

Plenary Session 2:

3R and Resource Efficiency towards Resilient Cities and Societies ~ Implications towards SDGs

MOVING TOWARDS RESOURCE EFFICIENT AND RESILIENT SOCIETY INSIGHTS INTO **SINGAPORE'S POLICY INITIATIVES**

2 November 2016 | Seventh Regional 3R Forum in Asia and the Pacific

Presented by:

Mr Ram Bhaskar

Director-General, Environmental Protection Division

National Environment Agency



Outline

1. Background
2. Solid waste management in Singapore
 - Key considerations for policy formulation / infrastructure development
 - Waste management strategies
3. Policies / programmes for 3R and solid waste management

1 BACKGROUND

Introducing Singapore



Country and a City-State

Small Land Area
719.2 km²

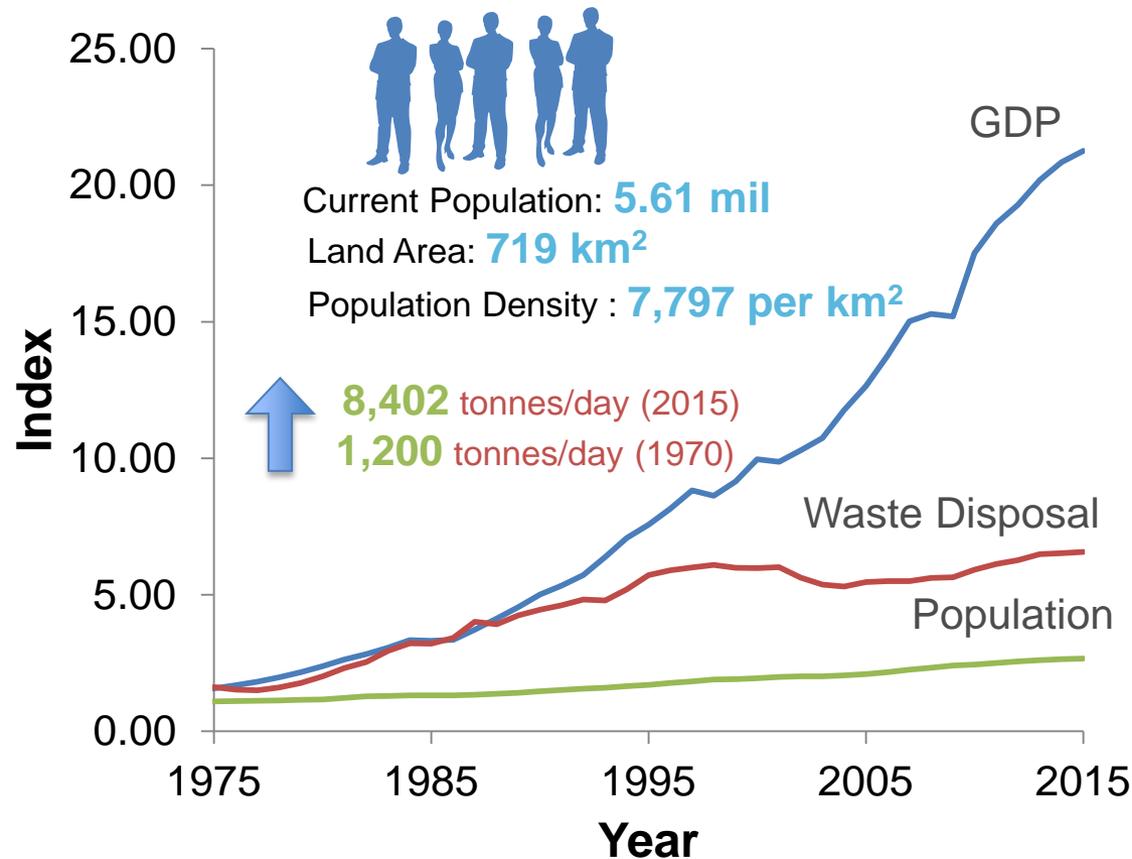
Dense Urban Setting
5.61 mil population

Limited Natural Resources



Key Driving Forces – Waste Growth and Land Scarcity

- Rapid rise in waste generation will continue if nothing is done
- Land will become more scarce



At the current rate of waste growth...



