



กรมควบคุมมลพิษ  
POLLUTION CONTROL DEPARTMENT

# *Sectoral Issues: Opportunities and Challenges: Waste*

**Rangsan Pinthong**

Director of Wastes and hazardous Substances  
Management Bureau

Pollution Control Department, Thailand

# Contents

- 1 *Status Quo: Waste Management*
- 2 *Policy Frameworks*
- 3 *Examples of WTE Project*
- 4 *Challenges & Keys to Success*

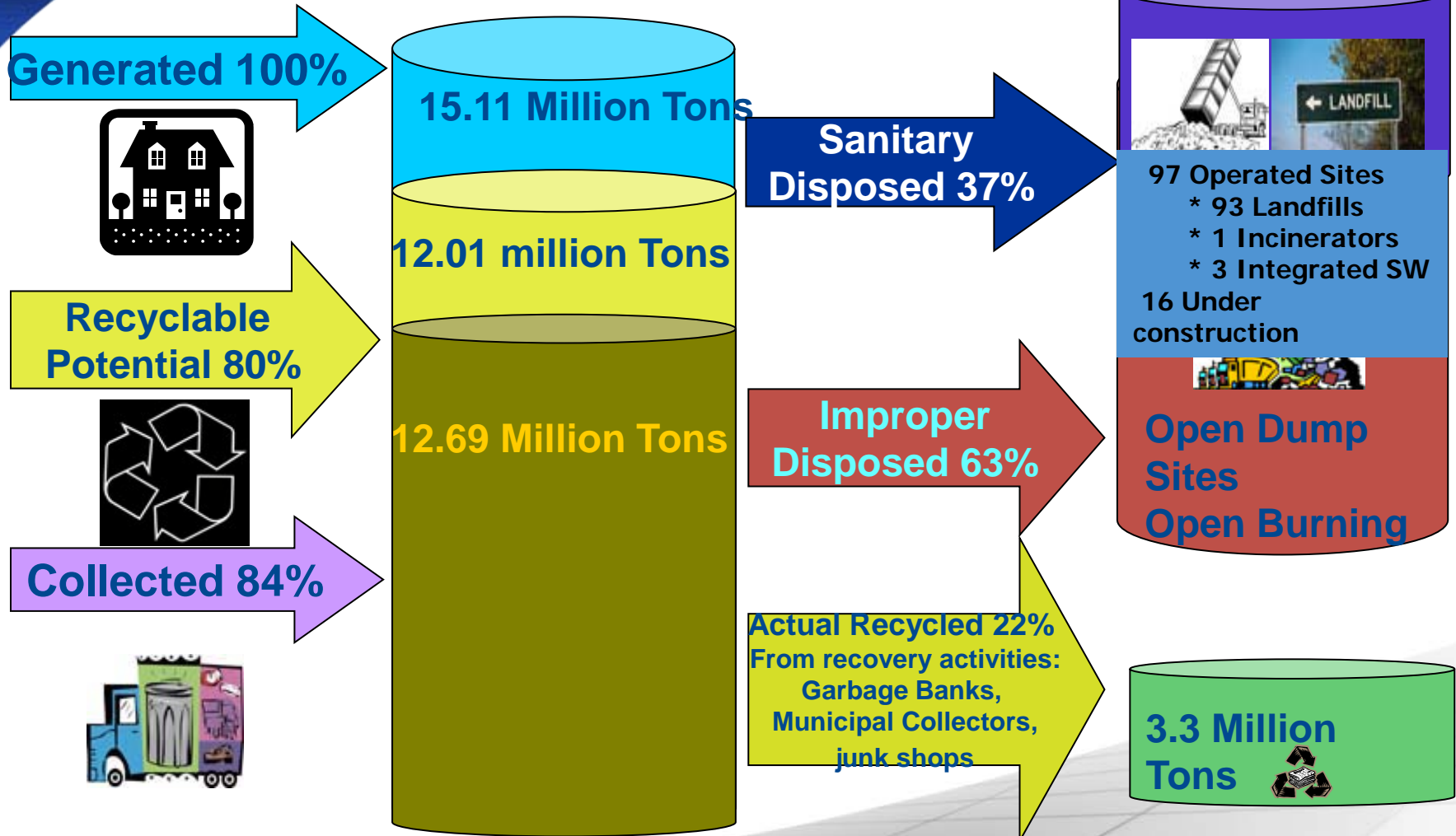
# Status Quo: Waste Management

(2009)  
41,410 T/d

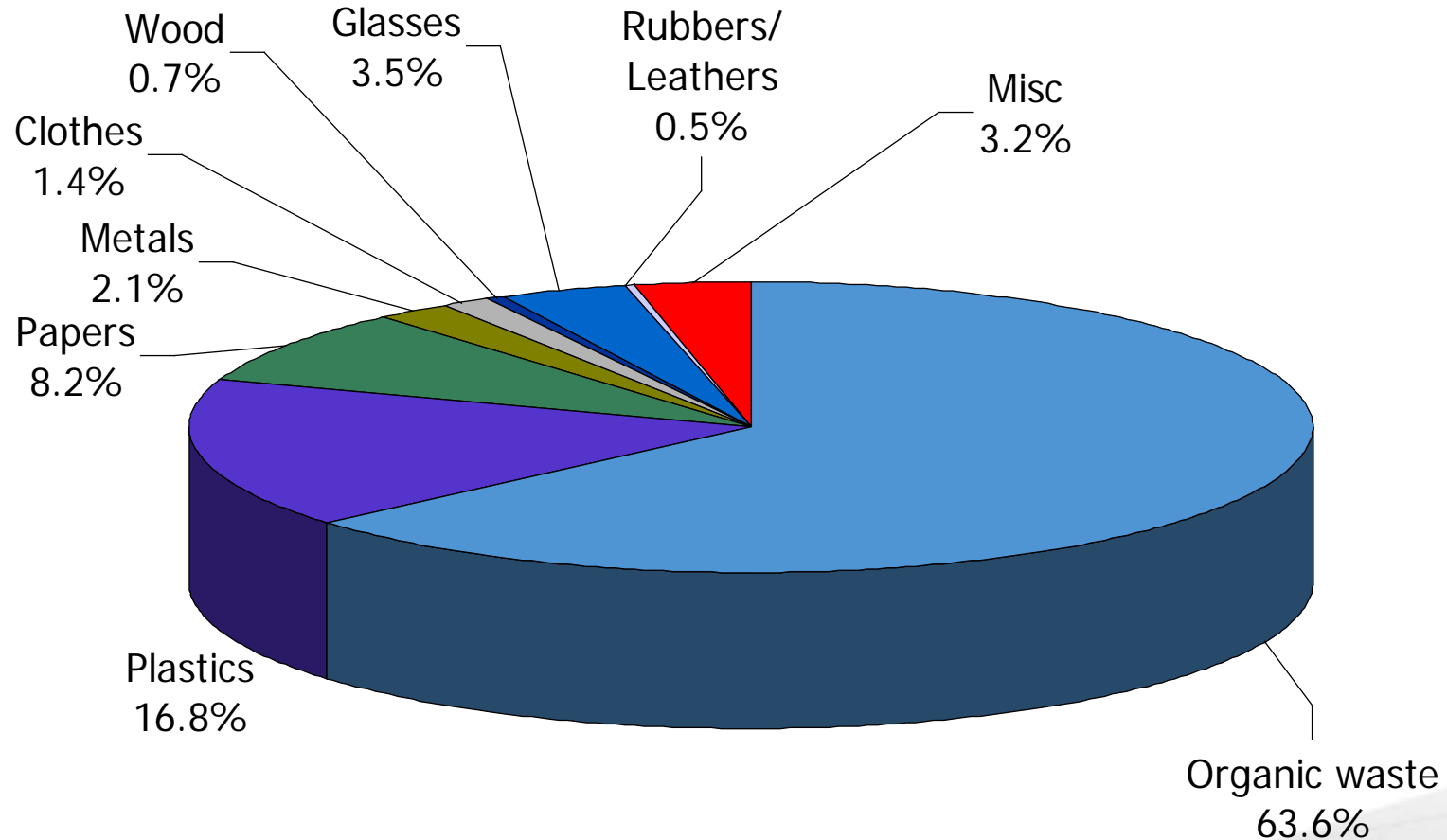


\*SAOs = Sub-District Administrative Organizations (Oboto)

