

SUSTAINABLE SOLID WASTE MANAGEMENT IN MALAYSIA: ISSUES & CHALLENGES



Razif Harun, PhD

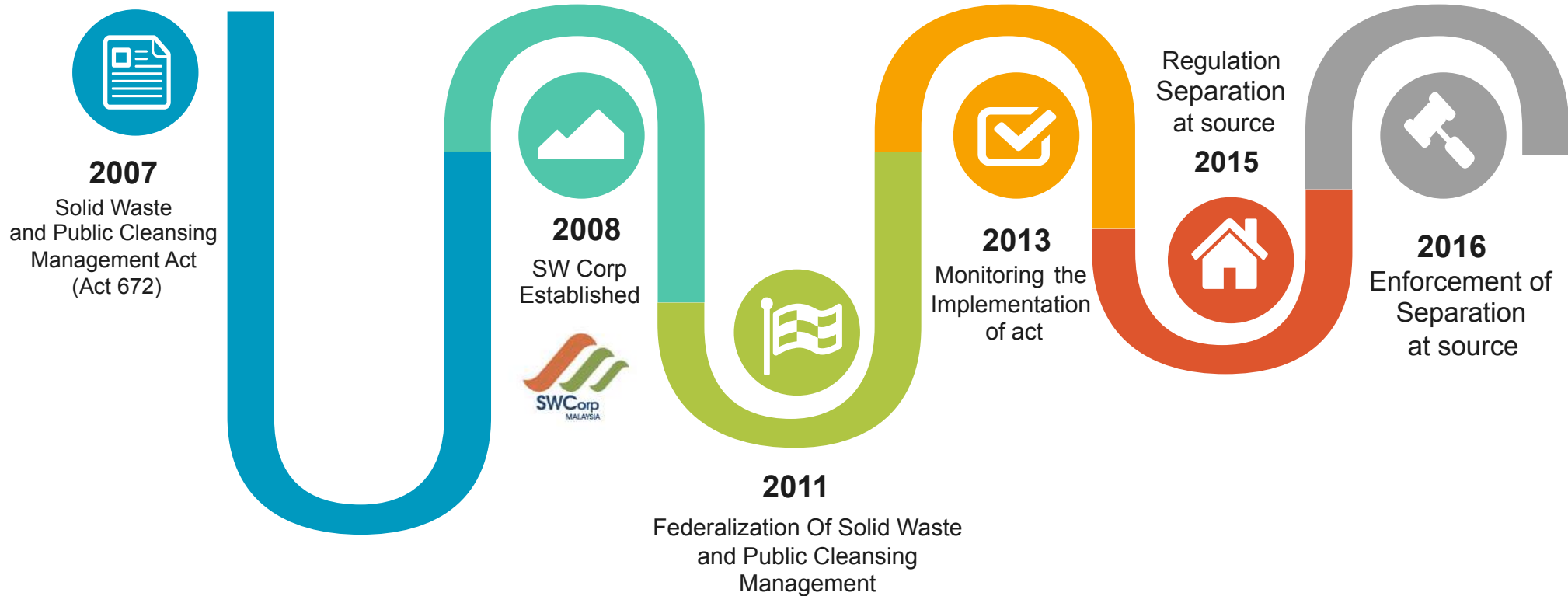
Department of Chemical & Environmental
Engineering, Universiti Putra Malaysia

Presentation Outline

- 1** | Overview of Solid Waste Management In Malaysia
- 2** | Issues & Challenges
- 3** | Initiatives towards Sustainable Waste Management in Malaysia
- 4** | Strategies for addressing solid waste
- 5** | Conclusion



Quick Facts on Solid Waste Management in Malaysia



Malaysian Controlled Solid Waste



Commercial

any solid waste generated from any commercial activity



Industrial

any solid waste generated from any industrial activity



Construction

any solid waste generated from any construction or demolition activity, including improvement, preparatory, repair or alteration works



Institutional

any solid waste generated by Federal or State government dept., educational premises, healthcare facilities, public places e.g. zoo, museum, libraries and etc.



Household

any solid waste generated by a household, and of a kind that is ordinarily generated or produced by any premises when occupied as a dwelling house, and includes garden waste



Imported

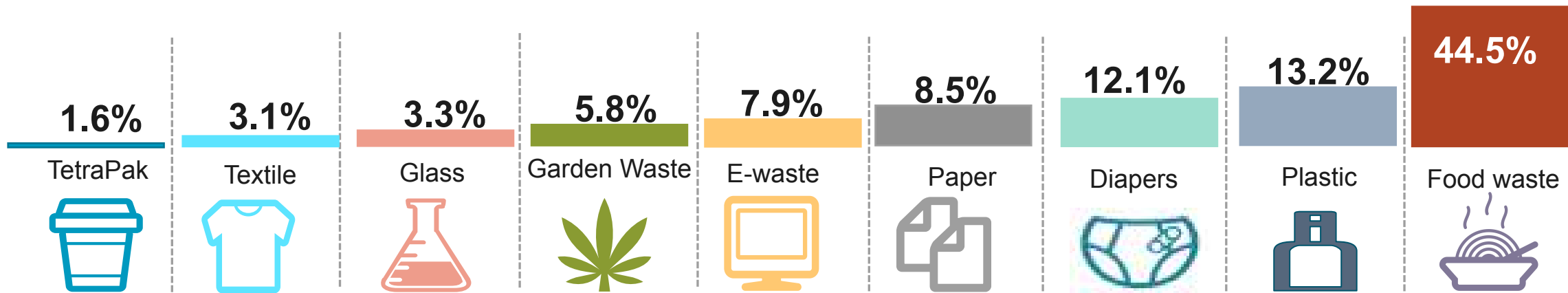
any solid waste generated in other countries and imported to Malaysia for processing or disposal



