

Environmental Management from the Perspective of 3R~ Experience of 3R practice internationally

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Why should 3R matter in environment and resource management?

1. Minimizing **local environmental problems**

- **Efficient use of resources can lessen environmental burdens**, such as urban air/water pollution, floods induced by solid waste clogging drainage canals, reduced availability and quality of freshwater supplies, and land degradation.
- High pollution levels put **public health at risk**, which translates into **economic costs**.

2. Taking benefit of win-win solutions to meet international obligations on **climate change**

- For example, **Asia's global share of GHG emission** grew from 8.7% in 1973 to 24.4% in 2003 and is expected to increase to 30% by 2030.
- **Efficiency measures can greatly reduce GHG emissions** from energy generation and use, materials extraction and processing, transportation, and waste disposal.

3. Ensuring **energy security**

- Dependence on fossil fuel and inefficient use of energy supplies make countries more exposed to price and supply fluctuations.
- Countries can dampen their demand for oil, electricity and natural gas by renewing emphases on **energy efficiency measures**.

4. Preserving **natural capital**

- **Future economic development** depends on conservation of natural capital assets and the services they provide to the economy.

Why should 3R matter in environment and resource management?

5. Improving **economic competitiveness**

- In view of the **long-term upward trend and volatility** of oil prices as well as other **commodity prices**, **resource efficiency** has become a major determining factor in the competitiveness of firms and nations.

6. **Minimizing disposal costs**

- Over-reliance on simple **waste disposal** is unsustainable. Waste disposal must be viewed as just one part of **IWM**.

7. Developing **new business opportunities**

- Many profitable business opportunities are available both in **input-efficient production** and in **environmentally responsible recycling and waste disposal**.

8. Pursuing **social benefits**

- Developing countries can benefit from viewing the **environment industry as a potential source of employment** and long-term asset protection.

9. Avoiding **resource conflicts**

- Improved resource efficiency could lessen **potential pressures** and avoid root causes of **social conflicts** that could arise **from resource competition**.

Regional 3R Forum in Asia-Pacific

(a joint initiative of UNCRD and MoE-Japan)

Goal: To achieve low carbon and sound material cycle societies in Asia through facilitating bilateral and multilateral cooperation for increasing resource and energy efficiency through the 3Rs, and for promoting environmentally sound management of wastes in the region; to set in motion a regional mechanism to address 3R issues, needs and priorities in Asian countries, including emerging issues of concern in waste management (Tokyo 3R Statement, 2009).

Objectives:

- (a) facilitate **high-level policy dialogues** on 3R issues, challenges, & opportunities;
- (b) facilitate **improved dialogue and cooperation with international organizations and donor communities** for materializing and implementation of 3R projects at local and national level identified through national 3R strategies;
- (c) provide a **strategic and knowledge platform** for sharing experiences and disseminating among Asian countries best practices, tools, technologies, policy instruments on various aspects of the 3Rs;
- (d) provide a platform to develop **multilayered networks of and partnerships among stakeholders** such as governments, academia, scientific and research community, private sector, and NGOs;
- (e) generate international consensus and understanding on the beneficial aspects of the 3Rs in the context of achieving **MDGs, resource and energy efficiency, resource efficient economy, and climate change mitigation**; and
- (f) to provide a platform for **proliferation of national 3R strategies** in developing countries.

United Nations Centre for Regional Development (UNCRD)



(Photo: 5th Regional 3R Forum in Asia and the Pacific, Surabaya, Indonesia, 25-27 Feb 2014)

Key messages from 4th Regional 3R Forum in Asia-Pacific

- Sustainable resource use will be instrumental for Asia to ensure socio-economic development in a world in which **resources are more constrained and the absorptive capacity of ecosystems is decreasing rapidly**;
- The region is faced with a number of critical challenges when it comes to **integration of resource efficiency in overall policy, planning, and development**;
- Many countries have become **net importers of raw materials** (fossil fuel, metals, timber, and other natural resources), the rapidly increasing volume, **changing characteristics of urban and industrial waste**, rising population, increasing consumption and per capita waste generation have posed serious challenges for the sustainability of the region;
- **resource-efficient economic behaviour** is important in Asia because of its large population, population density, its growing dependence in sourcing natural resources from global markets, and the need to **improve the material standard of living of its people**;
- Change will not occur spontaneously but will require **well designed policies**;
- 3Rs and resource efficiency measures provide **employment and green job opportunities**;
- resource and waste management challenges of the twenty-first century will be comprehensively addressed by 3R policy initiatives and policy measures to **achieve an inclusive and green economic development** of Asia and the Pacific; **and**
- **Urged special attention to SIDS issues** with 3R + “Return” due to limited recycling industries and infrastructure and limited scale of markets

Key Messages and Recommendations of 5th Regional 3R Forum in Asia-Pacific, 25-27 Feb 2014

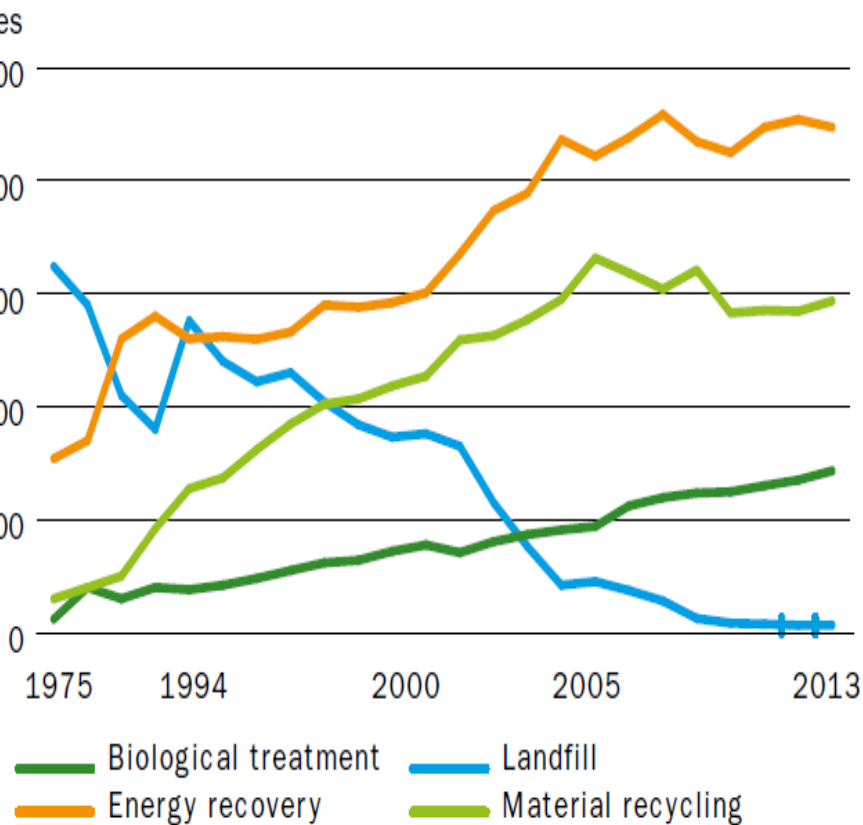
- ⇒ **Wastes and emissions are intrinsically linked with overall resource use**; natural resources and ecological assets are being used at increasing rate enabling economic growth and fuelling unprecedented growth of cities;
- ⇒ The goal of improving **resource efficiency and reducing the waste and emission intensity** for Asia-Pacific economies has become a **significant driver** of government policies and programs;
- ⇒ establishing **new forms of cooperation and partnerships** between govt, business, community will underpin successful implementation of 3Rs;
- ⇒ 3R needs to be linked to **other policy domain such as climate mitigation and adaptation, energy and water security, urban air pollution, and supply security of critical natural resources**;
- ⇒ One of the critical challenge is city level policy that mostly focus on end-of-pipe solutions rather than **waste prevention and minimization**;
- ⇒ Eco-parks and eco-towns need to encompass a range of **eco-initiatives including biodiversity and resource efficiency** and promote it across the region;
- ⇒ **Triangular cooperation** (Govt-Scientific-Private) is key to develop viable and effective business models in 3Rs and waste management;
- ⇒ Through the adoption of the **Surabaya 3R Declaration**, Asia-Pacific countries recognized the role of **multilayer partnerships and cooperation for advancement and implementation of 3Rs in the region**;
- ⇒ Establishment of **research, innovation and practice (RIP)** parks in the region should be established and support **Waste to Resource (W2R)**; and
- ⇒ **Sustainability and resiliency of cities**, and thereby the role of 3Rs, are critically important in post 2015 development agenda,

Surabaya 3R Declaration ~ on Promotion of Multilayer Partnerships and Collaboration for the Expansion of Reduce, Reuse and Recycle (3Rs) in Asia and the Pacific

- **country-country cooperation**, with specific emphasis to **south-south cooperation**, in exchanging valuable experiences and ideas, transferring knowledge and technologies, building 3R infrastructure;
- **city-city & inter-municipal cooperation** in exchanging practical experiences and ideas in realizing **sustainable and livable cities** with efficient waste management system;
- **multi-sector partnerships and collaboration**, including triangular cooperation (Government-Private-Scientific and Research) for **sustainable business models in 3R areas**;
- **industry-industry cooperation** for creating local and regional **recycling markets**;
- **government-NGO/CSO cooperation** to reduce waste management costs and **increase municipal cost savings**;
- a **regional cooperative framework among SIDS/PICs** to develop self sustaining 3R activities and easily adaptable technologies, including a pool of well-trained 3R practitioners; **viable business models for local employment creation**; and
- a multilayer partnership in the area of **disaster waste management** in order to provide capacity building for disaster response and **strengthened community resilience**.

