

Full Waste Recovery & Recycling Program

Presented by:
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REPUBLIC ACT No. 9003

An Act:

- providing for an Ecological Solid Waste Management Program,
- creating the necessary institutional mechanisms and incentives,
- declaring certain acts prohibited and
- providing penalties, appropriating funds therefor, and for other purposes.

INSTITUTIONAL MECHANISM

(National Level)

The National Solid Waste Management Commission (NSWMC)

- **Oversees the implementation of SWM plans;**
- **Prescribe policies to achieve the objectives of the Act;**

Composed of 17 members:

- **14 members from the government sector**
- **3 members from the private sector**

NSWMC Members

(Government Sector-14)

1. DENR as Chair

2. DILG

3. DOST

4. DPWH

5. DOH

6. DTI

7. MMDA

8 . LPP

9. DA

10. PIA

11. LCP

12. LMP

13. TESDA

14. LB

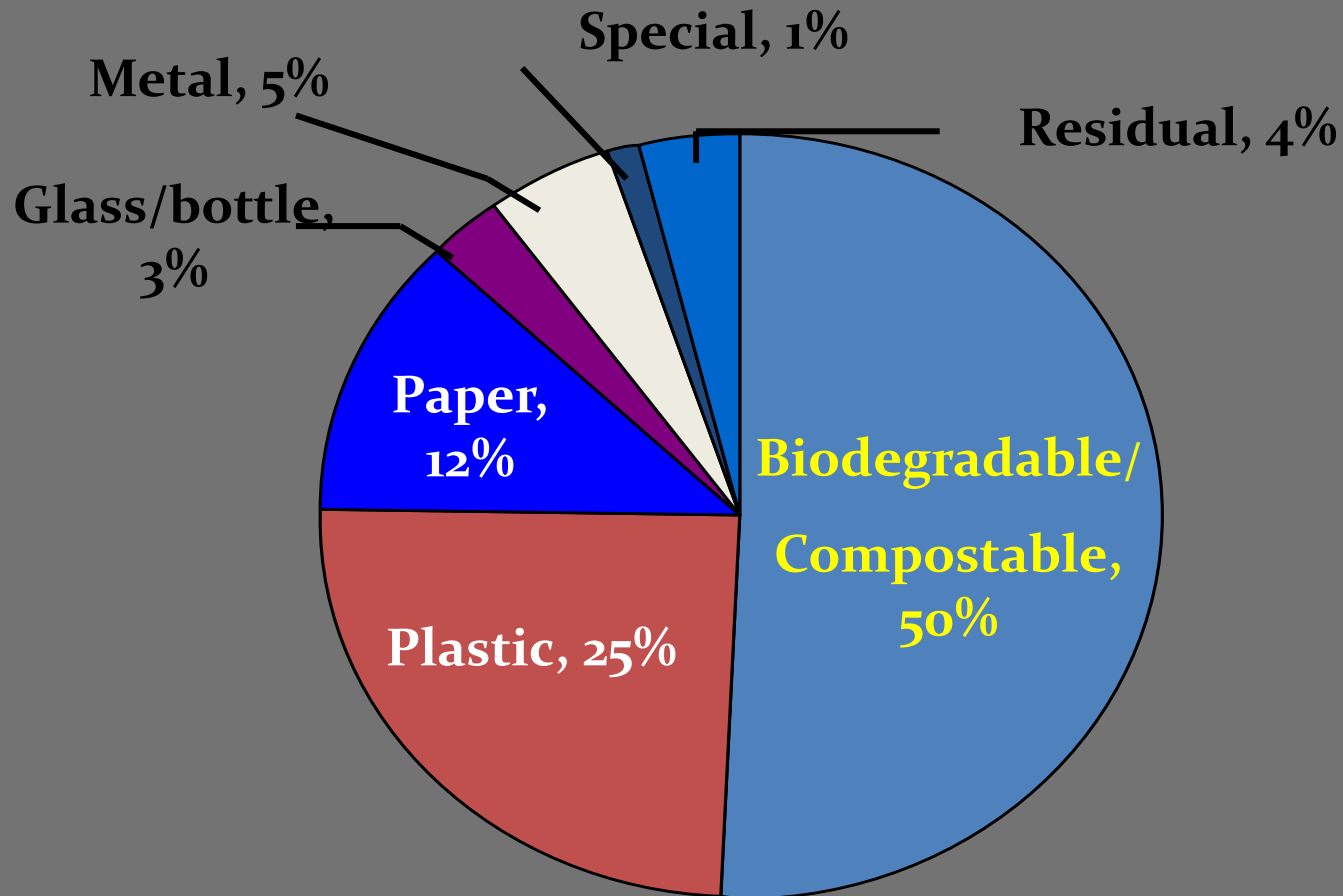
DIAGNOSIS OF SWM PROBLEM

1. R.A. 9003 (Ecological Solid Waste Management Act) relies on compliance by LGUs. Most of the LGUs does not include SWM as one of their priority programs.
2. Recyclability is dependent on junk shops & scrap dealers. Junk shops are entrepreneurs; not solid waste managers. Any waste that is not “profitable” is considered garbage.
3. The solid waste problem is a behavioural problem. The solution should address the behaviour of the waste generators.
