附件二、國際電子廢棄物回收管理夥伴會議第一天簡報

行政院環境保護署
Environmental Protection Administration, Executive Yuan, R.O.C. (Taiwan)

E-waste and Communities

SDG 11 Sustainable Cities and Communities

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2019.12.02

Outline

⇨ 1. SDG 11 & Waste Management
2. Taiwan's Policies
3. Taiwan's Actions
4. Taiwan's Achievements
5. Conclusions

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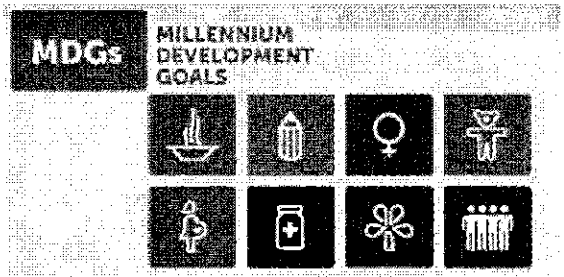
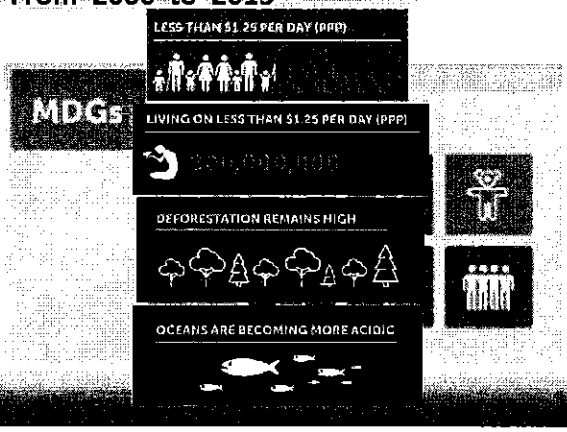
From MDGs (2000-2015) to SDGs

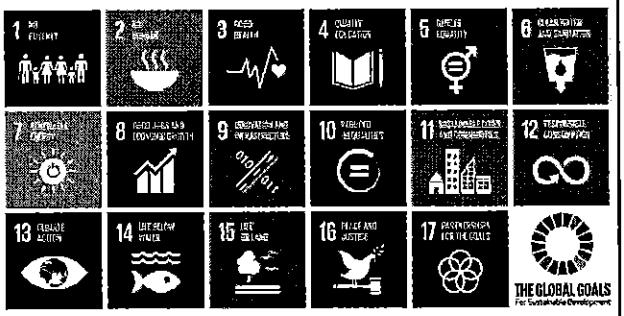


Eight international development goals for the year 2015 was established following the Millennium Summit of the United Nations in 2000.

From 2000 to 2015



SDGs- Goals



SDGs- with regards to Circular Economy

Item	Action and impact
SDG 6 Ensure availability and sustainable management of water and sanitation for all.	Water recycling/ Recycled water technology development/ Conserve water / Pipeline leaking prevention/ Smart water management
SDG 7 Ensure access to affordable, reliable, sustainable and modern energy for all.	Waste-to-energy/ biomass/ biogas/ Renewable energy
SDG 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	Leasing services/ Reverse logistics/ Recycling technology development / new services and products increase employment opportunities
SDG11 Make cities and human settlements inclusive, safe, resilient and sustainable.	Recycling facilities, services/ Waste reduction
SDG 12 Ensure sustainable consumption and production patterns.	Extended producer responsibility/ Environmental design of products/ Waste reduction/ Clean production/ Reuse recycled materials
SDG 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	Reduce lake eutrophication/ Reduce ocean plastics
SDG 15 Protect, restore and promote sustainable use of terrestrial ecosystems.	Improve resource efficiency, reduce forest development, mining, soil erosion, wetland development, etc

SDG 11- Targets

1. By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.
2. By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
3. By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.
4. Strengthen efforts to protect and safeguard the world's cultural and natural heritage.
5. By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.
6. **By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.**
7. By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

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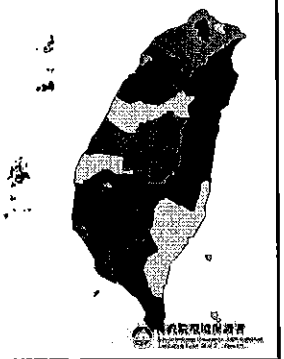
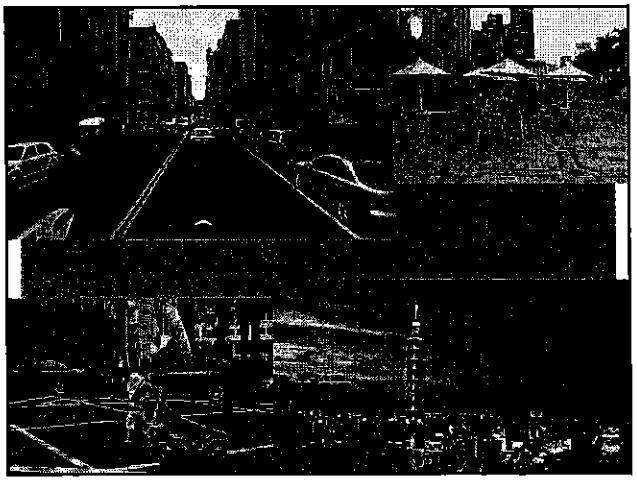
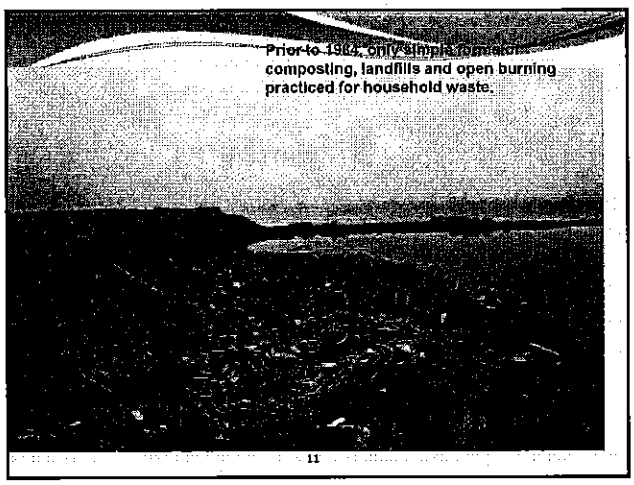
Background

- Population: 23 million
  Area: 36,000 km²
  Density: 644 persons/km²
- 98% of energy is imported.
- Natural resources deficient.
- Resource conservation and recycling are important to Taiwan's sustainable development.



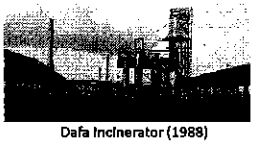




The Past History of E-Waste

Dioxin smoke near Erren River (1985)

Metal Scraps in Dafa Industrial Park (1987)



Dafa Incinerator (1988)

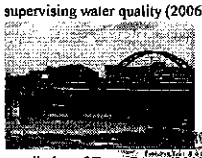
Acid pickling of metal scraps (1989)

The Past History of E-Waste

Trace of acid pickling in illegal plant (1989)

Environmental volunteers supervising water quality (2006)

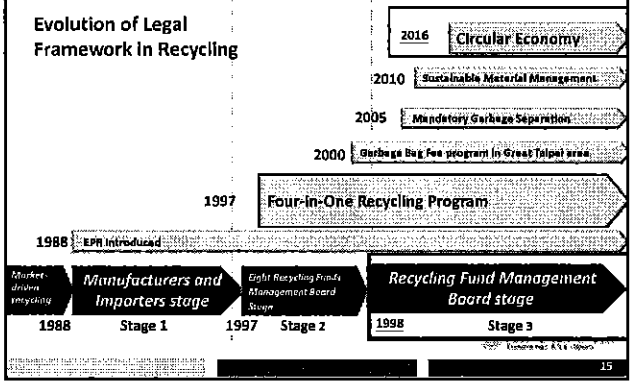
Rive bank restoration near Erren River (2006)



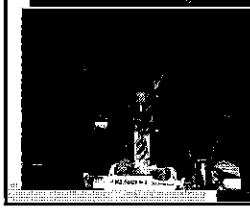
Remediation of Erren River (2011)

Taiwan's Policies

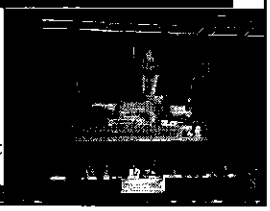
Evolution of Legal Framework in Recycling

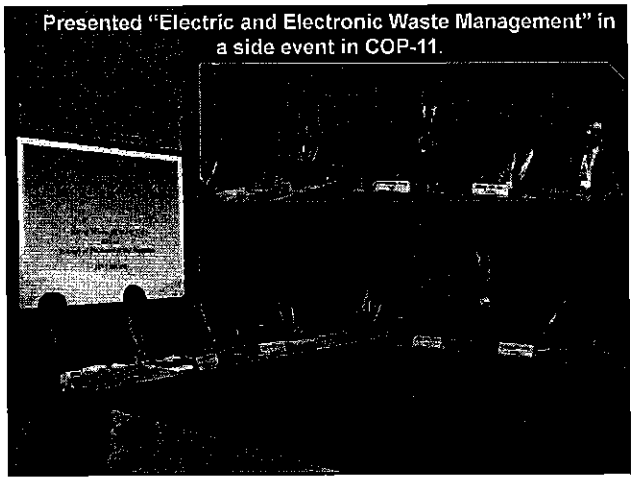


UN COP-11 and COP-13

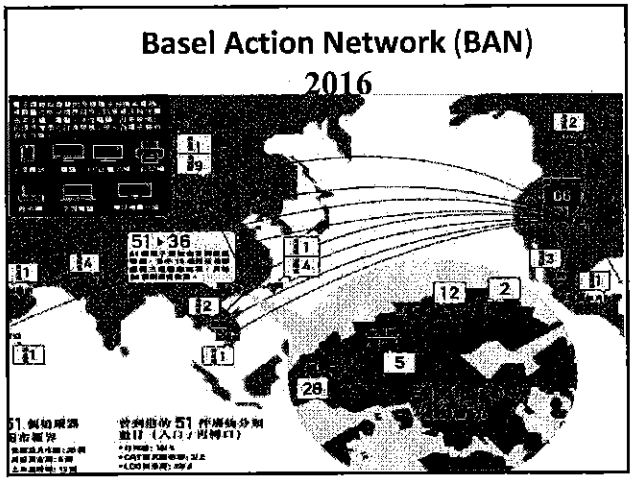


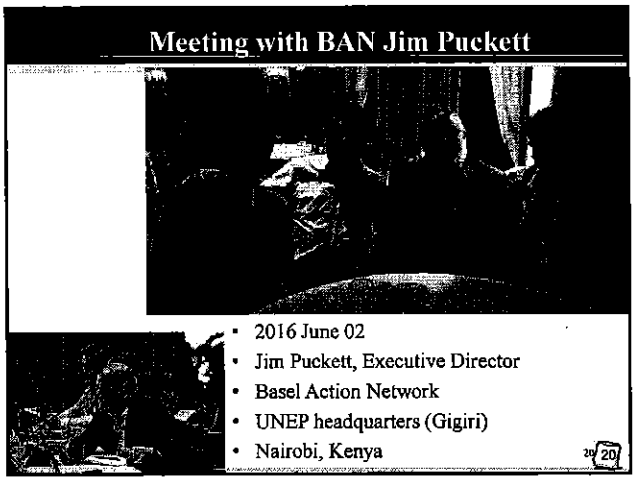
Executive Secretary: Jim Willis (COP-11), and Rolph Payet (COP-13)



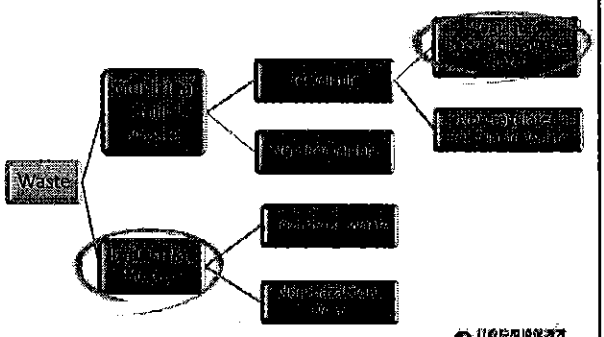

Presented "Electric and Electronic Waste Management" in a side event in COP-11.


Champions of environmental health & justice
Jim Puckett, Executive Director and Founder
Mission
BAN's mission is to champion global environmental health and justice by ending toxic trade, catalyzing a toxics-free future, and campaigning for everyone's right to a clean environment


Basel Action Network (BAN)
2016


Meeting with BAN Jim Puckett
2016 June 02
Jim Puckett, Executive Director
Basel Action Network
UNEP headquarters (Gigiri)
Nairobi, Kenya

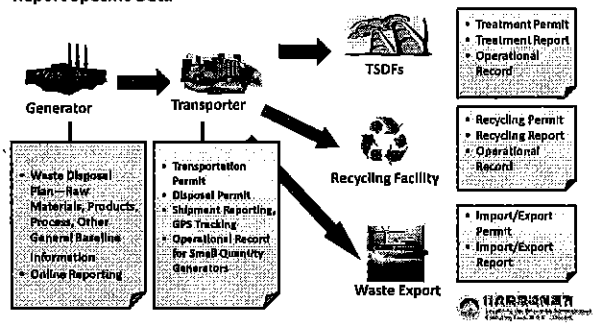
Categories of Waste



Waste Disposal Act

Industrial Waste Management System

- Each Party involved in the Waste Treatment Must Apply for A Permit and Report Specific Data



2013年由日本發起

Policy and purpose of the Japan, Korea and Taiwan Tripartite Network Meeting

1. Purpose

Strengthening of the cooperation among Japan, Korea and Taiwan through the effective information exchange about e-manifest system

2. Participating Organizations

- Japan : Japan Industrial Waste Information Center [JW]
- Korea : Korea Environmental Corporation[KECO]
  (on e-manifest)
- Taiwan: Environmental Protection Administration Taiwan[EPA]
  Industrial Waste Control Centers [IWCC]
  (on e-manifest)
  *Please refer to the correlation chart

3. Operation of the network meeting

(1)Each organization hosts the meeting by turns and holds it once a year.
(2) A hosting organization determines the location and time.

4. Cost

(1) Operating cost: Host pays.
(2) Travelling expense, accommodation, etc.: Each organization pays own expense.

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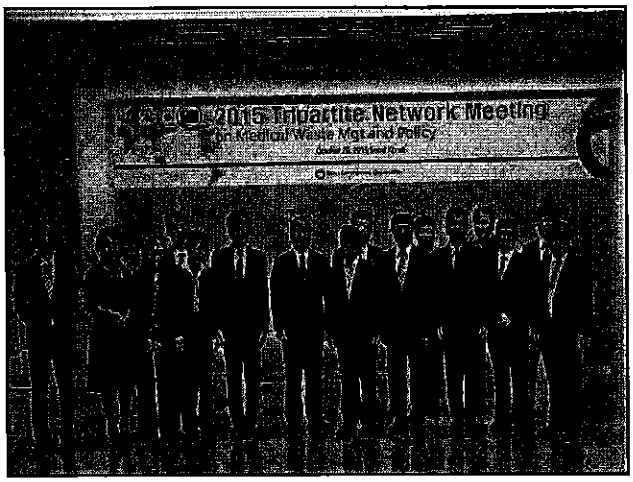
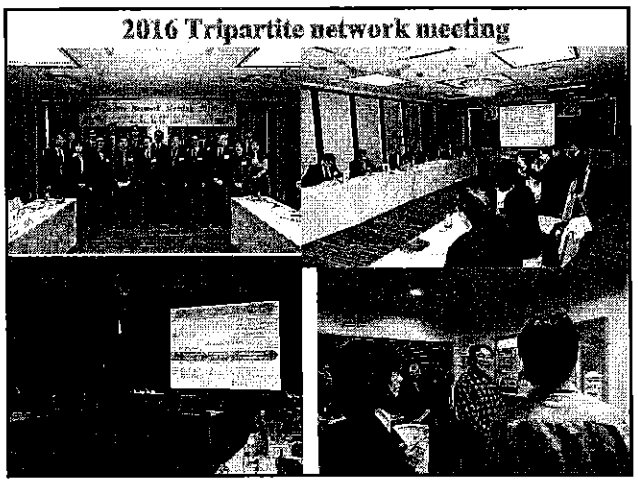
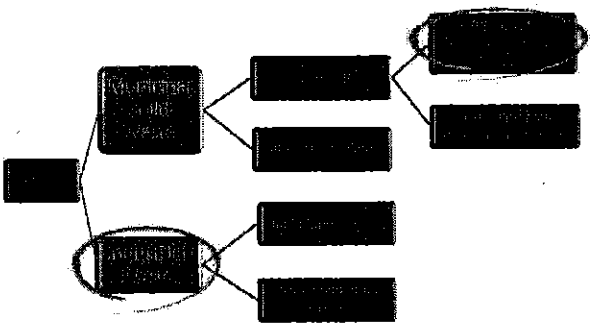
2014 Tripartite network meeting





Categories of Waste



Waste Disposal Act

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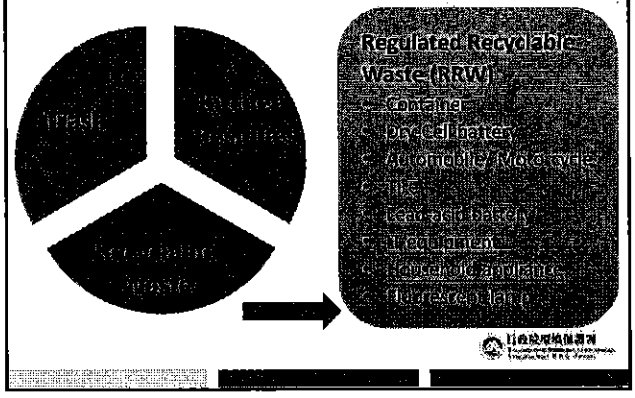
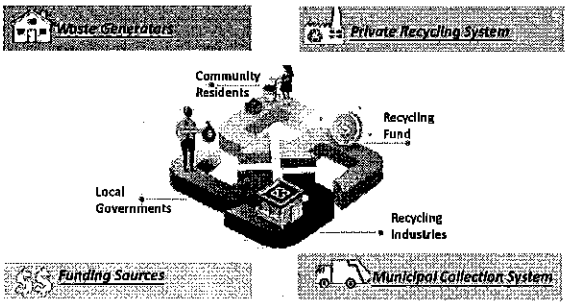
Municipal Solid Waste Sorting



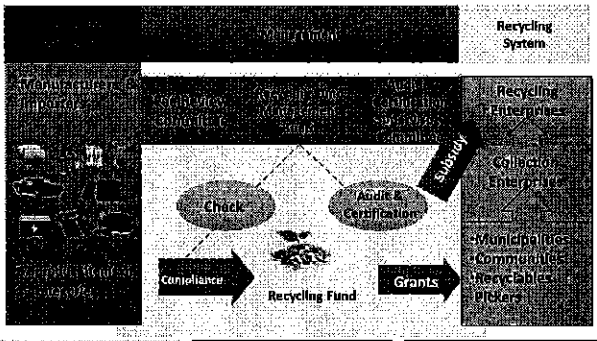
Taiwan's Policies

The Four-in-One Recycling Program



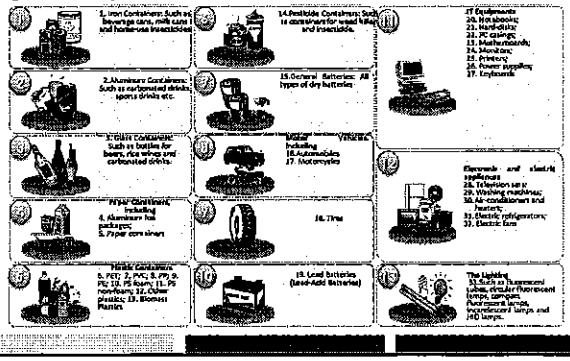
Taiwan's Policies

The Recycling Fund Management



Taiwan's Policies

Regulated Recyclable Waste 67 items in 33 types in 13 categories



Taiwan's Policies

RRW Items/E-Wastes

1998	TVs	Refrigerators	Washing machines	Air conditioners
	Computers (motherboard, hard drive, case, power supply unit, notebook PC, and monitor)			
2001	Printers			
2002	Light Tubes (Straight fluorescent tube)			
2007	Electric fans		Keyboards	
2008	Light Bulbs (fluorescent circle bulb, compact light bulb with integral ballast, etc.)			
2014	tablet			

Taiwan's Policies

RRW Items/E-Wastes

- **New RRW Items (From 2014):**
  - Tablet and others.
- **Take-back policy:**
  - TV, Refrigerator, Washing machine, Air conditioner
  - To take back the waste items without charge
- **Voluntary Agreement for Recycling of Mobile Communication Equipment (MCE)**
  - Mobile telephones, PDAs and GPS
  - To recover the waste MCE of the general public without charge

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1. SDG 11 & Waste Management
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Taiwan's Actions

Collection Channels of Recyclables

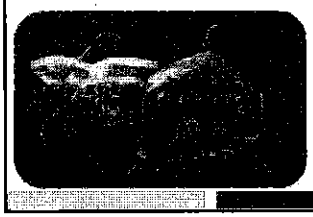
1) 地方清潔隊 Municipal collection teams
2) 村里資收站 Neighborhood collection stations
3) 學校 Schools
4) 零售商 Retailers
5) 民間回收業者 Private collectors
6) 民間團體:慈濟 NGOs e.g., Tzu Chi Foundation
7) 智慧無人回收機 Smart collection machines