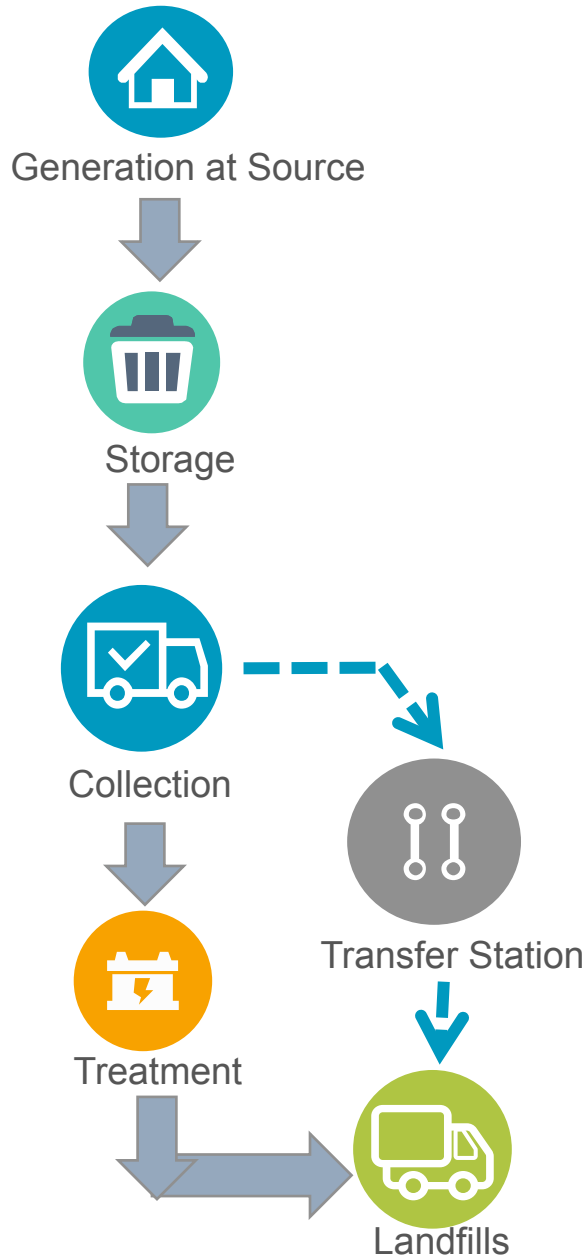
Public

any solid waste generated by public places, which are under the supervision or control of any local authority

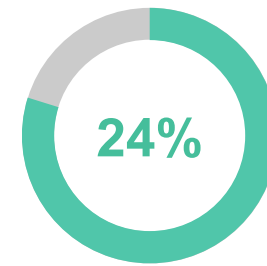
Malaysian Waste Generation



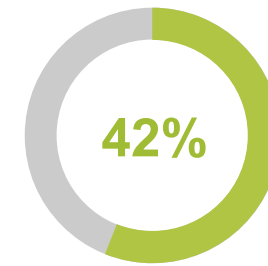
Waste Flow in Malaysia



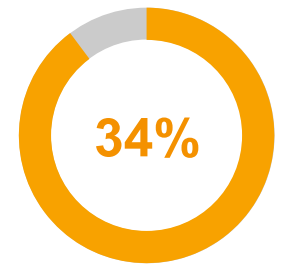
 **76% Disposal to Landfills**



Recycled



Sanitary Landfills



Landfills

Issues & Challenges

Malaysia is overflowing with waste and we're running out of options

ENVIRONMENT

Tuesday, 16 Jul 2019

6:00 AM MYT

By Sim Leoi Leoi



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Latest Pasir Gudang pollution caused by Sungai Kim Kim toxic waste: Minister



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Monday, 18 Mar 2019 09:22 PM MYT

By Ben Tan



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Illegal waste disposal: Three companies get RM15k fine each

NATION

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Cheaper to Dump than Recycle

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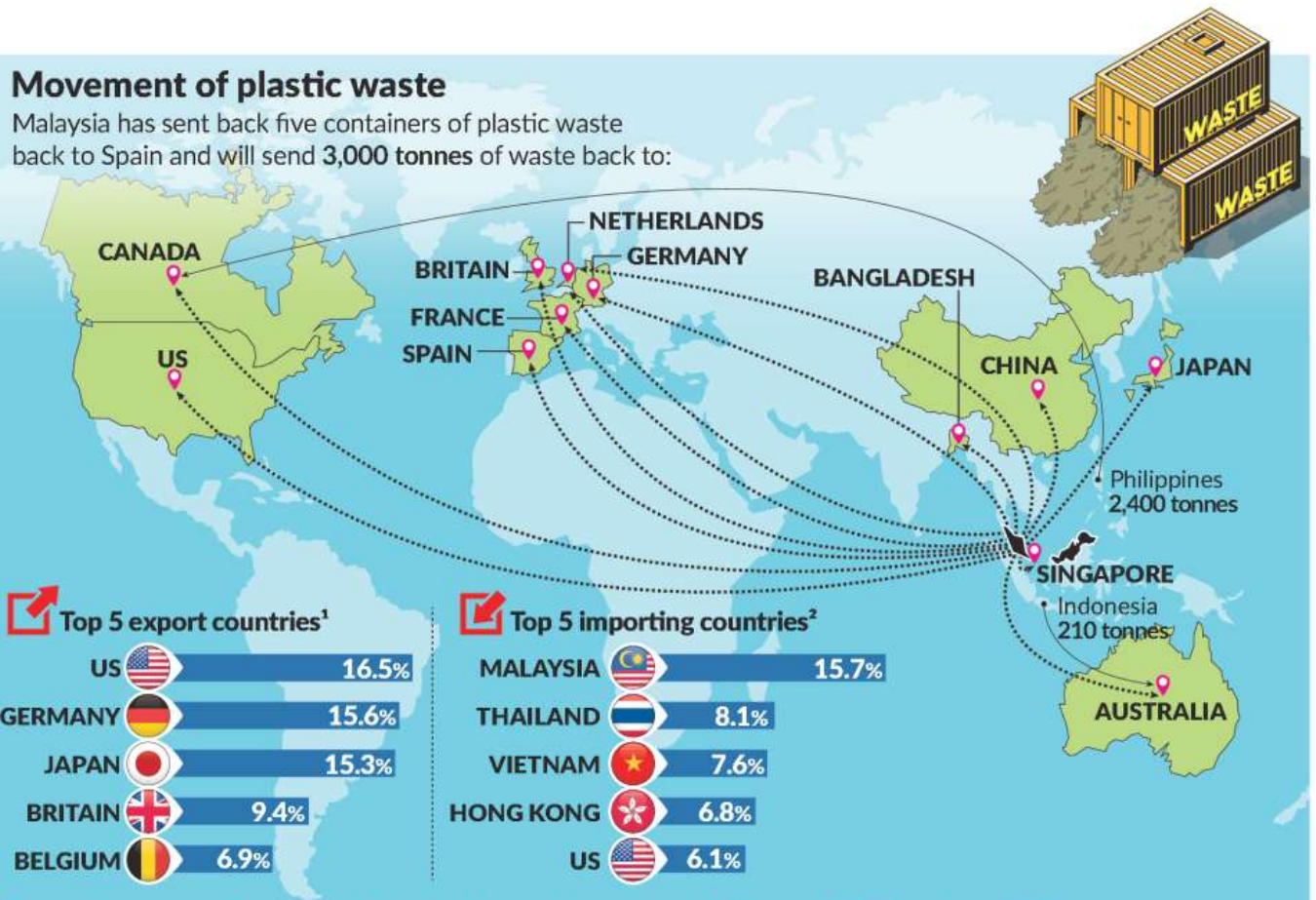
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Cheaper to Dump than Recycle

