StEP
SOLVING THE E-WASTE PROBLEM

ANNUAL REPORT 2011

Five Years of the StEP Initiative

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PREFACE

In 2012, we are celebrating the fifth anniversary of the formal launch of the Solving the E-waste Problem (StEP) Initiative. Founded in 2004 and officially launched in March 2007, the StEP Initiative has made important strides toward solving the e-waste problem. In this Annual Report, we look back on what we have accomplished and look forward to the work that must still be done.

Over the past year, the pressing problem of e-waste has attracted more interest around the world than ever before, thanks in no small part to the work of the StEP Initiative, its members, and its supporters. In 2011, an image of e-waste exported to Ghana earned first prize in UNICEF's prestigious annual photography competition and many more films and photographs have begun to shine a spotlight on the growing problems associated with the informal treatment of e-waste in developing countries. Important steps have also been made in the development of e-waste-related policy and regulation. In January 2012, the European Parliament and Council finally arrived at a compromise on the so-called WEEE Recast, setting the ambitious target of separately collecting 85 per cent of e-waste generated (65 per cent of electrical and electronic equipment (EEE) sold), or roughly 20 kg per capita per year by 2020. To meet such ambitious targets, the European Parliament and Council also called for a substantial increase in the collection of e-waste, along with increased media coverage and dissemination of information on e-waste collection. In recent years the Chinese government has issued a number of environmental laws, regulations, standards and technical guidance related to e-waste management. In the United States as of early 2012, 25 states have passed e-waste recycling laws, 18 of which include bans on placing e-waste in landfills, with Pennsylvania to follow suit in January 2013. Japan continues to favour the promotion of a sound material-cycle society based on the 3R approach (Reduce, Re-use, Recycle). India's first e-waste management and handling rules came into effect on 1 May 2012. Australia, New Zealand and 23 additional states in the Pacific are developing a regional e-waste management strategy, in addition to the first e-stewardship pro gramme in the region. On the African continent, a growing number of states are developing national e-waste legislation, with South Africa and Nigeria leading the way and countries like Ghana, Kenya, Uganda and Ethiopia also making important strides based on the "polluter pays" principle. Finally in Latin America, Costa Rica and Colombia have implemented compliance schemes and several other countries have either passed e-waste management legislation or are currently developing such bills.

While these developments in e-waste policy and regulation are encouraging, a number of challenges and shortcomings still hamper the development of a sustainable reverse supply chain and continue to allow unsustainable leakages of both valuable and toxic materials from e-waste. The majority of countries worldwide still lack effective e-waste policy and regulation, as well as appropriate e-waste collection systems and infrastructure. Furthermore, without more clarity and harmonization of e-waste policies from international bodies, even those country-level policies and regulations that do exist are limited in their effectiveness due to their patchwork nature. Finally, more research on consumers' role in establishing successful e-waste management systems is required to further improve consumers' return rates for used electrical and electronic equipment (EEE), a critical bottleneck even in those countries with long histories of e-waste management.

StEP will continue its mission to address these challenges and to support positive developments towards a solution to the e-waste problem through its science-based but applied recommendations on how to improve existing polices and legislation. Therefore, StEP continues to work on generic elements that each policy and legislative approach should contain. Each approach is backed up with the data and information necessary for public and private sector decision making for a sustainable solution to the e-waste problem. Towards this end, StEP has made considerable progress in transferring its finding into best practices for re-use and recycling concepts, such as the "Best of Two Worlds" philosophy and building capacity through its annual E-waste Summer School and the upcoming GeSI (Global e-Sustainability Initiative) & StEP E-waste Academy for policymakers and practitioners, especially from Western Africa.

As you will see in this report, StEP has become a recognized hub for expertise in meeting the social, political, economic and environmental challenges posed by the production, usage and disposal of electrical and electronic equipment. StEP's growing membership and numerous projects worldwide require appropriate and effective organizational coordination and strategic planning. We are confident that this annual report for 2011 makes clear that StEP is well positioned and on track to make substantial contributions towards a sustainable solution to the e-waste problem.

Stockholm/Bonn, April 2012

Per Döfnäs,
Steering Committee Chair,
StEP Initiative

Ruediger Kuehr,
Executive Secretary,
StEP Initiative

Looking back, moving forward:

FIVE YEARS OF THE StEP INITIATIVE

Official StEP Launch 2007

Press Comments

Bransje-støtte til FN-aksjon mot IT-søppel - Bransjens mektigste står bak et FN-initiativ for global håndtering og resirkulering av IT-søppel.

Digi, March 2007

http://www.digi.no/372248/bransje-stotte-til-fn-aksjon-mot-it-soppel

UN outlines global e-waste goals

The UN has launched a global initiative to tackle the growing mountain of electrical and electronic waste. The private-public partnership hopes to create a global recycling standard, extend the life of products and improve the market for second-hand goods.

BBC News, March 2007

Alleanza a guida Onu per ridurre i rifiuti elettronici

Mytech, March 2007

http://mytech.it/flash/2007/03/06/alleanza-a-guida-onu-per-ridurre-i-rifiuti-elettro/

国連と産業界、電子廃棄物リサイクルで協力 - 国連とHP、Microsoft、Dellなどのメーカーが、電子廃棄物のリサイクルを促進するイニシアチブを発足した。

IT media, March 2007

http://www.itmedia.co.jp/news/articles/0703/07/news024.html

Hardware abandonado é ameaça ao meio ambiente – As Nações Unidas iniciaram um programa contra a poluição gerada pelo descarte de hardware

info plantão, March 2007

http://info.abril.com.br/aberto/infonews/032007/06032007-14.shl

Computer sind die wahren Klimakiller

Der Lieblingsbösewicht in der aktuellen Klimadebatte ist das Auto. Doch Fachleute sagen: Immer neue Generationen von PCs und Mobiltelefonen schädigen die Umwelt ähnlich stark. Grund: kurze Lebenszyklen, hoher Herstellungsaufwand, viel Schrott.

Welt online, March 2007

http://www.welt.de/webwelt/article747227/Computer_sind_die_wahren_Klimakiller.html

General Assemblies

General Assembly Stockholm 2008

General Assembly Bonn 2009

General Assembly London 2010

General Assembly Amsterdam 2012

Further StEP Events

StEP E-waste Summer School 2009

PAN-African Forum on E-Waste

StEP E-waste Summer School 2011

Press Comments

联合国推动制订电子废弃物循环利用国际标准

Shangdu News, March 2007

http://news.shangdu.com/category/10002/2007/03/07/2007-03-07_588805_10002.shtml

PCs: the latest waste mountain

First it was the fridge mountain, then it was the tyre mountain. Now discarded computers have got environmentalists worried. According to a study released today our relentless appetite for buying new computers – and the ease with which we throw out old ones – is having a major impact on the environment.

The Guardian Online, March 2004

UN-led Meeting Agrees on Priority Actions for Managing E-Waste in Africa – Pan-African Forum on E-Waste Underlines Green Economy Opportunities in E-Waste Sector.

CNN News, March 2012

StEP E-waste Summer School 2011:

Tests Detail High Toxic Levels at School, Market Neighbouring Informal African E-waste Salvage Site. The contamination test results were shared by Ghana researcher Atiemo Sampson at this year's Solving the E-waste Problem (StEP-Initiative) Summer School, hosted in Europe by Philips and Umicore for 20 of the field's most promising international graduate researchers.

BBC World Service Radio, October 2011

Hazardous E-Waste Surging in Developing Countries

And, unless action is stepped up to properly collect and recycle materials, many developing countries face the spectre of hazardous e-waste mountains with serious consequences for the environment and public health, according to UN experts in a landmark report released February 22 by UNEP.

ScienceDaily, February 2010

ABOUT THE StEP INITIATIVE

The electrical and electronics industry is one of the world's fastest growing manufacturing sectors. As a result of this rise in production, as well as the increasing rate of product obsolescence, waste from electrical and electronic equipment, or e-waste, has become the fastest-growing waste stream in the (post-)industrialized world, leading to serious environmental and health problems, which are attracting growing public interest.

In late 2004, the United Nations University (UNU) identified the urgent need for action by the global community and, together with partners such as Hewlett Packard, took the initiative to develop a neutral arena provided by various UN organizations for creative discussions and scientifically-based pilot projects. The resulting initiative was called **Solving the E-waste Problem – The StEP Initiative.**

Since its official launch in 2007, StEP has continued to foster partnerships between companies, academia, and governmental and non-governmental organizations to facilitate the politically-, socially-, economically- and ecologically-sustainable handling of e-waste worldwide. Today, five years after its formal launch, StEP has grown into a remarkable and truly international initiative with more than 60 members worldwide.

E-waste, on the one hand, consists of a number of precious materials which can be extracted and put to use again. On the other hand, it contains over 1,000 different substances, many of which are toxic, for instance lead, cadmium and mercury or halogen compounds. Despite strict national controls, substantial amounts the old electrical and electronic equipment is exported to newly industrializing and developing countries, where it is often recycled through informal practices, sometimes called "backyard practices." Such informal recycling often takes place under the most primitive of conditions, with unprotected workers – often children – being exposed to dangerous chemicals and facing extensive health dangers. These informal practices also result in substantial environmental pollution. E-waste recycling and disposal practices found in places such as China, India, Nigeria, Bangladesh, Ghana and Pakistan include open burning of plastics, exposure to toxic solders, leakages of acids into rivers and general dumping of waste material.

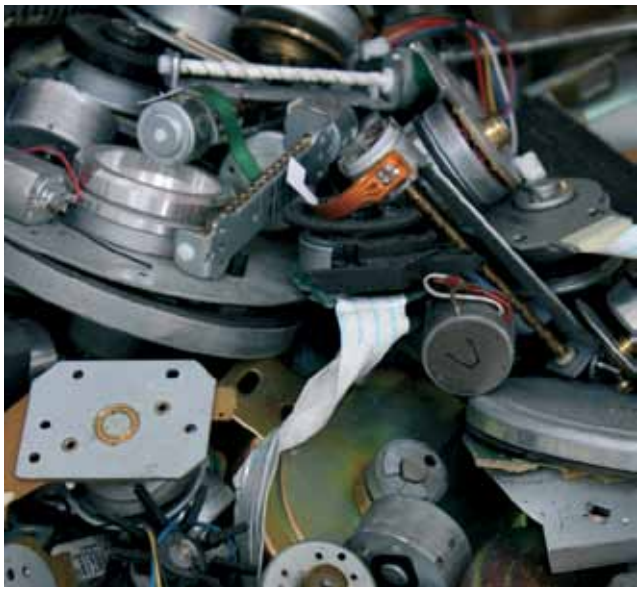
Such health and environmental dangers posed by improper e-waste handling demonstrate the need for a transnational sustainable e-waste management strategy and a global reduction in e-waste.

StEP is an initiative that brings together a network of actors who have joined to exchange ideas and experiences, and to work with each other toward the realization of common aims. Its members envision a future in which societies have reduced the e-waste-related burden on the ecosystem through the sustainable and responsible design, production, use and disposal of electrical and electronic equipment. These societies make prudent use of lifetime-extension strategies in which products and components – and the resources contained in them – become raw materials for new products.

