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**The Role of Industry-Academic-Government Cooperation to Develop
Eco-cities in Indonesia**

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INDONESIA

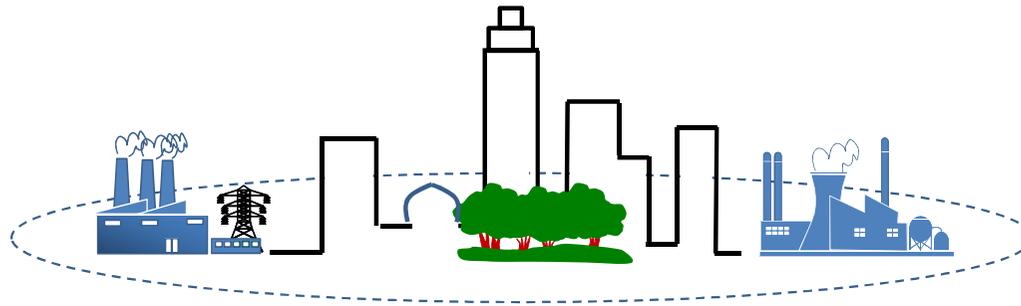


OUTLINE

- Eco-City
- Role of Industry-Academic-Government
- Cooperation of Industry-Academic-Government
- Industry-Academic-Government Cooperation Initiatives in Indonesia



