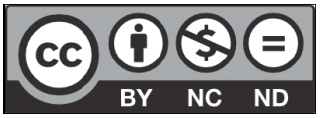
14 January 2014

Solving the E-Waste Problem (StEP) Green Paper

Differentiating EEE products and Wastes

Sabaa A. Khan, McGill University

ISSN: 2219-6579 (Online)
ISSN: 2219-6560 (In-Print)



Disclaimer

StEP Green Paper Series

The *StEP Green Paper Series* is a publication tool for research findings which meet the core principles of StEP and contribute to its objectives towards solving the e-waste problem. StEP members agreed on this support of the author(s) work, but do not necessarily endorse the conclusions made. Hence, StEP Green Papers are not necessarily reflecting a common StEP standpoint.
The StEP Green Paper series is published complimentary to the StEP White Paper Series for publication of findings generated within StEP which have been endorsed by its members.

Acknowledgements

We take pleasure in thanking those StEP members and external experts who have actively contributed to the development of this StEP Green Paper.

- Klaus Hieronymi (Hewlett-Packard Europe, Middle East and Africa)
- Ruediger Kuehr (United Nations University)
- Federico Magalini (United Nations University)
- Mario Tobias (Institute for Advanced Sustainability Studies)

Differentiating EEE Products and Wastes

Recent Developments and future possibilities under the Basel Convention

by

Sabaa A. Khan, McGill University

sabaa.ahmadkhan@mail.mcgill.ca

.

Table of Content

List of Tables

Executive Summary

The accelerated generation of electrical and electronic wastes (e-waste) and persistent trafficking of this high-risk waste stream towards developing countries present urgent environmental governance challenges on a global level. Nations have jointly committed themselves to prohibiting transboundary movements of e-waste that pose a risk to human and environmental health when inappropriately treated, notably, through international legal efforts in the form of the Basel Convention. However, implementation and enforcement of the multilateral environmental treaty with respect to e-wastes has been problematic due to definitional ambiguities between used electrical and electronic equipment (UEEE) and e-wastes. This paper discusses the provisions of the Basel Convention that concern e-wastes, and it further examines the potential impact of the Draft technical guidelines on transboundary movements of e-waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention, a technical guidance instrument in development intended to provide Basel Parties with clarification on how to differentiate between UEEE and e-waste. The author elaborates on currently disputed aspects of the UEEE Guidelines and discusses other possible solutions to ensuring a more effective application of the Convention without restricting international sustainable trade or hindering global access to digital development.

1 Introduction

As the consumption and obsolescence of electronic commodities have intensified during the digital era, waste streams have grown more complex with massive quantities of globally generated electronic waste (e-waste or Waste Electrical and Electronic Equipment [WEEE]) changing the material nature, toxicity and value of the common urban waste stream. Precious, non-renewable resources embedded within some used electronic commodities have given rise to a global "urban mining" industry that operates on the economic, social and environmental logic of transforming waste into resource (Widmer et al., 2005; Williams et al., 2008). Entrepreneurial activity in the recycling and recovery sector is flourishing in developing countries, where domestic markets for some Electrical and Electronic Equipment (EEE) are ever-growing (Schluep et al., 2009; SBC, 2011). At the same time, poor environmental and labour conditions and the observed continuation of illegal transboundary movements of e-waste (EEA, 2009; INTERPOL, 2009; IMPEL, 2006; GAO, 2008; BEA, 2004) have led to calls for stricter international regulation of the recycling industry (van Erp & Huisman, 2010). The significant human health and environmental degradation associated with improper handling and treatment of waste electronics in South East Asia and Africa, first brought to global attention through the work of local and transnational environmental non-governmental organizations (NGOs) (Puckett et al. 2002; Toxics Link, 2003; Greenpeace, 2008), has become a priority concern on the contemporary sustainable development agenda.[1]

The e-waste industry provides a pragmatic example of international trade growth that has been successful in generating new forms of work in developing economies, but not yet what would be internationally underpinned as "decent work" (ILO, 2012). A growing body of research shows that in industrializing countries, informal and semi-informal sectors engaged in what can be seen as the "de-manufacturing" of EEE have developed rampantly in the last decades. These sectors are generating economically significant, yet occupationally hazardous employment and entrepreneurial opportunities from the recycling and recovery of metals sourced from both imported and domestically generated WEEE (Sepúlveda et al., 2010; Widmer et al 2005; Hicks et al. 2005; Smith, Sonnenfeld & Pellow 2006; Osibanjo & Nnorom 2007; Chi et al. 2011). Informal e-waste work sites in densely populated, poverty high nations also threaten public and agricultural health (Fu et al., 2008; Wu et al., 2008; Atiemo et al. 2012; ESDO, 2010).

While the labour of informal waste workers has historically been regarded as environmentally beneficial (Medina, 2007), encompassing activities that allow for the transformation of wastes into resources, the manifestly technological dimension of the contemporary waste stream has intensified the environmental and occupational hazards of recycling and recovery operations. As such, the informal e-waste sectors in India, China, Ghana, Nigeria, Pakistan, Bangladesh and other non-Organization for Economic Cooperation and Development (OECD) countries have become focal points of social and environmental injustice claims emanating not only from a globalized network of environmental NGOs, but also from within the United Na-

[1] See *Nairobi Ministerial Declaration on the Environmentally Sound Management of Electrical and Electronic Waste*. Conference of the Parties to the Basel Convention, 8th meeting. UNEP/CHW.8/CRP.24 (1 December 2006); *Decision BC 10-3 Indonesian-Swiss country-led led initiative to improve the effectiveness of the Basel Convention*. Conference of the Parties to the Basel Convention, 10th meeting; *Call for Action on e-waste in Africa: Set of Priority Actions*, Pan-African Forum on E-waste. Nairobi, AMCEN/14/INF/3 (16 March 2012).

tions system (Commission on Human Rights, 2006; 2003). At the core of these international environmental justice concerns is the disproportionate exposure to waste suffered by poor, racialized communities (Pellow, 2007).

A common narrative in the work of environmental NGOs documenting international e-waste flows is the affirmation of a global trend whereby obsolete electronics, having outlived their optimal existence of virtual and functional to the state of being merely physical and potentially toxic, are internationally traded, or "dumped", towards poorer, less-regulated spaces of the global economy (BAN, 2002; Greenpeace, 2008). An alternative conceptualization that has emerged in recent scientific literature posits this flow as far less linear than the straightforward externalization of pollution from affluent nations to poor nations. This alternative narrative brings attention to the significance and dynamics of inter-regional trading patterns and the fallacy of waste disposal as an end point of economic activity by showing international movements of e-waste to be processes of "transubstantiation", whereby waste is transformed to value through a series of exchanges dependent upon geographic difference and mobility (Lepawsky and McNabb, 2010). In addition to challenging geographically fixed notions of waste, the global e-waste economy confounds the theoretical underpinnings of concepts classically used to analyze commodity chains, whose frameworks have never ventured into the post-consumption economic life of products (Lepawsky and Billah, 2011; Crang et al., 2013).

Despite the environmental pollution generally associated with international movements of likely inappropriately treated e-waste towards developing countries and the existence of trade restrictions based specifically on this concern, there is a significant "capture and creation of value" (Lepawsky and Billah, 2011) that occurs through these flows, which provides a livelihood for millions of individuals in precarious socioeconomic situations. This aspect of the e-waste economy complicates the issue of reconciling environmental protection goals with the social and economic realities of global trade.

At the core of regulatory debates on e-waste is the issue of trade legality. Various multilateral and national initiatives aim to restrict flows of e-waste from OECD to non-OECD countries. Yet in practice, transboundary movements of e-waste remain widely unregulated. While nations have jointly committed themselves to prohibiting transboundary movements of e-waste that pose a risk to human and environmental health, notably, through international legal efforts in the form of the Basel Convention, implementation and enforcement of the multilateral environmental treaty with respect to e-wastes has been problematic due to definitional ambiguities between used electrical and electronic equipment (UEEE) and e-waste. Moreover, in international shipping practice, e-wastes are often categorized as products for reuse, which impedes their tracking by the relevant authorities. This paper seeks to clarify the Basel Convention's control over transboundary movements of both e-waste and UEEE. In essence, the regulatory distinction between waste and non-waste is a critical determinant of the flow of global UEEE and e-waste streams. Institutional regimes play a key role in framing global trading patterns, as their classification of wastes and non-wastes prohibit certain transboundary shipments of waste from taking place, while they also enable the creation of value when wastes can be transformed into secondary resources (Crang et al., 2013). The primary challenge, in terms of international governance, is minimizing hazardous and illicit e-waste flows without infringing upon legitimate international trade in UEEE, the latter being an essential component to sustainable digital development, particularly to the en-

hancement of developing country participation in the global digital economy. In this respect, a notable obstacle hindering progress towards sustainable global e-waste management has been the multitude of understandings of waste and non-waste possible under the current framework of the Basel Convention and the consequential repercussions of this definitional inconsistency on the enforceability of the Convention and on the identification of a clear line of demarcation dividing illegal and legal transnational business activity. The following section provides an overview of the Basel Convention provisions that deal with e-waste and UEEE and further discusses recent initiatives by the Basel Parties to address the regulatory void originally set within the Convention in relation to transboundary movements of UEEE.