StEP's prime objectives are to:

- Optimize the life cycle of electrical and electronic equipment
- Improve supply chains and close material loops
- Reduce contamination
- Increase utilization of resources and promote re-use of equipment
- Exercise concern about disparities such as the digital divide between the industrializing and industrialized countries
- Increase public, scientific and business knowledge

Many valuable resources are lost every day due to low e-waste collection rates and improper recycling. Efficient and environmentally-sustainable recovery of materials in e-waste facilitates the continued production of electrical and electronic equipment in the future, while at the same time reducing the environmental impact of the mining and production processes. Five years on, StEP continues its work towards enhancing resource efficiency and optimizing the life cycle of electronics, as well as towards fostering a transnational and multi-stakeholder approach to solving the e-waste problem.



"Go on, StEP, with your very valuable initiative – best wishes for the coming next 5 years!"

Jürgen Schomburg, Director, GOAB mbH

MEMBERSHIP

StEP membership is generally open to all organizations that commit to pro-actively participating in StEP activities. StEP members must agree to the following key principles, which guide StEP's work:

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 solution of e-waste problems.
4. StEP condemns all illegal activities related to e-waste including illegal shipments and re-use/recycling practices that are harmful to the environment and human health.
5. StEP seeks to foster safe and eco/energy-efficient re-use and recycling practices around the globe in a socially responsible manner.

In order to join StEP, a potential member is required to sign a so-called Memorandum of Understanding among all StEP members, which lays down the key principles and objectives of the StEP Initiative. Furthermore, the potential member needs to elaborate in a written application on what it expects from StEP membership and how it is going to contribute to StEP projects. All membership applications are reviewed by the StEP Steering Committee and then voted upon by all StEP members.

StEP does not receive any funds from the United Nations core budget but relies solely on member contributions and successful project acquisitions. Each member is thus also expected to contribute through an annual monetary contribution, based on the type of organization and its size. StEP's annual contributions can be broken down as follows:

Type of organization	Amount	
Large-size companies	EUR	10,000
Medium-size companies	EUR	5,000
Small-size companies (including micro-enterprises)	EUR	1,000
All other full members	EUR	1,000

Table 1: StEP membership contributions

In exceptional cases and on a case-by-case basis, the StEP Steering Committee may decide to waive an organization's annual contribution. However, in such a case, 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.

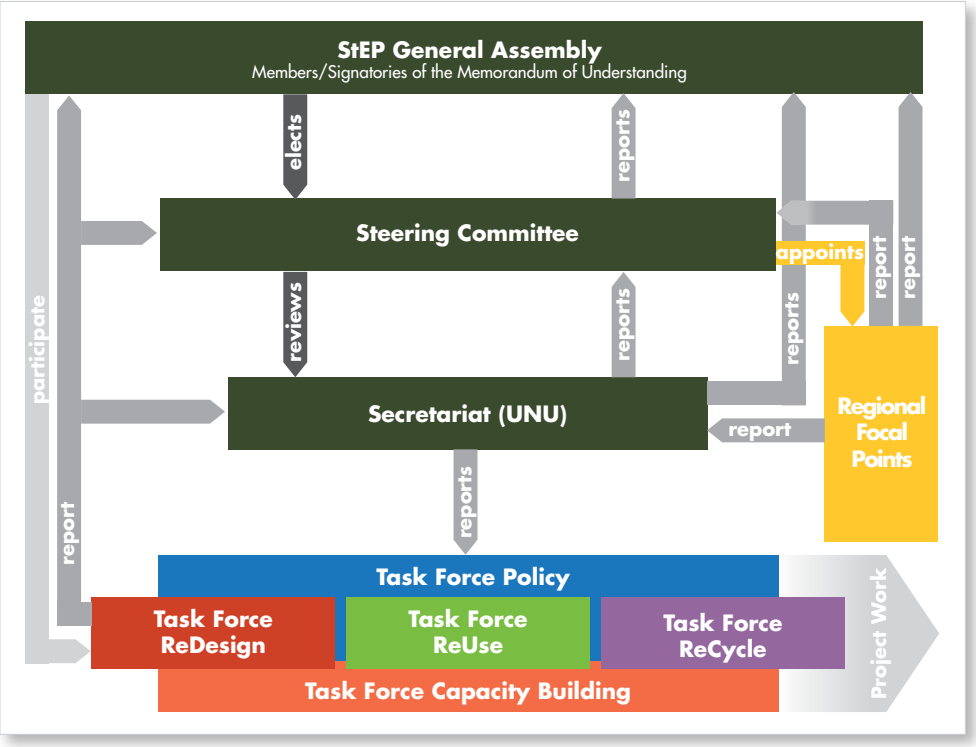
For small companies, research institutes, associations or NGOs, in particular from newly industrializing and developing countries, who oftentimes cannot afford the annual contribution for a full membership or are only interested in contributing to a specific project, the StEP General Assembly approved the inclusion of an associate membership 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). Associate members have access to StEP information and scientific databases and contribute to project work, though they are not permitted to vote in StEP's decision making.

StEP membership overview
(For list of members, see page 33)

ORGANIZATION

The key organizational organs of the StEP Initiative are the Steering Committee, the Secretariat, five Task Forces involving its coordinators and members, the General Assembly comprising all members, and Regional Focal Points who serve as regional links.

The Steering Committee, consisting of seven members representing key stakeholder groups, is responsible for the overall progress of the StEP Initiative. Its chief responsibility is to monitor and steer the overall developments of the StEP Initiative. Steering Committee members are elected for two years, with one Steering Committee member serving in the voluntary role of Chair, which is rotated among elected members every 1 July and 1 January.



The Secretariat functions as the internal and external operations hub of the StEP Initiative. 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 Na-

Elected on 18 October 2010, the Steering Committee members for the term 2010 – 2012 were:

Stephanie Adrian, United States Environmental Protection Agency (Chair, January – June 2011)

Jean Cox-Kearns, Dell (Chair, July – December 2011)

Per Döfnäs, Ericsson (Chair, January – June 2012)

Christian Hagelüken, Umicore Precious Metals Refining

Jinhui Li, Basel Convention Coordinating Centre for Asia & the Pacific, and Tsinghua University

Guido Sonnemann, United Nations Environment Programme (UNEP)

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

Ex officio:
Ruediger Kuehr, Executive Secretary of the StEP Initiative United Nations University

tions 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 StEP Secretariat is hosted by United Nations University Institute for Sustainability and Peace, Operating Unit SCYCLE (UNU-ISP SCYCLE) in Bonn, Germany. The Secretariat is headed by the Executive Secretary, who serves as the chief academic project and administrative officer of the StEP Initiative and is responsible for the overall management of StEP and its strategic progress towards overarching objectives.

The five Task Forces – Policy, ReDesign, ReUse, ReCycle and Capacity Building – are devoted to research, analysis and facilitation of pilot projects that are set up and carried out in line with StEP's objectives. StEP members actively contribute to at least one of the Task Forces by implementing or participating in projects. Each Task Force is coordinated by two StEP members who are responsible for representing each Task Force, managing the overall coordination within the Task Force, maintaining positive momentum and ensuring that Task Force activities fall in line with StEP's overall objectives.

The overall objective of **Task Force Policy** is to report on and analyze the status of existing approaches and particular policies for waste electrical and electronic equipment (WEEE) and used electronic products. Practically, members explore and define science-based, applied recommendations on existing policy measures and legislation currently in development, thereby working toward sustainable solutions to the e-waste problem. StEP's Task Force Policy is coordinated by Cédric Gossart of Télécom École de Management and Ruediger Kuehr of United Nations University (UNU).

TF Policy Coordinator Cédric Grossart, Telecom Business School

TF Policy Coordinator Ruediger Kuehr, United Nations University

StEP's Task **Force ReDesign** is dedicated to product design aspects. Its members contribute to StEP's aim of solving the e-waste problem by fostering the sustainable design of electrical and electronic equipment (EEE) in order to reduce negative environmental impacts in all phases of their life cycle. A special focus is placed on industrializing countries. The coordinators of Task Force ReDesign are Karsten Schischke, Fraunhofer IZM and Chirapat Popuang, Electrical and Electronics Institute (EEI).

TF ReDesign Coordinator Karsten Schischke, Fraunhofer IZM

TF ReDesign Coordinator Chirapat Popuang, Electrical and Electronics Institute

In **Task Force ReUse**, its members focus on the development of replicable and sustainable re-use/refurbishment/spare parts development systems in order to minimize environmental, health and safety impacts, especially in industrializing countries. The Task Force supports the development of "globally consistent" re-use practices, principles and standards for EEE products from business-to-business and business-to-consumer users that are economically, socially and environmentally appropriate. Task Force ReUse is coordinated by Colin Fitzpatrick of the University of Limerick and John Dickenson of AER Worldwide.

TF ReUse Coordinator Colin Fitzpatrick, University of Limerick

TF ReUse Coordinator John Dickenson, AER Worldwide

The major aim of **Task Force ReCycle** is to enhance infrastructures, systems and technologies to realize sustainable

"StEP provides sustainable solutions to stakeholders around the globe with technical knowledge sharing, capacity building, networking and other related matters throughout electrical and electronic product life cycles, with a focus on the end-of-life stage that can be both harmful and beneficial to the industry."

Somboon Hotrakool, President of Electrical and Electronics Institute, Thailand

e-waste recycling, especially in industrializing countries. Being a neutral platform, its members seek to initiate international, inter-stakeholder cooperative activities and dialogues on a scientific basis in order to find economically-, environmentally- and socially-sound solutions. StEP's Task Force ReCycle is coordinted by Mathias Schluep of Swiss Federal Laboratories for Materials Testing and Research (EMPA) and Jason Linnell of National Center for Electronics Recycling (NCER).

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

TF ReCycle Coordinator Jason Linnell, National Center for Electronics Recycling (NCER)

The mission of StEP's **Task Force Capacity Building** is to increase public, scientific and business awareness regarding the global e-waste problem. Its members want to achieve this goal by offering open access to the knowledge and experiences gained in the activities of the other Task Forces, as well as on related and welcomed initiatives in global e-waste management, and by actively engaging in training and capacity development. Coordinators of Task Force Capacity Building are Claudia Luepschen and Jaco Huisman, both of United Nations University.

TF Coordinator Capacity Building Claudia Luepschen, United Nations University

TF Coordinator Capacity Building Jaco Huisman, United Nations University

The **General Assembly** functions as the primary body of the StEP Initiative. The General Assembly meets at least once per year to vote on prospective new members, elect the Steering Committee, approve annual budgets and other financial matters such as project seed-funding, approve policy proposals and set up committees and subgroups. Each full member has one vote in the above fields. The 2011 General Assembly was hosted by Dell in Limerick, Ireland.

The primary purpose of the **Regional Focal Points** is to serve as a link between the StEP Secretariat and StEP members, activities and issues in their corresponding regions. For more information, please see the section on Regional Focal Points.