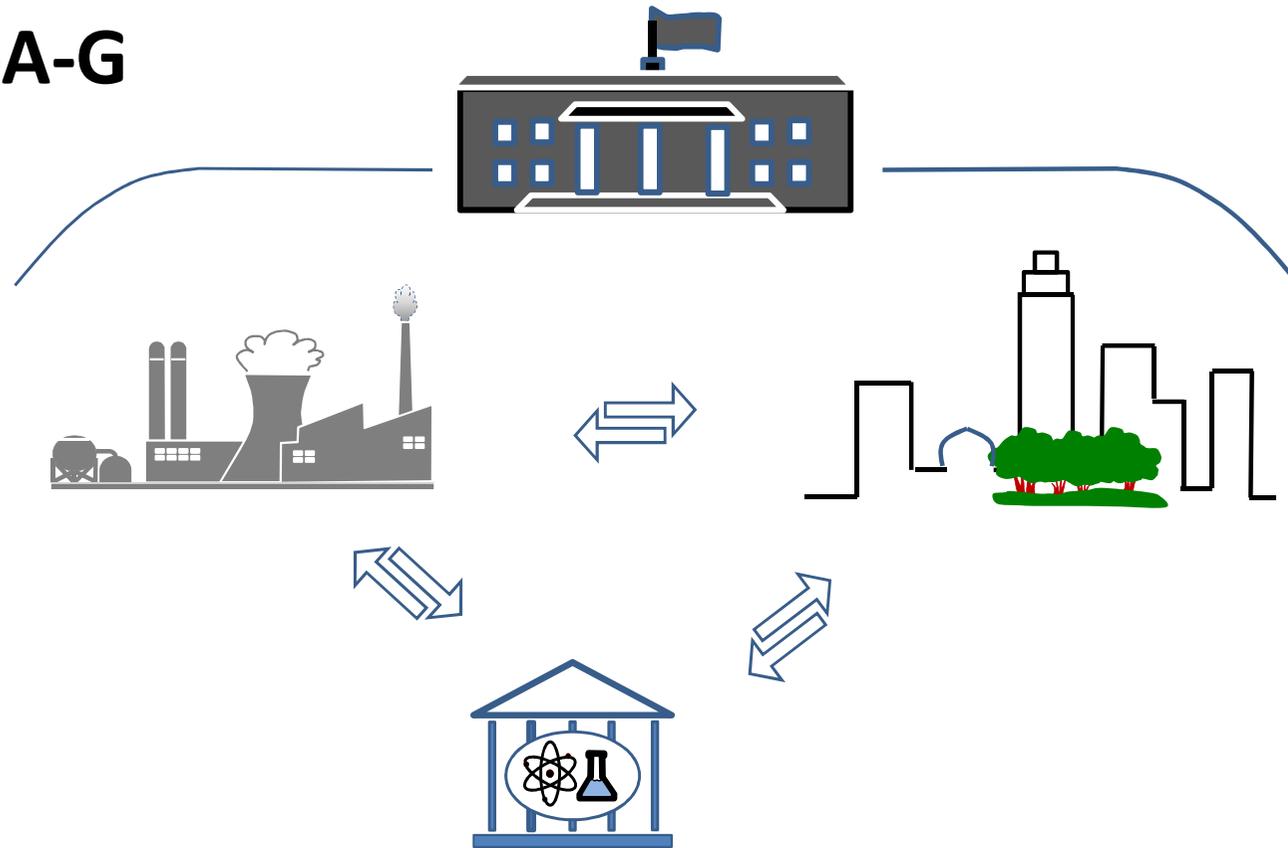
Eco-city



- Healthy human settlement,
- support economic growth
- Its inhabitants live in harmony with the natural environment
- minimum impact on the environment
- conservation of natural resources (water, energy, air, land)
- zero waste system
- efficient mobility infrastructure
- cultural values
- promote education and R&D



Role of I-A-G



Provision/delivery of:

Goods/products

Materials

Services

Energy

Employment

Knowledge/Technology

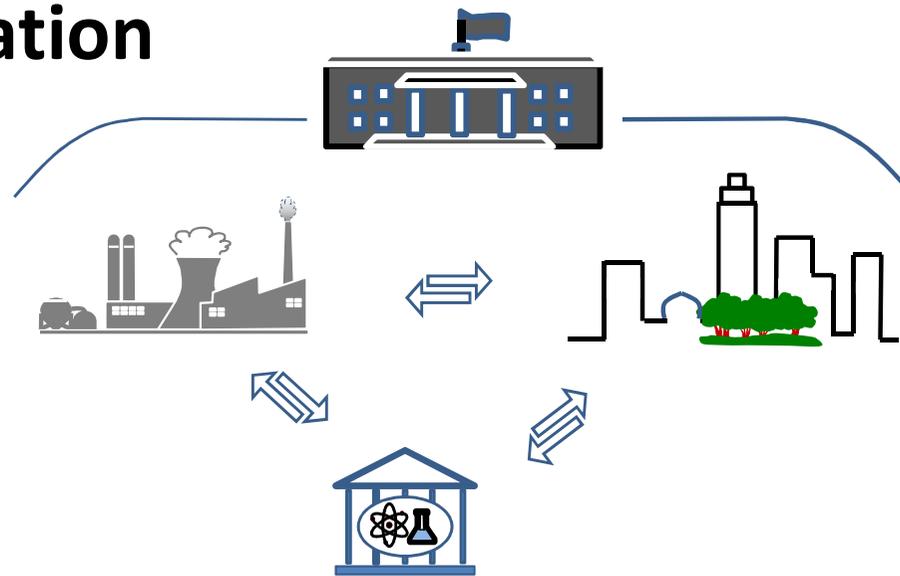
Education

Settlement

Leisure



I-A-G Cooperation



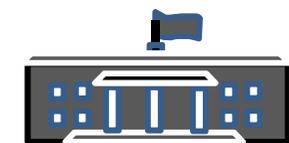
Industry – Academic:

- R&D Partnership
- Consultancy
- Capacity Building

Government – Academic:

- R&D Partnership
- Consultancy
- Capacity Building

Policy/regulation
Facilitation
Incentives





Industry-Academic-Government Cooperation Initiatives

Ultimate objective: GHG emission reduction

Sector: Energy and Materials (when appropriate)

Framework: MRV (Measurement, Reporting, Verification)

Activity*):

