EXTERNALIZING THE COSTS OF HAZARDOUS WASTE FROM THE UNITED STATES

By Sarah Westervelt & Whitney Beckham

INTRODUCTION

The history of hazardous waste pollution in the United States is marked by cost externalization and by significant impacts on the international community, despite the fact that most nations have adopted a United Nations treaty to restrict "trade" in hazardous wastes. This treaty is called the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal ("Basel Convention").[1] The United States is the *only* developed nation in the world that is *not* a Party to the Basel Convention.[2]

Part I of this article will first explore the accumulation of hazardous waste in the United States and reactive federal legislation during the last four decades of the Twentieth century. It then provides a brief history of international events that led to the creation of the Basel Convention and its Ban Amendment.[3] Part II of the article discusses the first two decades of the Basel Convention and the Ban Amendment, creating a lens to analyze the United States' non-Party status to the Basel Convention. Part III discusses the current status of the Basel Convention, including ratifications, and a separate treaty that the United States has ratified, explaining the legal and other implications of the United States not ratifying Basel. Finally, Part IV of this article recommends actions for the United States to take in order to emerge from its current status into a responsible global citizen relative to its hazardous waste management.

I. HISTORY OF HAZARDOUS WASTE DISPOSAL IN THE UNITED STATES

The 1960s and subsequent decades saw the United States pass various federal laws to mitigate environmental damage caused by pollution after years of industrialization.[4] The United States Environmental Protection

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1. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126, 126 [hereinafter Basel Convention], *available at* https //treaties.un.org/doc/Publication/UNTS/Volume%201673/v1673.pdf [http //perma.cc/6HHD-DTZZ].

2. *See Parties to the Basel Convention*, BASEL CONVENTION, http //www.basel.int/Countries/StatusofRatifications/PartiesSignatories [http //perma.cc/U6BC-6PCJ] (last visited Mar. 31, 2015) (showing how the United States is one of the few nations that has not ratified the Basel Convention).

3. *See The Basel Convention Ban Amendment*, BASEL CONVENTION, http //www.basel.int/Implementation/LegalMatters/BanAmendment/Overview/tabid/1484/Default.aspx [http //perma.cc/7CJY-EJNG] (last visited Mar. 31, 2015).

4. *See* ENVIRONMENTAL POLITICS AND POLICY THEORIES AND EVIDENCE 3 (James P. Lester ed., 2d ed. 1995). These laws include the following major federal environmental legislation the Solid Waste Disposal Act and the Water Quality Act (1965), the Clean Water Restoration Act and the National Environmental Policy Act (1966), the Federal Water Pollution Control Act and the Coastal

Agency ("EPA") has defined hazardous waste as "waste that is dangerous or potentially harmful to our health or the environment."[5] The period between 1960 and 1976 revealed a growing accumulation of hazardous waste and an urgent need for disposal plans.[6] A Congressional effort to monetize decades of hazardous waste dumping created two kinds of costs: (1) front-end costs to comply with new regulations and (2) back-end costs of potential fines for non-compliance.[7] This led to a large number of abandoned hazardous waste sites, concern over how these sites would be cleaned, and questions of liability.[8]

National concern over hazardous waste disposal led to the passage of two Congressional acts addressing the issue. In 1976, Congress passed the Solid Waste Disposal Act, later changed to the Resource Conservation and Recovery Act ("RCRA").[9] The goals of RCRA, as outlined by the EPA, are:

- To protect human health and the environment from the hazards posed by waste disposal;
- To conserve energy and natural resources through waste recycling and recovery;
- To reduce or eliminate, as expeditiously as possible, the amount of waste generated, including hazardous waste; and

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Zone Management Act (1972), the Safe Drinking Water Act (1974), the Toxic Substances Control Act and the Resource Conservation and Control Act (1976), the Amended Solid Waste Disposal Act and the Clean Water Act Amendments (1977), the Comprehensive Environmental Response, Compensation, and Liability Act Superfund (1980), the Hazardous and Solid Waste Amendments (1984), the Safe Drinking Water Act Amendments and the Superfund Amendments and Reauthorization Act (1986), the Clean Water Act Reauthorization (1987), the North American Wetlands Conservation Act (1989), and the Pollution Prevention Act (1990).

5. U.S. ENVTL. PROTECTION AGENCY, *Waste – Hazardous Waste*, http //www.epa.gov/osw/hazard/ [http //perma.cc/NQ8Q-RT7C] (last visited Mar. 18, 2015).

6. For example, incidents at Love Canal, NY and Times Beach, MO show the devastating effects of this period when hazardous waste sites were abandoned. The Federal Government, through the Federal Emergency Management Association, poured millions of dollars into relocating citizens and cleaning these sites. It became apparent that policy changes were needed to protect United States citizens from irresponsibly disposed waste created by communities and private owners. Eckardt C. Beck, *The Love Canal Tragedy*, U.S. ENVTL. PROTECTION AGENCY (Jan. 1979), http //www2.epa.gov/aboutepa/love-canal-tragedy [http //perma.cc/ES4F-AQLD], *Joint Federal/State Action Taken to Relocate Times Beach Residents*, U.S. ENVTL. PROTECTION AGENCY (Feb. 22, 1983), http //www2.epa.gov/aboutepa/joint-federalstate-action-taken-relocate-times-beach-residents [http //perma.cc/V7EB-7L9N].

7. *See* Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6922–6924, 6928 (2012) (requiring standards for generators and transporters, and requiring fines for non-compliance).

8. Beck, *supra* note 6, *Times Beach Residents*, *supra* note 6. Both the Love Canal and Times Beach cases created a need for federal intervention in the cleanup of those facilities to restore community health.

9. Resource Conservation and Recovery Act of 1976, Pub. L. No. 94-580, 90 Stat. 2795 (codified as amended at 42 U.S.C. §§ 6901–6992k (2012)).

- To ensure that wastes are managed in a manner that is protective of human health and the environment.[10]

In 1980, Congress reacted to the vast number of hazardous waste sites through the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA" or "Superfund").[11] Today, RCRA and CERCLA remain the major federal acts that govern the United States' domestic hazardous waste management. While RCRA and CERCLA did address the domestic hazardous waste problem, the issue of *where* the hazardous waste would end up remained. It became common practice for hazardous waste to be gathered and stored in containers.[12] These containers were either buried within the United States, or increasingly shipped to another country, and typically a developing country where costs were significantly lower.[13]

The rest of the developed world also began to appreciate the health and environmental impacts of hazardous waste and to experience multiple costs for properly managing hazardous waste during the 1960s and 1970s.[14] Industrialized nations producing large amounts of toxic waste began to devise ways to reduce the costs of hazardous waste management and at the same time protect the health of their own citizens and environments.[15] Accordingly, the profit-minded and protectionist practice of exporting hazardous waste from developed to developing countries became customary.[16] The shipment of hazardous waste from developed to developing nations has been referred to as "toxic colonialism."[17]

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10. *RCRA Summary*, U.S. ENVTL. PROTECTION AGENCY, http //www.epa.gov/Region2/waste/summary.htm [http //perma.cc/TH2H-29HL] (last visited Feb. 20, 2015).

11. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, Pub. L. No. 96-510, 94 Stat. 2767 (codified as amended at 42 U.S.C. §§ 9601–9675 (2012)).

12. *Toxic Waste: Man's Poisonous Byproducts*, NAT'L GEOGRAPHIC, http //environment.nationalgeographic.com/environment/global-warming/toxic-waste-overview/ [http //perma.cc/L6L2-X844] (last visited Mar. 23, 2015).

13. *Id.*, *see* Laura A. W. Pratt, *Decreasing Dirty Dumping? A Reevaluation of Toxic Waste Colonialism and the Global Management of Transboundary Hazardous Waste*, 35 WM. & MARY. ENVTL. L. & POLICY REV. 581, 584 (2011) (describing how disposal costs are lower when exporting to a developing country).

14. *See* Pratt, *supra* note 13, at 592 (discussing the beginning of toxic waste regulations).

15. *See id.* at 590 (explaining how exporting hazardous waste can be "cost-effective" for hazardous waste producers in developed countries).

16. *See id.* (discussing the role money plays in toxic colonialism).

17. Lassana Koné, *The Illicit Trade of Toxic Waste in Africa: The Human Rights Implications of the New Toxic Colonialism*, ACADEMIA.EDU, http //www.academia.edu/5340851/The_illicit_trade_of_toxic_waste_in_Africa_The_human_rights_implications_of_the_new_toxic_colonialism [http //perma.cc/WCZ2-S6QZ] (last visited Mar. 21, 2015).

A. International Concern over Hazardous Waste Injustices

The 1980s revealed major international scandals associated with the hazardous waste trade. In 1988, five ships transported 8,000 barrels of hazardous waste, including toxic PCBs and solvents, from Italy to the small town of Koko, Nigeria. Italy exchanged the hazardous waste for the equivalent of $100 monthly rent paid to a Nigerian landowner to use his farmland for outdoor storage of the hazardous waste.[18] The Nigerian landowner died, reportedly due to "cancer of the throat," within a year of the arrangement.[19]

The *Khian Sea* barge incident is another example of a major toxic waste injustice that galvanized nations around the world to take action. In the 1980s, a barge carrying 14,000 tons of toxic incinerator ash from Philadelphia was towed to Haiti, where the workers dumped a portion of the toxic ash before the Haitian government stopped them and sent the barge on its way.[20] It sailed for the next 27 months, changing its name, owner, and flag state several times.[21] Unable to unload the infamous cargo in any port, the crew was believed to have dumped much of it into the Indian Ocean.[22] This incident was one of many scandals that triggered international outrage at the emerging global hazardous waste crisis.

II. CREATION OF THE BASEL CONVENTION: INITIAL GOALS & PARTIES TO THE CONVENTION

The hazardous waste incidents of the 1980s proved to be the last straw for many nations. They came together to create a legal trade barrier under the umbrella of the United Nations Environment Programme ("UNEP").[23] The relationship between waste and trade is proportional; UNEP recognized

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18. *Id.*

19. ANDREAS BERNSTORFF & KEVIN STAIRS, POPS IN AFRICA HAZARDOUS WASTE TRADE (1980-2000) 80, 82 (2001).

20. THE ENCYCLOPEDIA OF CONSUMPTION AND WASTE THE SOCIAL SCIENCE OF GARBAGE, VOLUME 1, 64 (Carl A. Zimring, William L. Rathje, eds., 2012), *see also* Alex Santoso, *World's Most Unwanted Garbage· Cargo of the Khian Sea*, NEATORAMA (Aug. 15, 2007), http //www.neatorama.com/2007/08/15/worlds-most-unwanted-garbage-cargo-of-the-khian-sea/ [http //perma.cc/3FTQ-LYY4] (describing where the ash ultimately ended up and that the United States EPA declared the ash not hazardous).

21. Santoso, *supra* note 20.

22. *Id.* The ash waste in this incident was eventually disposed of in Pennsylvania at the Mountain View Reclamation landfill.

23. KATHARINA KUMMER PEIRY, BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY HAZARDOUS WASTES AND THEIR DISPOSAL 1 (2010), *available at* http //legal.un.org/avl/pdf/ha/bcctmhwd/bcctmhwd_e.pdf [http //perma.cc/KS45-YZCJ] (last visited Apr. 2, 2015).

that the increase in hazardous waste would increase the hazardous waste trade.[24] In 1987, UNEP adopted the Cairo Guidelines and Principles for Environmentally Sound Management of Hazardous Wastes ("Cairo Guidelines"), which put the onus on the exporter by requiring "notification to receiving and transit nations of any export and consent by those nations prior to export."[25]

The international community recognized the Cairo Guidelines, but with virtually no international laws pertaining to trade in hazardous waste there was no framework for enforcement at the country level.[26] In this milieu, nations came together to create a legally binding treaty with criminal penalties to protect developing countries from receiving the toxic spoils of rich countries.[27] Unfortunately, the hazardous waste trade is still going on today.

Using the Cairo Guidelines as a working draft, the original 82 signatory nations of the Basel Convention attempted to completely ban hazardous waste movement from developed to developing countries.[28] This was the original purpose of the Basel Convention, based on the principle of environmental justice—that no group of people deserves a disproportionate burden of toxics simply because of their social, racial, or socio-economic status.[29] The Parties hoped to create this Convention as a complete hazardous waste wall between developed and developing nations—effectively ending toxic colonialism.[30] Unfortunately, in 1989 the 82 original signatories completed and adopted the Basel Convention without this outright ban.[31] The Basel Convention allowed Parties a few years to

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24. *See Basel Agreement on Waste Trade*, TED CASE STUDIES, http //www1.american.edu/ted/basel.htm [http //perma.cc/4TR2-BLV7] (last visited Apr. 2, 2015) (describing the growth of hazardous waste generation in the last half of the Twentieth century and the resulting increase in hazard waste being shipped to developing countries).

25. *Id.*

26. *See id.* (describing how "UNEP wanted to enlarge the scope of their international regulation of hazardous waste" after the adoption of the Cairo Guidelines).

27. Dr. Zada Lipman, *Trade in Hazardous Environmental Justice Versus Economic Growth: Environmental Justice and Legal Process*, http //ban.org/library/lipman.html [http //perma.cc/4GA7-5Q99] (last visited Mar. 25, 2015).

28. Rebecca A. Kirby, *The Basel Convention and the Need for United States Implementation*, 24 GA. J. INT'L & COMP. L. 281, 290 (1994).

29. The EPA defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." OFFICE OF ENVTL. JUSTICE, U.S. ENVTL. PROT. AGENCY, TOOLKIT FOR ASSESSING POTENTIAL ALLEGATIONS OF ENVIRONMENTAL INJUSTICE 9 (2004), *available at* http //www.epa.gov/environmentaljustice/resources/policy/ej-toolkit.pdf [http //perma.cc/5KEW-QTE7].

30. *See* Pratt, *supra* note 13, at 600–01 (noting that a "total ban" has been a part of the negotiations from the beginning).