StEP Regional Focal Point for North America:

Jeremy Gregory and Randy Kirchain, Materials Systems Laboratory (MSL) at the Massachusetts Institute of Technology (MIT), USA

Jeremy Gregory, Materials Science & Engineering Systems, Massachussetts Institute of Technology (MIT), USA

Randy Kirchain, Materials Science & Engineering Systems, Massachussetts Institute of Technology (MIT), USA

StEP Regional Focal Point for the Middle East and North Africa:

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

Hossam Allam, Center for Environment & Development for the Arab Region and Europe (CEDARE), Egypt

StEP Regional Focal Pointfor South East Asia:

Chirapat Popuang, Electrical and Electronics Institute (EEI), Thailand

Chirapat Popuang, Electrical and Electronics Institute, Thailand

StEP Regional Focal Point for East Asia:
Jinhui Li, Basel Convention Coordinating Centre for Asia and the Pacific (BCRC China), and Tsinghua University, China

Jinhui Li,
Basel Convention Coordinating Centre for Asia and the Pacific (BCRC China), and Tsinghua University, China

StEP Regional Focal Point for the South Pacific:
Sunil Herat and David Thiel, Griffith University, Australia

Sunil Herat
Griffith University, Australia

David Thiel,
Griffith University, Australia

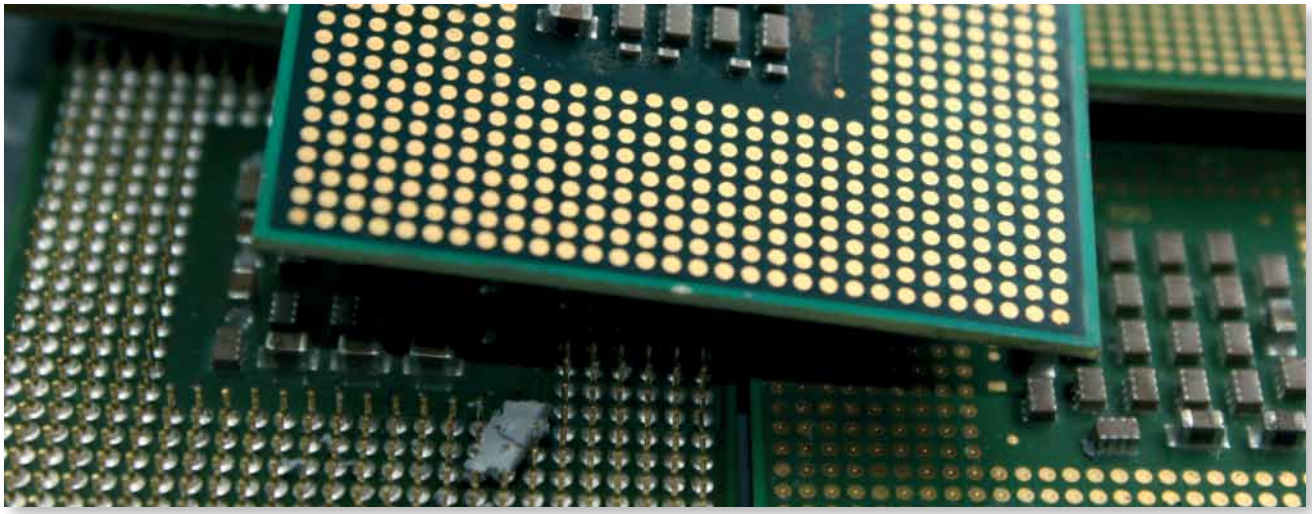
StEP Vision

StEP envisions a future in which societies have reduced to a sustainable level the e-waste-related burden on the ecosystem that results from the design, production, use and disposal of electrical and electronic equipment.

These societies make prudent use of lifetime extension strategies in which products and components – and the resources contained in them – become raw materials for new products.

”On behalf of MicroPro, we would like to congratulate StEP on its 5th Anniversary. Since joining the StEP initiative, MicroPro has had the benefit of being able to meet and collaborate with excellent colleagues from the private sector, academia, the social economy and research. This collaboration has guided and underpinned our endeavour to improve the sustainability of the computer equipment we manufacture. We wish StEP many more years of success.”

Paul Maher and Anne Galligan, Directors, MicroPro Computers



”Télécom École de Management congratulates StEP for their outstanding efforts in solving the e-waste problem in the world.”

Denis Lapert, Head, Télécom École de Management

StEP's FIVE TASK FORCES SUPPORT ITS MISSION TOWARDS

TASK FORCE 1 – POLICY AND LEGISLATION

In 2011, Task Force Policy (TF Policy) continued to report on and analyze existing approaches and particular policies related to (W)EEE. TF Policy used these analyses to explore and evaluate recommendations related to the solution of the e-waste problem in both developed and developing countries. It has disseminated results and outputs from previous projects through StEP publications, such as the Green Papers on e-waste indicators and another on scarce metals. TF Policy is supporting the ADDRESS (Annual Dynamic Digital Reporting on the global E-waste StatuS) project though the elaboration of an e-waste solutions index. The ESI was presented during the European Society for Ecological Economics conference in Istanbul in June 2011, a conference to which a draft of the aforementioned Green Paper was successfully submitted as well. It received encouraging comments on how performance between e-waste policies can be compared through using certain reliable indicators. This index will help foster the development of ambitious and effectively-implemented e-waste policies and trigger the publication of reliable e-waste data.

TF Policy has successfully submitted two seed-funded projects to the StEP Steering Committee: the first on e-waste definitions and the second on transboundary shipments of e-waste. Both projects have started producing results and will continue to be key areas of focus in the work of TF Policy throughout 2012. In addition, following the request from the Nigerian government to StEP to provide comments, feedback and suggestions to their draft e-waste legislation in late 2010/early 2011, StEP was given the opportunity to provide sound recommendations to the Ghanaian government on their draft legislation.

EEE and Climate Change

This project intends to inform the United Nations Framework Convention on Climate Change (UNFCCC) and other relevant stakeholders about the effects of greenhouses gas (GHG) emissions resulting from production, consumption and improper disposal of (W)EEE. In the course of this project, a survey was sent out to StEP members to investigate the possibility of buying carbon credits through voluntary markets (similar to the SENS International project [1]). Discussions are ongoing with the International Telecommunication Union

GeSI and StEP celebrate 41st Earth Day with shared commitment to e-waste solutions

On 22 April 2011, the StEP Initiative and the Global e-Sustainability Initiative (GeSI) celebrated Earth Day by announcing a partnership to address the global challenge of electronic waste. This partnership highlights key 21st century aspects of Earth Day's four-decade-long focus on accelerating a green economy and promoting environmental awareness.

The StEP-GeSI partnership will help build capacity in e-waste management, particularly in developing countries. In June 2012, StEP and GeSI will organize the first E-waste Academy, which will provide a fiveday pioneering programme on e-waste management and system design complemented by expert faculty presentations and interactive group work throughout the Academy. Further collaboration is planned to identify key success factors for e-waste policy by developing an index for countries' performance in handling e-waste.

Luis Neves, Chairman of GeSI, commented on this partnership: "As we transition to a low carbon society, the rapid deployment of innovative ICT solutions is enabling all sectors of the economy to reduce their carbon emissions and impact on the environment. Our industry needs to ensure that these ICT products are disposed of in a responsible manner at their end of life. Our vision is for the sector to move from managing risks to encouraging more efficient use and more extensive re-use of e-waste. Our partnership with StEP will address the need to build capacity for e-waste management among all actors in the value chain so that e-waste is viewed as a valuable resource."

Stephanie Adrian, Chair of the StEP Steering Committee, stated: "As global consumption of electronics grows exponentially, the role of StEP in bringing the various stakeholders together to address e-waste becomes even more paramount. Together with GeSI, StEP has the opportunity to draw on their realm of expertise in a way that reaches both developed and developing countries and grows the global capacity to develop practicable but science-based solutions to the e-waste problem."

and GeSI regarding the definition of common and standard procedures, as well as a methodology to evaluate and quantify the GHG emissions reduction achieved through the proper recycling of e-waste. A final report has been produced and future steps are being discussed.

Policy Recommendations for Ghana

StEP regularly receives requests from developing countries to support them in their efforts to develop effective and feasible e-waste policies. This year, StEP was approached by, among others, the government of Ghana for assistance and policy advice to improve its draft e-waste legislation. Ghana's effort to regulate and treat the heavy flows and accumulating stocks of e-waste within its borders is an important milestone. In February 2012, StEP finalized and submitted its comments on the Ghana E-waste Bill.

White Paper on E-waste Definitions

This White Paper seeks to develop a common definition of the term "e-waste" endorsed by all StEP members. A subgroup of interested StEP members was set up with the overall objective to accomplish this task and has conducted its research in three phases. First, they consulted the Compli ance-to-Product (C2P) database in order to identify existing definitions of e-waste, including their source, and to identify missing sources and definitions. Second, they critically analyzed the data gathered during the first stage identifying how it could contribute to a common StEP definition. Finally, all members of the project subgroup completed a questionnaire that allowed them to contribute their internal definitions of e-waste. Based on this accumulated data, a StEP definition of "e-waste" and "waste" will be proposed and diffused.

White Paper on Transboundary Movements of E-waste

This White Paper engages with the topic of transboundary movements of discarded electrical and electronic equipment. Building on the various recent studies and reports on global e-waste flows, this White Paper describes, quantifies and analyzes the global trajectory of discarded equipment. It also reviews the international, regional and national laws that govern the transboundary flows of e-waste. Finally, this White Paper identifies the various loopholes and leakages that enable the export of e-waste, despite concerted efforts to prevent it from crossing national boundaries. Of particular significance for regulating e-waste flows are: the difficulty in clearly defining the boundary between waste and commodity; the lack of coordination between various competent authorities; and finally, the tension between national environmental policies and a globalized, profit-driven economy. Based on this analysis, StEP members are currently developing this White Paper.

1 For more information, see: http://www.sens-international.org/en/

Survey on E-waste Arising

In recent decades, the rapid spread of electrical and electronic equipment into seemingly every corner of the world has been nothing short of revolutionary. Along with the benefits of this increased access, such as the reduction of the digital divide, however, improper management of e-waste has also resulted in negative effects on the environment and human health. An increasing number of reports are beginning to call attention to the alarming e-waste situations in many developing and transition countries and highlight the need for urgent global action.

The aim of the joint survey by the United Nations University, the International Telecommunication Union and Secretariat of the Basel Convention/UNEP (ITU), and supported by the Centre for Environment and Development for the Arab Region and Europe (CEDARE), was to collect necessary data on e-waste and e-waste-related policies and standards, and to promote collaboration and the exchange of information.

The survey's findings will be published in September 2012 on the occasion of ITU's Green Week. The Task Force plans to conduct this survey on yearly basis, taking into account new developments and changing circumstances related to e-waste flows, policies and standards.

Pan-African Forum on E-waste

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 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 from 14-16 March 2012 at the Nairobi headquarters of the United Nations Environment Programme (UNEP), a StEP member.