Case of Sweden (Contd.)

Waste Trend 1975-2013 in Sweden



Waste Prevention

Preventing the creation of waste is the first step in the waste hierarchy. It is the priority of both Swedish waste legislation. The waste hierarchy priority is:

- »» waste prevention
- »» reuse
- »» material recycling, including preparation for reuse
- »» other recycling, e.g. energy recovery
- »» disposal.

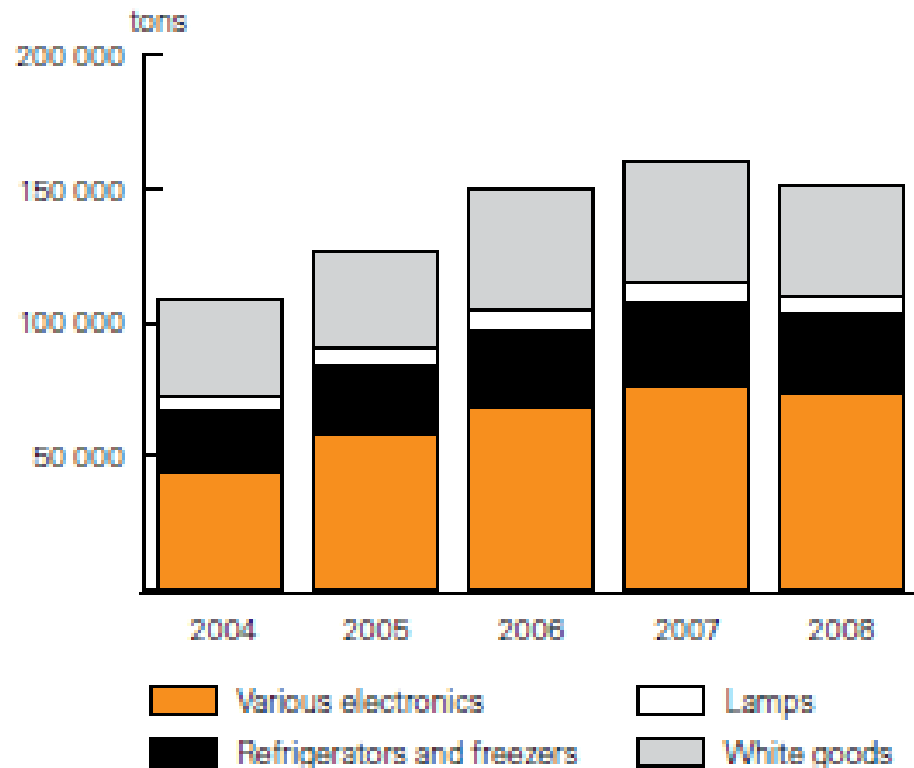
Source: Avfall Sverige Swedish Waste Management (2014)

Case of Sweden (Contd.)

Sweden – world leader in Electric And Electronic Waste Collection

Collected quantities from all collection points, households and businesses

E-waste management systems is “The Collector”



One of these systems is “**The Collector**”, a special device which is placed in stores, where the public may turn in light bulbs and smaller WEEE.

Case of Sweden (Contd.)

Waste Society of Borås / Sweden – Towards Zero Landfilling

National (and EU) driving forces

- Producer responsibility of e.g. paper and packaging
- Landfill ban on organic and combustible
- High tax on landfilling



Case of Sweden

Collaboration model of “Waste Recovery International Partnership”



All competence on waste treatment in one organization:
 “Waste Recovery International Partnership”



Plus:

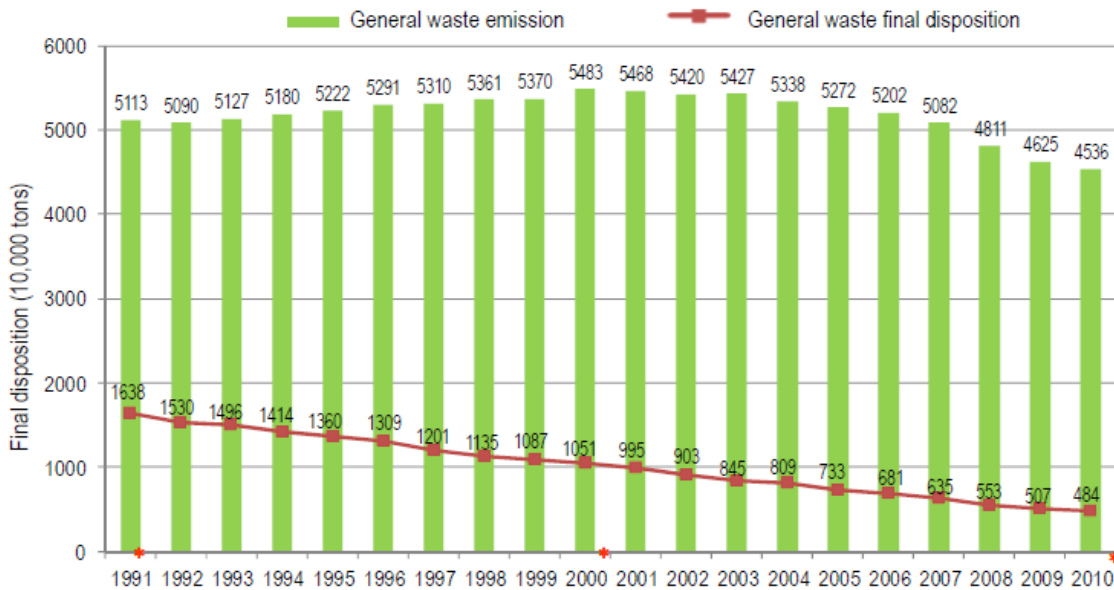
- Biogas System
- F.O.V. Fabrics AB
- KTH Architecture and the Built Environment
- Läckeby Water AB
- Metso Power
- Navet Science Center (for children)
- SAAB AB
- Scandfiltet
- Sweco Architects
- Uponor
- Sakab
- Stena Metal
- VA – Teknik (SP)
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Case of Japan (Contd.)

Changes in the amount of generated waste and Waste-to-energy technology

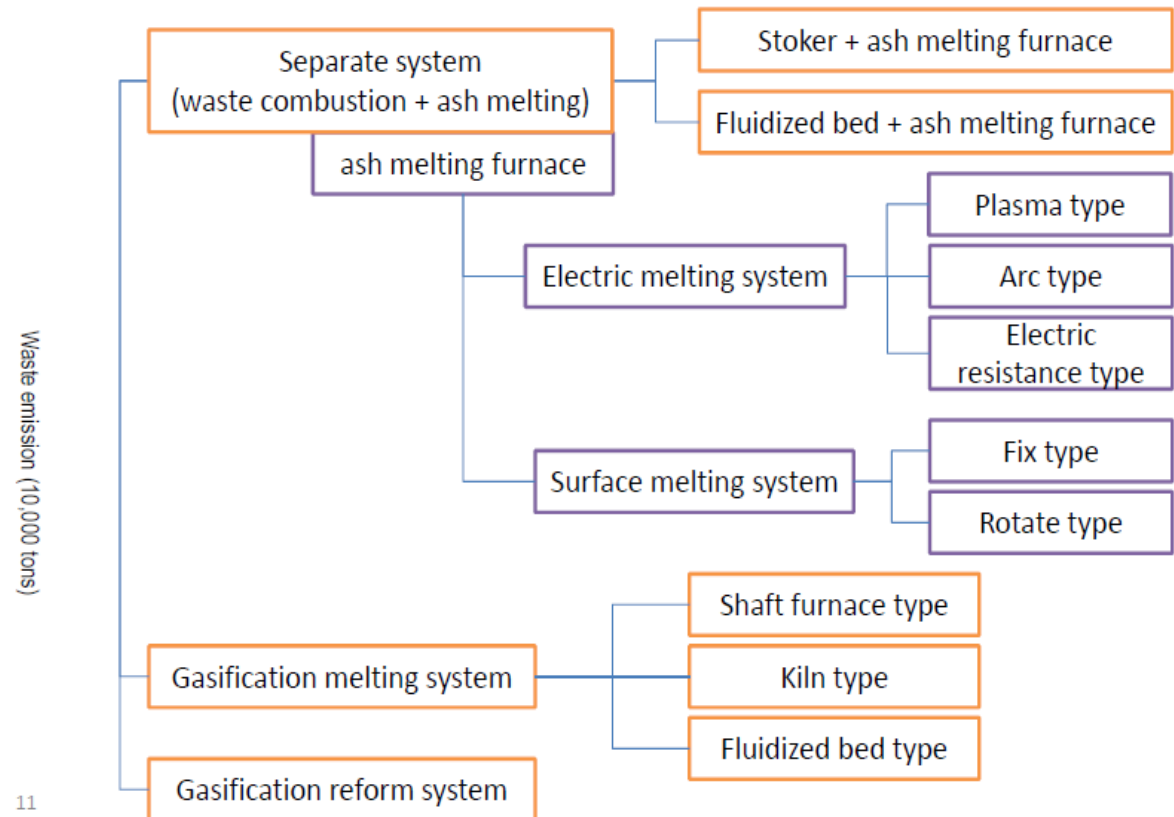
Changes in Municipal Solid Waste Generation in Japan

The amount of final disposition tends to decrease along with progress in recycling and reduction.



