

Solid Waste Management Lab 2015

27th May – 12th June 2015
Final Lab report

Strategies, action plans and targets have been identified in the Solid Waste Management Policy, studies, documents and NKEA labs.



Current Status

- Implementation and recommendation facing issues and roadblocks
- Lack of ownership
- Lack of budget and resources for implementation
- Lack of coordination and alignment among all stakeholders
- Lack of proper tracking on action plans execution

Different labs have been conducted in isolation for Solid Waste Management (SWM) under separate NKEAs...

EPP#9 Greater KL/ KV NKEA (Solid Waste Management)



Greater KL, Enhanced Services

4.1 Pedestrian Network

4.2 Solid Waste Management

4.3 Basic Services

- Conducted in 2010 under the Greater KL/KV NKEA
- Part of Economic Transformation agenda
- Scope:
 - Only covering Greater KL/KV area
 - Focus on the overall improvement to SWM in GKL/KV to cover for 2020 needs.

EPP #4 Business Services NKEA (Green Technology)



**Solid Waste
Management Lab**
26 March - 13 April 2012

- Conducted in 2012 under the Business Services NKEA
- Derived after a decision from YAB PM during PSM
- Scope:
 - Covering nationwide
 - Inclusion of Green Technology into SWM
 - Focus on the private investment in Green Technology in SWM and major international tender for Malaysia's SWM's system

Overview of issues related to EPP 9 Greater KL/ KV NKEA (Solid Waste Management)

1 Key issues



- Implementation of lab recommendation facing issues and roadblocks
- Difficult to meet 2014 KPIs

2 Feedback and views from JPSPN and PEMANDU Team

- Some **info and data** used in the GKL/KV NKEA lab report (Solid Waste Management chapter) is **inaccurate** and may not reflect the actual situation in Kuala Lumpur
- **No 3-feet plan** to detail out the implementation of solid waste management.
- No clear Governance Structure **to drive** the implementation of this EPP
- The lab initially thought the initiatives are quick wins and did not identify all potential hurdles along the implementation.

Overview of Solid Waste Management Lab under EPP#4 (Green Technology) of Business Services NKEA

A lab was conducted in 2012



Solid Waste Management Lab

26 March - 13 April 2012

Scope

To carry out a SWM lab to detail out the way forward for sustainable solid waste management across the country and the 3ft implementation plans, which shall include:

- A major international tender for Malaysia's solid waste management system
- Engagement campaigns for the general public

Outcome of the lab

- Mechanisms were developed for 3R (Reduce, Reuse and Recycle), and Disposal.
- Frameworks were developed for Recovery and Treatment.
- The common enablers identified were education and awareness programmes, enforcement of regulations as well as data management and incentives and standards.

Current Status

The success rate was **low**. Factors identified contributing to this are unavailability of funds, no proper tracking of initiatives and different scope.

Overarching issues related to Solid Waste Industry...

1 Gaps in appropriate policies, guidelines, standards and governance



There are gaps in existing policies, guidelines and standards *hindering the actual implementation*.

2 Inadequate Resources:- Technical Expertise & Skilled Manpower



Targets cannot be met as there is an insufficiency in *current manpower, technical expertise & financial resources*. There are also *delays* in receiving the designated funding, setting back implementation of prior National Plan on Solid Waste.

3 Inadequate of fund and mismatch between revenue and cost



- Inadequate fund to support implementation plans - *delay some implementation plan*
- The *current revenue-cost model* is *unsustainable* - contribution from the PBTs is insufficient and the Federal Government has to cover the losses hence increasing the financial burden.

4 Inadequate waste facilities



Only a fraction of the waste facilities planned were approved due to constraint in funds and also due to *limited manpower*.

5 Inadequacy of data



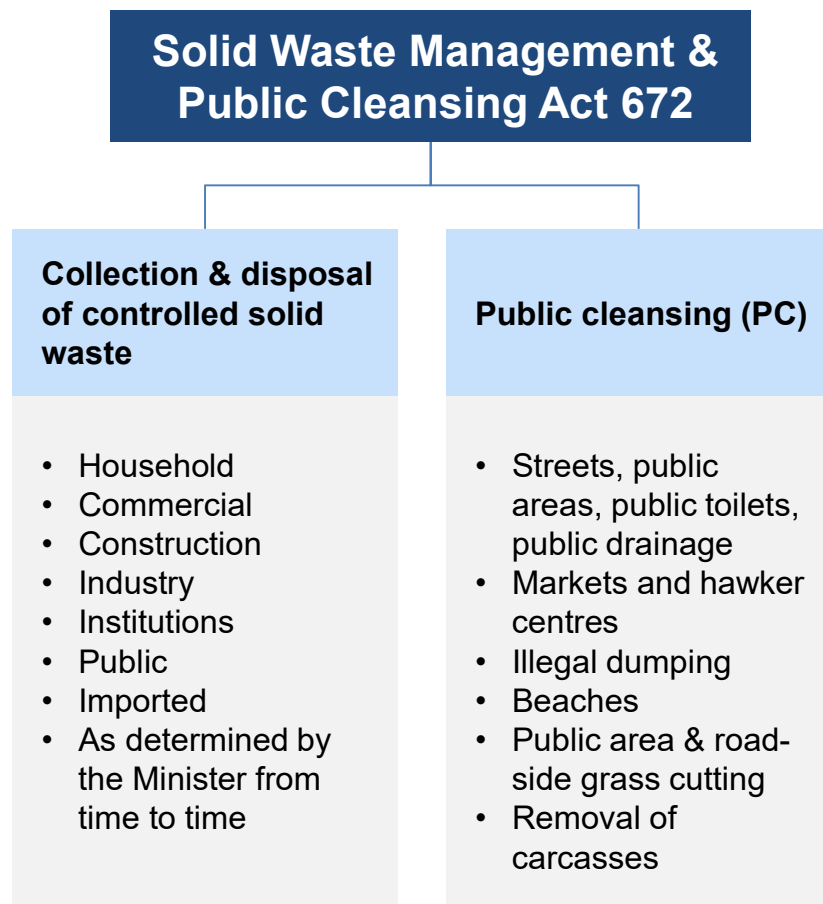
There are gaps in *existing data management practice* such as lack of a proper data system, data obsolescence, complications in data handover, and a lack of supporting facilities.

6 Unregulated and unmonitored recyclables market



Currently the recyclable market is highly unregulated and *operates as a grey market*. Its vast economic potential is undervalued as market demand for products from the waste stream cannot be properly *analysed or tracked*.

Act 672 was established mainly to standardise the level of solid waste management and public cleansing across all PBTs regardless of their respective income levels



Seven States adopted Act 672...

- Approved by the Parliament in 2007 and has been **in force since Sept 2011**
- Adopted by **Federal Territories KL & Putrajaya, Pahang, N. Sembilan, Melaka, Johor, Kedah & Perlis**
- Adoption of the Act is **open to other States**

Two new federal institutions were formed...

- Department of National Solid Waste Management (**JPSPN**)
- Solid Waste Management and Public Cleansing Corporation (**PPSPPA**)

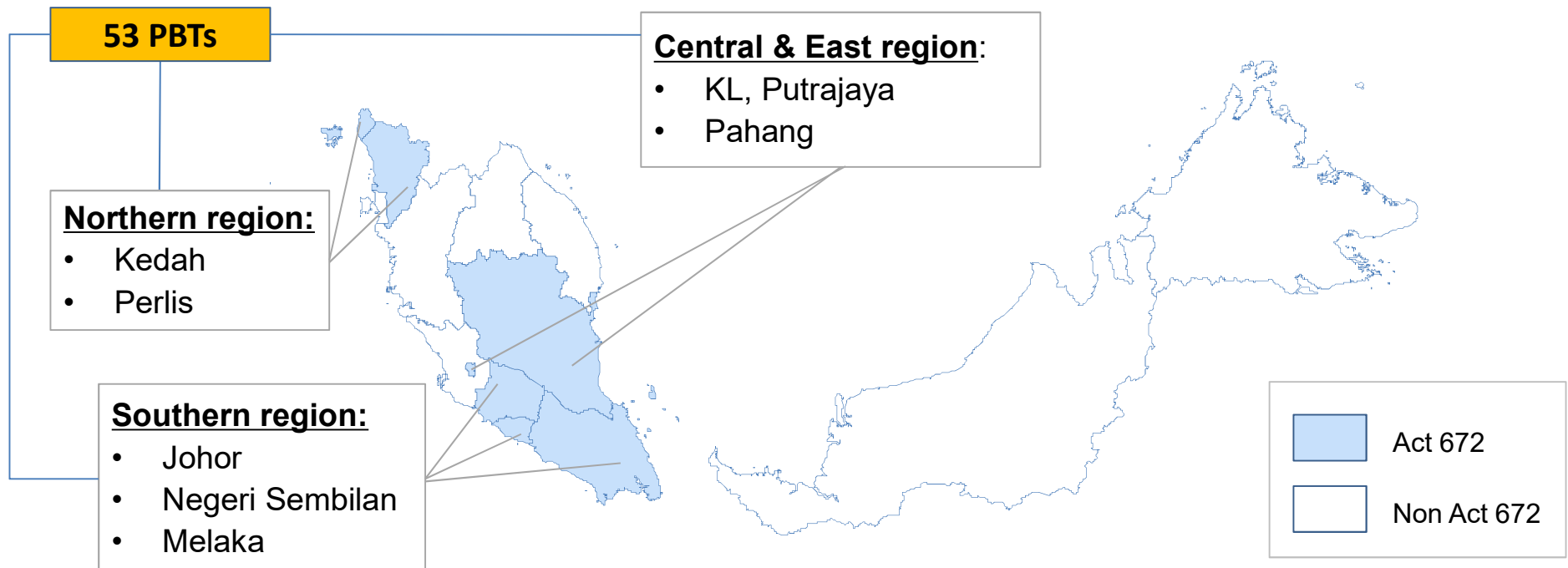
Two agreements were signed in 2011...

- **Tripartite Agreement** – between GoM, States and PBTs
- **Concession Agreement** – between SW Corp and three concessionaires

Main intentions of the Act:

- To standardise the level of solid waste management and public cleansing across all PBTs regardless of income
- Create economies of scale for appointment of contractors

For PBTs that adopt Act 672, the responsibility of collection & disposal of controlled solid waste and public cleansing is handed over to GoM



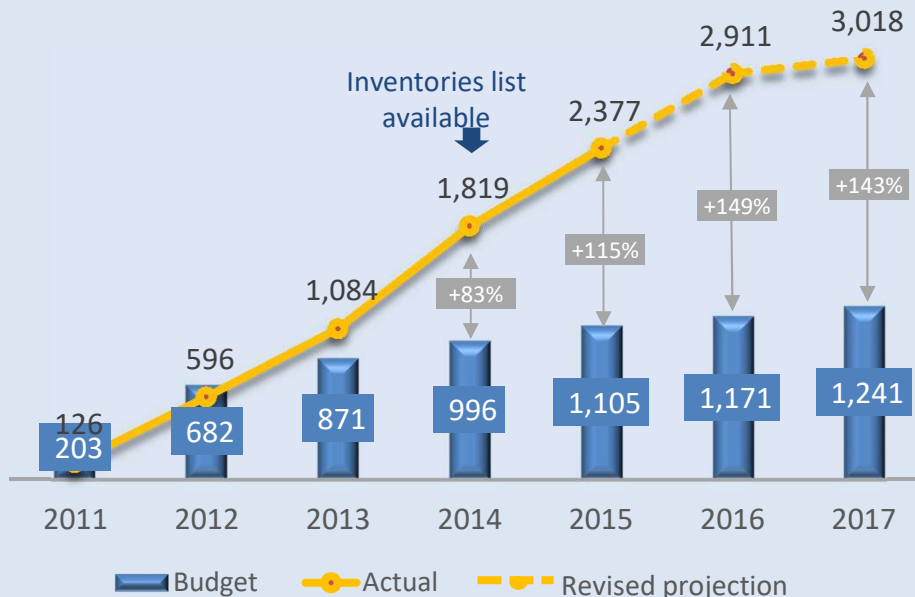
<u>Responsibility</u>	<u>Act 672 States</u>	<u>Non-Act 672 States</u>
Implementation	GoM	PBT
Cost	GoM with contribution from PBT	PBT

Privatisation cost especially for Public Cleansing is expected to increase substantially, with Federal Government is currently paying 61% of the total cost.

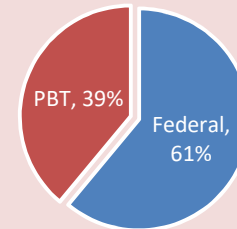
Cost to be borne by the Federal Government will continue to increase, due to following factors:

- Opening of new areas in PBTs that adopting Act 672 which require solid waste management and public cleansing service;
- PBT does not have the ability to pay the proper amount to KWPSPPA;
- Additional number of states adopting Act 672 (Perak and Kelantan); and
- Additional scope of public cleansing i.e. public toilets cleaning to be carried out by the concessionaire.

**Privatisation Cost
Initial Budget vs. Actual (RM mil)**

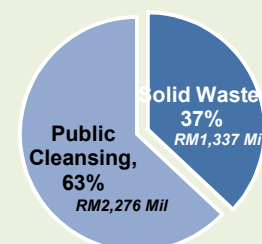


**Federal vs PBT's Contribution
2011-2014**



Federal Government is paying 61% of the total cost of SWM and PC

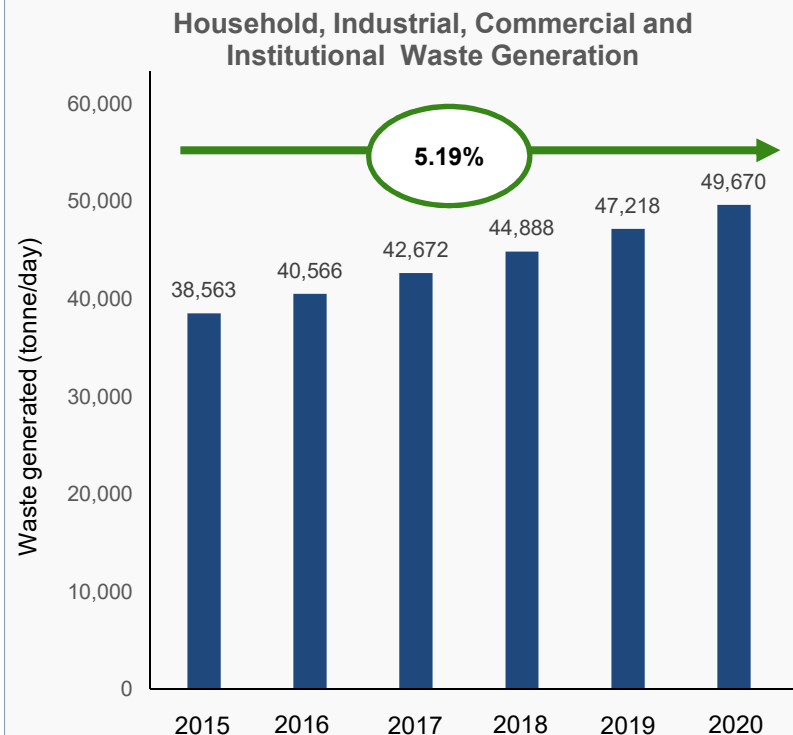
**Breakdown of actual cost
2011-2014**



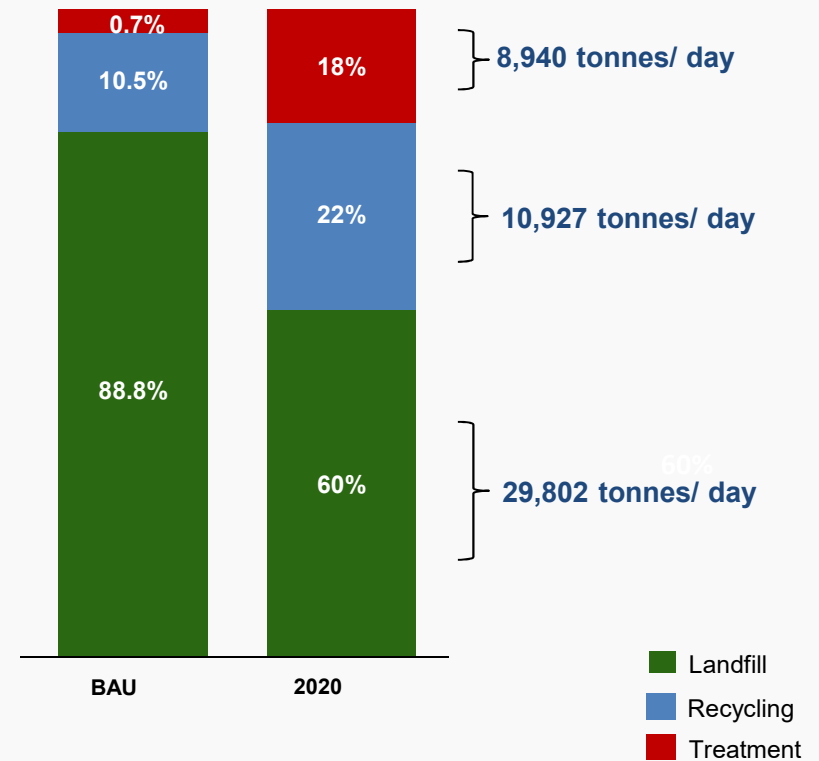
Public Cleansing is the major chunk of the total cost

Malaysia is currently dependent on landfills with ~89% of waste collected ending up in landfills

49,670 tonne/ day of waste is expected to be generated by Malaysians in the year 2020



19,867 ton/day waste nationwide need to be treated and recycled in order to achieve the 40% waste diversion from landfill by year 2020



Eleventh Malaysia Plan 2016- 2020

Clear direction on the way forward of Solid Waste Management



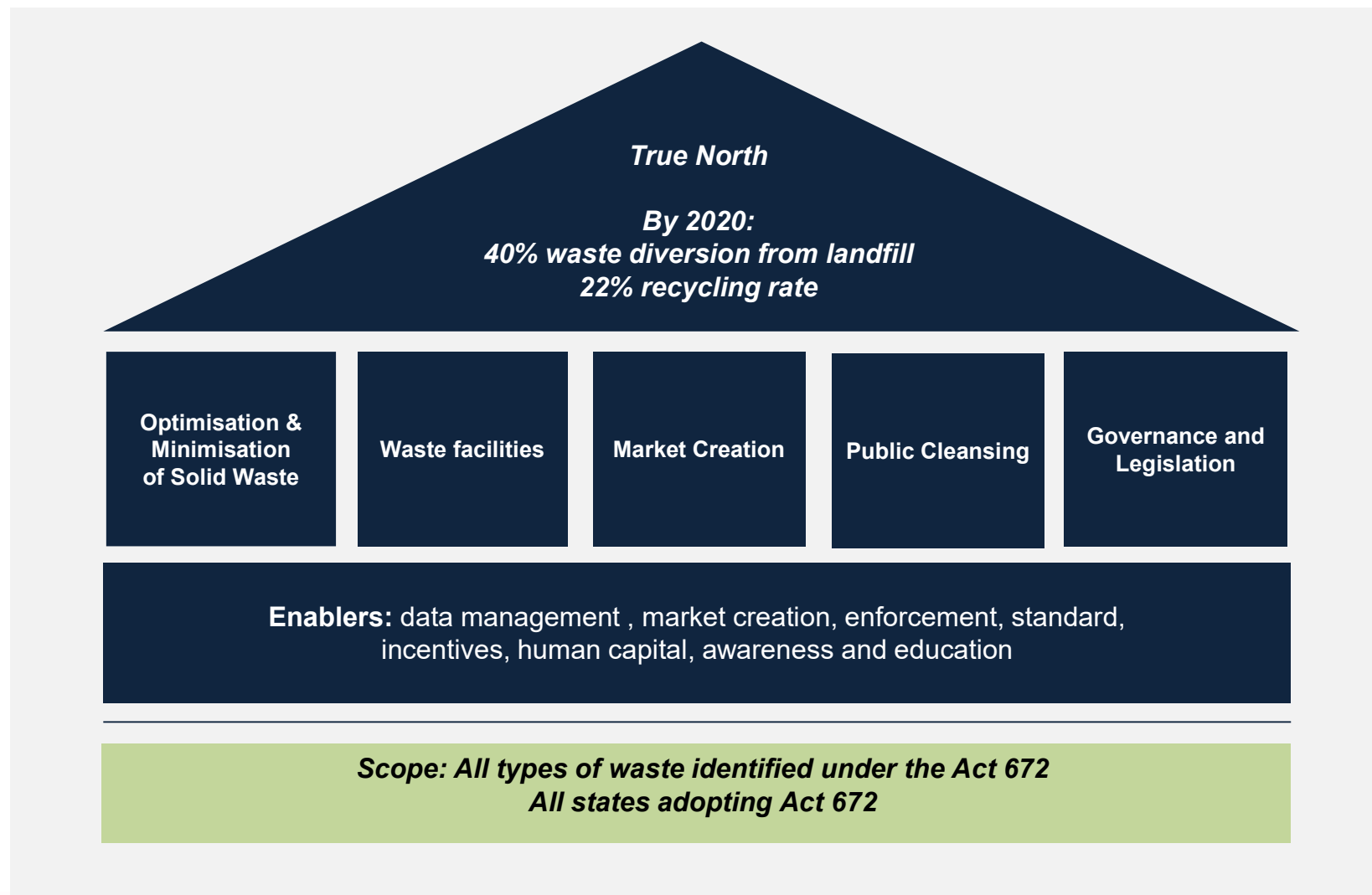
Objectives of Solid Waste Management Lab

- 1** To improve the execution and implementation of waste management (3R, Recovery, Treatment and Disposal) in Malaysia
- 2** To address governance issues in relation to solid waste management
- 3** To propose structural and policy adjustments including enablers that will ensure longer term viability of solid waste management and public cleansing initiatives
- 4** To recommend options in alleviating Government's financial burden in ensuring sustainable solid waste management and public cleansing activities

Approach of Solid Waste Management Lab



Framework for sustainable Solid Waste Management in Malaysia



Expected deliverables and outcomes from this lab

Deliverable	Description	Target by 2020
1 Optimisation & Minimisation of Solid Waste (SWM)	<ul style="list-style-type: none"> Sustained implementation with continuous improvement in minimising solid waste being sent to landfills. Optimisation of waste through recovery and treatment. 	<ul style="list-style-type: none"> 100% Implementation of mandatory separation at source in states adopting Act 672 22% of recycling rate to be achieved
2 Waste facilities	<ul style="list-style-type: none"> To develop Sanitary Landfill for final disposal To identify other facilities required to optimise the Solid Waste Management that helps to prolong the lifespan of landfill. . 	<ul style="list-style-type: none"> To build 23 Integrated Regional Sanitary Landfill with transfer stations network Safe closure of 17 open dumpsites by 2020 Sufficient facilities to support the 40% diversion of waste from landfill
3 Market Creation	<ul style="list-style-type: none"> Waste-to-wealth focus for identification of viable SWM activities where GoM CAPEX/OPEX burden can be transitioned/reduced by Private Sector enterprise & innovation Creation of viable, safely regulated private sector SWM industry that generates jobs & GNI Capacity-building of GoM readiness for combined legal, business evaluation, policy, regulatory & technical expertise 	<ul style="list-style-type: none"> Fully-operational waste flow data gathering: intelligence & knowledge on waste-derived resources by localized generation & demand Addressing linkages of feedstock security & product offtake (via Waste Symbiosis) Establishment of robust SOP pipeline for Private Sector business proposals; from GoM evaluation through to full commercialised implementation
4 Public Cleansing	<ul style="list-style-type: none"> Seek optimal strategy for viable balance of Service Level vs Cost across different areas 	<ul style="list-style-type: none"> Cost optimization for better value / quality by 2020
5 Governance and Legislation	<ul style="list-style-type: none"> To create a overall waste governance platform to monitor, manage and oversee the development of the SWM industry To review Act 672 and policies & regulations; restructuring where necessary to optimize 	<ul style="list-style-type: none"> Streamlining of diverging waste management governance, acts & policies by 2020

Introducing the Initiatives and Enabling Projects

Solid Waste Management Initiatives

1 Optimisation & Minimisation of Solid Waste

- Minimisation of solid waste generation
- Other related waste optimization initiatives

2 Waste facilities

- Basic Infrastructure – sanitary landfill and safe closure of dumpsite nationwide
- Waste treatment facilities – to support the waste diversion from landfill

3 Market Creation

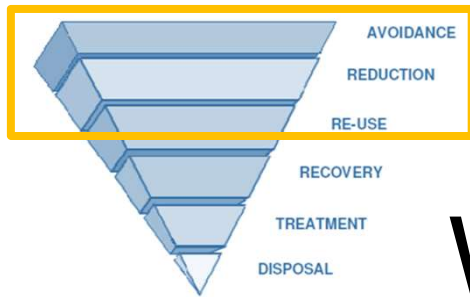
- MSW feedstock readiness
- Create vibrant enterprise: Conducive market structure
- Identify viable market initiation projects

4 Public Cleansing

- Review Concession agreement in 2018
- Carve out of Public Cleansing from Act 672
- Strengthen enforcement

5 Governance and Legislation

- Governance structure for SWM
- Review of Act and Legislations related to SWM



WORKSTREAM 1

OPTIMISATION AND MINIMISATION OF SOLID WASTE

Workstream 1 - Optimisation and Minimisation of Solid Waste



- Minimisation of solid waste generation



- Other related waste optimization initiatives

CONTEXT

The workstream focuses on the optimisation and minimisation of prioritised types of solid waste prior to being sent for recovery/ treatment or disposal

FOCUS AREAS



Municipal Solid Waste :
Waste that includes predominantly household waste and commercial waste



Construction & Demolition Waste :
Waste from demolition and construction activities



Hazardous / Toxic Solid Waste :
Waste that poses threats to public health or the environment



Electronic Waste (E-Waste) :
Waste type consisting of any electrical or electronic appliance

**Only from households*



Bio-medical (Clinical) waste :
Waste products that are produced from healthcare premises

Generation

- Generation of solid waste at households / commercial
- Sorting waste

Collection

- Scheduling of compactors or trucks for waste collection
- Providing bins for recyclables

Transport

- Transportation of waste to sites for transfers, recovery, or disposal

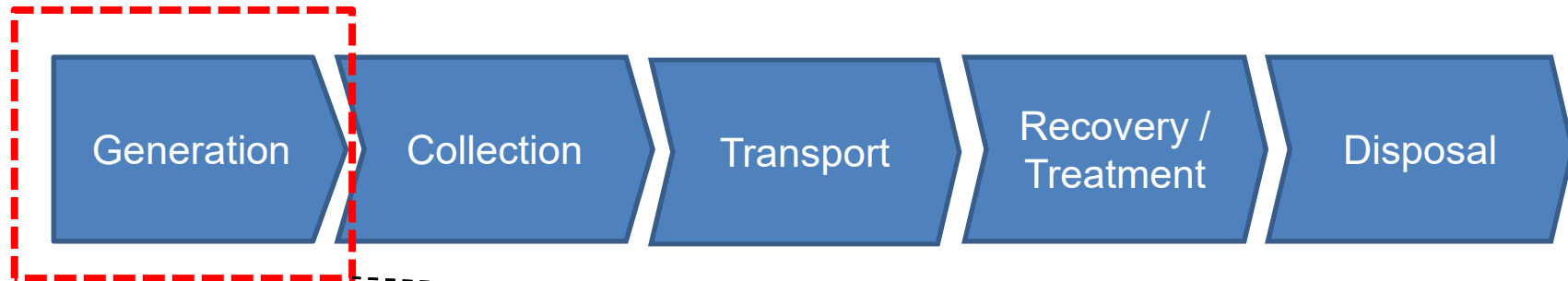
Recovery / Treatment

- Secondary sorting of waste, e.g. plastic, glass, paper, aluminium
- Treatment and recovery of other waste streams

Disposal

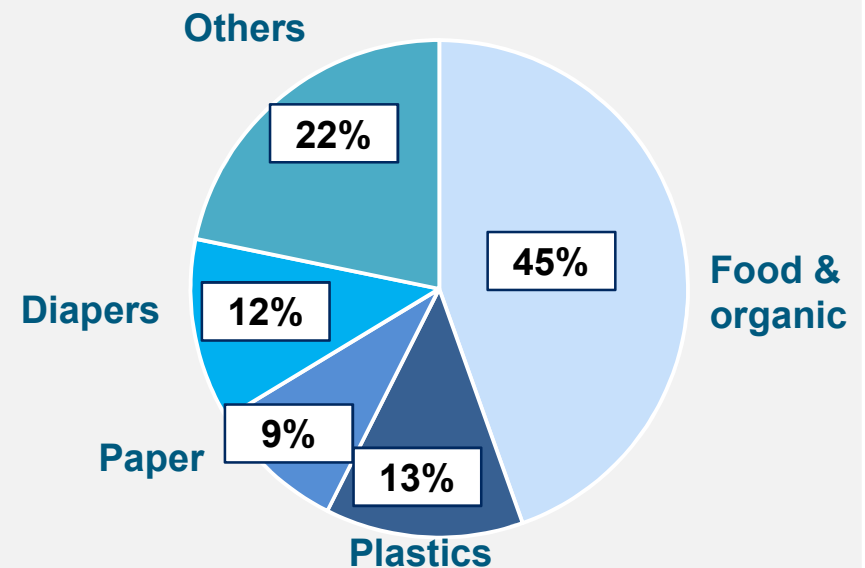
- Landfilling or incineration
- Environmental management

The first stage in the activity chain of Waste Management - Generation



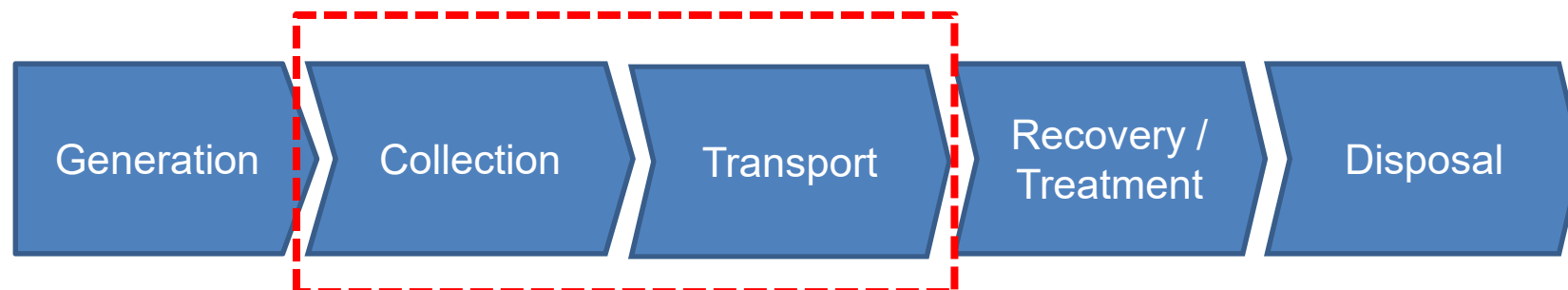
Current Landscape

- Total solid waste generation in Malaysia is 33,130 tonnes per day based on latest study
- High amount of food & organic waste generated from municipal solid waste
- Uncoordinated and unregulated ecosystem for recycled waste
- No reliable and accessible database on solid waste generation



Household waste composition, as generated (2012)

The subsequent stages in the activity chain of Waste Management – Collection and Transport



Current Landscape

- Privatisation of collection of household and similar solid waste and public cleansing with long term concession:
- Alam Flora Sdn Bhd (Central & Eastern Region)
- SWM Environment (Southern Region)
- Environment Idaman Sdn Bhd (Northern Region)

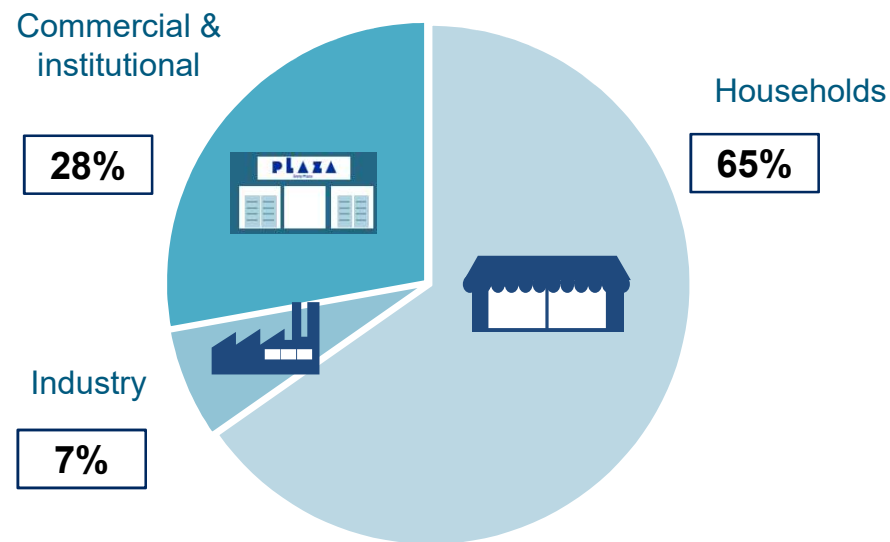
Starting 1 September 2012 :

- 2+1 collection system – 2 days for organic waste, 1 day for recyclable waste, bulky waste and garden waste
- New standards on waste bin and garbage collection trucks
- Enforcement of KPI on collection schedule
- Enforcement on leachate spillage and cleansing

SITUATIONAL ANALYSIS

Malaysia generates 33K tonnes of solid waste per day, mostly from households – at least 22% of waste can be extracted and recycled

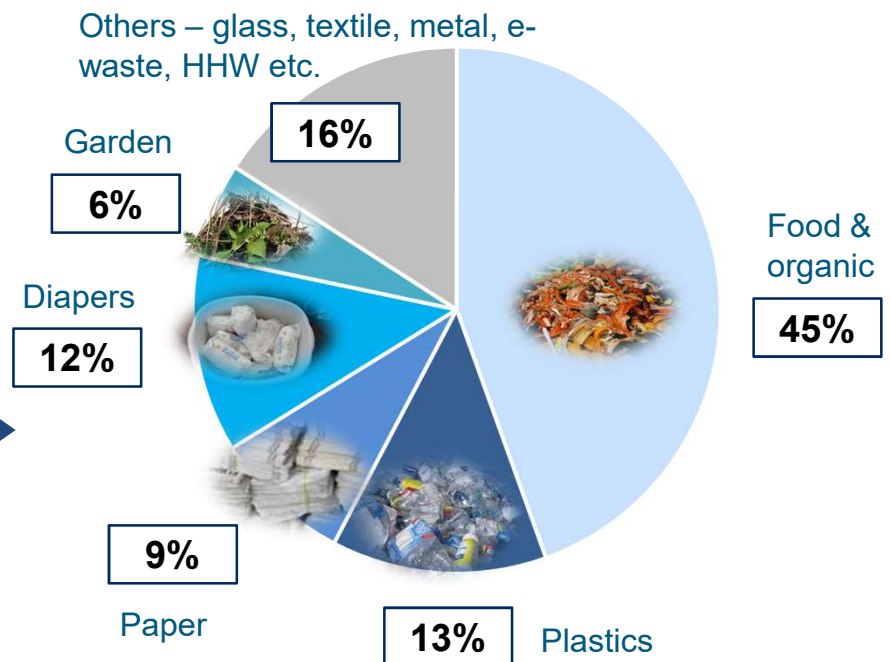
Solid waste generation in Malaysia (2012)



Total of 33 kT solid waste generated per day

- 1.17 kg of solid waste generated per capita
- GKL/ KV generate 1.35 kg waste per capita

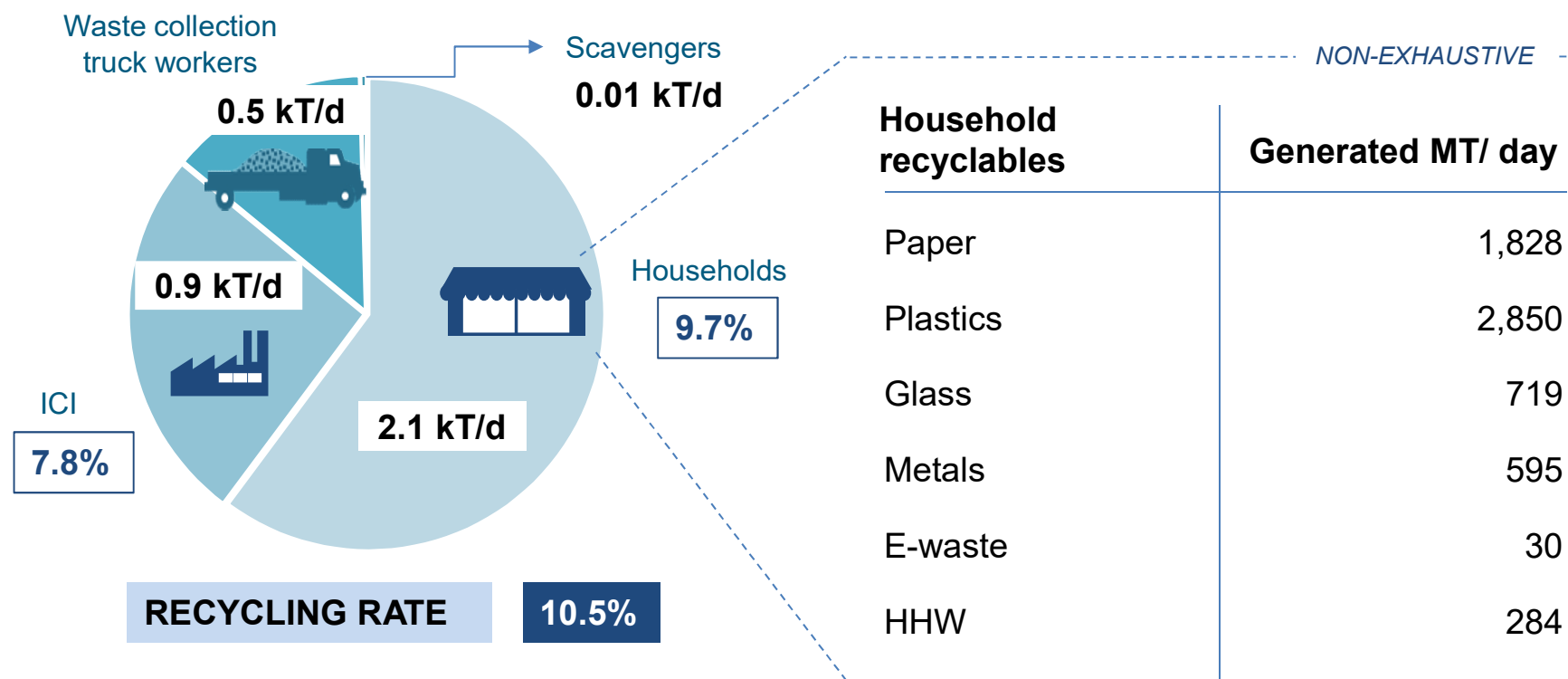
Household waste composition, as generated (2012)



- Organic waste is the largest chunk at 45%
- Paper & plastics form 22% of total waste

Currently overall recycling rate of 10.5% needs to be increased especially from households and ICI

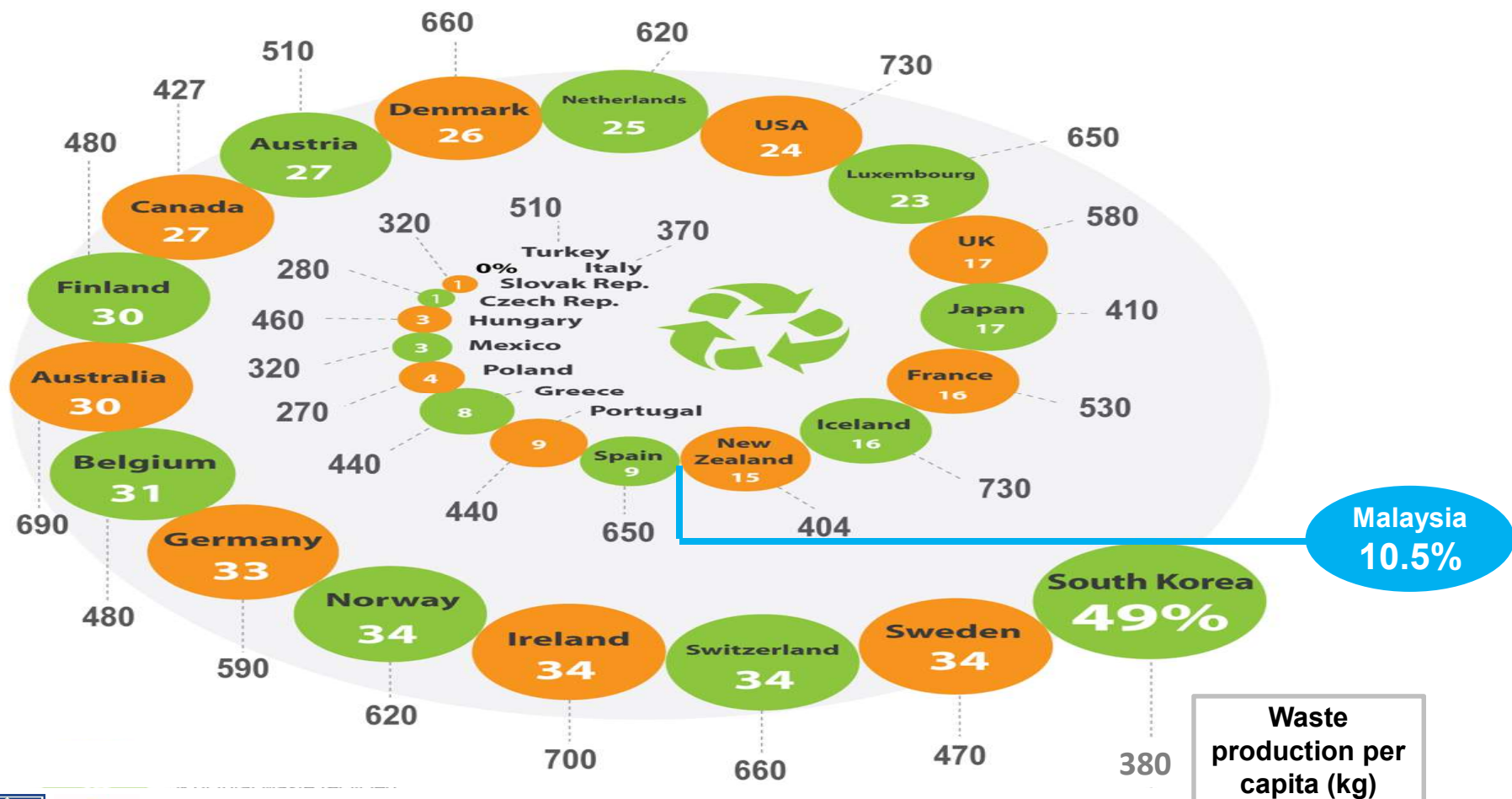
Recycling rate in Malaysia (2012)






- Overall recycling rate of 10.5%
- Recycling rates at source i.e. households and ICI is 9.1%

The recycling rate in Malaysia is relatively low compared to developed countries with best practices

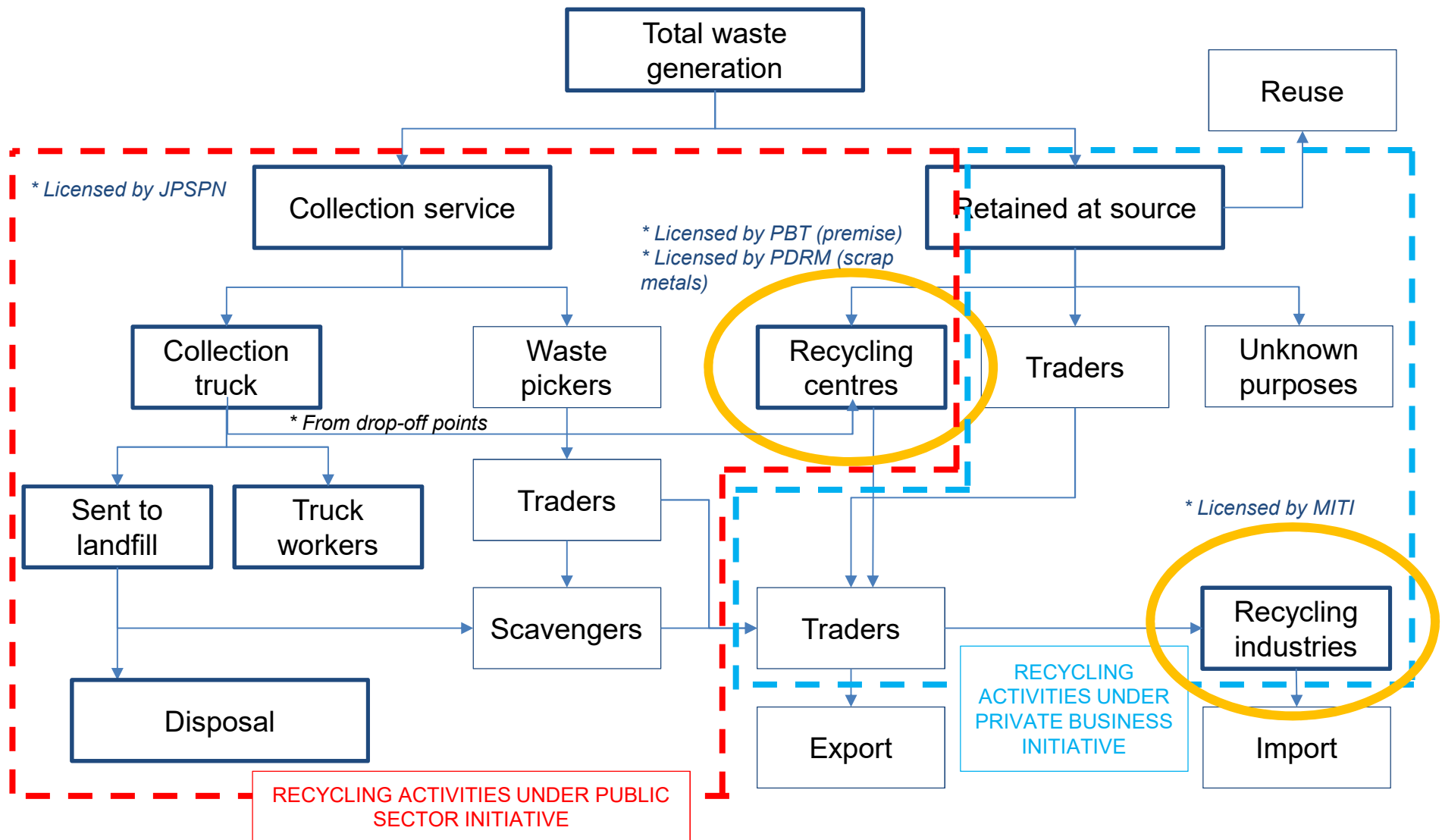
Recycling Rates of OECD Countries



The relatively low recycling rate in Malaysia is caused by several key factors, mainly due to undeveloped mindset and lack of a full-fledged database system

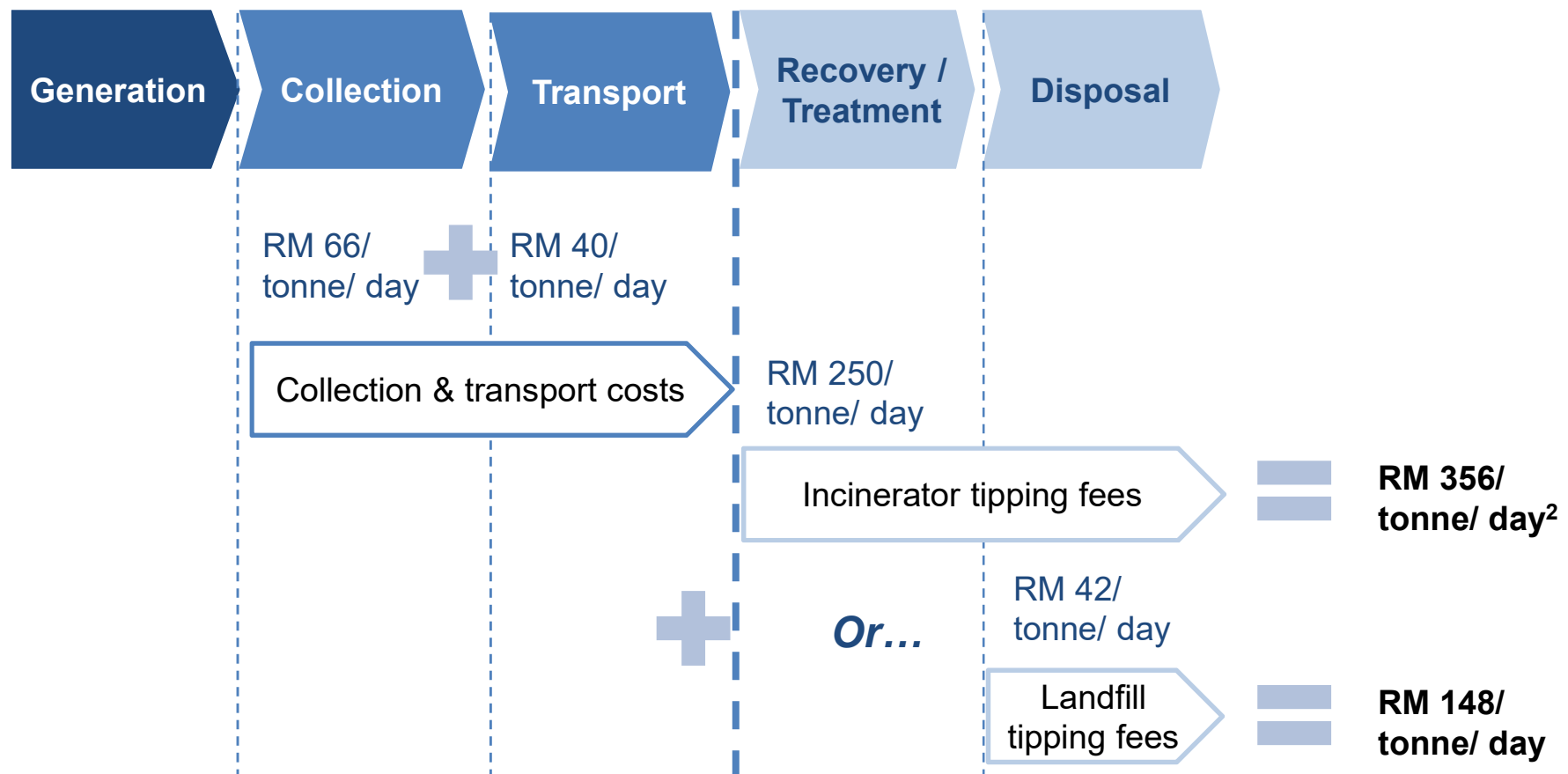
	 BEST-PRACTICE COUNTRIES	MALAYSIA 
MINDSET	<ul style="list-style-type: none"> • 3R practice is well ingrained in daily lifestyle. Non-compliance to waste separation is frowned upon • People generally understands the importance of sustainable waste management 	<ul style="list-style-type: none"> • Society absolves responsibility of waste management to the authorities • Knowledge on waste hierarchy is generally low
WASTE DATABASE	<ul style="list-style-type: none"> • Established data collection system in place 	<ul style="list-style-type: none"> • No consolidated data collection system in place, especially for industrial & commercial waste
CALCULATION METHOD	<ul style="list-style-type: none"> • Calculated periodically from the waste database 	<ul style="list-style-type: none"> • Done on a case-by-case basis via the commissioning of a sampling study
GOVERNING BODIES	<ul style="list-style-type: none"> • All types of waste fall under a single entity 	<ul style="list-style-type: none"> • Different types of waste fall under the purview of different Ministries/ Agencies

Data for collection service is collected by SWCorp from concessionaires¹ – however data from recycling centres and industries are not collected resulting in data gaps



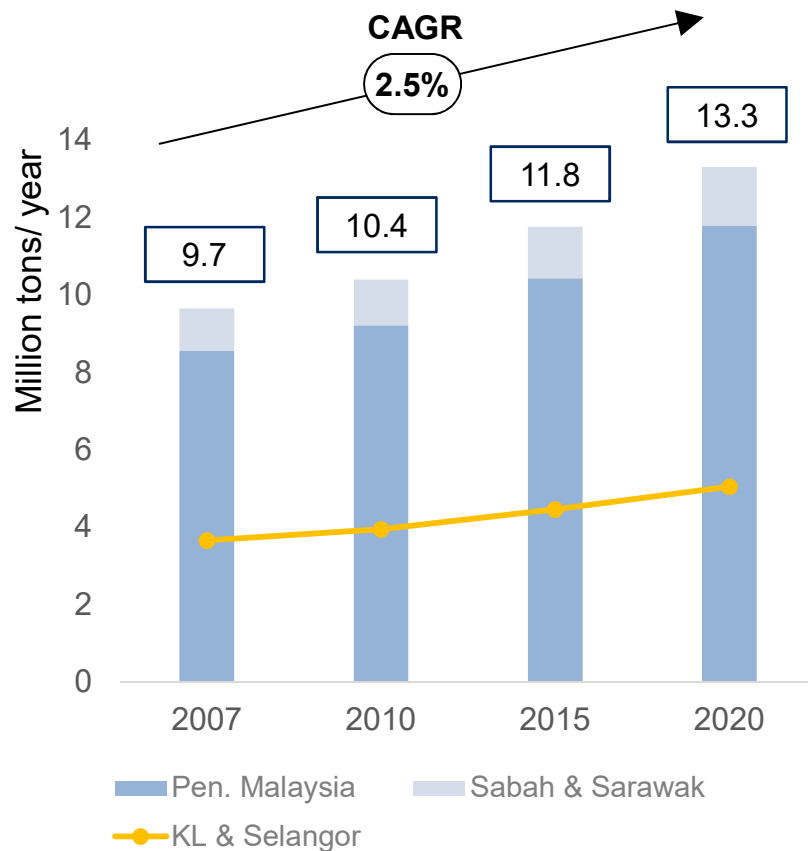
Current estimated cost for solid waste management in Malaysia is RM 148/ tonne/ day¹ – Significant opportunity to reduce costs by minimizing waste at point of generation

Total cost of solid waste management in Malaysia

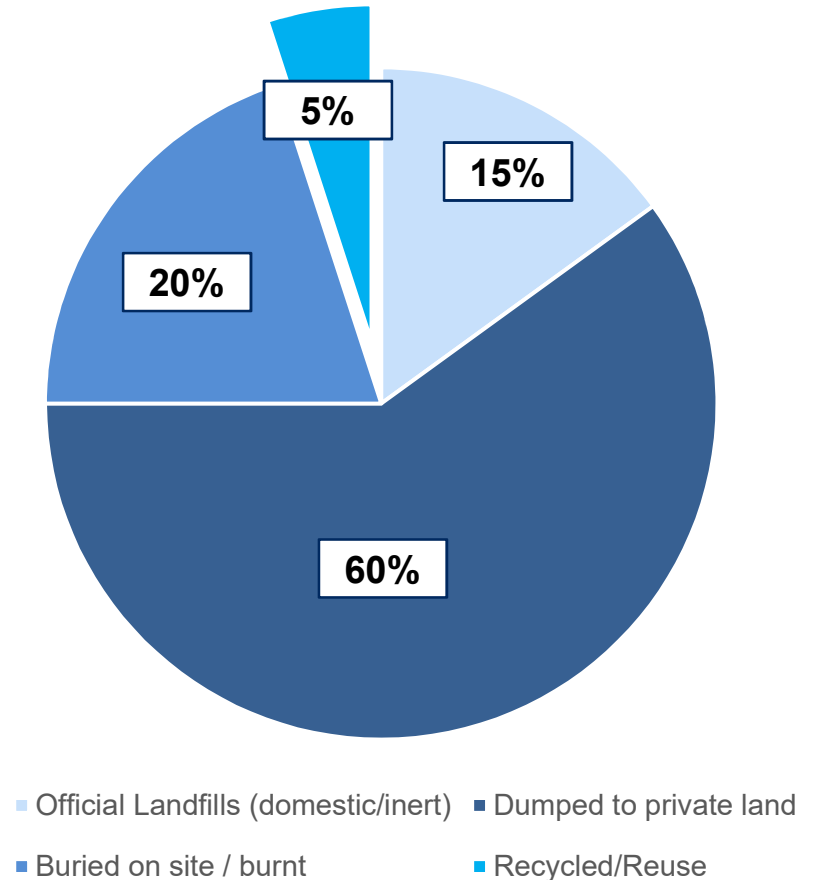


Construction and demolition (C&D) waste is expected to reach 13.3 million tonnes/ year in 2020 – a whopping 60% are dumped in private land or possibly illegally dumped

C&D waste generation projection



Disposal of C&D waste



C&D waste expected to reach 36,473 tonnes per day in 2020

Only 5% of C&D waste are recycled

Existing C&D facility in Sungai Kertas is underutilized due to absence of regulations to fully enforce the Act

C&D Waste Facility in Sq. Kertas



Legislative issues



LAWS OF MALAYSIA

Act 672

**SOLID WASTE AND PUBLIC CLEANSING
MANAGEMENT ACT 2007**

- Capacity of facility is 500 tonnes per day
- Received only 2,446 tonnes in 2014
- Dependent on PBTs to exercise their power under Permission to renovate or build

- C&D waste is within the scope of the Act
- However two regulations are still pending:
 - Licensing
 - Schemes

E-waste and hazardous household waste (HHW) are co-mingled with other domestic waste – improper disposal will lead to environmental contamination



E-waste



Hazardous Household Waste (HHW)

DEFINITION	<ul style="list-style-type: none"> • Used electronic & electrical equipment & items • Household appliances, digital equipment, light bulbs, batteries 	<ul style="list-style-type: none"> • Household waste that may cause adverse effects to environment and health • Paint, bleach, insect sprays etc
GENERATION (2012)	<ul style="list-style-type: none"> • 30 tonnes/ day 	<ul style="list-style-type: none"> • 254 tonnes/ day
ISSUES	<ul style="list-style-type: none"> • Ineffective collection system • Underutilised recycling facilities • Lack of awareness to separate e-waste from household waste 	<ul style="list-style-type: none"> • Ineffective collection system • Lack of awareness to separate HHW from household waste • Recycling facilities are inexistent

NATIONAL STRATEGIC PLANS

The 11th Malaysia Plan provides the guiding principles for effective and sustainable waste management for the period 2016-2020

11MP Chapter 6: Pursuing green growth for sustainability and resilience (excerpts)



The National Strategic Plan for Solid Waste Management is the ultimate policy document – Update to the policy is well overdue as this was done prior to establishment of Act 672

National Strategic Plan for Solid Waste Management (2005)

HIGH-LEVEL ACTION PLANS

1.	Set up the Core Unit within MHLG to launch the new SWM system
2.	Finalize the SWM Act
3.	Establish the Federal Government Agency responsible for SWM
4.	Develop the Master Plans for SWM
5.	Resolve the most suitable form for SWM privatisation
6.	Prepare the GOM Intervention Budget
7.	Improve Waste Generators' Awareness on SWM
8.	Develop the waste database
9.	Technical Research & Development in SWM
10.	Safe Closure of Disposal Sites

Most action plans have been implemented as the focus is more on the federalization of solid waste management via the setup of JPSPN and SWCorp

The Waste Minimisation Strategy provides the strategic plan for waste minimisation – However this too, is outdated as it was done prior to the establishment of Act 672

Waste Minimisation Strategy (2006)

HIGH-LEVEL ACTION PLANS

1.	Enhancement of Awareness Raising Activities under the National Recycling Programme (NRP)
2.	3Rs Activities in Schools
3.	Networking and Development of Partnership Activities of NGOs/CBOs
4.	Strengthening Legal, Regulatory and Financial Mechanism
5.	Improvement of Information Management
6.	Provision of Guidance to LAs on LAP-WM

- **Federal Action Plan is not cascaded down to Local level**
- **Several action plans have not been followed through**

The Waste Minimisation Strategy's 3R action plans were recently reviewed during the National 3R Strategic Plan Workshop and several improvements were proposed

Optimisation and
Minimisation of Solid
Waste

National 3R Strategic Plan Workshop

Objective

- To propose a comprehensive, integrated and cost-effective 3R action plan
- To identify, update and improve existing 3R action plans
- To identify issues and challenges of existing and newly proposed 3R action plans

Workshop implementation

- Presentation on Solid Waste Management Policy – Waste Minimisation by JPSPN
- Presentation on Separation at Source Action Plan by SWCorp
- Participants were grouped as follows:
 1. Enhancement of Awareness on Waste Minimisation (Awareness)
 2. Strengthening of Partnership for 3Rs Activities (Partnership)
 3. Enhancement of Institution to Strengthen Government Policies on Waste Minimisation

Key takeaways

- There are three overarching policies on 3R:
 - Waste Minimisation Plan (2006)
 - SW National Strategic Plan (2005)
 - SWCorp's Strategic Plan (2014-2020)
- Summary of main recommendations:
 - Strengthen and improve public awareness programmes
 - Establish partnerships with NGOs and private sector
 - Develop general guidelines for non-Act 672 States to refer to in order to improve State By Laws on SWM
 - Revise/ reinstate GoM disbursement of funds to non Act 672 states
 - Establish a 3R coordination platform between Federal, State and PBTs
 - Form an Environmental Committee to coordinate 3R activities in schools
 - Improve licensing conditions for recycle businesses for reporting to JPSPN

In lieu of the overdue policy update, Solid Waste Management & Public Cleansing Corporation (SWCorp) developed their own Strategic Plan based on types of waste

SWCorp Strategic Plan (2014-2020) and Comprehensive Action Plan (2015-2020)

STRATEGIC INITIATIVES

1.	Transformation of the society towards assuming responsibility for the cleanliness of the environment
2.	Implement a sustainable solid waste management
3.	Enhance service, use of technology, and solid waste management facilities
4.	Strengthening enforcement and regulatory actions
5.	Sustainable financial resources
6.	Intensify research and development
7.	Enhance corporate image and strengthen the organization of the delivery system

ACTION PLANS BY TYPE OF WASTE

1.	Food waste
2.	E-waste and Hazardous Household Waste
3.	Enhance service, use of technology, and solid waste management facilities
4.	Plastic waste
5.	Tetrapak waste
6.	Industrial waste
7.	Construction & Demolition (C&D) waste
8.	Refuse Derived Fuel (RDF) as renewable source of energy
9.	Diaper waste

- **Enforceable only for Act 672 states**
- **Action plans by type of waste**

INTERNATIONAL BENCHMARK: CASE STUDIES

Copenhagen's "Waste Plan 2008" is a best-case working example of a comprehensive waste management plan

Key Copenhagen statistics

- Population: 500,000
- Strategy: Waste Plan 2008
 - Three-step plan to reduce waste and improve management over the period of 2005-08
 - Five waste management objectives:
 - Less waste and less hazardous substances
 - Resources must be better utilised, reducing the amount of waste to be incinerated and landfilled
 - As much of the environment must be protected as possible for the money
 - Waste system must be adapted to the city
 - Waste system must be logical and well known
- Project status: Ongoing
- Annual CO₂ reduction: 40,000 tons via recycling
- Annual cost saving: USD 670,000

Waste Plan 2008 elements

1 Waste prevention

- Promotes prevention through information campaigns
- Local regulation stipulates citizen and business duties concerning waste behavior
- Encourages less packaging, reuse of products through recycling, composting schemes or other activities
- Participates and partly funds Agenda 21 projects, where citizens with special interest in waste prevention set up local schemes and activities to focus on waste and pin-point ways people can dispose of their waste in the right way

2 Separation


























- Waste contractors only remove separated waste
- Bags and bins provided for households, not businesses
- Bottles, cans, newsprint, paper and cardboard and almost all construction waste are collected at the source
- Shops take waste back
- City seeks continuously to encourage the separation of rubbish – for example, by establishing more civic amenity sites and local recycling centers
- Local environmental centers encourage participation in local projects such as waste separation

3 Treatment and outcomes

- Public companies operate incineration facilities and landfill
- Incineration plants generate power and heat. Amount of heat and power generated from waste in Copenhagen in 2004 equaled consumption of 70,000 households
- Increased awareness of chemicals to ensure they are discarded correctly. Most hazardous waste goes to landfill.
- Construction waste must be separated for recycling. 85% of building waste goes to recycling, a rate the City at least wishes to maintain. Initiatives aim to increase the recycling rate

Ineffective enforcement, poor National-Local level coordination and lack of public awareness are common issues amongst developing Asian countries


Key learnings from developing Asian countries (selected)

COUNTRIES/ recycling rate	 22%	 49%	 5%	 12%	 10%
Policy instrument					
Economic instrument					
Partnerships					
Informative measures					
ISSUES	<ul style="list-style-type: none"> Lack of coordination between the national authorities and the local government Declining recycling rate Not In My Backyard (NIMBY) phenomenon Inefficient management of WtE technologies Poor site selection, landfill issues Limited budget, lack of 3R awareness, poor enforcement and lack of political support Low compliance to the regulation by Local Government units Urban-Rural service disparity Poor enforcement Hazardous waste mixed with general waste 				

Source: Municipal Waste Management Report 2010 (UNEP), OECD, desktop research

 Exist fully

 Exist partially

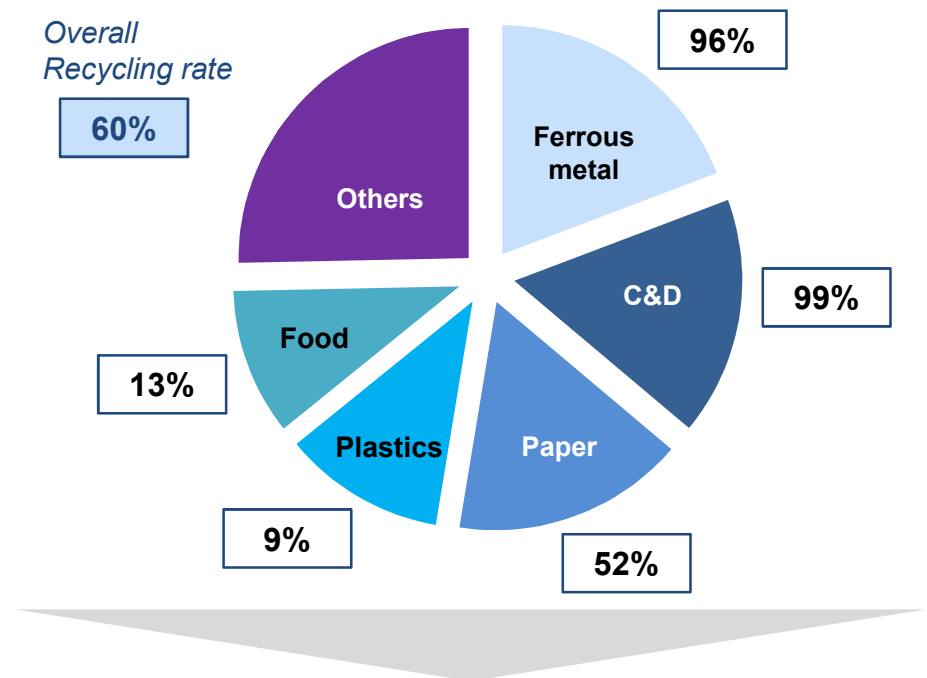
 Exist but ineffective

Lesson from Singapore – More emphasis should have been given towards waste minimisation at source, prior focus was on Waste-to-Energy (WtE) facilities

Solid Waste Management in Singapore

- Singapore invested heavily on WtE due to its small size and dense population
- 93% of Singapore's rubbish is burnt at its four incinerators
- The only landfill in Pulau Semakau is expected to be full by 2040
- NEA predicts that a new multimillion dollar incinerator will be built every 5 to 7 years, and a new landfill every 25 to 30 years
- NEA contracts out the daily collection of household waste (and its disposal) and fortnightly collection of dry recyclables
- Household recycling have slowed down due to existing infrastructure (e.g garbage chutes) and low accessibility of recycling facilities
- **Awareness on importance of 3R is still poor**
- **Currently, waste separation at source is not legislated and enforced**

Composition of recycled waste in Singapore¹ (2014)



- 60% Recycling rate is mainly due to high recycling rates of ferrous metal, C&D and paper
- Without metal & C&D recycling rate is 37%
- Recycling rate for food and plastics are low

'Polluter pays' principle has reduced residual waste in the Netherlands successfully

The polluter pays system

What

- Rather than distributing costs of municipal waste management over all citizens, households pay in function of their waste production (differentiated tariffs or DIFTAR)

How

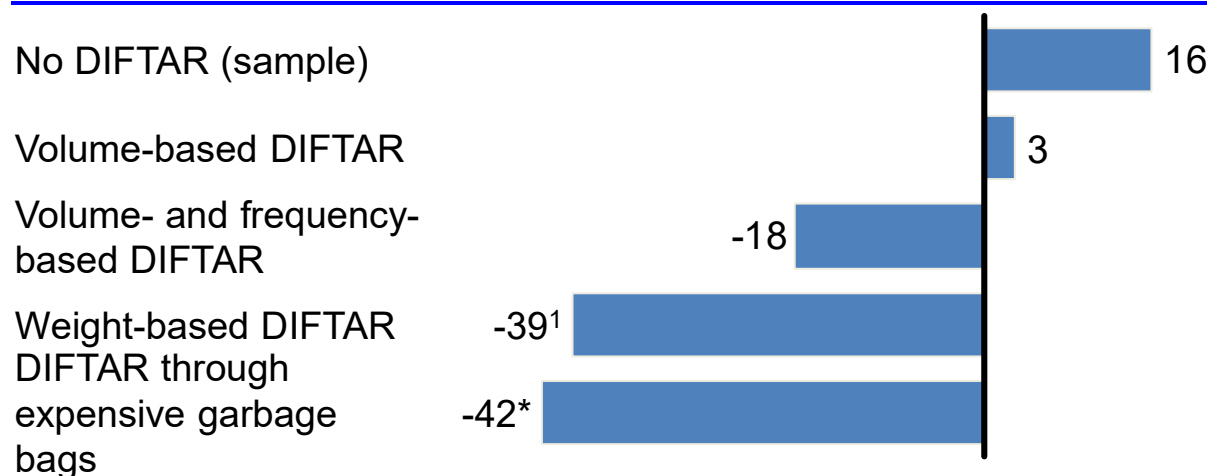
- Four types of DIFTAR systems are commonly applied
 - Based on volume
 - Based on frequency
 - Based on weight
 - Combination of the above

Experience in The Netherlands

- Reduction in residual waste due to increased separation at the source rather than to waste avoidance

Change in residual waste per capita after introduction of DIFTAR

Percent change '01 vs. '96



Reduction in residual waste due to increased separation at the source rather than to waste avoidance

¹ Based on small sample (10 municipalities for weigh-based DIFTAR and 7 for expensive garbage bags)

Nevertheless, the implementation mechanism and public implication need to be properly scrutinised as charging the public for public goods is never a popular decision

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National

Polluter-pay garbage plan hits snags in Vaud

Published: 09 Jan 2013 10:37 GMT+01:00

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A scheme introduced on January 1st to charge residents for the garbage they produce in Lausanne and almost 200 other municipalities in the canton of Vaud is off to a rocky start, according to media reports.

- Gas poisons 60 people at Lausanne birthday bash (16 Dec 12)
- Police crack down on Lausanne drug dealers (07 Nov 12)
- Swiss polluted sites Zug-sized, says report (01 Nov 12)

The polluter-pay principle, affecting 500,000 residents, was adopted by the municipalities in a bid to encourage recycling and reduce waste.

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NEWS

Posted May 20 | Updated May 20

INCREASE FONT SIZE **PA**

Waterville residents critical of pay-as-you-throw trash program

Officials responded to previous concerns as Mayor Nick Isgro urged people to talk to their councilors.

BY AMY CALDER STAFF WRITER

acalder@centralmaine.com | @AmyCalder17 | 207-861-9247

Share f t e 5 Comments

WATERVILLE — Some residents at a forum Wednesday trashed pay-as-you-throw, saying their taxes are too high now and having to buy special bags for garbage is insulting.