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, fridges, televisions and other electrical and electronic products in Africa. Increasing domestic consumption of electronics, coupled with the ongoing flows of WEEE into Africa from other regions, means that the continent is set to handle a higher annual volume of e-waste than Europe by 2017. The Pan-African Forum on E-waste in Nairobi adopted a Call to Action, which outlines eight priority areas to improve the environmentally-sound management of e-waste in Africa, including:

- Implementation and enforcement by African states of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the Bamako Convention, which bans the import of hazardous wastes into Africa
- Development of national systems to improve the collection, recycling, transport, storage and disposal of e-waste
- National institutions to cooperate with multiple stakeholders (United Nations, NGOs, private companies and others) in producing e-waste assessments
- Recognition that the safe and sustainable recycling of e-waste provides an opportunity for green jobs and poverty reduction
- Awareness raising activities on environmental and health hazards linked to the unsound management of e-waste

Delegates at the Pan-African Forum 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. However, the disposal of obsolete electronic equipment can pose significant environmental and health risks. E-waste often contains hazardous substances, including heavy metals such as mercury and lead, and endocrine-disrupting substances such as brominated flame retardants. Much of the recycling of e-waste that takes place in Africa today occurs on an informal basis, often in uncontrolled dumpsites or landfills by people – including children – who lack proper safety equipment and are regularly exposed to the hazardous substances that are released during the dismantling and disposal of e-waste. Open burning of cables, for example, is a major source of dioxin emissions, a persistent organic pollutant that travels over long-distances and can ultimately end up in the food chain. Attendees at the Pan-African Forum on E-waste highlighted the fact that recycling and materials recovery activities need to move from the unregulated, informal sector, where health and environmental risks are high, to a more regulated system using international recycling standards. 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 materials 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.

> "Against the background of the ever-growing e-waste problem, the foundation of StEP was timely and needed. StEP has been and continues to be an excellent initiative and I applaud its efforts to promote a better understanding of such a pressing global issue."
>
> *Kazuhiku Takeuchi, Vice-Rector, United Nations University and Director, United Nations University, Institute for Sustainability and Peace*

Green Paper on Resource Scarcity

This paper, published in early 2012, explores the international policy framework surrounding the supply and demand of geochemically scarce metals and seeks to discover where international policies have advanced to this end. The paper focuses particularly on indium and tellurium, two geochemically scarce metals that are used in 'thin film' photovoltaic (PV) power systems, a clean energy technology expected to see increased demand in the coming years. This Green Paper can be downloaded from the StEP website.

News from StEP Members

Project Renovadora

Since 2010, the Ecuadorian Government has been working on many projects to help reduce electricity consumption across the country by helping people upgrade their white goods such as refrigerators, to get rid of inefficient electrical equipment and to replace them with new ones. As a result, the project "Renovadora" was launched in 2011. The programme will discard more than 330,000 refrigerators all over the country over the next five years. Still in its infancy, the project has already upgraded more than 1,500 refrigerators. StEP member Vertmonde is one of only two organizations in the country that has been officially certified to properly handle, treat and dispose of these refrigerators. This process includes the extraction, capture and thermal des-truction of cooling system fluids (CFC gas and oil) and insulating material, followed by the manual destruction of the equipment.

GIZ activities in India, Mexico and South Africa

The WEEE Recycle Project (www.weeerecycle.in) is funded by the European Commission and the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). WEEE Recycle held trainings and awareness-raising workshops in four Indian cities for bulk producers of WEEE and EEE manufacturers in order to support the implementation of the new e-waste handling rules that went into effect in May 2012. The programme also supported the registration of small e-waste dismantlers so that they comply with the new rules. The GIZ environmental programme Advisory Services in Environmental Management (ASEM), implemented on behalf of BMZ, is currently assessing appropriate economic instruments to put into practice the producer responsibility principle stated in the rules.

In Mexico, a life-cycle assessment for e-waste has been conducted by the Mexican National Institute for Ecology and a study on the status and possible economic instruments for e-waste management is being developed by the BMZ-financed environment programme.

In South Africa, GIZ has formed a partnership with the company MTN in order to analyze and implement options to effectively collect and appropriately recycle e-waste in two urban centres.

Sustainable Recycling Industries (SRI) project by the Swiss Federal Laboratories for Materials Testing and Research (EMPA)

The Sustainable Recycling Industries (SRI) project is implemented by the Swiss Federal Laboratories for Materials Testing and Research (EMPA) as mandated by the State Secretariat of Economic Affairs (SECO) of Switzerland. The aim of the SRI programme is: "The sustainable integration and participation of small and medium enterprises from developing and transition countries in the global recycling of secondary non-renewable resources". The programme objectives are as follows:

1. Policies and standards for the sustainable management of secondary resources are internationally promoted, recognized and implemented in SECO partner countries.
2. Local capacity for sustainable recycling industries is created, aiming at competitive secondary resource recovery through environmentally- and socially-sound processes.
3. Basic information required to declare and compare the environmental and social life cycle performance for industrial activities along the reverse supply chains in developing and transition countries is available and used for enhancing sustainable trade schemes.

The project concept has been approved and the application for financing is in process. The project is expected to begin in the second half of 2012.

TASK FORCE 2 – REDESIGN

StEP's Task Force ReDesign is dedicated to product design aspects. Keeping substances of concern out of electrical and electronic equipment is a key strategy to reduce the impacts of these products over the course of their life cycles, in particular at the end-of-life stage. Smart product design can support and enhance the re-use and recycling of the equipment, but technical requirements and reliability concerns pose challenges. As end-of-life conditions vary broadly throughout the world, and even within individual countries, product design cannot be matched with a standard end-of-life scenario. Rather, it has to take into account possible contingencies and consequences in a range of disposal and recycling conditions. Task Force members develop re-use-friendly products, research end-of-life implications of electronics with regard to product design issues and explore policy measures globally to foster the trend towards "green electronics".

Achievements made so far by the Task Force and its partners include the successful development and launch of MicroPro's iameco, the first EU eco-labelled integrated personal computer of its class, and the publication of a "Desk Study on Worldwide Impacts of Substance Restrictions of ICT Equipment", authored by Fraunhofer IZM. The Task Force also reviewed the study "Closing the Loop – Electronics Design to Enhance Reuse/Recycling Value", authored by Green Electronics Council, which informed the development of the EPEAT scheme. The 2009 Asian Electrical and Electronic Green Society conference, hosted by the StEP member, Thai Electrical and Electronics Institute, was a huge success and brought together experts from Southeast Asia and around the world for a fruitful dialogue. Finally, the publication of an outstanding master thesis on "End-of-life implications of electronic textiles – Assessment of a converging technology", which was supported and reviewed by Task Force members, was awarded with an eco-design award in 2009

"Fantastic to see so many concluded and active projects within the StEP Task Forces that support the StEP mission to Solve the E-waste Problem."

Jean Cox-Kearns, Director of Compliance, Global Takeback, Dell

Project concept: Resource efficient technologies and services for closing the loop of post-consumer high-grade plastics for new electrical and electronic equipment

Most recently, some StEP partners and other external partners jointly initiated a project proposal to foster the re-use of post-consumer plastics for new products.

Plastics production consumes roughly 5 per cent of global crude oil production. Efficient use of these resources requires a high level recycling of polymers to replace further fossil fuel consumption. Whereas commodity plastics from packaging (the largest consumption sector for plastics) are recycled on a moderate level, the material recycling rate for high grade plastics from electrical and electronics equipment (EEE) is close to zero. Most other materials from EEE are subject to materials recovery, whereas plastics are a problematic fraction with very little high-level recycling in place. The lack of purity and presence of additives often reduces the quality of recycled plastics and preclude their use in many applications. To maximize resource efficiency and product possibility for recycled plastics, high grade polymers are required.

The objective of the project is to optimize and redesign the flows of resources over the life cycle of high-grade plastics in electrical and electronic equipment and to overcome barriers to the diffusion of recyclate in the market.

This objective will be achieved through the development of:

- Innovative, SME-owned technologies: recycling and processing of high-grade polymers, material analytics
- Innovative services: certification scheme for recyclate content in new EEE

The recyclates should meet or exceed the material specification for virgin material. Only in instances where high quality recycled plastics are "over-specified" for the intended application will the suitability of recycled plastics of lower quality will be explored.

Currently, a certain percentage of recycled plastics are mandated by a broadly accepted procurement scheme (EPEAT) for electronics delivered to the United States, which has a global impact on the electronics industry. Furthermore, the public's growing environmental consciousness is driving recycled plastics to be used increasingly in EEE. This market pull might even result in higher prices of recycled plastics compared to new plastic material. Innovative technologies will be necessary to meet the needs of this evolving market.

The certification workflow to be developed needs to characterize the physical and chemical properties of the recyclate and to ensure that no restricted substances are contained above acceptable concentration limits.

iameco – The First Desktop PC to Earn the EU Eco Flower Label

Irish computer manufacturer and StEP member MicroPro Computers has launched the latest model in its iameco (pronounced “I am eco”) computer range – the iameco touchscreen personal computer – which is the first integrated desktop PC worldwide to secure the prestigious Eco Flower Label of the European Union. Recognized throughout Europe, EU Eco Flower is a voluntary label promoting environmental excellence. The EU Eco Flower Label helps to identify products and services that have a reduced environmental impact throughout their life cycle, from the extraction of raw materials through to production, use and disposal. The iameco computer has achieved previously unattainable standards of energy efficiency, re-usability and recyclability. It consumes just 0.8 watts of power in standby mode, zero watts in off mode and 21 watts in full operation, just one third of the power usage of other desktop computers. It also incorporates the most environmentally-benign components in a fully-reusable and ultimately recyclable chassis and housing with a design life of up to 10 years. The iameco computer is an entirely new market offering with an upgradable, silent-running, solid state design that will run on any of the leading operating systems, including Mac OS and Windows 7.

”Since the first preparatory meetings of the initiative back in 2004 at the Electronics Goes Green in Berlin, StEP managed to turn passion into action, thanks to the cooperative spirit of the experts and stakeholders involved. Congratulations for the achievements so far and my sincere good wishes for the immense work still to be done.”

Nils F. Nissen, Head of the Department of Environmental and Reliability Engineering, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration

The EU Eco Flower Label for the iameco desktop computer was secured following an exhaustive two year development and testing process by MicroPro, under the Cleaner Greener Production Programme of the Environmental Protection Agency and with inputs from Fraunhofer IZM, Technical University Berlin in Germany and the University of Limerick. The Eco Flower Label confirms the quality and design of products from an environmental sustainability perspective, including the grades of components, their impacts on the environment, and their ability to be re-used and recycled.

For more information, see:
www.iameco.com or www.micropro.ie

TASK FORCE 3 – RE-USE

Re-use is regularly discussed as a means of moderating the environmental impacts of electrical and electronic equipment (EEE). It is seen as a progressive response to the shortening of product lifetimes, which is leading to greater pressure on resources and other manufacturing burdens, and contributing to the burgeoning quantities of e-waste which must be dealt with. Re-use, essentially, attempts to optimize the use phase of a product in order to achieve greater resource efficiency. It is difficult to envision a sustainable electronics industry that does not engage in re-use or other lifetime extension strategies.