31. Basel Convention, *supra* note 1, at 126–48.

transpose the Convention's requirements into their own domestic laws, and the full Convention went into legal force in 1992.[32] The United States was not among the Parties, and to this day, has signed but not ratified the Convention.[33]

A. Undermining Original Party-Goals: Requirements of the Basel Convention to this Day

The United States played an integral role in shaping the Basel Convention. Just before Basel was adopted in 1989, the United States led an effort that succeeded in removing the complete ban on exporting hazardous waste from developed to developing countries.[34] Instead of a ban from rich to poor, countries agreed to a procedure called "Prior Informed Consent," requiring government-to-government notification and consent before shipping hazardous waste between any Basel Parties.[35] However, six years later in 1995, the Parties passed a consensus decision to amend the Convention, to later achieve this original goal.[36]

Today, 181 countries—out of the total 193 United Nations member states—have ratified the Basel Convention.[37] The United States is the only developed country in the world that has not ratified this treaty to restrict the trade of hazardous waste.[38] A few developing countries have also not ratified; however, some of these are fairly new countries, like South Sudan, that are struggling with fundamental issues of governance.[39]

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32. *See Parties to the Basel Convention*, *supra* note 2 (showing the delay before legal enforcement to allow time for domestic enactments and the ratification of the Basel Convention by more countries).

33. *See id.* (showing how the United States is one of the few nations that has not ratified the Basel Convention).

34. *See* Pratt, *supra* note 13 (explaining that as ratified, the Basel Convention does not ban the export of hazardous waste as intended).

35. Eur. Chems. Agency, PRIOR INFORMED CONSENT REG., http //echa.europa.eu/regulations/prior-informed-consent-regulation [http //perma.cc/S6AF-NCES] (last visited Mar. 21, 2015). This is similar to the situation of the Kyoto Protocol, where the United States substantially participated in negotiations but then refused to sign the treaty at the last minute. "'U.S. withdrawal from the Kyoto Protocol in [sic] an extreme disappointment. U.S. action to reduce greenhouse gas emissions is essential to international efforts to prevent dangerous global warming. Nevertheless, the treaty will be beneficial and start the world moving in the right direction,' said Kert Davies, Director of Greenpeace's U.S. Global Warming Campaign." *U.S. Withdraws from Kyoto Protocol*, GREENPEACE (Apr. 5, 2001), http //www.greenpeace.org/usa/en/news-and-blogs/news/u-s-withdraws-from-kyoto-prot/ [http //perma.cc/57WB-65ZB].

36. *The Basel Convention Ban Amendment*, *supra* note 3, *see infra* Part II.B (explaining the Ban Amendment proposal).

37. *Parties to the Basel Convention*, *supra* note 2.

38. *Id.*

39. *See id.* (showing how not all of the United Nations member states have ratified the Convention).

What does Basel call for in those countries that have ratified it? The Basel Convention contains both "soft law"—non-legally binding principles (e.g. efforts aimed at prevention)—as well as "hard law," which specifies legally binding actions to be taken by Parties and criminalizes illegal traffic in hazardous wastes.[40] Basel regulates hazardous waste destined for both disposal and recycling because nations drafting the Convention understood the perils of allowing an exporting country to simply label hazardous waste as destined for "recycling" and fall out from under Basel regulation.[41] Such relabeling would likely become the new norm, if allowed.

First, the Convention calls for countries to minimize the generation of hazardous waste.[42] Second, if hazardous waste is created, Basel calls on Parties to use environmentally sound management of hazardous waste within their own countries, to the extent possible.[43] This self-sufficiency principle is, of course, intended to provide incentives for Parties to create less hazardous waste. Third, Basel calls on nations to minimize waste exports, recognizing the risks inherent in transporting hazardous materials (increasing possibilities of accidents and exposures), particularly to other countries that may or may not have the broad legal, technical, democratic, and social framework necessary for properly managing hazardous waste long term.[44]

In addition, Basel provides a set of definitions for hazardous waste, which each Party interprets relative to the contents and destinations of their waste shipments.[45] Specifically, Parties must examine and characterize each shipment according to its hazardous characteristics (such as leachability, toxicity, flammability, corrosiveness, etc.) and determine if it is destined for a recycling or disposal destination.[46] Furthermore, a clause in the Basel Convention prevents Parties to the Convention from trading in hazardous materials with non-Parties (including the United States) unless those non-Parties are members of other bi- or multilateral agreements controlling hazardous waste.[47] The United States has only ratified one other multilateral treaty on the transboundary movement of hazardous waste.[48]

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40. Basel Convention, *supra* note 1, at 132.
41. *Id.* at 155–56.
42. *Id.* at 131.
43. *Id.*
44. *Id.* at 132.
45. *Id.* at 129.
46. *See id.* at 132–33 (requiring proper labeling of hazardous waste shipments).
47. *Id.* at 132.
48. *Members and Partners*, ORGANIZATION FOR ECONOMIC COOPERATION & DEVELOPMENT (OECD), http //www.oecd.org/about/membersandpartners/ [http //perma.cc/P3HL-22FT] (last visited Mar. 23, 2015).

But the original goal of the Basel Convention was not achieved; it failed to stop developed countries from trading in hazardous waste with developing countries.[49] Instead, it set up the Prior Informed Consent protocol whereby any Basel Parties are allowed to ship to any other Party (developed or developing) as long as the exporting government first contacts the importing and transit governments using a written notification procedure and receives written consent from them to accept the shipment.[50] The importing country have a facility capable of environmentally sound management of that particular type of hazardous waste.[51]

Even though the Convention failed to achieve its outright ban from developed to developing countries, it did achieve a limited outright ban of hazardous waste. To this day, it bans Parties' hazardous waste only to Antarctica.[52]

B. Reclaiming Original Purpose: The Basel Ban Amendment

In 1989, after the Basel Convention failed to put up a complete legal barrier against transboundary movement of hazardous waste from developed to developing countries, African countries walked out in protest and developed their own regional treaty called the Bamako Convention.[53]

Developing countries eventually returned to the Basel Conference of the Parties, and in 1995, Parties passed a consensus decision (the United States having no vote as a non-Party) to amend the Basel Convention to achieve the outright ban on hazardous waste going from developed to developing countries for any reason.[54] The Basel Ban Amendment was adopted as a legally binding instrument (not yet in full legal force), with criminal penalties for violators.[55] It is important to note that this blatant trade barrier was adopted in an era otherwise characterized by a

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49. *See* Pratt, *supra* note 13, at 601 (explaining how the failure of the Basel Convention to stop developed countries from exporting hazardous waste to developing countries sparked the passage of the Ban Amendment).

50. Basel Convention, *supra* note 1, at 134.

51. *Id.*

51. *Id.* at 132.

53. *First Conference of the Parties to the Bamako Convention*, UNITED NATIONS ENV'T PROGRAMME, http //www.unep.org/delc/BamakoConvention [http //perma.cc/36KJ-EJ36] (last visited Mar. 18, 2015).

54. *The Basel Convention Ban Amendment-Overview*, BASEL CONVENTION http //www.basel.int/Implementation/LegalMatters/BanAmendment/Overview/tabid/1484/Default.aspx [http //perma.cc/2PVV-6ED7] (last visited Mar. 19, 2015).

55. Basel Action Network, *The Basel Ban: A Triumph for Global Environmental Justice*, (Sept. 2014) *available at* http //ban.org/library/briefing1.html [http //perma.cc/7UW8-2UVD].

proliferation of global free trade agreements (WTO, NAFTA, FTAA, etc.).[56]

This Amendment is a critical landmark. Once it goes into full legal force, it will finally disallow the transboundary movement of hazardous waste from developed to developing nations for applicable Parties.[57] Globally, the Ban Amendment will act to prevent the externalizing of costs to developing nations. The Ban Amendment will function as a separate legal instrument until it has been ratified by a minimum number of Parties.[58] Currently, 80 Basel Parties have separately ratified the Ban Amendment, putting it on track to become part of the Basel Convention itself in upcoming years.[59] In the meantime, some countries have already put it into legal force domestically; the European Union countries, for example, have not only ratified the Basel Ban Amendment,[60] but have fully implemented it in national laws, such as their Waste Shipment Regulations.[61] This means European Union countries are barred by law, unlike the United States, from shipping hazardous waste to developing countries.

C. Electronic Waste: A Growing Concern for the International Community

Electronic waste ("e-waste") is a massive hazardous waste stream with 20 to 50 million tons of waste generated globally per year.[62] There is significant toxicity in the e-waste stream.[63] Heavy metals including lead, cadmium, mercury, beryllium, and arsenic are present in electronic waste.[64] E-waste also contains halogenated materials (such as fluorine, chlorine,

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56. *Id.*

57. *The Basel Convention Ban Amendment*, BASEL CONVENTION, http://www.basel.int/Implementation/LegalMatters/BanAmendment/Overview/tabid/1484/Default.aspx [http://perma.cc/LF5U-KQNC] (last visited Mar. 31, 2015).

58. *Questions and Answers (Q&A) Related the Ratification of the Ban Amendment*, BASEL CONVENTION, http://www.basel.int/Implementation/LegalMatters/BanAmendment/QuestionsandAnswers/tabid/3596/Default.aspx [http://perma.cc/SZ9A-7S87] (last visited Mar. 22, 2015).

59. *Ban Amendment to the Basel Convention: Geneva, 22 September 1995*, BASEL CONVENTION, http://www.basel.int/Countries/StatusofRatifications/BanAmendment/tabid/1344/ [HTTP://PERMA.CC/95PQ-MBAQ] (last visited Mar. 22, 2015).

60. *See id.* (noting the European Union countries that have ratified the Ban Amendment).

61. *Waste Shipments*, EUR. COMMISSION, http://ec.europa.eu/environment/waste/shipments/legis.htm [http://perma.cc/66PM-GRBG] (last visited Mar. 18, 2015).

62. *E-Waste Facts*, CAUSES INT'L, https://www.causesinternational.com/ewaste/what-is-ewaste [http://perma.cc/AR6M-UX7A] (last visited Mar. 20, 2015).

63. *Id.*

64. *Id.*

etc., that can create dioxins and furans when openly burned), and rare earth metals.[65]

Unlike many other countries that have passed national laws to deal with e-waste, the United States government has not addressed the large-scale hazardous waste problem nationally.[66] Because of this, 25 states have passed separate electronic waste laws to collect and recycle e-waste, but only the federal government has jurisdiction over exports.[67] This means state governments cannot legally prevent e-waste from going to China, India, or any other nation.[68] In a country that has not ratified the Basel Convention, much less the Ban Amendment, and does not monitor and control its exports of hazardous e-waste, there are only estimates of the volumes going off-shore. According to anecdotes from the recycling industry, an estimated 80% of what is being collected for recycling is being exported.[69]

In 2002, Basel Action Network ("BAN"), a non-profit environmental group dedicated to protecting the global environment based on the Basel Convention, released a documentary film called *Exporting Harm*, with the first images of what happens to our e-waste in Guiyu, China, one of a number of Chinese destinations for United States e-waste.[70] There, primitive riverside acid baths were used to recover gold from a mix of heavy metals, dumping the rest of the metals and spent acids directly into rivers.[71] The documentary also documented families living and working in villages that burn computer wires in open fires in order to liberate the copper, while likely creating invisible, odorless, and highly toxic halogenated dioxins and furans in the process.[72]

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65. *Id.*

66. *Id.*

67. *See Map of States with Legislation*, ELECTRONICS RECYCLING COORDINATION CLEARINGHOUSE, http //www.ecycleclearinghouse.org/Content.aspx?pageid=10 [http //perma.cc/GPN6-BNJ4] (last visited Apr. 2, 2015), Jeffrey M. Gaba, *Exporting Waste: Regulations of the Export of Hazardous Wastes from the United States*, 36 WM. & MARY ENVTL. L. & POL'Y REV. 405, 408 (2012) (discussing the federal laws and regulations that govern the export of hazardous waste).

68. *See Decision of the Council Concerning the Control of Transboundary Movements of Wastes Destined for Recovery Operations*, ORGANIZATION FOR ECONOMIC COOPERATION & DEVELOPMENT (OECD), http //acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=221&InstrumentPID=217&Lang=en&Book=False (last visited Mar. 23, 2015) (providing that each country only needs to enforce its own laws on export and import).

69. The Basel Action Network et al., *Exporting Harm: The High-Tech Trashing of Asia*, 4 (Feb. 25, 2002), http //www.ban.org/E-waste/technotrashfinalcomp.pdf [http //perma.cc/AJM8-8E8X].

70. The Basal Action Network, *Exporting: The High-Tech Trashing of Asia*, YOUTUBE (May 16, 2013), https //www.youtube.com/watch?v=yDSWGV3jGek [http //perma.cc/H95R-T35Y].

71. *Id.*

72. *Id.*

In 2005, Basel Action Network went to Nigeria to document in a short film what some claimed was an alternative to sending e-waste to China for "recycling."[73] Instead, the rationale for exporting United States hazardous waste to Nigeria became "bridge the digital divide", i.e. send non-working electronics for repair and reuse.[74] Although Lagos, Nigeria was found to have many skilled workers trained to repair electronics, much of it ended up in both formal and informal waste dumps.[75] Frequently, much of the e-waste accumulated around residential areas.[76] When the piles grew too high, they were burned, one of the most environmentally and occupationally damaging methods of managing this waste stream.[77]

In 2006, Basel Action Network went to Ghana and found children burning fields of e-waste and breaking unwanted CRT televisions and monitors, each containing an average of five to eight pounds of lead.[78] In 2008, the investigative television program called *60 Minutes* aired an award-winning story featuring BAN.[79] In the *60 Minutes* report, it was revealed that, even though BAN had been to Guiyu, China six years earlier, "recyclers" had moved their visible, open air burning operations indoors where the occupational hazards were even higher.[80] The toxic by-products, which were still being released into the air, were now accumulating indoors and exposing workers to even higher concentrations.[81]

In sum, exporting hazardous electronic waste to developing countries externalizes costs and impacts, and damages human health and the global

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73. The Basel Action Network, *The Digital Dump: Exporting Re-use and Abuse to Africa*, YOUTUBE (May 16, 2013), https //www.youtube.com/watch?v=8tVdTBnBXw0 [http //perma.cc/8XLJ-68PQ].

74. *Id.*

75. *Id.*

76. *Id.*

77. *Id.*

78. The Basal Action Network et al., *supra* note 68, at 9.

79. *60 Minutes*, CBS NEWS (Aug. 27, 2009), *available at* http //www.cbsnews.com/news/following-the-trail-of-toxic-e-waste/ [http //perma.cc/ELB7-658L].

