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**Open-ended Working Group of the International Conference
on Chemicals Management**
First meeting
Belgrade, 15–18 November 2011
Item 5 (c) of the provisional agenda *
Implementation of the Strategic Approach: New and emerging policy issues

Report of the International workshop on hazardous substances within the life-cycle of electrical and electronic products, held in Vienna, from 29 to 31 March 2011

Note by the secretariat

The secretariat has the honour to circulate, for the information of participants, the report of the International workshop on hazardous substances within the life-cycle of electrical and electronic products, held in Vienna, from 29 to 31 March 2011. The report, contained in the annex to the present note, has been transmitted by the secretariats of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and the Stockholm Convention on Persistent Organic Pollutants, as well as the United Nations Industrial Development Organization (UNIDO). The report has been reproduced as received and has not been formally edited.

* SAICM/OEWG.1/1/Rev.1

ANNEX

**International workshop on hazardous substances within
the life-cycle of electrical and electronic products**

29, 30 and 31 March 2011
UNIDO Headquarters
Vienna International Centre
Vienna, Austria

REPORT OF THE MEETING

I. Background

The purpose of the international workshop is to advance international and national efforts to reduce the life-cycle impacts of the hazardous substances in electronic and electrical products.

The meeting was organized by the Secretariat of the Basel Convention, the United Nations Industrial Development Organization, on behalf of the participating organizations of the Inter-Organization Programme for the Sound Management of Chemicals, and the Secretariat of the Stockholm Convention. The meeting has been convened pursuant to decision II/4 of the International Conference on Chemicals Management (ICCM) at its second session in May 2009 concerning hazardous substances within the life-cycle of electrical and electronic products (operational paragraph 1 of section D) which:

- *Invites* the participating organizations of the Inter-Organization Programme for the Sound Management of Chemicals and the Secretariats of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the Stockholm Conventions on Persistent Organic Pollutants to develop, plan and convene, within available resources, a workshop to consider issues in relation to electrical and electronic products, based on a life-cycle approach. The workshop would seek to identify and assess where issues relating to the sound management of chemicals arise during the lifespan of electrical and electronic products, including the design of such products, green chemistry, recycling and disposal, in particular in the context of the requirements of the Basel and Stockholm conventions, and would develop a series of options and recommendations for future work, through existing mechanisms to the extent possible, which would be provided at the intersessional meeting and to the International Conference on Chemicals Management at its third session for its consideration and possible cooperative actions.

The workshop was made possible thanks to the financial support received from the Ministry of Environment of Japan, the Ministry of the Environment of Sweden, the United States Environmental Protection Agency and the United Nations Industrial Development Organization (UNIDO). UNIDO hosted the workshop. A total of 90 participants comprising representatives of governments, industry, civil society, intergovernmental organizations and the academia attended the workshop.

II. Opening of the meeting

The meeting was opened at 09:30 am on Tuesday 29 March 2011 by the Moderator, Mr. Heinz Leuenberger, as the representative of UNIDO, who welcomed the participants. He then gave the floor to Mr. Dmitri Piskounov, Managing Director of the Programme Development and Technical Cooperation Division (PTC) of UNIDO for his welcoming remarks. Mr. Piskounov thanked the Secretariats of the Basel and Stockholm Conventions and the Secretariat of the Strategic Approach to International Chemicals Management (SAICM) for the preparation of the international workshop and emphasized that this workshop was timely as end-of-life electronic and electrical equipment (EEE) is one of the fastest growing waste streams in the world and adequate infrastructure and capacity building are required to properly manage it. He further added that there is a lack of capacity to handle electronic waste in an environmentally sound manner in almost all developing countries and countries with economies in transition, leading to the release of hazardous substances, causing harm to human health and the environment. He pointed out that there is a pressing need for the development of clean technology, clean design and waste avoidance, product stewardship and extended producer responsibility. He referred to the fundamental need for

a paradigm shift and that UNIDO was addressing this challenge through its Green Industry Initiative. Finally, he stressed that to see the partners of the UN system working together was a very encouraging signal and that the full involvement of Member States was critical as well as to show results on the ground with practical sound solutions.

Mrs Katharina Kummer-Peiry, Executive Secretary of the Secretariat of the Basel Convention expressed her appreciation for the hard work to organize this meeting, with special thanks to Mr. Oladele Osibanjo, Chairman of the Workshop Steering Group, the Members of the Steering Group and Mr. Ibrahim Shafii for accepting to act as Secretary to the Steering Group. She also thanked UNIDO for hosting the workshop and those who provided financial support. She said that waste electrical and electronic equipment (WEEE) is recognized as one of the problematic waste streams worldwide presenting a heavy burden for people, especially the poor, and the environment while offering opportunities as potential resources to be recycled, recovered, or re-used. She pointed out that economic opportunities to create green jobs and manufacture electronic and electrical products (EEE) with less hazardous substances exist. The issue of WEEE was widely recognized, in the context of the Basel Convention at the eighth meeting of the Conference of Parties in 2006 as a result of efforts carried out since 2002 and the subsequent establishment of partnerships to address used or end-of-life mobile phones (Mobile Phone Partnership Initiative - MPPI) and computers (Partnership for Action on Computing Equipment - PACE) as well as through the development of technical guidelines and two region-wide programmes in Africa and Asia. She emphasized that a weak link in the life-cycle approach was the up-stream level where efforts have to be further strengthened towards reducing the harmful substances in EEE. The tenth meeting of the Basel Convention Conference of Parties that will be held in Colombia in October 2011 has selected as its theme 'the prevention, minimization and recovery of waste'. It will be a contribution to this important paradigm shift where efforts have to be made to transform waste into resources. The outcome of this workshop might provide useful input to the Conference of Parties. She highlighted that the recent reports of UNEP on "Towards the Green Economy: Pathways to Sustainable Development and Poverty Eradication" and on "Waste and Climate Change" recognised the important role of waste recycling and resource recovery and the sound management of waste for the reduction of greenhouse gases.

Mr. Donald Cooper, Executive Secretary of the Secretariat of the Stockholm Convention highlighted why the Stockholm Convention was part of this international workshop. The meetings of the Conference of Parties to the Stockholm Convention have recognized WEEE as an important issue. Both the Stockholm and Rotterdam Conventions address a particular aspect of chemical trade. They govern the safe handling of a number of chemicals that potentially can cause serious harm to human health and the environment because they are highly toxic, persistent, might travel long distances and will accumulate in fatty tissues. The risk of releasing these chemicals to the

environment occurs at multiple stages of the EEE life-cycle. UNEP and FAO launched a Safe Planet campaign targeting consumers worldwide to increase global awareness on the sound production, use, and recycling of EEE. He further pointed out that the Stockholm Convention looks at alternatives to persistent organic pollutants (POPs) and at the life-cycle of EEE to reduce the negative impacts of hazardous POPs in such equipment, an area where industry has a crucial role to play.