"Five years with StEP & 20 years of experience in recycling - the initiative still delivers us new facets of e-waste problems, as well as new approaches to managing them."

Neal Saunders, CEO,
Dataserv Group Holdings Ltd.

In recent decades, the re-use sector for electrical and electronic equipment has been growing steadily. Despite facing different challenges, many organizations have established successful operating models for the collection and preparation for re-use and redistribution of used EEE, in both the for-profit and non-profit sectors. Nonetheless, the re-use sector is considered to have a lot of latent potential. StEP's Task Force Re-Use seeks to learn how re-use can be leveraged as a strategy to deliver sustainable services through the most economically-, socially- and environmentally-responsible means possible.

At the outset of the StEP Initiative, this Task Force set about raising awareness of the topic and establishing a common language around re-use in order to draw attention to the sustainability benefits of re-use and to help foster a common understanding of this important and complex issue. The first major achievement of the Task Force was holding a special one-day conference on re-use, which took place the day before the opening of the Electronics Goes Green conference in Berlin in September 2008. The conference was a great success and was attended by over 100 international delegates. It was quickly followed up by the publication of the White Paper titled "One Global Understanding of Re-use Common Definitions" in March 2009, which aimed to create a "dictionary" of key terms, their definitions and underlying concepts for establishing a global standard for communication on the issue of re-use. With re-use now firmly defined and established as having a role in the solution of the e-waste problem, the work undertaken in the Task Force has since built on these foundations.

2 For more information, see: http://www.bsigroup.com.

Best Practices in Re-Use: Success Factors and Barriers

The Best Practices project wrapped up in spring 2010 but this has not been the end of the story. In this project four generic re-use operating models for ICT and large household appliances were identified:

- The Networking Equipment Recovery model
- The IT Asset Management model
- The Close the Digital Divide model
- The Social Enterprise model

This work was edited to form a submission to the peer-reviewed scientific journal *Resources, Conservation and Recycling*. After two stages of anonymous review by international experts, the paper was recently accepted for publication. This paper will now be available to other researchers in the area of e-waste through academic databases and search engines. The Task Force is also currently preparing an article on the barriers and success factors regarding re-use for submission to the same journal.

The Re-Evaluate Project: An Update

The Re-Evaluate Project, funded by the Irish Environmental Protection Agency (EPA), is being led by the University of Limerick and supported by the social enterprises Rehab Recycle and Clondalkin Community Recycling Initiative, with UNU sitting on the Steering Committee. The project aims to examine how re-use of EEE could become a mainstream

activity in Ireland with a specific focus on the role of the social economy.

One of the most significant developments to have occurred in the past year is the investment of over one million euros by Rehab Recycle in a facility in Tallaght to transform it into Ireland's first, state of the art, EEE re-use centre. Complying with guidelines set out in PAS 141[2], Rehab Recycle Tallaght is now capable of repairing up to 20 large household appliances and 200 pieces of IT equipment per hour.

From its headquarters in Tallaght, Rehab Recycle now also employs a dedicated remarketing team, charged with the resale of assets recovered for re-use. Rehab Recycle is currently finalizing arrangements to have access to a network of 16 retail outlets nationwide with the combined capacity to resell approximately 31,500 units of second life large household appliances and 70,000 units of second life laptops & desktops.

Learning from case studies in other jurisdictions, Rehab Recycle is also currently in advanced negotiations with one of Ireland's compliance schemes to cooperate on separating WEEE with potential for re-use from the general waste stream as soon as possible and will work on an educational campaign with the staff involved.

The Re-Evaluate Project has also conducted comprehensive modelling to determine when it is beneficial to re-use an appliance, as compared to purchasing a new appliance. The model implements a streamlined cumulative energy demand (CED) analysis focusing on the two most significant phases of the life cycle: the manufacture and usage phases. Models of this nature will inevitably have a high level of uncertainty due to assumptions about consumers' energy use and future energy generation. For this reason, the analysis is conducted on eight different possible scenarios to determine the sensitivity of the results.

The model is broken into two phases. The initial manufacture and usage phase is determined for the original user, while the second phase focuses on the second user's decision whether to purchase a refurbished appliance or a new, more energy-efficient appliance based on a suitable amortization period. The slope of both usage phases is determined by:

- the energy rating of the appliance
- original user usage intensity
- second user usage intensity
- the electricity generation portfolio
- the efficiency of the electricity supply

For large household appliances, the minimum energy ratings considered suitable for re-use are shown in the table below:

Appliance	Minimum Energy Rating
Washing Machine	B
Dishwasher	B
Dryer	D

Table 2: Minimum energy rating of certain large household appliances suitable for re-use in Ireland

Moreover, the Re-Evaluate Project has also been conducting novel research in the use of radio frequency identification technology (RFID) in reverse logistics for re-use of EEE. Two of the most interesting findings are that, from a technical perspective, RFID could be used to facilitate a move in the direction of Individual Producer Responsibility (IPR) and that standardization of discovery services is essential to enable greater utilization of this technology to improve the efficiency of re-use.

The Re-Use Potential Project

While there have been many observations that e-waste recycling systems do not facilitate re-use, and often have the effect of actually hindering re-use, this project will examine some of the places where there is evidence that re-use is occurring with moderate success. The project seeks to identify countries or states where re-use is relatively successful. A successful country or state is defined as "a place where there is both a considerable supply of goods available for refurbishment and demand for re-use goods that is being serviced by re-use organizations. It does not imply that re-use is happening in a completely optimal fashion, but instead may be contrasted with jurisdictions where negligible formal re-use is being undertaken". Some of the places being considered for the study include the UK, Belgium and Illinois, and will seek 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 some interesting contrasts and comparisons in approaches and attitudes both between the EU and the US and within the EU. By uncovering the impressions of stakeholders in areas considered to be relatively successful, the Re-use Potential project will help to provide avenues for experimenting with greater engagement with re-

"Ericsson congratulates StEP for its successful first 5 years and looks forward to a continued multi-stakeholder collaboration among StEP members in addressing the important matter of sustainable e-waste handling."

Elaine Weidman-Grunewald, Vice President, Sustainability and CR, Ericsson

use in those places currently experiencing less success with re-use and to provide generic recommendations on changes to the e-waste management systems that would promote re-use in any jurisdiction. The project is being led by the University of Limerick and the project group includes United Nations University, The Sustainability Consortium, Technical University Braunschweig, the University of Illinois, Dell, EMPA and AER Worldwide. That project is expected to be completed by summer 2012.

The Re-Use Data Set Project

Rigorous collection and analysis of quantitative data characterizing of the products and materials collected for re-use will greatly further the understanding of the e-waste problem and its potential solutions. The University of Illinois has collected data from a commercial computer refurbisher, PC Rebuilders & Recyclers. It is anticipated that this data set would be used as a starting point for an international data set accessible by all StEP members via the internet. This data set could then be analyzed to produce recommendations on technological, logistical or contractual changes that would facilitate greater levels of re-use, and to discern global trends in end of life electronics and a host of other life cycle optimization issues.

During the second phase of the project, the Re-Use Data Set Project will gather together a group of refurbishers from around the world to explain the mutual benefits of the concept and to agree on the creation of input protocols that would allow numerous international organizations to contribute to the data set. During the third phase of the project, the University of Illinois will implement the necessary web site programming to meet the specifications developed in the previous two phases. In phase four, the data set will be populated with data by project partner PC Rebuilders & Recyclers for sample analysis. The initial load of data should spur others to add their data.

"StEP has established itself as an indispensable and important platform for all e-waste stakeholders. Its liveliness after 5 years is the best evidence of its functioning and added value created. We thank StEP for its endeavour and hope that the e-waste problem will be brought forward as it has been in the past 5 years."

Heinz Böni, Head Technology and Society Laboratory, Empa – Swiss Federal Laboratories for Materials Testing and Research

TASK FORCE 4 – RECYCLE

According to the European WEEE and Waste Directive, the term “recycle” embraces “any recovery operation by which waste materials are reprocessed into products or materials whether for the original or other purposes”. For the past five years, Task Force ReCycle has aimed at enhancing such recovery operations by focusing on issues related to e-waste infrastructure, systems and technologies. Task Force ReCycle’s activities have included (i) gathering data about and assessing the current e-waste situation in developing countries, (ii) analyzing and proposing best practices and standards on a global level and for specific local situations and (iii) supporting communication and training.

Gathering Data and Assessing the Current E-waste Situation

Various Task Force ReCycle projects were dedicated to assessing the current e-waste situation in developing countries. As part of official and related StEP programmes funded by SECO [1], [2], HP [3], The United Nations Industrial Development Organization (UNIDO) [4], [5] and the Basel Convention [6], various countries in Africa, Asia and Latin America were assessed. Results contributed to a better understanding of the stakeholder set-up, the legislative situation, recycling practices and their impacts, and e-waste volumes in developing countries. These results, among others, were summarized and discussed in the UNEP/StEP study Recycling – From E-waste to Resources [7].

With projects such as the one with Basel Convention, 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 conducted under the North American StEP focal point, the Massachusetts Institute of Technology (MIT). 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 [8].

In a broad literature review, Task Force ReCycle analyzed the environmental health and safety impacts of informal recycling operations in China and India [9]. The study demonstrated that informal recycling activities under uncontrolled conditions cause serious detrimental effects on humans. This evidence can be transferred to any geographical set-up without significant additional research efforts. Since its publication, the review paper has been cited widely in research and technical reports.

Analyzing and Proposing Best Practices and Standards

The Task Force ReCycle seed-funded project for 2011 was developing a business model for adapted best practices in developing countries for sustainable e-waste recycling. The model focuses on manual dismantling facilities and provides a scheme for a calculation methodology tool and core data for a relevant business plan. This project makes use of the work of the Best of 2 Worlds (Bo2W) project, which was published as one of the core StEP Task Force ReCycle philosophies on sustainable e-waste recycling in developing countries[10]. StEP projects related to the Bo2W philosophy were also summarized and discussed in the UNEP/StEP study Recycling – From E-waste to Resources [7]. This report analyses adapted best practices for metal recycling and highlights the need for sustainable innovation requiring a sound market concept to address the increasing amounts of e-waste in the developed world. It continues to be cited and referenced by the international community as one of the key Task Force ReCycle publications.

After an intense and constructive review in 2011 by Task Force members, the StEP Green Paper titled “Standards for the Collection, Storage, Transport and Treatment of e-Waste” has been finalized in 2012. The paper seeks to provide a comprehensive and detailed set of recommendations to key stakeholders on the development of high-quality end-of-life (EoL) standards, their conformity assessment, and means

”Umicore strongly values the StEP Initiative to put the e-waste problem on the agenda and to create stakeholder dialogue. Congratulations to StEP on a successful first 5 years.”