80. The Basal Action Network, *eStewardship: Taking Responsibility in the Information Age (Part 1)*, YOUTUBE (May 16, 2013), https //www.youtube.com/watch?v=JFBj6LbyK3U [https //perma.cc/E5WN-9BQ7].

81. *See* Adaramodu, A.A. et al., *Heavy Metal Concentration of Surface Dust Present in E-Waste Components: The Westminster Electronic Market, Lagos Case Study*, 2 RESOURCES & MGMT. 11, 12 (2012) (finding support for the inference that higher concentrations of toxic metals are present indoors compared to outside because of the presence of surface dust). *see* Anna Leung et al., *Environmental Contamination from Electronic Waste Recycling at Guiyu Southeast China*, 8 J. MATERIAL CYCLES AND WASTE MGMT. 21, 22 (2006) ("However, the recycling industries in these countries, which include China, India, Pakistan, Vietnam, and the Philippines, are often crude and do not have the appropriate facilities to safeguard environmental and human health. The stripping of metals in openpit acid baths, the removal of electronic components from printed circuit boards by heating over a grill, chipping and melting plastics without proper ventilation, and recovering metals by burning cables and parts are common practices. Unsalvageable materials are disposed of either by dumping in fields and rivers or by open burning.").

ecosystem in ways that are long term and profound. There are deep social and environmental injustices that underlie externalization of toxic e-waste to those least able to deal with it, and these injustices are in violation of their laws. When the Convention was drafted in 1989, e-waste was not a big topic.[82] Today, in the Basel Convention's Conference of the Parties, hazardous e-waste is one of the most ubiquitous and compelling issues that nations are trying to address within this legal framework.[83] Complicated technical guidelines are now being negotiated under Basel, seeking global clarity around complex issues such as exports of used electronics for repair and reuse.[84]

III. CURRENT STATUS OF THE BASEL CONVENTION

According to BAN in one of its briefing papers:

> Treaties are living and growing instruments. Since its adoption in 1989, the Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal has evolved significantly from its original minimalist approach to controlling trade in wastes. The Basel Convention has now adopted hundreds of decisions, a protocol, an amendment, and has amended its annexes.[85]

A. Ratifications of the Basel Convention

In the 26 years since the Basel Convention first went into legal force with 20 country ratifications, most nations in the world have now ratified this global treaty achieving a legal framework to restrict trade in hazardous waste.[86] As of mid-February 2015, 181 out of 193 United Nation member nations have ratified the Basel Convention, including almost all South

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82. *The Basel Convention Overview*, BASEL CONVENTION, http //www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx [http //perma.cc/K8PE-EVKH] (last visited Mar. 21, 2015).

83. *Basel Convention Conference of the Parties, Overview and Mandates*, BASEL CONVENTION, http //www.basel.int/TheConvention/ConferenceoftheParties/OverviewandMandate/tabid/1316/Default.aspx [http //perma.cc/72CD-6WQ2] (last visited Mar. 22, 2015).

84. Basel Convention, *Press Advisory* (Aug. 31, 2007), *available at* http //www.basel.int/Portals/4/Basel%20Convention/docs/press/archive/presadv310807.doc [http //perma.cc/BKV3-Z4J4].

85. The Basel Action Network, *Why the US Must Ratify the Basel Convention Together with the BAN Amendment (or not at all)* (Sept. 2014), *available at* http //ban.org/library/briefing2.html [http //perma.cc/EXW6-HDCY].

86. *Parties to the Basel Convention*, *supra* note 33.

American, African, and Asian countries.[87] Only a handful of countries in the world have not ratified this legal trade barrier for hazardous waste; some of these non-ratifying countries include Haiti, South Sudan, and the United States.[88]

B. United States: Reasons for Not Ratifying Basel

Although the United States may have prepared legislation to ratify Basel, there has not been the political will since the Convention's adoption in 1989,[89] despite the fact that the United States signed the Convention, indicating intent to ratify. Since the Clean Air Act and Clean Water Act were enacted, there has been a persistent backlash within the business community against any legal restrictions perceived to limit United States business interests, despite evidence to the contrary.[90] The United States scrap industry, for example, represented by the Institute of Scrap Recycling Industries, has chosen for years not to incorporate Basel definitions of hazardous waste and restrictions in its trade specifications for scrap materials.[91] Under the label of "commodities," the United States exports hazardous waste; meanwhile, 181 other nations have ratified a legally binding treaty to stop free trade in toxic wastes.

Without Basel restrictions on United States exports, simple economic principles drive its hazardous waste to the highest bidders globally, with devastating long term impacts on the global commons. Businesses in one of the richest countries in the world can generate revenue by exporting their hazardous waste rather than paying to have it responsibly managed in the United States or the Global North. This practice leaves little motivation to ratify a United Nations treaty and its amendment, which erect a legal barrier to trade. In fact, between 1989 and 1992 (a time when motivation was high to ratify the Basel Convention), there were at least 11 bills introduced in the House that would have either pushed the United States to ratify the Basel

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87. *Parties to the Basel Convention*, BASEL CONVENTION, http //www.basel.int/Countries/StatusofRatifications/PartiesSignatories/tabid/1290/Default.aspx#a-note-1 [http //perma.cc/A6C7-6JBE] (last visited Mar. 18, 2015).

88. *See id.* (excluding Haiti, South Sudan, and the United States as countries that ratified the Basel Convention).

89. *International Waste Agreements: Basel Convention*, U.S. ENVTL. PROTECTION AGENCY, http //www.epa.gov/osw/hazard/international/basel.htm [http //perma.cc/KLG5-RJHN] (last updated July 24, 2012).

90. *See* RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 94–95 (2004) (noting resistance up to the 1970s and beyond).

91. *See generally Scrap Specifications Circular 2014*, INST. FOR SCRAP RECYCLING INDUS., http //www.isri.org/docs/default-source/commodities/specsupdatejuly2014.pdf [http //perma.cc/896T-LMLM] (last visited Mar. 22, 2015) (providing the institutes own guidelines on different hazardous waste materials).

Convention or at least forced federal law to comply with the Convention.[92] None of these bills came to fruition.[93]

In addition to the attraction of generating revenue from hazardous waste exports, United States businesses can also avoid Superfund liabilities by sending their hazardous waste offshore because CERCLA cannot be enforced extraterritorially.[94] Ratifying the Basel Convention would add a layer of legal restrictions currently not present, requiring United States exporters to seek government to government "notification and consent" for transboundary movement of Basel hazardous wastes, regardless of CERCLA limitations. These legal restrictions, of course, are not happening.

Furthermore, if the United States were to ratify Basel, it would be obliged to transpose the Basel definitions of hazardous waste into United States domestic laws.[95] Changing the definition would trigger a revision of the RCRA, for example.[96] Also the United States would be legally obligated to enforce the treaty, including controlling and monitoring its exports and imports of the newly defined hazardous wastes. Further, customs agencies, EPA, and other government agencies would need to learn these new definitions.

The old notion that protecting the environment will harm productivity and the economy has been repeatedly questioned and increasingly debunked in the past decade.[97] In fact, in the United States, responsible recyclers have created a coalition to lobby for a bill that calls for keeping hazardous e-waste in the country precisely for economic reasons such as, to create jobs and to supply the recycling infrastructure.[98] Because it appears

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92. Kirby, supra note 28, at 304 ("From 1989 to 1994, several bills meant to implement the Basel Convention have come before the U.S. Congress.").

93. Mark Bradford, Note, *The United States, China & The Basel Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal*, 8 FORDHAM ENVTL. L.J. 305, 326 n.98 (1997).

94. ARC Ecology v. U.S. Dep't of Air Force, 411 F.3d 1092, 1100 (9th Cir. 2005) (dismissing plaintiffs' argument that CERCLA provides relief for contamination outside the territorial boundaries of the United States).

95. *See* Bradford, *supra* note 92, at 306 (noting that the Basel Convention is a self-executing treaty, thus, if the United States becomes a party, Congress would need to amend existing law in order to conform to the provisions of the Basel Convention).

96. *See Resource Conservation and Recovery Act*, U.S. ENV'L PROT. AGENCY, http //www.epa.gov/agriculture/lrca.html [http //perma.cc/R54T-8QTR] (last updated Oct. 30, 2013) (RCRA currently defines hazardous waste as ignitable, corrosive, or reactive waste, or waste with toxic chemicals).

97. Matt Wade, *OECD Says Green Tape is Not Damaging the Economy*, SYDNEY MORNING HERALD (Jan. 31, 2015), http //www.smh.com.au/comment/oecd-says-green-tape-is-not-damaging-the-economy-20150131-132a98.html [http //perma.cc/NZ3D-2G55].

98. Coalition for American Electronics Recycling, *Combating Counterfeits, Protecting National Security*, http //www.americanerecycling.org/ [http //perma.cc/WU44-P668] (last visited Mar. 18, 2015).

unlikely that the United States will ratify Basel any time soon, a bill supported by both Democrats and Republicans, the Responsible Electronics Recycling Act, would make it illegal to export hazardous e-waste from the United States to developing countries.[99] Although this large coalition of United States recyclers and refurbishers has actively lobbied for the bill, it has languished for over two years without being heard in a powerful Republican-led committee, perpetuating uncontrolled United States exports of hazardous waste to developing countries.[100]

1. Legal and Practical Implications of Basel Ban on Trade Between Parties & Non-Parties

Because of a ban on hazardous waste trade between Parties and non-Parties in the Convention,[101] it is illegal for more than 140 developing countries that are party to Basel but not members of the Organization for Economic Cooperation and Development ("OECD") to trade hazardous wastes with the United States. And yet, from the perspective of domestic laws, United States businesses are allowed to sell their hazardous waste to buyers in almost any country, even though it is illegal for developing countries that are also Basel Parties to trade with the United States.[102] In other words, the United States failure to control its exports of Basel-regulated wastes results in illegal trafficking to most developing countries.

So why is there a regular flow of containers of hazardous waste leaving the United States to Hong Kong, China, and other developing nations?[103] Because it has not ratified the Basel Convention, the United States has no legal obligation to follow it. Moreover, it has not put controls in place to respect laws in importing Basel-member countries as is required under the

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99. Responsible Electronics Recycling Act, H.R. 2791, 113th Cong. (2013), *available at* https //www.congress.gov/bill/113th-congress/house-bill/2791 [http //perma.cc/PQ42-3YKD]. This bill was introduced by Rep. Green (D-TX) and was referred to the Subcommittee on Environment. Unfortunately, even with 22 co-sponsors, the bill has had no further action since Sept. 24, 2013.

100. *Id.*

101. Basel Convention, *supra* note 1, at 132.

102. *See* ALIBABA.COM, http //www.alibaba.com/ [http //perma.cc/SWT5-SQLH] (last visited Mar. 22, 2015) (providing international goods for global trade from a number nations), TBN ONLINE, http //www.tbnonline.com/ [http //perma.cc/FA2R-XMYM] (last visited Mar. 22, 2015) (offering global trade for electronic equipment), EXPORTERS.SG, http //www.exporters.sg/productdir.asp [http //perma.cc/Q7CF-Z9P5] (last visited Mar. 22, 2015) (providing products from different trade networks).

103. *Indonesia Turns Back Illegal Shipment of E-waste from USA "Recycler"*, THE BASEL ACTION NETWORK, http //ban.org/ban_news/2010/100301_indonesia_turns_back.html [http //perma.cc/38PA-9GQ7] (Mar. 1, 2010) ("It is estimated by Hong Kong authorities that 50–100 containers of e-waste enter the port of Hong Kong alone each day. Almost all of this comes from the United States according to BAN.").

Convention. Thus, the United States allows its exporters to freely arrange business-to-business transactions without engaging importing and transit governments to determine the legality of any particular waste trade as called for in the Basel "Prior Informed Consent" procedures.

The fact remains, however, that once United States shipments move outside of United States territory—usually the 200 mile off-shore limit known as the Exclusive Economic Zone ("EEZ")—those shipments fall under international law and are usually illegal for the more than 140 developing countries to import from a non-Party. But it is well understood that trying to control illegal trafficking at importing borders is very challenging.[104] As the United States discovered after the September 11th tragedy, it is very difficult for importing countries to adequately protect their borders from potential risks hidden in incoming containers.[105]Negative impacts on commerce, inadequate legislation, and lack of capacity at the borders limit most countries (particularly developing countries) from adequately controlling imports.[106]

For importing countries, the challenge of controlling illegal imports of Basel wastes from the United States is further complicated by the fact that many exporters simply mislabel their shipments as some sort of benign materials. For example some exporters use labels like "used equipment for reuse" to avoid the attention of customs officials.[107] In fact, exports of electronic waste "for repair" can result in the transboundary movement of hazardous components, such as bad batteries, mercury lamps, circuit boards, and leaded CRT glass for disposal in the importing country; import of these hazardous parts clearly violates the intent of the Basel Convention.[108] The effects of these hazardous wastes can be seen in developed nations where there are burning fields of e-waste.[109] Local citizens, whether scavenging a few materials of value or simply living near

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104. Katelyn J. Wendell, *Improving Enforcement of Hazardous Waste Laws: A Regional Look at E-waste Shipment Control in Asia*, *in* NINTH INTERNATIONAL CONFERENCE ON ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT 628 (2011), *available at* http://inece.org/conference/9/proceedings/58_Wendell.pdf [http://perma.cc/R3GR-KAYH].

105. Joann Peterson & Alan Treat, *The Post-9/11 Global Framework for Cargo Security*, J. INT'L COM. & ECON. at 17–19 (Mar. 2008), *available at* http://www.usitc.gov/publications/332/journals/cargo_security.pdf [http://perma.cc/SYP8-QYZJ].

106. Wendell, *supra* note 103, at 628–29.

107. *Electronic Waste Recycling Sparks a Toxic Trade*, L.A. TIMES, Nov. 19, 2007, http://articles.latimes.com/2007/nov/19/business/fi-ewaste19 [http://perma.cc/3PFJ-8H2G].

