no action is taken?
- Are many countries, people, or species placed at risk by the substance or activity?
- What is the state of scientific understanding of the causes and effects of the harm? How fully can the hazard and risk be characterized, quantified, or otherwise substantiated and demonstrated?
- Are the human health or environmental impacts temporary or permanent? In particular, might they impact future generations? Are certain vulnerable groups at greater risk?

- May the harm lead to secondary or related effects, such as impairing economic development, causing social unrest, or exacerbating poverty?
- Are there beneficial or economically important uses of the substance or activity that should be considered? Are substitutes or safer alternatives available?

3.2. An Act or Omission by One or More Countries May Increase the Risk of Harm to Others

49. As the Rio Declaration on Environment and Development acknowledges, "States have, in accordance with the Charter of the United Nations and the principles of international law . . . the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."[79] Additionally, "States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health."[80] Thus, States should ensure that their acts or omissions, including those related to international trade and investment, do not increase the risk of environmental harm to other countries, or to common resources upon which other countries depend (such as the atmosphere).

50. Moreover, the "developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."[81] This principle of common but differentiated responsibilities suggests that the *demand* of developed countries for commodities and products that may involve hazardous substances or harmful activities in developing countries should be a factor in determining whether the activity rises to an international concern.

51. The consideration of whether a country's acts or omissions may increase the risk of harm to others provides an essential rationale for the presence of trade-related measures in multilateral chemicals and environmental agreements. In some, such as the Stockholm POPs Convention and the Montreal Protocol on Ozone Depleting Substances, it reflects an understanding that trade in a given hazardous substance could undercut the effectiveness of other measures taken in those agreements to address the problem. In others, such as the Basel and Rotterdam Conventions and the Convention on International Trade in Endangered Species (CITES), it reflects an understanding that international trade, itself, may be among the primary factors giving rise to the risk that needs to be addressed. For example, international trade in certain hazardous substances may result in the substances being used or disposed of in an importing country that does not have the capacity to do so in an environmentally sound manner. Conversely, international trade may be a driver of market forces that result in unsustainable exploitation of natural resources in a country where harmful acts cannot be regulated effectively, such as taking endangered species of wildlife or plants. In the cases of lead and cadmium, demand for commodities and goods containing these metals can be a driver of market forces that result in unsustainable or unmanageable production practices in the exporting countries.

[79] UN GENERAL ASSEMBLY, RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT, Principle 2 (1992).
[80] *Id.*, Principle 14.
[81] *Id.*, Principle 7.

52. In exploring whether an act or omission (such as the failure to regulate international trade of a hazardous substance sufficiently) by one or more countries may lead to an unacceptable risk to human health or the environment in other countries, stakeholders may examine:

- Whether a significant risk may be traced to the trade?
- Whether it is reasonably foreseeable that the trade will contribute to the risk?
- The extent to which an exporting or importing country avoids internalizing the environmental and health risks or costs related to its consumption, and instead externalizes those costs to its trading partners and consumers?
- Whether there are mitigating factors to consider related to the trade, such as increased incomes in poor countries?

3.3. Countries Find It Difficult or Impossible to Protect Themselves Unilaterally from Increased Risk

53. When individual States can effectively prevent or address an environmental or health risk on their own or bilaterally, they do not need to pursue multilateral remedies.[82] Instead, States have taken action under multilateral chemicals, wastes, and other environmental agreements when significant numbers of them have found it difficult or impossible to protect themselves unilaterally from a transboundary risk, including risks that may be related to international trade. A widespread recognition of vulnerability to such risks is thus a key consideration as to whether a risk to human health and the environment may rise to the level of an "international concern" warranting an international, coordinated approach.

54. A State's difficulty in taking effective, unilateral action may derive from at least two different factors. The first factor relates to the State's *capacity* to deal with the risk. Capacity is usually, and appropriately, associated with the identified needs of developing countries and countries with economies in transition, especially capacity development for foundational chemicals management. As governments agreed in the Rio Declaration, "The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. . . ."[83] All of the major multilateral chemicals and wastes agreements cite the limited capacities of developing countries to manage hazardous wastes and substances soundly as an important reason why the agreement is needed.[84] They also recognize the critical relationship of financial and technology assistance to these capacity needs.