Taiwan's Actions

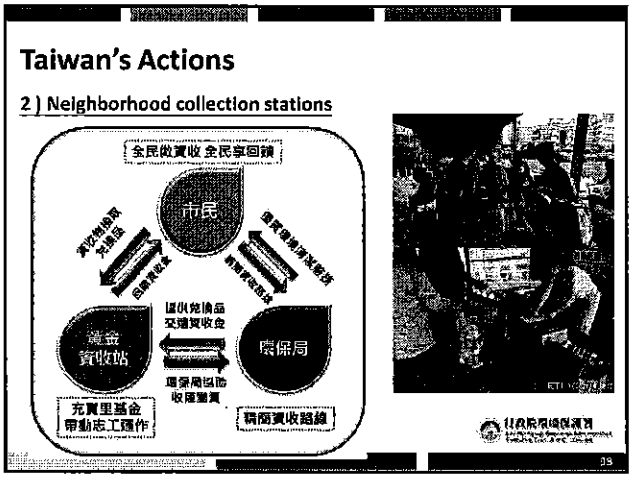
1) Municipal collection teams

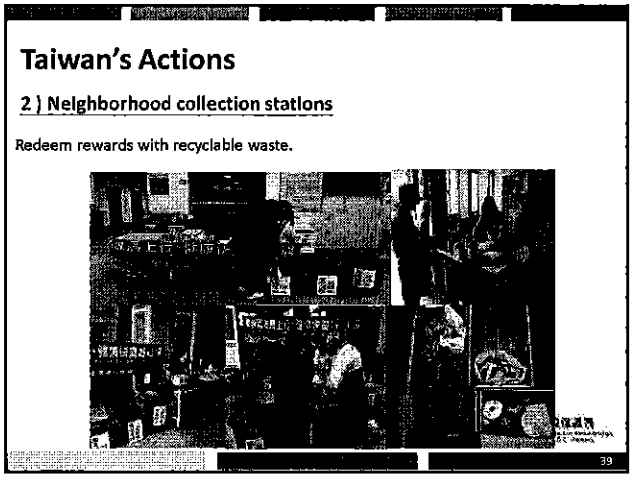
Garbage Bag Fee program in municipalities

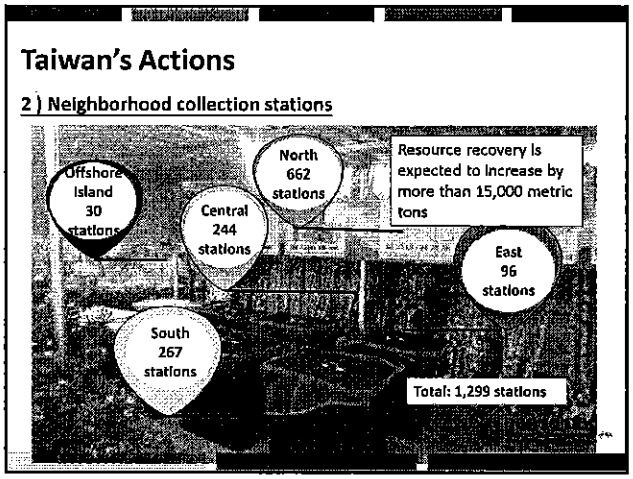
- Pay as you throw
- Garbage bag is NTD 0.36/L ; however, recyclable waste is collected for free
- Waste volume 70% ↓, Recycling volume 50% ↑




Sort 3, waste free


Taiwan's Actions
2) Neighborhood collection stations
全民做資收 全民享回饋
市民
環保局
資源回收路線


Taiwan's Actions
2) Neighborhood collection stations
Redeem rewards with recyclable waste.

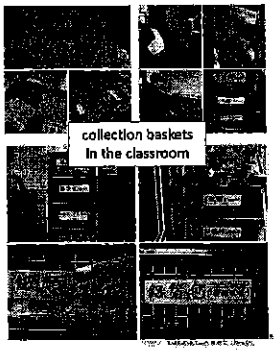

Taiwan's Actions
2) Neighborhood collection stations
Offshore Island 30 stations
North 662 stations
Central 244 stations
East 96 stations
South 267 stations
Resource recovery is expected to increase by more than 15,000 metric tons
Total: 1,299 stations

Taiwan's Actions

3) School Recycling Programs

Through education, daily activities, facilities, teachers and students create a resource recycling culture.

recycling site on campus

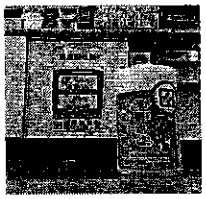


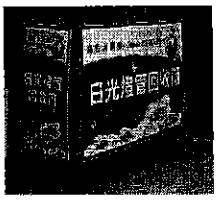
collection baskets in the classroom

Taiwan's Actions

4) Retailers

14 categories retail stores required to set up recycling collection stations





- Light tube or dry batteries for free
- Collection area or boxes
- Clear collection mark

Taiwan's Actions

4) Retailers

- Convenience stores offer discount for battery recycling

  e.g., 7-11: NT$ 8/per 0.5kg;
  Family Mart: NT$ 10/per 0.5kg

- EPA's promotion:

waste dry cell batteries*0.5 kilograms

⇕

NTD 11 per purchase (from 2019 Oct. 18 to 2019 Oct. 31)

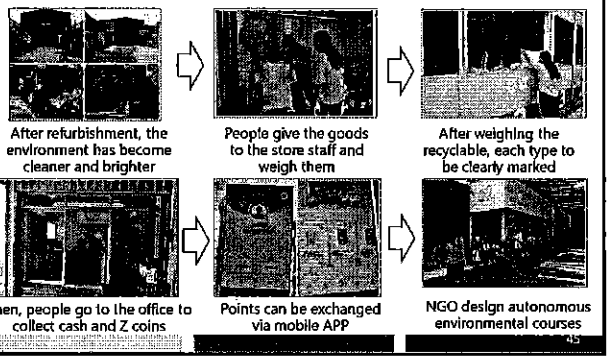
Taiwan's Actions

4) Retailers

- Purpose：easy to dump their bulky and large household waste
- Content：
  - Retailers must take back at no charge used appliances from consumers purchasing new appliances, and ship the waste appliances to the municipalities, or registered collectors or recyclers within 3 months
  - Retailers are prohibited from dismantling waste home appliances
  - After receiving waste appliance, collectors or recyclers must submit a report to Taiwan EPA within 7 days

Taiwan's Actions

5) Private collectors (for enterprises)



After refurbishment, the environment has become cleaner and brighter

People give the goods to the store staff and weigh them

After weighing the recyclable, each type to be clearly marked

Then, people go to the office to collect cash and Z coins

Points can be exchanged via mobile APP

NGO design autonomous environmental courses

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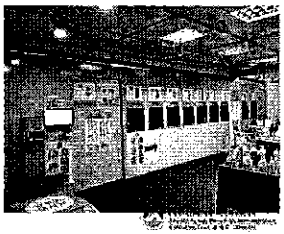
Taiwan's Actions

5) Private collectors (enterprises)

Zero Zero City Green Shop



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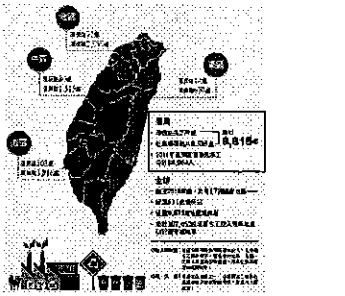
Taiwan's Actions

6) NGOs e.g., Tzu Chi Foundation

Collection amounted: 80,596 tons in 2018



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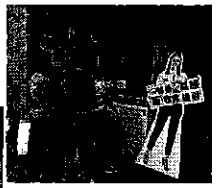
Taiwan's Actions

7) Smart collection Machines



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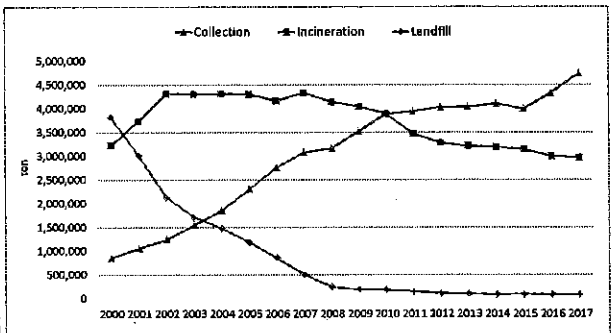
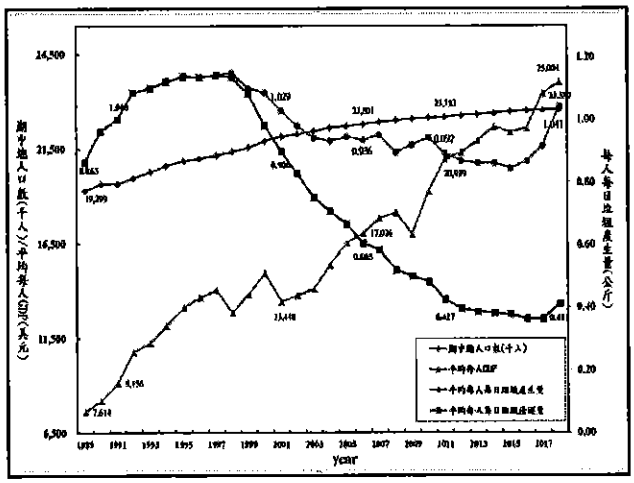
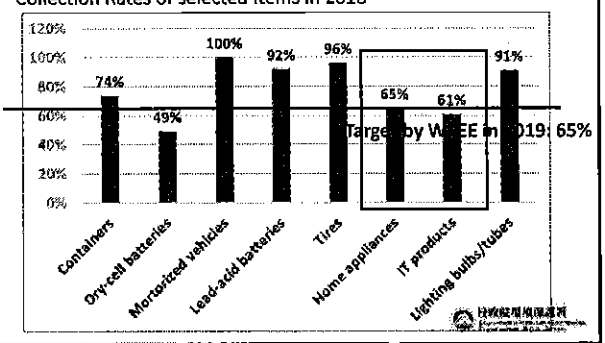
Taiwan's Achievements

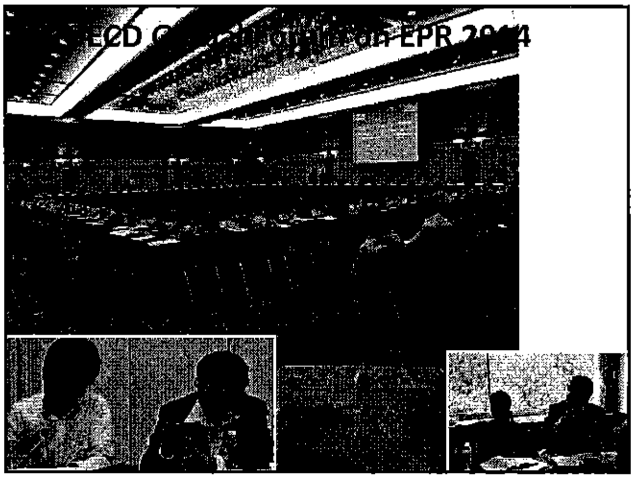


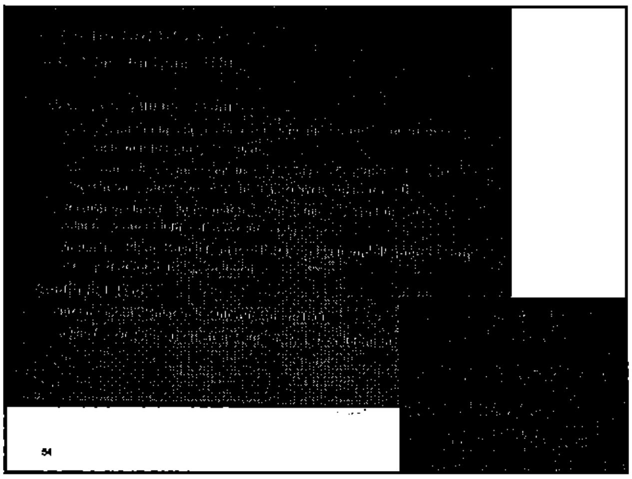


Taiwan's Achievements

Collection Rates of selected Items in 2018





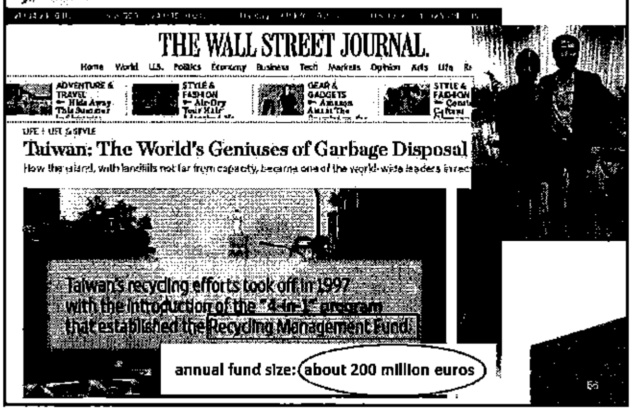


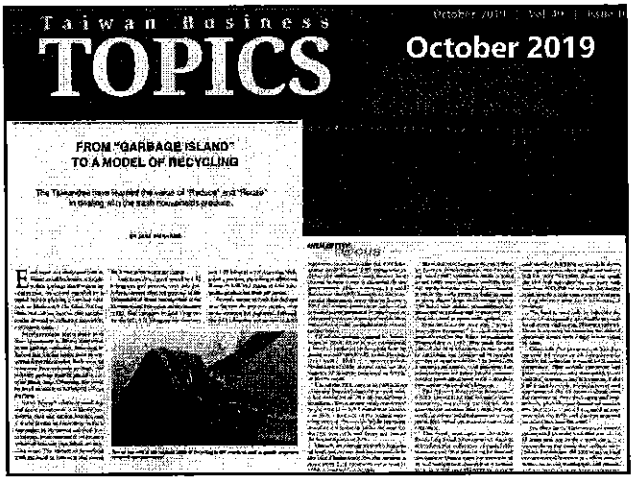
OECD 2015

Recycling Rate

Country	Year	Municipal waste generated	Recycling (%)	Composting (%)	Incineration (%) with energy recovery	Incineration (%) without energy recovery	Landfill (%)	Material recovery (%) (Recycling + Composting)	(%)
Germany	2015	5,104.60	47.83	18.23	22.07	11.67	0.21	66.05	100
Austria	2015	483.6	26.24	31.96	38.76	–	5.04	58.2	100
Belgium	2015	470.8	35.09	19.58	23.97	18.41	0.93	54.67	100
Switzerland	2015	603	31.91	20.83	47.26	–	–	52.74	100
Holland	2015	883.5	24.61	27.1	45.79	1.1	1.41	51.71	100
Italy	2015	2,952.60	29.14	19.82	9.37	11.7	29.18	48.95	100
Luxemburg	2015	35.6	28.51	19.78	34.1	–	17.62	48.79	100
Sweden	2015	417.7	32.37	15.63	51.2	–	0.8	48	100
Den Mark	2015	448.5	27.27	19	52.6	–	1.14	46.27	100
UK	2015	3,156.70	27.37	16.3	30.58	0.95	22.67	43.67	97.87
Norway	2015	218.7	26.13	16.69	52.35	–	3.39	42.81	98.55
Poland	2015	1,086.30	[illegible]	16.11	12.13	1.11	44.26	42.5	100
Australia	2015	1,333.90	41.59	–	11.65	–	46.77	41.59	100
Finland	2015	273.8	28.13	12.45	47.97	–	11.5	40.59	100
France	2015	3,339.90	22.26	17.26	33.64	1.09	25.76	39.51	100
Spain	2015	2,015.10	16.84	16.46	11.62	–	55.09	33.29	100
Hungary	2015	371.2	25.96	6.23	14.15	–	53.67	32.18	100
Israel	2015	512.6	[illegible]	4.37	–	–	79.95	20.05	100
Taiwan	2015	722.93	46.8	8.43	43.48	–	1.77	55.23	99.98

Wall Street Journal's Report in 2016




Taiwan Business
TOPICS
October 2019
FROM "GARBAGE ISLAND" TO A MODEL OF RECYCLING

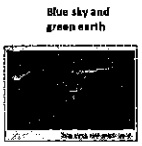
Outline

1. SDG 11 & Waste Management
2. Taiwan's Policies
3. Taiwan's Actions
4. Taiwan's Achievements
5. Conclusions ⇨

Conclusions

- ◆Adopting state-of-the-art technologies
- ◆Continuing fine-tuning policies and regulations
- ◆Participating in and devoting to the global communities


Verdant mountains and pristine water


Blue sky and green earth


Health and Sustainable


Thank
You
61

Partnership between Producers and Recyclers
SDG 12 Responsible Consumption and Production

Follow up Partnership to PACE Decision BC-14/19 Part I

Leila Devia
Director, BCRC Argentina

Alberto Santos Capra
Project Coordinator, BCRC Argentina

2019 IEMN Workshop
2 - 4 December, Bangkok, Thailand

SDG 12 Responsible Consumption and Production

- Promoting **resource and energy efficiency**;
- Sustainable infrastructure;
- Providing access to basic services, green and decent jobs and a better quality of life for all.

Its implementation helps to achieve overall development plans, reduce future economic, environmental and social costs, strengthen economic competitiveness and reduce poverty.

At the current time, **material consumption of natural resources is increasing**, particularly within Eastern Asia.

Countries are also continuing to address challenges regarding air, water and soil pollution

SDG 12 Responsible Consumption and Production

Since **Sustainable Consumption and Production (SCP)** aims at **"doing more and better with less"**, net welfare gains from economic activities can increase by reducing resource use, degradation and pollution along the whole life cycle, while increasing quality of life.

There also needs to be **significant focus on operating on supply chain**, involving everyone from producer to final consumer, and post-consumer management (**Take Back Schemes, Extended Producer Responsibility-EPR, and other modalities**).

This includes educating consumers on sustainable consumption and lifestyles, providing them with adequate information through standards and labels and engaging in **sustainable public procurement**, and for **Producers and Recyclers apply sustainable practices.**

SDG 12 Responsible Consumption and Production Targets related to E-wastes

12.1 Implement the **10-year framework of programmes on sustainable consumption and production (2012-2022)**, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

12.2 **By 2030**, achieve the sustainable management and efficient use of natural resources

12.4 **By 2020**, achieve the **environmentally sound management of chemicals and all wastes** throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment **(SAICM 2020 and SAICM Post-2020)**

12.5 **By 2030**, substantially reduce waste generation through prevention, reduction, recycling and reuse

SDG 12 Responsible Consumption and Production Targets related to E-wastes

12.6 Encourage companies, especially **large and transnational companies**, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

12.7 Promote **Public Procurement Practices (PPP)** that are sustainable, in accordance with national policies and priorities

12.8 **By 2030,** ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

12.A **Support developing countries** to strengthen their scientific and technological capacity to move towards more **sustainable patterns of consumption and production**

SDG 12 Responsible Consumption and Production Global Indicator Framework

- Developed by the **Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs)** and agreed upon **48th Session of the United Nations Statistical Commission** held in March 2017.
- Later adopted by General Assembly (GA) 6 July 2017 **Resolution GA on Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313), Annex.**
- Annual refinements of indicators are included in the indicator list as they occur.
- **Refinements** agreed by the Statistical Commission at 49th Session March 2018 (E/CN.3/2018/2, Annex II) and 50th Session in March 2019 (E/CN.3/2019/2, Annex II).

SDG 12 Responsible Consumption and Production Global Indicator Framework

- 12.1.1 Number of countries with **Sustainable Consumption and Production (SCP)** national action plans or SCP mainstreamed as a priority or a target into national policies
- 12.2.1 Material footprint, material footprint per capita, and material footprint per Gross Domestic Product (GDP)
- 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP

SDG 12 Responsible Consumption and Production Global Indicator Framework

- 12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement (Paragraph 20 Section II "Review of general issues of compliance and implementation under the Convention reporting: individual compliance performance" **National Reporting, BC-14/15 April-May 2019: Committee Administering the Mechanism for Promoting Implementation and Compliance**
- 12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment

SDG 12 Responsible Consumption and Production Global Indicator Framework

- 12.5.1 **National recycling rate**, tons of material recycled
- 12.6.1 Number of companies publishing sustainability reports
- 12.7.1 Number of countries implementing sustainable **Public Procurement Policies (PPP)** and action plans
- 12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

12.a.1 Amount of support to developing countries on research and development for SCP and environmentally sound technologies

Decision BC-14/19 Part I – April/May 2019

- The Conference of the Parties (COP) decided to establish a **Working Group of the Partnership** that will operate under the guidance of the Open-ended Working Group (OEWG);
- Invited Parties, signatories and all other stakeholders, to indicate their interest in participating in the working group of the Partnership to the Secretariat no later than 30 September 2019;
- Invited Parties and others to submit comments on the **Terms of Reference (ToR)** and the **Programme of Work (PW)** referred to in paragraph 1 of the present decision to the working group of the Partnership, through the Secretariat, by 30 September 2019;
- Requested the **Working Group of the Partnership** to prepare a revised version of both the **ToR** and the **PW**, including to prioritize tasks in the **PW** and outline the structure of the leadership of the Partnership, and taking into account comments from Parties and others, and to submit them for consideration by the OEWG at its twelfth meeting (2020)
- Mandated the OEWG to adopt, at its twelfth meeting, the **ToR** and the **PW** on behalf of the COP.

