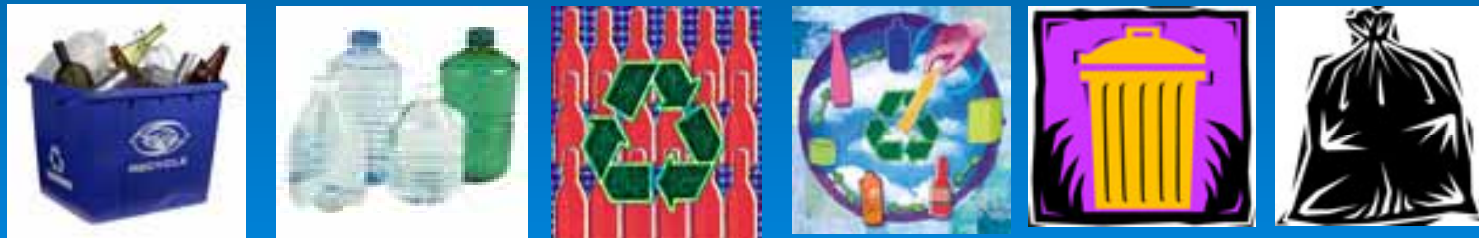




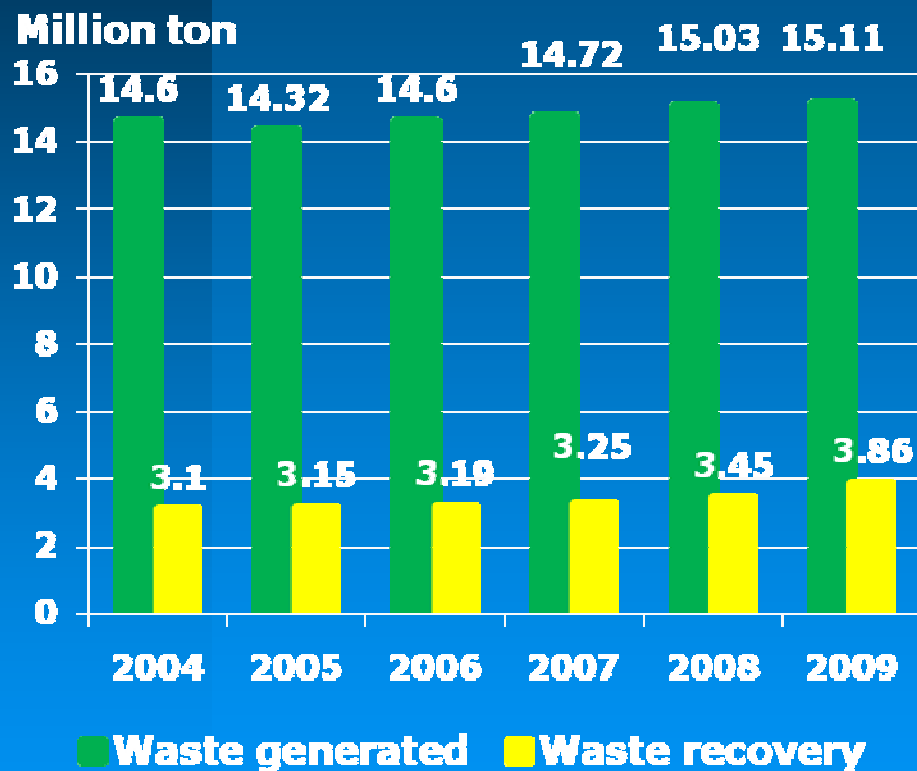
## 3Rs and Waste Management in Thailand



**Dr. Supat Wangwongwatana**  
**Director General**  
**Pollution Control Department**  
**Ministry of Natural Resources and Environment**  
**Thailand**