# Status Quo (2)



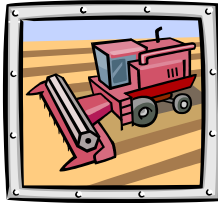
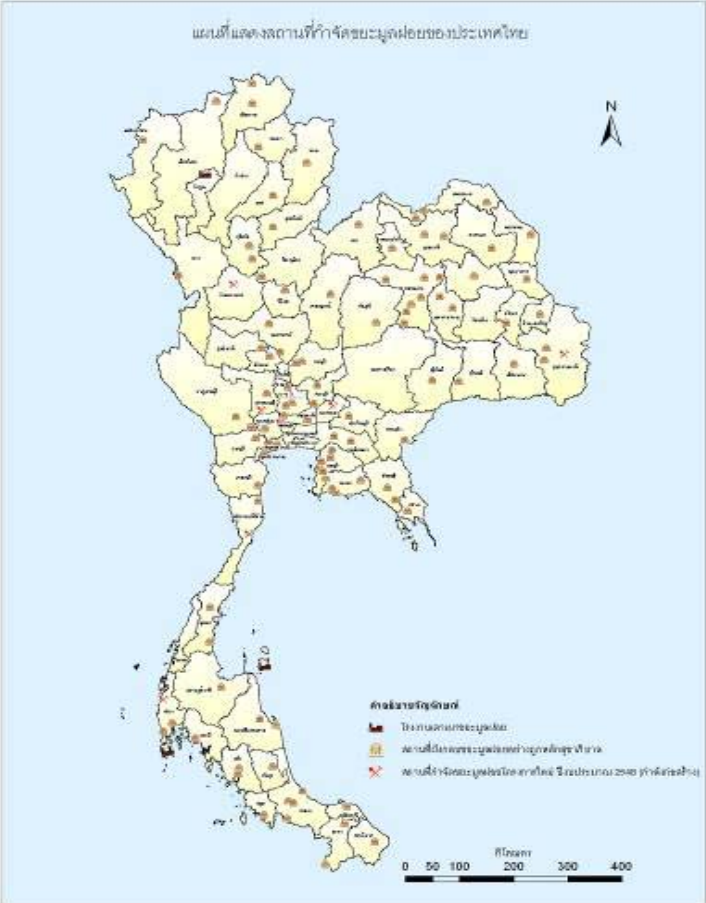
# Physical Waste Composition



**Calorific Values ~ 8,000-12,000 kJ/kg**

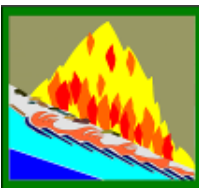
# Numbers of MSW Disposal Facilities

## Sanitary Landfill



- ▶ Working – 97 sites
- ▶ Never Run (due to NIMBY) – 6 sites
  - ▶ Stop Operating – 8 sites
- ▶ Under Construction – 16 sites

## Incineration



- ✚ Phuket – 250 tons/day
  - ✚ Samui Island\* – 150 tons/day
  - ✚ Lamphun\*\* – 20 tons/day
- \* System Stop due to Maintenance  
 \*\*Currently Dysfunction

## Integrated Systems

- ❖ Wieng Fang (Chiang Mai) – 150 tons/day
- ❖ Rayong Municipality – 80 tons/day
- ❖ Mae Sai (Chiang Rai) – 60 tons/day

Source: Surveys of Waste and hazardous Substances Management Bureau,  
**Pollution Control Department**



# ***Policy Frameworks (1)***

- ❖ Applying 3Rs for achieving waste reduction & utilization;***
- ❖ Promoting the integrated waste management system to reduce the landfill areas and generate the renewable energy;***
- ❖ Encouraging the cooperation of adjacent Local Governments for establishment of waste management facility;***
- ❖ Endorsing public and private sectors to participate in waste management project.***