2 The International Laws of the E-waste Trade

Basel Convention Scope and General Provisions

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal2 was adopted in 1989 as a multilateral response to a series of toxic trade scandals in which various developed-world industries were found to be dumping hazardous wastes in developing countries and Eastern Europe. Under international environmental justice concerns, nation states entered into the negotiation of a multilateral treaty aimed at suppressing environmentally and socially detrimental hazardous waste trading patterns. The resulting agreement is entitled the Basel Convention, which came into force in 1992. It regulates international transfers of hazardous substances as a means of addressing the rising threat to human health and environmental quality that is posed by the "increased generation, complexity, and transboundary movement of hazardous wastes".3 With 180 Parties to date, the Basel Convention constitutes one of the most widely ratified environmental treaties and is the primary legal instrument regulating the global trade of hazardous wastes.

The Convention affirms that in order to protect human health and the environment, hazardous wastes should not be traded freely, like ordinary commercial goods, and thus, it establishes a written notification and approval process (procedure of prior informed consent [PIC]) for all cross-border movements of hazardous wastes. The PIC is essentially a human health and environmental protection measure based on the principles of precaution, prevention and transparency. Under this system, Parties to the Convention are prohibited from exporting hazardous wastes unless the State of import has already consented to the shipment in writing. Furthermore, the State of export cannot approve a hazardous waste transfer unless it has received prior confirmation of the existence of a contract between the exporter and disposer from the State of import, ensuring the environmentally sound management (ESM) of the wastes in question. The strictly controlled trading regime established by the Convention applies to hazardous wastes, which are defined as those wastes listed in Annexes I and VIII of the Convention, unless they do not exhibit one of the characteristics listed in Annex III.4 Wastes that do not appear in these Annexes but are defined as hazardous wastes under the domestic legislation of an exporting, importing or transit country that is a contracting Party to the Basel Convention are also recognized as hazardous wastes.5

In addition to imposing a higher level of environmental legal responsibility on ex-

[2] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1673 UNTS 126; 28 ILM 657 (1989). [hereinafter the Basel Convention].

[3] *Ibid.*,Preamble.
[4] *Ibid.*, Art. 1(1)(a).
[5] *Ibid.*, Art. 1(1)(b).

porters, importers, transit-country waste dealers and government authorities with respect to transfers of hazardous wastes, the Basel Convention establishes specific circumstances under which Parties are authorized to engage in hazardous waste transfers. The Convention clearly discourages the export of hazardous waste for disposal, limiting such transfers to when a contracting Party is incapable of handling the waste in question in an environmentally sound manner within its own territory. However, the trading regime allows hazardous waste transfers between contracting Parties for the purposes of recycling and recovery. While a 1995 amendment to the Convention (the Basel Ban Amendment) prohibits the movement of hazardous wastes for the purpose of recycling and recovery from OECD countries (designated as Annex VII countries under the Basel Convention) to non-OECD countries (non-Annex VII), it has yet to come into force.[6]

In all cases that hazardous waste transfers are permitted, the Convention requires that they be managed in an environmentally sound manner and that this method be clearly established before the release of a shipment from the exporting State.[7] Of course, the Basel Convention's restrictions apply only to definitions of hazardous waste contained in, or recognized by, the treaty. As such, any control over transboundary movements of UEEE or e-wastes depends on whether or not these material categories are recognized as hazardous waste under the Convention. As discussed below, the extent to which UEEE and e-wastes are controlled under the Basel Convention remains a legally contentious aspect of the treaty.

E-wastes listed in Annex VIII of the Basel Convention are considered hazardous waste. Annex IX of the Convention makes a further clarification regarding UEEE and e-waste, listing those material categories that are not controlled as hazardous wastes. The last paragraph of Entry B1110 (Annex IX) introduces an important regulatory exemption with respect to UEEE, stipulating that when destined for direct reuse, electrical and electronic assemblies and their components do not fall under the definition of hazardous waste. Hence, when destined for disposal or recycling, UEEE assemblies and components constitute hazardous waste, and they are subject to transboundary movement restrictions outlined in the Basel Convention as the PIC procedure. However, when intended for reuse, these materials are not recognized as hazardous waste – in some cases, they may even qualify as regular commercial goods. Thus, they remain exempt from all hazardous waste controls. The broad definition of reuse which is provided within Annex IX furthermore suggests that material for "direct reuse" does not only include functioning equipment, but it may very well include electrical and electronic assemblies and components in need of "repair, refurbishment or upgrading but not major reassembly".[8] Annex IX additionally states, "In some countries these wastes destined for direct reuse are not considered wastes".[9] These understated footnotes of Annex IX can be pinpointed as the source of the Convention's obscurity regarding the distinction between products and wastes. Though Annex IX clearly represents Member States' attempt to uphold the social, economic and environmental benefits of EEE reuse, and also to recognize the important role of access to affordable technology for international development, the terminology of the Annex ultimately creates an incomplete regulatory framework, which provides little safeguard against transboundary e-waste pollution. The Basel Convention's classification of EEE as hazardous waste, non-hazardous waste and non-waste is summarized in Table 1. The

[6] The Basel Ban Amendment has been implemented in certain regional and national legal instruments, but has yet to enter into force at the international level.

[7] Basel Convention, *supra note* 1. Art. 6(3)(b).

[8] *Ibid.*, Annex IX, Footnote 20.

[9] *Ibid.*, Annex IX, Footnote 21.

beneficial and problematic aspects of the transboundary movement of EEE for reuse are explained further below.

Table 1 Selected figures and indicators for Ethiopia

Hazardous Waste	Non-hazardous Waste	Non-Waste
• WEEE listed in Annex VIII, containing Annex I constituents and exhibiting Annex III characteristics • UEEE or Waste EEE defined as hazardous waste under the national legislation of an importing, exporting or transit country involved in a transboundary movement	• WEEE listed in Annex IX, from which Annex I constituents have been removed to an extent that the material does not possess Annex III characteristics • EEE assemblies consisting only of metals or alloys	• UEEE intended for direct reuse (including repair, refurbishment or upgrading) and not for recycling or final disposal

3 Mapping the Sustainability of EEE Reuse

The Basel Convention's regulatory exemption on equipment destined for reuse is entirely compatible with its prime environmental objective to prevent waste generation, as reuse extends the lifecycle of EEE and therefore mitigates the generation of hazardous wastes. By prolonging the functionality of electronics, reuse promotes natural resource conservation and at least temporarily diverts the need for recycling or disposal (Williams et al., 2008; Kuehr et al. 2011). Reuse figures at the top of all contemporary waste management paradigms and is even legally recognized in the EU Waste Framework Directive[10], which outlines the waste management hierarchy prioritized in the waste prevention and management legislation of EU Member States. Here, like in all other waste hierarchies, reuse figures directly after prevention, and before recycling, recovery and disposal. Notably, the WEEE Directive[11] explicitly prioritizes reuse as a management option for EEE, over recycling and recovery.

Along with environmental advantages, employment growth and new social entrepreneurship opportunities, there are other major beneficial aspects of prioritizing reuse. It is widely noted that preparing UEEE material for reuse generates more work than sending that material towards recycling or recovery operations (UNIDO and Microsoft, 2009; Computer Aid International, 2010; DCEO, 2009). For one social enterprise in Ireland, preparing material for reuse generated 11 times more employment and 15 times more revenue than preparing an equivalent amount of material for recycling (Kuehr et al., 2011). In developing countries as well, a major ancillary benefit of wider access to information and communication technologies has been the emergence of local repair and refurbishment industries, which in the cases of Nigeria and Ghana, provide employment to more than 30,000 individuals in each coun-

[10] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Waste Framework Directive), Art. 4.