4. Processing and disposal technologies should match the behaviour and culture of the Filipinos, not the other way around. (Volumes, types of waste inputs & waste outputs)



Composition of Solid Waste

.71% kg./person = 8,700 tons/day in Metro Manila
Php 1,500/ton o Php 10.5 Million/day



Waste Analysis and Characterization Survey (WACS) by ADB 2003

5-Point Philosophy

1. Trash + Value = Resource

2. Incentivized Recovery

3. Corporate Social Responsibility

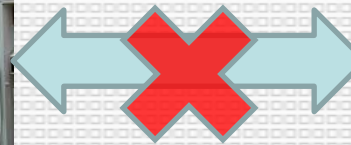
4. Maximum Recycling Potential

5. What's in it for me?



1. Trash + Value = Resources

Disconnection #1

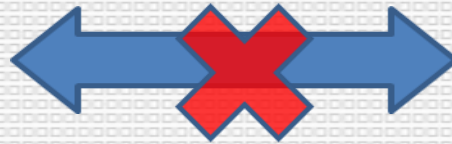


- Value does not have to be in cash all the time.
- Trash can be traded for many other items of value.
- **Problem: Who will do the matching of trash with available exchange values?
Who will do the research on up-cycling and recycling possibilities?**



2. Incentivized Recovery

Disconnection #2

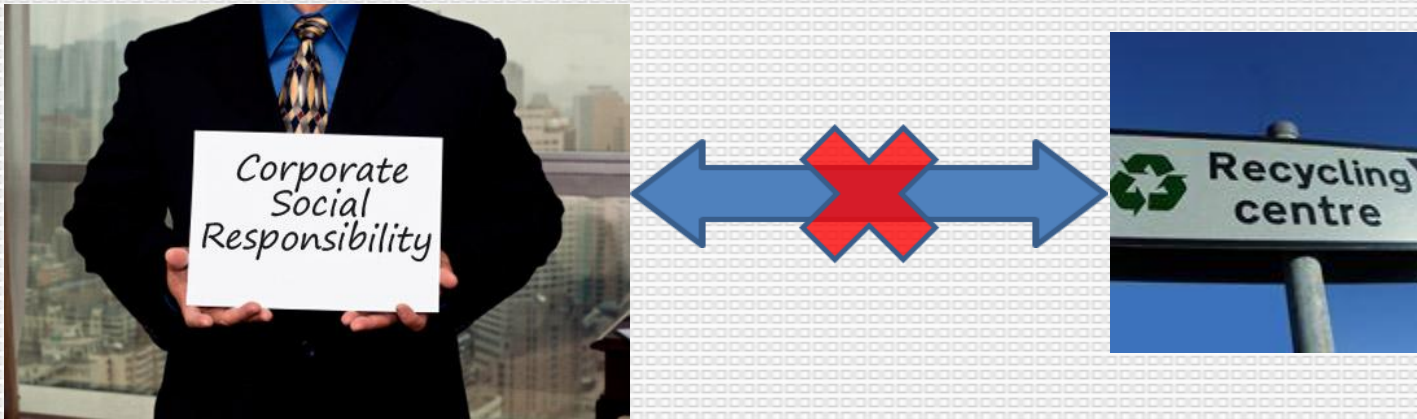


- Filipinos are trained to throw all trash to the garbage bin, which is collected by the LGU garbage collector. The simplified door-to-door collection encourages a “throw-away” mentality.
- **Problem: Where will people “bring” or divert waste resources? Who will inform them that there are incentives available and alternative collection schemes?**