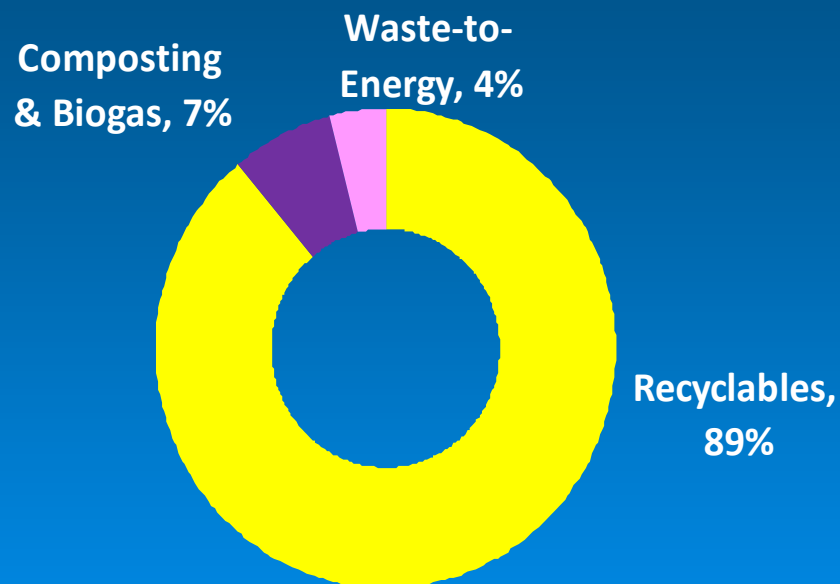


# Municipal Solid Waste Management : Generation, Recovery, and Disposal



Source: PCD, 2009

## Waste Recovery

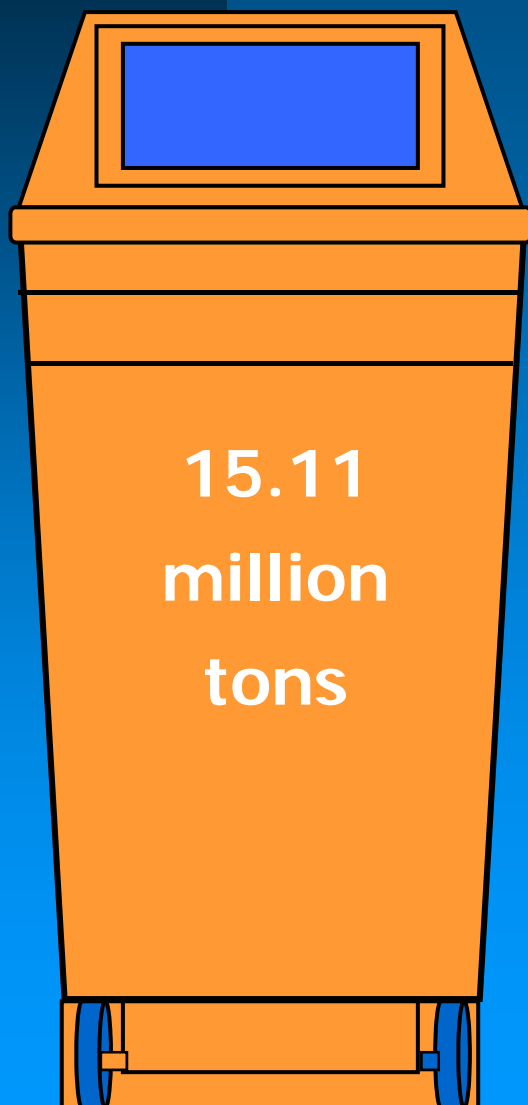


## Waste disposal

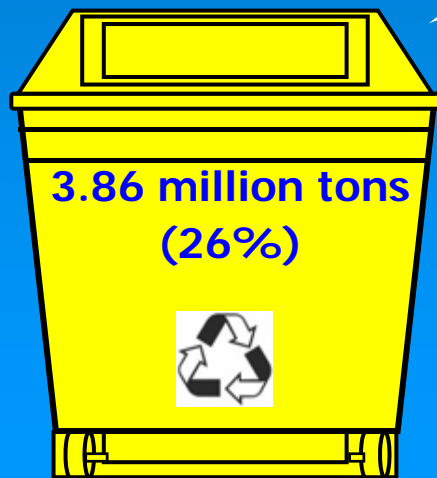




# Household Waste Utilization



Recycled  
Waste  
3.12 mt



Electricity and  
bio-fuel  
Generation  
0.11 mt