Movement of plastic waste

Malaysia has sent back five containers of plastic waste back to Spain and will send 3,000 tonnes of waste back to:



Exports from exporting countries/regions have dropped steadily from mid-2016 to late 2018, from 1.1 million tonnes monthly to 500,000 tonnes monthly. Total import have also dropped.

Notes: ¹Percentage of total export between January and November 2018.
²Percentage of total import between January and November 2018.

Source: Greenpeace
 ©The Star Graphics

The Asian Nikkei Review reported that disposing of plastic bottles in China cost around US\$200 (RM822) compared with US\$500 (RM2,000) in developed economies.

Strict regulation on exposing workers in developed countries to health risks from recycling processes – **Asian lives have always been cheaper.**

Small market for recycled materials e.g. plastics. What's more, oil's current low price means that it's often cheaper to produce virgin plastics than to recycle.

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illegal dumping of waste

CHEMICAL WASTE POLLUTION SUNGAI KIM-KIM PASIR GUDANG, JOHOR



LATEST UPDATE AS OF MARCH 17

1.3KM

of contaminated area cleaned up and work on remaining 200 metres will be completed within 1-2 days

143

patients still warded

108

patients allowed to return home

36

cases referred to hospitals outside Johor Bahru district

29

cases referred to hospitals in other states

7

patients still in ICU & reported to be in stable condition

Source: Johor State Health, Environment and Agriculture Committee chairman

Bernama Infographic

- Psychological Counseling Di the Psycholog Team The Soc Welfare Depa provides psych officers to ove trauma & fear victims

- 550 tonnes of contaminated soil & sludge, as well as 700 tonnes of water had been collected up to 4 pm, March 16, 2019

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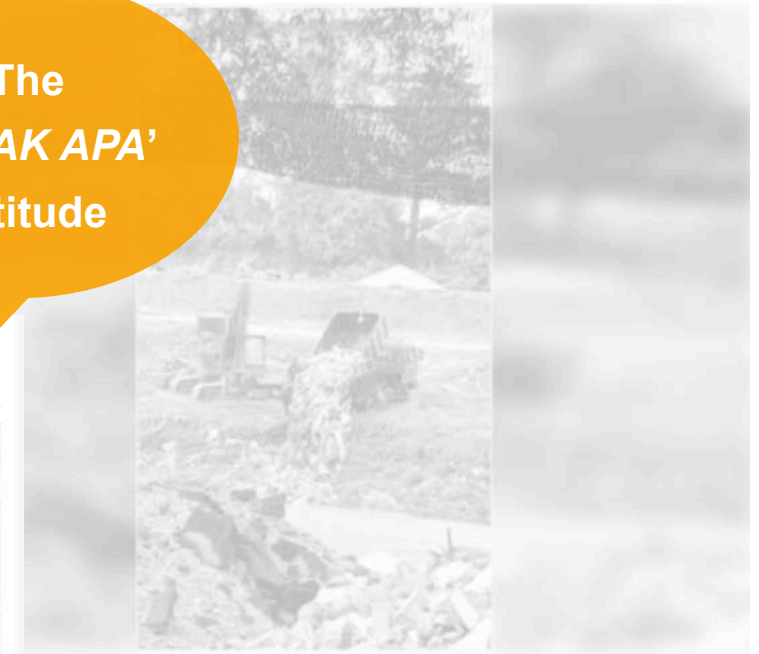
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The 'TIDAK APA' Attitude



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The '*TIDAK APA*' Attitude

Excuse: 'Recycling is inconvenient'

Translation: 'It's too much effort and hard'

Excuse: 'It doesn't make a difference'

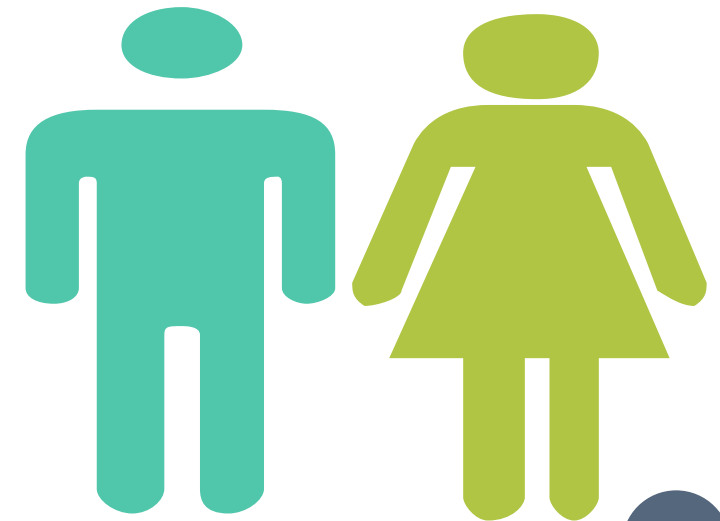
Translation: 'I don't understand how it makes a difference if one person recycles or not'

Excuse: 'It's too much hassle!'