Decision BC-14/19 Part I

Programme of work in five points

1) Translation of the current guidance documents into additional languages (**non UN Languages**);

2) Dissemination activities: **training packages and workshops**

3) Development of a Road Map for the ESM of e- waste

4) Propose a new focus on a new e-waste type

5) Pilot projects

Full Program of Work W in Annex II Document UNEP/CHW.14/INF/30

Decision BC-14/19 Part I

- **Proposed Dissemination Activities:**
  - Elaboration of the model of workshop for economic operators working in ESM
  - Elaboration of the model of workshop for manufacturers and importers
- **Working Group already established** since 30 September 2019
- Documents for OEWG-12: internal deadline March 2020
- OEWG-12 June 2020 new **Terms of Reference** and **Program of Work**

Follow up Partnership to PACE

- **Working Group** of the Partnership led by Regional Centres (RCs)
- Invitation to both Basel and Stockholm RCs to join the **Working Group** of the partnership
- Regional structure
- First online meeting of the **Program of Work** October 2019

Follow up Partnership to PACE
BCRC Argentina Chair of the Working Group
Decision BC-14/19 Basel Convention Partnership Programme

- **Document UNEP/CHW.14/INF/30**
  - ✓ Annex I Concept Note
  - ✓ Annex II Terms of Reference including Financing
  - ✓ Annex III Programme of Work 2020-2021
- **Starting with the following priority activities:**
  - ✓ Translation of the current guidance documents into additional languages
  - ✓ Dissemination activities
  - ✓ A Model Workshop for Authorities, Economic Operators, Manufactures and Importers, Schools; Toolkits
- **Update the technical guidelines of the Mobil Phone Partnership Initiative (MPPI) and PACE considered the recent amendments to Annexes II, VIII and IX to the Basel Convention regarding the new Y48 of Plastic Waste**

Follow up Partnership to PACE
BCRC Argentina Chair of the Working Group
Decision BC-14/19 Basel Convention Partnership Programme

- **E-waste European Tour from 4 to 8 November 2019 prepared by the BRS Conventions Secretariat**
  - ✓ APPLE Breda Netherlands: arrive to manufacture products without mining any new materials from the earth. The challenge: arrive to a quality of recyclables so that the product from recycled materials looks and behaves exactly in the same way as the product build with materials sourced through primary mining
  - ✓ STEP Vienna, Austria: potential cooperation working on formal and informal sector partnerships guidelines, led by GIZ Germany. StEP developed a training package for schools, based on the E-waste Academy for Managers (EWAM) manuals, batteries collection and recycling from phones and other e-waste could be included
  - ✓ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and Federal Ministry for Economic Cooperation and Development (BMZ), Bonn, Germany
  - ✓ Federal Office for the Environment, Bern, Switzerland: Testing the PACE guidelines and the E-waste TGs on TBM; producers campaigns for their take back and recycling programs with cooperation with recyclers

Follow up Partnership to PACE
BCRC Argentina Chair of the Working Group
Decision BC-14/19 Basel Convention Partnership Programme

- **Developing a Concept Note**
  - ✓ Project: To enhance the Environmentally Sound Management of computing equipment and E-waste, including during their transboundary movements, in the context of the follow up Partnership to PACE
  - ✓ Framework: Technical Assistance Plan for the implementation of the Basel, Rotterdam and Stockholm conventions for the period 2018-2021
  - ✓ Contributions: To develop both dissemination activities and Pilot Projects included in the work programme of this partnership and testing PACE and MPPI Guidance Documents
  - ✓ Main topics: to enhance the ESM of computing equipment and E-waste, to optimize the collection and recycling of computing equipment in an environmentally sound manner involving and informing the informal sector on health and environmental impact of sub-standard recycling operations, supporting the establishment of financial systems for the collection, recycling and final disposal of computing equipment and more generally e-waste, when policies and financial systems could be generalized to e-waste, supporting the transition of informal or existing facilities to a certified ESM standard and, where necessary, certified value chains.

CRSAS
Centro Regional Sudamericano para América del Sur

¡Thank you!

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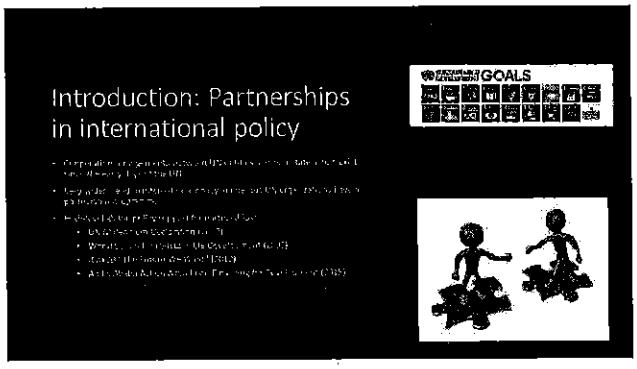
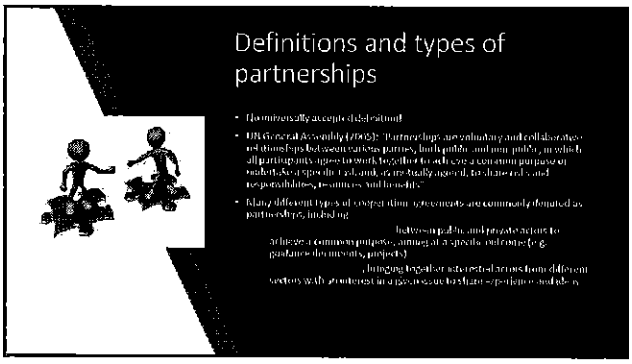


17 PARTNERSHIPS FOR THE GOALS

- Goal 17: "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development"
- Targets 17.1 to 17.19 relate to
  - Finance – mobilization of resources
  - Access to and transfer of technology
  - Capacity building in developing countries
  - Trade – promotion of an open and equitable global market
  - Systemic issues – policy and institutional coherence; multi-stakeholder partnerships; data, monitoring and accountability
- Reviewed by the High-Level Political Forum on SD in 2017, 2018 and 2019

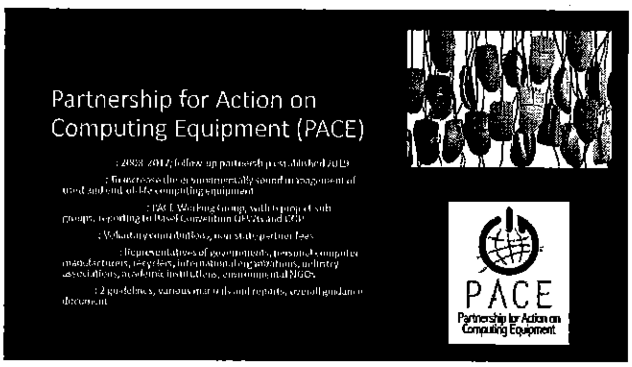
17 PARTNERSHIPS FOR THE GOALS

- Target 17.16: "Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries"
- Target 17.17: "Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships"


Definitions and types of partnerships
No universally accepted definition!
UN General Assembly (2005): "Partnerships are voluntary and collaborative relationships between various parties, both public and non-public, in which all participants agree to work together to achieve a common purpose or undertake a specific task and, as mutually agreed, to share risks and responsibilities, resources and benefits."
Many different types of cooperation agreements are commonly denoted as partnerships, including
between public and private actors to achieve a common purpose, aiming at a specific outcome (e.g. guidance documents, projects)
, bringing together interested actors from different sectors with an interest in a given issue to share experience and ideas


Partnerships on e-waste management
Global recognition of e-waste as a problem in the late 1990s/early 2000s
Early policy interventions include partnerships:
→ New area of work, limited mandate and experience of governmental organizations -> input of non-state partners particularly valuable
→ Significant experience now exists on e-waste partnerships; helpful in the building of new partnerships at all levels!


Mobile Phone Partnership Initiative (MPPI)
: 2002-2008
: To promote the objectives of the Basel Convention in the area of environmentally sound management of end-of-life mobile phones
: Mobile Phone Working Group, with thematic sub-groups, reporting to Basel Convention OEWG and COP
: Voluntary contributions
: Representatives of governments, mobile phone manufacturers, telecom operators, recyclers and refurbishers, industry associations, environmental NGOs
: 5 technical guidelines, overall guidance document


Partnership for Action on Computing Equipment (PACE)
: 2008-2017; follow-up partnership established 2019
: To increase the environmentally sound management of used and end-of-life computing equipment
: PACE Working Group, with 6 project sub-groups, reporting to Basel Convention OEWGs and COP
: Voluntary contributions, non-state partner fees
: Representatives of governments, personal computer manufacturers, recyclers, international organizations, industry associations, academic institutions, environmental NGOs
: 2 guidelines, various manuals and reports, overall guidance document
PACE
Partnership for Action on Computing Equipment

Solving the E-Waste Problem (StEP)

- : since 2004
- : to design strategies that address all dimensions of electronics in an increasingly digitalized world
- : Independent multi-stakeholder platform; organizational structure includes Management Board, Supervisory Committee, thematic Working Groups
- : Membership fees (different categories)
- : Government agencies/ministries, international organizations, companies, NGOs, academic institutions, individuals
- : Research, strategy and goal setting, training and development, communication and awareness raising
- : Studies, publications, projects, webinars

Benefits of partnerships

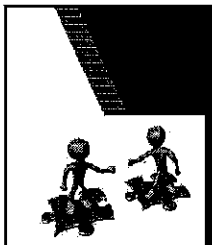
- Pooling of knowledge and experience in order to achieve a common objective
- Enhancing ownership and commitment to the issues from all partners
- : Tapping into the resources, knowledge, skills, mandates, networks, and perspectives of non-state actors
- : Opportunity to have a voice in policy making, to showcase own activities, to enhance visibility

Government organizations: Rationale for engaging in partnerships

- Potential for expanding the impact of the organization's efforts in an area of work that can benefit from
  - The experience and expertise of non-state entities
  - Additional financial resources and capacity contributed or generated by such entities
  - Additional outreach and visibility achieved through the involvement of such entities
- Engagement in activities beyond the formal scope of work of the organization but in line with its mandate and objectives

Government organizations: Mitigation of risks

- Risks of engagement with non-state partners (e.g. companies, advocacy NGOs):
  - Compromising the integrity, impartiality, credibility and independence of the organization
  - Conflict with the mandate of the organization (non-state partners pursuing their own agenda)
  - Undue influence of the non-state partners on the organization
  - Unfair advantages for the non-state partners
- Mitigation measures:
  - Criteria for selection of non-state partners (e.g. demonstrated support of UN values)
  - Governance structure ensuring transparency and accountability of all partners
  - Requirements for sharing information
  - Procedures for monitoring and evaluation, due diligence, and risk assessment



Important elements of a successful partnership (lessons learned from MPPI)

- Strong and continued leadership
- Active involvement of all stakeholders; transparency
- Self-funding mechanism (sustainable funding is core!)
- Balanced participation between different types of stakeholders; good understanding of the different viewpoints of the stakeholders to avoid misunderstandings and conflicts
- Sound coordination of activities throughout the process
- Committed individuals among the partners
- Mechanisms to reach consensus or resolve conflicts
- Flexible work programme with room for adjustment

Thank you!

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Policy and System Developments

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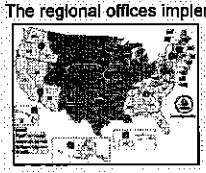
Chicago, IL

First – EPA's Regional Offices

- EPA has 10 regional offices
- Regional offices work directly with the states
- EPA's Headquarters office in Washington, DC creates policies
- The regional offices implement policies by working with the states



- Barnes Johnson – Office Director
- Karen Pollard – Technical Staff
- Stephanie Adrian – Technical Staff
- Ed Nam – Director
- Chris Newman – Technical Staff

Waste Management Regulatory Structure

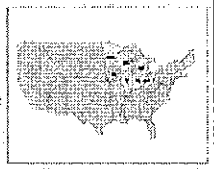
- The Resource Conservation and Recovery Act (RCRA) of 1976 regulates solid and hazardous waste in the United States
  - WEEE isn't specifically mentioned, neither are white goods
  - Some WEEE devices may be characteristic Hazardous Waste (leachable Pb, Hg)
  - Materials and awareness has changed since 1976 (ex: flame retardants aren't addressed)
  - Certain exclusions are made:
    - To support recycling (ex: CRTs sent to recycling are not solid waste)
    - To reduce the regulatory burden (ex: equipment from households or businesses that dispose of less than 100 kgs HW/month are conditionally exempt small quantity generators (CESQG))
  - In the U.S. white goods are not considered part of WEEE
- RCRA provides a framework to determine:
  - If it is a waste
  - What is a regulated hazardous waste?
  - Who is a generator of hazardous waste?
- 49 of the 50 U.S. states have been delegated authority to administer RCRA.
  - The federal law is the floor for performance, states can be stricter than the federal program
  - States can implement their own WEEE programs

Summary of State WEEE Efforts

- 25 states (+DC) have developed their own WEEE laws
  - Why? Because states want to address this growing waste stream
  - Most state laws focus on household E-waste
  - Some have laws that specifically effects business waste
  - Many include a landfill ban for certain types of WEEE, regardless of generator
  - Some states may require purchasing of 'green' electronics or have formal ewate policies for state owned equipment
- The states have become laboratories for these policies
- Business waste is still regulated as RCRA waste, even if the state program doesn't apply

Great Lakes Region WEEE Policies

- In 2005 – 2006 staff from Great Lakes states environmental agencies came together to develop a proposal for WEEE management
  - They saw that household WEEE could be landfilled
  - Is landfilling the best use of these resources, even if U.S. landfills can safely manage WEEE?
  - Millions of pounds were expected to be generated in the future
- Great Lakes states developed an extended producer responsibility (EPR) proposal for WEEE from households
- At about the same time there were efforts to streamline management of business materials
  - Michigan added cathode ray tubes as a Universal Waste bulb that streamlines the HW management standards commonly generated wastes
  - EPA developed the CRT regulation which provides a conditional exemption from the definition of solid waste for CRTs
- Additional WEEE efforts were underway in other states too



Comparison of Great Lakes State's WEEE Laws

Indiana	Yes	Previous year's sales share	Computers, TVs, peripherals, portable electronics. Cell phones are not covered.	Landfill ban on electronics
Illinois	Yes	Number of recyclers per county, based on population	Includes computer and video game systems. Cell phones are not covered.	Landfill and incineration ban on CEDs
Ohio	No Program			No
Michigan	Yes	Previous year's sales share	Limited to computers or video display device. Cell phones are not covered.	No
Minnesota	Yes	Previous year's sales share	Video displays (not based on screen size), computers, DVD players. Cell phones not covered	Landfill ban on electronics products containing a CRT
Wisconsin	Yes	Previous year's sales share	CEDs- consumer computers, printers and video displays (based on size). EEDs- what manufacturers will receive credit for recycling – adds DVD players/VCRs, DVRs, fax machines, computer peripherals	Landfill and incineration ban

What's the EPR Model?

- In the Great Lakes Region EPR includes:
  - Manufacturers (as brand owners) of covered devices paying for collection and recycling of ewaste
  - Achieving a collection goal based on previous years sales or
  - Offering a certain number of collection sites based on county population
- Alternatives to sales share models used in other states:
  - Return share costs:
    - Brand owners are billed for the cost of recycling their returns, or
    - Split by their share of the returns
  - Requirement to have a plan to collect and recycle
  - Payment of an annual fee, which is reduced if the manufacturer has a free collection program
  - Simple mandate for manufacturers to have a program
- Exceptions:
  - California has an advanced recovery fee that reimburses recyclers and collectors
  - Utah just requires manufacturers to do public education on recycling options in the state

Who Manages the WEEE Laws?

- Where WEEE laws have been adopted
  - The state environmental agency administers recycler/collector/manufacturer compliance and enforces the law when necessary
  - Other state agencies may have a role, market development grants for example
- At the community level (also in places where there's no law)
  - Local governments may host collection events
  - Retail outlets may parter with collectors/recyclers

Example WEEE Program Management Responsibilities in the Great Lakes Region

- State staff:
  - Registering manufacturers, recyclers, and collectors
  - Evaluating annual compliance reports from manufacturers, meeting their goals
  - Issuing 'do not sell' orders for non-compliant manufacturers as necessary
  - Program outreach, inspection of recyclers
  - Communication with other states about recyclers and brand owner issues
  - Enforcement of RCRA
- Manufacturers:
  - Contracting with recyclers or collectors for a certain number of pounds each year
  - Evaluating/contracting with their recyclers or collectors, often cooperatively
  - Maintaining program compliance
- Recyclers:
  - Maintaining registration and contracts with the manufacturers to collect a certain number of pounds
  - Maintaining program compliance (ex: recycler certifications)
- Collectors:
  - Maintaining contracts with recyclers
  - Running the collection site

Ensuring Proper Collection and Recycling in the Great Lakes Region

- Several states have RCRA inspection staff with WEEE experience
- Participating recyclers are R2/eStewards certified, or maybe ISO 14001
- Analysis of annual reports by state staff
- Maintaining good relationships with the industry
  - Attending industry meetings
  - Visit and inspect recyclers
- Even with a program, state staff needs to keep on top of the WEEE recycling landscape
  - Improperly operated recyclers have appeared even in states with the best run programs
  - Outreach is important to educate the public about WEEE recycling
  - Material can still flow to the lowest price or smoothest talking operator, who could be improperly operating
  - Exchanging information between states

Difficulties and Challenges of Policy Development

- "Difficult to see. Always in motion the future is." – Yoda
  - When developing a program future projects must be anticipated. But, what will the future look like?
  - It could be years between an initial idea/need and program implementation
  - Ex: light-weighting of TVs from CRT to LCD means more LCD TVs must be sold to cover the weight of one CRT that is collected
- Program justifications are challenged as manufacturers change their product
  - Toxins (Pb, Hg) were a program justification, but they are not as present in products
  - The amount of materials in bulky devices, size, and material use has been reduced
- What are today's or tomorrow's justifications?
  - The number of devices sold or product lifespans? (back in the amount of material)
  - Lithium batteries and their fire risk?
  - The volume of end-of-life solar panels will be huge, when are they considered for the WEEE program?

Difficulties and Challenges of Policy Development, Cont.

- Knowing where the challenges are:
  - In 2005-2006 state staff knew that an advanced recovery fee wasn't acceptable to Great Lakes Region state political leaders. It still isn't.
  - How will other allied industries respond (retailers or trade associations)?
- To be put into law a proposal must be approved by the legislature and signed by the governor.
  - This moves a policy proposal to the political sphere
  - Expect changes will be made along the way
  - Discussions could be regional, but something else from another part of the country could happen that affects your effort.

Difficulties and Challenges of Policy Development, Cont.

- Bring together lots of people, groups and ideas.
  - The sooner you get the ideas and concerns out into the open the better
  - It's better to invite people early than at the end of a process
  - Even if there's a group that's not directly related the WEEE, they still might have something to say about a policy
- Have a 'big tent' and include those that may not be supportive
  - Manufacturers, brand owners, retailers, collectors, recyclers, industry associations
  - Local governments and associations, environmental groups, public officials, other state agencies (ex: revenue), universities
- Keep communications flowing
  - Program participants know how to contact state program staff when they need to talk
  - Many Great Lakes state's programs have public meetings every year or two on program updates, challenges, issues that need to be addressed

Voluntary Programs

- Brand owners can still collect materials voluntarily in states without a program
- Brand owners often partner with retailers or charities for collection sites.
  - Mail back is an option too
- Rechargeable and single use batteries (in some locations) have a voluntary stewardship program
  - Call2Recycle collected 7.2 million pounds of batteries in 2018
  - Outreach campaign to reduce battery ignited waste fires
- There are some municipal programs as well
- U.S. EPA recognizes the electronics manufacturer's collection efforts through the SMM Electronics Challenge

WEEE Policies for Businesses

- RCRA applies, businesses are treated differently than households
  - Actions are based on amount of hazardous wastes generated per month
  - It is the responsibility of generator to determine if a waste is a hazardous waste
  - If they recycle WEEE that is a hazardous waste the weight doesn't go towards the 100 kg/month that would apply to their monthly total
- Landfill bans also apply to businesses
- Businesses are also subject to other factors that help guide waste management
  - Medical and financial privacy laws, issues with data loss
  - CERCLA, a liability for improperly managed waste
  - Public visibility for data losses
- There's a financial incentive for reuse, business equipment is more likely reusable/refurbishable and resalable, this will off-set some of the recycling cost
- EPA promotes proper e-waste management by manufacturers via recognition from the SMM Electronics Challenge

Chris Newman
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EPR models

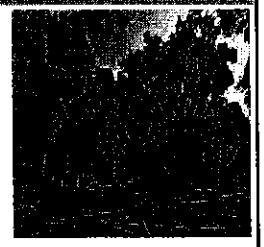
Taiwan's e-waste management system vs. PROs

Chun-hsu Lin 林俊旭, Ph.D.
Research Fellow, Deputy Director
Center for Green Economy
Chung-Hua Institution for Economic Research

CGE in CIER

◆ Chung-Hua Institution for Economic Research (CIER)

- Established in 1981
- A think tank with about 400 employees
- Focused on the research of economic issues, mainly serving Taiwanese government for the policy analysis



◆ Center for Green Economy (CGE)

- Established in 2013 under CIER
- Specialized in environmental economics, international trade and green policies
- With about 30 research fellows, assistants, supporting staff members.

