

# *Adelaide 3R Declaration ~ Implications towards Circular Economy of E-waste*

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## *Presentation Outline*

- Outcome of Adelaide 3R Declaration- commitment towards E-waste
- Generation and Problems of E-waste in Asia-Pacific region
- Problems and issues of e-waste management -Case of PR China, India and Lesson learnt from Japan
- Issues related to resource recovery and recycling of E-waste
- E-waste flow across the region
- Beyond recycling –ultimate aim “Circular Economy”

# Adelaide 3R Declaration

## *Towards the Promotion of Circular Economy in Achieving Resource Efficient Societies in Asia and the Pacific under the 2030 Agenda for Sustainable Development*

### ❖ Promote inter-municipal or city-city cooperation

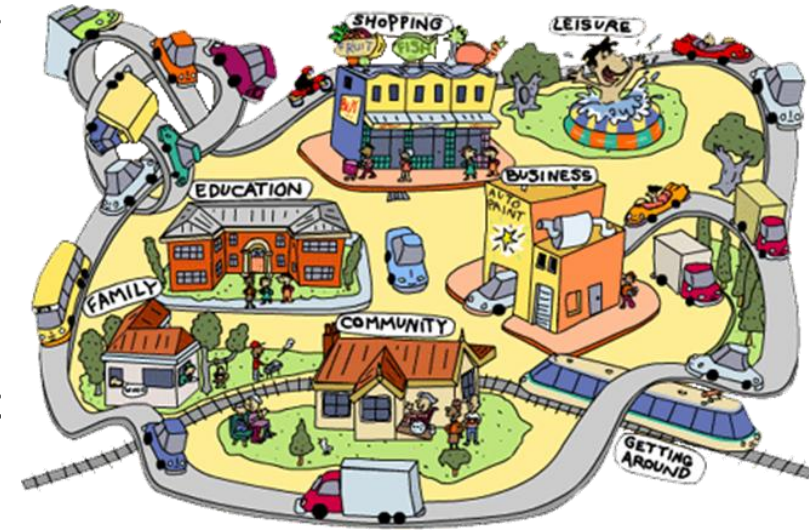
Creating circular economic opportunities, green and new employment opportunities, ultimately contributing to the well-being of the local communities

### ❖ Provide necessary capacity building and support

Human resource development, financing, knowledge and technical know-how for instituting circular economic development approaches

### ❖ Facilitate environmentally-sound management of wastes

Appropriate treatment of disaster wastes, e-wastes, medical wastes etc.



# Adelaide 3R Declaration

## *Towards the Promotion of Circular Economy in Achieving Resource Efficient Societies in Asia and the Pacific under the 2030 Agenda for Sustainable Development*

### ❖ Science and Innovation Technology

Technology based culture in overall policy setting and development agendas

### ❖ Private sector and sustainable business opportunities

3R technologies are key enablers for creating sustainable business opportunities

### ❖ Collaborative Research-Development and Projects

To address resource efficiency related problems in industry sector, Government and international collaborative research projects in the areas of strengthening basic statistics, material flow and waste accounting and analysis, and material and waste footprint analysis and resource productivity analysis and Bilateral/multilateral cooperation

### **Important commitment:**

### **Towards implications of Circular Economy of E-waste**

Express our commitments to **strengthen coordination among countries** and within countries to progressively adopt and implement **circular economy plans, whole-of-value chain approach, strategies and tools to reduce, reuse, and recycle natural resources** in production, consumption and other life-cycle stages, enabled by **extended producer responsibility (EPR)**, environmentally friendly design, ecological budgeting, financial incentives and investments taking into account the prevailing economic conditions;



# Generation and Problems associated with E-waste

- The top three Asia-Pacific countries with the highest e-waste generation in absolute quantities are PR China (6 Mt), Japan (2.2Mt) and India (1.7Mt).
- Asian region produced the highest amount of e-waste (16 Mt or 38% of total), followed by Americas (11.7 Mt) and Europe (11.6 Mt).

**Global e-waste generation to reach 50 Mt by 2018 (annual growth rate of 4 to 5%)**

***Dangerous chemicals and metals from e-waste- may leach into the environment***

- Lead present in the solders used to make electrical connections on printed wire boards and Cathode Ray Tubes (CRTs)
- Mercury found in laptop computers and discharge lamps.
- Cadmium (found in chip resistors, CRTs)
- Brominated Flame Retardants (BFRs)



# *Case of PR China: Weak treatment capacity compare to large E-waste amount*

## ○ **Current situation**

- 66.71 million units in 2011
- mainly televisions (84%), other items were washing machines (7.7%), refrigerators (4%), computers (desktop and laptop) 3.7% and air conditioners (less than 0.5%)

