



# MAXIMIZING RESOURCE RECOVERY

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**Thematic Session 1A: Waste Management**

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# CHALLENGES

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- ❖ Waste Separation at source not yet implemented
- ❖ Mixed waste hinders efficient resource recovery
- ❖ Creating more diversion points for recyclables and organic waste
- ❖ Changing people's mindset and practices

# CHANGING THE RULES

## By-Laws & Regulations

1. Source Separation By-laws
2. Waste Generator Pays Principle

# WASTE SEPARATION AT SOURCE BY-LAW

- (a) to encourage and facilitate the maximum recycling practicable on the part of each and every household, business, apartment complex, industry, and institution within State of Penang;
- (b) to establish, implement, and enforce minimum recycling-related practices and procedures to be applicable to all Waste Generators, Waste Haulers/Recyclable Collectors, and Materials Recovery Facilities/Recycling Facilities located within municipality; and
- (c) to require onsite Source Separation by each and every Waste Generator within Penang Island Municipal Council and the Seberang Perai Municipal Council and to ensure that those Recyclable Materials that are Source Separated are recycled properly and kept separate from Solid Waste.

# WASTE STREAMS COVERED

## ✘ MSW

- + Paper / paper products
- + Plastics
- + Metals
- + Glass
- + Organic Waste

## ✘ Organic Waste

- + Green Waste
- + Food waste
- + Animal Waste
  - ✘ Carcass
  - ✘ Dung
- + Bulky Waste

## ✘ E-waste

## ✘ C&D

- + Excavation waste / marine clay
- + Broken Glass
- + Wood
- + Concrete
- + Metal
- + Other Organic waste
- + Other Mixed Waste

# STAKEHOLDERS

- ✖ Domestic
  - + Highrise
  - + Kampung
  - + Landed
- ✖ Institutional
  - + Schools
  - + Universities /Colleges
  - + Hospitals
  - + Government
- ✖ Industrial
- ✖ Commercial
  - + Shoplots
  - + Hotels / Inns / Guest Houses etc
  - + Restaurants
  - + Food Courts / Hawkers Centres
  - + Markets
- + Farms
- + Turf Club
- + Others
- ✖ Recycling Business
  - + Collectors
    - ✖ NGOs
    - ✖ CBOs
    - ✖ Schools
    - ✖ Other collectors
  - + Traders
  - + Processors
  - + Convertors