Year	Waste emission per day per head (g/man-day)
1991	1,118 (g/man-day)
2000	1,185 (g/man-day)
2010	976 (g/man-day)

Classification of “waste-to-energy” technology



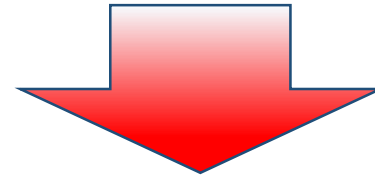
Case of Japan (Contd.)

❖ **Basic principle:** Aiming at establishing a sustainable recycling city

❖ **Targets of the Basic plan**

1. Promoting efforts to reduce waste: Reduce waste produced by 180 grams per citizen per day.
2. Promoting recycling: 200,000 tons of recycling for the entire city (35% recycling rate)
3. Reducing incinerated waste: Reduce incinerated waste by 130,000 tons

Plan period : FY 2005 to 2015



- ❖ **Lengthening the remaining life of final landfill sites**
- ❖ **Achieving a structure using three processing centers**
- ❖ Establishing an effective and efficient waste management system by having three of the four incineration facilities in operation.

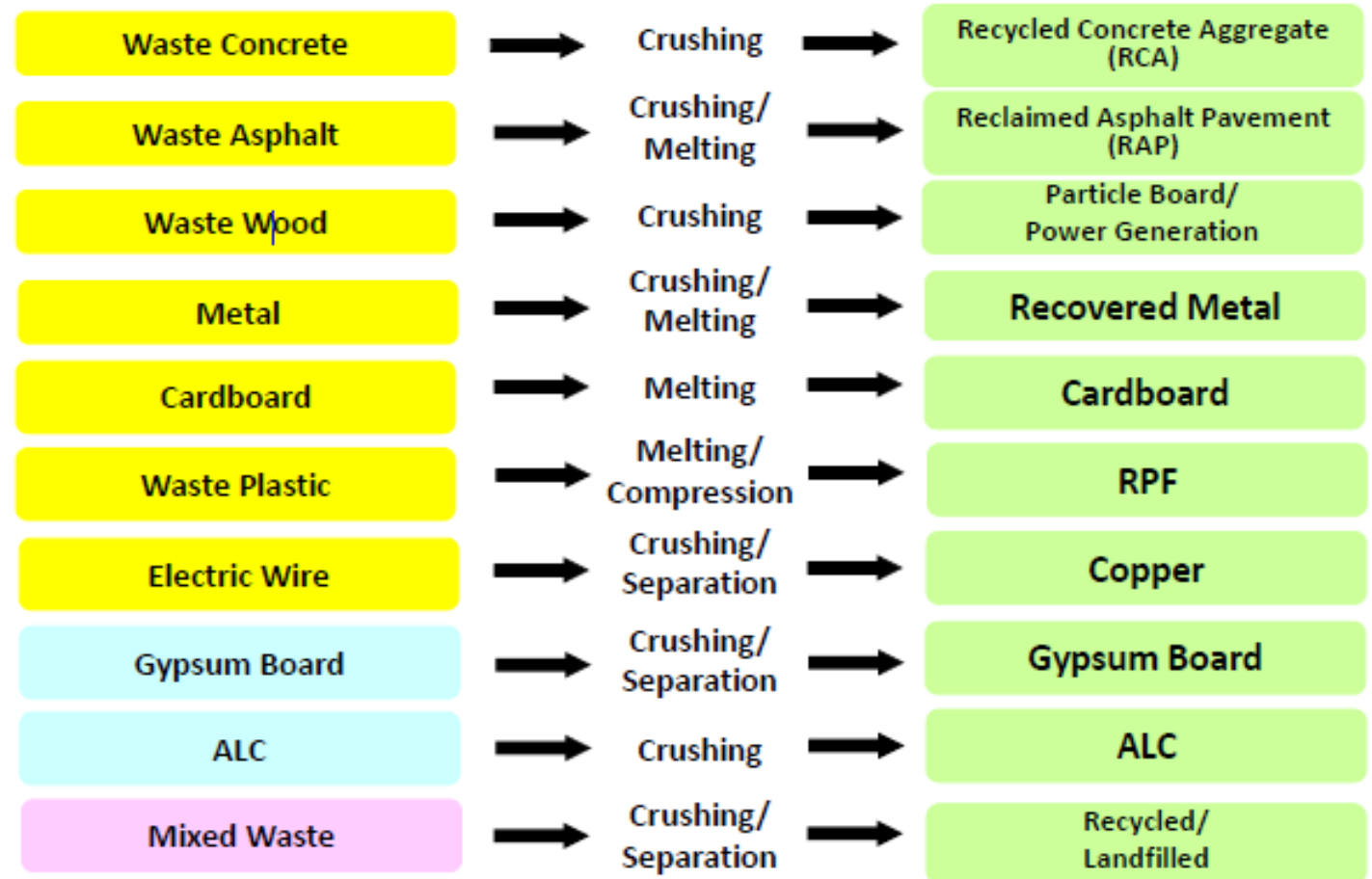
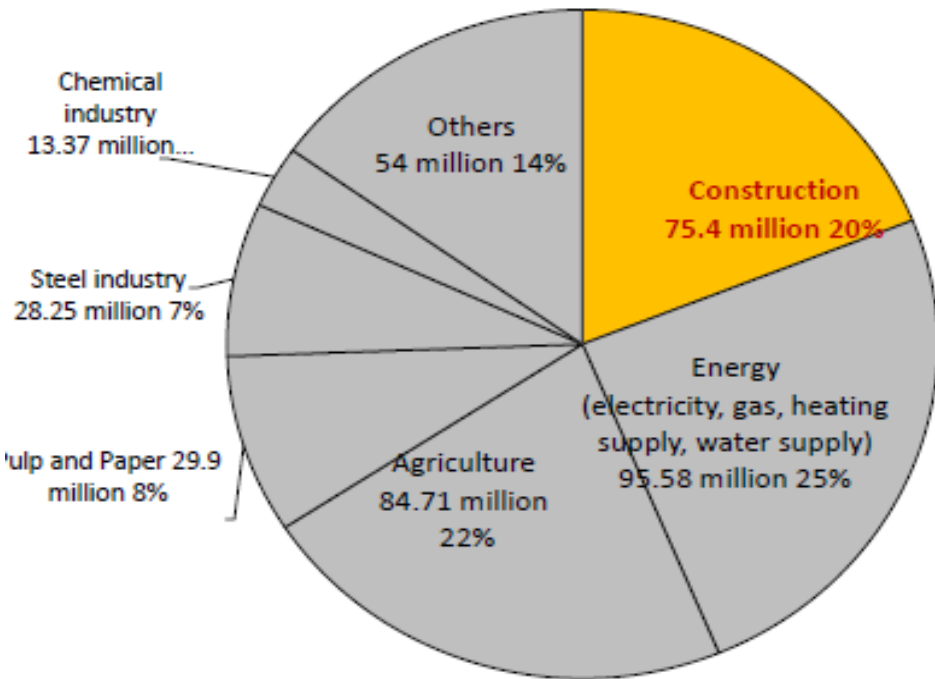


Case of Japan (Contd.)