Innovative use of technology and social media should be incorporated in awareness campaigns in order to educate and rally the community together

1



"Clean Up Australia Day" - Web Portal for volunteer participation

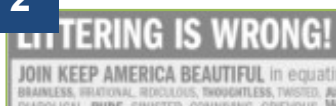
- A community-driven clean-up initiative that facilitates the creation of "clean-up sites" around Australia via the use of a **web portal**
- Via the portal, volunteers can:
 - Create clean-up sites
 - Browse existing sites and potential join those sites
 - Donate
- Various information can also be found on the portal such as the performance of clean-up efforts, sites that receive the most donations etc

- A simple and convenient platform for volunteers and donors to contribute to community clean-up efforts
- Faster and cheaper channel to rally volunteers together for an environmental cause

Site Name	Site Coordinator	Suburb	State	Postcode	Council	
Eligmore	Phil Duffy	Darlington	WA	6070	Mandurah Shire Council	DONATE
Eligmore Park	Anna Shelly	Lane Cove	NSW	2086	Lane Cove Municipal Council	JOIN DONATE
BLACKWOOD FOREST	GILLIE ROSSDAWN	Hawthorndene	SA	5051	Willesmere City Council	JOIN DONATE
Brown Road Stop	Chris Dawson	Dutton Park	QLD	4102	Brisbane City Council	DONATE
Cape Cleveland Bay	Tracy Stray	Cungahua	QLD	4818	Townsville City Council	JOIN DONATE
Capestone Clean Up	Karl Hansen	Capestone	NSW	2046	Lingens City Council	JOIN DONATE

1. Browse and filter sites by State
2. Details of "Clean-up site"
3. Join or donate to site

2



"Littering is Wrong Too" - Awareness campaigns utilizing the social media

- An awareness campaign by the Keep America Beautiful non-profit community-driven organisation which utilizes social media, events and viral marketing to engage young adults and increase awareness of the problem of litter

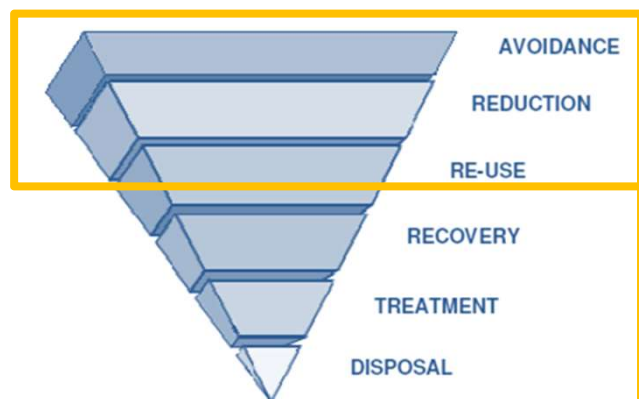
- Rides on the current trend on Social Media. The American public has high inclination to share photos and comments
- A campaign with a sense of humor – yet delivers the simple yet critical message that the act of littering is a bad habit



1. The public is encouraged to post a photo or comment on an issue/ habit etc that is wrong
2. The "Littering is Wrong Too" tagline appears under each photo/ comment to educate users on littering
3. Website visitors can also vote for their favorite "Wrong"

LIST OF INITIATIVES

Two main thrusts were identified under Optimisation & Minimisation of Solid Waste



WASTE HIERARCHY

Guiding principles:

1. Prevent waste generation (Reduce and Reuse)
2. Maximise waste diversion (Recycle and Recover)
3. Minimise disposal (residuals)

1

Minimisation of solid waste generation

- Existing **3R initiatives** laid out by various plans are consolidated and strengthened to improve effectiveness
- *5 key initiatives have been identified*

2

Other related waste optimization initiatives

- Other waste optimization initiatives to cater for **other priority types of waste** that were not covered under the federalization of solid waste management
- *2 key initiatives have been identified*

Under both Thrusts, seven key initiatives were identified

Thrust 1

1 Minimisation of
solid waste
generation

Five key initiatives

- | | | | |
|----------|---|----------------------------|--------|
| 1 | Implement Separation at Source | REDUCE | JPSPN |
| 2 | Introduce Pay-As-You-Throw (PAYT) mechanism | REDUCE | JPSPN |
| 3 | Introduce new mechanisms to encourage recycling | REUSE
RECYCLE | JPSPN |
| 4 | Enhance awareness and public education efforts on sustainable waste management | REDUCE
REUSE
RECYCLE | SWCORP |
| 5 | Establish smart partnerships with NGOs, private sector, academic institutions and communities | REDUCE
REUSE
RECYCLE | JPSPN |

Thrust 2

2 Other related
waste optimisation
initiatives

Two key initiatives

- | | | | |
|----------|---|----------|--------------|
| 6 | Ensure sustainable Construction & Demolition waste management practice | OPTIMISE | SWCORP |
| 7 | Implement effective management of e-waste and hazardous household waste | OPTIMISE | JPSPN
DOE |

Source: National Strategic Plan (2005), Waste Minimisation Strategy (2006), SWCorp Strategic Plan (2014-2020), 3R Workshop, pre-lab discussions

**Collectively, implementation efforts will peak in 2018.
However success highly depends on the key enablers –
funding, policy, database and manpower**

<u>KEY MILESTONES 2015-2018</u>			<u>IMPACT (2015-2020)</u>
1	Separation at Source	▶ Commence in Sept 2015 for households	<ul style="list-style-type: none"> • 22% overall Recycling Rate • Total waste of 40,477 T/ day diverted from landfills • Cost savings of RM 3.3 m due to landfill diversion • Recyclables recovered to grow by CAGR of 22%
2	Pay-As-You-Throw (PAYT)	▶ Commence in 2018	
3	New mechanisms to encourage recycling	▶ Enforce Gov't Green Procurement in 2016 ▶ Launch Take Back System in 2018 ▶ 20 pilots under Food Waste Plan by end 2016	
4	Awareness and public education	▶ Refine media strategy in 2016	
5	Smart partnerships	▶ Establish ongoing consultative forum in 2016	
6	C&D waste management	▶ Establish Code of Practice in 2016	
7	E-waste and HHW waste management	▶ Commence in tandem with Separation at Source	

Estimated total funding of RM 140 m until 2020

Policy update, database platform, manpower & capability

Initiative Factsheet

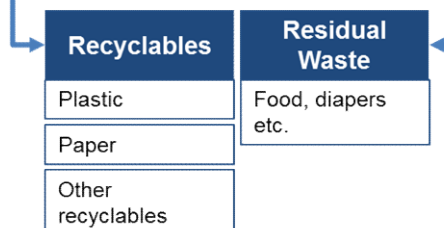
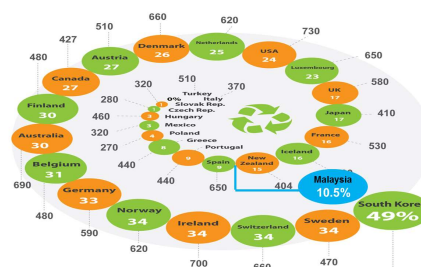
Implement Separation at Source

Case for change

- Relatively low recycling rate of 10.5%
- Awareness and understanding on the importance of waste segregation is still low
- Households utilize informal channels to recycle
- High cost of building treatment and disposal facilities

Our proposal

- Enact legislation and develop guidelines
- Establish strategic collaboration with Ministries/ Agencies, private sector, NGOs and communities
- Recognise achievements in Separation at Source
- Empower concession companies' readiness to implement
- Establish database on municipal solid waste
- Enhance awareness and education on separation at source through various media
- Full enforcement of the law
- Regular monitoring and evaluation
- Provision of Guidance to other States (Non-Act 672)
- Expand implementation to ICI (Industry, Commercial & Institution)



Cost / Funding

Total funding

RM 10 m

Impact

- 22% overall recycling rate in 2020
- 10,927 tonnes/ day diverted from landfills in 2020
- Recyclables recovered to grow by CAGR of 22% (2015-2020)
- Waste collectors to collect 58% of total recyclables generated
- Generate economies of scale for the recycling industry

Key success factors

- Regulations to be finalised before implementation
- Local level public engagements
- Effective monitoring and enforcement
- Consolidated database on recyclables

Owner & stakeholders

- JPSPN
- SWCorp, Concessionaires, PBTs

1 Minimisation of solid waste generation

▲ Launch

Implement Separation at Source – Action Plan (2/4)

Activity/ Task details	Owner	Duration	Progress/ Remarks	2015							2016	2017	2018	2019	2020
				6	7	8	9	10	11	12					
cont. b) Collaboration with Ministry of Education	SWCorp/ JPSPN	1 year	Completed												
i) Develop curriculum in primary & secondary schools		Ongoing													
ii) Develop participative school activities		1 year													
iii) Develop course content for Institute Pendidikan Guru		2 months													
c) Collaboration with NGO		3 months													
d) Collaboration with Govt Agencies		-													
e) Collaboration with Concessionaires	SWCorp	3 months	Completed												
f) Collaborate with an Iconic F&B company e.g. McDonald's, KFC to lead by example		-													
3. Recognise achievements in Separation at Source	SWCorp	Ongoing													
i) Establish awards according to category															
4. Empower concession companies' readiness to implement	SWCorp	-	Completed												
5. Establish database for municipal solid waste	SWCorp	4 months													
To prepare compositional data on collected recyclables															

Implement Separation at Source – Action Plan (3/4)

Activity/ Task details	Owner	Duration	Progress/ Remarks	2015							2016	2017	2018	2019	2020
				6	7	8	9	10	11	12					
6. Enhance awareness and education on Separation at Source through various media	SWCorp														
a) Promotional through TV		1.5 years													
b) Promotion through radio		1 year													
c) Promotion through social media		Ongoing													
d) Promotion through Newspaper		1 year													
e) Promotion through brochures & posters		2 months													
b) Community engagements		Ongoing													
g) Billboard		1 year													
h) Banners		3 months													
7. Full enforcement of the law	SWCorp														
a) Friendly reminder		2 months													
a) Warning notice		4 months													
b) Issuance of Summons or community cleansing service		Ongoing													
8. Continuous monitoring, evaluation and refinements	SWCorp	Ongoing													
- KPIs & performance															
- Complaints/ feedback															
- Strengthen database															
- Further waste separations															
- Annual study to determine recycling rate															



Launch

Implement Separation at Source – Action Plan (4/4)

Activity/ Task details	Owner	Duration	Progress/ Remarks	2015							2016	2017	2018	2019	2020
				6	7	8	9	10	11	12					
9. Provision of Guidance on Separation at Source to other States	JPSPN														
a) Formulation of Guidelines for Local Action Plan		1 year													
b) Dissemination of the Guidelines for Local Action Plan		1 year													
10. Expand Implementation of Separation at Source to ICI	JPSPN														
a) Develop guidelines		6 months													
b) Stakeholder engagements		6 months													
c) Launch and enforcement of the law		Ongoing													

Implement Separation at Source - Major challenges and mitigation plan

Major challenges	Priority	Mitigation Plan
1. Public misconception <ul style="list-style-type: none"> • Additional burden • Monetary gain for concessionaires • Method of waste separation 	2	Conduct public engagement activities down to local community level to clarify all misconceptions
2. Data from informal recyclers not available	1	Data submission as part of licensing conditions by JPSPN
3. No dedicated facility to collect recyclables in non-landed properties	4	Concessionaire to provide dedicated bins for recyclables in non-landed properties
4. Difficulty in enforcement <ul style="list-style-type: none"> • Collection of non-separated waste • Non-landed properties 	3	<ul style="list-style-type: none"> • Concessionaires will still collect unseparated waste but will notify SWCorp for enforcement • Responsibility will be placed on the JMB or PBTs

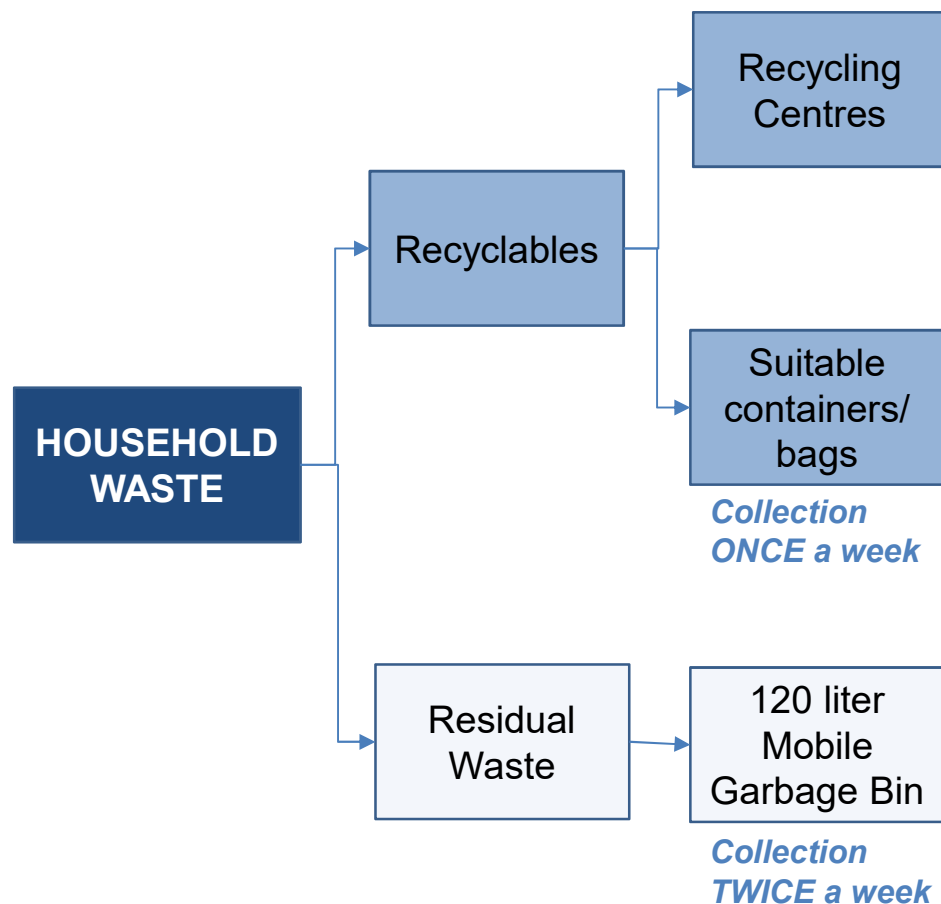
Implement Separation at Source – Enablers

Enabler	Function
<ul style="list-style-type: none"> Regulations to be ready before implementation kicks off in September 2015 – decision for the enforcement for non-landed property needs to be finalized as soon as possible 	<ul style="list-style-type: none"> To regulate implementation and subsequently enforce the law on Separation at Source for households
<ul style="list-style-type: none"> Promotional material & publicity must be informative, easy to understand and distributed to all by leveraging on residents associations 	<ul style="list-style-type: none"> To ensure the general public understands why and how Separation at Source is to be carried out
<ul style="list-style-type: none"> Provision of waste bags for recyclables by concessionaires/ PBTs – blue for paper, white for plastics and green for others 	<ul style="list-style-type: none"> To encourage the general public to adopt the practice
<ul style="list-style-type: none"> Consolidated data on recyclables – SWCorp to consolidate data from concessionaires and recycle centres (data submission as condition under license issued by JPSPN) 	<ul style="list-style-type: none"> To ensure results and impact of initiative can be effectively measured/ estimated
<ul style="list-style-type: none"> Regulations on Extended Producer Responsibility (EPR) to manufacturers 	<ul style="list-style-type: none"> To regulate implementation and subsequently enforce the law on Separation at Source for ICIs (Industry, Commercial & Institution)

Implement Separation at Source – Owners, KPIs and targets

Owner	Main KPI Dimension	Target(s)
JPSPN	Overall recycling rate (%)	• To reach 22% by 2020
	Preparation of related regulation	• To be ready by 1 September 2015
SWCorp	Reduction of recyclable content in residual waste disposed at landfills (%)	• 10% reduction per year
	Enforcement on non-separation of waste offences	• Not more than 20% cases of non-compliance per month
	Effectiveness of awareness programmes	• Sampling survey on willingness to implement – 80% by 2020
	No of community-based 3R programmes annually	• Bandaraya - 10 • Perbandaran - 5 • Daerah – 3

By September 2015, it is mandatory for households in the 7 States to separate recyclables from other household waste



Initiative Factsheet

Introduce Pay-As-You-Throw (PAYT) mechanism¹⁾

Case for change

- General public need to assume responsibility for excessive waste generation
- A supporting mechanism is required to encourage households to separate their waste
- To reduce excessive waste generation especially during festive seasons



Our proposal

- Explore, evaluate, recommend and obtain approval for the optimal PAYT mechanism
- Conduct benchmarking study on implementation in other countries
- Amend legislation (if necessary) and develop policy for PAYT
- Conduct stakeholder engagements to assess public willingness to pay & political implications
- Develop educational/ awareness programs to continuously educate the public
- Launch, monitor & review implementation
- Staggered and flexible enforcement for the initial months of implementation



Cost / Funding

Total funding	TBD
---------------	-----

Impact

- Overall recycling rate of 22%
- 10,927 tonnes/ day diverted from landfills
- Negative reinforcement measure to educate & encourage households to reduce waste
- Generate additional income

Key success factors

- Optimal implementation mechanism
- Key learnings from Separation at Source
- Implementation by phases
- Public acceptance

Owner & stakeholders

- JPSPN
- SWCorp, AGC, Concessionaires

1) Applicable for residual household waste, after separating out the recyclables

Introduce Pay-As-You-Throw (PAYT) mechanism – Action Plan (1/2)

1 Minimisation of solid waste generation

Activity/ Task details	Owner	Duration	2015							2016	2017	2018	2019	2020
			6	7	8	9	10	11	12					
1. Identifying The Optimal Mechanism i) Analyze & benchmark implementation mechanism - target groups, method , household, ICI ii) Identify acceptable charge rates to the public iii) Identify penalty system and required regulation iv) Finalize & decide on mechanism to be used	JPSPN	3 months 6 months 2 months 1 year												
2. Finalisation of Policy Paper (i) Drafting ii) JPP approval iii) Cabinet approval	JPSPN	2 months 1 month 3 months												
3. Regulation i) Drafting ii) JPP iii) AG iv) Ministers approval	JPSPN, AGC	3 months 1 month 3 months 1 month												

▲ Proposed launch

Introduce Pay-As-You-Throw (PAYT) mechanism – Action Plan (2/2)

1 Minimisation of solid waste generation

Activity/ Task details	Owner	Duration	2015							2016	2017	2018	2019	2020
			6	7	8	9	10	11	12					
4. Engagements	JPSPN													
i) Training & workshop		3 months												
ii) Awareness and education		15 months												
iii) Engagement with other stakeholders & communication campaigns		1 year												
5. Implementation	JPSPN & SWCorp													
(i) Launch														
ii) Reporting		Ongoing												
iii) Evaluate, review and enhance		Ongoing												
6. Enforcement of the law	SWCorp	Ongoing												
Staggered and flexible enforcement														

▲ Proposed launch

Introduce Pay-As-You-Throw (PAYT) mechanism - Major challenges and mitigation plan

Major challenges	Priority	Mitigation Plan
1. Mechanism to charge polluters <ul style="list-style-type: none"> Landed, non-landed households ICI Choice of billing method – direct billing, prepayment, hybrid Choice of charging method – by volume, weight or container Alignment with current collection method (for households) 	2	<ul style="list-style-type: none"> Implementation mechanism to be refined upon the outcome of Separation at Source Consider starting with ICI followed by household due to simpler monitoring/enforcement
2. The need to radically change the mindset and transform the culture of the general population	1	<ul style="list-style-type: none"> Continuous public engagements on education and awareness at community-level Special programmes for target groups Develop non-monetary incentives such as retailer discount vouchers, special awards for waste-efficient communities
3. Enforcement and monitoring	3	<ul style="list-style-type: none"> Boost up number of enforcers Delegation of power to PBT enforcers
4. Possible occurrences of illegal dumping	4	<ul style="list-style-type: none"> Strong collaboration and enforcement amongst stakeholders

Introduce Pay-As-You-Throw (PAYT) mechanism – Enablers

Enabler	Function
<ul style="list-style-type: none"> Review and itemize expenditure of assessment tax 	<ul style="list-style-type: none"> To provide transparency to general public on how their money is being utilised
<ul style="list-style-type: none"> Optimal mechanism to be decided <ul style="list-style-type: none"> Charge by volume, weight or container (exceeding 120L MGB) Method of charging – prepaid waste bag, direct billing or hybrid 	<ul style="list-style-type: none"> Ease of implementation without burdening the general public
<ul style="list-style-type: none"> Act 672 need to be amended if prepaid waste bag method is chosen – Sec.30(1) – Charging of fees via written notice within stated timeframe 	<ul style="list-style-type: none"> To allow fee to be charged before generation of waste e.g. for prepaid waste bags
<ul style="list-style-type: none"> Regulation PUA309 under Act 672 needs to be amended to include offenses under s.32 as a compoundable offense 	<ul style="list-style-type: none"> Ease of enforcement - To allow issuance of summonses and prevent offenses to be settled only via court proceedings
<ul style="list-style-type: none"> Promotional material & publicity must be informative, easy to understand and distributed to all leveraging on residents associations 	<ul style="list-style-type: none"> To ensure the general public understands why and how PAYT is to be carried out
<ul style="list-style-type: none"> Incentives for pollutants e.g. tax rebates, private sector sponsorship, vouchers etc 	<ul style="list-style-type: none"> To encourage behavioural and lifestyle change especially at the early stage of implementation

Introduce Pay-As-You-Throw (PAYT) mechanism – Owners, KPIs and targets

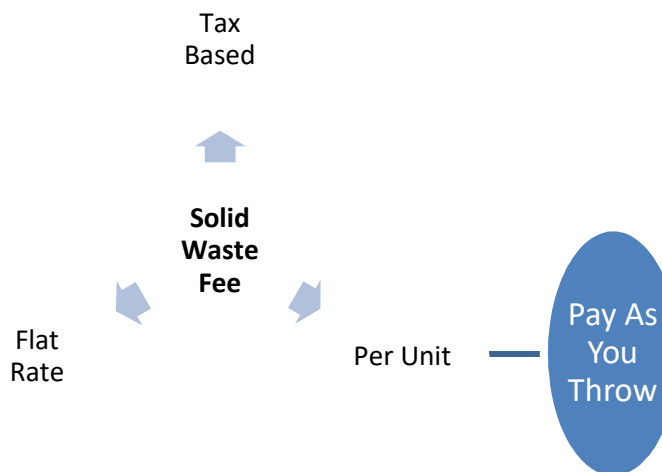
Owner	Main KPI Dimension	Target(s)
JPSPN	Overall recycling rate	• 22% by 2020
	Preparation of regulation	• To be ready by Q2 2017
SWCorp	Reduction of household residual waste, as generated (%)	• 5% reduction per year
	Public willingness to pay	• Sampling survey – 70% willing to pay prior to launch

In line with the move towards the Polluter Pay Principle the mechanism for Pay-As-You-Throw is being explored

1 Minimisation of solid waste generation



Pay-As-You-Throw (PAYT)



Optimizing costs



Economic instrument to supplement waste management cost

Negative reinforcement for waste reduction and separation at source



Encouragement to recycle at generation point

To promote:

- Cost Control
- Equity (Fairness)
- Environmental quality.



Method (to be decided)

Pay by Weight	<ul style="list-style-type: none"> • Any container (weighing device) • Specific container (bin lifter with weight sensor)
Pay by Volume	<ul style="list-style-type: none"> • Any container (volume sticker) • Specific container (specific volume) • Specially marked bag (specific volume)
Hybrid	<ul style="list-style-type: none"> • Minimum rate + specific container (weight/volume) OR specially marked bag (volume)

Options:

- Direct billing
- Prepayment
- Hybrid

Initiative Factsheet

Introduce new mechanisms to encourage recycling

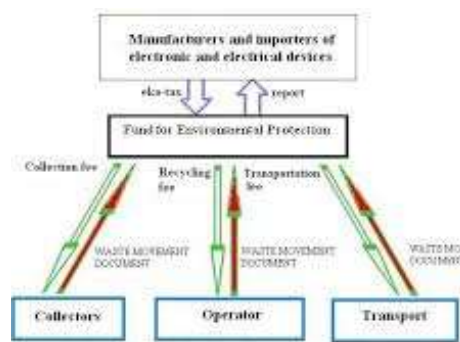
Case for change

- No responsibility placed on industry players to minimize waste
- Engagements with industry players are still lacking
- Public procurement policy does not set a good example
- 45% of waste composition are food & organic. Separation at source should begin with commercial entities due to simpler implementation & bigger impact



Our proposal

- Prioritise recycled products in public procurement
- Implement Take Back System to boost recycling demand
- Recycling incentives to encourage low value recycling industry such as glass, ceramic, textile etc
- Research and Development to create new technology in recycling
- Implement waste minimisation concept into the design of products
- Develop the strategic plan for Food & Organic Waste from commercial entities



Cost / Funding

Total funding

RM 45 m

Impact

- Overall recycling rate of 22%
- 10,927 tonnes/ day diverted from landfills
- Recyclables recovered to grow by CAGR of 22% (2015-2020)
- Minimise solid waste generation at the pre-consumption stage
- Develop the recycling industry

Key success factors

- Regulations on Extended Producer Responsibility (EPR) to manufacturers
- Incentives to develop R&D for recycled products and process
- Commitment from Govt stakeholders

Owner & stakeholders

- JPSPN
- SWCorp, MITI, MOF, SIRIM, MGTC, MOSTI, MOE

Introduce new mechanisms to encourage recycling – Action Plan (1/3)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
1. Prioritise recycled products in public procurement	MOF JPSPN														
i) Engagement with stakeholders (JPSPN, DOE, KETTHA, MITI, MIDA)		6 months													
ii) To issue treasury directive letter (AP) for selected products		6 months													
(iii) Begin implementation of Gov't Green Procurement (GGP)		Ongoing													
2. Take Back System To Boost Recycling Demand	JPSPN DOE														
i) Identify the priority of waste stream e.g. e-waste, fluorescent lamp etc		6 months													
ii) Engagement with manufacturer, producer, importer and retailer		6 months													
iii) Establish take back mechanism and technology e.g. vending machine		9 months													
iv) Develop EPR Regulations		6 months													
v) Implementation – pilot projects		6 months													
vi) Implementation – phased by sector		Ongoing													
vi) Monitoring and evaluation		Ongoing													
vii) Award and recognition		Ongoing													

Introduce new mechanisms to encourage recycling – Action Plan (2/3)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
3. Recycling Incentives To Encourage Low Value Recycling Industry	MITI SWCorp														
i) Engagement with concessionaires and recyclers/ SMEs		9 months													
ii) Support seed funding for SMEs		1 year													
iii) Develop standard guidelines for recyclable material values		1 year													
iv) Incorporate into Take Back System as support system		Ongoing													
4. Research and Development To Create New Technology In Recycling	MOSTI MOE														
(i) Incentivise R & D to increase recycling rate		Ongoing													
(ii) Promote more subject matter experts to support R&D		Ongoing													
(iii) Support grants for NGOs on the ground		1 year													
5. Implement waste minimisation concept into the design of products	SIRIM MGTC														
(i) Design - Easily recyclable material for packaging		Ongoing													
(ii) Material - Recyclable materials for selected products	Ongoing														

Introduce new mechanisms to encourage recycling – Action Plan (3/3)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
Develop strategic plan for food & organic waste	JPSPN														
i) Establish food waste procedures	SWCorp	1 year													
ii) Include provision for food waste in the Business Waste regulation	JPSPN	6 months													
iii) Pilot projects - 20 selected locations	SWCorp, BiotechC	1.5 years													
iv) Inculcate the culture of composting - 30 programmes per year	SWCorp	Ongoing													
v) Establish data collection system	SWCorp	1.5 years													
vi) Disseminate guidelines and conduct roadshows for implementation	SWCorp	5 months													

Introduce new mechanisms to encourage recycling - Major challenges and mitigation plan

Major challenges	Priority	Mitigation Plan
1. Product take back system not in place or inefficient as it is on voluntary basis for manufacturers	2	<ul style="list-style-type: none"> Analyse waste stream and identify priority types of waste Develop regulations and enforce according to type of waste (SWCorp for waste under Act 672, DOE for waste under EQA) Provide incentives to manufacturers
2. Government does not set a good example to the public as recycled products are not prioritized in public procurement	1	<ul style="list-style-type: none"> MOF to issue directive (Surat Arahan Perbendaharaan) to all Ministries/ Agencies to implement Green Procurement and impose KPIs accordingly Encourage innovation for recyclable products
3. No existing standards to determine market/ commercial value of recyclables	3	<ul style="list-style-type: none"> Formalise the recyclables market and set up pricing standards

Introduce new mechanisms to encourage recycling – Enablers

Enabler	Function
<ul style="list-style-type: none"> Regulations on Extended Producer Responsibility (EPR) to manufacturers 	<ul style="list-style-type: none"> To enforce Take Back System to manufacturers To enforce mandatory usage of recyclable material or easily recyclable in their product design
<ul style="list-style-type: none"> Incentives to develop R&D for recycled products and green innovative packaging to academic institutions and manufacturers 	<ul style="list-style-type: none"> Encourage usage of recycled materials Reduce waste before the point of generation i.e. at manufacturing stage Develop capabilities of local companies and talent
<ul style="list-style-type: none"> Commitment and strong collaboration between Government entities 	<ul style="list-style-type: none"> Regular stakeholder engagement platform to align efforts towards protecting the environment

Introduce new mechanisms to encourage recycling – Owners, KPIs and targets

Owner	Main KPI Dimension	Target(s)
JPSPN	Overall recycling rate (%)	• 22% in 2020
	Extended Producers' Responsibility (EPR) regulations	• To be ready by Q2 2017
SWCorp	No Food Waste Plan pilot projects	• 20 pilots by 2016
	Awareness campaigns to inculcate the culture of composting	• 30 programmes per year
JPSPN & DOE	No of companies that implement Take Back System	• 5 companies per year
MOF	Implement and enforce Government Green Procurement (GGP)	Implement GGP for the following product categories by 2016 <ul style="list-style-type: none"> • Cleaning services • ICT equipment, • Energy efficiency (EE) Indoor Lighting • Paper • Paints/Coating • Fibre Cement.

Initiative Factsheet

Enhance awareness and public education efforts on sustainable waste management

1 Minimisation of solid waste generation

Case for change

- Poor understanding and lack of understanding of the public
- Low reach in marketing communication efforts for target areas/ groups
- Unconsolidated social media activities
- Traditional community activities such as 'gotong-royong' no longer attractive

Our proposal

- Alignment and consolidation of efforts between Comms units of Government entities
- Implement targeted awareness campaigns through various media including online media
- Higher budget for marketing communication efforts for more impactful and innovative advertisements
- Consolidate and coordinate social media efforts
- Introduce new and innovative community activities
- Recognise and communicate success stories of Separation at Home to the mass public
- Engage and collaborate with companies as part of their CSR activities
- Instil awareness and understanding of waste management into the education system

Public still ignorant of waste separation beginning September 1



Cost / Funding

Total funding

RM 10 m / year

Impact

- Overall recycling rate of 22%
- 10,927 tonnes/ day diverted from landfills
- Most effective measure to minimise waste in the long run
- Transform the minds of the public to include 3R as a daily lifestyle

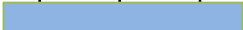
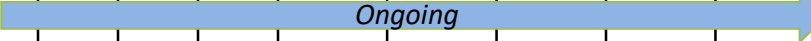

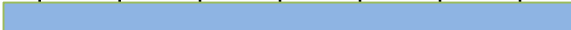
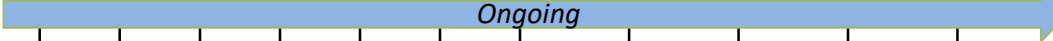
Key success factors

- Attractive, targeted and aggressive advertising campaigns
- Continuous education of the public
- Cooperation from the private sector and NGOs

Owner & stakeholders

- SWCorp
- JPSPN, MOE, DOE, PBTs, community leaders

Enhance awareness and public education efforts on sustainable waste management – Action Plan (1/2)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
1. Stakeholder engagements i) Coordination and knowledge sharing between Comms units ii) Utilise other Government media tools for info dissemination	SWCorp	3 months													
		Ongoing													
2. Targeted and Continuous Advertisement a) Television i) Animation videos - targetted to school children e.g. Boboboi ii) Documentary - special slots during news broadcast iii) Advertisement (short video, artist and etc) b) Radio i) Jingle ii) Interviews c) Social Media i) Facebook ii) Youtube iii) Twitter iv) Instagram	SWCorp	6 months													
		1 year													
		Ongoing													

Enhance awareness and public education efforts on sustainable waste management – Action Plan (2/2)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
d) Newspaper	SWCorp	1 year													
i) Print – article, advertisements															
ii) Online - article, advertisements															
e) Popular blogs and websites	SWCorp	1 year													
i) Online banner															
ii) Google Ads, Facebook Ads															
f) Outdoor advertising	SWCorp	1 year													
i) Bunting, billboard, banner															
3. Awareness campaigns	SWCorp														
i) 3R bazaar for recycled products – expand to other States		Quarterly													
ii) Local community activities – waste banks, mosque activity etc.		1 year													
iii) Q&A panel sessions		1 year													
iv) Collaborate with companies for CSR activities, seminars,, events		Ongoing	Ongoing												
v) Develop & distribute Fact Sheets		Quarterly													
4. Early education	SWCorp, MOE														
i) Develop curriculum in primary & secondary schools		1 year													
i) Develop participative school activities		Ongoing	Ongoing												
i) Develop course content for Institute Pendidikan Guru		1 year													

Enhance awareness and public education on sustainable waste management - Major challenges and mitigation plan

Major challenges	Priority	Mitigation Plan
1. SWCorp and Concessionaires conduct campaigns using different approaches resulting in variable impacts	3	<ul style="list-style-type: none"> • SWCorpo to consolidate and disseminate facts as a one stop centre • Coordinate efforts, pool resources, and allocate target groups
2. Outdated media strategy <ul style="list-style-type: none"> • Material not targeted to specific groups • Promotional materials are not very attractive and savvy 	1	<ul style="list-style-type: none"> • Content of promotional material should be customised to different segments • Enhance marketing efforts in social media, online newspapers, blogs
3. Social media posts are unattractive and not very informative	2	<ul style="list-style-type: none"> • Focus should be less on official events but more informative and informal • Highlight success of pilot programs - Success to be measured by the increase of recyclable tonnage
4. Brand awareness of SWCorp is still low amongst general public	4	<ul style="list-style-type: none"> • Conduct interactive info sessions with the public via radio interviews, Q&A panel events etc

Enhance awareness and public education on sustainable waste management – Enablers

Enabler	Function
<ul style="list-style-type: none"> • Every stage of education to include sustainable waste management practice 	<ul style="list-style-type: none"> • To continuously educate and create awareness amongst young people
<ul style="list-style-type: none"> • Recognise and communicate success stories of Separation at Source to the mass public 	<ul style="list-style-type: none"> • To act as catalyst for others to learn and do by example
<ul style="list-style-type: none"> • Attractive, targeted and aggressive advertising campaigns through social media, TV, radio, news paper and outdoor 	<ul style="list-style-type: none"> • Increase effectiveness of awareness campaigns
<ul style="list-style-type: none"> • Incentivize private sector involvement in promoting sustainable waste management 	<ul style="list-style-type: none"> • More innovative and attractive campaigns to attract public at large

Enhance awareness and public education on sustainable waste management – Owners, KPIs and targets

Owner	Main KPI Dimension	Target(s)
JPSPN	Overall recycling rate	• 22% by 2020
SWCorp	No of community-based 3R programmes annually	• Bandaraya - 10 • Perbandaran - 5 • Daerah – 3
	No of outdoor banner/ billboard in hotspots	• Bandaraya - 8 • Perbandaran - 3 • Daerah – 1

Initiative Factsheet

Establish smart partnerships with NGOs, private sector, academic institutions and communities

Case for change

- Large gap between JPSPN & SWCorp with external parties
- NGOs are more focused on environment conservation activities, and less focused on 3R activities
- Lack of incentives to NGOs & private sector to participate actively in 3R activities
- Uncoordinated and one-off partnership activities



Our proposal

- Formulate National Annual Plan for organising stake-holders' networking
- Establish ongoing consultative forum and provide networking opportunities between each party
- Develop partnership/ joint venture activities on 3Rs
- Provide standard guidelines for 3R activities by NGOs e.g. colour coding, location, design of bins, waste bag size
- Representative from Government to attend industry association meetings upon invitation



Cost / Funding

Total funding

RM 2 m / year

Impact

- Overall recycling rate of 22%
- 10,927 tonnes/ day diverted from landfills
- Formalise the platform for stakeholder networking
- Sharing of responsibilities on implementing 3R programs
- Bridge the gap between the Government and industry players

Key success factors

- Incentives or recognition to attract partnerships
- Continuity of partnership programmes

Owner & stakeholders

- JPSPN
- SWCorp, DOE, PBTs, industry associations¹, NGOs, academic institutions, community leaders

1) Industry associations – WMAM, AECCOM, SOWACO, IPMC (Selangor), FMM etc.

Establish smart partnerships with NGOs, private sector, academic institutions and communities – Action Plan (1/2)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
1. Formulate National Annual Plan for organising stakeholders' networking	JPSPN														
i) Develop overall strategic plan		3 months													
ii) Identify key Govt agencies, NGOs, industry players, academic institutions		1 week													
iii) Establish working committee		2 weeks													
iv) Establish ongoing consultative forum and provide networking opportunities between each party		Twice a year													
v) Representative from Government to attend industry association meetings upon invitation	Once a year														
2. Develop partnership/ joint venture activities on 3Rs	SWCorp														
i) Develop terms of reference for partnerships		1 month													
ii) Identify key partners - NGOs, community-based organisations, private companies		1 week													
iii) Establish working committee		2 weeks													
v) Identify list of projects		1 week													
vi) Project implementation		Ongoing													
vi) Monitoring and review	Ongoing														

Establish smart partnerships with NGOs, private sector, academic institutions and communities – Action Plan (2/2)

Activity/ Task details	Owner	Duration	2015							2016	2017	2018	2019	2020
			6	7	8	9	10	11	12					
3. Provide standard guidelines for 3R activities by partners e.g. colour coding, location, design of bins, waste bag size	JPSPN													
i) Develop standard guidelines		6 months												
ii) Consultation with the identified partners		3 months												
iii) Implementation		Ongoing												
iv) Monitoring and review		Ongoing												

Establish smart partnerships with NGOs, private sector, academic institutions and communities - Major challenges and mitigation plan

Major challenges	Priority	Mitigation Plan
1. Attracting cooperation from NGOs as most of them require funding	2	<ul style="list-style-type: none"> Identify list of NGOs Target relevant and reputable NGOs Leverage on the Separation at Source initiative (quantity of sorted recyclables) Fund NGOs to implement partnership awareness programmes Provide awards to successful NGOs
2. Attracting cooperation from the private sector	3	<ul style="list-style-type: none"> JPSPN to initiate consultation with major retailers and GLCs to be followed up by SWCorp Encourage sharing of assets and knowledge instead of just relying on sponsorship money
3. Partnership programmes are usually one-off and not sustained	1	<ul style="list-style-type: none"> JPSPN to develop guidelines and training modules for smart partnerships with external parties SWCorp to coordinate, monitor and empower concessionaires as programme owners

Establish smart partnerships with NGOs, private sector, academic institutions and communities – Enablers

Enabler	Function
<ul style="list-style-type: none"> Incentives or recognition to attract partnerships 	<ul style="list-style-type: none"> To increase participation from NGOs, companies, residents associations in implementing 3R activities
<ul style="list-style-type: none"> Coordination and planning of partnership programmes 	<ul style="list-style-type: none"> To ensure 3R activities are conducted on a continuous basis rather than just one-off
<ul style="list-style-type: none"> Strong collaboration with academic institutions on R&D 	<ul style="list-style-type: none"> To determine consumer waste generation habits and trends To develop R&D products based on recycled materials and introduce to the market
<ul style="list-style-type: none"> Cooperation with waste contractors through their respective associations 	<ul style="list-style-type: none"> To enhance monitoring and enforcement activities

Establish smart partnerships with NGOs, private sector, academic institutions and communities – Owners, KPIs and targets

Owner	Main KPI Dimension	Target(s)
JPSPN & SWCorp	No of partnership 3R programmes annually	<ul style="list-style-type: none"> • Bandaraya - 10 • Perbandaran - 5 • Daerah – 3

Initiative Factsheet

Ensure sustainable Construction & Demolition (C&D) Solid Waste Management practice in infrastructure projects

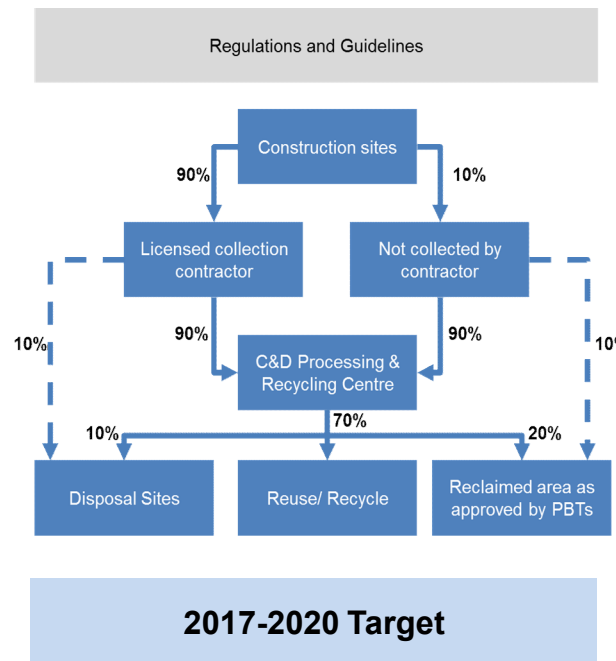
Case for change

- Only 5% C&D waste are estimated to be recycled
- Prevalence of illegal dumping due to ineffective enforcement
- Environment pollutants such as asbestos, paint, cement
- Breeding ground for Aedes mosquitoes
- Lack of facilities to process & recycle waste



Our proposal

- Sustainable C&D waste management at site
- Ensuring all C&D waste is properly disposed and recycled/ treated
- Improve enforcement and monitoring mechanism on C&D waste flow
- Ensure waste diversion from landfill for large-scale projects exceeds 50%
- Transform the minds of all stakeholders in the construction industry on the importance of 3R practice
- Identify and establish adequate facilities in local areas
- Increase the possibilities of usage of secondary material in the construction industry and other industries



Cost / Funding

Total funding	RM 25 m
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Impact

- Zero illegal dumping of C&D waste
- 60% recycling rate of C&D waste
- Promote recycling of building materials
- Increase utilisation of C&D facility in Sg Kertas
- Protection of the environment

Key success factors

- Regulations on C&D waste
- Effective enforcement
- Adequate facilities to process and recycle waste
- Cooperation from PBTs

Owner & stakeholders

- SWCorp
- JPSPN, CIDB, KeTTHA, JKR, DOE, AGC, PBTs, developers and construction companies

Ensure sustainable C&D Solid Waste Management practice in infrastructure projects – Action Plan (1/3)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
1. Sustainable C&D waste management at construction sites	SWCorp														
a) To Ensure sustainable waste management in every site															
i) Establishing Guidelines for Construction Waste Management In Construction Site		Complete													
ii) Establishing Auditing Procedure		1 year													
iii) Database creation and maintenance		5 years													
iv) Establishing reporting system		1 year													
v) Perform studies and R&D for secondary material	5 years														
b) To Ensure 50% of waste generated is diverted from landfill	SWCorp														
i) Engaging contractors for large-scale projects for waste planning at the initial stage		5 years													
ii) Create partnership with material suppliers and explore possibility to establish take-back-system		4 years													
iii) Routine enforcement and auditing for smale-scale projects		5 years													
iv) Periodic audit on wasted diversion from landfills for large-scale projects		3 years													
iv) To prepare guidelines for secondary material		5 years													
v) Establish training module for contractors and developers		2 years													

Ensure sustainable C&D Solid Waste Management practice in infrastructure projects – Action Plan (2/3)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
2. Ensuring All C&D Waste Is Properly Disposed and Recycled/ Treated															
a) Monitoring and enforcement of waste flow	SWCorp														
i) To establish related regulations		1 year													
ii) To establish GIS system to properly locate all the related industries, facility		1 year													
iii) To develop SOP for monitoring		1 year													
iv) Establish cooperation with related agencies to enforce the law		5 years													
b) Improve waste infrastructure and facility	SWCorp. JPSPN, PBTs														
i) To locate and identify suitable sites to developed as a C&D facilities		3 years													
ii) Collaborate with private sector to identify suitable facilities and treatment technology		3 years													

Ensure sustainable C&D Solid Waste Management practice in infrastructure projects – Action Plan (3/3)

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
3. At least 50% of construction waste is sent to approved disposal/ treatment facilities or reclaimed area	SWCorp, CIDB, KeTTHA														
a) Increase usage of secondary material to encourage 3R practice in the construction industry															
i) Promote Material & Resources (MR) criteria in application for Green Building Index (GBI) certification		3 years													
ii) Conduct research collaboration with academic institutions for R&D on secondary material and its applicability in the construction industry		5 years													
iii) Develop business model and commercialise secondary product and material		5 years													
iv) Cooperate with Agencies such as KETTHA & CIDB to promote products derived from secondary material as national green product		2 years													
v) Encourage usage of secondary material of at least 10% in construction material		2 years													

Ensure sustainable Construction & Demolition (C&D) Solid Waste Management practice in infrastructure projects - Major challenges and mitigation plan

Major challenges	Priority	Mitigation Plan
1. No existing guidelines on management of C&D waste in non Act 672 States	4	<ul style="list-style-type: none"> CIDB to develop Code of Practice for C&D waste management and engage JPSPN & SWCorp for input
2. No existing regulations to enforce disposal of C&D waste at Sg Kertas facility	1	<ul style="list-style-type: none"> JPSPN to expedite the regulations drafting process for regulations on scheme and licensing
3. Inexistence of C&D waste database	3	<ul style="list-style-type: none"> JPSPN to ensure regular data reporting is included in the regulations
4. Inadequate number of enforcement officers	2	<ul style="list-style-type: none"> Boost up number of enforcers Delegation of power to PBT, DOE and MoH enforcers

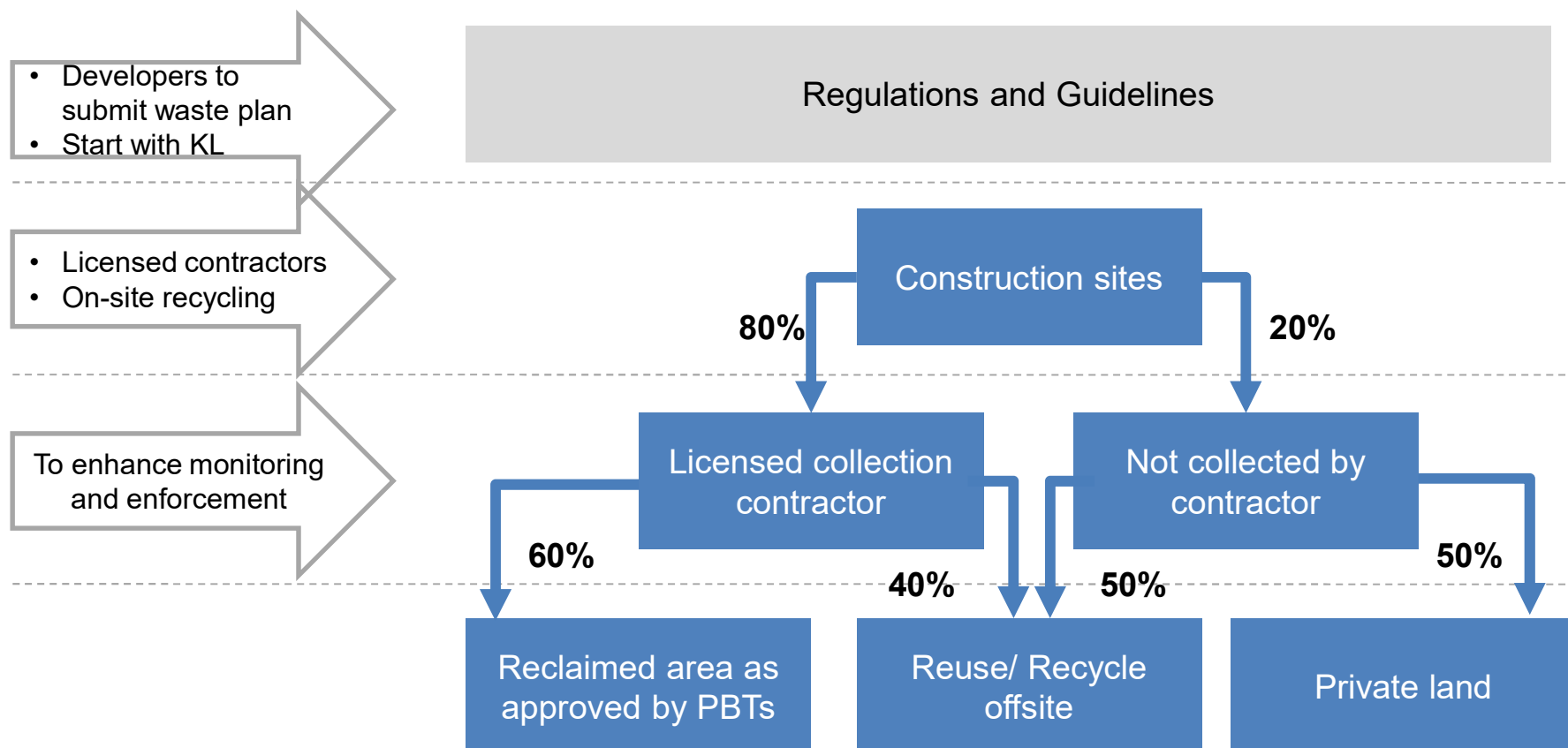
Ensure sustainable Construction & Demolition (C&D) Solid Waste Management practice in infrastructure projects – Enablers

Enabler	Function
<ul style="list-style-type: none"> Regulations and Guidelines on C&D waste 	<ul style="list-style-type: none"> To fully regulate C&D waste management
<ul style="list-style-type: none"> Adequate facilities to process and recycle waste 	<ul style="list-style-type: none"> To increase C&D waste recycling rate and conserve resources
<ul style="list-style-type: none"> Cooperation from PBTs to include C&D waste management requirement for new developments, renovations and demolition projects 	<ul style="list-style-type: none"> To avoid illegal dumping and control C&D waste flow
<ul style="list-style-type: none"> Regular submission of data from developers, contractors & waste collectors to SWCorp 	<ul style="list-style-type: none"> To establish the C&D waste database system

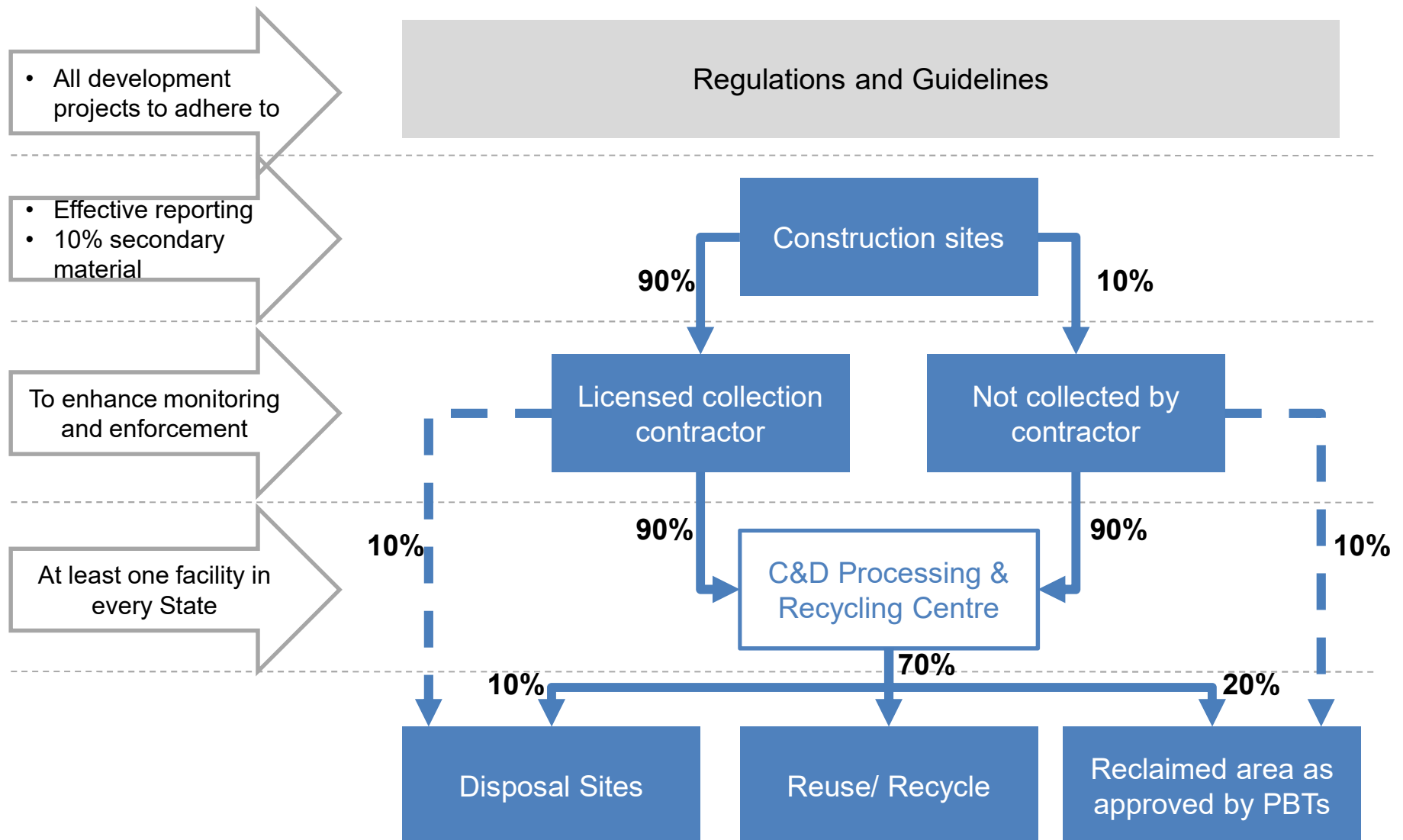
Ensure sustainable Construction & Demolition (C&D) Solid Waste Management practice in infrastructure projects – Owners, KPIs and targets

Owner	Main KPI Dimension	Target(s)
SWCorp	All Act 672 States to implement C&D waste management system	• By end 2016
	Reduction in incidents of illegal dumping of C&D waste	• Zero illegal dumping by 2018
	Recycling rate of C&D waste	• 60% by 2018

C&D waste management flow (2015-2017 target)



C&D waste management flow (2017-2020 target)



Initiative Factsheet

Implement effective management of e-waste from households and hazardous household waste (HHW)

Case for change

- Increased pollution from E-Waste and HHW
- Absence of coordinated collection mechanism
- Lack of awareness on the importance of proper disposal of e-waste and HHW
- Underutilised recovery facilities

Our proposal

- Leverage on Separation at Source
- Enhance knowledge and awareness on separation of e-waste and HHW at households,
- Strong collaboration (JPSPN, SWCorp and DOE) to consolidate collection of e-waste and HHW
- Provide access to DOE's appointed contractor to collect waste from concessionaire drop off points
- Establish adequate collection and recycling centres
- Establish data gathering mechanism from collection centres to obtain information on waste quantity and composition
- Effective monitoring of collection and separation activities up to final disposal facility according to procedures.
- Encourage/enforce collector to sent the collected waste to licensed facility



Cost / Funding

**Total
funding**

-

Impact

- Minimise toxic materials entering our waste stream
- Consolidated collection system for e-waste & HHW
- Create economies of scale for the recycling/ recovery industry
- Improve utilisation of e-waste recovery facilities

Key success factors

- Strong collaboration between JPSPN, SWCorp & DOE
- Finalisation of Household Scheduled Waste Regulations EQA 1974
- Collection centres for recyclables in selected zones based on population

Owner & stakeholders

- JPSPN & DOE
- SWCorp, Concessionaires, PBTs, manufacturers

Implement effective management of e-waste from households & hazardous household waste – Action Plan

Activity/ Task details	Owner	Duration	2015								2016	2017	2018	2019	2020
			6	7	8	9	10	11	12						
1.To separate HHW at Source															
i) Implemented with separation at Source	JPSPN	Ongoing													
ii) Establishing Guidelines for consumer	JPSPN	Complete													
iii)Awareness Creation Programs	SWCorp	12 months													
v) Form and facilitate stakeholder consultation platform	JPSPN/ DOE	2 months													
vi) Database creation and maintenance	JPSPN	Ongoing													
Collaboration with DOE															
ii) To notify DOE on location of drop off points	SWCorp	2 weeks													
iii)Setting up Criteria for Authorized Collectors / Collection Center / Retailers	DOE	5 months													
iv)Develop the guideline for Fee Structures	DOE	5 months													
v) Capacity Building Program	JPSPN/ DOE	2 weeks													
vi) Monitoring and evaluation	JPSPN/ DOE	Ongoing													

Implement effective management of e-waste from households and hazardous household waste - Major challenges and mitigation plan

Major challenges	Priority	Mitigation Plan
1. E-waste and HHW lumped together under Separation at Source approved brochures	1	<ul style="list-style-type: none"> DOE to list out all contractors and categorise by zone and inform SWCorp DOE's appointed contractor will collect sorted waste at concessionaire drop-off points
2. Inadequate zonal collection centres for waste collected by DOE contractors at concessionaire drop-off points	2	<ul style="list-style-type: none"> SWCorp to establish collection centres for recyclables in selected zones based on population density
3. Informal recyclable collectors 'stealing' e-waste	4	<ul style="list-style-type: none"> DOE to license all e-waste collectors Strengthen and facilitate registration of recyclers and collectors
4. Unclear responsibility for disposal fee	3	<ul style="list-style-type: none"> Enforce manufacturers to charge "recycling fee" to customers (to be included in product price) and channel it to a Fund to be co-managed by DOE and other stakeholders to cover the costs

Implement effective management of e-waste from households and hazardous household waste – Enablers

Enabler	Function
Finalisation of Household Scheduled Waste Regulations EQA 1974	<ul style="list-style-type: none"> • To regulate management of household scheduled waste
Finalisation of Guidelines: <ul style="list-style-type: none"> • Collection requirements • Fee structure • Reporting requirements • Recycling fund • Recycling requirements 	<ul style="list-style-type: none"> • To define roles and responsibilities of retailers, full recovery facilities and other stakeholders
Strong collaboration and coordination between JPSPN, DOE and SWCorp	<ul style="list-style-type: none"> • To develop and establish coordination and joint effort for awareness programs and collection mechanism

Implement effective management of e-waste from households and hazardous household waste - Owners, KPIs and targets

Owner	Main KPI Dimension	Target(s)
JPSPN	Overall recycling rate (%)	• 22% by 2020
JPSPN & DOE	Registration of informal collectors	• 70% by 2018
DOE	Recovery rate of DOE's licensed recovery/ disposal facilities (%)	• 2% increase per year
SWCorp & DOE	Effectiveness of awareness programmes	• Sampling survey – 80% aware
	No of community-based 3R programmes annually	<ul style="list-style-type: none"> • Bandaraya - 10 • Perbandaran - 5 • Daerah – 3

WORKSTREAM 2

WASTE FACILITIES



Workstream 2 - Waste Facilities



- **Basic Infra - Sanitary Landfill and safe closure of dumpsites nationwide**



- **Waste Treatment Facilities - To support the waste diversion from landfill**

Waste Facilities OVERALL SNAPSHOT

SNAPSHOT - SUMMARY OF WASTE FACILITIES FOR SOLID WASTE MANAGEMENT BY 2020

VISION

To establish targeted future **operating model** for waste integrated facilities



STRATEGY

To make **Johor State as test bed** in establishing comprehensive waste management model and **replicate** the operation model into other states in Malaysia

SCOPING

To cover basic infrastructure and treatment facilities for **Sates Under Act 672**

KEY ENABLERS

- Reliable waste data studies
- Govt readiness on putting in the required **RM6.7 billion** investment
- The need to establish a **dedicated Project Management Team** within JPSPN (37 Contract staff - JPSPN); 22 Direct Hire – SWCorp)
- Siting & Zoning (close proximity to demand site)
- Stringent RFP criteria
- New set of skills (HR issues) via knowledge transfer
- Maintenance, Repair, & Overhaul (MRO), and parts companies – supply chain

ASPIRATION BY 2020



INVESTMENT

RM6.7b New Required Investment to cover States Under Act 672 (including Basic Infra)
CAPEX

OPEX
RM818m/annum

VALUE CREATION

Value to the Government

RM129.6m

Potential savings on land acquisition costs for 20 years (to avoid to acquire 518 hectares of new land)

RM16m p.a

Potential savings on leachate treatment costs

RM5.2bn

Potential savings by govt (if business as usual, govt may needs to fork out RM11.9bn)

220MW
631,000

Potential to generate of 220MW renewable energy – to serve 631,000 houses per month

40%

Waste diversion from landfill

Value to the Rakyat

5.8m
1.2m

GHG Reduction – potential avoidance of 5.8million tonnes of CO₂, equivalent to 1.2million of car emission on the road per year

2,500

Potential creation of more than 2,500 employment to manage new waste facilities with new skillset in Waste Treatment Technology



Our True North

To have 40% waste diversion from landfill by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Waste Facilities



Value to the Government



RM129.6m

Potential savings on land acquisition costs for 20 years (to avoid to acquire 518 hectares of new land)

RM16m p.a

Potential savings on leachate treatment costs

RM5.2bn

Potential savings by govt (coz if business as usual, govt may needs to fork out RM11.9bn)

220MW
631,000

Potential to generate of 220MW renewable energy – to serve 631,000 houses per month

40%

Waste diversion from landfill

Value to the Rakyat



GHG Reduction – potential avoidance of 5.8million tonnes of CO₂, equivalent to 1.2million of car emission on the road per year

5.8m

1.2m

Spur SME industry - direct Spin Off impact into economy on building materials, machineries and OEM industry

2,500

Potential creation of more than 2,500 employment to manage new waste facilities with new skillset in Waste Treatment Technology



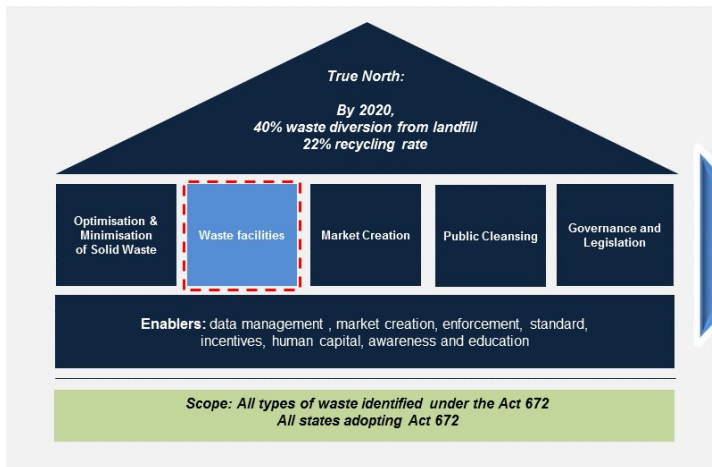
Source: Lab analysis

Waste Facilities

EXECUTIVE SUMMARY

Framework for Sustainable Solid Waste Management in Malaysia

True North of 40% waste diversion from landfill



Our Problem Statement

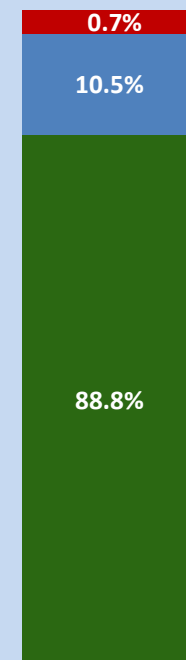
Current Solid Waste Facility Management Framework is NOT sustainable



Why is our current system would not sustain?....

- **Current exercise - 100%direct landfilling**
- **No single study or policy on waste mapping nationwide**
- **Waste management is regarded as a 'Low priority Items' in government's planning & budgeting**
- **Stakeholders in the whole ecosystem is working in silo**

This is Malaysia, currently

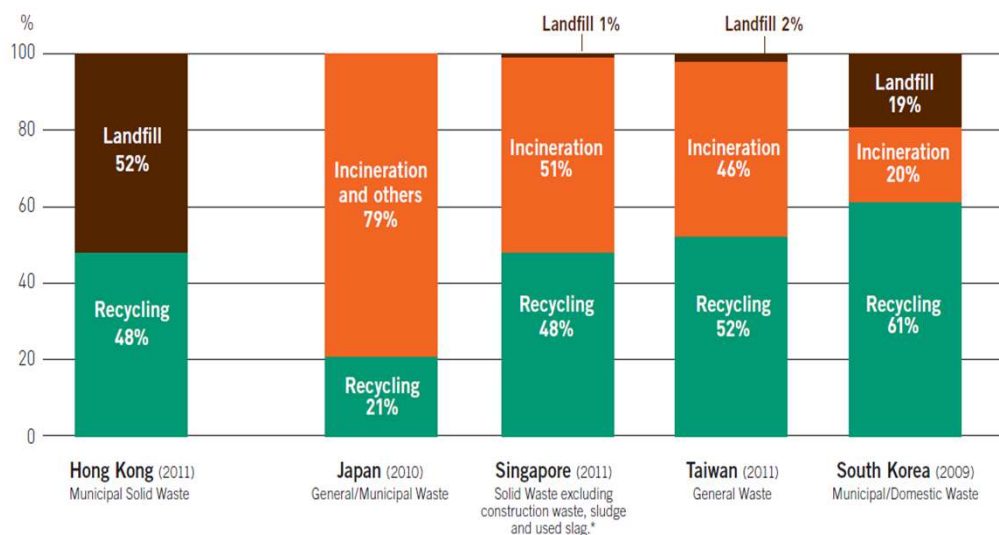


How Are Other Countries Been Doing?

Comparison of waste management structure with other Asia areas

Disposal Methods for Municipal Solid Waste in Selected ASEAN Countries

Country	Disposal methods (%)				Source
	Recycling	Landfilling	Treatment	Unspecified	
Indonesia	0	70	17	13	Waste in Asia, March 2011
Malaysia	10	89	1	-	
Philippines	0	85	10	5	Waste in Asia, March 2011
Singapore	60	2	38	0	Singapore Waste Statistics 2014
Thailand	10	40	50	0	Bangkok Metropolitan Administration, 2010



In nutshell - Different jurisdictions adopted a mix of policies and measures in terms of breakdown of recycled, incinerated and landfilled waste. Malaysia is unique in that up until now we have been relying **almost 90% on landfills for waste disposal.**

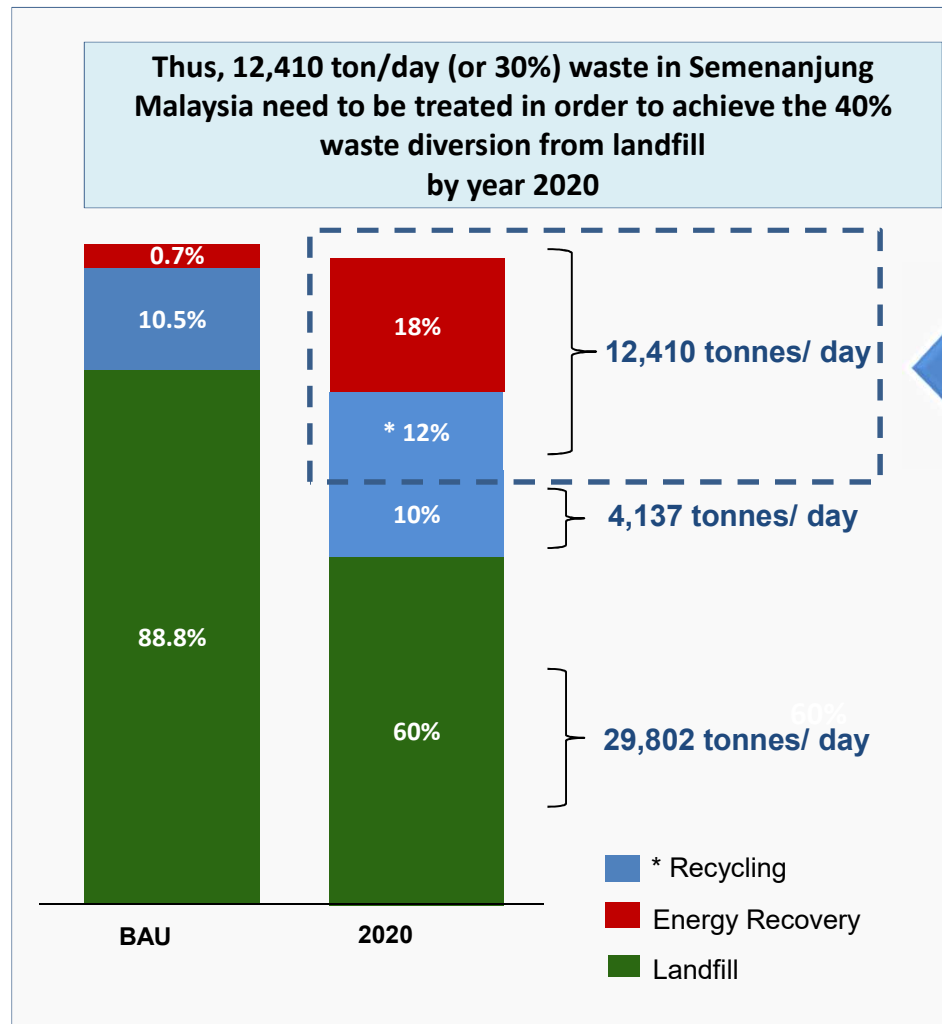


* Note: The published Total Solid Waste Recycling rate is 59%. After excluding construction waste, sludge and used slag, the solid waste recycling rate is 48%.

Source: Hong Kong Blueprint For Sustainable Use Of Resources 2013 – 2022

Malaysia aspires to divert 40% of waste from landfill by year 2020

To achieve this, treatment facilities are needed to address 30% of total waste capacity

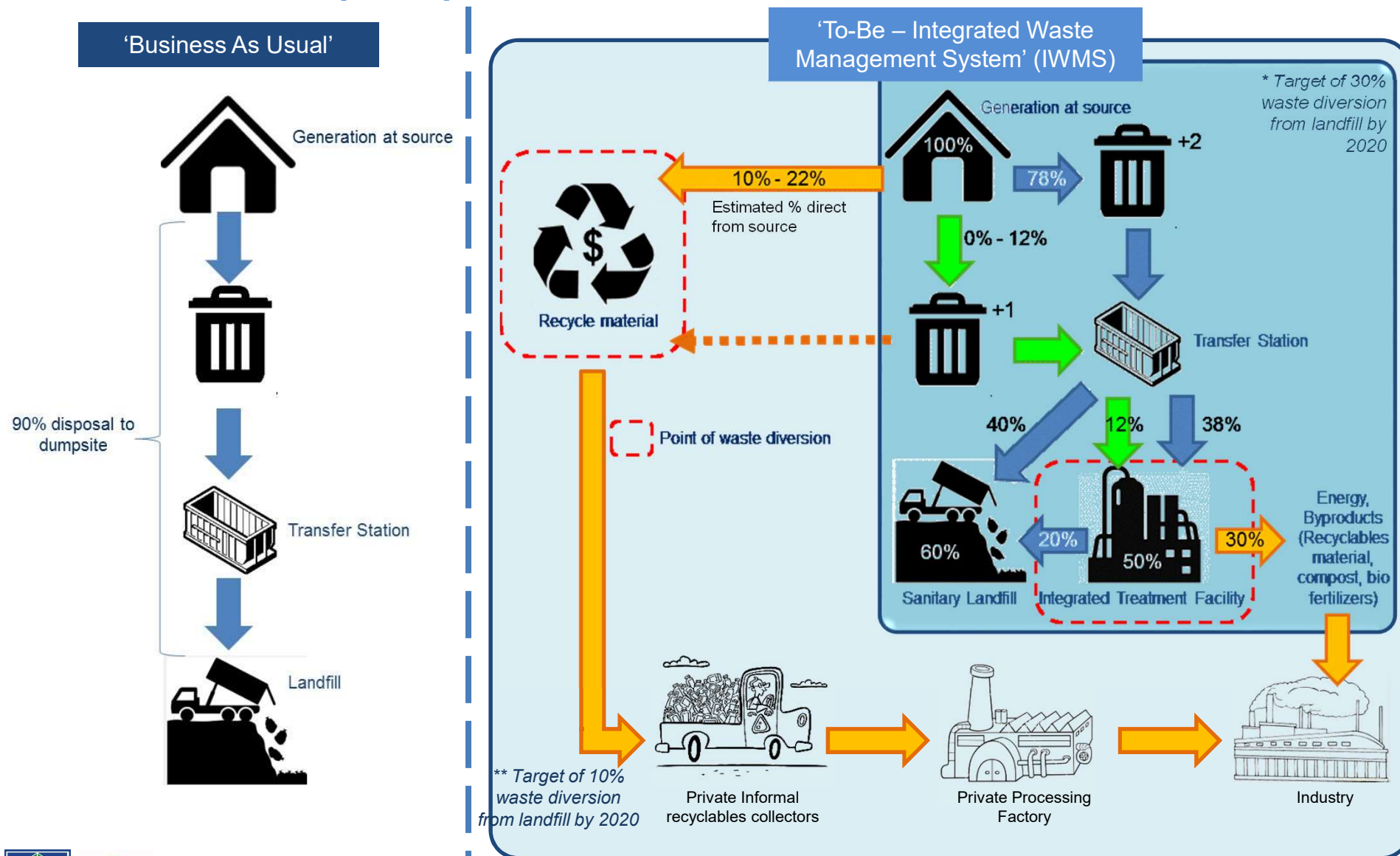


We apprehend that we need to address this amount of waste tonnage on every single day



Targeted Solid Waste Operating Business Model:

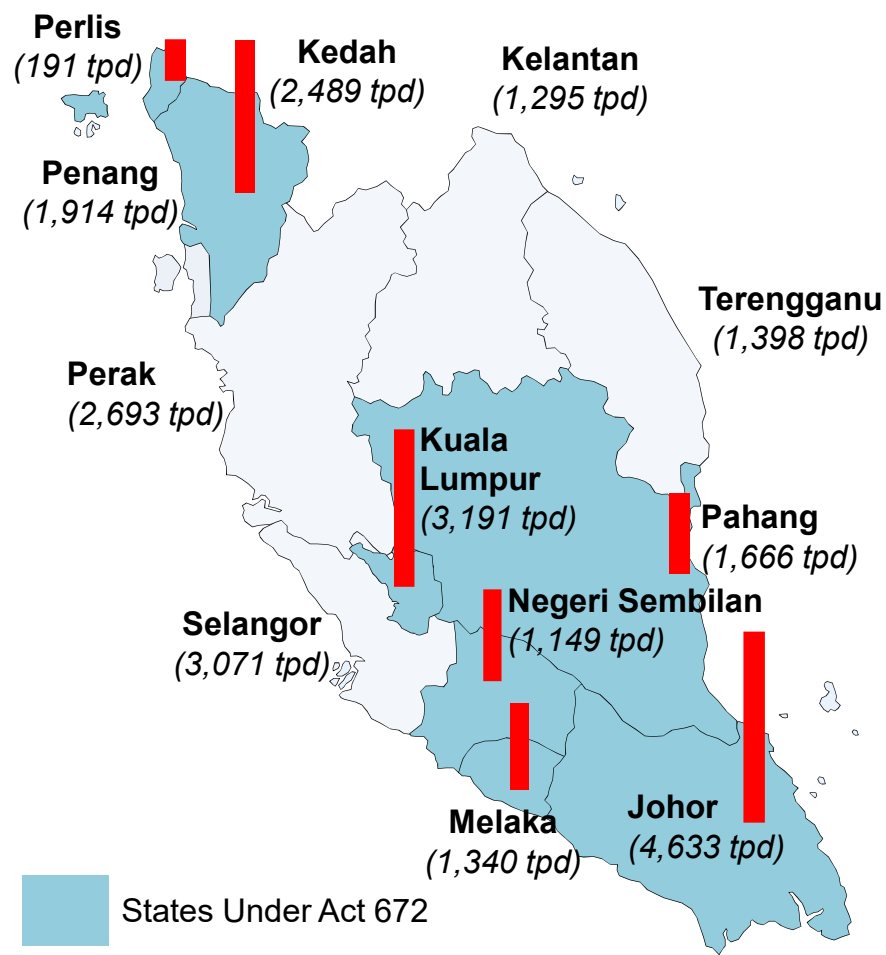
To have 40% waste diversion from landfill by 2020, the below 'To-Be' Model is a prerequisite...



Prioritisation is key in selecting the site for establishing an integrated waste facility for the most impact

Targeted tpd by 2020

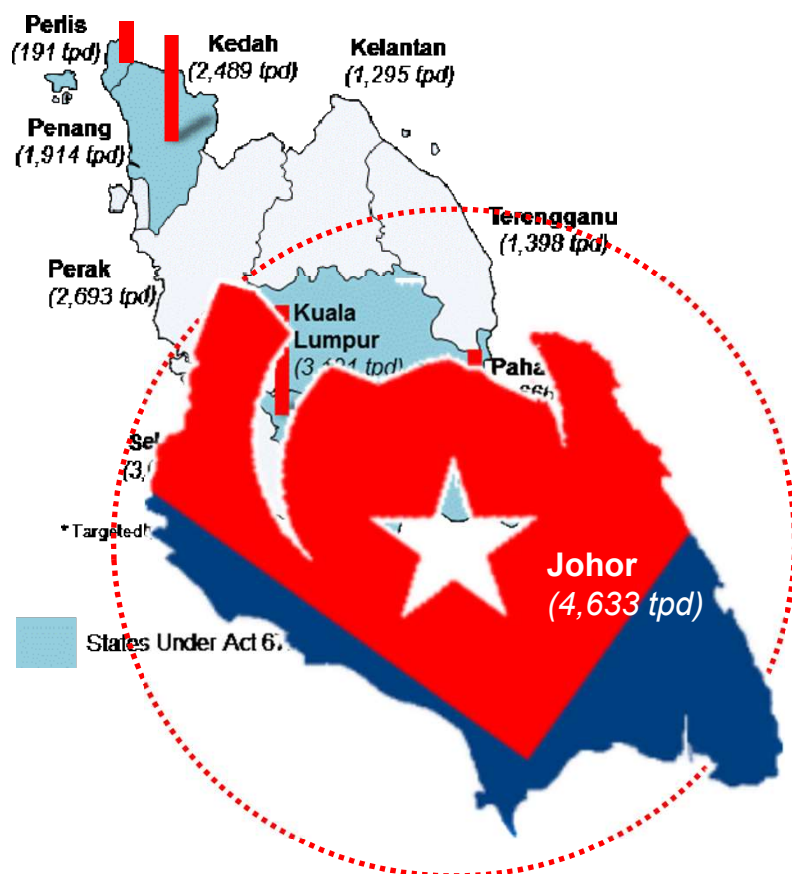
Key criteria – to only cover states under Act 672



Site selection criteria:

- 1 Focus on conurbations & sites with high density population
- 2 Focus on sites reaching landfill design capacity
- 3 Focus on sites with land scarcity for new landfill
- 4 Focus on sites with high waste generation

We started our journey by taking Johor as our 'test bed'...
We have also defined key parameters for the 'To-Be' Waste Management Operating Model as below:



Defined key parameters on
'To-Be' Operating Model:

**Taking Johor state as 'test bed',
we concluded that there is a need:**

- (1) To establish an Integrated waste treatment for high density population
- (2) To establish a min capacity for Integrated waste facility Type A (for feedstock >1,000tpd)
- (3) To establish facility with feedstock below 1,000tpd – non thermal treatment
- (4) Transfer station is needed within 30km radius from collection points
- (5) Bank-ability – financial security is needed in determining business partnership
- (6) To only cover states that govern under Act 672 as it is a pre-requisite implementation criteria to sync up with the IWMS
- (7) The future required facilities are to be determined based on waste composition pattern at that particular time and location.

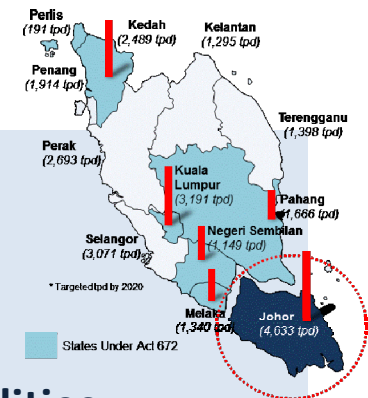
WHY Johor?

