



Division of Technology, Industry and Economics

Capacity building project for E-waste management

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Objectives of IETC work on E-waste

- To assist local and national stakeholders to build their capacities for effective and efficient e-waste management system based on 3R (reduce, reuse and recycle) approach
- To enable governments to meet their obligations under multilateral environmental agreements and conventions including Basel Convention
- To support other international, regional and national initiatives and efforts by various organizations

IETC Programme on WEEE / E-waste Management

Approach

- Normative
  - Regional training workshops for national and local stakeholders
  - Trainings for local project teams
- Demonstration Projects at City / Municipality Level (Phnome Penh - Cambodia, 2009):
  - E-Waste Inventory
  - Situation Analysis of Present E-Waste Management System
  - Target Setting and Identification of Issues of Concern
  - Development of E-waste Management Plan
  - Awareness Raising, Training and Public Dissemination
  - Capacity building on development of specific activities / projects for E-waste management

Activities (2007~):

- Normative: Three manuals on E-waste (E-waste inventory, E-waste management system, and take-back system), regional training workshops and policy dialogues – Compendium of technologies (under consideration) and disposal of counterfeit goods (led by CAP/OzonAction UNEP, Bangkok)
- Demonstration Projects: Phnom Penh – Cambodia
  Malaysia (under consideration)
  E-waste recycling practices in Asia (under preparations)

Converting e-waste into a resource

20th CENTURY

WASTE MANAGEMENT

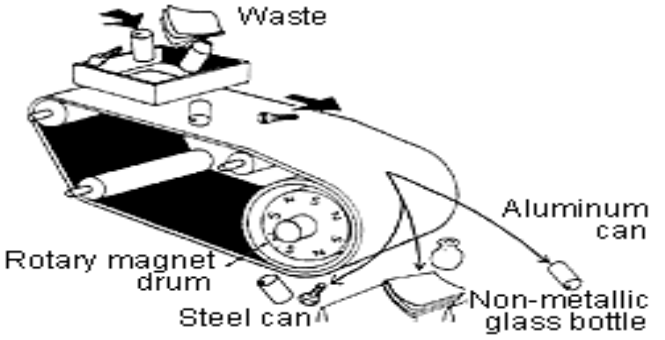
"How do we get rid of our waste efficiently with minimum damage to public health and the environment?"

21st CENTURY

RESOURCE MANAGEMENT

"How do we handle our discarded resources in ways which do not deprive future generations of some, if not all, of their value?"

Source: Dr. Paul Connett, Zero Waste, Power Point



IETC support for Projects/Policy

- Project team-building and training
- Awareness raising and political/community support
- Baseline reports on
  1. E-waste(quantification and characterization with future trends)
  2. Assessment of current E-waste management system (institutions, policies, financing, infrastructure and technology and stakeholder roles)
- Target setting for E-waste
- Stakeholders' concerns (environmental, economic, social and technical) for meeting the targets
- E-waste management plan with detailed actions (policy, technical and voluntary)
- Training and demonstration activities from E-waste management plan

Pre-requisites for Projects/Policy

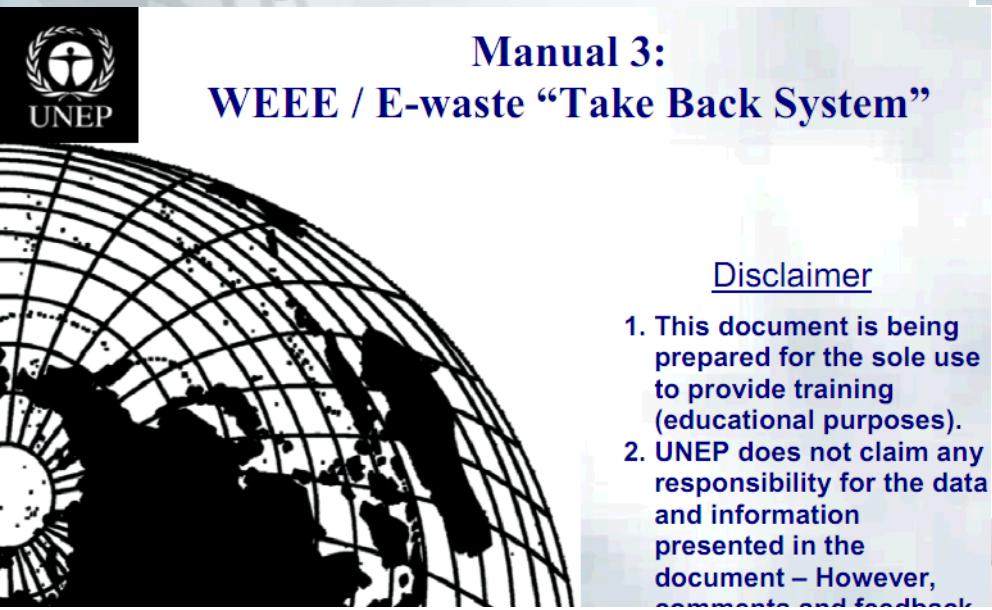
1. High level Support
2. Local project team
3. Political and community support
4. Cooperation
5. Part of overall “vision”