Construction and Demolition Waste Management in case of Japan

Construction Waste Treatment

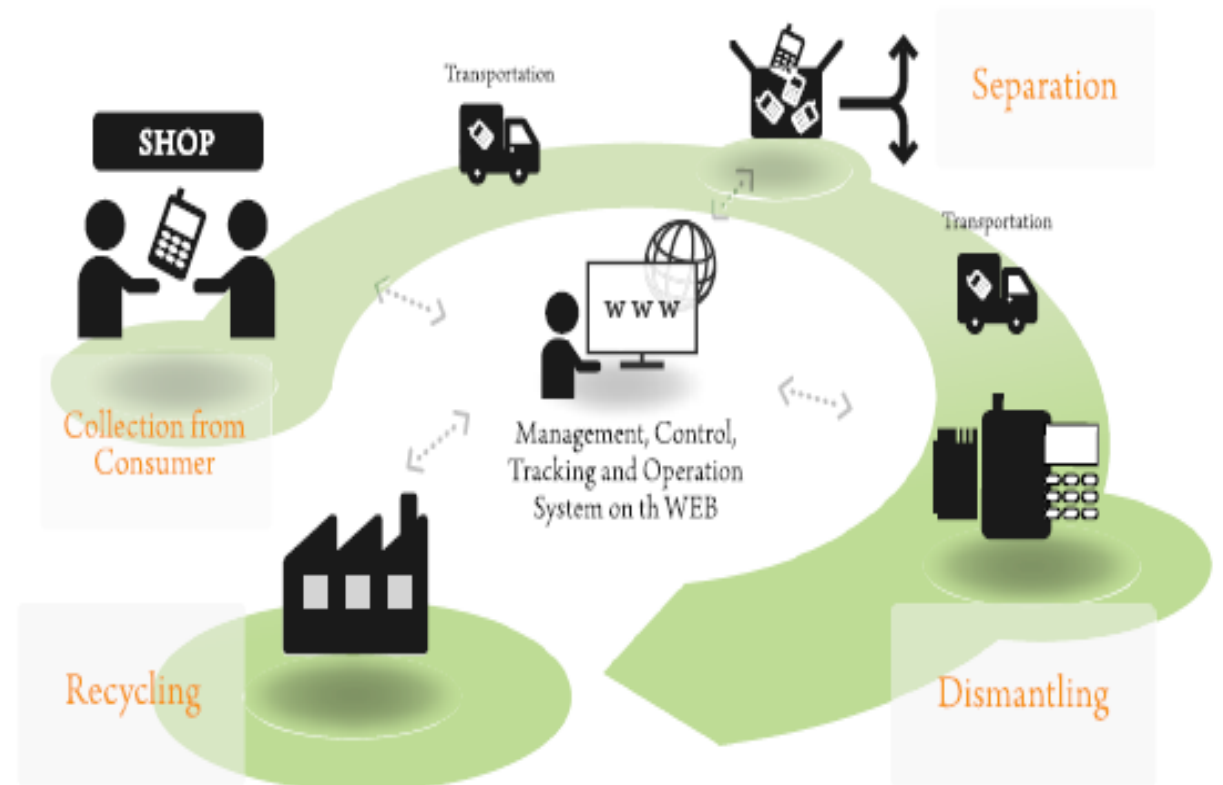
Construction Waste Generation



Case of Japan (Contd.)

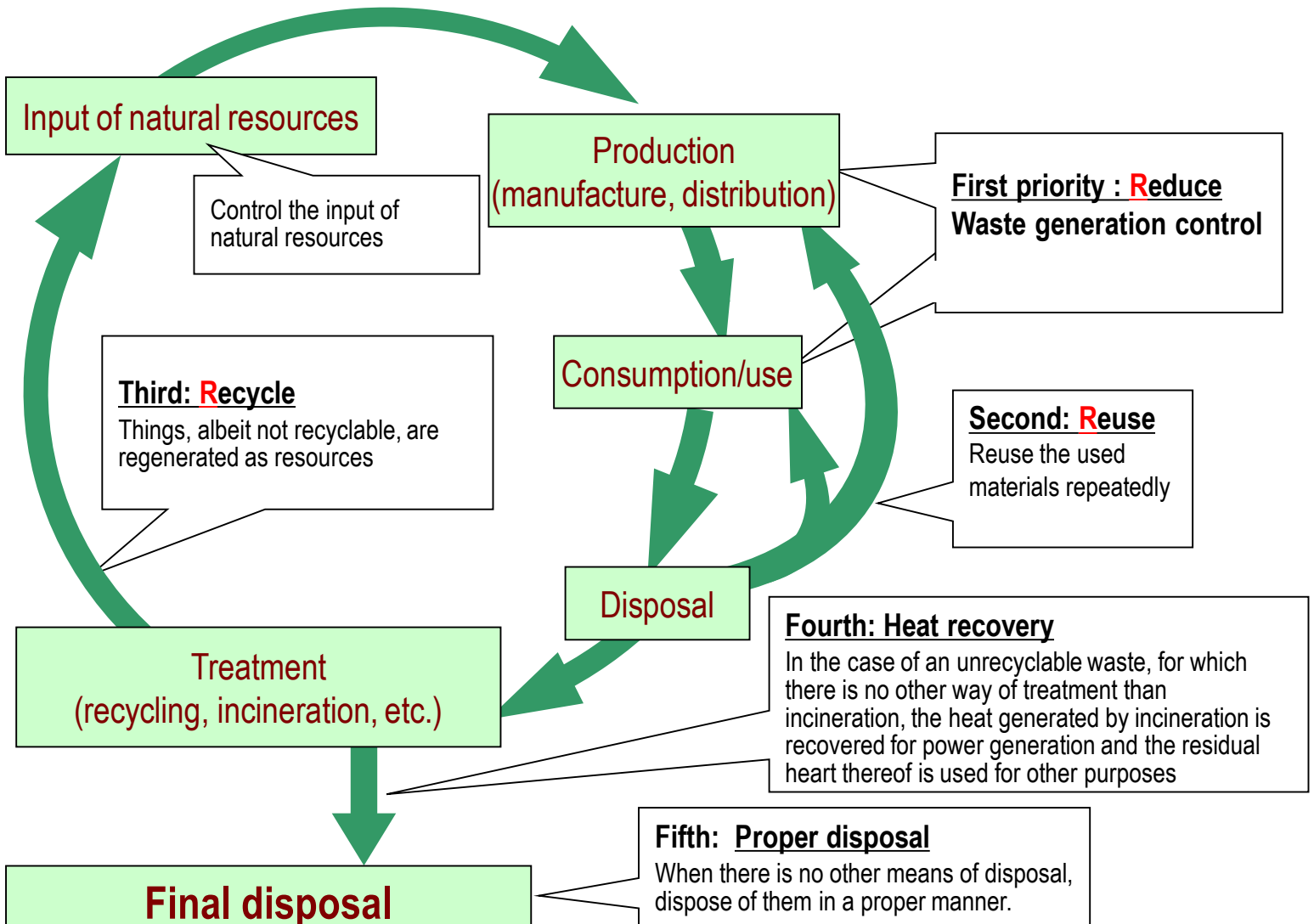


Domestic Mobile Phones Recycling Business systems



Case of Japan

Concept of a Sound Material-Cycle Society
(cf. the Basic Act for Establishing a Sound Material-Cycle Society)

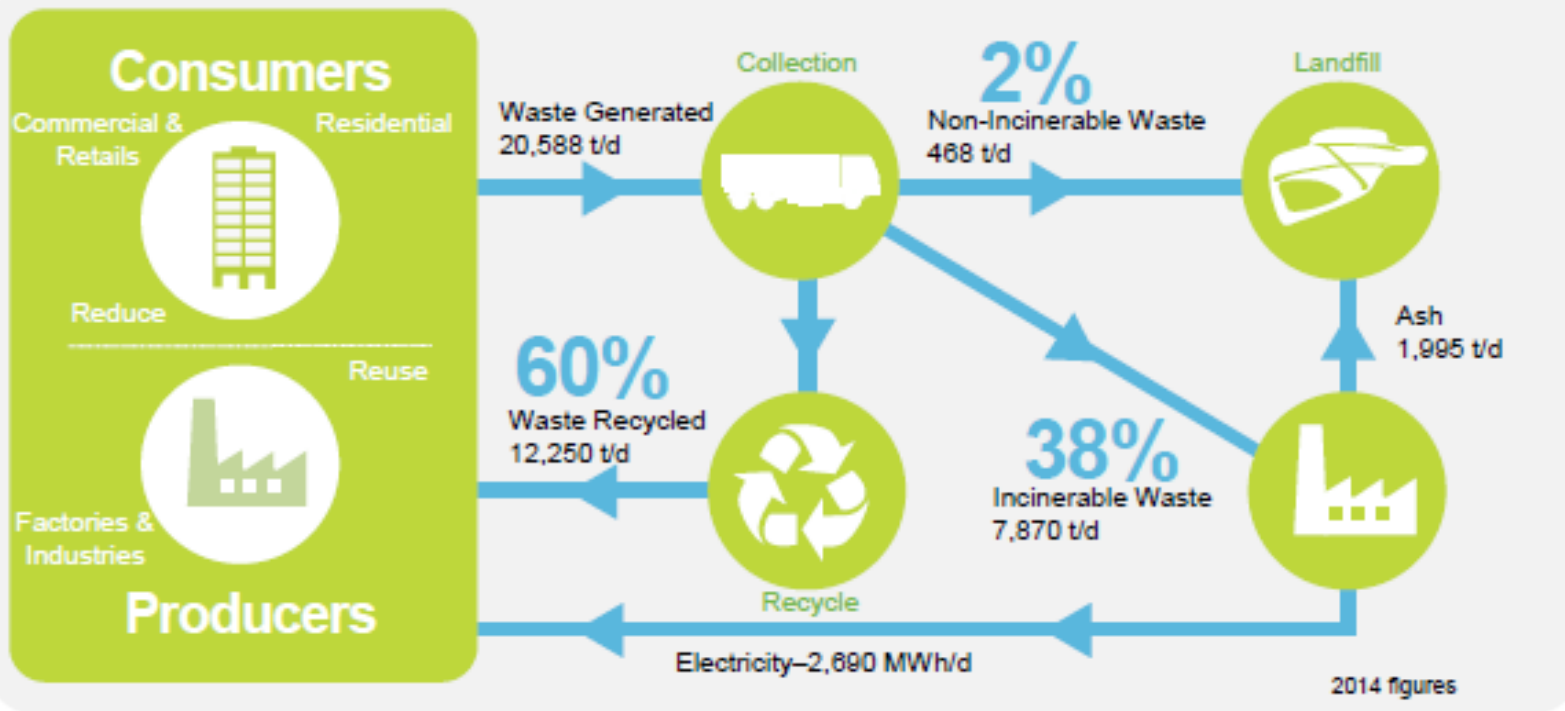


Case of Singapore (Contd.)