- Data readiness – JPSPN has already engaged formal studies by professional consultant. Thus provide comfort and confidence for test bedding
- Landfills are over ageing, over capacity and critical for treatment

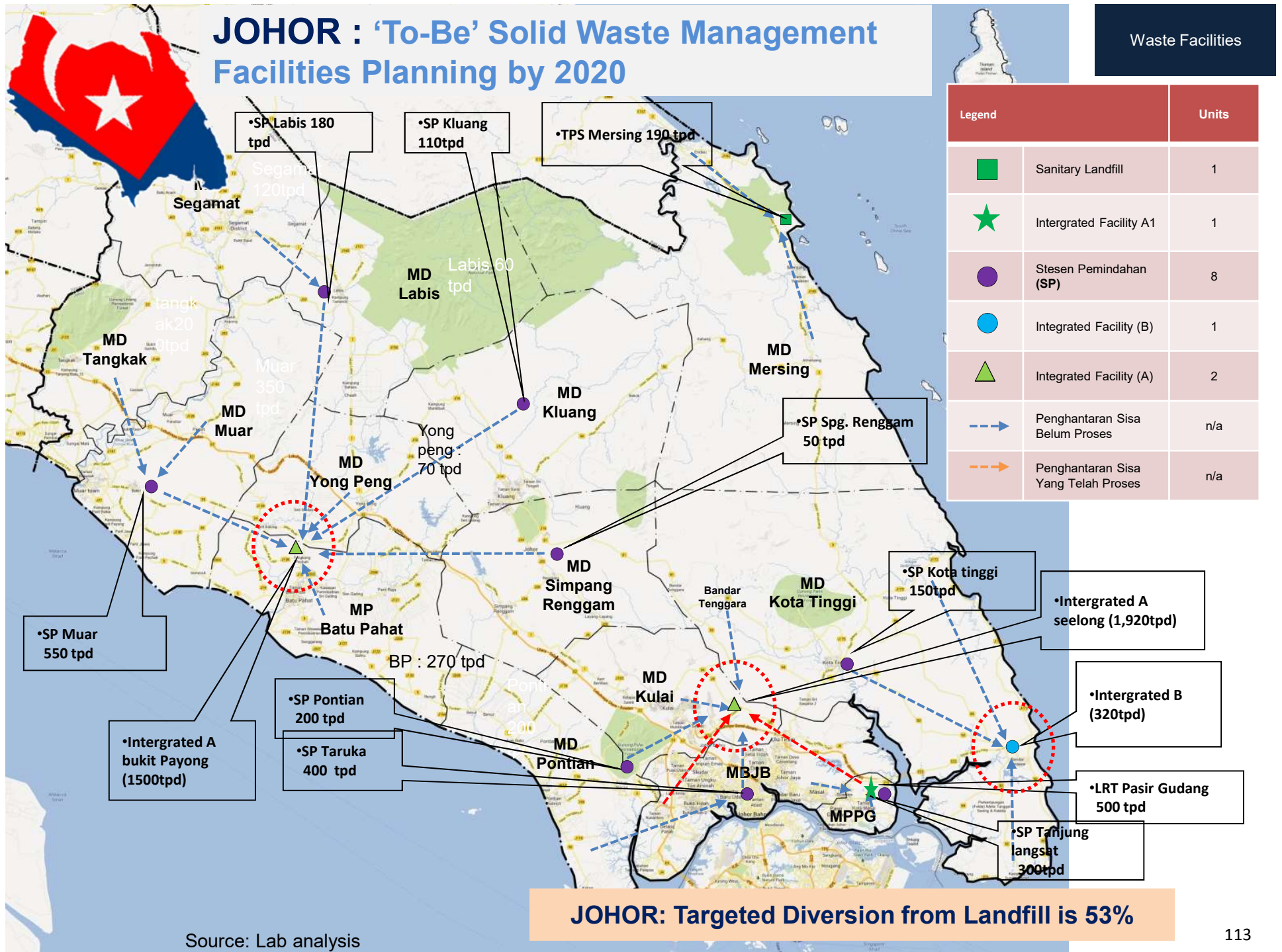
While working on Johor Model, we have also concluded that there is a need for **Regional Waste Centralisation Treatment Facility**, facilitated by localised smaller capacity of transfer stations



- To reduce points of pollution
- Better monitoring and enforcement from related agencies
- Able to manage risk at a focal point
- Eliminate redundancies in construction and operation of waste facilities
- Economies of scale for all key stakeholders in the whole ecosystem (in terms of capacity, and operation costs)
- Reduce worries in findings land
- Creation of centralised market with sufficient amount of feedstock and demand for byproducts (recyclables, energy and other potential related recyclables industries)



JOHOR : 'To-Be' Solid Waste Management Facilities Planning by 2020





Example of Consolidated Costs Analysis By Treatment Facilities - For Northern Johor -



Facilities		Location	Current tonnage disposed tpd (2015)	* Forecasted capacity needed by 2020 (avg tpd)	CAPEX (RM mil)	OPEX (RM/ton)	OPEX (RM mil p.a.)
Integrated A (>1000tpd)		Bukit Payung					
Sanitary Landfill			1,090	541	-	48	9.5
WTE (option)			-	1,000	600	200	73.0
AD + MRF (option)							
Transfer Station		Labis	210	268	30	35	3.4
		Muar	420	536	30	35	6.9
		Kluang	130	166	30	35	2.1
		Spg Renggam	60	77	30	35	1.0
Direct Haul		Batu Pahat to Bkt Payung	200	255	-	-	-
		Yong Peng to Bkt Payung	70	89	-	-	-
TOTAL			1,090	1,391	720	-	95.9

* Forecasted incoming tonnage received at landfill by 2020 at 5% growth per annum

FORECASTED INVESTMENT NEEDED FOR THE JOHOR STATE

CAPEX: RM2.1 Bil

OPEX: RM 263 Mil / per year

Capacity: 4,352 ton/day BY 2020



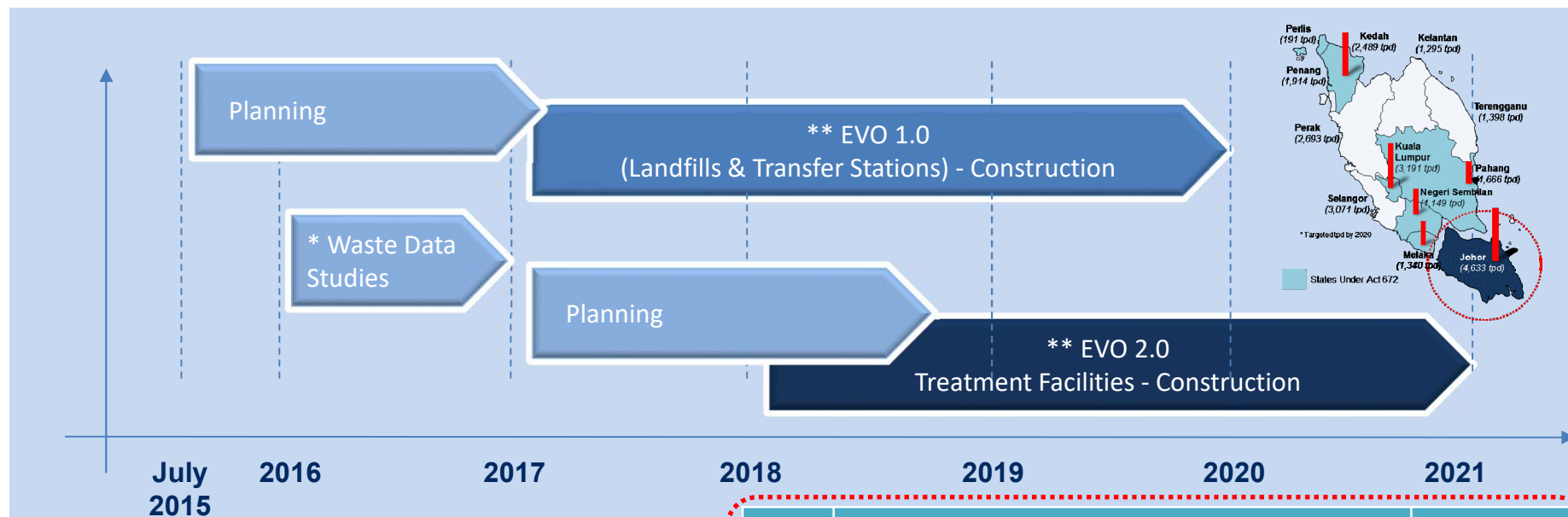
Source: Lab analysis

Approach Of The Whole Programme Would Be As Follows:

There will be two EVOs...

EVO 1.0 : To have basic Facilities (Sanitary Landfills and Transfer Stations)

EVO 2.0 : To have waste treatment facilities by 2020 in order to mark 30% waste diversion from landfill



* Key planning activities: Feasibility studies & Prelim Site Assessment, DEIA, Procurement

** Needs on Special lane on Land Acquisition

...and, the programme needs to be supported by these new additional infrastructures by 2020

NO	Facilities needed by 2020	Quantity
1	Sanitary Landfills	6
2	Transfer Stations	15
3	Integrated Facility A (capacity >1,000 tpd)	5
4	Integrated Facility B (capacity <1,000 tpd)	5
5	Integrated Facility A1 (Thermal without landfill)	1
6	Safe Closure of landfills	16

New Required Investment for States Under Act 672 (annual basis)

(Total required investment is RM6.7bn - including Basic Infra)



	Nos	2016 (RM 'm)	2017 (RM 'm)	2018 (RM 'm)	2019 (RM 'm)	2020 (RM 'm)	2021 (RM 'm)	2022 (RM 'm)	TOTAL (RM 'm)
Basic Required Facilities									
Sanitary Landfills	6	-	90	90	120	-	-	-	250
Safe Closure of Landfills	16	-	88	175	193	105	-	-	560
Transfer Stations	15	75	150	150	75	-	-	-	450
Treatment Facilities									
Integrated Facility (A)	5	-	-	450	750	750	750	300	3,000
Integrated Facility (B)	5	-	-	225	375	375	375	150	1,500
Integrated Facility (A1)	1	-	-	150	150	150	150	-	600
Land Acquisition	38	-	95	-	-	-	-	-	95
Planning	-	50	50	52	-	-	-	-	152
TOTAL (RM 'million)		125	473	1,292	1,663	1,380	1,275	450	6,657

NOTE: Estimated required investment if to cover all states in West Malaysia would be amounted to RM 9.8 billion



Consolidated Required New Investment Costs By States and Potential Diversion % (for States Under Act 672)



NO	STATES	Required Investment	Estimated OPEX per annum	*Forecasted Incoming tonnage to landfill (MT)	Potential Tonnage to be diverted (MT)	Potential Diversion % at landfill
1	Johor	RM2,110m	RM263m	4,352	2,295	53%
2	Melaka	RM630m	RM84m	1,532	1,041	68%
3	Negeri Sembilan	RM410m	RM63m	1,149	595	52%
4	WP KL	-	RM142m	3,191	850	27%
5	Pahang	RM1,090m	RM93m	2,618	625	24%
6	Kedah	RM1,010m	RM153m	3,522	1,105	31%
7	Perlis	RM300m	RM18m	388	170	44%
	TOTAL	RM5,550m	RM818m	16,853	6,681	40%

* Forecasted incoming tonnage received at landfill by 2020 at 5% growth per annum

6,681mt of waste representing 16.2% of the total generated waste in West Malaysia (including the states not under Act 672) vs our target of 30%

Our True North

To have 40% waste diversion from landfill by 2020

3 IMPLEMENTATION OPTIONS:

1ST

JOHOR AS PILOT MODEL

CAPEX : RM2.7 billion
OPEX : RM 263.3 Mil / per year
Diversion : 2,295 tpd

Targeted Diversion :
5.5%

2ND

TO COVER OTHER STATES UNDER ACT 672

CAPEX : RM6.7 billion
OPEX : RM 818.4 Mil / per year
Diversion : 6,681 tpd

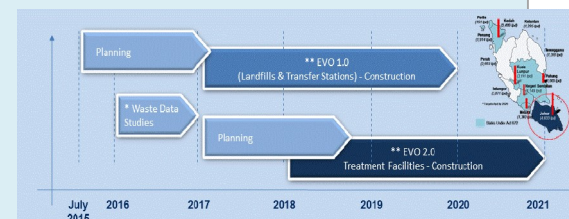
Targeted Diversion :
16.2%

3RD

NATIONWIDE (WEST MALAYSIA)

CAPEX : RM9.8 billion
OPEX : RM 1.35 billion per year
Diversion : 12,410 tpd

Targeted Diversion :
30%



Our True North

To have 40% waste diversion from landfill by 2020

Key Enablers for Waste Facilities:

- Reliable waste data studies
- **Govt readiness on putting in the required RM6.7 billion investment**
- **The need to establish a dedicated Project Management Team within JPSPN (37 Contract staff - JPSPN); 22 Direct Hire – SWCorp)**
- Siting & Zoning (close proximity to demand site)
- Stringent RFP criteria
- New set of skills (HR issues) via knowledge transfer
- Maintenance, Repair, & Overhaul (MRO), and parts companies – supply chain



Our True North

To have 40% waste diversion from landfill by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Waste Facilities



Value to the Government



RM129.6m

Potential savings on land acquisition costs for 20 years (to avoid to acquire 518 hectares of new land)

RM16m p.a

Potential savings on leachate treatment costs

RM5.2bn

Potential savings by govt (coz if business as usual, govt may needs to fork out RM11.9bn)

220MW
631,000

Potential to generate of 220MW renewable energy – to serve 631,000 houses per month

40%

Waste diversion from landfill

Value to the Rakyat



GHG Reduction – potential avoidance of 5.8million tonnes of CO₂, equivalent to 1.2million of car emission on the road per year

5.8m

1.2m

Spur SME industry - direct Spin Off impact into economy on building materials, machineries and OEM industry

2,500

Potential creation of more than 2,500 employment to manage new waste facilities with new skillset in Waste Treatment Technology



Source: Lab analysis



Our True North

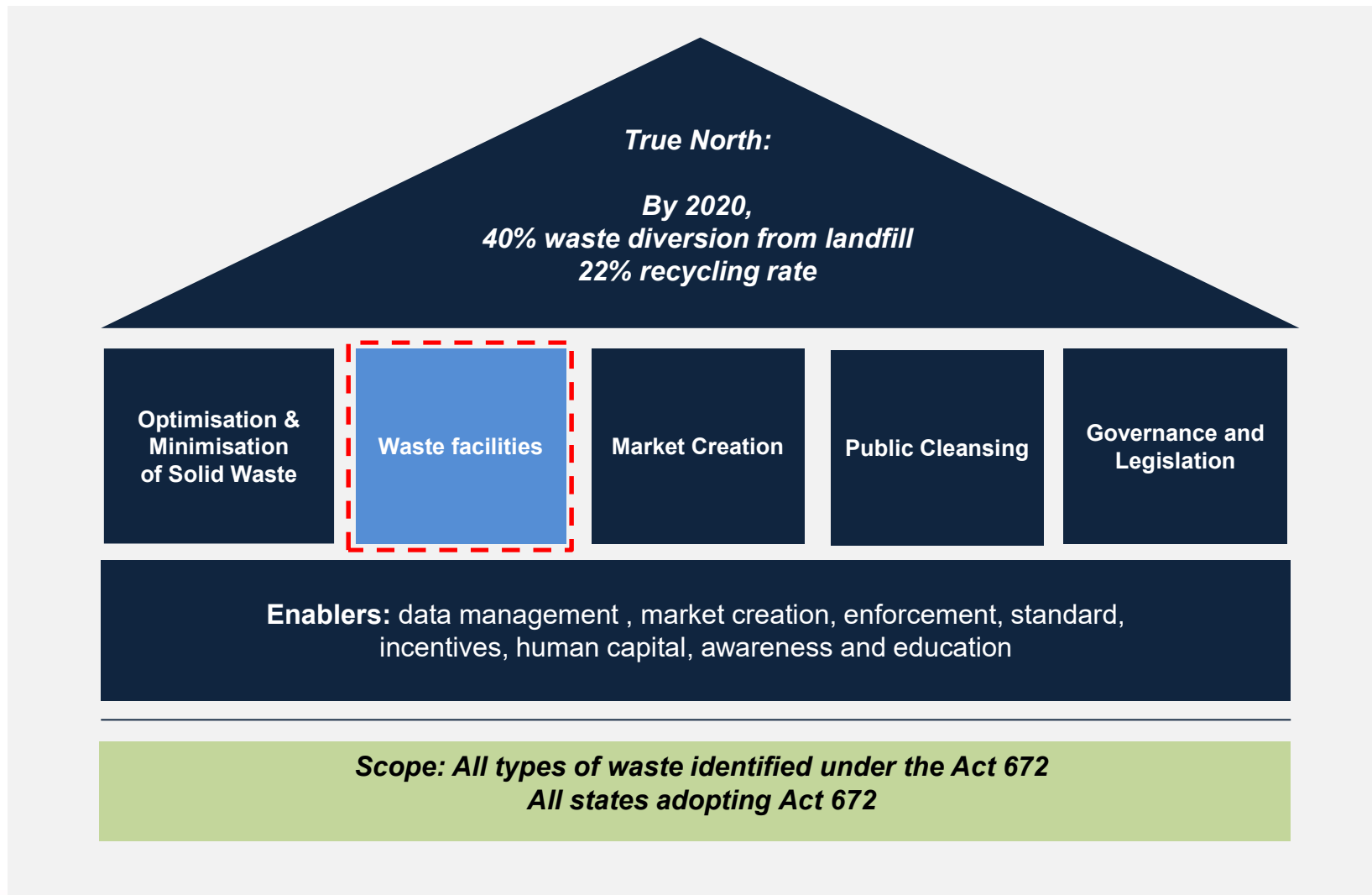
To have 30% waste diversion from landfill by treatment facilities by 2020

Workstream 2 - Waste Facilities

FULL LAB REPORT

Framework for Sustainable Solid Waste Management in Malaysia

True North of 40% waste diversion from landfill



What's Changed (and What Hasn't) in the Last Decade

- ▶ *What a Waste* (1999) predicted that by 2025 the daily MSW generation rate in Asia would be 1.8 million tonnes per day. These estimates are still accurate. At present, the daily generation rate in South Asia and East Asia and the Pacific combined is **approximately 1 million tonnes per day**.
- ▶ Low-income countries continue to spend most of their SWM budgets on waste collection, with only a fraction going toward disposal. This is the opposite in high-income countries where the main expenditure is on disposal.
- ▶ Asia, like much of the world, continues to have a majority of organics and paper in its waste stream: The combined totals are 72% for East Asia and Pacific region and 54% for South Asia region. **Growth in waste quantities is fastest in Asia.**
- ▶ Rates of recycling are increasingly influenced by global markets, relative shipping costs, and commodity prices.

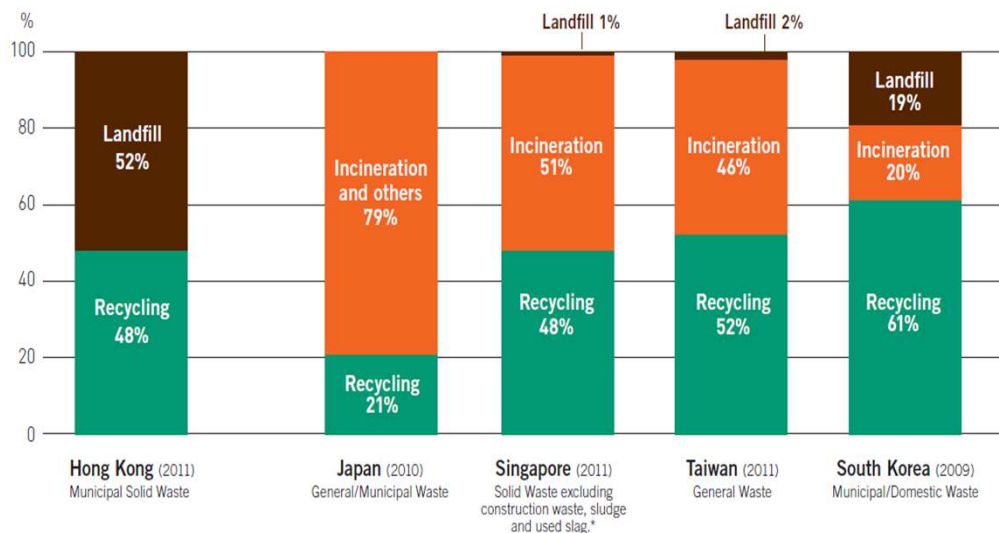


How Are Other Countries Been Doing?

Comparison of waste management structure with other Asia areas

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* Note: The published Total Solid Waste Recycling rate is 59%. After excluding construction waste, sludge and used slag, the solid waste recycling rate is 48%.

Source: Hong Kong Blueprint For Sustainable Use Of Resources 2013 – 2022

How are other countries been doing?

Comparison of waste management structure with other Asia areas : Technologies

Indonesia: Existing technologies on Municipal Waste include:

- Collection technologies: trucks, motorcycles, carts (local and imported).
- Segregation technologies: conveyor, gravitational sorter machine (local).
- Treatment technologies; composting (local and imported).
- Disposal technologies; sanitary landfill, controlled landfill, gas capture or LFG extraction.



Myanmar: Yangon, Nay Pyi Taw collection and segregation are carried out manually, truck & heavy machines also exist. Mandalay municipal waste is collected using available technology e.g. bell ringing system, communal, block and Karb sides. There is no treatment system in the municipality. But, a semi landfill system is utilized for disposal.



Japan: Available technologies on Municipal Waste in Japan include:

- Collection: Mechanical waste collection vehicle.
- Segregation.
- Treatment: Incineration (stoker furnace, shaft furnace, fluid bed furnace) and high efficiency power generation; gasification and melting furnace; gasification and reforming; carbonization; methane fermentation and power generation; RPF/RDF production and power generation; metal collection and recycling; biodiesel production from waste oil.
- Disposal: Semi-aerobic landfilling.



Philippines: Local government units are currently adopting low cost and local technology for collecting and segregating wastes. Sanitary landfills are currently being used by some LGUs as a mode of disposal. Some LGUs are currently in the process of rehabilitating/closing their open and controlled dumps while others continue to use open and controlled dump sites



Singapore: Waste collection is mechanised using rear end loaders and compactors. Some private developers adopted the pneumatic refuse conveyance system for the collection of refuse. Singapore adopted waste-to-energy incineration for the disposal of its waste with the belief that incineration is the most cost effective method of waste disposal reducing the volume of waste by 90%. Heat from the combustion of refuse is used to generate electricity while ferrous metal is recovered for recycling.



“...Different jurisdictions adopted a mix of policies and measures in terms of breakdown of technology application....”

* Note: The published Total Solid Waste Recycling rate is 59%. After excluding construction waste, sludge and used slag, the solid waste recycling rate is 48%.

Our True North

Framework for sustainable Solid Waste Management in Malaysia – Waste Facilities

True North of Waste Facilities:

*By 2020,
* 30% waste diversion by waste facilities in order to achieve the ultimate true North of 40% waste diversion from landfill*

Waste facilities



OUR ASPIRATIONS:

- To cover Johor, Melaka, Negeri Sembilan, KL, Pahang, Perlis and Kedah
- 23 sanitary landfills will be in operation by 2020
- 44 Safe Closure of landfills by 2020
- 17 Transfer Stations by 2020
- 13 Integrated Facilities by 2020

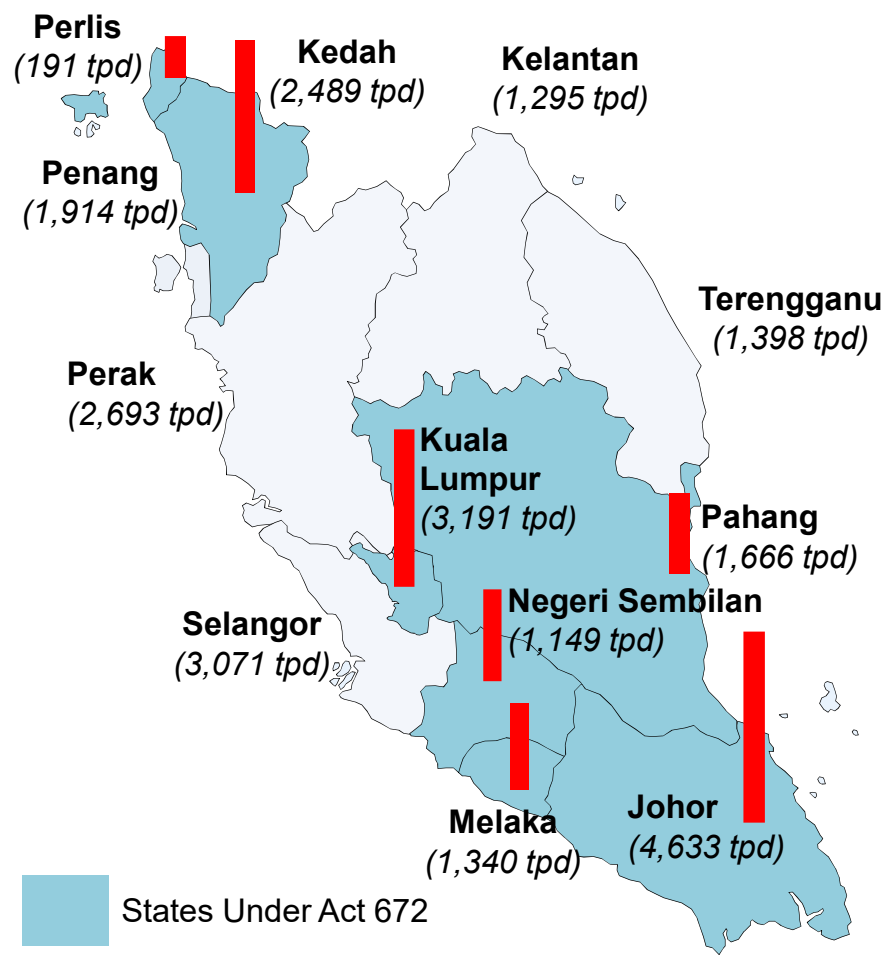
Enablers: data management , market creation, enforcement, standard, incentives, human capital, awareness and education

Scope: *All types of waste identified under the Act 672
All states adopting Act 672
Basic infrastructures – to cover all states in West Malaysia*

Prioritisation is key in selecting the site for establishing an integrated waste facility for the most impact

Targeted tpd by 2020

Key criteria – to only cover states under Act 672



Site selection criteria:

- 1 Focus on conurbations & sites with high density population
- 2 Focus on sites reaching landfill design capacity
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Our Problem Statement

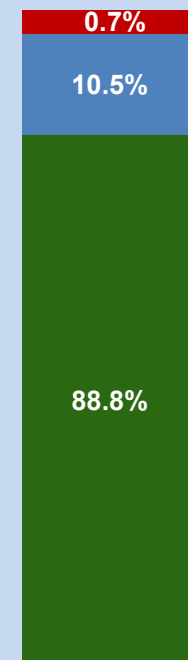
Current Solid Waste Facility Management Framework is NOT sustainable



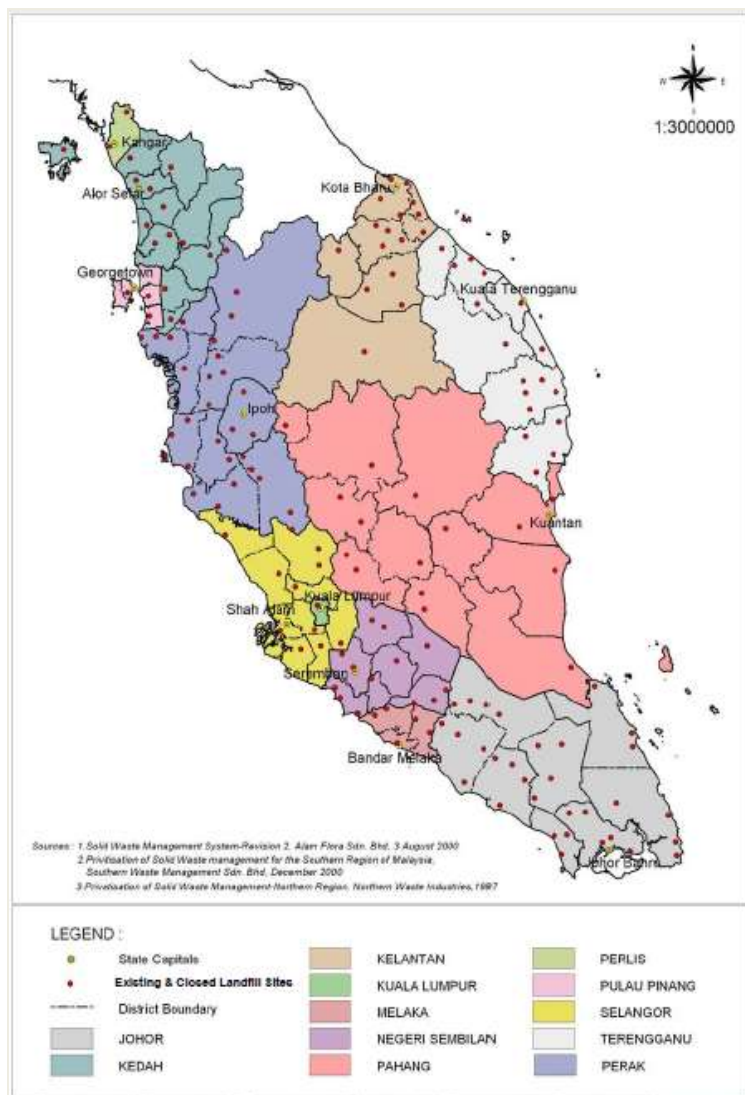
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- **No single study or policy on waste mapping nationwide**
- **Waste management is regarded as a 'Low priority Items' in government's planning & budgeting**
- **Stakeholders in the whole ecosystem is working in silo**

This is Malaysia, currently



Currently, 95% of landfills in Malaysia are non-sanitary.



State	Landfills in operation		Landfills Not in operation	Total
	Sanitary	Non - Sanitary		
Johor	1	13	23	37
Kedah	1	7	7	15
Kelantan	-	13	6	19
Melaka	1	2	5	8
N. Sembilan	-	7	11	18
Pahang	-	16	16	32
Perak	-	17	12	29
Perlis	-	1	1	2
Pulau Pinang	1	2	1	3
Sabah	-	19	2	21
Sarawak	3	46	14	63
Selangor	3	5	14	22
Terengganu	-	8	12	20
WP KL	-	0	7	7
WP Labuan	-	1	0	1
Total	10	156	131	297

Current landfill is insufficient to deal with high degree of recurring problems

Instances of landfill problems

- Leachate contamination in the surroundings destroyed marine life in the area and could pollute water resources
- Illegal dumping is a serious health concern especially as the food waste would create vermin infestations
- The cost of cleaning up by the local authorities would be very high; but if unaddressed would degrade the living and working environment
- Accidents on site are already happening. If not tackled, accidents will increase with potentially disastrous consequences

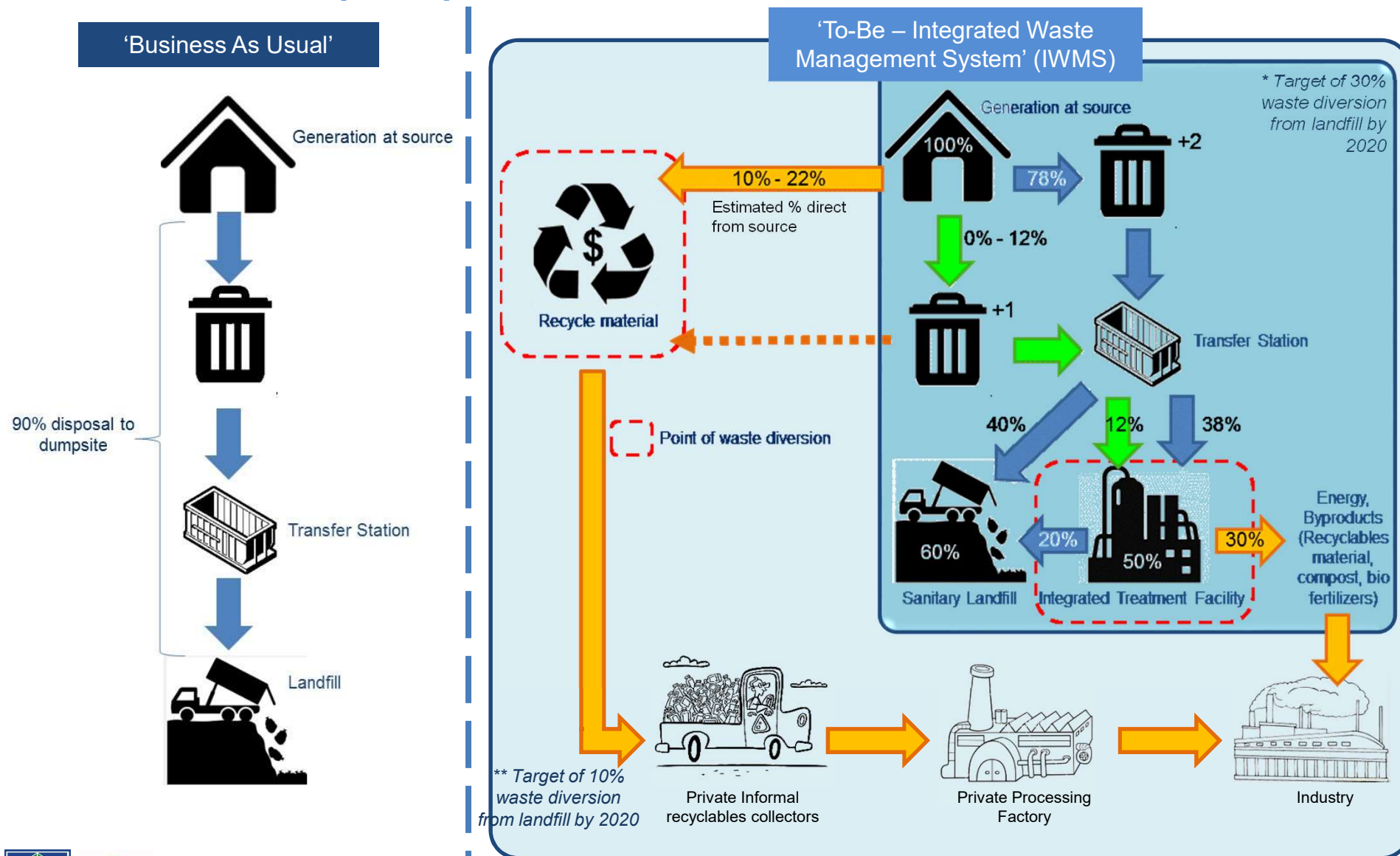
Impact

Uncollected waste	block drains, cause floods, create insanitary conditions, aesthetically unpleasant
Decomposing waste	Attract rats and other pests that cause damage and spread disease



Targeted Solid Waste Operating Business Model:

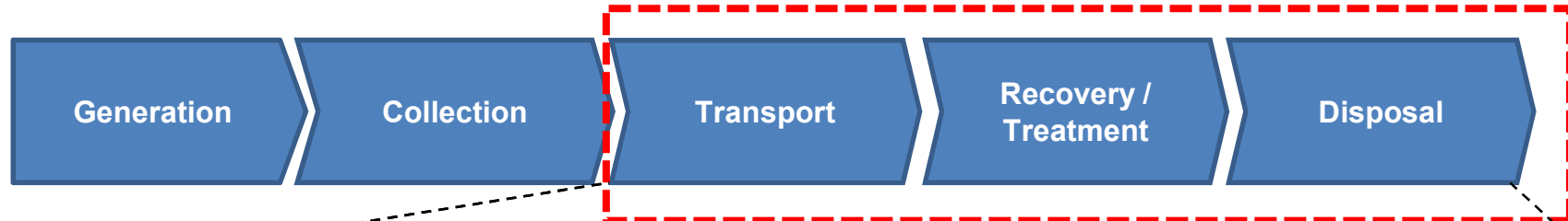
To have 40% waste diversion from landfill by 2020, the below 'To-Be' Model is a prerequisite...



Waste facilities: Current situation

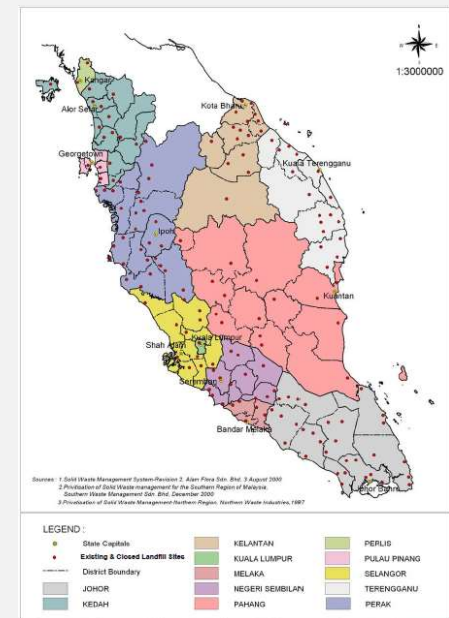
Basic Infra and Treatment Facility

Waste facility is crucial to support the 3 final stages in the activity chain of Waste Management



Current Landscape

- **Basic Infra - highly dependent on landfills :**
 - 165 operational landfills across Malaysia catering to 95% of Malaysian waste
 - In Peninsular Malaysia Only 7 sanitary landfills operational and 9 more under various stages of implementation & construction
 - Many landfills are reaching design capacity; - environmental challenges in closing landfill and land scarcity in opening new ones
- **Treatment Facility - very limited treatment facilities :**
 - 1 technology-based treatment facility (integrated material recovery, biological and thermal treatment) operational generating energy from waste
 - 4 small capacity incinerators under various stages of implementation on four islands (Langkawi, Tioman, Pangkor) & Cameron Highlands



Waste Facilities

BASIC INFRASTRUCTURE



Waste facilities: Basic Infra

But, First things first - for a start, we need to construct sanitary landfill, and to close open dumpsite and non-operational landfill as ultimately, untreatables / rejects / residuals are still need to be disposed into landfills

State	Sanitary Landfill			Safe Closure of dumpsite		
	Planned	In operation and on going	Balance	Planned	Completed and on going	Balance
1. Johor	4	2	2	35	4	29
2. Kedah	3	2	1	15	0	15
3. Kelantan	2	-	2	19	0	19
4. Melaka	1	1	-	7	5	2
5. N. Sembilan	2	1	1	18	4	14
6. Pahang	6	3	3	32	0	32
7. Perak	6	1	5	29	1	28
8. Perlis	1	1	-	2	0	2
9. Pulau Pinang	1	1	-	3	0	3
10. Selangor	3	3	-	19	3	16
11. Terengganu	4	1	3	20	1	19
12. WP KL	-	-	-	1	1	0
Total	33	16	17	200	18	182



Landfill Sanitization

Where are the 23 landfills?

State	Planning by 2020					
	Sanitary Landfill					
	In operation and on going	New	TOTAL	Location	When	Required budget
1. Johor	2	2	4	Mersing, Sedili	2016-2019	RM100m
2. Kedah	2	-	2	-	-	-
3. Kelantan	-	-	0	-	-	-
4. Melaka	1	-	1	-	-	-
5. N. Sembilan	1	1	2	Kuala Pilah	2016-2019	RM50m
6. Pahang	3	2	5	Kuantan, Rompin	2016-2019	RM100
m7. Perak	1	1	2	Teluk Mengkudu	2016-2019	RM50m
8. Perlis	1	-	1	-	-	-
9. Pulau Pinang	1	-	1	-	-	-
10.Selangor	3	-	3	-	-	-
11. Terengganu	1	1	2	Kemaman	2016-2019	RM50m
12. WP KL	-	-	-	-	-	-
Total	16	7	*23	* The balance of 10 sanitary landfill post 2020		
						RM350m

Landfill Closure

Where are the 44 to be closed landfills?



Waste Facilities

State	Safe Closure of dumpsite					
	Supposedly to be closed	Completed and on going	To be closed by 2020	Targeted dumpsite to close	TOTAL CLOSED DUMPSITE	Required Funding
1. Johor	35	4	5	Bakri, PG, Pekan Nenas, Segamat, Tangkak	9	RM175m
2. Kedah	15	0	2	Pendang, Yan	2	RM70m
3. Kelantan	19	0	1	Bkt Gedombak	1	RM35m
4. Melaka	7	0	2	Kerubung, Ayer Molek	2	RM70m
5. N. Sembilan	18	5	2	Kg Dato' Wong Seng Chow, Sikamat	7	RM70m
6. Pahang	32	4	4	Keratong 5, Cheroh, Chuat, Kg Fari	8	RM140m
7. Perak	29	0	4	Sg Wangi, Beruas, Bercam, K. Kangsar	4	RM140m
8. Perlis	2	1	1	Padang Siding	2	RM35m
9. Pulau Pinang	3	0	1	Jelutong	1	RM35m
10. Selangor	19	3	2	Bkt Beruntung, Sg Kembung	5	RM70m
11. Terengganu	20	1	2	Jln Bantangan, Sg Ikan	3	RM70m
12. WP KL	1	1	-	-	1	0
Total	200	18	26	26	44	RM910m

Basis of selection :

- Upstream of water intake, closed yet still running, running at over capacity, near to residential, aggressive public complaints



Source: Lab analysis, National Strategic Plan



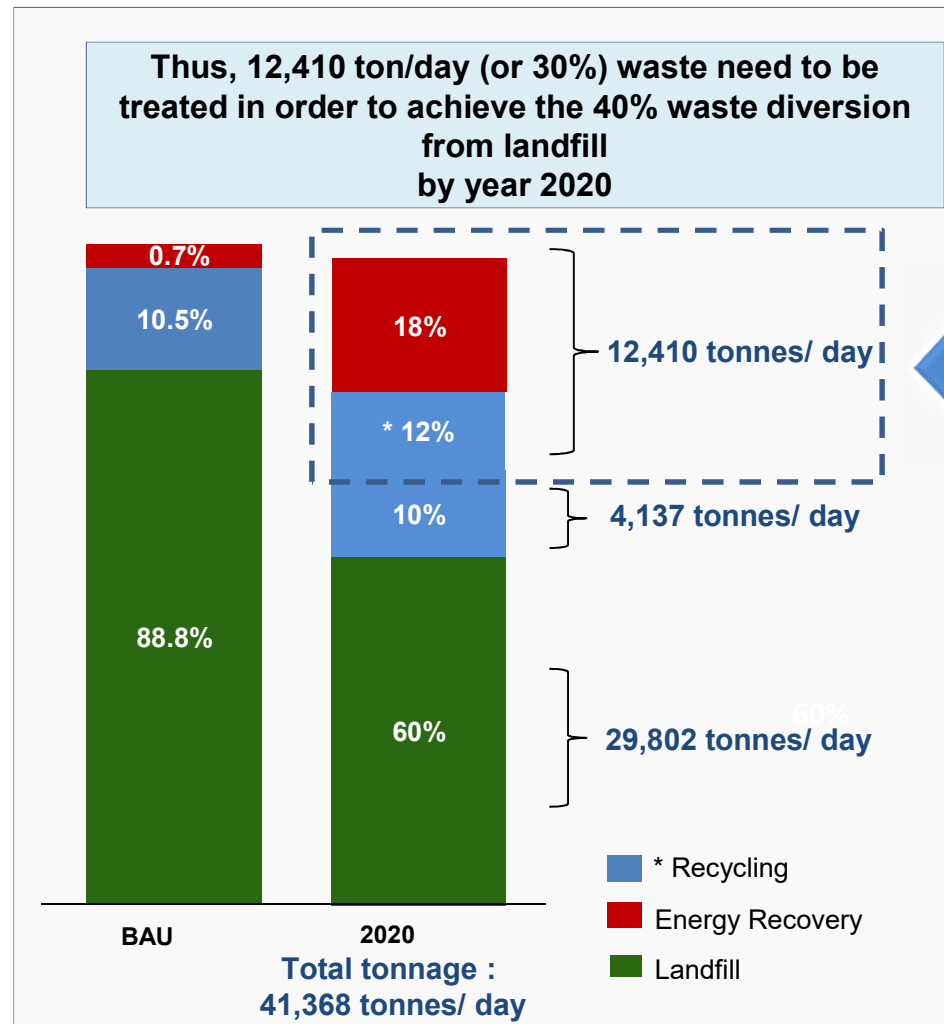
Waste Facilities

TREATMENT FACILITIES



Malaysia aspires to divert 40% of waste from landfill by year 2020

To achieve this, treatment facilities are needed to address 30% of total waste capacity



We apprehend that we need to address this amount of waste tonnage on every single day



We started our journey by taking Johor as our 'test bed'...

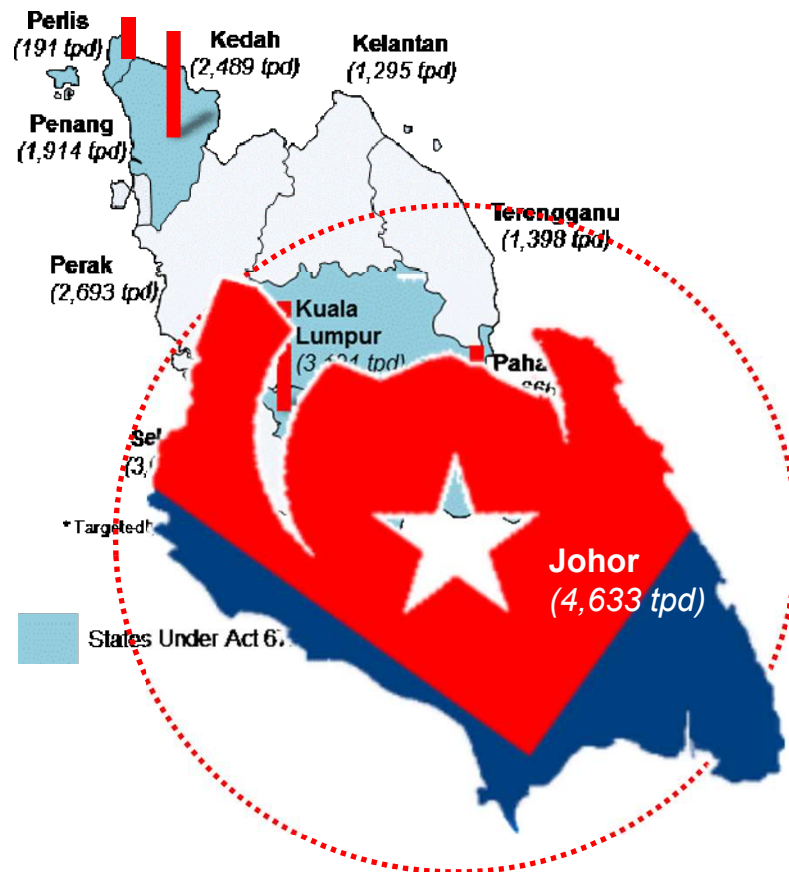
Our plan was to later replicate the defined operating model into other states...

WHY Johor?

- Data readiness – engaged formal studies by professional consultant. Thus provide comfort and confidence for test bedding
- Landfills are over ageing, over capacity and critical for treatment



Johor Model : While working on Johor, we have defined key parameters for the 'To-Be' Waste Management Operating Model as below:



Defined key parameters on 'To-Be' Operating Model:

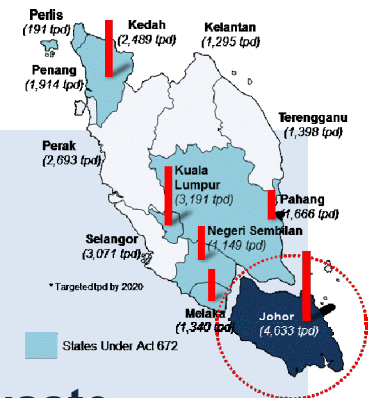
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- (2) To establish a min capacity for Integrated waste facility Type A (for feedstock >1,000tpd)
- (3) To establish facility with feedstock below 1,000tpd – non thermal treatment
- (4) Transfer station is needed within 30km radius from collection points
- (5) Bank-ability – financial security is needed in determining business partnership
- (6) To only cover states that govern under Act 672 as it is a pre-requisite implementation criteria to sync up with the IWMS
- (7) The future required facilities are to be determined based on waste composition pattern at that particular time and location.

Also, we have concluded that there is a need for **Regional Waste Centralisation Treatment Facility**, facilitated by localised smaller capacity of transfer stations



- To reduce points of pollution
- Better monitoring and enforcement from related agencies
- Able to manage risk at a focal point
- Eliminate redundancies in construction and operation of waste facilities
- Economies of scale for all key stakeholders in the whole ecosystem (in terms of capacity, and operation costs)
- Reduce worries in findings land
- Creation of centralised market with sufficient amount of feedstock and demand for byproducts (recyclables, energy and other potential related recyclables industries)



Johor – Two Key Categories of Proposed Treatment Facilities



1

Integrated Solid Waste Management Facilities A (above 1,000tpd):

Feedstock of **above 1,000tpd**; Sanitary Landfill; Or, Thermal; Or, Biological Treatment; Or / And, MRF
May involves combustion or use of heat for waste to be converted to energy.

Key attributes :

- High density population – land scarcity
- Proven technology with worldwide use
- Can deal with mixed MSW
- Continuous operation of 24 hours
- Balance residues to landfill max of 15%.

Challenges :

- High investment & maintenance cost
- Public acceptance

2

Integrated Solid Waste Management Facilities B (below 1,000tpd):

Feedstock of **below 1,000tpd**; Sanitary Landfill; Or, Biological Treatment; Or / And, MRF
May involves combustion or use of heat for waste to be converted to energy.

Key attributes








- Lower density population – land scarcity
- Proven technology with worldwide use
- Can deal with mixed MSW
- Balance residues to landfill max of 30%.

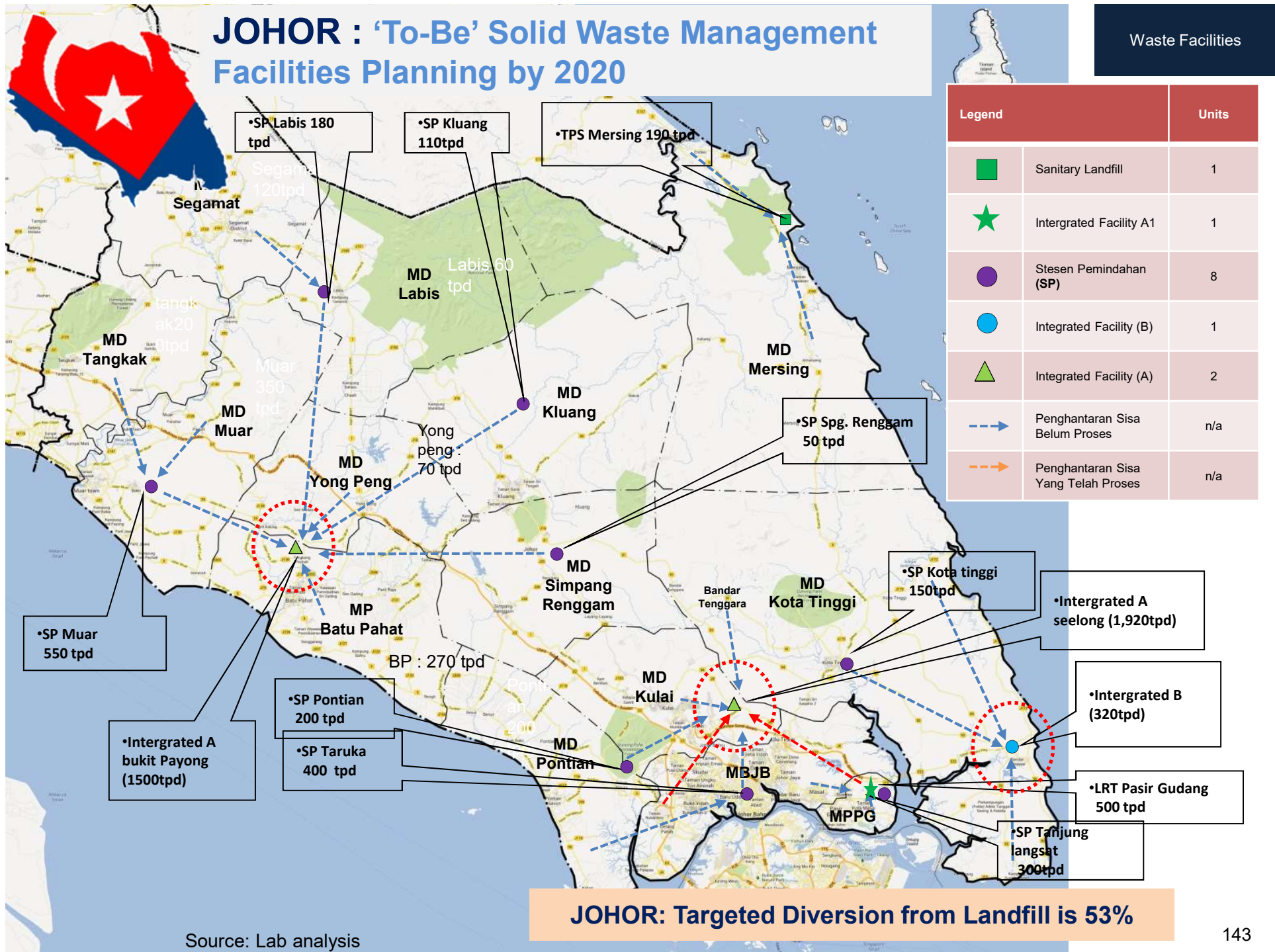
Challenges :

- Uncertain uptake of market of byproduct such as compost
- Higher operating cost due to smaller capacity

JOHOR : 'To-Be' Solid Waste Management Facilities Planning by 2020

Waste Facilities

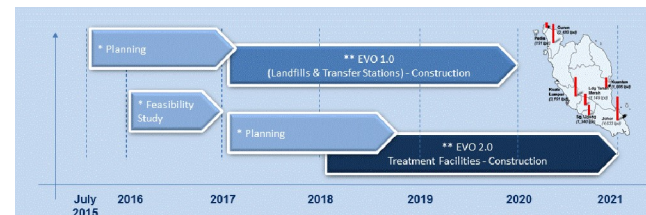
Legend		Units
	Sanitary Landfill	1
	Intergrated Facility A1	1
	Stesen Pemindahan (SP)	8
	Integrated Facility (B)	1
	Integrated Facility (A)	2
	Penghantaran Sisa Belum Proses	n/a
	Penghantaran Sisa Yang Telah Proses	n/a



Source: Lab analysis



Example of Consolidated Costs Analysis By Treatment Facilities - For Northern Johor -



Facilities	Location	Current tonnage disposed tpd (2015)	* Forecasted capacity needed by 2020 (avg tpd)	CAPEX (RM mil)	OPEX (RM/ton)	OPEX (RM mil p.a.)
Integrated A (>1000tpd)						
Sanitary Landfill	Bukit Payung	1,090	541	-	48	9.5
WTE (option)		-	1,000	600	200	73.0
AD + MRF (option)						
Transfer Station	Labis	210	268	30	35	3.4
	Muar	420	536	30	35	6.9
	Kluang	130	166	30	35	2.1
	Spg Renggam	60	77	30	35	1.0
Direct Haul	Batu Pahat to Bkt Payung	200	255	-	-	-
	Yong Peng to Bkt Payung	70	89	-	-	-
TOTAL		1,090	1,391	720	-	95.9

* Forecasted incoming tonnage received at landfill by 2020 at 5% growth per annum

FORECASTED INVESTMENT NEEDED FOR THE JOHOR STATE

CAPEX: RM2.1 Bil

OPEX: RM 263 Mil / per year

Capacity: 4,352 ton/day BY 2020



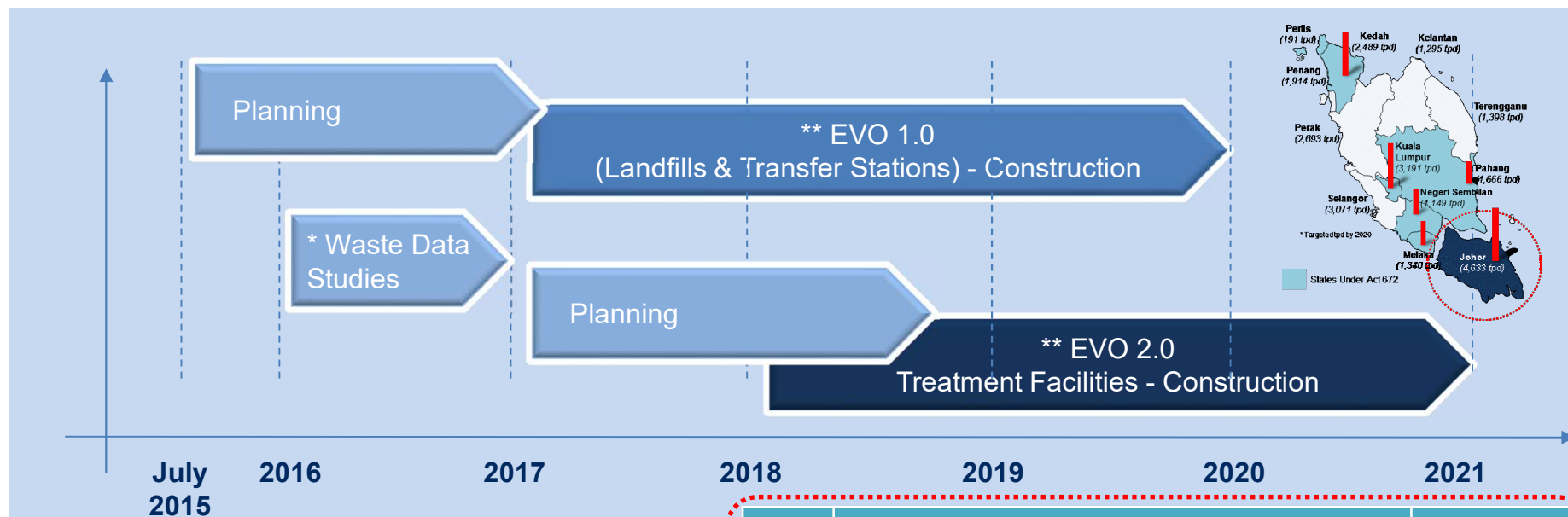
Source: Lab analysis

Approach Of The Whole Programme Would Be As Follows:

There will be two EVOs...

EVO 1.0 : To have basic Facilities (Sanitary Landfills and Transfer Stations)

EVO 2.0 : To have waste treatment facilities by 2020 in order to mark 30% waste diversion from landfill



* Key planning activities: Feasibility studies & Prelim Site Assessment, DEIA, Procurement

** Needs on Special lane on Land Acquisition

...and, the programme needs to be supported by these new additional infrastructures by 2020

NO	Facilities needed by 2020	Quantity
1	Sanitary Landfills	6
2	Transfer Stations	15
3	Integrated Facility A (capacity >1,000 tpd)	5
4	Integrated Facility B (capacity <1,000 tpd)	5
5	Integrated Facility A1 (Thermal without landfill)	1
6	Safe Closure of landfills	16

New Required Investment for States Under Act 672 (annual basis)

(Total required investment is RM6.7bn - including Basic Infra)



	Nos	2016 (RM 'm)	2017 (RM 'm)	2018 (RM 'm)	2019 (RM 'm)	2020 (RM 'm)	2021 (RM 'm)	2022 (RM 'm)	TOTAL (RM 'm)
Basic Required Facilities									
Sanitary Landfills	6	-	90	90	120	-	-	-	250
Safe Closure of Landfills	16	-	88	175	193	105	-	-	560
Transfer Stations	15	75	150	150	75	-	-	-	450
Treatment Facilities									
Integrated Facility (A)	5	-	-	450	750	750	750	300	3,000
Integrated Facility (B)	5	-	-	225	375	375	375	150	1,500
Integrated Facility (A1)	1	-	-	150	150	150	150	-	600
Land Acquisition	38	-	95	-	-	-	-	-	95
Planning	-	50	50	52	-	-	-	-	152
TOTAL (RM 'million)		125	473	1,292	1,663	1,380	1,275	450	6,657

NOTE: Estimated required investment if to cover all states in West Malaysia would be amounted to RM 9.8 billion



Consolidated Required New Investment Costs By States and Potential Diversion % (for States Under Act 672)



NO	STATES	Required Investment	Estimated OPEX per annum	*Forecasted Incoming tonnage to landfill (MT)	Potential Tonnage to be diverted (MT)	Potential Diversion % at landfill
1	Johor	RM2,110m	RM263m	4,352	2,295	53%
2	Melaka	RM630m	RM84m	1,532	1,041	68%
3	Negeri Sembilan	RM410m	RM63m	1,149	595	52%
4	WP KL	-	RM142m	3,191	850	27%
5	Pahang	RM1,090m	RM93m	2,618	625	24%
6	Kedah	RM1,010m	RM153m	3,522	1,105	31%
7	Perlis	RM300m	RM18m	388	170	44%
	TOTAL	RM5,550m	RM818m	16,853	6,681	40%

* Forecasted incoming tonnage received at landfill by 2020 at 5% growth per annum

6,681mt of waste representing 16.2% of the total generated waste in West Malaysia (including the states not under Act 672) vs our target of 30%

Our True North

To have 40% waste diversion from landfill by 2020

3 IMPLEMENTATION OPTIONS:

1ST

JOHOR AS PILOT MODEL

CAPEX : RM2.7 billion
OPEX : RM 263.3 Mil / per year
Diversion : 2,295 tpd

Targeted Diversion :
5.5%

2ND

TO COVER OTHER STATES UNDER ACT 672

CAPEX : RM6.7 billion
OPEX : RM 818.4 Mil / per year
Diversion : 6,681 tpd

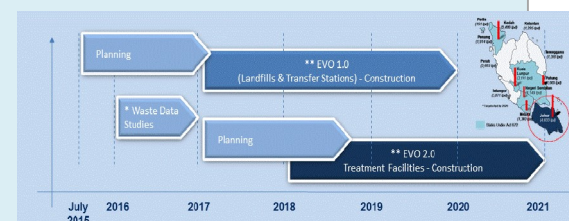
Targeted Diversion :
16.2%

3RD

NATIONWIDE (WEST MALAYSIA)

CAPEX : RM9.8 billion
OPEX : RM 1.35 billion per year
Diversion : 12,410 tpd

Targeted Diversion :
30%



Our True North

To have 40% waste diversion from landfill by 2020

Key Enablers for Waste Facilities:

- Reliable waste data studies
- **Govt readiness on putting in the required RM6.7 billion investment**
- **The need to establish a dedicated Project Management Team within JPSPN (37 Contract staff - JPSPN); 22 Direct Hire – SWCorp)**
- Siting & Zoning (close proximity to demand site)
- Stringent RFP criteria
- New set of skills (HR issues) via knowledge transfer
- Maintenance, Repair, & Overhaul (MRO), and parts companies – supply chain



Dedicated Project Management Team

To overseeing aggressive project management work

NO	Facilities needed by 2020	Quantity	* Contract staff required at JPSPN level (Development phase)	** Direct Hire permanent staff required at SWCorp level (Operational phase)
1	Sanitary Landfills	7	3	3
2	Safe Closure of landfills	26	13	2
3	Transfer Stations	18	9	5
4	Integrated Facility A (capacity >1,000 tpd)	9	9	9
5	Integrated Facility B (capacity <1,000 tpd)	2	2	2
6	Integrated Facility A1 (Thermal without landfill)	1	1	1
	TOTAL		37 staffs	22 staffs

* Contract staffs (2+1) are to be sited under Bahagian Perkhidmatan Teknikal, JPSPN ranges from J29 (25 persons), J41/44 (12 persons)

** Contract staffs (2+1) are to be sited under Bahagian Faciliti, SWCorp ranges from J41/J44 (6 persons), J29 (16 persons)

Our True North

To have 40% waste diversion from landfill by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Waste Facilities



Value to the Government



RM129.6m

Potential savings on land acquisition costs for 20 years (to avoid to acquire 518 hectares of new land)

RM16m p.a

Potential savings on leachate treatment costs

RM5.2bn

Potential savings by govt (coz if business as usual, govt may needs to fork out RM11.9bn)

220MW
631,000

Potential to generate of 220MW renewable energy – to serve 631,000 houses per month

40%

Waste diversion from landfill

Value to the Rakyat



GHG Reduction – potential avoidance of 5.8million tonnes of CO₂, equivalent to 1.2million of car emission on the road per year

5.8m

1.2m

Spur SME industry - direct Spin Off impact into economy on building materials, machineries and OEM industry

2,500

Potential creation of more than 2,500 employment to manage new waste facilities with new skillset in Waste Treatment Technology



Source: Lab analysis

Our True North

To have 30% waste diversion from landfill by treatment facilities by 2020

Waste Facilities








Waste Facilities

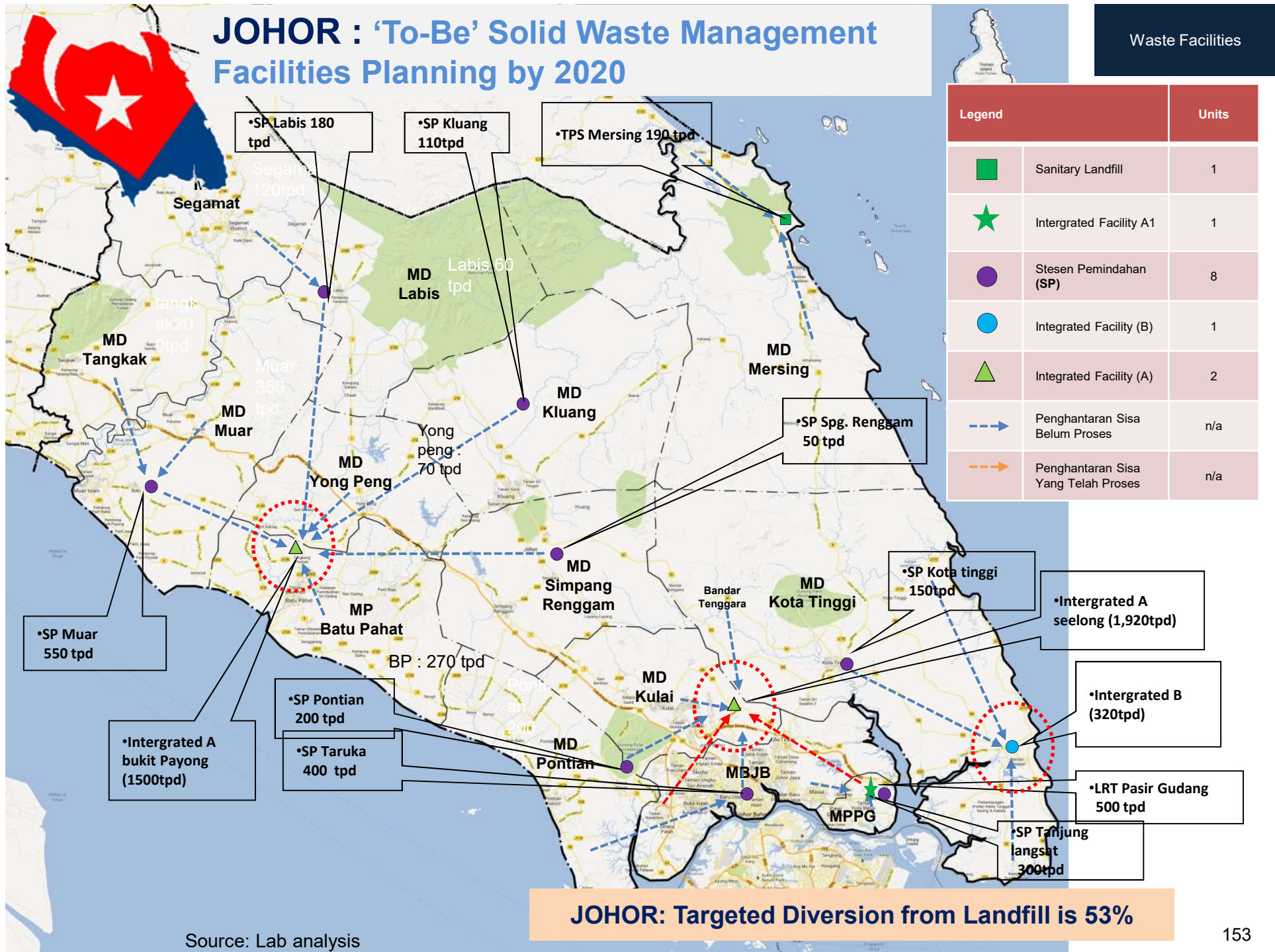
SOLID WASTE FACILITY PLANNING (STATE UNDER ACT 672)








JOHOR : 'To-Be' Solid Waste Management Facilities Planning by 2020

Waste Facilities

Legend		Units
	Sanitary Landfill	1
	Intergrated Facility A1	1
	Stesen Pemindahan (SP)	8
	Integrated Facility (B)	1
	Integrated Facility (A)	2
	Penghantaran Sisa Belum Proses	n/a
	Penghantaran Sisa Yang Telah Proses	n/a



Source: Lab analysis

Legend		Unit
	Sanitary Landfill	-
	Integrated Facility A1	-
	Stesen Pemindahan (SP)	1
	Integrated Facility (B)	-
	Integrated Facility (A)	1
	Penghantaran Sisa Belum Proses	n/a
	Penghantaran Sisa Yang Telah Proses	n/a

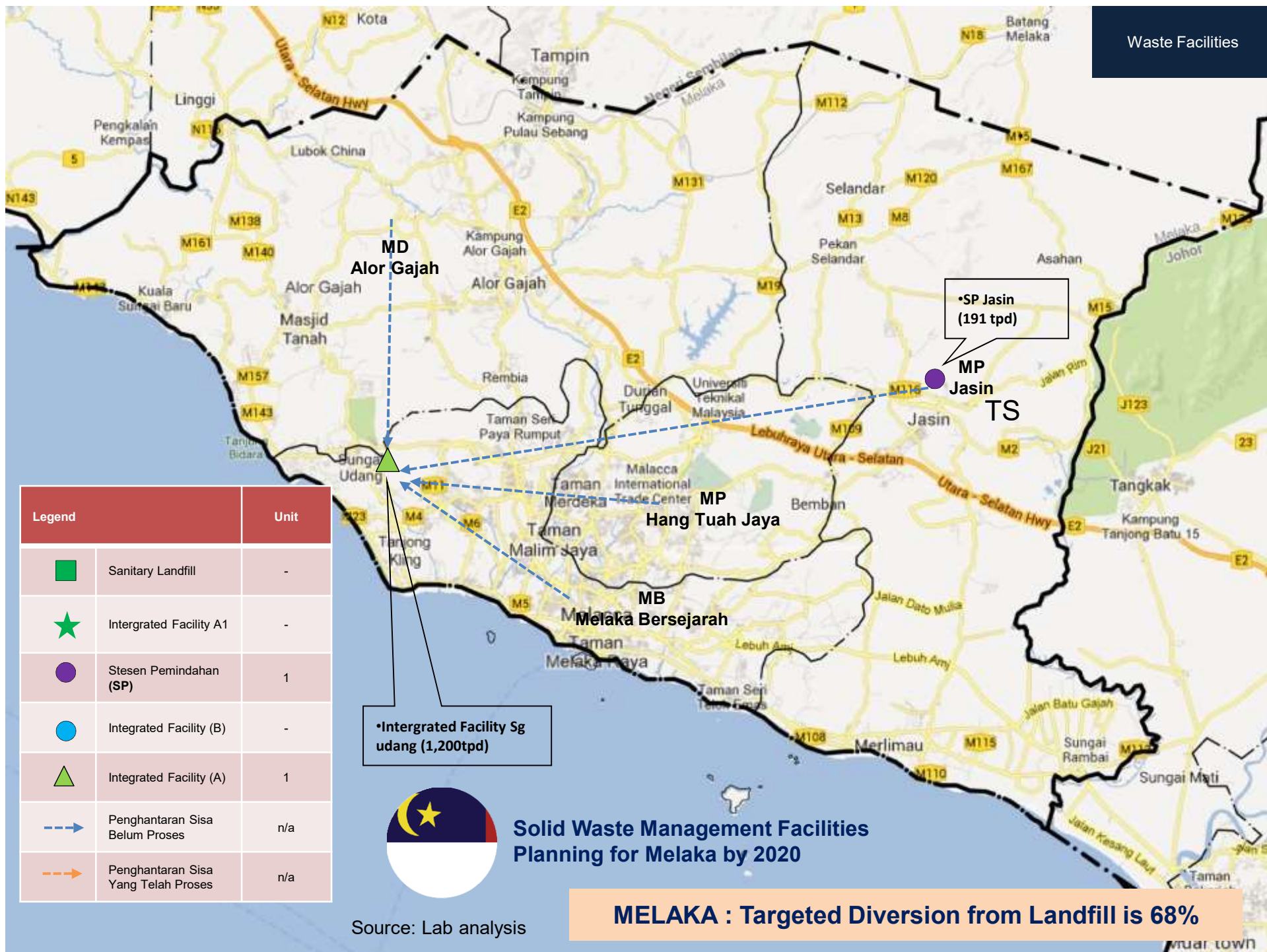
•Integrated Facility Sg udang (1,200tpd)

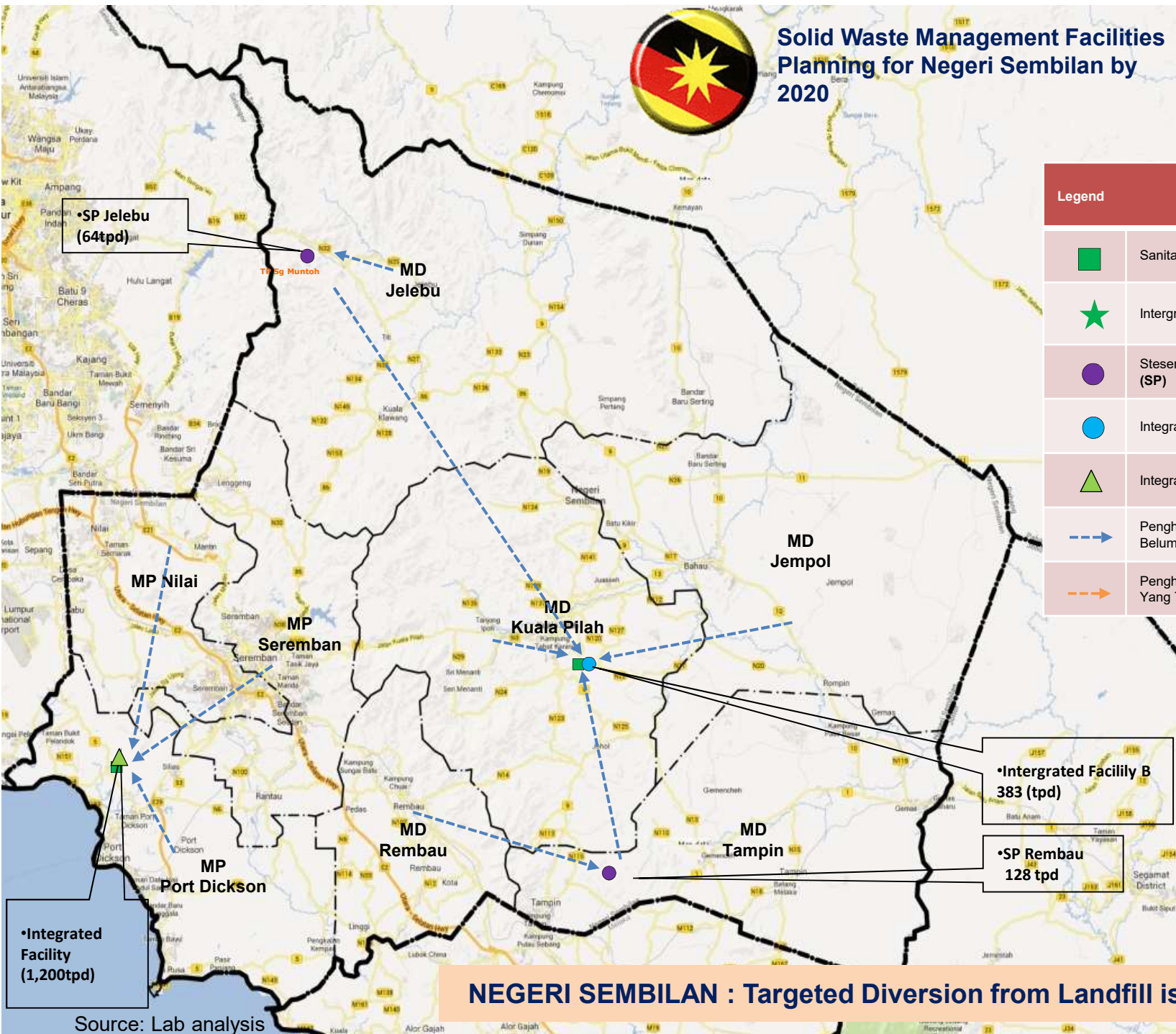


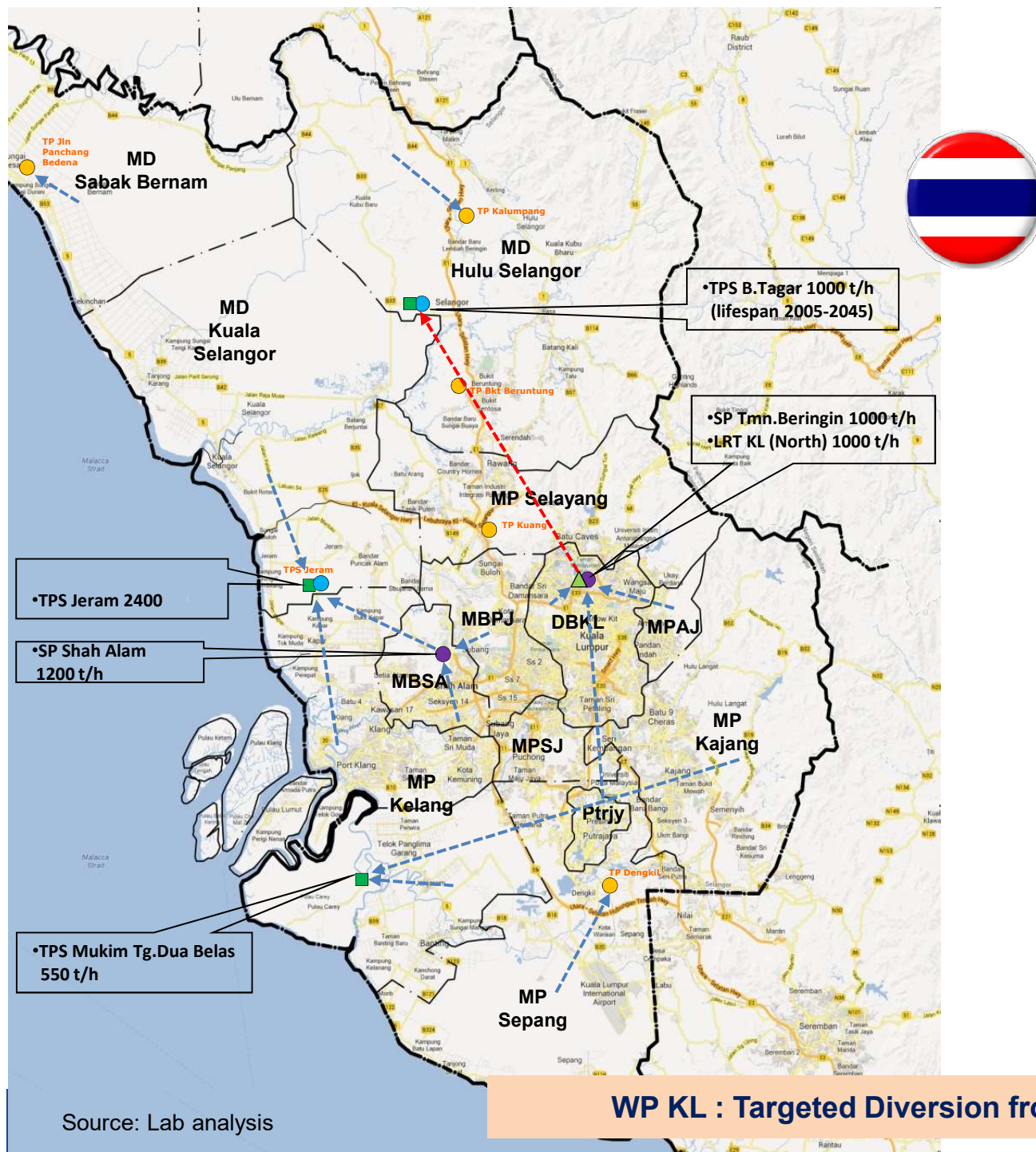
Solid Waste Management Facilities Planning for Melaka by 2020