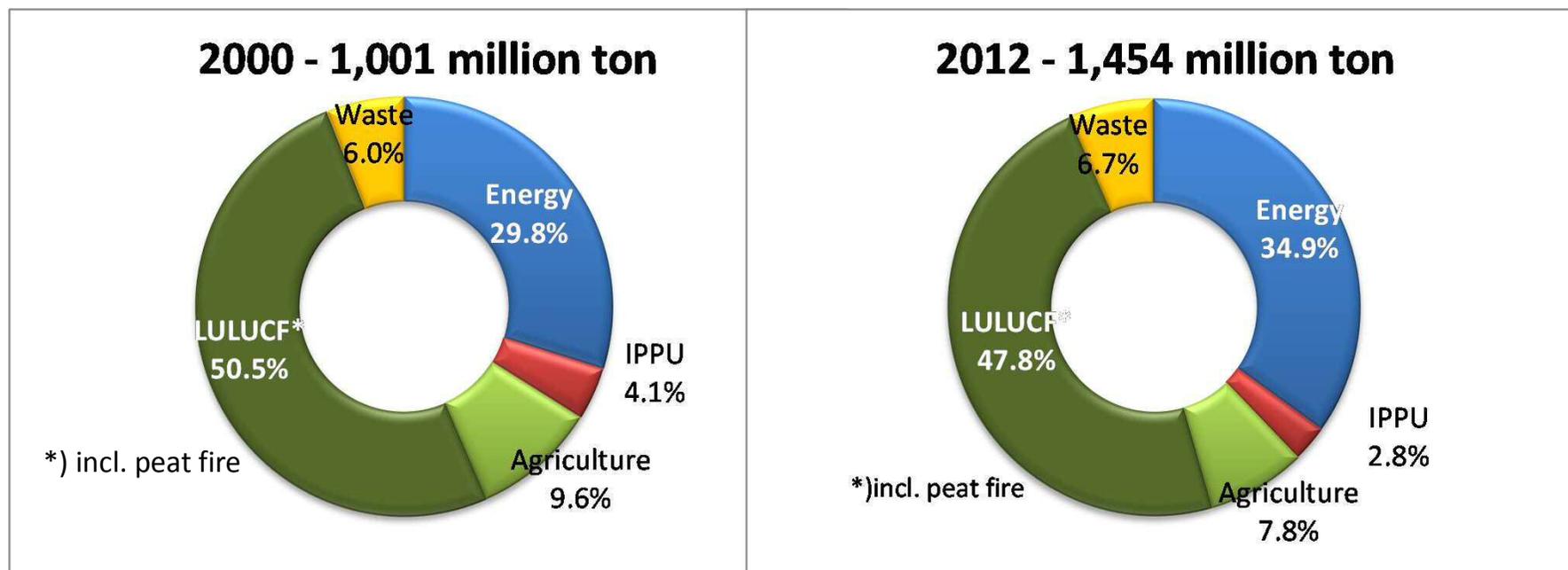
- Installation of energy monitoring device in industry
- Development of bottom-up energy model (industry, city, region, national)

