



Efforts Toward Building Low Carbon Cities

Phee Boon Poh
State Exco for Welfare Caring
Society & Environment
31 March 2014

OVERVIEW

- Global Commitments
- Penang's Environmental Policy
- Targets
- Local Action
- Strategies 1 – Activities
- Strategies 2 - Activities
- Strategies 3 - Activities
- Strategies 4 – Activities
- Challenges
- Conclusion

Global Environmental Commitments

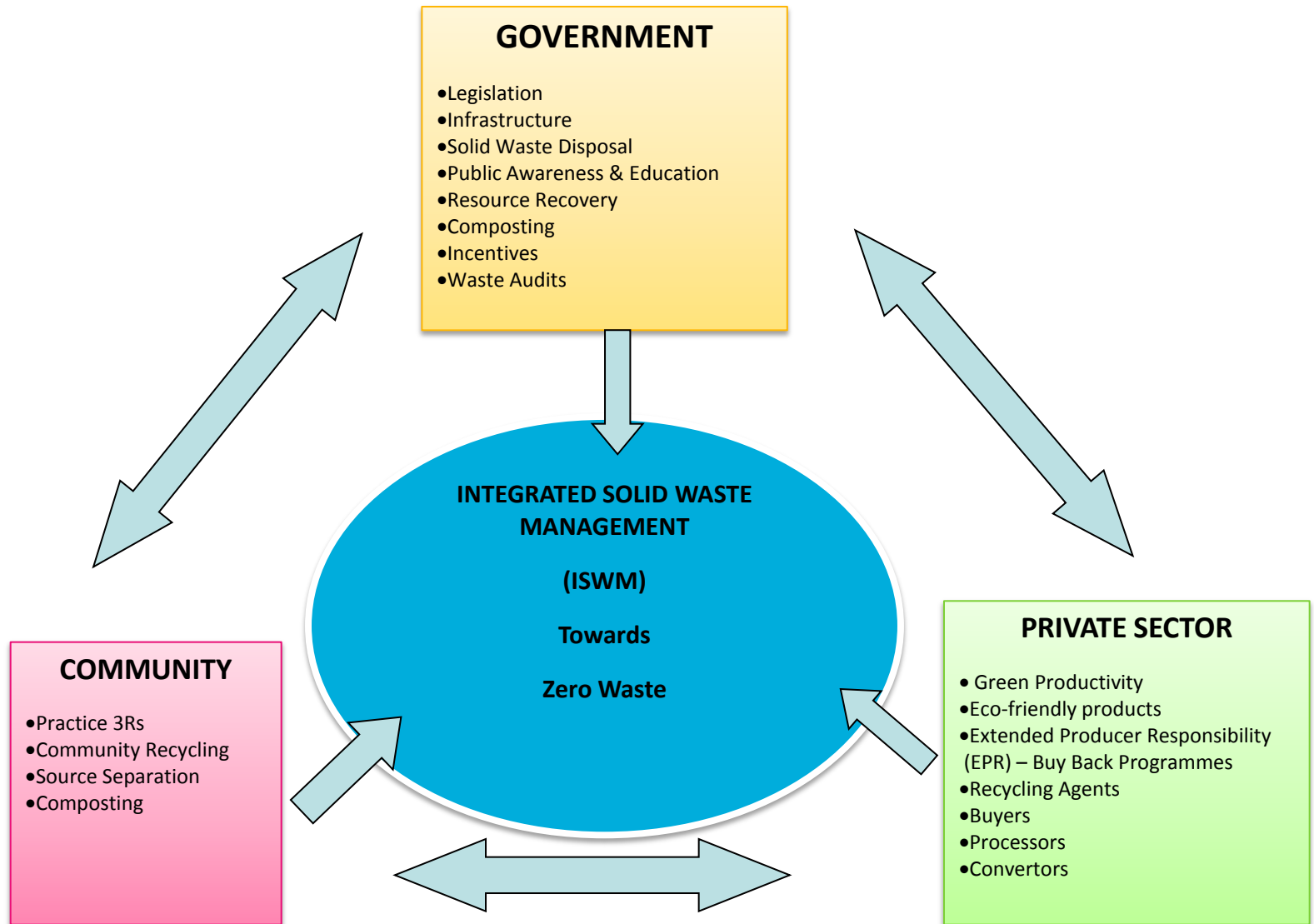
- Prime Minister of Malaysia, Datuk Seri Najib Tun Razak , delivered Malaysia's proposal to reduce its CO₂ emissions to 40 per cent by the year 2020 compared with its 2005 levels, subject to assistance from developed countries. Copenhagen, Denmark. *17 Dec 2009.*
- National Recycling target of 20% by 2020