SSB 2015: Target to achieve 70% overall recycling rate by 2030

An efficient system for waste collection and disposal is critical in Singapore, given our limited land area and dense population.

Dual Chute System



Pneumatic Waste Conveyance Systems (PWCS) for GreenPrint at Yuhua



Case of Singapore (Contd.)

Distinct Bin Design



- ❑ Singapore has a good recycling bin design includes clear labelling.
- ❑ They are colour-coded and comes with customized bin lid openings for easy identification and proper usage by shoppers and tenants.

Packaging Materials



- ❑ Encourage suppliers to provide reusable plastic crates instead of disposable cardboard boxes
- ❑ Identify and encourage suppliers/retailers to reuse cardboard boxes or other 'waste' products
- ❑ Encourage suppliers and retailers to look at alternatives such as refills in original containers
- ❑ Encourage the use of reusable shopping bags instead of single-use plastic carrier bags

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Education and Raising Awareness



- ❑ In partnership with recognised environmental organisations, such as NEA
- ❑ Organise events to raise public awareness on the 3Rs
- ❑ Provide information to retailers and shoppers to encourage the 3Rs

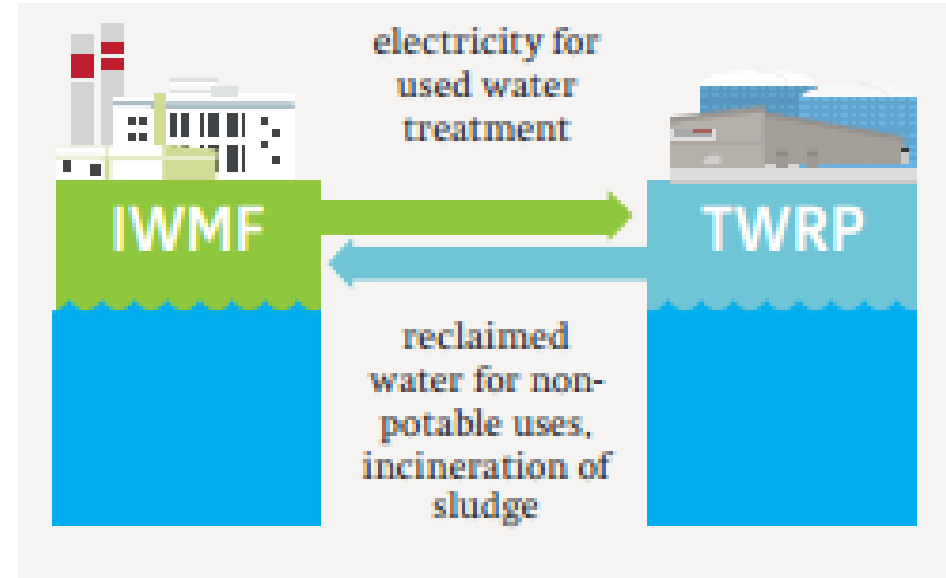
Case of Singapore

Multi-Storey Recycling Facility (MSRF)

~ Making Land Available for Recycling ~



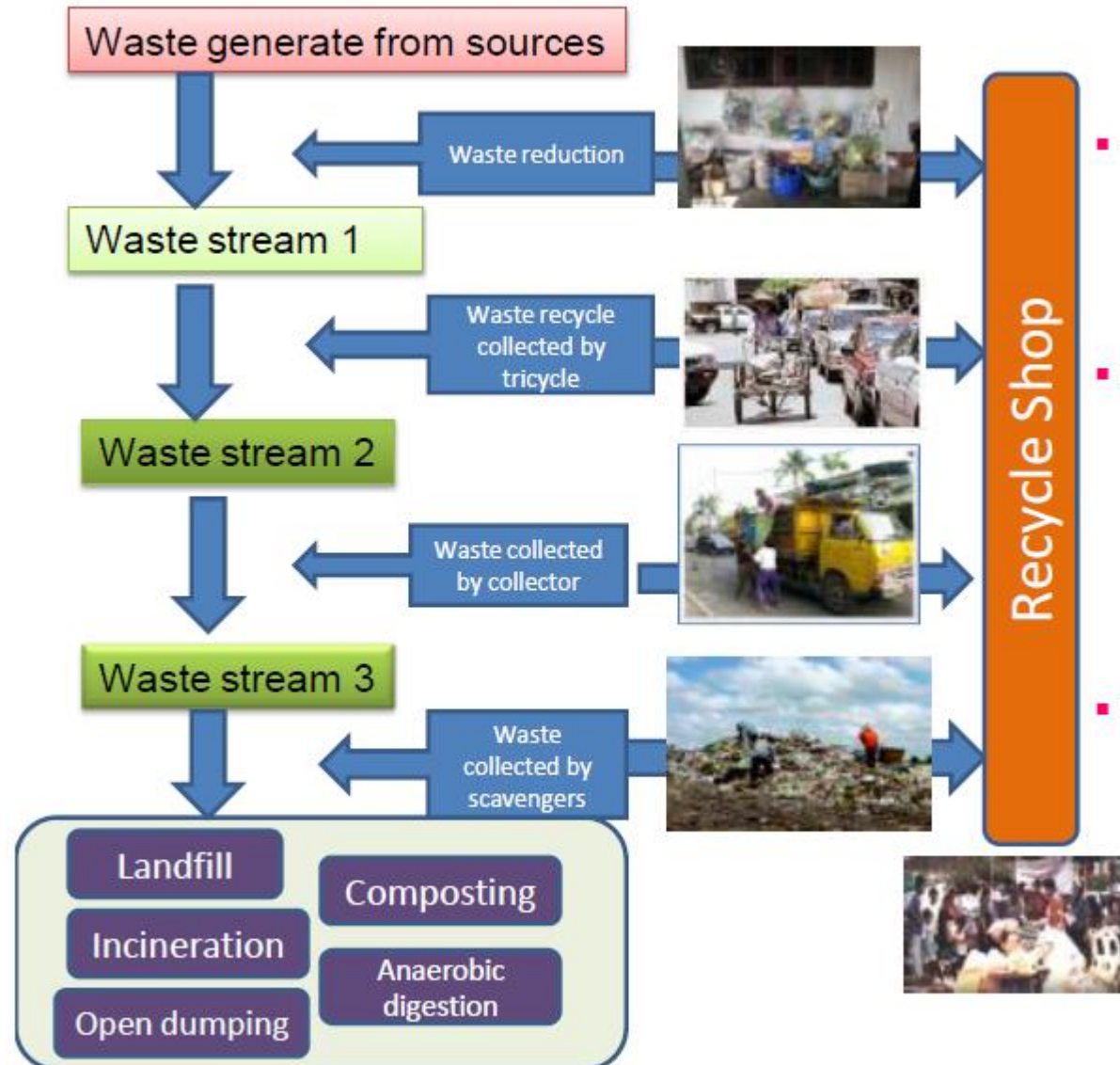
Multi-Storey Recycling Facility (MSRF)



Singapore is co-locating its upcoming Integrated Waste Management Facility (IWMF) with the Tuas Water Reclamation Plant (TWRP) to optimise land use and realise process synergies in the water-energy-waste nexus.

- Potential land saving for higher value-added economic activities by consolidating recycling activities within the facility
- Exploring feasibility to develop a MSRF - A multi-storey, multi tenanted facility processing different waste streams that could share common facilities and services e.g. weighbridges, parking depot

Case of Thailand (Contd.)