3. Corporate Social Responsibility

Disconnection #3

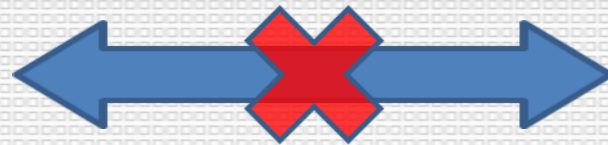


- Many corporations wish to engage in CSR projects but wish to simplify their involvement, at the same time, maximize their impact within chosen target communities.
- Recyclers need the help of corporations in providing incentives for the recovery and recycling of their wastes.
- **Problem: Who will provide the connection between corporations and recyclers to complement the recycling loop (both formal and informal)?**

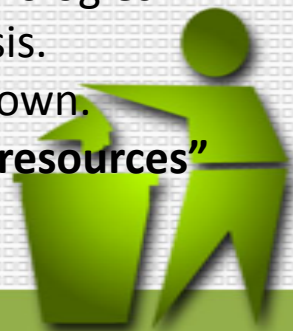


4. Maximum Recycling Potential

Disconnection #4



- Recycling, co-processing, refurbishing, up-cycling, etc. Many new technologies available but waste resources are hard to consolidate on sustained basis.
- This results in many recycling facilities being underutilized or closing down.
- **Problem: Beyond junk shops and scrap dealers, how else can “waste resources” reach the proper recyclers, especially the new ones?**



5. What's in it for me?

- Waste management has long been profitable for the entrepreneur. But this does not “trickle down” enough for the waste generator.
Problem: Who will handle the “behavioural” aspect of waste management? Who will endeavour to increase the incentives for the masses to cooperate and shorten the learning curve?



The “R” Approach

Resource Recovery to enhance Recycling

through the establishment of a Resource Recovery Facility (RRF) – to bridge the “disconnections” in recycling.

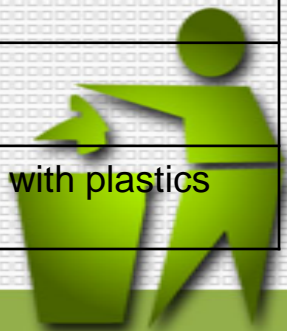
1. To assign appropriate values to trash, which will entice people to change their “throw-away” mentality.
2. To establish an “incentivized” recovery system in parking lots, warehouses, government facilities, etc. where people can easily “walk-thru” or “drive –thru.”
3. To encourage corporations to use the RRF as their recovery channel for their packaging (CSR Projects).
4. To engage in continuing research and networking with various recyclers in order to find the appropriate uses for the collected waste resources.



Recovery and Recycling Center Value Chain

Resource and value matching:

Types of Waste	Buying Value
Paper/Cartons/Newspapers	Cash or Exchange (school supplies or points)
Soft Plastics (LDPE, PE)	Cash or Exchange (food)
Hard Plastics (HDPE, PP, PET)	Cash
Styro, etc. (PS, Mono, PVC)	Cash or Exchange (points)
Bottles	Cash or Exchange (raffle)
Can / Tin / Aluminium	Cash
Steel, other metals	Cash
Laminates / Flexibles	Exchange (raffle or food) or tie-up with plastics



4-level Waste Diversion Scheme

Full Waste Recovery



Advocacy Partners:

- ▶ **National Solid Waste Management Commission**
- ▶ **Department of Environment and Natural Resources**
- ▶ **Philippine Chamber of Commerce & Industry**
- ▶ **Philippine Business for the Environment**
- ▶ **Zero Waste Recycling Movement**
- ▶ **Department of Trade and Industry**
- ▶ **League of Cities / Municipalities**
- ▶ **Solid Waste Management Association of the Philippines**
- ▶ **Liga ng mga Barangay**
- ▶ **Others**



Thank you very much!

