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**Solving the E-Waste Problem (StEP) Initiative –
Towards sustainable solutions**

What is e-waste?

...or Waste Electrical and Electronic Equipment (WEEE)...

- Generic term to describe old, end-of-life or discarded appliances using electricity which have been disposed of by their original users
- WEEE categories according to Directive 2002/96 EC:
 - 1 Large household appliances
 - 2 Small household appliances
 - 3 IT and telecommunications equipment
 - 4 Consumer equipment
 - 5 Lighting equipment
 - 6 Electrical and electronic tools
 - 7 Toys, leisure and sports equipment
 - 8 Medical devices
 - 9 Monitoring and control instruments
 - 10 Automatic dispensers



Volumes:

- Increasing sales of electronics, decreasing lifetimes
- ~50 million tonnes e-waste generated worldwide
- EU-27 in 2006: ~8.5 million tonnes generated, only 2.5 million tonnes recycled

Exports:

- As donations/2nd hand, often illegal
- Mainly to Asia (China, India, Pakistan, Vietnam), Africa (Nigeria & neighboring Western Africa, Northern Africa), Eastern Europe

Dangers:

- Re-use/repair of some devices, but low state-of-art recycling probability at final end-of-life
- Backyard recycling with high environmental & health impacts and low yields /efficiency
- Soil & water contamination from chemical disposal
- Toxic emissions from burning of materials



Total Au-recovery efficiency only $\approx 25\%$, while environmental & health damage is dramatic (Rochat, Keller, EMPA 2007)

“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.”

Solving the E-waste Problem (StEP) Initiative was created to...

➤ Initiate and facilitate environmentally, economically & socially sound approaches to reduce e-waste flows and handle them in a sustainable way around the globe



- (1) Functions as a **network of actors** who share experiences and best practices
- (2) Carries out **research and development projects**
- (3) **Disseminates** experiences, best practices and recommendations

1. StEP's work is founded on **scientific assessments** including **social, environmental and economic** aspects
2. StEP conducts research on the **entire life-cycle** of electronic and electrical equipment
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
5. StEP seeks to foster **safe and eco/energy-efficient reuse and recycling practices** around the globe in a socially responsible manner

StEP invites pro-active:



- **Companies**
- **Governmental Organizations**
- **Non-governmental Organizations (NGOs)**
- **International Organizations**
- **Academic Institutions**

from around the world to become a member

Members have to agree with the StEP principles through signing a Memorandum of Understanding between all StEP members

International Organizations

- Basel Convention Coordinating Centre for Asia and the Pacific (BCRC China)
- Basel Convention Coordinating Centre for the African Region (BCCC Africa)
- Center for Environment and Development for the Arab Region and Europe (CEDARE)
- Secretariat of the Basel Convention (SBC)
- United Nations Conference on Trade and Development (UNCTAD)
- United Nations Environment Programme (UNEP)
- United Nations Industrial Development Organization (UNIDO)
- United Nations University (UNU)

Industry

- | | |
|---------------------------|--|
| ▪ AER Worldwide | ▪ MicroPro |
| ▪ Cisco Systems Ltd. | ▪ National Center for Electronics Recycling (NCER) |
| ▪ Compliance & Risks | ▪ Nokia Corporation |
| ▪ Dataserv Group | ▪ Philips Consumer Lifestyle |
| ▪ Datec Technologies Ltd. | ▪ PT Worldwide |
| ▪ Dell | ▪ Sims Recycling Solutions |
| ▪ Ericsson | ▪ Taizhou Chiho Tiande |
| ▪ Flection | ▪ Umicore Precious Metal Refining |
| ▪ GOAB mbH | ▪ Vertmonde cia. Ltda.* |
| ▪ Hewlett Packard (HP) | |
- 11.07.2011