**) Research Project of Institut Teknologi Bandung, Indonesia
and
National Institute of Environmental Studies, Japan*



The rationale

Past Trend of GHG Emission



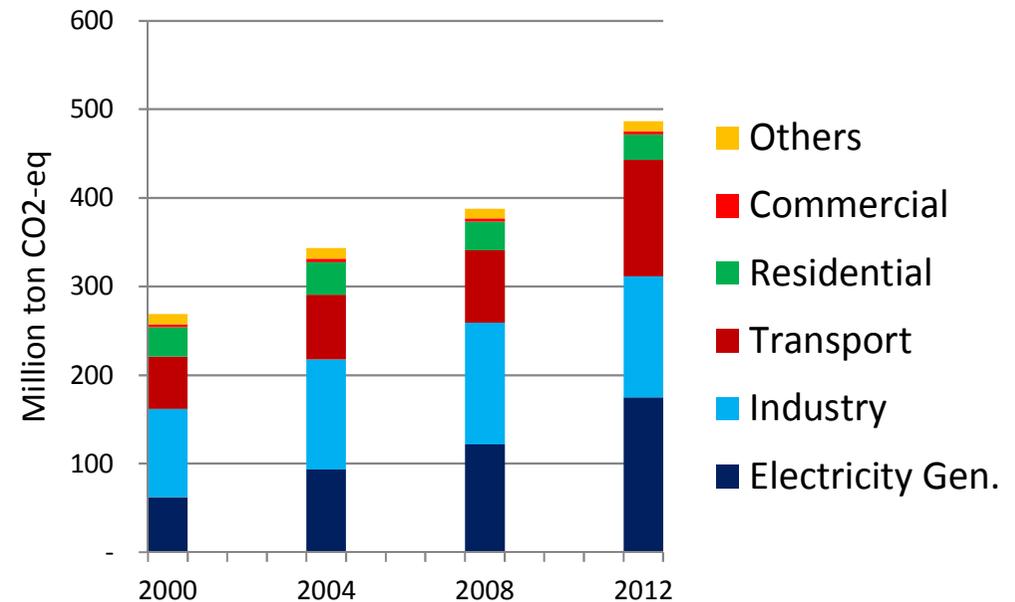
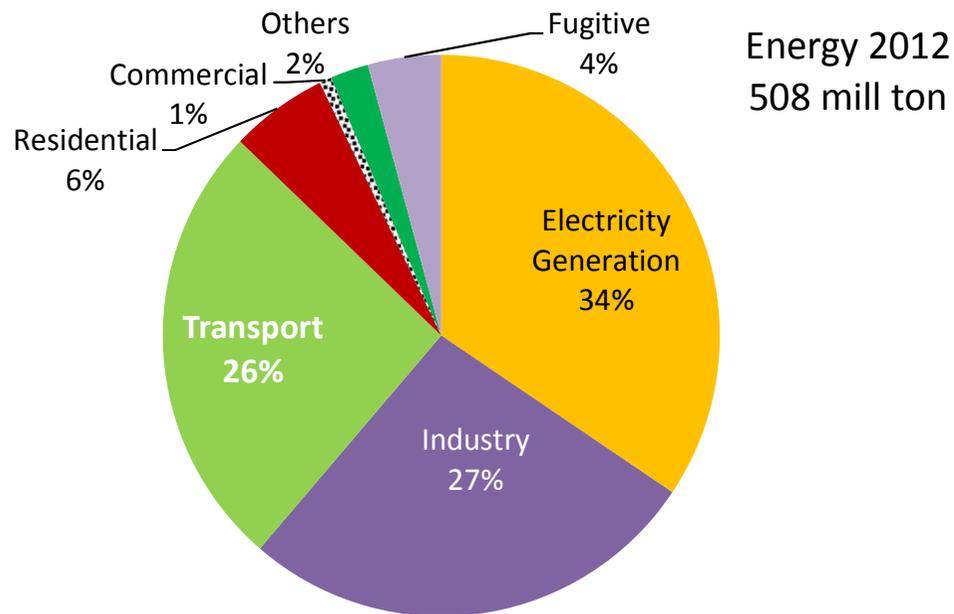
Sectors	Million ton CO2e		Percentage		Average annual growth
	2000	2012	2000	2012	
1 Energy	298	508	30	35	4.5% ←
2 IPPU	41	41	4	3	0.1%
3 Agriculture	96	113	10	8	1.3%
4 LULUCF *	505	695	51	48	2.7%
5 Waste	61	97	6	7	4.0%
Total	1,001	1,454			3.2%