Source: Lab analysis

MELAKA : Targeted Diversion from Landfill is 68%

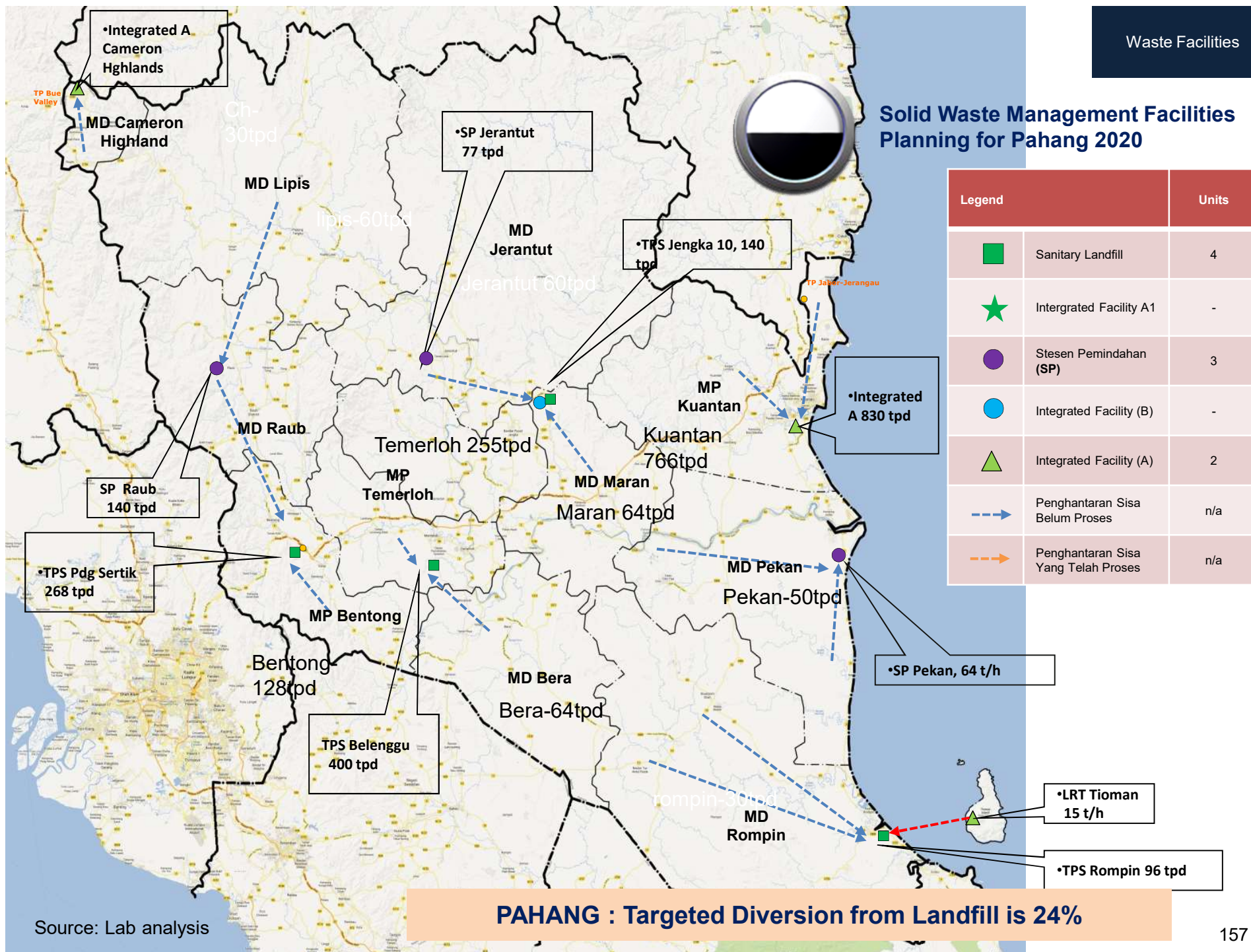






Source: Lab analysis

Solid Waste Management Facilities Planning for Pahang 2020



Source: Lab analysis

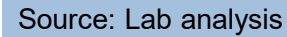


Solid Waste Management Facilities Planning for Kedah 2020





Legend		Units
	Sanitary Landfill	1
	Integrated Facility A1	-
	Stesen Pemindahan (SP)	3
	Integrated Facility (B)	-
	Integrated Facility (A)	2
	Penghantaran Sisa Belum Proses	n/a
	Penghantaran Sisa Yang Telah Proses	n/a

KEDAH : Targeted Diversion from Landfill is 31%



Solid Waste Management Facilities Planning for Perlis 2020

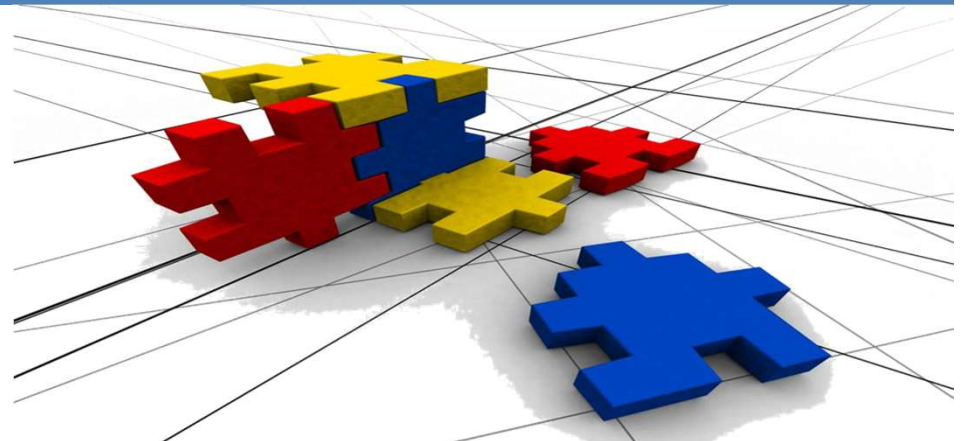
Legend		Units
	Sanitary Landfill	-
	Intergrated Facility A1	-
	Stesen Pemindahan (SP)	-
	Integrated Facility (B)	1
	Integrated Facility (A)	-
	Penghantaran Sisa Belum Proses	n/a
	Penghantaran Sisa Yang Telah Proses	n/a

PERLIS : Targeted Diversion from Landfill is 44%

Our True North

To have 30% waste diversion from landfill by treatment facilities by 2020

Waste Facilities IMPLEMENTATION PLAN



Implementation plan (Sanitary Landfills)

Initiative Title	Operationalising Sanitary Landfill	Investment (Private)
Project Owner	JPSPN	Funding (Public)	RM50m per unit

Key activity (Task)	Action party	Start Date	End date
Land Ownership	JPSPN, Kerajaan Negeri dan JKPTG	Julai 2015	Feb 2017
Preliminary Site Assessment & Detail Environmental Impact Assessment	JPSPN, JAS	Jan 2016	Jan 2017
Land Survey & Site Investigation	JPSPN	Jan 2016	April 2016
Conceptual & Detail design	JPSPN	Jan 2016	Feb 2017
Utilities submission	TNB, Syabas, Telekom	Ogos 2016	Disember 2016
Tendering process	JPSPN	Jan 2016	Feb 2017
Construction Stage	JPSPN	Mac 2017	Mac 2019
Testing and Commissioning	JPSPN	Jan 2019	Mac 2019
Operation Stage	SWCorp	April 2019	

Key risks	<ul style="list-style-type: none"> Public resistance Design defect Operational risk 	Mitigation	<ul style="list-style-type: none"> To comply with EQA conditions To comply with EIA approval conditions 	Ease of Implementation	Medium
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Implementation plan (Dumpsite Landfills)

Initiative Title	Landfill Closure (to closed existing open dumping landfill)	Investment (Private)
Project Owner	JPSPN	Funding (Public)	RM35m per closure

Key activity (Task)	Action party	Start Date	End date
Land Survey & Site Investigation	JPSPN	Jan 2016	April 2016
Conceptual & Detail design	JPSPN	Jan 2016	Dec 2016
Utilities submission	TNB, Syabas, Telekom	Jan 2016	Dec 2016
Tendering process	JPSPN	Jan 2017	Jun 2017
Construction Stage	JPSPN	Jun 2017	Jun 2018
Testing & Commissioning	JPSPN	Jun 2018	Jun 2018

Key risks	<ul style="list-style-type: none"> Potential pollution from leakages post closure 	Mitigation	<ul style="list-style-type: none"> To comply with EQA conditions To comply with EIA approval conditions 	Ease of Implementation	High
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Implementation plan (Transfer Station)

Initiative Title	To set up a Transfer Station	Investment (Private)
Project Owner	JPSPN	Funding (Public)	RM30m per unit

Key activity (Task)	Action party	Start Date	End date
Land Ownership	JPSPN, Kerajaan Negeri dan JKPTG	Julai 2015	Feb 2017
Preliminary Site Assessment & Detail Environmental Impact Assessment	JPSPN, JAS	Jan 2016	Jan 2017
Land Survey & Site Investigation	JPSPN	Jan 2016	April 2016
Conceptual & Detail design	JPSPN	Jan 2016	Feb 2017
Utilities submission	TNB, Syabas, Telekom	Ogos 2016	Disember 2016
Tendering process	JPSPN	Jan 2016	Feb 2017
Construction Stage	JPSPN	Mac 2017	Mac 2018
Testing and Commissioning	JPSPN	Jan 2019	Mac 2019
Operation Stage	SWCorp	April 2019	

Key risks	<ul style="list-style-type: none"> Public resistance Impact on traffic Design risk Operational risk 	Mitigation	<ul style="list-style-type: none"> To comply with EQA To comply with EIA approval conditions 	Ease of Implementation	Medium
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Implementation plan (Integrated Facility)

Initiative Title	To set up an Integrated WTE Facility	Investment (Private)
Project Owner	JPSPN	Funding (Public)	RM650m per unit

Key activity (Task)	Action party	Start Date	End date
Land Ownership	JPSPN, UKAS, JKPTG & State Govt	Julai 2015	Feb 2017
Contract Notices	UKAS	Jan 2016	April 2016
PQQ and Outline Design Proposals	JPSPN, SWCorp & UKAS	April 2016	Jun 2016
Approved Shortlisted Bidders	UKAS	Ogos 2016	Ogos 2016
RfP Stage	JPSPN , SWCorp & UKAS	Ogos 2016	Dec 2016
Detailed RfP Evaluation -	JPSPN, SWCorp & UKAS	Dec 2016	Mac 2017
Present RFP Findings to Committees	JPSPN, SWCorp & UKAS	Mac 2017	Mac 2017
Cabinet decision on BAFO Bidders Selection	JPSPN, SWCorp & UKAS	April 2017	April 2017
BAFO Engagement with Shortlisted Bidders	JPSPN, SWCorp & UKAS	April 2017	May 2017
Award Recommendation	JPSPN, SWCorp & UKAS	May 2017	May 2017
Cabinet Approval	JPSPN, SWCorp & UKAS	Jun 2017	Jun 2017
Contract Award	JPSPN, SWCorp & UKAS	Julai 2017	Julai 2017
Construction Stage	JPSPN & SWCorp	Julai 2017	Julai 2020

Key risks	<ul style="list-style-type: none"> Public resistance Design risk Operational risk Environmental risk 	Mitigation	<ul style="list-style-type: none"> To comply with EQA conditions To comply with EIA approval conditions Stringent RFP Market creation 	Ease of Implementation	Medium
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Waste Facilities

APPENDICES

Available Waste Facilities Technology

Comparison of key parameters based on existing technology in the market – Biological Treatment



Parameter	Unit	Anaerobic Digestion	No Waste Treatment	MBT
CAPACITY	Ton/Day	250	1000	1500
CAPEX	RM (million)	60	226	137.5
OPEX	RM/ton	70	40	47.8
Revenue/ ton	RM/ton	98-170	86	41
Technology status	Readiness	Ready	Ready	Ready
	Commercial Scale	Yes	Yes	Yes
	Local/Foreign	Foreign	Foreign	Foreign
	Track Record for MSW	>10 years	15 years	> 10 years
	Technology Competitiveness	Medium	Low	Medium

Biological Treatment

Anaerobic Digestion

A process that involves the biological breakdown of organic materials in the absence of oxygen. In the process, biogas containing methane and carbon dioxide is produced and can be used as fuel to generate energy. The material remaining after digestion is a partially stabilized organic material, which can then be aerobically cured and used as compost.



Mass reduction	80 - 98%
Energy /byproduct output (per 1000tpd)	480 kWh/t
Energy efficiency level	20%
Residue output	Reject material
Track Record for SWM	>10 years

CAPEX cost	RM 60m
OPEX cost/ per ton	RM 70
Facility lifespan	20 years
Construction Period	1.5 years
Ave. Land footprint	6 ha
Commercial Readiness	Ready

Biological Treatment

No Waste Treatment

A process that involves rapid biological breakdown of organic materials (3-4 hours). The material remaining after biological process will be compost/ RDF and recyclable materials. Up to 95% of treated MSW are diverted from the landfill.



Mass reduction	95%
Energy /byproduct output (per 1000tpd)	<ul style="list-style-type: none"> • Compost/RDF - 140t • Recyclables - 480t
Residue output	Reject material – 5%
Track Record for SWM	15 years

CAPEX cost	RM 226m
OPEX cost/ per ton	RM 40
Facility lifespan	20 years
Construction Period	1 year
Ave. Land footprint	10 acres
Commercial Readiness	Ready

Biological Treatment

ISOCOM [Integrated Sorting and COMposting - Mechanical & Biological Treatment (MBT)]

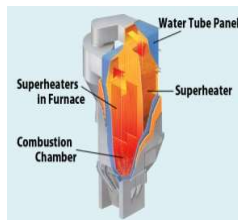
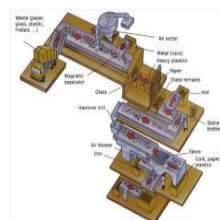
- A process that involves the biological breakdown and mechanical sorting of products. The product material remaining after biological process will be compost/ RDF, recyclable materials.
- A UN-Habitat Accredited System specially developed for Asian Waste



Mass reduction	80%
Byproduct output (per 1000tpd)	<ul style="list-style-type: none"> • 60% moisture • 9% plastic • 9% compost • 2% others
Residue output	Reject material – 20%
Track Record for SWM	7 years (for this particular technology)

CAPEX cost (1,500tpd)	RM 137.5m
OPEX cost/ per ton	RM 47.8
Facility lifespan	20 years
Construction Period	2 years
Ave. Land footprint	25 acres
Commercial Readiness	Ready

Comparison of key parameters based on existing technology in the market – Thermal Treatment



Parameter	Unit	MRF/WtE	Mass Burn Circularized Fluidised Bed	Mass Burn Stoker	Rotary Kiln	Plasma Gasification
CAPACITY	Ton/Day	1000	1000	1000	100	1000
CAPEX	RM (million)	250	360	550	68	650
OPEX	RM/ton	85	110	102	249	120
Revenue/ ton	RM/ton	101	129	124	0	202
Technology status	Readiness	Ready	Ready	Ready	Ready	Ready
	Commercial Scale	Yes	Yes	Yes	Yes (100tpd)	Yes
	Local/Foreign	Local	Local/Foreign	Foreign	Local	Local/Foreign
	Track Record for MSW	10 years	> 10 years	> 50 years	< 1 year	< 8 year
	Technology Competitiveness	High	High	High	Low	Low

Thermal Treatment

Mass Burn Incineration (Stoker)

- Incineration is a process that involves the combustion of organic materials and/or substances.
- Incineration of waste materials converts the waste into incinerator bottom ash, flue gases, particulates, and heat, the latter of which can in turn be used to generate electric power and/ or steam.



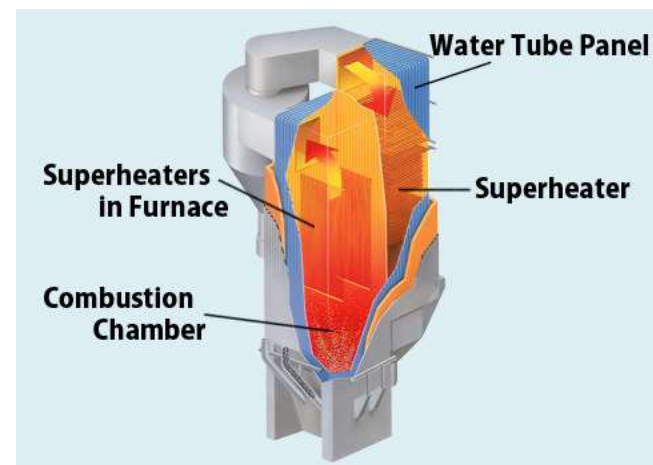
Mass reduction	90%
Energy /byproduct output (per 1000tpd)	20 MW
Energy efficiency level	21%
Residue output	Bottom ash Fly ash
Carbon footprint	0.12 kg CO ₂ /MW
Track Record for SWM	>50 years

CAPEX cost	RM550m
Nett OPEX cost/ton per year	RM102
Facility lifespan	20 years
Construction Period	2 years
Ave. Land footprint	15 acres
Commercial Readiness	Ready

Thermal Treatment

Mass Burn Incineration (Circularized Fluidized Bed)

- **Fluidized bed combustion (FBC)** is a combustion technology used in power plants. Fluidized beds suspend solid fuels on upward-blowing jets of air during the combustion process.
- The tumbling action, much like a bubbling fluid, provides more effective chemical reactions and heat transfer.



Mass reduction	90%
Energy /byproduct output (per 1000tpd)	16 MW
Energy efficiency level	25%
Residue output	Bottom ash Fly ash
Carbon footprint	0.12 kg CO ₂ /MW
Track Record for SWM	>10 years

CAPEX cost	RM360m
Nett OPEX cost/ton per year	RM110
Facility lifespan	20 years
Construction Period	2 years
Ave. Land footprint	12 acres
Commercial Readiness	Ready

Thermal Treatment

Mass Burn Incineration (Rotary Kiln)

- Incineration is a process that involves the combustion of organic materials and/or substances.
- Rotary kiln design of incinerator has 2 chambers: a primary chamber and secondary chamber. The primary chamber in a rotary kiln incinerator consist of an inclined refractory lined cylindrical tube. Movement of the cylinder on its axis facilitates movement of waste.



Mass reduction	90%
Energy /byproduct output (per 1000tpd)	1 MW
Energy efficiency level	20%
Residue output	Bottom ash Fly ash
Carbon footprint	0.12 kgCO ₂ /MW
Track Record for SWM	< 1 years

CAPEX cost	RM68m
Nett OPEX cost/ton per year	RM249
Facility lifespan	20 years
Construction Period	2 years
Ave. Land footprint	6 acres
Commercial Readiness	Ready

Thermal Treatment

Plasma Gasification

A process whereby highly ionised gas can be produced as a result of electric discharges. Plasma energy is produced when the ionised gas resists the flow of electric current through the gas thus creating radiant heat with temperatures exceeding 10,000°C. This process results in organic materials being converted to syngas which can be utilized for energy production or it can be condensed to produce oils and waxes. Inorganic materials are converted to solid slag.



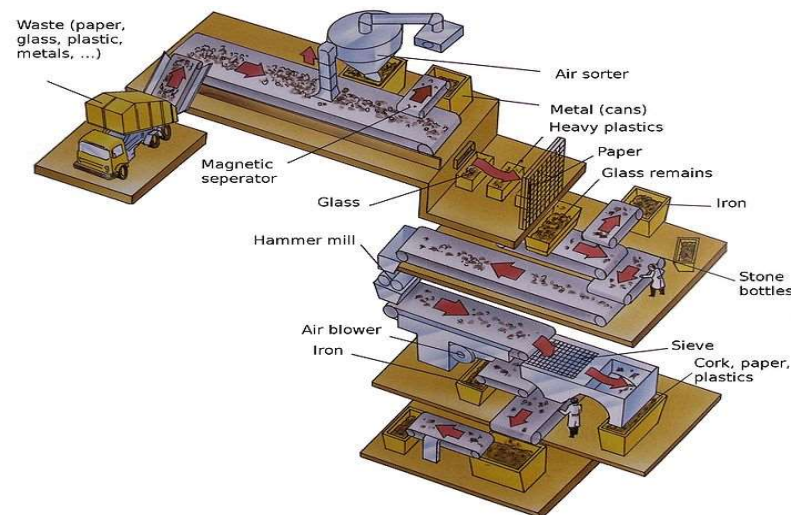
Mass reduction	90%
Energy /byproduct output (per 1000tpd)	40 MW
Energy efficiency level	43%
Residue output	Glassified Slag
Carbon footprint	-
Track Record for SWM	>8 years

CAPEX cost	RM650m
Nett OPEX cost/ton per year	RM120
Facility lifespan	20 years
Construction Period	2 years
Ave. Land footprint	25 acres
Commercial Readiness	Ready

Thermal Treatment

RRC (Resource Recovery Center) / WtE

- Incoming mixed waste is first processed and sorted by various mechanical and manual methods. Some recyclables (typically 5-10% are) extracted during this process, with the remainder being converted into cover for landfill material and refuse derived fuel. The RDF is then burned in an incineration or pyrolysis/gasification plant to produce energy (electricity and steam).
- Technology owned by Malaysian Government Linked Company, developed jointly with MINT and MOSTI, since 2001



Mass reduction	80%
Energy /byproduct output (per 1000tpd)	13 MW
Energy efficiency level	17%
Residue output	Bottom ash Fly ash Solid Rejects
Carbon footprint	0.12 kgCO ₂ /MW
Track Record for SWM	10 years

CAPEX cost	RM250m
Nett OPEX cost/ton per year	RM85
Facility lifespan	20 years
Construction Period	2-3 years
Ave. Land footprint	50 acres
Commercial Readiness	Ready

For critical areas which requires quick intervention, biological treatment is recommended for facilities below 500 tonne per day

	Min tonnage required	Speed of implementation	Competitive advantage
Biological treatment	50 tonne per day	18 – 24 months	<ul style="list-style-type: none"> Relatively cheaper compared to thermal treatment
Thermal treatment	500 tonne per day	24 – 36 months	<ul style="list-style-type: none"> High waste reduction

Ways to expedite implementation

- Establishment of treatment facility in existing landfill area
- Securing of land in identified industrial areas for facility establishment
- Detailed EIA performed in parallel with financial close. *Government needs to guarantee payment for DEIA if project does not proceed.*

Key Assumptions on Value Creation

THE CALCULATION

Our True North

To have 30% waste diversion from landfill by treatment facilities by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Waste Facilities



Value to the Government

- **30% of waste diversion** from landfill
- Reduce land usage – potential to avoid to acquire 518 hectares of new land, equivalent to **RM129.6 million** of savings on land acquisition costs for 20 years
- Reduce environmental pressure such as leachate treatment costs. Potential of **RM16 million** of savings per year
- Cost savings of **RM5.2 billion** by govt if were going to go for integrated solid waste treatment facilities (if Business as usual, we need RM11.9bn)
- Lower fuel / diesel consumption (reduce govt subsidy burden) due to lower haulage trips
- Potential to generate of **220MW renewable energy** – to serve **631,000 houses per month**

Value to the Rakyat

- GHG Reduction – avoidance of **5.8million tonnes** of CO₂, equivalent to **1.2million of car emission on the road per year**
- Spur SME industry - direct Spin Off impact into economy on building materials, machineries and OEM industry
- Creation of **more than 2,500 employment** to manage new waste facilities with new skillset in Waste Treatment Technology



Source: Lab analysis

Our True North

To have 30% waste diversion from landfill by treatment facilities by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Value to the Government



(1) Reduce land usage – potential to avoid to acquire 518 hectares of new land, equivalent to **RM129.6 million** of savings on land acquisition costs for 20 years

2,500 tonnes perday of waste for 40 yrs needs 700 hectares of land. Thus 41,368 tonnes, needs 11,600 hectares of land for 40 yrs.

For diversion of 5,963 tonnes, avoids of acquire (Density of waste =0.7tonnes per m³, height = 12m).
 $((5,963 \times 20 \text{ yrs} \times 365 \text{ days}) / 0.7) / 12 / 10,000 = 518 \text{ Ha for 20 yrs.}$

So, 518 Ha X RM250k per Ha = RM129.6 million

(2) Reduce environmental pressure such as leachate treatment costs. Potential of **RM16 million** of savings per year

Leachate treatment cost RM35/m³. 1tonnes of waste generates 0.21m³ of leachate.

Based on diversion of 5,963 tonnes, 1,252 m³ are generated per day. Thus, cost of leachate for a year (365 days) will be RM16 million per year)

(3) Cost savings of **RM5.2bn** by govt if were going to go for integrated solid waste treatment facilities

If the lab option is a NO-GO, then govt have to upgrade all the 297 Sanitary landfills, we may required to invest of 297 X RM40million = RM11.9billion. Thus costs savings = RM11.9 billion – RM6.7 billion = RM5.2 billion

Our True North

To have 30% waste diversion from landfill by treatment facilities by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Value to the Government

(4) Potential to generate of **220MW renewable energy** – to serve **631,000 houses**

11 Integrated able to generate $(11 \times 20\text{MW}) = 220\text{MW}$

Per month = $220\text{MW} \times 24 \text{ hrs} \times 30 \text{ days} \times 1,000\text{KWH per MWH} = 158.4 \text{ million KWH per month}$

Each household consume 251KWH per month

Thus, 158.4 million KWH per month can serve 631k houses per month



Value to the Rakyat

(5) GHG Reduction – avoidance of **5.8million tonnes** of CO₂, equivalent to **1.2million of car emission on the road per year**

GHG – 1 tonne of waste, generates 2.67 tonnes CO₂. Thus 5,963 is to convert $(5,963 \times 2.67 \times 365 \text{ days}) = 5.81 \text{ million tonnes of CO}_2$.

1 car emit 4.7 tonnes CO₂. Thus equal to $(5.81\text{million tonnes} / 4.7 \text{ tonnes}) = 1.2 \text{ million cars}$

Our True North

To have 30% waste diversion from landfill by treatment facilities by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Value to the Rakyat



(6) Creation of **more than 2,500 employment** to manage new waste facilities with new skillset in Waste Treatment Technology

	2016	2017	2018	2019	2020	TOTAL	Employment
Sanitary landfill	0	10	9	0	0	19	1,140 (60 people per landfill)
Safe Closure landfill	0	10	10	6	0	26	-
Transfer Station	0	6	6	5	0	17	5,10 (30 people per TS)
Integrated A	0	0	3	2	0	5	350 (70 people per Int A)
Integrated B	0	0	4	2	0	6	420 (70 people per Int B)
Integrated A1	0	0	2	0	0	2	120 (60 people per Int Int A1)
Island Incinerators	0	3	0	0	0	3	60 (20 people per Incinerator)
TOTAL							2,540 manpower

Dedicated Project Management Team

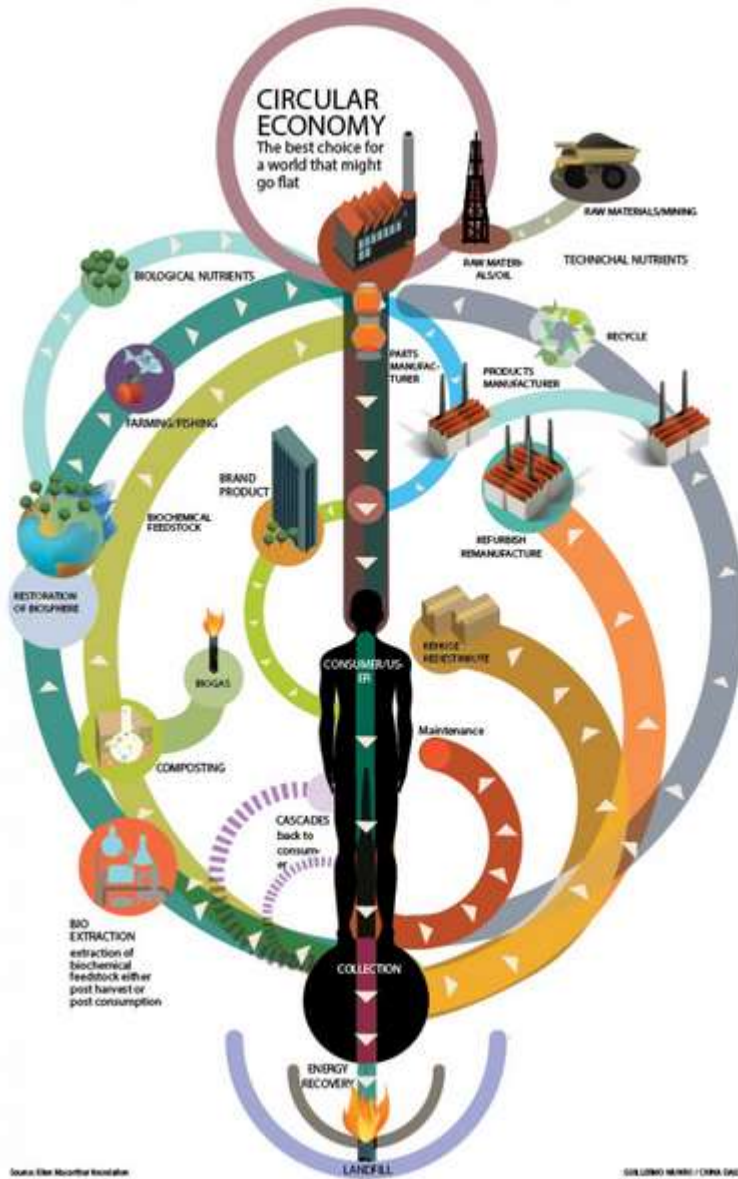
To overseeing aggressive project management work

NO	Facilities needed by 2020	Quantity	* Contract staff required at JPSPN level (Development phase)	** Direct Hire permanent staff required at SWCorp level (Operational phase)
1	Sanitary Landfills	7	3	3
2	Safe Closure of landfills	26	13	2
3	Transfer Stations	18	9	5
4	Integrated Facility A (capacity >1,000 tpd)	9	9	9
5	Integrated Facility B (capacity <1,000 tpd)	2	2	2
6	Integrated Facility A1 (Thermal without landfill)	1	1	1
	TOTAL		37 staffs	22 staffs

* Contract staffs (2+1) are to be sited under Bahagian Perkhidmatan Teknikal, JPSPN ranges from J29 (25 persons), J41/44 (12 persons)

** Contract staffs (2+1) are to be sited under Bahagian Faciliti, SWCorp ranges from J41/J44 (6 persons), J29 (16 persons)

Estimated costs : RM4,000 X 59 x 36 months = RM8.5million (or RM2.8million p.a)



WORKSTREAM 3

MARKET CREATION

Workstream: Market Creation



MSW Feedstock Readiness



**Create Vibrant Enterprise:
Conducive Market Structure**



Identify Viable Market Initiation Projects

Enablers

Industry Development Fund options

Green Govt Procurement & Purchasing Policies

SWM Industry Incentives

Unlocking Bank Financing

Key Thrusts for Market Creation

1 MSW Feedstock Readiness

To unlock recovery value:

Catchment Area Needs Statement (CANS) to matchmake Private Sector CAPEX/OPEX with GoM Public Service Needs, identifying minimum viable parameters for **Usable MSW Feedstock Intelligence**

(NSP 2005 – SWM Database; Draft DPSP 2014 – Information Mgmt System, Control Mechanism for SWM, Systematic Planning for SWM, Smart partnerships with NGOs, private, higher education and communities)

2 Create Vibrant Enterprise: Conducive Market Structure

To create conducive market structure for enterprising business innovation & market efficiency:

Commercialisation Pipeline: SOP & sustainable, holistic evaluation criteria for identification & implementation of business-viable projects; in tandem with **Capacity Building** for Federal management of Private Sector industry.

(Draft DPSP 2014 – Incentivise local industry, Capacity building stakeholders, Develop competent stakeholders)





3 Identify Viable Market Initiation Projects

To kickstart capacity & obtain proof-of-concept:

Identification & implementation of market pilot projects as proof-of-concept for both the Cost Avoidance mechanism, and the effectiveness of the proposed Commercialisation Pipeline holistic evaluation criteria. Once proven, these can be rolled out to assist rapid mobilization towards the 40% diversion target by 2020; and continued increase beyond 2020.

(Draft DPSP 2014 – Incentivise local industry)

Enablers

1 Facilitation Fund Options	<ul style="list-style-type: none"> Collaborate with MOF / EPU / UKAS on setting up a SWM Industry Facilitation Fund to help catalyse industry development from a percentage of cost avoidance generated 	 JPSPN, MOF, EPU
2 Green Government Procurement	<ul style="list-style-type: none"> Catalyse MSW-reclaimed product uptake via procurement policies & extended producer responsibility. Work with MOF/EPU/SIRIM to align uptake when market-viable products start to come onstream. 	 JPSPN, MOF, EPU
3 SWM Industry Incentives	<ul style="list-style-type: none"> Work with MITI / MIDA on tailoring specific industry incentives for SWM Investigate matchmaking of local private enterprise with international development grants / funds. 	 JPSPN, MIDA, MITI
4 Unlocking Bank Financing	<ul style="list-style-type: none"> Find solutions to minimize the mismatch between Banks Requirements & what possible certainties GoM can extend 	 JPSPN

Key initiatives under Feedstock Readiness

To unlock recovery value:

1

Catchment Area Needs Statement (CANS)

Compile & circulate catchment area tonnage diversion needs & current waste-flow chart. Clarity of this needs data helps leverage on Private Sector ingenuity in delivering suitable & appropriate proposals for addressing stated needs; taking over CAPEX/OPEX to reduce GoM burden.

To avoid delay, this should kick-start with a minimum viable information phase, adding on secondary useful data as the programme progresses.

The supporting data framework for CANS helps to define parameters of **useful & usable MSW feedstock intelligence**; how to account for appropriateness of business models by locality-specific character (HIRU), and any *competing, conflicting, or complementary* relationships with industries in close geographic proximity.

OWNER

**JPSPN,
SWCORP**

KPI : Launch of CANS
TARGET: 1 Jan 2016

Key initiatives to Create Vibrant Enterprise

To create conducive market structure for enterprising business innovation & market efficiency:

2

Commercialisation Pipeline, Capacity Building for industry development.

Addressing concerns that JPSPN has not been able to respond, evaluate and approve private sector proposals in the past; this delivers appropriate setup of capacity to facilitate evaluation & approval of private sector entry into SWM.

In addition to an SOP for receiving proposals and a guideline of evaluation criteria to determine business sustainability: it calls for building up a dedicated industry development capacity within JPSPN: skillsets needed will include understanding policy, legal contracts, and strategic business viability. Tools needed will include:

- **Mechanism** for identification & implementation of business-viable projects, along with guideline to holistic criteria for evaluation
- **Fast-track evaluation & implementation** of Private Sector Projects geared at reducing the long-term GoM burden on SWM CAPEX/OPEX financing, technical expertise & manpower.

OWNER

**JPSPN,
SWCORP,
JPA,
EPU, MOF**

KPI : Launch of Pipeline
TARGET: 1 Jan 2016

On launch, to be updated to an Overarching KPI: Acquisition of additional quantified new % of private sector contribution to the 40% Tonnage Diversion by 2020

Key initiatives to Identify Viable Market Pilots

Initiatives to build future capacity:

3

Identify Viable Market Initiation Projects

To kick-start Market Creation, potential pioneering projects need to be implemented and tracked as Proof-of-Concept that the proposed market creation strategies work.

Market Initiation Projects proposed are evaluated for business viability using the CANS and holistic evaluation criteria developed for the Commercialisation Pipeline. Once successful, these can be later replicated to assist more rapid mobilization towards the 2020 target of 40% diversion from landfills.

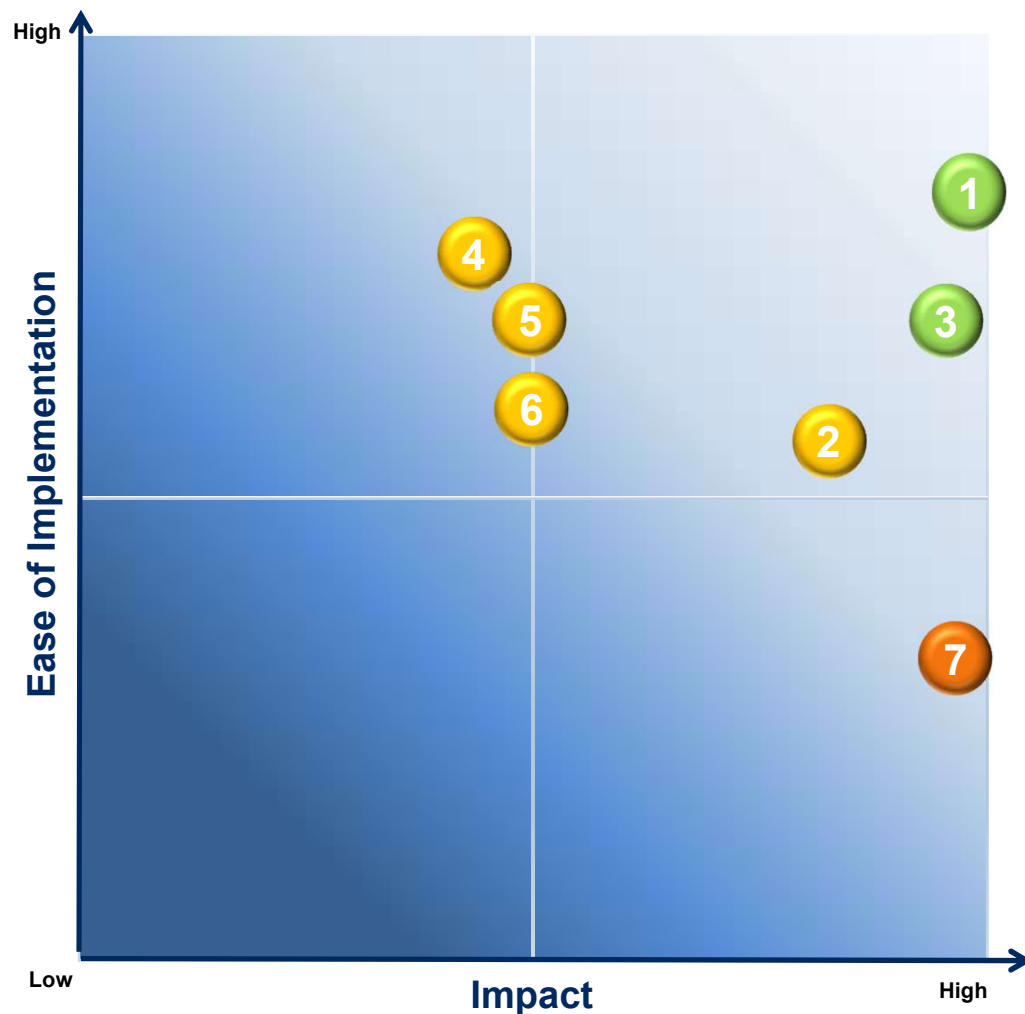
Data collected from the operation of these Market Initiation Projects will also enable target-setting quantity & timeline estimation of how much tonnage diversion can be projected from private sector involvement.

OWNER

**JPSPN,
SWCORP,
MOF,
MIDA,**

KPI : Launch of Market Initiation Projects
TARGET: 1 July 2017

Prioritisation: Initiatives & Enablers



Initiative list	Mobilisation
MSW Feedstock Readiness 1. Catchment Area Needs Statement identifying Useful Feedstock Intelligence	Short Term
Create Vibrant Enterprise 2. Commercialisation Pipeline & Capacity Building for Federal Govt	Mid Term
Viable Market Initiatives 3. Identification of Market Initiation Projects to kickstart industry development	Short Term
Enablers 4. Facilitation Fund options 5. Government Green Procurement 6. SWM Industry Incentives 7. Unlocking Bank Financing	Mid Term Mid Term Mid Term Long Term

Source:

Catchment Area Needs Statement

Catchment area tonnage diversion needs & current waste-flow chart; leverage on Private Sector CAPEX/OPEX to reduce GoM burden. Define parameters of **useful & usable MSW feedstock intelligence**. Tracking of MSW generation by locality-specific character (HIRU), quantity, availability; geographic proximity analysis & industry development purposes.

Case for change

- Currently: no organized communication channel between JPSPN & private sector; no mechanism to rapidly & effectively identify & satisfy mutual benefit; despite high private sector interest & capability.
- Without clarity on what waste management & treatment solutions JPSPN really needs, private sector's proposals are frequently misaligned or of poor quality; therefore disregarded as irrelevant. This creates perceived lack of responsibility & responsiveness by GoM.
- To transition towards a high-income nation model & unlock private sector waste-recovery, JPSPN needs to begin conducting industry-development; facilitating private sector participation and opening the market.

Our proposal

- Preparing the System: Publishing of CANS to a registered database of Private Sector provides a clear, accountable & targeted data platform to obtain private sector solutions that can specifically address JPSPN's tonnage diversion goals, so that JPSPN gains value from investing time in the review & approval of the proposals.
- Implementation:
 1. Kickstart CANS with minimum-viable framework data (*refer Slide 38 - 42*). Build from any existing SWCORP data and upload to JPSPN website with restricted-access.
 2. Private Sector register their interest with JPSPN. Registration is filed to a searchable database. JPSPN reviews registrants weekly & releases relevant segments of access to the CANS for qualified Private Sector on the 1st of every month.
 3. Proposals should be submitted within 60 days of receiving CANS access. Feedback on proposals to be communicated to Proposer within 1 week:
 1. Accepted and invited for further discussion/negotiation, or
 2. Rejected with clear reasons for rejection.
- Estimated cost of CANS database building & integration to JPSPN website
 - Phase 1: estimate RM 5k – 10k for basic functionality
 - Phase 2: estimate RM 5k for enhanced functionality
 - Phase 3: require Dashboard MySISA integration detail costs



Cost / Funding

Total
funding

RM 5k – 15k

Impact

- Business becomes able to propose locality tailored SWM solutions that sustainably satisfy GoM SWM tonnage diversion needs, unlocking local waste-recovery industry.
- JPSPN gains a clear, accountable & transparent data platform to initiate industry development. Also acquires a usable database of relevant business proposals & improves perception of GoM effectiveness & responsiveness.
- Starting point for fruitful engagement on private sector tonnage diversion to come onstream by 2020 (*infrastructure build can take up to 4 years in SWM*)

Key success requirements

- Appropriate commitment / manpower to kick-start & follow through.
- Effective collaboration between JPSPN & SWCORP to rapidly publish CANS.
- Rapid feedback to registration, clear communication of processing timeframe

Owner & stakeholders

- JPSPN
- SWCORP

Catchment Area Needs Statement

Market Creation

Activity/ Task details	Owner	Duration	Progress/ Remarks	2015							2016	2017	2018	2019	2020
				6	7	8	9	10	11	12					
A. Phase 1 : Minimum Viable Product - Develop & Circulate the Catchment Area Needs Statement	JPSPN SWCorp														
1. Assign appropriate manpower		3 months													
2. Compilation of existing data (area schemes with flow, tpd & current face cost) from SWCORP & MySISA		3 months													
3. Design & drafting of CANS framework into online search available to registered (subscribe) database of Private Sector		3 months													
4. Build website interface & payment mechanism for subscriptions		5 months													
5. Test interface user-friendliness for launch		3 months													
6. Engage with industry to inform opening of online registration for CANS project proposals.		3 months													
7. Launch CANS system & open registration database to gather business info: begin managing monthly input data updates from CANS on-ground changes, and from pilot projects		Ongoing													
8. Engage with industry to ensure system working. Troubleshooting of the CANS system & refinement		Ongoing													
9. Evaluate sufficiency of manpower allocation & plan for Phase 2		2016 Q2													

KPI : Launch of CANS

Launch

Ongoing

Ongoing

Catchment Area Needs Statement

Market Creation

Activity/ Task details	Owner	Duration	Progress/ Remarks	2016				2017				2018	2019	2020	2021	2022
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
B. Phase 2 : Preliminary Automation 1. CANS system to be automated with CANS now allowing online Proposal Submission & scoring. Notification auto-sent to CANS manager when qualifying proposals are received, to set up negotiation meeting. 2. Automated data feed in from any operating projects to be updated monthly direct to CANS display in searchable website. 3. Monitor CANS popularity, ongoing industry engagement	JPSPN SWCorp	3 months														
		3 months														
		Ongoing		Ongoing												
C. Phase 3 : Ramp-up capacity of CANS platform to deal with larger volume, Dashboard Integration 1. Link CANS system to MySISA Dashboard 2. Real-time notification of projects SWM performance	JPSPN SWCorp	3 months														
		3 months														

Commercialization Pipeline & Capacity Building

Appropriate setup of capacity to facilitate & regulate Private Sector / industry: dedicated business development capacity to evaluate concept proposals, contracts legality, strategic business viability. **SOP & Mechanism** for identification & implementation of business-viable projects.

Reliable, rapid evaluation & implementation of Private Sector Projects geared at reducing the long-term GoM burden & creating first-world SWM.

Case for change

- Currently no emphasis on facilitating private sector participation; incoming Proposals are bottlenecked at JPSPN.
- To facilitate private sector waste diversion from landfill by 2020, JPSPN requires a refreshed mandate; a clear timed Mechanism; and a guided Holistic Evaluation Criteria in order to accurately evaluate and approve Private Sector proposals; thus creating an **industry development capacity** in addition to its current infrastructure-building focus.

Our proposal

- Creation of a *Commercialisation Pipeline* process instituting a clear mechanism & timeline for Proposal evaluation, feedback & approval. Lab has drafted a framework guideline for JPSPN to finalise the mechanism (Slide 44 - 49) and scoring of a Holistic Evaluation Criteria (Slide 50 – 55). This mechanism & criteria to be workshopped by JPSPN by **30 Aug 2015**, and to begin the evaluation & facilitation process for the *Market Development Initiatives* by **1 Oct 2015**. Fullscale operation is to coincide with the launch of CANS, **Jan 2016**.
- Process is to be supported by the clear assignment of a single point of responsibility to drive and oversee the *Commercialisation Pipeline* processes end-to-end; from acknowledging receipt of proposals, to approval and implementation. (refer Slide 45 – 49)



- Once underway, quarterly review of the process will seek continuous improvement and optimisation of timeframe taken for evaluation & approval.
- Process differs from prior existing homogenous tender mechanism; in that it will deal with evaluating, qualifying, negotiating and implementing diverse innovation-based business models tailored to specific locality needs, received via the CANS RfI.

Cost / Funding

Total funding

N/A

Outcome

- Facilitate private sector entry to support national SWM tonnage diversion goals; catalyse industry development.
- Clear & immediate response to private sector on the quality & usability of their proposals; with clear timeframe & expectations management
- A standardised evaluations framework giving a holistic criteria of business models, delivering improved PPP/PFI solutions with long-term viability & sustainability
- Clear due-diligence trail in case of any reference required; record-keeping for review & improvement.

Key success requirements

- Appropriate manpower allocated to drive, oversee & improve process
- Rapid feedback to proposals, correct capability for accurate evaluation, fast-track approvals in order to get diversion onstream by 2020

Owner & stakeholders

- JPSPN

Commercialization Pipeline & Capacity Building

Market Creation

Activity/ Task details	Owner	Duration	Progress/ Remarks	2015							2016	2017	2018	2019	2020	
				6	7	8	9	10	11	12						
A. Phase 1 : Building the Pipeline 1. JPSPN workshop to agree on & finalise detail implementation of Pipeline: <ul style="list-style-type: none">Agreement on evaluations procedure timeframesAgreement on Mechanism & Evaluation Committee structure & membersDetailing & scoring of the <i>Holistic Evaluation Criteria</i>Set project planning for commencement, milestones & stages of delivery 2. Confirmation on manpower & point of ownership of the process 3. Pipeline first operation of evaluations & approvals – Market Initiation Projects 3. Pipeline full operation concurrent with CANS launch	JPSPN	2 months 1 month 9 - 12 months Ongoing														
											▲ KPI : Launch of Pipeline					

Identification of Viable Market Initiation Projects

Identification & implementation of pilot projects as proof-of-concept for both the Cost Avoidance mechanism, and the effectiveness of the proposed Commercialisation Pipeline holistic evaluation criteria. Pre-evaluated in-lab using the CANS and criteria developed for the Commercialisation Pipeline. Once proven, these can be rolled out to assist rapid mobilization towards the 2020 40% diversion target.

Case for change

- Operationalisation of the *Commercialisation Pipeline* and its first successful of evaluations could take 2+ years; EIA / DEIA another year, and infrastructure construction 2 – 4 years. (4 – 7 years span from 2015)
- More rapid results are required to impact the 2020 target of 40% tonnage diversion from landfills.
- Meanwhile, Facilities planning is reliant on the release of MOF / EPU final approved budget figures to plan and begin rollout. Mounting pressure of environmental degradation & health risks in the status quo interim.
- To minimise delay & risk of inertia: there is urgent need to get Market Initiation Projects on-stream in order to begin observing the impact of private sector involvement on national SWM goals.

Our proposal

- Kickstart and troubleshoot the first-flow operation of the *Commercialisation Pipeline* by identifying a pre-selection of sustainable, quick-win business proposals from the lab. (refer [Slide 64 - 75](#))
- These market initiation projects to be implemented as proof-of-concept. Evaluated against the CANS and Holistic Evaluation Criteria developed; these will also provide the first proof of the *Commercialisation Pipeline*. Once successful, they not only pave the way for other Private Sector Proposals, but may also be replicated to assist rapid mobilization towards the 2020 40% diversion target.
- Next-steps are an in-depth workshop with JPSPN to determine avenues to obtain funding impetus for rapid start, as the lab period has just missed the 2016 budget planning & request cycle for DE/OE, and the 2017 cycle is too long a delay. Preliminary discussions with JPSPN Facilities planning have suggested some possibilities to be explored.

Cost / Funding

**Total
funding**

RM TBD
(JPSPN workshop)

Outcome

- Operationalised Proof-of-Concept.
- Real & detailed business data, basis for:
 - Engagement with MOF on facilitation funding benchmarks, and with Banks on loans access
 - Extrapolation of tonnage diversion % allowing reality-grounded next-phase target-setting for industry & GoM
- Implementation test for monthly reporting data collection mechanism on tonnage-&-cost. Troubleshoot & prove the method of monthly data reconciliation, and the linkage pathway for update to the CANS.

Key success requirements

- Clear, strict timelines for Market Initiation Projects to go live
- Committed facilitation & troubleshooting for full implementation
- Demarcated set-aside kickstart liquidity
- Strict monthly data tracking from Market Initiation Projects

Owner & stakeholders

- JPSPN
- SWCORP
- Private Sector

Market Creation



PEMANDU
UNIT PENGURUSAN PRESTASI DAN PELAKSANAAN

Identification of Viable Market Initiation Projects

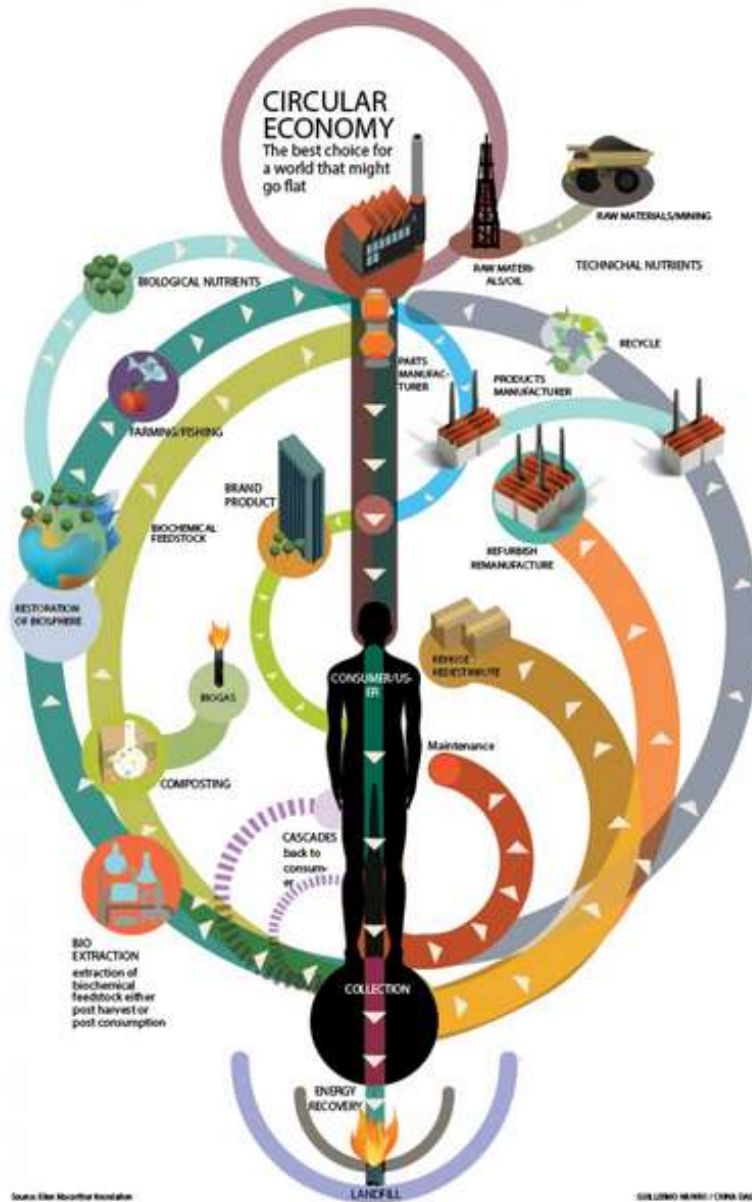
Market Creation

Activity/ Task details	Owner	Duration	Progress/ Remarks	2016				2017				2018	2019	2020	2021	2022	
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
C. Data linkage to CANS & Dashboard 1. Feed in of data from Market Initiation Projects to CANS & Dashboard 2. Review & refinement of Holistic Evaluation Criteria using any events & learning from the Market Initiation Projects	JPSPN SWCorp	Ongoing Ongoing								▲ KPI : Launch of Market Initiation Projects							

Summary of KPIs for Initiatives

Market Creation Workstream

Owner	Main KPI Dimension	Target(s)
1. Catchment Area Needs Statement		
JPSPN SWCorp	Launch of Catchment Area Needs Statement database, searchable online by registered private sector industry players	▲ 1 Jan 2016
2. Commercialisation Pipeline, Capacity Building for industry development.		
JPSPN	Launch of Business Evaluation Pipeline, full-scale operation	▲ 1 Jan 2016
JPSPN	Upon launch, to be amended to a quantified % of Tonnage Diversion by 2020. <i>Actual figure to be worked out based on:</i> <ul style="list-style-type: none"> Observed business & operations data from the Market Initiation Projects Total achievement of 40% diversion target at that point of time 	XX% Tonnage Diversion by 2020
3. Identify Viable Market Initiation Projects		
JPSPN	Launch of Market Initiation Projects	▲ 1 July 2017



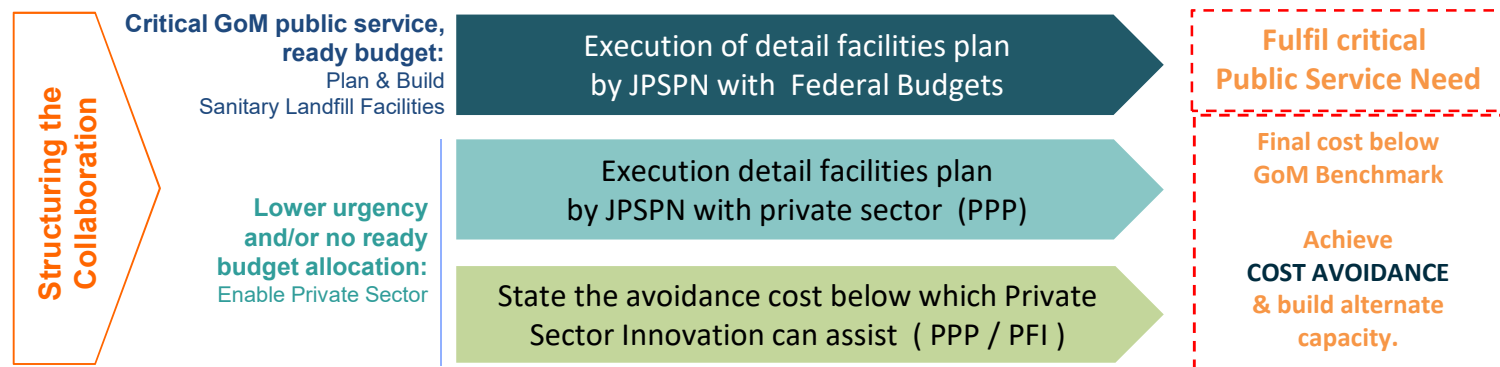
The VISION

SUSTAINABLE World-Class
Solid-Waste Management
via Private Sector Innovation

Market Creation is about activating **private sector** initiated waste management, treatment & recovery; as a sustainable solution to the **unsustainable** cost escalation of Solid Waste Management on Federal Budgets.

Current Barriers: Lacking facilitation to enable Private Sector entry and participation to assist tonnage diversion from landfills. SWM still viewed as a GoM infrastructure responsibility rather than a green growth industry (GNI, Jobs & Investment).

Enabling Solutions: Creation of a channel to facilitate Private Sector involvement & participation in waste management; in **collaboration & support of existing GoM plans**.



CONTENT

What's the Problem?

- Problem Statement
- Development Experience of Solid Waste Management
- Transition & Transformation: Malaysia

Solution *(geared to support Facilities Planning)*

- Same Budget, More Tonnage Diversion
 - Cost Avoidance Mechanism – How It Works (Private Sector Innovation)

Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
- How to Make it Happen
- Making sure Everything Goes Right
- Market Initiation Projects

Enablers



PROBLEM STATEMENT



Problem Statement

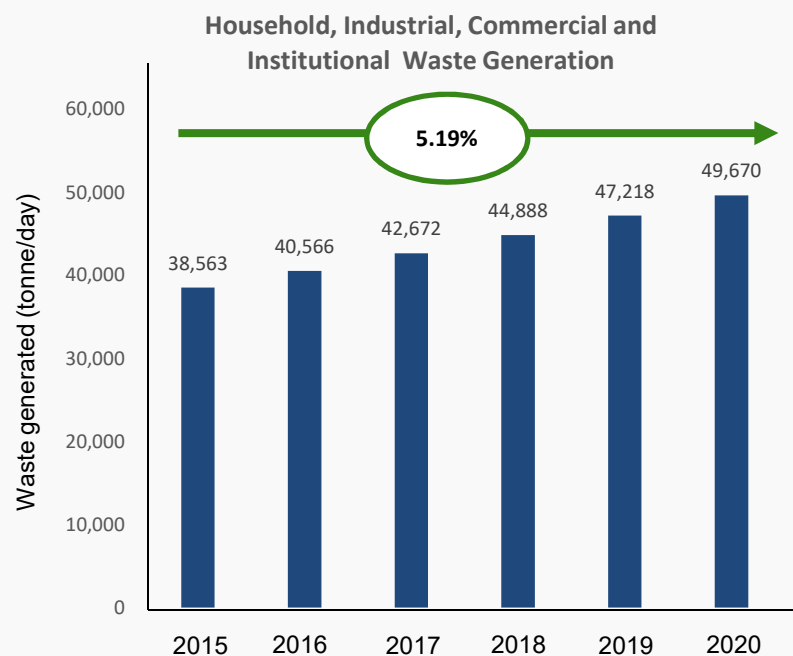
Malaysia currently dependent on Unsanitary Landfills

Market Creation

89% of collected waste is disposed in landfills. Facing escalating risks to public health & water resources contamination from leachate seepage.

Waste volume: 41,368 tonne/day of waste generated by 2020.

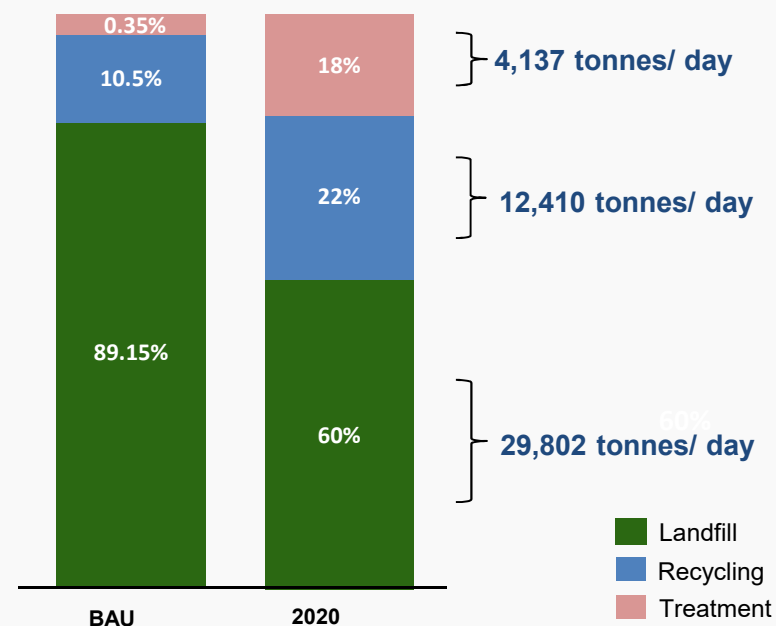
Estimated Disposal Cost: **RM 6.7 bn** (Peninsular Malaysia only)



(total Peninsular & East Malaysia) Source: JPSPN, 2012 (SWM 2012)

Target 2020: 40% waste diversion from landfill




= 16,547 tonne/day (Peninsular Malaysia only)



Key Issues

- Prohibitive time/cost of full infrastructure rollout by Federal.
- Shortness of time/manpower to accomplish by 2020.

2020 Critical Targets: Budget vs Time

WORKSTREAM 2 FACILITIES TARGETS		Estimated Total Need	Planned by 2020	Completed & Ongoing	Remaining for 2020
★ Safe Closure of Unsanitary Landfills (still remain as brown-field unusable for 20 years)		200	44	18	26
			RM 35m each		RM 910 m
★ Construction of Sanitary Landfills		33	23	16	7
			RM 50m each		RM 350 m
★ 14.5% Tonnage Diversion facilities (out of total 40% tonnage diversion goals intended to extend lifespan of Landfills)				CAPEX OPEX (p.a.)	RM 7400 m RM 817 m

Total budget need estimate **RM 6.7 bn**

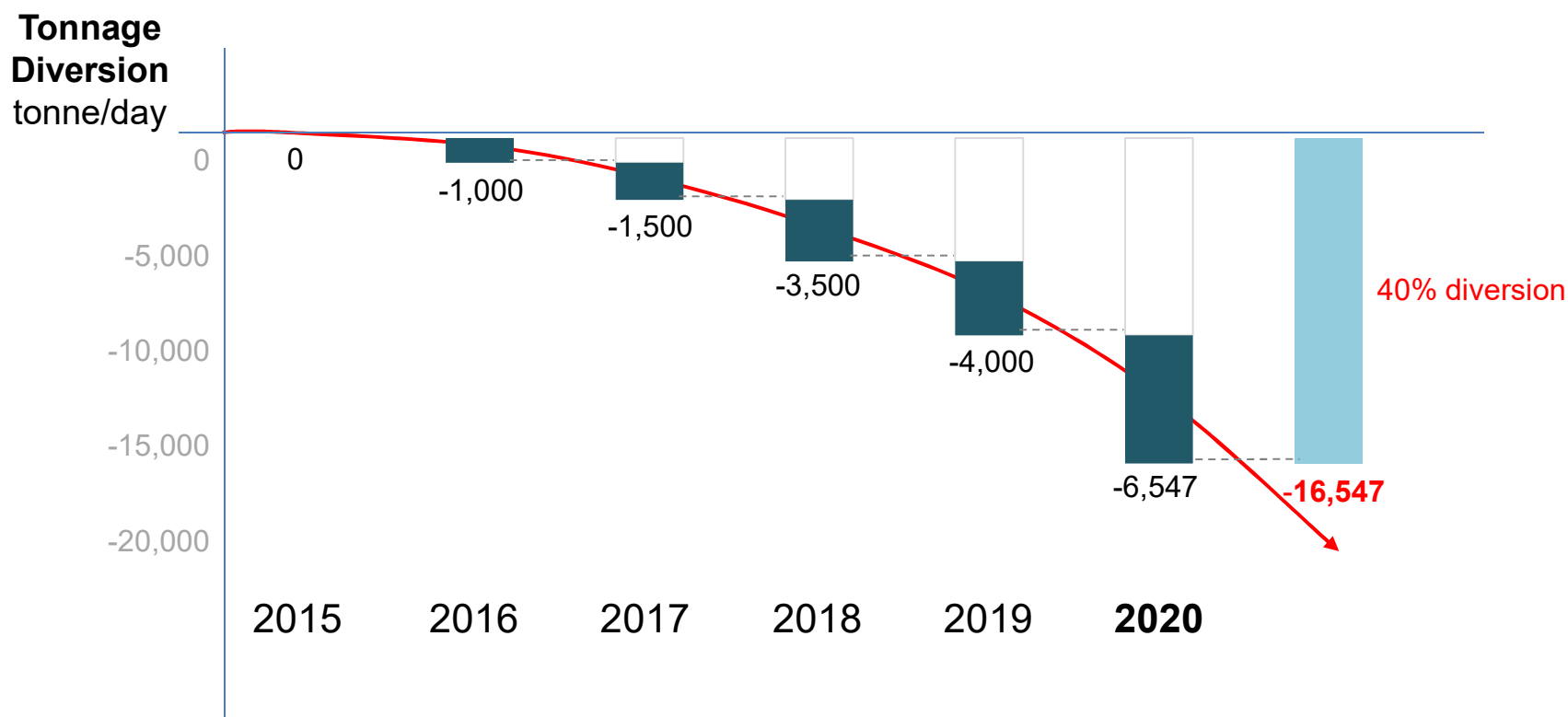
Assuming max allocation of DE budget per RMK **RM 1.5 bn**

Funding even CURRENT infrastructure need would take 20 years to **2040**

Targets & Timeline: **40% diversion goal**

Necessary Tonnage Diverted from Landfills

Reaching the Tonnage Diversion goals by 2020 will present steep stretch targets.

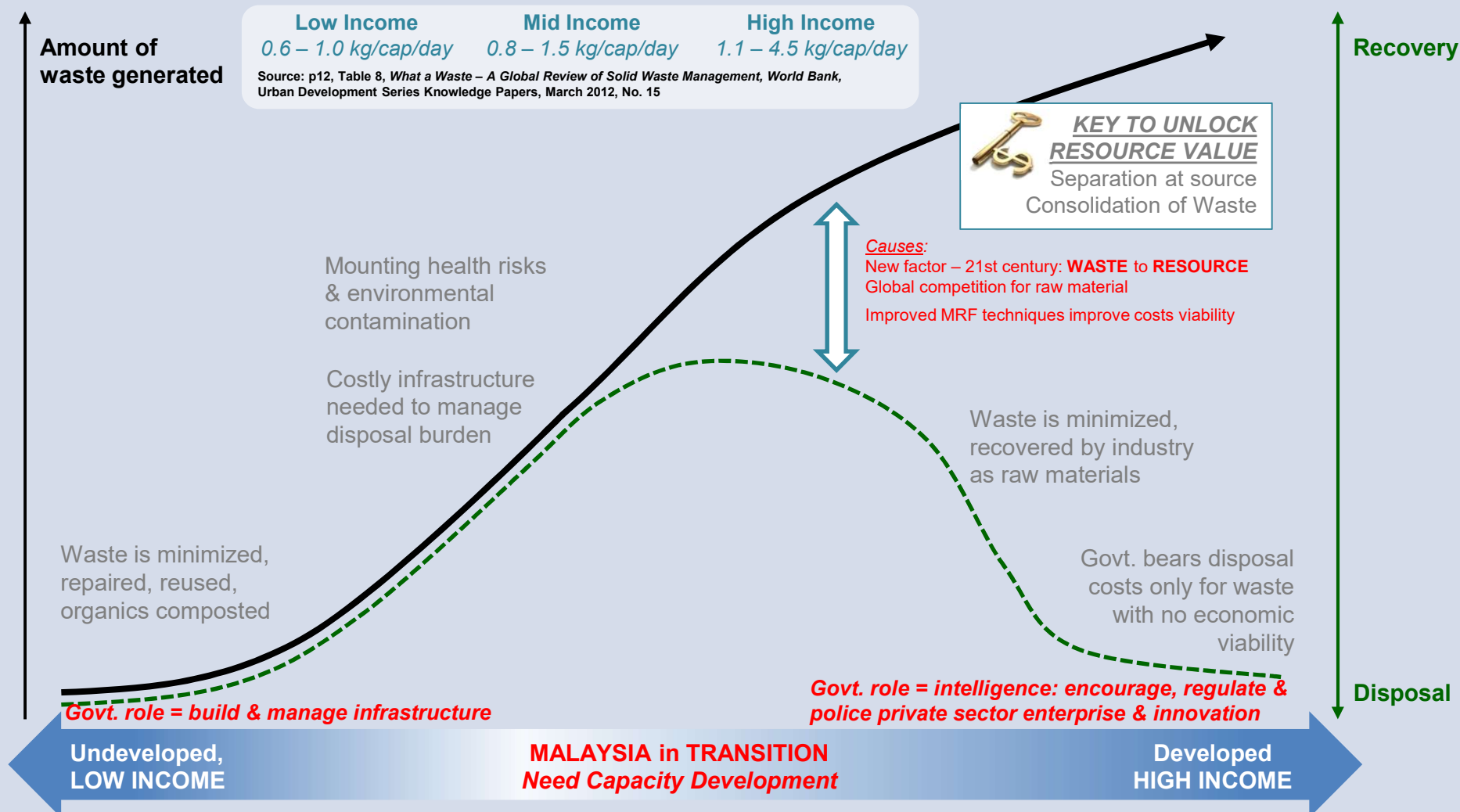


Lead Times: Typically takes **3 – 4 years** to build SWM treatment facilities

THE DEVELOPMENT EXPERIENCE of Solid Waste Management



Maturation of Solid Waste Management Systems



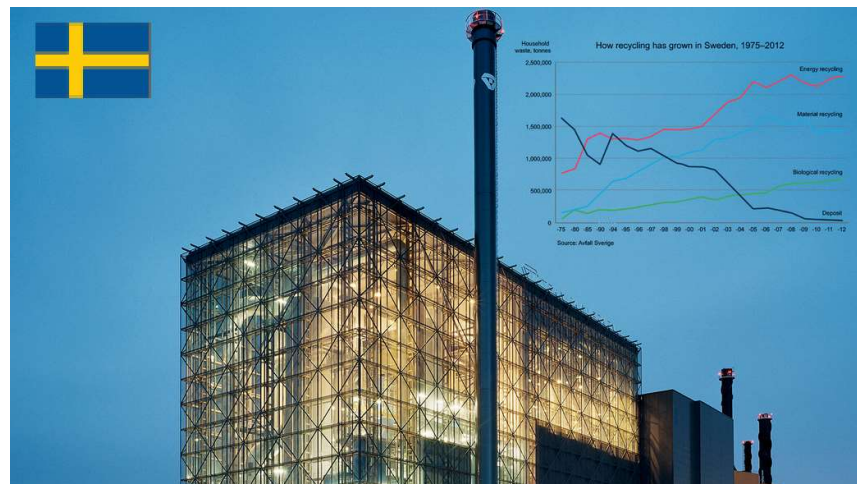
Comparison of Solid Waste Management Practices by Income Level

Activity	Low Income	Middle Income	High Income
Source Reduction	No organized programs, but reuse and low per capita waste generation rates are common.	Some discussion of source reduction, but rarely incorporated into an organized program.	Organized education programs emphasize the three 'R's' — reduce, reuse, and recycle. More producer responsibility & focus on product design.
Collection	Sporadic and inefficient. Service is limited to high visibility areas, the wealthy, and businesses willing to pay. High fraction of inerts and compostables impact collection— overall collection below 50%.	Improved service and increased collection from residential areas. Larger vehicle fleet and more mechanization. Collection rate varies between 50 to 80%. Transfer stations are slowly incorporated into the SWM system.	Collection rate greater than 90%. Compactor trucks and highly mechanized vehicles and transfer stations are common. Waste volume a key consideration. Aging collection workers often a consideration in system design.
Recycling	Although most recycling is through the informal sector and waste picking, recycling rates tend to be high both for local markets and for international markets and imports of materials for recycling, including hazardous goods such as e-waste and ship-breaking. Recycling markets are unregulated and include a number of middlemen'. Large price fluctuations.	Informal sector still involved; some high technology sorting and processing facilities. Recycling rates are still relatively high. Materials are often imported for recycling. Recycling markets are somewhat more regulated. Material prices fluctuate considerably.	Recyclable material collection services and high technology sorting and processing facilities are common and regulated. Increasing attention towards long-term markets. Overall recycling rates higher than low and middle income. Informal recycling still exists (e.g. aluminum can collection.) Extended product responsibility common.
Composting	Rarely undertaken formally even though the waste stream has a high percentage of organic material. Markets for, and awareness of, compost lacking.	Large composting plants are often unsuccessful due to contamination and operating costs (little waste separation); some small-scale composting projects at the community/neighborhood level are more sustainable. Composting eligible for CDM projects but is not widespread. Increasing use of anaerobic digestion.	Becoming more popular at both backyard and large-scale facilities. Waste stream has a smaller portion of compostables than low- and middle-income countries. More source segregation makes composting easier. Anaerobic digestion increasing in popularity. Odor control critical.
Incineration	Not common, and generally not successful because of high capital, technical, and operation costs, high moisture content in the waste, and high percentage of inerts.	Some incinerators are used, but experiencing financial and operational difficulties. Air pollution control equipment is not advanced and often by-passed. Little or no stack emissions monitoring. Governments include incineration as a possible waste disposal option but costs prohibitive. Facilities often driven by subsidies from OECD countries on behalf of equipment suppliers.	Prevalent in areas with high land costs and low availability of land (e.g., islands). Most incinerators have some form of environmental controls and some type of energy recovery system. Governments regulate and monitor emissions. About three (or more) times the cost of landfilling per tonne.
Landfilling / Dumping	Low-technology sites usually open dumping of wastes. High polluting to nearby aquifers, water bodies, settlements. Often receive medical waste. Waste regularly burned. Significant health impacts on local residents and workers.	Some controlled and sanitary landfills with some environmental controls. Open dumping is still common. CDM projects for landfill gas are more common.	Sanitary landfills with a combination of liners, leak detection, leachate collection systems, and gas collection and treatment systems. Often problematic to open new landfills due to concerns of neighboring residents. Post closure use of sites increasingly important, e.g. golf courses and parks.
Costs	Collection costs represent 80 to 90% of the municipal solid waste management budget. Waste fees are regulated by some local governments, but the fee collection system is inefficient. Only a small proportion of budget is allocated toward disposal.	Collection costs represent 50% to 80% of the municipal solid waste management budget. Waste fees are regulated by some local and national governments, more innovation in fee collection, e.g. included in electricity or water bills. Expenditures on more mechanized collection fleets and disposal are higher than in low-income countries.	Collection costs can represent less than 10% of the budget. Large budget allocations to intermediate waste treatment facilities. Up front community participation reduces costs and increases options available to waste planners (e.g., recycling and composting).

Developed Nation: Waste-to-Wealth Industry

UK (2013)

- **Waste Recovery industry = £6.8bn Gross Value**, and generates £41 GVA per tonne treated, compared to £16 for other mining extraction industries
- **103,000 jobs**
- **£4.35bn in exports** from 13 mil tonnes of recovered materials
- **£447m** electricity from landfill gas
- Projected an additional **£3.58bn** for UK business by 2020



Sweden (2015)

- Achieved **2% landfill rate**, targeting 0%
- Developed a **profitable waste-to-energy industry** importing **700,000 tonnes** of neighbouring country waste as fuel stock for electricity generation
- 32 waste-to-energy plants produce heat for 810,000 households and electricity for 250,000 homes.

TRANSITION & TRANSFORMATION



Transform this....



... to THIS



... and THIS



Incentivising the recovery of economic value from waste by private sector industry is now possible under Akta 672 via JPSPN issuance of **license to extract and pre-treat waste** (to allow for extraction of specific materials, substances or compounds) prior to final disposal.

Under Akta 672 JPSPN may undertake the following:

1. Development of a waste recovery and conversion plan (Section 6 Act 672)
2. Construction of Solid Waste Management Facilities that focuses on extraction of recyclable matter and pre treatment of waste prior to disposal (Section 8 Act 672)
3. Provision of licences for multiple operators to extract and pre-treat wastes (Sections, 14, 71 and 101)
4. Set directions specific to licensing multiple services, i.e. extraction of materials for recycling or re-use, pre-treatment etc.

