

ANNUAL REPORT

2012 / 2013



TABLE OF CONTENTS

S. 4 PREFACE

S. 6 SOLVING THE E-WASTE PROBLEM (StEP) INITIATIVE: A MULTI-STAKEHOLDER APPROACH

S. 10 MEMBERSHIP

S. 14 ORGANIZATION

- a. Steering Committee
- b. General Assembly
- c. Secretariat
- d. Task Forces
- e. Regional Focal Points

S. 20 TASK FORCE 1: POLICY

- a. General TF1 description and 2012/2013 updates
- b. Green Paper: Transboundary Movements of Discarded Electrical and Electronic Equipment
- c. Green Paper: E-waste in China: A country report
- d. White Paper: E-waste Definitions
- e. White Paper: E-waste Prevention, Take-back System Design and Policy Approaches

S. 24 TASK FORCE 2: REDESIGN

- a. General TF2 description and 2012/2013 updates
- b. Design for Recycling: Feasibility Assessment and Recommendations
- c. External projects with StEP member involvement
 - i. Upgrade – Improved valorization and integrated recovery of trace metals in Waste Electrical and Electronic Equipment (WEEE)

S. 28 TASK FORCE 3: REUSE

- a. General TF3 description and 2012/2013 updates
- b. Sustainable e-waste management system in Ethiopia
- c. Re-Evaluate Project: An Update
- d. Re-use Potential Project: An Update
- e. Re-use Dataset Project
- f. White Paper: The Effect of Waste Legislation on Transboundary Movements EEE Destined for Re-use

S. 34 TASK FORCE 4: RECYCLE

- a. General TF4 description and 2012/2013 updates
- b. MIT/NCER e-waste Monitoring Methodology
- c. Calculation Tool for e-waste Dismantling Facilities: An Update
- d. Green Paper: Standards for Collection, Storage, Transport and Treatment of e-waste
- e. CRT Recycling in Developing Countries
- f. PhD Thesis on Material Flows
- g. External projects with StEP member involvement
 - i. Sustainable Recycling Industries (SRI) Project

S. 40 TASK FORCE 5: CAPACITY BUILDING

- a. General TF5 description and 2012/2013 updates
- b. StEP ADDRESS: Quantification Activities
 - i. WAIT Project: WEEE Arising in Italy
 - ii. Recupel: WEEE Arising in Belgium
- c. StEP E-waste Academy (EWA)
 - i. E-waste Academy – Scientists edition (EWAS)
 - ii. E-waste Academy – Managers edition (EWAM)
- d. External projects with StEP member involvement
 - i. WAIT Project: WEEE Arising in Italy
 - ii. Recupel: WEEE Arising in Belgium

S. 48 StEP ORGANIZED AND SUPPORTED EVENTS

PREFACE

Ever since the first widely accepted definition of 'sustainable development' was published in the Brundtland Report following the World Commission on Environment and Development in 1987, the world has been taking strides in shifting global consumption and production patterns to more sustainable levels. In order to enable a paradigm shift toward sustainability, interdisciplinary approaches and strategies have to be developed addressing societal, environmental and economic elements in an integrated, holistic manner.

Using this as a guiding framework, the Solving the E-waste Problem (StEP) Initiative continued to make significant impacts in the sustainable management of e-waste in 2012. In order to tackle the e-waste problem from a scientific, multi-stakeholder perspective, one must be able to know the size of the challenge – how much e-waste is out there and how fast is this waste stream growing? Contributing to the overarching StEP ADDRESS strategy, for the first time comprehensive, verifiable data on e-waste volumes has been generated and made available by individual StEP members. Such invaluable information on waste electrical and electronic equipment (WEEE), electrical and electronic equipment (EEE) put on the market and consumer behaviour patterns will be readily accessible in a dynamic StEP World Map set to go live in 2013. Then, the scientific community, policymakers and other e-waste stakeholders will have access to comprehensive, complete e-waste country scenarios as well as the country studies and further information on legislation and societal aspects.

Simultaneously, StEP continued in 2012/2013 to address design aspects, with special attention to design for disassembly, design for re-use and design for end of life. With smart product design, products can be more easily disassembled and materials liberated at pre-processing phases of the value chain. Moreover, strategies such as dematerialization and substitution could enable product functionality with less materials and in many cases, longer life spans and more energy-efficient products. As e-waste legislation already exists in many developed countries, StEP has continued to support the developing world in developing sound and effective legislation.

StEP has again addressed multiple aspects of the pre- and end-processing stages of the life cycle, with particular attention to the developing world. Through a synthesis of existing end of life management standards, StEP published a content-rich, holistic analysis of the various standards and recommendations on strengths and bottlenecks in 2012. Now it is working to convert this study into a White Paper providing a practical and easily referenced check-list for policymakers. Additionally, StEP agreed at the 2012 General Assembly to tackle the ongoing CRT recycling dilemma in developing countries by synthesizing existing literature, conducting analysis on CRT amounts and developing subsequent management options in developing countries.

In order to effectively disseminate results and enable an ongoing knowledge transfer to various e-waste target groups, StEP added three more

publications to its White and Green Paper series in 2012 as well as organized the first ever E-Waste Academy – Managers edition (EWAM) for policy-makers and small and medium sized enterprises taking a geographical focus on Africa. Building off of the success and momentum of this pioneering capacity building event, StEP will organize a 2nd EWAM in El Salvador in Spring 2014. Addressing knowledge transfer and training of the research community, StEP re-branded its highly successful E-waste Summer School for PhD and post-doctoral researchers to the E-Waste Academy – Scientists edition (EWAS). The funding for a 4th edition to take place in Switzerland in Winter 2013 has already been secured. It is clear that throughout 2012/2013 StEP has continued to prioritize the knowledge building of a broad range of e-waste stakeholders in order to truly contribute to sustainable e-waste management.

We hope that this 2012/2013 summary of StEP projects and activities will provide you with a better understanding of StEP's global position as the leading steward of change and demonstrate StEP's unique, multi-stakeholder approach toward sustainability along the entire e-waste life cycle.

Stephanie Adrian, Chair StEP Steering Committee
Ruediger Kuehr, Executive Secretary StEP Initiative

Washington D.C./Bonn, October 2013



Stephanie Adrian, Chair StEP Steering Committee



Ruediger Kuehr, Executive Secretary StEP Initiative

SOLVING THE E-WASTE PROBLEM (StEP) INITIATIVE: A MULTI-STAKEHOLDER APPROACH

Electronics have revolutionized and enhanced the way our world functions. Electrical and electronic equipment (EEE) has enabled quick and efficient communication, fostered the ubiquitous diffusion of knowledge to bridge the digital divide, contributed to advancements in public health as well as added elements of comfort in our everyday lives. At the same time, electronics require large amounts of materials and energy at all stages of the life cycle; from the primary production of raw materials, to manufacturing, ultimately to their use and re-use phases and subsequent disposal at end of life (EoL). The result: increasing digitization, more complex products and a fast growing waste stream with various adverse environmental and workers' health impacts if not addressed and handled appropriately.

There are both challenges and opportunities in the management of e-waste. From a resources perspective, EEE contain a wide array of materials ranging from precious metals (e.g. platinum, gold, silver), rare earth and critical metals (e.g. neodymium, indium, tantalum) but also commodities (e.g. steel, plastics) and hazardous substances (e.g. lead, cadmium, CFCs). Inherently, these materials do not pose a threat; it is when they are improperly handled along the waste electrical and electronic equipment (WEEE) value chain that adverse impacts arise.

Such impacts range from environmental and ecological degradation caused by improper EoL management to human health hazards associated with crude 'backyard' recycling practices but also economic implications such as loss or dissipation of resources due to low collection rates and impro-

per recycling. When the entire e-waste system is taken into consideration, holistic and effective solutions can be developed to reduce detrimental impacts and exploit e-waste opportunities.

Because of this there was a profound need for robust analysis and a global dialogue from a neutral, science-based standpoint in order to engage all relevant stakeholders and develop sustainable solutions at all stages of the WEEE life cycle. This ultimately led to the establishment of the StEP Initiative in late 2004 which has grown to a 65-member initiative today, with members coming from industry, international organizations, governments, NGOs, research, academia etc.

Since its official launch in 2007, StEP has steered and supported the international e-waste discourse through its members and activities. By acting as a steward of change, StEP offers a neutral, interdisciplinary platform to its members in order to foster concrete and solutions-oriented discussion and develop and carry out research, demonstration and dissemination projects and activities. Some noteworthy milestones include the development of the StEP White and Green Paper series, the establishment of the Best of 2 Worlds (Bo2W) philosophy combining manual dismantling in developing countries with state-of-the-art recycling in industrialized countries, the highly successful E-waste Academies and organization as well as support of international e-waste events and conferences. StEP's success results out of the pro-active engagement and invaluable contributions from its members towards the sustainable management of e-waste along the entire life cycle.



StEP'S CONCRETE OBJECTIVES CAN BE POSITIONED UNDER FOUR PILLARS DETAILED BELOW:

1. E-WASTE RESEARCH & PILOTING:

- Conduct and publish scientific research to inform knowledge and policymaking
- Steward and promote positive change in the use of natural resources
- Research the design of systems, processes and management practice
- Support the piloting of problem-solving ideas through to implementation
- Monitor and analyze product-to-recycler supply chain effectiveness

2. STRATEGY & GOAL SETTING:

- Develop durable strategies and recommendations that can be modified to fit local boundary conditions
- Describe, define and document best e-waste practices worldwide
- Leverage member expertise to define optimization potential and goals by industry sector

3. TRAINING & DEVELOPMENT:

- Develop StEP training activities for multi-sector e-waste players
- Define the standards and design the syllabus for training
- Organize capacity-building and employee training modules
- Further develop the interdisciplinary StEP E-waste Academy

4. COMMUNICATION & BRANDING:

- Design and write publications to broaden audience understanding and deepen their understanding
- Raise awareness about issues and opportunities in e-waste prevention, processing and disposal
- Engage with National Governments and the international community on legislation development

MEMBERSHIP

StEP membership is generally open to all organizations that commit to pro-actively participate in StEP activities. StEP membership offers unique opportunities including but not exclusively:

- Expert stakeholder collaboration with individual StEP members and StEP's extended network
- Access to new markets through global networking
- Cooperation in a truly science-based, multi-stakeholder platform
- Privileged access to the most current e-waste updates on global policy developments, advancements in technology, scientific data
- Unique influence on a systems-oriented research agenda
- Shaping future global e-waste strategies and integrated approaches toward e-waste system design

In order to join StEP, a potential member must apply through the StEP Secretariat and is required to sign the StEP Memorandum of Understanding, which lays down the key principles and objectives of the StEP Initiative while also completing an application form. These prospective StEP members will need to elaborate on their expectations from a StEP membership and how they will contribute to the overall StEP mission. All membership applications are reviewed by the StEP Steering Committee and then voted upon by all StEP members in the regular General Assemblies.

From a financial perspective, StEP relies solely on member contributions and successful project acquisitions. The members' annual monetary

contribution is based on the type of organization and their size.

For small companies, research institutes, associations or NGOs, in particular from newly industrializing and developing countries, an associate membership is available with a reduced annual contribution of at least EUR 500 per year (associations of commercials are expected to make an annual contribution similar to large OEMs as stated above). This is especially for members who are contributing to a specific project only or don't have the financial capacity to be a full member. Associate members have access to StEP information and scientific databases and contribute to project work, though they are not permitted to vote at StEP's decision making bodies including the General Assemblies.