Governmental & Development Cooperation, Non-profit Organizations

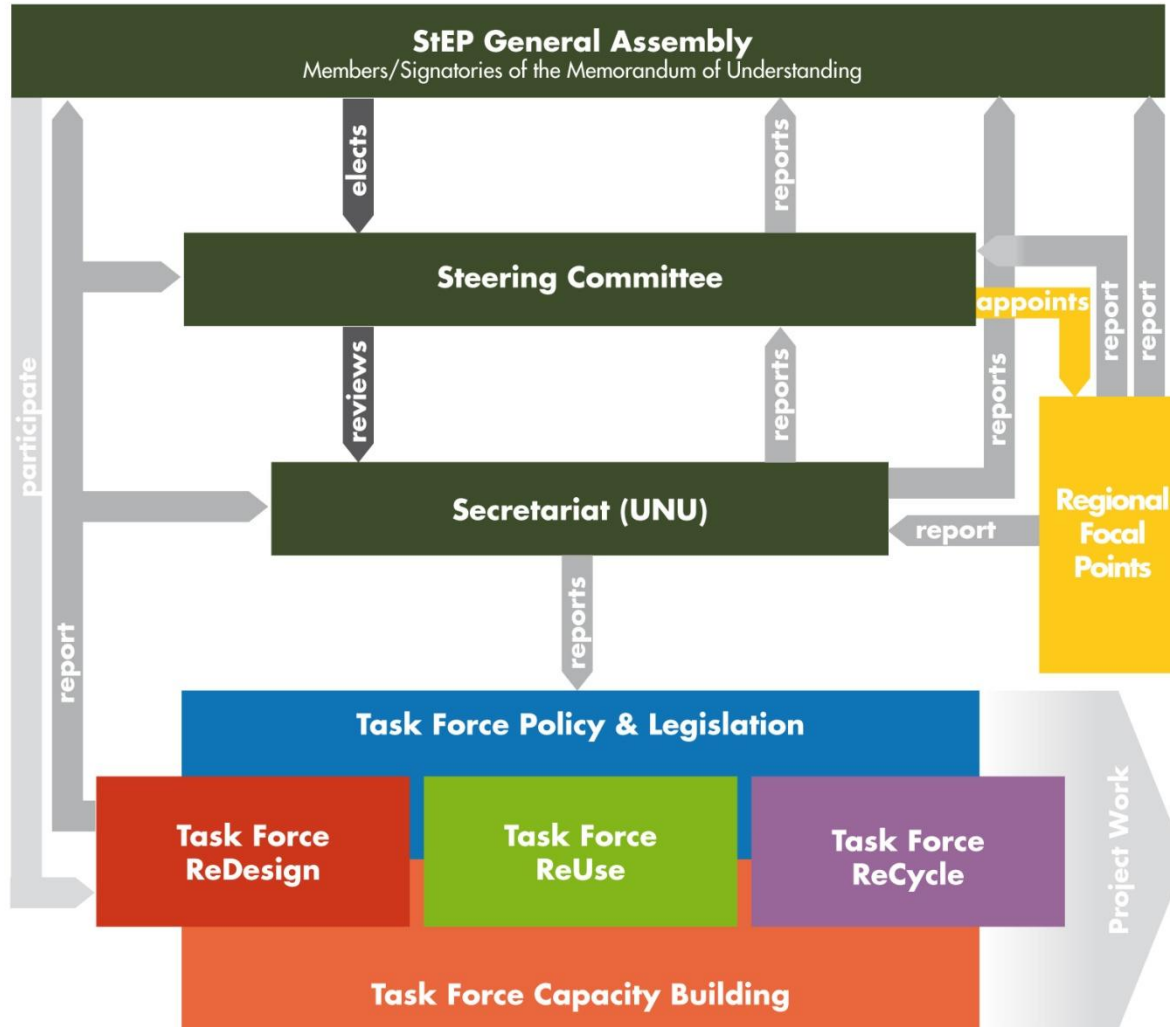
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- Enda Europe*
- Morocco Cleaner Production Centre
- Renewable Recyclers
- Swiss State Secretariat of Economics (SECO)
- TechSoup Global
- United States Environmental Protection Agency (US-EPA)

Academia & Research

- Austrian Society for Systems Engineering and Automation (SAT)
- BIO Intelligence Service
- Chinese Academy of Sciences (CAS)
- Delft University of Technology
- GAIKER Foundation
- Griffith University
- Institute for Applied Ecology (Öko-Institut)
- Swiss Federal Laboratories for Materials Testing and Research (EMPA)
- Fraunhofer Institute for Reliability and Microintegration (IZM)
- KERP Research Electronics & Environment
- Korea Institute of Geoscience & Mineral Resources (KIGAM)
- Massachusetts Institute of Technology (MIT)
- Rifer Environmental
- The Sustainability Consortium
- Sustainable Electronics Initiative
- Technical University of Braunschweig
- Telecom Business School
- Thai Electrical and Electronic Institute (EEI)
- University of Limerick
- WEEE Forum*
- 3P Consortium for Sustainable Management

* Associate Member

StEP Organizational Chart





Analyzes the status of existing policy approaches on e-waste, and elaborates policy recommendations for future developments...