Step 1 - Training Materials

http://www.unep.or.jp/Ietc/Publications/spc/EWasteManual_Vol1.pdf
http://www.unep.or.jp/Ietc/Publications/spc/EWasteManual_Vol2.pdf



Case studies: experiences/lessons learned

Compendium of technologies

http://www.unep.or.jp/IETC/SPC/news-jul11/UNEP_Ewaste_Manual3_TakeBackSystem.pdf

Step 2 – Awareness Raising

1. Government (National & Local) – All relevant departments
2. Stakeholders (waste generators, service providers, informal and formal businesses)
3. Civil society and academia
4. Project Team

Step 3 – Training for Project Team

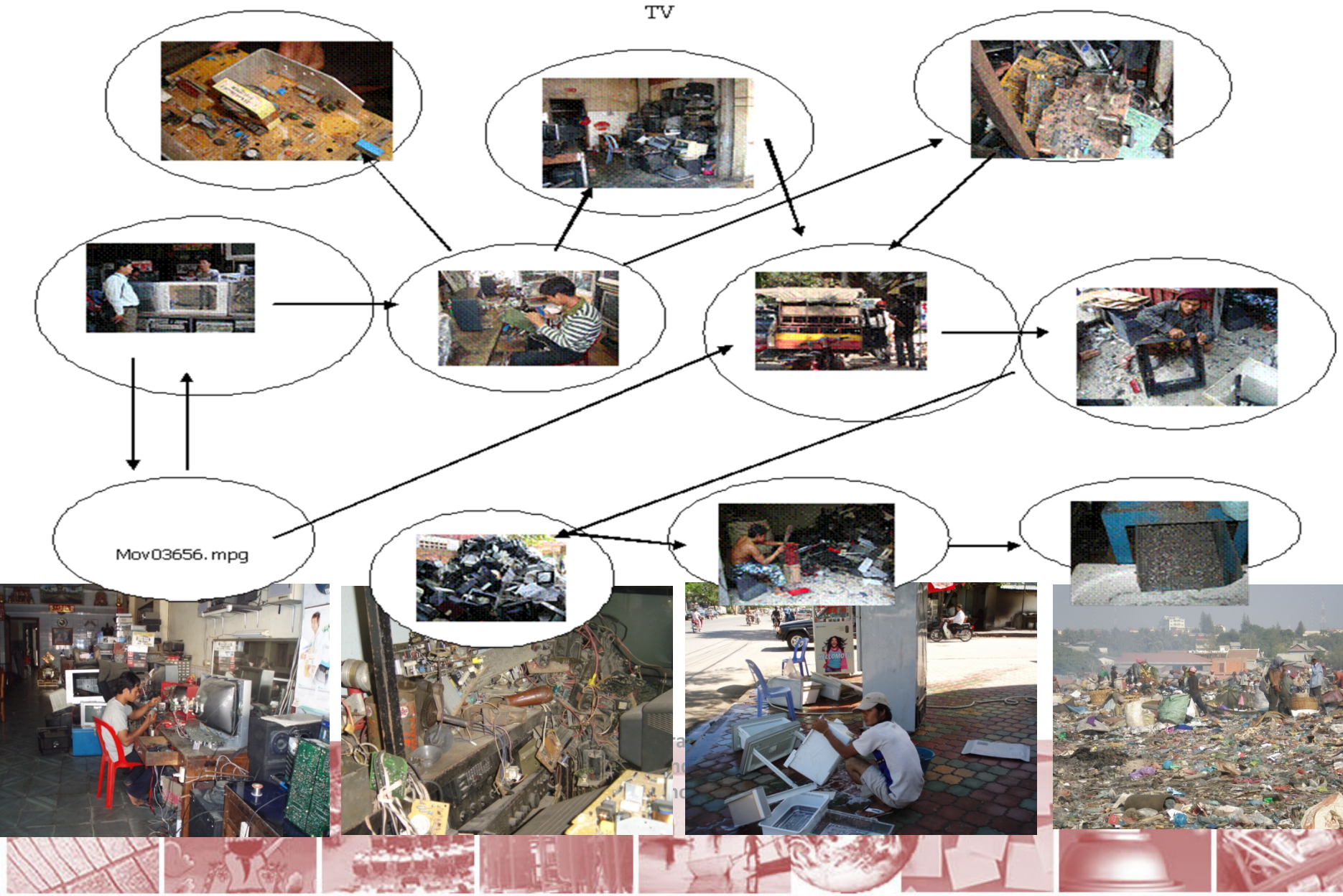
Project team consists of:

- National government (Environment, Industries, Customs, etc.)
- Local government (provincial and local government)
- Local experts from academia and non-profit organizations

Step 4 – Data & Information Collection

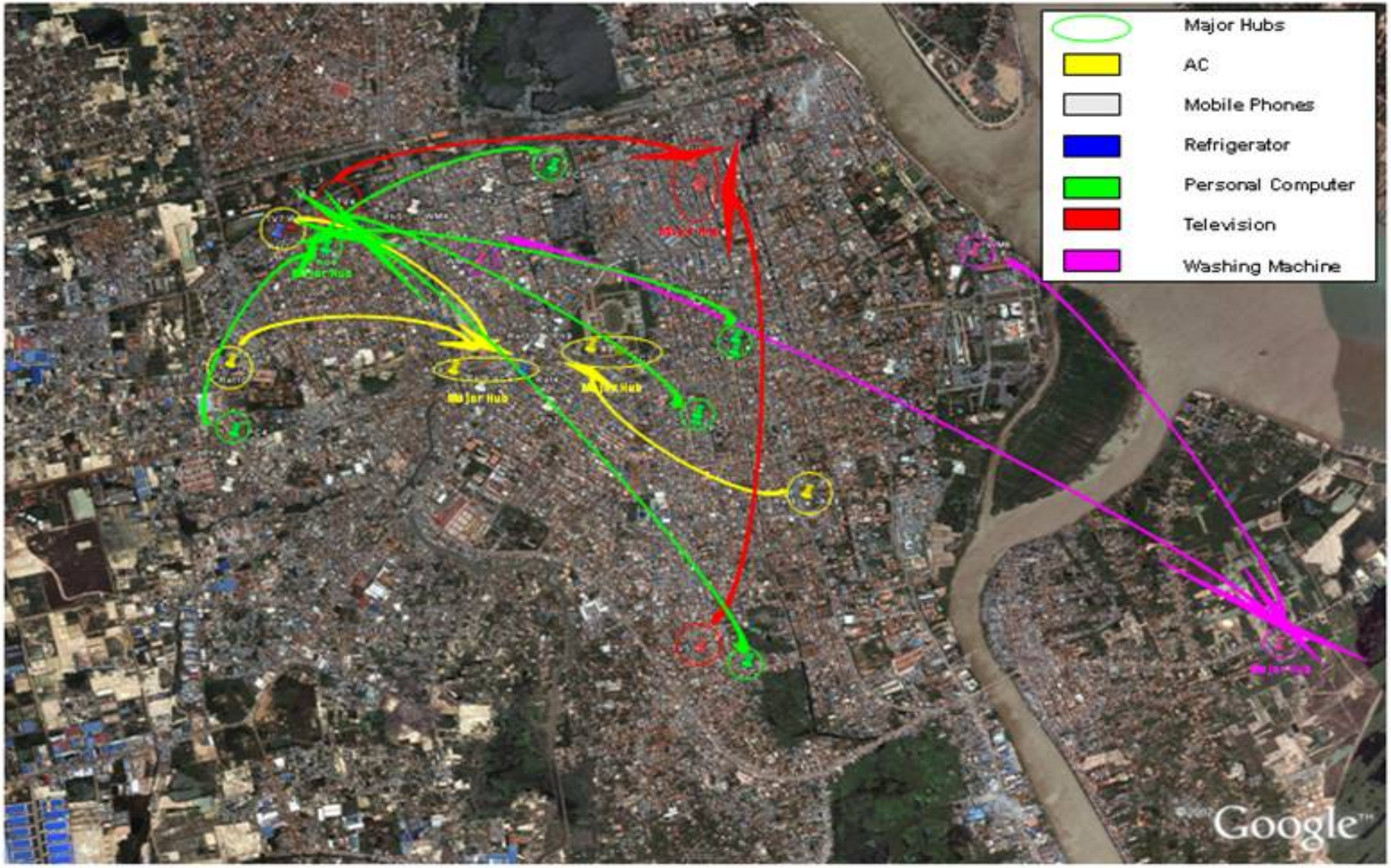
1. WEEE / E-waste Inventory
2. Current management system for WEEE / E-waste (Policies/Regulations, Institutions, Financing Mechanisms, Technology and Stakeholders' role)