108. Basel Convention, *supra* note 1, at 127.

109. *Poisoning the Poor: Electronic Waste in Ghana*, GREENPEACE INT'L (Aug. 5, 2008), http://www.greenpeace.org/international/en/news/features/poisoning-the-poor-electroni/ [http://perma.cc/6MYW-RBXP].

the smoldering e-waste dumps, suffer the ill-effects through pollution of air, water, and soil and direct exposures.[110]

2. The OECD Treaty: Only Applicable to Developed Countries

Although the United States has not ratified the global United Nations treaty restricting hazardous waste trade, it has ratified a multi-lateral environmental agreement ("MEA") pertaining to the trade in hazardous waste between the 34 OECD countries.[111] It is important to understand that the OECD trade agreements apply only to the developed OECD countries.[112] Because multilateral and bilateral agreements are allowed under Basel, it is legal for the United States to trade hazardous waste only with the other 33 developed Basel countries that have also ratified the OECD agreements, including Canada, Japan, Australia, and much of Europe.[113] Consequently, the United States controls hazardous waste exports to other developed OECD countries, but fails to control exports of its hazardous waste to developing countries, where risks and impacts are the greatest.

However, according to BAN:

> This legally binding OECD decision (C(86)64(Final)), which requires Prior Informed Consent ("PIC") for all hazardous wastes and prohibits exports if there is reason to believe that the wastes will not be handled in an environmentally sound manner, has never been properly implemented into U.S. national law. Thus, current U.S. law allows highly dangerous and unscrupulous exports of asbestos and lead acid batteries, lead/cadmium contaminated sludges, electronic wastes, etc. to developing countries – with few controls if any."[114]

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110. *See* Alexander Göbel, *Home for Some, E-waste Dump for the World*, DEUTSCHE WELLE (July 1, 2014), http //www.dw.de/home-for-some-e-waste-dump-for-the-world/a-17313876 [http //perma.cc/NKE2-54TN] (describing the conditions faced by children who collect e-waste for money in Ghana and the health effects—including liver damage and toxic smoke inhalation).

111. *Decision of the Council Concerning the Control of Transboundary Movements of Wastes Destined for Recovery Operations*, *supra* note 68, *Decision-Recommendation of the Council on Exports of Hazardous Wastes from the OECD Area*, ORGANIZATION FOR ECON. COOPERATION & DEVELOPMENT (OECD), http //acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=54&Lang=en&Book=False [http //perma.cc/EUN5-4UZF] (last visited Mar. 23, 2015).

112. *See Members and Partners*, *supra* note 49 (describing OECD members as the "world's most advanced countries").

113. *See id.* (showing that the OECD countries are largely developed and include a number of European nations).

114. *Why the US Must Ratify*, *supra* note 84, at 2.

Aside from the fact that it is illegal for the more than 140 developing countries that are Basel Parties to accept hazardous waste from the United States, there are also moral and diplomatic issues to consider. The laws of physics dictate that heavy metals such as lead, mercury, and cadmium are immortal, i.e. they never disappear, although they may change form. When any country exports its hazardous wastes to countries that can least capable to manage them, illegality aside, these heavy metals along with persistent bio-accumulative chemicals are released into air, water, and soil leaving entire regions with widely dispersed immortal elements and persistent chemicals. Where primitive recycling techniques have been used to reclaim a few valuable materials from a hazardous waste stream without adequate occupational and environmental controls, the resulting toxics released into the environment can have profound long term effects, and not only for the local region. Many of these persistent chemicals bio-transport, carrying toxics around the globe into the far reaches of oceans, air, and land, into the food chain and many forms of life—virtually impossible to "clean up."

C. Ethical and Diplomatic Implications of United States Non-Ratification of Basel & Its Ban Amendment

Politically and ethically, how can one of the world's richest countries, and most wasteful, continue its unrestricted transfer of hazardous wastes to developing countries? What are the diplomatic implications of such ongoing activities, as most nations have agreed to restrict trade in hazardous wastes, while others have implemented the Basel Ban Amendment, completely banning trade in hazardous waste between developed and developing countries?

In 1991, an internal memo from the World Bank was leaked to the world press—a memo written by then World Bank Chief Economist (and United States citizen), Lawrence Summers.[115] It articulated his influential point of view of the "impeccable" economic logic of toxic trade.[116] According to the memo, he stated: "I think the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable and we should face up to the fact that . . . under-populated countries in Africa are vastly under-polluted."[117]

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115. *Furor on Memo at World Bank*, N.Y. TIMES (Feb. 7, 1992), http //www.nytimes.com/1992/02/07/business/furor-on-memo-at-world-bank.html [http //perma.cc/G53G-3BU9].

116. *Id.*

117. *The Basel Ban: A Triumph for Global Environmental Justice*, BASEL ACTION NETWORK (Sept. 2014), http //www.ban.org/wp-content/uploads/2014/09/BP1_September2014Final.pdf [http //perma.cc/34GP-DT48].

According to BAN, Summers's words:

> . . . resulted in a global outcry. Then Environment Minister of Brazil, Jose Lutzenberger, found words for the collective outrage in his written rebuke to the Bank and Mr. Summers. "Your reasoning is perfectly logical but totally insane . . . your thoughts [provide] a concrete example of the unbelievable alienation, reductionist thinking, social ruthlessness and the arrogant ignorance of many conventional 'economists' concerning the nature of the world we live in."[118]

Today, the United States is ever present at Basel meetings as a non-voting "observer," seeking to influence Parties and usually to weaken the implementation of the Basel Ban Amendment. According to Jim Puckett, executive director of the Basel Action Network, who has attended every Basel Conference of the Parties:

> The United States has consistently taken an insupportable and embarrassing stance with respect to the Basel Convention. We are the country that creates the most waste per capita on earth, including hazardous waste. We are the country that is currently exporting electronic waste with impunity and without control. We are the country that has for years purported to care about the poor and less fortunate and have made this part of our foreign relations ethic—e.g. the Peace Corps, CARE, U.S. AID, etc. We are the country that invented the important term and principle of 'environmental justice'. And yet our role at Basel—the world's only waste treaty and arguably one of the few global instruments of environmental justice, has been a tragedy of conscience. We are the only developed country in the world that refuses to ratify the Convention, and stand with Haiti as the only two countries in the world that signed the Convention in 1989 but never ratified it, even some 25 years later. And despite not being a Party to the Convention, we actively work to undermine its most significant achievement—the ban on exporting hazardous wastes from developed to developing countries. Meanwhile, we turn a blind eye to thousands of illegal shipments of hazardous waste each year that leave our shores and are exported to countries that have forbidden

118. *Id.*

> their importation. We are perpetrators of environmental crime on an unfathomable scale.[119]

But this does not prevent the United States from going to the Basel meetings, even as a non-Party, and arguing for weaker global policies, while failing to contribute needed funds to the United Nations program.[120] The Basel Convention provides a legal framework designed to protect all communities around the world from hazardous waste; the United States should be playing a key role in supporting, strengthening, and enforcing this critical United Nations treaty.

IV. RECOMMENDATIONS FOR THE UNITED STATES

The United States' failure to ratify the Kyoto Protocol,[121] the United Nations Convention on the Rights of the Child,[122]and the Basel Convention with its Ban Amendment[123] has rightly resulted in a growing perception that the United States is out-of-step with the global community on many critical issues. Many perceive the United States as a nation that externalizes the real costs of doing business, *particularly* to countries with low labor costs, weak environmental and occupational laws and enforcement, lack of tort law for redress of wrongs, and little capacity to manage toxic metals and chemicals in both the short and long term.[124]

When it comes to hazardous waste trade, the United States is not controlling its exports beyond the 33 other developed countries, raising diplomatic and ethical questions as developing countries receive uncontrolled United States-generated hazardous wastes. These questions have become particularly visible as developing countries better transpose

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119. E-mail from Jim Puckett, Exec. Director, Basel Action Network, to author Sarah Westervelt (Apr. 16, 2015, 18 22 EDT) (on file with author).

120. Peeyush Gaurav Soni, *Managing the E-Waste Menace; a Developing Country's Perspective*, WORLD TRADE R. (March 1–15, 2007) http //worldtradereview.com/news.asp?pType=N&iType=A&iID=151&siD=14&nID=32263 [http //perma.cc/PF3S-GTK7].

121. *U.S. Withdraws from Kyoto Protocol*, GREENPEACE (April 5, 2001), http //www.greenpeace.org/usa/en/news-and-blogs/news/u-s-withdraws-from-kyoto-prot/ [http //perma.cc/5WWT-Q585].

122. *UN Convention on the Rights of the Child*, UNITED NATIONS TREATY COLLECTION, art. 11 (Nov. 20 1989), *available at* https //treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-11&chapter=4&lang=e [http //perma.cc/NCM6-YUJ4] (last visited Mar. 22, 2015).

123. *Parties to the Basel Convention*, *supra* note 33.

124. *FAQs on Global E-Waste Dumping*, ELECTRONICS TAKEBACK COALITION (Sept. 28, 2010), http //www.electronicstakeback.com/wp-content/uploads/Q_and_A_on_Exporting_Issues [http //perma.cc/SAV4-77T5].

Basel obligations into their domestic laws and enforce the ban on hazardous waste trade (for recycling and disposal) between Parties and non-Parties. In the international Basel meetings, developing countries voice significant concerns regarding hazardous waste from the developed countries. This hazardous waste results in high levels of immortal heavy metals, persistent bio-accumulative toxins, and other hazards in the importing countries, which are causing increasingly visible impacts on human health and the ecosystem.[125] These impacts are not only local and regional, but inevitably global impacts, as wind and water carry the elements far and wide. Given the current United States status as the only developed country in the world that has not ratified the Basel Convention, what are the best ways forward?

A. Either the United States Should Simultaneously Ratify the Basel Convention and its Ban Amendment or Neither

In order to understand the following recommendation, it may be useful to first summarize the current legal realities for the United States. Because the United States is a non-Party to the Basel Convention, exports of hazardous electronic waste from the United States to most developing countries are illegal once they leave United States territory. Under the Convention, no Basel Party can trade in hazardous waste with a non-Party without a special Article 11 agreement.[126] The United States has not ratified any multilateral hazardous waste agreements with countries outside of the OECD member countries.[127] Therefore, most of the e-waste traffic currently going to Basel developing countries from the United States is illegal for those importing countries.

If the United States were to ratify the Convention alone, this trade would become *legal* between the United States and any consenting Basel developing countries, utilizing Basel's "Prior Informed Consent" regime. But legally shipping United States hazardous waste to developing countries would conflict with the notions of environmental justice, best management practices for hazardous waste, United States global citizenship, and the

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125. *Our Sustainable Future: The Role of the Basel Convention*, BASEL CONVENTION, *available at* http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/broch090508.pdf [http://perma.cc/K7N3-MDUG] (last visited Mar. 20, 2015).

126. Basel Convention, *supra* note 1, at 138. Article 11 of the Basel Convention allows bilateral, multilateral, and regional agreements between Parties and non-Parties with some stipulations.

127. *See International Waste Agreements*, U.S. ENVT'L PROTECTION AGENCY, http://www.epa.gov/epawaste/hazard/international/agree.htm [http://perma.cc/Z4TV-T77P] (last visited Mar. 24, 2015) (listing the international agreements on waste, with the OECD as the only multilateral agreement).

consensus decision by Basel Parties in 1995 to completely ban hazardous waste going from developed countries to developing countries.

Therefore, the United States should only ratify both the Basel Convention and its separate Ban Amendment *simultaneously*, or neither. Given the history of United States and the Basel Convention, it is highly unlikely that the United States will ratify the Ban Amendment any time soon. Therefore, it is far preferable that a legal barrier remains between the United States and developing countries. For this reason, the United States should not ratify the Basel Convention without the Amendment.

B. Improve Global Enforcement

Many nations are cooperating with international efforts to stop illegal trafficking of hazardous waste. Especially because the United States has not ratified Basel, it should be investing significantly in these efforts to prevent illegal trafficking from its shores to the more than 140 developing countries. The International Network for Environmental Compliance and Enforcement ("INECE") represents one such global effort.[128] Another is INTERPOL's Project Eden,[129] which has developed a multinational strategy and database, but needs funding. While the United States has no legal obligations under Basel, it could be aggressively contributing to INTERPOL's and INECE's efforts, both financially[130] and programmatically, as they rely on the support and cooperation of member countries to share information about illegal shipments and to crackdown on the illegal trafficking.

C. Pass a Federal Export Ban

In lieu of ratifying both the Convention and the Ban Amendment, Congress could pass a federal bill to ban exports of hazardous e-waste from the United States to developing countries. Such a law would result in the following:

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128. *See Who We Are*, INT'L NETWORK FOR ENVT'L COMPLIANCE & ENFORCEMENT, http //inece.org/about/who-we-are/ [http //perma.cc/2NFL-8VW6] (last visited Mar. 19, 2015) ("The International Network for Environmental Compliance and Enforcement (INECE) is a partnership of government and non-government enforcement and compliance practitioners from more than 150 countries. INECE's goals are raising awareness to compliance and enforcement, developing networks for enforcement cooperation, and strengthening capacity to implement and enforce environmental requirements.").

129. *Project Eden*, INTERPOL, http //www.interpol.int/Crime-areas/Environmental-crime/Projects/Project-Eden [http //perma.cc/8HX7-CGT7] (last visited Mar. 23, 2015).

130. United States funding to INTERPOL could be earmarked for Project Eden.

a) Create jobs in the United States. If the United States were to responsibly manage its hazardous waste in country instead of exporting it to the highest bidder globally, the large volumes of used electronics could supply the hungry United States recycling and refurbishing facilities struggling to compete with exporters. Keeping e-waste in the Untied States would also improve data security and hazardous waste management for corporate, government, and organizational customers when they need to get rid of used electronic equipment;
b) Provide an incentive to reduce United States generation of hazardous waste in the first place, solving the hazardous waste problem upstream, where the real leverage lies;
c) Contribute to better Untied States diplomacy as a global citizen;
d) Result in far more responsible management of toxic, leaching, corrosive, explosive, and otherwise hazardous substances and mixed wastes, using United States state-of-the-art technologies; and
e) Prevent harm to the global commons and particularly to the developing countries of the world, actively pursuing environmental justice for all people.

D. Use Certified E-Stewards Recyclers

There is now an accredited, independently audited certification program to help customers around the world identify globally responsible recyclers and refurbishers that operate in conformity with the Basel Convention and the Ban Amendment.[131] The program, www.e-stewards.org, provides recyclers and their customers with a rigorous standard and "conformity assurance" program. This auditing program defines responsible management of electronic waste relative to international trade, occupational health and safety, data security, reuse, downstream accountability, final disposition of toxic materials, site closure, and much more.[132] It is invaluable to have a rigorous voluntary certification program, helping to bring a high bar and transparency to a relatively new recycling industry that

131. *Basel Convention · Meetings and Workshops*, BASEL CONVENTION, http //www.basel.int/Implementation/CountryLedInitiative/Meetings/tabid/3624/Default.aspx [http //perma.cc/LYE2-HPAF] (last visited Mar. 28, 2015).