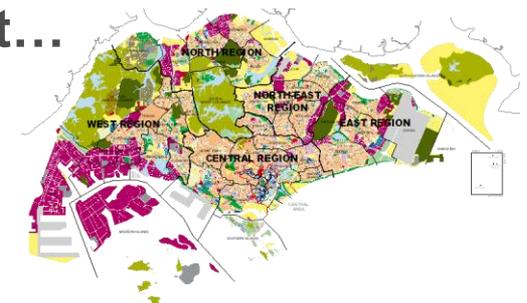
New waste-to-energy
Incineration plant every
7-10 years



Current landfill will be
filled by **~2035**

New offshore landfill every
30-35 years

But...



there will be less & less land available

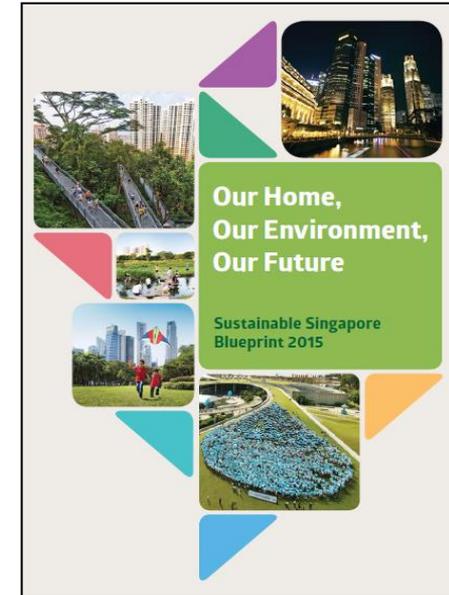
Sustainable Singapore Blueprint 2015 (SSB2015)

Sets out the national vision and plans for current phase of sustainable development



A Vibrant & Sustainable City **A Zero Waste Nation**

- Put in place infrastructure and programmes for the 3Rs
- Keep Singapore clean & healthy, conserve resources, free up land