# National Waste Management Targets

## Waste Reductions:

- Applying 3Rs
- Promoting Green Procurement

Waste Utilization Rate  
not less than 30%



Integrated Waste  
Management System

Waste Disposal in Engineered  
Practices not less than 40%

Household Hazardous  
Waste Management  
System

HHW properly managed  
at least 30%





# Waste Management: Policy

**Waste Reduction:**  
Applying 3Rs  
promoting Green Procurement



# WTE Strategic Approaches

**Waste Reductions:**  
Applying 3Rs,  
Promoting  
Green Procurement



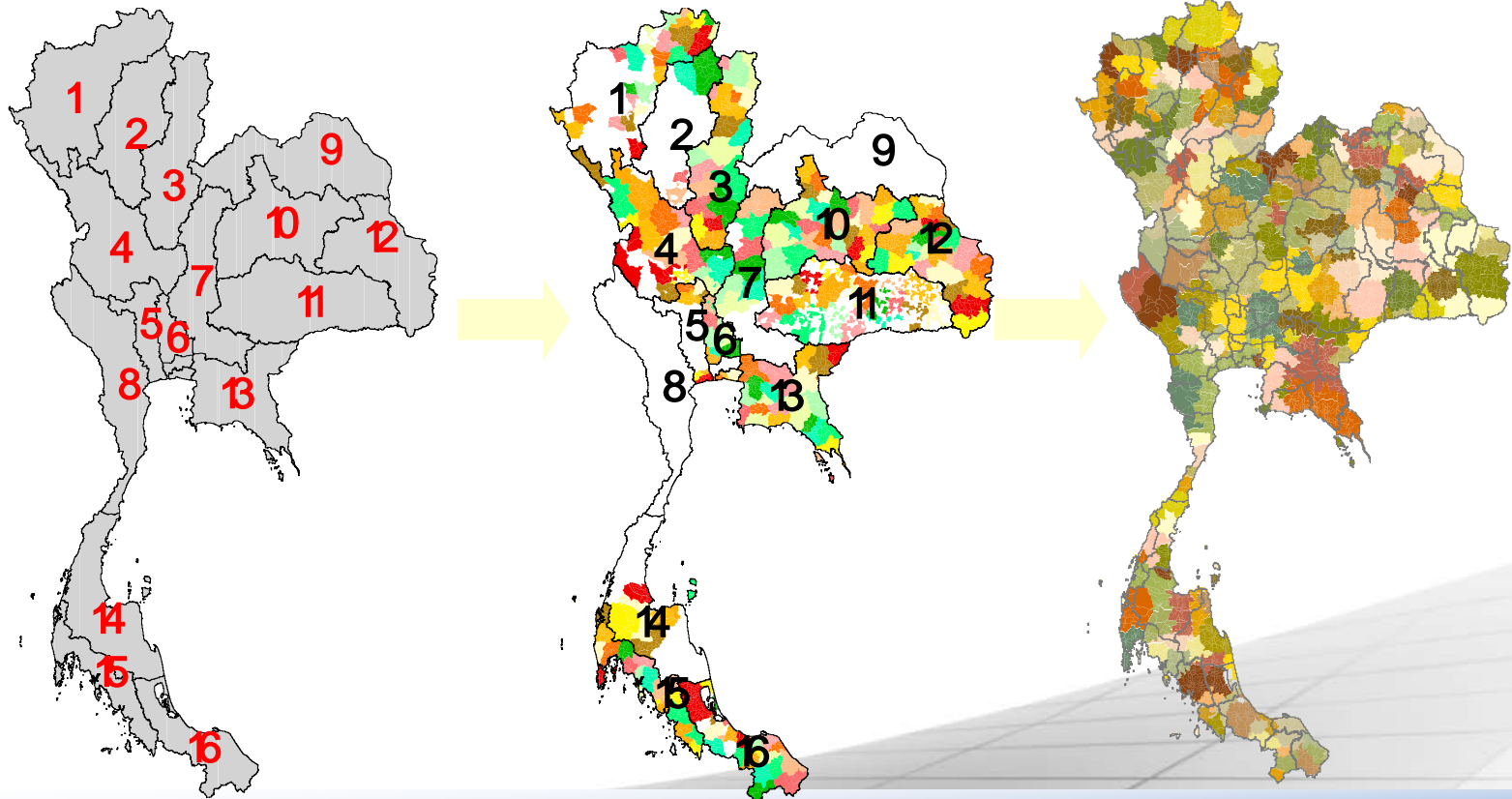
**Integrated Waste Management System Specifically for Generating Renewable Energy**