Translation: 'I don't think it's important'

Excuse: 'I don't have time to recycle'

Translation: 'I don't have time to clean the jars and cans before recycling'



Issues & Challenges

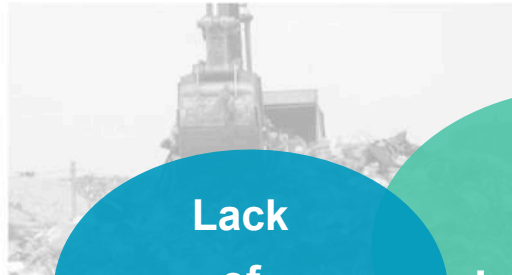
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Lack of Enforcement

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Lack of Enforcement



You want to enforce, (you) must have people to enforce (but) they cannot be on site 24 hours a day, every day,”

The Star, Jun 2019

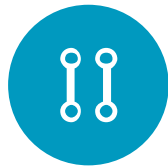


demi kesejahteraan masa depan!

Issues & Challenges



Unsanitary Landfill



Scattered & Unsuitable Location



Less utilization of Technology



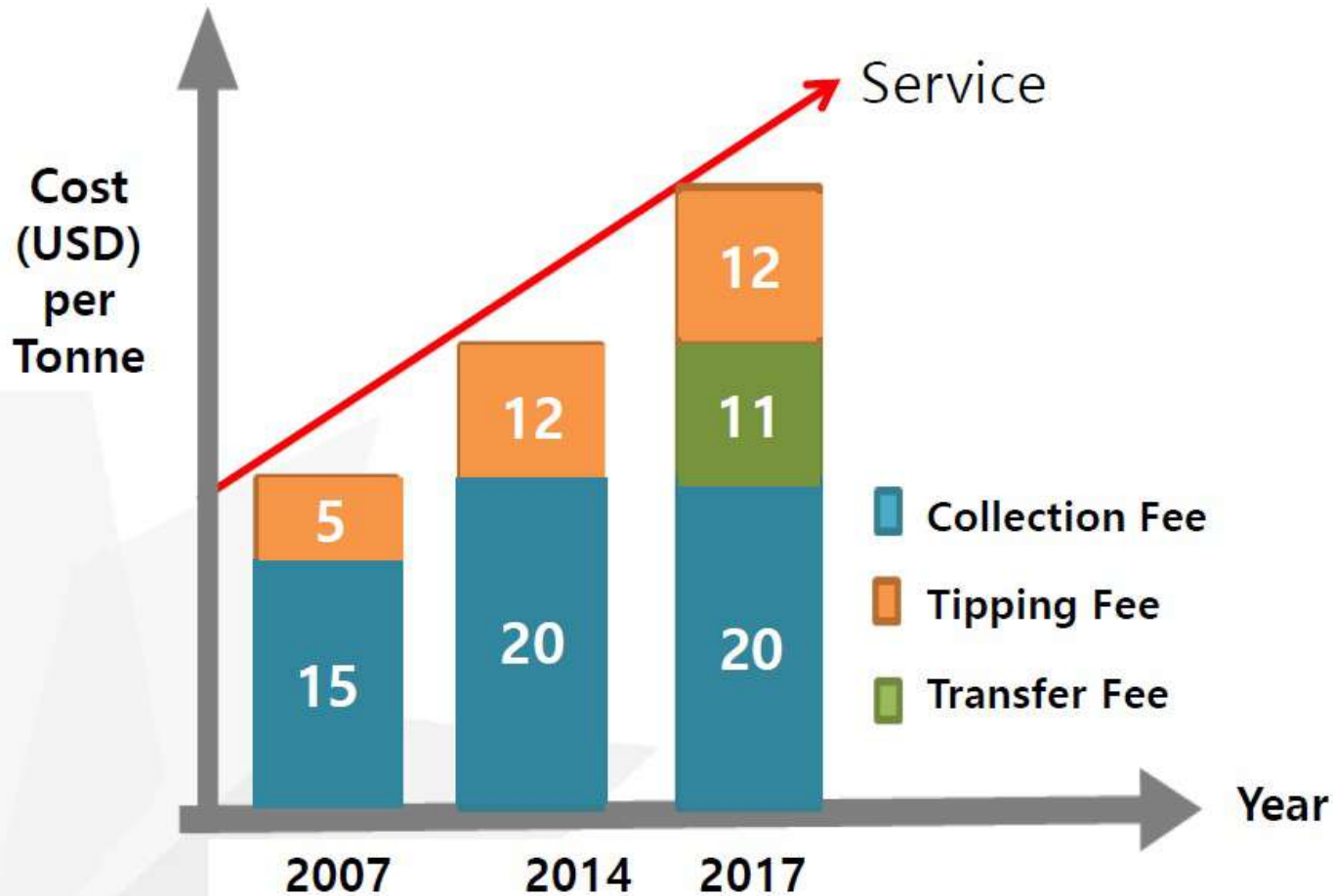
Risk to Public Health



Risk to Environment & Safety Issues



Increasing Cost of Solid Waste Management



Improvement of Service Level



Leachate Treatment Plant



New Bin Replacement



Transfer Station



New Machineries

SOP

Standard Operating Procedures

Standard Operating Procedures



Safe Closure of Landfills

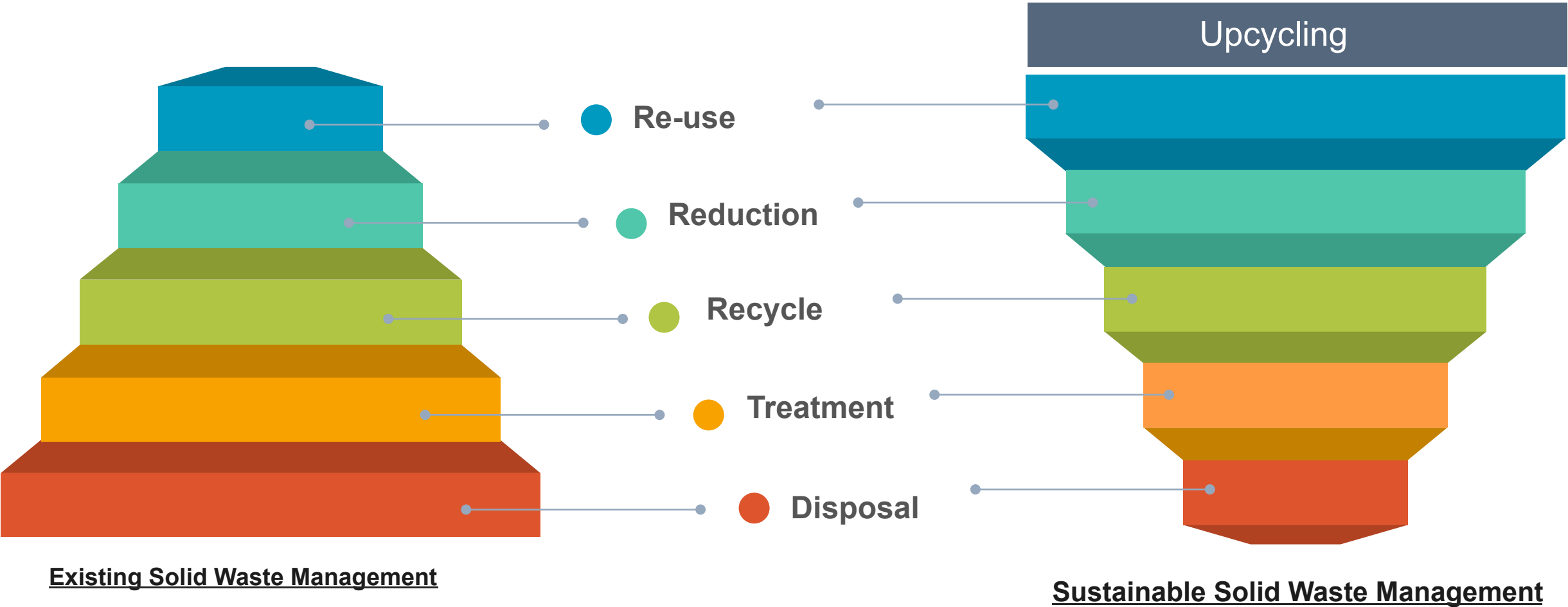