In exceptional cases where a StEP member is not in the position to make the annual monetary contribution, the case will be reviewed by the StEP Steering Committee which may ultimately decide to waive the annual contribution for that year. However, because of StEP's unique funding scenario, waivers must be justified and are not intended to be a permanent solution. In the case that a waiver is granted, the respective member must contribute to the overall progress of the StEP Initiative through in-kind contributions; this can be via content related contributions to a project or any other service.

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 electrical and electronic equipment and their corresponding global supply, process and material flows.
3. StEP's research and pilot-projects are meant to contribute to the solutions 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- and energy-efficient re-use and recycling practices around the globe in a socially responsible manner.

ANNUAL CONTRIBUTIONS:

TYPE OF ORGANIZATION	AMOUNT
Large-size companies	EUR 12,000
Medium-size companies	EUR 6,000
Small-size companies (including micro-enterprises)	EUR 1,200
All other members	EUR 1,200

MEMBERS



StEP MEMBERS (as of July 2013)

FULL MEMBERS:

- (29) Austrian Society for Systems Engineering and Automation (SAT)
- (47) Basel Convention Coordinating Centre for Asia & the Pacific (BCRC China)
- (45) Basel Convention Coordinating Centre for Training and Technology Transfer for the African Region (BCCC-Africa), University of Ibadan
- (21) BIO Intelligence Service S.A.S.
- (46) Centre for Environment and Development for the Arab Region and Europe (CEDARE), Egypt
- (49) Chiho-Tiande (HK) Limited
- (5) Cisco Systems, Inc.
- (16) Compliance and Risks
- (20) Dataserv Group Holdings Ltd.
- (18) Datec Technologies Ltd.
- (33) Delft University of Technology
- (7) Dell
- (37) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
- (42) Ericsson
- (59) Fecaclub-UNESCO
- (32) Flection
- (41) Fraunhofer Institute for Reliability and Microintegration (FHG-IZM)
- (14) GAIKER Foundation
- (54) Griffith University
- (4) Hewlett-Packard (HP)
- (36) Institute for Applied Ecology (Öko-Institut)
- (56) International Telecommunication Union (ITU)
- (57) KERP research
- (9) Kevoy Community Development Institute (KCDI)
- (12) Massachusetts Institute of Technology (MIT) – Materials Systems Laboratory



THE StEP INITIATIVE

			
(13)	Memorial University		
(17)	MicroPro Computers		
(44)	Morocco Cleaner Production Centre (CMPP)		
(10)	National Center for Electronics Recycling (NCER)		
(43)	Nokia		
(34)	Philips Consumer Lifestyle Sustainability Center		
(39)	PT Plus KG		
(55)	Renewable Recyclers		
(3)	Reverse Logistics Group Americas (RLGA)		
(25)	Secretariat of the Basel Convention (SBC)		
(35)	Sims Recycling Solutions		
(1)	Secretariat of the Pacific Regional Environment Programme (SPREP)		
(28)	Swiss Federal Laboratories for Materials Testing and Research (EMPA)		
(27)	Swiss State Secretariat of Economic Affairs (SECO)		
(6)	The Sustainability Consortium		
(53)	Thai Electrical and Electronics Institute		
(40)	Technische Universität Braunschweig, Institute of Machine Tools and Production Technology		
(22)	Télécom École de Management		
(30)	Umicore Precious Metal Refining		
(26)	United Nations Conference on Trade and Development (UNCTAD)		
(24)	United Nations Environment Programme / Division of Technology, Industry and Economics (UNEP/DTIE)		
(52)	United Nations Industrial Development Organization (UNIDO)		
(51)	United Nations University (UNU)		
(11)	United States Environmental Protection Agency (US-EPA)		
(15)	University of Limerick		
(19)	University of Northampton (UoN), The Centre for Sustainable Wastes Management		

NEW MEMBERS IN 2013:

- (58) Basel Convention Regional Centre for Central America and Mexico (BCRC-CAM)
- (14) Ministry of the Environment Japan, Office Waste Disposal Management, Department of Waste Management and Recycling
- (60) Technische Universität Berlin, Institut für Technischen Umweltschutz, Fachgebiet Abfallwirtschaft (Chair of Solid Waste Management)
- (62) Plataforma de Residuos Eléctricos y Electrónicos para Latinoamérica y el Caribe (RELAC Platform)
- (48) Dismantling and Recycling Centre Vienna (DRZ)
- (61) WEEE Help
- (44) WorldLoop



ASSOCIATE MEMBERS:

- (23) ENDA Europe
- (31) Global e-Sustainability Initiative (GeSI)
- (50) Korean Institute of Geoscience and Mineral Resources (KIGAM)
- (8) Vertmonde Cia. Ltd.



ORGANIZATION

Hosted by the United Nations University Institute for Sustainability and Peace, Operating Unit SCYCLE (UNU-ISP SCYCLE) since 2007, StEP Initiative is a multi-stakeholder network of actors under the UN umbrella. The chief institutional objective of UNU-ISP SCYCLE is to enable societies to reduce the environmental load of the production, use and disposal of especially but not exclusively, electrical and electronic equipment to sustainable levels through the development and promotion of independent, comprehensive and practical research as a sound basis for policy development and decision making. In this sense StEP projects and activities directly contribute to fulfilling a core research mandate of SCYCLE as such.

STEERING COMMITTEE

Within StEP there are various key organizational organs whereby their interdependencies ensure a streamlined, results-oriented initiative. The Steering Committee is responsible for monitoring the overall progress and representing StEP members in various strategic decision making processes. The StEP Steering Committee comprises seven StEP

members, each member elected by the General Assembly for a two-year term and one ex-officio member from United Nations University. The Steering Committee comprises the following stakeholder groups:

- Two manufacturers/assemblers/purchasers
- One recycler/refurbisher
- One UN organization/affiliated organization
- One academia/research affiliated organization
- One governmental organization/development cooperation
- One NGO/not-for-profit organization
- One ex officio member from United Nations University

Each Steering Committee member will serve as the acting Chair with this role rotating among the Steering Committee members every six months (1 January and 1 July).

STEERING COMMITTEE MEMBERS FOR THE 2012 – 2014 TERM:



Stephanie Adrian, United States
Environmental Protection Agency
(US-EPA) (Chair since 1 July 2013)



Christina Meskers,
Umicore Precious Metals Refining
(Chair 1 July – 31 December 2012)



Per Doefnaes, Ericsson



Rolf Widmer, Swiss Federal
Laboratories for Materials Testing
and Research (EMPA)



Smail Alhilali, United Nations Industrial
Development Organization (UNIDO)



Jean Cox-Kearns,
Dell



Hossam Allam, Centre for Environment
and Development for the Arab Region
and Europe (CEDARE)



Ruediger Kuehr,
United Nations University,
Ex-Officio

THE StEP INITIATIVE

GENERAL ASSEMBLY

The General Assembly is the collective decision making body of the StEP Initiative. The General Assembly takes place physically once per year and is kindly hosted by a StEP member. At each General Assembly, all StEP members vote on decision proposals and new StEP members, agree on seed-funding allocation in each Task Force, participate in brainstorming break-out sessions and workshops, and ultimately establish the research agenda and crucial priority areas for the year to come. Additionally, this is the platform where the Secretariat presents the financial and institutional summary from the previous year and

the forecast for the year to come. A virtual General Assembly is taking place mid-term in order to provide updates to the plenum on interim activities and results, re-visit pending issues, discuss prioritization areas and maintain momentum leading up to the next General Assembly. This also puts all members into the position to at least participate once per year in a General Assembly.

StEP SECRETARIAT

The StEP Secretariat functions as the internal and external operations hub of the StEP Initiative with

StEP REGIONAL FOCAL POINTS

The primary purpose of the StEP Regional Focal Points is to serve as a link between the StEP Secretariat and StEP members, activities and issues in their corresponding regions.

1. NORTH AMERICA: Jeremy Gregory and Randy Kirchain, Materials Systems Laboratory (MSL) at the Massachusetts Institute of Technology (MIT), USA
2. MIDDLE EAST AND NORTH AFRICA: Hossam Allam, Centre for Environment and Development for the Arab Region and Europe (CEDARE), Egypt
3. SOUTH EAST ASIA: Chirapat Popuang, Electrical and Electronics Institute (EEI), Thailand
4. EAST ASIA: Jinhui Li, Basel Convention Coordinating Centre for Asia and the Pacific (BCRC China), and Tsinghua University, China
5. SOUTH PACIFIC: Sunil Herat, Griffith University, Australia
6. StEP SECRETARIAT: Ruediger Kuehr, UNU, Bonn, Germany



a physical location at the UN premises in Bonn, Germany. It coordinates and manages the flow of information and relevant developments among the StEP Task Forces and members. The Secretariat is also responsible for the executive management, administration and daily operational work of the Initiative and serves as the liaison between United Nations agencies and the individual StEP members. In addition it assists the Task Forces, particularly in stakeholder dialogues, development of publications, marketing, networking, liaising and fundraising.

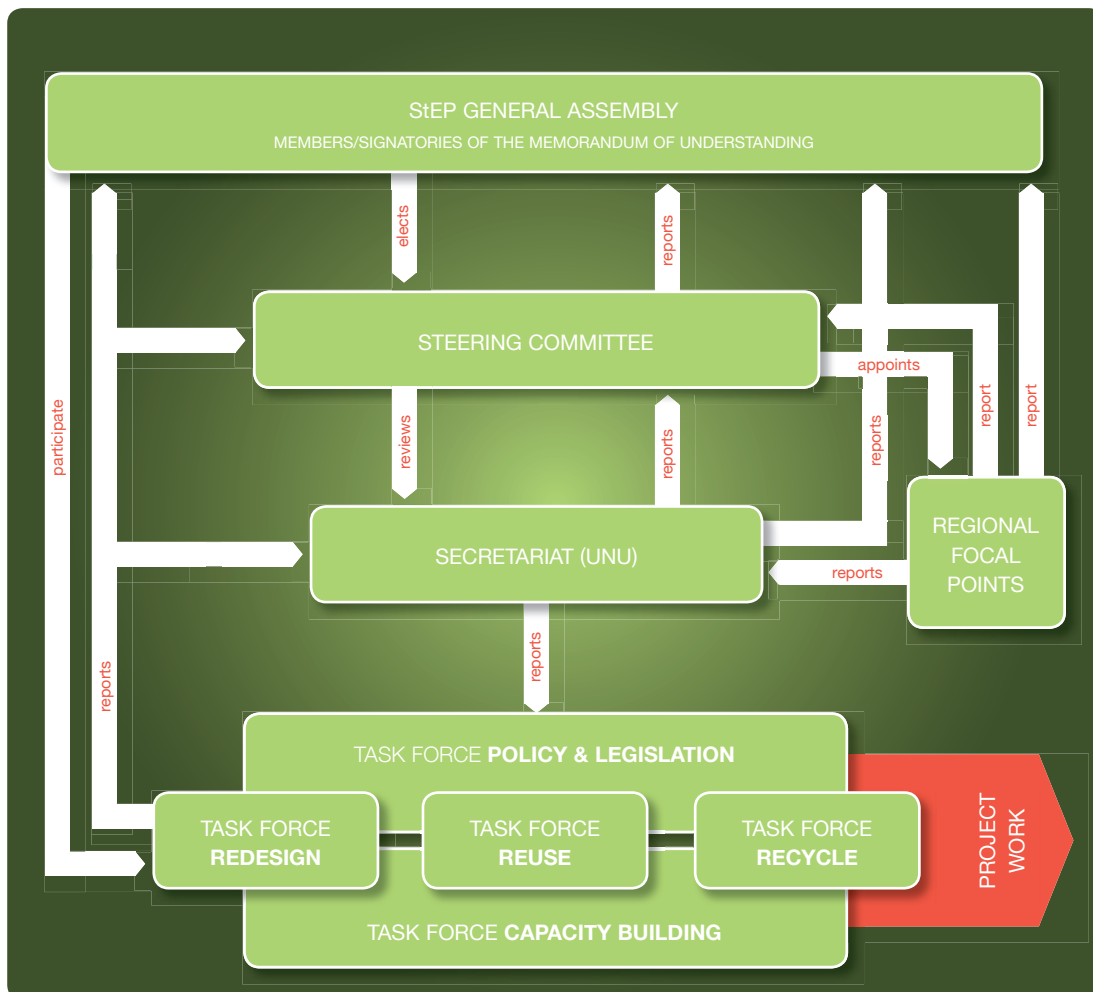
The Secretariat is headed by the Executive Secretary, who serves as the chief academic project and administrative officer, responsible for the

overall management of StEP and its strategic progress towards overarching objectives.