*) including peat fire

Source: Draft-Indonesia 1st BUR



Breakdown of Energy Sector Emissions



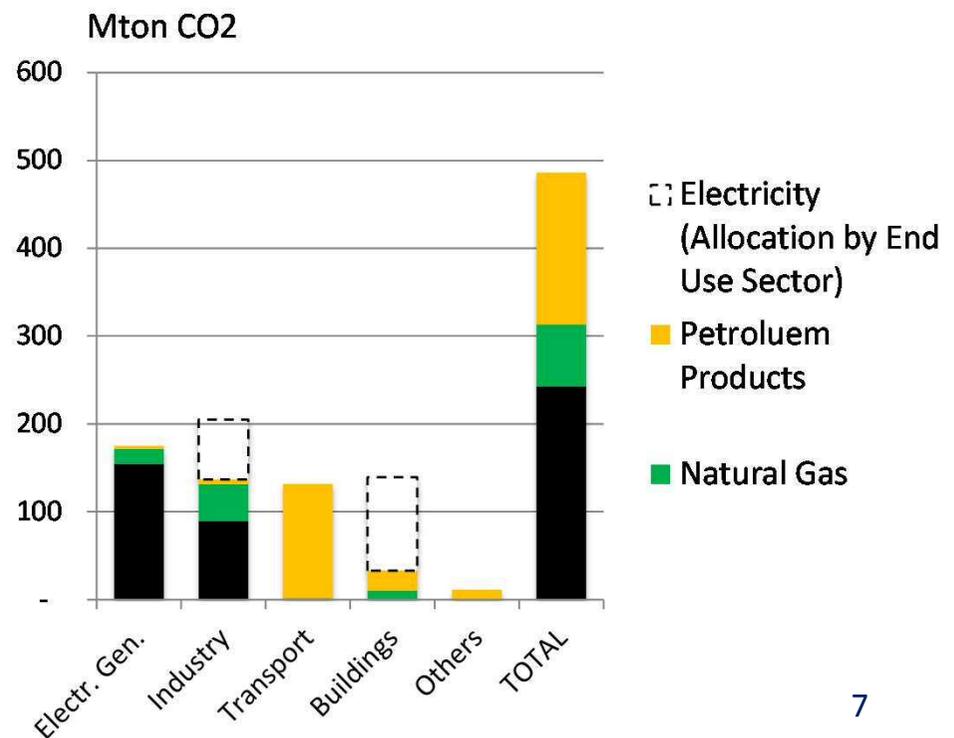
Combustion Emissions

Major sources: coal & oil

Uses: Power gen., industry, transport

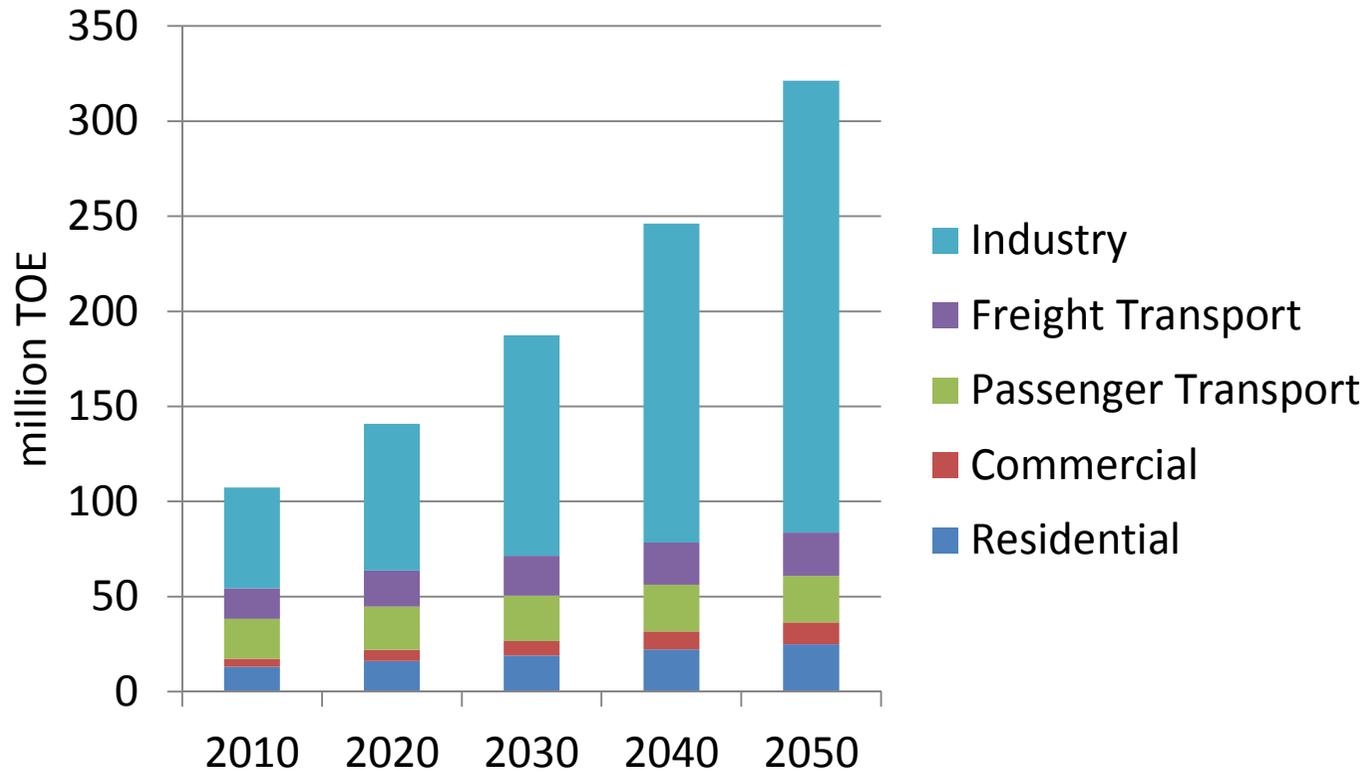
End-use sector: 45% from fuel burning in industry;