Office of the Secretariat

National Solid Waste Management Commission

<http://www.emb.gov.ph/nswmc>

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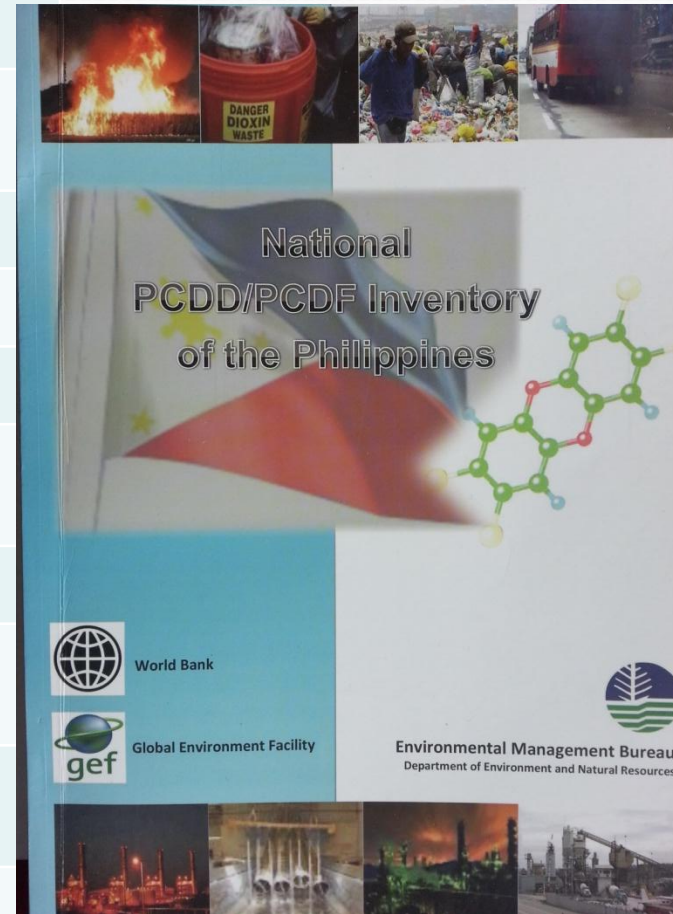


National PCDD/PCDF Inventory of the Philippines

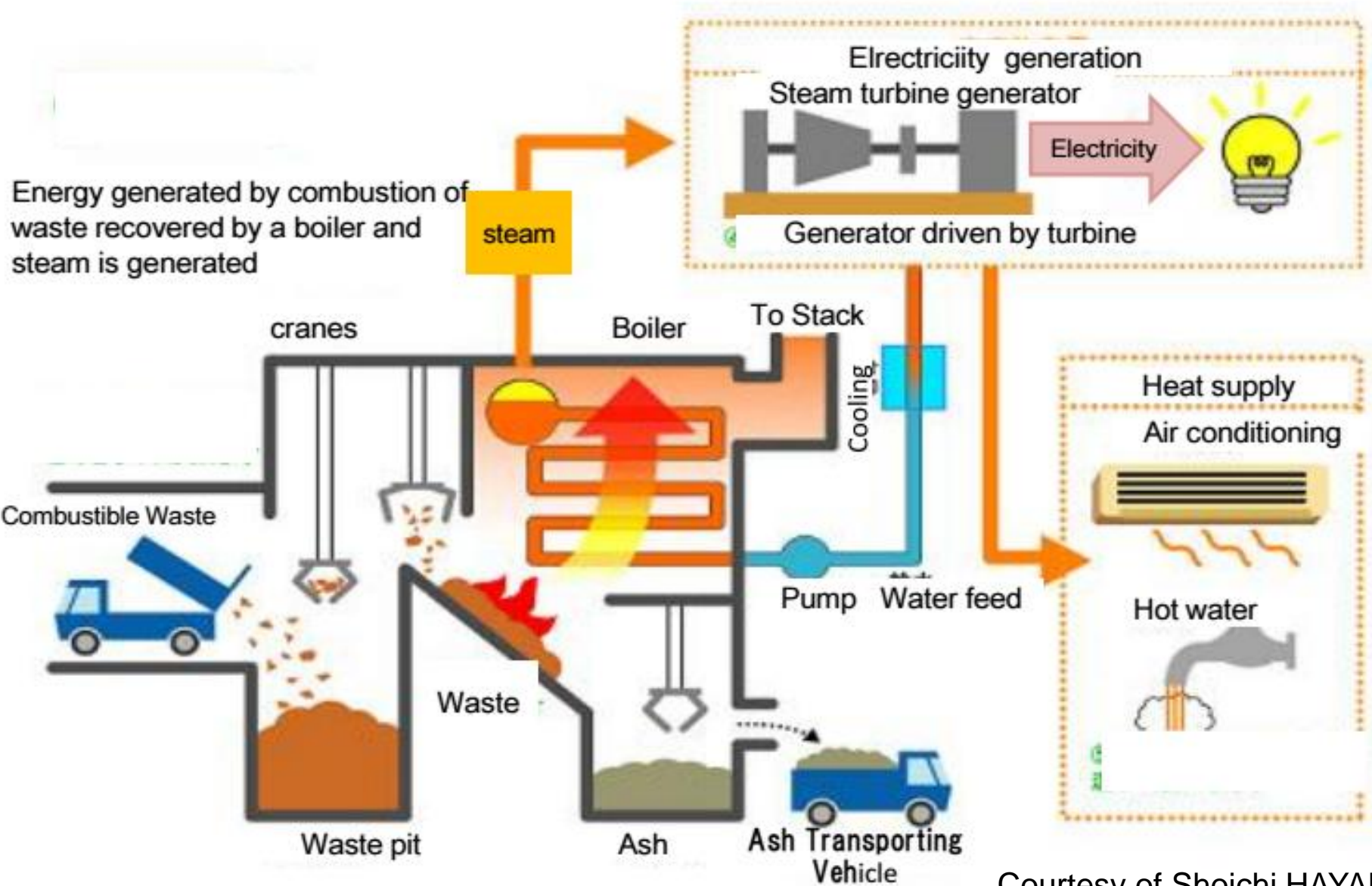
Group No.	Source Groups	Annual Releases (g TEQ/a) - 2010					
		Air	Water	Land	Product	Residue	Total
1	Waste incineration	0.009	0.000	0.000	0.000	0.315	0.324
2	Ferrous and non-ferrous metal production	17.696	0.088	0.000	0.000	13.514	31.298
3	Heat and power generation	14.912	0.000	0.000	0.000	9.598	24.510
4	Production of mineral product	9.657	0.000	0.000	0.000	0.033	9.690
5	Transportation	3.241	0.000	0.000	0.000	0.000	3.241
6	Open burning	375.029	0.000	64.754	0.000	0.000	439.784
7	Production of chemicals and consumer goods	12.512	0.054	0.000	3.305	0.044	15.915
8	Miscellaneous	0.152	0.000	0.000	0.268	0.532	0.952
9	Disposal	0.000	1.982	0.000	10.265	237.404	249.651
10	Potential hot spots				0.000		0.000
Total		433.208	2.124	64.754	13.838	261.440	775.364