STEP TASK FORCES

Because StEP takes a life cycle, systems approach toward the development of sound solutions to the global e-waste dilemma, StEP's projects and activities are carried out and assessed in its five Task Forces. Each Task Force addresses one core component along the entire WEEE value chain whereby the seed-funded projects, pilot demonstrations, activities and targeted results of one task force substantially overlap and serve as

StEP ORGANIGRAM

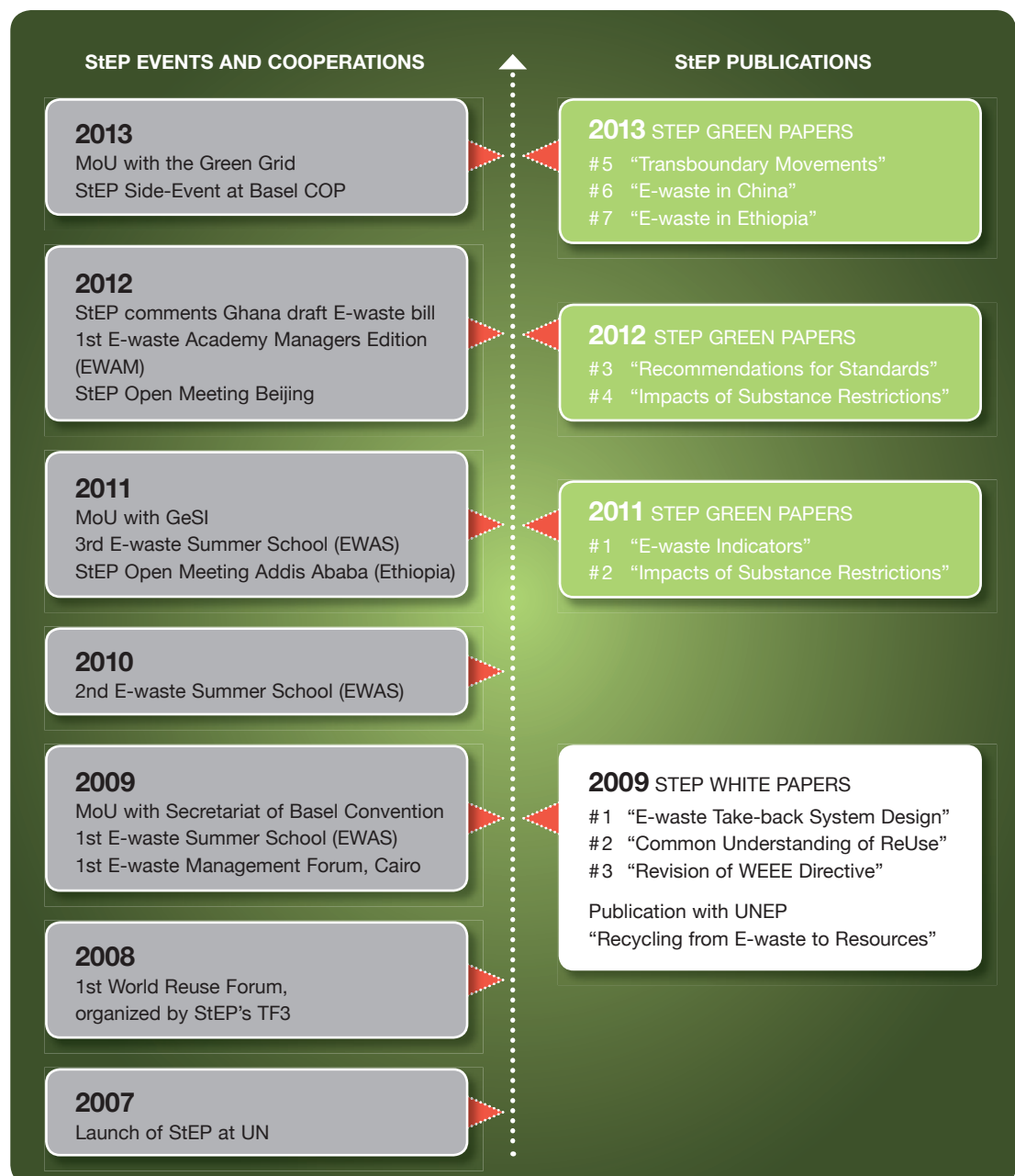


THE StEP INITIATIVE

invaluable inputs to other Task Forces. Each Task Force is coordinated by two StEP members who are responsible for representing and maintaining the momentum of the respective Task Force, ensuring its projects and activities are in line with the agreed-upon work plan established at the

General Assembly and are responsible for overall coordination of the Task Force and its members. As laid out in the Memorandum of Understanding, each StEP member actively contributes to at least one Task Force by implementing, managing or supporting Task Force projects.

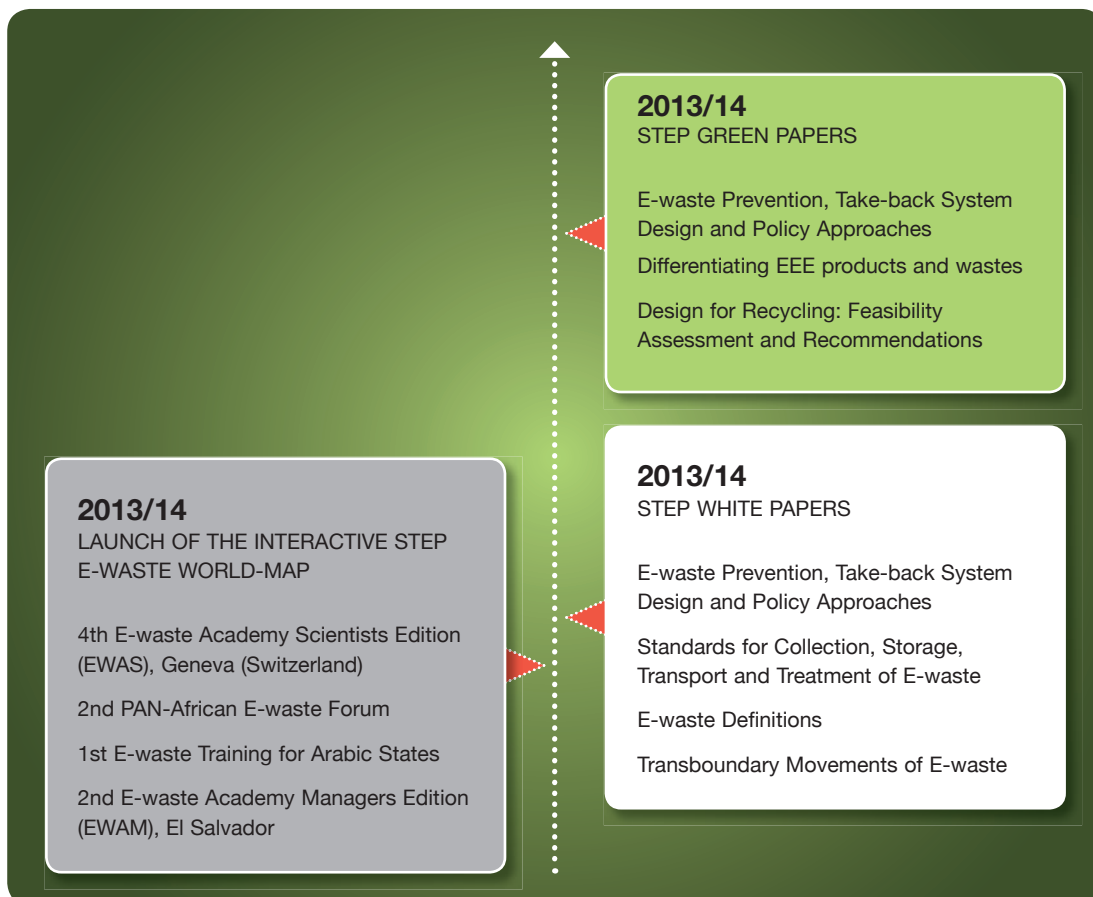
STEP MILESTONES 2007 – 2013



“Since the EGG 2004+ where the idea of developing StEP was sharpened by a dozen of stakeholders it has become a world-wide recognized initiative involving actually more than 65 from around the globe.”



UPCOMING MILESTONES



POLICY

GENERAL TF1 DESCRIPTION AND 2012/2013 UPDATES

A cross-cutting Task Force that receives results from other Task Forces and in turn provides the analytical policy and legislative framework to the other four Task Forces, Task Force (TF) Policy aims to analyze national legislation and the international political framework for meeting the principles of sustainability, effective controlling and enforcement while also elaborating on effective policy instruments supporting eco-design, re-use and viable recycling practices. At the practical level, Task Force Policy comments on existing policies and legislation, disseminates White and Green Papers on e.g. system design and science-based recommendations to the research community and e-waste practitioners.

At the 2012 General Assembly hosted by Philips in Amsterdam, Ruediger Kuehr of UNU stepped down as a Task Force Policy Co-coordinator after 5 years of service with Jonathan Perry of Dell being elected and subsequently approved by the StEP Steering Committee to join Cédric Gossart of Telecom Ecole de Management as Task Force Co-coordinator.

In 2012 Task Force Policy continued to report on and analyze existing legislative approaches and particular policy instruments related to WEEE. TF Policy used the outcomes of these analyses to explore and evaluate recommendations related to applicable solutions to the e-waste problem in both developed and developing countries. In addition TF Policy continued facilitating inter-regional knowledge transfer of policy development among its members through sharing regional policy updates and activities of developing and existing policy. It has disseminated results and

outputs from previous projects through StEP publications, such as the Green Paper on e-waste indicators and another on scarce metals.