[11] Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE Directive), Art. 20.

try (SBC, 2011). More broadly, the reuse of UEEE enables citizens and institutions in lower-income nations to have access to affordable information and communication technologies, an essential factor in economic and social advancement, and in the attainment of the Millennium Development Goals.[12]

In allowing global transfers of UEEE for the purpose of reuse, the Basel Convention contributes to mitigating resource and energy consumption related to digital sector manufacturing and to bridging the digital divide between post-industrialized and developing countries (Kuehr and Williams, 2003; Liqiu et al., 2011). At the same time, it is now well-documented that the Basel Convention's failure to regulate transboundary movements of UEEE for reuse has been widely exploited by unscrupulous trading networks, enabling them to engage in international transfers of e-wastes (i.e., equipment with no potential value for reuse) to countries that lack the appropriate legislative framework and waste infrastructure to deal with e-wastes without gravely endangering human and environmental health (Puckett et al., 2002; Greenpeace, 2008; GAO, 2008; IMPEL, 2006; INTERPOL, 2009; EEA, 2009; BEA, 2004). For e-waste brokers, international shipment represents a profitable opportunity, providing a convenient way to avoid treatment costs and other responsibilities and obligations associated with environmentally sound recycling.

Ultimately, since EEE is not designed for perpetual reuse, the need for recycling or disposal is inevitable, and thus it is perhaps more appropriate to qualify reuse as a management strategy which at best delays and reduces the environmental impact of EEE, but can never entirely eliminate it. While reuse is generally considered to be the most environmentally sound treatment option for UEEE, exports for reuse may serve as a significant source of pollution in developing countries with expansive informal recycling and recovery networks (Sepùlveda et al., 2010; Leung et al., 2008; Fu et al., 2008; Huo et al., 2007). This is especially the case when UEEE requiring repair or refurbishment is exported, as these processes often involve the replacement and disposal of non-functioning components that may lack environmentally sound treatment options. Because of the high risk of pollution, international transfers of UEEE, particularly those towards non-OECD countries, should only be undertaken within a framework of high-level due diligence in conformity with the precautionary principle that is intrinsic to international environmental law and policy (Freestone and Hey, 1996). In particular, countries importing UEEE for reuse should have legislative frameworks in place that enable them to assess if the equipment can be reused before import, and even more importantly, to ensure the environmental management of all equipment, whether imported or domestic, at end-of-life.

Overall, the reuse of EEE figures prominently on the global sustainable development agenda. In addition to providing greater global access to digital development, promoting the reuse of UEEE supports industrial production and consumption models based on extended product lifecycles. In this sense, supporting the reuse of UEEE is a way for Basel Parties to fulfill their obligations with respect to the reduction of hazardous waste generation.[13] The premature designation of reuse-able UEEE as waste could even be interpreted as contradicting the aims of the Basel Convention, in that such a management approach inadvertently supports product obsolescence and increases manufacturing rates, thereby also enhancing energy use and raising carbon emissions. The promotion of reuse is especially important in the context of an international governance paradigm increasingly shifting from its traditional focus on geographical restrictions

[12] See UN Millennium Development Goals, Target 8F.

[13] Basel Convention, *supra note* 1, Art 4(2)(a).

and waste disposal towards the establishment of sustainable international partnerships in waste-resource management. This directional change is reflected in a number of recent initiatives [14] and decisions [15] adopted under the Basel Convention, and it was also proposed in an emerging stream of scientific literature as the "Best-of-Two-Worlds approach" (Manhart, 2010; Wang et al. 2012), an industrial ecology concept based on the idea of strategic international partnership in e-waste management between developed and developing countries. Still, there is an evident need for enhanced protective measures to frame this rapidly growing global market.

4 Impact of the Annex IX Reuse Loophole

It is apparent that the reuse exemption was incorporated into the Basel Convention to prevent hazardous waste controls from hindering equitable access to growth, development and participation in the global ICT economy. However, legal ambiguity in the drafting of the exemption created a *carte blanche* for exporters and importers regarding environmental responsibility and diligence, as no additional provisions were adopted to ensure the mandatory pre-testing, labeling or certification of electronics destined for reuse. The notion of environmentally sound reuse was left undefined. As a result, the exemption on exports for reuse has become a portal for trafficking e-waste, providing a legitimate guise for the dumping of hazardous electronics into developing countries. Under these circumstances, the Convention's potential to offer a meaningful level of human health and environmental protection against hazardous e-waste trading is currently severely limited.

Legal definitional uncertainties pertaining to "waste" are perhaps the Convention's greatest source of contention, as the term is diversely interpreted by Basel Parties[16] and by other stakeholders involved in cross-border waste transfers (Salehabadi, 2013; Kreuger, 1998). The text of the Basel Convention defines waste as substances that are intended or required by national law to be disposed of. "Disposal" is meant to include operations listed in Annex IV of the Convention, which may lead to final disposal, resource recovery, recycling, reclamation, direct reuse or alternative uses.[17] Thus, under the Basel Convention, hazardous materials intended for either disposal or recycling are considered hazardous wastes, except for the materials listed in Annex IX. However, as emphasized by Kreuger, "industry… defines materials, hazardous or not, that are intended for recycling as 'products' or secondary raw materials, that should not be subject to waste regulations" (Kreuger, 1998). Divergent understandings of products and wastes are, in fact, a source of tension between the international trading regime and international environmental law. Any trade-restricting measure within an environmental agreement such as the Basel Convention, which imposes geographical and/or quantitative limitations on the import or export of certain goods, could be viewed as challenging non-discrimination between trading partners, which is the foundational principle of international trade.[18]

[14] Mobile Phone Partnership Initiative (MPPI) and the Partnership for Action on Computing Equipment (PACE)

[15] Nairobi Ministerial Declaration on the environmentally sound management of electrical and electronic waste (2006); Decision VIII/2: Creating Innovative Solutions through the Basel Convention for the environmentally sound management of electrical and electronic wastes (2006).

[16] Information on how Basel Parties legally approach the differentiation of waste and non-waste can be found in Appendices 2, 3 and 4 of the *Draft Report on the Implementation of the Basel Convention as it relates to the Interpretation of Certain Terminology* (Secretariat of the Basel Convention, 25 May 2012).

[17] Basel Convention, *supra note* 1, Art.2(1)(4).

[18] *General Agreement on Tariffs and Trade* (1947), Art. II.

The presence of a strong global market for UEEE and the lack of global consensus on the definition of waste enhance the challenge of creating regulatory frameworks to distinguish between wastes and products without infringing upon international trading rules, hindering resource conservation goals, stunting technological progress in developing countries or unnecessarily shortening the lifespan of EEE products. Member States of the Basel Convention have undertaken this difficult balancing act through the development of a voluntary technical guidance document intended to shed light on the distinction between UEEE and e-waste.

5 The Technical Guidelines

In order to provide further clarity on the distinction between UEEE and e-waste, the Basel Convention Open-ended Working Group (OEWG) has been working on the adoption of *Technical Guidelines on transboundary movements of e-waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention*, which is currently in draft phase.[19]

Technical guidelines are meant to advise Basel Parties on the basic standards for ESM as they are understood within the Convention. The main objectives of the UEEE Guidelines are to provide guidance on the provisions of the Convention that are relevant to transboundary movements of e-waste and clarify the distinction between waste and non-waste in the context of EEE moved across borders. The UEEE Guidelines also aim to offer general guidance on the transboundary movements of e-waste, on international transfers of used equipment and on the enforcement of control mechanisms established by the Convention. It is essential to note, however, that Technical Guidelines have no legal authority.

5.1 Distinction between waste and non-waste: functionality

The governance framework proposed by the UEEE Guidelines, which attempts to prevent international regulatory exemptions on cross-border flows of UEEE for reuse from continuing to provide opportunities for illicit e-waste trading, rests on the mandatory functionality testing of all UEEE destined for transboundary movement. The Guidelines recommend that a number of documents accompany all shipments of UEEE intended for direct reuse in order to prove claimed intent and that these documents be provided by the holder of UEEE to any authorities upon request.[20] The UEEE Guidelines also provide material, physical, pricing and EEE market criteria under which a shipment should be considered waste, as opposed to UEEE.[21]

In introducing a governance framework whereby the reuseability of UEEE must be proven through mandatory functionality testing before import, the UEEE Guidelines respond directly to the definitional ambiguity of Annex IX of the Basel Convention. Functionality is presented as the key variable in determining whether an international shipment of UEEE should be subject to the waste control mechanisms. The problem that has been signalled with such an approach is the implications it entails for return-to-manufacturer business systems that engage a globalized repair and refurbishment sector. It is argued that if shipments of non-functioning equipment sent back to the manufacturer for repair or

[19] The latest (5th) draft is dated 22 December 2012. Available at: http://www.basel.int/Implementation/TechnicalMatters/DevelopmentofTechnicalGuidelines/Ewaste/tabid/2377/Default.aspx.

[20] See Art.24.

[21] Art. 25.

refurbishment were controlled as waste, this could engender complex, costly and lengthy notification and consent controls that may deeply affect the solvability of these systems.[22] As currently drafted, the UEEE Guidelines provide an exception for cross-border movements of consumer products under warranty, as well as for warrantied and non-warrantied equipment for professional use[23] (discussed below). However, the exception does not apply to a vast range of non-warranty EEE, namely any equipment designed for both private household and office use. Under the current proposal, such transfers, while intended for the purposes of reuse, would be treated as "waste" transfers, and the equipment in question would have to conform to the strict procedural controls of the Basel Convention if it met the hazardous waste definition as prescribed by the Convention.