SSB 2030 Targets



70%

Overall recycling rate

30%

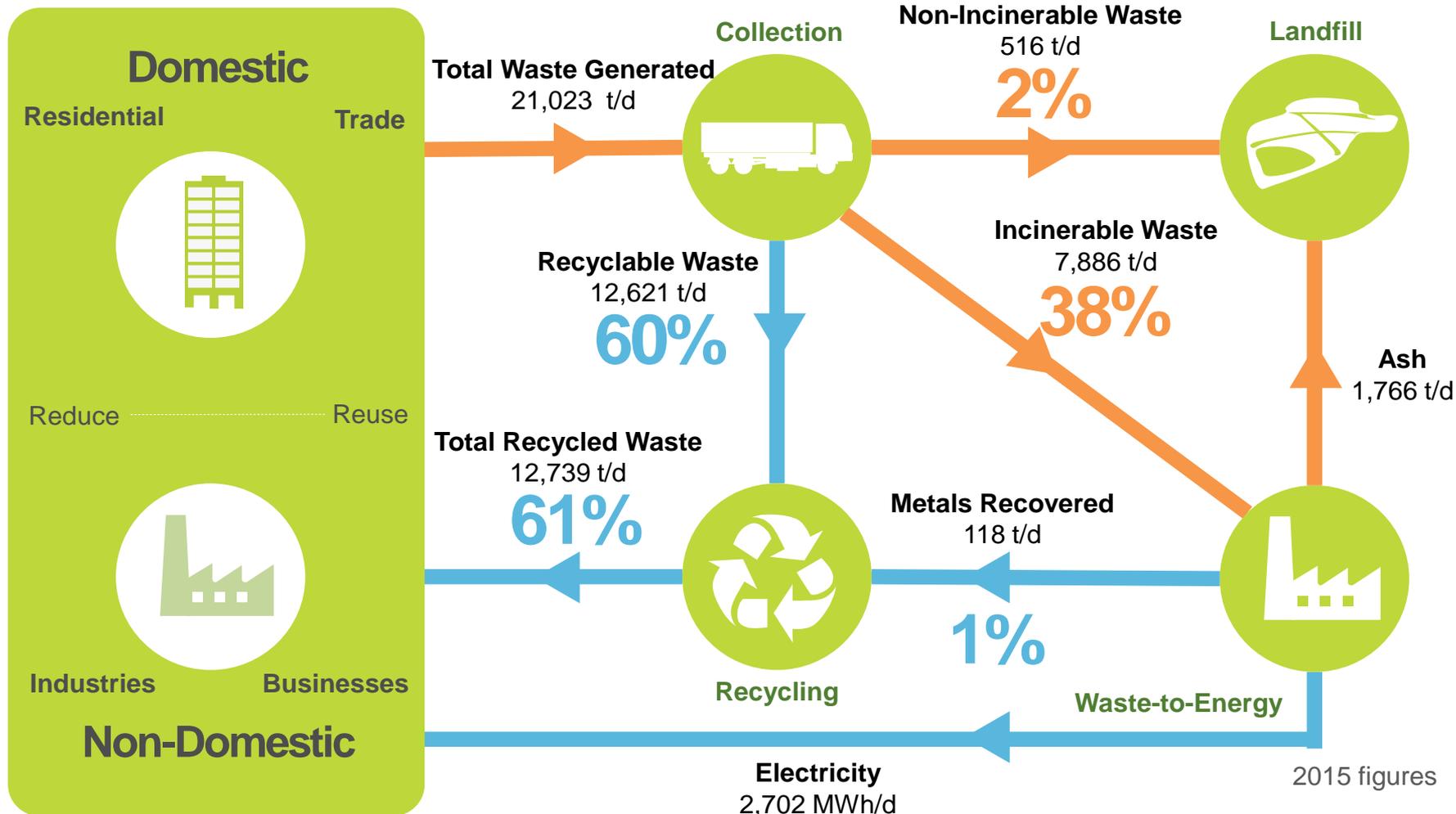
Domestic recycling rate

81%

Non-domestic recycling rate

2 SOLID WASTE MANAGEMENT IN SINGAPORE KEY CONSIDERATIONS & STRATEGIES

Overview of Singapore's Solid Waste Management System



Key Considerations for Policy Formulation / Infrastructure Development

1. Minimising land-use
2. Curbing waste growth / towards zero waste
3. Prioritising approaches according to recognised solid waste management hierarchy
4. Maximising resource efficiency and resource recovery (material and energy resources)
5. Involving businesses and the community in the 3Rs
6. Meeting obligations under international agreements

Solid Waste Management Strategies

MINIMISATION / PREVENTION

- Promote efficient use of resources in production processes
- Promote 3Rs & waste segregation at source in businesses & homes
- Control hazardous substances upstream to prevent downstream waste management challenges



RECYCLING

- Maximise resource recovery from waste
- Enhance recycling infrastructure



WASTE-TO-ENERGY / VOLUME REDUCTION

- Adopt innovative technologies to maximise energy recovery, minimise ash & land use



LANDFILL

- Minimise waste to landfill
- Maximise lifespan of landfill



3 POLICIES / PROGRAMMES FOR 3R & SOLID WASTE MANAGEMENT

Promoting Efficient Use of Resources in Production Processes

Mandatory Requirements for More Sustainable Packaging Waste Management



Voluntary agreement by the government, industry and non-governmental organisations (NGOs) to reduce packaging waste



Announcement of introduction of mandatory requirements for more sustainable packaging waste management within the next 3- 5 years

2007

Packaging Waste Reduced through SPA

6,330 tonnes per year

<1%

Packaging Waste Disposed of

1.02 million tonnes in a year

2015

Jul 2016

2019 - 2021

Implementation of mandatory requirements

Promoting 3Rs & Waste Segregation at Source in Businesses

Mandatory Waste Reporting for Large Commercial Premises



Commercial premises can benefit by recycling more & saving on waste disposal cost