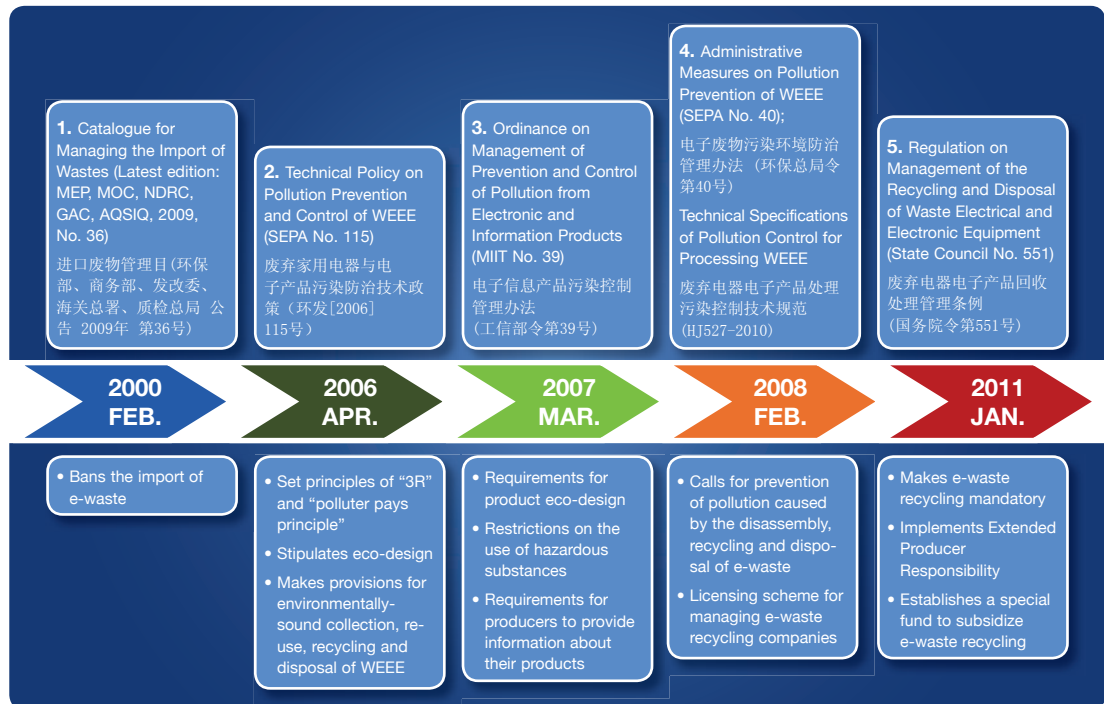
TF Policy has successfully submitted one new seed-funded project to the StEP Steering Committee which will allow a subgroup to revise the 2009 White Paper on 'E-waste Take-Back System Design and Policy Approaches' taking a developing country approach as well as the incorporation of a short policy brief for policymakers. Taking an integrative approach, TF Policy will build off of previous StEP projects and publications such as the White Paper on 'E-waste Definitions' and the Green Paper on 'Transboundary Shipments of E-waste'. All three projects have been producing results and will continue to be key areas of focus in the work of TF Policy throughout 2013.

GREEN PAPER: TRANSBOUNDARY MOVEMENTS OF DISCARDED ELECTRICAL AND ELECTRONIC EQUIPMENT



TF Policy supported the development of the Green Paper authored by Djahane Salehabadi of Cornell University to describe, quantify and assess global trajectories of discarded electrical and electronic equipment (EEE). It builds on primary archival and trans-cultural research while incorporating the results from secondary sources such as recent studies and reports on global flows. Furthermore, it reviews key international, regional and national legislative frameworks and their guidelines that regulate the transboundary flows of this material stream. Finally, the paper describes and analyzes the drivers of export, as well as the various loopholes and leakages that

TASK FORCE 1: POLICY



Green Paper on E-waste in China: Key e-waste legislation in China.

facilitate the global flow of used and end-of-life electronics, better known as 'e-waste'.

A follow-up, policy-oriented White Paper with scientific-supported recommendations will be developed as a next step. The StEP seed-funded Green Paper was published in Spring 2013 and can be downloaded from the StEP website.

GREEN PAPER: E-WASTE IN CHINA: A COUNTRY REPORT

As one of the world's largest exporters of electrical and electronic equipment (EEE) and importers of waste electrical and electronic equipment (WEEE) worldwide, China plays a key role in the social, economic, environmental and material life cycle of much of the world's electrical and electronic equipment. As a result of increased Chinese and worldwide consumption and turnover of EEE, China is now facing serious e-waste problems from both growing domestic generation and foreign imports. This report supported by the StEP members and authored by Feng Wang of

UNU, Ruediger Kuehr of UNU, Daniel Ahlquist of UNU and Jinhui Li of Tsinghua University presents a comprehensive review of the extant e-waste problems, e-waste flows, the state of the informal and formal e-waste collection and recycling sectors, legislative progress and relevant stakeholders in China. Information and data sources include published national statistics, reports, research papers, project documents and expert interviews. The Green Paper was published in Spring 2013 and can be downloaded from the StEP website.

WHITE PAPER: E-WASTE DEFINITIONS

Identified as a crucial and fundamental aspect by the StEP General Assembly, TF Policy has continued to further develop a common 'e-waste' definition for approval by all StEP members. Building off of the three-phase methodology for carrying out this research, TF Policy developed an elaborate inventory of existing e-waste definitions. Second, this was discussed and assessed from academic and practical perspectives in



order to benefit from existing e-waste definitions, learn from pitfalls and bottlenecks and subsequently avoid duplication of existing definitions. Lastly, using the results of an internal questionnaire, TF Policy further scoped out a working definition, leading to the need for both a definition of 'e-waste' and 'waste'. Based on this accumulated data, a StEP definition of "e-waste" and "waste" along with other required supporting sub-definitions are in the final stages of completion and the results will be disseminated in a White Paper in 2013.

WHITE PAPER: **E-WASTE PREVENTION, TAKE-BACK SYSTEM DESIGN AND POLICY APPROACHES**



In order to contribute to the ongoing developments in global e-waste policy development, a TF Policy subgroup was established to update the 2009 StEP White Paper on 'E-waste Take-Back System Design and Policy Approaches' with particular focus on developing countries. The aim will be to disseminate a concise, yet comprehensive set of policy design recommendations to be considered at the policymaking level.

Such recommendations will comprise effective policy tools and instruments, collection systems, financing mechanisms and overarching tools that may be used to operate such take-back systems. The completed seed-funded White Paper will be endorsed by all StEP members and is expected to be published in 2014.

TF POLICY PUBLICATIONS

GREEN PAPERS:

- Transboundary Movements of Discarded Electrical and Electronic Equipment
- E-waste in China: A country report

TF POLICY CO-COORDINATORS:



Duncan McCann, WEEE Help
(since April 2013)



Jonathan Perry, Dell



Cédric Gossart, Telecom Ecole
de Management (until April 2013)

REDESIGN



President of Ireland Michael D. Higgins, launches iameco v3 PC, designed to minimize IT waste (Source: MicroPro).

GENERAL TF2 DESCRIPTION AND 2012/2013 UPDATES

Committed to carrying out design-oriented research, Task Force ReDesign addresses the complexities associated with product design, especially eco-design elements and design for recycling and re-use, design for disassembly and design for end of life (EoL). One of the chief priorities of this Task Force is phasing out hazardous materials and identification of substitutions for critical metals. Additionally, Task Force ReDesign looks at design decisions and their energy impacts during the use and re-use phases.

In 2011 and continuing in 2012, conceptual work on obstacles and solutions for post-consumer plastics for new electrical and electronics products was initiated and yielded a sound project proposal, which was submitted to various funding programmes on the European and Member State levels. Moreover, the UPgrade project, an ongoing

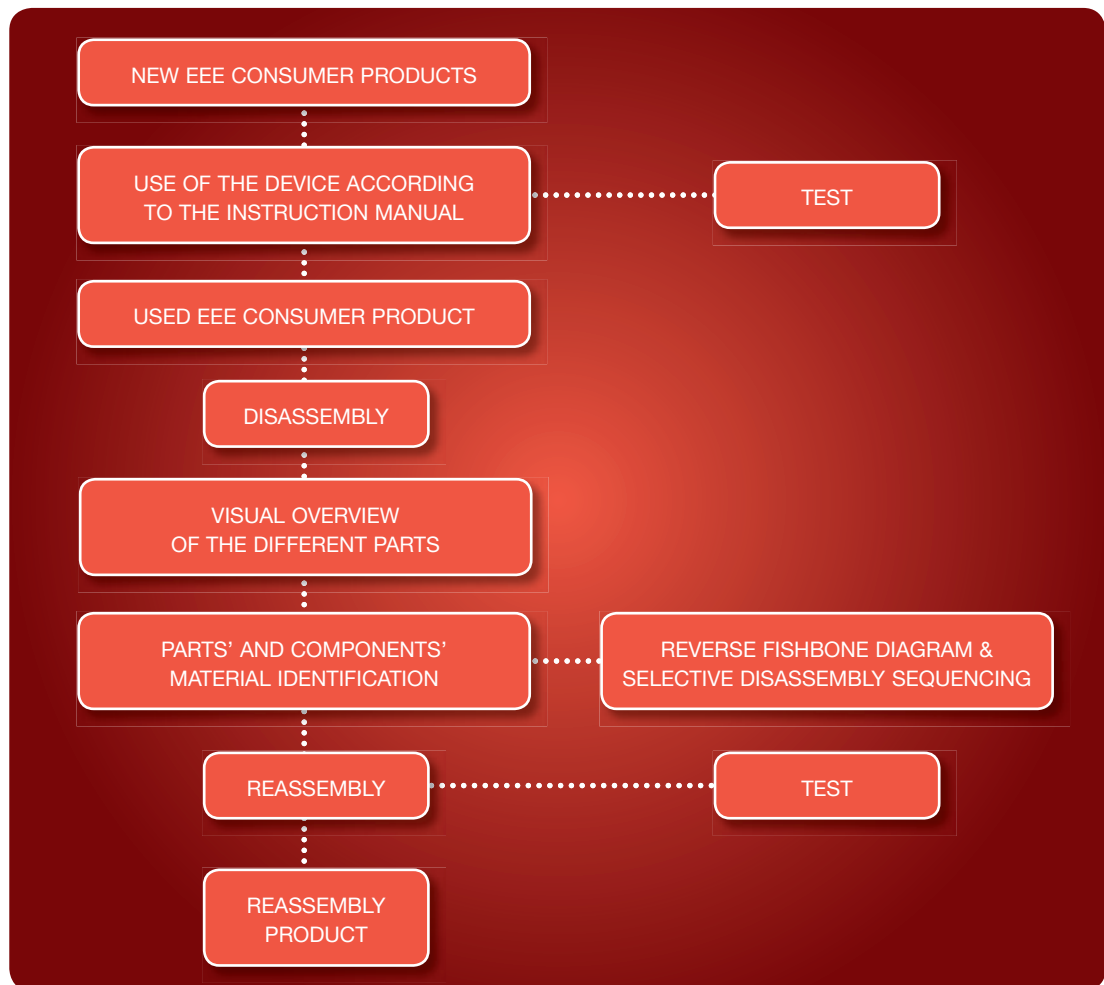
project including various StEP members, kicked off in August 2012 and activities and results will be shared with Task Force ReDesign, especially in the work package dedicated to the design for recovery of critical metals expected to be carried out in 2013/2014.

DESIGN FOR RECYCLING: FEASIBILITY ASSESSMENT AND RECOMMENDATIONS

This TF2 seed-funded project executed by Delft University of Technology aims to demonstrate the feasibility to integrate design for refurbishment, recovery and recycling (DfR) criteria into marketable products, to formulate recommendations about what standards should be considered and to use the knowledge to secure external funding to expand the research. The project will be carried out in three modules detailed below.



TASK FORCE 2: REDESIGN



Case study methodology looking at a various design methodologies for a coffee machine.

MODULE 1

The chief objective of the first step of this seed-funded project is to demonstrate the relevance and most importantly, the potential to integrate DfR strategies into electrical and electrical equipment using the example of a case study – an eco-friendly television. A material analysis will be carried out as a first step followed by the design reconsiderations of flat panel televisions using the EU Eco-design Directive as a guiding policy framework. Final research report from this module is expected in Autumn 2013.