About Dr. Chun-hsu Lin

◆ Education

- Ph.D. in Environmental and Natural Resource Sciences, Washington State University, USA, 2001
- Master of Regional Planning, University of Pennsylvania, USA, 1993.
- BSc in Civil Engineering, National Taiwan University, 1989

◆ Experiences

➢ Chung-Hua Institution for Economic Research
- Research Fellow , since Oct. 2010
- Associate Research Fellow, International Division, 2005~2010

➢ Green Trade Project Office, Ministry of Economic Affairs
- Secretary-General, 2011~2016

➢ Institute for Environment and Resources
- Associate Research Fellow, 2001~2005

Outline

- Municipal solid waste management overview
- EPR in Taiwan vs. Others
  - Global EPR types
  - Legal structure and mechanism
  - Roles of stakeholders
- Performance indicators and status
- Conclusions

Municipal Solid Waste Management Overview

Taiwan Basics

Taiwan **is an export-driven economy,**

Ranked 20th largest economy in the world.

Item	Data of the year 2017
Population	23.6 million
Gross Domestic Product (GDP)	575.5 billion (country comparison to the world: 20)
GDP per capita	US$ 24,402
Economic Growth Rate	2.9%
Total Exports / Imports	US$ 317 billion / US$ 259 billion

Source: Department of Statistics, Ministry of Finance, "Summary of Exports and Imports for March, 2018"

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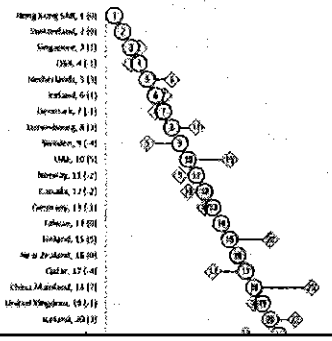
Ranked 14th in Competiveness worldwide

Source : * IMD World Competitiveness Yearbook 2017

World Competitiveness Ranking 1 Year Change



7

Three-in-One Trash Collection

Three Categories to be collected:

1. **General Trash:** unit-pricing bags required
2. **Kitchen Waste:** no unit-pricing bags are required
3. **Recyclables:** no unit-pricing bags are required

- **Unit-price bag**
  - July, 2000
- **kitchen waste collection**
  - December, 2003

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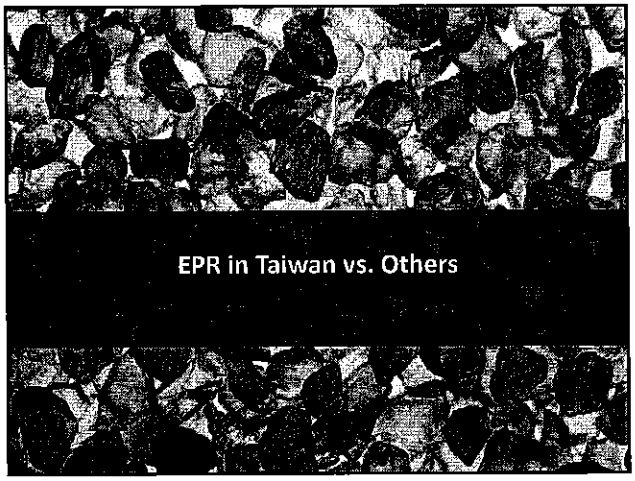
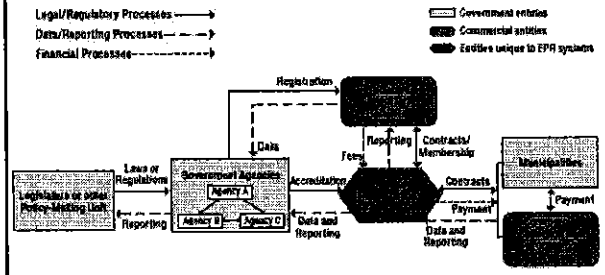


EPR Model 1:
One PRO with commercial and/or municipal collection and processing services



▶ Summarized by OECD 2016

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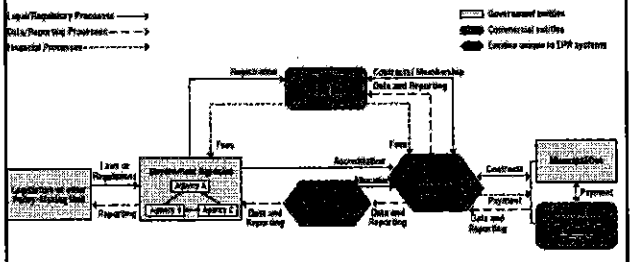
EPR Model 2:
Multiple PROs with clearinghouse and commercial and/or municipal collection and processing services



▶ Summarized by OECD 2016

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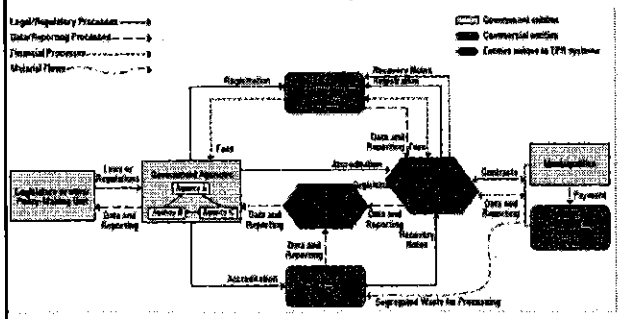
EPR Model 3:
Trade Credit Systems



▶ Summarized by OECD 2016

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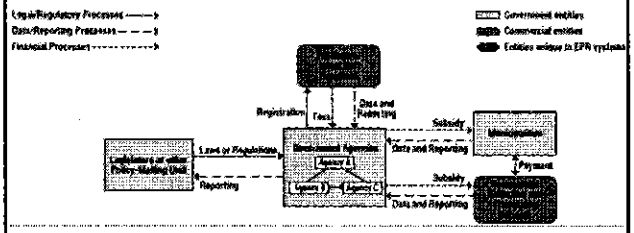
EPR Model 4: Government-run EPR system



▶ Summarized by OECD 2016

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The applications of EPR systems

Types of EPR	Countries
Single PRO	Belgium, Sweden, Switzerland, Canada (Ontario), Japan
Multiple PROs	Germany, Netherlands, UK, France
Tradable Credits	UK (for paper packaging)
Government-run	US (California), China, Taiwan

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Difference in Physical Responsibility Assignment

Types of Responsibility
• **No collection target required for any party (usually for single-PRO or government-run systems)** ✓ As long as producers get registered in a PRO and pay the charge, no particular target of take-back imposed
• **Annual overall collection targets imposed on PROs (usually for single-PRO systems)** ✓ Overall collection rates required by environmental authorities
• **Collection Shares Imposed on Producers (usually for multi-PROs systems)** ✓ Usually based on every producer's individual market shares

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EPR Types vs. Physical Responsibility Requirement

	Multiple-PROs	Single-PRO	Government-run
• No collection targets imposed	France Netherlands	Belgium Switzerland Japan	Taiwan China California, US
• Annual overall collection rates imposed on PROs		Korea	
• Collection shares imposed on producers	Germany		

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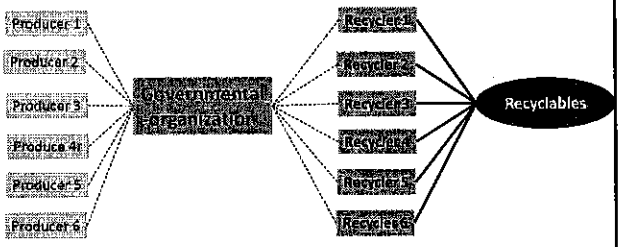
The Competition Mechanisms
Government-run systems



Competition 1: Commissioned recyclers competing for recyclables

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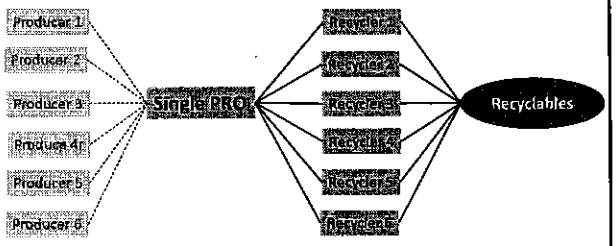
The Competition Mechanisms
Single-PRO systems



Competition 1: Commissioned recyclers competing for recyclables
Competition 2: Recyclers competing for contracts with single PRO

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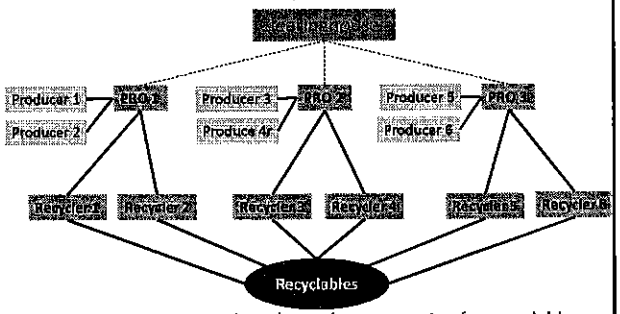
The Competition Mechanisms
Multiple-PROs systems



Competition 1: Commissioned recyclers competing for recyclables
Competition 2: Recyclers competing for contract with PROs
Competition 3: PROs competing for producers

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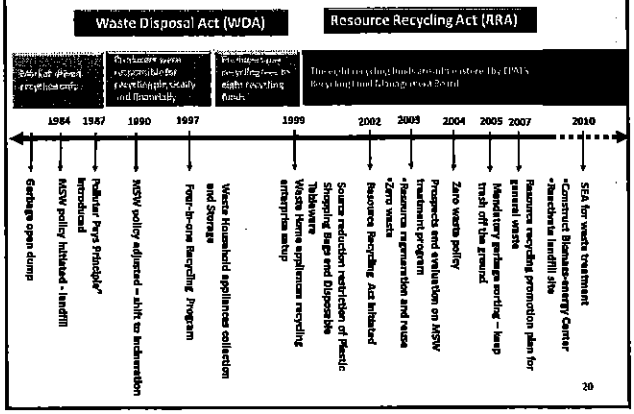
Recycling Management Policy in Taiwan



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Legal Basis for EPR

- **Waste Disposal Act**
  - Since 1974; last mandated 2012
  - Article 15
    - *For articles and the packaging and containers thereof that, after consumption or use, are sufficient to produce general waste possessing one of the following characteristics and cause concern of serious pollution to the environment, the manufacturer or importer of the articles and the packaging and containers thereof at issue or the manufacturer or importer of the raw materials shall bear responsibility for recycling, clearance and disposal and the vendor shall bear responsibility for recycling, clearance work.*
      - *I. Difficult to clear or dispose of*
      - *II. Contains a component that does not readily decompose over a long period*
      - *III. Contains a component that is a hazardous substance*
      - *IV. Is valuable for recycling and reuse*

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Mandatory Items for Recycling

• Tires	1989	☐ PET containers	1989
• Lubricants	1990	☐ Ferrous containers	1989
• Car batteries	1990	☐ Aluminum containers	1989
• Automobiles	1994	☐ Pesticide containers	1989
• Motorcycles	1994	☐ Foamed PS containers	1991
• Household appliances	1997	☐ PS containers	1992
• IT objects	1997	☐ PVC containers	1992
• Batteries	1999	☐ PP/PE containers	1992
• Fluorescent lamp	2002	☐ Al foil containers	1992
		☐ Glass containers	1993
		☐ Paper containers	1993

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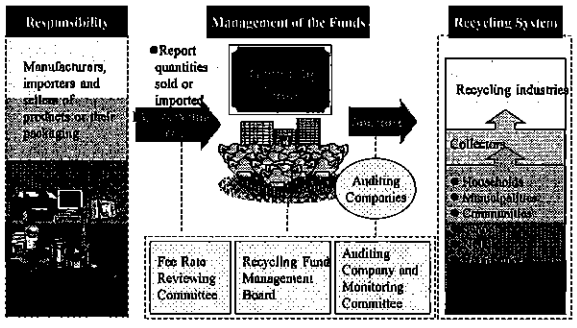
Institutional Framework



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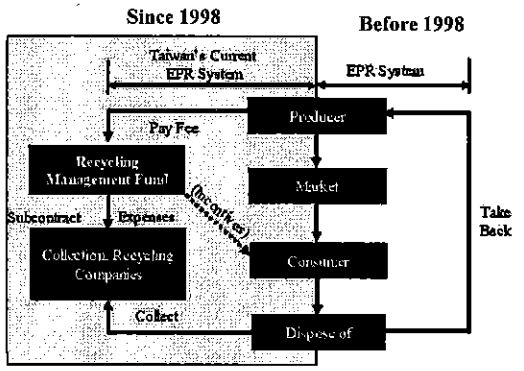
EPR System in Taiwan



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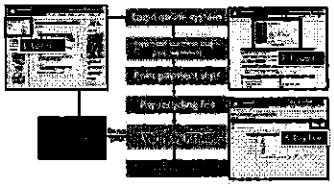
Roles of Main Stakeholders

- ***Trash Generators:***
  - Sorting
  - Legal dumping

- ***Producers:***
  - Registration
  - Reporting
  - Paying fees to Taiwan EPA



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Roles of Main Stakeholders

- ***Recyclers:***
  - Subject to monitoring
  - Reporting the amounts for subsidy application

- ***Government (Taiwan EPA)***
  - Fund Management
  - Technical standards
  - Monitoring recycling process
  - Auditing on producers and Recyclers
  - Propaganda, training, education

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Fee Calculation Equation

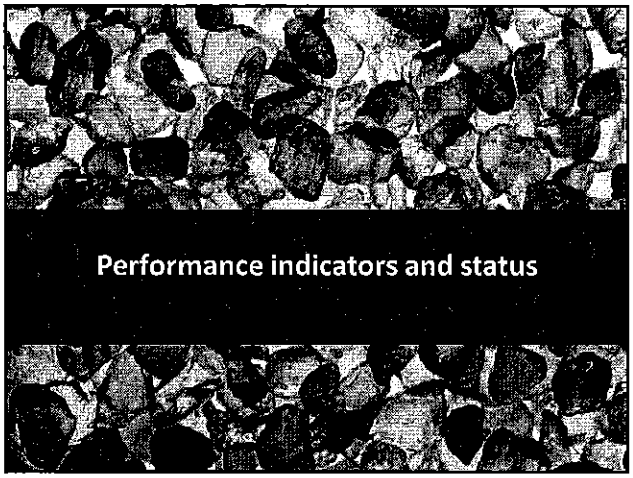
*Recycling Fee = (C*R+ L – F)/S*

C：recycling cost per unit
R：waste collected
L：administration cost
F：trust fund
S：annual sales

Green Differential Fee

- Since 2013
  - To encourage the market competiveness of environmental friendly products

Home appliances	• Green Mark by EPAT • Energy Label • Water Conservation Mark	30%~10% Discount
Computer equipment	• Green Mark by EPAT	30%~5% Discount



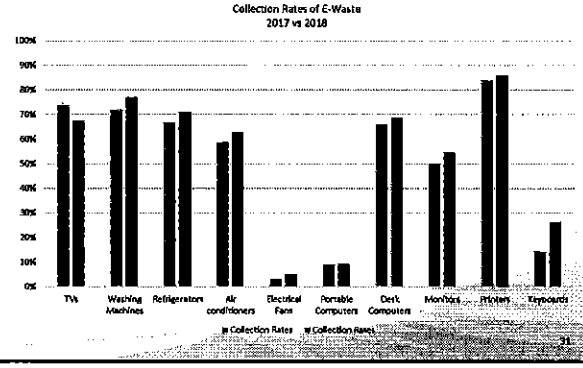
Performance Indicator
Collection Rate

- $C_i = Q_i / S_i$
- Numerator:
  - The actual waste amount of a particular product collected or returned for recycling during a period;
- Denominator：
  - The total waste volume of a particular product i generated after consumption or usage;
- Applications:
  - To assess the performance of recycling programs for a particular good i, especially for ***short*** life span goods, such as lubricants and single-use containers/bottles.

In 2018: **64.3%** for e-Waste collection in Taiwan
(target for EU in 2019: 65%)

30

Collection Rates by Items



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Performance Indicator
Recycling Rate

- $r_i = \dfrac{M_1 + M_2 + \cdots + M_n}{Q_i}$
- Numerator:
  - The volume of secondary materials can be retrieved or recycled from the waste amount of product *i*;
- Denominator：
  - The waste volume of a particular product *i*;
- Applications:
  - To assess the recycling performance for particular good item, such as home appliances and motorized vehicles

In 2017:
79.1% for IT items **83.5%** for home appliances

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Ideal Performance Indicators

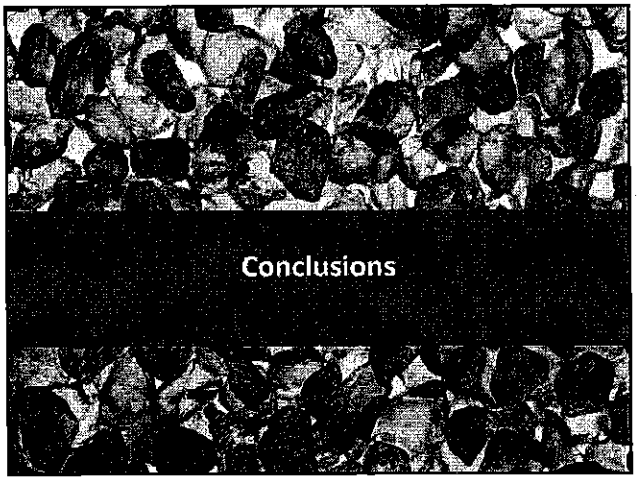
- ***Resource Recovery Rate***

  = ***Collection Rate*** x ***Recycling Rate*** x ***Cyclical Use Rate***

  - collection rate： waste taken back / waste generated
  - recycling rate： secondary materials generated / waste taken back
  - cyclical use rate： secondary materials used/ (secondary materials used + virgin materials used)

- ***Production Value Per Unit of Waste Taken Back***

  = *Production Value of Recycling Industry / Waste Taken back*



Conclusions

- ***Taiwan EPR: A governmental system imposing financial responsibility on Producers***
  - *Simple task for producers*
  - *Good coordination in enhancing take-back performance*
  - *Effective enforcement from government*
- ***However,***
  - *High administration and social cost*
  - *Lacking communication between producers and recyclers*
  - *Other thoughts needed such as, value added through this system*
  - *Low competition mechanisms*

Additional Issues

- **Needs more emphasis on value-added from recycling operations**
  - Down-cycling vs. Up-cycling
  - Cradle-to-Cradle practice not or scarcely existing
- **Needs appropriate recycling schemes for emerging technology products**
  - Solar photovoltaic modules
  - EVs

Thank You

Partnership with CGE and EPAT

Contact Information

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CGE
綠色經濟研究中心

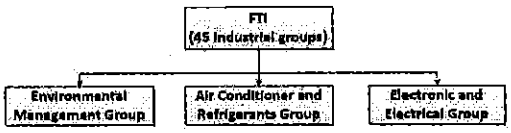
Private Sector on EPR Progress

Poonsak Chanchampee, Dr.-Ing.

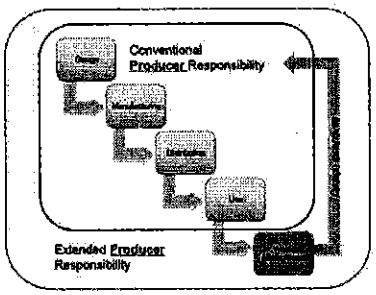
2nd December 2019

Background of Federal Thai Industries (FTI)

1. Non-profit organization established in 1967
2. Representative of Thai Industries Business of the whole Kingdom
3. Operating 45 Industrial groups:



EPR Systems



Extended Producer Responsibility (EPR) is a policy approach under which producers are given a significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products.

ร้อเผาทิ้ง

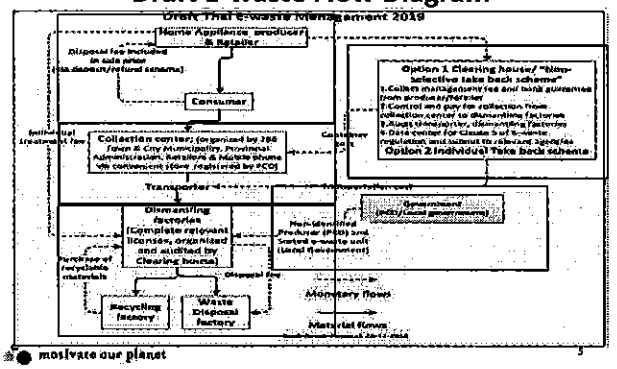
Source: OCED (https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm

EPR in Practices

EPR	Stakeholders
EPR in Principles	Producers
	Consumers (Societies)
EPR in Practices	Government (Regulation)
	Municipalities (Collection center)
	NGOs
	Retailers
	Clearing houses
	Producers/Importers
	Trade Registration
	Consumers (Societies)

สภาอุตสาหกรรมแห่งประเทศไทย
The Federation of Thai Industries

Draft E-waste Flow Diagram



สภาอุตสาหกรรมแห่งประเทศไทย
The Federation of Thai Industries

Benefit of our proposal

1. Cost sharing reduce a burden to consumer
2. Producers/Retailers pay the management fee based on the actual E-waste quantity
3. Deposit/Refund system controls illegal collection and dismantling.
4. Clearing house can be a representative for all stake holders
5. "Free Rider" is elminate through registration, bank guarantee etc.
6. Government and municipality involve.