Koen Demesmaeker, Senior Vice Presdent
Umicore Precious Metals Refining

for implementation in order to effectively and efficiently improve the management of e-waste. The Green Paper was published in June 2012 and is intended to be developed into a more concise White Paper, which will reflect a common StEP philosophy on this topic. The issue of global standards for sustainable recycling will also be a key topic in the upcoming programme "Sustainable Recycling Industries" (SRI), which is the successor initiative of SECO's Swiss e-Waste Programme. SRI intends to incorporate the StEP network 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.

Task Force ReCycle members, working with major OEMs, launched several activities in Africa in a coordinated effort under the principles of Extended Producer Responsibility (EPR). StEP is actively supporting this collaborative effort with the aim of defining appropriate strategies and conditions to enable sustainable EPR take-back models in African countries. This includes policy, infrastructural and financing issues and takes into account the informal sector, which often dominates recycling activities in African countries.

Support Communication and Training

All of these results were communicated on international platforms and used for training purposes in cooperation with other StEP task forces. This includes organizing special StEP events at international conferences (e.g. World Resources Forum in Switzerland, REWAS in Mexico, WasteCon in South Africa and the E-Scrap Conference in the U.S.), presenting Task Force ReCycle results at public events and in the media, and supporting other initiatives (e.g. PACE) and governmental policy processes (e.g. in Nigeria and Ghana). Finally, Task Force ReCycle has also provided input for the StEP E-waste Summer School and the upcoming StEP E-waste Academy.

"Safe and efficient solutions for e-waste recovery and recycling is of utmost importance to Nokia. We are glad to be working together with StEP to find ways to ensure that e-waste is managed effectively on a global scale."

Kirsi Sormunen, Vice President, Sustainability, Nokia Oyj

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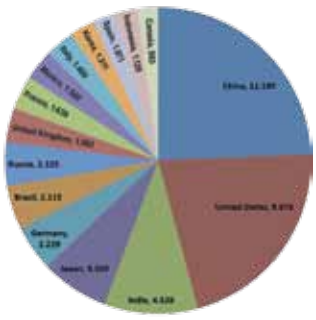
TASK FORCE 5 – CAPACITY BUILDING

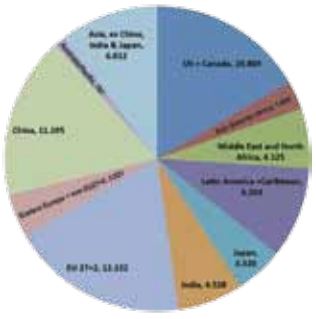
Since its formal launch in 2007, StEP has recognized the importance of building capacities on the sustainable and responsible design, production, use and disposal of electrical and electronic equipment, in particular in developing countries where e-waste amounts are accumulating due to growing domestic production of electronics and trans-boundary (W)EEE flows.

StEP's Task Force Capacity Building follows two main objectives: first, it disseminates the results of the work of the other four StEP Task Forces. And, second, it strives to develop infrastructure for a sustainable, effective and target group-oriented capacity development to increase awareness on, and strengthen coping capacity for, the growing e-waste problem. This is accomplished in part by providing training and resources, as well as through providing access to information and scientific data.

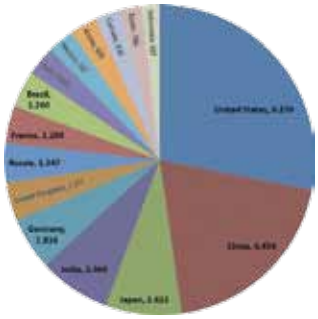
The major achievements towards this aim were the launch of the ADDRESS project to quantify and qualify the volumes of e-waste worldwide and the establishment of the StEP E-waste Summer School series, with the first Summer School taking place in 2009. This concept of training for young academics has proven so successful that another format was added this year, an e-waste academy for policy-makers and small- and medium-sized enterprises (SMEs). The first training for policymakers and SMEs in the African region will take place on 25-29 June 2012 at the United Nations University Institute for Natural Resources (UNU-INRA) in Accra, Ghana.



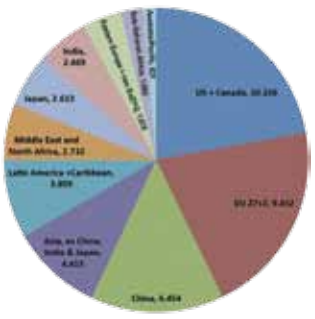
EEE placed on market, 2012
(per region, in ktons)
65.1 million tonnes



EEE placed on market, 2012
(per country, top-15 globally, in ktons)
65.1 million tonnes



WEEE generated, 2012
(per region, in ktons)
45.6 million tonnes



WEEE generated, 2012
(per country, top-15, in ktons)
45.6 million tonnes

Future Flows – The Dutch 2011 WEEE Flows

The StEP Initiative has identified a pressing need for the global dissemination of e-waste information, as well as the compilation of and emphasis on the utilization of best practices. Such data would not only shed more light on the nature and scale of the problem, but would also help to develop sustainable solutions based on scientific knowledge and practical lessons learned. The work intends to track the progress made in take-back systems in specific countries and regions. Thus, Task Forces Capacity Building and ReCycle have initiated a long-term project called "Annual Dynamic Digital Reporting on the global E-waste StatuS" (ADDRESS). As a first step in this long-term project, NVMP, Wecycle and ICT Milieu have commissioned UNU to quantify Dutch e-waste flows for 2011.

In the Netherlands in 2010, Wecycle and ICT Milieu collected and treated around 7.5 kg of WEEE per inhabitant, or about 28 per cent of the three previous years' sales of EEE, which is well below the new WEEE Recast target of 65 per cent. However, significant complementary recycling streams also exist. Therefore, the aim of this research is to provide a factual basis for the upcoming WEEE Recast collection target definition in the Netherlands and to provide a more detailed and complete quantitative assessment of WEEE flows.

Summary of key findings:

1. Based on methodology that uses production, import and export data for EEE from Statistics Netherlands, combined and validated with other sources, it is calculated that 26.5 kg/inh (440 kton) of EEE was put on the market in 2010. The average for 2007-2009 is 26.8 kg/inh. This includes all EEE and WEEE equipment both from households and businesses, professional appliances and installations, and consumer luminaires (lamp fittings). The method is easily transferable to other EU countries.
2. A new model developed by UNU is able to calculate with unprecedented accuracy WEEE amounts based on interrelated historic sales data, average residence times and stocks in households and businesses. It calculates the amount of WEEE plus export of used EEE generated in

"Congratulations to StEP for the past five years of bringing together the international community and a multitude of orgnizations to help forge unilateral effort on e-waste issues. Best wishes for the future."

Jeff Borrman, Business Development Director, Datec Technologies Limited

"Over the past 5 years, StEP has contributed extensively to bringing together expertise on e-waste management, influencing policy development in Europe and serving as an international platform to exchange best practices and capacity building across different geographical zones. Finally, the StEP summer school provides a unique training opportunity to young professionals in the e-waste arena."

Eric Labouze, CEO, Bio Intelligence Services

the Netherlands at 23.7 kg/inh (+/-0.4), or 392 kton. The ratio of WEEE + used EEE versus the same year Put On Market (POM) is 89 per cent in weight.

3. Export of used EEE is documented as at least 2.7 kg/inh (44 kton or 9 per cent of POM); from this, 1.7 kg/inh is from households and 0.9 kg/inh is of B2B origin.
4. From the potential WEEE that can be collected and treated in the Netherlands (21.0 kg/inh (349 kton), Wecycle and ICT Milieu collected and treated 7.5 kg/inh (125 kton, 28 per cent of POM).
5. Parallel to this, the total complementary recycling stream is 6.6 kg/inh (110 kton, 25 per cent of same year POM). From the complementary recycling stream, 60 per cent is a so-called mono-flow consisting of a single type of re cognizable WEEE equipment; the remaining is present in a mixed stream with other metals and a small percentage of WEEE-derived parts.
6. In total, 2.3 kg/inh, mainly small household appliances, is ending up in residual waste and being incinerated (38 kton, 9 per cent of POM).
7. At the beginning of the project, approximately 30 per cent of WEEE flows were documented. As a result of the project, roughly 80 per cent of all WEEE flows are now being documented (19.1 kg/inh, 316 kton). The documented amounts of WEEE are validated using an advanced WEEE chain model, incorporating detailed information on mass balances per actor and logistical constraints. Moreover, the model more precisely allocates the amounts to the individual collection categories.
8. In addition, clear indications are derived on the likely destinations of the not-yet-documented remainder of 3.9 - 5.1 kg/inh (64 - 85 kton, 15 - 19 per cent of POM). For a number of reasons, roughly half of this undocumented WEEE, 2.2 kg/ inh, (+/- 37 kton), is thought to be structurally non-identifiable.

UNU is currently conducting a similar WEEE quantification study in Italy and is in discussions with compliance schemes in Belgium, Switzerland and France about plans to undertake country assessments.

StEP E-waste Summer School for Academics

The third StEP E-waste Summer School took place over ten days in September 2011. The theme of this Summer School was "Closing Resource Loops: Complexities and Solutions in Managing E-waste". The event was carried out in five cities in three countries (the Netherlands, Belgium and Switzerland).

The goal of the 2011 Summer School was to bring together promising e-waste researchers from around the world and facilitate interdisciplinary collaboration and learning about the global e-waste problem. The Summer School provided a unique forum for researchers to interact and explore key issues with a diverse group of experts from industry, academia, the NGO community and policymakers. The students discussed and debated with various stakeholders (recyclers, OEMs, regulators, etc.) involved in shaping the different life cycle stages of electrical and electronic equipment. This year's 19 participants were motivated, engaged and truly committed to keeping in touch as a multidisciplinary network of young scholars, sharing the benefits of their Summer School learning experience with their respective academic fields and geographic regions.

As in the past, Philips Consumer Lifestyle in Eindhoven (Netherlands) and Umicore Precious Metals Refining in Hoboken (Belgium) hosted the Summer School. In addition, this year, the group enjoyed a study tour at Flection's refurbishing facility in Culemborg (Netherlands). They had a special "SWICO Day" in Zürich (Switzerland), where they visited e-waste logistics and recycling facilities and were introduced to the Swiss take-back system. The programme included many expert lectures, an OEM panel discussion, workshops and study tours, as well as a challenging group work assignment. The group explored the idea of using labels to maximize resource recovery from e-waste, and developed a "Critical Metals Stewardship Model" which they presented and discussed at the World Resources Forum in Davos, Switzerland.

The feedback received from the students, experts, panellists and faculty participating in this year's Summer School was overwhelmingly positive and encouraging. The feedback also demonstrated the relevance and usefulness of the Summer School's yearly sessions. This success reflects

the important commitment and contribution of the Summer School's sponsors; Dell, the Swiss Federal Laboratories for Materials Testing and Research (EMPA), HP, Nokia, Philips Consumer Lifestyle, SWICO-Recycling (the Producer Resources Organization for the management of used Electronics in Switzerland), and Umicore Precious Metals Refining. Each sponsor actively contributed to the programme's development through the Summer School's Technical Committee and participated in various Summer School activities, enriching and diversifying its content. EMPA provided additional technical support by coordinating the students' group work.