Key Performance Monitoring

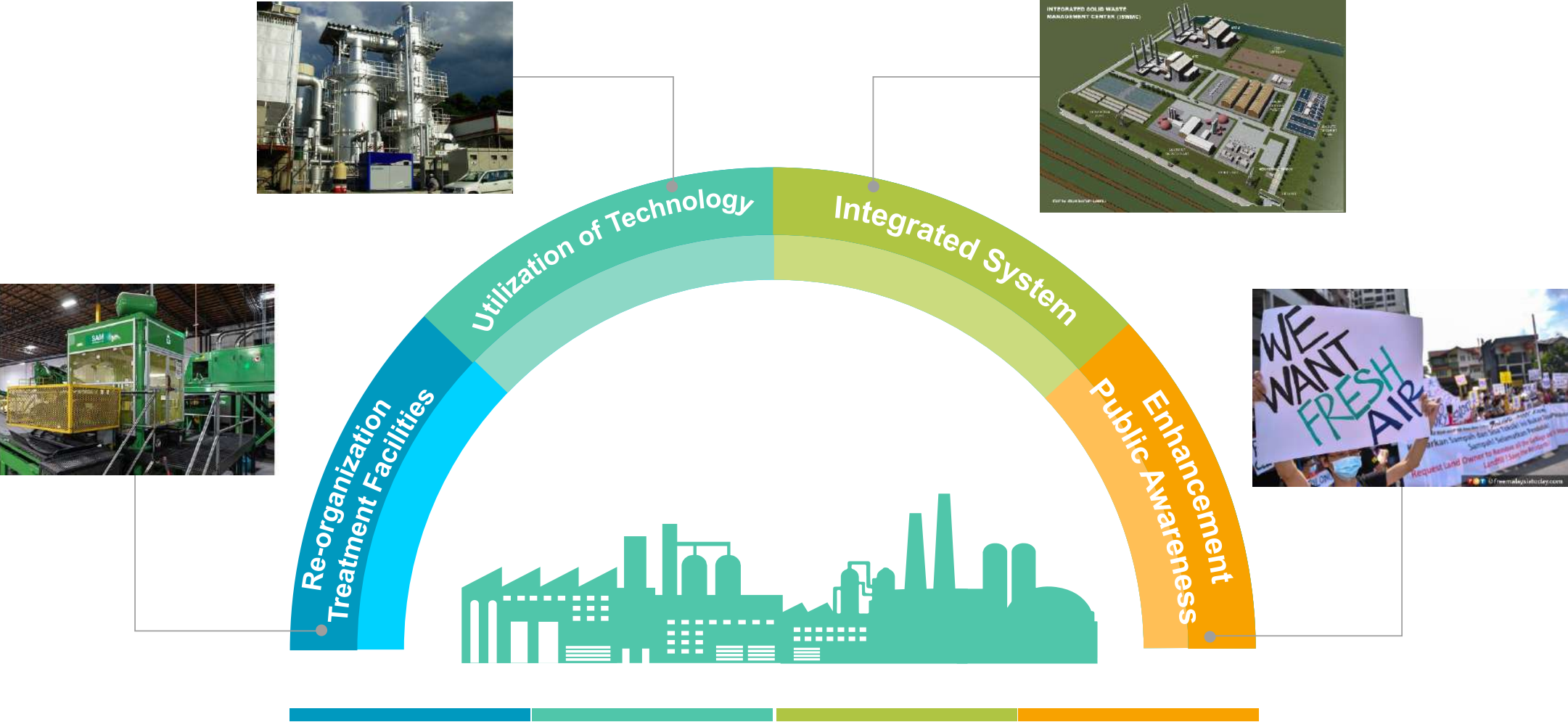


Initiatives Towards Sustainable Solid Waste Management

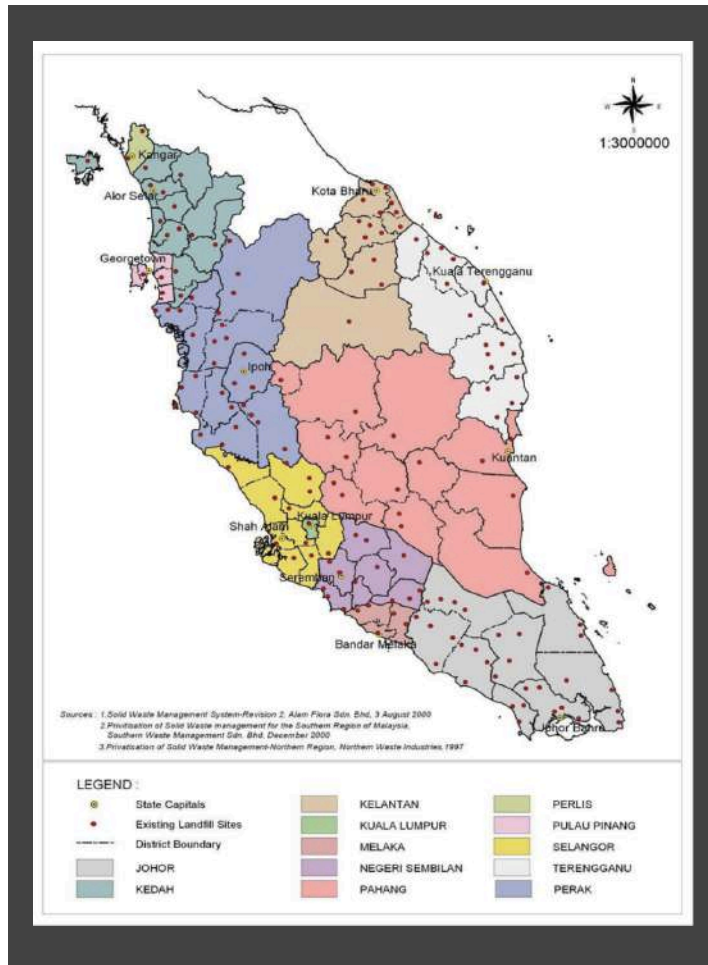
Sustainable Solid Waste Management



Initiatives by Malaysian Government



Re-organization Treatment Facilities



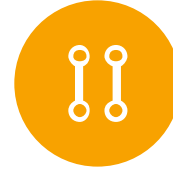
146
Landfill Sites

17
Sanitary
Landfills

4
Transfer
Station

4
Incinerator Sites

Sanitary Landfills Vs Incinerator



Sanitary Landfills

Incinerator

	Sanitary Landfills	Incinerator	
Land Requirement			
Cost			1,000 metric tonnes per day of MSW treated, the installation cost of an incinerator would RM700- RM900 million. The cost of a sanitary landfill, on the other hand, is a quarter of that.
Tipping Fees			Sanitary landfill would be about RM50 per metric tonne of MSW incinerator could be four to five times higher than that for a sanitary landfill.
Suitability of Malaysian MSW			The moisture content of local MSW is greater than 60%. Due to MC, local MSW adversely affects the performance of incinerators. The high MC prolongs the drying process of solids in incinerators.