สภาอุตสาหกรรมแห่งประเทศไทย
The Federation of Thai Industries

E-waste Dismantling and Pilot Project

1. Dismantling trial project
Materials: TETA/FTI members
Dismantling & Data analysis: Supported by WMS & SCI Eco
Time frame: 8 months (Dec 2019-July 2020)

2. Pilot project for E-waste collection & Dismantling
Location: Under discussion
Cost: Under discussion
Procedure & Timeframe: Under discussion

สภาอุตสาหกรรมแห่งประเทศไทย
The Federation of Thai Industries

E-waste Dismantling Project

Objectives

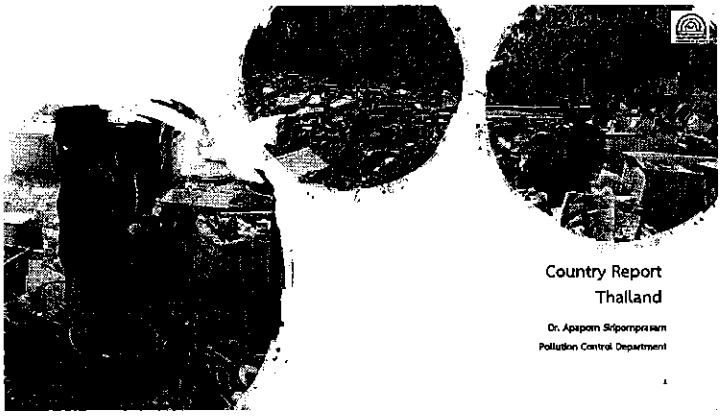
1. Assess potential trial dismantling demonstration of 5 E-wastes categories: *A/C, Refrigerator, TV, Computer, and Mobile phone*
2. Propose standard price of
   - 2.1 *Transportation cost (from collection center to dismantling facility)*
   - 2.2 *Dismantling fee = management cost + disposal cost + recycling cost*
3. Evaluate E-waste dismantling data in terms of:
   - 3.1 *Composition (including recycling rate)*
   - 3.2 *Effect of brands to dismantling cost*

E-waste Dismantling Project: Delivery schedule

Month	Type	Delivery	Operation
December 2019	Phone PC, Notebook	Dec 17	Dec 18-20
January 2020	CRT TV & Computer Monitor,	Jan 14	Jan 15-17
February 2020	Flat TV	Feb 18	Feb 19-21
March 2020	Air Condition	Mar 10	Mar 11-13
April 2020	Refrigerator	Apr 7	Apr 8-10

Challenge for E-waste Management in Thailand

1. Collaboration to develop E-waste take back & management scheme
2. Control free rider
3. Control cherry picking
4. Governmental support



Country Report
Thailand

Dr. Apaporn Siripornpraram
Pollution Control Department

E-waste generation @ 2018 (Statistic)

Types of wastes	Amount (tons)
Television	98,612.65
Air conditioner	76,653.41
Refrigerator	64,970.07
Computer	58,261.41
Telephone	11,824.85
Total	310,322.39

Definitions and Background

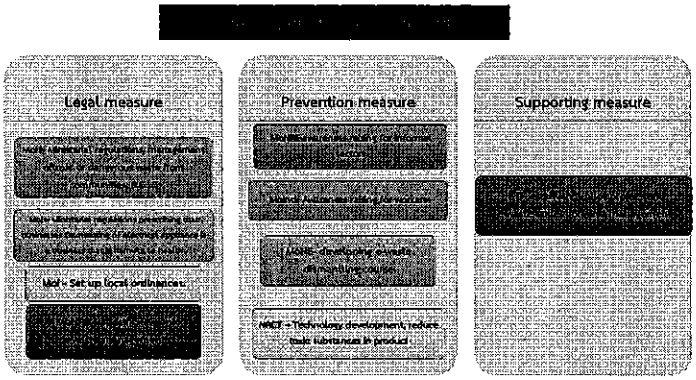
- Public Health Act B.E. 2535 (1992): Hazardous waste is toxic or hazardous waste caused by various activities in the communities. It is an object or contaminated with a toxic, flammable, oxidizing, irritated, corrosive, reactive, explosive, mutagenic property. It may cause or tend to cause the danger to human, animal, plant, properties, or environment. It does not include municipal solid waste, infectious waste, radioactive waste, and hazardous industrial waste.
- E-waste is product, electrical appliance and electronic device that is damaged or deteriorated to no longer be used or are needed.
- Local Administrative Organization, Ministry of Interior is in charge of e-waste management.

Changes in E-Waste Policies and Regulation

11 January 2019
- PCD proposed the draft act on e-waste management to National Legislative Assembly
- Consideration pending by NLA agenda 2

22 April 2019
- Former Ministry of Natural Resources and Environment (General Surasak Kanjanarat) ordered PCD to propose the measures for e-waste management to the National Environmental Board and Cabinet

2 September 2019
- PCD proposed e-waste management measure to the Sub-Committee on Supervision of Operations in accordance with the E-waste Management Strategy
- The measure was approved and will be proposed to National Environmental Board and Cabinet



Recycling facilities in Thailand with current available technology

About 2,000 informal sectors for manually dismantling e-waste (they register as antique shops with the department of provincial administration)

148 dismantling and recycling facilities registered to department of industrial works

Current E-waste management system

- Donation 8%
- Kept in house 25%
- Discarded with MSW 16%
- LAO 1%
- Informal sector 50%

Informal sector 50%

Manual Dismantling

- Recycling
- Reuse
- MSW Landfill / Opening burning

Challenges of E-waste recycling system in technology or policy aspects

Current e-waste is managed by the government. However, the management system is poor because of the limit resources (e.g. budget and manpower) from the government

Specific law for e-waste management system, using EPR system is needed.

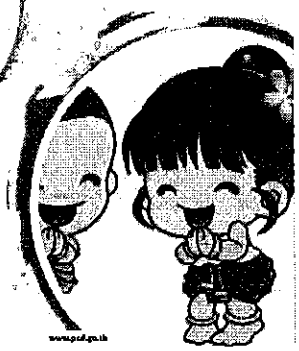
Awareness of people on hazard of e-waste is low. Informal sectors play an important role on e-waste collection and dismantling.

Unstable policy on imported e-waste causes investment of e-waste dismantling and recycling facilities is limited.

Other Relevant Projects or Information

- Mobile phone collection collaboration project between public and private sectors. However, it has not been very successful.

Thank you / Question

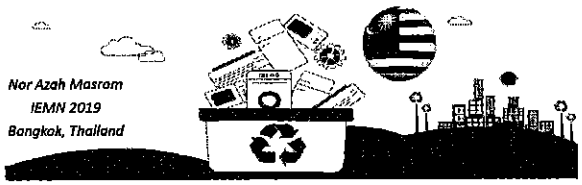


How has IEMN supported or helped you on E-waste Management issue in Thailand

- This workshop provides
  - An opportunity for environmental officials to exchange information and best practices on e-waste management
  - An understanding on e-waste management system
  - Information and knowledge on dismantling and recycling technology
  - Challenge and lesson learn on e-waste management of IEMN member countries

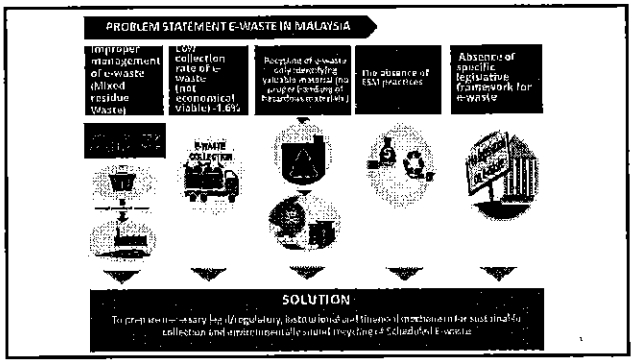
E-WASTE MANAGEMENT SYSTEM IN MALAYSIA

Nor Azah Masrom
IEMN 2019
Bangkok, Thailand



BACKGROUND

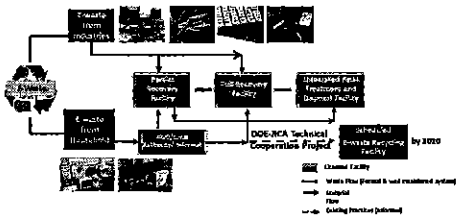
- E-waste : waste from the electrical and electronic assemblies containing components such as accumulators, mercury-switches, glass from cathode-ray tubes and other activated glass or polychlorinated biphenyl-capacitors, or contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese or polychlorinated byphenyls.
- Hazardous waste : Any substance prescribed to be scheduled waste or any matter whether in a solid, semi-solid, or liquid form, or in the form of a gas or vapor, which is emitted, discharged, or deposited in the environment in such volume, composition, or manner as to cause pollution.
- E-waste is listed in the **First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005, EQA 1974.**
- E-waste management : Department of Environment, Ministry of Energy, Science, Technology, Environment and Climate Change



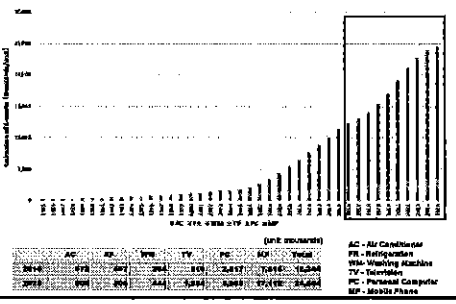
LEGISLATION FOR THE CONTROL OF E-WASTE

	E-waste from Industry	Household E-Waste
Regulation	▪ Regulated under the Environmental Quality (Scheduled Wastes) Regulations 2005 that came into effect on 15th August 2005, administrated by the Department of Environment.	▪ Under the current Regulation, E-waste produced by household has not been enforced.
Management	▪ Generated e-waste must be treated and disposed at prescribed or licensed premises by DOE in an Environmentally Sound Manner (ESM).	▪ Generated e-waste is ended up at informal sector or landfills which may pose health and environmentally hazards to humans, livestock and ecology if not properly managed.

OVERVIEW OF EXISTING E-WASTES MANAGEMENT IN MALAYSIA

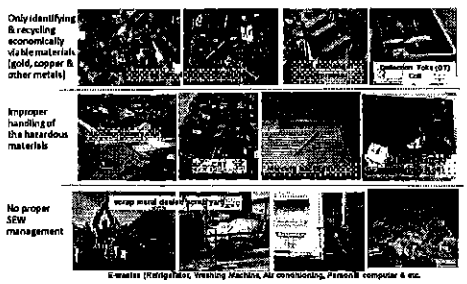


ESTIMATION OF SCHEDULED E-WASTE GENERATION IN MALAYSIA



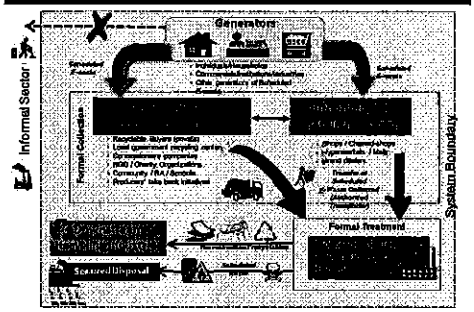
AC - Air Conditioner
FR - Refrigerator
WM- Washing Machine
TV - Television
PC - Personal Computer
MP - Mobile Phone

Current Situation in Managing Scheduled E-waste (SEW)

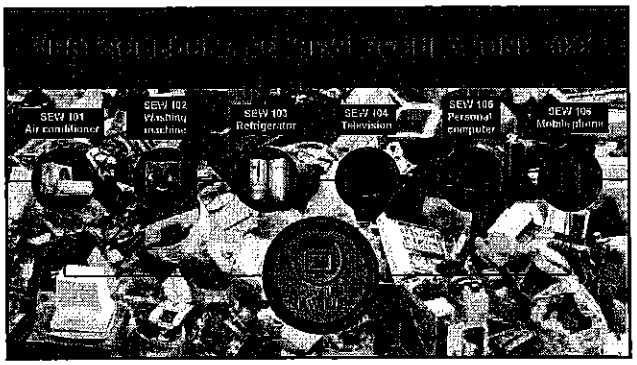


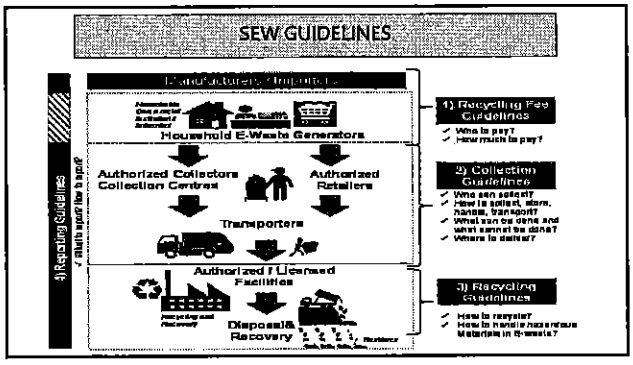
E-wastes (Refrigerator, Washing Machine, Air conditioning, Personal computer & etc.

Scheduled E-waste Legal Framework

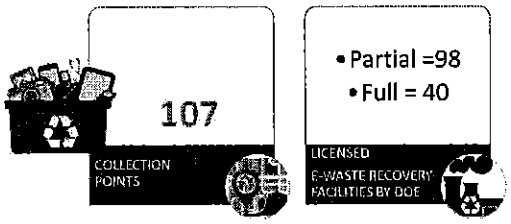


ENVIRONMENTAL QUALITY (SCHEDULED ELECTRICAL AND ELECTRONIC EQUIPMENT WASTE) REGULATIONS 20XX

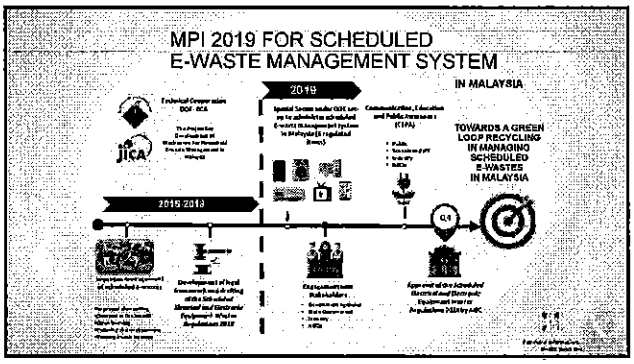


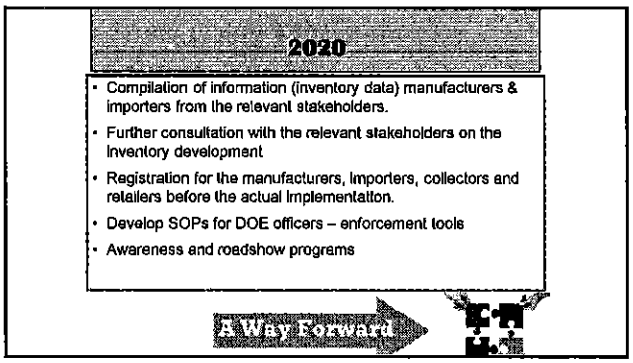


EXISTING E-WASTE INFRASTRUCTURES



- Mechanical process: segregation, dismanding, destruction, crushing, shredding, magnetic separations and decontamination
- Chemical process: precious metal recovery and refining process





How has IEMN supported or helped you on E-waste Management issue in your country

Platform/benchmarking for Malaysia to obtain and share experiences on best practices/ innovation/ emerging issues related to E-waste management

Lesson learnt and know how – legal framework, financial mechanism, recycling and recovery technology in ESM, incentive, EPR model, public awareness raising

CRBAS
Centro Regional Basilea para América del Sur

2019 International E-Waste Management Network (IEMS) Meeting

Alberto Santos CAPRA, Project Coordinator

Bangkok, Thailand, 2 - 4 December 2019

CRBAS
Centro Regional Basilea para América del Sur

Definition and background

- There is no specific definition for E-waste in Argentina
- The definition of WASTE It has been recently modified by national Decree 591/2019 (previous national Decree 181/1992):
  - ✓Article 3: Article 3: Waste is considered to be any substance or object to which disposal is carried out, it is proposed to proceed or is obliged to proceed.
  - ✓Article 4: Likewise, it will also be considered waste, any material, substance or object that is intended to be imported or introduced in the same state in which it was discarded by the generator, and / or offered to our country either free of charge or by paying a fee for recycling, treatment or final disposal.
- WEEE materials regulated as hazardous wastes: wastes resulting from the dismantling of EEE containing hazardous constituents according to Law 24.051 of hazardous wastes Categories Controlled: batteries (Y26 Ni /Cd,Y35 basic solutions and Y42 Ion/Li) and printed circuit board-PCB (Y20 Be,Y21 hexavalent Cr,Y22 Cu,Y23 Zn, Y25 As,Y26 Cd,Y27 Sb,Y29 Hg andY31 Pb)
- Secretariat of Environmental Control and Monitoring (SECM) of the Secretariat of Government of Environment and Sustainable Development (SGESD) is in charge of WEEE management together with the competent local environmental authorities (23 provinces and Buenos Aires City-CBA)

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Latest Regulations News 2019

- SGESD 407/2019 (published 21 October): ESM of plastics throughout their life cycle, to mitigate the progress of contamination of water bodies due to plastic and microplastic waste, guideline Annex I
- Joint Resolution SGESD and Ministry of Production and Labor 3/2019 (published 12th November): procedures regulating the import of plastics, ferrous and non-ferrous scrap metal for recovery, among other wastes, and the transit
- SGESD 451/2019 (published 28th November): prohibits the production, importation, formulation, trade and use of chemicals achieved by the Stockholm Convention on POPs – PFOs flame retardants in plastics
- SGESD 453/2019 (published 1st December) GIRO SYSTEM
  - ✓Create the Integrated Waste Management System (GIRO)
  - ✓Gradually replace the previous Manifest Online System (SIMEL from October 2015 Resolution ex SAyDS 827/2015)
  - ✓Establish a trial period of 60 days with operators; 240 days after SIMEL will be discontinue
  - ✓For ones located in different jurisdictions, which are registered in the National Registry of Generators and Waste Operators Law 24.051

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Statistics

- There are no official statistics in Argentina of generation in quantity and quality of WEEE
- Report "eWaste in Latin America Statistical analysis and policy recommendations November 2015": University United Nations Institute for the Advance Study of Sustainability (UNU-IAS) and prepared by GSMA Latin America together with the Inter-American Development Bank
  - ✓Argentina ranks third in WEEE generation after Brazil and Mexico with 292.000 tons in 2014 (computers, cell phones and many other technological devices in disuse); expected to reach almost 0,5 millions tons in 2019
  - ✓6.9 kg/person 2014; expected to reach 10 kg/person in 2019
- Export of Printed Circuit Boards (PCBs) as Hazardous Wastes under Basel Convention TBM: BC: 90-100 tons annually
- In the best case: dismantling and recovery of 5% of the total generation

- The data is dispersed and in some cases held by local environmental authorities
- There is no harmonized system for collecting and analyzing data and statistics
- Not having national legislation makes it very difficult to have statistical data

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E-Waste/WEEE Policies and Regulation

- Since 2008, bills have been discussed in the National Congress, some with the endorsement of the Executive power. Only one came to have a half-sanction in Senators in May 2011 and lost parliamentary status in November 2013 as it was not approved by deputies
- Resolution Ministry of Environment and Sustainable Development 522-E /2016: objectives, definitions and guidelines for the development of a National Strategy referred to the Sustainable Management of Special Generation Waste (waste from mass consumption: REGU); Annex I: WEEE
- Resolution SGESD189/2019 implements the National Sustainable Management Strategy of REGU established by Resolution 522/2016 through the creation of a Management Systems (documentation for movements between provinces and Buenos Aires city and export)
- 2019-2020 implement WEEE Management Systems

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E-wastes recycling systems

- There is no national system implemented
- There are establishments licensed by the national and provincial authorities that dismantle, recover, value and dispose of WEEE components: batteries, PCBs, metals and alloys (ferrous, aluminum, copper and steel, scrap in general), some plastics
- The materials that encourage the implementation of dismantling and recovery systems are the prices of metals, alloys and scrap, PCBs which are exported to countries en Europe
- The technology implemented is generally manual or semi-automated, it is valued exclusively by physical treatments recovering the materials in the same state or crushing them or by grinding to minimize volume. Metals and alloys melting for reuse
- A maximum of 15 establishments licensed for dismantling and monitoring

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Challenges and policy aspects

- Implementation of the Management Strategy and Systems
  - ✓Poor information and education of the ctizens for the take-back activities
  - ✓Long distances for collection and transport
  - ✓High costs of investment in technology for recovery
- Development and implementation of an adequate national Financial Mechanisms
- Difficulty in accepting and applying the principle of Extended Producer Responsibility (EPR) by the regulated import, producer and retailing sector
- Internalize to the formal system monetary transactions from the informal to the formal sector
- There are only 8 provincial initiatives for WEEE management standards; however, there is still no national framework law for the management of used EEE and WEEE

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Relevant Projects
(not including UNIDO Project)

- BCRC Argentina November 2018

  Latin American and Caribbean Regional Workshop on the Environmentally Sound Management of E-wastes and Forum on their Transboundary Movements
  - ✓In the frame Secretariat of the Basel, Rotterdam and Stockholm Conventions; funded by EU
  - ✓Sharing experience and disseminating good practices for the ESM of e-waste in GRULAC Region
  - ✓Based on guidance and guidelines developed by the Mobile Phone Partnership (MPPI) and the Partnership for Action on Computing Equipment (PACE), and relevant technical guidelines and manuals on e-waste under the Basel Convention
- BCRC Argentina Project 2021 for South American countries