55. An additional, important aspect of capacity relates to the ability of *all* States, both developed and developing, to protect themselves from hazardous substances that are

[82] Zambia reported a relevant success story, in which the Zambia Bureau of Standards was actively involved with other stakeholders to phase out leaded fuel by withdrawing the standard for leaded fuel (ZS 370:2000) and replacing it with a lead replacement fuel standard (ZS 716: 2007). Lead had previously been imported into Zambia to produce leaded fuel. Interview with Mr. Michael Musenga, Senior Environment Health Officer, Zambia Public Heath Department, 29 February 2008, 78th Forum Standing Committee meeting, Bangkok, Thailand.

[83] Rio Declaration, Principle 6.

[84] *See* Basel Convention, preamble; STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPs), preamble (2001); Rotterdam Convention, preamble; International Conference on Chemicals Management, *Dubai Declaration on International Chemicals Management* (2006); International Conference on Chemicals Management, *Overarching Policy Strategy* (2006).

widely distributed through environmental media or international commerce. For example, both developed and developing countries have great difficulty protecting themselves from persistent organic pollutants, once these substances are released into the environment. Similarly, both developed and developing countries often face difficulty screening their imports for the presence of contaminants such as lead, and they are challenged in their efforts to achieve environmentally sound recycling and disposal of imported products that contain cadmium.[85]

56. The second factor relates to whether international trade law may have a "chilling effect" on the ability or willingness of individual countries to take unilateral measures to address an environmental health risk that can be traced to international trade. In respect to trade policies, "Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus."[86] World Trade Organization rulings also suggest that trade-related environmental and health measures taken by States pursuant to multilateral efforts would not run afoul of WTO principles.[87] Thus, the potential for conflicts between international trade law and unilateral efforts by States to protect themselves from environmental health risks that may result from international trade may be a factor in determining whether unilateral action or an international, coordinated approach would be most effective in avoiding, reducing or mitigating health and environmental harms caused by the international trade of these metals throughout their lifecycles.

57. In deciding whether the difficulty or impossibility of States to protect themselves unilaterally from risks related to international trade in hazardous substances throughout their lifecycles should contribute to the substances being considered of international concern, stakeholders may consider:

- Whether measures regarding the presence and risks of hazardous substances in products that are subject to international trade can be taken most effectively and efficiently by producing or importing States?
- Whether developing countries and countries with economies in transition that are experiencing the harm have the technical, financial, legal, and other resources to address it by themselves? If they do not, are there obstacles to their receiving sufficient bilateral assistance? If so, could these difficulties be overcome through multilateral action?
- Whether a country with significant chemicals management capacity is able to address the harm by itself?
- Whether measures addressing international trade in the hazardous substance (including, possibly, process and production methods) would be the most efficient and effective way to prevent the harm from occurring? If so, would the measures best be implemented through a multilateral chemicals arrangement or by the individual States that are being harmed?
- Whether a multilateral framework would be necessary or desirable to avoid challenges under international trade law to national efforts?

[85] *See* UNEP Interim review on cadmium, *supra* note 10.
[86] Rio Declaration, Principle 12.
[87] *Report of the Appellate Body, United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/AB/RW, adopted on 21 Nov. 2001, paras. 111-34; BERNASCONI-OSTERWALDER, NATHALIE ET AL, ENVIRONMENT AND TRADE: A GUIDE TO WTO JURISPRUDENCE 128-35 (Earthscan: London, 2006).

- The extent to which existing multilateral chemicals frameworks or agreements may be able to respond to the challenges posed by the hazardous substances in question?

4. Discussion of Whether Trade in Lead and Cadmium May Present an International Concern

58. This Part discusses international trade in lead and cadmium within the context of the considerations presented in Part 3. *Unless otherwise noted, the assertions of fact in this Part are based on the facts presented and cited above, in Part 2.*

4.1. Do Lead and Cadmium Present an Unacceptable Risk to Human Health or the Environment?

59. Health and environmental harms caused by exposure to lead and cadmium throughout their lifecycles occur every day around the world. Global use of ores, compounds, products, and wastes continues apace for cadmium, and is increasing for lead. Electronic wastes, the fastest growing component of municipal waste worldwide, are exported to countries that are unable to manage them in an environmentally sound manner. Global trade in products and materials is expanding dramatically. In the globalized economy, the likelihood is high that the harms caused by primary production and exports, imported products and waste will continue to occur, and likely increase, in the future, if no action is taken.