## ○ **E-waste Policies**

- National Old-for-new Home Appliance Replacement Scheme (since 2009)
- Appliance Trade-in Policy (since 2009)
  - 10% subsidy in old-for-new consumption
  - All replaced home appliances shall be returned to designated collectors for treatment and recycling

## ○ **Issues**

- China is not only a large consumption nation of electrical products, but also a largest importer of e-waste (Wei&Liu, 2012)
- Appliance Trade-in Policy accelerated the development of processing enterprises. However, along with their expanding business scale, the actual operating rate of treating and recycling the collected appliances is still quite low.
- The e-waste treatment in China is mainly motivated by the economic value of precious metals and organic materials, thus the less advanced separation treatment method have further resulted in the release of toxic metals and pollutants.

# *Case of India: Regulation based on the principle of EPR started*

## ○ **Current situation**

- 1.641 million tones in 2014
- mainly large household appliances (42%), other items were communication technology (34%), customer electronics (14%), and others (10%)

## ○ **E-waste Policies**

- Guidelines on Implementation of E-Waste (Management) Rules (2016)
  - to incentivize industries to develop partnership with waste-recycling companies, other waste generators and handlers (paper, plastic, glass, metal, etc.) and corporate sectors
- Regulation based on the principle of extended producer responsibility (EPR)

## ○ **Issues**

- The e-waste amount is expected to be booming along with the fast development in IT and manufacture sector in India
- Workers in the recycling sector are dominated by the urban poor who are with very low literacy levels and have very little awareness regarding the potential hazards of e-waste.
- Strict checking measures are required to stop the entry of illegal trans-boundary e-waste from other countries.

# Case of Japan: Recycling rate standard with legal force

## ○ Current situation

- 1,086 exchanged units in 2014
- a particularly high need for recycling in the case of 4 categories, namely home air-conditioners, televisions, refrigerators & freezers, and finally, washing machines & cloth dryers

## ○ E-waste Policies

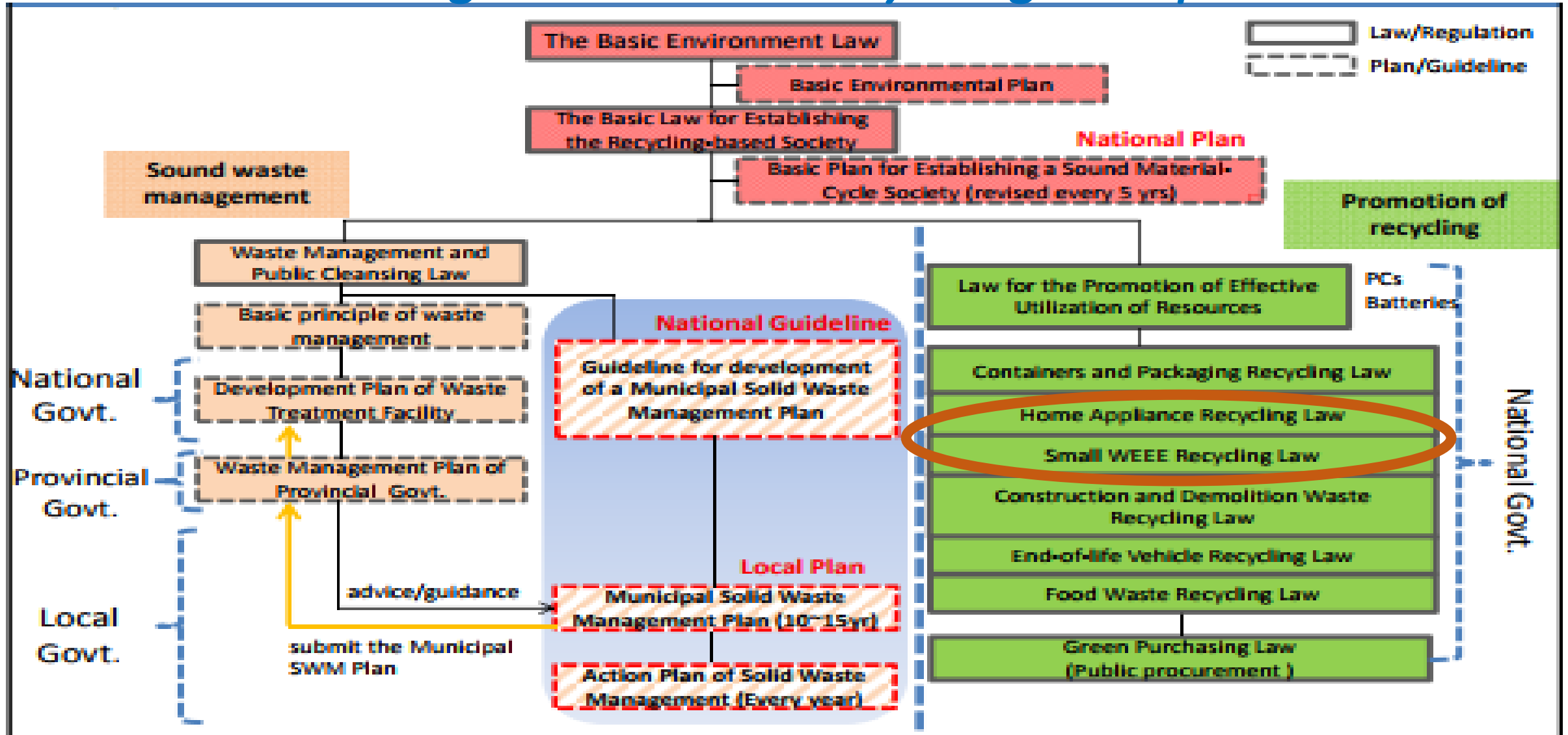
- Law for Promotion of Effective Utilization of Resources (division pertaining to voluntary recovery and recycling), since 2001
- Law for Promotion of Recycling of Small Waste Electrical and Electronic Equipment (Small Home Appliance Recycling Law), since 2013