In this respect, the prospective technical guidelines risk imposing new administrative and financial requirements on current EEE production, consumption and servicing models that involve globally distributed repair and refurbishment networks. Institutional and individual consumers would be required to label their equipment intended for repair and reuse as "waste", and repair or refurbishment facilities receiving the equipment would have to hold waste treatment licenses or special permits in order to receive the equipment. Furthermore, repair and refurbishment facilities operating in non-OECD countries would be prohibited from receiving equipment from OECD countries, as various international and regional agreements and national laws prohibit transboundary waste shipments from OECD to non-OECD countries. The viability of the international repair and refurbishment sector, an essential component to sustainable digital development, would be put at risk. Ultimately, EEE business models that encourage repair and refurbishment over the production of brand new equipment would be rendered economically inefficient, with waste minimization and resource conservation goals severely undermined. The classification of EEE as proposed under the UEEE Draft Guidelines is summarized in Table 2.

While it is true that the fulfillment of global climate protection and resource efficiency objectives, as well as the attainment of the Millennium Development goals, rely on the instilment of a digital culture in which reuse, repair and refurbishment are encouraged, prioritized and optimized, stricter measures are urgently needed to combat e-waste trafficking. Governance frameworks intended to protect human and environmental health need to be designed in a way that does not mischaracterize sustainable, globally distributed business networks as sites of illegal activity by sheer virtue of their geography. As such, it has been suggested that the cross-border movements of a strictly limited stream of non-functioning EEE may be transferred as non-waste under the UEEE Guidelines. Basel Parties and other relevant stakeholders have proposed exceptions to the proof-of-functionality documentation required under Article 24. The section below addresses these proposals and further discusses related strategies that may enhance the regulatory framework for international transfers of UEEE in a way that diminishes the potential for e-waste traffic, while fully allowing legitimate and environmentally sound trade that does not discriminate arbitrarily against vital and globally relevant

[22] Phillips estimates the proposed guidelines would engender an added cost of €500 million annually to health care providers, and disrupt medical equipment servicing worldwide. See Philips, *Philips comments on 28-September-2012 draft Technical Guidelines on Transboundary Movements of Electronic and Electrical waste* (e-waste), Eindhoven, 31 October 2012. Available at *supra note* 30.

[23] The UEEE Guidelines define equipment for professional use as only encompassing equipment that is designed solely for professional or commercial use (medical equipment, large copying machines). This does not include equipment that would also likely be used in private households (personal computers and mobile phones, small copying machines).

repair and refurbishment industries located in developing countries.

Table 2 Classification of UEEE under the Draft Guidelines

Type of UEEE	Classification	Hazardous Waste Regulatory Controls
All functioning UEEE (proven through mandatory testing as per Draft Guidelines)	Non-waste	None
Warrantied and non-warrantied non-functioning UEEE for professional use sent back to manufacturer for repair or refurbishment. Excludes all EEE designed to be used by households	Non-waste	None
Warrantied non-functioning UEEE designed to be used by both households and offices sent back to manufacturer for repair or refurbishment	Non-waste	None
Non-warrantied non-functioning UEEE designed to be used by both households and offices sent back to manufacturer for repair or refurbishment	Waste	Controlled under Basel Convention PIC procedure where hazardous waste definitions apply In all cases, transfers from Annex VII to non-Annex VII countries prohibited

5.2 Article 26: Non-functioning EEE as non-waste

The range of equipment and the scope of geographical restrictions are the two main aspects in debate regarding allowable exceptions to proof-of-functionality documentation required under Article 24 of the UEEE Guidelines. In their current wording, the UEEE Guidelines provide that all equipment under warranty and all equipment for professional use that is transported across borders within a business-to-business framework to the producer or a third party acting on their behalf should not be controlled as waste, so long as the equipment is appropriately packaged and a declaration from the holder states that the equipment is not considered waste in any of the countries involved in the transaction. Outlined below are several alternative proposals have been made regarding the scope of these exceptions.

Equipment under warranty

With respect to equipment under warranty, the EU has proposed that exceptions should only apply within the context of business-to-business transfers. A disputed aspect of this approach is that individual consumers shipping their equipment under warranty directly to producers for repair and refurbishment would have to declare the equipment as waste. This requirement could inhibit consumers from extending the lifecycle of their UEEE. As noted above, this could significantly disrupt currently globalized infrastructures of return-to-manufacturer systems. Suggestions for the elimination of the business-to-business criterion have also been made, such as the widely supported joint proposition by BAN and the United States, under which shipments by individual customers of their own defective equipment under warranty for repair or refurbishment would not be

subject to transboundary waste controls. It is worth noting that similar guidance documents on the transboundary movement of mobile phones and of computing equipment developed in the context of the Mobile Phone Partnership Initiative (MPPI) and Partnership for Action on Computing Equipment (PACE),[24] both exclude equipment under warranty from the Basel Convention's scope of application.

Non-warranty equipment

Stakeholders involved in the development of the Guidelines have also taken various positions on which streams of non-warranty equipment intended for reuse should be allowed to cross borders as non-waste. Article 26(b)ii of the UEEE Guidelines is meant to provide clarification in this regard. Broadly, two main perspectives emerge. Under one approach, only transfers of non-warranty equipment for professional use sent to the manufacturer or a third party acting on their behalf would be categorized as non-waste, thus excluding a massive range of equipment that is used in both individual consumer and business environments. The EU, in supporting this approach, has also proposed a geographical restriction consistent with the Basel Ban Amendment, according to which shipments of non-warranty UEEE for professional use from Annex VII to non-Annex VII countries would be prohibited. In contrast, Japan has proposed that both these limitations be lifted. The proposal by the Information Technology Industry (ITI) and European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry (COCIR) groups reflects a middle ground between the two extremes, creating an exception for all producer-related used equipment flows without imposing geographical restrictions, but maintaining a prohibition on Annex VII to non-Annex VII transfers to independent third party facilities. The critical point here is whether the text that is eventually adopted refers to "used equipment for professional use" or to the much broader category of "used equipment". If only a narrow exception for equipment solely designed for professional use is agreed upon, massive quantities of non-warranty office automation and consumer electronics will have to be labelled as waste when exported for repair or refurbishment.

Several Basel Parties and other stakeholders have expressed concern over the business-to-business requirement, especially over the implications of a geographical restriction. [25] Singapore, for instance, has expressed its view that all UEEE sent to producers, or third parties acting on their behalf, for repair or refurbishment under a valid contract for reuse, do not qualify as waste.[26] The Government has also emphasized its position on geographical restrictions, stating that all countries with appropriate legal infrastructure, technological skill and resources should not be prohibited from importing or exporting UEEE for repair and refurbishment.[27] Similarly, Malaysia has expressed opposition to geographical limitations.[28]

Companies and industry associations in the IT and medical devices sectors have indicated their apprehension over the important economic and social consequences that a narrow range of exceptions under Article 26(b) is likely to entail for currently established producer-related, globally-based repair and refurbishment networks.[29]

[24] PACE Guidelines and MPPI Guideline

[25] In addition to the exceptions being proposed on warranty and professional non-warranty equipment, the UEEE Guidelines also include exceptions on defective medical equipment sent to the producer for root cause analysis under a valid contract (26(b)(iii)) and off-lease equipment shipped by the lessor or third party acting on their behalf with the intention of reuse (26 (b)iii). No geographic limitations have been attached to these exceptions.

[26] Comments from Singapore submitted 28 February 2013, *supra note* 30.

[27] *Ibid.*

[28] Comments from Malaysia dated 9 November 2012, *supra note* 30.

[29] Comments received from Parties and Others, *supra note* 30.

In particular, DIGITALEUROPE, which represents more than 10,000 companies in the European digital technology sector, has drawn attention to potential impacts on the global IT and communications industry, where it estimates that approximately 15 to 20 million repairs and refurbishments are performed each year, often implicating cross-border transfers to specialized repair and refurbishment centers in non-OECD countries.[30] These potential impacts include increased e-waste generation through shortened product lifecycles, the potential closure of centralized repair facilities in non-OECD countries, and a marked decrease in producers' abilities to meet increasing worldwide demand for affordable used IT equipment, medical devices and service parts.[31] From a product lifecycle perspective, the problem is that because institutional and individual consumers may be unwilling to assume time-consuming notification procedures related to the shipping of waste, UEEE will likely be replaced by new products at a heightened pace, causing an increase in raw materials extraction for the purposes of manufacturing.