Mr. Mohamed Omotola spoke on behalf of the SAICM Secretariat. Mr. Omotola reminded the audience that the issue of the life-cycle of hazardous substances in EEE was among the four emerging issues that ICCM2 identified together with lead in paint, chemicals in products and nanotechnologies and manufactured nanomaterials. This international workshop is an opportunity in regard to SAICM work. Indeed, SAICM is now launching regional consultations as an input for the preparation of SAICM Open-ended Working Group that will be held in August 2011 on the road to ICCM3 in 2012 that will evaluate the work of and progress made by SAICM.

The Moderator thanked the speakers for their opening remarks and handed-over the podium to the Chairman of the meeting, Mr. Oladele Osibanjo.

III. Key note address by the Chairman

The Chairman welcomed the participants on behalf of the Steering Group. He thanked UNIDO for hosting the meeting and the Governments of Japan, Sweden, the USA and UNIDO for providing financial support. He emphasized that it would be important for the participants to share their knowledge and experience so a road map for actions related to the electrical and electronic waste affecting the world could be developed. Some of the challenges related to the EEE and WEEE are the lack of legislation and the lack of knowledge on how to deal with e-waste. He said that the generation of uncontrollable high volumes of WEEE is a dark side of the information-communication technology which has revolutionized modern living, international business and global governance. What makes WEEE hazardous is principally due to the hazardous chemicals they contain, e.g. heavy metals and brominated flame retardants (BFRs). There is a global trade for WEEE that represents a danger for developing countries that lack infrastructure and capacity to manage such hazardous waste streams in an environmentally sound manner.

There is need to enter into a new paradigm shift where waste is transformed into resources. However, there are many difficulties on the road. There are huge information gaps along the supply chain that create difficulties for waste managers and recyclers. The control of transboundary movements of hazardous WEEE is essential to protect importing countries from the potential harm these waste streams represent to human health and the environment.

ICCM2 gave this meeting a mandate to come up with options and recommendations on what to do in the context of the life-cycle of hazardous substances in EEE. The international workshop derives from resolution II/4 of ICCM2 organized under the auspices of SAICM. It should address the issue of the fate and sound management of chemicals during the life-cycle of EEE along the supply chain. The main objective of the international workshop is to contribute to international and national efforts aimed at understanding and reducing the impacts of the hazardous chemicals content of electrical and electronic equipment during their life cycle, along the supply chain, on human health and the environment while seizing opportunities to exploit employment creation, poverty alleviation and entrepreneurship potentials that may arise.

The Chairman was confident that the meeting will provide a platform for sharing information and coming up with solutions that will feed into the SAICM/ICCM3 process. He clarified that this meeting was not a negotiating meeting. Finally he stated that the organization of this workshop by some United Nations agencies is a good manifestation of the synergy process of UNEP at work.

IV. Organization of the workshop

The Chairman explained that the work will be conducted both in plenary and working groups which are to be set up later after the presentations. He referred to the provisional agenda that is contained in Annex 1 to the present report. The meeting was conducted as a paperless meeting and all presentations made during the meeting were up-loaded on a special website of UNIDO under <https://www.unido.org/forum>.

The list of participants is found in Annex 4 to the present report.

V. Brief overview

The Chairman called on Mr. Mathias Schluep from the Swiss Federal Laboratories for Materials Science and Technology (EMPA) to deliver an introduction on the hazardous substances issues within the life-cycle of EEE. Mr. Schluep focused on specific examples of hazardous substances in EEE, including polychlorinated biphenyls (PCBs) in capacitors, polybrominated flame retardants (PBDEs) in plastics and mercury and indium in flat-panel displays, which have particular implications for the end-of-life equipment. Specific examples of improper treatment of WEEE, such as desoldering and acid leaching, lead recycling, and cable and plastic waste burning were highlighted.

VI. Regional perspective

Mr. Joe DiGangi of the International POPs Elimination Network (IPEN) was invited by the Chairman to make a presentation on the regional perspective and expectations regarding the hazardous substances issues within the life-cycle of EEE building on a series of regional consultations undertaken in the context of SAICM. Brief overview of SAICM and its key policy documents as well as emerging policy issues was made by Mr. DiGangi. Furthermore, in his presentation Mr DiGangi discussed the needs and expectations related to upstream, midstream and downstream issues of EEE and WEEE agreed upon in the regional meetings held in four UN regions between 2009 and 2010.

VII. Presentations on up-stream, mid-stream and down-stream chemicals issues

Seven Speakers were invited by the Chairman to present the up-stream, mid-stream and down-stream chemicals issues. The Speakers were:

- Up-stream-issues: Mr. Mark Rossi, Clean Production Action, USA and Mr. Hans Wennekes, DSM Engineering Plastics

- Mid-stream issues: Ms. Jeong-ok Kong, Korea Institute of Labour Safety and Health, Korea, and Mr. Pavan Baichoo, International Labour Organization
- Down-stream issues: Mr. Jim Puckett, Basel Action Network, USA, Ms. Oyuna Tsydenova, Institute for Global Environmental Strategies, Japan, and Ms. Huo Xia, Shantou University Medical College, China.

A discussion followed the presentations. Some of the points raised concerned the importance to use the regional and coordinating centres established under the Basel and Stockholm Convention to address regional needs. The concern on how to benefit from experience on green design was raised and it was suggested that a search on this topic on the internet would provide a lot of information. Some participants volunteered to provide such information. The issue of ensuring that suppliers provide adequate and in-time information was highlighted as critical to manage WEEE in an environmentally sound way. Also, the importance to develop a domestic secondary raw market for used or end-of-life EEE was underlined. A view was expressed that the increasing volume of EEE and WEEE in developing countries requires a transfer of green technologies to these countries. The issue of costs externalities came up to promote the reduction of the pollution burden, greenhouse gas emissions and energy and encourage green design; although it was noted that costs of green design could be prohibitive. It was noted that issues of sustainable design and production management will impact on EEE design as well as the use of the extended producer responsibility principle.

VIII. In-session working groups

Three in-session working groups were established by the Chairman entrusted with the task to come up with ideas, solutions, options or recommendations on how to best handle the issues concerning the life-cycle of hazardous substances in EEE, including looking at gaps and potential for synergies. The three working groups were responsible for one dimension of the life-cycle each:

- Group 1 dealt with up-stream issues (Co-chairs: Prof. Ab Stevels and Ms. Maria Delvin).
- Group 2 dealt with mid-stream issues (Co-chairs: Mr. David Kapindula and Mr. Ted Smith).
- Group 3 dealt with down-stream issues (Co-chairs: Mr. Pierre Portas and Mr. O.O. Dada).

The three Groups met on Wednesday, 30 March 2011.

XI. Report by the Working Groups

One Co-chair for each working Group was invited by the Chairman to report on the work of their respective group at the opening of the plenary in the morning of Thursday 31 March 2011.

Further to the presentations by the three Co-chairs a discussion followed. The discussion focused on the need to be as complete as possible and provide a coherent set of recommendations to be presented to the SAICM process. In order to further improve the output of the international workshop, the Chairman proposed that the three Working Groups reconvene in the morning to address any outstanding, unclear or unsolved issues and start harmonizing the presentation of their respective work.