MSW-Derivable Products

Market-Ready, High-Value Remanufactured Materials

MSW Key Composition

Organics

high purity

*wet market,
F&B outlets,
hotels*

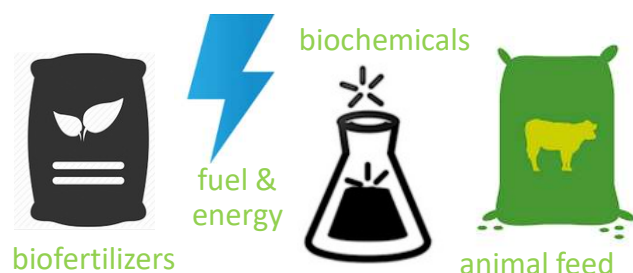
low purity

*residential
commercial*

Recyclable

Residual/mix

*hazardous
household,
diapers,
others*



Development of Green Industry



High-Value Products

BIOGAS (process product)

- Bottled Gas (*household / industry scale tanks*)
- Inject to Pipeline (*household / industry with GAS MALAYSIA*)
- NGV Transportation Fuel
- Electricity

HORTICULTURE AGRICULTURE USE

- Fertilisers
- Animal feed & Aquaculture
- Biochar (*high value for landscaping, soil conditioner, fuel source, deodorizer*)

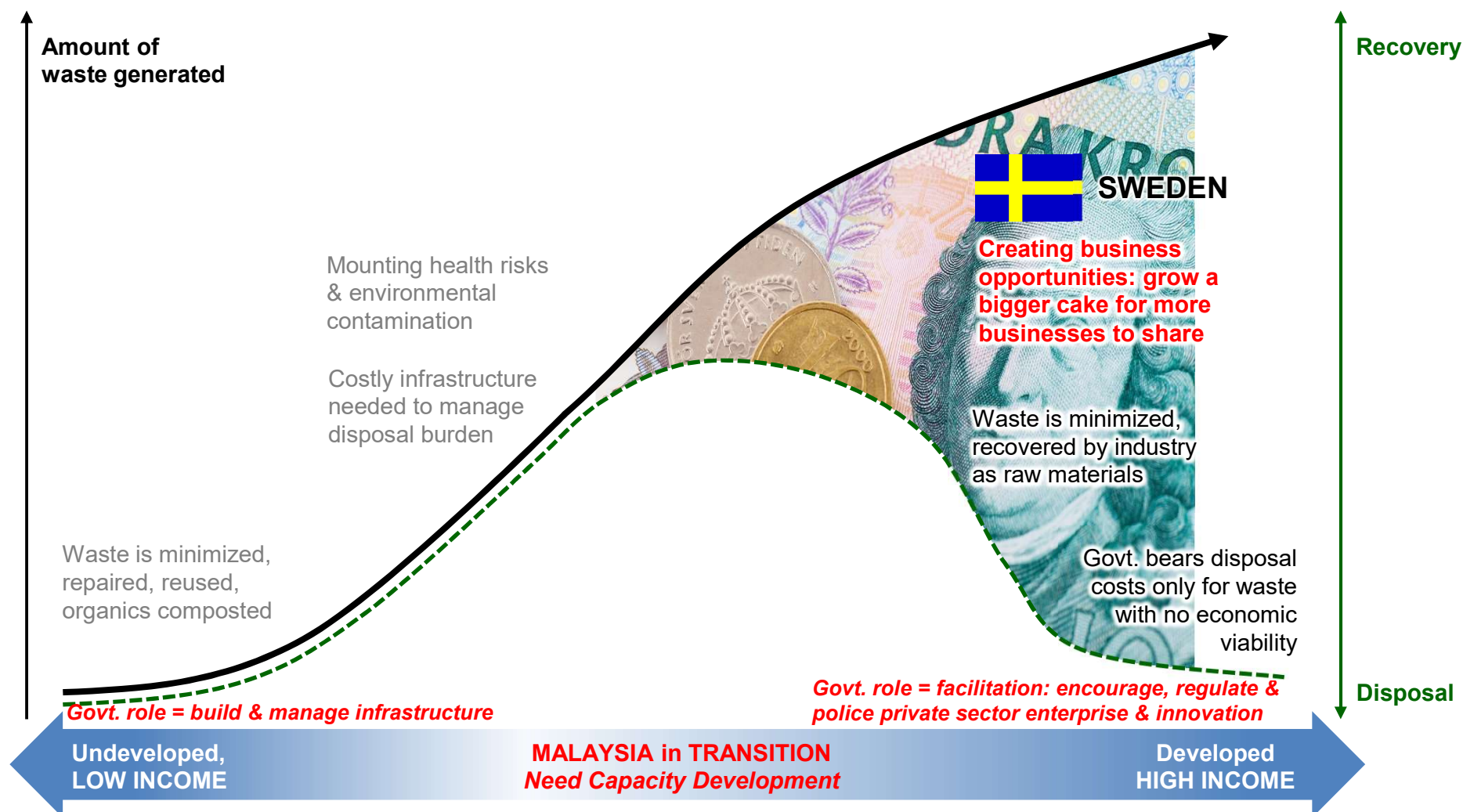
MSW-Derivable Products

Market-Ready, High-Value Remanufactured Materials

MSW Components	Weight / Ton MSW	Primary Products	Percentage Recoverable	Value of Product	Value / ton Feedstock	Secondary Products
Organics	440.5	Biogas	$440.5 * 0.5 = 220.25$	RM 1.75 / m3	RM 26.98	Compost / Animal Feed
Plastic	130.2	Recycle	$130.2 * 0.5 = 65.10$	RM 0.50 / kg	RM 32.55	Green Diesel
Paper	80.5		$80.5 * 0.5 = 40.25$	RM 0.25 / kg	RM 10.07	
Metal / Alu	20.7		$20.7 * 0.5 = 10.35$	RM 2.5 / kg	RM 25.88	
Diapers	120.1	Refuse Derived Fuel	$231.6 * 0.25 = 57.9$	Rm 0.38 / kg	RM 22.00	
Textile	30.1					
Rubber	20.2					
Wood	10.4					
Garden	50.8					
Glass	30.3	None	None	None	None	Tipping Fees @ RM 49 / ton = RM 4.73
Others	66.20					
Total	1000		40.60 (% Diverted)		RM 117.48 (Gross)	RM 112.75 (Net)

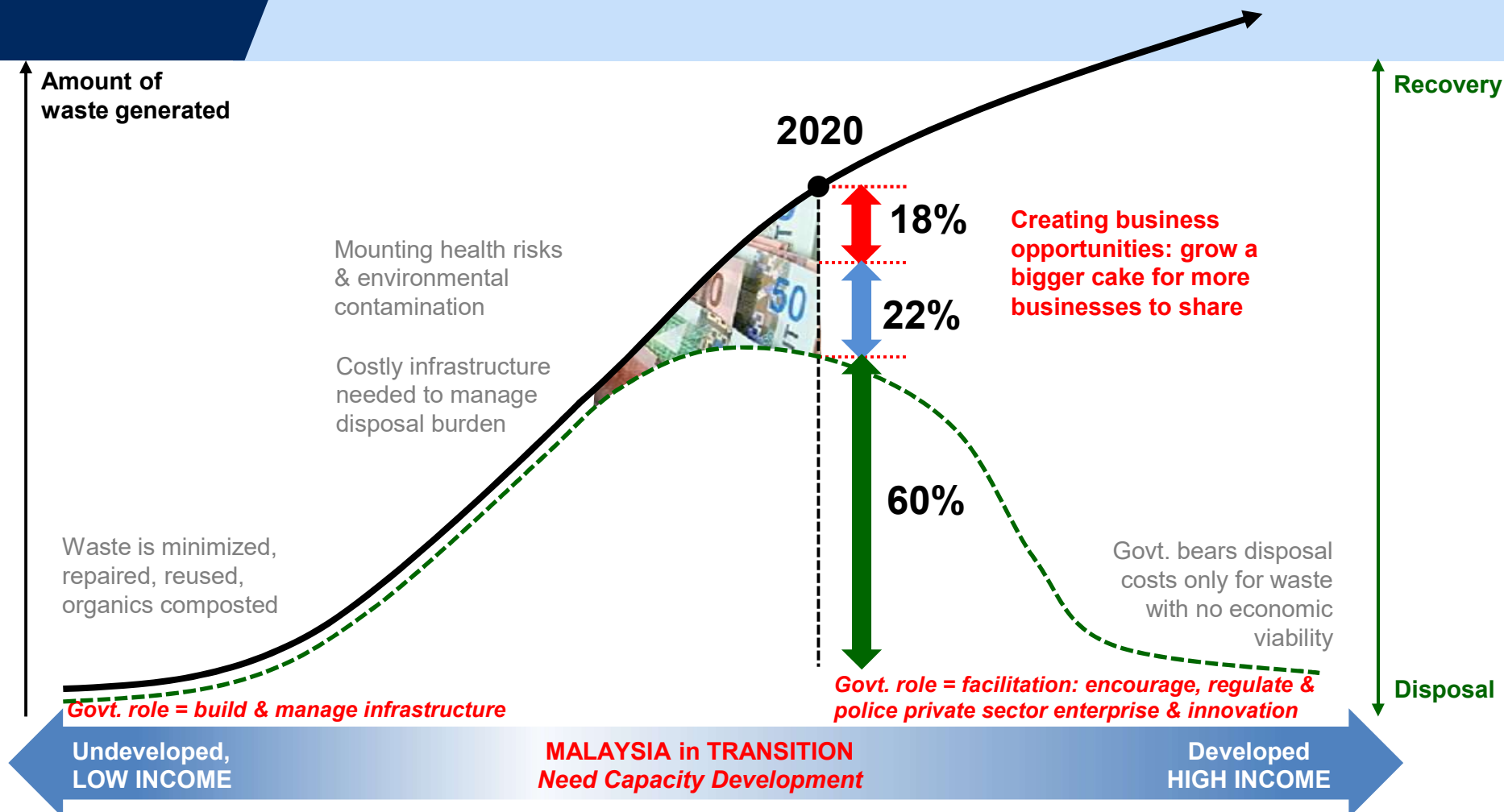
Source: Current industry poll & experience estimates, desktop research; MIGHT, JPSPN SWM Labs 2015 June

Key to Turning a **Pile of TRASH** into a **Pile of CASH**



SOLUTION for 40% Waste Reduction to Landfill

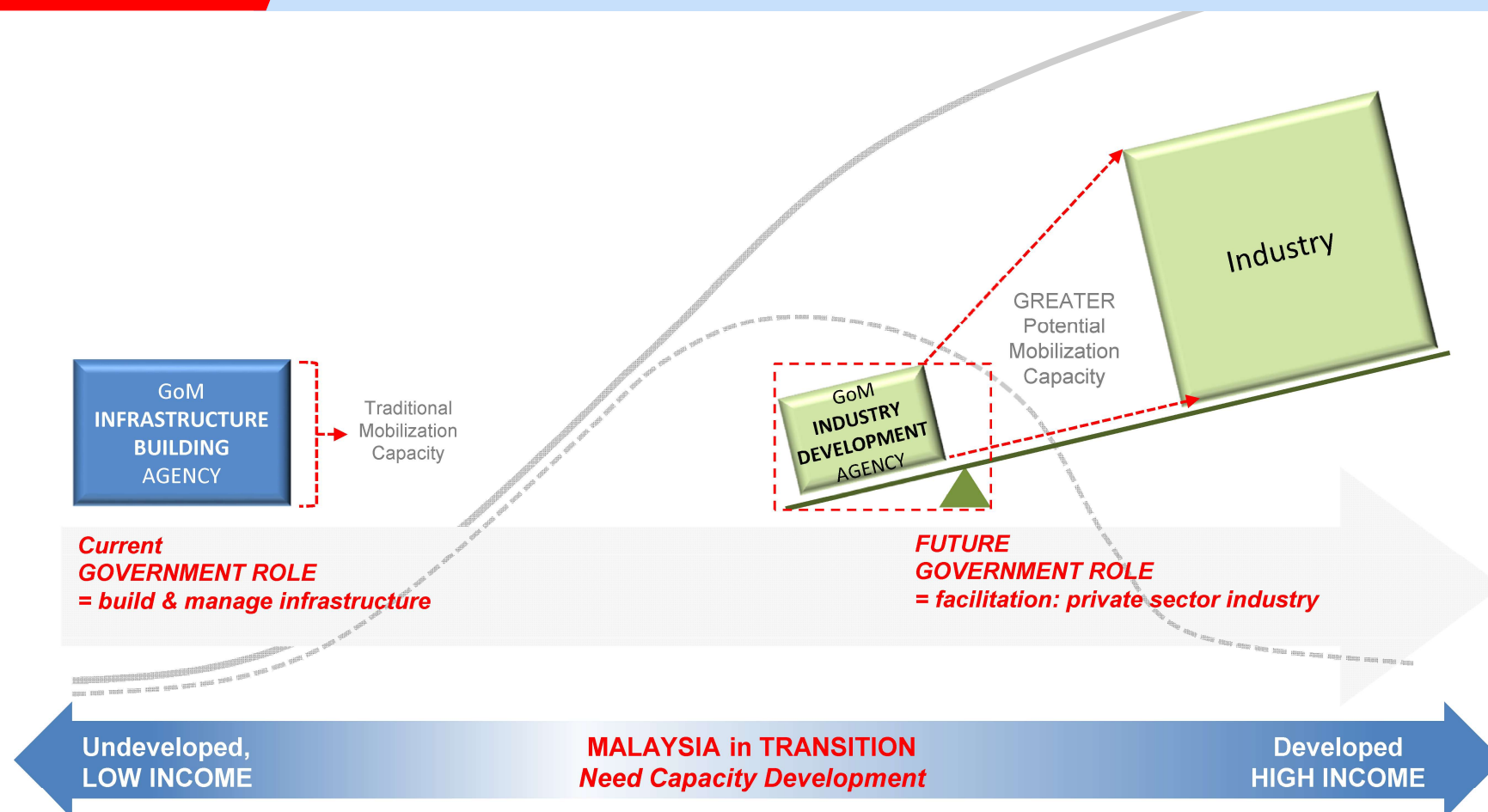
Mobilisation of PRIVATE SECTOR Manpower & Resources via Market Creation

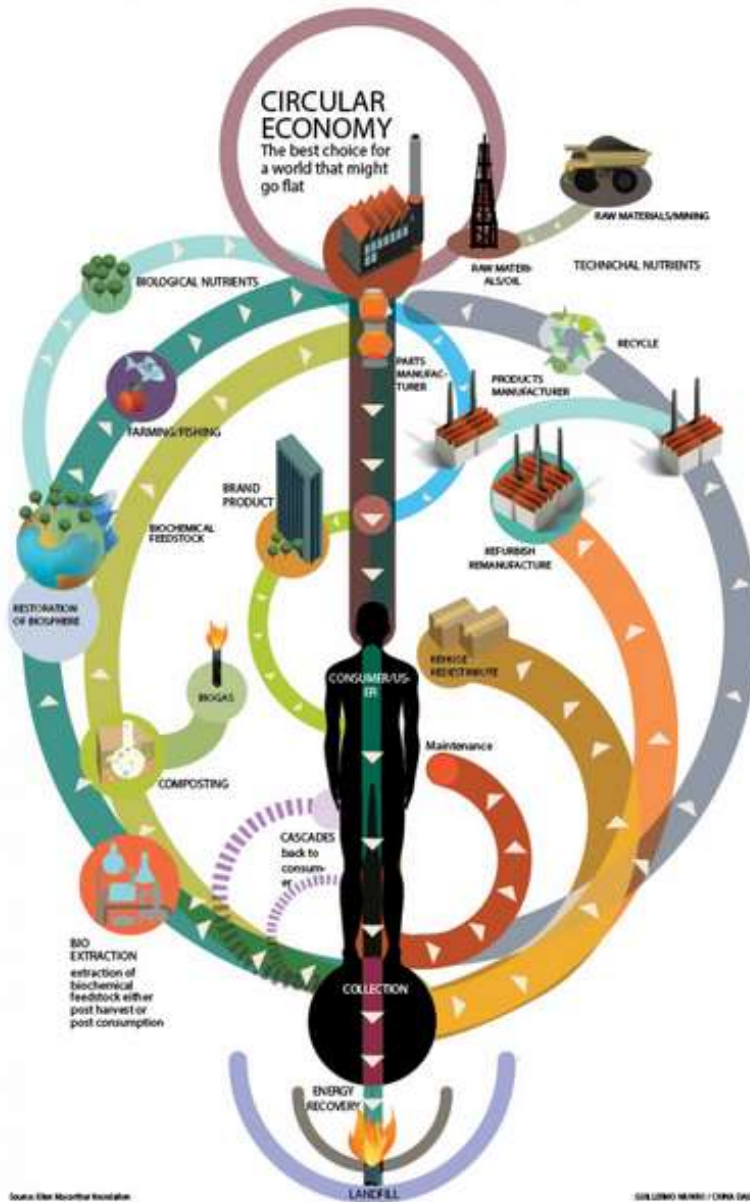


Facilitating the SOLUTION

GoM in Industry Development role to Facilitate Private Sector mobilisation

Transition of Malaysia's SWM model from **Developing Nation Model** (GoM CAPEX/OPEX) to **Developed Nation Model** (Industry Development, i.e.: Facilitation, Regulation, Monitoring and Enforcement)





The VISION

SUSTAINABLE World-Class
Solid-Waste Management
via Private Sector Enterprise

CONTENT

What's the Problem?

- Problem Statement
- Development Experience of Solid Waste Management
- Transition & Transformation: Malaysia

Solution *(geared to support Facilities Planning)*

- Same Budget, More Tonnage Diversion
 - Cost Avoidance Mechanism – How It Works (Private Sector Innovation)

Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
- How to Make it Happen
- Making sure Everything Goes Right
- Market Initiation Projects

Enablers



Achieving our Tonnage Diversion KPIs

(Same Budget, More Tonnage Diversion)



Guiding Principles

Leveraging Private Sector Resourcefulness to simultaneously deliver:

- **Cost Avoidance to Federal Budgets**
- **40% Diversion of Tonnage to Landfill**

4 Key Strategic Factors to enable sustainable Cost Avoidance in Solid Waste Management

1. Proximity Principle
 - Transport Minimization (largest cost component in SWM)
 - Suitability for Locality (HIRU)
 - Industry Symbiosis (Complementary / Competing / Conflicting)
2. Open & Competitive Markets promoting Best Available Technology Not Entailing Excessive Cost (BATNEEC)
3. Economies of Scale
4. Product Uptake - connected markets

The Waste Hierarchy



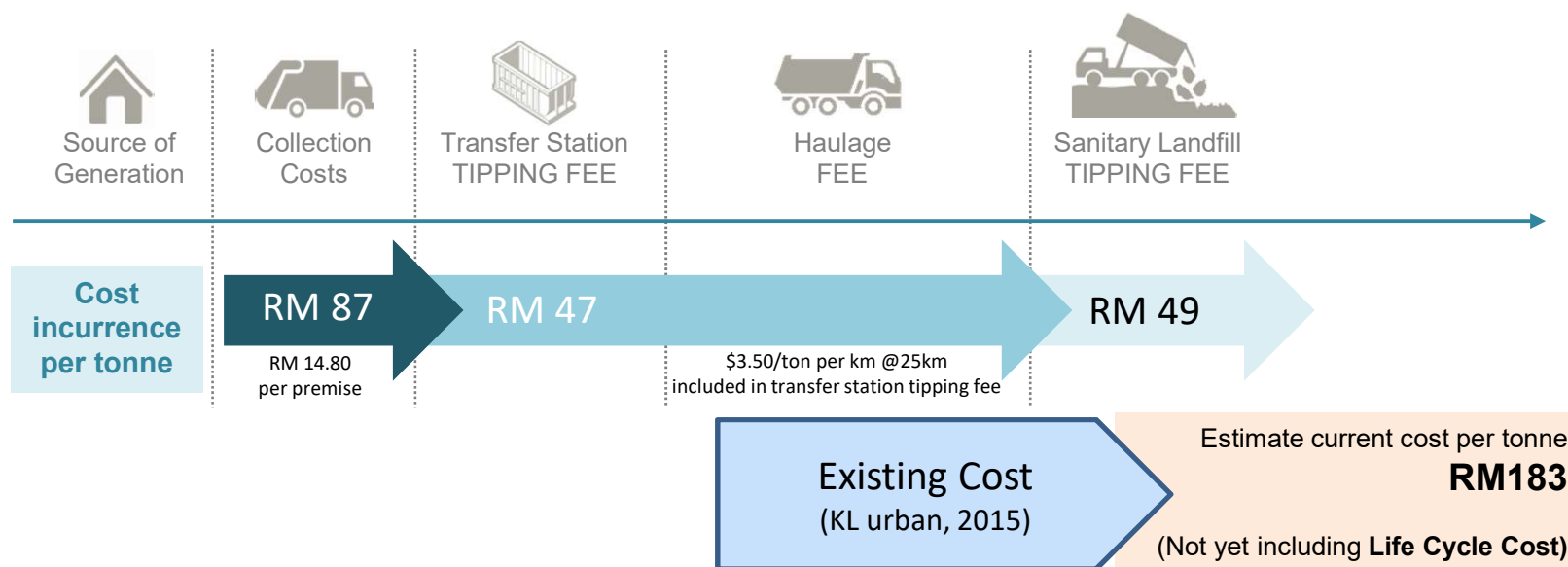
SOLUTION

Transportation Minimisation as a high-impact **Cost Avoidance Mechanism**



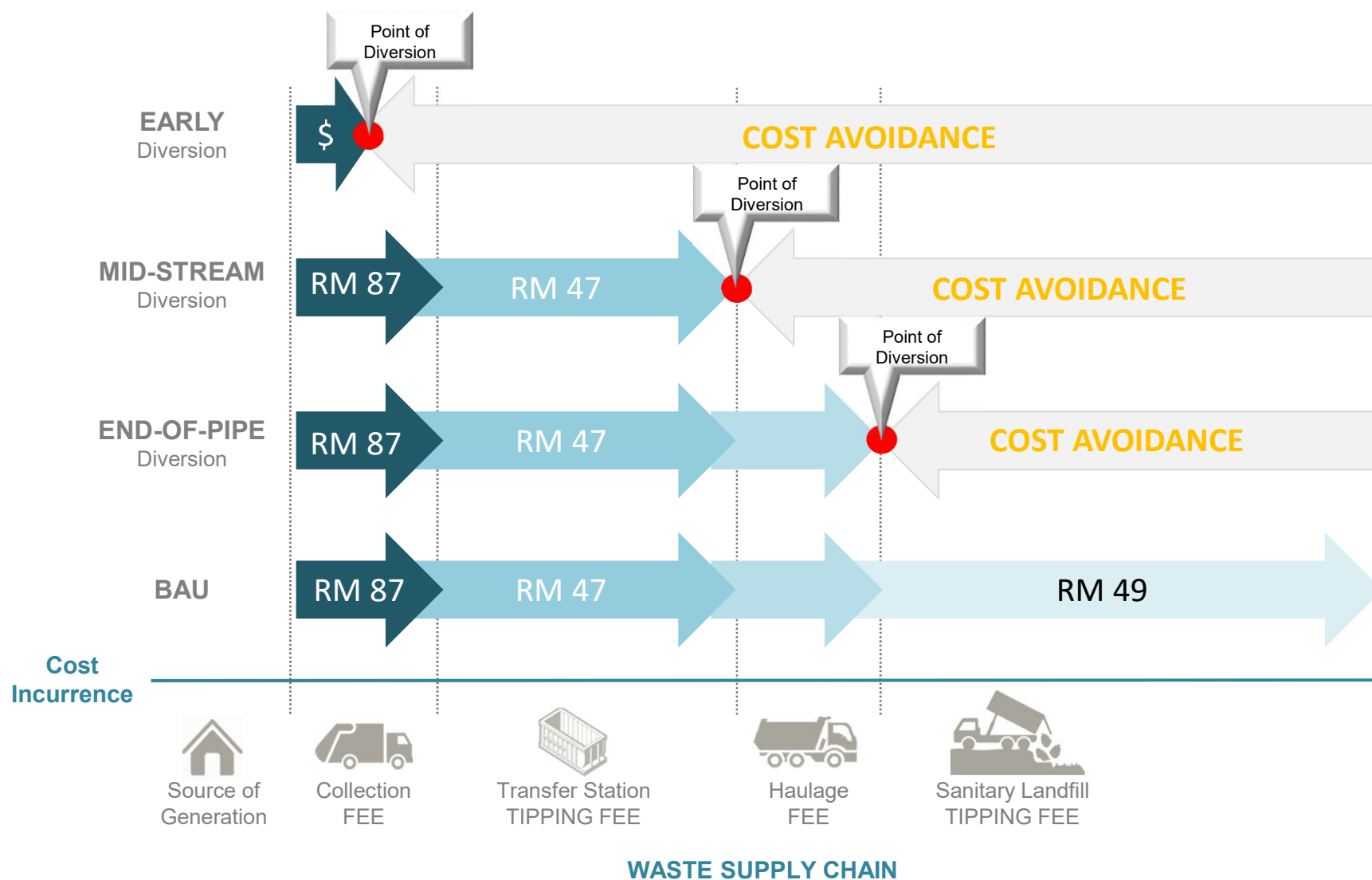
OPEX Cost Structure of Solid Waste Management

WASTE SUPPLY CHAIN (OPEX only)

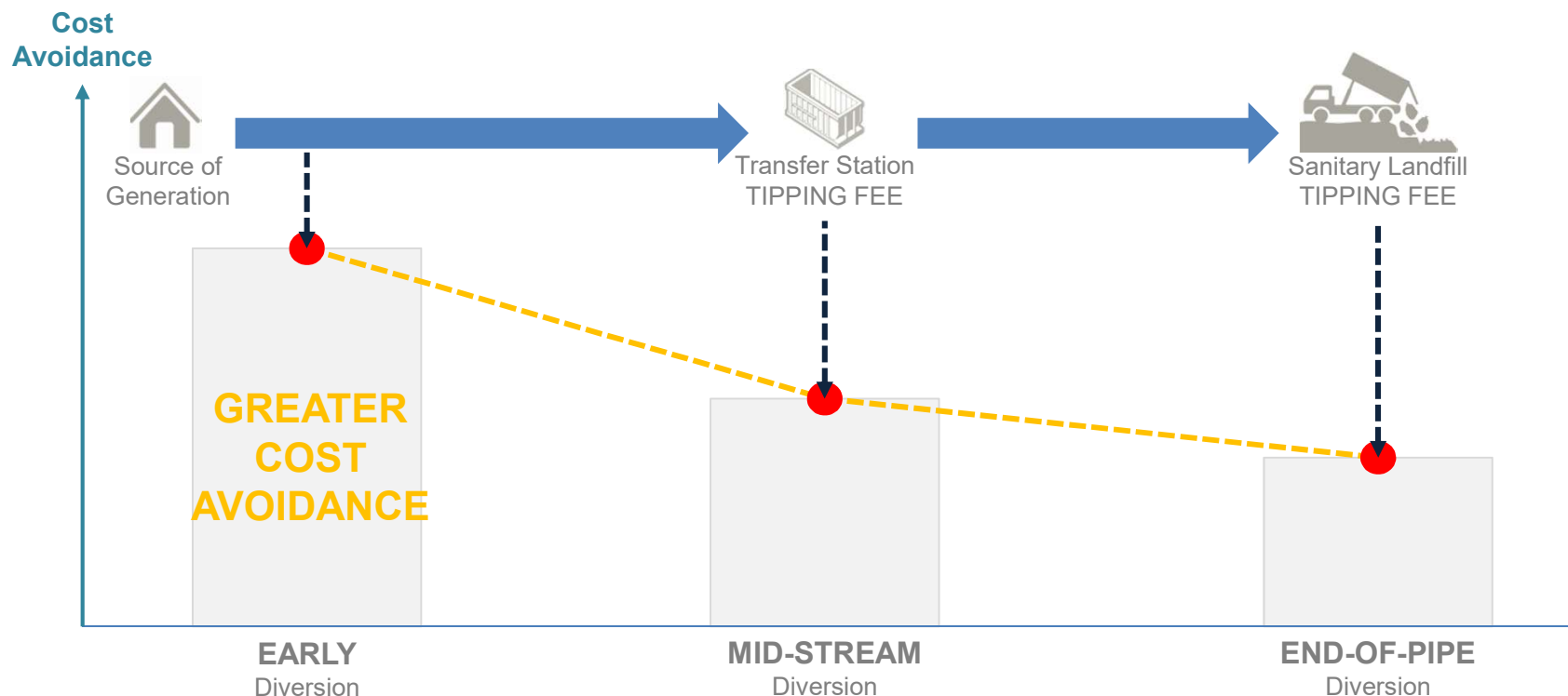


The largest cost component in current cost of SWM is transportation. Therefore, one high-impact strategy to minimize cost of SWM is transportation minimization. Where practicable, earlier diversion and treatment of tonnage creates efficiencies; saving cost, and reducing carbon footprint.

Cost Avoidance – Tonnage Diversion



Cost Avoidance – Transportation Minimisation



The earlier the diversion, the greater the cost avoidance, the greater potential to create market

Motivated by Profit Incentive, private sector has the **flexibility & innovation** to propose a **wider range of early intervention treatments** in the waste stream.

CONTENT

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Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
- How to Make it Happen
- Making sure Everything Goes Right
- Market Initiation Projects

Enablers



CONTENT

What's the Problem?

Solution *(geared to support Facilities Planning)*

Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
 - Business Evaluation (Homogenous Tender vs Innovation Models)
- How to Make it Happen
 - Catchment Area Needs Data Framework (CANS)
 - Business Evaluation Pipeline setup
- Making sure Everything Goes Right
 - Facilities Planning Coordination / Complementary Support
 - Data Accountability & Data Ownership
 - Contracts
- Market Initiation Projects

Enablers



So... Why hasn't this happened already?

Business Evaluation

(Homogenous Tender vs Innovation Models)



Facilitating Industry Development: Evaluating Private Sector Proposals

CURRENT SITUATION:

Roadblock identified to private sector entry:

JPSPN capacity is currently structured to deal with **homogenous tenders**, not suited to **identify, evaluate & approve effective private sector innovation**.

In order to leverage on private sector enterprise (efficiency & innovation) for cost savings to GoM while delivering the **40% Waste Diversion**, JPSPN will urgently need to have internal capability to perform a new industry development role.

REMEDY:

- Must have clear mechanism to create a regular pipeline for evaluation, negotiation & implementation of private sector proposals on Infrastructure or Activities which help reduce disposal burden on landfill from **unified / combined business strategic, legal/contracts & technical aspects**.
- Standardised evaluation criteria will both expedite and give clear due-diligence trail.

Different DESIGN & CAPACITY of different AGENCIES

Infrastructure Implementing Agencies

- JKR
- JPSPN

Core Function

- Strategic INFRASTRUCTURE planning
- Engineering
- Implementation

PROCUREMENT STRUCTURE

- Traditional tender RFP
- Suitable for evaluating **homogenous product & service**, non-innovative suppliers

Industry Development Agencies

- InvestKL
- SEDA
- GreenTech

Core Function

- Strategic FUTURE planning
- Business evaluation
- Industry policy, regulation

PROCUREMENT STRUCTURE:

- Fast-track industry development
- Suitable for evaluating **Innovation & Value Add Models**

Potential mobilisation

INFRASTRUCTURE
BUILDING
AGENCY

INDUSTRY
DEVELOPMENT
AGENCY

Industry

CONTENT

What's the Problem?

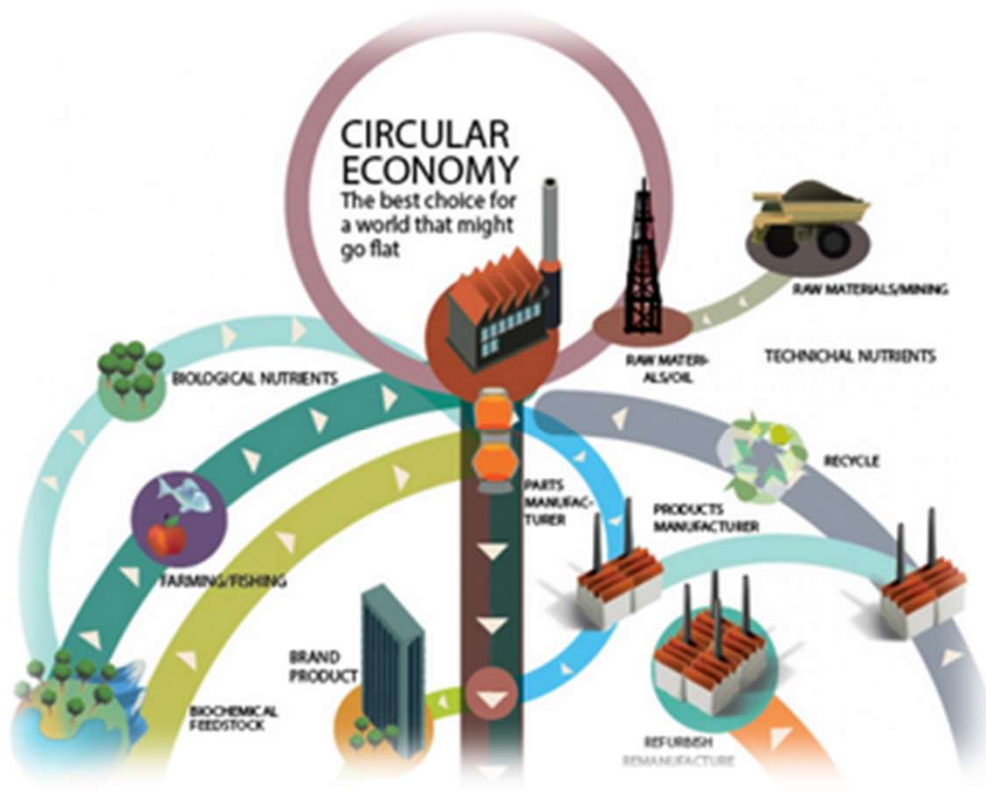
Solution *(geared to support Facilities Planning)*

Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
 - Business Evaluation (Homogenous Tender vs Innovation Models)
- **How to Make it Happen**
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 - Data Accountability & Data Ownership
- Market Initiation Projects

Enablers





Activating the Market, Developing Vibrant Industry

*Achieving Sustainable
First-World Solid Waste Management*

How to Make it Happen

**Catchment Area Needs Statement (CANS)
Data Framework**

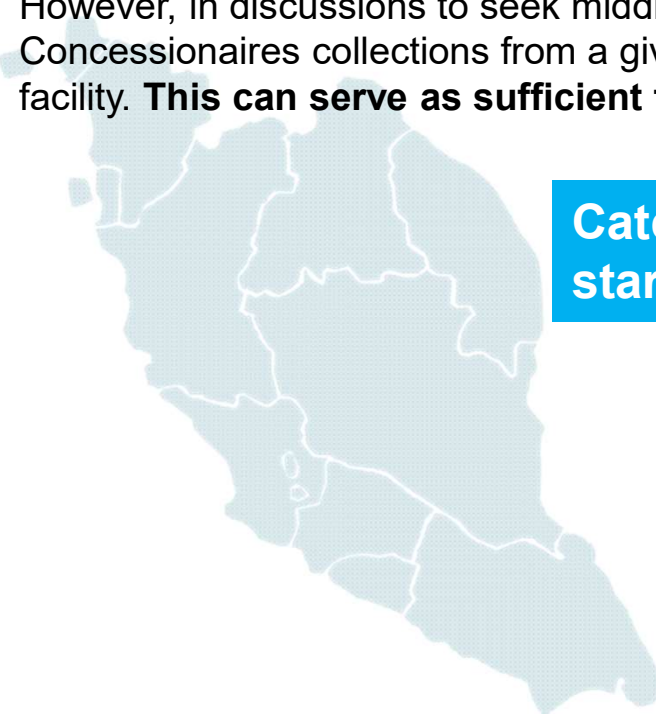


What is a Catchment Area Needs Statement (CANS); and why is it needed?

Prior to this, the possibility of Private Sector enterprise assisting in waste recovery and tonnage diversion had not seemed widely feasible; because there was an apparent mismatch between the basic needs of GoM and the needs of Private Sector.

In order to establish sustainable business viability, Private Sector has usually asked GoM for guarantees of MSW feedstock (volume & quality). Meanwhile GoM cannot be bound by feedstock guarantees on volume & quality; as the fluctuation of waste generation is random.

However, in discussions to seek middle ground, it was clarified that GoM does have the ability to direct Concessionaires collections from a given **Catchment Area scheme**, to be delivered to a specific waste facility. **This can serve as sufficient feedstock security for private sector business viability.**

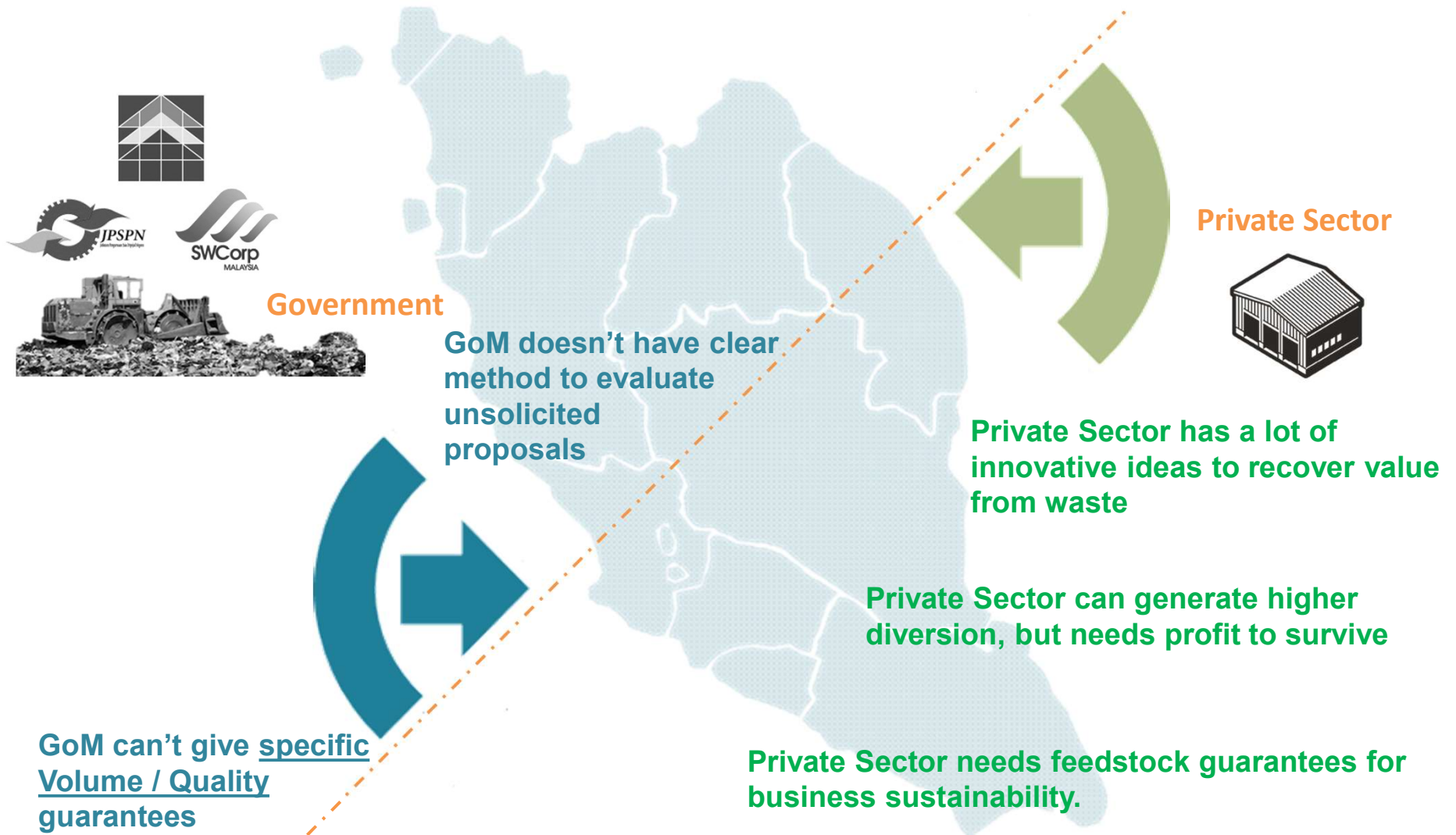


Catchment Area collection schemes can serve as a starting point of common ground for mutual benefit.

Developing and publishing a **Catchment Area Needs Statement** can therefore allow **effective matchmaking** between GoM waste service disposal needs; unlocking the innovative efficiencies of waste management ideas & solutions that the Private Sector can come up with.

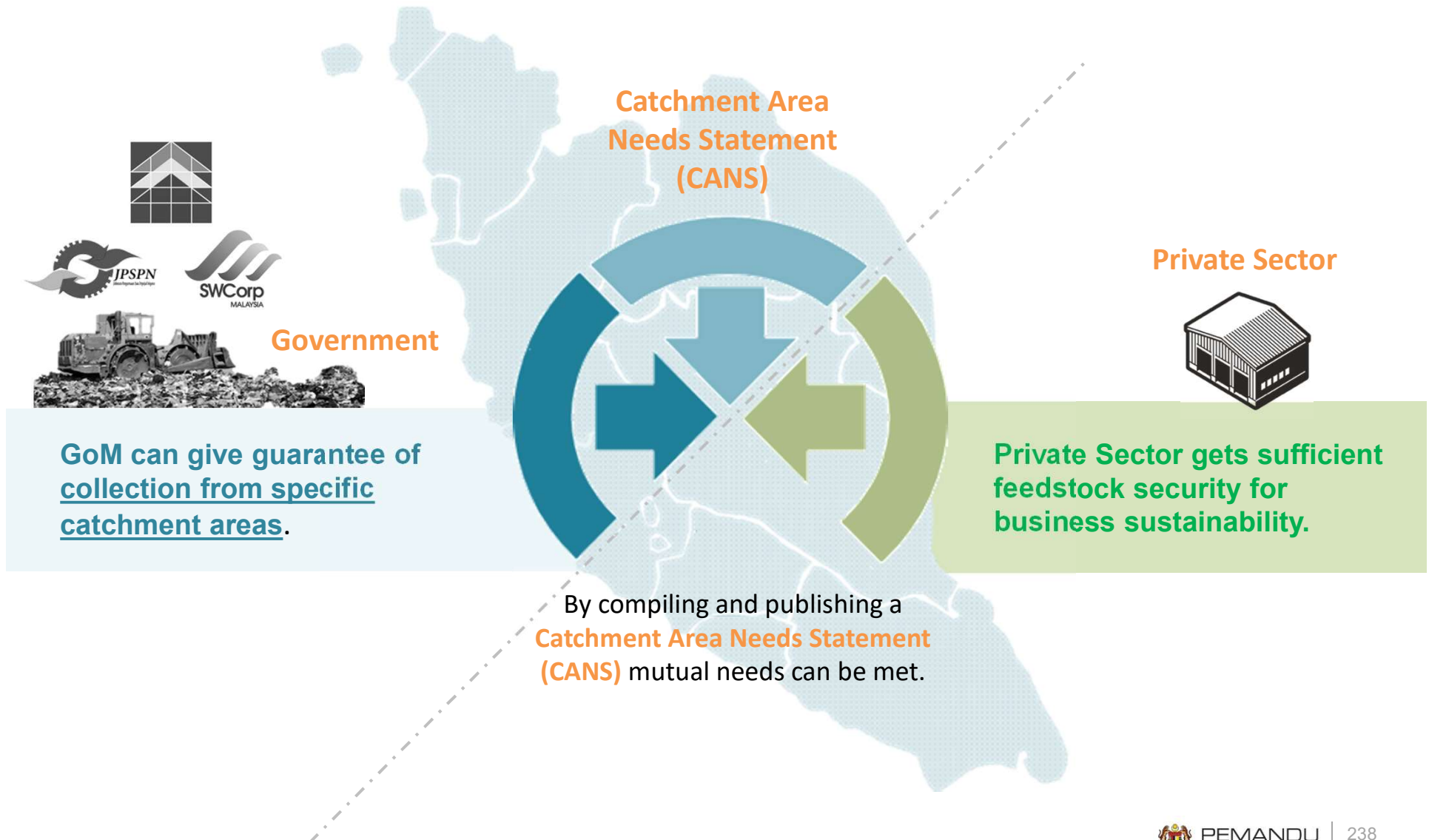
Current Situation

No Alignment between Government needs & Private Sector ability



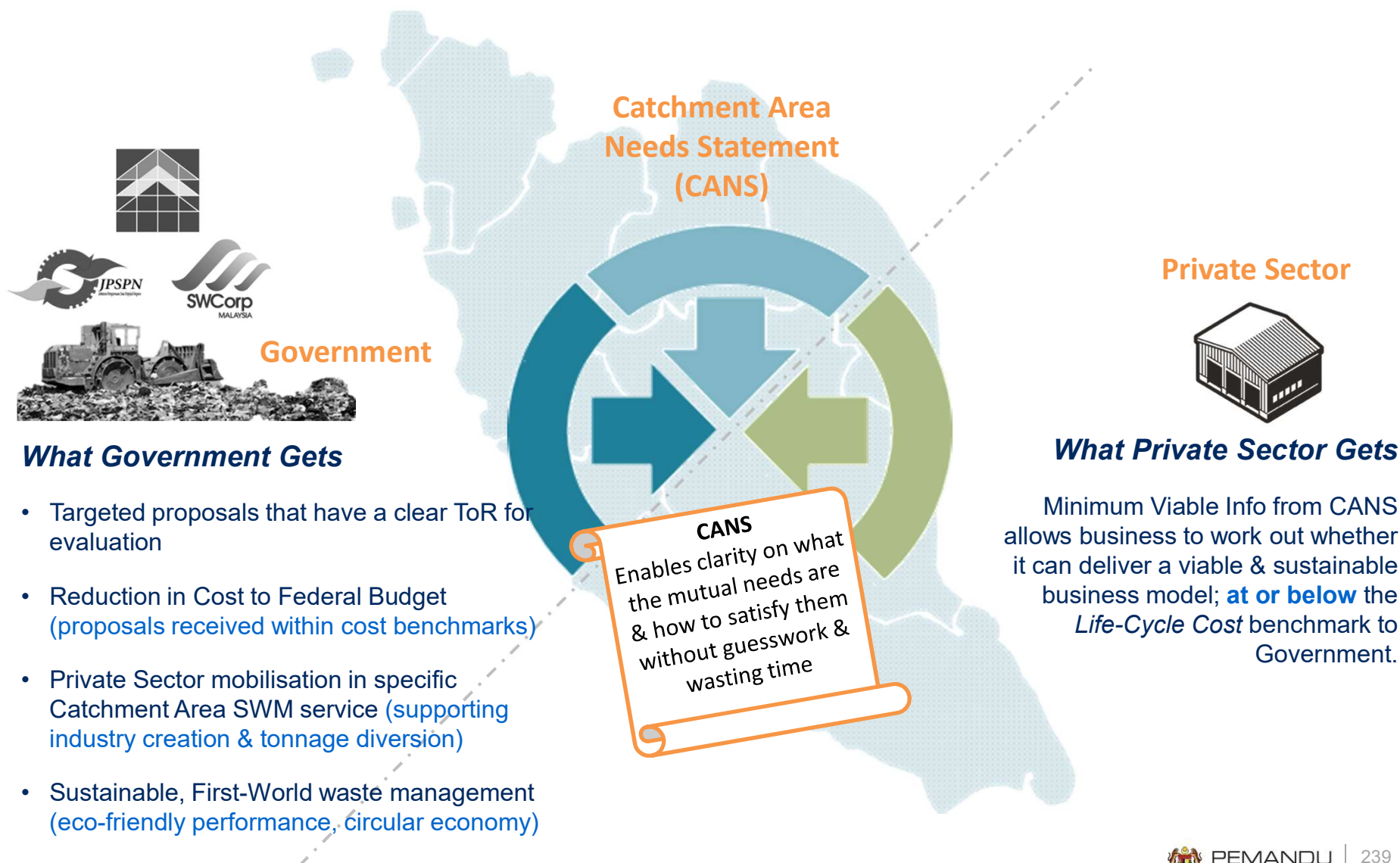
Catchment Area Needs Statement (CANS)

Allows Alignment between Government needs & Private Sector ability



Catchment Area Needs Statement (CANS)

Allows Alignment between Government needs & Private Sector ability



Catchment Area Needs Data Framework

Minimum Viable Info needed to proceed

PRIMARY DATA (Minimum viable)

- Catchment Area (scheme) geographic boundaries
- Waste transportation flow routing
- Tonnage Per Day, historical generation rates (*on best-effort basis- does not indicate a guarantee*)
- Cost-Avoidance Benchmark, stating 2 values:
 - Current Disposal Rates
 - Life Cycle Cost (*verification obtainable from SWCORP experience*)

Minimum Viable Info from CANS allows business to work out whether it can deliver a viable & sustainable business model; at or below the *Life-Cycle Cost* benchmark to Government.

SECONDARY DATA (Useful additional)

- Locality Characteristics
 - **HIRU** (Urban, Rural, Island, Highland – *see next slide*)
 - Nearby Industries
(*Complementary / Conflicting / Competing*)
 - Population growth projections
 - Waste physical & chemical characteristics
- Any SWM facilities & activities located in the area & surrounds
 - Existing (Type & Capacity)
 - Planned (Type & Capacity, On-stream DATE)

Enables better business strategy planning, improving the likelihood of business sustainability.

Awareness of **Complementary, Conflicting or Competing** industry enables businesses to plan for market uptake of their waste-recovery byproducts & remnant fractions, by neighbouring industry. This creates a cyclical economy that optimizes revenue viability, as well as optimizes diversion from landfill.

As the network of SWM industry grows, tonnage diverted info must be continually captured & updated to harmonise planning; avoiding facility-choke where competition for MSW feedstock destroys viability.

Urban, Rural, Island, Highland (HIRU)

Locality characteristics are important in evaluating suitability of Facilities

It was noted that some prior attempts at launching waste treatment & recovery intermediary facilities have failed. Risk of failure can be minimized by factoring in **Locality Characteristics** when evaluating the suitability & sustainability of a proposed waste treatment & recovery method.

As viability of a waste treatment proposed depends heavily on Locality Characteristics. in addition to data on tonnage generation rates; as part of a secondary development, the CANS data should in future include Locality Characteristics. These can be described as follows:

Considerations	Urban	Rural	Island	Highland
Population	<i>Dense population</i>	<i>Scattered/ sparsely population</i>	<i>Low Population/ tourist</i>	<i>Low Population/ tourist</i>
Generation rates	<i>Higher generation rate</i>	<i>Lower generation rate</i>	<i>Low to Mid-generation/ tourist /seasonal centric</i>	<i>Low to Mid-generation/ tourist /seasonal centric</i>
Waste composition	<i>Organics, combustible recyclable e-waste,</i>	<i>Little organics and Generally 2D Plastics, little combustible</i>	<i>Organics, combustible packaging materials</i>	<i>Highly Organics, combustible packaging materials</i>
Market Availability / Needs	<i>High</i>	<i>Low/ Compost</i>	<i>Low/ compost /Power</i>	<i>Low/ compost</i>
Logistics	<i>Good infrastructure</i>	<i>Good infrastructure</i>	<i>Minimum infrastructure</i>	<i>Minimum infrastructure</i>

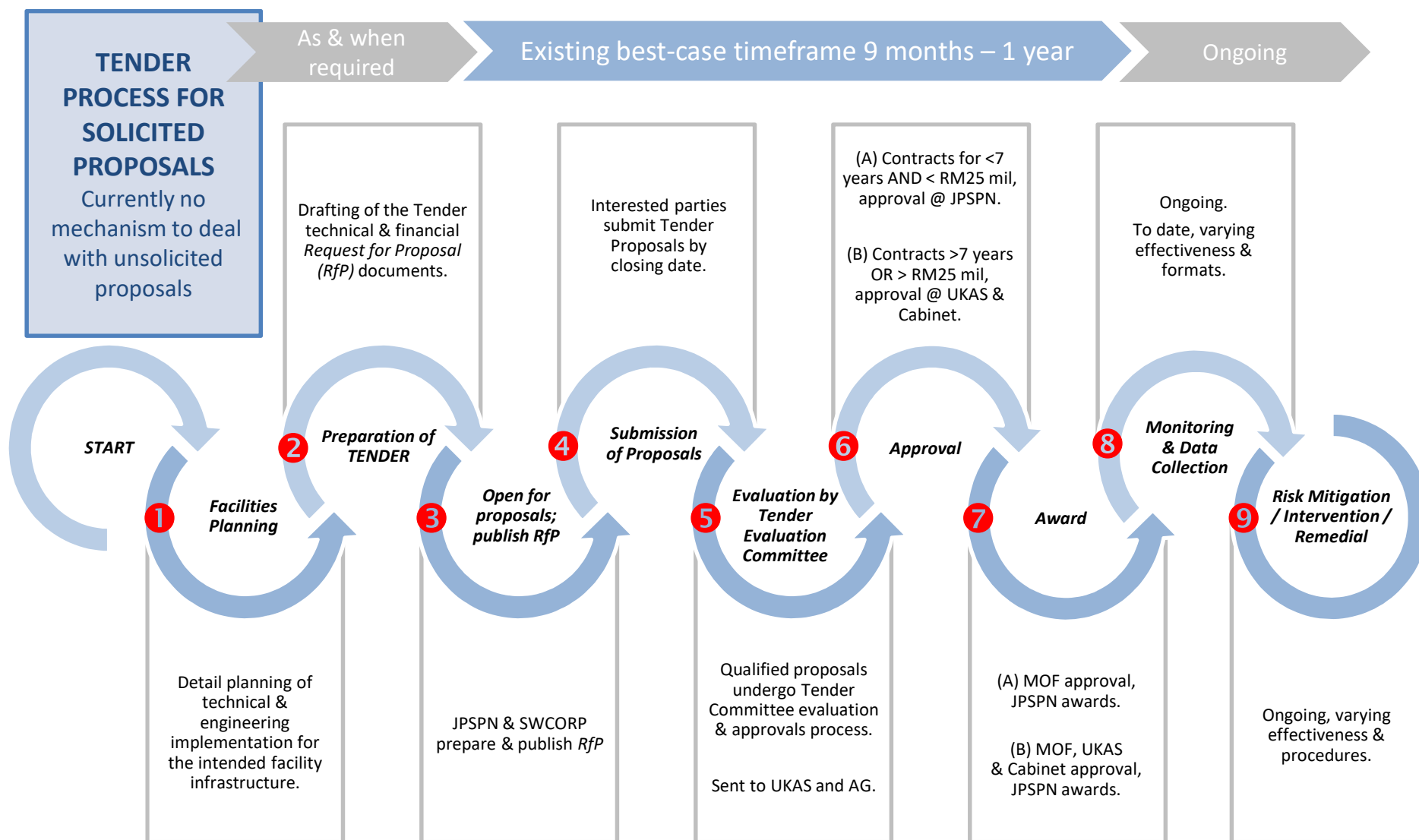
How to Make it Happen

Business Evaluation Pipeline setup

(Homogenous Tender vs Innovation Models)



Current Evaluation Pipeline for TENDER PROCESS (homogenous, B.A.U.)



Clear Mechanism: Evaluating Private Sector Proposals



Intended outcomes of the Business Evaluation Pipeline for proposals detailed as follows:

STEPS	OUTCOME
1 Open for proposals; publish CATCHMENT AREA NEEDS STATEMENT (CANS) with Request for Information (RfI) JPSPN & SWCORP prepare & publish the Catchment Area Needs Statement as a guiding <i>Terms of Reference (ToR)</i> for bidders to ascertain their interest to bid and draft a targeted proposal.	<ul style="list-style-type: none"> The CANS information allows effective matchmaking between GoM catchment area SWM service disposal needs; leveraging the innovative efficiencies of waste management ideas & solutions that the Private Sector can come up with. Proposals submitted will be Targeted Proposals that have a clear ToR for evaluation
2 Registration into online database by Businesses Interested businesses register (with a small access fee) to JPSPN via website, and receive the current month's updated Catchment Area Needs Statement based on their registered segment of interest. <ul style="list-style-type: none"> Database qualifies serious registrations by set criteria. A draft PreQualification Questionnaire (PQQ) framework is provided in the Appendix, for further refinement in workshop with JPSPN. 	<ul style="list-style-type: none"> JPSPN gains a screened, high-quality database of interested & serious private sector players. Long term benefit: helps incentivize the legalization of the informal sector.

Clear Mechanism: Evaluating Private Sector Proposals

STEPS	OUTCOME
<p>3 Submission of Proposals & Evaluation</p> <p>Business drafts CANS tailored proposals demonstrating value of cost reduction and tonnage diversion benefit to GoM.</p> <p>Businesses are given 60 days from their CANS registration to draft their proposal.</p> <p>Received proposals undergo a Qualification Screening (QS) using the framework of the CANS Holistic Evaluation Criteria (HEC)</p> <p>Rejected proposals receive a notification with clear reason against their scoring.</p> <ul style="list-style-type: none"> Phase 1 rollout: Manual via LOCKED EXCEL: Auto-scoring Business Logic model reduces workload, qualifying proposals to invite to negotiation process Phase 2 upgrade: Online via JPSPN WEBSITE: Immediate feedback; disqualified if the QS is below a minimum score; immediate data save & submit to database if QS passed. 	<ul style="list-style-type: none"> CANS Holistic Evaluation Criteria (HEC) provides a clear ToR for proposal scoring & rejection. Response to submissions improves public perception of GoM. Clear ToR for evaluation means rejected proposals receive a clear reason and guide for improvement; rather than attributing blame to JPSPN unresponsiveness. Automation lightens manpower workload needed to screen the quality of proposal applications

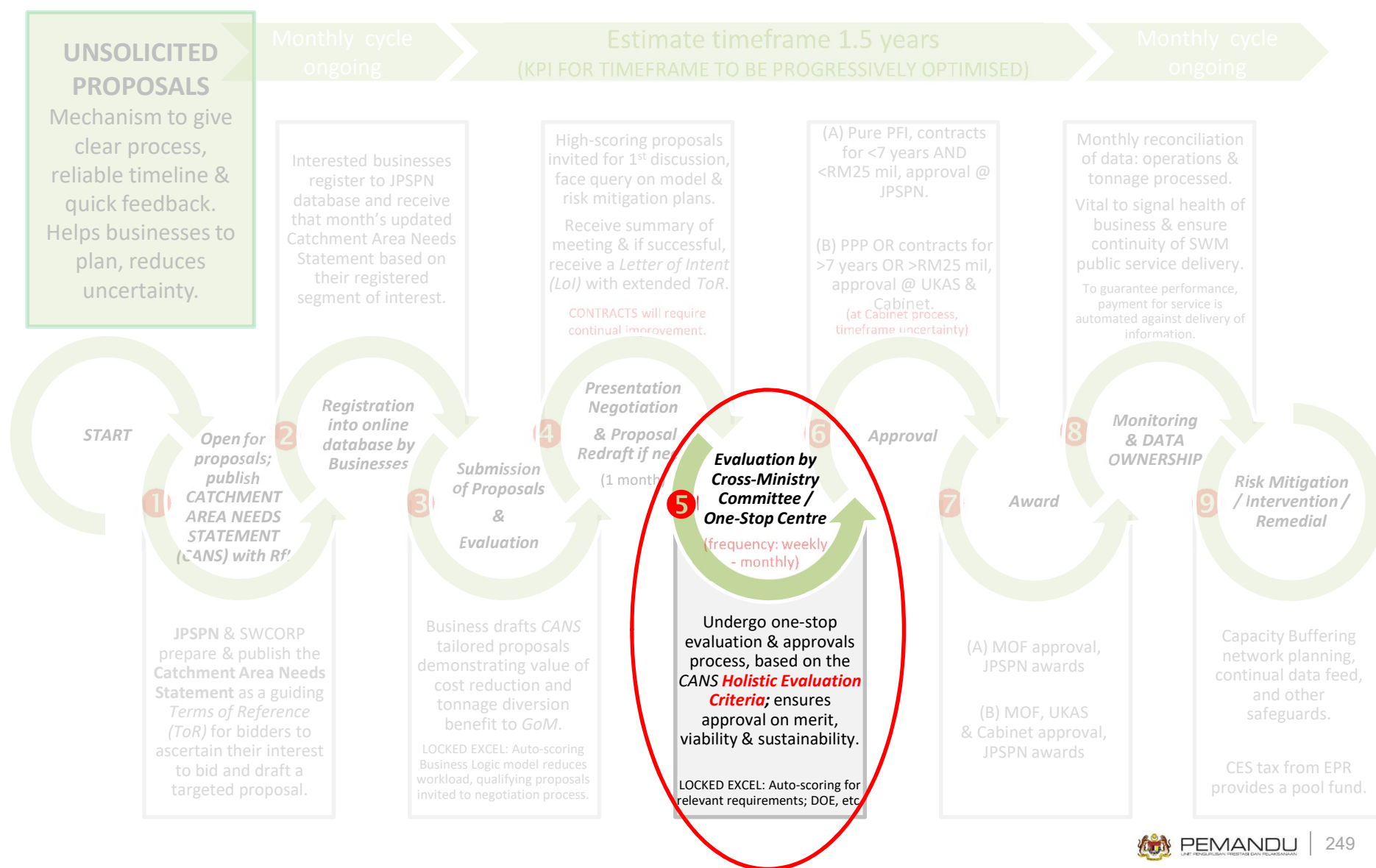
Clear Mechanism: Evaluating Private Sector Proposals

STEPS	OUTCOME
<p>4 Presentation Negotiation & Proposal Redraft if need (timeframe: within 1 month)</p> <p>High-scoring proposals invited for 1st discussion, face query on model viability & risk mitigation plans. Proposers receive summary of meeting & perform any minor redraft if needed.</p> <ul style="list-style-type: none"> Negotiation of basic Contract Terms, including clear understanding on the strict terms of data accountability & data ownership (<i>weighbridge, online real-time link, etc</i>), incentive & penalty for performance (<i>monthly reconciliations & outcome-linked payment</i>). Predetermined performance-outcome goals and acceptable range of performance is set based on the original proposal intent clearly outlined from process Step 1. <p>The successful Proposers will receive a <i>Letter of Intent (LoI)</i> with extended <i>ToR</i>.</p>	<ul style="list-style-type: none"> CANS Holistic Evaluations Committee shortlists and selects business plans that can deliver Tonnage Diversion contributing to National SWM Targets, based on CANS Holistic Evaluations Criteria Framework. Recommends to JPSPN KP & the One-Stop-Centre for approvals. Better legal/contractual protection for GoM. Enforceable performance-outcome KPIs on private sector. Monthly reportage of the Private Sector KPI output mandated – failure to report incurs fee/penalties
<p>5 Evaluation by Cross-Ministry Committee / One-Stop Centre (frequency: minimum monthly)</p> <p>Finalised qualified proposals undergo one-stop evaluation & approvals process, based on the CANS Holistic Evaluation Criteria. This ensures approval on merit, viability & sustainability.</p> <ul style="list-style-type: none"> Phase 1: Manual via LOCKED EXCEL: Auto-scoring for relevant requirements from DOE, etc 	<ul style="list-style-type: none"> Pre-screened quality proposals and comprehensive framework criteria can deliver clear & rapid evaluations, faster decisions; clear feedback on timeframes. The delay & uncertainty which are unattractive to serious private sector players is minimized.

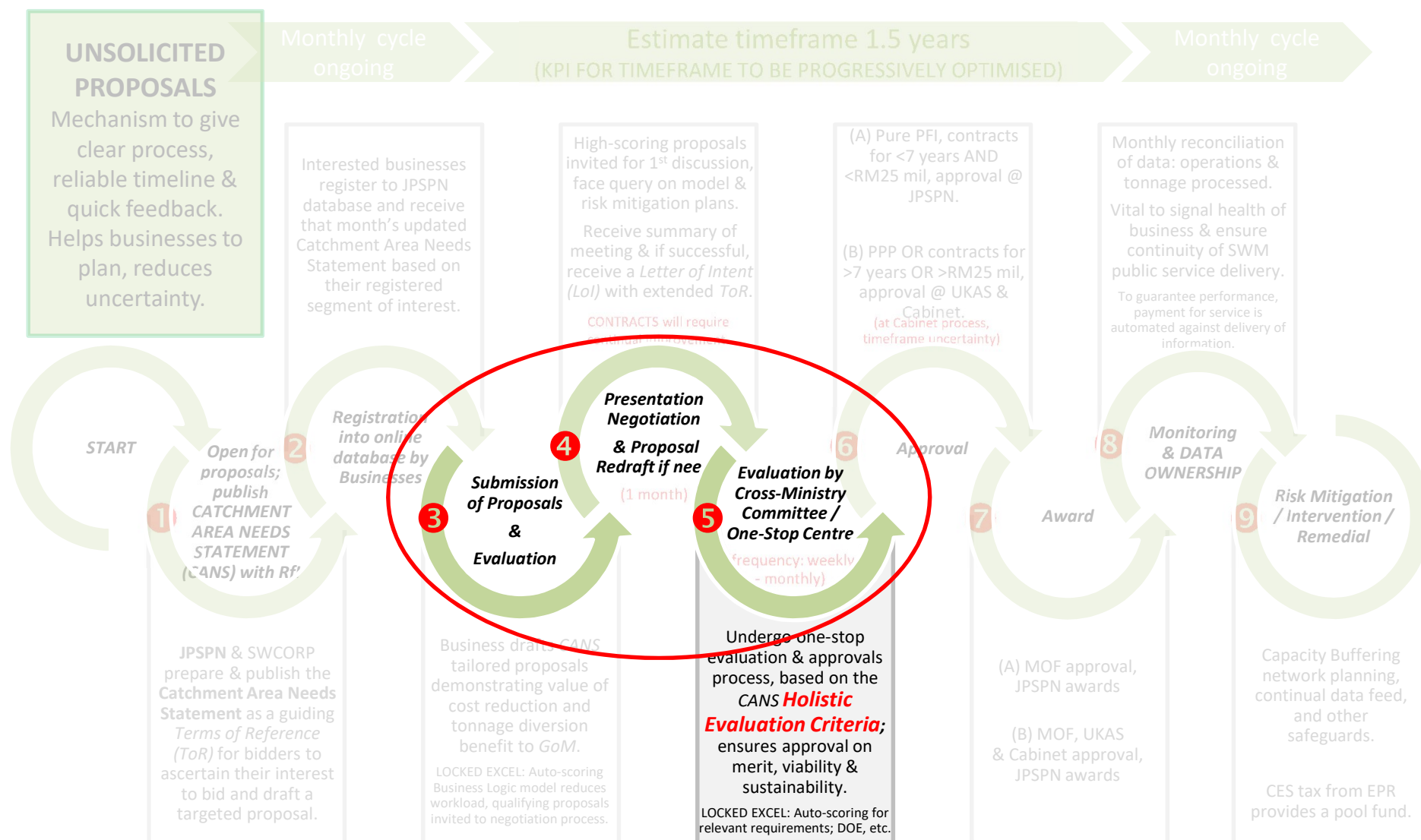
Clear Mechanism: Evaluating Private Sector Proposals

STEPS	OUTCOME
6 & 7 Approval & Award	<ul style="list-style-type: none"> Private sector involvement in assisting national tonnage diversion goals & improving solid waste management.
8 Monitoring & DATA OWNERSHIP <p>Monthly reconciliation of business data on operations & tonnage processed; monitoring & tracking of commercial implementation progress.</p> <p>Vital to signal health of business & ensure continuity of SWM public service delivery.</p> <ul style="list-style-type: none"> To guarantee performance, payment for service is automated against delivery of information (supporting evidence for the monthly payment) Combined Incentive & Penalty structure enforced on private sector to guarantee performance. Evidence for enforcement if failure to meet specification of predetermined goals Business data collected enables GoM to structure incentives against the cost-savings benefit to GoM. Long term: Also serves an indicator of when industry growth assistance & facilitation can be phased out. 	<ul style="list-style-type: none"> Comfort-level to proceed & GoM confidence from continued insight into progress. Clear Due Diligence trail for GoM in case of any questions raised. Positive, clearly tracked movement in national solid waste management Tonnage Diversion goals. Data collection for MSW Database
9 Risk Mitigation / Intervention / Remedial <p>Capacity Buffering network planning, continual data feed, and other safeguards.</p> <p>CES tax from EPR provides a pool fund to address any arising needs.</p>	<ul style="list-style-type: none"> Necessary protection of GoM public service mandate and accountability for pipeline to function & support Tonnage Diversion targets.

Business Evaluation Pipeline for Unsolicited Proposals (innovation, CANS)



Business Evaluation Pipeline for Unsolicited Proposals (innovation, CANS)



CANS Holistic Evaluation Criteria

A Clear Merit-Based Framework with Scoring Weightage

Some aspects needed for a **standardized holistic evaluation** have been missing from previous technical-centric evaluation & approvals of PPP / PFI solid waste management & treatment options. The CANS Holistic Evaluation Criteria framework assists in achieving more accurate evaluation of the viability & sustainability of private sector proposed Business Models.

Enabling faster & more accurate decisions to be made by GoM the criteria form a starting basis that can be continually refined as GoM facilitates Industry Development.



Criteria should ensure that the Business Model demonstrates:

- ☐ It is based on Catchment Area Need Statement
- ☐ Cost Avoidance to GoM compared to B.A.U.
- ☐ It caters for Local Area Characteristics (HIRU)
- ☐ Clearly outlines any Risks & Mitigation Plans
- ☐ Demonstrates Reliability

CANS Holistic Evaluation Criteria

Proposed necessary Parameters in the Scoring Weightage Framework

BASIS: Catchment Area Needs Statement (CANS)

This section auto-filled from the Catchment Area Needs Statement data published by GoM.

Forms basis of necessary data for Business planning

Catchment Area Needs Statement (Primary, Minimum viable)

0

- *Geographic Boundaries & Waste-Flow map*
- *Tonnage Per Day, Historical generation rates*
- *Cost-Avoidance Benchmark*
 - *Current Disposal Rates*
 - *Life Cycle Cost*

Catchment Area Needs Statement (Secondary Refinement)

- *Area Characteristics*
 - *HIRU*
 - *Nearby Industries (Complementary / Conflicting / Competing)*
 - *Population, projected growth*
 - *Waste physical & chemical characteristics*
- *Any SWM facilities & activities located in the area & surrounds*
 - *Existing (Type & Capacity)*
 - *Planned (Type & Capacity, On-stream DATE)*

CANS Holistic Evaluation Criteria

Proposed necessary Parameters in the Scoring Weightage Framework

Demonstrate Maximum Cost Avoidance to Federal Budgets

Crucial / critical part of scoring weightage.

Strategies to be clearly substantiated to ensure illegal dumping is de-incentivized.

1

Calculation of COST AVOIDANCE to GoM against

- ☒ Current Incurred Disposal Cost (collection-transportation-disposal)
- ☒ Full Life Cycle Cost (inc. safe closure, sanitary landfill)

Explain the proposed Business Strategy for cost avoidance:

- ☒ Transportation minimisation
- ☒ Early treatment on the waste stream
- ☒ Cost recovery from additional / alternative revenue streams
- ☒ Reduction of disposal costs of treatment remnants
- ☒ Potential for complement/conflict/competition with local area industry
- ☒ Other strategy

If WTE: must include proposed strategy to solve the TNB grid last mile issue – viability for many projects

CANS Holistic Evaluation Criteria

Proposed necessary Parameters in the Scoring Weightage Framework

The Business Model

Business Viability

2

- ☒ Suitability for stated Area Characteristics from CANS
- ☒ Catchment Composition of Waste
(Onus lies on Proposer to check & verify independently, besides any data existing with JSPSN)
- ☒ Any relevant Climate characteristics noted
- ☒ Land availability *(status of progress: proposed location, GoM owned, private sector owned)*
- ☒ Any other relevant considerations put forward

Financial Sustainability

- ☒ GNI Template *(jobs, investment, revenue projected break-even point, financial structure)*
- ☒ Proposed Funding Structure / Request for Funding
- ☒ Projected ROI duration

Company Profile

- ☒ Business holdings
- ☒ MOF registration and/or verified statement of assets/accounts
- ☒ Staff strength

Company Track Record

- ☒ Client portfolio
- ☒ Prior projects completed & ongoing

CANS Holistic Evaluation Criteria

Proposed necessary Parameters in the Scoring Weightage Framework

Reliability & Technical / Engineering considerations

*Proven Track Record preferred.
Highest weightage to be local.*

Reference to case study of technology proposed
(or most similar conditions)

- ☒ Local / Regional / International
- ☒ Scalability of technology?
- ☒ Max – min range of volume processing?

3

Clear Risks & Proposed Mitigation Plans

Sections 3 & 4 have more qualitative elements, and should be included in *Presentation Negotiation* stage besides scoring.

- ☒ Tonnage diversion in case of downtime / emergencies
 - On-site buffering
 - Off-site load-balancing of the neighboring facilities
- ☒ Engineering & Technology
- ☒ Safety / financial / public opinion

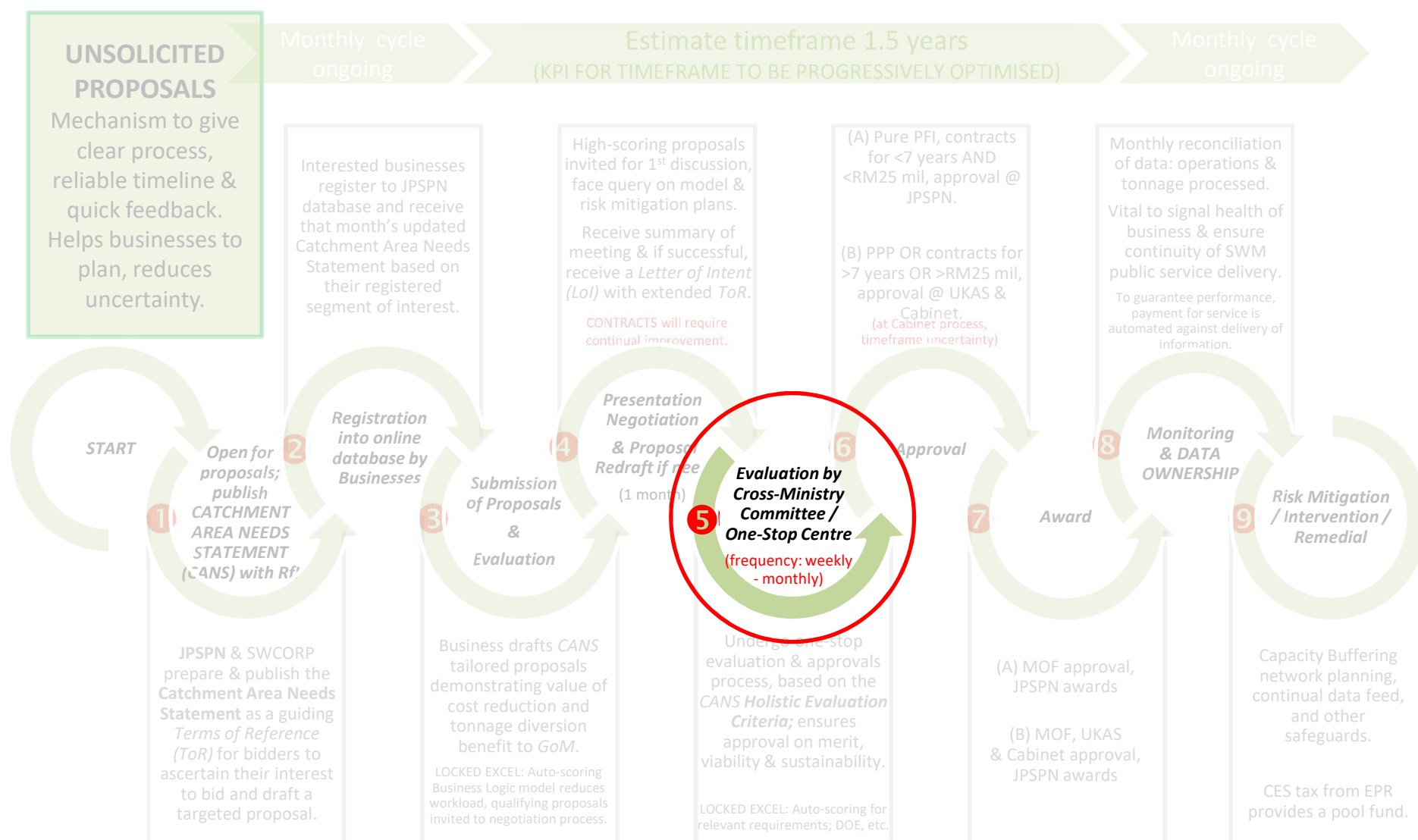
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CANS Holistic Evaluation Criteria

Proposed Sample Output

KEY PARAMETERS		DESCRIPTION							
Current Lifecycle Cost to GoM	<div>1</div> <div>Demonstrate maximum cost avoidance to Federal Budgets</div>	<div>2</div> <div>MARKET SUITABILITY</div> <table><tr><td>HIRU</td><td>Scalability of Technology</td></tr><tr><td>Tonnage Range</td><td>Market Readiness</td></tr><tr><td>Waste Stream</td><td>Technology Readiness</td></tr></table> <div>The Business Model: Business Viability & Financial Sustainability</div>		HIRU	Scalability of Technology	Tonnage Range	Market Readiness	Waste Stream	Technology Readiness
HIRU				Scalability of Technology					
Tonnage Range				Market Readiness					
Waste Stream				Technology Readiness					
Future Lifecycle Cost to GoM									
CAPEX Saved by GoM									
Waste Diversion Rate									
Total Land space saved per year									
CANS		FINANCIAL ASSUMPTIONS							
Scheme	<div>0</div> <div>Relevance to CANS ToR</div>	Lifespan	Equity						
Total Tonnage from Scheme		Recyclables Extraction Rates (+1)	Equity Internal Rate of Return (EIRR)						
Tonnage input to Facility		Residue from MRF to LF	WACC						
Tonnage Diverted		Transportation Cost	Diversion Fee (RM/ton)						
Category Diverted		All in Interest Rate	Landfill TF (RM/ton)						
Stage Diverted		Tenure	CPI Cost						
Distance from Collection Area to LF			CPI Revenue						

Business Evaluation Pipeline for Unsolicited Proposals (innovation, CANS)

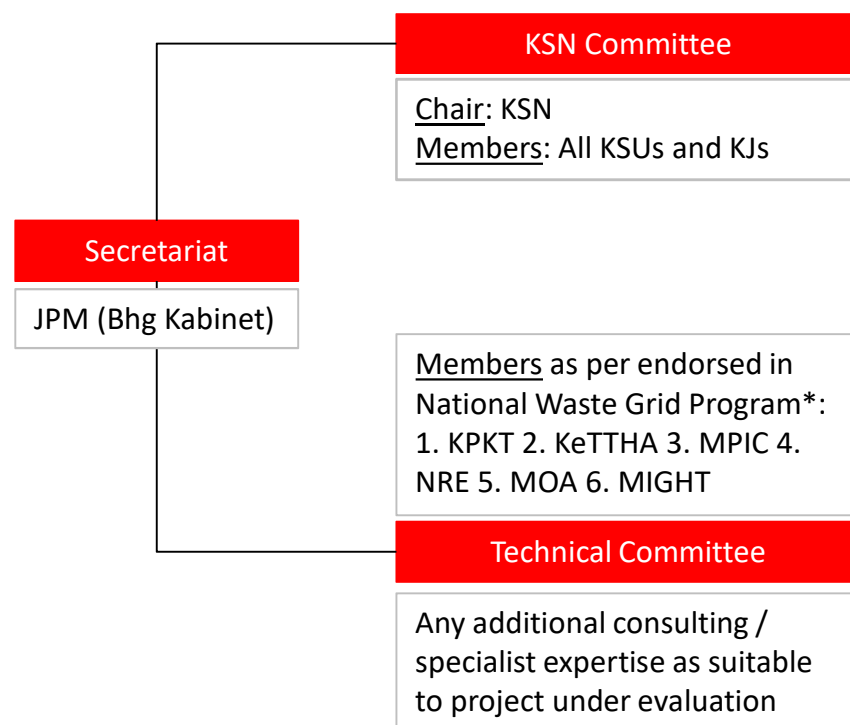


Expedited Approvals Cross-Ministry

Terms Of Reference & Responsibilities

Need identified: Uncertainty of evaluation frequency and approval timeframes is unattractive to Private Sector investment. Regularly convened evaluations needed to eliminate uncertainty & opportunity cost of delay for Private Sector.