Evidently, Basel Parties' obligations to ensure the minimization of hazardous wastes would be undermined by any mechanism that expedites the designation of UEEE as waste without due consideration to potential value for reuse, either direct or based on environmentally sound repair and refurbishment operations. In this respect, it is important to take note of the guiding principles of the *Strategic Framework for the Implementation of the Basel Convention for 2012-2021*[32], which includes the recognition of a waste management hierarchy that takes into account lifecycle thinking, and moreover, the promotion of policy tools which encourage "the recognition of wastes as a resource as appropriate", as well as "sustainable consumption and production".

The challenge, from a sustainable development perspective, is to support legitimate, transparent and environmentally sound international trade flows for reuse, while closing the regulatory loophole contained in Annex IX of the Basel Convention and ensuring the ESM of all wastes generated in any transboundary movement of UEEE. An effective trade strategy would recognize the sustainability interests in allowing environmentally responsible and accountable entities to maintain their globally-based repair and refurbishment networks while simultaneously targeting high risk, illegal transboundary movements of e-waste masked as UEEE. The ITI/COCIR proposal implements such an approach by focusing geographical restrictions onto the specific actors known to be involved in illegal transboundary movements (INTERPOL, 2009; Bisschop, 2012; UNODC, 2013;). However, such a strategy also contradicts the interests of independent third party facilities located in non-Annex VII countries who may view themselves apart from the global repair and refurbishment sector, without any consideration as to their ESM capacity. Indeed, this is the general argument made against the Basel Ban amendment and the dichotomous grouping of countries under the Convention, which does not take into account the particularities of their domestic resource recovery and waste management industries (Kreuger, 1998).

While numerous Basel Parties (both Annex VII and non-Annex VII) and private sector stakeholders affirm the need to allow certain exemptions on functionality testing, concern has been raised over the legality of any transboundary movement of non-functional or untested equipment as non-waste. The non-governmental organization Basel Action Network (BAN), for instance,

[30] Comments from DIGITALEUROPE dated 27 February 2013, *supra note* 30.

[31] *Ibid.*

[32] Though currently in a draft phase, certain elements of the Strategic Framework (including the guiding principles) were agreed upon by the 7th Session of the OEWG. The draft document is available at: http://www.basel.int/TheConvention/StrategicPlan/NewStrategicFramework/tabid/1546/Default.aspx.

argues the Convention provides no legal basis for exceptions to its definitions of waste.[33] However, the framework of the Convention may be too ambiguous to reach this conclusion with clarity. The *UN Convention on the Law of Treaties* provides that treaties should be interpreted by their preamble, text, annexes, subsequent agreements between the Parties, and the subsequent practice of the Parties to the Convention.[34] The adoption of technical guidelines is a necessary practical measure for the effective implementation of the Basel Convention, and it is meant to orient the practice of States in regards their obligations under the treaty. If the Basel Convention were definitively clear on the waste status of non-functional EEE, there would be no need for technical guidelines on the distinction between waste and non-waste EEE. It is precisely because the Convention is not explicit in this respect, and that important definitional parameters were not originally set within Annex IX, that technical guidelines are required.

What further complicates the issue of legal clarity is that the Convention defines wastes in relation to "disposal", which in turn, is defined as any operation specified in Annex IV of the Convention. Notably, repair, refurbishment and upgrading are not listed as Annex IV operations, though they may well entail some form of disposal. In essence, the Basel Convention does not provide a consistent or clear legal basis on which to differentiate transboundary movements of waste and non-waste, other than referring to national legal definitions. However, national legal interpretations of the Basel Convention differ so widely, that achieving a common understanding with respect to the terminologies used in the Convention, and particularly on the distinction between waste and non-waste, has been identified as the leading objective of the new *2012-2021 Strategic Framework* for the implementation of the Convention. Many Basel Parties have already developed, or are in the process of developing, objective criteria which would determine when UEEE for reuse is to be regulated under the Basel Convention, while other Basel Parties have adopted a much stricter approach. Colombia, for instance, unanimously treats all transboundary movements of used and end-of-life electronic equipment as movements of hazardous waste subject to Basel control procedures.[35] Ultimately, Parties to the Convention have exclusive competence to decide which materials should be designated as hazardous waste within their jurisdictions. However, the relevant authorities of exporting States are not always familiar with the importing countries' hazardous waste classification lists. A State of export, in which a certain material is not considered hazardous, might not control a shipment as hazardous waste, even though the material may well be destined for a State where it is defined as hazardous.

While Annex IX of the Convention makes way for national differences regarding reuse, the terminology used is far too open-ended, resulting in a regulatory loophole that facilitates e-waste trafficking. It is clear that effective implementation of the Convention rests significantly on the further clarification of reuse, in part through the development of the UEEE Guidelines. In the course of drafting these technical guidelines, Parties to the Convention are not bound by the Convention's original definitional limitations; rather, they are presented with an opportunity to clarify implementation of the treaty to enhance its relevance to contemporary social, economic and environmental realities. Given the current knowledge available on e-waste trafficking and the global agenda to promote lifecycle thinking to establish sys-

[33] See BAN, Preventing the Digital Dump: Ending Re-use Abuse. Available at http://www.ban.org/wp-content/uploads/2012/09/OEWG8_Delegate_Alert_2.pdf.

[34] UN Convention on Law of Treaties, Art.31.

[35] See Secretariat of the Basel Convention, Study on End-Of-Life Goods (SBC, 25 May 2012).

tems of extended producer responsibility and encourage sustainable international linkages in the UEEE chain, this could mean regulating wastes not exclusively by their nature, but also with respect to the level of transparency and accountability of the contractual relations to which they are attached. Trade restrictions are unlikely to offer a real remedy to the problem of e-waste pollution currently faced by developing countries, particularly if they are not based on empirical knowledge of real-world UEEE markets and transnational trading networks.

As discussed further below, what developing countries need most is a labelling and certification system to distinguish between UEEE and e-waste, as well as the human and technological resources to implement such a system efficiently (Osibanjo & Nnorom, 2008).[36] National legal frameworks must regulate UEEE imports both upstream and downstream.

5.3 Documentation requirements related to permitted flows of UEEE

Whether or not the Parties ultimately approve a narrow or wide range of exceptions under Article 26(b), the key to the success of the UEEE Guidelines, and more broadly, to the reduction of illegal transboundary movements of e-waste under the guise of reuse, lies in the capacity of Basel Parties to obtain information on and effectively monitor all permitted UEEE flows, as well as to deal with all wastes generated within the context of these flows in an environmentally sound manner. The careful assessment of what information should be required to validate international UEEE flows for reuse may bring the Basel Parties closer to resolving the regulatory loophole that is presented by Annex IX of the Convention. A key challenge will be drafting these requirements without imposing an excessive administrative burden on stakeholders, while minimizing the risk of false or pollutive shipments and guaranteeing that wastes generated through permissible shipments are treated in an environmentally sound manner.

In this respect, as repair and refurbishment always entail some type of disposal, the receiving facility should be asked to show proof of its environmentally sound waste disposal policy, either by providing a copy of its waste disposal licence (should it have one, which is not normally the case) or by showing proof of contractual agreement with an environmentally sound, licenced recycling or waste disposal facility. In countries where no national certification or licensing systems exist, proof of compliance with a recognized international standard could also serve as a criterion. The inclusion of this information would seek to ensure the proper stewardship of wastes resulting from all repair and refurbishment operations. Furthermore, such information would enhance knowledge on recycling entities and networks, contributing to increased traceability and transparency throughout the global value chain.

The issue of proving environmental stewardship of wastes generated through international transfers of UEEE intended for reuse merits inclusion in the UEEE Guidelines, particularly if a wide range of exceptions are to be stipulated. In this regard, it may be necessary to incorporate provisions similar to paragraphs 8.8, 8.9 and 8.11 of the *PACE Guidance on Transboundary Movement of Used and End-of-life Computing Equipment*, which explicitly address the environmentally sound treatment of wastes arising from repair or refurbishment operations.

[36] Osibanjo O., and Nnorom, I.C., Material Flows of mobile phones and accessories in Nigeria: Environmental Implications and sound end-of-life management options (2008) 28 Environmental Impact Assessment Review 2/3, 198 – 213.

6 Effectiveness of the UEEE Guidelines

Current knowledge of illegal transboundary movements of e-waste indicates that success in eliminating traffic depends largely on the inspection and enforcement capacity of customs authorities and the extent of their collaboration with environmental protection agencies, police authorities and other relevant national and international stakeholders (INTERPOL, 2009; EEA, 2009; IMPEL, 2006). [37] This knowledge is reflected in Article 25 of the UEEE Guidelines, which provides the critical investigative points for enforcement authorities to detect waste shipments. Evidently, the suppression of e-waste trafficking will require strengthened institutional commitment on behalf of all contracting States in inspection and enforcement capacity building.