In the afternoon, the Co-chairs of the three Working Groups presented their outcomes to plenary. The outcomes of the work of the three in-session Working Groups are contained in Annex 2 to the present report.

X. Presentation of recommendations to SAICM and ICCM3

Based on the work done by the three in-session Working Groups, the Chairman proposed a way forward. Firstly he reminded the participants about the process. The recommendations of this meeting will be presented to the Open-ended Working Group (OWEG) of SAICM planned to meet in August 2011. Therefore, a draft consolidated version of the report of this meeting should be ready as soon as possible. The draft report will be circulated to the Members of the Steering Group, the Co-chairs and Chairman for comments. Comments by participants to the workshop will be invited to be sent to the Secretariat of the Basel Convention, and the recommendations from this meeting will be submitted to SAICM/OWEG in time for its consideration. .

The Chairman introduced possible textual elements that would accompany the set of recommendations prepared by the international workshop. A contact group was set up to prepare a statement that will form part of the present report and that would introduce the recommendations. The key messages from the workshop are as set out in Annex 3 to this report.

Due to time constraints the agenda items regarding the synthesis by the Chairman and Other matters could not be considered by the meeting.

XI. Closure of the meeting

The Chairman thanked heartily the Co-chairs of the Working Groups, the participants and

the Secretariats for their active participation and hard work that has enabled the meeting to enrich the debate on the complex issues surrounding the life-cycle of hazardous substances in EEE. He expressed full satisfaction with the outcomes of the workshop and the high quality of the work done.

He then called on UNIDO to make a closing statement. The representative of UNIDO, Mr. Smail Alhilali, recognised the very good contribution this workshop is making to the SAICM process. He thanked everyone for their excellent work.

The Chairman again thanked the representative of UNIDO and those who made financial contributions for the workshop. He declared the workshop closed at 18:00 on Thursday 31 March 2011.

Annex 1 Provisional Agenda

| DAY 1. Tuesday, 29 March 2011 (Location: M Building Board Room B) | | |
|--|---|---|
| Time | Subject | Chairs / Speakers |
| 09:30-10:00 | Opening of the workshop (plenary) Welcome by host Opening remarks by IOMC, Basel Convention, Stockholm Convention and SAICM | UNIDO SBC SSC SAICM |
| 10:00-10:30 | Key note address by Prof. O. Osibanjo, Chairman of the Steering Committee | Prof. O. Osibanjo |
| 10:30-10:45 | Organisation of the workshop Presentation of the agenda and objectives Organisation of work | Prof. O. Osibanjo |
| 10:45-11:00 | Coffee break | |
| 11:00-11:30 | Brief overview of hazardous substances issues within the life-cycle of electrical and electronic equipment | Mathias Schlupe |
| 11:30-12:00 | Regional perspective of hazardous substances issues within the life-cycle of electrical and electronic equipment | Joe Digangi |
| 12:00-13:00 | Up-stream chemicals issues, policy and capacity-building | Mark Rossi Hans Wennekes |
| 13:00-13:45 | Lunch break | |
| 13:45-14:45 | Side events | |
| 15:00-16:00 | Mid-stream chemicals issues, policy and capacity-building | Jeong-ok Kong Pavan Baichoo |
| 16:00-17:00 | Down-stream chemicals and waste issues, policy and capacity-building | Jim Puckett Oyuna Tsydenova Prof. Huo Xia |
| 17:00-17:15 | Coffee break | |
| 17:15-18:00 | Establishment of in-session working groups; tasks; expectations | |
| 18:00 | End of first day. Reception hosted by UNIDO | |

| DAY 2. Wednesday, 30 March 2011 (Location: M Building, Conference Rooms MOE 79, MOE27 and MOE05) | | |
|---|--|----------------------------------|
| Time | Subject | Co-chairs |
| 09:30-11:00 | In-session working groups reconvene | Up-stream: |
| 11:00-11:15 | Coffee break | Prof. Ab Stevels Maria Delvin |
| 11:15-13:00 | In-session working groups reconvene | Mid-stream: |
| 13:00-13:45 | Lunch break | Ted Smith David Kapindula |
| 13:45-14:45 | Side events | Down-stream: |
| 15:00-16:30 | Continuation of in-session working groups focusing on action and recommendations | Pierre Portas Dr. O.O.Dada |

| | | |
|-------------|--|--|
| 16:30-16:45 | Coffee break | |
| 16:45-18:00 | Continuation of in-session working groups focusing on action and recommendations | |

| DAY 3. Thursday, 31 March 2011 (Location: M Building, Board Room B) | | |
|--|--|-------------------|
| Time | Subject | Chair |
| 09:30-10:15 | Report by working groups (plenary) | Prof. O. Osibanjo |
| 10:15-10:45 | Discussion | |
| 10:45-11:00 | Coffee break | Prof. O. Osibanjo |
| 11:00-12:00 | Introduction to the preparation of recommendations to SAICM/ICCM3 and discussion | |
| 12:00-13:00 | Working groups set up to draft recommendations | |
| 13:00-13:45 | Lunch break | |
| 13:45-14:45 | Side events | |
| 15:00-15:45 | Presentation of set of recommendations by each group (plenary) | Prof. O. Osibanjo |
| 15:45-16:00 | Discussion | |
| 16:00-16:15 | Coffee break | |
| 16:15-16:45 | Synthesis by chairperson on recommendations to SAICM and ICCM3 | Prof. O. Osibanjo |
| 16:45-17:15 | Last round of comments | |
| 17:15-17:45 | Other matters | |
| 17:45-18:00 | Closure of the workshop | |

SIDE EVENTS

| Day/time | Title | Room |
|---------------------------------------|--|-------------|
| Tuesday, 29 March 13:45-14:45 | National Environmental Standards and Regulations Enforcement Agency (NESREA): E-waste issues: The Nigerian experience | MOE79 |
| | Stockholm Convention Secretariat/UNIDO SCU: The Stockholm Convention and the control of persistent organic (POPs) pollutants occurring in WEEE. New POPs | MOE27 |
| Wednesday, 30 March 13:45-14:45 | UNIDO: Presentation of the project "Establishment of a dismantling facility for e-waste in Uganda" | MOE79 |
| | Secretariat of the Basel Convention: Progress on E-waste activities and PACE under Basel Convention | MOE27 |
| Thursday, 31 March 13:45-14:45 | Basel Action Network: Update on the global challenges to stem the tide of toxic e-waste and introduce their responsible recycling certification program – e-Stewards. | MOE27 |

Annex 2: Outcomes of the working groups

A. Upstream recommendations

The Upstream Working Group recognizes the importance of the Strategic Approach to International Chemicals Management (SAICM) playing a coordinating role in making connections across organizations and other stakeholders in realizing the following five recommendations.