Emissions			Releases hazardous pollutants. emissions of heavy metals and toxic chemicals such as dioxins and furans, gases e.g. CH4 and CO2

Utilization of Technology

Generation

- Separation At source
- Treatment At source
- Value Food No Waste

Collection

- Curbside Collection-household Waste And Recyclable Material
- Radio Frequency Identification (RFID) Technology

Treatment

- Composting
- Anaerobic Digester
- Waste to Energy

Storage

- Automated Waste Bin
- Spiral Waste Bin
- Mobile Compactor
- Deep Collection System

Recovery

- Material Recovery Facilities

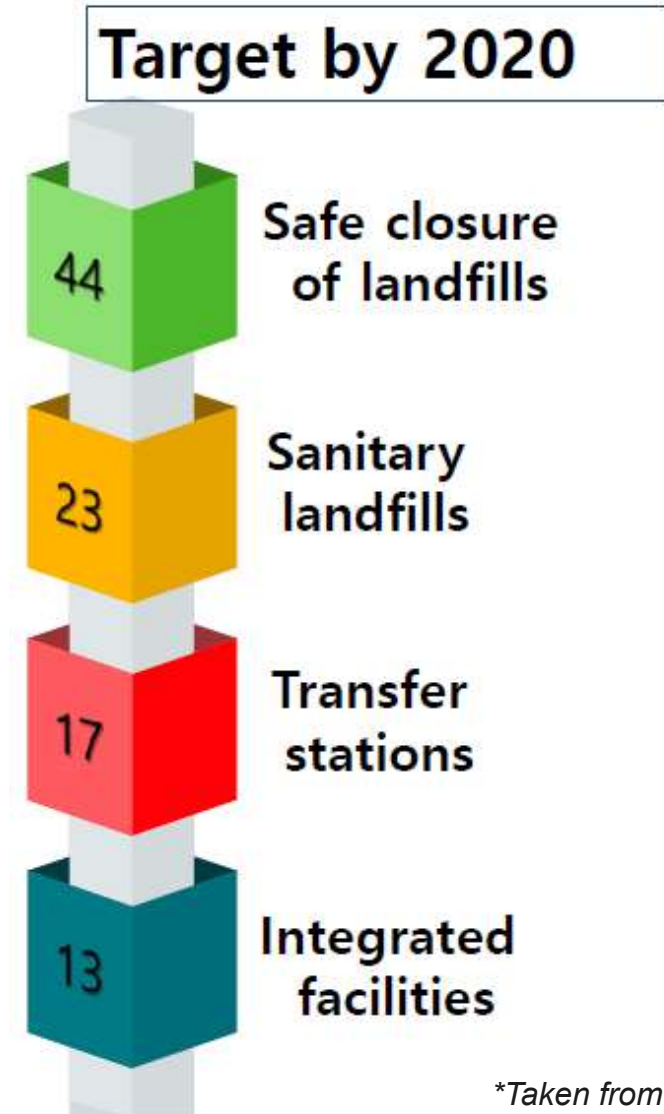
Disposal

- Final disposal at the landfill of non-recyclable material and bottom ash from waste treatment

Integrated Facilities



Integrated Facilities



**Taken from SW Corp's presentation*

Utilization of Technology



SMART RECYCLE BIN
Recycling Bins for Rewards Point



3R CARD
Recycling Redemption Point Collection



COMPOSTING MACHINE (25 kg)
Located in Ministry, School and Commercial Area



COMPOSTING MACHINE (500kg)
Located in Fraser Hill (tourist attraction) to treat food waste on daily basis