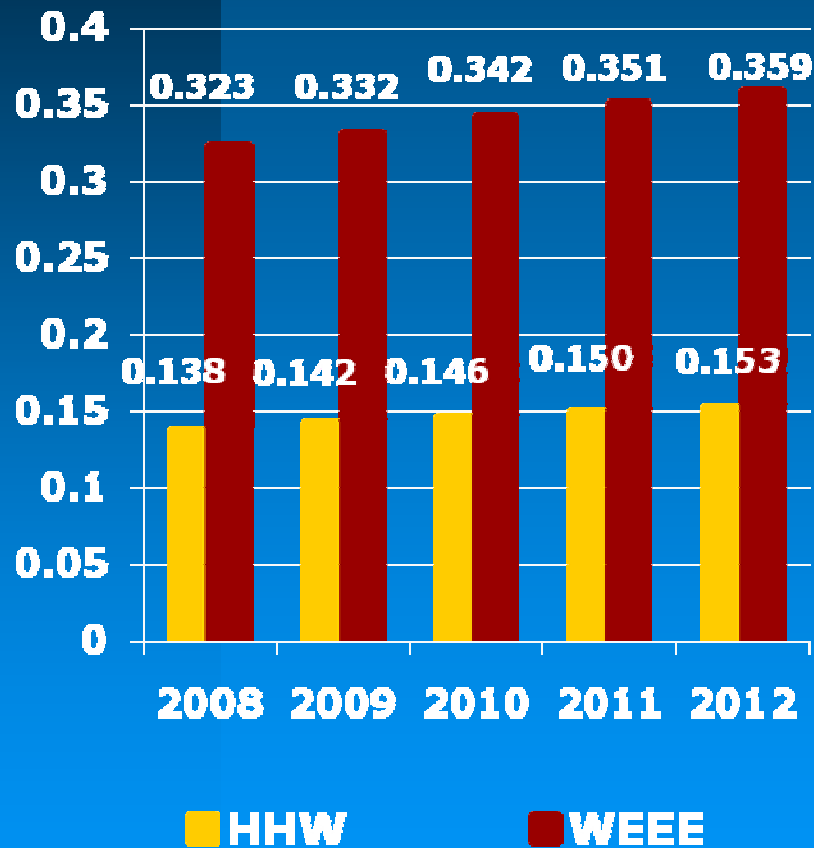
Bio-fertilize  
and biogas  
0.63 mt



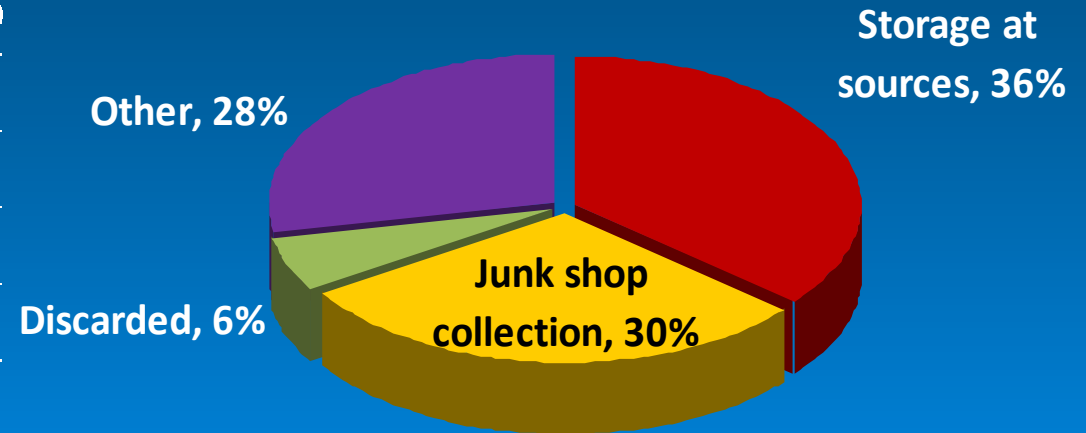


# E- Wastes Management & Trend

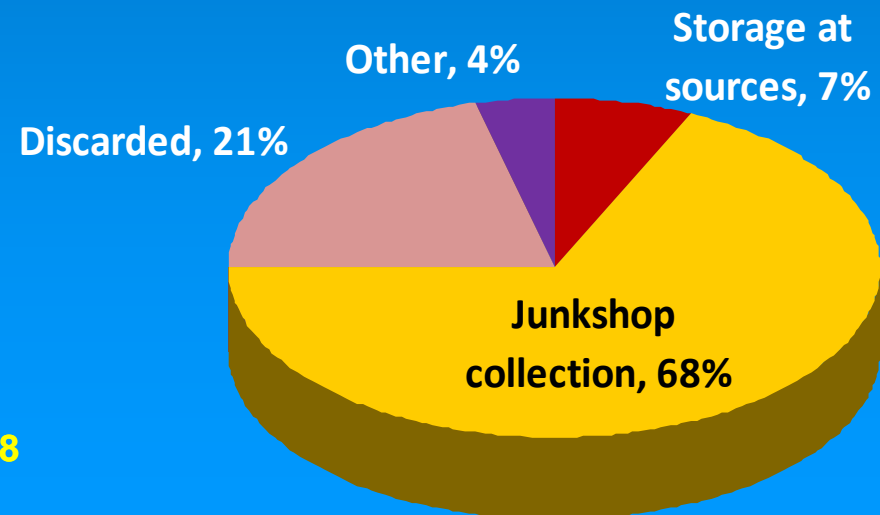
Million Ton



## WEEE Management



## HHW Management



Source: HHW & WEEE Inventories, PCD, 2008



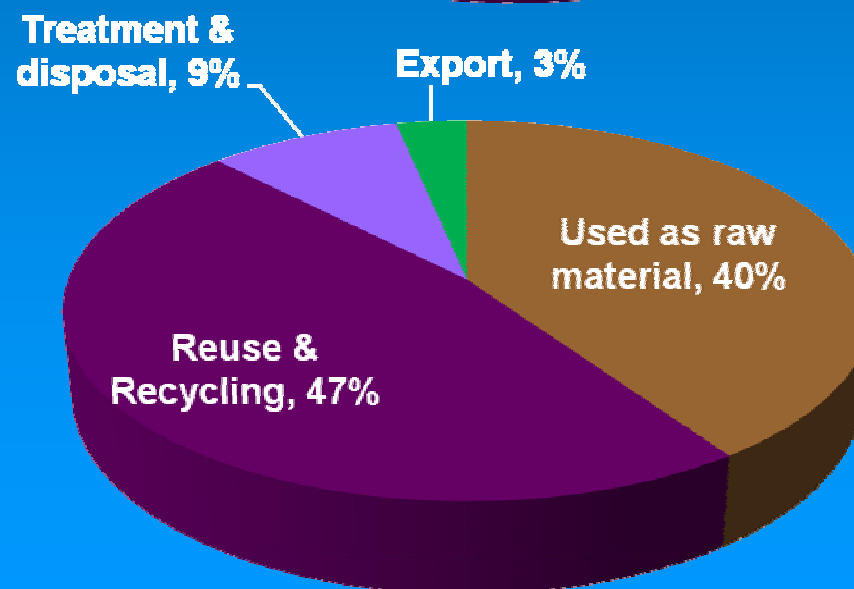
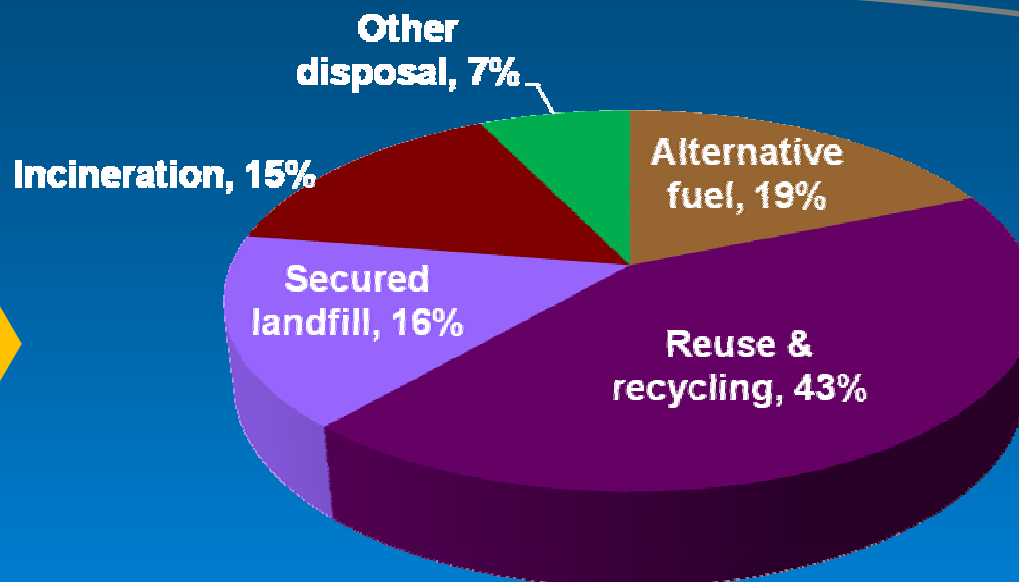
# Industrial Waste Management