Emissions from power generation is accounted by building (60%) and industry (40%) sectors.





Final Energy Demand Projection



Source: Center for Research on Energy Policy - ITB

Economic growth: 5-5.5% per year

Industry energy demand growth: 4% per year (average)



Measurement, Reporting, and Verification (MRV)

Within the context of climate change arena, MRV stand for **M**easurement/**M**onitoring, **R**eporting and **V**erification of GHG emission.

The term MRV is originated from UNFCCC Decision 1/CP.13 – 2007, Bali Action Plan:

*Paragraph 1 (b)(ii) of the Decision underlines the need for “... nationally appropriate **mitigation actions** by developing country Parties in the context of **sustainable development**, supported and enabled by technology, financing and capacity-building, in a **measurable, reportable and verifiable** manner.*

“Measurable, Reportable, Verifiable” are now commonly abbreviated as MRV.

As indicated by the Decision, the enabling support (technology, financing and capacity-building) for mitigation actions is also the object of MRV.



SCOPE/BOUNDARY OF EMISSION

Concerning the scope or coverage of the boundary to which the emission is accounted, there are two types of MRV i.e.:

- MRV of GHG emission level/removal at organization level and
- MRV of GHG emission level/removal at national/sub-national level.

Concerning from which GHG emission reduction is resulted, there are 2 types of MRV:

- MRV of GHG emission reduction due to mitigation action at project level and
- MRV of GHG emission reduction resulted from the adoption of policy and measures.

Mitigation actions may be undertaken:

- on voluntary basis,
- to fulfil country pledge on emission reduction,
- to meet country commitment to reduce GHG emission (Annex I countries) or
- to trade the emission reduction in domestic or international carbon market, i.e. CDM (Clean Development Mechanism), JCM (Joint Crediting Mechanism)



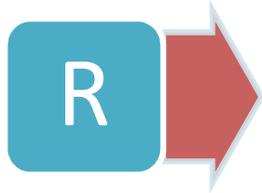
Ministerial Regulation No.15 /2013

To gather mitigation action information that is accurate, transparent, consistent and credible



Measurement

- During planning and implementation of action
- **To determine the GHG emission level before and after mitigation action**
- **To monitor the achievement of mitigation action**



Reporting

- To document the achievement of mitigation action.
- As reference document in verification process (by MRV commission).



Verification

- To ensure that all information stated in the report is correct
- Verification is carried out by verifier appointed by “project participant” (the party that is responsible in mitigation action)
- Requirement of verifier:
 - ✓ Not involved in mitigation action implementation;
 - ✓ Hold competency certificate (as mitigation action verifier).



The Needs for MRV

MRV lately become important issue within the context of NAMAs (Nationally Appropriate Mitigation Actions), i.e. climate change mitigation actions that are in line with country development objective and in support to sustainable development.

The issue of MRV is still relevant and an important component in the global efforts in climate change mitigations organized/managed under **INDC** (Intended Nationally Determine Contribution).

In order to have credible claim of the GHG emission reduction achieved by implementing all mitigation efforts, including the INDC, the reduction has to be measured, reported, and verified (MRV-ed).

Those are the rationale that we have to continue researches that support to the development of MRV system in all sectors, including in industrial sector.