Large hotels & malls are required by law to submit waste data and waste reduction plans

Working with hotels and malls to improve their waste management practices

Premises can tap on NEA's **3R Fund** to co-fund initiatives on waste minimisation and recycling



Large commercial premises affected

Reporting requirements

- Report amount of waste disposed of and recycled
- Submit waste reduction plans and targets to NEA annually

Promoting 3Rs & Waste Segregation at Source in Homes; Enhancing Recycling Infrastructure

Enhanced National Recycling Programme



Introducing enhancements to increase household recycling rate

1 recycling bin for every block of flats rolled out in **2014**

Dual chutes (refuse and recycling) systems for all new public housing projects

Collection of garden waste from private landed properties for recycling

Incentives for residents to recycle



Image courtesy of the Housing & Development Board

Dual Chute System in new public housing

Controlling Hazardous Substances Upstream to Prevent Downstream Waste Management Challenges

Control of Hazardous Substances in Electrical and Electronic Equipment (EEE)

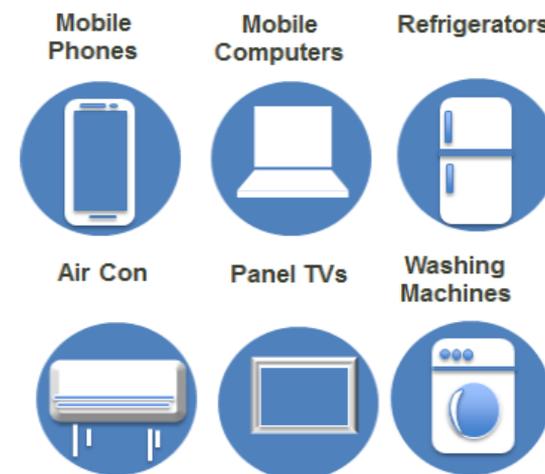
Environment Protection and Management Act

Restriction of Hazardous Substances (RoHS)

- Gazetted in Aug 2016, will take effect on 1 June 2017
- Adapted from the EU RoHS Directive, Directive 2011/65/EU
- Prevent environmental pollution by minimising 6 hazardous substances in the production, treatment and disposal of EEE