**Industrial Waste**  
21.551 MT

**Hazardous Waste**  
2.287 MT (10.61 %)

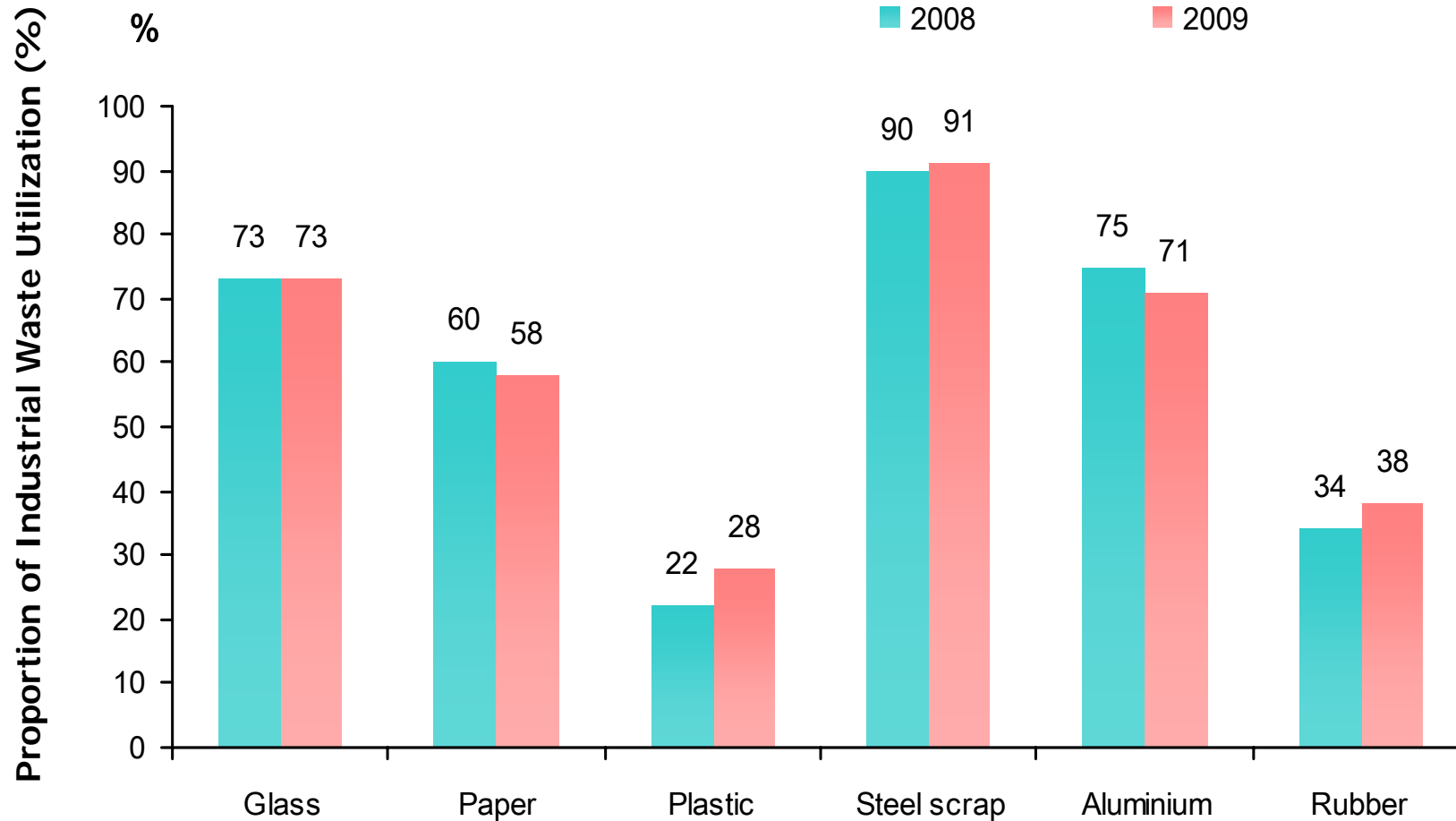
**Non-Hazardous Waste**  
19.264 MT  
(89.39 %)



Source: DIW, 2009



# Industrial Waste Utilization





# Impacts of Improper Management

- **Air pollution**
- **Leachate / wastewater**
- **Surface water and groundwater contamination**
- **Land use and ecological damages**
- **Nuisance and Health risk and its impacts**
- **Socio-economic impact**





# Mismanagement of Waste



Co-disposal of HW & MSW  
| Illegal Dumping / Open Dumping







# Mismanagement of Waste

Lack of awareness & knowledge

No appropriate segregation & collection system



Poor recycling facilities



No properly disposed





# Mismanagement of Waste

Illegal Trafficking & Dumping of Industrial HW



Illegal Import of HW and E-wastes





# Mismanagement of Waste



No Operational Procedures  
No Environmental Controls





# Current Waste Management



## Strategies

- **Government policy statement and announcement**
- **Awareness raising/ Capacity building / Stakeholders' participation**
- **Community - based solid waste management**
- **R&D on 3Rs (CT/CP/Eco-design, Green products)**
- **Promotion for recycling business**
- **Policy and Implementation on Green Procurement of Government Sector**



# Waste Management Policy

## Internal Factors

- Government policy
- Socio-economic development
- Resource and energy conservation
- Pollution status

## External Factors

- International agreements
- Trade and environment
- International standards
- Global environmental problems

National Policy on Waste Management

3Rs Promotions

Integrated Technology

Clustering Management

Public Private Partnership

Waste-to-Energy



# Policy and Measures



**Control Waste/Pollution  
generated by Production &  
Consumption  
→ 3Rs/CT/RoHS**

**Restrict  
Control of  
Transboundary  
Movement  
of Wastes  
→illegal traffic  
of HW/2<sup>nd</sup>hand  
commodities**

**National Environmental  
Quality Management  
Plan 2007 – 2011**

**National Agenda on  
Waste Management**

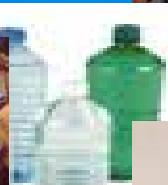
**Promote  
the Private  
Sector's Role  
→Green supply  
chain/3Rs/CT/  
Eco-design**

**Implement Efficient  
WM System  
→Integrated WM Center  
(WTE) /CGHW Center**



# Policy and Measures

Minimize waste generations  
Apply 3Rs  
Promote Green Products





# Policy and Measures

**Develop separation system for household hazardous waste from end-of-life products**







# 3Rs Capacity Building

3Rs  
Training



Guidelines &  
Manuals



Awareness  
Raising



Waste - specific containers



# Community- Based Recycling

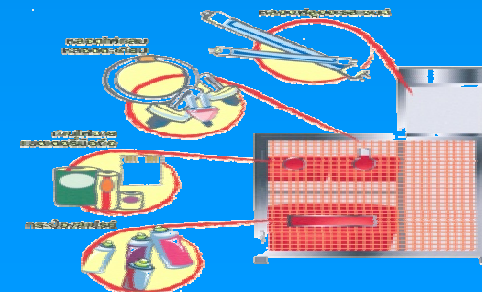
- School recycling programs (Garbage Bank)
- Community buy back centre
- Waste donation
- Household composting
- Zero waste programs