## ○ Essential notes from the Japan's E-waste management system

- Clear and specific identification of what should be covered under the new system
- Clear description of roles and responsibilities (obligations) of stakeholders (Who does what, who pays what, and so forth)
- Prevention of free-riders.
- Collection efficiency
- Determining the recycling cost is the most difficult part in designing workable and feasible system



# Legal/Regulatory Mechanism to Control E-waste Management and Recycling in Japan



# Effective lessons learnt from Japan~ towards Circular Economy

## ○ Home Appliances Recycling Law in Japan

- The law stipulates that retailers collect and transport specific household appliances.
- The standards for the recycling rate as stated in the law from April 2015 has been increased to 80% for air conditioners, 55% for CRT TV, 74% for LCD and Plasma TVs, 70% for refrigerators and freezers, 82% for washing machines and clothes dryers.
- Developing countries could adopt such recycling rate standards with legal force, but according to local e-waste structures.

## ○ Law for Promotion of Recycling of Small Waste Electrical and Electronic Equipment (Small Home Appliances Recycling Law)

- The Basic Policy of Small Home Appliance Recycling Law aims at a recovery recycling implementation amount of 140,000 tons per year by 2015, amounting to 1 kg per person per year.
- People attempting to recycle such used small electronic devices can create a re-commercialization business plan and receive approval from the cabinet minister in-charge, without the need to gain permission from the waste processing industry. This is intended to promote the recycling of items such as used small electronics.
- Developing countries could adopt such policy to encourage the reuse of small-size WEEE in private sectors and raise the recycling awareness of residents.