# Criteria to Develop Cluster Size

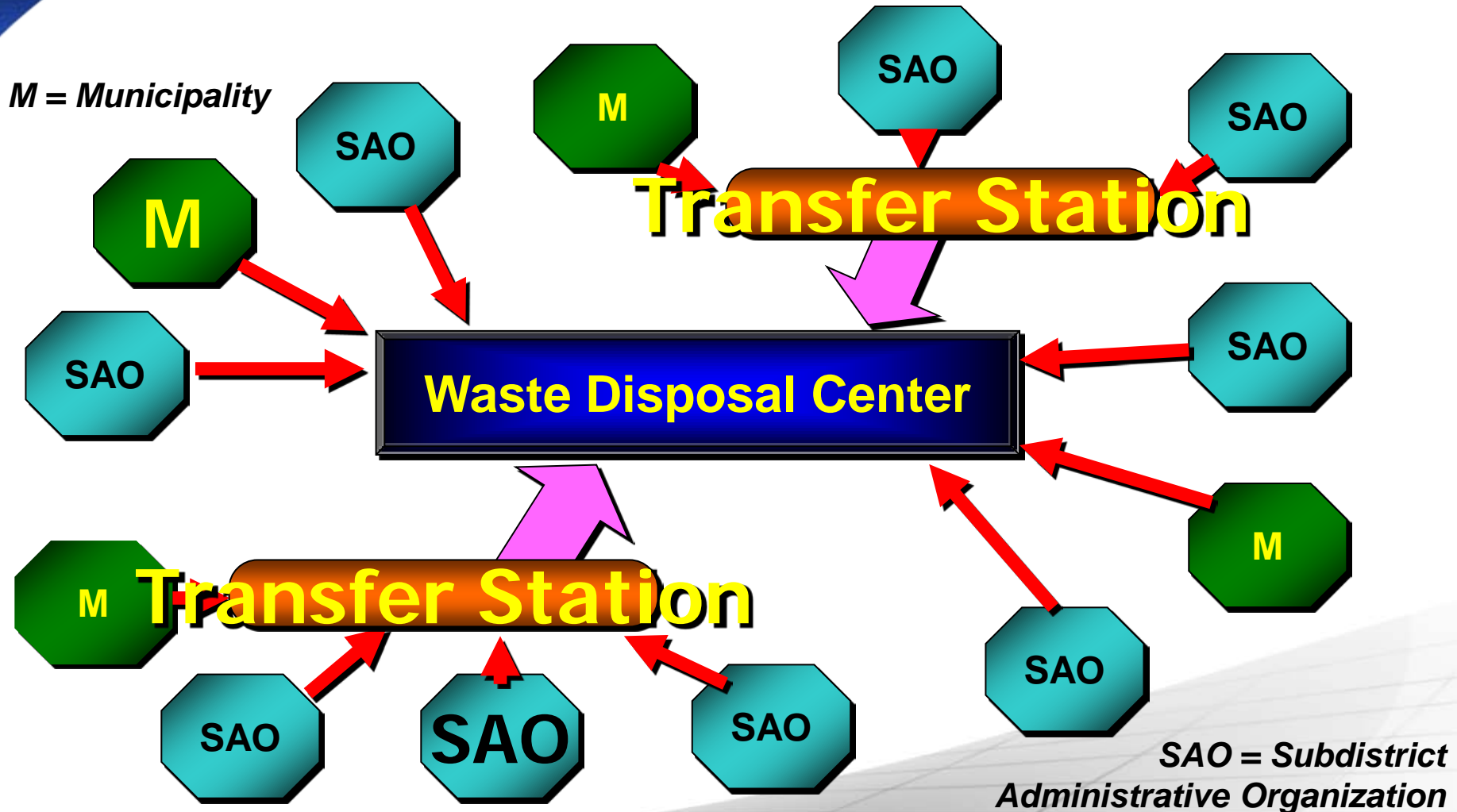
<i>Cluster Size</i>	<i>Waste Loading to System (T/d)</i>
<i>Large Cluster</i>	<i>&gt; 500</i>
<i>Medium Cluster</i>	
<i>M1</i>	<i>250 - 500</i>
<i>M2</i>	<i>100 - 250</i>
<i>M3</i>	<i>50 - 100</i>
<i>Small Cluster</i>	<i>&lt; 50</i>