# Hazardous Waste Management

- E-waste Inventory : Funded by Ministry of the Environment, Japan and cooperation with Electric and Electronics Institute of Thailand to survey 6 types of E-wastes from cradle-to-grave and to recommend effective management
- Household Hazardous Waste : To promote system management from source separation to recycling and disposal targeted in Bangkok metropolitan and 23 major municipalities





# Multi-Stakeholders Cooperation

- Cooperate with manufacturers, distributors and communities to take back end-of-life products

- Packaging and packaging wastes
- Mobile phone and batteries



- Fluorescent lamp



- Used lead-acid batteries and dry cell batteries





# 3Rs in Industry

## Policies

1. Promoting Proper Waste Management, 3Rs and Waste Utilization/Minimization
2. Promoting Eco-Industrial Estate/Park/Town
3. Supporting networking among States, Publics, and Enterprises



## 3Rs in Industry (cont.)

### Projects and Activities

1. Eco-Industrial Development Pilot Project  
(At Rojana Industrial Park, Ayutthaya, year 2010 – 2014 )
  - To implement Eco-town Concept and 3R Activities in Industry and Communities
  - To enhance network capacities of Recycling-Oriented Society



## 3Rs in Industry (cont.)

### Projects and Activities (cont.)

#### 2. Waste Utilization Demonstration Project (year 2009 – 2013)

- To promote 3Rs activities in Industrial Waste management
- To reduce waste to landfill



## 3Rs in Industry (cont.)

### Projects and Activities (cont.)

3. Metal Recovery Project (year 2009 – 2012)
  - To conduct simplified metal recovery technology for E-waste
  - To transfer simplified technology for commercials





# Management Constraints

- Less concerns on waste separation, reuse, and recycling
- Insufficient financial support for 3Rs activities and related infrastructures
- Uncertainty in market prices of recyclable wastes
- Lack of R&D on 3Rs modern technologies
- Limitations of system management for WEEE and hazardous wastes
- Lacks of mechanisms to promote private investment on waste management



# 3Rs Achievement

- Government Green Procurement
  - Lists of green products and services (19 products and 4 services)
  - Guideline and criteria for green procurement
  - Capacity building for stakeholders
  - Road map for promotion of green products