ITB – NIES Research on The Development of MRV System

Current

Focus area: industry sector

Activities :

- (a) Installation of equipment to monitor energy system performance in industry in order to identify the potential of energy efficiencies, develop baseline emission and identify the corresponding GHG emission reduction potential. The efficiency may be obtained through technological intervention at an industry or through integration of energy system between industries in a location (i.e. industrial park).
- (b) Capacity building for climate change mitigations in industry and the associated MRV system
- (c) Modeling of Low Carbon Development incorporating mitigation actions in industry sector

Previous ITB - NIES Research Collaboration

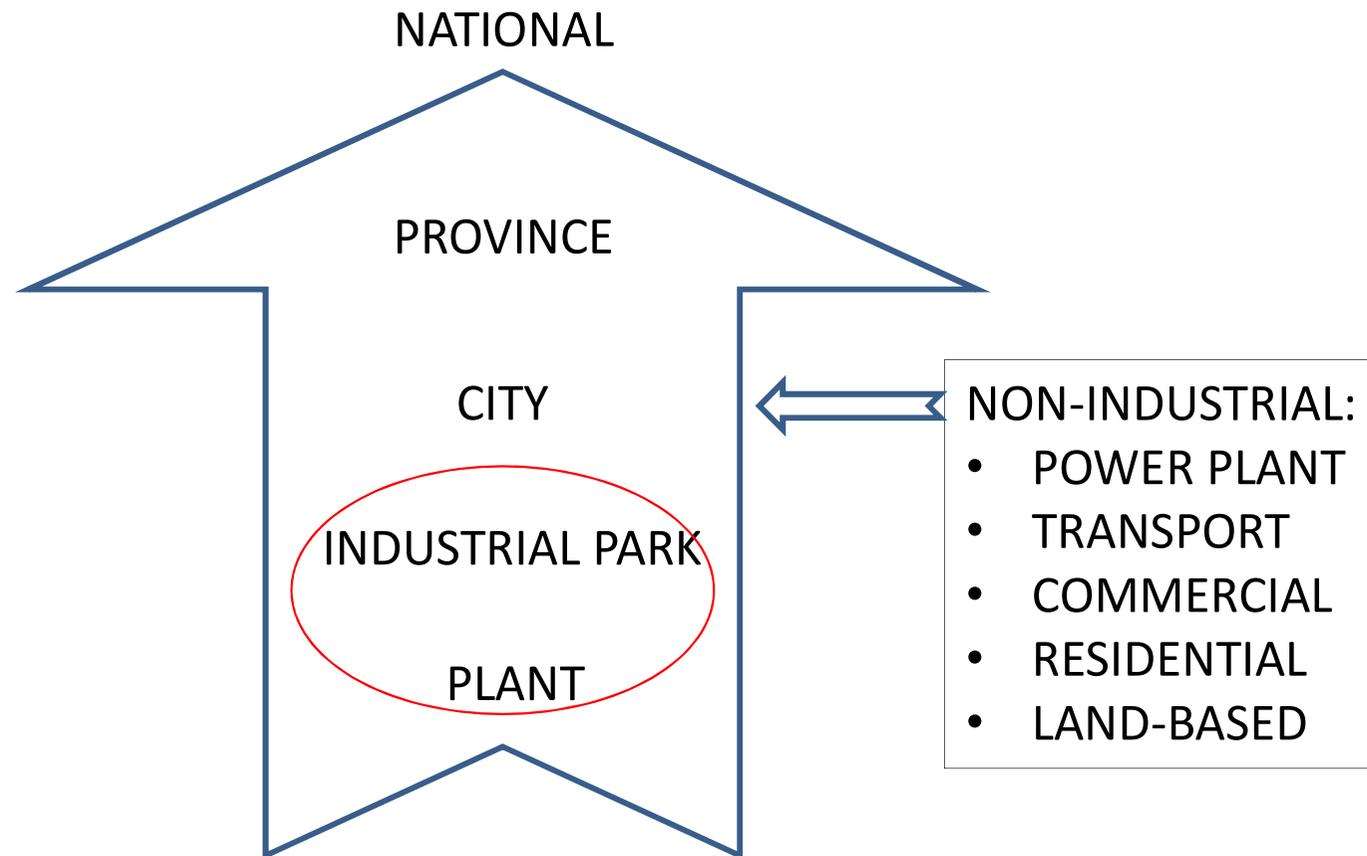
AIM Modeling Research: ITB-IPB-NIES-Kyoto University