132. *Review Version · e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment*, E-STEWARDS, iii (Nov. 1, 2013), http //e-stewards.org/wp-content/uploads/2014/09/eStewards_Standard_Review_Version.pdf [http //perma.cc/MQ2W-XKVY].

exists in a dearth of occupational protections, hazardous waste laws, and hazardous waste disposal infrastructure in many countries.

E. Adopt Laws for Production of Non-Toxic Products

At the same time we work to prevent cost externalization via the export of pollution to poorer economies or the global commons, we also need to create incentives for solving the toxic waste problem upstream, in the design and production phase of the life cycle of products. It is there that is the most effective place to solve hazardous waste problems. Manufacturers redesign toxic products and processes to phase out toxic inputs, and create products that are designed to last, designed for recycling, and designed for the environment. Europe has passed a law restricting the use of some toxic metals and chemicals in new products.[133] The United States could also require by law that manufacturers phase out the most hazardous substances from their products, creating a "level playing field" in which manufacturers compete to produce cleaner products for all.

Regardless of whether the United States ratifies the Basel Ban Amendment and the Convention, or adopts laws requiring the phase out of hazardous substances from products and processes, it is critical that individuals, companies, organizations, and governments push for reducing hazardous waste at its source through waste prevention. As a society, we can help shift the paradigm by purchasing the cleanest new electronic products,[134] and communicate directly with manufacturers the importance of non-toxic products. Manufacturers repeatedly state that they are not highly motivated to redesign products for the environment because they do not hear from consumers asking for this.[135] It is worth noting, however, that some manufacturers are developing innovative solutions.[136] Dell, for example, is working on mushroom packaging, Asus has a pilot for bamboo

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133. Council Directive 2011/65, Art. 114, 2011 O.J. (L 174) 88 (EU), *available at* http //eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX 32011L0065&from=EN [http //perma.cc/8UJC-TGDJ].

134. *See* Green Electronics Council, *Who Participates in EPEAT?*, EPEAT, http //www.epeat.net/ [http //perma.cc/7S34-4S26] (last visited Mar. 23, 2015) (providing a user-friendly tool to consumers for identifying high-performance and environmentally preferable products).

135. *See* MICHAEL HOWES, POLITICS AND THE ENVIRONMENT RISK AND THE ROLE OF GOVERNMENT AND INDUSTRY 161, 172 (2005) ("Up to the end of the 1970s most firms adopted neo-liberal rejection that denied or played down the significance of environmental risks.").

136. *See id.* at 162, 172 (citing the company 3M as an example of a company that redeveloped its program line in order to reduce their pollution per tonne of product).

casing surrounding a laptop, and there are prototypes for cardboard computer towers and printers, as well.[137]

As a nation, we should ensure that toxics (e.g. mercury and brominated flame retardants) are removed from our products and the hazardous waste stream. Furthermore, these toxics should be retired and properly managed, by placing them in long-term monitored hazardous waste storage, and not put back into new products.

CONCLUSION

As a member of the global community of nations, the United States is the only developed country unwilling to ratify the United Nations treaty adopted by most nations to reduce and legally restrain hazardous waste trade. Just as nations have decided not to allow free trade in slaves, endangered species, nuclear weapons, and other "bads," most countries have also agreed not to consider hazardous waste as "goods," despite any economic value they may have on the black market. But the United States continues to "go it alone," transferring its moral and financial responsibilities and the real impacts of hazardous wastes to other countries.

Global society has tried to resist this kind of externalization for decades, particularly externalization to developing countries, in the form of the Basel Convention and its Ban Amendment. While enforcement of any law can be challenging, it is another matter altogether for the most powerful country in the world to refuse to adopt the global legal restrictions that 181 other countries have voluntarily adopted. The future of the planet is dependent upon the choices made by citizens/consumers, organizations, manufacturers, and governments, to reject toxic products, and the trade in the resulting hazardous waste. But as long as toxic products are manufactured, recycled, and disposed, the United States must become a far better global citizen, and not externalize the real costs and impacts of its hazardous wastes.

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137. *Green Packaging and Shipping*, DELL, http //www.dell.com/learn/us/en/uscorp1/corp-comm/mushroom-packaging [http //perma.cc/YHK4-V9ZB] (last visited Mar. 20, 2015). *Bamboo Series – Inspired by Nature, Designed for Style*, ASUS, http //www.asus.com/Notebooks_Ultrabooks/U6V_Bamboo/ [http //perma.cc/D65C-XBWN] (last visited Mar. 20, 2015). *Understanding Sustainability and Product Life Cycle*, RECOMPUTE, http //recomputepc.com/index.php/about/about-philosophy [http //perma.cc/NT88-BY64] (last visited Mar. 20, 2015).

A COMPARISON OF E-WASTE EXTENDED PRODUCER RESPONSIBILITY LAWS IN THE EUROPEAN UNION AND CHINA

By Robert Reagan[*]

INTRODUCTION

Technological advances and economic development have made the world increasingly dependent on electronic devices. Electronics are so ubiquitous, that in 2013 the United Nations estimated that more people have access to cell phones than toilets.[1] This should come as no surprise: 1.75 billion cell phones were sold in 2012,[2] and cell phones are just one of the myriad of electronics available to consumers. With all these electronics buzzing around, a natural question is: where do they wind up?

The answer depends largely on where the product was discarded. Most electronics discarded in the United States go either to landfills or to China, while most of the electronics discarded in Europe find their way to India, Pakistan, or the west coast of Africa.[3] Until recently, the issue for the international community was how to stop the flow of discarded electronics from the developed world to the developing world. The developing world is now facing a new electronic waste issue: domestically consumed electronics. In 2010, the United Nations estimated that sales of electronics would "rise sharply" over the next decade in China, India, and South and

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* Robert Reagan holds a J.D. from Vermont Law School and a B.A. from Centre College. He would like to thank the staff of the *Vermont Journal of Environmental Law* for their assistance in editing this article.

1. Yue Wang, *More People Have Cell Phones than Toilets, U.N. Study Shows*, TIME (Mar. 25, 2013), http://newsfeed.time.com/2013/03/25/more-people-have-cell-phones-than-toilets-u-n-study-shows/ [http://perma.cc/G58G-ZASC] ("Out of the world's estimated 7 billion people, 6 billion have access to mobile phones. Far fewer—only 4.5 billion people—have access to working toilets.").

2. *Worldwide Mobile Phone Sales Fell in 2012: Gartner*, REUTERS (Feb. 13, 2013), http://www.reuters.com/article/2013/02/13/us-mobilephones-gartner-idUSBRE91C0G120130213 [http://perma.cc/6TA2-E46G].

3. *Where Does E-waste End Up?*, GREENPEACE INT'L (Feb. 24, 2009), http://www.greenpeace.org/international/en/campaigns/detox/electronics/the-e-waste-problem/where-does-e-waste-end-up/ [http://perma.cc/YE88-STF4].

Central America.[4] This prediction has so far proven accurate: China is second only to the United States in the annual number of electronics sold.[5]

In 2009, China took its first step toward managing the large amount of domestically produced electronic waste ("e-waste") when the State Council passed the Regulation for the Administration of the Collection and Disposal of Waste Electrical and Electronic Products ("China WEEE").[6] China WEEE is an extended producer responsibility law, and it is based on a similar law passed by the European Union in 2003, the Waste Electrical and Electronic Equipment Directive ("WEEE Directive"). This Article compares the two laws in an effort to recommend changes to China WEEE. Part I of this Article outlines the e-waste problem generally and in China particularly. Part II introduces the concept of extended producer responsibility and identifies four elements necessary for successful implementation of extended producer responsibility e-waste laws. Part III compares the key provisions of the WEEE Directive and China WEEE. Part IV recommends changes aimed at improving China WEEE.

I. E-WASTE EVERYWHERE

A. The Numbers

Tremendous amounts of electronics are sold every year. In 2012, more than 341 million computers, 119.5 million tablets, 238.5 million televisions, and 1.75 billion cell phones were sold worldwide.[7] Increasingly, electronics are designed to have short life spans,[8] which keep replacement rates high.[9]

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4. *Urgent Need to Prepare Developing Countries for Surge in E-Wastes*, U.N. UNIV. INST. FOR SUSTAINABILITY & PEACE (Feb. 22, 2010), http //isp.unu.edu/news/2010/urgent_need_to_prepare_developing_countries_for_surge_in_e-wastes.html [http //perma.cc/2U5X-6V4W].

5. *Id.*

6. Feiqi dianqi dianzi chanpin huishou chuli guanli tiaoli (废弃电器电子产品回收处理管理条例) [Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products] (promulgated by State Council, Feb. 25, 2009, effective Jan. 1, 2011) (China), *available at* http //www.asianjudges.org/wp-content/uploads/2014/03/Regulation-on-the-Administration-of-the-Recovery-and-Disposal-of-Waste-Electrical-and-Electronic-Products.pdf [http //perma.cc/G4Q5-YFXN].

7. ELECTRONICS TAKE BACK COALITION, FACTS AND FIGURES 4 (June 25, 2014), *available at* http //www.electronicstakeback.com/wp-content/uploads/Facts_and_Figures_on_EWaste_and_Recycling.pdf [http //perma.cc/F9N2-YLGP].

8. *See* Victor H., *Americans Replace Their Cell Phones Every 2 Years, Finns' Every Six, a Study Claims*, PHONEARENA.COM (July 11, 2011), http //www.phonearena.com/news/Americans-replace-their-cell-phones-every-2-years-Finns--every-six-a-study-claims_id20255 [http //perma.cc/W2FS-VG3Y] (finding that the average American replaces his or her cell phone every 21.7 months), Sam Grobart, *A Bonanza in TV Sales Fades Away*, N.Y. TIMES (Jan. 5, 2011), http //www.nytimes.com/2011/01/06/technology/06sets.html?_r=0 [http //perma.cc/5994-Z5T4].

The combination of high replacement rates and high annual sales translates to large numbers of obsolete electronics. In 2009, global generation of e-waste exceeded fifty-three million tons.[10]

Most of the fifty-three million tons of e-waste found its way to China. Each year, some seventy percent of all e-waste is shipped to China.[11] There, e-waste is dismantled and recycled in a manner that degrades the environment and harms human health.[12] For China, domestic demand only exacerbates this problem. China's Ministry of Industry and Information estimated that there were 747.4 million cell phones, 220 million computers, and 560 million television sets used in China in 2009.[13] In 2010, China produced some 2.3 million tons of e-waste, second only to the United States, which produced around three million tons.[14]

B. Guiyu, China

Most of the electronics exported to China end up in Guiyu, China, the "e-waste capital of the world."[15] There, over 150,000 migrants work sixteen-hour days, harvesting valuable materials from discarded electronics.[16] While primitive, e-waste recovery in Guiyu is remarkably organized. The work is completed in small-scale, family-run workshops that specialize in discrete tasks.[17]

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9. *See* ELECTRONICS TAKE BACK COALITION, *supra* note 7, at 4 (finding that sales of consumer electronics in 2013 exceeded sales in 2012 in tablets, "ultra mobile" computers, and cell phones, and were still high in overall PC sales).

10. Aidan Lewis, *Europe Breaking Electronic Waste Export Ban*, BBC NEWS (Aug. 4, 2010), http://www.bbc.co.uk/news/world-europe-10846395 [http://perma.cc/4CCD-3JPR].

11. *70% of Annual Global E-Waste Dumped in China*, CHINA.ORG.CN. (May 24, 2012), http://www.china.org.cn/environment/2012-05/24/content_25461996.htm [http://perma.cc/7GRP-7WLH]; Bryan Walsh, *E-Waste Not: How—and Why—We Should Make Sure Our Old Cell Phones, TVs and PCs Get Dismantled Properly*, TIME (Jan. 8, 2009), http://content.time.com/time/magazine/article/0,9171,1870485,00.html [http://perma.cc/B369-H7AT]; *see* GREENPEACE INT'L *supra* note 3 (estimating that fifty to eighty percent of e-waste in the United States is exported to countries like China).

12. *See infra* Part I.C.

13. SARAH BROOKS ET AL., ADDRESSING E-WASTE IN CHINA UNDERSTANDING THE ROLE OF THE CHINESE GOVERNMENT AND CIVIL SOCIETY THROUGH ADVOCACY 4 (2011), *available at* http://sites.fordschool.umich.edu/china-policy/files/2012/09/China-E-waste-FINAL.pdf [http://perma.cc/56DM-RDSQ].

14. U.N. UNIV. INST. FOR SUSTAINABILITY & PEACE, *supra* note 4.

15. *Electronic Waste Dump of the World*, SOMETIMES INTERESTING (July 17, 2011), http://sometimes-interesting.com/2011/07/17/electronic-waste-dump-of-the-world/ [http://perma.cc/F3VK-HF49].

16. *Id.*

17. Xia Huo, et al., *Elevated Blood Lead Levels of Children in Guiyu, an Electronic Waste Recycling Town in China*, ENVTL. HEALTH PERSP. (Mar. 28, 2007), http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1913570 [http://perma.cc/H29L-CWWG].