- 40-60% of solid waste general can be recycled and reused
- The 3 top recycled waste categories are
 - Paper 57%
 - Glass 19%
 - Plastic 15%
- The recycling rate has increased approximately 9% every year

Case of Thailand

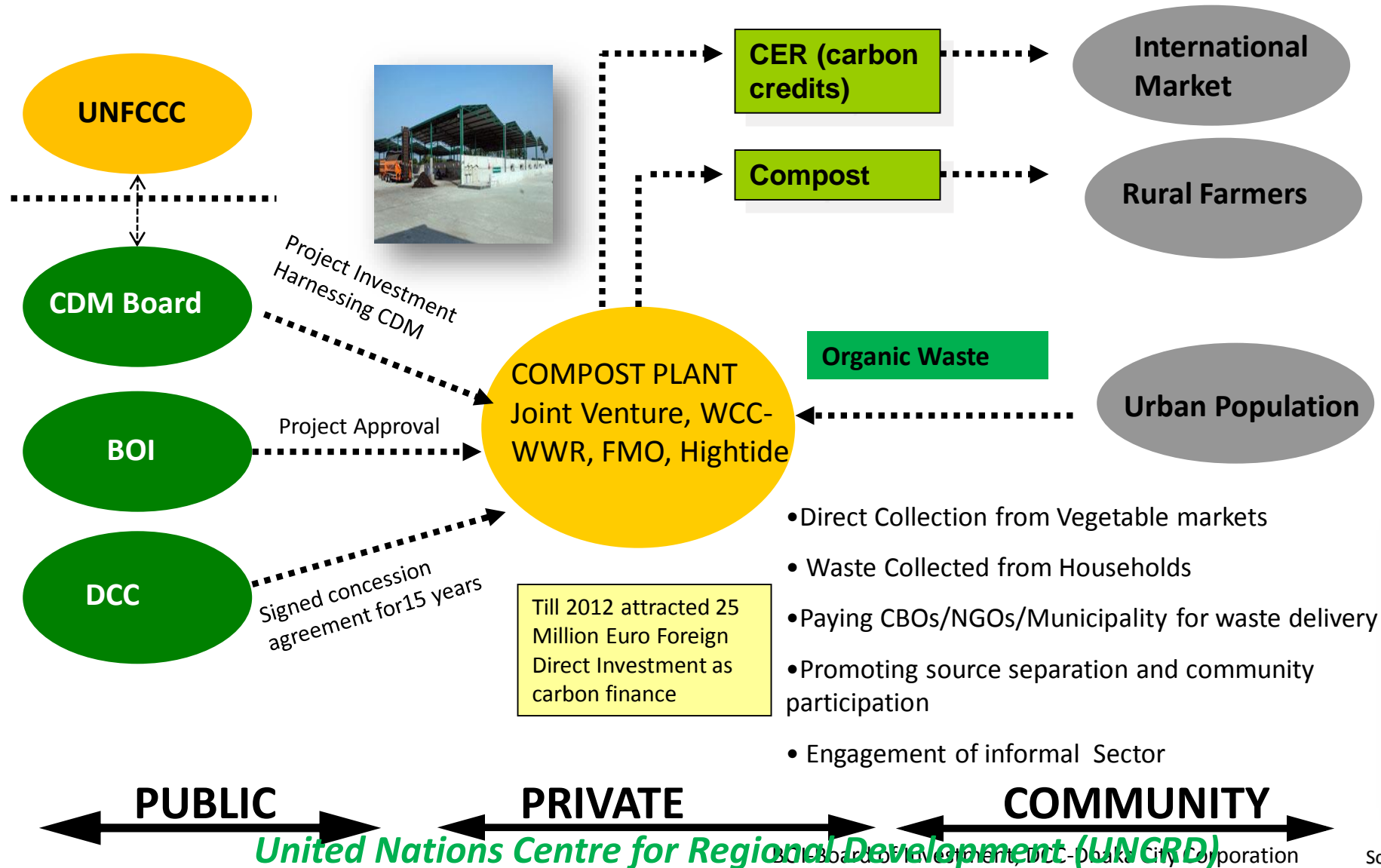
Key Measures

- Reducing resource use, and lowering greenhouse gas emissions in accordance with the principle of reduce, reuse and recycle
 - Develop towns or eco-industrial towns to become a low-carbon society
 - Support the production, use, R&D of renewable and alternative energy sources, with the objective of replacing 25% of the energy generated by fossil fuels within the next decade
 - Promote energy conservation through reduction of power usage in the production process by 25 % within the next two decades



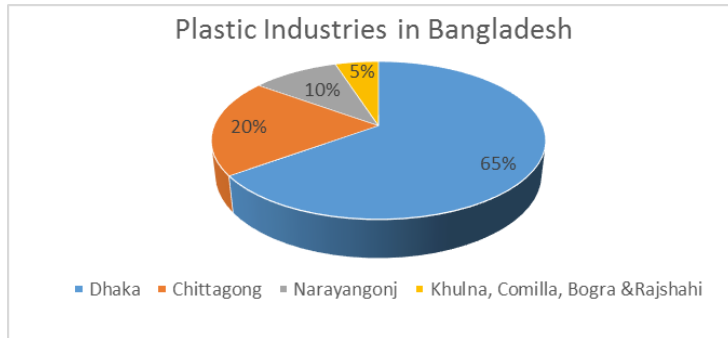
Case of Bangladesh (Contd.)

PPP Model for Centralized Community Based Composting in Dhaka

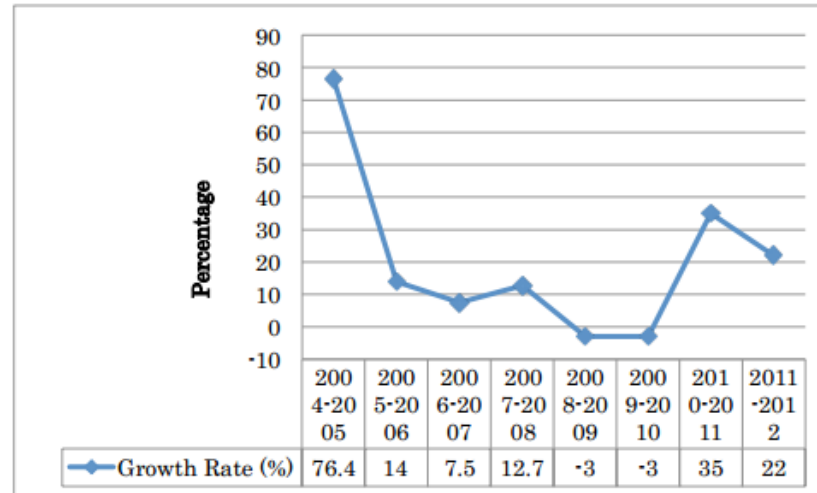


Case of Bangladesh (Contd.)

Business opportunity: Recycling of plastic waste in Bangladesh



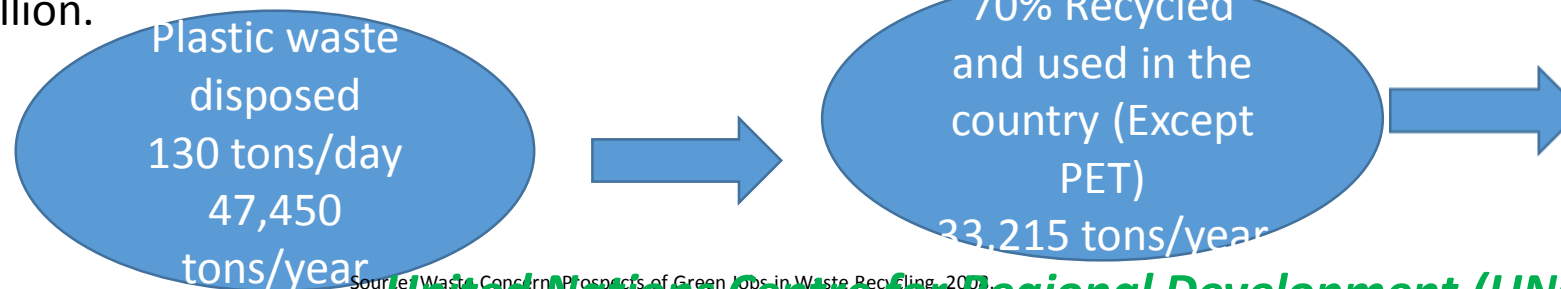
Plastic waste is ranked **12th** in terms of **export oriented sectors** of the country



Plastic waste recycling follows **direct economic benefit**

- (a) **Less landfilling** requirement
- (b) **Large recycling industry jobs and economic output**
- (c) **Direct savings** of foreign currency

❖ Per capita consumption of plastics in Bangladesh is 5 kg per year. The plastic sector constitutes **1.0 of GDP** and provides **employment for half a million people**. Total export earning for both direct and deem exports is about US \$ 337 million.



- ❑ **Generating 21,000 jobs**
- ❑ **Saving expenditure** of Tk3.08 crore by avoiding plastic waste
- ❑ **Saving Foreign currency** of US \$51 million/ year by avoiding import of virgin plastic.