MODULE 2

Carried out in parallel with the research activities in module 1, this second step of the project will synthesize the above research results into sound, science-supported recommendations for product redesign to support reuse of used and electrical and electronic equipment through the incorporation of sound standards. Final presentation of results will be disseminated in a 3rd party workshop.

MODULE 3

Further reaching objective will be to streamline and optimize the resulting recommendations to ultimately secure external funding to expand this innovative research. Funding has already been secured with the Ellen MacArthur Foundation and Schmidt Family Foundation with TF2 securing a place in its pilot year. The concrete plan will be the development of a week-long summer school in London in Summer 2013 with a focus on design for disassembly.



Karsten Schischke, Fraunhofer IZM



David Peck, Delft University of Technology

EXTERNAL PROJECTS WITH StEP MEMBER INVOLVEMENT:

UPGRADE - IMPROVED VALORIZATION AND INTEGRATED RECOVERY OF TRACE METALS IN WASTE ELECTRONIC AND ELECTRIC EQUIPMENT (WEEE)

The UPgrade project (2012-2015), funded by the German Federal Ministry of Education and Research (BMBF), aims at enhanced recovery of critical and trace metals from waste electrical and electronic equipment (WEEE) along the entire value chain by developing new liberation and separation steps (e.g. mechanical, thermal, che-

mical) sufficiently considering the technological requirements of final recovery processes.

The research approach is based on creating a value substances register for WEEE and experimental studies of technical and organizational processes to dissipate losses of trace metals in the current recycling system. The project is coordinated by the Technical University of Berlin. Project partners and subcontractors include fellow StEP members TU Berlin, Umicore Precious Metals Refining, Fraunhofer IZM, Sims Recycling Solutions and United Nations University.

REUSE

GENERAL TF3 DESCRIPTION AND 2012/2013 UPDATES

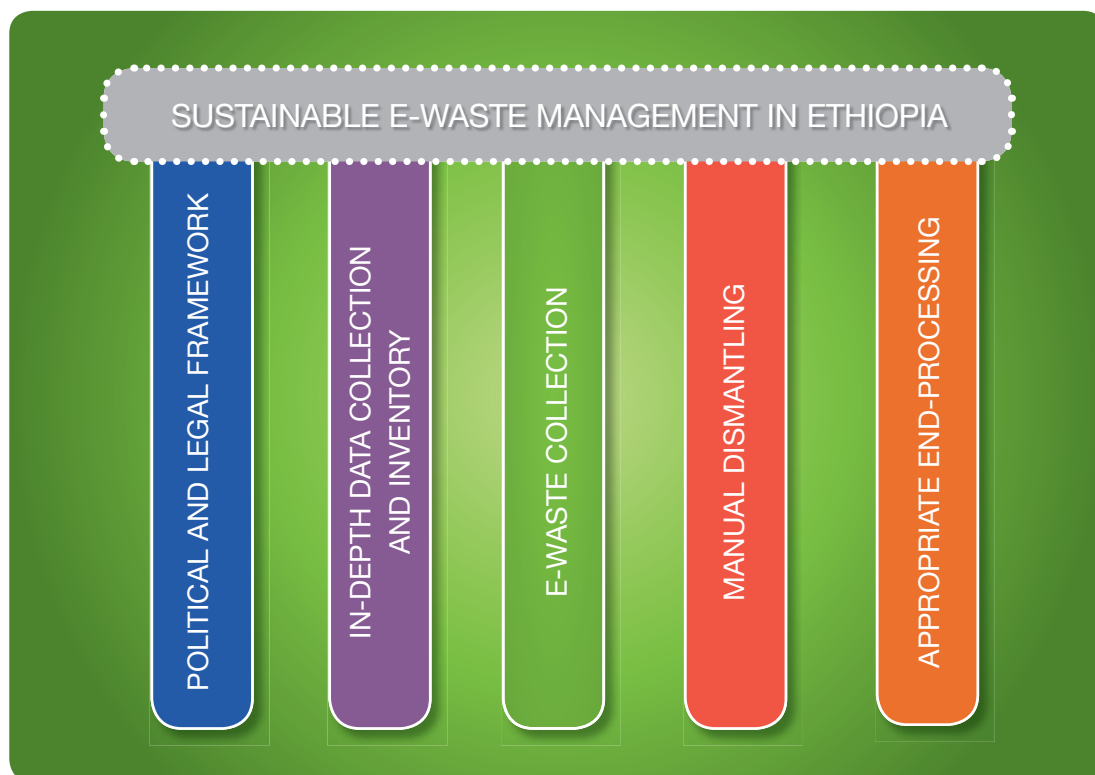
The primary goal of Task Force ReUse is to define globally consistent “re-use” practices, principles and standards for EEE ranging from business to business (B2B) and business to consumer (B2C) users that are economically, socially and environmentally viable. This inventory of effective principles addresses varying consumer behaviour and consumption patterns for harnessing broad re-use and product take-back acceptance, extending the life of a product and/or its components and minimizing the illegal transboundary flow of non-functioning goods to developing countries.

Throughout 2012 and 2013 TF ReUse has been active with updates to many existing projects, especially at the dissemination and policy levels while also exploring new re-use-oriented activities. Supported by the Global Environment Facility (GEF), further e-waste activities will be carried out in Ethiopia with the kick-off meeting in Spring 2013. Following up from the successful ‘Best Practices in Re-use’ project, the final report was submitted in two parts and accepted by the scientific journal, *Resources, Conservation and Recycling*; the publication can be downloaded [here](#) and [here](#). The Irish Environmental Protection Agency (EPA) funded Re-Evaluate project team was involved in fruitful consultative activities with

the Irish government aiming to provide the necessary re-use information required for the national transposition of the newly recasted WEEE Directive. Finally, TF Reuse has developed an in-depth report on current transboundary movement legislation and its impacts on flows of used EEE.

SUSTAINABLE E-WASTE MANAGEMENT SYSTEM IN ETHIOPIA

The Global Environment Facility (GEF) will co-fund the further work required to install an e-waste management system in Ethiopia with a contribution of USD 1 million. Further financial support and in-kind contributions will come from the Ethiopian Government and StEP Members US-EPA, Nokia and Dell, as well as from non-StEP member, Cascade Asset Management. UNIDO will function as the implementing agency with StEP and UNU taking on the international coordination of the project.



Main Components of the E-waste Management Project in Ethiopia.

The project started on 1 April 2013 and will run for two years.

The project objectives are:

- Set up a national e-waste strategy for Ethiopia comprising e-waste-related regulation, financing mechanisms, awareness raising, monitoring and control of the established system.
- Upgrade the Akaki Refurbishment and Demanufacturing Facility. This facility was established under an earlier World Bank project, but so far only works on refurbishment and dismantling of computers and is not connected to national or international downstream markets. The scope of activities will be expanded to other categories of electrical and electronic equipment, dismantling activities will be optimized, and a business plan will enable the economic sustainability of the activities.
- Regional approach: Other countries in Eastern Africa shall upgrade their e-waste-related activities as well. It is therefore effective and efficient to establish a regional cooperation and align the various activities.

In order to kick off project activities, UNIDO, StEP and UNU travelled to Addis Ababa on 18-20 April 2013 to discuss details of the project with the Ethiopian Government, recruit local staff to assist in carrying out project activities and to prepare the project kick-off meeting. The official project kick-off meeting was held on 17 and 18 April 2013, flanked by an Open National E-waste Stakeholder Forum to involve the Ethiopian public on 19 April. At the kick-off meeting, the project structure was agreed as well as the work plan for forthcoming results and deliverables.

AN UPDATE: RE-EVALUATE PROJECT

The Re-Evaluate Project, funded by the Irish Environmental Protection Agency (EPA), is being coordinated by the University of Limerick and supported by the social enterprises Rehab Recycle and Clondalkin Community Recycling Initiative, with UNU participating in the Steering Committee. The main objective of the project is to



Repair of mobile-phones in Accra (Ghana).
(Source: Nokia)



AN UPDATE: RE-USE POTENTIAL PROJECT

assess the re-use potential of used EEE with particular attention to broader application of re-use at the national level. Achievements thus far have been the development of the first Irish re-use centre in Tallaght thanks to the generous contribution from Rehab Recycle. Additionally, to further support ubiquitous re-use in Ireland, Rehab Recycle has been in discussions and consultations with the Irish WEEE compliance schemes in order to establish mechanisms for separating functioning used EEE from the WEEE waste streams. On a more technical level, there have been large modeling strides in the spatial assessment of environmental and economic benefits of re-using appliances compared to buying new EEE.

In late 2012, as a result of the Re-Evaluate project, Rehab Recycle and the University of Limerick were asked to chair a stakeholder consultation group on how re-use would be addressed in the Irish government transposition of the Recast of the WEEE Directive. This group has now reported and currently awaits to see if its findings are taken up in the legislation.

In order to assess where re-use activities have been generally successful or become part of the larger societal context, this project uses a variety of indicators to examine if certain countries or states have a considerable supply of goods available for refurbishment and if there is a high demand for refurbished goods. It does not imply that re-use is taking place in a complete optimal manner but juxtaposed against countries or regions where re-use of EEE is negligible.

Some of the countries and states being considered for the study include the UK, Belgium and the US state of Illinois. The project sought and will continue to elicit opinions towards re-use from a broad range of stakeholders, including re-use organizations, compliance schemes, regulators and producers. The study promises to uncover interesting contrasts and comparisons in both re-use approaches and attitudes between the EU and the US and within the two EU countries. Initial



Second hand auction of TVs in Bangkok (Thailand).
(Source: EEI)

observations denote the emphasis on re-use may be due to the strong role of the regulator in Belgium while the UK relied purely on a market driven system. Producers and retailers also expressed very little concern for the competition it offered to new products and observed that re-use had the effect of forging new markets. On the whole the Belgian system appeared to provide greater satisfaction at large as the policy and regulation-based approach permitted investment and long term planning by re-use stakeholders.

This project ended in Summer 2012 with results synthesized in a final report. More information can be requested from the StEP Secretariat.

the establishment of greater reseller confidence, increased consumer confidence and greater confidence to design for re-use.

This project sought to examine if the data available from the Self-Monitoring and Reporting Technology (S.M.A.R.T.) installed on the hard disk drives (HDDs) of end-of-life (EoL) computers can provide reliable data for better-informed re-use decisions. Using data acquired from the hard drives of 519 computers from Rehab Recycle, the project analyzed the Power On Hours, Power Cycle Count and Start/Stop count to discern critical attributes of a computers use phase.

During this project it has been demonstrated that it is possible to extract use phase information from a HDD that can be used to accurately communicate the manner in which a PC has been used during its first life cycle. A system whereby SMART attributes could be recorded during preparation for re-use and made readily available would support re-use markets through providing clear and reliable information about the PCs first use phase. This could be readily incorporated in commercial software products employed for HDD erasure.

This project ended in Summer 2012 with results synthesized in a final report. More information can be requested from the StEP Secretariat.