Penang's Environmental Policy



- **The Penang Government is committed to the transformation of Penang State's economic, social and cultural development so as to improve the quality of life of its citizens through environmentally sound and sustainable principles based on the CAT principle.**
- **Competency**
- **Accountability**
- **Transparency.**

FUNCTIONAL RELATIONSHIP OF STAKEHOLDERS IN PENANG'S ISWM SYSTEM



CHALLENGES

- Overlapping portfolios – Environment & SWM
- Grey areas of Responsibilities
- Need to streamline and coordinate for more efficient handling
- Clear policy direction for balanced development to benefit future needs
- Protect environmental resources
- Local authorities to coordinate with other agencies

- Make changes towards realising environmental importance and sustainability in growing Green Economy supported by strong political will leadership.
- Appropriate action reflected in policy changes and programmes, especially from the State Government towards ecological sustainability & food security

3. Changing Mindsets

Moving towards Changing Mindsets

- **Awareness**
- **Education**
- **Attitude Change**
- **Warning &**
- **Enforcement**

Success factors

- Strong political will
- Public education & awareness campaigns for behavioural change
- Receptive stakeholders (NGOs, CBOs, Private Institutions) with community commitment
- Strong Community support and participation
- Incentives & Penalties

Selecting Technologies

Selection of Technology

- **Available**
- **Accessible**
- **Appropriate**
- **Affordable**

Targets for Waste Reduction & Recycling 2011-2020

Indicator	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Waste Generation kg/capita/day	1.5	1.35	1.21	1.09	0.98	0.88	0.78	0.72	0.64	0.58
Recycling Rates (%)	25	27	30	33	37	40	44	49	53	59

Source: PEMANDU SWM Lab, 2011

**Target (by 2020):
0.58 kg/day/capita**

(2011: 1.50 kg/day/capita)

**Target (by 2020):
60% recycling rate**

(2011: 23% recycling rate)

Landfill*

- Reduce total volume landfilled
- Divert organic waste
- Reduce/ban recyclables – paper, plastics, glass
- Reduce/ban high volume wastes – construction, used tyres, bulk waste
- Ban toxic wastes – electronic and electrical, batteries, Styrofoam, used medicine

Participants:

