INDONESIA COUNTRY REPORT ON THE IMPLEMENTATION OF 3R PROGRAM

Jointly prepared by:
Ministry of Environment & Forestry and Ministry of Industry

The 7th Regional 3R Forum in Asia and the Pacific
Adelaide, Australia 2-4 November 2016




GEOGRAPHYCAL OVERVIEW

- LOCATION: 6° 08' N and 11° 15' S, and between 94° 45' E and 141° 05‘ E
- TOTAL AREA: 5.193.250 sq km
  - Land: 1.922.570 sq km
  - Water: 3.257.483 sq km
- COASTLINE: 54,716 km WITH EXPENSE ARE 3,977 miles
- NUMBER OF REGISTERED ISLLAND: 13,466

- POPULATION : 253,609,643 Annual growth: 1,2%
- APROXIMATELY 509 MUNICIPALITIES
- ETHNIC GROUP 1,340
- GDP (2014): USD 16 BILLIONS AND PER CAPITA: USD 3,631 WITH GROWTH 6.15% ANNUALY (2010-2013)

POLICY AND MAJOR PROGRAMMES

POLICY AND REGULATION

- LAW NO. 18/2008 CONCERNING SOLID WASTE MANAGEMENT
- LAW NO. 32/2009 CONCERNING ENVIRONMENTAL PROTECTION & MANAGEMENT
- LAW NO. 3/2014 CONCERNING INDUSTRY
- GOVERNMENT REGULATION NO. 81/2012 CONCERNING HOUSEHOLD SOLID WASTE & HOUSEHOLD-LIKE SOLID WASTE MANAGEMENT
- GOVERNMENT REGULATION NO. 101/2014 CONCERNING HAZARDOUS WASTE MANAGEMENT
- PRESIDENTIAL REGULATION NO. 185/2014 CONCERNING ACCELERATION OF WATER SUPPLY & SANITATION
- MINISTERIAL REGULATION NO. 13/2012 CONCERNING IMPLEMENTATION 3R THROUGH WASTE BANK
- SOME POLICIES & REGULATIONS ARE UNDERDEVELOPMENT

MAJOR PROGRAMS

- **PROGRAM ADIPURA (MONITORED & EVALUATED CLEANLINESS AND GREENERY PERFORMANCE OF 380 CITIES)**
- PROMOTING & IMPLEMENTING 3R THROUGH WASTE BANK
- **PROVIDING COMMUNITY & NEIGHBORHOOD 3R FACILITY (2014: 570 UNITS), INTERMEDIATE TREATMENT FACILITY (2014: 3 UNITS), DEVELOPED & REHABILITATED LOCAL & REGIONAL SOLID WASTE LANDFILL (2014: 247 UNITS)**
- CAPACITY DEVELOPMENT PROJECT FOR NATIONAL AND LOCAL GOVERNMENT ON 3R AND SOLID WASTE MANAGEMENT SYSTEM, SUPPORTED BY JICA
- PROMOTING & IMPLEMENTING GREEN INDUSTRY THROUGH RESOURCE EFFICIENCY & CLEANER PRODUCTION PROGRAM
- GREEN INDUSTRY:
  - SET UP OF MINISTRY OF INDUSTRY DECREE REGARDING ROAD MAP OF CO2 EMISSION REDUCTION IN CEMENT INDUSTRY AND OZONE DEPLETING SUBSTANCES ABOLITION
  - SET UP OF TECHNICAL GUIDANCE FOR ENERGY CONSERVATION TECHNIQUE AND CO2 EMISSION REDUCTION FOR STEEL, FERTILIZER, PULP & PAPER, AND CERAMIC INDUSTRIES.
  - TRAINING ON GREEN INDUSTRY IMPLEMENTATION FOR INDUSTRY (INCLUDING SMES)
  - TECHNICAL AND FINANCIAL SUPPORT FOR GREEN INDUSTRY CERTIFICATION