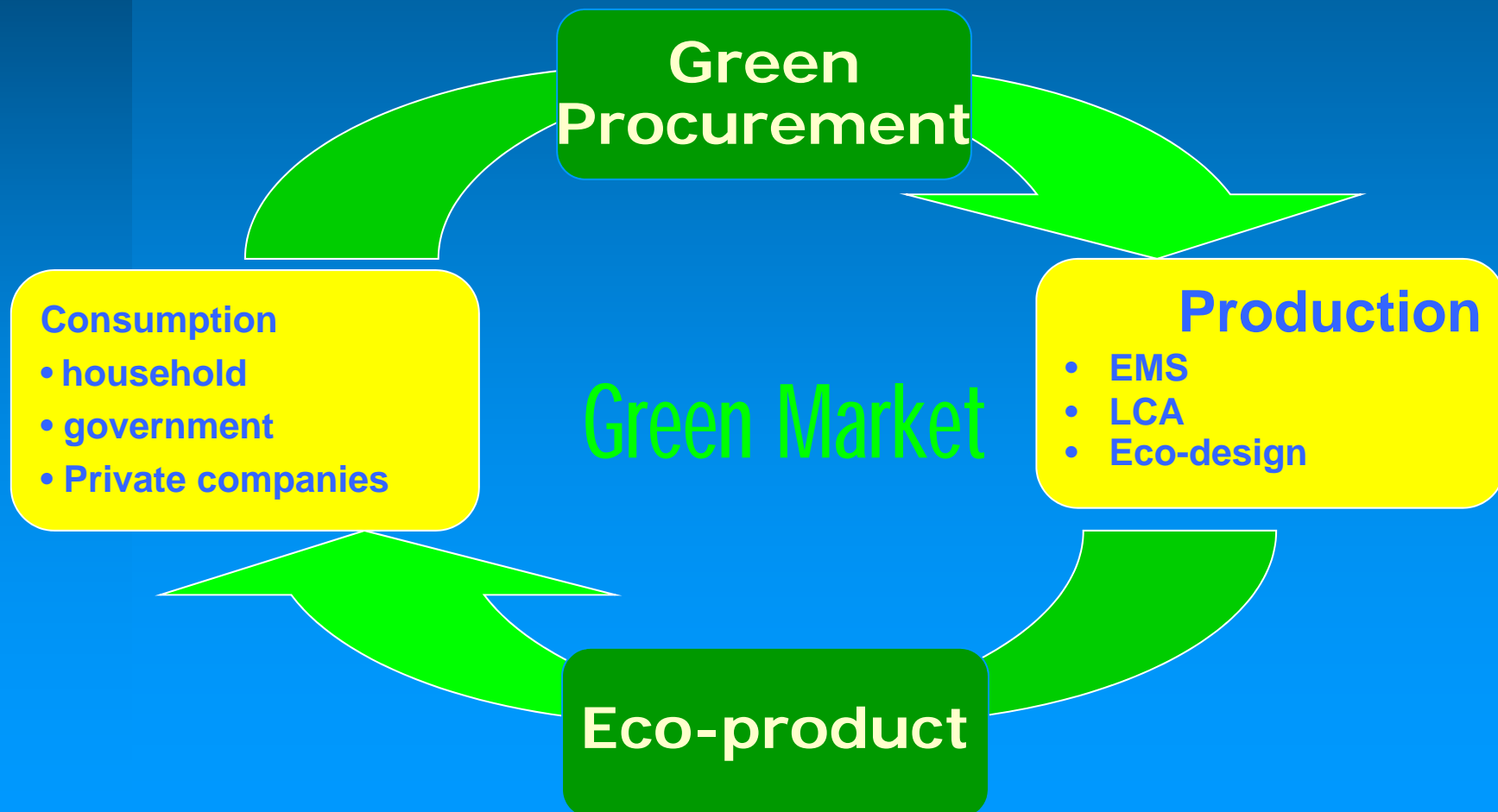




# Government Green Procurement



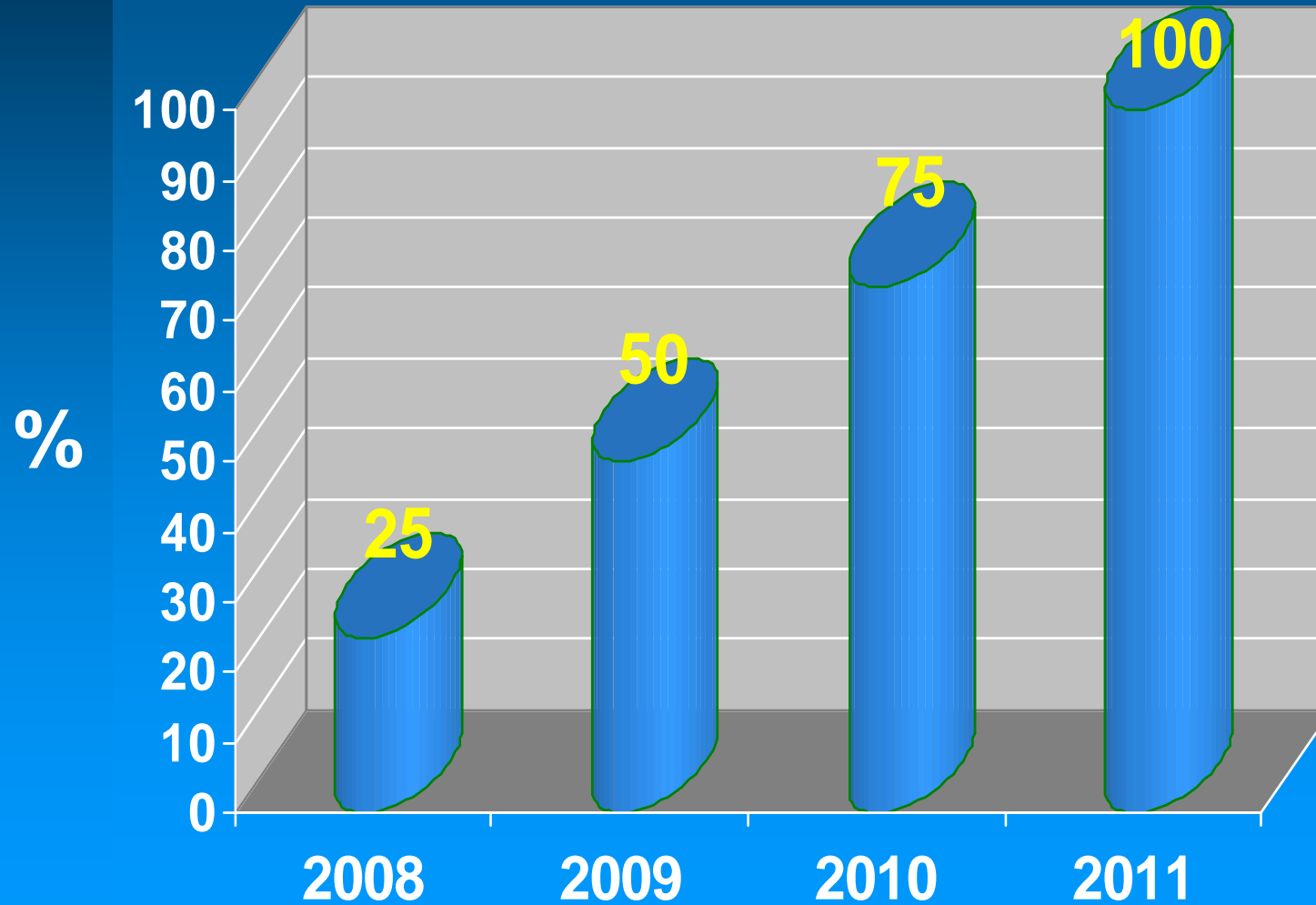
Government must take lead in green procurement to promote green market





# Government Green Procurement

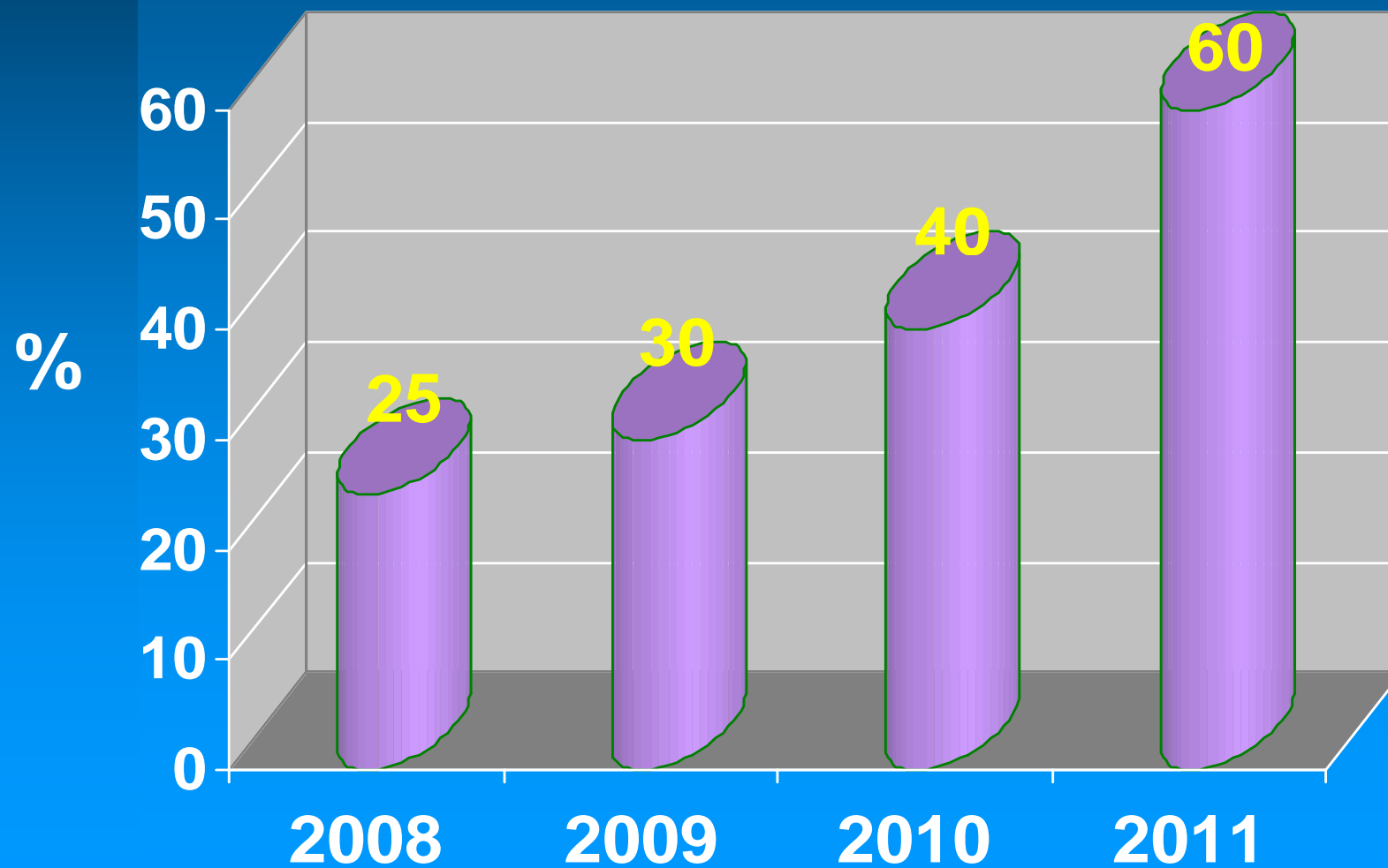
## Targets on Number of Government Agencies