Best practices in managing chemical information flows

1) Governments, international agencies, businesses and business associations should create an international set of best practice resources for managing chemical information flows, including:

- Government initiatives for managing chemical information flow in electrical and electronic products and manufacturing¹
- Business standards and practices for tracking and disclosing chemicals in products, (including: industry standards,² supply chain information sharing, hazardous substance disclosure in electrical and electronic products,³ and company-specific initiatives)

Best practices in business organizational procedures

2) Universities, businesses, business associations, governments and international agencies should research, compile and disseminate best practices in business organizational procedures for managing hazardous substances in electrical and electronic products; and create a guidance document for interested parties that includes:

- Corporate policies, programs (design, manufacturing and purchasing), roadmaps and reporting
- Staff incentives for environmental performance (including senior management)
- Transition management plans that address investments, procurement, and substitution⁴
- Supply chain management
- Chemical management systems
- Prevention activities such as waste minimization
- Investments in green chemistry

¹ For example, see: UNEP Chemicals in Products (CIP) electronics case study; UNEP CIP recommendations to OEWG/ICCM3; Globally Harmonised System (GHS) for the Classification and Labeling of Chemicals; and national examples.

² For example, see standards for material declarations developed by International Electrotechnical Commission (IEC) and IPC, such as: IEC 62474.

³ For example see safety data sheets.

⁴ This could include how to move from low cost-high volume to high cost-low volume solutions.

- Stakeholder engagement

Chemicals of concern

3) International agencies should compile and communicate lists of chemicals of concern to human health or the environment in the electrical and electronic products sector that include:

- Restricted substance lists from businesses in the electrical and electronic products sector
- Lists from national governments, global treaties, and regional regulations, including but not limited to: Stockholm Convention on Persistent Organic Pollutants, European Union Restriction of Hazardous Substances Directive (RoHS), European Union REACH Substances of Very High Concern (SVHCs), Basel Convention, and Rotterdam Convention
- Lists from NGOs: for example: ChemSec Substitute It Now list
- Summaries of the hazard and toxicological data of the chemicals on the above lists
- Scientific statements of concern, for example the San Antonio Statement on Brominated and Chlorinated Flame Retardants⁵

The compilation of lists and selection criteria are for information purposes aimed at identifying chemicals of concern in electrical and electronic products sector, not for setting regulations. The next step could be used for further priority setting.

Tools and best practices for hazardous chemical reduction, elimination and substitution

4) Governments, international organizations, universities, businesses and business associations should identify tools and best practices that advance design for hazardous chemical reduction, elimination, and substitution, including:

- Government substitution initiatives and resources⁶
- Resource documents on the tools for implementing substitution and hazardous chemical reduction⁷
- Guides for using hazardous chemical reduction and substitution tools
- Potential substitutes to chemicals of concern in specific electrical and electronic product applications
- Green purchasing strategies used in businesses

⁵ Environmental Health Perspectives (2010) 118: 516 – 518

⁶ For example, see: POPs Review Committee Alternatives Guidance document; ECHA Guidance on PBT; and US EPA Chemical Action Plans.

⁷ The resource document should include: a) tools and best practices from businesses, governments, research institutes, universities and NGOs; b) criteria used for evaluating substitutes, including: costs, health and environmental impacts and technical performance; and c) benchmark assessments of these tools.

- Strategies and actions that should be taken when elimination is not possible or substitutes are unavailable⁸

Policy Instruments

5) Governments should consider adopting policy instruments, and intergovernmental organizations should promote actions, that support hazardous chemical reduction, elimination, and substitution in electrical and electronic products, including:

- Regulation of hazardous chemicals in electrical and electronic products, for example, measures of the type in the European Union Restriction of Hazardous Substances Directive (RoHS)
- Hazardous chemical ingredient disclosure across supply chain and the consumer right to know chemicals of concern (such as the European Union REACH Substances of Very High Concern) in electrical and electronic products
- Green electrical and electronic product procurement initiatives that can be supported by:
 - Completing a survey of national green electrical and electronic product procurement initiatives
 - Developing guidelines for effective green electrical and electronic products procurement initiatives
 - Training stakeholders in green procurement
 - Promoting good governance and transparency in green electrical and electronic products procurement initiatives
- National development policy plans that integrate and prioritize sound management of hazardous substances and waste management systems
- National/regional electrical and electronic products eco-label programs that integrate hazardous chemical reduction, elimination and substitution in electrical and electronic products
- Educational programs that raise awareness among the general public on the need for recycling electrical and electronic products and understanding concerns with hazardous chemicals in electrical and electronic products
- Extended Producer Responsibility (EPR) policies that are optimized by:

⁸ Such strategies and actions may happen at the upstream or downstream stage of the life cycle. Upstream actions may include: reduce chemical use by lowering the volume of chemical in the product (for example, reduce mercury content in compact fluorescent light); provide information across the supply chain; describe why alternatives are unavailable; and support research and development into alternatives. Downstream actions may include: adopting eco-design attributes such as design for disassembly, design for recyclability, and design for longer life; increasing collection rates; adopting extended producer responsibility measures; or specifying waste treatment.

- Identifying barriers to reuse and take back and propose policies that address those barriers, including: culture, costs, hazardous chemicals in products, dilution of hazardous chemicals in the waste stream, and producers are not taking full responsibility for products
- Documenting experiences in countries implementing EPR
- Promoting further implementation in developing countries / countries that are only importers of products; recognize that EPR implementation is different in developing countries; producer responsibility to create take back programs in all countries

The Upstream Workgroup made additional observations on the challenges not addressed above, on the drivers for addressing hazardous substances in electrical and electronic products and the key stakeholders that need to be engaged in the upstream issues of electrical and electronic products.

Challenges not addressed above

Governments and all stakeholders should take note of the following challenges in the upstream part of the electrical and electronic product lifecycle which have not been addressed in the points above:

- Implementing hazard reduction in Small- and Medium-sized Enterprises is difficult
- Electronic waste includes complex materials: some of which have value, much of which does not have value; valuable metals are extracted and the rest is “disposed”, containing chemicals of concern
- When new safer products replace old hazardous products in some markets, the old hazardous products may be transferred into other markets
- Organizations may place a low priority on considering the toxicity of chemicals in the product design of electrical and electronic products
- Different countries regulate electrical and electronic products differently
- Lack of common and agreed upon principles for managing hazardous substances in electrical and electronic products
- Some businesses implement electrical and electronic policies differently across regions

Drivers for addressing hazardous substances in electrical and electronic products

Governments and all stakeholders should take note of the following drivers for addressing hazardous substances in electrical and electronic equipment:

- Regulations

- Business leaders and activities by industry leaders
- Procurement, purchasing
 - Government
 - Business
- Consumer demand such as purchasing by individual consumers
- International Standards, for example, International Organization for Standardization (ISO), Association Connecting Electronics Industries (IPC)
- Collaborative efforts across supply chain
- SAICM implementation and country coordination
- Resource scarcity and resource conservation
- Information transparency / disclosing chemicals in products
- Profits and need to create recovery systems that create value (downstream)

Stakeholders that should engage in upstream issues

The following stakeholders should engage in upstream issues of electrical and electronic products:

- Businesses
- Governments
- International organizations
- Universities
- Research institutes
- Industry organizations, for example: standard setting bodies, industry consortia, trade associations
- NGOs including public interest, consumer, and civil society organizations
- General public

B. Midstream recommendations

Aware that the manufacture of electrical and electronic products has increased dramatically over the past several decades and that there are now billions of electronic and electrical products produced and consumed throughout the world;⁹

Recognizing that the manufacture of electrical and electronic products relies on and uses thousands of chemicals and other materials, many of which are hazardous;

Aware that hazardous substances contained in consumer electrical and electronic products can include phthalates, metals such as chromium, lead, and mercury, and persistent organic pollutants such as certain flame retardants, as well as other carcinogens, mutagens, reproductive and developmental toxins and endocrine disrupting compounds;¹⁰

Recalling the need for transparency with respect to information on hazardous substances throughout the entire life cycle, and in particular those contained in electrical and electronic equipment and products as well as in the workplace and communities around extraction, production and disposal sites;^{11 12}

Aware that the manufacture of electronic products can pose severe negative impacts on health of workers and communities as well as the environment where these products are made and disposed of⁹;

Recalling the need to protect workers and community health all throughout the life-cycle of electrical and electronic products from extraction through materials processing to component manufacture to assembly to recycling and disposal^{11 12};

Aware that there is a lack of capacity to properly address and to provide adequate protection from the hazards of electronics production in an environmentally sound manner in many countries leading to the exposure to hazardous substances causing harm to human health and the environment;¹³

Recognizing the pressing need for the continued development of clean technology¹³;

Recalling that it is important to consider product stewardship and extended producer responsibility aspects in the life-cycle management of electronic and electrical products¹³;

⁹ SAICM/ICCM.2/INF/36 Background information in relation to the emerging policy issue of electronic waste.

Recommendations on hazardous substances within the lifecycle of electrical and electronic products by participants in the African regional meeting on implementation of the Strategic Approach to International Chemicals Management, Abidjan, Côte d'Ivoire, 25- 29 January 2010

¹⁰ SAICM/ICCM.2/INF/36 Background information in relation to the emerging policy issue of electronic waste

¹¹ Recommendations on hazardous substances within the lifecycle of electrical and electronic products by participants in the African regional meeting on implementation of the Strategic Approach to International Chemicals Management, Abidjan, Côte d'Ivoire, 25- 29 January 2010

http://www.saicm.org/documents/meeting/afreg/Abidjan%202010/Advance%20report%20of%20the%203rd%20Africa%20reg%20mtg%20on%20SAICM_April%2025%202010.pdf

¹² Latin America and the Caribbean: Hazardous substances within the life cycle of electrical and electronic products

<http://www.saicm.org/documents/meeting/grulac/Jamaica%202010/LAC%20report-%20final%20clean.pdf>

¹³ Resolution II/4 on emerging policy issues adopted by the International Conference on Chemicals Management at its second session, held in Geneva, Switzerland, 11 to 15 May 2009

Recognizing important provisions with regards to workers in the Universal Declaration of Human Rights¹⁴ and International Labor Organization Convention 98 - Adopted by the International Labour Conference at its Eighty-sixth Session, Geneva, 18 June 1998 (Annex revised 15 June 2010);

Recognizing UNEP guidelines for the development of domestic legislation on liability, response action and compensation for damage caused by activities dangerous to the environment, including any adverse or negative effect or impact on human health;¹⁵

Recognizing the work of the International Conference on Chemicals Management at its Second Meeting and subsequent SAICM Regional Meetings held in 2009 – 2010;

The Participants of the International Workshop on Hazardous Substances Within the Life Cycle of Electronic and Electrical Products hereby recommends to the SAICM Open-ended Working Group and the International Conference on Chemicals Management at its third meeting (ICCM3) the following:

Environmentally sound manufacturing and capacity building

- 1) Governments, intergovernmental organizations, and non-governmental organizations including the private sector and others should encourage and promote sustainable production and pollution prevention by using cleaner production techniques, waste minimization, and safer substitutes whenever available;
- 2) The producers and manufacturers should prioritize reduction of exposure to chemicals, primarily by elimination or substitution of the most hazardous substances and production processes, especially those processes involving worker and community exposure to substances of concern. In the present context, substances of concern include those that are persistent, bioaccumulative and toxic and/or those that are carcinogens, mutagens, reproductive or developmental toxins, neurotoxins, neurodevelopmental toxins, respiratory toxins, immuno toxins, organ system toxins, and/or endocrine disrupting compounds. ;
- 3) Specific protection and prevention measures¹⁶:
 1. The employer should ensure that the risk from a hazardous chemical agent to the safety and health of workers at work is eliminated or reduced to a minimum.
 2. In applying paragraph 1, substitution should by preference be undertaken, whereby the employer should avoid the use of a hazardous chemical agent by replacing it with a chemical agent or process which, under its condition of use, is not hazardous or less hazardous to workers' safety and health, as the case may be.
 3. Where the nature of the activity does not permit risk to be eliminated by substitution, the employer should ensure that the risk is reduced to a minimum by application of protection and prevention measures. These will include, in order of priority:
 - (a) design of appropriate work processes and engineering controls and use of adequate equipment and materials, so as to avoid or minimise the release of hazardous chemical agents which may present a risk to workers' safety and health at the place of work;
 - (b) application of collective protection measures at the source of the risk, such as adequate ventilation and appropriate organizational measures;

¹⁴ (<http://www.un.org/en/documents/udhr/index.shtml>)

¹⁵ http://www.unep.org/dec/PDF/chemicalfinancing/Proceedings_K1060433_final%2011SSGCGMEF.pdf; note finalized in 2011 GMEF/GC = UNEP Governing Council / Global Ministers of Environment Forum

¹⁶ [Source: EU-Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work]

- (c) where exposure cannot be prevented by other means, application of individual protection measures including personal protective equipment.
- 4) The producers and manufacturers and chemical suppliers should conduct ongoing assessments of chemicals and materials used in products to implement green design and select safer substitutes.
 - A safer substitute is an alternative that reduces the potential for harm to human health or the environment
 - When reducing the use of substances of concern, select substitutes that are inherently safer than the substances they replace. Substitutes include safer chemicals, materials and products as well as eliminating the need for the chemical in the first place.
 - Create a list of preferred substitutes -- those that are inherently safer than chemicals of concern -- for electronic and electrical products.
 - Chemical substitutes should not have hazardous properties such as very persistent and very bioaccumulative (vPvB), persistent, bioaccumulative and toxic (PBT), carcinogen, mutagen, reproductive or developmental toxicant, neurotoxicant, or endocrine disruptor
 - 5) Producers and manufacturers should inventory all materials and chemical substances used throughout the life cycle (including conflict minerals and rare earth minerals), disclose these substances and share this information publicly and throughout the supply chain;
 - 6) Producers and manufacturers should phase out the use of substances of concern in their production when there are safer alternatives available;
 - 7) Producers, and manufacturers and chemical suppliers should provide funding for robust, independent and transparent research to develop safer substitutes and safer production processes;
 - 8) Environmentally unsound technologies and products that are prohibited or cause severe environmental degradation or are found to be harmful to human health should not be transferred to other countries¹⁷;
 - 9) If companies transfer technologies and products to subcontractors they should be environmentally sound and the companies should ensure that the subcontractors have the capacity to protect workers and the surrounding communities before making the transfer.
 - 10) Environmentally sound technologies and their technical transfer should be promoted by relevant intergovernmental, governmental, academic and non-governmental organizations and the private sector. The Cleaner Production Centres should play a guiding role in this process.
 - 11) Pollution prevention should be adopted in policies, management practices, programmes, and activities of governments as well as producers and manufacturers, taking into consideration the whole life cycle of the chemicals used in the production of electronic equipment;