ANAEROBIC DIGESTOR (100kg)
Located in Port Dickson, Hang Tuah Jaya, Kulim Hi Tech and Pulau Tuba (Langkawi)

Utilization of Technology

WASTE TO ENERGY PLANT



Location : Kuala Lumpur
Capacity : 1,200 tonnes per day
Power generation : 35.23MW
Technology : Stocker
Expected Construction Date : Early 2018
Expected Completion : Early 2021
Total area : 4ha

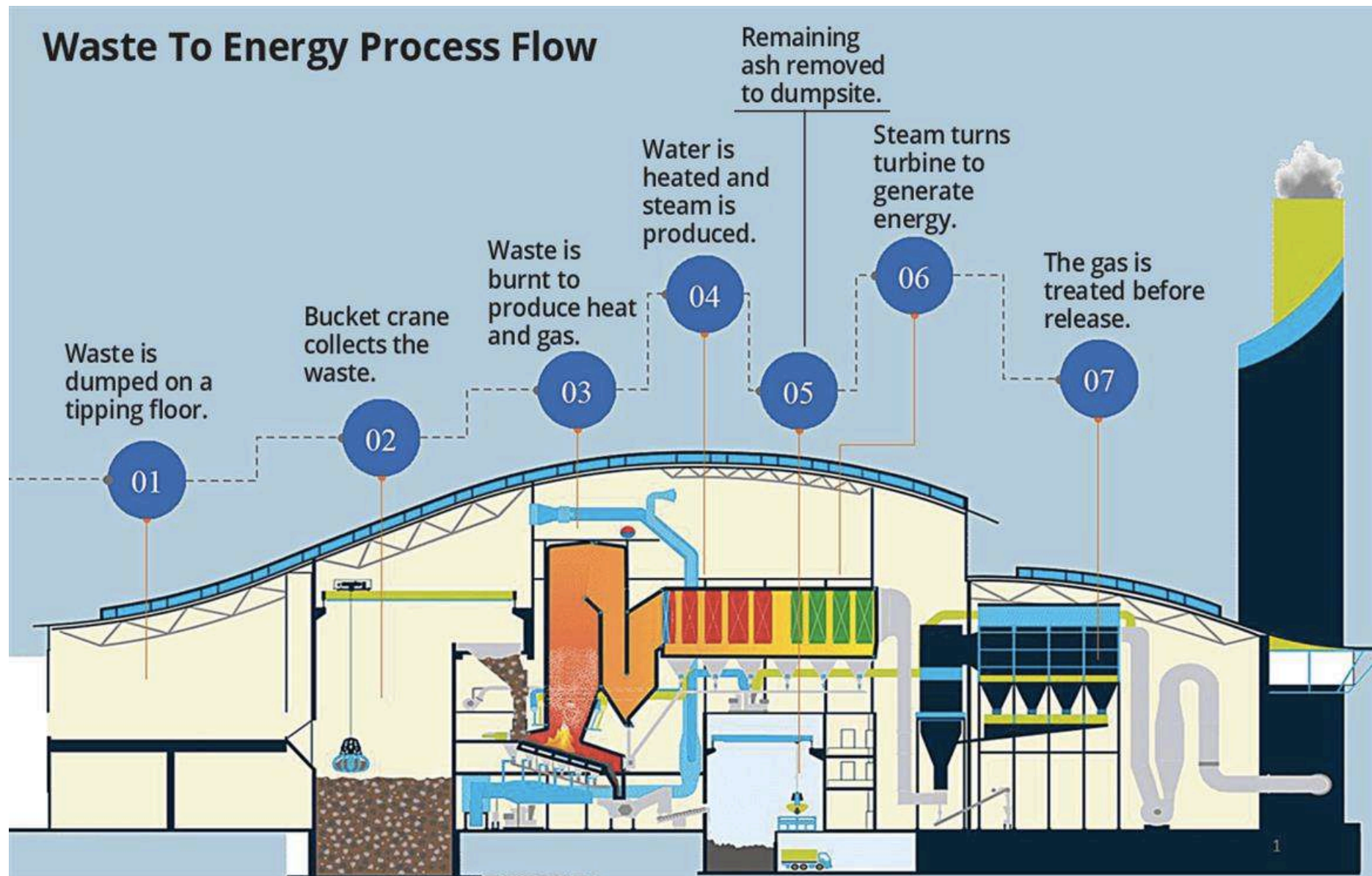
INTEGRATED WASTE FACILITIES



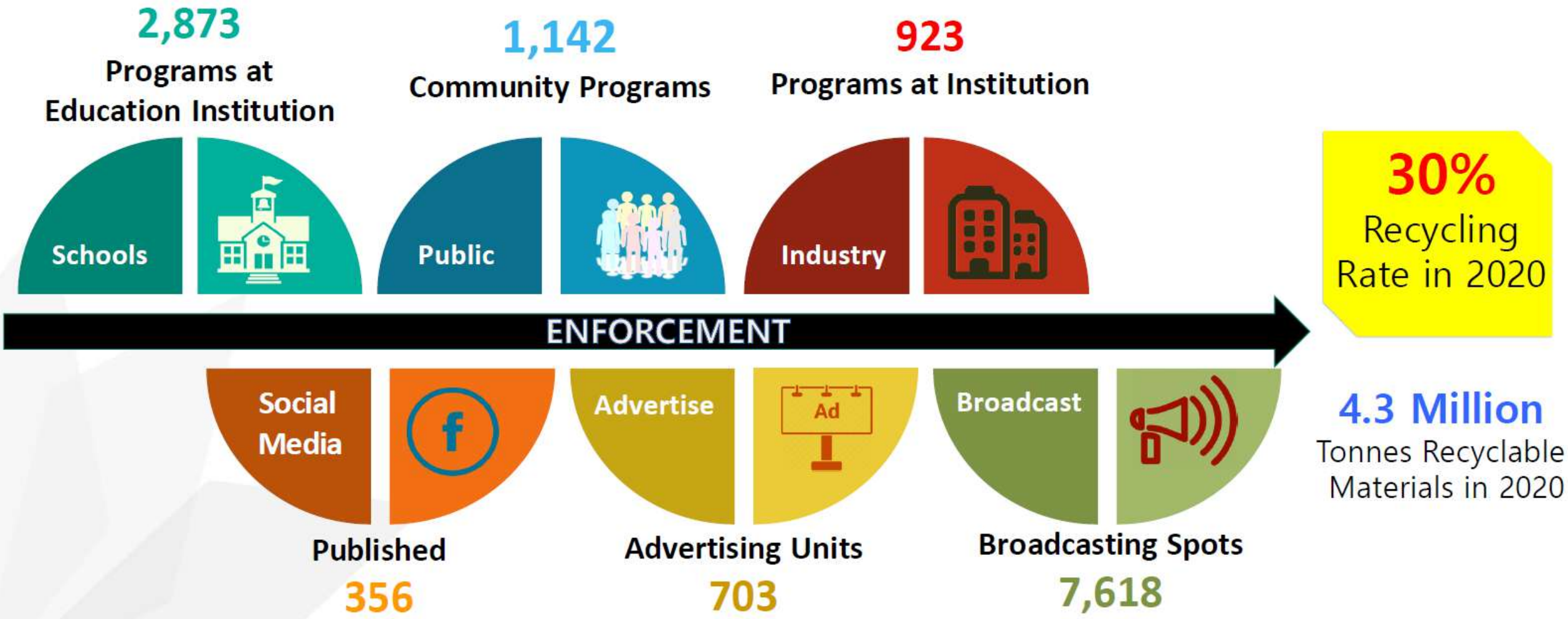
Location : Negeri Sembilan
Capacity : 800 tonnes per day
Power generation : 20MW
Technology : Landfill + MRF + AD + WTE
Total Area : 120ha

**Taken from SW Corp's presentation*

Utilization of Technology



Enhancement Public Awareness



Enhancement Public Awareness

Competitions

- Recycling Competition
- 3R International Sculpture Competition
- Sustainability Speech Competition



Green Initiatives during 29th SEA Games and Para ASEAN 2017



National Recycling Day
11th November every year



National Sustainable Convention



Curricular Module

• 231 Kindergartens Nationwide



Summary



Policy and Regulatory

Policies exist, but are not effectively implemented/enforced due to a lack of human resources and effective economic instruments to support enforcement of laws