The Summer School is quickly growing in popularity, as evidenced by the record number of applications and new sponsorships. This success reflects the strength and vitality of the StEP community, which stood behind the Summer School's development and fulfilment, from its conception in 2008 through its third edition in 2011.

E-waste Academy for Policymakers and SMEs

Following the huge success of the E-waste Summer School for academics, StEP has started preparations for an E-waste Academy (EWA) for policymakers and small- and medium-sized enterprises.

The approach for the first E-waste Academy will be a regional one, with policymakers and SME operators in Western Africa as the target group, though some participants from other regions of the world will also attend in order to establish vital South-South cooperation. This regional approach will enable a more targeted effort to stimulate fruitful discussions among policymakers and SME operators while also facilitating the exchange of best practices and expert feedback, taking into account regional disparities. The overarching idea is to replicate the E-waste Academy in different regions of the world, ultimately weaving together academy results and thereby guiding and facilitating effective dialogue and action on e-waste management and system design at the international level.

The first E-waste Academy is being co-organized by the Global e-Sustainability Initiative (GeSI), supported by the Dutch NVMP and UNIDO. The first E-waste Academy will take place from 25-29 June 2012 at the UNU Institute for Natural Resources in Africa (UNU-INRA) in Accra, Ghana.

For more information, please visit the E-waste Academy website at www.ewasteacademy.org.

Recycling Trainer Online

Many developing countries are facing huge challenges in the management of electronic waste, which is either internally generated or imported. Because of insufficient infrastructure and knowledge regarding the proper and safe handling of this waste stream, these wastes are oftentimes buried, burnt in the open air, or dumped into surface water. Furthermore, recovery of valuable and recyclable material from this waste if often accomplished through informal, unsafe and highly-polluting practices. In response to the great demand for training on safe and sustainable e-waste treatment, in particular by small enterprises in developing countries, Task Force Capacity Building has initiated the Recycling Trainer Online (RTO) project.

The basic idea behind the RTO is to provide recyclers and other e-waste handlers in developing and transition countries with knowledge on recycling of e-waste using an online interactive tool. While the amounts of e-waste are growing rapidly in these countries, there is a severe lack of knowledge on best recycling practices, resulting in consequences such as:

- severe environmental pollution
- damage to the health and safety of workers and third parties
- loss of valuable resources

The RTO thus contributes to preventing environmental pollution, protecting recycling workers and saving valuable resources StEP member GOAB mbH developed an RTO version for German charity organizations interested in recycling e-waste[3]. This version shall be further developed and adapted to the specific requirements of developing countries. Task Force Capacity Building will continue to seek funding for further development of the RTO in 2012.

3 http://www.recycling-trainer.eu/

OUTREACH TO THE REGIONS
REPORTS BY STEPS REGIONAL FOCAL POINTS

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

(1) StEP Regional Focal Point for North America: Jeremy Gregory and Randy Kirchain, Materials Systems Laboratory (MSL) at the Massachusetts Institute of Technology (MIT), USA

(2) StEP Regional Focal Point for the Middle East and North Africa: Hossam Allam, Center for Environment and Development for the Arab Region and Europe (CEDARE), Egypt

(3) StEP Regional Focal Point for South East Asia: Chirapat Popuang, Electrical and Electronics Institute (EEI), Thailand

(4) StEP Regional Focal Point for East Asia: Jinhui Li, Basel Convention Coordinating Centre for Asia and the Pacific (BCRC China), China

(5) StEP Regional Focal Point for the South Pacific: Sunil Herat and David Thiel, Griffith University, Australia]

StEP Regional Focal Point for North America

The primary activity of the North American Focal Point for StEP has been leadership of a StEP project characterizing transboundary flows of used electronics with a particular emphasis on the United States. This project is the outcome of the partnership between StEP and the United States Environmental Protection Agency (US EPA); US EPA funds to StEP have been used to support the effort. The project is being led by the Materials Systems Laboratory (MSL) at the Massachusetts Institute of Technology (MIT), StEP Regional Focal Point for North America, and the National Center for Electronics Recycling (NCER), Coordinator of StEP's Task Force ReCycle.

A highlight of the project in 2011 was a workshop that took place in June at the US EPA in Washington, DC. The workshop was organized and run by MIT MSL and NCER and included stakeholders from academic and research institutions, industry and non-profit organizations, and US government agencies. The objective of the workshop was to bring these stakeholders together to assess existing work characterizing transboundary flows of used electronics all over the world and to chart a path forward for collaborative data collection and characterization efforts. The ultimate goal is to bring a scientific and balanced perspective to the issue of transboundary flows of used electronics. The primary desired outcome from the meeting was that the group would develop a vision for a roadmap to characterize the transboundary flow of used electronics using a collaborative approach. The vision is long-term; the characterization of these flows will continuously evolve over time in order to track the dynamic nature of the system. The workshop included extensive and stimulating discussion and exchange of ideas. The outcomes of the workshop were summarized in a report, which also included a framework for characterizing transboundary flows, a review of previously-established characterization methods and results, a list of new proposed approaches and feasibility assessments of all approaches.

This 100+ page report is available online at www.step.initiative.org.

Following the workshop and publication of the summary report, the research team transitioned to the next phase of research, which built off of the workshop and report findings. An important finding was that previous efforts to quantify amounts of used electronics flows have been hampered by a lack of comprehensive data on key topics such as product sales and lifetimes, collection amounts and shipment records. Furthermore, the analyses have been static snapshots of amounts and are not geared towards continuous and dynamic tracking of changes in stocks and flows. Consequently, estimates of the overall performance of take-back and recycling efforts in the US are highly uncertain. Thus, the next phase of

"Managing used electronics is a growing global challenge and thanks to the hard work of StEP over the past 5 years, there is now a global platform for identifying, building capacity and implementing solutions to put us on a path towards solving the e-waste problem."

Michelle DePass, Assistant Administrator, International and Tribal Affairs, United States Environmental Protection Agency

the research effort focuses on the development of a streamlined process to characterize amounts of used electronics generated and collected in the United States and exported from the US. An important goal of the project is to develop a process that is geared towards regular updates of the characterization in order to illuminate trends and changes in quantities over time. The findings of the research will feed into the Annual Dynamic Digital Reporting on the global E-waste Status (ADDRESS) project within StEP. As such, the work will proceed as a close cooperation between the research team and the leaders of the ADDRESS project. The ultimate outcome of the work will be a description of the requirements for conducting streamlined and continuous characterization of used electronics stocks and flows in the United States and the expected confidence levels of the characterizations, as well as an initial set of estimates using the proposed model. Preliminary outcomes are expected in mid-2012.

> "Kevoy Community Development Institute (KCDI) and its associate partners congratulate StEP on its work and achievements over the past five years and pledge our full support in solving the world's electronic waste problem. The StEP Initiative, being cognizant of the fact that no one organization, country or government can address the world's e-waste challenges, has created the ultimate forum for dialogue and cooperation among its members."
>
> *Donovan McLaren, Executive Director, Kevoy Community Development Institute*

StEP Regional Focal Point for the Middle East and North Africa

In 2011, the Moroccan Cleaner Production Centre (CMPP) joined StEP, further strengthening StEP's presence in the Middle East and North African region (MENA). Already in 2010, CMPP organized the E-waste Management Forum (E-waste 2010) in Marrakech, a yearly StEP event in the MENA region.

The Swiss Federal Laboratories for Materials Testing and Research (EMPA) and the Centre for Environment and Development for the Arab Region and Europe (CEDARE), both StEP members, have cooperated on implementing the inception phase in Egypt of the SECO Sustainable Recycling Industries (SRI) project for African countries.

In recent decades, the rapid spread of electrical and electronic equipment into seemingly every corner of the world has been nothing short of revolutionary. Along with the benefits of this increased access, such as the reduction of the digital divide, improper management of e-waste has also resulted in negative effects on the environment and human health. An increasing number of reports are beginning to call attention to the alarming e-waste situation in many developing and transition countries and highlight the need for urgent global action. In response to this pressing need for action, CEDARE cooperated with StEP, UNU, the International Telecommunication Union (ITU) and the Secretariat of the Basel Convention on a global survey of e-waste practices. The aim of the survey was to collect necessary data on e-waste and e-waste-related policies and standards, and to promote collaboration and the exchange of information.

CEDARE presented with StEP at the 9th World Telecommunication/ICT Indicators Meeting in Mauritius, 7 - 9 December 2011, a meeting organized by the International Telecommunication Union.

StEP Regional Focal Point for South East Asia

The 2011 Annual Conference of the Electrical and Electronics Institute (EEI) comprised two sessions: "Update on the Environmental Laws and Regulations in the Electrical and Electronics Industry" and "Electronics Go Green: Opportunity to AEC (ASEAN Economic Cooperation) and the World Market". Panellists included representatives from local and international government offices, Thai federal enterprises, private companies and EEE associations.

The primary activity of EEI as StEP's Regional Focal Point for South East Asia has been a project assessing estimation methods on electrical and electronic waste quantities in Thailand. In the project, EEI is implementing the following activities:

1. Review and collect information on existing database systems, data management and methods of estimating e-waste quantities in Thailand and five other countries.
2. Propose a survey method, a study guide and information collection tools necessary to design an appropriate e-waste management database and information system in Thailand.
3. Organize a focus group meeting on how to survey and collect the required information for the above information system.

4. Organize a seminar to transfer knowledge on information management and e-waste quantities estimation.
5. Carry out a survey and collect data on end-of-life product disposal, recycling and treatment, as well as consumer behaviour and attitudes. This should comprise data for 13 products, namely TVs, VDO cameras, VCD/DVD players, printer/fax machines, telephones, personal computers, air conditioners, refrigerators, fluorescent lamps, dry cell batteries, microwave ovens, washing machines and electric fans.
6. Propose an information system to support e-waste management in Thailand. This should include comparing advantages and disadvantages of the past methods employed overseas, assessing primary and secondary information sources available in the country to forecast e-waste quantities, constructing prediction models on e-waste quantities (utilizing existing models domestically and internationally) and designing a database system to support future e-waste management by connecting to existing WEEE tracking, flows, types and quantities of re-used, recycled and recovered materials.
7. Estimate e-waste quantities for the above 13 products.
8. Organize a focus group meeting to generate feedback on the information analysis and the database system.
9. Disseminate related information to all relevant stakeholders.

The quantification methods have been reviewed and initial results are now available. Based on 1200 survey questionnaires collected from households, organizations, companies, equipment collectors and repairers, second-hand equipment stores and recyclers, waste quantities for the above-mentioned 13 products were estimated for the time period of 2017-2021.

EEI has also started work on the "New Product Development Incubator Project" under the Product Design and Development Center (PDDC). This project aims to improve knowledge of electrical and electronic equipment manufacturers in designing four types of value-added products: freezers, electric lamps, electric fans and microwave detectors. Four manufacturers have been selected to produce the respective prototypes.