  Promote Public-Private regional Partnerships (PPP) to implement EPR schemes or systems on wastes, particularly in plastic wastes, WEEE and lead-acid batteries. Lead by countries with experience
- BCRC Argentina Project 2022 for South American countries

  Implement a "Technician of Re-functional Managers Program", officially recognized, to promote the training of workers in the proper management of WEEE (all employees linked to EEE, WEEE and Urban Solid Wastes-USW)

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IEMN Contributions

The past IEMN workshops provide to the BCRC Argentina:

- Relevant exchange of information shared with actors and Competent Authorities of countries that BCRC Argentina serves
- Knowledge and expertise to proper assist Competent Authorities and legislative bodies in South American region for developing their used EEE and WEEE management strategies, plan and policies
- Provided expert advice, among others international organizations, to the International Telecommunication Union (ITU) on technical rules and normalization
- Be up to date with the latest and better technologies for handling WEEE

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¡Thank you!

ascapra@hotmail.com

Centro de Tecnologia da Informação Renato Archer

WORKSHOP 2019
INTERNATIONAL E-WASTE MANAGEMENT NETWORK
DECEMBER 2nd – 4th / BANGKOK - THAILAND

BRAZIL
South America

Marcos Pimentel
Center of Information Technology Renato Archer – CTI
Ministry of Science, Technology, Innovation and Communication - MCTIC

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA, INOVAÇÕES E COMUNICAÇÕES
PÁTRIA AMADA BRASIL GOVERNO FEDERAL

CTI Renato Archer

BRAZIL

Definitions and Background

BRAZIL

- **E-waste or WEEE**
  - *All waste derived from household electronic products and their components, whose proper functioning depends on electrical currents with a nominal voltage not exceeding 220 volts.*
- **Hazardous Waste**
  - *Those waste which, due to their flammability, corrosiveness, reactivity, toxicity, pathogenicity and mutagenicity characteristics, present a significant hazard to public health or environmental quality. (PNRS - Art. 13)*
  - *Hazardous waste that is required reverse logistics system: I – pesticides; II - batteries; III - tires; IV - lubricating oils; V - fluorescent, sodium and mercury light bomb and VI - electro-electronic products. (PNRS)*
- **Hazardous E-waste or WEEE materials**
  - *E-waste will be not considered hazardous if "between the environmentally appropriate disposal and final disposal phases, including transportation, the Electro-Electronic Products is not disassembled (IBAMA Normative).*
  - *All substances regulated by RoHS directive (EU) are considered hazardous still. The Brazilian government has been working since 2018 to regulate the Brazilian RoHS.*
- **Management Government Ministries/Agencies**
  - *National System of Environment (SISNAMA) - Protecting and improving environmental quality*
  - *Ministry of Environment (MMA) - Formulate and implement national environmental public policies*
  - *Institute of Environment and Natural Resources (IBAMA) - Implementation policy and preservation heritage*
  - National Environment Council (CONAMA) - Create resolutions to regulate de National Environment

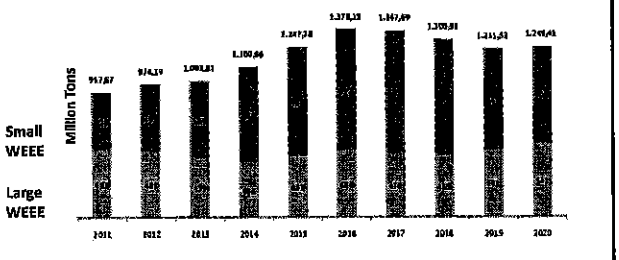
WEEE Statistics

BRAZIL

2013

Technical and Economic Feasibility Study (2013)

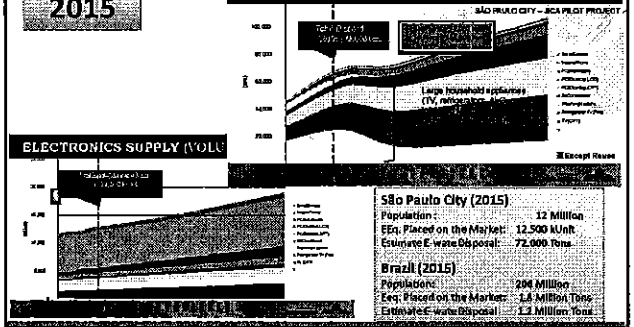
WEEE Generated



WEEE Statistics

2015

E-WASTE ESTIMATE DISPOSAL (WEIGHT)



ELECTRONICS SUPPLY (VOLU

São Paulo City (2015)

Population :	12 Million
EEq. Placed on the Market:	12.500 kUnit
Estimate E-waste Disposal:	72.000 Tons

Brazil (2015)

Population:	204 Million
Eeq. Placed on the Market:	1,8 Million Tons
Estimate E-waste Disposal:	1,1 Million Tons

Brazil (2016)

POPULATION: 208 million

Electronic Placed Market: 1.8 Million Tons
9 Kg/person

E-waste Generated: 1.5 Million Tons
7,4 Kg/person

BRAZIL GENERATES

1,5 Million tons of e-waste per year

2nd Largest generator of e-waste of Americas

7th Largest generator of e-waste of the world

CORRECT DISPOSAL:

NORWAY 74%

MÉXICO 35%

BRAZIL 3%

E-Waste/WEEE Policies and Regulation

BRAZIL

POLICIES
- Brazilian National Policy on Solid Waste – PNRS (Law 12305./ 2010)
- PNRS Regulation and Logistic System Implementation (Decree 7404 / 2010)
- Electro Electronic Sectorial Agreement

STANDARDS
- ABNT NBR 16.156/2013
  - Electrical and electronic equipment waste - Requirements for reverse manufacturing activity
- ABNT NBR 15833/2010
  - Reverse manufacturing process of refrigerator equipment

TRANSBOUNDARY MOVEMENTS
Transboundary movements of hazardous wastes and their disposal (Import and export bans)
- Brazil incorporated the Basel Convention (Brazilian Decree 875 / 1993)
- Brazil regulated the Basel Convention principles (CONAMA Resolution 452 / 2012)

E-Waste/WEEE Policies and Regulation

BRAZIL

APPROVED October 31st 2019

POLICIES
- Brazilian National Policy on Solid Waste – PNRS (Law 12305./ 2010)
- PNRS Regulation and Logistic System Implementation (Decree 7404 / 2010)
- Electro Electronic Sectorial Agreement
  - Objective > E-waste reverse logistic System implement
  - Goal / Schedule > 5 years to collect 17% (weight) electronic placed on the market (300.000 Tons)
  - Equipment Market (2016) > 1,8 Million Tons electronic equipment placed on the market

STANDARDS
- ABNT NBR 16.156/2013 Electrical and electronic equipment waste – Requirements for reverse manufacturing activity
- ABNT NBR 15833/2010 Reverse manufacturing process of refrigerator equipment

TRANSBOUNDARY MOVEMENTS
Transboundary movements of hazardous wastes and their disposal (Import and export bans)
- Brazil incorporated the Basel Convention (Brazilian Decree 875 / 1993)
- Brazil regulated the Basel Convention principles (CONAMA Resolution 452 / 2012)

Challenges of Recycling

BRAZIL

TECHNOLOGY

- To structure, implement and operate the e-waste reverse logistic system
- To encourage setting up e-waste recycling plants
- Support e-waste recyclers to comply with ABNT NBR 16156 standard
- To implement an efficient and cost effective e-waste shipping system

POLICY

- Support e-waste recyclers to comply with Brazilian environmental permit
- Implement an efficient data system monitor of e-waste ESM system ,
- To measure the reverse logistic system efficiency and oversee the goals
- Support the e-waste shipping through the States of the country

Challenges and Solutions

BRAZIL

RECYCLING CHALLENGES

- Increase capacity from 3% (54K Tons) to 17% (300k Tons) (> 5 fold / 5 years)
- Very large area covered by the system (8,5M Km2 , 5.000 Km between cities)

RECYCLING SOLUTIONS

- Encourage anchor recycling plants in metropolitan regions
- Increase the capacity and quality of small recyclers (turn into formal enterprises)
- Implement an efficient and cost effective e-waste shipping system

IEMN HELP

- Know the recycling challenges and solutions of IEMN member countries
- Cooperation among member countries to exchange successful experiences

Relevant PROJECTS INFORMATION

ambientronic +10
Eco-friendly electronic products

Brazilian Government Program
Cooperation among MCTIC (Science and Technology), MDIC (Industries and Trade) and MMA (Environment) Ministries

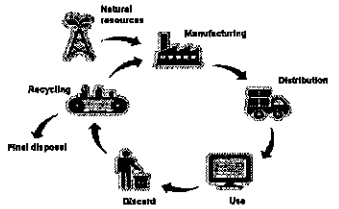
ENVIRONMENTAL ASPECTS OF ELECTRONIC LIFE CYCLE

Direct Logistic

- ☐ Ecodesign
- ☐ RoHS
- ☐ LCA

Reverse Logistic

- ☐ Take back
- ☐ Re-Use
- ☐ Disassemble
- ☐ Recycling
- ☐ Disposal



Relevant PROJECTS INFORMATION

BRAZIL

CURRENTLY

- REMATRONIC PROJECT / AMBIENTRONIC+10 (CTI / GRI_SOLVI / BNDES)
  - Technology for recovering precious metal (Cu / Pd / Ag / Au) from electronic boards
- CR2C PROJECT / AMBIENTRONIC+10 (CTI / MCTIC)
  - Computer refurbishing and recycling training laboratory
- BRAZILIAN RoHS REGULATION / AMBIENTRONIC+10 (CTI / MCTIC)
  - Technical support on hazardous substances for Ministry of Environment

PAST YEARS

- E-WASTE REVERSE LOGISTIC SYSTEM for SÃO PAULO CITY - PILOT PROJECT (Brazilian Government / JICA Japan)
  - Implementation of e-waste reverse logistic system (based on PNRS), analysis of main challenges and opportunities
- SÃO PAULO STATE EXTENSION NETWORK PROJECT / AMBIENTRONIC+10 (CTI / IPT / SIBRATEC)
  - Training and technical support of small e-waste recycling plant in order to be in compliance with ABNT NBR 16156

FUTURE

- INTERNATIONAL PROJECT COOPERATION / AMBIENTRONIC+10 (CTI / Brazilian Company / International Partner)
  - Technology recycling development for recovering value (critical) elements of e-waste.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E-waste management in Vietnam

Vietnam Environment Administration (VEA)
Ministry of National Resources and Environment (MoNRE)

Contents

- Legal framework
- Management of E-waste
- Experiences and challenges for the implementation of the Basel Convention Technical Guidelines on E-waste

I. LEGAL FRAMEWORK

Import of E-Waste

The Law on Environmental Protection 2014

- Import and transfer waste from abroad in any form is strictly prohibited
- Allow to import certain categories of scraps as material for production (E-waste is excluded).
  - List of scraps follow on Decision No. 73/2016 of Prime Minister

Commercial Law 2005 and Foreign Trade Administration Law 2014

- Decree No. 69/2018/NĐ-CP dated May 15, 2018
  - Used goods specified in Section II of Annex I is prohibited: Used electronics, electrical appliances... is prohibited for importation
- Circular No. 31/2015/TT-BTTTT of Ministry of Information and Communications
  - List of used electric goods banned from import (Appendix 1): used printers, computers, mobiphones, LCD/CRT screens... with HS code
- Circular No. 11/2018/TT-BTTTT of Ministry of Information and Communications
  - Update the List of used electric goods banned from import by Circular No. 31/2015/TT-BTTTT

Temporary import for re-export

Decree No. 69/2018/ND-CP dated May 15, 2018

- The List of goods banned to import for re-export in **Annex 6** (including some E-Wastes)
  (In special case, MOIT has response to adopt the List of goods banned to temporary import for re-export)
- The List of used goods to temporary import for re-export conditions in **Annex 8** (including some E-Wastes)
  - License of MOIT for temporary import for re-export
  - A deposit of 7 billion VND (300,000 USD) at the credit institution in the province or central city where the business registried

Export of E-Waste

Circular No. 36/2015/TT-BTNMT dated June 30, 2015

- The definition and classification of hazardous waste in Annex 1 of the National Technical Regulation QCVN 07:2009/BTNMT
  E-waste is classified as hazardous waste
- Registration for exporting of hazardous waste: Article 22 of Circular No. 36/2015/TT-BTNMT and follow on Basel Convention
  MONRE has response to business on Export of hazardous waste (including E-Waste)
  No regulation on procedure for temporarily import for re-export of waste

DOMESTICALLY MANAGEMENT OF E-WASTE

Decision No. 16/2015/QD-TTg on providing regulations for recall and treatment of discarded products

- List of discarded products and the time of recall and treatment
  Manufacturer organizes the recall of discarded products having sold in Vietnam
- Place of retrieval established directly by manufacturers, or by manufacturers in association with distributors
  Discarded products after being discarded must be managed and treated follow on regulations on waste management

Circular No. 34/2017/TT-BTNMT on regulations of recall and treatment of discarded products

- Regulations of technical conditions for retrieval places of e-waste, accumulators/batteries, etc...

LIST OF DISCARDED PRODUCTS

No.	Description	Schedule of recall and disposal
I	ACCUMULATOR AND BATTERY	
1	All types of accumulator	01/7/2016
2	All types of batteries	01/7/2016
II	ELECTRIC AND ELECTRONIC EQUIPMENT	
1	Compact light, fluorescent light	01/7/2016
2	Desktop or laptop, computer monitor; CPU (micro processor)	01/7/2016
3	Printer, fax machine, scanner	01/7/2016
4	Photo camera, movie camera	01/7/2016
5	Cell phone, tablet computer	01/7/2016
6	DVD, VCD, CD recorder and other tape or disc player	01/7/2016
7	Photocopier	01/7/2016
8	Television, refrigerator	01/7/2016
9	Air conditioner, laundry machine	01/7/2016
III	DIFFERENT KINDS OF LUBRICANTS	01/7/2016
IV	INNER TUBE, TYRE	
1	All types of inner tubes	01/7/2016
2	All types of tires	01/7/2016
V	Transportation	
1	All kinds of motorcycles	01/01/2018
2	All kinds of automobiles	01/01/2018

II. IMPLEMENTATION OF BASEL CONVENTION AND E-WASTE MANAGEMENT

Registered cases of E-waste export

Category of wastes	Year	Country of destination	Quantity (in metric tons)
E-waste	2013	Korea	200
E-waste	2014	Malaysia	400
E-waste	2014	Japan	600
E-waste	2014	Singapore	1,729
E-waste	2015	Japan	600
E-waste	2015	Malaysia	230
E-waste	2015	Singapore	1,999
E-waste	2016	Singapore	60
E-waste	2017	Singapore	300
E-waste	2018	Korea	2,156
E-waste	2018	Japan	600

illegal e-waste import

NAME OF BUSINESS	YEAR	E-WASTE IMPORT	PENALTY
Thuan Phong Co.,LTD	2015	PCB, cell phone, computer, etc...	Fined, forced re-export
Hoang Giap Co.,LTD	2015	PCB	Fined, forced re-export
Truong Thinh Co.,LTD	2017	01 container of PCB	Fined, forced re-export
CEM Casting and Fabrication JSC	2017	326.661 kg of PCB	Fined, forced re-export
Nguyen Tan Co.,LTD	2017	02 containers of PCB	Fined, forced re-export
Truong Thinh Packaging Private Enterprise	2018	02 containers of PCB	Fined, forced re-export
Huong Quynh Cam Hung Co.,LTD	2018	03 containers of PCB	Fined, forced re-export

Some typical examples of illegal e-waste import cases

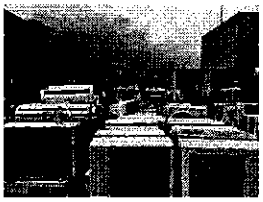
On Jan.03,2017, at the port of Phuoc Long - Thu Duc, the customs inspection team carried out a search of 4 imported scrap containers of CEM Joint Stock Company. All the goods in the containers are e-waste in the list of goods banned from import.

Some typical examples of illegal e-waste import cases

These e-waste containers were imported from Hong Kong and the USA to Phuoc Long Port, Viet Nam.

Some typical examples of illegal e-waste import cases

A shipment of refrigerating and electronic household appliances was seized by the Customs at the Tan Cang - Cai Mep International Port in October, 2017.



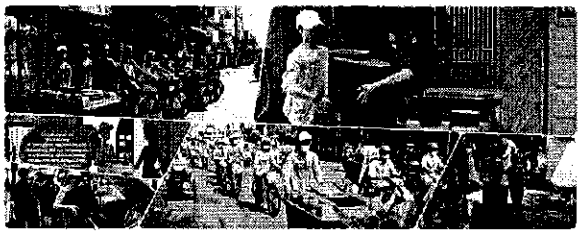
Vietnam Recycles

Viet Nam has started a trial Project to collect and treat WEEE called the Vietnam Recycles.

- Electronic devices collected: Computer CPU, Laptop, CRT TV screen, LCD TV screen, Printer, fax machine, scanner, Mobile phones, tablets, Photocopiers, Television – LCD, Television – CRT, DVD, VD, CD player and other players, Camera and camcorder, Electronic battery types, Other accessories related to information technology.
- Collection area: Hanoi inner city area and Ho Chi Minh City Ho Chi Minh
- Application range: businesses and households.
- 10 point to E-waste collection (5 in Hanoi and 5 in HCM city)

Vietnam Recycles (cont.)

In 2016, Vietnam Recycles collected and recycled nearly 7 tons of e-waste, including equipment such as computer desk, printer, fax, scanner, server, telephone, television, player ...



III. Challenges and difficulties

- Vietnam prohibits importation of waste in general and used electronic and electrical equipment so e-waste or used electronic and electrical equipment is not imported to Vietnam legally;
- The Decision No. 16/2015/QD-TTg does not set the target of collection, so that it is difficult to assess the retrieval effectiveness of the manufacturers.
- Dismantling is a major activity of the informal facilities by hand. They use backward technology and rudimentary equipment, treat the ordinary material.
- Existing recycling process is ineffective, lost of natural resources.
- It is needed to develop the proper recycling technology.

VI. Challenges and difficulties

- Collaboration among relevant national authorities from central to local level is not always smooth and effective, particularly without a prompt and effective information mechanism among national authorities, mostly still with paper-based system.
- Low transparency in customs procedures and limited knowledge of customs officials and police is a barrier to the discovery of illegal e-waste import.
- Lack of human resource and capacity to control in-land border. The Government established environment police foces, but the authorities have not adequate capacity for their effective implementation.

Thank you for your attention!

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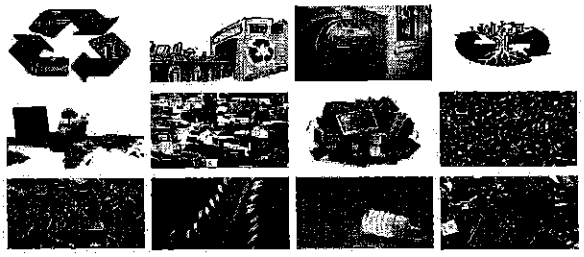
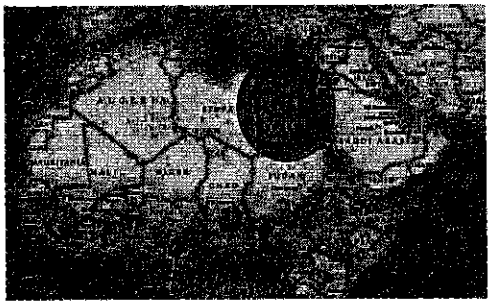
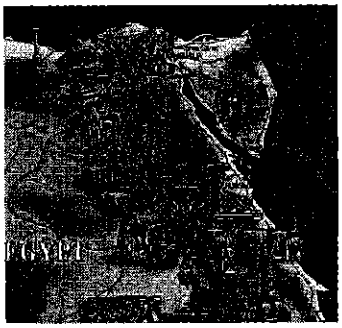
Assessment of WEEE in Egypt

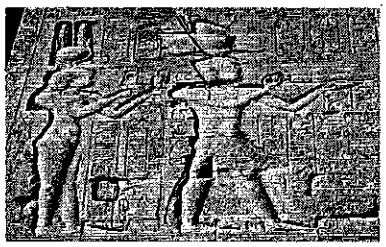
Final report and key findings

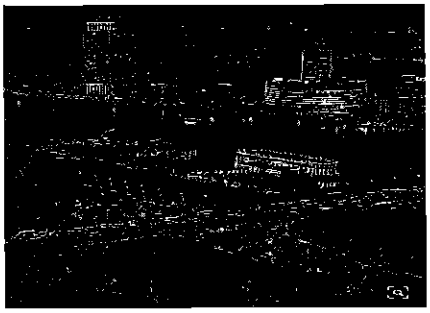


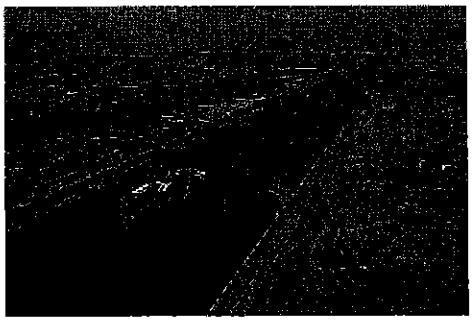
EcoConServ

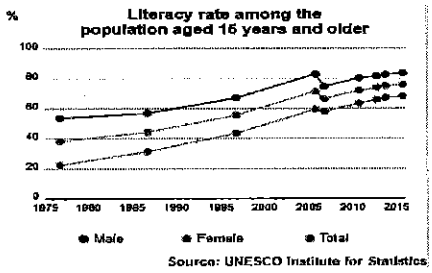












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  - *Mass flow*
- System Definition
- Policy and Legislation
- Stakeholder Assessment
  - *Consumers*
  - *Informal and Formal Sector*
- Mass Flow Assessment
  - *Conceptual Approach*
  - *WEEE Inventory*
  - *WEEE mass flow trends*
- Impacts
  - *Hot Spots*
  - *Environmental*
  - *Social*
  - *Economic*
- Country Analysis - Challenges
- Recommendations
- Conclusion

Introduction

Overview:

- In Egypt E-waste makes up around 5% of total solid waste and counted as fastest growing stream of solid waste (200,000 tons per day).
- There is sharp growth of personal electronic appliances. In 2018 PC s sold nation wide Increased 65% more than in 2008 and mobiles >100% than in 2008.
- Decrease in average life time of personal electronic equipment.