Technical and Scientific Understanding

Capacity for understanding of technical/technical guidelines needed e.g. data collection, management and analysis



Financial

Lack of resources for collection equipment, capacity to raise/secure fund needed due to increasing costs of waste management



Social

People don't understand the benefits of separating waste, capacity awareness raising and community involvement needed.

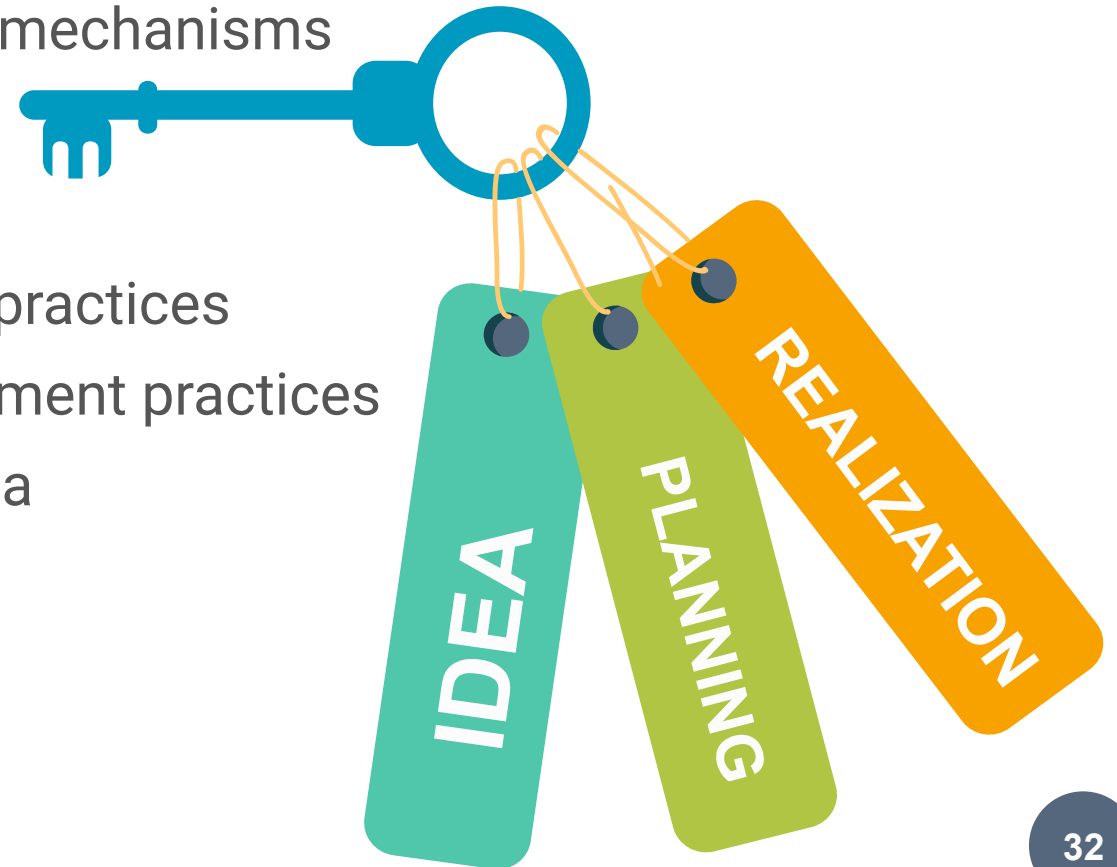


Institutional

Lack of coordination among responsible institutions, no coordinated management between municipal councils, practices differ between municipal councils

Strategies for addressing solid waste

- ❑ Closure of open dumps and construction of sanitary landfills
- ❑ Promote decentralization and strategic planning mechanisms
- ❑ Political dialog and vote
- ❑ Approach to zero waste system
- ❑ Increase the knowledge on waste management practices
- ❑ Include financing for sustainable waste management practices
- ❑ Decision support system e.g. waste analysis data



Thank You

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