# Policy Frameworks (2)

Supporting Local Government Clusters to obtain long-term effectiveness of waste management

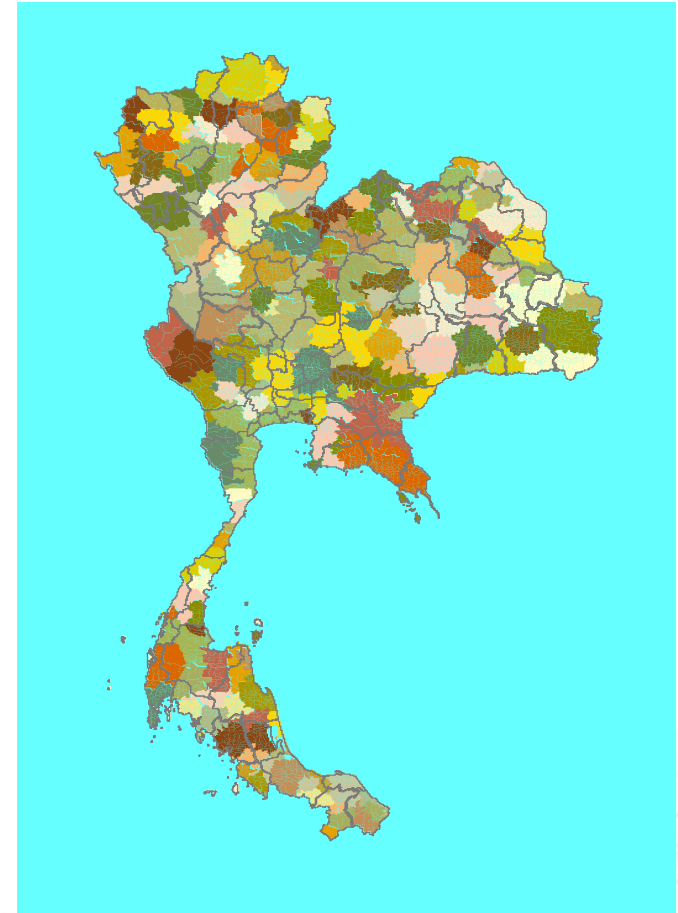


# MSW Management: Practical Concept



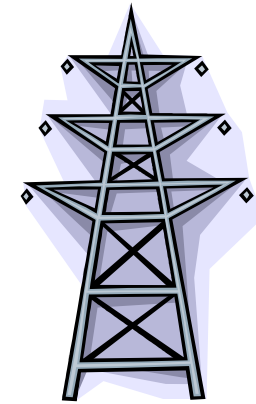
# Clusters of Local Governments

CLUSTER SIZES	Numbers	MOU agreement
<b><u>LARGE</u></b> > 500 tons/day	3	3
<b><u>MEDIUM</u></b> 250 – 500 tons/day	206	140
100 – 250 tons/day	26	18
50 - 100 tons/day	88	65
<b><u>SMALL</u></b> < 50 tons/day	92	57
Total	301	207