Case of Bangladesh

Business opportunity: Recycling of lead acid battery in Bangladesh

- ❖ Recycling of lead acid batteries are taking place in an **environmental sound manner** to adopt public policy for **economically efficient** and also keeping in view the **health hazards arising from exposure to lead**.
- ❖ Lead acid battery has more than **ten parts** such as, plates, separator, hard rubber container, lead, bitumen, battery cap, cork, connectors, electrolyte, electrical accumulator, negative plate or anode positive plate or cathode, sealant and chemical compound: CFCs, carbon tetrachloride, halons, methyl chloroform, lead, Sulphuric acid.
- ❖ Approximately, **3,420 tons of lead are recovered per year** from ULABs in Bangladesh. This allows to meet **60%** of the total lead requirement of the country **from secondary lead**.

In recycling process, the price of used battery is increasing by about 100% in each stage of transfer.

Small buyers → Broker → Separator → Re-builder/Smelter

❑ **Recovered Lead:** 6000 ton/Year

❑ **Savings:** 4.73 million US\$/year

(avoiding lead import using foreign currency (60% recycling rate at present))

❑ **Jobs Created:** 6000 new jobs



Case of Rep of Korea (Contd.)

Comparison of Strategic Environmental Assessment and Environmental Impact Assessment

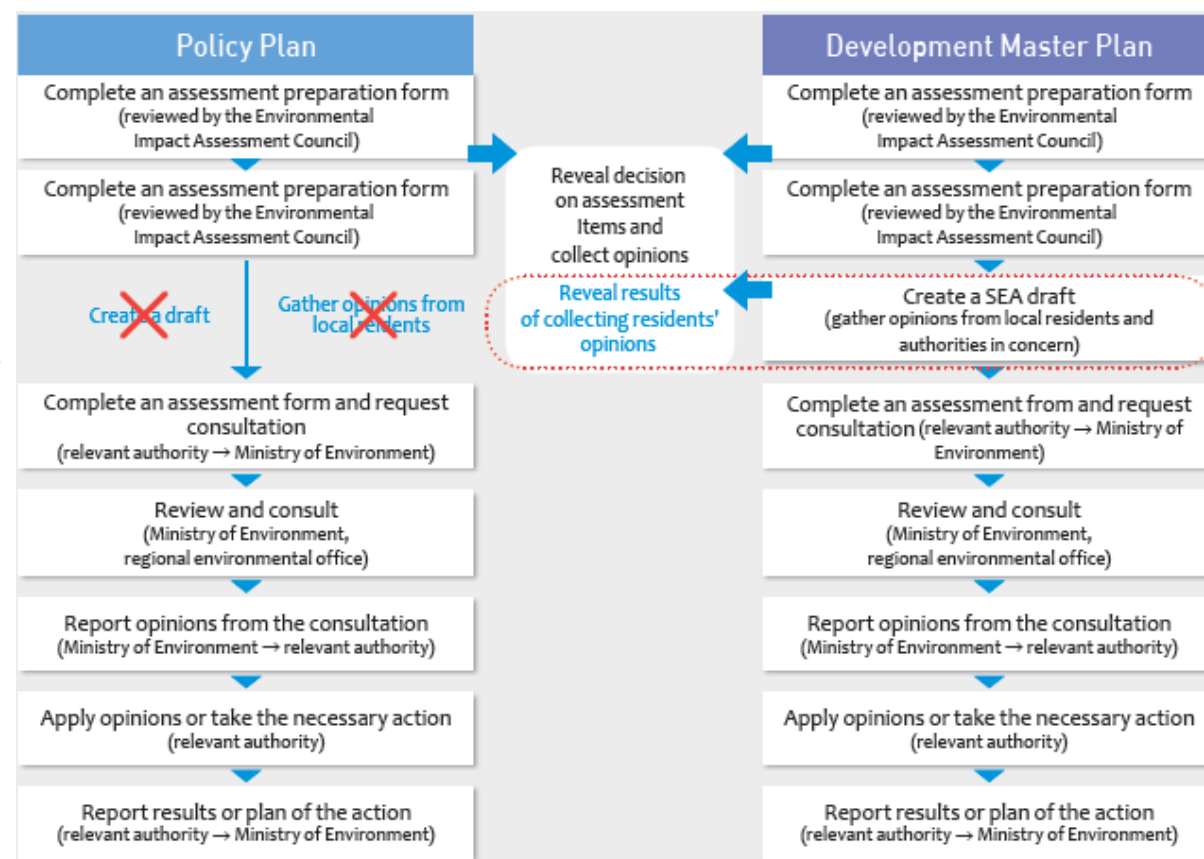
Environmental Impact Assessment(EIA)

- Carried out at the **final stages** of decision making
- **Passive approach** to the proposed development plan
- **Specific investigation** of environmental impacts
- **Difficult to consider alternatives**
- **Difficult to review cumulative impact**
- Focused on **measures to minimize environmental impact**
- Very **detailed review** within a small range

Strategic Environmental Assessment(SEA)

- Carried out at the **early stages** of decision making
- **Active approach** to the proposed development plan
- Investigation of relevance to sustainable development and environment
- **Can consider a wide range** of potential **alternatives**
- **Early warning** regarding **cumulative impact**
- Focused on achieving environmental **purposefulness** and maintaining **natural environmental systems**
- Less detailed but can suggest visions and a comprehensive framework from a **broader perspective**

Strategic Environmental Assessment Procedure

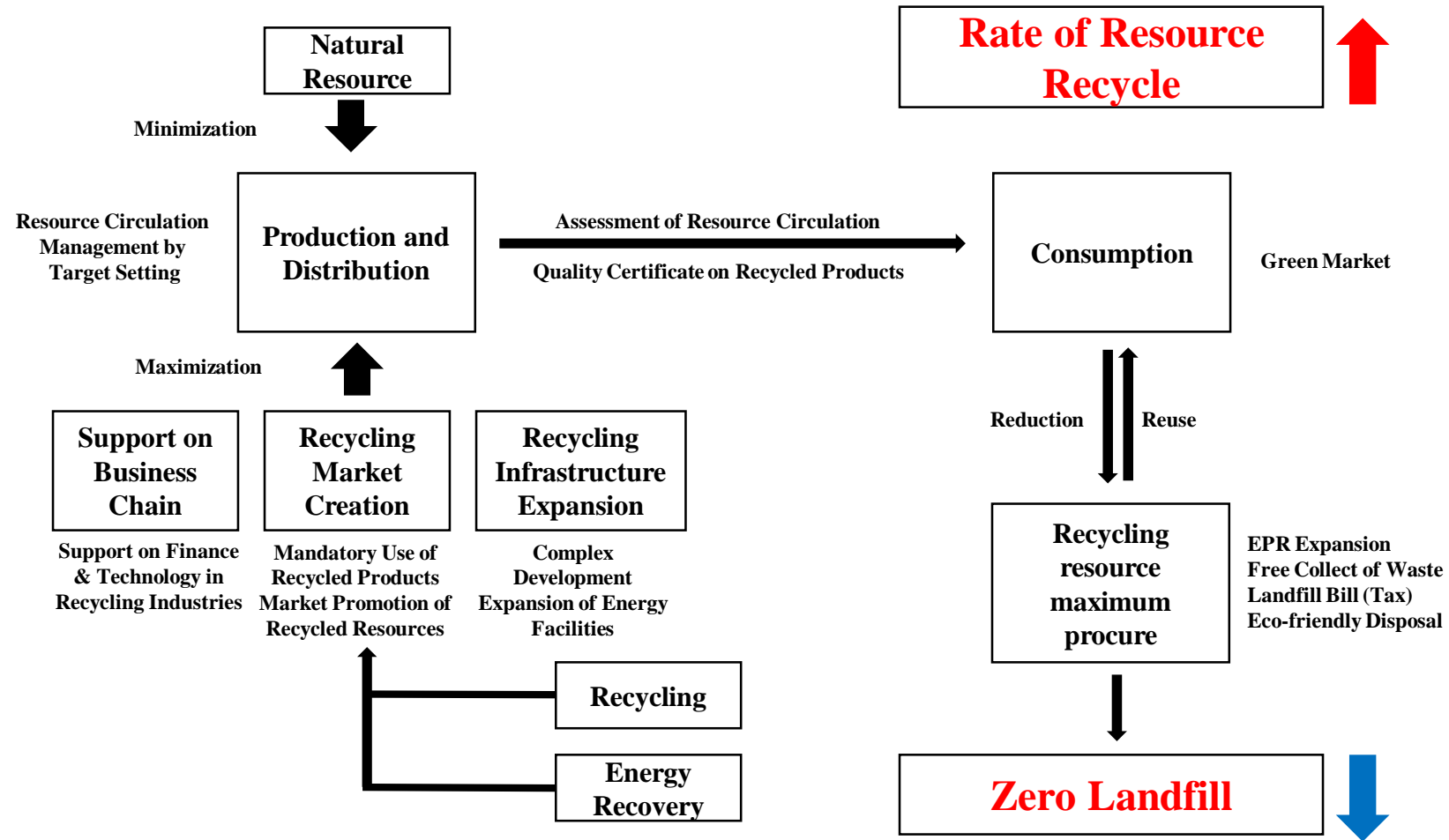


Source : Waste Environmental Review 2015, Korea

Case of Rep of Korea (Contd.)