Although the UEEE Guidelines clearly stipulate their non-application to equipment collected from takeback programs, it is nevertheless important to note how the technical guidelines synergize with global efforts in the area of extended producer responsibility. Across the globe, various jurisdictions have adopted extended producer responsibility legislation in an effort to curb the environmental impacts of EEE. One of the main challenges to producers in this respect has been the leakage of both UEEE and e-waste to independent third-party entities, which are not legally obliged to finance the collection or treatment of used equipment. As currently drafted, the UEEE Guidelines have the potential to contribute significantly to reducing waste leakage into unaccountable trading networks by effectively eliminating the possibility for non-producer entities to move non-functional UEEE across borders. Of course, as previously noted, providing exceptions that favour producers or producer-related entities exclusively reveals potential trade discrimination issues. From an environmental perspective, there appears to be no clear justification for allowing producers or entities contracting on their behalf to engage in transboundary movements of UEEE without requiring them to provide documented proof that wastes generated from their operations will be managed via environmentally sound processes. The imposition of such a requirement may further foster a level playing field between producers, raising the baseline standard for downstream corporate social responsibility. In essence, any prospective international governance framework should support transboundary movements of UEEE for reuse taking place within closed-loop and environmentally sound industrial systems, be they globally-distributed or not.

While the UEEE Guidelines were considered at the 11th Conference of the Parties 11 (COP 11) in Geneva, Parties to the Convention ultimately failed to reach consensus on Article 26(b). Among the salient issues raised at COP 11 with regard to e-waste and UEEE regulation was the pressing need for linkage between the governance framework in adoption, and "real-world" contexts (IISD, 2013). Evidently, a lifecycle approach to e-waste management at the international level, which prioritizes repair and reuse over recycling, cannot be elaborated without further knowledge on the characteristics of existing local markets for UEEE and further enhancing traceability, transparency, accountability and international cooperation along the reverse supply chain. Although the contact group established at COP 11 to address technical matters prioritized the issue of the UEEE guidelines, the only consensus reached pertains to the process for ongoing work. By virtue of decision United Nations Environment Program (UNEP)/CHW.11/CRP.22, Basel Parties have included development of the e-waste

[37] See INTERPOL, IMPEL and EEA, *supra note* 21. See also Juc, L., INTERPOL's response to the illegal transboundary movements of WEEE in Africa and Europe (INTERPOL, Environmental Crime Programme, 20 March 2013).

guidelines in the work programme of the OEWG for 2014-2015 and requested information from all relevant stakeholders, specifically on the current practices and issues related to Article 26(b), that is, to situations where UEEE should normally be considered waste or not. The decision also calls for the publication of a revised draft of the technical guidelines by November 2013.

7 Further Legal Possibilities

In general, the eventual adoption of the UEEE Guidelines can be seen as a progressive step towards legal clarification. However, because technical guidelines are not legally binding, the instrument may only have limited effect in influencing national legislation and business practices, especially given that Basel Parties have historically determined their definitional boundaries for waste based on their respective domestic interests. Despite the existence of international and regional agreements, as well as national import bans prohibiting e-waste transfers into developing countries, effective enforcement of these regulatory measures has not been possible to date. Indeed, the voluntary nature of the mechanisms adopted under the Basel Convention, combined with the refusal of some States to incorporate the treaty into domestic legislation and the great variances in definition and implementation between those that have transposed the treaty into national law, continue to undermine the "real-world" significance of this historic, most widely ratified multilateral environmental agreement.

For definitive legal clarity on the issue of reuse and in particular, in order to raise global ESM capacity in the area of reuse, repair, refurbishment and upgrading, a legally binding approach may be preferable. In this respect, several possibilities present themselves within the current framework of the Convention, namely, amendment to the text of the Convention, amendment of the Annexes and adoption of a Decision or Protocol. Due to the extensive negotiation and procedure related to amendments of the text of the Convention, and given the high number of ratifications necessary for such an amendment to be adopted, the Parties to the Convention are unlikely to utilize this approach. However, amendments to the Annexes entail a far less complex procedure[38] and may be an interesting way to proceed on the issue of UEEE for reuse.

The recently published *Study on End of Life and Used Goods* (12 May 2012), prepared under Decision BC 10/3 of the Conference of the Parties, identifies options for addressing the problems associated with transboundary movements of used and end-of-life goods (UELG). The study presents several directions for legal clarification on the waste or non-waste status of UELG. Among the various options the study proposes is amending Annex IV and Annex IX of the Basel Convention, clarifying their application to materials destined for reuse. This approach could be further narrowed down to the issue of electrical and electronic equipment exclusively. In this context, based on the guidance documents adopted under the MPPI and PACE partnerships and the UEEE Guidelines (once adopted), disposal operations listed in Annex IV B could be expanded to include repair and refurbishment of EEE within the list of Section B operations – that is, disposal operations which may lead to resource recovery, recycling, reclamation, direct reuse, or alternative uses. In this way, the disposal aspects to EEE repair and refurbishment would be duly recognized. To accommodate certain exemptions for equipment under warranty or equipment for professional use, the operation could be formulated as follows:

Repair and refurbishment of electrical and electronic equipment, excluding:

[38] Procedure for amendment to the Annexes is stipulated in Arts. 17 (2)(3)(4) and 18 of the Basel Convention.

Repair and refurbishment of equipment under warranty returned to the manufacturer or a third party acting on their behalf, with the intention of reuse.
Repair and refurbishment of used equipment [for professional use] returned to the manufacturer or a third party acting on their behalf with the intention of reuse.
Repair and refurbishment of defective medical equipment sent to the producer for root cause analysis under a valid contract.
Repair and refurbishment of off-lease equipment shipped by the lessor or third party acting on their behalf with the intention of reuse.

Concomitantly, references to "repair" and "refurbishment" in footnote 20 of Annex IX would have to be deleted. Hence, Annex IX entry B1110, which qualifies "electrical and electronic assemblies… destined for direct reuse and not for recycling or final disposal" as non-hazardous waste (and in some cases, commodity), would no longer include equipment in need of repair or refurbishment under its scope.
Introducing these modifications to Annex IV B and Annex IX would, firstly, resolve the Convention's silence with respect to the fact that repair and refurbishment operations necessarily imply some form of disposal. Secondly, regarding Annex IX Entry B1110, eliminating repair and refurbishment would bring much clarification to the term "direct reuse". In fact, this approach would directly target the regulatory loophole that currently facilitates e-waste trafficking by disassociating the term "direct reuse" from "repair and refurbishment". Making amendments to the Annexes reflects an unprecedented authoritative approach, but given the widely documented, urgent and intergenerational environmental and social dilemmas associated to e-waste dumping, a preventive and precautionary approach towards repair and refurbishment appears necessary.
Another advantage of proceeding through amendments to the Annexes is that the exceptions listed can be modified easily, and thus, remain open to future technological, environmental and social developments. For instance, if Parties eventually agree on a global certification standard for repair and refurbishment facilities, they may agree to provide a new exclusion on the repair and refurbishment of equipment returned to a [*name of global standard*] certified facility, with the intention of reuse.
Although there is currently no global standard or certification scheme for environmentally sound repair and refurbishment of used EEE, the PACE Working Group has developed a *Guideline on Environmentally Sound Testing, Refurbishment and Repair of Used Computing Equipment* (17 February 2011), which provides an essential starting point of reference.

8 Conclusion

The latest decisions of the Conference of the Parties as well as a number of initiatives recently completed or currently underway in relation to the Convention's implementation (most notably, the MPPI and PACE guidance documents, UEEE Guidelines, *Study on UELG*, *Draft Report on the Interpretation of Terminology*, new *Strategic Framework 2012-2021* and the preparation by the Secretariat of a *Glossary of Terminology* [currently in draft phase]), reflect the enhanced commitment of Basel Parties to achieve a new level of consensus on the Convention's scope and enforcement. To date, the Parties to the Convention have taken a "soft law" approach to implementation, developing voluntary guidance instruments in lieu of agreeing to legally binding obligations. Individual countries have defined their own criteria for ESM, instead of negotiating upon mandatory international standards for transposition into national legal systems or setting specific targets and timetables in relation to their obligations under the treaty – a mechanism that has been used widely in the context of other multilateral environmental agreements. A voluntary approach

to standardization presents benefits in that it allows developing countries to adopt standards according to their respective technical, social and economic capabilities, as called for by the international legal principle of common but differentiated responsibilities [39] that is foundational to global environmental governance. However, the current problems presented by illegal UEEE trading indicate that the Basel Convention's legal ambiguity with respect to EEE and e-waste has led to a veritable environmental crisis, the resolution of which may effectively require a revised regulatory framework combined with the adoption of a global standard for environmentally sound repair, refurbishment and reuse, not only recommendations.