¹⁷ Asia-Pacific Recommendations on hazardous substances within the life cycle of electrical and electronic products
<http://www.saicm.org/documents/meeting/asiapacific/Beijing%202009/Meeting%20docs/FINAL%20REPORT%20-%20Asia-Pacific%20regional%20meeting%20report.pdf>

Information

- 12) Information on health and safety for humans and the environment for the substances used in manufacturing of electronic and electrical products and present in products should not be considered confidential;
- 13) Producers and manufacturers should provide ongoing understandable and free health and safety information to workers which is sufficient to protect safety and health; governments have the role to enforce provision of health and safety information to workers.
- 14) Producers and manufacturers should provide to consumers easily understandable information on substances of concern in EEE as well as information about their sound disposal.
- 15) Producers and manufacturers should cooperate with government, non-governmental organizations, trade unions, health care providers, and others to provide ongoing training to workers, community representatives and first responders to provide early warning systems about the inherent hazards of the materials being used, detailed information about best practices for protection from and reduction of exposure to those hazards, how to recognize early signs of adverse health impacts, and prevention of exposure to all hazards
- 16) Governments, intergovernmental organizations, and non-governmental organizations including the producers and manufacturers and others should promote full transparency with respect to information on hazardous substances found throughout the lifecycle of electronic and electrical products, including those used in production, those contained in electrical and electronic equipment, those found in the workplace and communities, as well as those found around recycling, waste and disposal sites, including smelters¹⁸¹⁹;
- 17) Governments should formulate, promote, and implement policies requiring the public disclosure of the identity of chemicals and materials used in production and manufacturing of electronic and electrical products, those released during production, as well as those that end up in products; this disclosure should include health and safety information about the hazard traits and exposure traits of such chemicals and materials¹⁸.
- 18) Governments, intergovernmental organizations, and non-governmental organizations including the producers and manufacturers and others should formulate, promote, and implement legislative as well as voluntary initiatives to adopt and implement Pollutant Release and Transfer Registries (PRTR). Governments that have not yet ratified the

¹⁸ Recommendations on hazardous substances within the lifecycle of electrical and electronic products by participants in the African regional meeting on implementation of the Strategic Approach to International Chemicals Management, Abidjan, Côte d'Ivoire, 25- 29 January 2010
<http://www.saicm.org/documents/meeting/afreg/Abidjan%202010/Advance%20report%20of%20the%203rd%20Africa%20reg%20mtg%20on%20SAICM%20April%2025%202010.pdf>

¹⁹ Latin America and the Caribbean: Hazardous substances within the life cycle of electrical and electronic products
<http://www.saicm.org/documents/meeting/grulac/Jamaica%202010/LAC%20report-%20final%20clean.pdf>

Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters are encouraged to do so.

Exposure and monitoring

- 19) Governments should formulate, promote, and implement health-based exposure limits for workers. These exposure limits are to be based on thorough and adequate hazard testing of all chemicals and mixtures used and produced throughout the life cycle. Producers, manufacturers and suppliers of chemicals are responsible for performing these tests. Exposure limit values should be protective of the most vulnerable populations, and should provide equal protection in the workplace and the community; In cases where data are not yet sufficient to develop a health-based exposure limit value, the precautionary principle should be applied, namely by eliminating exposure to chemicals or reducing it as low as possible.
- 20) Producers and manufacturers, with oversight by the government and the full participation of worker and community representatives should ensure (and report the results to appropriate governmental authorities of):
 - a. comprehensive, occupationally relevant health surveillance for all of its workers;
 - b. comprehensive ongoing industrial hygiene and environmental monitoring to measure the release and exposure to all hazardous materials used in manufacturing and production;
 - c. access to these data (and adequate funding) to ensure comprehensive and independent epidemiological assessments of worker health;
 - d. action plans to preserve and protect worker health based on these data.
 - e. in situations where pollution from electronics production facilities has been found in surrounding communities, the manufacturers and producers should cooperate with health researchers and investigators to assess and control adverse health impacts, especially with respect to vulnerable populations.
- 21) Governments should promote the establishment, continuous improvement of and adequate funding of national inspection and enforcement systems for the protection of workers from the adverse effects of chemicals and encourage cooperation between employers and workers (and their representatives) to maximize chemical safety and minimize workplace hazards;
- 22) The producers and manufacturers²⁰, with oversight from government, should provide workers and surrounding communities with all occupational and environmental health monitoring protocols and records including the extent and duration of each person's exposure, as well as health outcomes data, corporate health records, and other relevant records, while making sure to protect confidentiality for each individual;
- 23) The producers and manufacturers should ensure protection of individual confidentiality for monitoring and exposure data;

Health surveillance and disease prevention

- 24) The ILO in collaboration with World Health Organization and Governments are invited to provide financial and technical resources for a) occupational health training of healthcare providers b) for better recognition and treatment of diseases associated with the

²⁰ In those situations when there are industrial parks and entities with similar management structures, the same provisions should apply to such entities

electronics industry and c) tracking of diseases associated with substances used in the electronics industry

- 25) National governments are invited to collaborate with ILO to collect and report worker health information specific to the electronics industry. EEE companies, trade unions and other actors should be encouraged to contribute to this process.
- 26) The ILO in collaboration with World Health Organization are invited to develop coordinated systems for record keeping, tracking, and reporting for disease relative to occupation in the electronics industry. Countries should be encouraged to ratify the ILO convention 155 regarding Occupational Safety and Health
- 27) The ILO in collaboration with World Health Organization are invited to intensify coordination with Ministries of Health and Labor in identifying, examining, and reporting patterns of disease associated with work in electronics industries;

Work environment

- 28) Governments should guarantee that workers have the right to collectively bargain as a fundamental human right, guaranteed by the Universal Declaration of Human rights (adopted in 1948 by the United Nations; the right to bargain collectively is subsumed under the rights to freedom of association and the right to organize into a trade union -- see Articles 20 and 23). The right to organize and bargain collectively is explicitly covered under International Labor Organization Convention 98 adopted in 1949. Pursuant to these rights, all workers involved in each stage of the life cycle of electronics production should have the right to:
 - form unions and to organize for self-protection;
 - to form health and safety committees;
 - to receive training to develop the capacity to monitor and enforce effective health and safety protections in the workplace;
 - to refuse unsafe or unhealthy work; and the right to be protected from retaliation for exercising those rights (right-to-act and “whistle-blower” protection)²¹;
- 29) Governments, producers and manufacturers with the full participation of workers and their representatives should enhance and implement ILO safe work standards and ILO guidelines on occupational safety and health, with special care for vulnerable or precarious workers, including women and migrants;
- 30) The producers and manufacturers are encouraged to develop frameworks to promote the active and meaningful participation of all stakeholders in the sound management of chemicals and wastes, including community representatives, non-governmental organizations, managers, workers, and trade unions;
- 31) The producers and manufacturers should promote and implement a work environment which protects of workers and community health all throughout the life-cycle of electrical and electronic products from extraction through materials processing to manufacture to recycling and disposal; all hazard communication and training should be conducted in appropriate languages of the workers¹⁸¹⁹²²²³.