Step 5 – Tracer Tracking



Step 6 – Mapping the Markets

Step 7 – Tracing the Trade Value Chain



Step 8 – Smart Scenarios

UNEP

Year	Scenario 1: Inventory (TV)	Scenario 2: Inventory (TV)	Scenario 1: Inventory (PC)	Scenario 2: Inventory (PC)	Scenario 1: Inventory (MP)	Scenario 2: Inventory (MP)	Scenario 1: Inventory (Ref)	Scenario 2: Inventory (Ref)	Scenario 1: Inventory (Air Con)	Scenario 2: Inventory (Air Con)	Scenario 1: Inventory (WM)	Scenario 2: Inventory (WM)
2006	**104907.47**	**69142.10**	**111858.79**	**106781.85**	**83200.00**		**19851.35**	16464.02	**18736.18**		**26440.24**	24058.47
2007	109310.61	85977.85	110495.94	109228.35	138543.96		20821.86	18676.82	19741.84		27718.14	25221.26
2008	144272.21	104907.47	120616.08	111858.79	189756.39	83200.00	21609.34	19851.35	20699.28	18736.18	29057.81	26440.24
2009	179260.95	109310.61	122996.01	110495.94	269227.20	138543.96	26471.10	20821.86	23524.00	19741.84	30462.22	27718.14
2010	**215480.22**	**144272.21**	**125514.78**	**120616.08**	**330980.65**	**189756.39**	**25950.54**	**21609.34**	**23968.12**	**20699.28**	**31934.51**	**29057.81**
2011	251974.02	179260.95	128093.01	122996.01	380627.75	269227.20	27263.19	26471.10	25276.98	23524.00	33477.96	30462.22
2012	277661.25	215480.22	130672.39	125514.78	412976.40	330980.65	28494.58	25950.54	26592.70	23968.12	35096.00	31934.51
2013	306104.71	251974.02	135884.57	128093.01	474922.86	380627.75	30575.25	27263.19	28336.24	25276.98	36641.73	33477.96
2014	327659.82	277661.25	139911.21	130672.39	546161.29	412976.40	32580.81	28494.58	30095.06	26592.70	39244.08	35096.00
2015	347328.58	306104.71	143862.16	135884.57	628085.49	474922.86	33905.56	30575.25	31600.06	28336.24	40882.70	36641.73
2016	361299.89	327659.82	148877.13	139911.21	722298.31	546161.29	46184.10	32580.81	54556.21	30095.06	42764.64	39244.08
2017	454964.75	347328.58	154096.04	143862.16	775737.80	628085.49	65124.09	33905.56	76763.43	31600.06	43713.90	40882.70
2018	501110.51	361299.89	159528.23	148877.13	851637.30	722298.31	68420.98	46184.10	84878.56	54556.21	45971.00	42764.64
2019	548561.95	454964.75	165183.52	154096.04	929820.20	775737.80	71143.02	65124.09	88542.52	76763.43	47835.54	43713.90

Step 9 – Preparing the Plan with Policy

Technologies

1. Tec
2

Policies (Regulatory & Fiscal)

1. Tec
2

Voluntary Measures

1. Technical Feasibility
2. Economic Viability
3. Implement-ability

Detailed Schemes based on Strategic Action Plan (Measures)

- Institutional, Policy and Regulatory
- Technological/Infrastructure (Projects)
- Voluntary

Implementation Strategy
(Financing, Human Resources, Institutional Aspects, Timeline-Schedule, etc.)