RE-USE DATASET PROJECT

Lifetime extension through re-use is frequently advocated as a viable area in which PCs can reduce their overall environmental impact in the immediate future. However, in spite of the emergence of a number of re-use operating models, there are still many barriers to the greater adoption of widespread or formal re-use infrastructures. Better availability of data on the life cycle and current health of PCs could lead to greater levels of re-use. More data would lead to greater signaling to secondary markets, which could lead to

WHITE PAPER:
**THE EFFECT OF WASTE
LEGISLATION ON TRANSBOUNDARY
MOVEMENTS OF EEE DESTINED
FOR RE-USE.**

This report evaluates the current trans-frontier shipment legislation and its influence on the movement of used electrical and electronic equipment (UEEE) destined for re-use and refurbishment, especially addressing the electronic refurbishment industries' point of view. It does so by examining (i) current international trans-frontier shipment and e-waste legislation, (ii) case study experiences from electronic industry stakeholders based on survey and interviews and (iii) various models and practices adopted by re-use organizations to handle the proliferation of electrical and electronic equipment (EEE). The report identifies three priority areas obstructing re-use organizations' movement of used EEE across the globe: (i) discrepancies in legislation and enforcement between developed and developing countries, (ii) legislative limitations and (iii) the valuation of used EEE. Based on these evaluations the report authors propose five key recommendations to resolve such issues:

1. Identification of specific policy amendments for the current trans-frontier shipment legislation.
2. The establishment of national e-waste and re-use policies within developed and developing countries.
3. The development of a comprehensive database to harmonize legislation liaisons between developed and developing countries.
4. The expansion of recycling and dismantling facilities in developed and developing countries, using the informal recycling sector as a valuable element.
5. The introduction of a regulated green e-waste transboundary channel.

TF Re-use will further discuss the results from this project in order to identify thematic areas on which further work can be carried out in 2013/2014.



Colin Fitzpatrick, University of Limerick



John Dickenson,
Reverse Logistics Group Americas (RLGA)

RECYCLE

GENERAL TF4 DESCRIPTION AND 2012/2013 UPDATES

Concerned with electronics once they reach their end of life (EoL), Task Force ReCycle aims to enhance both pre- and end-processing infrastructures, systems and technologies that facilitate sustainable recycling practices within a level playing field. Task Force ReCycle takes into account the disparities in the developed and developing world in order to extrapolate effective solutions depending on various boundary conditions and capacities. From a science-based perspective, Task Force ReCycle initiates international, inter-stakeholder cooperative activities and dialogues in order to generate economically, environmentally and socially sound solutions.

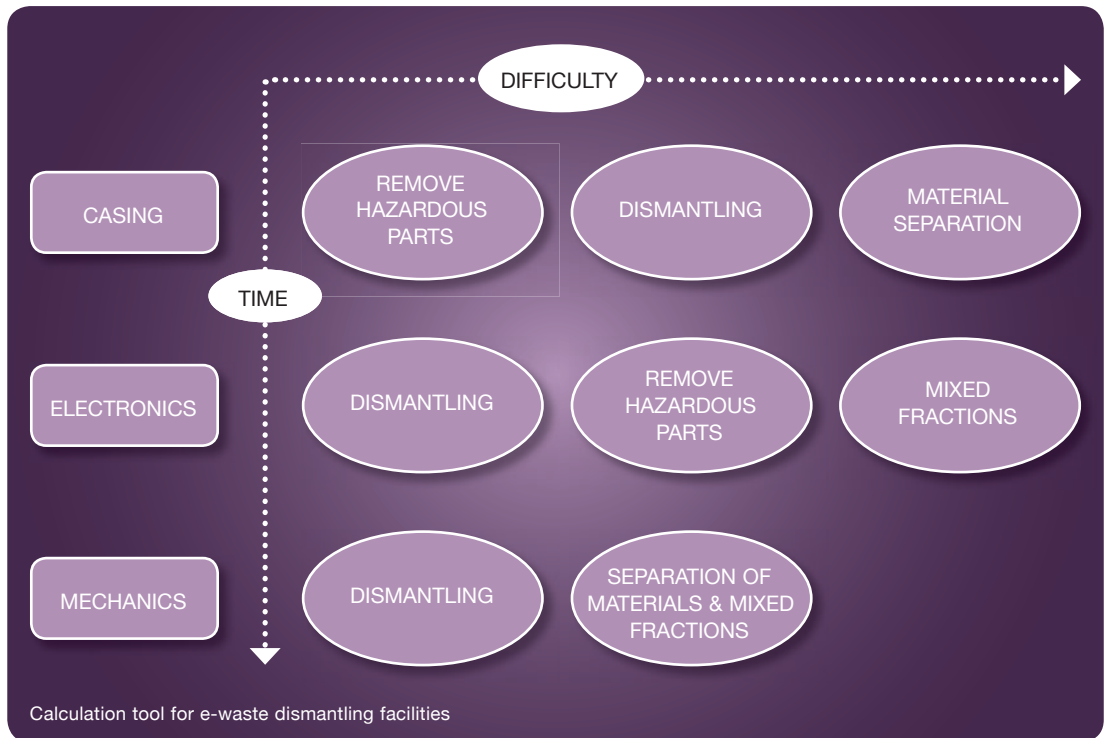
Throughout 2012 TF ReCycle was involved in various outreach activities in addition to more technical work. Under a five-year grant agreement with the United States Environmental

Protection Agency (US-EPA), the Massachusetts Institute for Technology (MIT) and the National Center for Electronics Recycling (NCER) continued its research on a methodology for quantifying flows of e-waste leaving the US. At the same time, the 2011 seed-funded project began synthesizing its results from the previous year in the development of a business model tool for pre-processors and recyclers and the 2012 seed-funded project on CRT recycling in developing countries kicked off its activities.

MIT/NCER E-WASTE MONITORING METHODOLOGY

With this project Task Force ReCycle has also contributed to a better quantitative understanding of the transboundary movement of used equipment and e-waste from Europe to West Africa. Export flows from North America are addressed in an ongoing project financially supported by the

TASK FORCE 4: RECYCLE



Scheme of dismantling processes/depth.

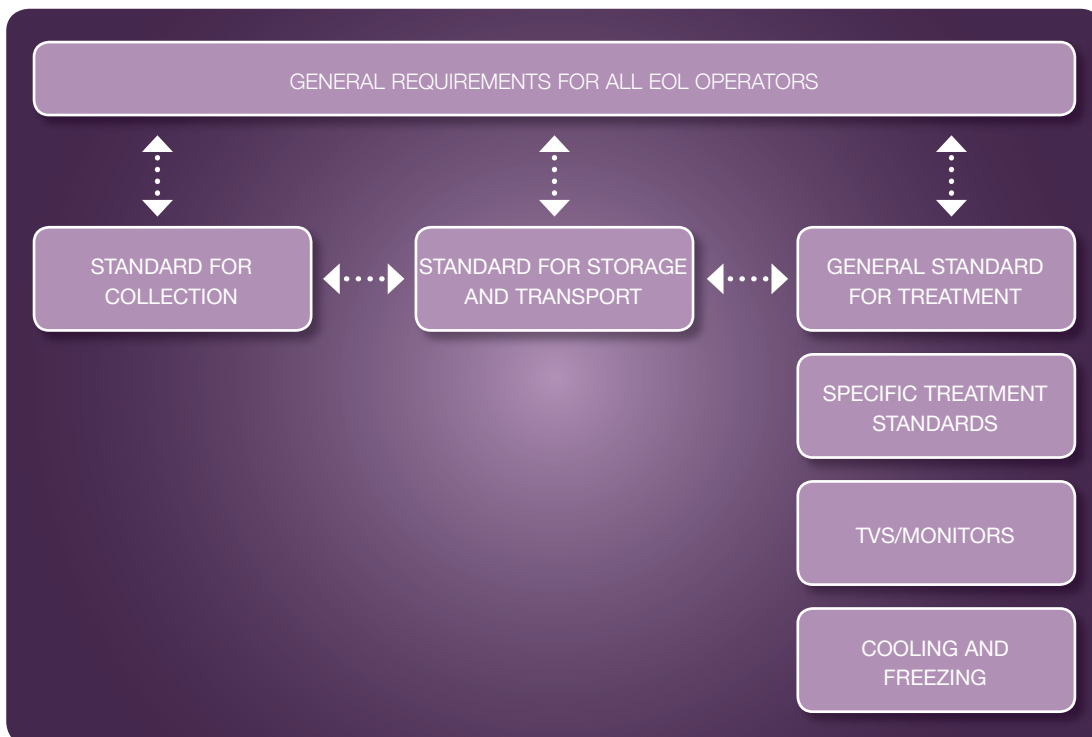
United States Environmental Protection Agency (US-EPA) under a five-year grant agreement with United Nations University. The chief activities carried out under this project are coordinated by the North American StEP Focal Point, the Massachusetts Institute of Technology (MIT) and the National Center for Electronics Recycling (NCER). This project characterizes the nature of the flows of used electrical and electronic equipment from the United States, including a qualitative characterization of the routes by which used equipment is leaving the country and an assessment of methodologies that may be used to quantify the volume of this equipment, with a particular emphasis on data collection. An interim report authored by T. Reed Miller, Jeremy Gregory and Randy Kirchain from the Massachusetts

Institute of Technology and Jason Linnell from the National Center for Electronics Recycling was published in early 2012 and can be downloaded from the StEP Website.

WHITE PAPER:
**STANDARDS FOR THE
 COLLECTION, STORAGE,
 TRANSPORT AND
 TREATMENT OF E-WASTE**



E-waste contains numerous materials, toxic metals and organic materials as well as valuable and scarce resources. In order to prevent pollution and to save valuable resources, e-waste



Example architecture of EoL standards covering the entire EoL chain of EEE.

requires specific treatment. As compared to other waste streams, e-waste is highly complex as it must be collected separately and treated carefully to enable environment-friendly and safe treatment. This Green Paper will be a comprehensive guide for the setup of country-or region-specific end-of-life (EoL) standards taking into account best practices. It is crucial to keep in mind that this study is not an EoL standard, rather, it gives an overview of the principle criteria of EoL standards, suggests standards requirements for EoL WEEE and proposes approaches for translating the requirements into EoL standards.

The Green Paper was published in Spring 2013 and can be downloaded from the StEP website. At the 2012 General Assembly, TF Recycle agreed

to convert the data-rich Green Paper into a more concise White Paper which will reflect a common StEP philosophy on EoL management. The final version of this White Paper is expected in Autumn 2013.

**CALCULATION TOOL FOR E-WASTE
DISMANTLING FACILITIES:
AN UPDATE**

This 2011 seed-funded project aimed to develop an integrative business model supporting sustainable e-waste pre-processing and recycling in developing countries. The model incorporated





the results generated from the StEP-established Best of 2 Worlds (Bo2W) philosophy by emphasizing the environmental and economic relevance of proper manual dismantling. Additionally, the business model tool contains a user-friendly calculation methodology tool which uses core data required for a relevant and self-sustaining e-waste business model. In 2012 the draft calculation tool and user manual were finalized and further work continues to incorporate the results of dismantling trials.

CRT RECYCLING IN DEVELOPING COUNTRIES

A new project on CRT recycling in developing countries was discussed at the 2012 General Assembly and is of interest for many Task Force ReCycle members. The project involves performing a literature review on volumes, treatment/disposal options, and analysis of the results with recommendations for CRT management and treatment in developing countries. The Task Force is currently finalizing a proposal and may propose this project for seed funding in 2013.

PHD THESIS ON MATERIAL FLOWS

The PhD thesis from Esther Müller, Empa and ETH Zürich, “A methodology to dynamically model the spatial distribution of anthropogenic critical metals stocks and flows” was adopted as a new TF4 project in 2012. The thesis will contribute to the objectives of the StEP Task Force ReCycle and contribute to sustainable solutions through the provision of knowledge on the quantity and location of relevant products in use as well as the quantity, location and pathways of input and output flows. This knowledge provides a basis to develop appropriate reverse supply chains and recycling systems. Findings from this research will be regularly reported back to TF4 supporting various StEP-related activities on WEEE material flows.



Recycling practices in Africa and Asia (Sources: EMPA and FHG-IZM).