MPPP

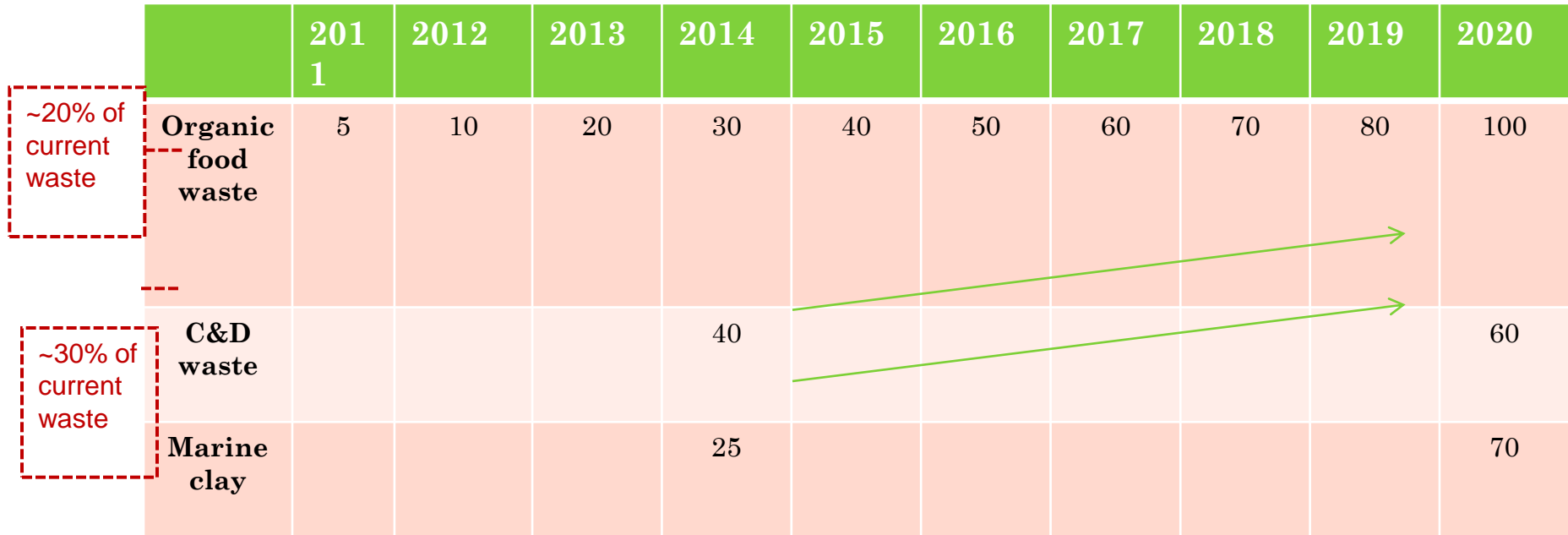
MPSP

Civil society

Private sector

Source: PEMANDU LABS 2011

% Targets for recycling and recovering specific waste streams by 2020



Source: PEMANDU LABS 2011

Local Action

Economy

Environment

Stakeholders

Institution

Balanced
Sustainable
Development
for a
Green State

CHANGING THE RULES

By-Laws & Regulations

1. Source Separation By-laws

2. Waste Generator Pays Principle

Strategy 1:
Economy

**Economic Growth with
Protection for
Environment and
Reducing Impacts of
Development**

Strategy 2:
Environment

**Improve economy &
Quality of Life through
Environmental Planning**

Strategy 3:
Stakeholders

**Adaptation for Future
Environmental
Challenges and Threats
with Sustainable
Resources for Future
Generations**

Strategy 4:
Institution

**Strong Political Will
Looking Ahead
Towards a Green State**



**Strategy1:
Protection for
Environment
and Reducing
Impacts of
Development**

- Objectives:
 - Promoting a Green Economy
 - Identify & solve current environmental problems in Penang.
 - Reduce environmental impacts and ecological footprint through environmental planning.

Strategy 1 activities



Promote waste minimisation programmes for waste diversion from the landfill with 3Rs in the setting up of Environment Resource Centres in Residential Areas and Zero Waste Communities



Develop a better managed solid waste management system through the upgrading the existing landfill at Pulau Burong into a Level IV Sanitary Landfill with leachate treatment.



Set up buy-back centres, at shopping malls, material recovery facilities or resource recovery centres to divert waste away from the landfill such as school recycle banks



Collect used PCs & peripherals under the Dell-Sunshine-MPPP Programme



Collect used cooking oil from eateries, restaurants, food complexes.



Collect food and green waste for composting and processing into liquid fertilizer.

Strategy 1 activities



Established “No smoking” zones for Penang and encouraging a healthy life style like cycling.



Banned the giving of free plastic shopping bags in Supermarkets / Hypermarkets to reduce the carbon footprint. Polluters pay: Bring your Own Shopping Bags



Banned the use of Styrofoam food containers.
Promoting the use of tiffin carriers



Enforced the closed house system for pig-farming & chicken farming activities - Zero Discharge



Collection of used roadside banners to be turned into shopping bags.



Implemented the “100 steps to cleanliness” project with 3R recycling boxes as Street Furniture and advertising media

NO FREE PLASTIC BAG CAMPAIGN:



HARI TANPA BEG PLASTIK

Isnin, Selasa, Rabu

Bayaran 20 sen bagi setiap beg plastik pada "Hari Tanpa Beg Plastik" akan disalurkan ke dalam Tabung Rakan Anti-Kemiskinan.