StEP Regional Focal Point for East Asia

As StEP Regional Focal Point for East Asia, the Basel Convention Coordinating Centre for Asia and the Pacific (BCRC China) was instrumental in carrying out the following activities in 2011:

As part of the grant agreement between the US Environmental Protection Agency and the StEP Initiative, Tsinghua University/ BCRC China has started work on an e-waste mapping project for China. In the preparation stage, the detailed work assignment included:

- The collection of available data and references on domestic e-waste generation, e-waste and component flows, geographic distribution of e-waste recyclers, recycling capacity and quality of the formal sectors in China. This data will be incorporated into an initial desk study drafted by UNU.
- Cooperation with UNU and the StEP Initiative on the develop ment and organization of the first stakeholder workshop. During this stakeholder workshop, the results from the initial e-waste study will be presented to the audience. The workshop is scheduled to take place in summer 2012 in China.

To strengthen and increase the flow of e-waste to the formal collection and treatment sectors, a project was implemented during June 2010 and October 2011 aimed at the "Development of a Public Private Partnership for E-Waste Collection". The project's primary activities included:

Regional Workshop of the 'Public Private Partnership for E-waste Collection' project

- On-site investigation in the pilot city Suzhou, China
- Achievement of a multi-party agreement on partnerships among stakeholders
- Improvement of information exchange
- Monitoring the collection and treatment practices under the partnership
- Sharing experiences from the partnership and lessons learned regarding environmentally-sound e-waste management in the region

In 2011, the StEP Regional Focal Point for East Asia partnered with the Chinese Academy of Safety Science and Technology (CASST) on a project to investigate the labour, health and environmental dimensions of e-waste management in China, and to promote increased levels of proper e-waste collection and disposal.

A project titled "Capacity Building for Minimization of BFR Emissions from E-Waste" was selected for funding under the Small Grant Programme. On 31 May - 2 June 2011, a regional workshop was held in Guangzhou, China to exchange information on brominated flame retardant (BFR) emissions from e-waste, to further enhance appropriate technologies and to develop a regional action plan for environmentally-sound management of BFRs.

Regional Training Workshop on Partnership for Action on Computing Equipment (PACE) Guidelines in Asia and the Pacific

BCRC China held the first "Regional Training Workshop on Partnership for Action on Computing Equipment (PACE) Guidelines in Asia and the Pacific" with support of the Secretariat of the Basel Convention on 2-3 December 2011 in Shenzhen, China. The aim of this workshop was the promotion of environmentally-sound e-waste management and increased awareness of the PACE guidelines.

Finally, BCRC China and Tsinghua University cooperated with UNIDO to initiate an MSc and PhD programmes on chemical waste management, which enable distinguished eligible students from developing countries to study at Tsinghua University and bring this knowledge home to their native countries.

StEP Regional Focal Point for the South Pacific

On 8 August 2011, the Australian Government passed the Product Stewardship Act 2011, which provides a framework for mandatory, co-regulatory and voluntary product stewardship. Under the Product Stewardship Act, the Product Stewardship (Televisions and Computers) Regulations 2011, also called the National Television and Computer Recycling Scheme, went into effect on 8 November 2011 to support a co-regulatory recycling scheme for televisions, computers, printers and computer products. The scheme's recycling target is set at 30 per cent of waste arising in 2012-13 and increasing to 80 per cent of waste arising in 2021-22. The scheme also includes a material recovery target of 90 per cent, which will go into effect in 2014-15. The Product Stewardship Act requires liable parties specified in the Regulations to become members of approved co-regulatory arrangements.

During 2011, Griffith University developed a Memorandum of Understanding with the Secretariat of the Pacific Regional Environment Programme (SPREP) in Samoa and the Institute for Policy on Natural Resources and Environment (ISPONRE) in Hanoi, Vietnam to collaborate on research related to e-waste. Furthermore, a representative from Griffith University was invited to make the keynote presentation on issues and challenges of managing e-waste in Asian countries during Sri Lanka's National E-waste Forum held in Colombo. Griffith University, StEP's Regional Focal Point for the South Pacific, is now functioning as a member of the expert subsidiary group representing the e-waste area of the Regional 3R Forum for Asia managed by the United Nations Centre for Regional Development (UNCRD). Expert members provide policy advice on their area of expertise to key decision makers in Asian countries. In 2011, Griffith University was appointed as one of the Sub-Regional Secretariats of United Nations International Partnership for Expanding Waste Management Services in Local Authorities (IPLA).

In order to strengthen their presence in the region, the StEP Regional Focal Point for the South Pacific and the Secretariat of the Pacific Regional Environment Programme will organize a StEP regional event for the South Pacific to take place on 23 – 25 April 2013. The event will take place in Bangkok, Thailand.

Regional Focal Point Dr. Sunil Herat of Griffith University is the co-editor of the special issue on WEEE for the journal Waste Management & Research, which is expected to be published during 2012.

"BCRC & SCRC-Tehran thank the StEP Initiative for their consistent effort over the past five years and wish all the members, staff, officers and managers a happy 5th anniversary. We look forward to a fruitful cooperation in the future. It is because of initiatives like StEP and people like you that our world will become a better place."

A.R. Shiri Garakani, Director, Basel and Stockholm Convention Regional Centre in Tehran

StEP EVENTS AND PUBLICATIONS IN 2011

The following overview summarizes various international conferences and events which have been organized by StEP or where StEP has been present to raise visibility and present outcomes of its activities:

May 2011 – StEP General Assembly 2011 in Limerick, Ireland

From 24-26 May 2011, Dell hosted the StEP General Assembly 2011 at their facilities in Limerick, Ireland. More than 50 members met to vote on new members, approve the annual budget and other financial matters such as project seed-funding, approve policy proposals and set up project committees and subgroups.

June 2011 – Successful StEP-funded Workshop: Characterizing Transboundary Flows of Used Electronics

On 21 June 2011, 30 participants brought their expertise from academia, non-governmental organizations, industry, and US government agencies to work collaboratively towards the development of qualitative and quantitative characterizations of used electronics exports. The day-long workshop, funded by StEP, was hosted at the US EPA Office of International and Tribal Affairs in Washington, DC, and was organized by researchers at the MIT Materials Systems Laboratory and National Center for Electronics Recycling.

In mid-August, a thorough report was released describing prior methods and suggested approaches. The report incorporates outcomes and information shared during workshop discussions and can be downloaded at www.step-initiative.org.

September 2011 – StEP E-waste Summer School

The third StEP E-waste Summer School took place from 11-22 September 2011 in the Netherlands, Belgium and Switzerland. The theme of the 2011 Summer School was "Closing Resource Loops: Complexities and Solutions in Managing E-waste".

19 students from around the world participated in this years Summer School. The programme included many expert lectures, an OEM panel discussion, workshops and study tours, as well as a challenging group work assignment. The group explored the idea of using labels to maximize resource recovery from e-waste, and developed a "Critical Metals Stewardship Model", which they presented and discussed at the World Resources Forum in Davos, Switzerland.

October 2011: First Open StEP Meeting in Africa

During the first Open StEP Meeting in Africa, a group of StEP members met in Addis Ababa, Ethiopia, with Ethiopian governmental, industry and non-governmental stakeholders. The purpose of the meeting was to establish a project for proactively addressing e-waste issues in Ethiopia. During the three day meeting in early October 2011, the participants reviewed available information on Ethiopia's stocks and growth rates of electrical and electronic equipment (EEE) and its available infrastructure for dealing with the end-of-life (EoL) of EEE. They also developed the first framework for a future project on the management of e-waste to prevent e-waste problems in Ethiopia.

It was agreed to establish the "Ethiopia E-Waste Management Working Group" (EEWoG), consisting of the Steering Committee and the international Advisory Group. The Steering Committee is set up of local stakeholders, such as the Ethiopian Environmental Protection Authority, Ministry of Communication and Information Technology and other Governmental organizations, as well as academics and NGOs. The Steering Committee is in control of the Ethiopian e-waste management project. The Advisory Group consists of non-Ethiopian and international organizations such as the StEP members US-EPA, UNU, UNIDO, Dell, Öko-Institut and the University of Limerick.

As a first project target, the EEWoG decided to promote and increase the activities of the Demanufacturing Factory (DMF), which is already established close to Addis Ababa. The Steering Committee will come up with more concrete proposals for next steps. These efforts are supported by StEP with resources provided by the US-EPA through a cooperative grant agreement signed in late 2010.

StEP issued the following publications in 2011:

April 2011

StEP Annual Report 2010

15 September 2011:

StEP Green Paper #1 – TF Policy:
StEP Green Paper on E-waste Indicators

8 November 2011:

StEP Green Paper #2 - TF ReDesign:
Worldwide Impacts of Substance Restrictions of ICT Equipment

To access all StEP publications, please see:
http://www.step-initiative.org/index.php/Publications.html

StEP MEMBERS (as of May 2012)

Full members

(3) AER Worldwide
(29) Austrian Society for Systems Engineering and Automation (SAT)
(47) Basel Convention Coordinating Centre for Asia and the Pacific (BCRC China)
(45) Basel Convention Coordinating Centre for Training and Technology Transfer for the African Region (BCCC-Africa), University of Ibadan, Nigeria
(21) BIO Intelligence Service S.A.S.
(46) Centre for Environment and Development for the Arab Region and Europe (CEDARE), Egypt
(5) Cisco Systems, Inc.
(16) Compliance and Risks
(20) Dataserv Group Holdings Ltd.
(18) Datec Technolgies Ltd.
(33) Delft University of Technology, Netherlands
(7) Dell
(37) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
(42) Ericsson
(32) Flection
(41) Fraunhofer Institute for Reliability and Microintegration (FHG/IZM)
(14) GAIKER
(2) Green Electronics Council
(38) GOAB - Gemeinnützige Offenbacher Ausbildungs- und Beschäftigungsgesellschaft mbH
(54) Griffith University
(4) Hewlett Packard (HP)
(36) Institute for Applied Ecology (Öko-Institut)
(57) KERP research
(12) Massachusetts Institute of Technology (MIT) – Materials Systems Laboratory
(13) Memorial University
(17) MicroPro
(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
(48) Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences (RCEES-CAS)

(25) Secretariat of the Basel Convention
(35) Sims Recycling Solutions
(28) Federal Laboratories for Materials Testing and Research (EMPA)
(27) Swiss State Secretariat of Economic Affairs (SECO)
(6) Sustainability Consortium
(49) Chiho-Tiande (HK) Limited
(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
(15) University of Limerick
(60) University of Illinois at Urbana-Champaign(UIUC)

New members in 2012:

(59) FECACLUBS-UNESCO
(56) International Telecommunication Union (ITU)
(9) Kevoy Community Development Institute (KCDI)
(1) Secretariat of the Pacific Regional Environment Programme (SPREP)
(19) University of Northampton (UoN), The Centre for Sustainable Wastes Management

Associate members:

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

Invitees:

- Basel Convention Regional Centre (BCRC) Tehran
- Plataforma RELAC

For more information on all StEP members, please see: www.step-initiative.org.

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

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The United Nations University

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