While workers employ a variety of methods to dismantle the e-waste, there are some common techniques and themes. For instance, much of the work is conducted in open-air workshops. In some workshops, workers use hammers, screwdrivers, and occasionally electric drills to dismantle e-waste, which is then sold for re-use or to other workshops that specialize in other tasks.[18] In the other workshops, laborers place circuit boards, computers, and other appliances over hot plates or fires to melt and recover solder and other materials.[19] Additional materials are recovered by soaking microchips, circuit boards, and other components in acid, which is then discharged into nearby streams.[20] In some workshops, families strip or burn wires and cables to separate the metal and plastic.[21] In still other workshops, workers rip apart printer cartridges to access toner, aluminum, steel, and plastic.[22] Any spare plastic is sorted by rigidity, color, or shine. Plastic that cannot be separated by look or feel is burned and classified according to odor and the color of the flame.[23] Workshops then shred the sorted plastic, which is placed on vibrating platforms and washed to separate heavier metals from lighter metals and plastics.[24] Unsurprisingly, the water used in this process contains high levels of toxic, suspended solids, and is discharged without treatment or re-use.[25]

Much of the e-waste recovery in Guiyu is performed in the Beilin area of Guiyu. The work is turning Guiyu into a toxic dump. Soil and dust samples from workshops revealed dangerous levels of toxic metals[26] and various organochlorides.[27] Samples from workers' homes showed high levels of toxic metals and organochlorides, suggesting that workers carry the metals and organochlorides home.[28] Streams running alongside acid workshops were highly acidic and showed elevated levels of brominated

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18. *Id.*
19. *Id.*
20. *Id.*
21. *Id.*
22. *Id.*
23. *Id.*
24. GREENPEACE, RECYCLING OF ELECTRONIC WASTES IN CHINA & INDIA 11 (2005), *available at* http //www.greenpeace.org/international/Global/international/planet-2/report/2005/10/recyclingelectronicwasteindiachinafull.pdf [http //perma.cc/RF48-ZWD6].
25. *Id.*
26. *See id.* at 19, 22 (finding dust and soil samples from shredders showed high levels of antimony, cadmium, and copper).
27. A. Walters & D. Santillo, *Evidence of Environmental and Health Impacts of Electronics Recycling in China: An Update*, GREENPEACE 6 (2008), http //www.greenpeace.to/publications/impacts-of-e-recycling-china-update.pdf [http //perma.cc/PE2H-ZML9].
28. *Id.* at 4, GREENPEACE, *supra* note 24, at 33.

flame retardants, phthalates, and various metals, including: antimony, cadmium, copper, mercury, and nickel.[29]

Not surprisingly, people living in Guiyu have elevated levels of lead and other toxins in their systems. A study conducted by Environmental Health Perspectives compared the blood lead levels ("BLLs") of 165 children under six years of age in Guiyu, China with those of children under six in Chendian, China. Neither the children in Guiyu nor Chendian worked with e-waste.[30] However, the average BLL of a child in Guiyu was 15.3 micrograms of lead per deciliter (μg/dL) of blood, whereas the average in Chendian was 9.94 μ g/dL.[31] The United States Centers for Disease Control and Prevention defines elevated BLLs in children under six as those in excess of 5 μg/dL of blood.[32] Lead's impact on development is well known, and studies have demonstrated deleterious effects on child development at even lower levels[33] The Environmental Health Perspectives study concluded that processing e-waste caused the elevated levels of lead.[34]

C. Loss of Resources

In addition to the human health and environmental contamination associated with improper recycling of e-waste, improper recovery raises another significant concern: the loss of valuable resources. Electronics contain several valuable and rare metals, many of which are lost due to improper recovery. For example, every year 320 tons of gold and 7,500 tons silver—or twenty-one billion dollars, the GDP of El Salvador—are placed into cell phones, computers, televisions, tablets, and electronic devices.[35] Less than fifteen percent of these metals are recovered.[36]

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29. *See* GREENPEACE, *supra* note 24, at 42 (explaining that river samples downstream of acid workshops contained between ten and thirty times the amount of dissolved metal than samples upstream from acid workshops).

30. Xia Huo et al., *supra* note 17.

31. *Id.* (Samples were taken from four areas in Guiyu Beilin, Dutou, Huamei, and Longgang. The BLL range was 4.40 to 32.67 μg/dL. Children in Beilin—where most of the e-waste recycling takes place—had the highest average BLL of all the areas tested 19.34 μg/dL.).

32. *What Do Parents Need to Know to Protect Their Children?*, CTRS. FOR DISEASE CONTROL & PREVENTION, http //www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm [http //perma.cc/HDD7-5FXE] (last updated June 19, 2014).

33. *Id.*

34. *Id.*

35. *E-waste: Annual Gold, Silver "Deposits" in New High-Tech Goods Worth $21 Billion+; Less than 15% Recovered*, UNITED NATIONS UNIV. (July 9, 2012), http //unu.edu/media-relations/releases/step-news-release-6-july-2012-e-waste-precious-metals-recovery.html [http //perma.cc/D9J9-3UQP].

36. *Id.*

Limited recovery requires procurement of new resources, which means more mining. Mining is fiscally and environmentally costly because most of the metals required to produce electronics are extracted from expansive, open pit mines.[37] One mine in Arizona, for instance, stretches two miles by three-quarters of a mile.[38] Moreover, accessing metals in these mines necessitates large quantities of waste rock. In some mines, more than ten tons of waste rock is required to produce one ounce of gold.[39]

Moving excess rock and processing the ores is also energy intensive. Moving the waste rock alone consumes between seven and ten percent of the world's energy production.[40] Once the waste rock is removed and the ore isolated, the ore must be processed. Separating the metal from the ore generates numerous toxins, such as sulfur dioxide, nitrogen oxides, and lead.[41] Many of these toxins end up contaminating streams and groundwater.[42] Mining releases more toxins into the environment than any other industry in the United States, and improper disposal prevents the recovery of these costs.[43]

II. EXTENDED PRODUCER RESPONSIBILITY

A. EPR Theory

Extended producer responsibility has been trumpeted as a possible solution to all of issues listed above. The term and concept of extended producer responsibility ("EPR") is relatively new. EPR as a concept and term was first used in 1990 by Thomas Lindhqvist in a report for the Swedish Ministry of Environmental and Natural Resources.[44] Lindhqvist defines EPR as:

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37. ELIZABETH GROSSMAN, HIGH TECH TRASH DIGITAL DEVICES, HIDDEN TOXICS, AND HUMAN HEALTH 25, 27 (2006).

38. *Id.* at 27.

39. Lauren Kritzer, *Open Pit Gold Mine*, YOUTUBE (Dec. 10, 2011), https://www.youtube.com/watch?v=S16q_x8TUo0 [https://perma.cc/8CUH-ZXC3]. Other metals generate similarly large quantities of waste rock. For instance, two pounds of copper generate 620 pounds of waste rock. The 200 million computers built in 2005 generated 124 billion pounds of waste rock. *See* GROSSMAN, *supra* note 37, at 27.

40. GROSSMAN, *supra* note 37, at 25.

41. *Id.*

42. *Id.* at 26–27.

43. *Id.* at 25, 31.

44. Thomas Lindhqvist, Extended Producer Responsibility in Cleaner Production Policy Principle to Promote Environmental Improvements of Product Systems ii (May 2000) (Doctoral Dissertation, Lund University), *available at* http://www.lub.lu.se/luft/diss/tec355.pdf [http://perma.cc/3QYH-JYHZ].

> [A] policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling[,] and final disposal of the product. [45]

EPR is an extension of both the polluter pays principle and take-back programs.[46] By combining these principles, EPR seeks to hold producers accountable for the negative effects of their products by making them financially responsible for the costs associated with recovery and recycling. While assigning recovery responsibilities to producers is a significant departure from the notion that municipalities should be responsible for waste disposal, "there is no obvious reason why government should manage waste instead of industry."[47] Shifting management of waste from the people to the producers creates a natural incentive for producers to reduce waste, an incentive not present when the cost of waste management is borne by the people.[48]

The theory of EPR is particularly attractive to those concerned about e-waste for at least three reasons. First, as discussed above, electronics contain a bevy of toxic material that is harmful to man and the environment if not treated properly. Second, improper disposal results in the loss of valuable resources and the inputs required to procure such resources.[49] Finally, proper and efficient recycling of electronics is closely tied to

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45. *Id.* at v.

46. This Article refers to EPR as if it were a single waste management theory. In reality, EPR is an umbrella term for several types of laws that extend producer responsibility. Some types of EPR include (1) financial responsibility EPR, which requires producers to pay the full or some part of the cost of collection, recovery, or final disposal, (2) physical responsibility EPR, which requires producers to take responsibility for the physical management of their products, (3) informative responsibility EPR, which requires producers to supply information on their products, (4) liability EPR, which makes producers responsible for environmental damage caused by their products. This Article uses "EPR" to mean wholesale EPR, which makes producers fully responsible for the entire life-cycle of their products. *See* CHRIS VAN ROSSEM, NAOKO TOJO, THOMAS LUNDHQVIST, EXTENDED PRODUCER RESPONSIBILITY AN EXAMINATION OF ITS IMPACT ON INNOVATION AND GREENING PRODUCTS 5 (2006), *available at* http //www.greenpeace.org/international/PageFiles/24472/epr.pdf [http //perma.cc/6TZ4-SE8T].

47. Noah Sachs, *Planning the Funeral at the Birth: Extended Producer Responsibility in the European Union and the United States*, 30 HARV. ENVTL. L. REV. 51, 63 (2006).

48. *Id.*

49. Hannah G. Elisha, *Addressing the E-Waste Crisis: The Need for Comprehensive Federal E-Waste Regulation Within the United States*, 14 CHAP. L. REV. 195, 231 (2010).

design. Because each new model is built according to a different schematic, each new model requires different recovery techniques.[50]

Where there is a strong correlation between initial product design and recovery, and especially where that correlation extends to materials toxic to man and the environment, the logic of placing responsibility for end-of-life recovery on the producer is particularly strong. This is because placing such responsibility on the producer internalizes costs.[51] Once producers are responsible for end-of-life recovery, the desire to remain competitive creates an incentive to reduce costs.[52] By forcing producers to recycle their products, EPR creates an incentive to design products that are easier to recycle, to make fewer design changes, and to create products with less lead, cadmium, mercury, and other harmful materials.[53] Thus, EPR laws hold the potential to fund recycling programs for e-waste and change the way electronics are manufactured, used, discarded, and recycled. EPR has the potential to make our electronics less harmful to man and the environment. As Lindhqvist states, "allocating full physical and economic responsibilities to manufacturers will encourage a shift towards providing the functions of the products in a more efficient way."[54]

B. EPR Laws

While EPR laws, in theory, hold the potential to "encourage a shift towards providing the functions of the products in a more efficient way," they must be carefully designed to be effective. To encourage producers to build more easily recycled products, EPR laws must be able to fully assign the costs of recovery and recycling to producers. To fully assign these costs, EPR laws must contain at least four elements: (1) a strong recovery requirement; (2) meaningful financial responsibility; (3) substantial oversight of recyclers; and (4) robust enforcement provisions.

Several countries have passed electronics EPR laws, including India,[55] Japan,[56] South Korea,[57] and Brazil.[58] And while there is no federal law in

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50. Philipp Bohr, The Economics of Recycling New Approaches to Extended Producer Responsibility, 36 (Sep. 28, 2007) (dissertation for Doctorate of Engineering, Technical University of Berlin).

51. Lindhqvist, *supra* note 44, at 50.

52. *Id.* at ii.

53. *Id.* at 10.

54. *Id.* at vi.

55. Tom Dowdall, *Victory—India Introduces E-Waste Law*, GREENPEACE INT'L (June 10, 2011), http //www.greenpeace.org/international/en/news/Blogs/makingwaves/victory-india-introduces-e-waste-law/blog/35240/ [http //perma.cc/RTR2-ALD5].

56. Sung-Woo Chung et al., *Application of EPR to Recycling Policies in Japan, Korea, and Taiwan*, *in* EXTENDED PRODUCER RESPONSIBILITY POLICY IN EAST ASIA IN CONSIDERATION OF

the United States extending the responsibility of electronics producers, several states have passed EPR laws, including: Maine, Vermont, New York, New Jersey, Pennsylvania, Michigan, Texas, Washington, and Oregon.[59] In 2003, the European Union ("EU") passed the world's first e-waste EPR law when it enacted the WEEE Directive. The WEEE Directive is considered the "largest, most comprehensive public-to-private transfer of responsibility for e-waste management thus far."[60] The WEEE Directive states that its purpose is to:

> [C]ontribute to sustainable production and consumption by, as a first priority, the prevention of WEEE and, in addition, by the re-use, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste and to contribute to the efficient use of resources and the retrieval of valuable secondary raw materials. It also seeks to improve the environmental performance of all operators involved in the life cycle of EEE, e.g. producers, distributors and consumers and, in particular, those operators directly involved in the collection and treatment of WEEE.[61]

The WEEE Directive seeks to accomplish this purpose by requiring Member States to compel electronics producers to recover and recycle e-waste in an environmentally responsible manner. The WEEE Directive has generally been considered a success in reducing the amount of e-waste that ends up in landfills and reducing the use of virgin materials.[62] China's e-

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INTERNATIONAL RESOURCE CIRCULATION 13, 14 (Yasuhiko Hotta et al., eds., 2009), *available at* http //pub.iges.or.jp/modules/envirolib/upload/2607/attach/section2_p011-p072.pdf [http //perma.cc/Q54G-XE2J].

57. *Id.*

58. Vanda Scartezin, *Redeeming E-Waste in Brazil*, WASTE MGMT. WORLD, http //www.waste-management-world.com/articles/print/volume-14/issue-2/features/redeeming-e-waste-in-brazil.html [http //perma.cc/QP5V-9TD6] (last visited Mar. 23, 2015).

59. *See State Legislation*, ELECTRONICS TAKEBACK COALITION, http //www.electronicstakeback.com/promote-good-laws/state-legislation/ [http //perma.cc/6HX8-LG7M] (last visited Mar. 19. 2015) Other states that have passed electronics EPR laws include Connecticut, Delaware, Maryland, West Virginia, Virginia, North Carolina, South Carolina, Indiana, Illinois, Missouri, Wisconsin, and Oklahoma. *Id.* California has adopted a consumer fee law and Utah has passed a manufacturer education law. In total, 25 states mandate statewide e-waste recycling. An e-waste recycling law covers some sixty-five percent of Americans. *Id.*

60. Holly K. Towle et al., *The European Union Directive on Waste Electrical and Electronic Equipment: A Study in Trans-Atlantic Zealotry*, 31 RUTGERS COMPUTER & TECH. L.J. 49, 54 (2004).

61. Directive 2012/19, of the European Parliament and of the Council of 4 July 2012 on Waste Electrical and Electronic Equipment (WEEE) 2012/19/EU, 2012,O.J. (L 197) 38–39, *available at* http //eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ L 2012 197 0038 0071 en PDF [http //perma.cc/5YDT-4JZD].