# Policy Frameworks (4)

**Endorse the Partnership between Governments and Private Sectors for Implementing Integrated Waste Management**



Heat/Electricity

# ***WTE Objectives***

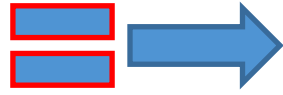
- ❖ To handle waste generated by applying properly WTE technologies and retrieving renewable energy;*
- ❖ To initiate public participation in WTE project;*
- ❖ To perform WTE model for high potential Local Governments;*
- ❖ To develop and demonstrate appropriate technologies on WTE through R&D projects and pilot plants .*



# Waste as Renewable Energy Source



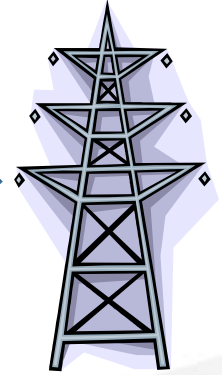
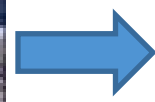
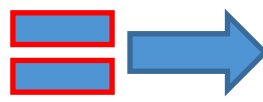
**Waste 15.11 Mton**



Equivalent to 3.5 million tons of lignite



or



**400 MW power generated**



# Waste Management & CDM

**Electricity**



*CH<sub>4</sub> projected cost*

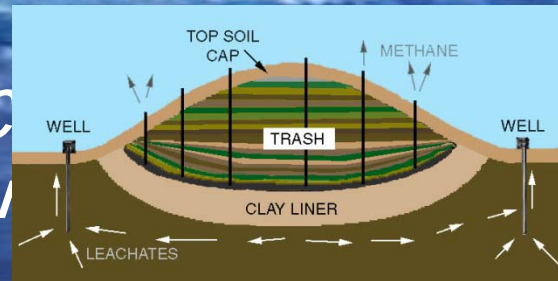


*Active energy Landfill 200,000 ton  
~ 50 million baths*

**CDM**

*Collection Field 200,000 ton  
~ 500 million baths*

**Reduce Greenhouse Gas**



*200,000 ton*

## ***Collection efficiency : $C_e$ (%)***

<b>Classified Disposal Sites</b>	<b><math>C_e</math> Value (Low)</b>	<b><math>C_e</math> Value (High)</b>
<b>Open dump</b>	<b>20-30</b>	<b>50-60</b>
<b>Controlled dump</b>	<b>40-50</b>	<b>60-70</b>
<b>Sanitary landfill</b>	<b>60-70</b>	<b>70-90</b>