EXTERNAL PROJECTS WITH StEP MEMBER INVOLVEMENT:

SUSTAINABLE RECYCLING INDUSTRIES (SRI) PROJECT

Following up and even interlinking to the Green Paper on EoL standards, the realm of global recycling standards will be a key priority in this new project. Sustainable Recycling Industries (SRI), the follow-up to the SECO Swiss e-Waste Programme, will incorporate the knowledge and expertise of StEP members in order to support the harmonization of international standards and the introduction of processes to distinguish “fair” secondary resources from materials recovered under sub-standard conditions. Currently, SRI has committed financial resources to support the 2nd edition of the E-waste Academy – Managers Edition (EWAM). The SRI project was officially launched in Zurich in 2013.



Jason Linnell,
National Center for Electronics Recycling (NCER)



Mathias Schluep, Swiss Federal Laboratories for
Materials Testing and Research (EMPA)

CAPACITY BUILDING



(Source: Umicore)

GENERAL TF5 DESCRIPTION AND 2012/2013 UPDATES

Another cross-cutting Task Force, Task Force Capacity Building strives to disseminate the knowledge and data generated tailored to specific target groups, including the scientific and academic communities but also on the political and practical levels. Additionally, Task Force Capacity Building undertakes coordination activities on the awareness raising and training of various stakeholders through its E-waste Academy editions for researchers and policymakers and study tours and trainings on demand.

The 2012 TF5 highlights include further support and results from StEP member activities to the StEP ADDRESS strategy for quantifying e-waste volumes worldwide. For example, following up to the successful quantification activities in the Netherlands, UNU completed a national quantification study in Italy and will finalize similar

e-waste quantification activities in Belgium and France. The first E-Waste Academy – Managers edition (EWAM) for policymakers, government officials and small and medium sized enterprises (collectors, refurbishers, recyclers) took place in June 2012 in Accra, Ghana due to the increasing demand for training of e-waste practitioners. Building off of the success of the first EWAM, a second edition is being planned in El Salvador in Spring 2014. Finally, the StEP Summer School for PhD and post-doctoral researchers, now rebranded as the E-waste Academy – Scientists Edition (EWAS) has secured funding for a fourth edition taking place in December 2013.

StEP ADDRESS: QUANTIFICATION ACTIVITIES

The Annual Digital Dynamic Reporting of the E-waste StatuS (ADDRESS), an overarching methodology facilitating the quantification of the

TASK FORCE 4: CAPACITY BUILDING



2012 E-waste Academy – Managers Edition (EWAM) participants and experts during a site visit at the Port of Tema in Ghana (Source: UNU).

size of the e-waste problem, falls into the domains of both TF ReCycle and Capacity Building. Throughout the years since its inception, this project was converted into an ADDRESS strategy focusing on facilitating the generation of data for the quantification of the StEP vision. The practical translation lead to various individual, externally funded projects supporting this mission.

Ongoing StEP member activities have substantially contributed and provided the necessary e-waste data to the ADDRESS strategy from quantification projects and activities described below. It was agreed at the StEP 2012 General Assembly that current and future ADDRESS results on e-waste amounts will be detailed further and soon published online in the StEP World Map.

StEP E-WASTE ACADEMY (EWA)

The StEP E-Waste Academy (EWA) is a pioneering concept in the development of capacity on

e-waste research and management to foster multi-stakeholder partnerships and establish opportunities for continued collaboration on e-waste research, policy and management. It looks at the e-waste issue in its entirety, rather than through the lens of a specific discipline. Because e-waste poses diverse challenges, including environmental, economic and social aspects, where all stakeholders need to participate in the development and the implementation of solutions, the StEP E-waste Academy addresses this issue through providing tailor-made and targeted training and capacity building for different stakeholder groups.

The E-waste Academy (EWA) will serve as the overarching capacity building umbrella with two specific modules positioned underneath to contribute to holistic, integrated solutions through scientific research and sound policy development and system design. The EWA – Scientists edition (EWAS) and the EWA – Managers edition (EWAM) represent both a valuable global network of future e-waste researchers and practitioners as well as access to new and upcoming e-waste policy



EWAM participants dismantling e-waste (Source: UNU).

development and design processes. The vision of the EWA transcends the academies as such by promoting and fostering continued collaboration and interaction among EWA alumni beyond the academies as such. Additionally, this alumni network will be in a privileged position to apply the knowledge and experiences gained at the EWA to their local conditions and will be a future valuable source for both StEP and sponsors alike.

E-WASTE ACADEMY – SCIENTISTS EDITION (EWAS)

The former StEP E-waste Summer School, now renamed the E-waste Academy – Scientists edition (EWAS) brings together young e-waste researchers from around the world, looking at solving the e-waste problem from different disciplinary perspectives. It aims to be the foremost forum available with the following concrete objectives:

- Develop a multidisciplinary network of young scholars who will function as multipliers in their

respective academic and geographic areas

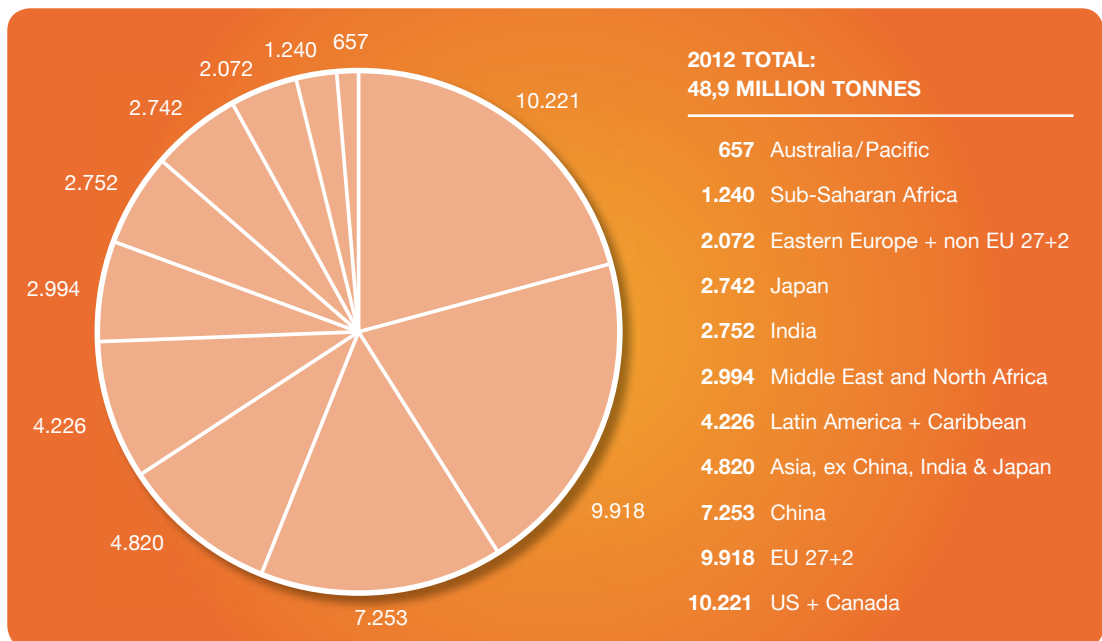
- Link young researchers to experts from industry, academia and policy makers which leads to concrete research collaboration and projects on the ground
- Enable young scholars to develop key skills for high quality research and teaching and also provide an opportunity to get their research reviewed by renowned experts in a neutral environment
- Promote innovative and rigorous scientific research, to identify research gaps in order to establish an international research agenda and develop a holistic view on e-waste research

Based on the success of the three editions of the E-waste Summer School in 2009-2011, TF5 worked hard to secure the funding for a fourth EWAS to take place in 2013. With the kind support of SWICO Recycling, EMPA, Dell, Philips, Umicore and the Secretariat of the Basel Convention, the fourth edition will take place in December 2013 in Geneva, Switzerland. As in previous years, a call for applications will be disseminated where each interested applicant

TASK FORCE 4: CAPACITY BUILDING



Ab Stevels discussing with EWAS participants.



WEEE generated 2012

(J. Huisman, 2012, Waste Electrical and Electronic Equipment (WEEE) Handbook, Page 93-119, Woodhead Publishing Limited)

TASK FORCE 4: CAPACITY BUILDING



EWAS participants opening a flat-screen.



will submit an application form and their research abstract which will be evaluated by an independent panel of reviewers with ultimate selection of 16-20 participants. The EWAS Organizing Team will design an innovative, integrated programme incorporating expert lectures, student presentations, group work activities, study tours and site visits.

During the EWAS participants will be sensitized to the diverse aspects of e-waste management, with the aim to:

- Share existing knowledge and research
- Exploit synergies of multidisciplinary research
- Develop capacity for high quality scientific research.

For more information, please contact ewas@unu.edu

E-WASTE ACADEMY – MANAGERS EDITION (EWAM)

The E-Waste Academy – Managers edition (EWAM) focuses on the practical implementation of science-based solutions, in particular in policy

development and e-waste system design. Targeted at policymakers and government officials as well as small- and medium-sized enterprises (collectors, refurbishers, recyclers), the EWAM aims to address the following core objectives:

- Establish a neutral platform for exchange of best practices and existing challenges among practitioners of e-waste legislation, including both policymakers and small and medium size enterprises (collectors/refurbishers/recyclers)
- Generate a snapshot into the current status of e-waste policy in the respective countries and regions
- Foster an interactive atmosphere of knowledge sharing and practical first-hand experiences, supporting better-informed decision-making
- Obtain constructive feedback and advice from e-waste experts and fellow policymakers
- Establish a sustaining network for continued interaction after the EWAM
- Integrate the EWA – Scientists edition (EWAS) in order to provide science-based data and perspectives to the decision making process

With the kind support from the Global e-Sustainability Initiative (GeSI), the Dutch NVMP Foundation, UNIDO and UNEP, the first GeSI & StEP E-Waste

TASK FORCE 4: CAPACITY BUILDING

Academy – Managers edition (EWAM) took place in June 2012 in Accra, Ghana. The first EWAM took a regional focus with particular emphasis on e-waste issues in the African region, receiving enormous positive feedback from all participants.

The open Call for Applications for the first EWAM garnered a staggering 87 unique applications from all six continents. A multi-disciplinary pool of expert faculty were invited to present their e-waste activities at the EWAM, ensuring a content-rich, diverse programme containing interactive elements such as group work and site-visits.

Building on the success of the first EWAM, the funding has been secured for a second edition. The second EWAM will be hosted by the Basel Convention Regional Centre for Central America and Mexico (BCRC-CAM), taking place April 2014 in El Salvador.

DATA	BEL	NLD	ITA	NOTE
EEE PoM	26,2	26,2	21,6 (B2C)	
Stock EEE	260	285	220 (B2C)	
WG	22,4	24,2	16,3 (B2C)	ITA excel Lamps
Reported Formal System ○	10,5	7,5	4,3	
Complementary ●	2,7	6,6	> 6,9	
Export EEE	> 0,6	2,7	> 0,7	
Export WEEE	> 0,3	< 0,8	> 0,7	
MSW	1,5	2,3	1,6 – 2,3	
Unidentified ●	+/- 6,8	3,9 – 5,1	+/- 6,0	ITA no downstream investigation in the study

● Formal(s) alone currently does not suffice
 ○ Complementary streams play a crucial role
 ● Joint efforts (stakeholders) are needed to:

- Investigate and track downstream
- Identify missing flows

Key findings from UNU's e-waste quantification activities carried out in Belgium, the Netherlands and Italy.