1. TARGET OF SOLID WASTE MANAGEMENT

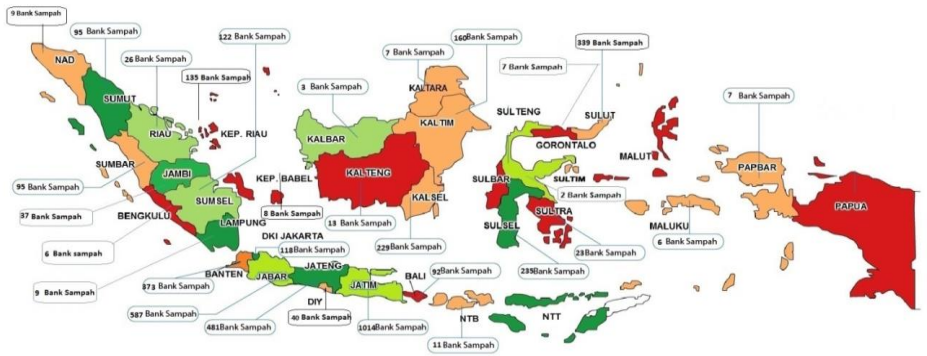
INDICATOR	SOLID WASTE MANAGEMENET TARGET										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
SOLID WASTE PRODUCTION (MILION TON)	64.4	65.2	65.8	66.5	67.1	67.8	68.5	69.2	69.9	70.6	**71.3**
SOLID WASTE REDUCTION TARGET (MILIION TON)	10% (6.44)	12% (7.82)	15% (9.89)	18% (12)	20% (13.4)	22% (14.)	24% (16.4)	26% (17.99)	27% (18.9)	28% (19.7)	**30% (20.9)**
SOLID WASTE HANDLED (MILION TON)	70% (45)	71% (46)	72% (47.3)	73 % (48,5)	75% (50.3)	75% (50.8)	74% (50.7)	73% (50.52)	72% (50.3)	71% (50.1)	**70% (49.9)**

2. TARGET OF INDUSTRIAL WASTE MANAGEMENT

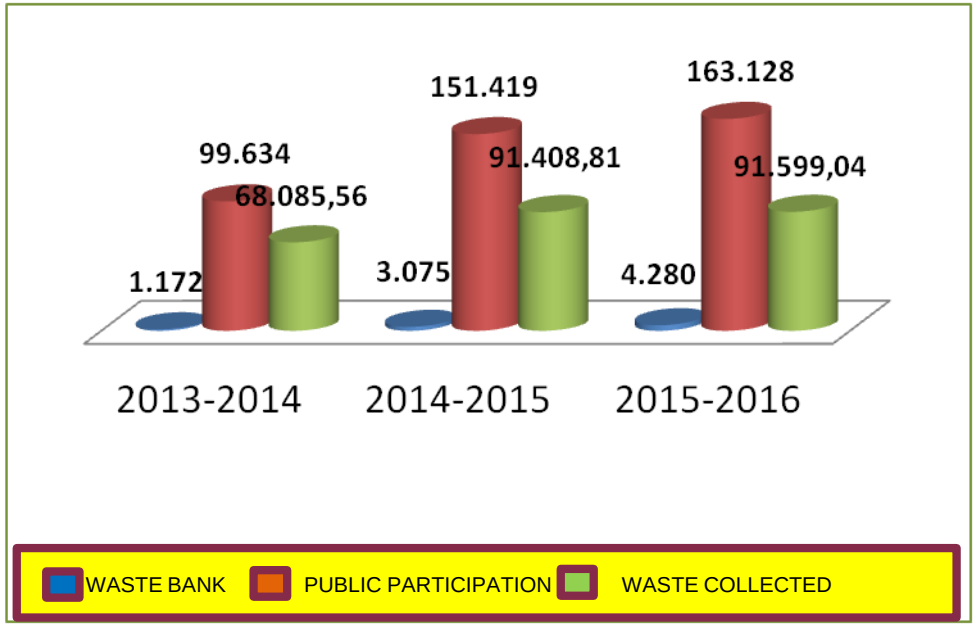
1. Generated waste can be 100 % managed with emphasis on the 3Rs principle
2. Decreasing the burden of environmental pollution caused by waste