# Government Green Procurement

## Targets on Amount of Green Products to be Procured





# 3Rs Achievement

- National 3Rs Conference

To introduce 3Rs principle, policy and strategies as well as transfer knowledge, experience and best practices among government, business, NGOs and civil society in 4 regions of Thailand ( Central, North, Northeast and South)

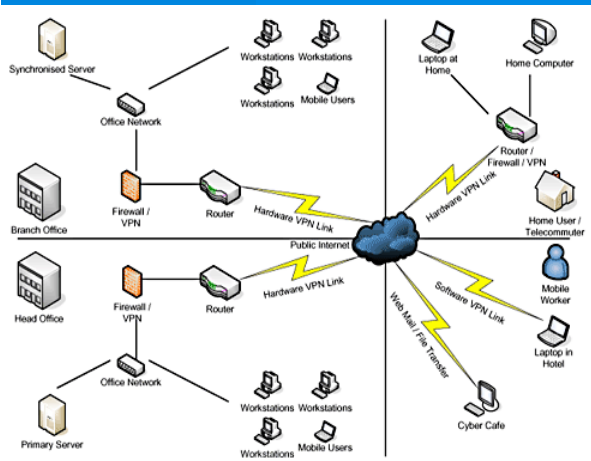




# 3Rs Achievement

- **Thailand Waste Recovery Center (TWRC)**

To develop 3Rs database and information technology as knowledge hub for dissemination of 3Rs knowledge, technologies, experiences, and best practices through cyber network





# 3Rs Achievement

- 3Rs Regulation Development
  - Develop master law for promotion of waste reduction, reuse and recycling from up stream processes to final disposal
  - Basic principle of the law include resource efficiency, extended producer responsibility, public private partnership and economic instruments