Monitoring & Feedback Mechanism

Step 10 – SWOT Analysis for EPR

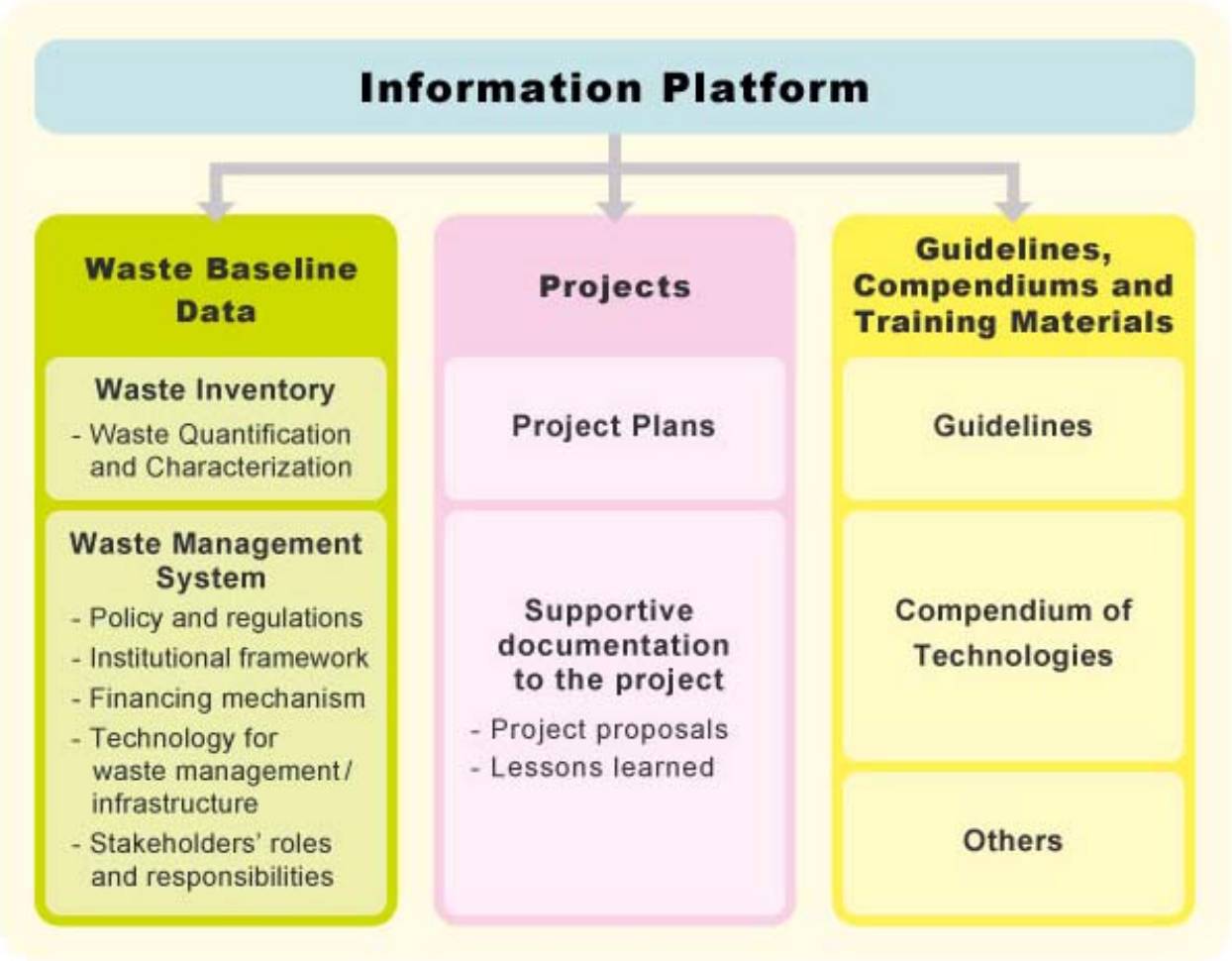
Strengths		Weakness		Opportunities		Threats	
EPR	**Conventional**	**EPR**	**Conventional**	**EPR**	**Conventional**	**EPR**	**Conventional**
Limited Material Risk:							
1. Mandates availability of raw material either free or at subsidized rates 2. Ensures constant revenue stream in terms of recycling fee and ownership of recovered material. 3. Monitoring and compliances is stronger. 4. Producers are made responsible for addressing pollution	1. Market based which require limited regulatory intervention. 2. Can easily absorb historical and orphaned E-waste. 3. Complete control over transportation. 4. Can be monitored and made compliant to existing regulatory system. 5. Easy of monitoring due to existing capacity of regulators.	1. Leakages do exist e.g. collection efficiency has been reported to be around 40% in EU 2. Orphaned & historical E-waste are difficult to channelize into formal E-waste recycling stream. 3. Requires time for implementation in Combodian context due to large geographical area. 4. Needs capacity building to implement in Combodian context. 5. Requires change in consumer behavior.	1. Availability of raw material is a constraint. 2. Revenue stream is subject to market fluctuation and dependent on only recovery of base and precious metals.	1. Long term pollution abatement approach based on 3Rs. 2. Producer's will be motivated for more R & D especially in the context of design for environment. 3. Integration with international regulatory regime.	**1st conventional step** 1. Provides stepping milestone for developing E-waste management in the country. 2. Promotion of recycling in waste management 3. Technology transfer and increase of knowledge base.	1. May become monopolistic	May not survive the market risks.