EXTERNAL PROJECTS WITH STEP MEMBER INVOLVEMENT:

WAIT PROJECT: **WEEE ARISING IN ITALY**

This study commissioned by Ecodom and carried out by UNU and Politecno University Milano and Ipsos, provides evidence that will support the development of more accurate future collection targets, quantifying household WEEE generated and highlighting consumers' WEEE disposal habits and attitudes, as well as shedding light on complementary/alternative waste streams, which, to date, account for a substantial share of WEEE arising in Italy.

A combination of detailed reconstruction of the historical put on market data for different types of EEE, the quantification of the accumulated EEE stocks in households, and the creation of life-time profiles for various EEE, has enabled the formulation of reliable estimates of WEEE generated annually in Italy. These WEEE streams have been categorized into different disposal channels in order to highlight key aspects of WEEE collection and management to which legislators must pay particular attention in the definition of future strategies for achieving WEEE collection targets. Full version of the final report can be requested from the StEP Secretariat: info@step-initiative.org

RECUPEL: **WEEE ARISING IN BELGIUM**

In addition to the Italian quantification activities, WEEE arising, EEE put on market and consumer behaviour data was collected and synthesized in Belgium as commissioned by Recupel, the Belgian e-waste take-back and recycling organization. The aim of the research was to gain a better understanding of the amount of electrical and electronic equipment (EEE) put on the Belgian market, the amount of WEEE generated in the country and the various pathways in recycling, export and disposal in anticipation of the EU's ambitious new e-waste collection targets. The research was carried out by non-STEP member FFact with scientific coordination from United Nations University (UNU). A final report detailing the key findings of the study will be published in 2013.



Claudia Luepschen, UNU



Mireille Heijnen, Hewlett-Packard (HP)



Jaco Huisman, UNU (until April 2013)

STEP EVENTS AND OUTREACH 2012/2013

STEP ORGANIZED EVENTS

2012 StEP GENERAL ASSEMBLY, 23 – 25 MAY 2012

The 2012 StEP General Assembly, was hosted by Philips at their headquarters in Amsterdam, the Netherlands. There were more StEP members present at this year's General Assembly than all previous ones, with 55+ members arriving in Amsterdam contributing yet again to fruitful discussions and roadmaps for planned activities throughout the remainder of 2012.

The main agreements and decision proposals approved were on the updated StEP Memorandum of Understanding, increased and streamlined visibility through StEP media activities and a way forward on integration of StEP E-Waste Academy alumni into the StEP network.

Additionally, in order to discuss interim results and provide mid-term updates to all StEP members, a virtual General Assembly took place 23 – 25 April 2013.

2012 GESI & StEP E-WASTE ACADEMY, 25 – 29 JUNE 2012

The 2012 GeSI & StEP E-waste Academy targeted e-waste practitioners – policymakers, government officials and SMEs (collectors/refurbishers/recyclers) on the African continent due to the increasingly dire e-waste situation on the continent and the swift strides being made regarding e-waste policy development in African countries. The EWA was hosted by the United Nations University Institute for Natural Resources in Africa (UNU-INRA) and took place at their premises in Accra, Ghana.

During the 5-day programme, participants gathered further holistic insights into the complexities of e-waste management and system design through a life cycle-oriented programme addressing opportunities and challenges along the WEEE value chain. The expert lectures were combined with hands-on group work activities based on the lecture content of that day, a half-day dismantling session of various products, a pre-processor panel discussion, exercises on shipment notification and waste classification as well as a site visit to the Port of Tema. Final group work presentations were held on the last day where participant groups synthesized the key criteria into a 'compendium of smart ideas' to take back to their host countries. Additionally, an interactive 2012 EWAM Tool-Kit containing all expert lectures, programme material, scientific publications and daily proceedings is being finalized and will be published in Summer 2013. For more information, see www.ewasteacademy.org.

STAKEHOLDER WORKSHOP & StEP OPEN MEETING IN CHINA, 16 AND 17 JULY 2012

The first "Stakeholder Workshop & StEP Open Meeting in China" was successfully held in Beijing, co-organized as an event of the Solving the E-waste Problem (StEP) Initiative by United Nations University (UNU) and Basel Convention Regional Center for Asia and the Pacific (BCRC Beijing). The workshop was supported by China Ministry of Environmental Protection (MEP) and the US Environmental Protection Agency (EPA). It provided an interactive platform to understand ongoing and upcoming stakeholder activities on e-waste management in China, identify the roles and responsibilities of different stakeholders, and facilitate cooperation amongst them based on shared priorities and goals.

The workshop was attended by more than 50 participants, with a variety of Chinese, international and multinational representatives from UN organizations, governmental agencies, research institutes, electronic producers, collection and recycling companies.

The first day of the workshop consisted of presentations about ongoing activities related to used electronics and e-waste management in China, including the progress made by recent policies and the latest developments in electronics recycling technologies in China.

The second day focused on in-depth group discussions in which participants identified and compared key priorities and challenges for the different organizational sectors represented at the meeting. During these discussions, participants identified several shared priorities for future work. These included (i) strengthening regulations in order to promote formal e-waste collection channels, (ii) increase the environmental standards for electronics recyclers in China, (iii) the development of third-party certification and licensing systems for recyclers, (iv) coordinate research and development across academic and industrial sectors, (v) build technical and institutional capacity for the informal recycling sector and (vi) establish a communication platform for knowledge sharing among both domestic and international stakeholders. The second day concluded with a site visit to a local e-waste recycling facility in Beijing.

EGG 2012+ TUTORIAL ON STRATEGIES AND SOLUTIONS IN DEVELOPING COUNTRIES:

The 2012 Electronics Goes Green conference took place from 9-12 September 2012 in Berlin, Germany. The conference was organized by Fraunhofer IZM and attended by over 450 delegates with

parallel sessions, poster sessions, workshops and interactive e-waste tutorials. Of particular interest to the delegates and plenum was the issue of resource management and resource efficiency and the required life cycle approach that must be taken along all stages of the supply chain.

StEP organized a tutorial along with StEP members EMPA and GIZ addressing the e-waste situation and potential strategies and solutions in developing countries. The concept was to let representatives from developing countries and countries with market economies in transition report about e-waste related problems and solutions from their specific, national point of view. Government representatives from Colombia, Egypt, Mexico, India and Thailand gave short presentations about the situation and the approaches their countries take to overcome roadblocks towards sustainable e-waste management. Two moderated panel discussions followed with these country representatives and members of industry on the panel about the legal framework and best practices, technologies and e-waste management systems. The more than 50 participants in the audience learned about the perspectives developing countries and countries with market economies in transition have on the e-waste problem, how they think about core elements of e-waste management like extended producer responsibility, best practices, technology and which support they hope to receive from outside their countries. The presentations and discussion were highly differentiated and provided valuable insights for the audience as well as the speakers and panelists on the current status, expectations and future possibilities and needs of cooperation to achieve the sustainable management of e-waste.

StEP-SUPPORTED EVENTS

PAN-AFRICAN E-WASTE FORUM IN KENYA, 14 – 16 MARCH 2012

Organized by the Secretariat of the Basel Convention and UNEP, with support from the StEP Initiative, the Government of Kenya and private sector companies including StEP members Dell, HP, Nokia and Philips, the forum was the first event of its kind on the continent. It focused on long-term solutions to the rising levels of obsolete mobile phones, refrigerators, televisions and other electrical and electronic products in Africa.

Representatives from 18 African states, the United Nations, non-governmental organizations, academia and the private sector agreed on priority actions for reducing the environmental and health impacts of growing levels of electrical and electronic waste (e-waste) in Africa, as well as for promoting proper e-waste management as a source of green jobs and economic development.

The actions were agreed on the final day of the Pan-African Forum on E-Waste, which was held at the Nairobi headquarters of the United Nations Environment Programme (UNEP), a StEP member.

Delegates at the Pan-African Forum on E-Waste underlined the importance of improved access to information and communication technologies (ICT) in Africa as a step towards achieving the United Nations Millennium Development Goals. As part of the 'Call to Action', manufacturers,

importers, re-sellers and other handlers of electrical and electronic products should be required to organize the collection, recycling and recovery of e-waste. The forum agreed that Extended Producer Responsibility (EPR) should be a key component of the environmentally-sound management of e-waste.

INTERNATIONAL TELECOMMUNICATIONS UNION (ITU) GREEN STANDARDS WEEK IN PARIS, 17–21 SEPTEMBER 2012

Industry leaders outlined their commitment to a green agenda with a Declaration issued at the end of ITU's Green Standards Week which was organized together with ITU and TechAmerica Europe and hosted by Microsoft in Paris. Agreed by over 150 participants from the private and public sectors, the green agenda includes carbon commitments from the leading ICT companies worldwide.

StEP and UNU were organizing partners and co-organized two sessions. One session addressed 'Mapping E-waste to address future challenges' where a panel discussed the complexity of the e-waste problem and a follow up on the next impacts of e-waste on resources. The second co-organized session looked at 'Strategies for greening the ICT supply chain' which addressed the business-related challenges of a more sustainable supply chain as well as interactive discussions on potential solutions.

1ST INTERNATIONAL CONFERENCE ON WASTE MANAGEMENT IN SAUDI ARABIA, 20–21 NOVEMBER 2012

Due to the increasing waste streams in the Kingdom of Saudi Arabia and across the Middle East as such, this 1st International Conference on Waste Management in Saudi Arabia offered the unique opportunity for participants to collaborate, share experiences and ultimately learn how to best manage industrial waste. StEP-supported the development and promotion of this conference taking place at the King Fahd Civic Center, Yanbu Al Sinaiyah with special sessions on industrial e-waste management.



BCRC-Caribbean PACE Workshop on the ESM and WEEE in the Caribbean (Source: Kevoy Community Development Institute).



THE StEP INITIATIVE:

Initiated by various UN organizations, the “Solving the E-waste Problem (StEP) Initiative“ works with representatives from industry, governments, international organizations, NGOs and academia to initiate and facilitate approaches that promote the sustainable handling and management of e-waste. Organized into five Task Forces, StEP seeks to develop feasible, just and environmentally-safe solutions to the e-waste problem through scientific analysis, planning and pilot projects.

For more information, please visit: www.step-initiative.org

THE UNITED NATIONS UNIVERSITY

The United Nations University (UNU) is the academic arm of the United Nations system. Its mission is to contribute, through collaborative research and postgraduate education, dissemination of knowledge and advisory services, to efforts to resolve the pressing global problems of human survival, development and welfare that are the concern of the United Nations, its Peoples and Member States. The University functions as a think tank for the United Nations system and for UN Member States providing knowledge-based policy advice.

Website: www.unu.edu

Photos: © by EEI, EMPA, FHG-IZM, Kevooy Community Development Institute, MicroPro, Nokia, Umicore, UNU

DISCLAIMER

United Nations University / StEP Initiative 2013

This work is licensed under the Creative Commons by-nc-nd license. To view a copy of this license, please visit <http://creativecommons.org>. This publication may thus be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from the StEP Initiative/ United Nations University.

The StEP Initiative/United Nations University would appreciate receiving a copy of any publication that uses this publication as a source.

CONTACT

StEP Secretariat
c/o United Nations University
Institute for Sustainability and Peace (UNU-ISP)
Operating Unit SCYCLE
UN Campus
Platz der Vereinten Nationen 1
53113 Bonn, Germany

Phone: +49-228-815-0213/0214

Fax: +49-228-815-0299

e-mail: info@step-initiative.org

www.step-initiative.org



UNITED NATIONS
UNIVERSITY

UNU-ISP

Institute for Sustainability and Peace