62. Sachs, *supra* note 47, at 72.

waste EPR law is based on the EU's WEEE Directive.[63] And because the WEEE Directive has successfully[64] imposed comprehensive requirements[65] on a diverse array of people across a significant geographical range,[66] it is the natural law to which China's electronics EPR law should be compared. The State Council passed China's electronics EPR law, the Regulation for the Administration of the Collection and Disposal of Waste Electrical and Electronic Products (China WEEE), on February 25, 2009.[67] The law was passed pursuant to the Clean Production and Solid Waste Laws.[68] The purpose of China WEEE is to "regulat[e] the recovery and disposal of waste electrical and electronic products, [to] promot[e] the comprehensive resource utilization and the development of [a] circular economy, [to protect] the environment, and [to safeguard] the human health."[69] While the purpose of China WEEE is similar to the EU's WEEE Directive, Charles McElwee notes that "it bears little resemblance to the EU Directive."[70] The remainder of this Article will compare the four elements listed above in the WEEE Directive with China WEEE.

III. COMPARISON OF CRITICAL PROVISIONS OF THE WEEE DIRECTIVE & CHINA WEEE

A. Recovery Requirement

To be effective, EPR laws must ensure that producers recover their end-of-life, obsolete products. In the context of electronics, at least three elements are required for successful recovery. First, because electronics are so ubiquitous, an effective recovery requirement must force producers to recover a variety of electronics. Second, the law must make it simple for

63. CHARLES R. MCELWEE, ENVIRONMENTAL LAW IN CHINA MITIGATING RISK AND ENSURING COMPLIANCE 275 (2011).

64. Sachs, *supra* note 47, at 72.

65. *See id.* at 86 (comparing the United States and Europe and stating that Europe has a comprehensive policy), *see also ERP Celebrates Recycling Success in Ireland on the 6th Birthday of the WEEE Directive*, EUR. RECYCLING PLATFORM (Aug. 12, 2010), http //www.erp-recycling.ie/index.php?content=399 [http //perma.cc/T3AJ-C7PE] (stating the WEEE is the first compliance scheme to have operations in multiple countries).

66. *See* Sachs, *supra* note 47, at 68 (stating that the European EPR program can be "implemented at national and supranational scales" and that the EPR legislation has been adopted in 25 EU member states).

67. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products (China).

68. MCELWEE, *supra* note 63.

69. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products (China) art 1.

70. MCELWEE, *supra* note 63.

consumers to dispose of e-waste so that it stays out of the municipal waste stream. Finally, producers must be responsible for collection.

1. Scope

a. WEEE Directive

Article 2 of the WEEE Directive states that the law covers electronics listed in the Annexes.[71] Annex 1 lists the ten basic categories to which the law applies: (1) large household appliances; (2) small household appliances; (3) IT and telecommunications equipment; (4) consumer equipment and photovoltaic panels; (5) lighting equipment; (6) electrical and electronic tools; (7) toys, leisure, and sporting equipment; (8) medical devices; (9) monitoring and control instruments; and (10) automatic dispensers.[72] Annex 2 further defines the scope of the WEEE Directive by providing numerous example products in each of the ten categories listed in Annex 1.[73]

b. China WEEE

The scope of China WEEE is substantially less than the WEEE Directive. China WEEE's recovery requirements apply to "waste electrical and electronic products listed in the Catalogue of [W]aste [E]lectrical and Electronic Products for Disposal."[74] The first Catalogue was released in early 2010 for comments, officially published on September 8, 2010, and approved by the State Council on January 1, 2011.[75] The Catalogue included five types of products: televisions, refrigerators, washing machines, air conditioners, and computers.[76]

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71. Directive on Electrical and Electronic Equipment (WEEE), art. 2.
72. *Id.* annex I.
73. *Id.* annex II (an exhaustive list of products that expands on the categories found in Annex I).
74. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products, (China) art. 3.
75. MCELWEE, *supra* note 63, at 276. *First Product Catalogue of China WEEE Published*, SGS TAIWAN (Oct. 26, 2010), http://www.sgs.com.tw/en/Local/Taiwan/News-and-Press-Releases/2010/10/First-Product-Catalogue-of-China-WEEE-Published.aspx [http://perma.cc/4HHB-TDZJ].
76. *First Product Catalogue of China WEEE Published*, *supra* note 75.

2. Collection Responsibilities

a. WEEE Directive

The WEEE Directive provides extensive legislation on collection and recovery of e-waste. Importantly, the Directive imposes collection responsibilities on both the Member States and the distributors. Article 5 requires Member States to "adopt appropriate measures in order to minimise the disposal of WEEE in the form of unsorted municipal waste, to ensure the correct treatment of all collected WEEE and to achieve a high level of separate collection of WEEE."[77] For WEEE from private households, Member States must ensure that:

> (a) systems are set up allowing final holders and distributors to return such waste at least free of charge. Member States shall ensure the availability and accessibility of necessary collection facilities, taking into account, in particular, population density;
> (b) when supplying a new product, distributors are responsible for ensuring that such waste can be returned to the distributors at least free of charge on a one-to-one basis as long as the equipment is of equivalent type and has fulfilled the same functions as the supplied equipment . . . ;
> (c) distributors provide for the collection at retail shops with sales areas relating to EEE at least 400 m2, or in their immediate proximity, of very small WEEE . . . free of charge to end-users and with no obligation to buy EEE of an equivalent type . . . ;
> (d) without prejudice to points (a), (b), and (c) producers are allowed to set up and operate individual and/or collective take-back systems for WEEE from private households . . . .[78]

Member States also must ensure producers, or third parties on their behalf, collect "WEEE other than WEEE from private households."[79]

Article 8 expands on the collection responsibilities, adding that "Member States shall ensure that producers or third parties acting on their behalf set up systems to provide for the recovery of WEEE using best available techniques."[80] Importantly, Article 8 allows producers to recover

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77. Directive on Electrical and Electronic Equipment (WEEE), art. 5 ¶ 1.
78. *Id.* ¶ 2(a)–(d).
79. *Id.*
80. *Id.* art. 8 ¶ 3.

WEEE either "individually or collectively."[81] Once e-waste is separated, the WEEE Directive prohibits it from being disposed of without first undergoing treatment.[82]

b. China WEEE

Article 11 requires the state to:

> [E]ncourage the producers of electrical and electronic products to recover waste electrical and electronic products by themselves or by entrusting distributors, repair institutions, after-sales service institutions or operators dealing in the recovery of waste electrical and electronic products. The distributors, repair institutions and after-sales service institutions of electrical and electronic products shall set up prompts on the recovery and disposal of waste electrical and electronic products in the conspicuous positions of their business premises.[83]

Recovered waste "shall be disposed of by the disposing enterprises with the qualifications for disposing of waste electrical and electronic products."[84]

3. Informational Requirements

a. WEEE Directive

In addition to the WEEE Directive's recovery requirements, the Directive includes informational requirements aimed at improving collection and recovery. Under the WEEE Directive, Members States may, but are not compelled to, require producers to inform customers at the time of purchase of the cost of collection, treatment, and disposal of the product.[85] Producers must inform users of electronics in private households of several things, including: (1) not to dispose of e-waste in the unsorted municipal waste stream, (2) to dispose of e-waste in an available collection system, (3) the user's "role in contributing to re-use, recycling and other forms of recover of [e-waste]," and (4) the effects of e-waste on human

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81. *Id.*
82. *Id.* art. 6.
83. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products (China), art. 11.
84. *Id.*
85. Directive on Electrical and Electronic Equipment (WEEE), art. 14 ¶ 1.

health and the environment.[86] Finally, to discourage individuals from placing their e-waste in the municipal waste stream, the WEEE Directive requires producers to include the following symbol on all electronics.[87]

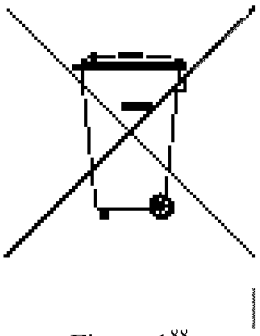

Figure 1[88]

b. China WEEE

China WEEE contains no similar informational requirement. Article 10 comes closest to the WEEE Directive's informational requirement. It states: "[s]uch information as content of relevant toxic or hazardous substances and prompt recovery and disposal shall be stated on the electrical and electronic products or in the third product instructions."[89]

4. Comparison

The WEEE Directive's recovery requirements are much stronger and more detailed than China WEEE's requirements. First, the WEEE Directive applies to a much broader scope of electronics.[90] Second, the WEEE Directive requires Member States to compel producers to collect their waste, whereas China WEEE merely "encourages" recovery.[91] Third, the WEEE Directive's information requirement goes much further toward keeping e-waste out of the municipal waste stream because it is much more explicit than China WEEE's informational requirement.[92] The WEEE

86. *Id.* ¶ 2 (a)–(d).
87. *Id.* ¶ 4.
88. *Id.* annex IX.
89. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products (China), art. 10.
90. Directive on Electrical and Electronic Equipment (WEEE), art. 2.
91. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products, art. 8.
92. Directive on Electrical and Electronic Equipment (WEEE), art. 5.

Directive's broader scope and more explicit informational requirements go further toward reducing the amount of e-waste that is improperly disposed, a vitally important component of a successful EPR law. Moreover, the WEEE Directive's mandate that producers recover their products is more in line with the theory of EPR.

Therefore, while the WEEE Directive allows producers to form group recovery operations—obscuring the actual costs of recovery—its mandates get closer to establishing a true electronics EPR. Given the extensive recovery requirements in the WEEE Directive, it is no surprise that its Member States have largely met the recovery goals. As a result of its success, in 2012, the EU increased collection targets to require Member States to collect a higher percentage of e-waste.[93]

B. Financial Responsibility

Clear financing responsibility is critical to a successful electronics EPR law. If an EPR law does not compel producers to pay the full price for the recovery, collection, and disposal of their products, the EPR law will be less effective at incentivizing product redesign. Thus, in analyzing the financial responsibility provisions of the WEEE Directive and China WEEE, it is important to consider whether and to what extent the laws internalize the costs of end-of-life recovery.

1. WEEE Directive

Article 12 and Article 13 contain the WEEE Directive's financing requirements. Article 12 outlines financing for e-waste from private households and Article 13 provides for the financing of e-waste from sources other than private households. Article 12 states that "Member States shall ensure that producers provide at least for the financing of the collection, treatment, recovery and environmentally sound disposal of WEEE from private households."[94] Under the Directive, Member States must "ensure that each producer provides a guarantee when placing a product on the market showing that the management of all [e-waste] will be

93. *Electronic Waste: EU Adopts New WEEE Law*, BBC NEWS (Jan. 19, 2012), http //www.bbc.co.uk/news/world-europe-16633940 [http //perma.cc/ZDB5-T9NW] (The Directive's new requirements compel Member States to collect forty-five percent of e-waste by 2016 and sixty-five percent by 2019.).

94. Directive on Electrical and Electronic Equipment (WEEE), art.12 ¶ 1.

financed."[95] Financing of e-waste from users other than private households must also be borne by the producers.[96]

2. China WEEE

The funding requirement in China WEEE is listed in Article 7. It provides that:

> The state shall establish a fund for the disposal of waste electrical and electronic products for the expense for recovering and disposing of waste electrical and electronic products. The producers of electrical and electronic products, the consignees of imported electrical and electronic products and their agents shall, according to the relevant provisions, perform obligation of payment to the fund for the disposal of waste electrical and electronic products.[97]

3. Comparison

The WEEE Directive's financing provisions are more thorough than China WEEE's. The Directive's clear mandate that producers be capable of financing the collection, treatment, recovery, and environmentally sound disposal of e-waste before placing products on the market ensures that electronics producers think about cost of recovery at the design stage, and makes it more likely that funds will be available when the electronics become obsolete.[98] Further, by requiring that individual producers be financially responsible for their own products, the WEEE Directive guarantees that producers receive the feedback necessary to redesign products to reduce costs.[99] Thus, the WEEE Directive's financing provision forces producers to internalize the costs associated with placing electronics on the market.

China WEEE does a poor job of forcing producers to internalize costs, and therefore, falls short on one of the most important components of an EPR law. Because it establishes a fund instead of forcing producers to pay

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95. *Id.* ¶ 3.

96. *Id.* art. 13 ¶ 1.

97. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products (China), art. 7.

98. KNUT SANDER ET. AL., THE PRODUCER RESPONSIBILITY PRINCIPLE OF THE WEEE DIRECTIVE IV (2007), *available at* http //ec.europa.eu/environment/waste/weee/pdf/final_rep_okopol.pdf [http //perma.cc/VWC9-JM8W].

99. CHRIS VAN ROSSEM ET. AL., EXTENDED PRODUCER RESPONSIBILITY AN EXAMINATION OF ITS IMPACT ON INNOVATION AND GREENING PRODUCTS 5 (2006), *available at* http //www.greenpeace.org/international/PageFiles/24472/epr.pdf [http //perma.cc/CT2F-XKC5].

for their products, China WEEE does nothing to provide producers with individual feedback.[100] By failing to provide producers with individual feedback, China WEEE does nothing to incentivize producers to develop products for ease of end-of-life recovery. China WEEE's failure to create producer incentives cannot be overstated because an EPR law's success or failure depends largely on its ability to incentivize design change. But even if the fund did provide feedback and incentivize product redesign, the efficacy of a state-controlled fund is likely to be undermined by corruption.[101] Thus, on the whole, China WEEE's funding requirement is inadequate for the purpose of the law.

C. Oversight of Recyclers

Oversight of recyclers is imperative. Without proper oversight, recyclers will dispose of their e-waste in the cheapest possible manner, which usually means sending e-waste to places like Guiyu.[102] Proper oversight is also important to ensure that the recyclers use environmentally sound techniques. Effective EPR laws must (1) have strong permitting requirements that ensure recyclers use best available technology and (2) have strong oversight provisions to prevent recyclers from shipping e-waste to workshops in India, China, and the rest of the developing world.

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100. Xin Tong & Lin Yan, *From Legal Transplants to Sustainable Transition: Extended Producer Responsibility in Chinese Waste Electrical and Electronic Equipment Management*, 17 J. INDUS. ECOLOGY 199, 200 (2013).

101. *See* 2014 Corruption Perceptions Index, TRANSPARENCY INTERNATIONAL, http://www.transparency.org/cpi2014/results (last visited May 5, 2015) (ranking China as highly corrupt).