- No Free Plastic Bag Campaign-
 - Penang - 1 Jul 2009 (Mon, Tues, Wed)
 - 1 Jan 2011 (Everyday)
 - Retailers, Supermarkets, Hypermarkets, Departmental Stores
 - 2008 - 25.2 mil / yr 2.5 mil bags/month, now less than half
 - 20 cents per plastic Bag following the polluter pays policy



Appreciate Food Don't Waste & Healthy Living Campaign



MAKAN SAMPAI HABIS

光盘行动 你我开始



Appreciate Food Don't Waste

உணவை முழுமையாக
உண்ணவும்







Awareness Promotion by



RECYCLE BANK



FLOW CHART

-  **Collected**
-  **Segregated**
-  **Weighed**
-  **Recorded in Bank Book**
-  **Stored**
-  **Sold to recycling agent**



'CLEANER GREENER PENANG' COMMUNITY PROGRAMMES, PENANG ISLAND MUNICIPAL COUNCIL



ALTERNATIVES TO PLASTICS AND STYROFOAM FOOD CONTAINERS



2010 - 44 Food complexes on the island

2011 - Education Phase for all restaurants, shops, night markets licensed by MPPP

**Office & Household e-Waste Management
started in 2004 in collaboration with the
Penang Island Municipal Council (MPPP) – Dell, Sunshine Supermarket
Total Collection todate: 133,211.50 kgs**



JICA-Penang State Government Household e-waste Management Project

Officially launching

- **14 April 2012 by the Seberang Perai Municipal Council**
- **1 June 2012 by Penang Island Municipal Council**



ZERO WASTE PROGRAMME(VILLAGE COMMUNITY)



**Strategy 2:
Improve
Quality of Life
through
Environmental
Planning**

- Objectives:
 - Create more green and open spaces as City Lungs
 - Provide more recreational facilities
 - Ensure Environmental health and cleanliness
 - Car Free Sunday
 - Minimum 7 healthy Sunday exercise programme in all 5 districts to create a Healthy Living Programme

Strategy 2a activities



Cleaning up of rivers and waterways through the EM mudball treatment programme at Sungai Juru, and Sungai Pinang
Water quality improved from Class 5 to stabilised Class 3 by cleaning at source.



Implement Carnarvon Street Tree planting projects - Green the Streets



Commission Penang Botanic Gardens Masterplan – expansion of the oldest botanic gardens in Malaysia



Revitalisation of Relau Agriculture Station – Green Lung

Strategy 2b activities



Develop Penang Hill into an eco-tourism destination – eco-Village Concept



To establish a “Jungle in the City Mangrove Park” at Bagan Jermal /Marina Bay.



Develop Prangin Canal area into a city park – back to good old days.

Strategy 3: Adaptation for Future Environmental Challenges and Threats

- Objectives:
 - Recognise global environmental crisis and its implications on Penang
 - Prevent natural resources depletion & scarcity
 - Prevent ecosystem loss and biodiversity erosion
 - Develop policy and practice to meet future sustainability challenges
 - Conserve natural resources.
 - Plan for sustainable development.

Strategy 3 activities



Set up Environmental Resource Centres in each district.
(7 units set up on the mainland and 1 on the Island)



Grow your own vegetable programme - organic awareness



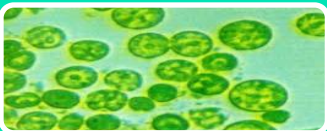
Incorporating rainwater harvesting systems in wet markets.



Landfill gas extraction



Turning pig waste into bio-gas and electricity.



Cultivation of algae from pig waste for animal feed



Implement eco-town concept for the Bayan Lepas Free Industrial Zone – Brown field to eco-town

Strategy 3 activities



Plan of Eco-town at Batu Kawan –Green Field



Plan for eco-village in Penang Hill – Green field –
Balanced & Sustainable



Provide incentives for green activities :

- Implemented the Green School Award
- Promoted the Green Citizen membership to encourage citizens to be green
- Developed the “Aqua Save” Programme to conserve and use water efficiently
- Penang Environmental Award
- Green Journalist Award to promote environmental activism

Strategy 4: Looking Ahead

- Objectives:
 - Develop a vision of a sustainable Penang.
 - Develop a new state agenda for sustainable development.