²¹ <http://www.ilo.org/declaration/lang--en/index.htm> for the full range of ILO protections

²² Asia-Pacific Recommendations on hazardous substances within the life cycle of electrical and electronic products
<http://www.saicm.org/documents/meeting/asiapacific/Beijing%202009/Meeting%20docs/FINAL%20REPO RT%20-%20Asia-Pacific%20regional%20meeting%20report.pdf>

²³ Central and Eastern Europe region Recommendations on hazardous substances within the life cycle of electrical and

- 32) Governments are encouraged to develop and implement policies promoting the internalization of the costs (and discouraging the externalization of the costs) to human health, society and the environment throughout the life cycle of electronic and electrical products, including extraction, materials processing, production, assembly, recycling and disposal;
- 33) Governments are encouraged to develop and implement effective liability and compensation legislation for the victims of toxic exposures in the workplace and the community. Given that the electronics industry is characterized by multiple chemical exposures to chemicals of concern, many of which are in addition inadequately tested and regulated, and the frequent changes in process chemicals, it is particularly important to develop compensation systems funded by the employers that are designed to address these inherent challenges to fair compensation by developing mechanisms that assure that workers harmed by such exposure qualify for adequate and timely compensation, as well as treatment and rehabilitation.

electronic products

http://www.saicm.org/documents/meeting/cee/Lodz%20Dec%202009/SAICM%20CEE3_final%20report.pdf

C. Downstream recommendations

1. Policy

1.1. Governments, business, and all other relevant stakeholders are urged to promote integrated policies on the environmentally sound management of e-waste, ensuring the involvement of health, labour and waste management sectors and considering the needs of local communities.

1.2. Mechanisms must be provided to ensure coordinated implementation of and cooperation between the relevant Multilateral Environmental Agreements (MEAs) and intergovernmental bodies.

1.3. Policies and perhaps legislation should be developed in order to provide disclosure and communication of the composition and risks involved in constituents of EEE to recyclers and the public.

1.4. The improvement of the working conditions in the informal economy taking into account the social and economic dimensions, its transition to the formal economy, and promoting professional recognition of the informal services is a matter of urgency.

1.5. It is necessary to ensure that the national waste management plans of all countries address the issue of hazardous chemicals in WEEE.

1.6. It is vital to promote policies calling for the prevention of exports of hazardous WEEE to developing countries and countries with economies in transition.

1.7. Coordination and cooperation between intergovernmental organizations, the participation of the civil society, and all other relevant stakeholders is necessary to solve the problem of hazardous chemicals and their impacts at end-of-life.

1.8. It is vital to consider the special circumstances of small islands developing states (SIDS) in particular in providing regional collection and disposal services and policies for WEEE.

1.9. Governments, national and local, should lead the way in setting the best examples for legal, responsible and environmentally sound WEEE management for those wastes generated by the government itself.

1.10. Ensure that national strategic action plans for the environmentally sound management of hazardous chemicals in WEEEs are developed.

1.11. Governments must develop and apply government procurement policy that promote "cleaner" EEE being purchased and used whenever possible.

1.12. The introduction of requirements for preventing and controlling the export and import of unwanted near-end-of-life e-products, in particular to developing countries and countries with

economies in transition, is necessary.

2. Legislation

2.1. All efforts must be made to ensure ratification and then national implementation (domestication) of all of the relevant Conventions and International Instruments related to minimizing, managing and prohibiting use of hazardous chemicals and wastes. Legislation must assign clear responsibilities and provide for adequate enforcement capacity.

2.2. It is vital that all governments develop regulatory legislation for the environmentally sound management of WEEE that provides a high level of protection with regard to the environment, occupational health, safety policies, and is consistent with international law and standards for communities, workers and businesses in the recycling field.

2.3. Legislation is needed in all countries to ensure and provide funding for the remediation of contaminated sites and communities.

2.4. The establishment of within the World Customs Organization (WCO) of harmonized tariff codes for the various fractions of electronic waste is essential in order to get much needed data on hazardous and other WEEE trade flows. Much of this work can be initiated at a national level.

2.5. Legislation is necessary to provide transparency to recyclers and the public on the constituents of chemicals in WEEE and hazardous characteristic testing data.

2.6. The Basel Convention and national governments need to develop harmonized legislation/policy to distinguish between Electronic and Electrical Equipment (EEE), problematic used Electronic and Electrical Equipment and Waste Electronic and Electrical Equipment (WEEE) in order to control trade in these in accordance with the Basel rules.

2.7. All countries should create legislation (e.g. Extended Producer Responsibility legislation) that places responsibility on manufacturers to take financial responsibility for WEEE arising on a national basis that serves to internalize the costs and provide competitive incentives for brands to make products with less negative impacts on the environment.

3. Enforcement

3.1. Enforcement of ILO Conventions and MEAs is paramount.

3.2. Enforcement is needed to better control the import and export of hazardous wastes including WEEE, that provides for monitoring and strategic targeting of “hot spots” including collectors, recycler facilities, smuggling routes, canals, ports, and border crossings.

3.3. It is essential that there is effective and maintained collaboration between environmental agencies, customs, police, and other relevant national regulatory bodies in order to ensure enforcement of trade and environmental laws.

3.4. To effectively enforce the Basel Convention and national implementation of it, collaboration and communication is needed between regions, and within regions and governments through bodies such as INTERPOL and INECE and the World Customs Organization.

3.5. There is a need of capacity building for customs, enforcement institutions, in particular in developing countries and countries with economies in transition (for e.g. prevention of illegal traffic, safety for workers, etc).

3.6. Authorities should take action against illegal traffickers and exporting countries to ensure proper repatriation and subsequent management of illegal waste shipments.

3.7. Legislation should be considered to assist in converting the informal recycling sector into a formal sector.

3.8. Legislation finding liability and providing compensation to the public and workers to polluters and illegal traffickers in waste is encouraged.

3.9. Manuals and other educational and operational tools should be developed to implement international waste trade rules to help strengthen the capacity of inspectors and customs and border and port police.

4. Voluntary Approaches/Cooperate Social Responsibility

4.1. Voluntary Industry take-back programmes should always be transparent, free for the public, and include increasing recycling rates over time. They should be designed to give green design a competitive advantage, and be compliant with national law.