60. Exposure to lead and cadmium ores, compounds, and products and wastes containing lead and cadmium that place people and wild flora and fauna at risk are well documented and occur in most, if not all, countries of the world. The UNEP Executive Director states that the "key findings developed by the [Lead and Cadmium] Working Group show that there is a significant international dimension of the risks to human health and the environment arising from the release of lead and cadmium into the environment. . . ."[88]

61. The toxicity and eco-toxicity of lead and cadmium and their routes of exposure have been extensively studied and described by national governments and international bodies. Lead and cadmium can cause severe acute and chronic health and environmental effects, including reproductive effects. Pregnant women, fetuses, and children are among the most vulnerable populations. Chronic lead neurotoxicity is particularly severe for children, and can result in damage to the brain and nervous system and lifelong behavioral, developmental, and learning problems. Maternal exposure to cadmium is associated with low birth weight and an increase of spontaneous abortion.

62. The health harms resulting from exposure to lead, particularly long-term neurological and developmental impacts on children, may cause significant economic losses for society, especially in developing countries and transition economies where exposure is often the highest. Health harms resulting from exposure to lead and cadmium diminish labor potential and productivity, exacerbating poverty and impairing economic development. Examples abound: Chinese workers producing cadmium batteries are routinely sickened. Over 99% of the children who live next to the metal smelting facility in the Peruvian city of La Oroya suffered from lead poisoning, causing

[88] UNEP Governing Council, *Interim reviews of scientific information on lead and cadmium: Note by the Executive Director*, UNEP/GC/24/INF/16 (2006).

lifelong developmental and neurological problems. The improper recycling of e-waste has led to high blood levels of lead in half the children of Bangalore, resulting in lowered IQs and diminished abilities.

63. Mining and refining of lead and cadmium and the industrial and manufacturing processes that use lead and cadmium generate employment and revenues. For example, approximately 80,000 people are employed in lead mining worldwide. Nevertheless, the enormous social and environmental costs of exposure, which are borne largely by the poorest and most vulnerable sectors of society—laborers, waste recyclers, children, pregnant women, and the malnourished—are incalculable. Moreover, many of the jobs that result in the highest exposures pay the least. Electronic waste recyclers in India and elsewhere, for example, earn less than one dollar per day.

64. Substitutes or safer alternatives are available that can reduce the flow of lead and cadmium throughout international commerce and the environment. Alternatives to lead are available for a wide range of applications, from gasoline additives and lead shot to cable sheathing and pigments.[89] Similarly, alternatives to cadmium have been introduced for cadmium applications including NiCd batteries, plating alloys for solders and other alloys, PVC stabilizers, and pigments.[90]

4.2. Do Trade-Related Actions Increase the Risk of Harm from Lead and Cadmium?

65. The trade flows of lead and cadmium and products and wastes containing them are complex due to rapid globalization. For example, Peru is a major exporter of lead concentrates and ores to China, while China is a major exporter of refined lead to other east-Asian countries. Generally speaking, the production and use of these metals is decreasing in OECD countries and increasing in Asia and some other parts of the developing world. Especially in rapidly industrializing countries with export-driven economies, a large amount of the environmental health risk from production and use of lead and cadmium may be traced to overseas demand for processed materials and manufactured products. That demand is driven significantly by consumer preference for inexpensive products. One of the factors explaining why such products are comparatively inexpensive is the fact that some or many of the stages of their manufacture are undertaken with few, if any, environmental health safeguards. Thus, in the cases of lead and cadmium, competition within and between supply chains, and consumer preference for inexpensive imports may often result in much of the environmental health risks associated with the imported products being externalized to the exporting country. Demand for commodities and goods containing lead and cadmium can be a driver of market forces that result in unsustainable practices in exporting countries where harmful acts cannot be regulated effectively.

66. Not all of the environmental health risks, however, are externalized away from consumers. The same lax safeguards that result in low prices for consumers may bring increased risks of contamination, especially lead contamination, in the finished products, which contribute to higher releases of these metals throughout the products' lifecycles, including when they are disposed of. Consumers of these products are in developed countries, countries with economies in transition, and developing countries, where environmentally sound management of wastes may be ineffective or nonexistent. These imported products may thus have a significant, negative impact on environmental health in developing countries and countries in transition.

[89] UNEP Interim review on lead, *supra* note 10, at 24.
[90] UNEP Interim review on cadmium, *supra* note 10, at 22.

67. In contrast to consumer products that use or contain lead and cadmium, international trade of e-waste (including "used" electronics that effectively are e-waste) overwhelmingly flows from developed to developing countries and economies in transition. The devastating environmental health impacts to trash pickers, recyclers, their families and communities are increasingly well-documented and foreseeable. The export of these materials from North to South occurs because it is cheaper for people and companies in rich countries to export, rather than bear the costs of environmentally sound disposal at home.