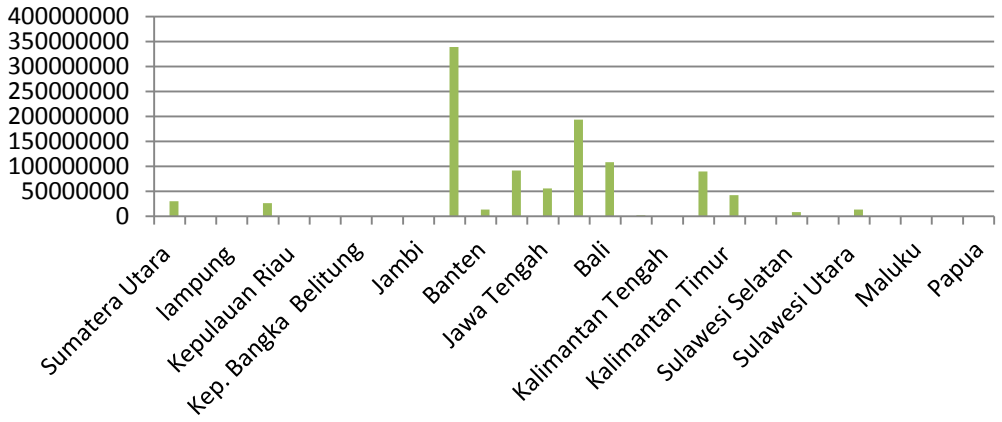
ON GOING PROGRESS ON 3R PROGRAMS
3R THROUGH THE WASTE BANK

WASTE BANK DISTRIBUTION IN INDONESIA



4280 WASTE BANK





ECONOMICAL ASPECT: INCOME OF WASTE BANK
IDR 3,5 BILLION /MONTH

- **Waste Bank is developed as a business unit by community initiative and creatives throug the implementing 3R program of solid waste management.**
- Environmental commitment oriented
- Based on Community Agreement
- Product; compost, handycraft and Recycling Material

METHANE CAPTURE FORM LANDFILL GAS

Kendari City

- Captured & utilized landfill gas for heat & electricity
- Distributed landfill gas for heating & electricity 'Kampung Mandiri Energi' (self-sufficient energy village) consist of more than 100 households
- Built and operated by local government

Malang City and Malang Regency

- Captured & utilized landfill gas for household cooking
- Malang Regency : gas is connected to 75 households
- Malang City : 300 households
- Built and operated by local government

Capital City of Jakarta

- Advanced Technology
- Landfill gas for electricity: produces 8-9 MW
- Built and operated by local government
- On Going negotiation regards electricity selling to State Electricity Company

UTILIZATION OF USED OIL WASTE

WASTE	STORAGE (TON)	UTILIZATION (TON)	PERCENT (%)
USED FOR: • Oil Product; • Base Oil; dan • Alternative fuel	**6.161.131**	**4.942.459**	**80 %**

UTILIZATION OF FLY ASH

WASTE	STORAGE & LANDFILL (TON)	UTILIZATION (TON)
Fly Ash (High Quality) ▪ Raw material subtitute in cement industry ▪ Substitution of cement in making concrete blocks , paving blocks dll ▪ Substitution of cement for the manufacture of ready mix concrete .	**111.849.665**	**1.500.000**

UTILIZATION OF USED BATTERIES

WASTE	IN STORAGE (TON)	UTILIZATION (TON)
• Lead as Ingot Pb • Recycle	**16.737,28**	***120.000**

UTILIZATION OF USED BATTERIES

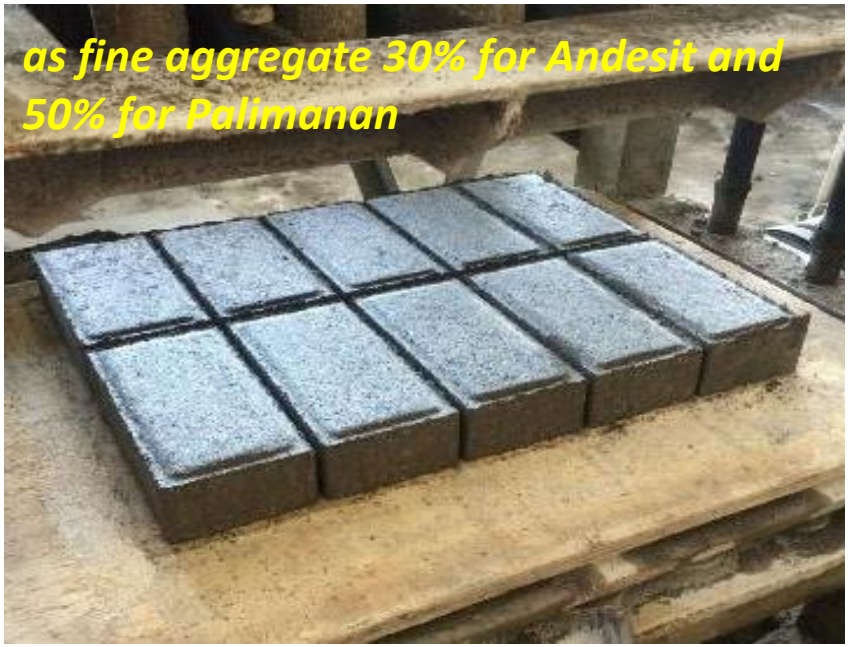
WASTE	STORAGE (TON)	MANAGE & UTILIZATION (TON)
SLUDGE OF WWT: • For *low grade paper.* • Alternative fuel (calory > 2500 Kkal) • Alternative material in cement insustry (Si > 50 %) • As soil fertilizer	**47.815.388**	**32.136.722**