Proposed Mitigation: Commercialisation Pipeline's regular evaluations to be placed as part of a permanent agenda for Waste Management into **KSN's weekly meeting with KSU's** (ref Option 3, Governance Workstream)



Alignment

1. First meeting targeted for Q3 2015
2. Frequent meeting (weekly) if there are cross-ministry issues to be resolved
3. It is a high level committee addressing the issues (Decisionmaking level)
4. Fast decision-making and fast implementation

Terms of Reference & Responsibility

- Rapid fast-track **proposal evaluation** and **approval facilitation** for private sector projects guided by the Framework of the Criteria for Evaluation
- Aim & Intent towards HOW TO SOLVE & EXPEDITE the approval of high qualified proposals rather than WHAT BARRIERS

CONTENT

What's the Problem?

Solution *(geared to support Facilities Planning)*

Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
 - Business Evaluation (Homogenous Tender vs Innovation Models)
- How to Make it Happen
 - Catchment Area Needs Data Framework (CANS)
 - Business Evaluation Pipeline setup
- **Making sure Everything Goes Right**
 - Facilities Planning Coordination / Complementary Support
 - Data Accountability & Data Ownership
 - Contracts
- Market Initiation Projects

Enablers



Making sure everything goes right

Complementing Facilities Planning

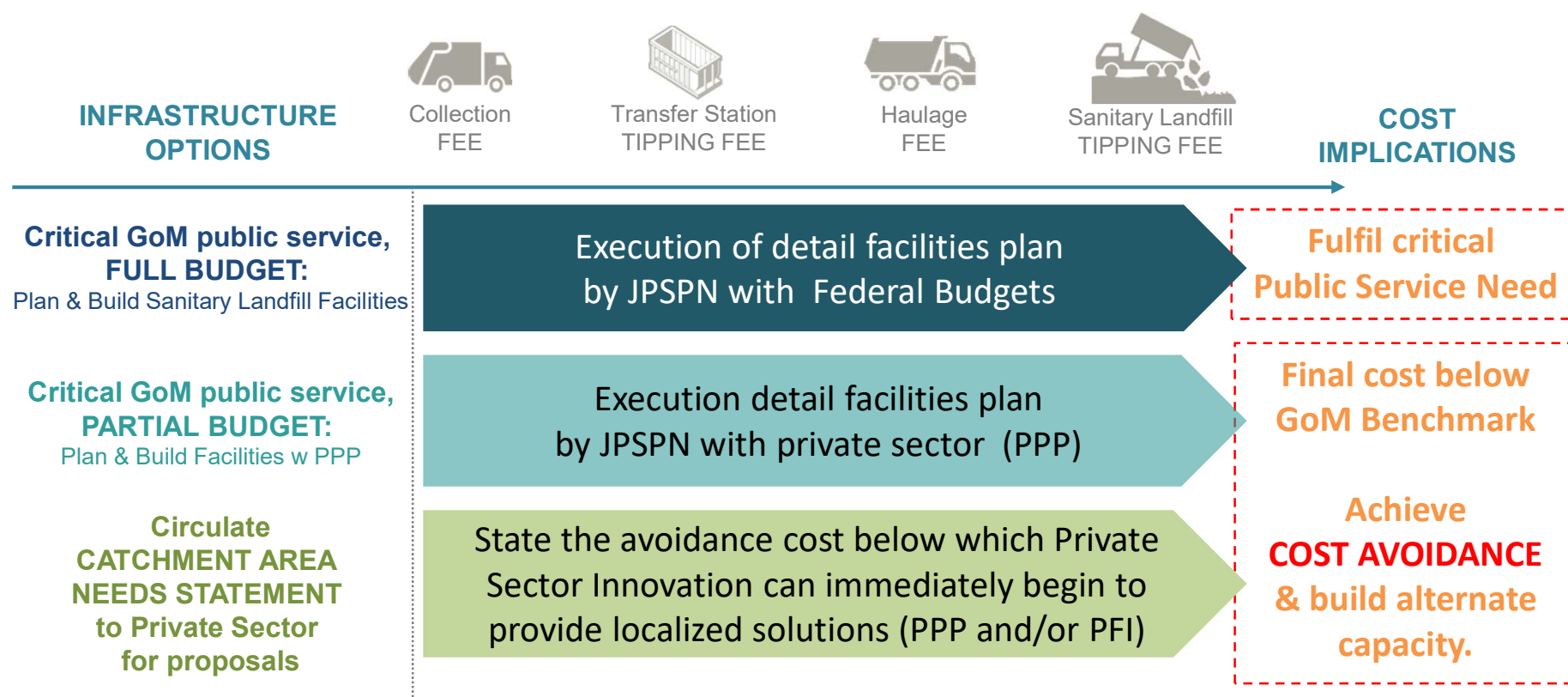


Complementary Tonnage Diversion

Structuring a Collaboration to leverage on Private Sector Innovation

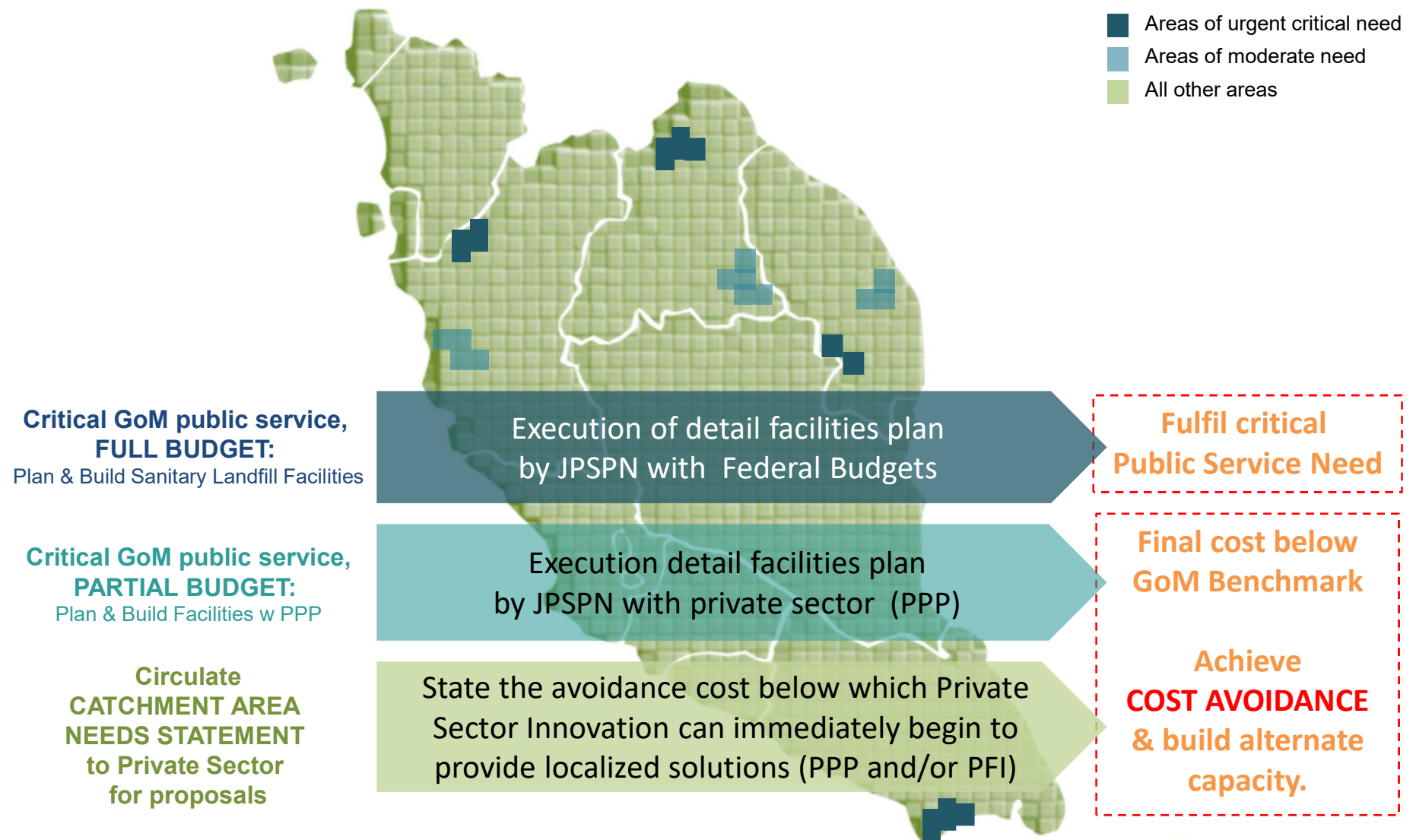
GoM SWM facilities are a **public service need & the final line of defense**. Thus critical service targets identified should proceed without delay.

However to **expedite diversion targets and generate cost savings**, we also need to attract & build up private industry without delay. The following collaboration structure delineates a **clear method to structure the division of labour**. Any additional tonnage diversion obtained will extend lifespan of sanitary landfills.



Complementary Tonnage Diversion

Conceptual Example of Collaboration



Making sure everything goes right

Data Accountability & Ownership



Data Accountability & Ownership

Monthly current updated operations data will be key to managing Private Sector participation in Solid Waste Management. Therefore, market initiation projects will have built-in an incentive system to enable easier data management by GoM. A lightweight, simple system will roll out within the first market initiation projects, and will be ready to plug-in to a concerted dashboard once that is ready.



What We Need

- Flags for **health of operation**, monitored by fluctuation of operations data
- Continually updated knowledge of diversion capacity within a catchment area to **avoid facilities choke or over-capacity planning**
- Detailed business data, for **cost avoidance incentives & industry facilitation** to be discussed with MOF, EPU, MIDA

Therefore We Will Mandate

- Data collection & transmission equipment to be built-in to the ToR in CANS PPP/PFI contracts
- Monthly data reconciliation mechanism will form the basis for remuneration / penalty (tonnage diversion performance & cost savings performance). Continuous extended non-reportage (3 billing cycles) will incur penalty.

Options to include: Process workload can be further lightened via feed-in to an automated dashboard delivering:

- Automatically transmitted data-feed via built-in live sensors from weighbridges (mass balance)
- Breach-of-contracts alert flags to be built into the database
- Automated & immediate paper trail generated on notices of breach

Making sure everything goes right

Contracts



Contracts

Contracts have been flagged as an area requiring improvement. For industry sustainability, contracts need to be drafted to give **balanced protection to both GoM, and business** in PPP and PFI situations.



GUIDING PRINCIPLES:

- Achieve Balance between protection for GoM and protection for Private Sector
- Learn from prior experience – continual update & refinement of contract clauses
- Seek reference to other countries successful contracts for similar facility types
- Design contracts to minimise Government cost exposure & risk exposure



Moving forward, a specific workshop is recommended as a follow-up to this lab, to develop a framework for improving contracts relevant to unique solid waste management situations, in collaboration with experienced industry input.

CONTENT

What's the Problem?

Solution *(geared to support Facilities Planning)*

Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
 - Business Evaluation (Homogenous Tender vs Innovation Models)
- How to Make it Happen
 - Business Evaluation Pipeline setup (3ft plan detailing)
 - Area Needs Data Framework (3ft content detailing)
- Making sure Everything Goes Right
 - Facilities Planning Coordination / Complementary Support
 - Data Accountability & Data Ownership
 - Contracts
- **Market Initiation Projects**

Enablers

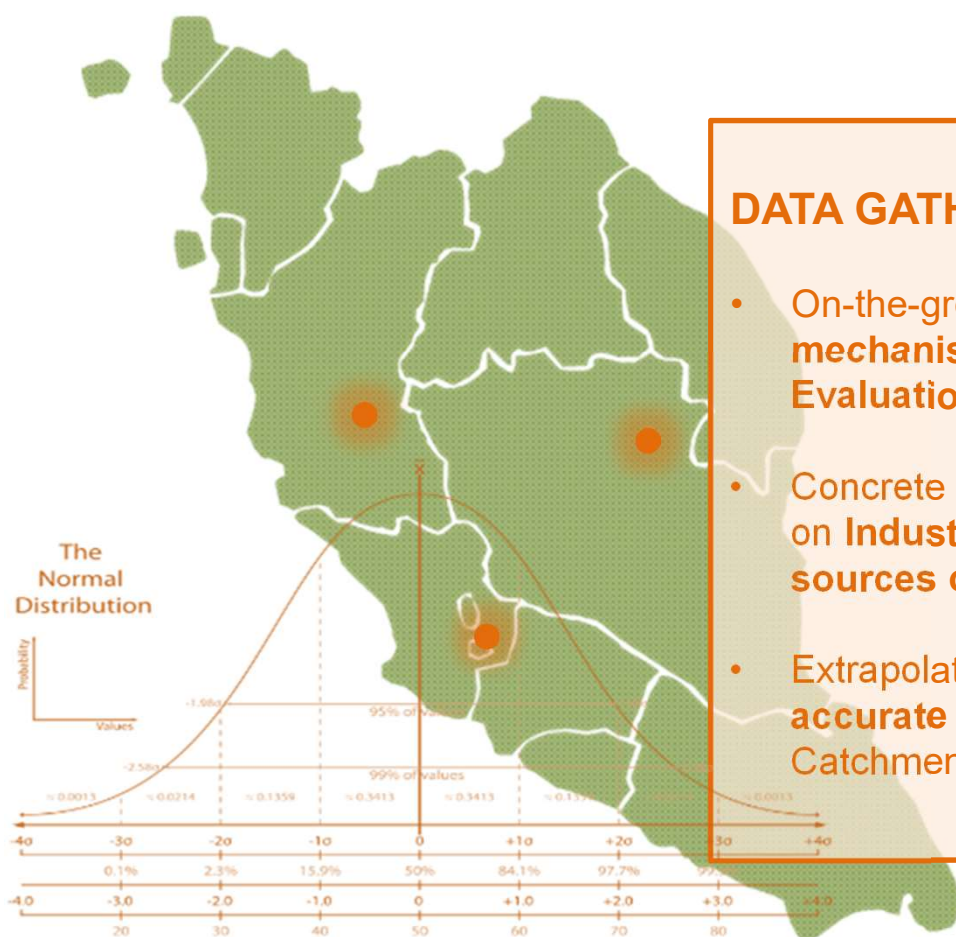


Market Initiation Projects



Identifying Sustainable Market Initiation Projects

Market initiation projects to be implemented as proof-of-concept. To be pre-evaluated using the *CANS* and criteria developed for the *Commercialisation Pipeline*. Once successful, can be rolled out to assist rapid mobilization towards the 2020 40% diversion target.



DATA GATHERED WILL ENABLE:

- On-the-ground verification of the **Cost Avoidance mechanism** and the **Commercialisation Pipeline Evaluation Criteria**
- Concrete business data for engagement with GoM & Banks on **Industry Development Funds, tax incentives & other sources of liquidity**
- Extrapolation of observed Tonnage Diversion will allow **accurate performance projections** against similar Catchment Area Needs parameters

Market Initiation Project #1:

MRF for +1 in Putrajaya



KEY PARAMETERS		DESCRIPTION			
Current Lifecycle Cost to GoM	RM 162/tonne	Diversion of +1 collection from Putrajaya through dry Material Recovery Facility (MRF). Putrajaya has one of the most advance recycling practice in the country. Land for waste facility is readily available.			
Future Lifecycle Cost to GoM	RM 151/tonne				
CAPEX Saved by GoM	RM 11.1 million				
Waste Diversion Rate	45%	MARKET SUITABILITY			
Total Land space saved per year	2,460 sq ft (equivalent to 1 corner lot terrace house)				
		HIRU	URBAN	Scalability of Technology	High
		Tonnage Range	> 100tpd	Market Readiness	High
		Waste Stream	+1	Technology Readiness	High
CANS		FINANCIAL ASSUMPTIONS			
Scheme	PJPS01 & PJPS02	Lifespan	15 years	Equity	30%
Total Tonnage from Scheme	100 tpd	Recyclables Extraction Rates (+1)	45%	Equity Internal Rate of Return (EIRR)	11%
Tonnage input to Facility	11 tpd	Residue from MRF to LF	55%	WACC	7.03%
Tonnage Diverted	4.9 tpd	Transportation Cost	RM17.5/tonne	Diversion Fee (RM/ton)	RM42/tonne
Category Diverted	Fraction Diversion (+1)		RM3.50/km	Landfill TF (RM/ton)	RM35/tonne
Stage Diverted	Early	All in Interest Rate	5.75%	CPI Cost	3.50%
Distance from Collection Area to LF	50 km	Tenure	15 years	CPI Revenue	2.00%

Market Initiation Project #1:

MRF for +1 in Putrajaya



Pilot #1 - MRF Putrajaya

Putrajaya [+1]
11tpd



Landfill Tg 12
6.05tpd



Recyclables
4.95tpd

Market Initiation Project #2:

MRF for +1 in Sg Karang, Pahang

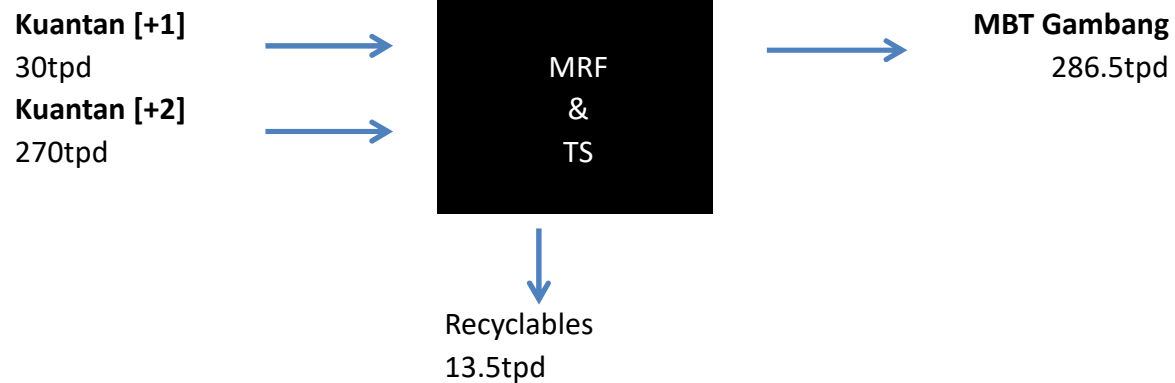


KEY PARAMETERS		DESCRIPTION			
Current Lifecycle Cost to GoM	RM 162/tonne	Diversion of +1 collection from Kuantan through dry Material Recovery Facility (MRF).			
Future Lifecycle Cost to GoM	RM 119/tonne				
CAPEX Saved by GoM	RM 14.7 million				
Waste Diversion Rate	45%	MARKET SUITABILITY			
Total Land space saved per year	7,381 sq ft (equivalent to 2 Semi-D house)				
		HIRU	RURAL	Scalability of Technology	High
		Tonnage Range	100tpd > 300tpd	Market Readiness	High
		Waste Stream	+1	Technology Readiness	High
CANS		FINANCIAL ASSUMPTIONS			
Scheme	PHKT 1,2,3	Lifespan	15 years	Equity	30%
Total Tonnage from Scheme	300 tpd	Recyclables Extraction Rates (+1)	45%	Equity Internal Rate of Return (EIRR)	13%
Tonnage input to Facility	33 tpd	Residue from MRF to LF	55%	WACC	7.03%
Tonnage Diverted	14.9 tpd	Transportation Cost	RM14/tonne	Diversion Fee (RM/ton)	RM10/tonne
Category Diverted	Fraction Diversion (+1)		RM3.50/km	Landfill TF (RM/ton)	RM35/tonne
Stage Diverted	Middle	All in Interest Rate	5.75%	CPI Cost	3.50%
Distance from Collection Area to LF	40 km	Tenure	12 years	CPI Revenue	2.00%

Market Initiation Project #2: MRF for +1 in Sg Karang, Pahang



Pilot #2 - MRF +1 & +2 TS Sg Karang



Market Initiation Project #3:

MBT for +1 & +2 in Gambang, Pahang

Integrated Sorting & Composting (ISOCOM)



KEY PARAMETERS		DESCRIPTION			
Current Lifecycle Cost to GoM	RM 162/tonne	Diversion of +1 & +2 collection from Kuantan through ISOCOM Mechanical Biological Treatment (MBT).			
Future Lifecycle Cost to GoM	RM 111/tonne				
CAPEX Saved by GoM	RM 98 million				
Waste Diversion Rate	75%	MARKET SUITABILITY			
Total Land space saved per year	6.94 acres				
		HIRU	RURAL, URBAN	Scalability of Technology	Low
		Tonnage Range	> 300tpd	Market Readiness	Medium
		Waste Stream	+1 +2	Technology Readiness	High
CANS		FINANCIAL ASSUMPTIONS			
Scheme	PHKT	Lifespan	15 years	Equity	30%
Total Tonnage from Scheme	737 tpd	Recyclables Extraction Rates	6.5%	Equity Internal Rate of Return (EIRR)	15%
Tonnage input to Facility	737 tpd	Residue from MBT to LF	25%	WACC	7.03%
Tonnage Diverted	553 tpd	Transportation Cost	RM0.35/tonne	Diversion Fee (RM/ton)	RM15/tonne
Category Diverted	Whole Diversion (+1&+2)		RM3.50/km	Landfill TF (RM/ton)	RM35/tonne
Stage Diverted	End	All in Interest Rate	5.75%	CPI Cost	3.50%
Distance from Collection Area to LF	1 km	Tenure	15 years	CPI Revenue	2.00%

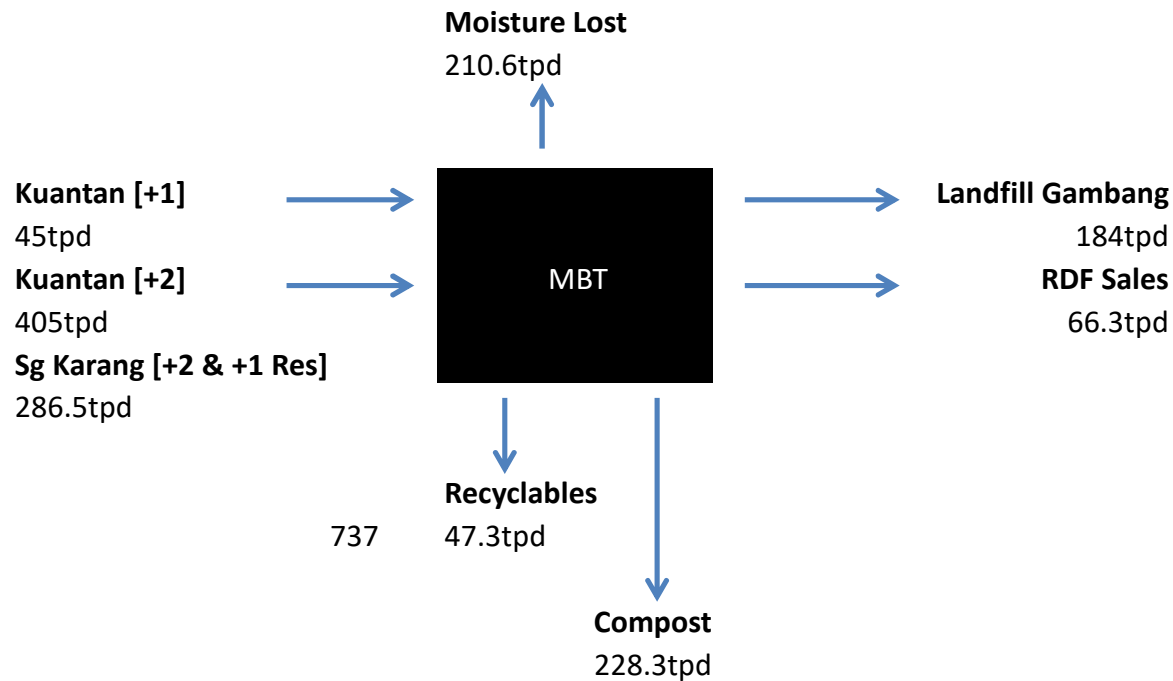
Market Initiation Project #3:

MBT for +1 & +2 in Gambang, Pahang

Integrated Sorting & Composting (ISOCOM)



Pilot #3 – MBT (ISOCOM) +1 & +2 Gambang



Market Initiation Project #4:

MRF for +1 in Cheroh, Pahang



KEY PARAMETERS		DESCRIPTION			
Current Lifecycle Cost to GoM	RM 162/tonne	Diversion of +1 collection from Raub through dry Material Recovery Facility (MRF).			
Future Lifecycle Cost to GoM	RM 120/tonne				
CAPEX Saved by GoM	RM 18.3 million				
Waste Diversion Rate	45%	MARKET SUITABILITY			
Total Land space saved per year	17,223 sq ft				
		HIRU	RURAL, URBAN	Scalability of Technology	High
		Tonnage Range	> 100tpd	Market Readiness	High
		Waste Stream	+1	Technology Readiness	High
CANS		FINANCIAL ASSUMPTIONS			
Scheme	PHRB 1	Lifespan	15 years	Equity	30%
Total Tonnage from Scheme	70 tpd	Recyclables Extraction Rates (+1)	45%	Equity Internal Rate of Return (EIRR)	13%
Tonnage input to Facility	70 tpd	Residue from MRF to LF	55%	WACC	7.03%
Tonnage Diverted	31.5 tpd	Transportation Cost	RM19.25/tonne	Diversion Fee (RM/ton)	RM11/tonne
Category Diverted	Fraction Diversion (+1)		RM3.50/km	Landfill TF (RM/ton)	RM35/tonne
Stage Diverted	Middle	All in Interest Rate	5.75%	CPI Cost	3.50%
Distance from Collection Area to LF	55 km	Tenure	10 years	CPI Revenue	2.00%

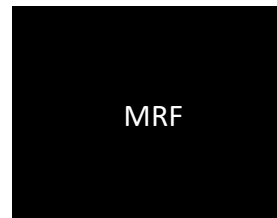
Market Initiation Project #4:

MRF for +1 in Cheroh, Pahang



Pilot #4 - MRF Cheroh

Raub [+1]
70tpd



Landfill Sertik
38.5tpd



Recyclables
31.5tpd

Market Initiation Project #5:

MRF-WtE for +1&+2 in Semeling, Kedah



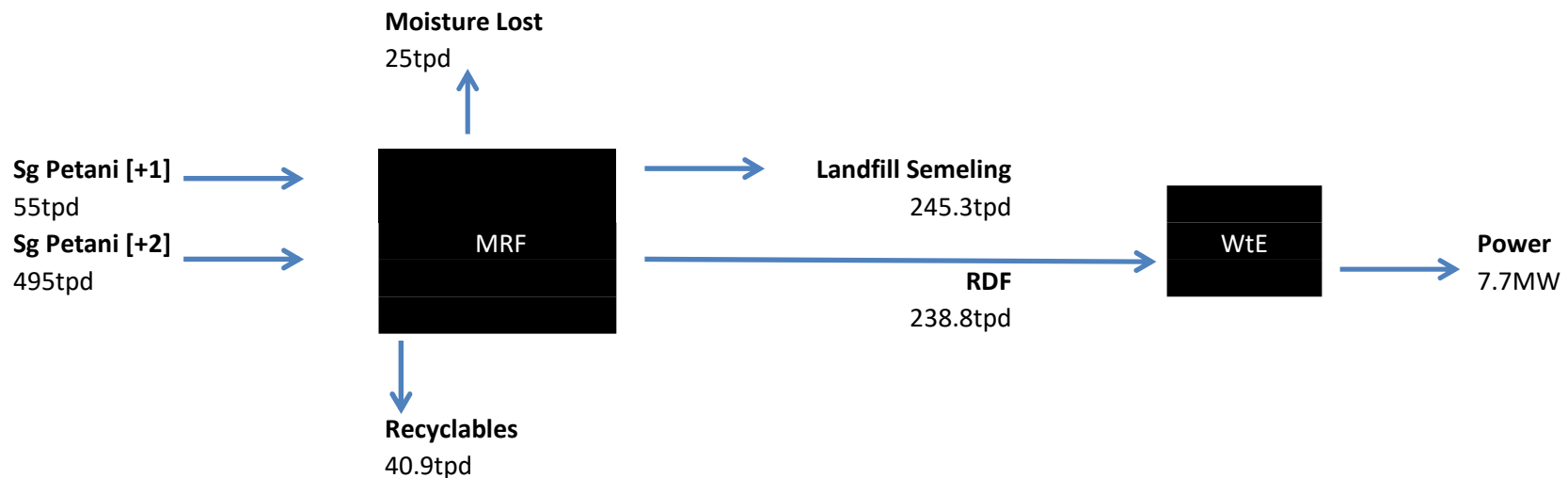
KEY PARAMETERS		DESCRIPTION			
Current Lifecycle Cost to GoM	RM 137/tonne	Diversion of +1 & +2 collection from Sg Petani through dry Material Recovery Facility (MRF) and thermal waste to energy (WtE) facility.			
Future Lifecycle Cost to GoM	RM 137/tonne				
CAPEX Saved by GoM	RM 150 million				
Waste Diversion Rate	51%	MARKET SUITABILITY			
Total Land space saved per year	3.5 acres	HIRU	RURAL, URBAN	Scalability of Technology	High
		Tonnage Range	> 500tpd	Market Readiness	High
		Waste Stream	+1 +2	Technology Readiness	High
CANS		FINANCIAL ASSUMPTIONS			
Scheme	Unknown	Lifespan	16 years	Equity	30%
Total Tonnage from Scheme	550 tpd	Recyclables Extraction Rates	6%	Equity Internal Rate of Return (EIRR)	10%
Tonnage input to Facility	550 tpd	Residue from MRF-WtE to LF	49%	WACC	7.03%
Tonnage Diverted	280.5 tpd	Transportation Cost	RM0.35/tonne	Diversion Fee (RM/ton)	RM30/tonne
Category Diverted	Whole Diversion (+1,+2)		RM3.50/km	Landfill TF (RM/ton)	RM10/tonne
Stage Diverted	End	All in Interest Rate	5.75%	CPI Cost	3.50%
Distance from Collection Area to LF	1 km	Tenure	15 years	CPI Revenue	2.00%

Market Initiation Project #5:

MRF-WtE for +1&+2 in Semeling, Kedah



Pilot #5 - MRF-WtE +1 & +2 Semeling



CONTENT

What's the Problem?

Solution *(geared to support Facilities Planning)*

Activating the Market, Developing Vibrant Industry

- So... Why hasn't this happened already?
- How to Make it Happen
- Making sure Everything Goes Right
- market initiation projects

Enablers

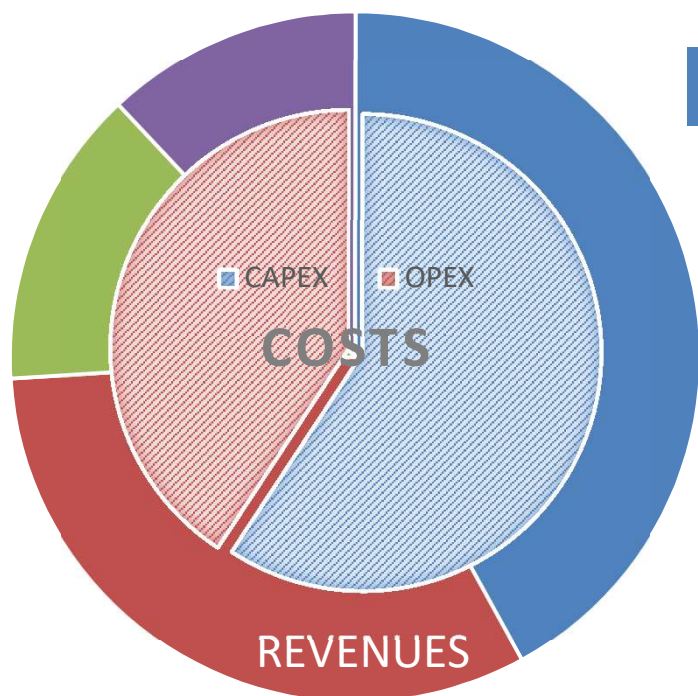
- Other Industry Development fund / liquidity
- GGP inclusion
- SWM Industry Incentives (MIDA)
- Bank Guarantee Options

FACILITATION

Understanding SWM Business Models

Understanding Private Sector business models in SWM

Solid Waste Management Waste-To-Wealth business models typically juggle a complexity of multiple revenue streams to cover costs. As business viability is not supported by one revenue stream alone, **existing incentive structures** drawn from other industries are difficult to apply. Additionally **Banks are also reluctant to lend**, as it is a new industry sector without clear precedents in Malaysia.



■ Tipping Fee ■ FIT ■ ByProducts ■ Other

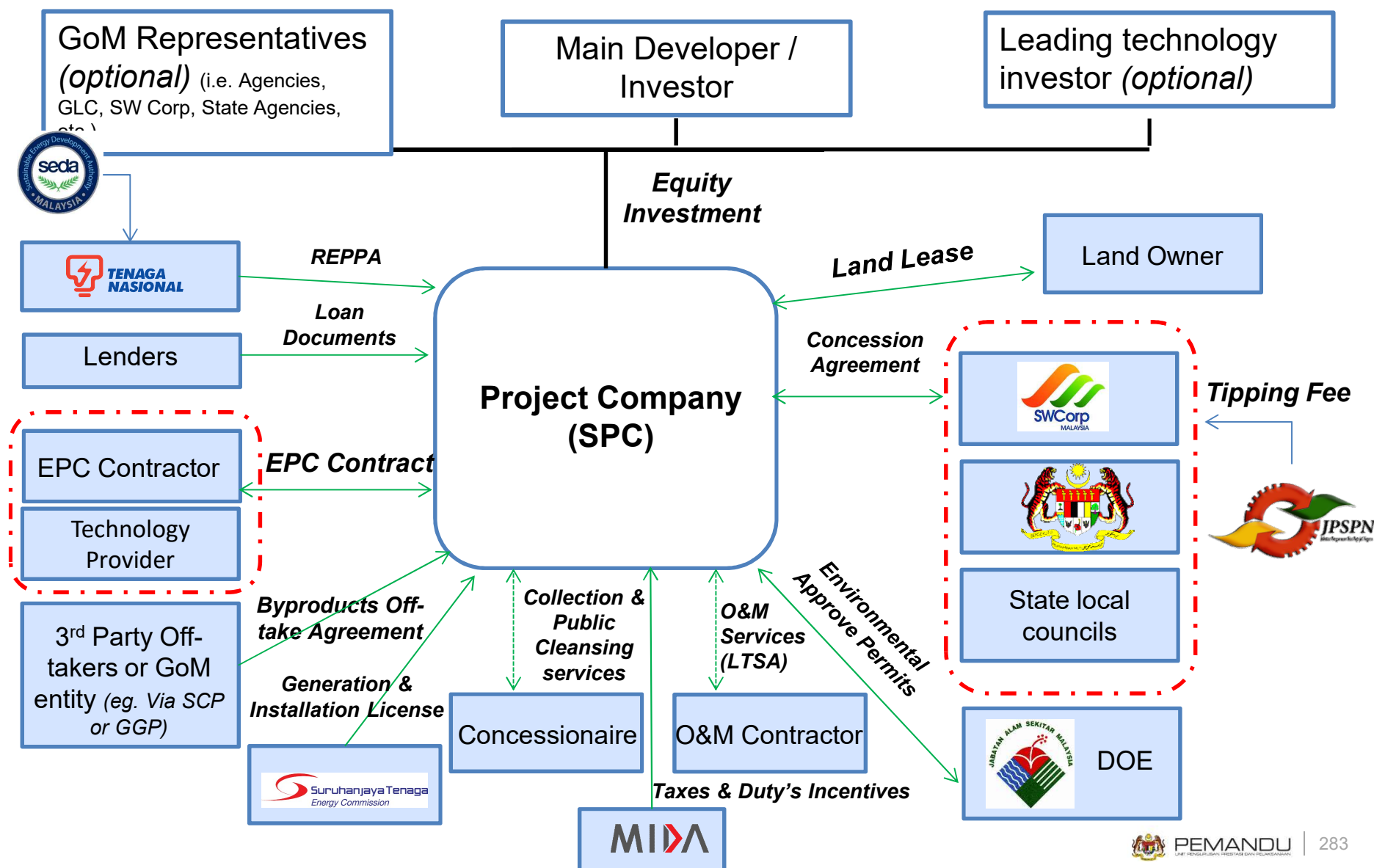
Facilitation is needed to catalyse the industry.

◀ SWM Private Sector Business Model Characteristic Multiple Revenue Streams Profile

- Typical investment lead-time 3 – 4 years
- Typical revenue stream in fractions. Cost cannot be recouped by one revenue stream alone.
- Need to structure tailored incentives for SWM to make Private Sector involvement attractive.

Typical SWM Project Structure for Facilities (PPP approach)

Project structure & required project documents to be secured by project proponent



ENABLERS

- **Industry Development Fund options**
- **Government Green Procurement**
- **SWM Industry Incentives (MIDA)**
- **Unlocking Bank Financing**

ENABLERS

- **Industry Development Fund options**
- Government Green Procurement
- SWM Industry Incentives (MIDA)
- Unlocking Bank Financing

Structuring Other Industry Development Fund Options

Access to Start-Up Liquidity is currently a barrier to catalyzing Malaysia's SWM industry development, because local banks have no precedents on lending profiles to evaluate new & innovative SWM business models geared at delivering **early & mid-stream Tonnage Diversion** for **sustainable, first-world waste management, maximizing landfill lifespan**.

Next steps:

Business performance data from this lab's **Market Initiation Projects** will enable a proposal to be prepared for discussion with MOF, EPU and UKAS.



Proposed sources of liquidity could come from:

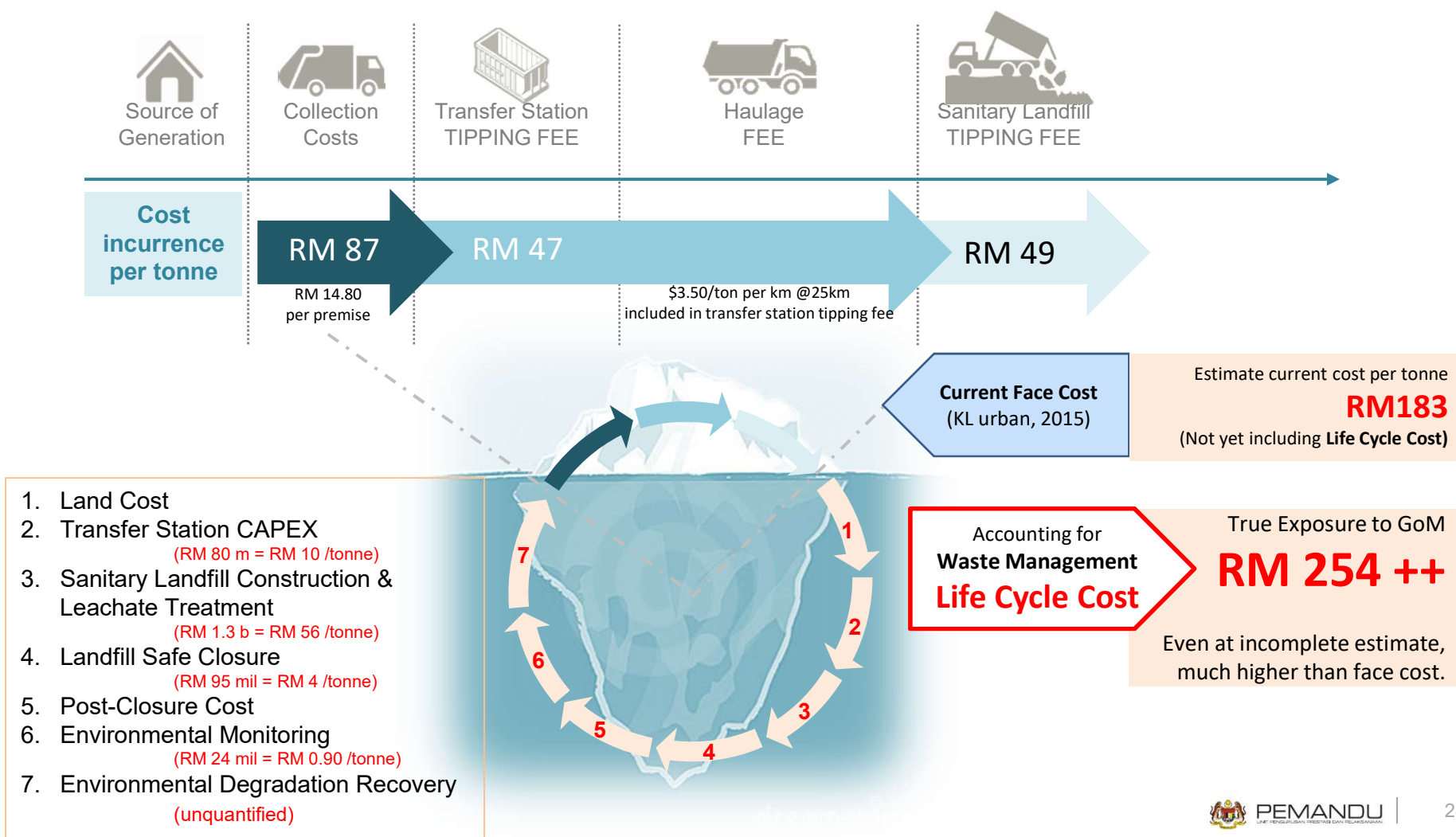
- structuring a **Industry Development Fund** against the nett value of **Cost Avoidance** gained
- coordinating an **Extended Producer Responsibility Ces fund**

Government **bridging facilitation** will be required to catalyse and kick-start the industry, along with policies to unlock sources of liquidity. The value of development assistance should take into account the full total cost exposure borne by GoM, ie: **LIFE CYCLE COST (detail on next slide)**.

Accounting for Life Cycle Cost

In evaluating the need for an Industry Development Fund

Face cost of waste management cost to GoM covers only collection, transportation & tipping fees. However the total true cost exposure is much higher because GoM is responsible for the full life cycle of waste management. This total **Life Cycle Cost** exposure must be weighed against the value of encouraging private sector participation in solid waste management.



ENABLERS

- Industry Development Fund options
- **Government Green Procurement**
- SWM Industry Incentives (MIDA)
- Unlocking Bank Financing

GGP Incentives to directly impact national interest SWM diversion targets

Government procurement plays a crucial role as a catalyst for socioeconomic development as it represents about 12-15% of Gross Domestic Product (GDP).

Aligning **GGP** as well as **Extended Producer Responsibility policies** with the targets of waste diversion from landfill will lend the critical impetus to unlock lender reluctance, encourage investments and instil business confidence in SWM.

KEY INTENTION: to prepare alignment with GGP for when SWM treatment plant outputs come on-stream in 3 to 4 years



Leverage on benefits which can be achieved through GGP

- Local innovation and support to the local economy
- Increased company competitiveness
- New and larger markets for innovative sustainable solutions
- Improved environmental performance of businesses
- Achievement of national environmental goals
- Long-term savings
- Higher quality products
- Healthier working conditions
- Improved public image
- Policy coherence

Enabling MSW-derived Product Uptake

One of the main barriers to an improved and sustainable recycling performance and the reprocessing of waste in general is the lack of stable and economically attractive markets and outlets for recyclable materials. A **Market Development Programme** for Waste Resources is required to identify and address these barriers to harness the full potential of existing markets and to identify new applications and markets for recyclable material and secondary recycled products in parallel to providing greater incentives for waste recovery activities.

Guiding Principles

- **Resources not Waste:** a departure from the traditional view of waste as a problem, towards being a valuable resource which can bring economic, environmental and social benefits;
- **Partnership:** opportunity for new partnerships between those who produce goods and those who manage post-consumer waste resources. Need to create links between manufacturers, retailers, waste management companies, research and development groups and the public sector under a waste ecology/symbiosis framework;
- **Creating Demand:** develop in parallel with supply-side optimisation, namely collection and sorting of recyclable materials in a form suitable for the production of high quality products, the stimulation of demand for secondary materials among the end users, so that recycling can be sustained and competition encouraged;
- **Innovation:** stimulate imaginative and original solutions to working with secondary materials;
- **Support:** funding to support development of new approaches to recycling and product development, giving support in the feasibility and pilot/demonstration phases so that good ideas can become reality; and
- **Sustainability:** contribute towards resource efficiency and energy efficiency by reducing the use of local and global resources including raw materials and energy in transportation.



Objectives of Market Development Programme

ENABLERS

- Industry Development Fund options
- Government Green Procurement
- **SWM Industry Incentives (MIDA)**
- Unlocking Bank Financing

Existing Incentives

MIDA – Clean Technology & Environment Management Division

Promotion of Investment Act (PIA) 1986.

Waste management activities are eligible for incentives under the Act, and cover diverse industries

Incentives for Waste Recycling

Apply to diverse industries in Metal & Alloys, Chemicals, Textile, Electrical & Electronic, etc

Pioneer status (PS)

Income tax exemption of 70% of the statutory income for a period of 5 years;

or

Investment Tax Allowances (ITA)

Investment tax allowance of 60% on the qualifying capital expenditure incurred within a period of 5 years to be utilised against 70% of statutory income.

Criteria

- Companies are allowed to recycle waste/scrap obtained within Malaysia.
- Import of scrap/waste are not allowed.

Incentives for Agricultural Waste

Processing of agricultural waste - sugar cane mill waste, rice mill waste, palm oil mill waste.

Utilization of Palm Oil waste & by products - Pellets and briquettes.

Pioneer status (PS)

Income tax exemption of 70% or 100% of the statutory income for a period of 5 or 10 years;

or

Investment Tax Allowances (ITA)

Investment tax allowance of 60% or 100% on the qualifying capital expenditure incurred within a period of 5 years to be utilised against 70% or 100% of statutory income.

Criteria:

- Specified value-added and Managerial, Technical and Supervisory (MTS) level of staff involved.
- Manufacturing process involved.

Existing Incentives

MIDA – Clean Technology & Environment Management Division

Renewable energy activities are eligible for incentives as follows.

Recognised renewable energy resources

- Palm oil mill/ estates waste
- Rice mill waste
- Sugar cane mill waste
- Timber/sawmill waste
- Paper recycling mill waste
- Municipal solid waste
- Biogas (*from landfill, palm oil mill effluent (pome), animal waste, others*)
- Hydro Power (*not exceeding 10 Megawatts*)
- Solar Power

Recognised types of energy generated

- Electricity
- Steam
- Chilled Water
- Heat
- Waste to Energy can be considered

(a) Incentives for Companies Undertaking Generation of Energy Using Renewable Energy Resources

Pioneer status (PS)

Pioneer Status with income tax exemption of 100% of statutory income for ten years. Unabsorbed capital allowances as well as accumulated losses incurred during the pioneer period can be carried forward and deducted from the post pioneer income of the company;

or

Investment Tax Allowances (ITA)

Investment Tax Allowance of 100% on the qualifying capital expenditure incurred within a period of five years. This allowance can be offset against 100% of the statutory income for each year of assessment. Any unutilised allowances can be carried forward to subsequent years until fully utilised.

(b) Incentives for Generation of Renewable Energy for Own Consumption

Investment Tax Allowances (ITA)

Investment Tax Allowance of 100% on qualifying capital expenditure incurred within a period of five years. This allowance can be offset against 100% of the statutory income for each year of assessment. Any unutilised allowances can be carried forward to subsequent years until fully utilised.

Green Technology Incentive

In Budget 2014, the Government has proposed that in order to potentially “strengthen the development of green technology, the Government will provide investment tax allowance for the purchase of green technology equipment and income tax exemption on the use of green technology services and system”. This incentive will cover broader scope of green technology services activities in the areas of energy, transportation, building, water and waste management. Currently, the incentive is under review for gazette order. Upon expiry of (a) and (b), RE / WtE projects can be considered under this new incentive.

Incentive (a) and (b) will be expiring on 31 December 2015.

Proposed Incentives

MIDA: Incentives to directly impact national interest SWM diversion targets

Issues: Current incentives are not optimised for the waste management industry, which depends on multiple revenue fractions to support business viability. Costs inputs are therefore difficult to assign and rationalise for tax incentivisation. On tailoring specific incentives the following was identified:

Proposal

Structure a broad umbrella incentive for the waste management industry; similar to the **Developer Incentive** for *Mines Wellness City*:

Incentive for Developers of a Waste Recovery & Treatment facilities

- Income tax incentives 100% on statutory income (derived from rental) for 10 years
- Stamp duty exemption 50% for transfer of land
- Investment Tax Allowance or Pioneer Status

Incentives for Operators of a Waste Recovery & Treatment facilities

- Incentives for tenant services (for example, recyclers, recovery centers)
- If providing services related to developer, income from those services to be exempted (May be under a separate operator or subsidiary under the developer)
- Incentives on the specialist O&M services.
 - Specialist category, list of qualified activities for O&M service providers (caveat: need to be majority locally-owned to spur technology transfer)
 - These are usually direct companies providing O&M of advanced technologies for waste treatment services, to waste facilities
 - Speciality industry sector by itself where there is a knowledge & experience gap in Malaysia: providing O&M for green facilities or waste facilities. Eg:
 - *Services on acclimatization of AD*
 - *Specialised in operating waste plants (even if owned by GoM)*

Justification

- Support national solid waste tonnage diversion goals; **catalyzing industry development as a long-term solution to escalating & unsustainable pressure on Federal Budgets**
- Transform waste management from a Federal cost-centre to a **green growth industry** generating **Jobs, GNI & Investment**; as per developed nation experiences.
- 10 years validity of incentive needed to bring the industry up to self-sustaining level. Tenure should remain similar to RE incentives.

Need for SPECIALIST skillsets, in taking the industry to another level

- This market is a key enabler for the industry. Need for world class operators; as at the moment we have no local expertise, since we have not had these facilities prior.
- Require presence of these specialists to kick-start the industry, & shorten the lead-time otherwise needed to build up in-house capability to run & manage a facility.
- Lenders requirement prefers 3rd party O&M to diversify risk exposure; helps obtain better interest rates

Intended impact: Impact model similar to that of AIROD, to spur the market and bring in specialist skills

ENABLERS

- Industry Development Fund options
- Government Green Procurement
- SWM Industry Incentives (MIDA)
- **Unlocking Bank Financing**

Unlocking Bank Financing

Because waste treatment and waste recovery are relatively new and unproven industries in Malaysia on a commercial scale, banks and lenders lack experience benchmarks of risk profiling and are unwilling to finance these ventures at mutually viable interest rates.



KEY INTENTION: Minimising mismatch between Banks lending requirements & any possible certainties GoM might comfortably extend

Once onstream and operating, tangible business data gathered from Market Initiation Projects will assist in developing risk profiling track record.

However some key terms recently proposed in GoM contracts have been identified as increasing the difficulty the unlocking of private sector financing & investment for SWM treatment & recovery.

Unlocking Bank Financing

Terms & References in existing draft concession agreement (CA)
which will contribute to reluctance to lend, higher interest rates

1. Security restrictions; no Lenders' Step-In Rights

- No assignment of lease agreement
- No security granted over the facility
- No assignment of the CA
- No assignment of insurance

Impact with Lenders

- Non-recourse financing requires security to be granted to the lenders so that lenders can be reimbursed in case of an EOD by enforcement of security
- A limited security package that doesn't include assignment of project agreements and assets will not be acceptable to lenders unless other security can be pledged (ie debt service undertaking etc...)
- Lenders will need to have right to step-in initially with the opportunity to cure the problem
- This is standard for projects of this nature and is driven by the termination regime and security package
- Government step-in shall occur post lenders' step-in unless the outstanding debt, interests due and swap breakage costs have been paid

Implications

- In the event these security assignments are extended to lenders, project owner / developer is required to provide a security documents in form of bonds or PCG.
- In the event that project owner comes with the security documents, a risk cost will be implied and passed through to the GoM.

Recommendations

- Preferential creditors approach is recommended - security documents to be assigned to the bank for a certain period in the event of default
- Banks should get a reasonable time to mitigate / remedy

Unlocking Bank Financing

Terms & References in existing draft concession agreement (CA)
which will contribute to reluctance to lend, higher interest rates

2. Extension of Time / Longstop Date

- No extension of time for delays less than 6 months due to government or corporation
- No compensation in case of delays due to government or corporation
- Longstop of 6 months from the planned service commencement date
- Extension of time

Impact with lenders

- A delay of less than 6 months will have impact the project cash flows. Lenders will require a longer tail than typical IPPs.
- The SPV will be responsible for construction cost overruns and hence will require sponsors commitment in this respect. This could be a concern given the ongoing clarifications in respect to the site
- In addition, delay LDs will be payable to TNB under the REPPA and these will have to be passed through to either
 - i) the government / corporation or
 - ii) EPC contractor
- The longstop date is too short to cater for a replacement contractor scenario. In case of termination during the construction period, no termination payment is due by the government, hence resulting in total loss for the lenders. This is unlikely to be accepted

Implications

- Long stop date means last date by which something must be done. In this case referring to EOD.
- These terms are not reasonable for project owner to absorb

Recommendations

- GoM should be amenable to modifying these terms; as they lead to high contingencies charges by the project owner to pass-through to GoM.

Unlocking Bank Financing

Terms & References in existing draft concession agreement (CA)
which will contribute to reluctance to lend, higher interest rates

3. No Cure Periods

- Not in current draft of salient terms

Impact with Lenders

- Termination shall only occur post remedy/ cure periods.
- This is standard for projects of this nature and is driven by the termination regime and security package

Recommendations

- More productive to set a properly-evaluated cure period with strict enforcement

4. Termination Payment

- No termination payment during construction
- Termination payment could be less than the debt outstanding and interests due
- Termination due to government default /or the corporation
- Expropriation
- Force majeure

Impact with Lenders

- Expropriation means the act of taking away or modifying the facility from a project owner by GoM.
- Lenders will require compensation during construction / operation to cover the debt outstanding and interest as well as swap breakage costs. Current termination payment does not cover such amount
- Lenders will require clarity on termination by mutual consent in case of a force majeure event
- Lenders will require clarity on termination due to expropriation

Recommendations

- Should not be a blanket application – there has to be demonstrably valid grounds for termination
- In the event of GoM default there should reasonable compensation

Unlocking Bank Financing

Terms & References in existing draft concession agreement (CA)
which will contribute to reluctance to lend, higher interest rates

5. Change in Law

- Not in current draft of salient terms

Implications

- Millions of cost to developers with no compensation or recovery

Recommendations

- CES could be put in place to help mitigate this
- Seek any other sources of fund that can be pooled as insurance against change of law

APPENDIX

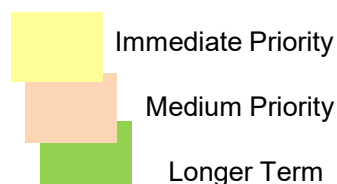
- **Workshop Development Targets**
- **Draft PQQ**
- **Capacity Development (Staffing)**

APPENDIX

- **Workshop Development Targets**
- Draft PQQ
- Capacity Development (Staffing)

Next-Steps Follow-up Workshops

Output Targets To Cover



1 **Market Initiation Projects**

- Discussion & agreement on details of the initiatives
- Data accountability & ownership mechanism, enforcement. How to build-into contracts, facilitate easy low-maintenance monitoring
- Implementation timelines

2 **Staffing**

- Assessment of staffing required
- Possibility of setting up DMO
- Assignment of duty

3 **Catchment Area Needs Statement (CANS)**

- Agreement on the publication format & detail of implementation on website
- Seek implementation budget
- Timelines

4 **Holistic Evaluation Criteria (HEC)**

- Agreement on the scoring weightages & full detail breakdown of the guideline categories
- Preparation of the auto-scoring mechanism locked-excel sheet

5 **Business Evaluations Pipeline Mechanism & Committee**

- Decision on the committee permanent members
- Budgeting of any cost set-aside for on-demand specialist expertise
- Final ToR & Timelines

6 **Contracts**

- Review of contracts – multiparty with GoM (JPSPN, AGC, UKAS), private sector industry (associations, GLC, SME, Concessionaire) & legal counsel
- Comparison of contracts with other nation experiences

7 **Enablers**

- GGP – further discussion with MOF / EPU on the uptake of products
- Bank financing
- CES tax fund, deciding feasible sources, structure & purpose, eg:
 - *Facilitation of industry development*
 - *Reserve fund in case of unforeseen events, risk mitigation*
 - *Collateral against bank loans*

APPENDIX

- Workshop Development Targets
- **Draft PQQ**
- Capacity Development (Staffing)



PQQ-001_JPSPN

WASTE SECTOR DEVELOPMENT
40% Waste Diversion Initiative (WDI)

PRE-QUALIFICATION QUESTIONNAIRE

1. COMPANY

Full Name:	Click here to enter text.		
Registration #:	Click here to enter text.	Website URL:	Click here to enter text.
Full Address:	Click here to enter text.		
Telephone #:	Click here to enter text.	Facsimile #:	Click here to enter text.
Contact Person:	Click here to enter text.	Designation:	Click here to enter text.
Email Address:	Click here to enter text.	Mobile #:	Click here to enter text.

2. TECHNOLOGY (Please indicate X in the relevant boxes)

Origin:	Where does the technology come from? Click here to enter text.										
	What is your status? <input type="checkbox"/> Technology Owner <input type="checkbox"/> Local Agent <input type="checkbox"/> Reseller <input type="checkbox"/> Distributor <input type="checkbox"/> Others Click here to enter text.										
Waste Stream:	<input type="checkbox"/> Solid Waste <input type="checkbox"/> Liquid Waste <input type="checkbox"/> Others Click here to enter text.										
Category:	<input type="checkbox"/> Sorting <input type="checkbox"/> Treatment <input type="checkbox"/> Conversion/Extraction <input type="checkbox"/> Thermal <input type="checkbox"/> Digestion <input type="checkbox"/> Others Click here to enter text.										
Feedstock:	<input type="checkbox"/> MSW <input type="checkbox"/> Agricultural <input type="checkbox"/> Industrial <input type="checkbox"/> Hazardous <input type="checkbox"/> Medical <input type="checkbox"/> Others Click here to enter text.										
	Does your technology require any specific feedstock quality/composition/characteristic? Click here to enter text.										
Fraction:	<input type="checkbox"/> Organics <input type="checkbox"/> 2D Plastics <input type="checkbox"/> 3D Plastics <input type="checkbox"/> Metal <input type="checkbox"/> Wood <input type="checkbox"/> Glass <input type="checkbox"/> Textiles <input type="checkbox"/> Others Click here to enter text.										
Capacity:	Is the technology modular? <input type="checkbox"/> Yes <input type="checkbox"/> No What is the minimum capacity in Mt/day? Click here to enter text.										
Footprint:	Is there a minimum area required? <input type="checkbox"/> Yes <input type="checkbox"/> No What is the estimated area required per Mt input? Click here to enter text.										
Investment:	Please state your indicative CAPEX and OPEX per Mt of feedstock input CAPEX/Mt Click here to enter text. OPEX/Mt Click here to enter text.										
End Product:	Please list your end products/by-products and application/market: <table border="1"> <tr> <th>End products/By-products</th> <th>Application/Market/Recipient</th> </tr> <tr> <td>Click here to enter text.</td> <td>Click here to enter text.</td> </tr> <tr> <td>Click here to enter text.</td> <td>Click here to enter text.</td> </tr> <tr> <td>Click here to enter text.</td> <td>Click here to enter text.</td> </tr> </table>			End products/By-products	Application/Market/Recipient	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
End products/By-products	Application/Market/Recipient										
Click here to enter text.	Click here to enter text.										
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Click here to enter text.	Click here to enter text.										
	Do you have an existing market/contract for your end products/by-products? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In discussions/negotiations Where are your existing/intended markets? <input type="checkbox"/> Malaysia <input type="checkbox"/> Japan/Korea <input type="checkbox"/> Europe <input type="checkbox"/> Others Click here to enter text.										



PQQ-001_JPSPN

4. REFERENCE SITES

Malaysian: Do you have a Malaysian reference site? ☐ Yes ☐ No
If YES, please list your most recent reference sites:

Location	Feedstock	Capacity	Year
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

Other: If NO, please list your most recent reference sites outside of Malaysia:

Location	Feedstock	Capacity	Year
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

5. REGISTRATION OF INTEREST

I/We registered our interest for this project through ☐ KPKT ☐ JPSPN ☐ SWCorp
Registration: via a ☐ meeting ☐ letter ☐ email dated [Click here to enter a date.](#)
Contact person: [Click here to enter text.](#) met/contacted
Designation: [Click here to enter text.](#) met/contacted

6. SUBMISSION CHECKLIST

- ☐ PQQ-001_JPSPN Main Form
- ☐ Certified copy by SSM of Form 9 (Company Act, 1965)
- ☐ Latest Company Profile
- ☐ Certified Copy by SSM of Form 24 (Company Act, 1965)
- ☐ Certified Copy by SSM of Form 49 (Company Act, 1965)

PLEASE **INITIAL ALL PAGES** AND SUBMIT THE DULY COMPLETED FORMS AND SUPPORTING DOCUMENTATION IN PDF FORMAT VIA EMAIL TO nisha@kpkt.gov.my cc: faisal@kpkt.gov.my

7. DECLARATION

(This section must be signed by an individual with the legal authority to represent the company)

☐ I/We certify and solemnly declare that as of the date of this declaration:

- ☐ I/We have read, completed and understood the latest version of the PQQ-001_JPSPN Form and its objective to evaluate prospective companies and relevant technologies to participate in the Request for Proposal (RFP) for the WDI project;
- That the information provided in this application, negotiation, including attachments, is true and correct to the best of ☐ my/☐ our knowledge and agree that KPKT/JPSPN reserve the right to revoke submissions and withdraw approval based on false information submitted by company; and
- Receipt of this submission does not in any way constitute a confirmation or approval of the company or technology or any form of partnership, joint venture or other similar relationship.

Name:	Click here to enter text.	Signatory 1
Designation:	Click here to enter text.	
Malaysian IC/Passport #:	Click here to enter text.	
Date:	Click here to enter a date.	
Name:	Click here to enter text.	Signatory 2
Designation:	Click here to enter text.	
Malaysian IC/Passport #:	Click here to enter text.	
Date:	Click here to enter a date.	

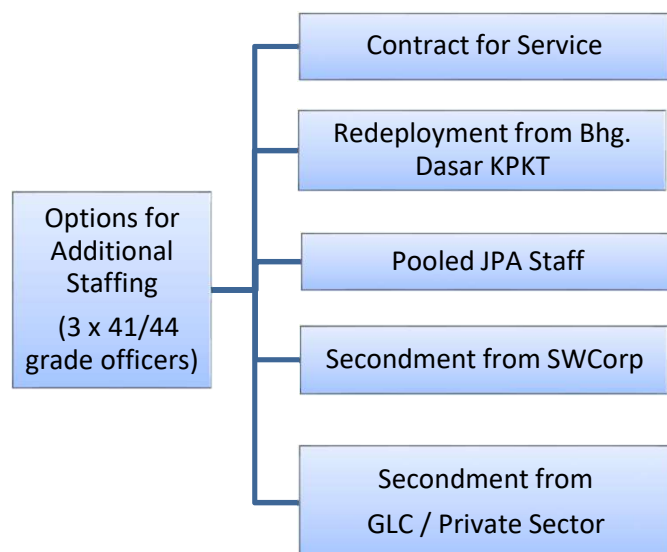
APPENDIX

- Workshop Development Targets
- Draft PQQ
- **Capacity Development (Staffing)**

Capacity Development – JPSPN Staffing Boost

The Industry Development role required to facilitate Private Sector involvement will require a capacity boost to staffing.

Secondment from GLC / Private Sector has been suggested as a quick method to boost requisite skills along with manpower.



Manage and publish CANS launch & updates

- Identify and coordinate CANS updates
- Engagement & management of private sector
- Manage website integration & troubleshooting

Coordinate between JPSPN departments, SWCorp & Concessionaires to ensure smooth continuity

- Continual communication to ensure smooth coordination

Driving the process:
Facilitating Private Sector entry to SWM Industry

Coordinate evaluation & approvals process for business proposals from private sector

- Manage received proposals for further evaluation
- Secretariat for evaluation process
- Continuous improvement of timeline & process

Market uptake facilitation with relevant agencies

- Identify potential uptake products
- Facilitate touch points between private sectors and GoM agencies
- Promote/ unlock market for SW related products
- Database secretariat/ update for industrial and market creation

INITIATIVE FACTSHEETS

CASE FOR CHANGE – Malaysia's SWM situation

Scenario

High Opportunity Cost of Business-As-Usual

- Shrinking Federal Budgets
- Environmental Degradation damage (currently unquantified) including **leachate contamination** & proliferation of **vectors of disease**



Objectives

Key To Success: WHERE WE NEED TO BE

- **Sustainable, World-Class SWM. Waste is minimized, recovered by industry as raw materials**
- Govt. bears disposal cost **only for waste with no economic viability**
- **Transition of Government SWM model from CAPEX & OPEX to Regulation, Monitoring and Enforcement in line with developed nation practices.**

Key takeaways

- Overarching focus:
 - Economic Transformation of national solid waste management to a **Jobs & GNI contributor** instead of a federal expense



Remanufactured Products



Employment

- Summary of main recommendations:
 - Creation of **viable business climate** for mid-stream entry of private sector innovation & process efficiency in waste product recovery/recycling.
 - **Capacity building** for Government readiness in policy, regulatory & technical expertise
 - **Identification & Tracking** of national waste feedstocks & matching with **existing high-demand, high-value** product markets

Workstream 3: Boundaries & Limitations

Brief to Workstream

Seek avenues to improve the sustainability, economic viability, and quality of national Solid Waste Management activities, under the purview of Akta 672.

Boundaries & Limitations

- Develop solutions that can impact the near-term effectiveness of the 40% diversion of tonnage from landfills; activating private sector SWM activity towards optimizing national solid waste management activities by 2020.
- Development of action plans should not conflict with wider, longer-term integrated national Waste Management goals for beyond 2020.
- Solutions for this present lab are to address the scope of Municipal Solid Waste Management under Akta 672 (Household, ICI, C&D). Not currently tasked to integrate with other waste feedstocks.
- Public Cleansing falls under a different scope.