68. Large numbers of people in developing countries and countries with economies in transition, depend on all of these activities for their livelihoods. For many of the most polluting and dangerous activities, such as e-waste recycling, the most dependent people are generally the poorest and least-able to cope with the health impacts of lead, cadmium, and other toxics. While a cost-benefit analysis that fully accounted for the environmental health impacts might demonstrate that the international trade that makes their livelihoods possible can leave them worse off, they may have no other readily apparent survival options, or they may have little information and awareness of the risks to which they and their families are exposed.

69. On a broader economic scale, the key strategy for poverty alleviation in many developing countries and countries with economies in transition is to rapidly expand their manufacturing sector for low-cost goods for export. Heavy environmental pollution is often accepted as an unavoidable cost of economic growth. However, as the pollution from lead, cadmium, and other toxics intensifies and public awareness of the high environmental health costs increases, citizens may become less willing to accept those costs.

4.3. Do Countries Have Difficulty Protecting Themselves Unilaterally?

70. Existing multilateral agreements that include trade-related measures such as the Basel and Rotterdam Conventions and the Convention on International Trade in Endangered Species (CITES) reflect the understanding that where international trade is among the primary factors giving rise to a health or environmental risk, unilateral action is unlikely to be either an effective or sufficient approach for dealing with that risk. For lead and cadmium, international trade is a driver of mining, refining and manufacture that give rise to increased occupational, public health, and environmental risks, particularly in developing countries and countries in transition. International trade is also a major factor in increased risks of exposure to commodities, products and wastes containing these metals.

71. Experience shows that industrialized countries with significant chemicals management capacity have been unable to protect themselves effectively from the increased risks presented by the international trade in products containing lead and cadmium. Public health officials, e.g. in the United States, have not been able to screen imported children's products effectively for lead content. Similarly, because NiCd battery collection and recycling programs in the United States and Denmark, for example, have proven in practice only partly effective, a significant portion of these batteries is still disposed of as municipal solid waste, which greatly increases the risk of lead and cadmium leaching into water and soils.

72. The limited capacity and capability for sound chemicals management commonly found in developing countries and countries with economies in transition, including gaps in national legislation and environmental standards, make it even more difficult, if

not impossible, for these countries to protect themselves from the increased risk of harm resulting from international trade in lead and cadmium throughout their lifecycles. Addressing the "widening gap" in capacity is a recognized and important function of all the agreements addressing chemicals and waste. The recent dumping of enormous quantities of hazardous waste in Côte d'Ivoire is a tragic reminder that developing countries seldom possess the capacity to control the transport of hazardous substances across their borders.

73. This lack of capacity is also reflected in the fact that many developing countries reported to the UNEP interim scientific reviews that they have few or no regulatory programs for lead and cadmium. India, for example, does not have any enforceable standard for the total content of lead, cadmium, and other toxic metals in toys. In Peru, air levels of lead in areas near a large metal smelter remain four to seven times higher than permitted under applicable standards.

74. The hurdles can be high for developing countries to obtain bilateral development assistance to address their capacity needs for sound chemicals management, including capacity needs related to lead and cadmium. Officials from some donor States frequently (and accurately) observe that such official development assistance (ODA) might be available if developing countries would only include it as a priority in their national development strategies and requests. However, poverty alleviation is the most pressing need in most developing countries, and environmental health issues are often not viewed as being among the highest priorities. Thus, chemicals managers in these countries rarely have the political clout to place sound chemicals management on their national government's development assistance agendas. In contrast, the receipt of multilateral assistance through, for example, the financial mechanisms of environmental conventions, is not contingent on such prioritized requests. Chemicals managers in developing countries therefore may have far greater success through multilateral, as opposed to bilateral, channels in obtaining financial assistance to support sound chemicals management capacity, including capacity to address risks from exposure to lead and cadmium.

75. The production and consumption of lead and cadmium ore, metals, compounds, and products containing lead and cadmium are a global enterprise, in which trade flows crisscross the planet and each of the many steps in the lifecycle of a product is often conducted in a different country. The UNEP interim scientific reviews of lead and cadmium recognize that "substance flows as a consequence of trade and waste disposal, mainly in developing and transition countries, are major causes of human exposure."[91] This suggests that preventive measures to control trade flows of lead and cadmium could not only be effective, but could also be among the most efficient, because measures that prevent environmental health harms from happening are usually far less expensive than the costs of dealing with the harm after it has occurred.