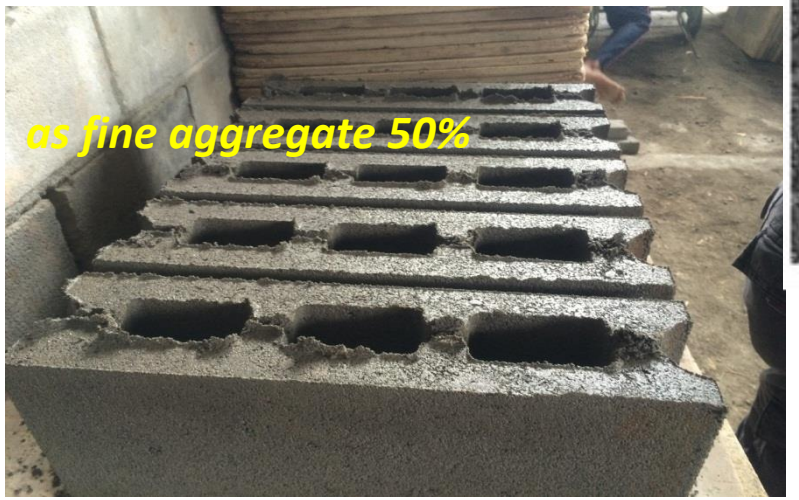
UTILIZATION OF COPPER SLAG

Waste	TOTAL WASTE UTILIZED (TON)
COPPER SLAG Utilization of Waste as: • Alternative maerial for ship blasting & pipe coating • Alternative material of iron sand pasir in cement industry • Raw material alternative of sand in the manufacture of ready-mix concrete products.	800.000

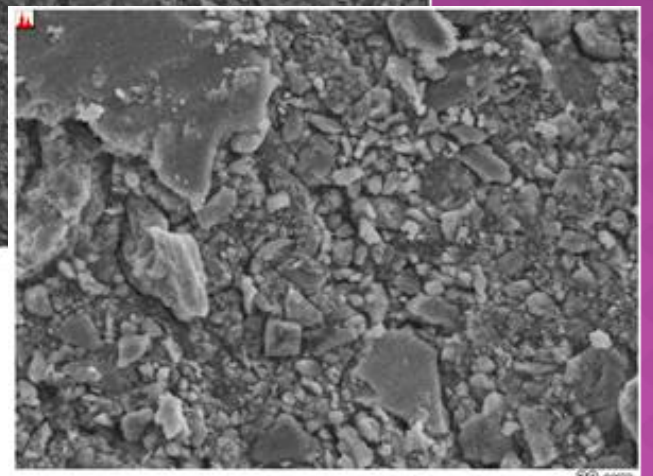
3R RESEARCH OPPORTUNITY UTILIZE SOLID WASTE AS MATERIAL

- **Application of Natural Stone Waste as Fine Aggregate Paver Block, Concrete Brick and Cement Raw Material**
- **The main content of solid waste from natural stone industry are carbon, silica, alumina, calcium oxide and ferry oxides**