Key Barriers in Current Landscape

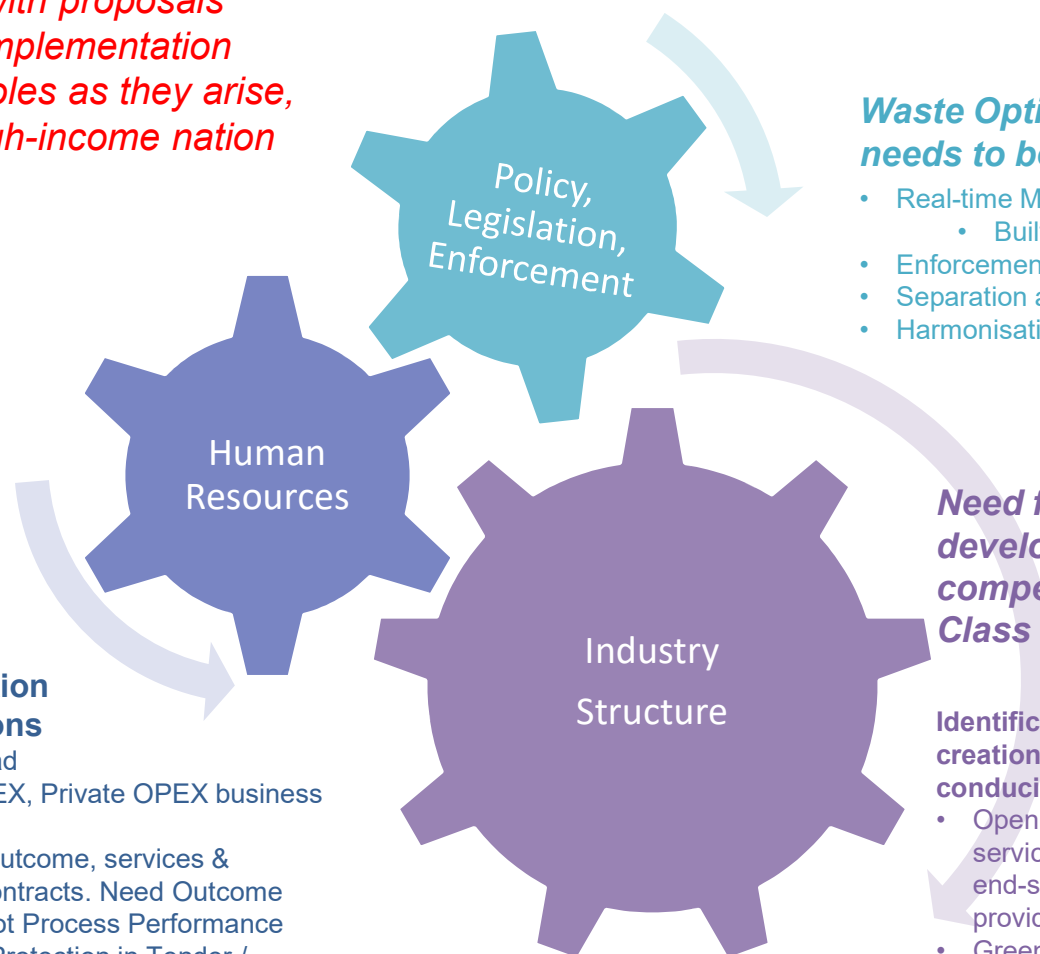
*GoM needs to adopt an **Industry Development mindset & skillset***

- to:*
- deal proactively with proposals*
 - react & remedy implementation breaches / loopholes as they arise, in transition to high-income nation model.*

Capacity Building needed for requisite skills competency in Business Strategic, Contracts, Legal, Policy & Technical Evaluation Expertise

Need Improved Protection for GoM in PPP situations

- No more BOT, BOO instead
- Inefficiencies in GoM CAPEX, Private OPEX business model
- KPI should be specific to outcome, services & standards in Tenders & Contracts. Need Outcome Performance-based KPI not Process Performance KPI (eg: Facility Lifespan Protection in Tender / Contract KPI)



Waste Optimisation Mandate needs to be strengthened

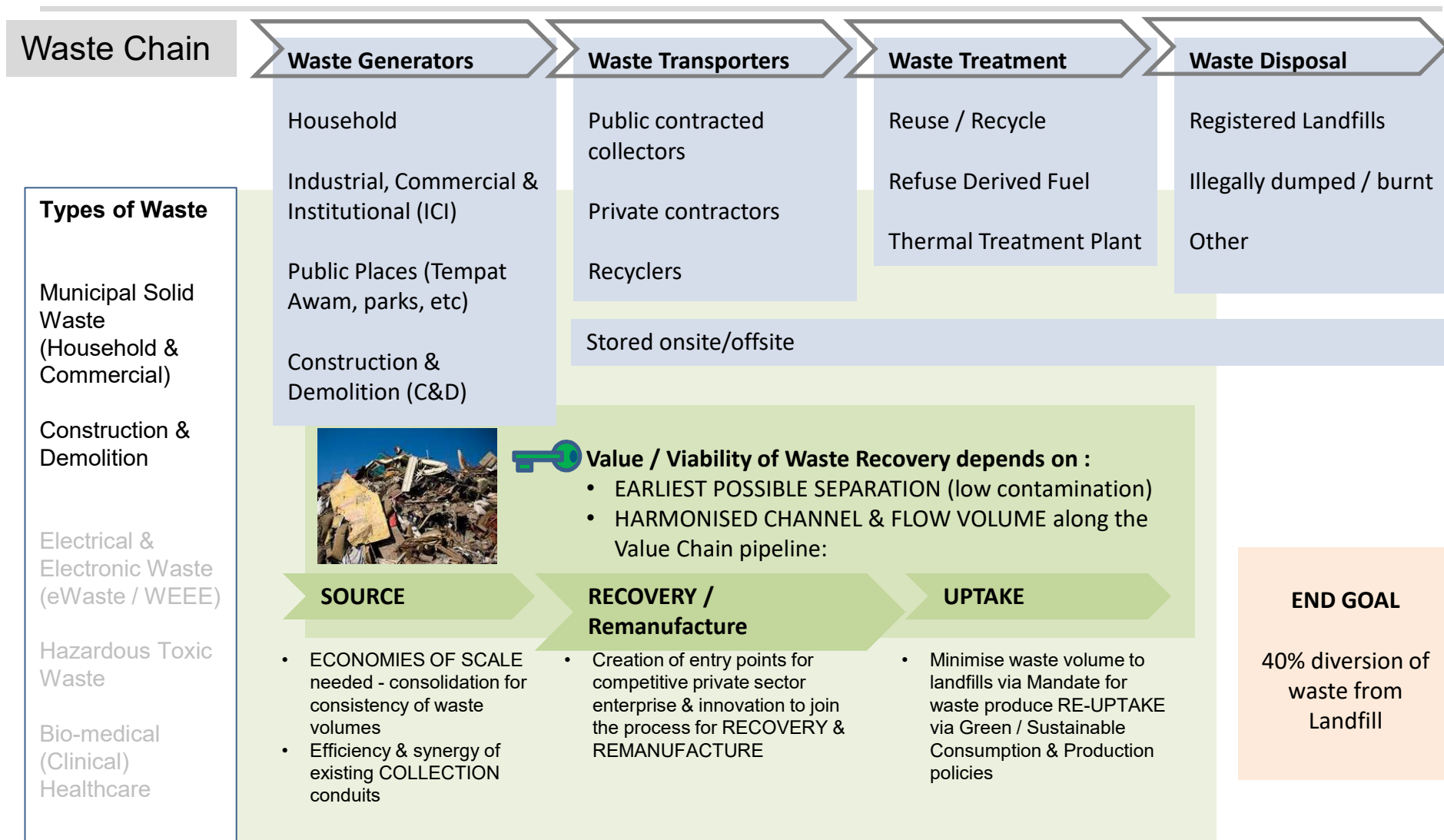
- Real-time MSW Feedstock Database
 - Built-in data reporting, all new tenders
- Enforcement culture
- Separation at Source
- Harmonisation of Acts / Policies

Need fast-track industry development to catalyse a competitive, vibrant World-Class waste recovery industry

Identification of current weakness & creation of market mechanisms for conducive market structure

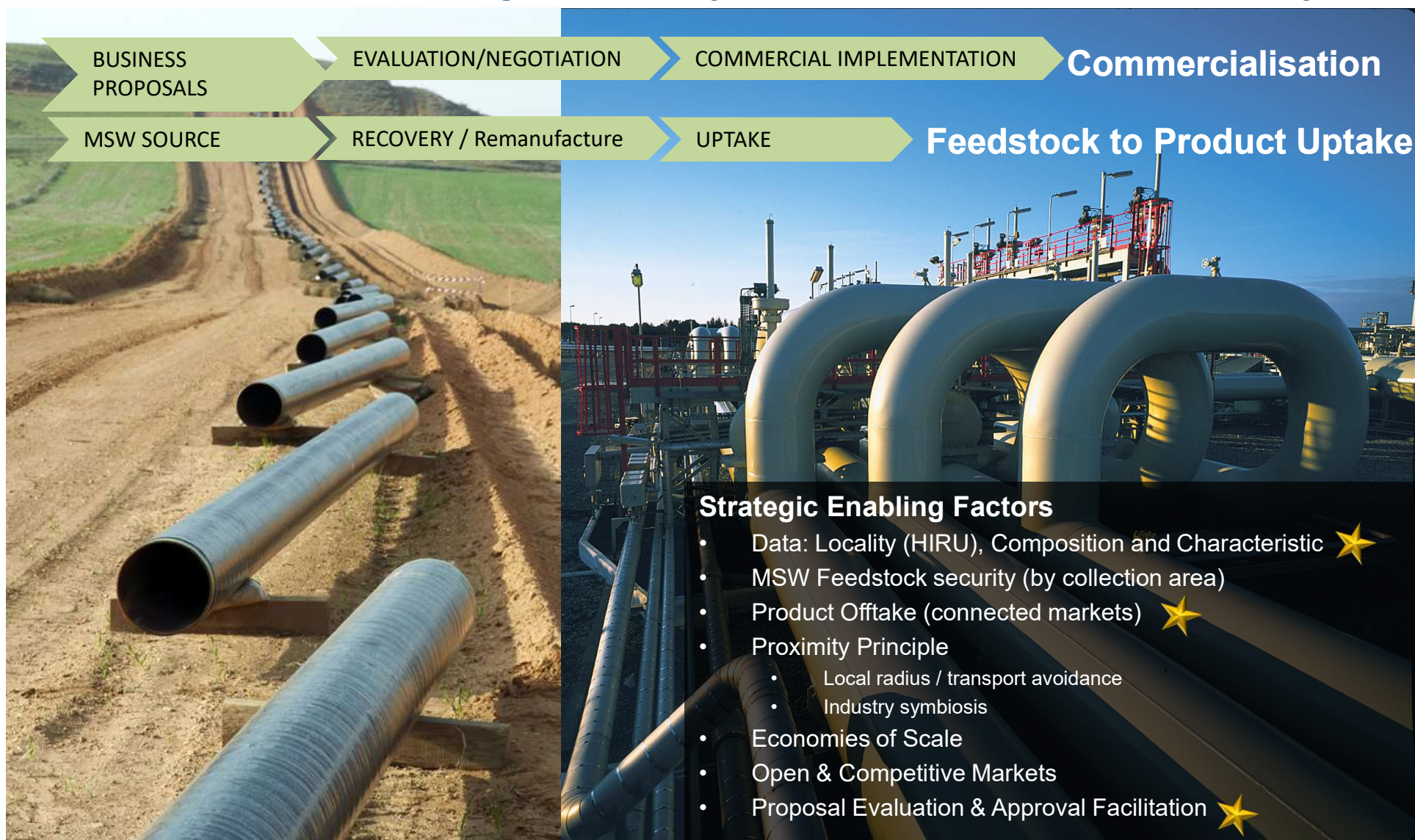
- Open up market entry pipeline in various service segments between mid-stream & end-stream for Waste Treatment service providers
- Green financing, liquidity / seed capital

Current Landscape of SWM – Market Creation



Problem Origination Analysis:

Broken Pipelines Impeding the Viability of SWM Waste-To-Wealth industry



Problem Origination

Pipeline Flow Viability: TARGET OUTCOMES

TARGET OUTCOME / KPI

BUSINESS PROPOSALS TO COMMERCIAL IMPLEMENTATION PIPELINE

PROPOSALS

- TREMENDOUS INTEREST of private sector proposals, may be willing to test small pilots with ZERO COST to Federal Govt

EVALUATION/NEGOTIATION

- No **SOP & MECHANISM** for evaluation, elimination & selection
- No training / skills development: current format JPSPN geared at building infrastructure, not industry development

COMMERCIAL IMPLEMENTATION

- Private Sector must be held to appropriate outcome-based KPIs
- JPSPN must have dedicated manpower for monitoring, enforcement & termination of sub-par Private Sector performance

- **Diversion of Tonnage from Landfills**
- **Formation of the Evaluation Mechanism**



MSW FEEDSTOCK TO PRODUCT UPTAKE PIPELINE

MSW SOURCE

- Usable & Updated location & availability Data
- Catchment Area Service Needs Statement
- Identify suitable feedstock economy-of-scale
- Leverage on efficiency of existing Collection conduits

RECOVERY / Remanufacture

- Creation of entry points for competitive private sector enterprise & innovation to join the SWM process for RECOVERY & REMANUFACTURE

UPTAKE

- Carve out the product uptake **ECONOMIES OF SCALE** needed to **catalyse** private sector production from within existing GoM purchasing
- Prioritise MSW for Energy use as other higher-purity Feedstocks have better alternative uses

Products

Energy

- **Minimise waste volume to landfills via Mandate for waste-reclaimed product RE-UPTAKE**

WORKSTREAM 4

PUBLIC CLEANSING



Objective and Guiding Principles for the Public Cleansing work stream

Objective

This work stream aims to explore options to address the unforeseen high cost of Public Cleansing to the Federal Government

Guiding Principles

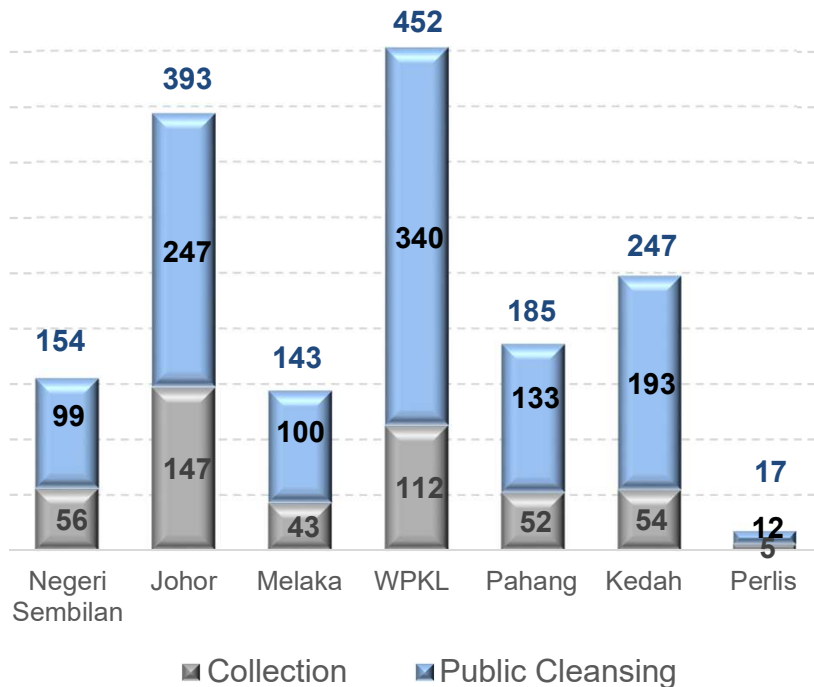
Guiding principles established through syndication sessions with the Minister:

1. Achieve cost optimization for Public Cleansing
2. Avoid revising the amount agreed to be paid to Concessionaires before 2018 (as it affects their investment for the first cycle of the Concession period)

In 2014 alone, the Federal Government spent RM1.18 bil on Public Cleansing

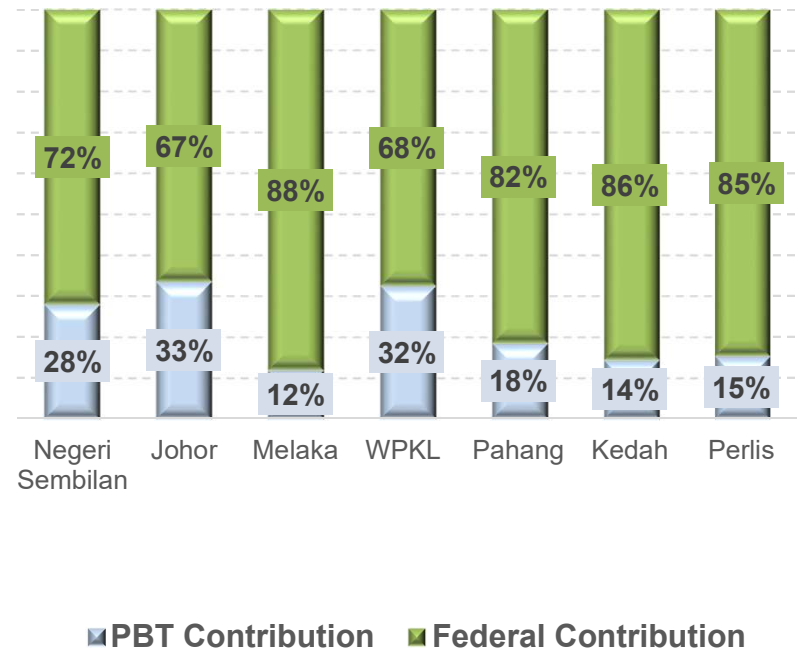
Total payment to Concessionaires in 2014 was about **RM1.594 bil**, out of which **70% (or RM1.124 bil)** was for Public Cleansing

**Total Payment to Concessionaires
Collection vs. Public Cleansing (RM, mil)**
Jan 2014 – Dec 2014

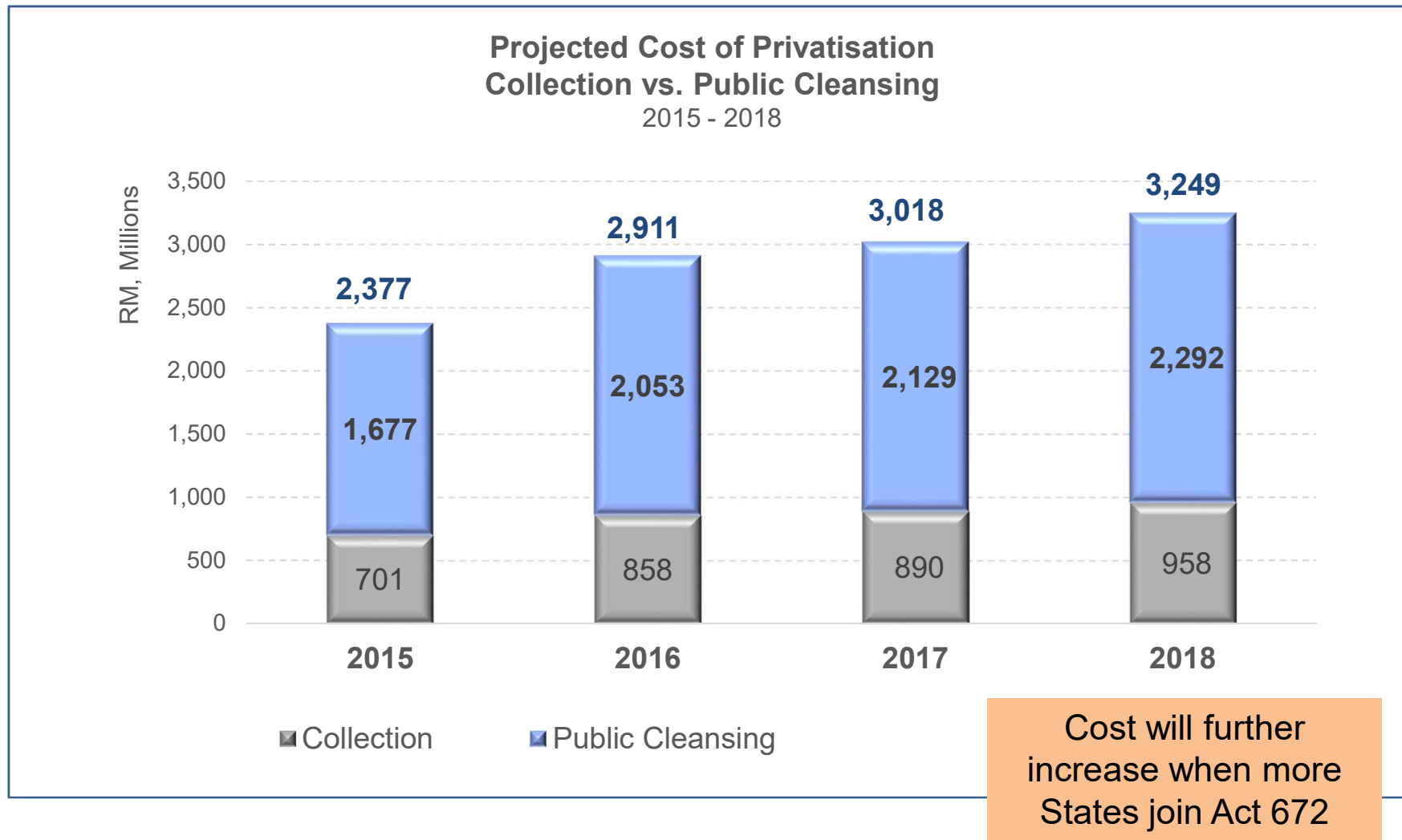


Of the total amount spent, **74% (or RM1.182 bil)** was contributed by the Federal Government

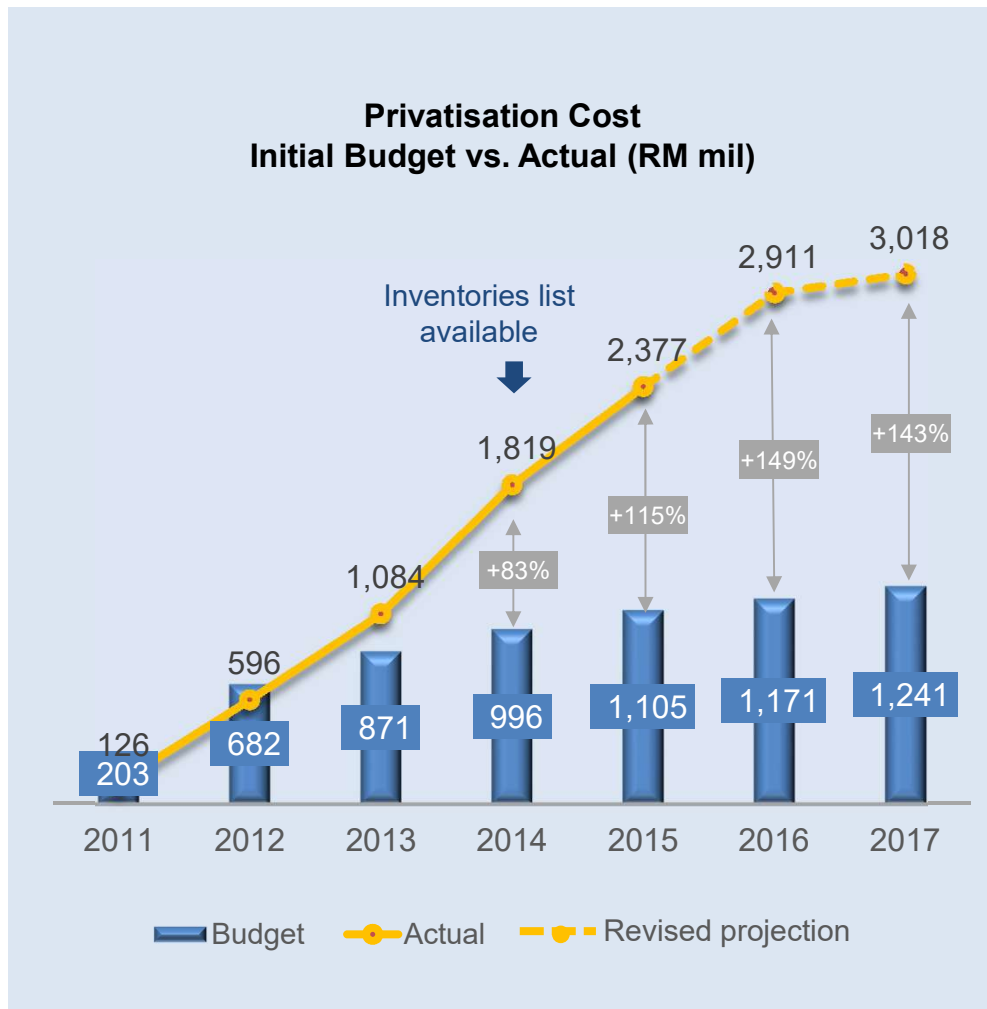
**Total Payment to Concessionaires
Federal Government vs. PBT Contribution (%)**
Jan – Dec 2014



The total cost of privatization will continue to increase, with significant contribution from Public Cleansing



However, the initial budget projections are insufficient to cater for the current cost of Public Cleansing



Contributed largely by an **underestimation of the total cost of Public Cleansing** prior to the enactment of Act 672

Previously, the real cost was not known:

- Lack of precise measurement and data on inventories
- Underestimation of the quantity of inventories in initial calculation
- Higher labour requirements to uphold service levels

Therefore, the cost is now high compared to initial projection

Three broad areas of options are explored to achieve cost optimization of Public Cleansing to the Federal Government

1 Review Concession Agreement in 2018

2 Carve out Public Cleansing from Act 672
(either partially or fully)

3 Strengthen enforcement



Three broad areas of options are explored to achieve cost optimization of Public Cleansing to the Federal Government

1

Review Concession Agreement in 2018

- (A) Introduce three (3) categories of standard levels and associated scope and frequencies of services**
- (B) Increase scope of services with no increase in current rates**



Option 1: Introduce three (3) categories of standard levels and associated scope and frequencies of services

Review service structure and frequency based on set standards *(subject to further study)*

Introduce three (3) categories of standards for each activity, in each area within PBT:

Category 1



- High population zones
- Tourist areas
- High frequency in public visits and activities
- Administration zones
- Protocol Area
- CBD

Category 2



- Mid population zones
- Mid frequency in public visits and activities

Category 3



- Low population zones
- Low in tourists
- Allow for ad hoc requests by PBTs for increased frequencies upon request

Step 1: Determine the areas that fall into Category 1, 2 and 3

Step 2: Determine the standard levels of each activity/ service for each of the area

- Each category of standards will have different structures and frequency of services



Category 1: Where additional requirements are required, additional cost is to be borne by PBTs on actual cost



Category 2: Current standards in CA hold



Category 3: For reduced frequency, there will be potential reduced amount collected from PBT for KWSPPA

Spending is optimized and overall cost to Fed Govt is expected to decrease

Proposed baseline standards for each grouping – *subject to further study* (1 of 2)

Proposed Categories by Activity and Area				
Service/ Activity	Current Frequency (Baseline)	Category 1	Category 2	Category 3
Public Road Cleansing				
A) Protocol Road	Daily	Daily	Daily	Daily
B) Main/ commercial road	6 times per week	Daily or Twice Daily	6 times per week	N/A
C) Industrial Road	1 time per month	As decided by RIC	1 time per month	N/A
D) Residential Road	As decided by RIC	Minimum 1 time per month OR As decided by RIC	As decided by RIC	As decided by RIC
E) Pedestrian bridge, flyover, tunnel	Daily	Daily	As decided by RIC	As decided by RIC
Public places cleansing	Daily	Daily (to revise KPI on cleanliness level – to consider litter picking and washing services)	Daily	N/A
Public toilets cleansing	Daily	Daily	Daily	Daily
Public drains cleansing	1 time per month	1 time per month (to revise scope of service & KPI – to include standards service levels for closed drain, monsoon drain)	Open drain - 1 time per month Closed drain - 1 time per 2 months	Open drain - 1 time per month Closed drain - 1 time per 2 months New area – effective 3 months (subject to further study on needs)

Proposed baseline standards for each grouping – *subject to further study* (2 of 2)

		Proposed Categories by Activity and Area		
Service/ Activity	Current Frequency (Baseline)	Category 1	Category 2	Category 3
Hawker Centres	Daily	Daily	Daily	Daily
Market	Daily	Daily	Daily	Daily
Pasar Malam, Pasar Tani, Pasar Pagi	As decided by RIC	As decided by RIC	As decided by RIC	As decided by RIC
Clearing of Illegal Dumping	On call	On call	On call	On call
Public Beach Cleansing	Daily	Daily	Daily	N/A
Kerbside grass cutting	2 times per month	2 times per month OR as decided by RIC	2 times per month	1 time per month
Grass cutting in public places	2 times per month	2 times per month OR as decided by RIC	2 times per month	1 time per month
Removal of carcasses	On call	On call	On call	On call

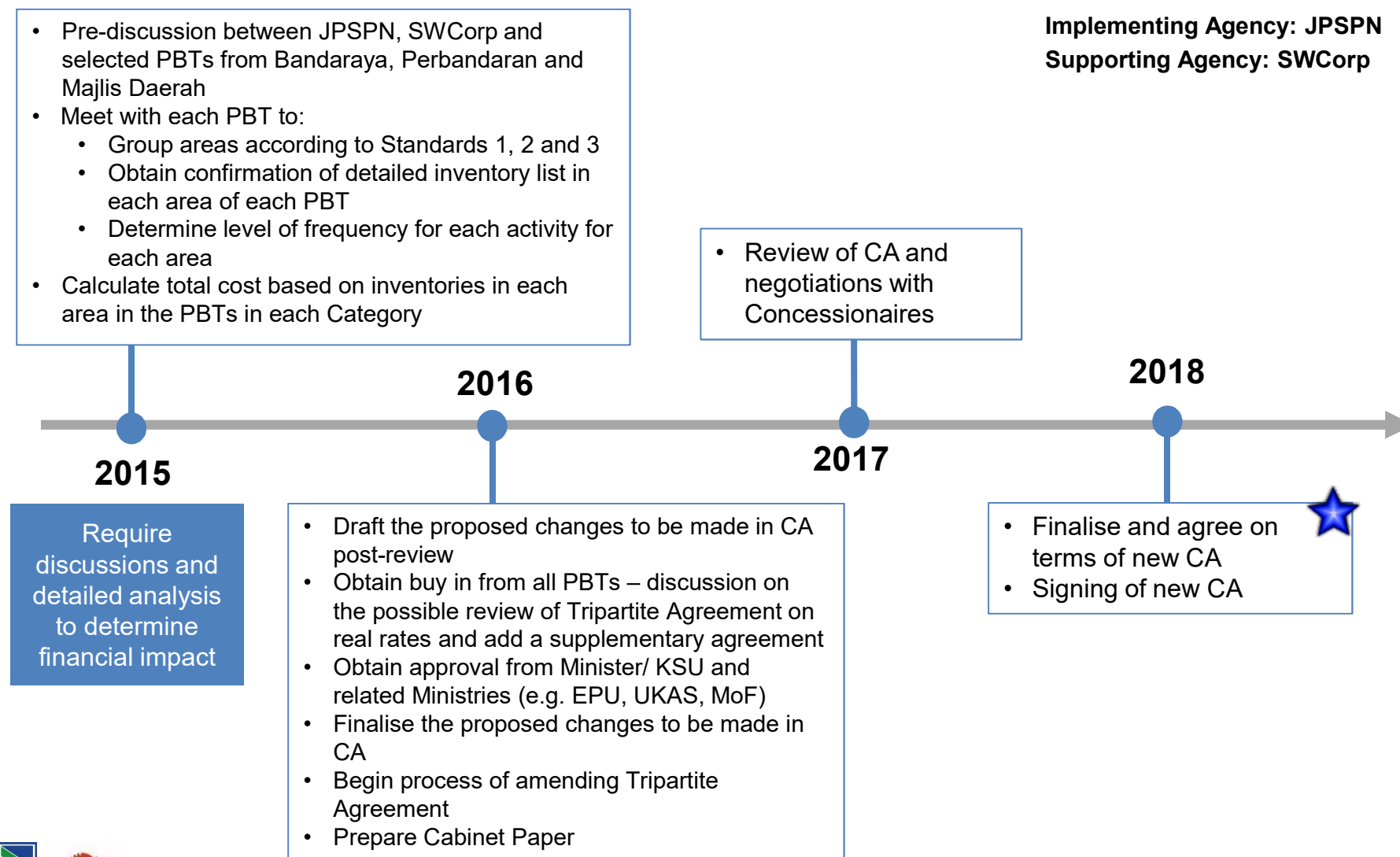
This option will create optimization of spending according to specific needs and requirements of PBTs

Positive Impact	
✓	Spending is optimized as per the different requirements of areas
✓	Overall cost to Fed Govt. is reduced
✓	Focus on critical areas to raise quality of output

No	Potential Implications/ Challenges	Possible mitigation actions
1	PBTs are not willing to make additional payments based on actual cost	PBTs can choose to remain with current standards (i.e. Category 2)
2	Some PBTs may dispute/ reduce contribution to the KWSPPA fund	Meetings and discussions with all PBTs to agree on areas and activities to be placed in Category 1, 2 and 3
3	PBTs with areas and activities under Category 1 may have dispute on bearing the full portion of the additional cost according to real rates	Requires amendment to the clause on Contribution Fund in the Tripartite Agreement - to state contribution by PBT on extra activities will be based on the real cost to the Federal Government
4	Certain PBTs (e.g. DBKL) may want service level above current services and new scope	To have a supplementary agreement with Concessionaires for scope beyond the CA
5	Public may complain on reduced frequencies and service on Category 3 areas	Discussions with all PBTs to ensure areas under Category 3 is targeted and would not cause considerable public impact
6	Dispute from Concessionaires and potential legal action taken against GoM	<ul style="list-style-type: none"> • Introduce changes in 2018 for lower impact • Syndication with Concessionaires • To explore protection of Government in Clause 30 in CA – National Interest (confirm with BUU KPKT)

Implementation timeline

Implementing Agency: JPSPN
Supporting Agency: SWCorp



Implementation Plan

	Action Required	Expected timeline	Parties Responsible/ Involved
1	Pre-discussion between JPSPN, SWCorp and selected PBTs from Bandaraya, Perbandaran and Majlis Daerah	By Aug 2015	JPSPN, SWCorp and selected PBTs
2	Meeting through SUK to discuss with each PBT to: <ul style="list-style-type: none"> • Group areas according to Standards 1, 2 and 3 • Obtain confirmation of detailed inventory list in each area of each PBT • Level of frequency for each activity for each area 	By Feb 2016	JPSPN, SWCorp & SUK PBT
3	Calculate total cost based on inventories in each area in the PBTs in each Standard group (based on two rates – interim and actual)	By Mar 2016	JPSPN & SWCorp
4	Draft the proposed changes to be made in CA post-review	By May 2016	JPSPN, PUU KPKT
5	Obtain buy in from all PBTs – discussion on the possible review of Tripartite Agreement on new rates and add a supplementary agreement	By Jul 2016	JPSPN, PUU KPKT, SWCorp
6	Obtain approval from Minister/ KSU and related Ministries (e.g. EPU, UKAS, MoF)	By Sep 2016	JPSPN
7	Finalise the proposed changes to be made in CA	By Dec 2016	JPSPN, PUU KPKT, SWCorp, UKAS, MoF, AGC
8	Begin process of amending Tripartite Agreement	By Dec 2016	JPSPN, PUU KPKT, SWCorp, AGC
9	Prepare Cabinet Paper	By Dec 2016	JPSPN, UKAS
10	Review of CA and negotiations with Concessionaires	By Dec 2017	JPSPN, SWCorp, UKAS, MoF, Concessionaires
11	Finalise and agree on terms of new CA	By March 2018	JPSPN, SWCorp, UKAS, Concessionaire
12	Sign terms of new CA	Sep 2018	JPSPN, SWCorp, UKAS, Concessionaire

Option 2: Increase scope of services with no increase in current rates

Rationale

- The current scope contained in the CA is insufficient to maximize the impact of public cleansing
- Hence, certain PBTs request for additional services

Proposal

- **To increase the scope of services without increase in current rates (in 2018 CA review)**
- Additional scope to include, inter alia:
 - Washing of roads
 - Continuous litter picking
 - Continuous maintenance of the cleanliness of CBD area (including protocol roads and main roads)
 - Provide at least the same level of services for PBTs pre-Act 672, even as the scope is beyond the CA (e.g. cleansing of bus stop, flyover, pedestrian walkway roofing, road signage, road furniture)

Action Required

- Present proposed additional scope of services to the Regional Implementation Committee (RIC) for discussion and to obtain consensus
- Finalise proposed changes and obtain endorsement from Service Level Committee (SLC)

Rates to Concessionaires remain the same with better service levels being provided to the Public

High Level Implementation Plan

What is to be done?

- Draft proposed additional scope of services
- Bring matter to the Regional Implementation Committee (RIC) for discussion and to obtain consensus
- Finalise proposed rates, scope of services and/or area of coverage
- Provide details at Service Level Committee (SLC)
- Obtain endorsement from SLC

Who is responsible?

Implementing Agency: JPSPN
Supporting Agency: SWCorp

Expected timeframe

2015 to 2018

Key Success Factors

- Agreement from Concessionaires

Stakeholders

- Concessionaires, PBTs, State Governments

Positive Impact

- ✓ Better service levels to PBTs and the public
- ✓ Optimised current cost to obtain increased output
- ✓ Overall impact of public cleansing activities is maximised

Potential Implication

Push back from Concessionaires due to increased manpower and machineries requirements

Possible mitigation actions

- Introduce changes in 2018 for lower impact
- Syndication sessions with Concessionaires to manage expectations

Three broad areas of options are explored to achieve cost optimization of Public Cleansing to the Federal Government

2

Carve out Public Cleansing from Act 672
(either partially or fully)

- (A) Carve out Public Cleansing from Act 672 and hand it back to the respective PBTs**
- (B) Federal Govt to focus on 4 key activities and hand the remainder back to the respective PBTs**



Option 3: Carve out Public Cleansing from Act 672 and hand it back to the respective PBTs

Current Issues:

Lack of control

- Lack of control by the Federal Govt as the assets belong to PBT
- Maintenance is done by PBT, while cleansing is done by Fed Govt.

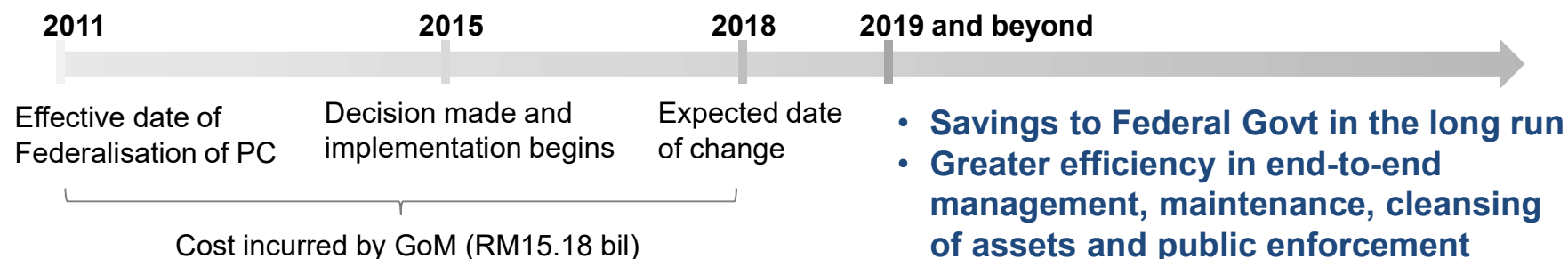
Inefficiencies / PC not looked at in entirety

- Certain PBTs have additional needs, beyond what is stipulated in CA
 - Hence, some PBTs (e.g as syndicated with DBKL, MP Muar and Kuantan), hire other contractors to meet their requirements

High unforeseen costs

- Initial assumption on the privatization cost of PC is no longer valid (due to insufficient inventory data at the time), leading to underestimation of actual cost and large amount of additional funds to be requested from MoF
- While there was a good basis to federalize collection (assets are owned by JPSPN) and centralization will create enhanced efficiency, Public Cleansing is different as PBTs own the assets

Proposal:



This option is expected to result in greater end-to-end efficiency and high cost saving impact to the Federal Government

High Level Implementation Plan

What is to be done?

- Develop and put in place a system that can be replicated and used by all PBTs to manage contracts and monitor the process and output of PC
- Syndicate with all PBTs, Concessionaires and all related agencies, e.g. JPA, UKAS
- Amend Act 672, Tripartite Agreement and CA
- Obtain approval from Minister/ KSU and related Ministries (e.g. EPU, UKAS, MoF, JPA)
- Negotiations with PBTs and Concessionaires
- Prepare Cabinet Paper

Who is responsible?

Implementing Agency: JPSPN
Supporting Agency: SWCorp

Expected timeframe

May take from 2 years to 5 years to obtain Cabinet approval and amend Act, Regulations, CA, Tripartite Agreement

Key Success Factors

- Agreement from all PBTs, Concessionaires

Stakeholders

- Concessionaires, PBTs, State Governments, UKAS, MoF, AGC, EPU

Positive Impact

- ✓ High expected cost saving impact to the Federal Govt
- ✓ Maintenance and cleansing of all Public Cleansing activities to be the responsibility of ONE party, creating cost effectiveness and efficiency in the end-to-end process
- ✓ PBT can deal directly with contractors, without having to go through SWCorp
- ✓ Expected to be implemented in 2018, hence financial risk from legal standpoint may be lower

However, thorough planning and proper implementation are crucial for its success

No.	Potential Implications/ Challenges	Possible mitigation actions
1	Reputation risk for the GoM in the policy reverse	Properly strategized communications plan
2	Non-standardized service level leading to potential decrease in standards	Federal Govt to provide a standardized system and ongoing support to PBTs to manage, monitor and enforce on Public Cleansing services
3	Some PBTs will not be able to afford cost of PC up to desired standards	Federal Govt to provide funding support for high need PBTs, with the condition on being on the panel of tender process
4	There may be minimal cost savings as PBT may incur more cost in appointing contractors and require top up from Fed Govt	Federal Govt to provide support to PBTs on a system and requirements on RFP to appoint suitable contractors at competitive pricing
5	PBT may have additional requests to rebuild the set up/ system (e.g. additional staff, higher management cost), creating additional cost for Fed Govt	Partial transfer of staff from related agencies to assist with PBTs' operations
6	Dispute from Concessionaires and potential legal action taken against Fed Govt	<ul style="list-style-type: none"> To explore protection of Government in <i>Clause 30 in CA – National Interest (to be advised by BUU KPKT)</i> To explore implementing this option in 2018 (during review of CA) to reduce quantum of financial implication
7	Workers who have been transferred to Concessionaires to be given back to PBTs at current cost	Special arrangements with PBT, JPA to transfer staff back to PBT or other agencies
8	Additional workers hired by Concessionaires may be terminated	Special arrangements with PBT, JPA to absorb staff to PBT or other agencies
9	Contractors absorbed by PBTs may not be successful in obtaining tender contracts	Contractors with good track record on KPIs can participate in tender to bid for contract

Implementation Plan (1 of 2)

	Action Required	Expected timeline	Parties Responsible/ Involved
1	Obtain buy-in from KSU and Minister of KPKT	Q3 2015	JPSPN
2	Produce Cabinet Paper to obtain way forward on carving out Public Cleansing from Act 672 (e.g. to conduct a detailed study)	Q3 2015	JPSPN
3	Discussion and negotiation with all PBTs and SUKs on handing back Public Cleansing to them (to determine PBTs that can manage on their own vs. PBTs that need support from Federal Govt)	Q4 2015 – Q2 2016	JPSPN, SWCorp
4	Work out the financial support required by PBTs from Federal Government	By Q2 2016	JPSPN, MOF, UKAS
5	Prepare guidelines on selection of contractors, standard service levels, KPIs	By Q2 2016	JPSPN, SWCorp
6	Discussion with JPA on the takeover of staff by PBT from Concessionaires and new recruitment	Q2 2016	JPSPN
7	Negotiations with Concessionaires and determine legal and financial implications to the Federal Government	Q2 2016 – Q2 2017	JPSPN, UKAS, MoF, Jawatankuasa Penswastaan
8	Draft amendment on Tripartite Agreement	Q3 2016	JPSPN, BUU KPKT, AGC, SWCorp
9	Draft amendment on Act 672 and all related Acts and regulations	Q3 2016 – Q3 2017	JPSPN, BUU KPKT, AGC, SWCorp

Implementation Plan (2 of 2)

	Action Required	Expected timeline	Parties Responsible/ Involved
10	Draft amendment on Concession Agreement and all Appendices under it	Q3 2016 – Q3 2017	JPSPN, BUU KPKT, AGC, SWCorp
11	Prepare Cabinet Paper to obtain approval on Carving out PC from Act 672	Q3 2017	JPSPN, SWCorp, UKAS, MOF
12	Circulate and obtain feedback/comments from all related Ministries and Agencies on the Cabinet Paper	Q3 2017	JPSPN
13	Bring paper to Cabinet for approval	Q4 2017	JPSPN
14	Present amended Acts to Parliament for approval	Q1 2018	Minister of KPKT
15	Re-inforcement of all amended regulations and Acts	Q1 2018	Minister of KPKT
16	Sign amended CA	Q1 2018	KSU KPKT, CEO of SWCorp

Option 4: Federal Govt to focus on four (4) key activities and hand the remainder back to the respective PBTs

To be held by Federal Govt:

1. Public Roads / Streets
2. Public Drainage
3. Grass cutting – Roadside & Public Areas
4. Illegal Dumping

Rationale for these activities:

- *High impact activities*
- *Requires added focus in enforcement*



To be given back to respective PBTs:

1. Public Places
2. Public Toilets
3. Markets
4. Hawker Centres
5. Beaches
6. Removal of carcasses

Key enablers required to ensure the success of this option:

1. Standard Guidelines and Enforcement by PBT on the 6 activities
2. Education and awareness to the public
3. Federal to provide top up funding to PBTs that cannot afford
4. Positions to be given back to PBT

Enables Federal Govt to focus on key activities and PBTs to handle activities that result in greater efficiency

High Level Implementation Plan

What is to be done?

- Develop and put in place a system that can be replicated and used by all PBTs to manage contracts and monitor the process and output of PC
- Syndicate with Concessionaires and all PBTs
- Amend Act 672, Tripartite Agreement and CA
- Obtain approval from Minister/ KSU and related Ministries (e.g. JPM – EPU & UKAS, MoF)
- Negotiations with Concessionaires
- Prepare Cabinet Paper

Who is responsible?

Implementing Agency: JPSPN
Supporting Agency: SWCorp

Expected timeframe

May take from 2 years to 5 years to obtain Cabinet approval and amend Act, Regulations, CA, Tripartite Agreement

Key Success Factors

- Agreement from all PBTs, Concessionaires

Stakeholders

- Concessionaires, PBTs, State Governments, UKAS, MoF, AGC, EPU

Positive Impact

- Federal Government is able to focus on the four key activities only
- Will free up enforcers to be deployed in the critical areas
- Maintenance and cleansing of the four key Public Cleansing activities to be the responsibility of ONE party, creating cost effectiveness and efficiency in the end-to-end process
- Cost reduction impact is low, however it reduces escalating costs as more PBTs join Act 672

Potential Implications

- Some PBTs may not accept the remaining activities or only partial acceptance
- Dispute from Concessionaires and potential legal action taken against GoM
- Drop in service levels for the remaining activities (esp. for PBTs that cannot afford the cost)
- PBT may have additional requests to rebuild the set up/ system (e.g. additional staff, higher management cost), creating additional cost for Fed Govt
- Dispute from PBT (esp. bigger ones)
- Will create grey area of responsibilities of Concessionaires vs. PBT
- Workers transferred to Concessionaires to be given back to PBTs

Three broad areas of options are explored to achieve cost optimization of Public Cleansing to the Federal Government

3 Strengthen enforcement

- (A) Introduce punitive action on **PBT** should payment not be made according to agreed terms
- (B) Strengthen enforcement on non-performing **Concessionaires**

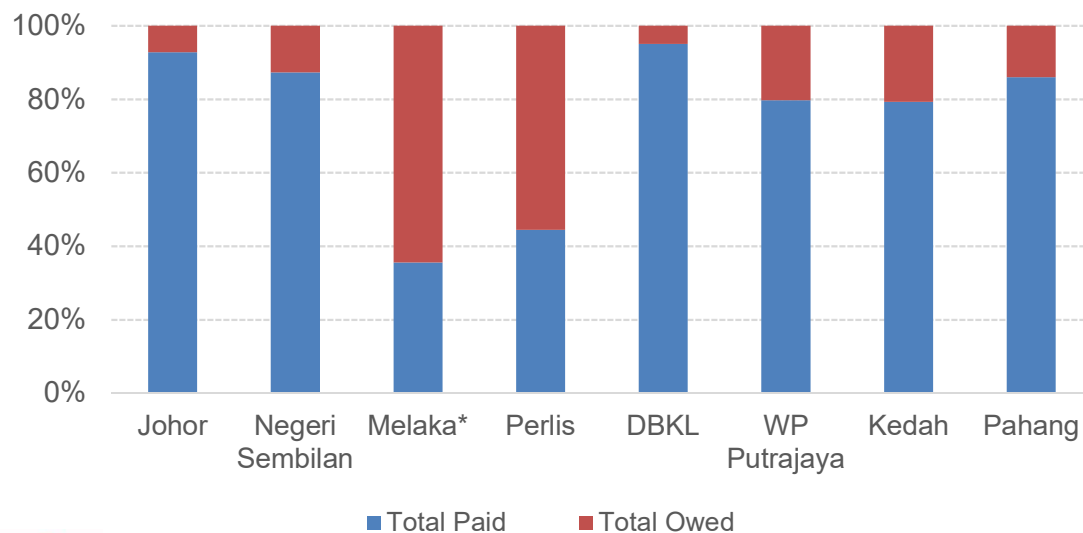


Option 5: Introduce punitive action on PBT should payment not be made according to agreed terms

A total of **RM286.9 mil** is owed by PBTs to the KWPSPPA fund, based on the agreement of 60% cost to PBT and 40% to Federal Government

- In the Tripartite Agreement, PBT is to provide contribution (“sumbangan”) to the Federal Government
- Verbal Agreement: PBT to contribute amount equal to amount paid to contractors pre-Act 672 and SWCorp to top up the remainder

Summary of Claims & Payments from PBTs (By State)
FY 2011 to Mar 2015



Proposed Action to be taken:

- SWCorp to not accept new areas under the PBT
- Reduce services after a pre-determined period of failed contribution in full

To increase certainty of funds received from PBTs and reduce financial burden to the Federal Government

High Level Implementation Plan

What is to be done?

- Draft clause to be inserted in the Addendum of Tripartite Agreement
- Obtain approval from KSU KPKT
- Send to AGC for verification and approval
- Obtain consent from all three parties
- Signing of Addendum

Who is responsible?

Implementing Agency: JPSPN
Supporting Agency: SWCorp, BUU KPKT, AGC

Expected timeframe

By end of 2015

Key Success Factors

- Consent from all PBTs, States, AGC

Stakeholders

- PBTs, State Governments, BUU KPKT, AGC

Positive Impact

- ✓ Increase the collection rate of funds from PBT, thereby reducing the need for top up from the Federal Government
- ✓ Provide certainty on the available funds for Public Cleansing activities

Potential Implication/Challenges	Possible mitigation actions
Dispute from PBTs	Syndication sessions to manage the expectations of PBTs
Non-agreement from AG Chambers	May require intervention of Minister and KSU

Option 6: Strengthen enforcement on non-performing Concessionaires

No. of Cleansing Zones where termination can be enforced due to non-performance of KPIs for the period of Jan - Apr 2015
(under dispute from Concessionaires)

Concessionaire	Public Cleansing Service	No. of Cleansing Zones
Alam Flora	Grass Cutting	11
	Drain Cleansing	15
	Road Cleansing	12
	Total	38
E-Idaman	Grass Cutting	5
	Drain Cleansing	7
	Road Cleansing	3
	Total	15
SWM	Grass Cutting	14
	Drain Cleansing	25
	Road Cleansing	11
	Total	50
	Grand total	103

Termination action can be taken on 103 cleansing zones due to non-performance of KPIs

To ensure the outcome received is commensurate to the cost incurred for Public Cleansing

Current situation:

- Penalty is given for breach of KPIs
- However, termination has not been enforced due to dispute and inconsistent understanding of KPIs

Planned action:

- To **address the dispute and clarify KPIs** – workshop to be held in July 2015 between SWCorp, JPSPN and Concessionaires
- JPSPN/ SWCorp to come up with **a plan covering: appropriate grace period given and timeframe to look for a new contractor** should there be a termination

JPSPN/ SWCorp to be given full authority to strengthen enforcement on non-performance according to agreed KPIs

Positive Impact

- ✓ Create disincentive for breach of KPIs
- ✓ Increased performance of Concessionaires and contractors, leading to better value for the cost incurred
- ✓ Empower SWCorp officers

Potential Implication

Dispute from Concessionaires

Possible mitigation actions

- SWCorp and JPSPN to hold engagement sessions to ensure definition of KPIs are detailed, clear and agreed upon to avoid them being open to interpretation and dispute
- Obtain formal agreement from Concessionaires

Key enablers to ensure the long term sustainability of public cleanliness

Key Enablers

- (A) Strengthen enforcement on the public**
- (B) Strengthen planning and operations management by PBT**



Key Enabler 1: Strengthen enforcement on the public

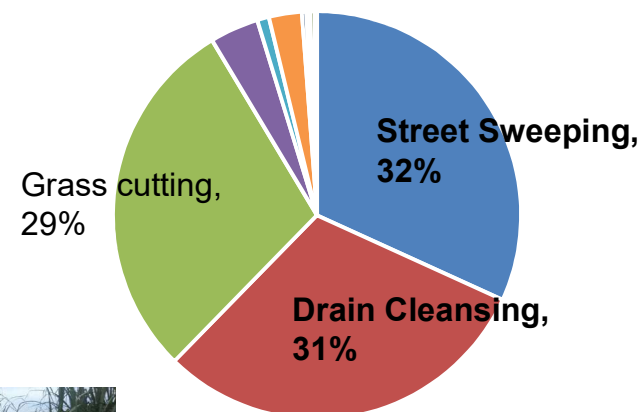
Current situation:

- General public attitude towards littering and illegal dumping is poor and lack care
- Foreigners are key contributors of litters and waste disposal outside of designated areas
- **Lack of action taken on public offense** (no consequences on adverse behavior)
 - Power of collection and cleansing handed over to JPSPN, however, the **power on anti-littering enforcement is unclear** and is not done by PBT or SWCorp
 - AGC advised that anti-littering falls under Section 71 of Act 672 (illegal dumping), where the power to enforce falls with JPSPN and the power to execute can be given to PBT. However, the **stipulated degree of punishment is too high for littering** (as it relates to illegal dumping)
 - To take action on offenders, the current **process is long and involves multiple steps**

Impact:

- Currently, road sweeping and drain cleansing contributes the most to the cost of public cleansing
- Public littering is a key contributor to the amount of cleaning required

Percentage spend of Public Cleansing activities (Jan 2015)



Sorong Tuanku Abd Rahman, WPKL



Pekan, Pahang



Kg Benteng, WPKL

Buiding the right public behavior enables Public Cleansing activities to be carried out in an efficient and sustainable manner

Action to be taken:

1. Introduce a mechanism to control public littering

- Amend Act 672 to include a specific clause to give power to SWCorp on the enforcement of public littering
- Delegate power to capable PBTs with adequate resources to carry out enforcement

2. SWCorp to increase focus on public enforcement:

- Enforcement officers to be placed in areas with high propensity for illegal dumping and public littering
- Review the process of enforcement to shorten timeframe and increase severity of punishment

Expected outcome:

- ✓ Reduced frequency in the cleaning of drains and illegal dumpsites, leading to reduced cost
- ✓ The right public behavior is developed in creating a cleaner country for long term sustainability
- ✓ Increase revenue through fines
- ✓ SWCorp enforcement officers are empowered

Key Enabler 2: Strengthen planning and operations management by PBT

• Management and enforcement of market cleanliness

Current situation:

- Currently, the cleaning of the whole market (including the stalls) is being done by the Concessionaires
- Charges are as per the size of the whole market
- This creates disincentive for market tenants to upkeep the cleanliness of their respective stalls and the market
- Leads to high cost incurred by the Federal Government

Proposed:

- PBTs to appoint a third party company to manage the operations of market cleanliness
- PBTs to manage and carry out enforcement on market tenants
- The onus will be on market tenants to keep their booths clean and operate within the stipulated timeframe and boundaries
- Non compliance will result in strict action to be taken by PBT (e.g. non-renewal or revoke of license)
- The policy on hawking as related to markets needs to be clearly redefined



Expected outcome:

- ✓ Reduced cost to Federal Government due to reduced scope of services
- ✓ Better management and sustainability of market cleanliness

Proper planning and guidelines are required to ensure the optimization of outcomes

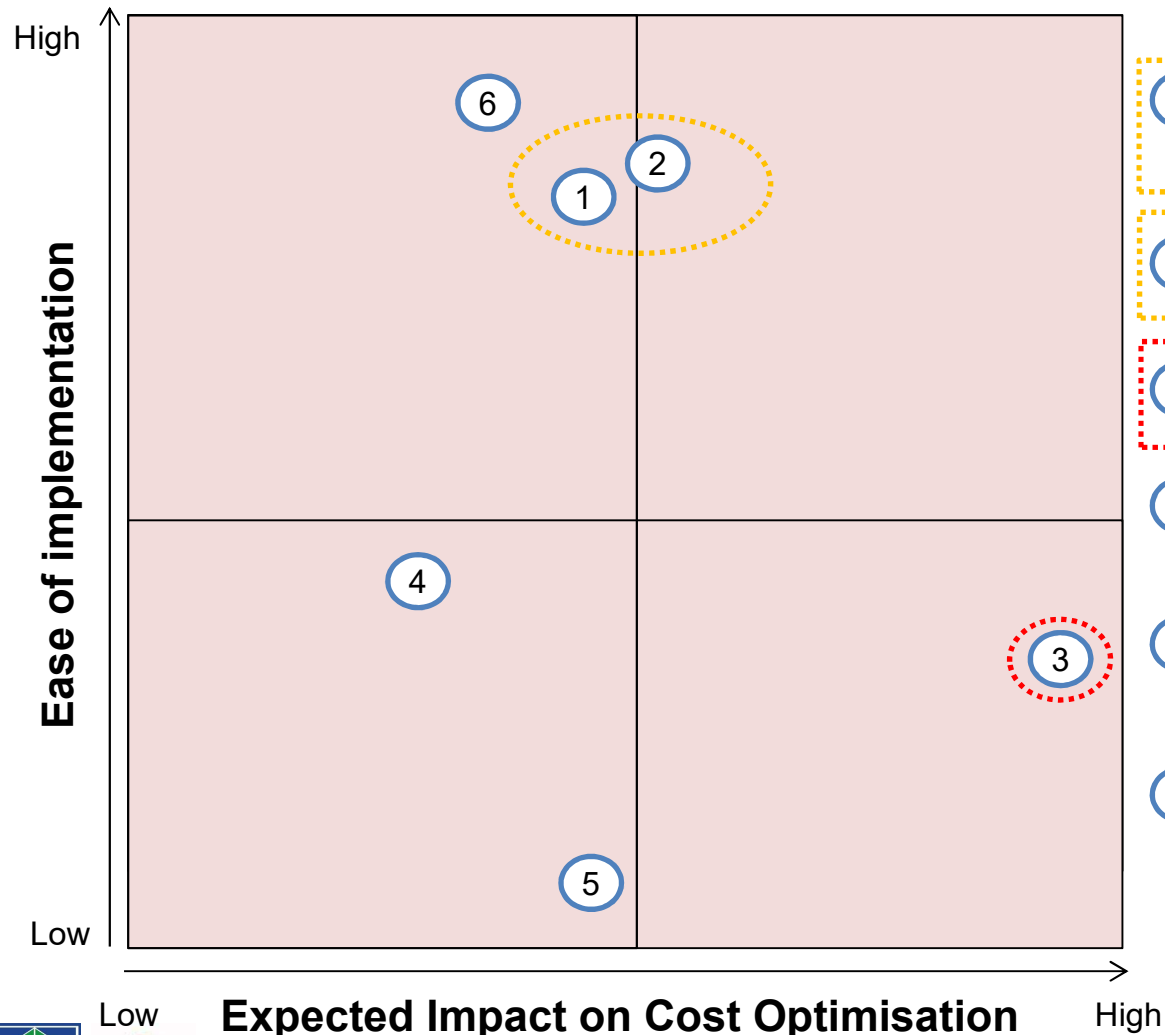
- **Proper planning on:**
 - **Drains – Ensuring proper gradient of drains, closed and underground drains for new development**
 - **Requirements of new housing developments**
 - **Grease traps**
 - **Types of trees and grass grown**



Action to be taken:

1. Planning: Discussions with PBTs to obtain input
2. **JKT to produce detailed and clear guidelines**
3. **JKT to issue the circular and guidelines to all PBTs**
4. Meetings with PBTs to provide guidance and ensure progress

Options Prioritisation Matrix



Proposed Options:

- 1 Introduce three (3) categories of standard levels and associated frequencies of services
- 2 Increase scope of services with no increase in current rates
- 3 Carve out PC from Act 672 and hand it back to PBT
- 4 Federal Govt to focus on 4 key activities and hand the remainder back to PBT
- 5 Introduce punitive action on PBT should payment not be made according to agreed terms
- 6 Strengthen enforcement non-performing Concessionaires

Feedback from stakeholders...

Ministry of Finance (MoF) and UKAS:

- **Concern is on the high cost of Public Cleansing** and the increase beyond current projections when more states and PBTs join Act 672
- No objection on any of the options presented, and **would support the option with the highest financial impact** to the Government

PBTs:

- Some PBTs believe that they can manage Public Cleansing well if given the same amount spent by Federal Govt now
- However, **unless structural issues are addressed, many PBTs are not willing to take back the responsibility of Public Cleansing** due to reasons such as:
 - PBT has already been downsized and manpower handed out
 - It would disrupt the current system that has been put in place
 - The drop in service level (esp. for smaller PBTs with limited income) will affect the image of the PBT and Fed Govt.
 - Potential grey areas in terms of areas of coverage and complications where multiple parties are involved

Concessionaires:

- The current cost of Public Cleansing reflects the true cost
- PC should continue at the current structure and cost to achieve optimal standards of output
- Carving out of PC from Act 672 is seen as a step backwards for the country
- Options impacting Concessionaires (e.g. carving out of PC) will result in financial implications for Concessionaires and compensation will be sought

Conclusion...

Further action is required for preferred option(s) – *(to be decided by Minister and KSU of KPKT)* :

- Comprehensive **data gathering**
- Detailed analysis on **financial impact**
- Detailed discussions with all relevant parties to produce **3-feet implementation plan(s) for selected option(s)**

APPENDIX:

Other options discussed at the lab

Option 7: Alternative treatment of non-PBT areas

Areas currently serviced by Concessionaires:

1 All PBT areas
(incl. residential, commercial and industrial)

2 Certain areas under other agencies (e.g. JKR and JPS)

Proposed:

Assets owned by PBTs (as covered in Act 672):
Continued to be serviced by Concessionaires

Non-PBT owned assets and areas:

Option 1: Hand the responsibility back to the relevant agencies (e.g. JKR roads, JPS monsoon drains)

- Smoothen out service levels
- Involves a thorough discussion between Ministers and KSUs of all relevant Ministries to finalise the decision
- No impact on CA and Tripartite Agreement

Option 2: Take over the services with contribution of budget from the respective agencies)

- Contract to remain with Concessionaires
- Based on actual cost in CA

Option 3: Open bidding (by JPSPN) to obtain more attractive rates

- Continue to be managed by SWCorp
- No impact on CA, Tripartite Agreement

Option 8: Separate Public Cleansing from Concession Agreement & call for open tender for each Cleansing Zone

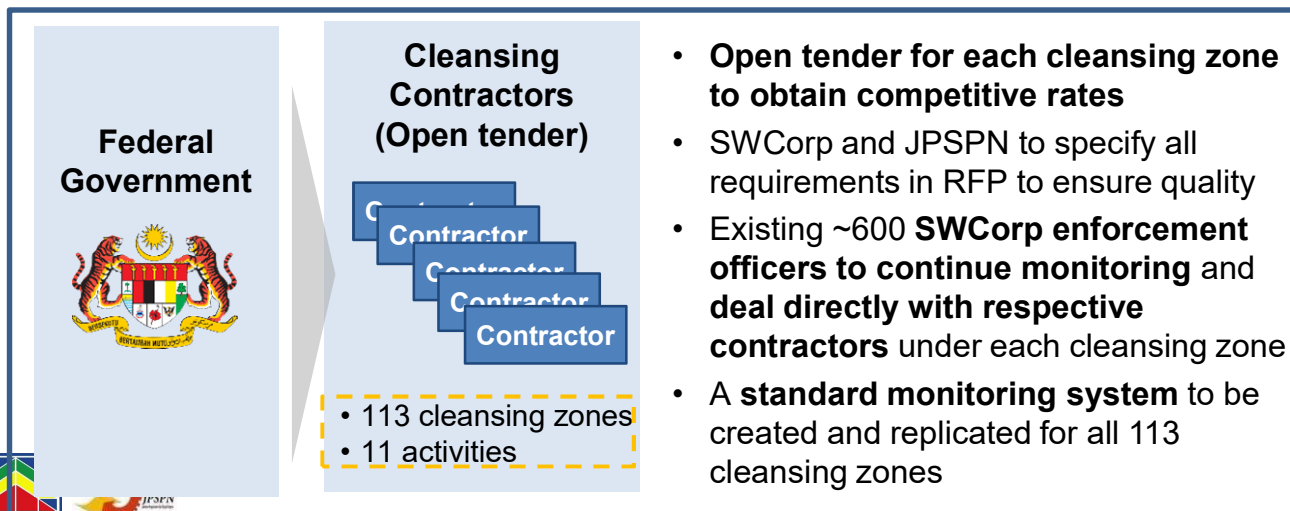
Current State



Rationale:

- Obtain competitive market rates and cut out monopoly and "middle man" costs
- Provide equal opportunities to small contractors with BLESS licence
- SWCorp able to monitor the performance of independent contractors and terminate underperformers for better quality service

Proposed State



Potential Implications:

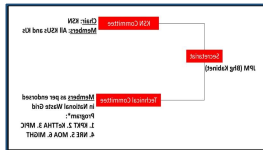
- **Legal implication:** Action taken by the Concessionaires
 - **Financial implication:** Potential compensation to be made to Concessionaires
- > To be further advised by Legal Dpmt of KPKT

WORKSTREAM 5

GOVERNANCE AND LEGISLATION



Governance and Legislation



- Governance structure for SWM



- Review of Act and Legislations related to SWM

“Capitalisation of Opportunities for Efficient Services”

Governance & Legislation

Objectives

- **To create a overall waste governance platform to monitor, manage and oversee the development of the SWM industry**
- **To review Act 672; restructuring where necessary to optimize**
- **To empower Federal Government role for centralised regulatory oversight, monitoring and enforcement of a new high-value industry sector in line with developed nation practices**
- **To transition regional/local SWM implementation responsibilities of Federal policy closer to source, ie: Municipal & Local Authorities to optimize performance**

Key takeaways

- **Overarching focus:**
 - **Revision of acts & policies connected with solid waste management towards sustainability, minimization & optimisation**
- **Summary of main recommendations:**
 - **Priority on database creation & maintenance for feedstock resource mapping, tracking of facilities capacity & implementation**
 - **Streamlining of diverging waste management acts & policies**

Key Thrusts for Governance & Legislation

1

Governance structure for SWM

- 1. Establish a overall waste governance platform tasked with continuous Optimisation. (Mesyuarat Kabinet Sisa Pepejal was dissolved). Must have buy-in at highest level, in order to streamline different Acts & Policies**
- 2. Mechanism to ensure data tracking & reportage. Maintaining a continuously updated GIS (Geographical Information System)**

2

Review of Act 672 and Legislations related to SWM

- 1. Future planning for a transition to federalised regulations & standards of SWM; oversight & supervision of Municipal/Local execution & implementation of SWM**
- 2. Revision of Concession Agreement (“CA”) for sustainability, & to enable a business ecosystem for Solid Waste that facilitates sustainable private sector involvement to complement GoM role (waste diversion)**

OVERVIEW

“Capitalisation of Opportunities for Efficient Services”

Eleventh Malaysia Plan 2016- 2020

Chapter 6, Strategy B5 provided clear direction for JPSPN and SWCorp to spearhead the initiative to manage waste holistically



Strategy B5

Managing waste holistically

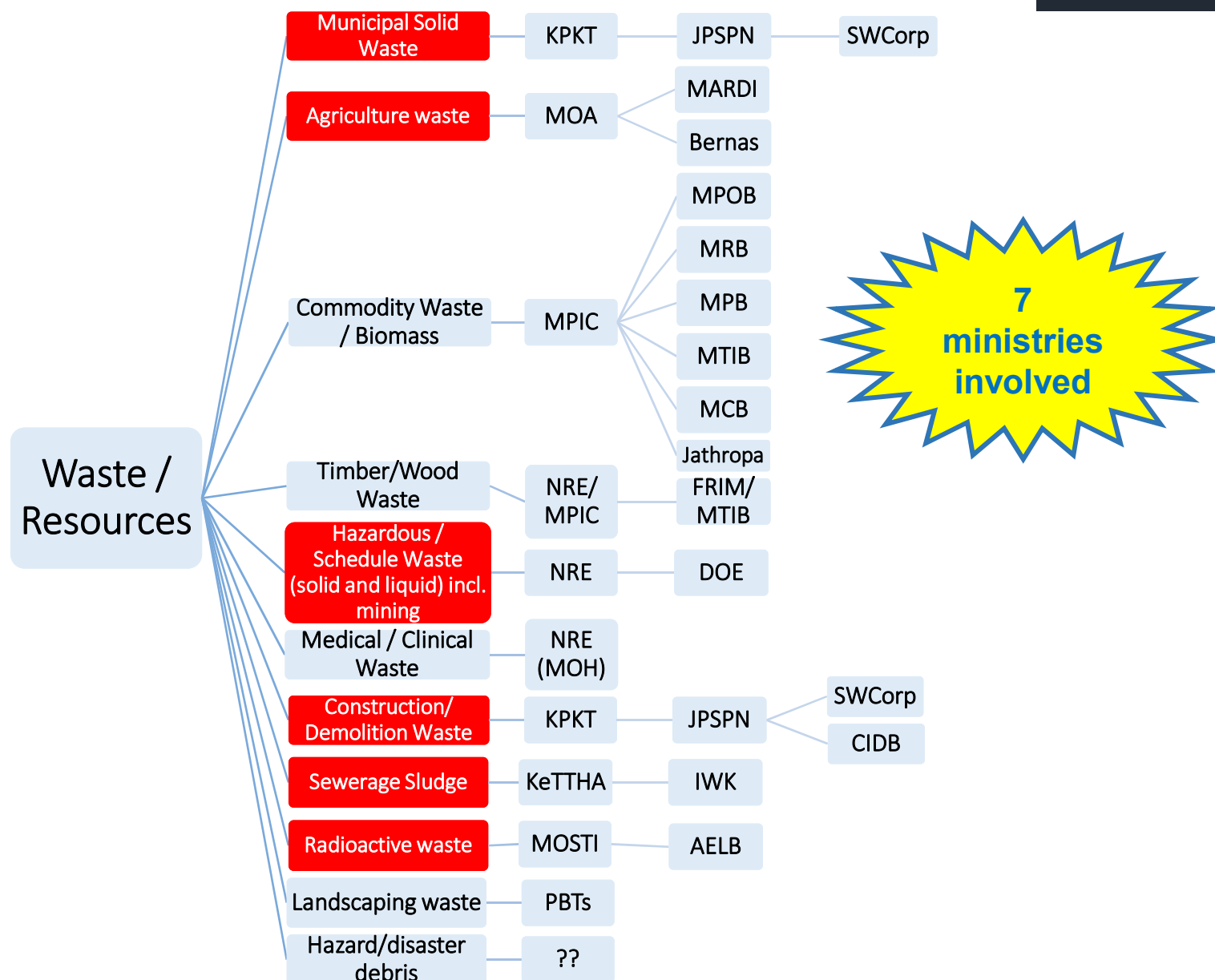
All seven types of waste - solid, agricultural, construction, radioactive, mining, sewage, and scheduled waste - will be managed in a holistic manner based on a life cycle approach. This approach extends beyond merely disposing the waste, rather it aims to increase recycling and recovery rate of waste and improve management of landfills to reduce the amount of waste and pollution. The National Solid Waste Management Department and the Solid Waste Management and Public Cleansing Corporation (SWCorp) will spearhead these initiatives, together with other relevant agencies such as the Atomic Energy Licensing Board, Department of Agriculture, DOE, Minerals and Geoscience Department, and Suruhanjaya Perkhidmatan Air Negara (SPAN).

Increasing coordination on waste management

A waste management platform that meets regularly to coordinate matters on sustainable and holistic waste management will be established. Waste management is currently implemented independently by relevant agencies such as the DOE, SPAN and SWCorp as per their respective jurisdictions. This creates a gap in waste management, which will be addressed effectively through the establishment of a mechanism to provide oversight and perform tasks in a more integrated and coordinated manner.

Multiple Mandates for Waste Governance

Governance and
Legislation



Source: *MIGHT proposal on National Waste Grid / National COE for Waste Management, 2015*

Note: ■ Types of wastes suggested to be spearheaded by JPSPN and SWCorp under RMK11

More legislations are required to support all SWM planning and implementation

Legislations - Available

1. Regulations on approval of Prescribed Facilities

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Kemudahan Pengurusan Sisa Pepejal Yang Ditetapkan dan Kelulasaan bagi Pembinaan, Pengubahan dan Penutupan Kemudahan) 2011. (P.U. (A) 302/2011)

2. Regulations on compoundable offences

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Pengkompaunan Kesalahan) 2011. (P.U. (A) 309/2011)

3. Regulations on manner of appeal

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Cara Rayuan) 2011. (P.U. (A) 308/2011)

4. Regulations on scheme for household waste

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Skim bagi Sisa Pepejal Isi Rumah dan Sisa Pepejal yang Serupa dengan Sisa Pepejal Isi Rumah) 2011. (P.U. (A) 307/2011)

5. Regulations on licensing of prescribed solid waste management facilities

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Pelesenan) (Pengurusan Atau Pengendalian Kemudahan Pengurusan Sisa Pepejal Yang Ditetapkan) 2011. (P.U. (A) 304/2011)

6. Regulations on licensing of transportation of household solid waste

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Pelesenan) (Pengusahaan atau Penyediaan Perkhidmatan Pemungutan Bagi Sisa Pepejal Isi Rumah, Sisa Pepejal Awam, Sisa Pepejal Keinstitusian Awam dan Sisa Pepejal Yang Serupa Dengan Sisa Pepejal Isi Rumah) 2011. (P.U. (A) 303/2011)

More legislations are required to support all SWM planning and implementation

Legislations – Available (cont'd)

7. Regulations on public cleansing

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Pelesenan) (Pengusahaan atau Penyediaan Perkhidmatan Pengurusan Pembersihan Awam) 2011. (P.U. (A) 306/2011)

8. Regulations on licensing of Long Haulage

Peraturan-Peraturan Pengurusan Sisa Pepejal dan Pembersihan Awam (Pelesenan) (Pengusahaan atau Penyediaan Perkhidmatan Pengangkutan oleh Pengangkutan Jauh) 2011. (P.U. (A) 305/2011)

Legislations - Drafting

1. Regulations schemes for construction and demolition waste

Peraturan-Peraturan Sisa Pepejal Dan Pembersihan Awam (Skim Bagi Sisa Pepejal Pembinaan) 2015

2. Regulations on licensing of transportation of construction and demolition waste

3. Regulations on schemes for business waste (commercial and industrial)

Peraturan-Peraturan Sisa Pepejal Dan Pembersihan Awam (Skim Bagi Sisa Pepejal Perniagaan) 2015

4. Regulations on licensing of transportation of business waste (commercial and industrial)

5. Regulations on Separation at Source for household

6. Regulations on Separation at Source for Commercial and Institution

More legislations are required to support all SWM planning and implementation

Legislations – Regulations identified but not yet in place

1. **Regulations on collection vehicle** (*define standards of collection vehicles*)
2. **Regulations on receptacles** (*define standards of receptacles*)
3. **Regulations on standards and specification for the design, construction, operation and maintenance of sanitary landfill**
4. **Regulations on standards and specification for the design, construction, operation and maintenance of thermal treatment facility**
5. **Regulations on standards and specification for the design, construction, operation and maintenance of MRF**
6. **Regulations on standards and specification for the design, construction, operation and maintenance of transfer station**
7. **Regulations on standards and specification for the design, construction, operation and maintenance of composing facility**
8. **Regulations on storage sites** (*for all types of wastes e.g. imported waste, recyclables etc.*)
9. **Regulations on charges** (*all charges as defined in Act 672*)
10. **Regulations on import waste**

More legislations are required to support all SWM planning and implementation

Legislations – Regulations identified but not yet in place (cont'd)

11. Regulations on licensing of non- prescribed solid waste management facilities
12. Regulations on extended producer responsibilities (buy back/ take back/ deposit refund system)
13. Regulations for Industrial Waste Disposal (to confirm with Regulations on schemes for business waste – commercial and industry)
14. To include Anti-Littering in Act 672 (amendment)
15. Regulations on packaging (design, eco-labelling, % of recycled material and % recyclable material)

ORDER

16. Order on method or manner and level of recycling by any prescribed solid waste management facilities
 17. Order on controlled solid waste to be recycled and the duty of any person to separate recyclable solid waste
-

Proposed new policies to support all SWM planning and implementation

DOMESTIC WASTE	Policy	Priority
Recycling Vendor	Licensing & buy-back	Low
Transfer Station and Hauling	Regional landfill and MRF	High
Recycling Industry	Importation & exportation of wastes	Medium
Thermal, Mechanical & Biological Treatment	Treatment	Medium
Landfill	Landfill mining	Medium
Manufacturing Stage	Packaging, product design, eco-labelling	Medium
Distribution & Retailing Stage	Take-back system	Low
Separation, Storage & Collection Stage	Food waste & waste disposal education	High



SOURCE: Team Analysis

Proposed new policies to support all SWM planning and implementation (cont'd)

INDUSTRY WASTE

Manufacturing Process

Policy

- Industrial ecology (waste eco-town)
- Sustainable production and consumption
- Extended producers responsibility (EPR)
- Take-back and buy-back

Priority

Low
Low
Low
Low

CONSTRUCTION & DEMOLITION WASTE

Planning & Design Stage

Policy

- IBS/modular
- Secondary material
- Recycling

Priority

Medium
Medium
Medium

Construction Stage

- Separation of waste

High



SOURCE: Team Analysis

Proposed new policies to support all SWM planning and implementation (cont'd)

COMMERCIAL & PRIVATE INSTITUTION WASTE

Manufacturing Process

Policy

- Food waste plan
- Separation at Source

Priority

Medium
Medium

PUBLIC CLEANSING

Separation, Storage and
Collection Stage

Policy

- Concession Agreement
- Anti-littering

Priority

Medium
Medium



SOURCE: Team Analysis

OVERALL WASTE GOVERNANCE

“Capitalisation of Opportunities for Efficient Services”

Initiative Factsheet

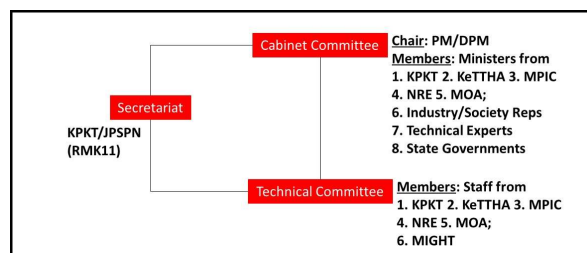
Overall Waste Governance for 7 types of wastes listed in RMK11

Case for change

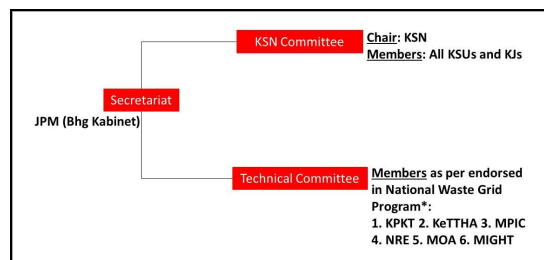
- Multiple agencies governing waste – there is no existing platform for overall waste governance
- Multiple agencies & mandates – many ministries involved and unclear coordination
- Grey areas exist in definition of some wastes and governing bodies
- There are no clear guidelines on who has authority to divert wastes for capitalization of opportunities whilst meeting waste diversion target

Our proposal

- Option 1: Set up a new Cabinet Committee • Option 2: Leverage on existing Majlis Teknologi Hijau dan Perubahan Iklim (MTHPI) Committee



- Option 3: Add a permanent agenda (Waste Management) into KSN's weekly meeting with KSU's



- Option 4 (Long term): Park total waste management under one Ministry
- Option 5: State Level Solid Waste & Public Cleansing Governance

Cost / Funding

Total
funding

N/A

Outcome

Establishment of a waste management platform that meets regularly to coordinate matters on sustainable and holistic waste management

Key success factors

Commitment from all ministries to resolve cross-ministry waste issues

Open-mindedness of stakeholders to accept and adopt changes for the betterment of the country's waste management

ISSUES IN OVERALL WASTE GOVERNANCE

No.	Issue	Proposed Solution	By Whom
1	<p>Multiple agencies governing waste – there is no existing platform for overall waste governance.</p> <p>For 672 states solid waste and public cleansing: working level committee (e.g. Service Level Committee SLC & Regional Implementation Committee RIC) – anecdotal evidence that cross-sectional issues cannot be resolved due to lack of power of chairperson & less respect from members</p> <p>For non-672 states, anecdotal evidence that there is no common platform to address waste management and public cleansing issues</p>	<p>New overall waste governance platform – see proposed structure (<i>in later slides</i>)</p> <p>For 672 states SLC (KPKT KSU to chair) and RIC (KPKT DKSU to chair): for CA matters</p> <p>To facilitate overall waste governance at state level, a permanent agenda for waste should be included at state level committee meetings/EXCO meetings (including non-672 states)</p>	<p>JPSPN, SWCorp, MOA, KeTTTHA, DOE, MOH, MPIC – minilab or Technical Committee</p>

ISSUES IN OVERALL WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
2	<p>Multiple agencies & mandates – many ministries involved and unclear coordination</p> <p>Anecdotal evidence that there is no supply and demand match – missed opportunities for demand creation – data sourcing and management lacking</p>	<p>New overall waste governance platform – see proposed structure (<i>in later slides</i>)</p> <p>Develop a database management framework to be governed by JPSPN (see <i>later slides</i>)</p>	<p>JPSPN, SWCorp, MOA, KeTTTHA, DOE, MOH, MPIC – minilab or Technical Committee</p>

ISSUES IN OVERALL WASTE GOVERNANCE (cont'd)

No	Issue	Act/Regulation	Proposal
3	<p>There are no clear guidelines on who has authority to divert wastes for capitalization of opportunities whilst meeting waste diversion target</p> <ul style="list-style-type: none"> - Land, some landfills and non-sanitary facilities belong to PBT, sanitary facilities belong to JPSPN - Leased land for waste treatment facilities – what happens when the lease expires, what is the contingency plan? - JPSPN does not own all the landfill facilities in Act 672 states (currently owns only less than 10% out of over 100) – Land ownership either private or PBT, possible issues on control over the operation and the land (safety, access, scavenging) 	<p>Sanitary landfills governed under <u>P.U.(A) 304 Act 672 – Solid Waste and Public Cleansing Management (Licensing) (Management or Operation of Prescribed Solid Waste Management Facilities) Regulations 2011</u></p>	<p>KPKT to make a policy decision if it wants to claim ownership of all landfills under Act 672 states – if this is agreed, KPKT needs to play an active role to start negotiation with PBTs - enter into smart partnership arrangements with PBTs to capitalize on the economic potential of waste (energy, harvesting of methane, recreational value)</p>

ISSUES IN OVERALL WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
4	Ministries have individual budgets over wastes requiring same type of treatment – e.g. food waste governed by JPSPN and sewerage governed by KeTTHA under different capex	New overall waste governance platform – see proposed structure (<i>in later slides</i>) to discuss:	JPSPN, SWCorp, MOA, KeTTHA, DOE, MOH, MPIC – minilab or Technical Committee
5	Prioritisation of actions – should take into consideration from the point of generation, treatment/recovery, disposal - consider Life Cycle Analysis, instead of current practice of end of pipe solutions e.g. community and industry based activities are carried out uncoordinated	Optimise budget through reducing waste treatment footprint: <ul style="list-style-type: none"> - Understand waste treatment footprint - Develop budget profile for waste treatment in each Ministry - Conduct budget streamlining at national level 	

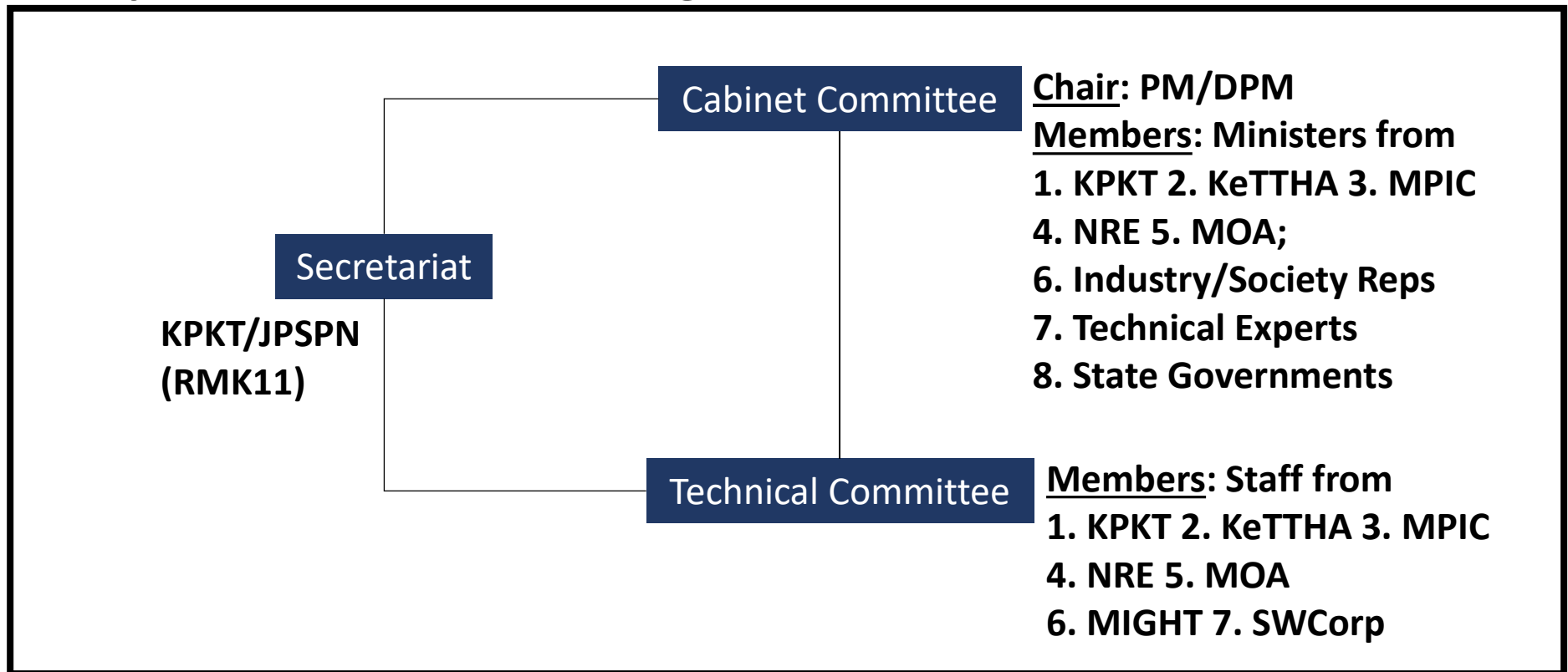
ISSUES IN OVERALL WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
6	Government dependent solutions and actions, but Government requires strategic expertise to evaluate cross-sectoral proposals (mismatch in expectations) – too much focus on specific waste type	Technical Committee to look out for opportunities to coordinate waste management, maybe agencies like UKAS Unit Kerjasama Awam Swasta can play a role	JPSPN, SWCorp, MOA, KeTTHA, DOE, MOH, MPIC – minilab or Technical Committee
	There is no comprehensive policy for wastes (covering from generation to final disposal, including harvesting economic benefits)	There is a need to consider the formulation of a comprehensive waste policy or to review coverage of existing related policies	
7	There is no overarching communication channel between ministries, state level stakeholders and between private and public sectors to enable informed decision making	New overall waste governance platform – see proposed structure (<i>in later slides</i>) to establish a cross-sectoral communication platform to allow interaction between multiple stakeholders and beneficiaries	