Project overview (samples):

- ✓ White Paper Recast WEEE Directive
- ✓ White Paper 'Take-Back Systems and Design Guidelines'
- ✓ Research Study 'Best e-waste policies'
- @ Project 'EEE and Climate Change'
- @ Green Paper on E-waste Indicators
- @ White Paper on Transboundary Shipments (with Task Force ReUse)

✓ completed, @ working phase, \$ acquisition phase, ? idea phase



... dedicated to product design aspects to reduce negative impacts of the entire life cycle of electronics...

Project overview:

- ✓ DfR (Design for Recycling) Case Studies Library
- ✓ Research study 'Wearable Computers – End-of-Life Implications'
- ✓ Closing the Loop
- ? Project 'Certification Technology for Recycling Plastic'

✓ completed, @ working phase, \$ acquisition phase, ? idea phase



... defines globally consistent “re-use” practices, principles, and standards to enhance re-use opportunities, change consumer behaviour & reduce „sham re-use“...

Project overview (samples):

- ✓ Conference ‘1st World ReUse Forum’
- ✓ White Paper ‘One Global Understanding of Re-use – Common Definitions’
- ✓ Case studies synthesis ‘Best practices in re-use’
- @ White Paper on Transboundary Shipments (with Task Force Policy)
- ? Recommendations for re-use certification/guidelines

✓ completed, @ working phase, \$ acquisition phase, ? idea phase



... overall aim is to enhance global recycling infrastructures and technologies to realise a sustainable e-waste recycling...

Project overview (samples):

- ✓ Research study 'Recycling – From E-waste to Resources'
- ✓ Review 'Environmental fate and effects of hazardous substances of informal e-waste recycling'
- @ Project 'Best of 2 Worlds'
- @ Green Paper on End-of-Life Standards

✓ completed, @ working phase, \$ acquisition phase, ? idea phase

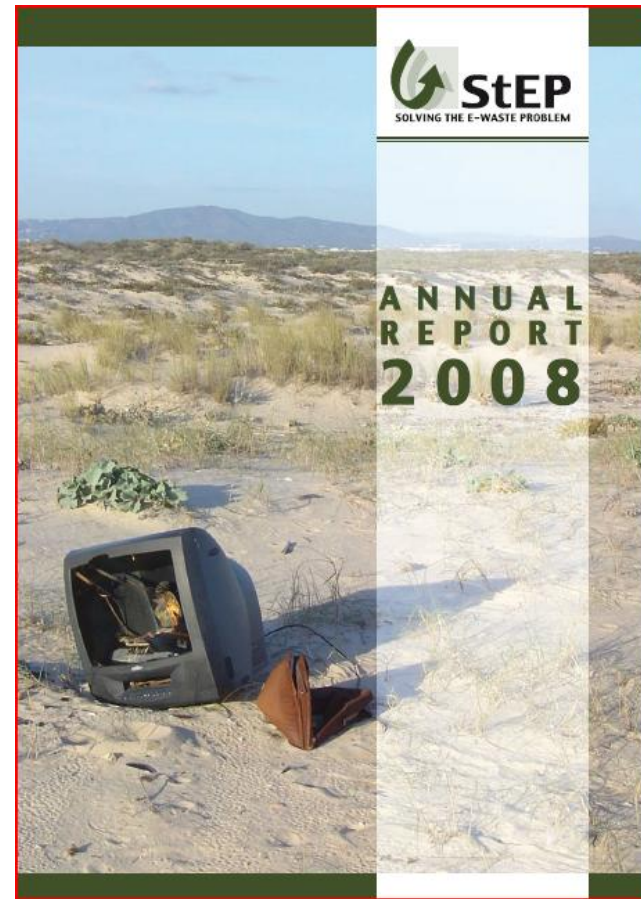


... aims at increasing public, scientific and business awareness and disseminating the results of TFs 1 - 4...

Project overview (samples):

- @ Annual Reporting on the global E-waste Status (ADDRESS)
- @ 2009 & 2010 NVMP-StEP E-waste Summer School Series
- \$ E-waste Academy for policymakers and small and medium size enterprises
- ? Online Recycling Trainer

√ completed, @ working phase, \$ acquisition phase, ? idea phase



www.step-initiative.org/publications



- Knowledge hub for e-waste related issues
- International e-waste knowledge transfer
- Multi-stakeholder approach
- Holistic view
- Based on scientific assessment
- Pragmatic and problem-oriented

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