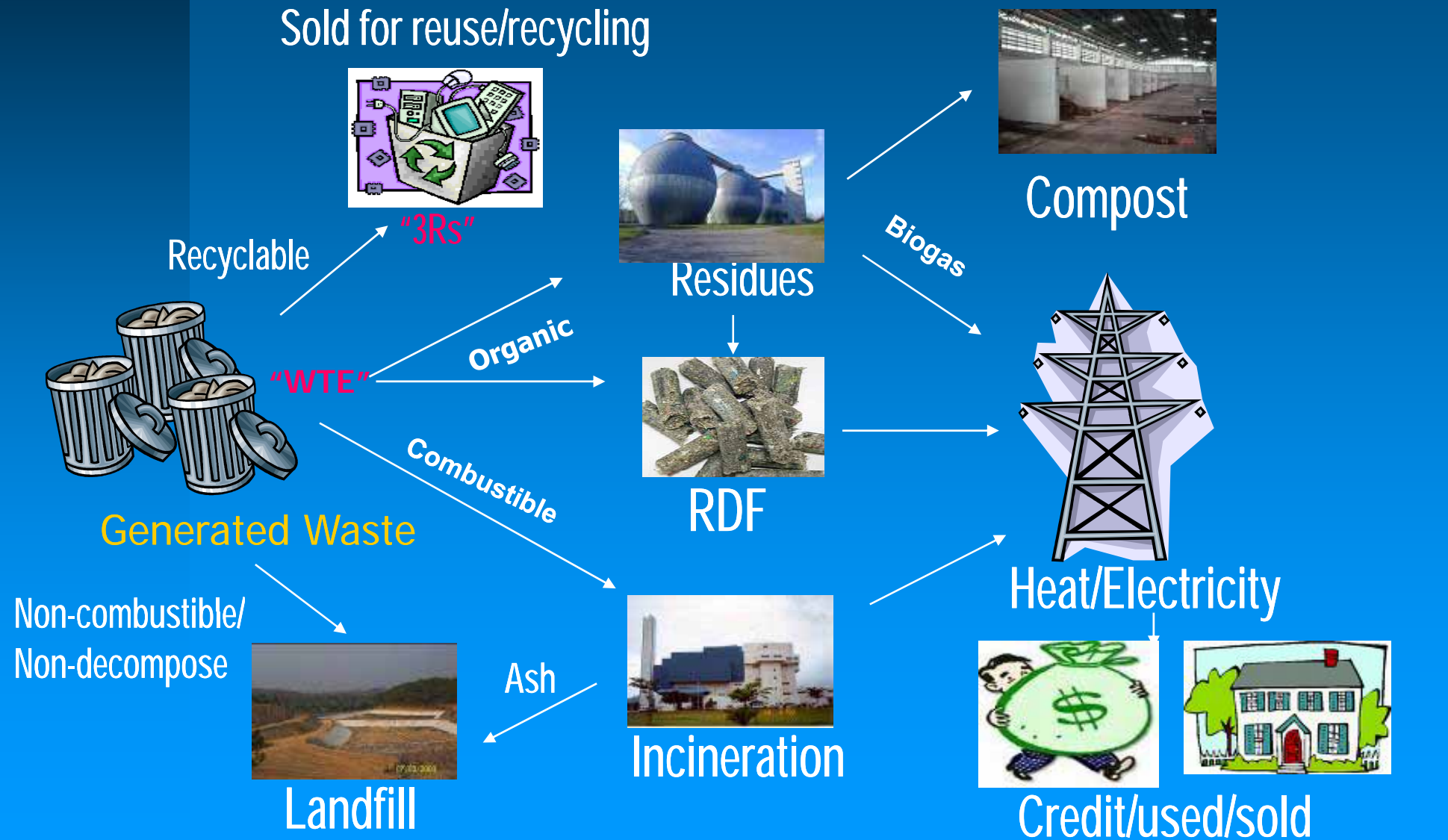
# 3Rs Achievement

- National 3Rs Strategic Plan
  - Supported by UNEP RRC.AP under the project of Advance Waste Management in Asia and the Pacific (AWMAP)
  - Objective : To develop national 3R policy, goal and strategies as direction of environmental sound management of wastes for all stakeholders
  - 3Rs strategy : Apply various principles and measures of waste management such as resource efficiency, sustainable consumption, 3Rs promotion, proper treatment and disposal of waste residues



# Future Vision

## • Integrated Management of 3Rs and WTE





# Future Vision



- **Eco-Industrial Development**

- Develop and transfer sound management and 3Rs technologies for sustainable resource and energy consumptions with pilot projects on selected industries
- Full scale study and planning for development of eco-industrial zone/eco industrial park/eco-town projects and related businesses





# Future Vision



## • Linkage of 3Rs and Sustainable Development

**3Rs  
Principle**



**Sustainable Production and  
Consumption**

**Global Warming/CDM**

**Poverty/Job Opportunity**

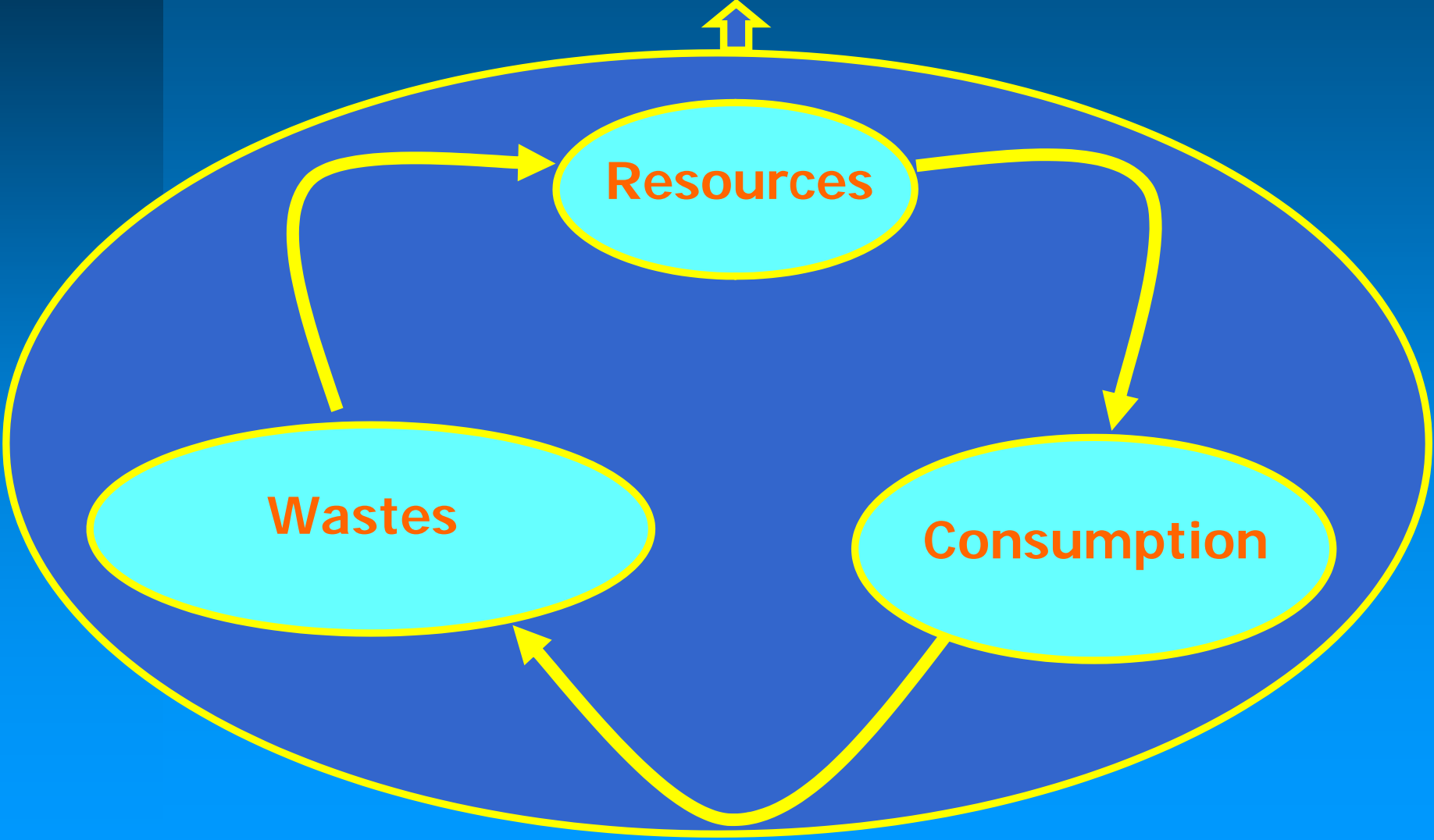
**Trade and Environment**

**Resource and Energy  
Conservation and Recovery**



# 3Rs Ultimate Goal

Sustainable Development Society





# Conclusions and Recommendations



## 3Rs Key Issues

- **Integrate 3Rs principle into national environmental and socio-economy policies**
- **Clear Statement and communication on 3Rs policy, goal and strategies.**
- **Awareness raising ,education, participation programs and capacity building**
- **Finance / funding 3Rs programs**
- **R&D on related 3Rs infrastructures or technologies**
- **Develop related management tools (laws/ regulations, economy instruments)**



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