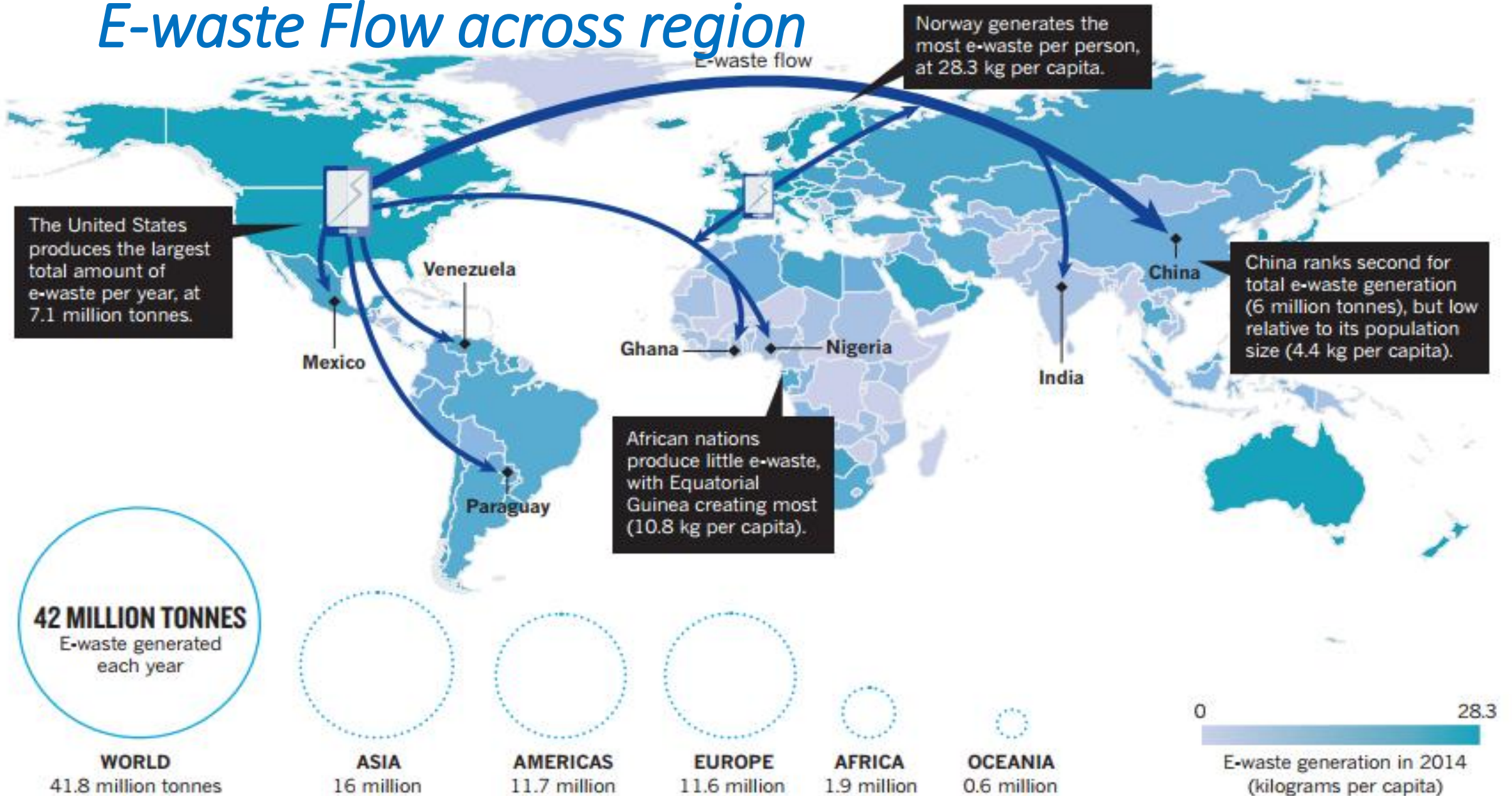
# Resource recovery from E-waste

- Non toxic components-such as iron, steel, copper and gold- are valuable, so are more frequently recycled than toxic ones.
- 1 million cell phones can recover 24kg of gold, 250kg of silver, 9kg of palladium and 9000kg of copper.
- 1 tonne of e-waste from personal computers contains more gold that can be recovered from 17 tonne of gold ore.
- 1 tonne of used mobile phones (about 6000 handsets) contains 3.5kg of silver, 340grams of gold, 140grams of palladium and 130 kg of copper – worth US\$15,000!!!



*Recovery of expensive and scarce materials from e-waste represents a significant opportunity for environment and economy*

# E-waste Flow across region





# Circular Economy of E-waste ~ Case study of European Union

- European Union has a renewed focus on raw materials
- Circular Economy package launched in 2012 – currently being reviewed
- Member states have developed their domestic strategies
  - Germany – Raw Material Strategy (ProGress)
  - UK – Making Waste work at home
- Focus on closing material loops as a part of Industrial Policy
- Innovation as an enabler of maintaining economic competitiveness





# *Beyond recycling-the ultimate aim “Circular Economy”*

Circular economy means re-using, repairing, refurbishing and recycling existing materials and products. What used to be regarded as ‘waste’ can be turned into a resource. All resources need to be managed more efficiently throughout their life cycle.

## ***Benefits of Circular Economy in respect of effective E-waste management:***

- The e-waste management in circular economy has the potential to **increase jobs**, and decrease the damaging environmental impact from rare earth metals.
- Continue to reuse more old devices and using its different components with new products that will benefits towards circular economy.
- By having a **reusable, efficient and sustainable economic model** will ensure benefit economy of country.
- Recycling of e-waste **reduces the lifecycle toxicity and greenhouse gas (GHG) emissions.**
- Further it helps to **reduce global warming** by preventing discarding e-waste in together with municipal waste.

# *Welcome to*

## *8th Regional 3R Forum in Asia and the Pacific*

*Theme: Achieving Clean Water, Clean Land and Clean Air through 3R and Resource Efficiency – A 21<sup>st</sup> Century Vision for Asia-Pacific Communities*

*Venue: International Convention Centre, Hyderabad, India*

*Co-organizers: Ministry of Housing and Urban Affairs (MoHUA),  
Government of India;  
Ministry of Environment, Forest and Climate Change (MoEFCC),  
Government of India;  
Ministry of the Environment, Japan; and UNCRD*

*Thank you for your kind attention*