# WASTE GENERATOR PAYS PRINCIPLE

Proposed Mechanism for  
Final Disposal of Commercial & Industrial  
Waste



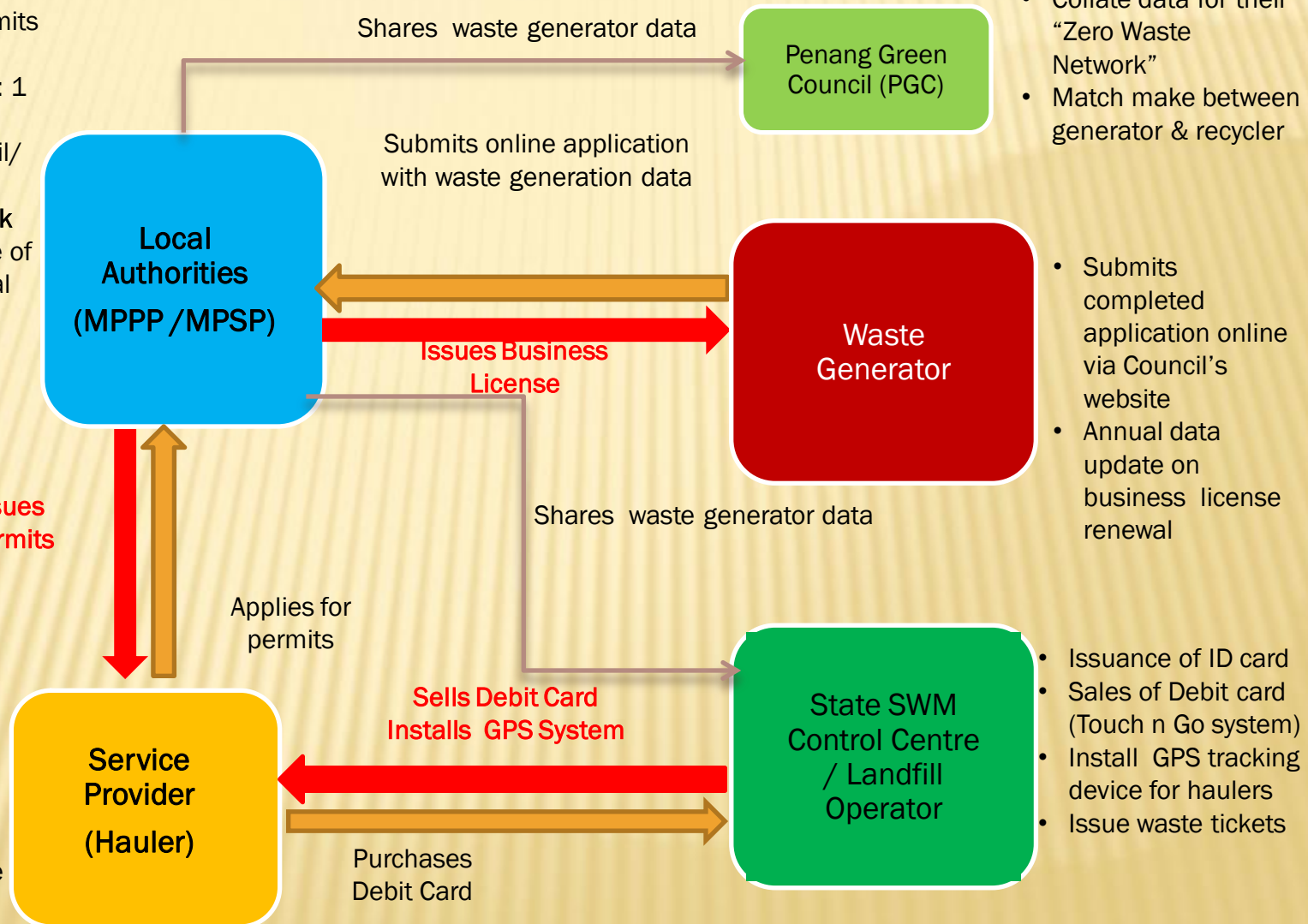
# BENEFITS TO LOCAL AUTHORITIES

- 1. Save SWM final disposal costs**
- 2. Income from issuance of permits**
- 3. Additional income from tipping fees**
- 4. Leverage on private sector to collect data for Commercial & Industrial database**
- 5. Cost of GPS monitoring and tracking system borne and operated by private sector**
- 6. Private sector to monitor illegal dumping of Commercial & Industrial waste.**

# FUNCTIONAL RELATIONSHIPS BETWEEN STAKEHOLDERS

- Approves & Issues permits to hauler on per track basis (Min: 1 mth; Max: 1 yr)
- 4 plys - Hauler /Council/ WG/ LFO
- **Verify and countercheck yearly amount and type of Commercial & Industrial waste disposed at the landfill.**
- Renew WG yearly business license

- Applies for permits
- Purchase debit card
- Informs Waste Generator
- Install GPS system on trucks
- Returns copy of waste ticket to WG for verification



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# SUCCESS STORIES

# ORGANIC WASTE DIVERSION APPROACH



1. Processing the food / kitchen waste on site with a food waste processing machine,
2. Diverting food / kitchen waste for community composting,
3. Diverting food / kitchen waste to an existing organic waste treatment facility and
4. A combination of methodologies (2) and (3).



# PENANG ISLAND – HIGHRISE PILOT PROJECTS



Taman Pelangi Medium Cost Apartments  
Separation of Organic waste via food  
processing machine



# SEBERANG PERAI – HIGHRISE PILOT PROJECTS



Park View Condo, Harbour Place, Butterworth



Taman Pandan , Butterworth



Separation of Recyclables  
& Food Waste





# ORGANIC WASTE DIVERSION CENTRES



Taman Pelangi On-site Food Waste Processing Plant



Bagan Ajam Wet Market Food Waste Processing Plant



# BUILDING ZERO WASTE COMMUNITIES

## Premise on Penang Island

Landed Properties : 818  
High Rise : 1,213  
Shop lot : 48

## Estimated Generation of Waste:

$2,031 \times 5 \times 1.1 \text{ kg} = 11.17 \text{ ton per day}$

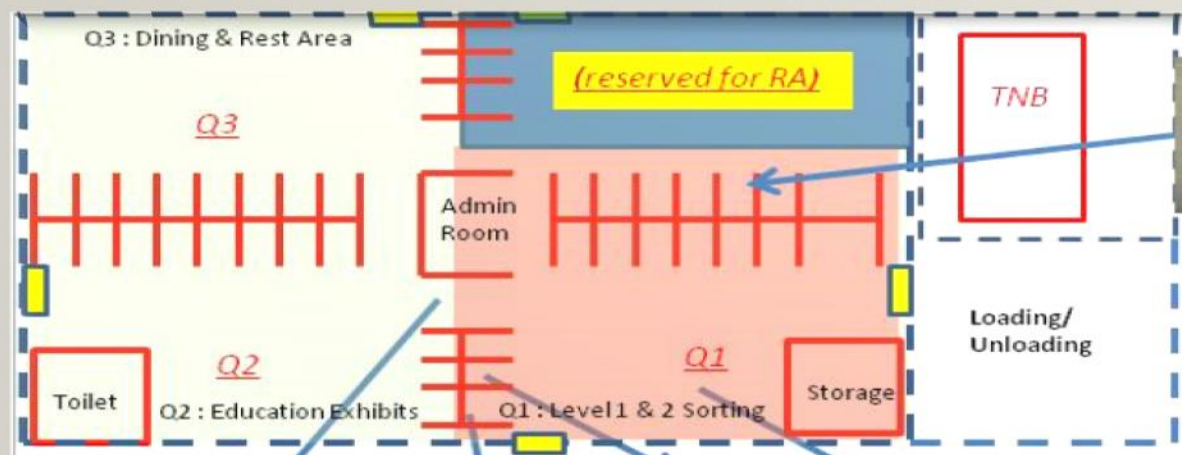
Estimated Generation of Organic  
Waste:  $33\% \times 11.17 \text{ ton} = 3.68 \text{ ton per day}$





# BUILDING ZERO WASTE COMMUNITIES

## Tzu Chi Community Recycling Centre



CD/Tape Dismantling

PC Refurbish



Registration



Tool



B/W sorting





# ZERO WASTE PROGRAMME (VILLAGE COMMUNITY)





# ZERO WASTE PROGRAMME(VILLAGE COMMUNITY)





# Green Schools Award



2012- 53 schools  
2013- 84 schools





## Giving Talks on Composting At School







## BRIEFING ON SOAP PRODUCTION USING USED COOKING OIL





# Education & Awareness



# SUCCESS FACTORS

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- ✗ Strong political will
- ✗ Public education & awareness campaigns for behavioural change
- ✗ Strong ground champions and supportive NGOs
- ✗ Strong Community support and participation
- ✗ Incentives & Penalties



# CONCLUSION

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- ✗ Your Environment , Your Ownership
- ✗ Focus on the waste generator and not on the waste generated!
- ✗ Waste generators must pay!



# TERIMA KASIH