Introduction

Problem:

- Egypt is among top 3-4 African countries (Ghana, Nigeria, Kenya) with highest e-waste generation in absolute quantities (4.3Kg/Inhabitant)
- Environmental and Health impacts: large quantities is generated per year, not enough are collected/recycled by formal sector, leaving majority of e-waste treated or dumped by the informal sector.
- Major challenges: collection and recycling processes, disposal of untraceable fractions and consumer awareness

Introduction

Objectives:

- Analysis of local context and stakeholders Identification.
- Describe WEEE practices in the country by formal and Informal sector
- Describe and analyze national policies and regulatory framework on WEEE handling and recycling
- Establish baseline for current and future WEEE inventory and mass flow
- Identify hot spots and develop road map for WEEE management in Egypt
- Environmental and social impacts of current WEEE practices
- Identify the challenges Egypt face with WEEE recycling industry
- Recommendations based on this study

Methods

Data Acquisition

- Secondary Data
  - Governmental Sources: e.g. CAPMAS, MCIT
  - Regional and International Data Base: e.g. WB, ITU, BC
  - Literatures: e.g. UNU report, EPA
  - Market Research Agencies
- Primary Data
  - Surveys
  - Interviews
  - Transect and Tracer walk

Mass Flow Assessment

- Approximation 1 stock based method - (Consumption and Use)

System Definition

Tracers

- Category 1: PCs (desktop computer, desktop computer monitors and laptops)
- Category 2: Mobiles
- Category 3: Telephones

Geographical Context

- Survey conducted in Greater Cairo, Alexandria And Sharkeya
- Primary data source collected focused in Cairo
- All secondary source data are national scale

Policy and Legislation

Solid Waste management Related Laws

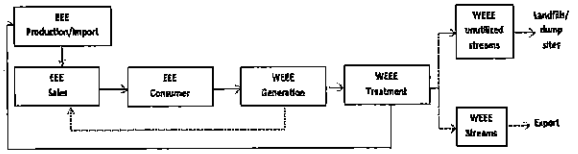
Egypt has no stipulated solid waste management law however main legislation enforcing the establishment of solid waste management are:

- Law number 38 of 1967, General Public Cleansing
- Law Number 4 of 1994 and its amendments Law 9/2009, Environment Law
- Law Number 48 of 1982, Protection of the River Nile and its Canals
- Law 84/1968 Concerning Public Ways

Laws influencing WEEE Recycling Industry

- Age of imports: restricting the import of old EEE equipment with exception of some EEE goods conditional it is not longer than 5 years from day of production.
- Second Hand Telecommunication Equipment import: Article 46 prohibits the import of used telecommunication equipment for purpose of trading
- WEEE import: Decree 165 of year 2002 of ministry of industry prohibits the importing of WEEE
- Egyptian Law of Auction

Stakeholder Assessment



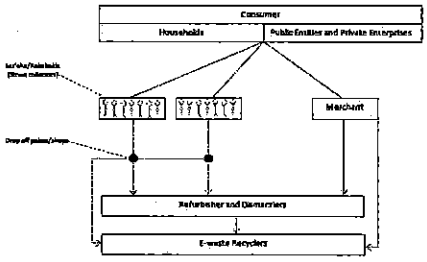
1. EEE production/import: Electrical and electronic equipment imported into the country or manufactured within the country.
2. EEE sales: Electrical and Electronic equipment in the market, ready for sales to end user.
3. EEE consumption: Consumption by households, private and public entities.
4. WEEE generation: The end of useful use of EEE and disposing to collectors/merchants.
5. Re-use / down cycle: Disposed EEE, which can be fixed or refurbished for second hand consumer
6. WEEE treatment/ Re-cycle: Applied process to EEE (e.g. dismantling) to extract useful fractions.
7. Secondary raw material: Specific fractions, which are reused as a feedstock for other industries (e.g. copper, plastics, iron and etc..)
8. Secondary raw material: Fractions such as electric boards, which are exported to other countries e.g. China

Stakeholder Assessment

Formal Sector – ITG, ERC, Spear ink

Stakeholder Assessment

Informal Sector



Stakeholder Assessment

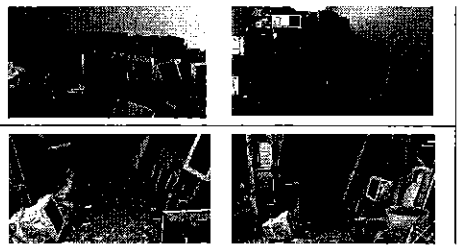
Informal Sector

		EGP/Unit
Merchant	CRT Screen	150-400
	LCD screen	60-110
	CPU	70-80
		EGP/Kg
Refurbisher and Dismantler	Mobile boards	60-100
	Computer boards	25-35
	Computer processor	10-20
	HDD	4
	CD/Floppy	1.5
	Keyboard	1.5
	Mouse	0.5

Commodity	EGP/Kg
Plastics	0.25
Iron	1.6
Aluminum (soft)	14.0
Aluminum (hard)	8
Stainless Steel	4.0
Copper Red	40.0
Copper Yellow	30.0

Stakeholder Assessment

Informal Sector

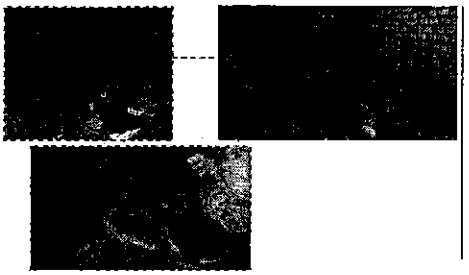


Merchant

Refurbisher and dismantler

Stakeholder Assessment

Informal Sector



E-waste recycler

Mass Flow Assessment

Conceptual Approach

- Step 1: Establish the installed base of selected tracers with medium term future projections (5 years) to ensure the reliability projections
- Step 2: Identify obsolescence rate/average life data using "upper limit" and "lower limit"
- Step 3: Quantify WEEE inventory with medium future projections

Mass Flow Assessment

Step 1: Installed Base

Sector	Mobile		Telephone		Desktop Computer		Laptop		CRT Monitor		LCD Monitor		Installed
Population	[illegible]	[illegible]	[illegible]	[illegible]									[illegible]
Households					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Enterprises			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sub total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Assumptions for calculation		
Subject	Quantity	Unit
Private MSMEs	1,407,911.0	enterprise
Private large enter	1,671.0	enterprise
Egypt Population 2018	91,508,084.0	capita
Egypt HHs 2018	21,747,619.0	households
Governmental sector employees	5,782,000.0	employee

Weights	
Tracer	kg
Mobile	0.1
Telephone	1.0
Computer	9.9
laptop	3.5
CRT monitor	14.1
LCD monitor	4.7

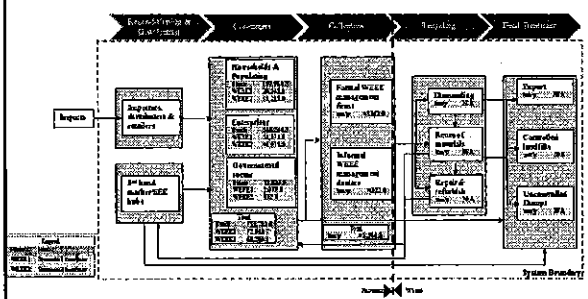
- The installed base of tracers for year 2017 amounts 795,782.59 tons with enterprises having the largest volume of installed tracers, followed by households and governmental sector respectively.
- Mobile quantities superseded all other tracers with respect to volume. Desktop computers superseded all other tracers with respect to weight.

Mass Flow Assessment

Step 2: Average life data using "upper limit" and "lower limit"

Tracer	Average life Time	Average Life Cycle of Tracers	
	Usage Years [Years]	Scenario 1: Lower period [Years]	Scenario 2: Upper Period [Years]
Mobile	2	3	4
Telephone	10	11	12
Desktop computer	10	11	12
Laptop	8	9	10
CRT Monitor	10	11	12
LCD Monitor	10	11	12

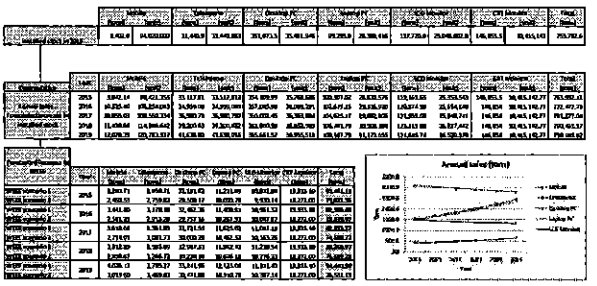
Mass Flow Chart



Mass Flow Assessment

- Based on scenario 1 the mass flow is 72,992.7 tons/year and based on scenario 2 the mass flow is 66,203.8 tons/year.
- The largest amount of mass flow is generated by the enterprises, followed by households then governmental sector.
- Currently only around 1,584.0 tons/year of electronic waste is been collected from the total generated electronic waste mass flow, which only represents 2.2% to 2.4% based on WEEE1 and WEEE2 respectively.
- For the selected tracers, the stock of equipment/inhabitant and stock of equipment/household is around 8.3 kg and 34.69 kg respectively. As for the waste mass /year/inhabitant is around 0.80 kg (WEEE1) and 0.72 kg (WEEE2).

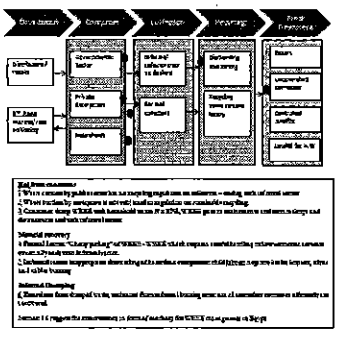
Step 3: WEEE Inventory Projections



Step 3: WEEE Inventory Projections

Between 2015 and 2019, the stock of equipment in Egypt would increase by around 5.9%, rising from 755,782.6 tons to 799,985.02 tons and the flow of WEEE would increase by around 15.7%, rising from 72,992.6 tons/year to 84,440.99 tons/year for WEEE1, indicating an annual WEEE mass flow increase of 3.14%.

Impacts – Hot spots



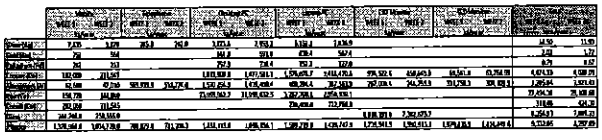
Impacts

- Environmental
  - It is common practice within the informal sector to break TV and CRT to retrieve the cooper, then dump the rest. This in turn cause heavy metals such as lead to leach into the ground and release toxic phosphor .where, the lead disrupts the function of water and soil systems.
  - open burning of cables produces a high toxic emission (POPs)
  - land filling of potential hazardous such as CRT monitors with no appropriate treatment causes soil contamination with lead.
- Social
  - Child labour
  - Safe and healthy working conditions

Impacts – Economic

Fraction	Mobile phones	Desktop PC	Laptops PC	CRT Monitor	LCD Monitor
Source: Umicore					
Silver (Ag)	250 mg/unit	1000 mg/unit			
Gold (Au)	24 mg/unit	200 mg/unit			
Palladium (Pd)	9 mg/unit	60 mg/unit			
Copper (Cu)	9 g/unit	800 g/unit		7.00% of weight	0.65% of weight
Cobalt (Co)	9 g/battery	75 g/laptop battery			
Source: Ribeiro and Schluep					
Aluminium (Al)	2.00% of weight	4.92% of weight	3.70% of weight	2.00% of weight	3.10% of weight
Iron (Fe)	8.00% of weight	75.00% of weight	29.80%		
Glass	11.00% of weight			60.00% of weight (CRT glass)	
Plastics	44.00% of weight	5.60% of weight	14.50% of weight	18.00% of weight	16.50% of weight

Impacts – Economic



Aggregated Economic Impact:
Looking into gold commodity industry in Egypt, in 2013, the 50-50 joint venture Sukari Gold Mine Co., which operated the Sukari gold mine, was owned by Centamin plc of the United Kingdom and ECMR. The company mined 11.7 Mt of ore, processed 5.7 Mt of ore, and produced 11,102 kilograms (kg) of gold compared with 6.4 Mt of ore mined, 4.5 Mt of ore processed, and 8,175 kg imported as 262,828 troy ounces) of gold produced in 2012. The gold recycling potential from WEEE mass flow is about 2.03 tones, which represents around 17.35% of the mined gold by Centamin plc in 2013 and 31.7% in 2012.

Recommendations

Laws & Regulations: Develop short and succinct law on the disposal of obsolete electrical equipment as a type of waste, and recognize it with a term such as WEEE/WEEE.
Collection: Enforce licensing and EHS regulation requirement on collectors/recyclers participating in auctions for WEEE from governmental sector and enterprises.
Recycling & Treatment: Empower the informal sector through trainings, technical and financial scheme. Design a business models for informal sector and incentives through better prices. Encourage civil society and development NGOs to prioritize WEEE recycling sector. Encourage the Egyptian metallurgy industry to utilize WEEE streams. Facilitate the export channels to specialized firms.
Awareness and Education: Conduct mass awareness campaigns targeting specific sectors, supported by booklets and manuals on WEEE. Such campaigns should work closely with civil societies and governmental agencies working on environmental concerns to reach as much social segments as possible.
IMS: Require governmental institutions affiliated with WEEE industry to adopt digital format of information management in non-fiscal units and digital based documentation.
EEE Producers/Retailers: Integrate end producer/end distributer responsibility in legal framework with respect to WEEE

Thank You for your kind attention

2019 International E-Waste Management Network Workshop

Cambodia Updates of E-Waste Management

Date: 02-04 December 2019

Legal and Institutional Frameworks

- Up to now, Cambodia has relevant policy, legislations and regulations of WEEE (or E-waste) management. Although most of them are not specifically to WEEE but these may use as the common tool for govern WEEE on the right way. Relevant policy, legislations and regulations are described below.

Existing legislation and regulations

- A- At National level
- Up to now several environmental legislations and regulations are enter into forces.
- Few of them may indirectly impact to the management of E-Waste.
- Law on Environmental Protection and Natural Resources Management (1996)
- Sub-decree on Solid Waste Management (1999)
- Sub-decree on Water Pollution Control (1999)
- Sub-decree on Environment Impact Assessment (1999)
- Sub-decree on Air Pollution and Noise Disturbance (2000)
- Sub-decree on Business Facilitation by Risk Management (2006)
- Law on Water Resources Management in the Kingdom of Cambodia (2007)
- Law on Land Traffic (2007)
- Law on Standards of Cambodia (2007)

Existing legislation and regulations

- A- At International level
- As prioritized in the Political Platform of the Royal Gov't of Cambodia of the 5th Legislature of the National Assembly in September 2013, Cambodia via the MoE joins the international and regional communities in the context of environmental protection by doing the bunch of activities under:
- The Stockholm convention (POP)
- Vienna convention and Montreal Protocol
- Basel convention
- Minamata convention (mercury)
- Outputs of these activities include such as: capacity building and awareness raising, nat'l reports, nat'l strategies and action plans, etc.

Specific E-Waste Management Legislation

- B-Cambodia have the specific E-Waste management legislation "the Sub-decree on E-Waste Management" endorsed by Government of Cambodia on 01 Feb 2016.
- C- Guideline on the Environmental Sound Management of E-Waste in Cambodia will become the implement tool to achieve the target of the Sub-decree based on the environmental manner (in the processing of preparation) etc.

Restrictions on Transboundary Movement

- Restrictions on export for final disposal: Cambodia has no restrictions on the export of hazardous wastes and other wastes for final disposal or resource recovery purpose.
- Restrictions on import for final disposal : Cambodia restricts the import of hazardous wastes and other wastes for final disposal. The Article 21 of the Solid Waste Management Sub-Decree states that "the import of hazardous waste into the country is strictly prohibited".

E-Waste process

- E-waste is individually retrieved by informal sector collectors who sell it either to repair shops for dismantling or to waste traders. The reusable parts are kept for sale, and the recyclable materials are then sold to local scrap yard owners for export. The residues left after the extraction of reusable components, and recyclable materials are then disposed of through municipal waste systems, burned by owners or discarded in dumpsites or landfills.
- In recent years, through various projects and pilots, the Ministry of Environment, Cambodia (MOE) has worked with the informal sectors to upgrade their methods and techniques for environmentally sound management of e-waste and has developed a strategy for developing a national e-waste management system, taking into account the informal e-waste sector.

Conclusion

- To minimize and phase out these constraints, Cambodia, especially, the MoE step-by-step efforts as possible for:
- Capacity building and institutional strengthening (at both nat'l and sub-nat'l levels) to minimize and intercept environmental pollution, including public awareness promotion to relevant stakeholders
- Controlling/monitoring and assessing environmental pollution activities and/or projects, including transboundary issues
- Developing specific legislations/regulations based on current requirement
- Promoting and strengthening the cooperation among nat'l and sub-nat'l institutions, or among riparian countries and countries in the region/world, including networking development.


THANKS YOU
FOR YOUR KIND ATTENDTION !!

United States Update

IEMN 2019

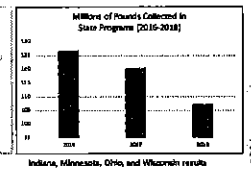
Chris Newman
U.S. EPA
Great Lakes Region
Chicago, IL

Definitions and Background

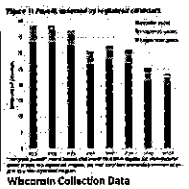
- WEEE definitions:
  - Nationally – none in law
  - State level – WEEE devices are defined in certain U.S. states with mandated recycling programs. Generally covers electronics products (TVs, DVD players, and others), not white goods.
- Hazardous waste definitions:
  - Set in regulation by the Resource Conservation and Recovery Act (RCRA), 1976
  - RCRA defines HW based on certain waste characteristics, the level of lead leachability (toxicity) is usually what determines if a WEEE device is HW.
  - HW regulations are also applied based on who the generator is: small generators (based on kgs disposed/month) are conditionally exempt
  - Almost all U.S. states are authorized to implement the RCRA program; with the federal program as the minimum requirements, states can be more strict than the federal program
- What e-waste or WEEE materials are regulated as HW:
  - This is determined by RCRA regulations:
    - who is generating the waste (and is conditionally exempt small quantity generator), and
    - if the waste fails a set of characteristics (one of the following: toxicity, reactivity, ignitability, corrosivity)
  - The only material that's generally considered HW is CRT glass, but it needs to be evaluated for lead leachability and generator sizes to make the regulatory case
  - Hg in backlight bulbs (toxicity), batteries (ignitability) could also make WEEE a HW, and if they are part of a device or removed may affect this
  - It's the responsibility of the waste generator to determine if a waste is HW when planning for disposal
- What government ministries are in charge of e-waste/WEEE management:
  - U.S. EPA, as RCRA applies
  - State environmental protection agencies that have been delegated RCRA authority

Statistics

- U.S. EPA's Great Lakes Region has six states with a population of 52.4 million people, 16% of the U.S. total.
- We starting seeing a downward trend in collections.
  - Does this mean that fewer CRTs are returned?
  - Or products are getting lighter?



Indiana, Minnesota, Ohio, and Wisconsin results

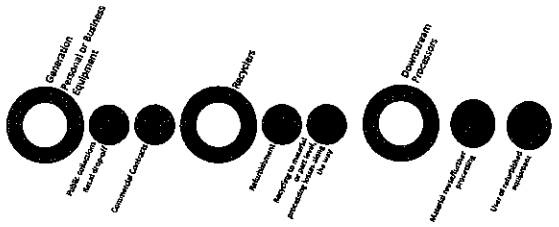


Wisconsin Collection Data

Changes in E-Waste/WEEE Policies and Regulation

- WEEE Regulation:
  - At the federal level – as a waste, WEEE is regulated by RCRA, but other laws might affect management decisions (medical privacy laws, data security), transportation (HW batteries)
  - At the state level – each state can set their own WEEE regulations and specifically list devices that are prohibited from the landfill, thus should be recycled
- Five of the six Great Lakes Region states have regulations specifically on WEEE
  - New changes
    - Illinois has a new :
      - program that requires a minimum number of collection sites per county based on population
      - law that prohibits lithium batteries, and devices containing them, in the curbside recycling bin
    - Michigan has a grant program to fund equipment for public WEEE collection sites
  - Anticipated future changes
    - The electronics industry is promoting the collection site/population model in other states, with an advanced recovery fee. We will see what happens.