Step 11 – Public Private Partnerships

- Though Cambodia has not much experience of implementing PPP models in infrastructure sector, the proposed E-waste recycling project can be formulated and implemented along the PPP mechanism. Following are the salient features of this model:
  1. The project should fall under the category of urban infrastructure. In case, it is not included in this category then efforts should be made to included it under urban infrastructure category
  2. Any state statutory/ government agency can become partner in the project both in terms of provision of land on concession basis and/ or equity partnership
  3. 20% to 40% of the project cost can be contributed by the government in order to make it viable
  4. “User Fee” or “Service Fee” can be in the form of annuity transferred from the government to the recycling project operators every year. This annuity can be transferred by the authorized government agency in proportion to the recycled E-waste by recycler every year

IETC Information Platform

http://www.unep.or.jp/ietc/spc/activities/GPWM/info_platform.asp



Working together in 2012

1. Pan-African Forum on E-waste led by Basel Convention in Nairobi – 14 to 16 March 2012
2. StEP and GeSI led E-waste Academy in Accra – 25 to 29 June 2012
3. UNEP and WIPO led regional workshop on the "Disposal of Counterfeit Goods" for the judiciary, law enforcement officials and environmental officers (3 and 4 July 2012)
4. IGES led workshop on "E-waste recycling" (10 July 2012)
5. UNCRD and UNIDO led workshop on E-waste management in the context of trans-boundary movement (11 to 13 July 2012)
6. UNIDO led E-waste focal area under the Global Partnership on Waste Management – April 2012 and November 2012

7. MOE Japan led workshop 2012 of the network for prevention of illegal transboundary movement of hazardous waste

Training and Facilitation

- IETC training workshops:
  1. Regional training workshop for Asia on E-waste inventory and E-waste management – July 2010
  2. International training workshop on “take-back system for E-waste” – July 2011

- Facilitation:
  1. Open session for stakeholders on E-waste management – July 2010
  2. Open session for private sector, public sector and other stakeholders on “take-back system for E-waste” – July 2011
  3. Multi-stakeholder dialogue – July 2012
  4. Side-event at Basel Convention Open Ended Working Group (OEWG) – September 2012
  5. Training Resource Pack (TRP) on hazardous waste – November 2012

Multi-stakeholder Policy Dialogue

- Title: “Addressing e-waste challenges and opportunities through public-private sector participation”
- Date and venue: 18 to 20 July 2012, UNEP/IETC (Osaka, Japan)
- Participation: The dialogue was attended by approximately 70 participants from government, the private sector, IGOs, academia and public interest groups.
- Outcome document: "The Future WEEE Need: A Call for Action".

  This "Call for Action" highlights the complementary roles of the different stakeholders and encourages their enhanced efforts to tackle the growing challenges of e-waste management

Lessons Learned from IETC work

- Multi-stakeholder support should be scaled up and strengthened through awareness raising campaigns and dialogue. Inter-agency support at international and national level is also vital for an effective and efficient project/programme
- Local project team should be trained for carrying out all the activities under “life cycle approach” and if some activities are beyond the borders then international partners should work closely with local partners and project team
- Training and information is the key, so training materials and information should be updated and disseminate on regular basis either through face to face training or through follow-up virtual forums

ESM for e-waste and TBM

- Overall costs and benefits for ESM with resource recovery in the context of trans-boundary movement (TBM)?
- Resource recovery systems to avoid TBM
- Resource recovery based on innovative approaches including policy & technology
- Roles and responsibilities for ESM – e.g. waste generators, producers and/or manufacturers, and government

Let us work together for better future!

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