102. *See* Howard Pankratz, *Colorado Recycling Firm and Two Officers Found Guilty in Export Scheme*, DENV. POST (Dec. 21, 2012), http://www.denverpost.com/breakingnews/ci_22240497/colorado-recycling-firm-and-two-officers-found-guilty [http://perma.cc/TE3P-4S5G] (noting that there are countless examples of recycling companies shipping e-waste to the developing world, the case in Colorado is not unique but for the audacity of Executive Recycling's CEO, who secured a government contract to recycle waste based largely on his representations that his company recycled e-waste in compliance with all local, state, and federal laws. The CEO was found guilty on multiple counts of wire and mail fraud and numerous environmental crimes. In addition to fines, the CEO faces up to twenty years in prison). *Following the Trail of Toxic E-Waste*, CBS NEWS (Nov. 8, 2008), http://www.cbsnews.com/news/following-the-trail-of-toxic-e-waste/ [http://perma.cc/KZ6G-7DWX]. Ryan Boldrey, *Recycling Execs File for Appeal*, HIGHLANDS RANCH HERALD (Jan. 17, 2013), http://content.time.com/time/photogallery/0,29307,1870162,00.html [http://perma.cc/RB7T-3BMF].

1. WEEE Directive

Member States must "ensure that all separately collected [e-waste] undergoes proper treatment."[103] Proper treatment must include the "removal of all fluids and a selective treatment in accordance with Annex VII."[104] Annex VII contains a detailed list of mixtures and components that must be removed from any e-waste separated from the municipal waste stream.[105] Any entity that treats e-waste must obtain a permit in compliance with Article 23.[106] In addition to other conditions, permits may only be issued to entities capable of meeting the requirements outlined in Annex VII.[107] Article 23 requires Member States to carry out "appropriate inspections and monitoring to verify the proper implementation of th[e] [WEEE] Directive."[108] Inspections must include "the operations at treatment facilities."[109] The cost of such inspections may be charged to producers.[110]

2. China WEEE

China WEEE requires recyclers to:

> [O]btain the qualification for disposing of waste electrical and electronic products according to this Regulation; if it fails to obtain the qualification for disposal, it shall deliver the recovered waste electrical and electronic products to a disposing enterprise with the qualification for disposing of waste electrical and electronic products for disposal.[111]

According to Article 23, disposing enterprises must:

> (1) [h]av[e] sound facilities for the disposal of waste electrical and electronic products;
> (2) [h]av[e] a plan for the proper use or disposal of waste electrical and electronic products which cannot be fully disposed of;

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103. Directive on Electrical and Electronic Equipment (WEEE), art. 8 ¶ 1.
104. *Id.* ¶ 2.
105. *Id.* annex VII.
106. *Id.* art. 9, ¶ 1 at 47 (referring to article 23 of Directive 2008/98/EC).
107. *Id.* art. 8 ¶ 3.
108. *Id.* art. 23 ¶ 1.
109. *Id.* ¶ 1(c).
110. *Id.* ¶ 3.
111. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products (China), art. 12.

> (3) [h]av[e] the sorting, packing and other equipment appropriate for the waste electrical and electronic products to be disposed of; and
> (4) [h]av[e] the relevant technical professionals on safety, quality and environmental protection.[112]

Recyclers must also "meet the relevant requirements of the state for the comprehensive resource utilization, environmental protection, labor safety and protection of human health."[113] Recyclers are not allowed to "dispose of waste electrical and electronic products by technologies and processes which have been expressly eliminated by the state."[114]

Entities that dispose of electronic waste must "establish a daily environment monitoring system for the disposal of waste electrical and electronic products."[115] These entities must also:

> [E]stablish an information management system for data on waste electrical and electronic products, and report the basic data and relevant information on the disposal of waste electrical and electronic products to the competent department of environmental protection of the people's government of a districted city where it is located. The basic data on the disposal of waste electrical and electronic products shall be kept for a period of not less than three years.[116]

3. Comparison

China WEEE provides for little oversight of recyclers. Moreover, China WEEE's qualifications for recyclers are subjective and undefined, leaving recyclers without guidance and the government without objective criteria with which to judge recyclers. Finally, Article 17 seems to impose a self-reporting requirement in place of government inspections. Thus, there seems to be no real mechanism in China WEEE with which to oversee how e-waste is recycled.

In contrast, the WEEE Directive's permitting requirements are outlined in detail in Annex VII. Prior to receiving a permit, recyclers must complete a variety of tasks to a specified standard. The WEEE Directive requires

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112. *Id.* art. 23.
113. *Id.* art. 15.
114. *Id.*
115. *Id.* art. 16.
116. *Id.* art. 17.

Member States to inspect recyclers to verify compliance. These requirements ensure that producers pay the full cost of dismantling products in an environmentally responsible manner.

D. Enforcement

Strong enforcement provisions are important for obvious reasons. Without adequate enforcement measures, recyclers and producers will not comply with the law, and the goals of EPR will not be achieved. A strong enforcement provision must set penalties high enough to make noncompliance more costly than compliance.

1. WEEE Directive

The WEEE Directive requires Member States to penalize violations of the national laws adopted pursuant to the Directive.[117] "The penalties provided for must be effective, proportionate and dissuasive."[118] Member States have established heavy penalties for violations. In Germany, are as high as 50,000 Euros per violation; in Italy, up to 100,000 Euros; in Spain, up to 1.2 million Euros; and in Ireland, up to fifteen million Euros and imprisonment up to ten years.[119]

2. China WEEE

Chapter IV of China WEE covers Legal Liabilities. Article 27 imposes a 50,000 yuan fine on producers for the failure to "state such information as content of toxic or hazardous substances and prompts on recovery and disposal on the produced or imported electrical and electronic products or in the product instructions according to relevant provisions."[120] Article 28 provides that the Government can close businesses, "confiscate illegal gains, and impose a fine of not less than 50,000 yuan but not more than 500,000 yuan" for improper disposal of electronic waste.[121] Article 31 states that:

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117. Directive on Electrical and Electronic Equipment (WEEE), art. 22.

118. *Id.*

119. *WEEE Directive*, HONG KONG GREEN MFG. ALLIANCE, http //www.gma.org.hk/questcms/main/main.php?obj=23&page=1&kw=&ii=&ci=&lg=en&theme=default [http //perma.cc/3BZD-9RBV] (last updated Jan. 2007).

120. Regulation on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products (China), art. 27.

121. *Id.* art. 28.

> Where, in violation of this Regulation, a disposing enterprise fails to establish an information management system for data on waste electrical and electronic products, fails to report the basic data and relevant information according to the relevant provisions, reports false basic data or relevant information, or fails to keep the basic data according to the prescribed period, the competent department of environmental protection of the people's government of a districted city where it is located shall order it to correct within a prescribed time limit, and may impose a fine of not more than 50,000 yuan on it.[122]

Article 32 imposes the same fine on "disposing enterprises" that either "fail[] to establish a daily environment monitoring system or fails to carry out daily environment monitoring."[123]

3. Comparison

China WEEE's penalty provisions are too low to dissuade producers from violating the law. Converted to dollars, the 50,000 to 500,000 yuan penalties range from $8,093.90 to $80,939.00.[124] In 2009, total sales revenue for electronic products sold in China exceeded 5.1305 trillion yuan, or $751 billion.[125] Given the sales revenue, it is unlikely that these fines are high enough to dissuade producers from violating the law because compliance is more costly than the penalties stemming from noncompliance. But beyond the relatively small penalty for noncompliance, enforcement of China WEEE runs into the same problem that plagues enforcement of all environmental laws in China: the difficulty of balancing economic growth and environmental protection.

In contrast, the WEEE Directive merely provides that penalties be of sufficient amount to be "effective, proportionate, and dissuasive."[126] From a review of the various Member States' penalty provisions, it seems that Member States have taken this requirement seriously. Member States have

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122. *Id.* art. 31.
123. *Id.* art. 32.
124. *See generally Renminbi (Yuan)*, N.Y. TIMES, http://topics.nytimes.com/top/reference/timestopics/subjects/c/currency/yuan/index.html [http://perma.cc/DG28-8RXR] (last visited Apr. 24, 2015) (currency exchange converter).
125. BROOKS ET AL., *supra* note 13, at 3.
126. Directive on Electrical and Electronic Equipment (WEEE), art. 22.

set penalties high enough to make noncompliance prohibitively expensive, and have fined producers for failing to implement laws.[127]

IV. RECOMMENDATIONS

There is little information available on the success of China WEEE, but comparing its key provisions with those of the WEEE Directive, it seems clear that, as it stands now, the law will not create true extended producer responsibility. To extend producer responsibility, EPR laws must, at minimum, have four elements: (1) strong recovery requirements; (2) meaningful financial responsibility; (3) substantial oversight of recyclers; and (4) robust enforcement provisions. China WEEE's recovery requirements are not as robust as the WEEE Directive's; the fund China WEEE establishes does not create meaningful financial responsibility; China WEEE does not require oversight of recyclers; and the law's penalty provisions are too low to encourage compliance.

A. Stronger Recovery Requirement

To effectuate true EPR, China WEEE must have a stronger recovery requirement. In the context of e-waste, EPR laws must cover a broad range of products, must prevent waste from entering the municipal waste stream, and must obligate producer recovery.

China WEEE's recovery requirements are failing. The law applies to a limited range of products, does little to prevent e-waste from entering the waste stream, and merely encourages producers to recover their obsolete electronics. China WEEE's recovery requirements must be amended to benefit from extending producer responsibility. In amending the recovery requirements, Chinese lawmakers would do well to consider the WEEE Directive's collection and informational requirements, which do much more to obligate producers to recover their products and increase collection rates.

B. Financial Responsibility

China WEEE's financial responsibility provisions are inadequate and fall short of creating meaningful EPR. China WEEE obligates producers to

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127. *See* Leo King, *Plymouth City Council Fined £12,000 for WEEE Breach*, COMPUTERWORLD UK (June 28, 2010), http //www.computerworlduk.com/news/public-sector/20869/plymouth-city-council-fined-12000-for-weee-breach [http //perma.cc/9GGU-9DKG] (discussing that in 2010, the United Kingdom fined Plymouth City Council £8,000 for allowing unauthorized recyclers to remove and sell computers from its waste plants without first checking that the companies were certified recyclers).

pay into a fund rather than pay the cost of recovering and recycling their products.[128] Because fund payments do not correspond to the cost of end-of-life recovery, they do not provide producers with the feedback necessary to incentivize product redesign. Product redesign will only occur when producers must pay the full price of recycling their product. Because one of the primary goals of EPR is to encourage product redesign, China WEEE's financial responsibility provisions fall short.

Chinese lawmakers should examine the WEEE Directive's financial responsibility provisions, which go further toward incentivizing product redesign. While no study confirms the WEEE Directive's impact on product redesign, individual financial responsibility should, in theory, encourage producers to redesign products for ease of end-of-life recovery.

C. Oversight of Recyclers

China WEEE must provide for more stringent oversight of recyclers. At present, China WEEE's permitting requirements are subjective and undefined, leaving recyclers and the government with little guidance.[129] In addition, China WEEE does not require inspections of recycling facilities.[130] By failing to provide clear permitting and inspection requirements, China WEEE does nothing to force producers to responsibly recycle their electronics. If the Chinese government is concerned about the toxins released through the improper recycling of e-waste, China WEEE must be amended to provide meaningful permitting and inspection requirements. The WEEE Directive provides extensive permitting requirements in Annex VII.[131] Chinese lawmakers should consider these requirements before updating China WEEE's permitting system. To ensure permitting requirements are met, China WEEE must inspect recycling facilities instead of relying on self-reporting. Although the WEEE Directive neither imposes a frequency or thoroughness requirement on inspections, China WEEE could be more effective by requiring routine inspections and delineating exactly what the inspections must cover.[132]

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128. *Electronic Waste Rules*, CHINA BUS. REVIEW (May 1, 2009), http //www.chinabusinessreview.com/china-recently-approved-long-awaited-electronic-waste-rules-but-a-product-catalogue-is-pending/ [http //perma.cc/DN27-A9WZ].

129. *Id.*

130. *Id.*

131. Directive on Electrical and Electronic Equipment (WEEE), annex VII.

132. *Id.* art. 23.

D. Enforcement

Setting penalties for violations is difficult. To be effective, a penalty must reach a level where compliance is cheaper than the risk of violation. It seems clear that the penalties imposed under China WEEE are too low to properly discourage noncompliance; however, it is not clear where penalties should be set. The WEEE Directive deals with this problem by requiring Member States to simply set penalties that are "effective, proportionate, and dissuasive."[133] Member States have imposed substantial penalties on violators because if the EU determined a Member State's penalty provisions were too low, it would take the Member State to court for failing to properly implement the WEEE Directive. While allowing individual Member States to set penalties is a unique and clever way to get around the difficult issue of setting appropriate penalties, it is not clear that a similar provision is warranted or advisable to deal with China's electronics producers. Whether giving local governments the authority to set effective, proportionate, and deterrent penalties is reasonable would require an analysis of both the cost of compliance in different regions of China, and the relative ease with which the central government could oversee the local governments. Such analyses are outside the scope of this Article; however, it remains clear that the various penalties imposed by China WEEE are too low to encourage producers to comply with its provisions.

CONCLUSION

This Article sought to compare China WEEE with the purposes of EPR and its model, the WEEE Directive to determine whether China WEEE could fulfill the goals of EPR. This Article identified four key elements necessary to the successful implementation of EPR laws and compared the provisions of China WEEE with the provisions of the WEEE Directive that implement those four elements. Comparison of these provisions makes clear that China WEEE is lacking in all elements necessary for successful implementation of EPR. The recovery requirements are too weak; the financing responsibilities are too indirect; the oversight of recyclers is too little; and the penalty provisions are too low for China WEEE to effectuate extended producer responsibility.

To improve recovery requirements, Chinese lawmakers should broaden the scope of China WEEE, obligate producer recovery, and mandate strong information requirements so that producers internalize the deleterious

133. *Id.* annex VII.

externalities they produce. For China WEEE to create true EPR, the law must be amended to place full financial responsibility for recovery and recycling on individual producers instead of obligating producers to pay into a state-administered fund. If China is serious about reducing the improper recycling of electronics, China WEEE must incorporate explicit and clear permitting requirements for recycling companies, as well as require routine and thorough inspections of recycling facilities. Finally, to deter noncompliance, China WEEE must make noncompliance expensive by increasing penalties and ensuring violators are quickly and appropriately punished. If China is serious about extending the responsibility of electronics producers, China WEEE must be amended.