Strategy 4 activities



Establish the Penang Science Council to help inspire great interest in science and technology that will result in an environment that generates great passion for excellence through technical innovations.

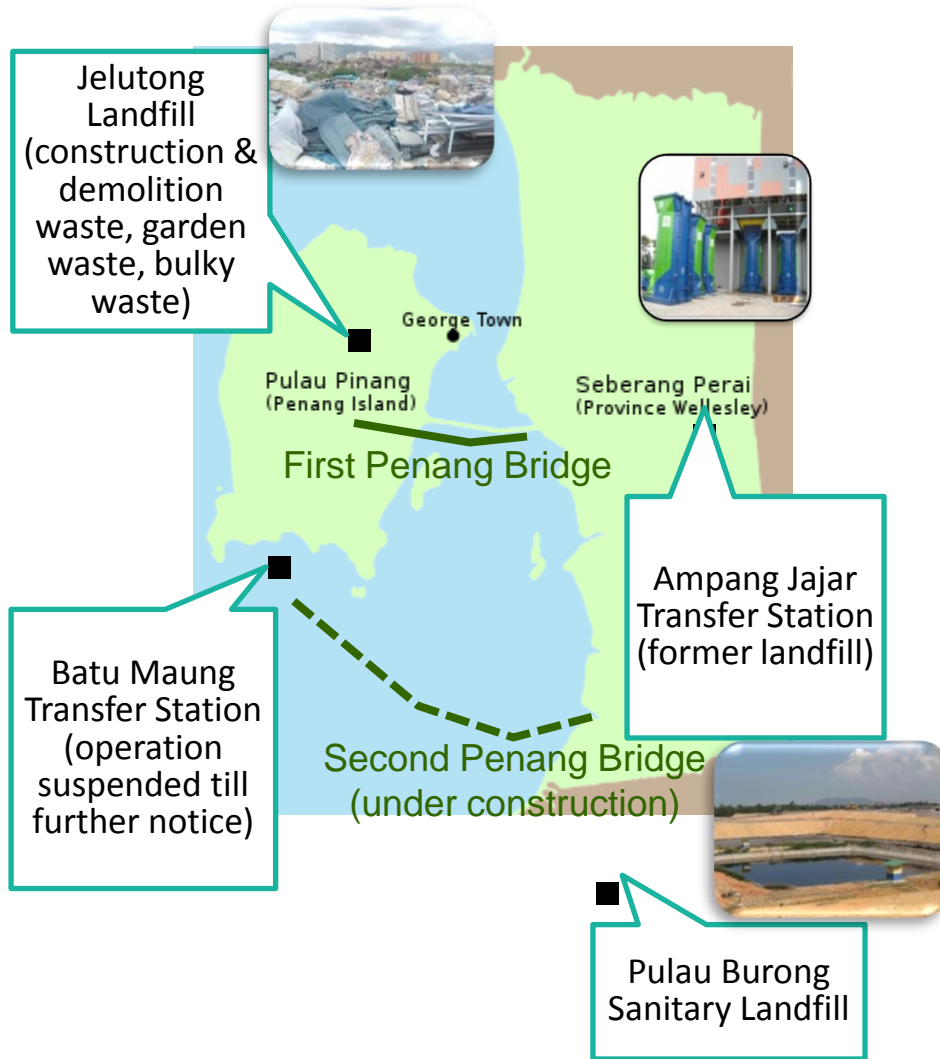


Establish **Penang Green Council** to look into all matters pertaining to environment and sustainability, promotion & awareness creation and endorsement facilitator for Green Certification



Establish a Special Purpose Vehicle (SPV) to manage public cleansing, solid waste collection, transfer and disposal.