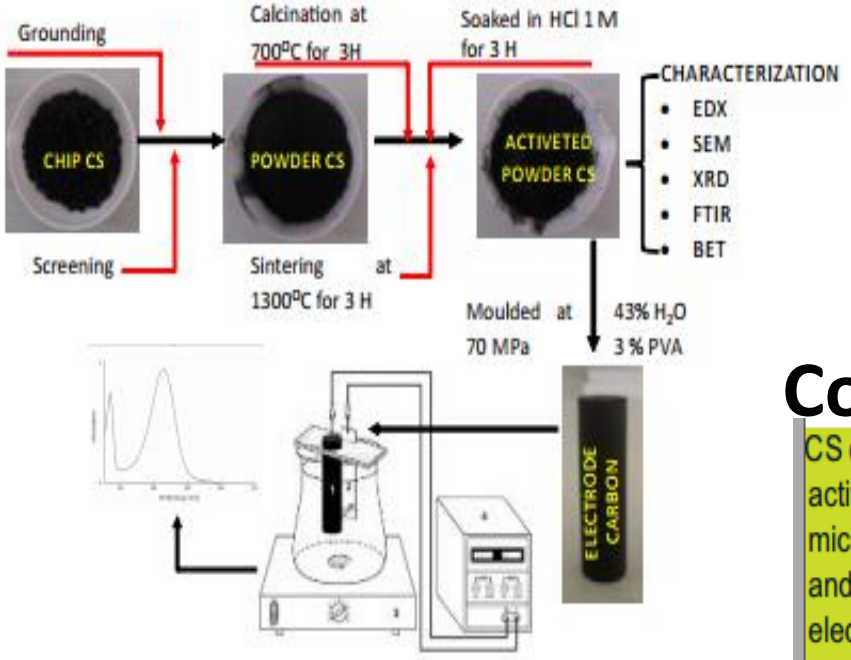
Cement made from waste of natural stone with sintering temperature of 1450 ° C

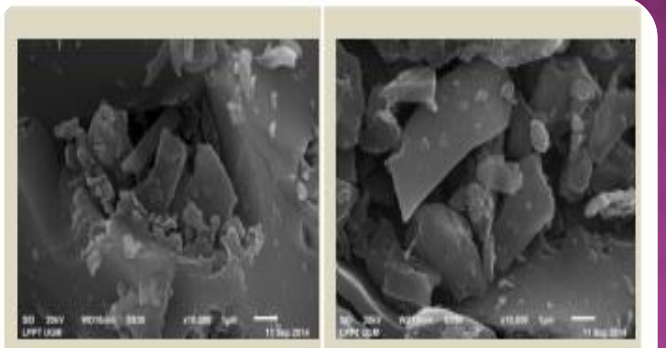


3R RESEARCH OPPORTUNITY UTILIZE SOLID WASTE AS MATERIAL

- Utilization of coconut shells as materials for carbon-based electrode for oxidation of pollutants wastewater
- Coconut shell, solid waste obtained in the processing of coconut has higher average content of carbon than other chars, indicating its potential as carbonaceous precursor

Experimental Section





SEM 10000x of (a) inactivated and (c) sintered carbon char

Conclusion

CS charcoal is a potential carbonaceous precursor for the production of electrode. Properties of electrode was improved by physico-chemical activation and sintering, including: carbon content (83.24% to 98.69%), structural change of amorphous to semi-crystalline, widening of microporosity, and development of surface area (83.013 m^2/g to 402.298 m^2/g activated carbon). Moulded electrodes were made of activated and sintered carbon using the following formula: 54% carbon, 43.3% water, 2.7% PVA and 70 MPa compression force. The performance of dye electrodegradation is comparable to those of graphite electrode, with 49% and 75% removal efficiency on UV and visible regions.

3R RESEARCH OPPORTUNITY UTILIZE SOLID WASTE AS MATERIAL

Prototype of Fixed Dome High Rate Anaerobic Biogas Reactor in CPO industry

Palm Oil Effluent Mill

Biogas Reactor

Product of Biogas

Integrated Wastewater Treatment Plant in Tofu SMEs (Biogas Reactor – Anaerob – Wetlands)

Tofu Wastewater

OPPORTUNITIES OF WASTE MANAGEMENT IN INDONESIA

- Formulate new regulations with strong law enforcement
- Develop manufacture & retailer with implementing the EPR concept.
- Improve national budget for waste management
- Improve national capacity on waste management including man power, technology and infrastructure
- Improve commitment and political will from governments (both executive and legislative) and community participation
- Optimising waste utilization as renewable resources through campaign program and insentive and disinsentive tools
- Provide technical guidelines and financial support

TERIMAKASIH
AND
THANK YOU