Development of Solid Waste Management in Malaysia
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.

**Solid Waste Management & Public Cleansing Act 672**

- **Collection & disposal of controlled solid waste**
  - Household
  - Commercial
  - Construction
  - Industry
  - Institutions
  - Public
  - Imported
  - As determined by the Minister from time to time

- **Public cleansing (PC)**
  - Streets, public areas, public toilets, public drainage
  - Markets and hawker centres
  - Illegal dumping
  - Beaches
  - Public area & roadside grass cutting
  - Removal of carcasses

**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

*Source: Act 672, JPSPN, pre-lab analysis*
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
   - Current manpower, technical expertise & financial resources are insufficient.
   - There are also delays in receiving the designated funding, setting back implementation of prior National Plan on Solid Waste.

3. Inadequate fund and mismatch between revenue and cost
   - Inadequate fund to support implementation plans: delay some implementation plans.
   - The current revenue-cost model is unsustainable: contribution from 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.
Framework for sustainable Solid Waste Management in Malaysia

True North
By 2020:
40% waste diversion from landfill
22% recycling rate

Optimisation & Minimisation of Solid Waste
Waste facilities
Market Creation
Public Cleansing
Governance and Legislation

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

SOURCE: Dasar, Team Analysis
# Landfills in Malaysia

<table>
<thead>
<tr>
<th>State</th>
<th>Landfill in operation</th>
<th>Closed landfill</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johore</td>
<td>11</td>
<td>26</td>
<td>37</td>
</tr>
<tr>
<td>Melaka</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Negeri Sembilan</td>
<td>5</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Pahang</td>
<td>16</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Kuala Lumpur</td>
<td>0</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Selangor</td>
<td>8</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Perak</td>
<td>17</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>Kedah</td>
<td>8</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Pulau Pinang</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Perlis</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kelantan</td>
<td>13</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Terengganu</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>WP Labuan</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sabah</td>
<td>19</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Sarawak</td>
<td>49</td>
<td>14</td>
<td>63</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>159</strong></td>
<td><strong>137</strong></td>
<td><strong>296</strong></td>
</tr>
</tbody>
</table>
Current Waste Treatment Systems

- Landfilled: 88%
- Recycle: 9.7%
- Incinerator: 0.45%
- Refuse Drive Fuel: 1.5%

Waste Composition

<table>
<thead>
<tr>
<th>Main Waste component</th>
<th>2005 (Percentage,%)</th>
<th>2012 (Percentage,%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic/Food waste</td>
<td>45</td>
<td>44.5</td>
</tr>
<tr>
<td>Paper</td>
<td>7</td>
<td>8.5</td>
</tr>
<tr>
<td>Plastic</td>
<td>24</td>
<td>13.2</td>
</tr>
<tr>
<td>Metal</td>
<td>6</td>
<td>2.7</td>
</tr>
<tr>
<td>Glass</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td>Diapers</td>
<td>?</td>
<td>12.1</td>
</tr>
<tr>
<td>Others (textiles, tetrapak, HHW, Leather etc)</td>
<td>15</td>
<td>15.7</td>
</tr>
</tbody>
</table>
The lab is targeting 40% reduction of waste to landfill by year 2020.

16.76 million tonne of waste is expected to be generated by Malaysians in the year 2020.

Target to reduce waste to landfill by 40% compared to 15% BAU.

Household and Commercial Solid Waste Generation:

- Total Waste: 45,900 tonne/day
- Commercial Waste: 30%
- Household Waste: 70%
- Recycling rate: 5%
- Disposed (Commercial): 22%

Source: Lab analysis.

Treatment facility includes: 860 tpd RDF in Semenyih, 175 tpd for 4 mini-incinerators in islands and Cameron, 175 tpd facility in KK.
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 States Under Act 672

**ASPIRATION BY 2020**
- Sanitary landfills will be in operation: **23**
- Safe Closure of landfills: **44**
- Transfer Stations: **17**
- Integrated Facilities: **13**

**INVESTMENT**
- **RM6.7b**
  - CAPEX
- **RM818m/annum**
  - OPEX

**VALUE CREATION**
- **Value to the Government**
  - Potential savings on land acquisition costs for 20 years (to avoid to acquire 518 hectares of new land)
  - Potential savings on leachate treatment costs
  - Potential creation of more than 2,500 employment
  - 220MW
  - 631,000
  - 40%
  - 5.8m
  - 1.2m

**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

**NEW**
- **RM129.6m**
  - 631,000 houses per month
- **RM16m p.a.**
- **RM5.2bn**
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.

Thus, 12,410 ton/day (or 30%) waste need to be treated in order to achieve the 40% waste diversion from landfill by year 2020.

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

Source: Lab analysis

* Recycling includes recyclables items direct sorting at source that are collected by concessionaires.
Prioritisation is key in selecting the site for establishing an integrated waste facility for the most impact. Targeted ton per day 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

Source: Lab analysis
Our True North
To have 40% waste diversion from landfill by 2020

POTENTIAL VALUE CREATION OF RM6.7bn Investment

Value to the Government

RM79.5m
RM16m p.a
RM5.2bn

Potential savings on land acquisition costs for 20 years
Potential savings on leachate treatment costs
Potential savings by govt (coz if business as usual, govt may needs to fork out RM11.8bn)

200MW
400,000
40%

Potential to generate of 200MW renewable energy – to serve 400,000 houses per month
Waste diversion from landfill

Value to the Rakyat

5.8m
1.2m
2,500

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

Source: Lab analysis
THANK YOU!