How WEEE flows in the U.S.:

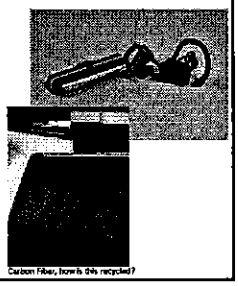


E-waste recycling system in your country

- **Details**
  - Many state programs are based on EPR
    - This could be a large part of the responsibility, or just fee to the state
    - Costs are covered by the generator and manufacturer (either as an advanced recovery fee or in the product price.)
    - Local or state governments may cover some costs (often collection and infrastructure costs).
  - In states without formal collection programs citizens still have WEEE recycling, without mandated manufacturer participation. However manufacturers may still support a collection program. Landfill bans aren't often seen, RCRA still applies.
  - U.S. EPA supports the use of certified electronics recyclers (R2 or eStewards) for proper management of WEEE
  - Businesses will contract with a recycler
  - Waste management, including hazardous waste, regulations have been streamlined to encourage proper recycling
    - EPA's universal waste regulations streamline the hazardous waste management standards for certain categories of hazardous waste that are commonly generated by a wide variety of establishments
    - Worker health and safety, data security and other rules still apply
    - Speculative accumulation limits may apply to certain HW stored over one year
  - Many markets for the recovered materials are outside the US.

Challenges of E-waste recycling system in technology or policy aspects

- New devices/materials are always coming on to the market
  - How are they recycled? What happens if they are improperly managed?
- How can we have safe products and fully recyclable ones?
- Consumers/businesses need to take an action to recycle
- Challenges on the horizon:
  - Rechargeable battery challenges will grow
  - Plastics recycling
  - End-of-life solar panels
- State policy challenges:
  - Do regional states 10+ year old e-waste programs need updating?
  - How has product design changed? RCRA metals (Pb and Hg) have been reduced, some say 'we're done' others say 'there's more to address', and devices are smaller and lighter, but, there are more devices.
  - Making sure the cost of recycling is appropriately accounted for
- Illegal dumping and abandonment still occurs, how do we make it easy for people to do the right thing?
- Promoting reuse of the products.



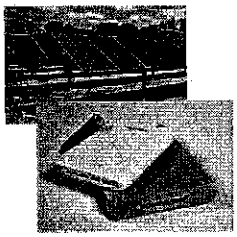
Carbon Fiber, how is this recycled?

Challenges and Solutions

- In the Great Lakes region the collection and recycling infrastructure is developed.
  - The reuse/resale market is decent, especially for business equipment
  - Downstream materials markets are more challenging, and will continue to be
- There are multiple certified recyclers (R2 and eStewards) in the region
- Challenges, and EPA outreach topics
  - ePlastics
    - US Department of Energy REMADE Institute is funding research on ePlastic recycling
    - States are starting to rethink their policies, is incineration or landfilling a better option than recycling for some e-waste materials?
  - Lithium-ion batteries
    - Recycling industry fires have been attributed to batteries
    - The industry stewardship program covers removable batteries and cell phones, but not small batteries in devices.
    - US Department of Energy's ReCell is studying lithium-ion battery recycling
  - Solar Panels
    - Some are coming in, but volumes are expected to increase; recoverable materials/value is dropping
    - The waste characterization isn't consistent, some panels may be HW, others may not be HW
- What would be helpful?
  - Learning about new recycling technologies and outreach techniques.

Other Relevant Projects or Information

- U.S. EPA SMM Web Academy Webinars
  - Solar panel recycling
  - E-waste generation and the cost of digitization to the environment
  - An introduction to lithium batteries and their challenges
  - Upcoming – Transportation of used lithium batteries
- Other Webinars:
  - Fires at municipal solid waste recycling facilities
  - Federal Green Challenge webinars on solar panels, and WEEE
- Other federal efforts:
  - Outreach efforts with U.S. Dept. of Transportation for lithium battery shipping
  - Department of Energy's
    - REMADE Institute for plastics recycling
    - ReCell for lithium-ion battery recovery
- EPA's SMM Electronics Challenge



Asian Productivity Organization Center of Excellence on Green Productivity (APO COE on GP)

Shirley Lin
China Productivity Center
Taiwan, Rep. of China

2 December 2019

Contents

- Introduction of APO
- Introduction of CPC
- Introduction of APO COE on GP

Introduction of APO

Overview of APO

- The Asian Productivity Organization (APO) was established in **1961** as an intergovernmental organization.
- Secretariat: **Tokyo, Japan**

Mission

Contribute to the sustainable socioeconomic development of Asia and the Pacific through enhancing productivity

Vision

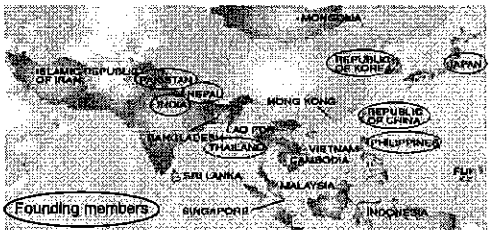
To be the leading international organization on productivity enhancement, enabling APO economies to be more productive and competitive by 2020

Strategic Directions

- Strengthen NPOs and promote the development of SMEs and communities
- Catalyze innovation-led productivity growth
- Promote Green Productivity

Member Economies

20 member economies pledge to assist each other in their productivity drives by sharing knowledge, information, and experience and coordinate with the APO through the designated national productivity organizations (NPOs).

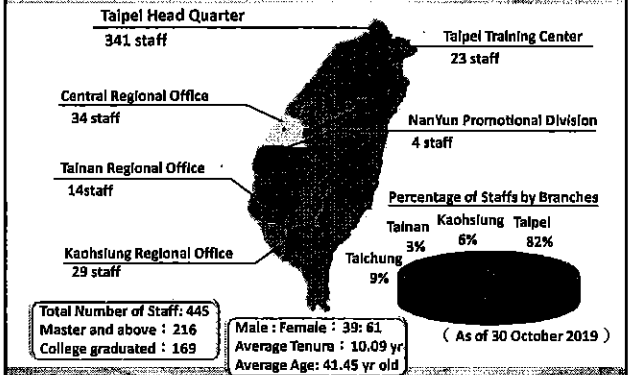


Introduction of CPC

Overview of CPC

Mission: to assist enterprises to enhance productivity

Branch Offices



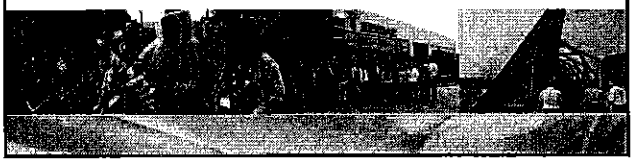
Introduction of APO COE on GP

Overview of APO COE on GP

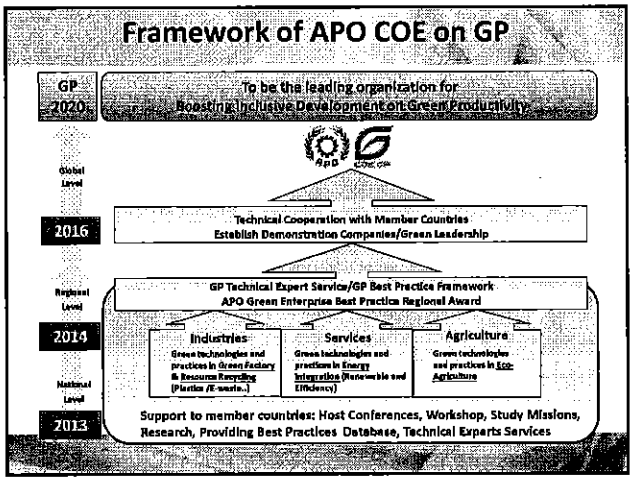
Mission:

- **Share R.O.C. experiences, contribute to the green growth of member countries**
- **Promote regional innovation and sustainable development**
- **Enhance green productivity and competitiveness jointly with member countries**

- APO established the Center of Excellence on Green Productivity (APO COE on GP) in R.O.C. in 2013.

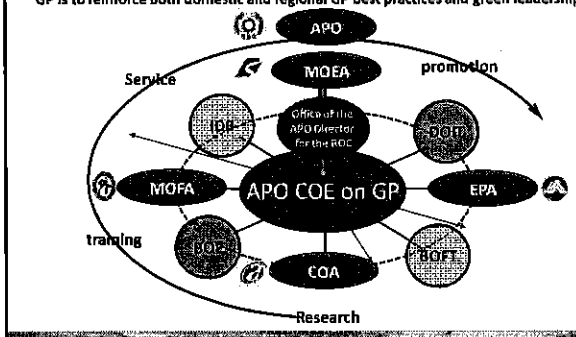


Framework of APO COE on GP



Public & Private Sectors Partnership

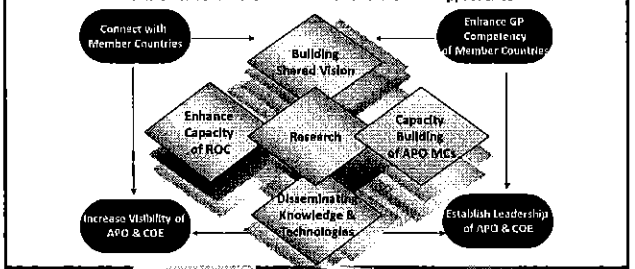
By integrating the resources of the government and industries, the objective of COE on GP is to reinforce both domestic and regional GP best practices and green leadership.



Support to member countries : Conferences, Workshop , Study Missions, Research, Best Practices Database, Technical Experts Services.

APO COE on GP Strategic Direction

Framework of APO COE on GP and the five main approaches



Achievements of APO COE on GP

2019	Complementary to APO/inter-department/industrial resources, connecting APO Member Countries as a regional platform for promoting international cooperation
2018	Proclaiming GP 2020 for Asia; build a benchmark demonstration system for targeted APO Member States/joining international organizations Conducting comprehensive industrial cooperation projects with targeted APO Member Countries: Promoting activities of "APO COE on GP Green Technical Service Team" and "APO Demo Project" to encourage benchmarking, industrial cooperation, and exchanges of knowledge and technology.
Nov. 2014	• Signing "GP 2020" for Asia-pacific region – APO World Conference on Green productivity / APO submits it to the UN (80 government officials and industrial representatives attended the conference) • Dispatching the "APO COE on GP Green Technical Service Team" to work with 6 countries (Vietnam, Indonesia, the Philippines, Laos, India, and Thailand) • Developing and planning for Green Excellence Award for Enterprise • APO EPIF and international conference held in Taipei
2013	• Launching meeting and research seminar/ 4 professional technology seminars / planning for Green Excellent Award for Enterprise in Asia • Establishing APO COE on GP in Taipei
2012	APO formally designated the ROC as the APO COE on GP during 2013-2014
2011	Proposing to host the APO COE on GP in the ROC Proposing states: 1. COE on Green Productivity in the ROC 2. COE on Energy Efficiency in India 3. COE on Energy Efficiency in Pakistan APO 50th Anniversary Celebration & Taipei Declaration on Green Productivity

Achievements - India

Leverage public sectors, associations and industries to jointly promote green technologies and capacity building in 2014-2019. The Strategic actions of technical services on Needs Assessment, Training and Technology Transfer includes:

- E-Waste Recycling and Green Solar Power System: Build a 20 kWp Rooftop Solar Power System /Precious Metal Recovery Technology (APO Demonstration 2014-2016)
- Wastewater Treatment Recycling and IoT Smart Solutions: Implemented 4 pilots, conducted Site Process Diagnosis and Training in Chennai and New Delhi CETP Society. (2017-2019)
- Taiwan-India Industrial Collaboration Summit: Hold conference, B2B matching and facilitated technology adaption and joint research on emerging technology. (2017-2019)

Wastewater Treatment/IoT Pilot for ZLD/ZWD at Ranitec CETP

Process Diagnosis and Technology Training at CETP Society, New Delhi

Rooftop Solar Power System to support Training Center in AIP NPC

Achievements – Malaysia

- **2015** - Established cooperation with Malaysia Productivity Corporation and signed a MOU to carry out deep, long-term technical exchange and collaboration.
- **2018** - Created a communication channel with GreenTech Malaysia, GreenTech Malaysia is also proactive about seeking opportunities for cooperation with APO COE GP.

Economic Planning Unit

GreenTech Malaysia

MIDA

Achievements – Thailand

- 2017 - Signed MOU between CPC and 3R Foundation for future collaboration on resource recycling and waste management.
- 2018 - Signed MOU between CPC and Thammasat University for collaboration and assisted the Eterbright Solar Corp. to donate solar panels to university for research projects.
- 2018- Assisted private sectors to analyze Thailand market distribution in the field of resource recycling and needs of technical hardware upgrades , backend resource recycling technologies, zero zero shop and online business model.

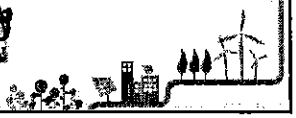
MOU Signing Ceremony between CPC and 3R Foundation

Site visit to recycle company Wongpanit in Ayuttya and meeting with CEO

Donation Ceremony of Taiwanese solar panels to TU for research projects

Paradigm Shift towards Green Productivity for Asia-Pacific Region

Thank You



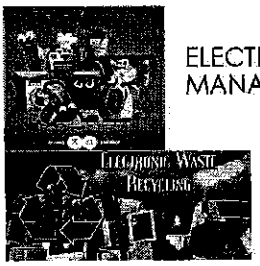
MINISTRY OF ENVIRONMENT AND FORESTRY
REPUBLIC OF INDONESIA

INDONESIA COUNTRY STATUS ON E-WASTE

Upik Sitti Aslia Kamil
Depuy Director for Determination and Notification of Hazardous and Non Hazardous Waste

Directorate of Verification Hazardous and Non Hazardous Waste Management
Directorate General of Solid Waste, Hazardous Waste, and Hazardous Substance Management

2019



ELECTRONIC WASTE MANAGEMENT

NATIONAL POLICY

E-Waste categorized as hazardous waste and listed on the GR 101/2014 with code *Based on Annex I, Table 1 List of Hazardous Waste from Not Specific Source:*

Given Code is B107d for Electronic Waste including CRT, fluorencent lamp, PCB and wire rubber; and A111d for used refrigerant from electronic equipment

Based on Annex I, Table 3 List of Hazardous Waste from General Specific Source,

activity 28: Electronic manufacturing or electronic equipment; and

activity 29: Recondition and Remanufacturing of Electronic Equipment

LEGAL BASIC FOR WASTE IMPORTATION

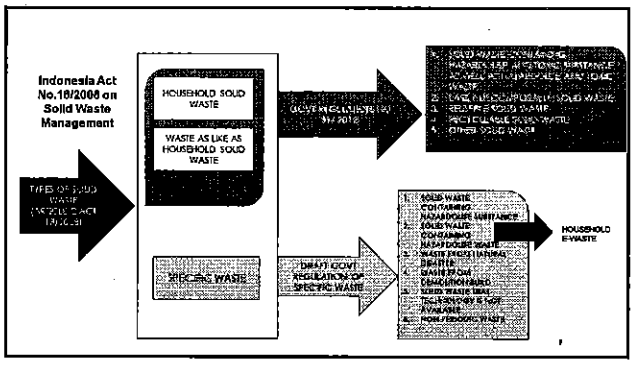
1. Act No. 32/2009 regarding Environmental Protection and Management, article 69:
   1. Everyone is prohibited to do the following
   2. point (1.c). Bring in wastes from outside of Indonesia into the living environment of Indonesia (explanation: except for those governed by the law and regulations)
   3. point (1.d). Bring in hazardous waste into Indonesian territory
2. Act No. 18/2008 regarding Domestic Solid Waste Management, article 29: Everyone is prohibited to bringing in domestic solid waste into Indonesia territory
3. Ministry of Trade regulation No. 84/2019:
   Every non hazardous waste importer should provide statement letter from the exporter to make sure non hazardous waste being imported is not hazardous waste

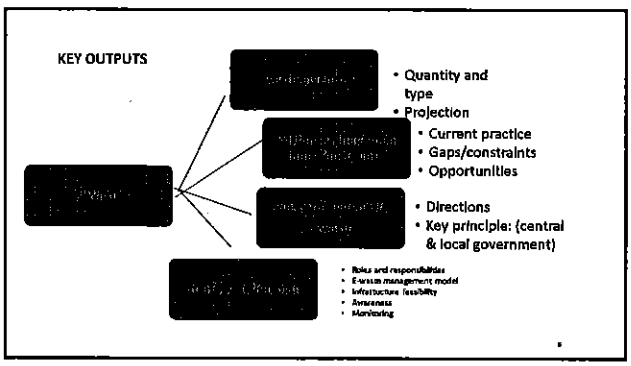
REGULATION CONCERNING THE IMPORTATION OF SECOND HAND ELECTRONIC EQUIPMENT AS A CAPITAL GOODS TRADE MINISTERIAL DECREE NUMBER 118 YEAR 2018

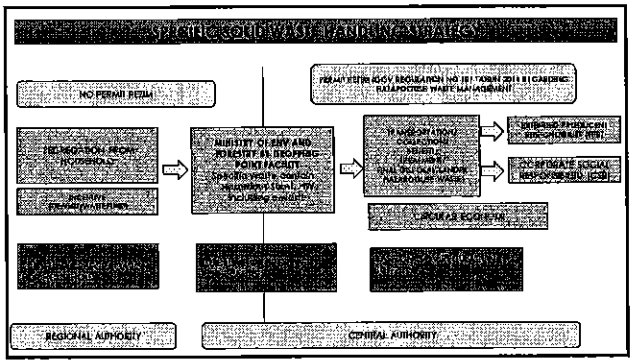
The second hand computer and monitor can be imported by fulfil such requirements as follows:

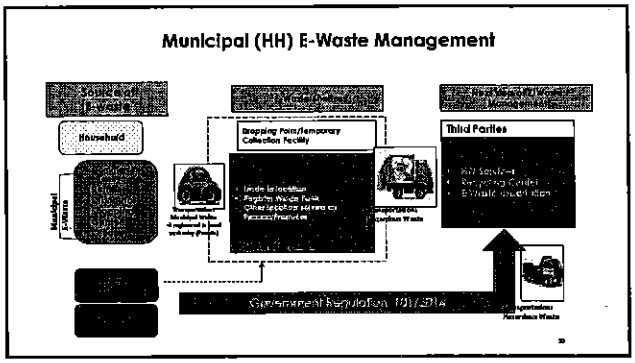
1. Still being function (proven by certificate)
2. The lifetime is not more than 5 years
3. New technology (definitely not CRT),
4. Must be in one complete set
5. Must be imported in proper packaging

AMOUNT OF E-WASTE EXPORTATION IN 2018









CURRENT E-WASTE MANAGEMENT IN DKI JAKARTA PROVINCE (SUCCESS STORY)

Legal Based :

- Instruction by the Head of Environmental Department Jakarta Number 28 and 29 dated 20 March 2017 regarding electronic waste collection for the Department of Environmental employees and residents of the department's dormitories
- Letter of the Head of Environmental Department Jakarta Number 3528/-1.774.13 dated 5 May 2017 regarding the Collection Activity of Electronic Waste for 5 mayors in DKI Jakarta Province
- Letter of the Head of Environmental Department Jakarta Number 3166/-1.774.13 dated 25 April 2017 regarding the Collection Activity of Electronic Waste in Sub District's Environmental Office

The Signing Of Cooperation Agreement Between Environmental Department Of Jakarta Provincial Government and PT.PPLI regarding The Program of Managing Electronic Waste Specific For Used Mobile Phone dated 3 May 2017

CURRENT CONDITION

National Regulation on E-waste

1. Government Regulation No. 101 /2014 concerning Hazardous Waste Management
   - Based on Annex I, Table 1 List of Hazardous Waste from Not Specific Source: Given Code is B107d for Electronic Waste including CRT, fluorescent lamp, PCB and wire rubber; and A1110 for used refrigerant from electronic equipment
   - Based on Annex I, Table 3 List of Hazardous Waste from General Specific Source, activity 28: Electronic manufacturing or electronic equipment; and activity 29: Recondition and Remanufacturing of Electronic Equipment
2. Ratification of Basel Convention by Presidential Decree No. 61 Year 1993 Based on Basel Convention, Annex VIII: A1080 and A1180
3. Act No. 18 /2008 concerning Municipal Solid Waste Management
4. Draft on Government Regulation Regarding Specific Waste Management which will include House Hold E-Waste Management → on going process
5. On going process → Ministerial Decree on National E-Waste Management

Further Steps for E-Waste Management

- We still need more references and success story regarding policies from other countries → including responsibility of all stakeholder and management of incentive mechanism
- We need to build an incentive system to encourage electronic producer doing EPR
- We need more analysis study/cost analysis study on how much extra cost needed to manage e-waste (based on type of e-waste)
- We need to coordinate with local governments to disclosure the e-waste management system and to build program on how to encourage community willing to collect their e-waste

CHALLENGES

1. How to provide detailed guideline of specific waste management
2. Hot to improve infrastructure of specific waste management
3. Supporting the partnership program between local government and private sector → develop collection point
4. We need to find the way on handling the informal sector
5. We need to coordinate with local governments to disclosure the e-waste management system and to build program on how to encourage community willing to collect their e-waste
6. To support coordination among electronic producer, refurbishment/recondition company and local government on how to build collection point.

TERIMA KASIH
THANK YOU

Further information:
1. Directorate of Verification on Hazardous Waste and Non Hazardous Waste Management - A Building, 5th Floor
2. Directorate of Solid Waste Management – C Building, 2nd Floor

Ministry of Environment and Forestry
Jl. D.I. Panjaitan Kav. 24, Kebon Nanas, Jakarta 13410
INDONESIA

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