OVERALL WASTE GOVERNANCE – OPTION 1

There is a **need for cross-sectoral consolidation** and complementary entity/body to ensure integrated and targeted actions

Option 1: Form a mediating committee at Cabinet level



IMPLEMENTATION PLAN IN OVERALL WASTE GOVERNANCE – OPTION 1

Option 1: Form a mediating committee at Cabinet level

No.	Activity	By Whom	Time Required
1	Identify core members and set up an interim committee (after obtaining PM's mandate)	JPSPN	3 months
2	Obtain endorsement from relevant authorities to convert interim committee to Technical Committee (Cabinet Paper)	JPSPN	6 months
3	Conduct study to recommend towards setting up of the Cabinet Committee (Cabinet Paper)	Tech. Comm	6 months
4	Set up Cabinet Committee	JPSPN	1 month
5	First Cabinet Committee meeting with proposals from Technical Committee (subject to availability of Ministers or Deputy Ministers)	Cab. Comm	1 month

Pro's:

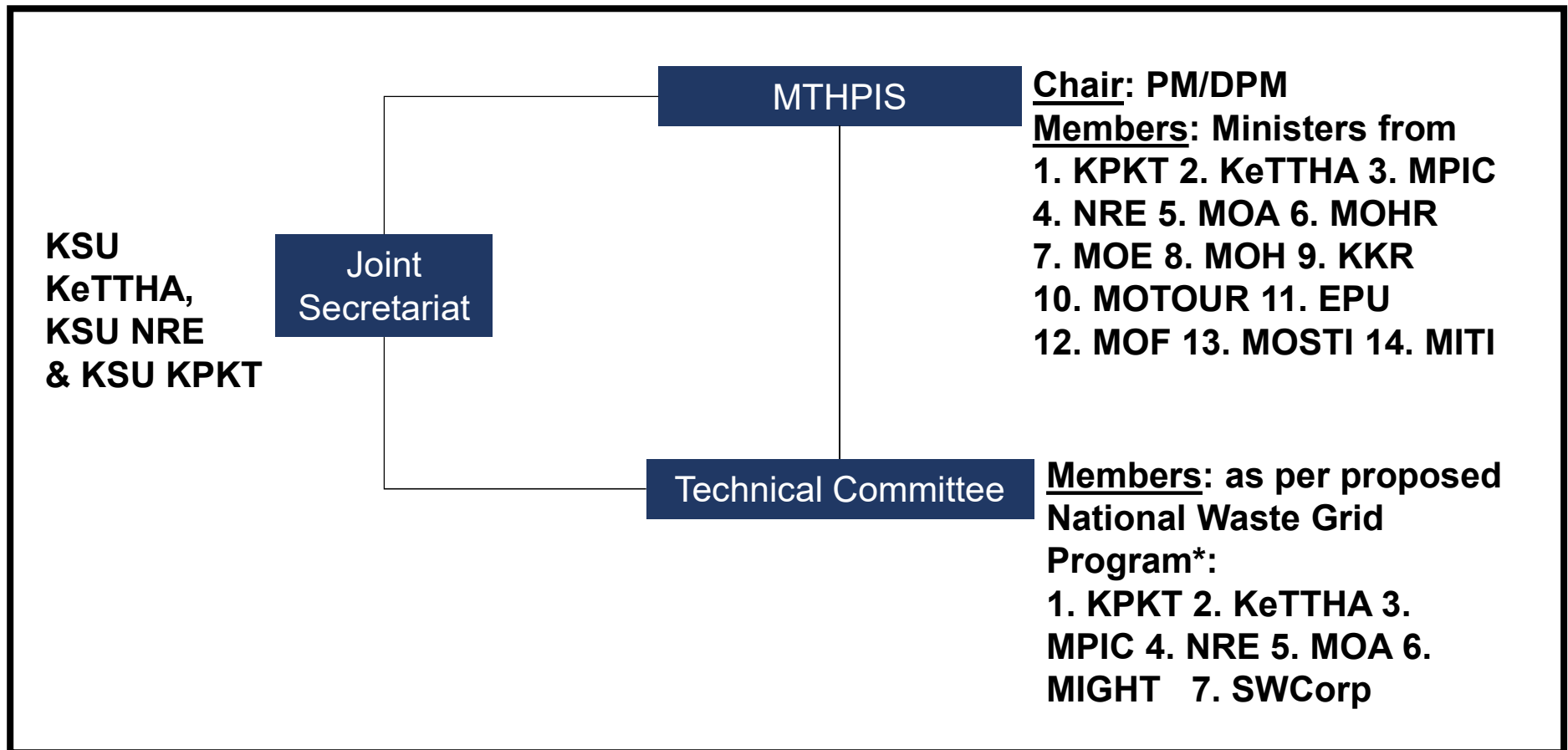
- Perceived high level of commitment and more frequent meetings
- All ministers onboard, mandate to reconcile becomes easier
- Planning and budget all under KPKT

Concerns:

- Getting all ministers' time for meeting– may not be as frequent to address all issues immediately
- There is already an existing ministerial level committee – Majlis Teknologi Hijau dan Perubahan Iklim (MTHPI)
- How to consolidate all budget under one ministry - Distribution of budget amongst multiple ministries may be tricky
- Multiple areas – secretariatship is questionable

OVERALL WASTE GOVERNANCE – OPTION 2

Option 2: Leverage on MTHPI as a mediating platform – add one more working committee for solid waste (become MTHPIS)



Note: Endorsed by MTHPI on 25 February 2015. Currently allocated budget under RMK11 by KeTTHA. In the midst of forming the Technical Committee, target first meeting in Q3'15.*

IMPLEMENTATION PLAN IN OVERALL WASTE GOVERNANCE – OPTION 2

Option 2: Leverage on MTHPI as a mediating platform – add one more working committee for solid waste (become MTHPIS)

No.	Activity	By Whom	Time Required
1	Harmonise between RMK11 and KeTTHA to allow MIGHT to become the interim secretariat – meeting between EPU, JPSPN and KeTTHA	MIGHT	3 months
2	Set up Joint Secretariat and Technical Committee based on proposed structure	MIGHT	3 months (concurrent)
3	Upon final approval, holistic waste management agenda will be included in MTHPIS	MIGHT	

Pro's:

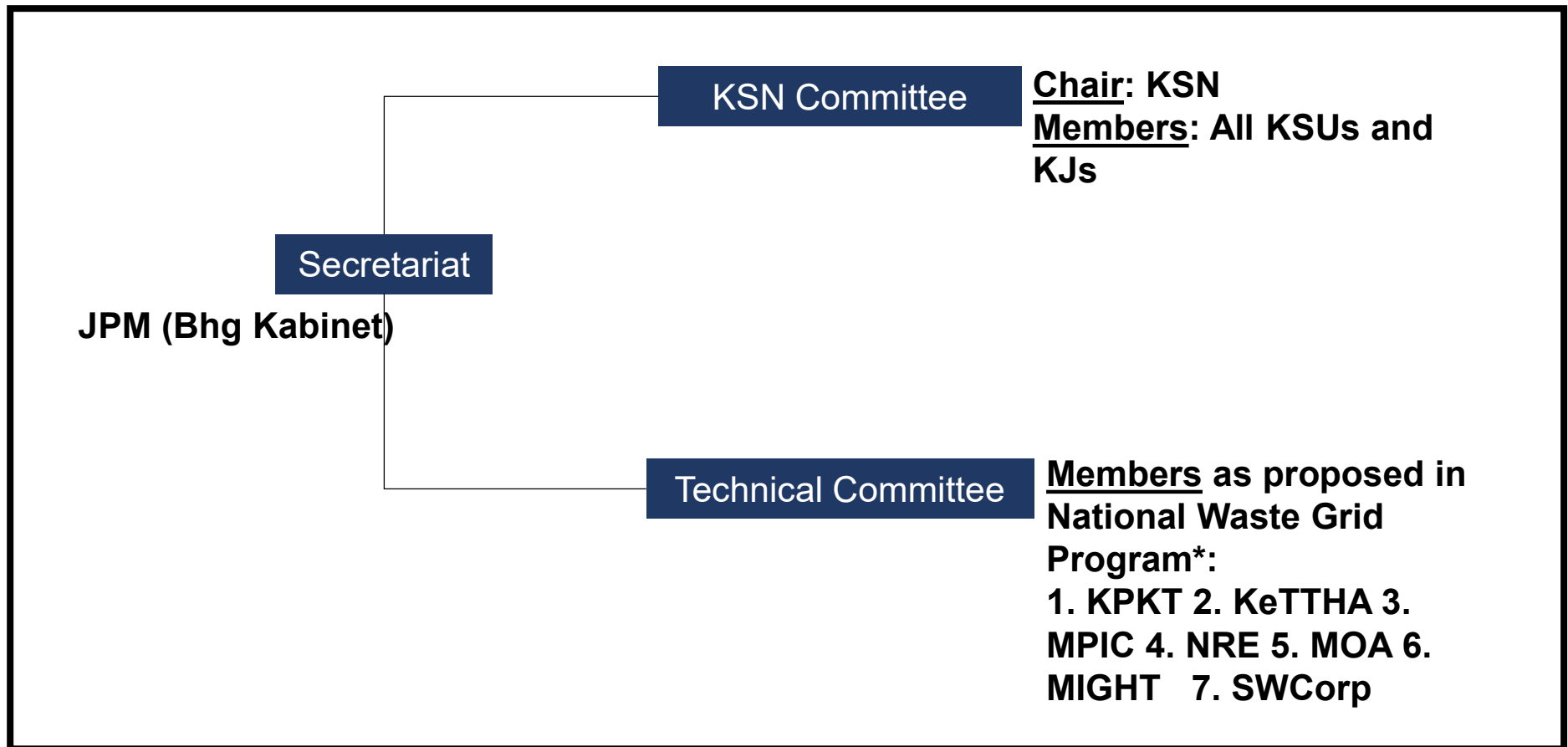
- Existing committee, just add one category (*Sisa*)
- Leverage on existing work already commissioned by KeTTHA, KPKT, MPIC and MIGHT
- Involvement of multiple ministries (14), a good platform for open communication
- Technical Committee already up and running with proposed programs

Concerns:

- Frequency of decision-making meeting – only once a year
- Execution and implementation of post-decisions (cross-ministry) may be difficult
- Budget for implementation (especially cross-ministry) may be tricky

OVERALL WASTE GOVERNANCE – OPTION 3

Option 3: Add a permanent agenda (Waste Management) into KSN's weekly meeting with KSU's



IMPLEMENTATION PLAN IN OVERALL WASTE GOVERNANCE – OPTION 3

Option 3: Add a permanent agenda (Waste Management) into KSN's weekly meeting with KSU's

No.	Activity	By Whom	Time Required
1	Submit paper to KSN to add a permanent agenda on holistic waste management into KSN's weekly meeting with KSU's	KSU KPKT	2 months
2	Set up Technical Committee based on proposed structure	JPSPN	3 months
3	Upon final approval, waste agenda will be included in KSN's weekly meeting	JPSPN	

Pro's:

- Frequent meeting (weekly) if there are cross-ministry issues to be resolved
- It will be a high level committee addressing the issues
- Fast decision-making and fast implementation

Concerns:

- Execution and implementation of post-decisions (cross-ministry) may be difficult
- Budget for implementation (especially cross-ministry) may be tricky

OVERALL WASTE GOVERNANCE – OPTION 4

Option 4: Park total waste management under one Ministry

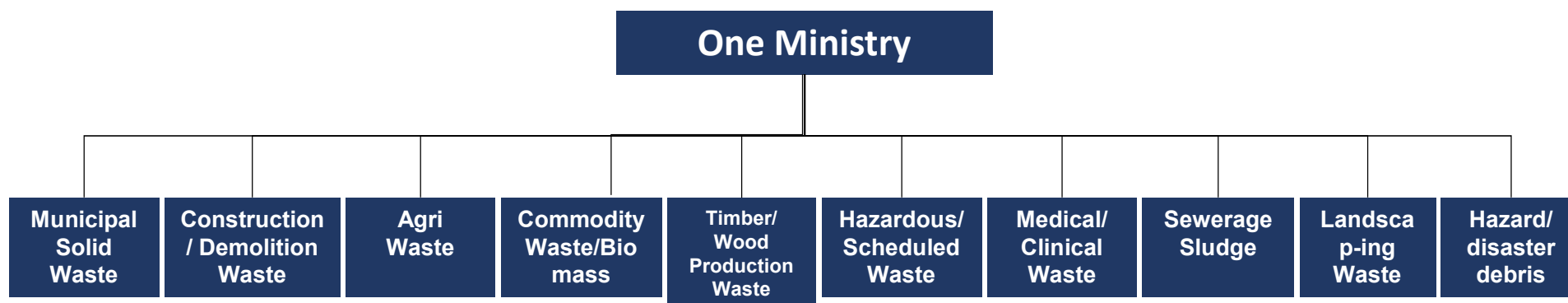
Below is a list of countries that park all matters related to environment (including waste) under one ministry – for ease of governing, monitoring, implementation and enforcement.

NO.	COUNTRY	DIVISION/MINISTRY	JURISDICTION
1.	Japan ¹	Waste Management and Recycling Department, Ministry of the Environment	Covers global environment, air, transport, health, water, soil, ground, park and waste.
2.	England ²	Department of Environment, Food and Rural Affairs (DEFRA)	Covers environmental, food and rural issues.
3.	Denmark ³	Danish Environmental Protection Agency, Danish Ministry of the Environment	Covers agriculture, air, chemical, industry, noise, sustainability and waste.
4.	USA ²	Office of Solid Waste and Emergency Response, US Environmental Protection Agency (USEPA)	Covers almost all matters relating to environment except under other federal, tribal, state or local agencies.
5.	New Zealand ²	Ministry for the Environment	Covers air, climate change, fresh water, marine, land, RMA and waste.
6.	Singapore ¹	National Environment Agency, Ministry of Environment and Water Resources	Covers public health, environmental protection, waste and meteorological services.
7.	South Korea ³	Resources Recirculation Bureau, Ministry of Environment	Covers water, sewerage, biodiversity, natural resources, waste, environmental industry, environmental technology, health, climate, chemical, air, transport.
8.	Thailand ³	Pollution Control Department, Ministry of Natural Resources and Environment	
9.	Indonesia ³	Environment and Forestry Ministry	

¹Mono-state ²Federated state ³Centralised functions & facilities

LONG-TERM PLAN IN OVERALL WASTE GOVERNANCE – OPTION 4

Option 4: Park total waste management under one Ministry



Current Ministry:

KPKT KPKT MOA MPIC MNRE/MPIC MNRE NRE (MOH) KeTTHA PBTs ??

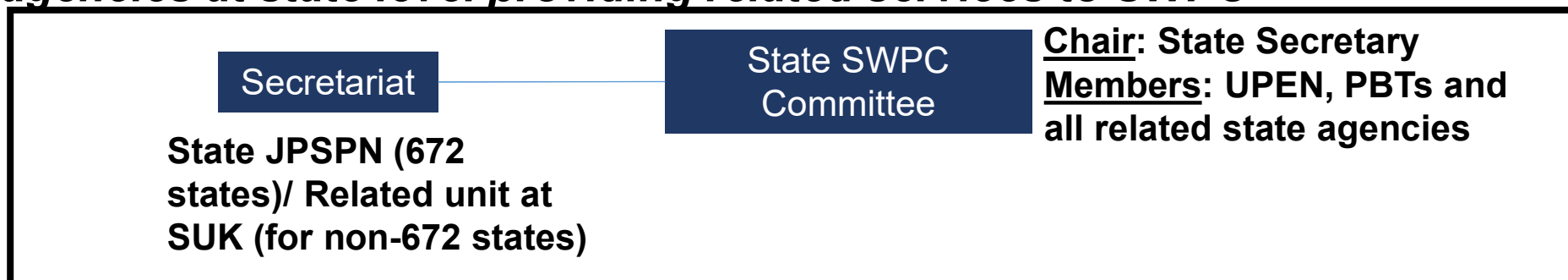
This Ministry should also govern the following activities in order to meet the objectives of ease of governance, monitoring, implementation and enforcement:

- **Natural resources management**
- **Forest management**
- **Irrigation and drainage management**
- **Biodiversity and marine management**
- **Land**
- **Climate change**
- **Disaster risk reduction, preparedness and response**
- **Sustainable technology**
- **Environmental conservation and management**

STATE LEVEL – SOLID WASTE & PUBLIC CLEANSING (SWPC)

GOVERNANCE

Option 5: State Secretary heads a committee for SWPC that involves all agencies at state level providing related services to SWPC



No.	Activity	By Whom	Time Required
1	Engage with all stakeholders (both 672 and non-672)	KSU KPKT	12 months
2	Determine agenda, Terms of Reference and consider function as one-stop center for SWPC related matters (management, development, planning, operations etc.)	SS/KPKT	3 months
3	Formalise committee	SS/KPKT	

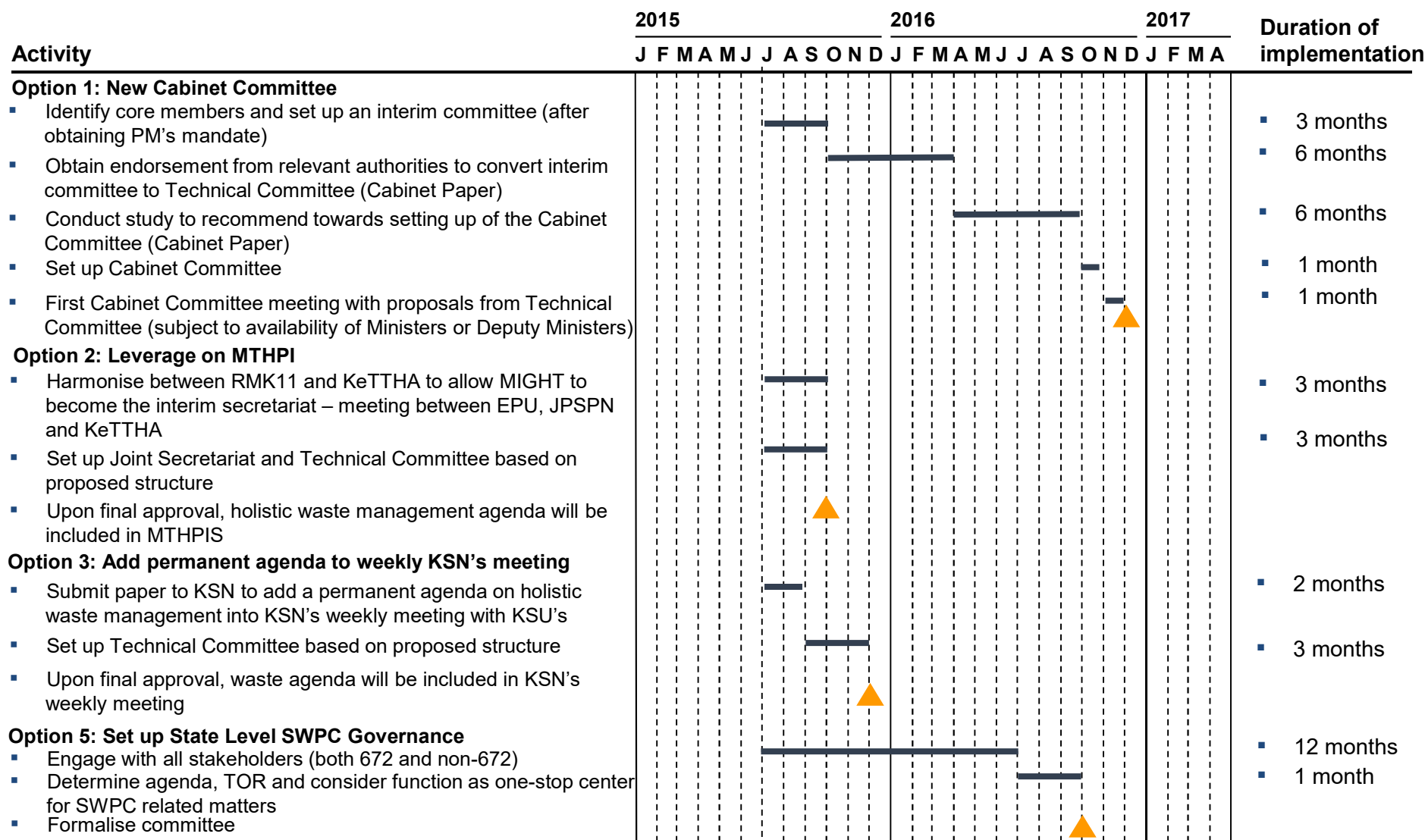
Pro's:

1. SWPC to be addressed at state level monthly
2. It will be a high level committee addressing the issues at state level
3. Fast decision-making and fast implementation at state level

Concerns:

1. Budget for implementation
2. Human resources (the necessary expertise) and technical support for implementation

Overall Waste Governance for 7 types of wastes listed in RMK11 – implementation activities



SOLID WASTE GOVERNANCE

“Capitalisation of Opportunities for Efficient Services”

Initiative Factsheet

Solid Waste Governance

Case for change

- Waste ownership can be read from Sec. 3 Act 672, but the sale and purchase of waste is not clear
- There are still some grey areas with regards to types of solid waste (e.g. sludge, grease) resulting in the difficulty to determine the appropriate measures for treatment
- Solid waste management services is highly technical and demands strategic expertise to address dynamic and emerging legal/management/operational issues that arise

Our proposal

- Faster solution (within the next 3 months): Conduct a minilab attended by all ministries governing all types of wastes (JPSPN, SWCorp, MOA, KeTTHA, DOE, MOH, MPIC) to identify all aspects of controls related to solid waste by reviewing all Acts and subsidiary statutory instruments – to iron out grey areas and to improve governance management and partnerships in solid waste management
- Alternative longer term solution: Set-up of Technical Committee in the new Governance structure to discuss the same agenda
- Prioritise and invest in talent development with emphasis on training and capacity building across sectors including all stakeholders

Cost / Funding

Total
funding

N/A

Outcome

Governance and legislations are adequate to govern all areas of solid waste management with clear definitions and accountability among ministries

Key success factors

Commitment from all ministries to resolve cross-ministry waste issues

Open-mindedness of stakeholders to accept and adopt changes for the betterment of the country's waste management

ISSUES IN SOLID WASTE GOVERNANCE

No	Issue	Act/Regulation	Proposal
1	There are still some grey areas with regards to types of solid waste (e.g. sludge, grease) resulting in the difficulty to determine the appropriate measures for treatment	<p><u>Sec. 2 Act 672 (definitions of solid wastes)</u></p> <p>Currently engine oil is under DOE, any grease mixed with water is under KeTTHA (IWK), cooking oil has no ownership. Drinking water treatment sludge goes to DOE (main generators: SPAN & IWK)</p>	<p>Technical Committee in new governance structure to:</p> <ul style="list-style-type: none"> - Discuss the need to regulate grease and sludge, perhaps making grease a solid waste - Define ways of disposing these wastes - If these wastes are managed in a controlled manner there is a demand for it

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No	Issue	Act/Regulation	Proposal
2	<p>Aspects related to export of solid waste is not controlled by Act 672 – no ministry is tracking exportation of waste – categorized as “others”, and export is not monitored (anecdotal evidence: it has no revenue for government)</p> <p>Aspects related to import of solid waste particularly categorization and labelling of wastes being imported is not clearly provided for (e.g. license to import waste – definition of waste tyres vs. used tyres; issues relating to exemptions and duties)</p>	Importation regulations: identified and spearheaded by SWCorp at the moment	<p>There is a need to regulate and control import and export of waste as it impacts recycling rate and national income from exporting finished goods rather than wastes</p> <p>JPSPN to spearhead the regulation of importation and exportation of solid waste</p>

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No	Issue	Act/Regulation	Proposal
3	<p>Waste ownership can be read from Sec. 3 Act 672, but the sale and purchase of waste is not clear</p> <p>a) Concessionaires – custodianship</p> <p>b) Issue of handover of wastes between ministries e.g. method of regulation is unclear for agriculture waste (could it be governed under National Land Code?) until it goes to landfill</p>	<p>a) <u>Sec. 3 Act 672 – Federal Government to have executive authority</u> The Federal Government shall, upon the coming into operation of this Act, have executive authority with respect to all matters relating to the management of solid waste and public cleansing throughout Peninsular Malaysia and the Federal Territories of Putrajaya and Labuan.</p> <p>b) Different types of wastes under different ministries</p>	<p>a) <u>Note</u>: Under Sec. 3 Act 672, it can be presumed that wastes belong to Government.</p> <p>JPSPSN to spearhead initiative to:</p> <p>i) Clarify the issue of ownership of wastes involving all mandate holders</p> <p>ii) Look into the issues of sale and purchase of wastes</p> <p>b) Technical Committee in new governance structure to:</p> <p>i) Identify options to allow all agencies to complement each other in the performance of wastes management services across all sectors</p> <p>ii) Identify operations requirements to streamline activities, handover and communication mechanism among key stakeholders</p>

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By whom
4	<p>No clear measure for the assessment and response to address risks & hazards for the full solid waste management cycle</p> <ul style="list-style-type: none"> - At collection, sorting, storage, handling, recovery and transportation etc. - At landfills (sanitary landfills governed under P.U.(A) 304), need to check by-laws for non-sanitary landfills owned by PBT in non-672 states - Imported solid waste which may pose risks & hazards - Who owns facilities in an open dump site? 	<p>Identify all aspects of controls related to solid waste (responsibility, indemnity, risk mitigation) – review all Acts and subsidiary statutory instruments</p> <p>State land vs Federal facilities</p>	JPSPN, SWCorp, KPKT

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
5	<p>Provision of solid waste management services is only managed by 3 concessionaires over a long period (with 7-year review cycles), which may give rise to problems addressing variation and adjustment of contracts</p> <p>Selection process of subcontractors is unclear and not governed under Act 672 – issue of monopoly, suitability and reliability of contractors</p>	<ul style="list-style-type: none"> - To allow for annual performance review of concessionaires - To review selection process of subcontractors – develop a register for subcontractors to allow monitoring of subcontractors who may need to be deregistered 	JPSPN, SWCorp, KPKT

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
6	<p>There is no concerted and comprehensive direction for RDI4C (Research & Development, Innovation for Commercialisation) in solid waste management</p> <p>There is no consortium approach applied (where all universities are gathered and questions are farmed out based on expertise and location of different universities)</p> <p>There is no clear direction for research and commercialization opportunities (between academia, industry and government ministries/agencies)</p>	<ul style="list-style-type: none"> - Establish a research consortium leveraging on multiple funding from different ministries - Conduct needs assessment to match R&D to actual operational, development and planning requirements 	JPSPN, SWCorp, MOSTI, MOE, MOA, MPIC, KPKT

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
7	There is no clear strategic direction to optimize the roles of JPSPN and SWCorp (Act 672) e.g. both parties are carrying out 3R activities independently	Formulate plan detailing strategic direction for the optimization of resources (human, technical and financial) and roles (smart partnership arrangements in specific areas of management)	KPKT
8	Solid waste management services is highly technical and demands strategic expertise to address dynamic and emerging legal/management/operational issues that arise. In addition, services require intensive budgetary allocation and investment of equipment, tools, technology etc.	<p>Prioritise and invest in talent development with emphasis on training and capacity building across sectors including all stakeholders</p> <p>Prioritise, invest and explore opportunities for cost effective solutions in service provision, looking at alternative financing arrangements</p>	JPSPN, SWCorp, KPKT

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
9	The construction and operation of facilities involve different parties. Some facilities and services do not have testing & commissioning, takeover and handover implemented as per contracts. The terms are inadequate in contracts	<p>Create audit process that will review both construction and operation in one loop. Both parties cannot be released until the facility is fit for purpose as certified by JPSPN (Develop a certification process)</p> <p>Ensure saving clauses that will allow for the government to receive facilities which are fit for purpose and performing as per design are enforced by S.O.</p>	JPSPN

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No	Issue	Act/Regulation	Proposal
10	<p>Scavenging is not addressed in Act 672 as the act of 'taking' waste is not covered.</p> <p>As a result, it is hard to establish the real recycling rate of the country because this is not accounted for</p>	<p><u>Act 672 Section 73 – Waste placed in receptacles or deposit sites for controlled solid waste</u></p> <p>(2) No person, unless he is licensed under this Act to collect the solid waste, shall sort over, disturb or otherwise interfere with any receptacle or receptacle chamber for controlled solid waste, which is placed with a view to its being emptied, or which is deposited at any place caused to be provided by the Director General or the Corporation for the collection and disposal of controlled solid waste—</p> <p>(a) regardless of who provides that receptacle or causes it to be provided; and</p> <p>(b) whether or not that receptacle is used for public or private purposes.</p> <p>(3) Any person who contravenes subsection (2) commits an offence and shall, on conviction, be liable to a fine not exceeding one thousand ringgit.</p> <p>(4) The Director General may exempt collection of recyclable solid waste carried out by charity groups or any other organization from the provision of subsection (2).</p>	<p>JPSPN will need to address the issue of scavenging by introducing legal provisions to control the act</p>

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No	Issue	Proposal	By Whom
11	<p>The provision for sale and purchase of wastes under Act 672 by government/ concessionaires/waste facilities operators is not provided for</p> <p>Note: Anecdotal input – Currently there is a profit-sharing arrangement with waste facilities operators in the collection of 3rd party commercial and industrial wastes</p>	<p>Introduce provisions to cover sale and purchase of wastes taking into account issues of ownership and custodianship</p>	JPSPN

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No	Issue	Act/Regulation	Proposal
12	<p>Grey areas in Separation at Source:</p> <p>a) In the process of amending the related regulation e.g. implementation on non-landed properties</p> <p>b) How are separated wastes being managed by Concessionaires</p>	<p>a) <u>Amendment to P.U.(A) 307 2011 - Solid Waste and Public Cleansing Management (Scheme for Household Solid Waste and Solid Waste Similar to Household Solid Waste) Regulations 2011</u></p> <p>b) <u>Clause 18.1.1(a) of CA:</u> Concessionaires to prepare Operation Manual</p>	<p>a) For non-landed: JMB to be made accountable</p> <p>b) Concessionaires to prepare/amend SOP for collection services, and submit to SWCorp for approval – spell out what concessionaires can do with the separated wastes</p> <p>[pending decision from Workstream 1]</p>

ISSUES IN SOLID WASTE GOVERNANCE (cont'd)

No.	Issue	Proposed Solution	By Whom
13	The liberalization of environmental services once AFTA 2016 (?) comes into effect, will impact on existing and future local service providers as well as requiring extensive review of legal provisions to regulate foreign service providers	Identify potential impacts to local service providers and regulatory requirements in relation to foreign service providers	KPKT & JPSPN (work closely with MITI)

PUBLIC CLEANSING GOVERNANCE

“Capitalisation of Opportunities for Efficient Services”

Initiative Factsheet

Public Cleansing Governance

Case for change

- Limited area under Act 672 – only covers public cleansing services area provided by legacy PBT, but no services provided to other zones (e.g. highways)
- Anti-Littering by-laws and penalties are not consistent among PBT and Act 672
- The term ‘cleansing’ has not been clearly defined, clear direction has not been given as to whether it includes cleaning, cleansing, removal, scrubbing etc.
- Waste from public cleansing not capitalized for reuse and recycling – waste ownership is not clear

Our proposal

- KPKT to make a policy decision if it wants to cover highways in Act 672 states; if it does, JPSPN to regulate the cleansing sub-contractors appointed by highway concessionaires through licensing
- Reconcile different provisions concerning littering under different Acts
- KPKT to initiate a platform for the relevant stakeholders to clearly define the term and respective boundaries
- Revisit contractual requirements to allow for diversion of wastes from public cleansing to reuse and recycle wastes with private sector involvement (subject to formalization of wastes sale and purchase provisions)

Cost / Funding

Total funding	N/A
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Outcome

Governance and legislations are adequate to govern public cleansing with clear accountability and boundaries

Key success factors

Agreement among PBTs and GoM on demarcation of accountabilities and boundaries

Clear KPIs for quality of cleanliness developed and agreed upon

ISSUES IN PUBLIC CLEANSING

No	Issue	Act/Regulation	Proposal
1	<p>Limited area under Act 672 – only covers public cleansing services area provided by legacy PBT, but no services provided to other zones (e.g. highways)</p> <p><i>*“public roads” means any public road which is currently repaired or maintained by a local authority or which has been transferred to or has become vested in the local authority under any written law and includes any street, square, court, alley, lane, bridge, footway, track, bridle-path, passage, tunnel, lay-by, interchange, round-about, traffic island, road divider, traffic lane, acceleration lane, deceleration lane, side-table, median strip, overpass, underpass, approach, entrance or exit ramp whether a thoroughfare or not, over which the public have a right of way, but shall not include any Federal road, State road, highway, bridge, tunnel or anything connected to that road which is maintained and kept by any Federal or State authority or any private person or private bodies</i></p> <p><i>“public places” means any open space, parking place, garden, recreation and pleasure ground or square, whether enclosed or not, set apart or appropriated for the use of the public or to which the public shall at any time have access</i></p>	<p>Sec. 2, Act 672: “public cleansing management services” means the following services:</p> <p>(a) the cleansing of public roads*, public places**, public toilets and public drains;</p> <p>(b) the cleansing of–</p> <p>(i) hawker centres excluding privately owned and maintained food courts; and</p> <p>(ii) markets excluding privately owned and maintained markets;</p> <p>(c) the clearing of illegally dumped controlled solid waste on public roads and in public places;</p> <p>(d) beach cleansing;</p> <p>(e) kerbside grass cutting on public roads;</p> <p>(f) grass cutting in public places; and</p> <p>(g) removal of carcasses, but excludes landscaping and the maintenance of public roads and public places;</p>	<p>KPKT to make a policy decision if it wants to cover highways in Act 672 states.</p> <p>If it does, JPSPN needs to regulate the cleansing sub-contractors appointed/paid by highway concessionaires through licensing:</p> <ul style="list-style-type: none"> - If it is within CA scope, license will be issued based on scheme - If it is not within CA scope, to issue open license

ISSUES IN PUBLIC CLEANSING (cont'd)

No	Issue	Act/Regulation	Proposal
2	Anti-Littering by-laws and penalties are not consistent among PBT and Act 672	<p><u>Sec. 75, Act 672 – Power to direct controlled solid waste to be removed</u> 75. (1) If any person has in his possession any accumulation of controlled solid waste or any consignment of controlled solid waste on any land or premises which is in contravention of this Act, which cause a nuisance or is prejudicial to health or offensive to the neighbourhood, the Director General may, by notice in writing serve on that person, direct him to deliver the controlled solid waste within time specified in the direction to any solid waste management facilities or any areas as the Director General may determine for treatment or disposal.</p> <p><u>Sec. 71, Act 672 – Prohibition against unauthorized depositing, treatment, etc., of controlled solid waste</u> (8) Any person who contravenes subsection (1) or (5) commits an offence and shall, on conviction, be liable to a fine not less than ten thousand ringgit and not exceeding one hundred thousand ringgit or to imprisonment for a term not less than six months and not exceeding five years or to both.</p>	<p>Anti-Littering <u>Short term:</u> Collaborate with PBT and PDRM to enforce Sec. 47 under Act 133 (Akta Jalan, Parit dan Bangunan 1974); also Sec. 73 under Act 171 (Local Government Act)</p> <p><u>Long term:</u> Reconcile different provisions concerning littering under different Acts and consider amendment of Act 672 to include Sec. 47 under Act 133 into Act 672</p>

ISSUES IN PUBLIC CLEANSING (cont'd)

No.	Issue	Proposed Solution	By Whom
3	<p>The term 'cleansing' has not been clearly defined, clear direction has not been given as to whether it includes cleaning, cleansing, removal, scrubbing etc.</p> <p>Determining boundaries of different authorities (JKR, JPS, PBT) responsible for public cleansing becomes unclear due to the term 'cleansing' and 'cleaning' not being defined</p> <p>Without a clear definition, uniformity cannot be achieved among different authorities and concessionaires; and to determine the machine/equipment/tools to be used and the level of expertise required</p>	<p>KPKT to initiate a platform for the relevant stakeholders to clearly define the term and respective boundaries:</p> <ul style="list-style-type: none"> - Reprofile control and enforcement measures at state levels - Identify opportunities for complementarity 	JPSPN, SWCorp, PBT/SUK
4	<p>There is no standard quality definition for cleanliness to be referred to by different authorities (perception of cleanliness)</p> <p>Frequency of service at present is not based on density and intensity of usage of different areas (market, high- to low-cost housing, public places, commercial areas)</p>	<p>Identify options to develop minimum standards and criteria for cleanliness at state level – aesthetics based performance for different zones according to density and usage intensity, and not just frequency</p>	JPSPN, SWCorp

ISSUES IN PUBLIC CLEANSING (cont'd)

No.	Issue	Proposed Solution	By Whom
5	Waste from public cleansing not capitalized for reuse and recycling	Revisit contractual requirements to allow for diversion of wastes from public cleansing to reuse and recycle wastes with private sector involvement (subject to formalization of wastes sale and purchase provisions)	JPSPN, SWCorp, BUU KPKT
6	Grey areas e.g. grease trap, cleaning of drains outside car mechanic workshops in shoplots	Define clearly 'grease' – who to govern and manage. Review CA – to reward for recycling/reuse than to dispose (subject to formalization of wastes sale and purchase provisions)	JPSPN, SWCorp, BUU KPKT

ISSUES IN PUBLIC CLEANSING (cont'd)

No	Issue	Act/Regulation	Proposal
7	<p>Properties owned and maintained by PBT but cleaning/cleansing are responsibilities of concessionaires under Act 672 – level of cleanliness of public toilets is dependent on facilities being well-maintained (including repairs, improvements and upgrade by PBT)</p> <p>There is no cleanliness standard for public toilets in terms of cleanliness, hygiene and health</p>	The respective PBT by-laws	<ol style="list-style-type: none"> 1. KPKT to explore handover of public cleansing back to PBT – amendment of Act 672 2. If PBT is not willing to proposal (1), explore smart partnership potential to optimize costs with private sector (e.g. PBTs lease toilets to 3rd party) 3. Identify options to develop minimum standards and criteria for cleanliness for toilets by usage <p><i>(pending options from work stream 4)</i></p>

DATABASE MANAGEMENT

“Capitalisation of Opportunities for Efficient Services”

OBJECTIVES OF DATABASE MANAGEMENT

There is a need to create a centralized solid waste database in order to meet the following objectives:

- 1. Enable the mapping of feedstock resource, tracking of facilities capacity & implementation;**
- 2. Create a mechanism to ensure data tracking & reportage on real time basis.**

The database is important in supporting stakeholders in making informed, holistic and quick decisions.

Critical Success Factors for solid waste database to be effective and meet its objectives:

- A. A Standard Operating Procedures (SOP) is developed to clearly defined the roles of SWCorp and JPSPN in database development, management and maintenance**
- B. JPSPN is given access to the database to extract and analyse the data**

SYSTEMS OWNED BY SWCORP

Currently, SWCorp has a few systems (which are not integrated) to manage different needs:

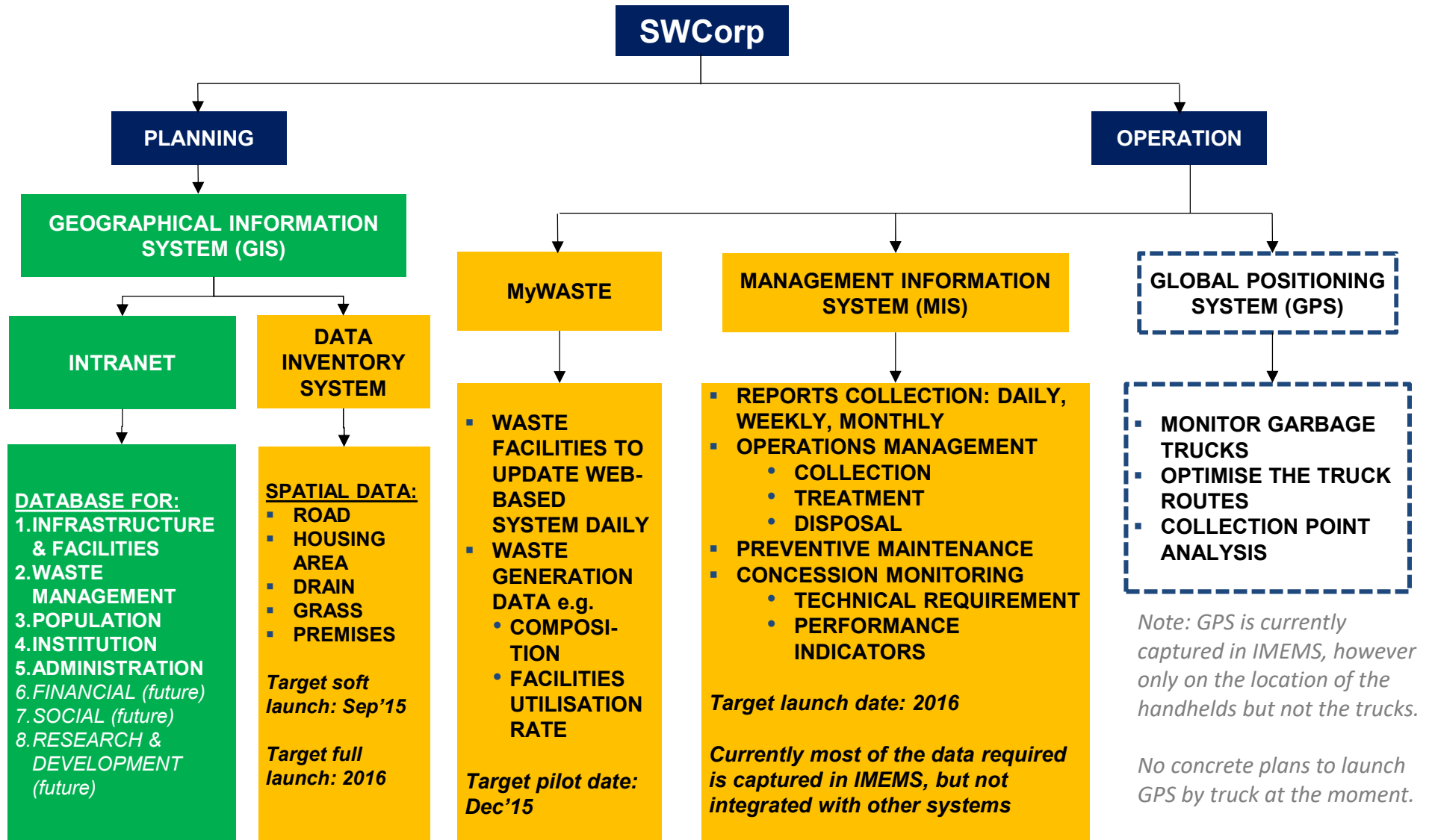
1. Geographical Information System (GIS)

- i. SWCorp Intranet – Captures basic spatial information (e.g. scheme areas based on CA and landfill locations) and waste flow information (by distance of each scheme to landfill and estimated tonnage)
- ii. Data Inventory System – Soft launch in September 2015, will capture detailed spatial data (geographical boundaries by road, housing area, drains, grass, premises etc.) of selected schemes. Detailed spatial information will be fully validated and populated into the system by 2016 (due to budget constraint)

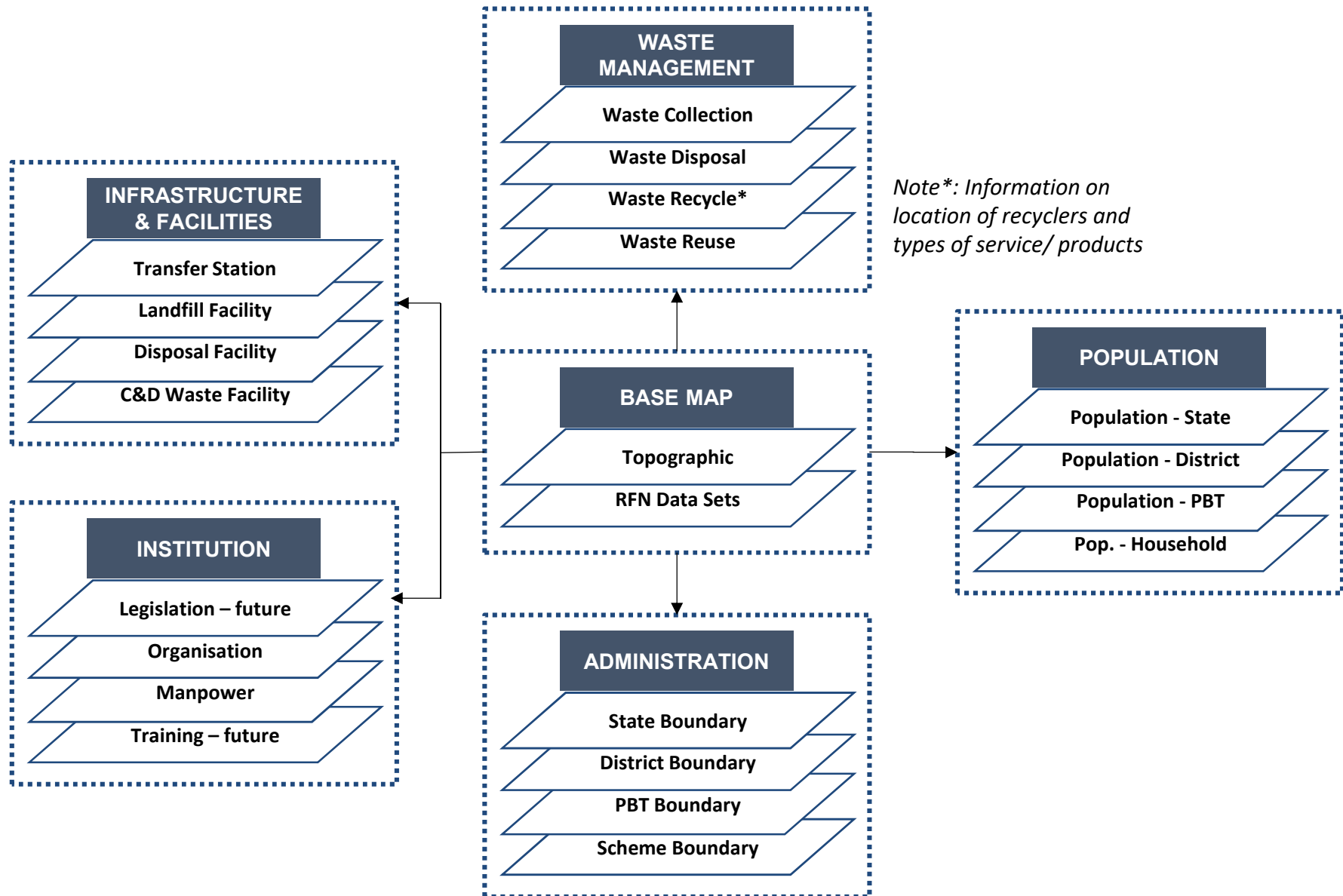
2. Intelligent Monitoring & Enforcement Management System (IMEMS)

- This system links to the handheld devices used by SWCorp enforcement officers
- Live updates of handheld information captured, KPI's of concessionaires and penalties to be imposed, Global Positioning System (GPS) of each handheld device

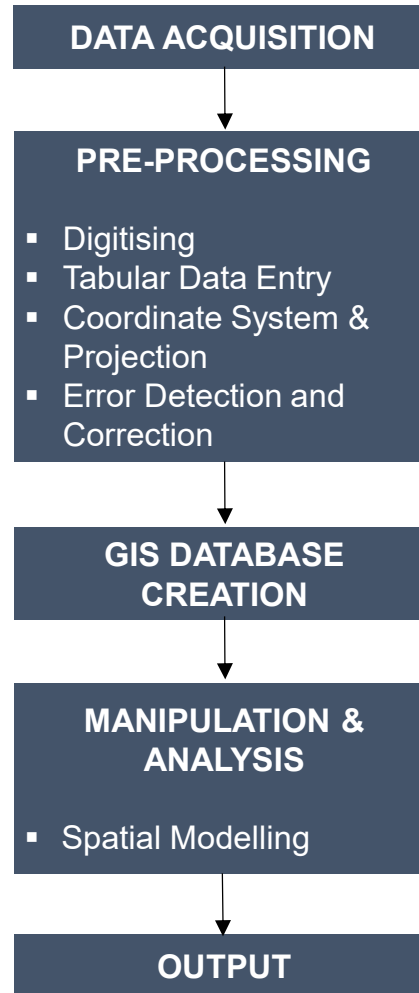
SYSTEMS OWNED BY SWCORP



EXISTING STRUCTURE OF GIS DATABASE

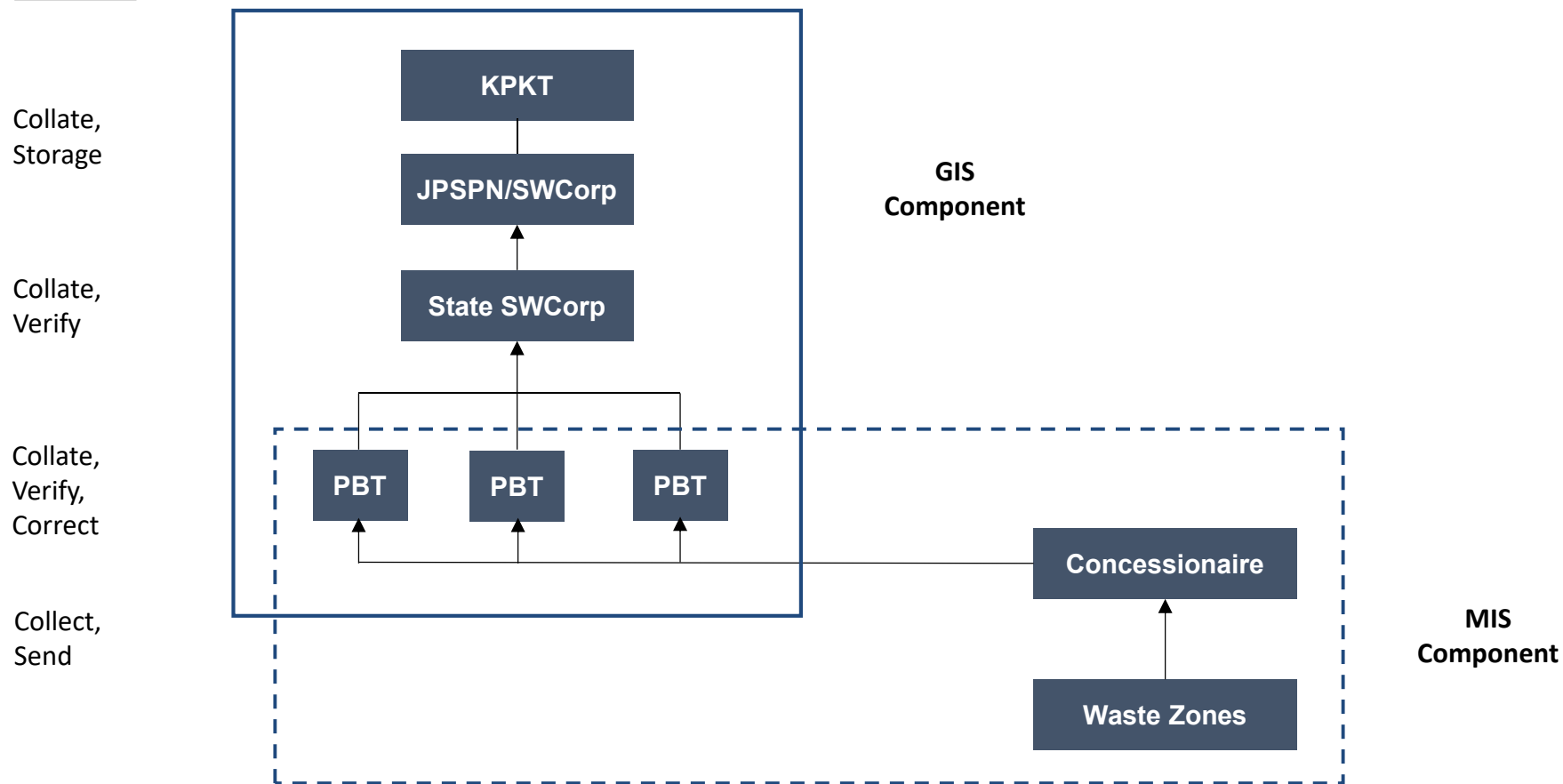


GIS METHODOLOGY FLOWCHART



PROPOSED FUTURE INTEGRATION OF GIS AND MIS SYSTEM

Procedure



Remarks:

GIS – Geographical Information System
MIS – Management Information System

REQUIREMENTS OF DATABASE MANAGEMENT

No	Requirement	Comments	System/team
1	<p>Waste Generation (By TPD/Scheme/Zone/PBT/States):</p> <p>Waste Characterisation:</p> <ul style="list-style-type: none"> i. Waste Composition (by ICI) ii. Waste Composition (by households) iii. Waste Composition (by +1) iv. Waste Composition (by +2) v. Proximate Analysis vi. Ultimate Analysis vii. Calorific Value 	<ul style="list-style-type: none"> i. Will be in system ii. Will be in system iii. Will be in system iv. Will be in system v. Info. available by request vi. Info. available by request vii. Info. available by request 	MyWASTE
2	<p>Recycling Rate (By TPD/Scheme/Zone/PBT/States):</p> <ul style="list-style-type: none"> i. Waste Recyclables Composition & Weight by ICI ii. Waste Recyclables Composition & Weight by households 	Info will be available IF all recyclers are licensed (note: it is a condition for the licensees to provide data upon request)	3R team

TPD: Tonnage per day

REQUIREMENTS OF DATABASE MANAGEMENT (cont'd)

No.	Requirement	Comments	System/team
3	<p>Disposed to landfill (by TPD):</p> <ul style="list-style-type: none"> i. Waste Composition ii. Waste Characterisation 	<ul style="list-style-type: none"> i. Info. available by request ii. Info. available by request 	MyWASTE
4	<p>Lists of Concessionaires/Operators & Contact Details</p> <ul style="list-style-type: none"> i. List of Facilities & Installed Designed Capacity ii. Facility Utilisation Rate iii. Costs of Tipping Fees / Agreement Fees 	<ul style="list-style-type: none"> i. Will be in system ii. Will be in system iii. Not sure at this point 	MyWASTE
5	<p>Lists of Recyclables Collectors / Players in industry & Contact Details (By TPD/Scheme/Zone/PBT/States):</p> <ul style="list-style-type: none"> i. List of Recyclables & Pricing ii. List of 3R Centres 	Info will be available IF all recyclers are licensed (note: it is a condition for the licensees to provide data upon request)	3R team

TPD: Tonnage per day

REQUIREMENTS OF DATABASE MANAGEMENT (cont'd)

No.	Requirement	Comments	System/team
6	i. Geographic Boundaries ii. Waste-Flow map	i. Validating. Target completion date 2016 ii. Available now	GIS
7	TPD and Historical generation rates	At the moment it is based on estimation. Once MyWASTE goes live fully in 2016 actual data will be captured	MyWASTE
8	Cost-Avoidance Benchmark i. Current Disposal Rates ii. Life Cycle Cost	Need further study	SWCorp
9	Area Characteristics i. HIRU ii. Nearby Industries (Complementary/Conflicting/Competing) iii. Population	i. Need further study ii. Need further study iii. Available now	SWCorp

TPD: Tonnage per day

REQUIREMENTS OF DATABASE MANAGEMENT (cont'd)

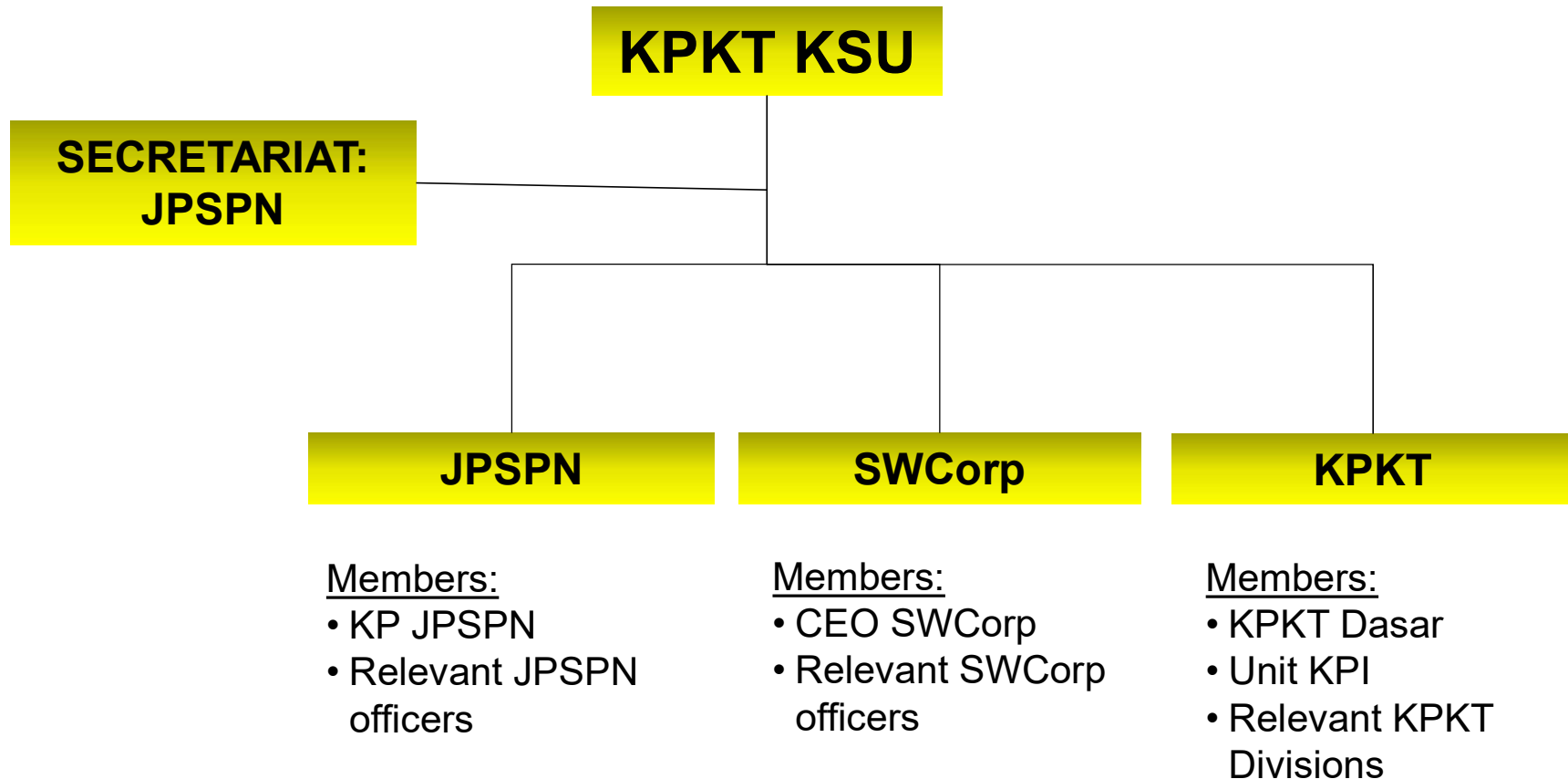
No.	Requirement	Comments	System/team
10	Any SWM facilities & activities located in the area & surrounds i. Existing (Type & Capacity) ii. Planned (Type & Capacity, On-stream DATE)	Available now	GIS
11	Include an automatic monthly reconciliation mechanism in every facility operator's responsibility for monthly updated data management via feed-in to an automated integrated dashboard model with: i. Automatically transmitted data-feed via built-in live sensors from weighbridges ii. Breach-of-contracts alert flags to be built into the database iii. Automated & immediate paper trail generated on notices of breach	Will need further study when system is fully launched and stabilised i. At the moment only 6 landfills taken over by government has weighbridges	MyWASTE & SWCorp

TPD: Tonnage per day

DELIVERY MANAGEMENT OFFICE

“Capitalisation of Opportunities for Efficient Services”

PROPOSED DELIVERY MANAGEMENT OFFICE (DMO) TO BE SET UP IMMEDIATELY



Function:

To drive the implementation of the plans proposed in this lab – ensure the plans are delivered on a timely manner by engaging the relevant stakeholders

Meeting Frequency:

Monthly

Workstream, Facilitators & Members

Champion : YB Minister of KPKT/ Secretary General of KPKT/ Director General of JPSPN

Lab Leader: Khalilulnisha Abu Bakar

Engagement Manager: Sharul Azwa Abd Rani

1 Facilitator: Shahrul Azhar Shaari

- JPSPN
- DBKL
- SW Corp
- The Waste Management Association of Malaysia (WMAM)

2 Facilitator: Mohd Ariff Ithnin

- JPSPN
- Biotechnology Corporation
- Concessionaires
- ECER
- IRDA
- JPBD
- MGTC
- MIGHT
- SIRIM
- SW Corp
- UTM

3 Facilitator: Kathleen Choo

- EPU
- IRDA
- JPSPN
- KETTHA
- MGTC
- MIGHT
- SW Corp
- WMSH

4 Facilitator: Samantha Pheh

- JPSPN
- SW Corp
- DBKL

5 Facilitator: Loh Yee Lian

- JPSPN
- SW Corp
- DBKL

Glossary – General

Definitions under Act 672:

Term	Definition
3R	Reduce, Reuse and Recycle
Anaerobic digestion	Biochemical process that breaks down the organic constituents of waste in the absence of oxygen.
Calorific value	The quantity of heat generated when unit mass of a material undergoes complete combustion under a certain specified condition.
Disposal	Disposal of any solid waste by any means including destruction, incineration, deposit or decomposing.
Disposal fees	“Tipping” fee for the disposal process.
Diversion	Minimising amount of final disposal in landfill with the goal of an x number of waste going to landfills, simultaneously maximizing the lifespan of landfills.
Incineration	Thermal degradation of waste under controlled conditions.
Local Authority (also PBTs)	<ul style="list-style-type: none"> Any local authority established or deemed to have been established under the Local Government Act 1976; in relation to the Federal Territory of Labuan, means the local authority established under the Local Government Ordinance 1961 of Sabah, in operation in the Federal Territory of Labuan as modified by the Federal Territory of Labuan (Modification of Local Government Ordinance) Order 1984 [P.U. (A) 169/1984]; in relation to the Federal Territory of Kuala Lumpur, means the Commissioner of the City of Kuala Lumpur appointed under section 3 of the Federal Capital Act 1960 [Act 190]; and includes any person or body of persons appointed or authorized under any written law to exercise and perform the powers and functions which are conferred and imposed on a local authority under any written law.

Glossary – General

Definitions under Act 672:

Term	Definition
Local Authority (also PBTs)	<ul style="list-style-type: none"> Any local authority established or deemed to have been established under the Local Government Act 1976; in relation to the Federal Territory of Labuan, means the local authority established under the Local Government Ordinance 1961 of Sabah, in operation in the Federal Territory of Labuan as modified by the Federal Territory of Labuan (Modification of Local Government Ordinance) Order 1984 [P.U. (A) 169/1984]; in relation to the Federal Territory of Kuala Lumpur, means the Commissioner of the City of Kuala Lumpur appointed under section 3 of the Federal Capital Act 1960 [Act 190]; and includes any person or body of persons appointed or authorized under any written law to exercise and perform the powers and functions which are conferred and imposed on a local authority under any written law.
Licensee	A person who is licensed under Act 672.
Occupier	<ul style="list-style-type: none"> A person in occupation or control of any premises; in relation to premises where different parts of the premises are occupied by different persons, means the respective person in occupation or control of each part of the premises.
Materials Recovery Facility (MRF)	Facility which is designed and operated to process solid waste by the use of mechanical or manual products to separate useful materials from the waste stream for use as raw materials or products.
Premise	Includes houses, buildings, lands, easements of any tenure, whether open or enclosed, whether built on or not, whether public or private, and whether maintained or not under statutory authority.
Public Places	Any open space, parking place, garden, recreation and pleasure ground or square, whether enclosed or not, set apart or appropriated for the use of the public or to which the public shall at any time have access.

Glossary – General

Term	Definition
Public Cleansing Management Services	<ul style="list-style-type: none"> • The cleansing of public roads, public places, public toilets and public drains; • the cleansing of:– <ul style="list-style-type: none"> • hawker centres excluding privately owned and maintained food courts; and • markets excluding privately owned and maintained markets; • the clearing of illegally dumped controlled solid waste on public roads and in public places; • beach cleansing; • kerbside grass cutting on public roads; • grass cutting in public places; and removal of carcasses, • but excludes landscaping and the maintenance of public roads and public places.
Recycling	To collect and separate solid waste for the purpose of producing products.
Recycling centre	Collect and segregate waste by type.
Recycling fees	Fees to cover for the recycling process. Party responsible is obligated to collect and properly dispose used waste. Fees cover disposal fees as well.
Recycling industries	Take away recyclables and process to become raw materials.
Reduce	The process of designing, manufacturing, acquisition and reuse of material so as to minimise the quantity or toxicity of the waste generated.
Reuse	The process by which, waste for disposal is collected for utilization more than once either for the same-level function or new-life reuse.
Separation at source	Segregation of various waste at the point of generation.

Glossary – General

Term	Definition
Solid Waste	<ul style="list-style-type: none"> Any scrap material or other unwanted surplus substance or rejected products arising from the application of any process; any substance required to be disposed of as being broken, worn out, contaminated or otherwise spoiled; or any other material that according to this Act or any other written law is required by the authority to be disposed of.
Solid Waste Management Facilities	Any land, fixed or mobile plant and systems incorporating structures, equipment used or intended to be used for the handling, storage, separation, transport, transfer, processing, recycling, treatment and disposal of controlled solid waste and includes transfer stations, disposal sites, sanitary landfills, incinerators and other thermal treatment plants, recycling plants and composting plants.
Thermal Treatment Plant	A fixed or mobile plant where solid waste is treated under controlled conditions by mass burn incinerators, gasification, plasma technology, pyrolysis or other means of degradation under controlled temperature and pressure.
Transfer Station	Place or facility where waste is transferred from a smaller collection vehicle to a larger transport vehicle for movement to treatment or disposal facility, usually landfill.
Waste treatment	Any appropriate process or activity designed to minimise the impact of waste on the environment.

Abbreviations - General

Term	Definition
AG	Attorney General
CANS	Catchment Area Needs Statement
CoE	Centre of Excellence
EPC Contractor	Engineering, Procurement and Construction Contractor
EPR	Extended Producer Responsibility
EQA	Environmental Quality Act 1974
GGP	Green Government Procurement
GVA	Gross Value Added
IBS	Industrialised Building Systems
LTSA	Long-term Service Agreement
O & M Contractor	Operations and Maintenance Contractor
PFI	Private Finance Initiative
PQQ	Pre-qualification Questionnaire
R&D	Research & Development
REPPA	Renewable Energy Power Purchase Agreements
SCP	Sustainable Consumption and Production

Abbreviations – Ministries, agencies, bodies and entities

Term	Definition
AELB	Atomic Energy Licensing Board
Bernas	<i>Padiberas Nasional Berhad</i>
CIDB	Construction Industry Development Board
DOE	Department of Environment (also JAS, <i>Jabatan Alam Sekitar</i>)
FRIM	Forest Research Institute Malaysia
IWK	Indah Water Konsortium
JKR	Road Works Department (<i>Jabatan Kerja Raya</i>)
JKT	Local Government Department (<i>Jabatan Kerajaan Tempatan</i>)
JPP	<i>Jabatan Perkhidmatan Pembentukan</i>
JPSPN	Department of National Solid Waste Management (<i>Jabatan Pengurusan Sisa Pepejal Negara</i>)
KETTHA	Ministry of Energy, Green Technology and Water
KPKT	Ministry of Urban Wellbeing, Housing and Local Government
MARDI	Malaysian Agricultural Research and Development Institute
MGTC	Malaysian Green Technology Corporation
MIDA	Malaysia Investment Development Authority
MIGHT	Malaysian Industry-Government Group for High Technology

Abbreviations – Ministries, agencies, bodies and entities

Term	Definition
MOA	Ministry of Agriculture
MCB	Malaysian Cocoa Board
MOE	Ministry of Education
MOF	Ministry of Finance
MOH	Ministry of Health
MOSTI	Ministry of Science, Technology and Innovation
MOTOUR	Ministry of Tourism
MPB	Malaysian Pepper Board
MPOB	Malaysian Palm Oil Board
MRB	Malaysian Rubber Board
MNRE (NRE)	Ministry of Natural Resources and Environment
SEDA	Sustainable Energy Development Authority
SIRIM	Standards and Industrial Research Institute of Malaysia
SME Corp	Small and Medium Enterprise Corporation
SWCorp	Solid Waste Corporation (also <i>Perbadanan Pengurusan Sisa Pepejal dan Pembersihan Awam</i>)
TNB	<i>Tenaga Nasional Berhad</i>
UKAS	Public Private Partnership Unit (<i>Unit Kerjasama Awam Swasta</i>)

Abbreviations – Ministries, agencies, bodies and entities

Term	Definition
GoM	Government of Malaysia
CBO	Community based organisations
NGO	Non-governmental organisations (Scope: Environmental NGOs)
RA	Residents' Association

Translations - General

Term	Definition
<i>Bandaraya</i>	City
<i>Daerah</i>	District
KJ	<i>Ketua Jabatan</i> , Head of Department
KP	<i>Ketua Pengarah</i> , Director
KSN	Chief Secretary to the Government of Malaysia
KSU	Chief Secretary of the Ministry
<i>Perbandaran</i>	Township
PUU	<i>Pegawai Undang-undang</i> , Legal Officer

Glossary – Types of waste

Term	Definition
Controlled solid waste	Any solid waste falling within the following categories: Commercial, construction and demolition, household, industrial, institutional, import, public or solid waste which may be prescribed from time to time.
Commercial solid waste	Any solid waste generated from any commercial activity.
Debris	Waste from disastrous and hazardous events.
E-waste	Waste from electric and electrical assemblies containing components such as accumulators, mercury-switches, glass from cathode ray-tubes and other activated glass or polychlorinated biphenyl-capacitors. Waste from electrical and electronic assemblies containing components contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese, or polychlorinated biphenyl.
Food waste	Organic waste (preparation or leftovers) arising from household or other food catering and food processing industrial activities.
Hazardous household waste	Post-consumer waste or “household solid waste” which qualifies as hazardous waste when discarded.
Household solid waste	Any solid waste generated by households, and of a kind that is ordinarily generated or produced by any premises when occupied as a dwelling house, and includes garden waste.
Industrial solid waste	Any solid waste generated from any industrial activity.

Glossary – Types of waste

Term	Definition
Institutional solid waste	<ul style="list-style-type: none"> Any premises approved under any written law or by the State Authority for use wholly or mainly for religious worship or for charitable purposes; any premises occupied by any Federal or State Government department, any local authority or any statutory body; any educational premises; any healthcare facilities including hospitals, clinics and health centres; or any premises used as public zoos, public museums, public libraries and orphanages.
Municipal solid waste (MSW)	Defined under Act 672 as “controlled solid waste”.
Public solid waste	Any solid waste generated by public places, which are under the supervision or control of any local authority.
Recyclable solid waste	Controlled solid waste which is suitable for recycling as may be prescribed.
Scavenged recyclables	Recyclables unlawfully obtained by unauthorised persons from recycling bins or containers.

Formula: Recycling rates

$$\text{HRR (Household Recycling Rate)} = \frac{\sum \text{household recyclables}}{\text{Total Solid Waste Generated**}}$$

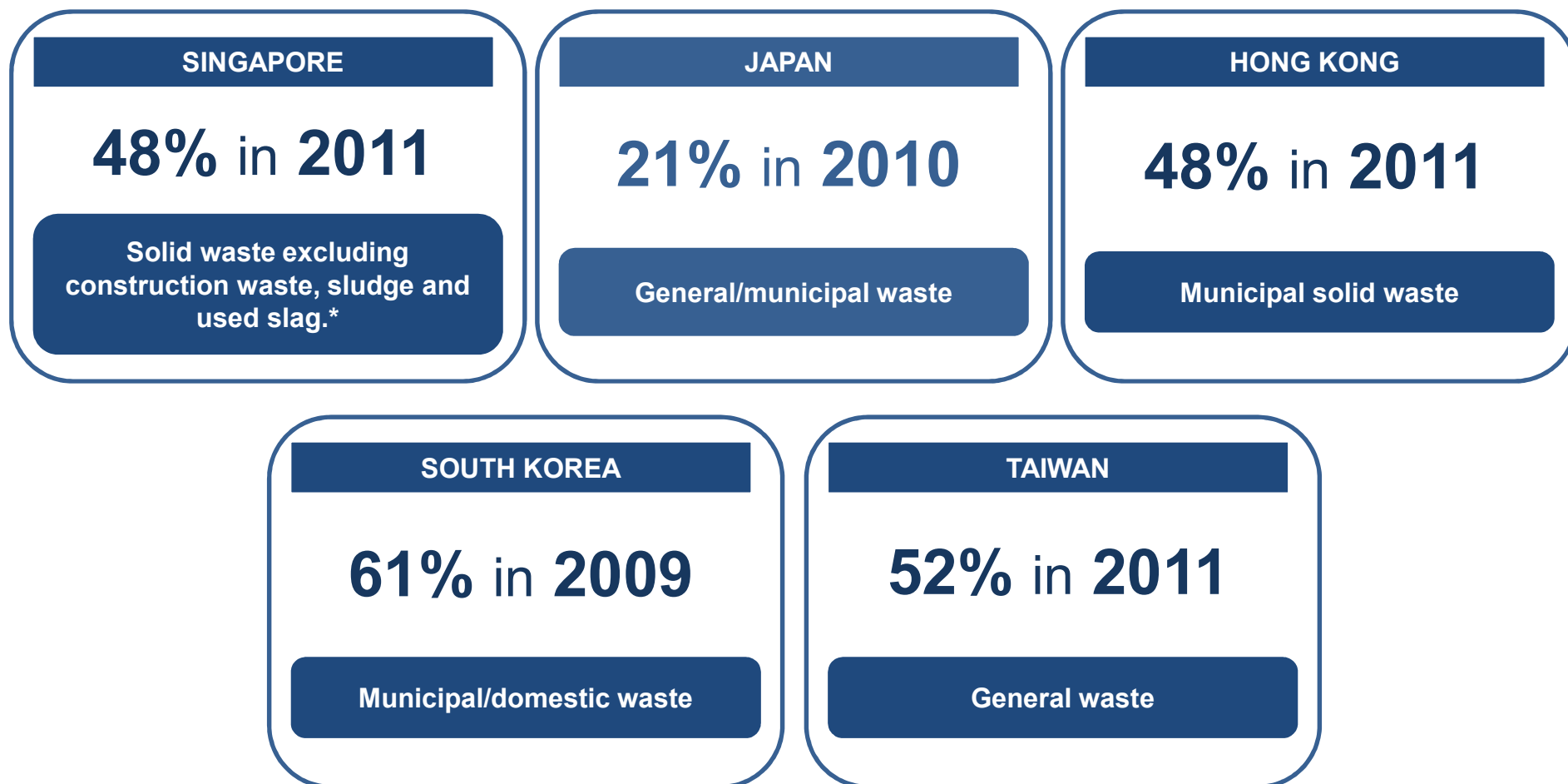
$$\text{ICIRR (ICI Recycling Rate)} = \frac{\sum \text{ICI non-production waste recyclables}}{\text{Total Solid Waste Generated**}}$$

Formula: Recycling rate of 22%

$$\text{TRR (Total Recycling Rate)} = \frac{\sum \text{household recyclables} + \sum \text{ICI non-production waste recyclables} + \sum \text{scavenged recyclables}}{\text{Total Solid Waste Generated**}}$$

- ICI – industrial, commercial and institutions.
- 22% recycling rate as set in the National Solid Waste Strategic Plan 2005 and derived based on assumption that recycling rate will increase 1% per annum with the aim that Malaysia will achieve the 22% target at the end of the concession period. (NSP increase by 5% every year – history up until now 10.5).
- Numbers for Household recyclables and ICI non-production waste recyclables are based on the Survey.

Benchmark: Recycling rate of other countries



- The published Total Solid Waste Recycling rate is 59%. After excluding construction waste, sludge and used slag, the solid waste recycling rate is 48%.

Note: Formulas for respective recycling rates are not published for public consumption. There is also no standardised international formula.