New Waste Management Policy

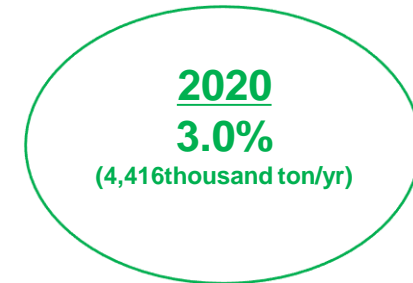
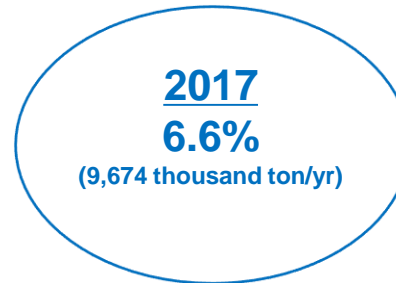
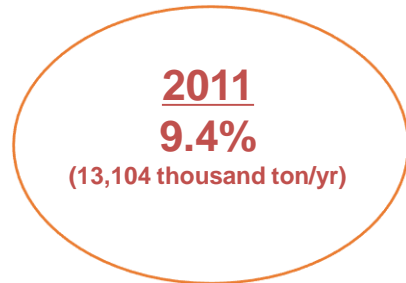
- Structure of Resource Circulation Society (RCS)



Case of Rep of Korea

- **New Waste Management Policy (Goals)**

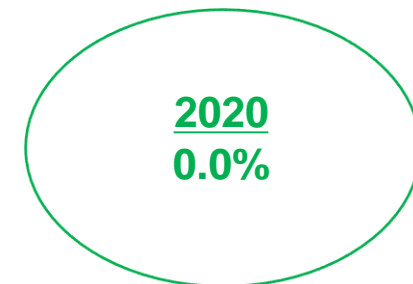
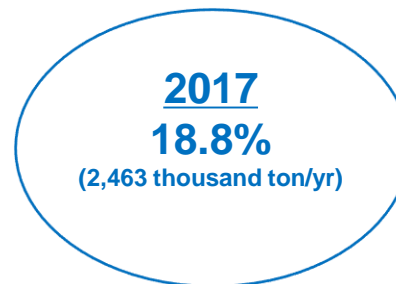
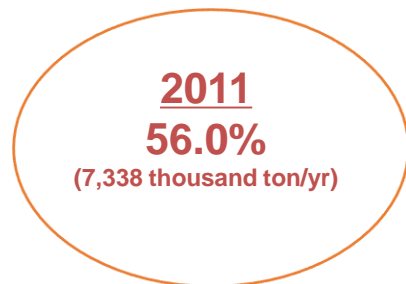
- Landfill Rate of Waste in Overall



※ Landfill rate of household waste of developed country is 0.42% in Germany, 0.97% in Sweden, 3.8% in Japan based on 2010

So, those countries actually achieved the landfill zero of recycling available resource

- Landfill Rate for Recyclable Waste



Sustainable Development Goals (SDGs) ~ Post-2015 development agendas

Goal 1 End poverty in all its forms everywhere

Goal 2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3 Ensure healthy lives and promote well-being for all at all ages

Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5 Achieve gender equality and empower all women and girls

Goal 6 Ensure availability and sustainable management of water and sanitation for all

Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Goal 10 Reduce inequality within and among countries

Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12 Ensure sustainable consumption and production patterns

Goal 13 Take urgent action to combat climate change and its impacts*

Goal 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17 Strengthen the means of implementation and revitalize the global Partnership for sustainable Development

Direct or Indirect Relevance of 3Rs in Post 2015 Development Agenda / SGDs (Contd.)

❖ Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

- ✓ Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality – **3R (full scale utilization of organic waste as composting for sustainable agriculture and food security)** (Hanoi 3R Declaration / Goal 2)

❖ Goal 3: Ensure healthy lives and promote well-being for all at all ages

- ✓ Target 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination – **3R (proper and effective management of hazardous waste and chemicals)** (Hanoi 3R Declaration / Goal 9, 13, 14, 16, 26)

❖ Goal 6: Ensure availability and sustainable management of water and sanitation for all

- ✓ Target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and increasing recycling and safe reuse by [x] per cent globally – **3R (type and level of waste management and sewage treatment activities are important drivers for water quality, quantity and security); Reuse and recycling wastewater)** (Hanoi 3R Declaration / Goal 25)
- ✓ Target 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity – **3R and resource efficiency (water efficiency by using water saving technologies, rain water harvesting, desalination, wastewater treatment/reuse/recycling technologies)** (Hanoi 3R Declaration / Goal 18, 20, 22, 24)

Direct or Indirect Relevance of 3Rs in Post 2015 Development Agenda / SGDs (Contd.)

- ❖ **Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all**
 - ✓ **Target 7.1** By 2030, ensure universal access to affordable, reliable and modern energy services – **3R (waste-to-energy as affordable energy sources)** (Hanoi 3R Declaration / Goal 2, 11, 28)
 - ✓ **Target 7.3** By 2030, double the global rate of improvement in energy efficiency – **3R and resource efficiency (cleaner production, technologies for clean energy and renewable energy)** (Hanoi 3R Declaration / Goal 5, 6, 22, 24)

- ❖ **Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**
 - ✓ **Target 8.2** Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value-added and labour-intensive sectors – **3R and resource efficiency (state of art resource recovery facilities, recycling industries, waste to energy, eco-industrial zones, etc.)** (Hanoi 3R Declaration / Goal 3, 5, 8, 23)
 - ✓ **Target 8.4** Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead – **3R (resource and material efficiency, circular economy, sound material cycle)** (Hanoi 3R Declaration / Goal 3, 5, 6, 7, 8)
 - ✓ **Target 8.5** By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value – **3R (Hanoi 3R Declaration calls for health and safety aspects in waste sector, complete elimination of illegal engagement of children in informal waste sector, mandatory of health insurance for informal waste pickers)** (Hanoi 3R Declaration / Goal 32)

Direct or Indirect Relevance of 3Rs in Post 2015 Development Agenda / SGDs (Contd.)

❖ Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

- ✓ Target 11.6 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 – **3R and zero waste policies, programs and infrastructures are intrinsically linked to realization of safe, resilient, smart and sustainable cities with a focus to quality of life and better living conditions; e.g., Japanese eco-towns, which serve good examples to demonstrate how science-policy-business are closely tied to each other for their own success and survival as well as achieving resiliency. (Hanoi 3R Declaration / Goal 4, 9, 13, 16, 18, 25)**

❖ Goal 12: Ensure sustainable consumption and production patterns

- ✓ Target 12.1 Implement the 10-year framework of programmes on sustainable consumption and production patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries – **3R policies, programmes and infrastructure directly contribute to SCP through resource efficient development (Hanoi 3R Declaration / Goal 3, 5, 6, 7, 8)**
- ✓ Target 12.2 By 2030, achieve the sustainable management and efficient use of natural resources – **3R / LCA directly contribute to sustainable use of natural resources and virgin raw material / recyclables substituted as secondary raw materials (Hanoi 3R Declaration / Goal 3, 4, 5, 6, 7, 8, 17, 19)**
- ✓ Target 12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses – **3R policies contributes to reduction of food waste (Hanoi 3R Declaration / Goal 10)**
- ✓ Target 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– **3R policies, programmes and infrastructure directly contribute to safe and environmentally sound management of hazardous and toxic chemicals and wastes (Hanoi 3R Declaration / Goal 9, 13, 14, 26)**

Direct or Indirect Relevance of 3Rs in Post 2015 Development Agenda / SGDs

- ✓ Target 12.5 By 2030, substantially reduce waste generation through **prevention, reduction, recycling and reuse**
- ✓ Target 12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities – **3R policies, programs, markets promote trade in recyclable products, green purchasing, eco-products** (Hanoi 3R Declaration / Goal 21, 22, 23)

❖ Goal 13: Take urgent action to combat climate change and its impacts

- ✓ Target 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning – **robust 3R policies, programs, infrastructure and market could reduce unnecessary reliance on landfilling responsible for emission of CH₄, a potent GHG** (Hanoi 3R Declaration / Goal 18, 19, 21)

❖ Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

- ✓ Target 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution – **a robust 3R policy, programme, and recycling infrastructure prevents plastics and other land-based pollutants getting into ocean and water bodies** (Hanoi 3R Declaration / Goal 12, 25, 31)

Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

- ✓ Target 17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection – **3R as an economic industry could help with domestic resource mobilization and other revenue generation; multi-layer partnership, including international partnership and cooperation in 3R areas (country-country, city-city, inter-municipal cooperation, industry-industry cooperation) through “Surabaya 3R Declaration (2014)”** (Hanoi 3R Declaration / Goal 3, 23, 29)

Thank you!!