Overview of MSWM system



- MSW from Penang Island
(Before the bridge construction)
Transported to Batu Maung TS → barged to Pulau Burong Landfill
(During the bridge construction)
Transported to Ampang Jajar TS via the First Penang Bridge → compacted → transported to Burong Landfill
- MSW from North/Central Seberang Perai
Transported to Ampang Jajar TS → compacted → transported to Pulau Burong Landfill
- MSW from South Seberang Perai
Directly transported to Pulau Burong Landfill

Solid Waste Sector Information

No.	Item	MPPP	MPSP	Unit
1	Quantity of waste generated annually	288,377	528,275	Tonnes/year (2012)
2	Quantity of waste generated daily	790	1447	Tonnes/ day (2012)
3	Quantity of waste generated per capita	1.07	1.47	Kg/capita/day
4	Total number of households in the city	189,829	195,829	Households
5	Percentage of municipal budget used for solid waste sector	26	43	Percent
<i>Waste Composition* (Source: Derived from Satang Report 2003)</i>				
i	Organic	43	63	percent
ii	Paper	28	5	percent
iii	Plastic	15	17	percent
iv	Metal	5	4	percent
v	Glass	0	0	percent
vi	Other	6	11	percent

Overall Waste Generation & Recycling

Year	Waste Disposed at Landfill Per Year (metric tons)			Recycling Per Year (metric tons)			Total Waste Generation Per Year (metric Tons) C=(A+B)	Recycling Rate (%) B/C
	MPPP	MPSP	Total A	MPPP	MPSP	Total B		
2005	280,489	416,254	696,743	57,178	96,032	153,210	849,953	18.03%
2006	295,498	463,750	759,248	82,210	119,964	202,174	961,422	21.03%
2007	216,490	490,729	707,219	80,351	125,504	205,855	913,074	22.55%
2008	218,440	472,005	690,445	33,775	124,121	157,896	848,341	18.61%
2009	216,456	428,563	645,019	61,307	132,039	193,346	838,365	23.06%
2010	213,591	426,152	639,743	63,756	129,804	193,560	833,304	23.23%
2011	209,701	401,663	611,364	72,341	144,682	217,023	828,387	26.20%
2012	205,972	370,989	576,961	82,405	157,286	239,691	816,652	29.35%

Source:

Penang Island Municipal Council (MPPP), 2013
Seberang Perai Municipal Council (MPSP), 2013

Targets for Organic Waste Reduction for Penang State

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Organic waste Reduction (%)	5	10	20	30	40	50	60	70	80	100

Source: PEMANDU SWM Lab, 2011

**Heng Ee High School
Canteen waste
Collection (3,000
students)**

**Bayan Baru Hawker
Complex Food Waste
Collection**



Taman Bagan Lalang Zero Waste Community launching



BAGAN AJAM WET MARKET WASTE COMPOSTING PLANT





**THE GROUNDSWELL™
PROCESS for
GREEN WASTE**

MANAGING MEGA-EVENTS



Treatment at jelutong dumpsite



Groundswell Static Fermentation Process

Waste to top soil



Stage
1

Picking
Incoming
Waste

Stage
2

Inoculating
With
Starter &
Seeder

Stage
3

Turning &
Respraying

Stage
4

Curing

4-6 weeks

8-12 weeks



BUILDING ZERO WASTE ON GREEN WASTE - PROJECT DEVELOPMENT

1. Reuse & recover green waste to Humisoil through a natural process using minimal energy or wholesale methane generation
2. Diversion of green waste from Jelutong Dumpsite
3. Reduce the cost expenditure of tipping fees
4. Decentralized material recovery facility
5. Selection of Groundswell Static Fermentation Process



Location

Phase 1 : Relau Green Waste Processing Plant

Phase 2 : Teluk Bahang Green Waste Processing Plant



PENANG'S VOLUNTARY CARBON OFFSET SCHEME



Original Photo: churchofnobody.blogspot.com

CO₂ Abatement Processes

- Penang's program for assisted change

Activities

- 2 kinds of Defined Activities:

Avoided Emissions

- e.g. Diverting Organics, recycling food, etc

Carbon Sequestration

- e.g. building a pool of soil carbon on farms, permanent tree planting, re-forestation etc.

Penang's Commitment

When you buy offsets in this scheme you help our landfills and farmers to go green.

By offsetting emissions made elsewhere the community helps itself and a direct incentive to reduce waste and improve agricultural land is created.

CONCLUSION

- **Your Environment , Your Ownership**
- **Focus on the polluter /waste generator and not on the symptom!**
- **Polluters must pay!**



TERIMA KASIH