While many national Information and Communication Technologies for Development (ICT4D) policies encourage the import of EEE for reuse, there are also continuous reports of a daily influx of non-functional equipment entering developing country ports via independent importers and waste brokers. Similarly, Original Equipment Manufacturers (OEMs) have expressed concern over used equipment and e-waste being appropriated into unsustainable and opaque international trading networks not held financially or environmentally responsible as producers under national extended producer responsibility laws or under any other environmental governance measures. These conditions call for a highly precautionary approach to regulating international transfers of UEEE, one which takes into account the social and economic value of currently established, environmentally sound repair and refurbishment operations in developing economies, as well as the universal importance of adopting lifecycle thinking and establishing closed-loop industrial systems. In this regard, recognizing that all non-functional UEEE should be controlled as waste or hazardous waste, with the exception of transboundary movements of UEEE for reuse sent back to manufacturers or to third parties acting on their behalf, under the condition that the ESM of wastes generated via such transfers be proven, appears to be the most precautionary direction. Such a measure would also encourage those countries that have not already done so to adopt national extended producer responsibility legislation so that producers and importers of UEEE can be appropriately held responsible for the downstream treatment of wastes generated through their repair and refurbishment networks. The UEEE Guidelines offer essential guidance in this regard, yet Parties may wish to consider legal amendments that would recognize repair and refurbishment as Annex IV operations with explicit reference to the exempt cases, coupled with a modification of the problematic terminology used in Annex IX and the elaboration of a global standard defining environmentally sound repair, refurbishment and reuse.

[39] See *Rio Declaration on Environment and Development* (1992), Principle 7.

9 Bibliography

Atiemo, S., Ofosu, F.G., Kwame Aboh, I.J., Kuranchie-Mensah, H. (2012). Assessing the Heavy Metals Contamination of Surface Dust from Waste Electrical and Electronic Equipment (E-waste) Recycling Site in Accra, Ghana. Research Journal of Environmental and Earth Sciences. 4(5). 605-611.

BEA. (2004). Green List Waste Study. British Environment Agency / Industry Council for Electronic Equipment Recycling.

Bisschop, L. (2012). Is it all going to waste? Illegal transports of e-waste in a European trade hub. Crime Law Soc. Change. 52. 221-249.

Chi, X., Streicher-Porte, M., Wang M.Y.L., Reuter, M.A. (2011) Informal electronic waste recycling: A sector review with special focus on China. Waste Management. 31. 731-742.

Commission on Human Rights. (2003). Adverse effects of the illicit movement and dumping of toxic and dangerous products and wastes on the enjoyment of human rights: Report submitted by Ms. Fatma-Zohra Ouhachi-Vesely, Special Rapporteur, in accordance with Commission resolution 2003/20, 60th session, Geneva, 15 December 2003. UN Doc. E/CN.4/2004/46. Geneva: Office of the United Nations High Commissioner for Human Rights.

Commission on Human Rights. (2006) Adverse effects of the illicit movement and dumping of toxic and dangerous products and wastes on the enjoyment of human rights: Report of the Special Rapporteur Okechukwu Ibeanu, 62nd session, Geneva, 20 February 2006. UN Doc. E/CN.4/2006/42. Geneva: Office of the United Nations High Commissioner for Human Rights.

Computer Aid International. (2010). Special Report Series ICT and the Environment: Why reuse is better than recycling. Computer Aid International.

Crang, M., Hughes, A., Gregson, N., Norris, L., Ahamed, F. (2013) Rethinking governance and value in commodity chains through global recycling networks. Transactions of the Institute of British Geographers. 38. 12-24.

DCEO. 2009. *Electronics Recycling: Economic Opportunities and Environmental Impacts*. Illinois Department of Commerce and Economic Opportunity Available at: http://www.illinoisbiz.biz/NR/rdonlyres/8DD41FE3-A7ED-4447-87C0-DD05815F2747/0/EwasteFactSheet.pdf.

EEA. (2009). Waste without borders in the EU? Transboundary shipments of waste. Copenhagen: European Environment Agency.

ESDO. (2010). Study on E-waste: The Bangladesh Situation. Dhaka, Bangladesh: Environment and Social Development Organisation.

Freestone, D., Hey, E. (1996) *The Precautionary Principle and International Law: The Challenge of Implementation.* The Hague; Boston: Kluwer Law International.

Fu, J., Zhou, Q., Liu, J. (2008). High levels of heavy metals in rice (oryza sativa L.) from typical e-waste recycling are in southeast China and its potential risk to human health. Chemosphere. 31. 1269.

GAO. (2008). Electronic Waste: EPA Needs to Better Control Harmful U.S. Exports through Stronger Enforcement and More Comprehensive Regulation. Washington DC: Government Accountability Office.

Greenpeace. (2008). Chemical contamination at e-waste recycling and disposal sites in Accra and Korforidua, Ghana. Greenpeace International. Amsterdam.

ILO (2012). The global impact of e-waste. International Labour Office. Geneva.

Hicks C., Dietmar, R., Eugster, M. (2005) The recycling and disposal of electrical and electronic waste in China – legislative and market responses. Environmental Impact Assessment Review 25(5). 459-471.

Huo, X., Peng, L., Xu, X. et al. (2007) Elevated blood lead levels of children in Guiyu, an electronic waste recycling town in China. Environmental Health Perspective 15. 1113-1117.

IISD. (2013). Summary of the ordinary and extraordinary meetings of the conferences of the parties to the Basel, Rotterdam and Stockholm Conventions: 28 April - 10 May 2013. IISD. Available at:http://www.iisd.ca/download/pdf/enb15210e.pdf

IMPEL. (2006). IMPEL-TFS Project II: 'International Cooperation in Enforcement Hitting Illegal Waste Shipments', Project Report September 2004 – May 2006. European Union Network for the Implementation and Enforcement of Environmental Law.

INTERPOL. (2009). Electronic Waste and Organized Crime: Assessing the Links, Phase II Report for the Interpol Pollution Crime Working Group. INTERPOL.

Kreuger, J. (1998). When is Waste not a Waste? The Evolution of the Basel Convention and the International Trade in Hazardous Wastes. Paper presented at the 39th Annual Convention of the ISA, Minneapolis. USA.

Kuehr, R., Fitzpatrick, C., Luepschen, C. (2011). E-waste Challenges: Re-use Practices, Principles and Standards. United Nations University. Available at: http://unu.edu/publications/articles/e-waste-challenges-re-use-practices-principles-and-standards.html [Last access: 7 June 2013].

Kuehr, R., Williams, E. (eds). (2003). *Computers and the Environment: Understanding and Managing their Impacts.* Kluwer Academic Publishers; United Nations University.

Lepawsky, J., Billah, M. (2011). Making chains that (un)make things: waste-value relations and the Bangladesh rubbish electronics industry. Geografiska Annaler: Series B, Human Geography. 93(2). 121-139.

Lepawsky, J., McNabb. C. (2010). Mapping international flows of electronic waste. The Canadian Geographer. 54 (2). 177-195.

Leung, A., Duzgoren-Aydin. N., Cheung, K.C., Wong, M.H. (2008). Heavy Metals Concentrations of Surface Dust from e-Waste Recycling and Its Human Health Implications in Southeast China. 42 Environmental Science and Technology (42)7. 2674-2680.

Liqiu D., Babbitt, C.W., Williams, E. (2011). Economic-balance hybrid LCA extended with uncertainty analysis: case study of a laptop computer. Journal of Cleaner Production. 19 (11). 1198-1206.

Manhart A. (2010). International Cooperation for Metal Recycling from Waste Electrical and Electronic Equipment: An assessment of the Best of Two Worlds Approach. Journal of Industrial Ecology 15(1). 13 – 30.

Medina, M. (2007). The World's Scavengers. Lanham, MD: Alta Mira Press.

Osibanjo, O., Nnorom, I.C. (2007) Material flows of mobile phones and accessories in Nigeria: environmental implications and sound end-of-life managementoptions. Environmental Impact Assessment Review. 28 (2-3). 198-213.

Pellow, D.N. (2007). Resisting Global Toxics: Transnational Movements for Environmental Justice. Cambridge: MIT Press.

Puckett J., Byster, L., Westervelt, S., Gutierrez, R., Davis, S., Hussain, A., Dutta, M. (2002) Exporting Harm: The High-Tech Trashing of Asia. Basel Action Network and Silicon Valley Toxics Coalition.

Salehabadi, D. (2013). Transboundary Movements of Discarded Electrical and Electronic Equipment. StEP Green Paper Series. UNU-StEP.

Schluep, M., Hagelueken, C., Kuehr, R., Magalini, F., Maurer, C., Meskers, C., Mueller, E., Wang, F. (2009). From E-Waste to Resources. United Nations Environment Program and United Nations University.