76. Numerous multilateral environmental agreements, including the Basel and Rotterdam Conventions, CITES, the Montreal Protocol, and the Cartagena Protocol to the Convention on Biological Diversity, are based on the understanding that controlling trade flows of hazardous substances or activities can be among the most effective approaches to preventing, reducing, or mitigating threats to environmental health. These agreements recognize that it is the international trade itself (in hazardous chemicals and waste, endangered wildlife, or living modified organisms) that results in

[91] UNEP Interim review on lead, *supra* note 10, at 149; UNEP Interim review on cadmium, *supra* note 10, at 164.

or is a primary cause of the health or environmental harms, and that these harms can only be effectively addressed via a coordinated international approach.

77. Moreover, in the absence of a multilateral approach controlling trade in lead and cadmium metals, products, and wastes, States may be concerned that they could be vulnerable to challenges under international trade law if they take unilateral trade-related action. Conversely, World Trade Organization rulings suggest that trade-related environmental and health measures taken by States pursuant to multilateral efforts would not run afoul of WTO requirements. This is an important consideration, especially for developing countries and countries with economies in transition that may not have the resources to defend themselves against trade challenges and thus may be reluctant to take unilateral, trade-related regulatory measures, such as restrictions or bans on the import of products or wastes containing lead and cadmium.

78. The Basel Convention currently covers all types of wastes that contain lead and cadmium. Thus, Parties may not export such wastes to countries that have exercised their right to prohibit them, and they may not allow the export if they have reason to believe that the wastes will not be managed in an environmentally sound manner. The Convention also requires Parties to cooperate in developing technical guidelines to improve and achieve environmentally sound management of wastes. In addition to the publication of guidance documents relevant to lead and cadmium waste, the Convention is developing programs to address the environmentally sound management of e-waste including, for example, an extended producer liability initiative in partnership with major cell phone manufacturers aimed at keeping discarded cell phone waste out of municipal waste streams. Parties have not been able to agree on an approach to address the growing problem of trade in e-wastes that are traded under the guise of used products, which represents a significant portion of total international trade flows.

79. The Rotterdam Convention could address certain aspects of the challenges presented by lead and cadmium compounds, including their use in products, although Convention Parties have not yet decided to list the use of any chemical in products. A broad listing of lead and cadmium in the Convention could result in the prior informed consent (PIC) procedure applying to exports of most industrial uses of lead and cadmium in international trade, and exchange of information on the environmentally sound management of those uses. However, it should be noted that COP decisions to add chemical listings to the Convention may only be taken by consensus and do not automatically follow a recommendation from the Convention's Chemical Review Committee. Accordingly, it could be very difficult to achieve a broad listing of lead or cadmium. Additionally, developing countries with limited institutional capacity to monitor and enforce PIC export notifications may not be able to address lead and cadmium risks adequately through this approach.

80. The Rotterdam Convention applies to international trade in listed chemicals among Parties, for the use category specified in the listing. It does not directly restrict or prevent such trade, other than to the extent that exporting countries may allow trade in listed chemicals only if an importing country has provided its prior informed consent. Moreover, receipt of the PIC notification and the information that must precede or accompany international shipments of listed chemicals may facilitate improved management of the chemical in the importing country.

81. While the Basel Convention provides a legal framework to deal with the full range of issues related to lead and cadmium wastes, no existing agreement offers a comprehensive framework to prevent, reduce, or minimize the risk of harm from

exposure to lead and cadmium throughout their lifecycles. Moreover, neither the Basel nor the Rotterdam Conventions includes a mandatory financial mechanism for assisting developing countries and countries with economies in transition to secure needed financial resources for implementation of their treaty commitments.

5. Potential Outcomes of the Forum VI Session on Lead and Cadmium

82. During the Forum VI session on lead and cadmium, the Forum may wish to discuss and consider whether the dispersal of lead and cadmium through international trade of these metals as commodities and in products and wastes may warrant coordinated international action to protect human health and the environment. The Forum may wish to examine this question from the point of view of both producing and consuming countries, and especially developing countries and countries in transition. The Forum may wish to consider whether such trade may lead to problems that cannot be sufficiently addressed by countries acting alone, whether those problems may rise to the level of an international concern, and thus whether they call for a coordinated international approach to addressing them irrespective of the legal nature of the measures.

83. If the Forum concludes that adverse effects related to mobility of these metals through international trade may warrant coordinated international action, then the Forum may wish to consider what additional steps or actions may be desirable, including the means for their implementation. The Forum may wish to prepare and submit a statement containing its findings and recommendations for consideration by the UNEP Governing Council at its twenty-fifth session and by the International Conference on Chemicals Management at its second session.