National PCDD/PCDF Inventory

Category/ Class		2010 Total Releases (g TEQ/a)	Percentage Contribution (%)
6a: Open burning			
1	Agricultural residue burning in the field (impacted)	227.092	51.64
3	Sugarcane burning	7.793	1.77
4	Forest fires	0.055	0.01
5	Grassland and savannah fires	0.088	0.02
6b: Waste burning and accidental fires			
1	Fires at waste dumps	65.598	14.92
2	Accidental fires in houses and buildings	4.919	1.12
3	Burning of domestic waste in the open	134.180	30.51
4	Vehicular fire	0.059	0.01
Total		439.784	100.0

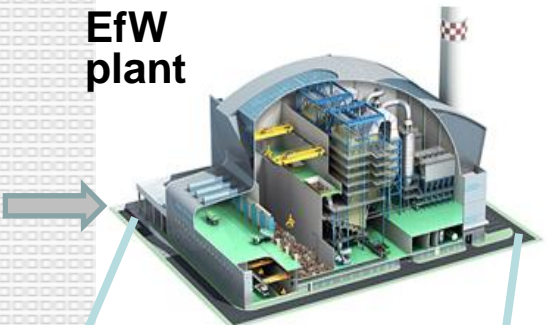


1-4-3 Energy Recovery System



Municipal Solid Waste

EfW plant



Source: <http://www.volund.dk> (Sembcorp Singapore)



Clean flue gas/smoke

GHG: +367 gCO₂/kWh*



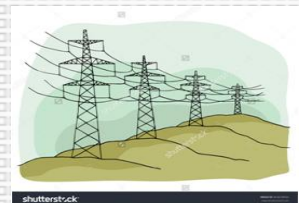
-183 gCO₂/kWh
-87.84 kgCO₂/waste



-550 gCO₂/kWh

Electric power (and/or Steam/hot water)

Electricity: 20 MW



160 GWh/yr

Ash and residues

**-90% volume or
- 80% mass**



250,000 t/yr
(1 ha/yr)
250,000 tons = 1 ha

Final Disposal Site



Metals
Construction Materials
Raw materials for cement plants

*Source: ISWA (2013), ISWA Guidelines: EfW in Low & Middle income countries