SBC (2011), Where are WEee in Africa? Findings from the Basel Convention E-waste Africa Programme. Secretariat of the Basel Convention.

Sepúlveda, A., Schluep, M., Renaud, F.G., Streicher, M., Kuehr, R., Hagelueken, C., Gerecke, A.C. (2010). A review of the environmental fate and effects of hazardous substances released from electrical and electronic equipments during recycling: examples from China and India. Environmental Impact Assessment Review 30(1). 28-41.

Smith, T., Sonnenfeld D.A., & Pellow N. (2006); Challenging the chip: Labor rights and environmental justice in the global electronics industry. Philadelphia, PA, Temple University Press.

Toxics Link. (2003). Scrapping the high-tech myth: Computer waste in India. New Delhi: Toxics Link: New Delhi.

UNIDO, Microsoft. (2009). Reuse and Recycle: Growing Green Business.

UNODC. (2013). Transnational Organized Crime in East Asia and the Pacific: A threat assessment. United Nations Office on Drugs and Crime. 101-112.

Van Erp, J., Huisman, W. (2010) Smart regulation and enforcement of illegal disposal of electronic waste. Criminology & Public Policy. 9(3) 579-590.

Wang, F., Huisman, J., Meskers C.E., Schluep, M., Stevels A., Hagelüken, C. (2012). The Best-of-2-Worlds philosophy: developing local dismantling and global infrastructure network for sustainable e-waste treatment in emerging economies. Waste Management 32(11). 2134-46.

Widmer, R., Oswald-Krapf, H., Sinha-Ketriwal, D., Schnellmann, M., Boni, H., Global Perspectives on e-waste. Environmental Impact Assessment Review 25 (2005). 436-458.

Williams, E., Kahhat, R.,Allenby, B., Kavazanjian, E.,Kim, J., Xu, M. (2008). Environmental, Social and Economic Implications of Global Reuse and Recycling of Personal Computers. Environ. Sci. Technol. 2008, 42, 6446-6454.

Wu, J.P., Luo, X.J., Zhang, Y., Luo, Y., Chen, S.J., Mai, B.X., Yang, Z.Y. (2008). Bioaccumulation of polybrominated diphenyl ethers (PBDEs) and polychlorinated biphenyls (PCBs) in wild aquatic species from an electronic waste (e-waste) recycling site in South China. Environment International. 34(8). 1109-1113.

Members and Associate Members of the StEP Initiative are:

(Nov 2013)

Full Members:

Arrow Electronics
Austrian Society for Systems Engineering and Automation (SAT)
Basel Convention Coordinating Centre for Asia & the Pacific (BCRC China)
Basel Convention Coordinating Centre for Training and Technology Transfer for the African Region (BCCC-Africa), University of Ibadan
Basel Convention Regional Centre for Central America and Mexico (BCRC-CAM)
BIO Intelligence Service S.A.S.
Blueprint ERE Pte Ltd
Center for Environment and Development for the Arab Region and Europe (CEDARE)
Chiho-Tiande (HK) Limited
Cisco Systems, Inc.
Compliance and Risks
Dataserv Group Holdings Ltd.
Datec Technologies Ltd
Delft University of Technology (TU Delft)
DELL Inc.
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Dismantling and Recycling Centre Vienna (D.R.Z)
Empa – Swiss Federal Laboratories for Materials Science and Technology
Ericsson
FECACLUBS-UNESCO
Fraunhofer Institute for Reliability and Microintegration (FHG-IZM)
Griffith University
Hewlett Packard (HP)
Institute for Applied Ecology (Öko-Institut e.V.)
International Telecommunication Union (ITU)
KERP Center of Excellence Electronics & Environment GmbH
Kevoy Community Development Institute (KCDI)
Massachusetts Institute of Technology (MIT) – Materials Systems Laboratory
Memorial University
MicroPro Computers
Ministry of the Environment Japan, Office Waste Disposal Management, Department of Waste Management and Recycling
National Center for Electronics Recycling (NCER)
Nokia Corporation
Philips Consumer Lifestyle Sustainability Center
RELAC Platform
Renewable Recyclers
Reverse Logistics Group Americas (RLGA)
Secretariat of the Basel Convention (SBC)
Secretariat of the Pacific Regional Environment Program (SPREP)
Sims Recycling Solutions
Swiss State Secretariat of Economic Affairs (SECO)

Technische Universität Berlin, Institut für Technischen Umweltschutz, Fachgebiet Abfallwirtschaft (Chair of Solid Waste Management)
Technische Universität Braunschweig, Institute of Machine Tools and Production Technology
Télécom École de Management
Thai Electrical and Electronic Institute (EEI)
The Sustainability Consortium
UMICORE Precious Metal Refining
United Nations Environment Programme/Division of Technology, Industry and Economics (UNEP/DTIE)
United Nations Industrial Development Organization (UNIDO)
United Nations University (UNU)
United States Environmental Protection Agency (US-EPA)
University of Limerick
University of Northampton (UoN), the Centre for Sustainable Wastes Management
WEEE Help
WorldLOOP

Associate Members:

ENDA Europe
Global e-Sustainability Initiative (GeSI)
Vertmonde Cia. Ltd.

StEP White and Green Paper Series

Number	StEP Task Force	Title	Date
Green Paper #8	TF 1 "Policy"	Differentiating EEE products and wastes	14 January 2014
Green Paper #7	TF 3 "ReUse"	E-waste Country Study Ethiopia	10 April 2013
Green Paper #6	TF 1 "Policy"	E-waste in China: A Country Report	05 April 2013
Green Paper #5	TF 1 "Policy"	Transboundary Movements of Discarded Electrical and Electronic Equipment	25 March 2013
Green Paper #4	TF 4 "ReCycle"	Recommendations on Standards for Collection, Storage, Transport and Treatment of E-waste	22 June 2012
Green Paper #3	TF 1 "Policy"	International policy response towards potential supply and demand distortions of scarce metals	01 February 2012
Green Paper #2	TF 2 "ReDesign"	Worldwide Impacts of Substance Restrictions of ICT Equipment	30 November 2011
Green Paper #1	TF 1 "Policy"	E-waste Indicators	15 September 2011

Number	StEP Task Force	Title	Date
White Paper #3	TF 1 "Policy"	On the Revision of EU's WEEE Directive - COM(2008)810 final	1 October 2009, revised 22 March 2010
White Paper #2	TF 3 "ReUse"	One Global Understanding of Re-use – Common Definitions	5 March 2009
White Paper #1	TF 1 "Policy"	E-waste Take-back System Design and Policy Approaches	28 January 2009

All StEP publications are online available at http://www.step-initiative.org/publications/.

About the StEP Initiative:

"StEP envisions a future in which societies have reduced to a sustainable level the e-waste-related burden on the ecosystem that results from the design, production, use and disposal of electrical and electronic equipment. These societies make prudent use of lifetime extension strategies in which products and components – and the resources contained in them – become raw materials for new products."

Our name is our programme: solving the e-waste problem is the focus of our attention. Our declared aim is to plan, initiate and facilitate the sustainable reduction and handling of e-waste at political, social, economic and ecological levels.

Our prime objectives are:

- Optimizing the life cycle of electric and electronic equipment by
  - improving supply chains
  - closing material loops
  - reducing contamination
- Increasing utilization of resources and re-use of equipment
- Exercising concern about disparities such as the digital divide between industrializing and industrialized countries
- Increasing public, scientific and business knowledge
- Developing clear policy recommendations

As a science-based initiative founded by various UN organizations we create and foster partnerships between companies, governmental and non-governmental organizations and academic institutions.

StEP is open to companies, governmental organizations, academic institutions, NGOs and NPOs and international organizations which commit to proactive and constructive participation in the work of StEP by signing StEP's Memorandum of Understanding (MoU). StEP members are expected to contribute monetarily and in kind to the existence and development of the Initiative.

StEP's core principles:

1. StEP's work is founded on scientific assessments and incorporates a comprehensive view of the social, environmental and economic aspects of e-waste.
2. StEP conducts research on the entire life cycle of electronic and electrical equipment and their corresponding global supply, process and material flows.
3. StEP's research and pilot projects are meant to contribute to the solution of e-waste problems.
4. StEP condemns all illegal activities related to e-waste including illegal shipments and re-use/ recycling practices that are harmful to the environment and human health.
5. StEP seeks to foster safe and eco/energy-efficient re-use and recycling practices around the globe in a socially responsible manner.

Contact:

StEP Initiative
c/o United Nations University
Institute for Sustainability and Peace (UNU-ISP)
Operating Unit SCYCLE
Hermann-Ehlers-Str. 10
53113 Bonn, Germany
Phone: +49-228-815-0271
Fax: +49-228-815-0299
info@step-initiative.org
www.step-initiative.org
www.isp.unu.edu

UNITED NATIONS UNIVERSITY