# Examples of Integrated Waste Management System

100 % Commingled Waste

Sorting System



Composting  
50 - 60 %



Recycled materials  
20 - 30 %



Leftover  
10 - 20 %

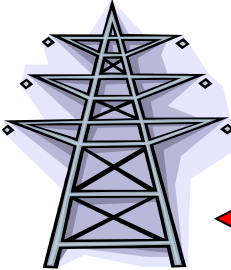


Final Disposal  
< 5 %



Conversion to RDF



  
Power and Energy  
Utilization



***Examples of WTE  
Projects in Thailand***

# MSW Disposal Facility Fang Municipality, Chiang Mai



# Organic Waste Compost and Energy Production Plant, Rayong



70-80 T/d



Sorting



↓ Organic waste



Power generated of 625 kW



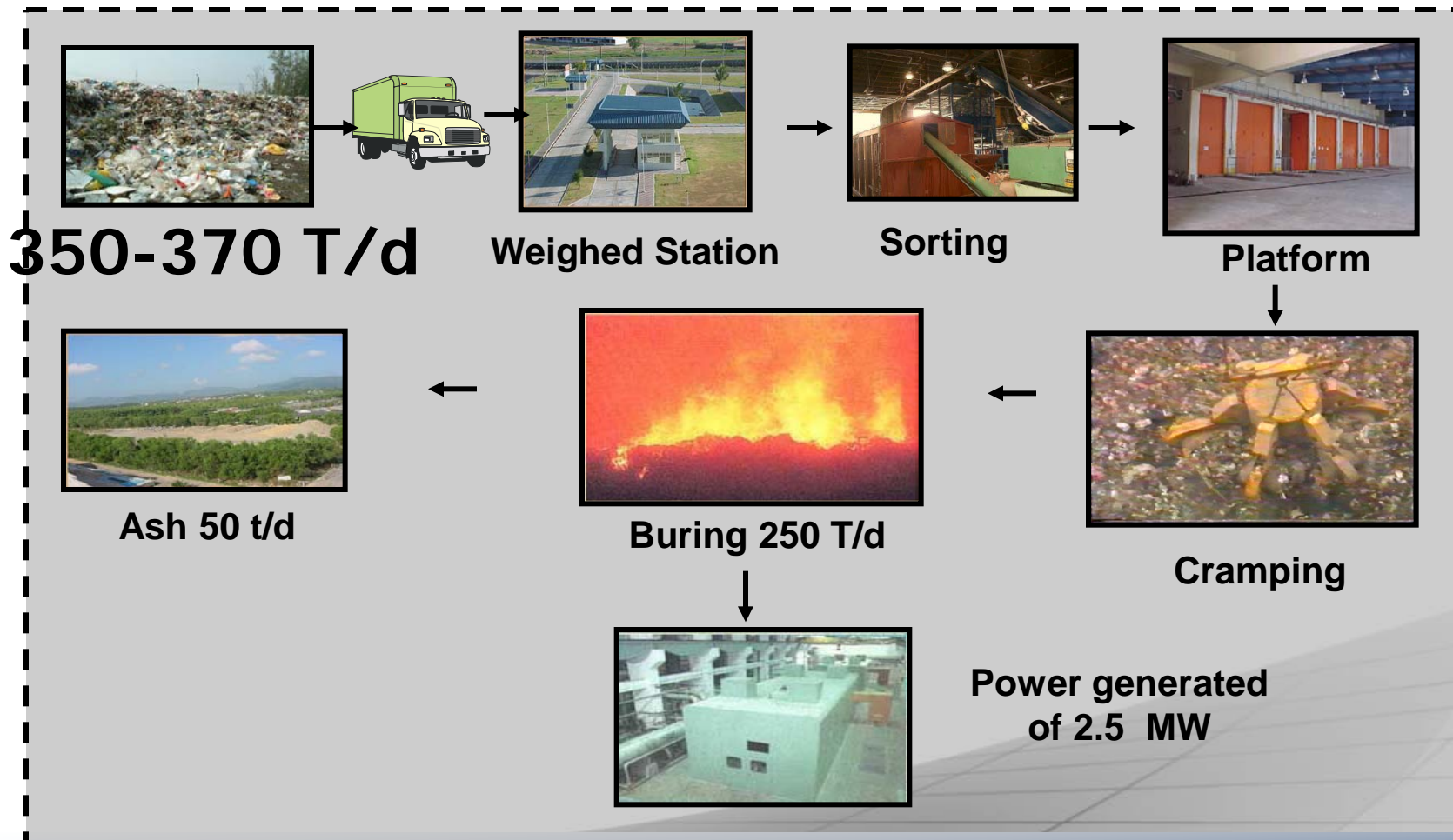
Gas Collection Tank



Gas Digester



# Phuket Incineration Plant





# Challenges & Keys to Success

- ❖ Maximized Recycle;
- ❖ Good Management;
- ❖ Efficient Technology;
- ❖ Proper Regulation;
- ❖ Private Endorsement



# Involvement with Relevant Disciplines

- Socio-Economic
  - Employment/Occupation
  - Sustainable Development

- Natural Resources
  - Conservation
  - Management to obtain Maximum Benefits

- Environments
  - Local/Regional Impacts
  - Global Impact

- Energy
  - Promotion & Conservation of Energy
  - Waste to Renewable Energy

## Waste Management

- Trade and Environments
  - Package&Packaging Waste Management
  - WEEE Management
  - Transboundary Movements of Waste



***Thank You !***

***...Q&A...***

**Tel. 0 2298 2424**

**Fax. 0 2298 2425**

**Email: [Rangsan.p@pcd.go.th](mailto:Rangsan.p@pcd.go.th)**

**<http://www.pcd.go.th>**