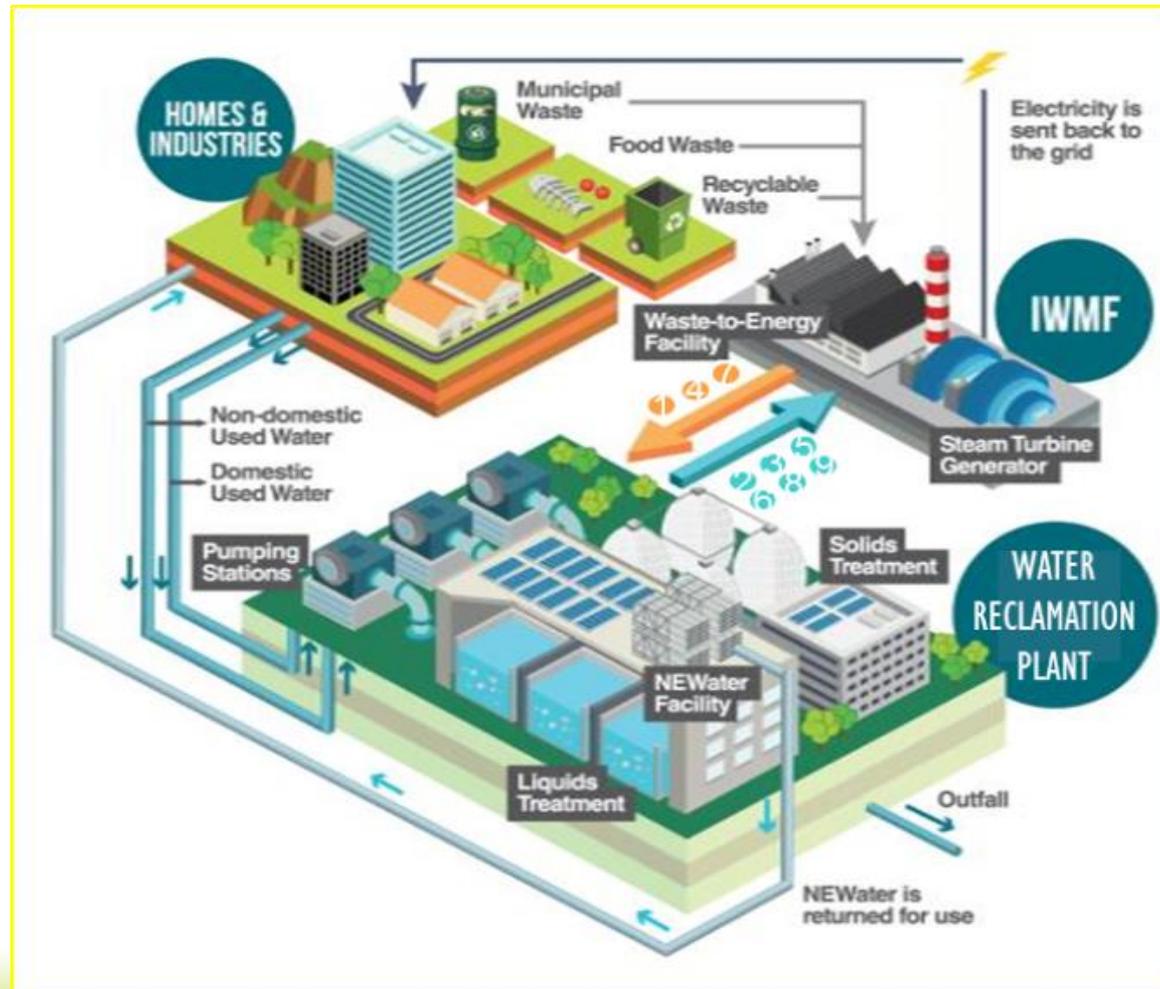
Restricted substance	Allowable concentration limits
Lead (Pb)	Maximum 1,000ppm (0.1% by weight)
Mercury (Hg)	
Hexavalent Chromium (Cr VI)	
Polybrominated Biphenyls (PBBs)	
Polybrominated Diphenyl Ethers (PBDEs)	
Cadmium (Cd)	Maximum 100ppm (0.01% by weight)

Product scope for Singapore RoHS



Maximising Resource Recovery from Waste; Adopting Innovative Technologies to Maximise Energy Recovery, Minimise Ash & Land Use

Integrated Waste Management Facility (IWMF)



Maximising Lifespan of Landfill

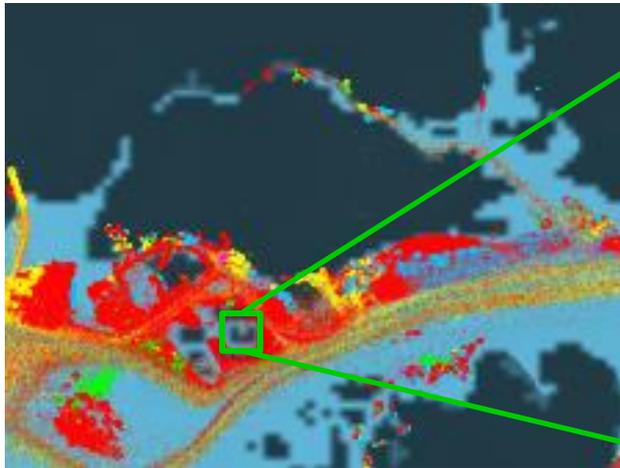
Semakau Landfill

Constraints:

- Lack of sea space to expand the size of Singapore's only landfill

To maximise lifespan of Semakau Landfill:

- Single-cell design for Phase II to maximise capacity
- Explore ways to improve quality of incineration ash to increase possibility of ash reuse



Visualisation of global shipping routes



Single-cell design for Semakau Landfill Phase II

Conclusion

Vision:

A zero waste nation

A vibrant and sustainable Singapore



Our Environment

Safeguard • Nurture • Cherish

Other Back Up