4.2. Voluntary Industry take-back programmes should be applied in all countries/regions of the world where extended producer responsibility legislation does not yet apply in order to assure that WEEE is collected and properly recycled.

4.3. Voluntary certification programs for recyclers, for environmental management systems etc. should be encouraged. Such Certifications should always supplement legislation and not be used as a substitute for legislation.

4.4. Guidelines for the environmentally sound management of WEEE (for recycler, disposers, waste managers, etc) such as those produced by StEP, PACE UNIDO and ILO should be promoted.

5. Information / Awareness-raising

5.1. Each country should undertake an inventory of EEE and WEEE related to the volumes production, use, export, import, and wastes generated.

5.2. All Stakeholders and especially governments should development mechanisms to disseminate information to the public regarding hazards in EEE and WEEE and to network such information between regional organizations working to prevent harm from WEEE and prevent illegal and harmful trade in WEEE.

5.3. An effort to raise awareness and educate all key stakeholders including producers, supply chain actors, workers in the formal and informal sectors, households, media, academic institutions, policy makers, regulators and enforcement officers, civil society, regarding the problem of WEEE and its hazards.

5.4. Disclosure of hazardous chemicals in EEE must be made available by manufacturers and provided to all national governments which in turn would make readily available to the public to ensure safe and ESM of WEEE. Governments should produce an inventory and warning mechanisms as appropriate based on this information.

5.5. Shipping companies should be encouraged to disseminate and exchange information with governments enforcers regarding bills of lading to better control illegal exportation of WEEE.

6. Capacity-building

6.1. The promotion of capacity building for the safe and environmentally sound management of WEEE in developing countries and countries with economies in transition is of utmost importance. In particular there is a need to provide assistance in order to facilitate the transformation of the informal WEEE recycling sector to the formal sector while maintaining employment.

6.2. All governments and other stakeholders should be encouraged to undertake assessments of national and regional capacity needs for ESM of WEEE and to ensure effective coordination of capacity building activities on the national, regional and global level.

6.3. All stakeholders including governments should be encouraged to identify, establish and strengthen mechanisms and tools for training WEEE recyclers including the informal sector and local communities impacted by informal WEEE recycling operations.

6.4. Assistance is needed especially from the Parties to the Basel Convention, BCRCs, NGOs, IGOs, SBC, SAICM and others for developing countries and countries with economies in transition to ratify the Basel Convention and its Amendment and Protocol and then to develop or strengthening legislation on the implementation of these instruments.

6.5. Assistance is necessary for the implementation of international rules and regulations regarding export/import of WEEE and their ESM should be undertaken by organizations and governments including SBC, Basel Parties, IMPEL, INECE, INTERPOL, Green customs, and the BCRCs.

7. International and regional cooperation

7.1. Regional and inter-Regional cooperation should be undertaken to improve enforcement, information exchange, best practices, etc. In this regard special attention to the needs of Small Island Developing States (SIDS) in collection, transport, interim storage and re-export of WEEE is appropriate.

7.2. Regional and international waste and chemicals Conventions and instruments should be ratified at the earliest opportunity.

7.3. The work, including training, awareness, institutional building, pilot projects, of the Basel and Stockholm regional and coordinating centers and partnerships such as PACE should be supported and funded by all stakeholders.

8. Synergy approach

8.1. Effective synergies among existing and future chemicals and waste conventions, programmes and partnerships including those involving SAICM, DESA, UNIDO, ILO, WHO UNEP, UNDP, CSD etc. should be encouraged.

8.2. Governments are also encouraged to replicate synergies at the national and regional level.

8.3. Efforts should be made to recognize and utilize a multiple stakeholder/multi-sector approach.

8.4. Effective synergies on enforcement (police, customs, shipping lines, etc) should be encouraged and utilized.

9. Research and Development

9.1. Further research and development on technology options for the sound and safe recycling, reuse, recovery of WEEE must be funded and encouraged.

9.2. Further research on the environmental and health impacts of WEEE must be funded and encouraged.

9.3. Research is needed on how to deal with plastics containing BFRs, LEDs, photo cells, lithium ion batteries, rare earth metals, and other fractions currently not being adequately recycled, or for

which recycling capacity is disappearing such as cathode ray tube (CRT) glass.

10. Investment and fund raising opportunities

10.1. Governments and other stakeholders should provide enabling national and international conditions to mobilize resources for ESM of WEEE and remediation of contaminated sites, occupational health and safety infrastructure in particular for capacity building in developing countries and countries with economies in transition.

Annex 3: Key messages of the International Workshop on Hazardous Substances within the Life-cycle of Electrical and Electronic Products

The mandate of the International Workshop on Hazardous Substances within the Life-cycle of Electrical and Electronic Products was to identify and assess where issues relating to the sound management of chemicals arise during the lifespan of electrical and electronic products and to develop a series of options and recommendations for future work which would be provided to the SAICM Open-ended Working group and the International Conference on Chemicals Management at its third session for its consideration and possible cooperative actions.

At this workshop a series of recommendations on upstream, midstream and downstream issues have been developed. The participants of this workshop recognized the following:

1. Preventing harm to human health and the environment from hazardous substances in the life-cycle of electrical and electronic products is essential.
2. The life-cycle approach in the sound management of chemicals found in electrical and electronic products is of key importance.
3. The expected growth in the electrical and electronic sector and the need for its long-term sustainability will require making parallel and proportional improvements in environmental, health and safety, and social justice attributes.
4. Solutions are most efficiently and effectively accomplished upstream and addressing problems upstream can significantly and positively impact other parts of the life-cycle.
5. An increased pace to implement green design and the phase-out of hazardous substances contained in electrical and electronic products is required.
6. The improvement of transparency with respect to information on hazardous substances used in electrical and electronic products for all stakeholders involved in the life-cycle, including consumers, workers, and in communities around manufacturing and disposal sites is necessary.
7. It is important to equally protect consumer, worker and community health throughout the life-cycle of electrical and electronic products.
8. The urgent need to reverse the disproportionate burdening faced by developing countries during the more damaging phases of the life-cycle of electrical and electronic products, including manufacture, trade, waste handling and management, is recognized.
9. The export of hazardous electrical and electronic waste from developed to developing countries and countries with economies in transition need to be prevented; and export and import of near-end-of-life electrical and electronic products should be controlled.

10. The development and implementation of effective policy and regulatory frameworks and techniques for the safe and environmentally sound management of electrical and electronic waste, and for the remediation of contaminated sites should be encouraged.
11. The development and implementation of best practices and capacity for safe and environmentally sound recycling, including those fractions that are currently not recycled or for which capacity is inadequate, is needed.
12. The different needs of certain regions, e.g. Small Islands Developing States, should be taken into account.
13. Countries should ratify the Stockholm Convention, the Rotterdam Convention, the Basel Convention, the Basel Ban Amendment, ILO conventions and other relevant instruments and transpose these into national laws and implement them.

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