- Extended Snapshot (ExSS) - Scope: National and Sub-National (DKI Jakarta)*
- End Use Model - Power, Industry, Transport, Commercial, Residential - Scope: National*
- CGE - National - for evaluating impact of national action plan (RAN) - Scope: National*



Framework of Modeling Approach

BOTTOM-UP AND INTEGRATED APPROACH



Notes:

existing models consider the object as non spatial (national as well as sub-national)



Indonesia Priority Industries 2015-2035

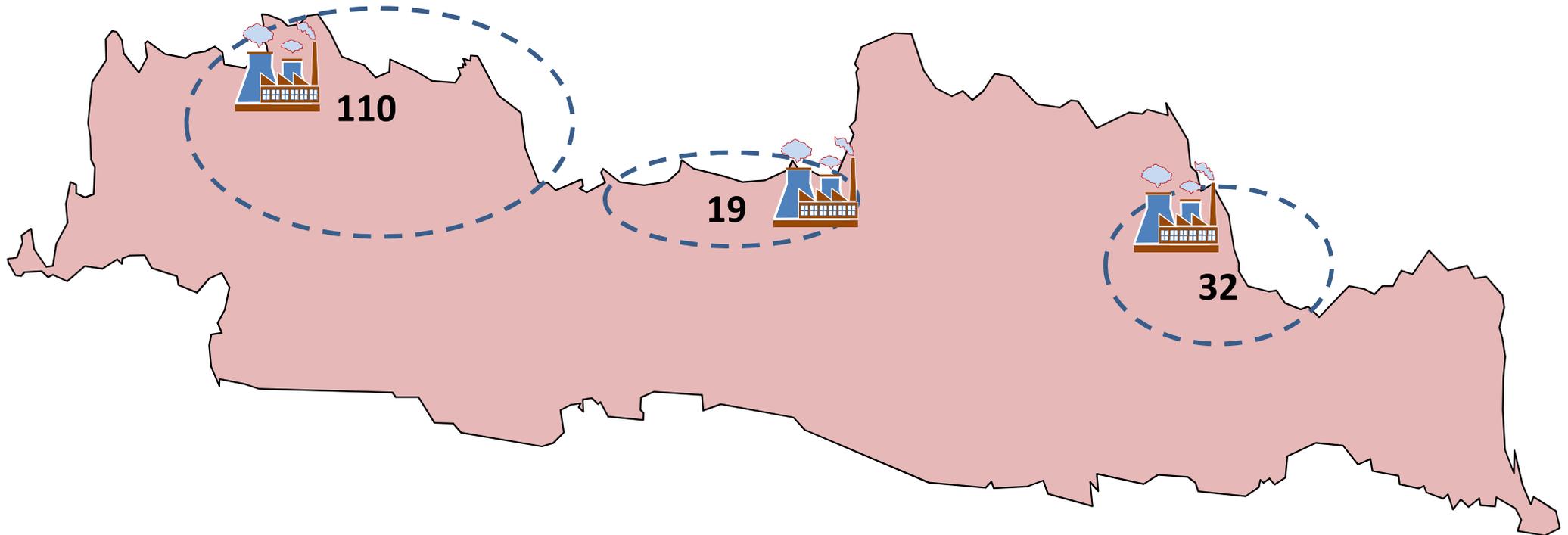
1. Food
2. Pharmaceutical, Cosmetics and Medical Equipment
3. Textile, Leather and Footwear
4. Transportation Equipment
5. Electronics and Telematics
6. Energy Generator
7. Raw material, Component, Services
8. Upstream Agroindustry
9. Basic metal and Non-Metal Quarry
10. Petroleum and Coal Based Chemicals

Source: Indonesia Industry Master Plan 2015 – 2035



**INDONESIA
INDUSTRIAL PARKS
TOTAL: 232 SITES**

**71 OUTSIDE
JAWA**



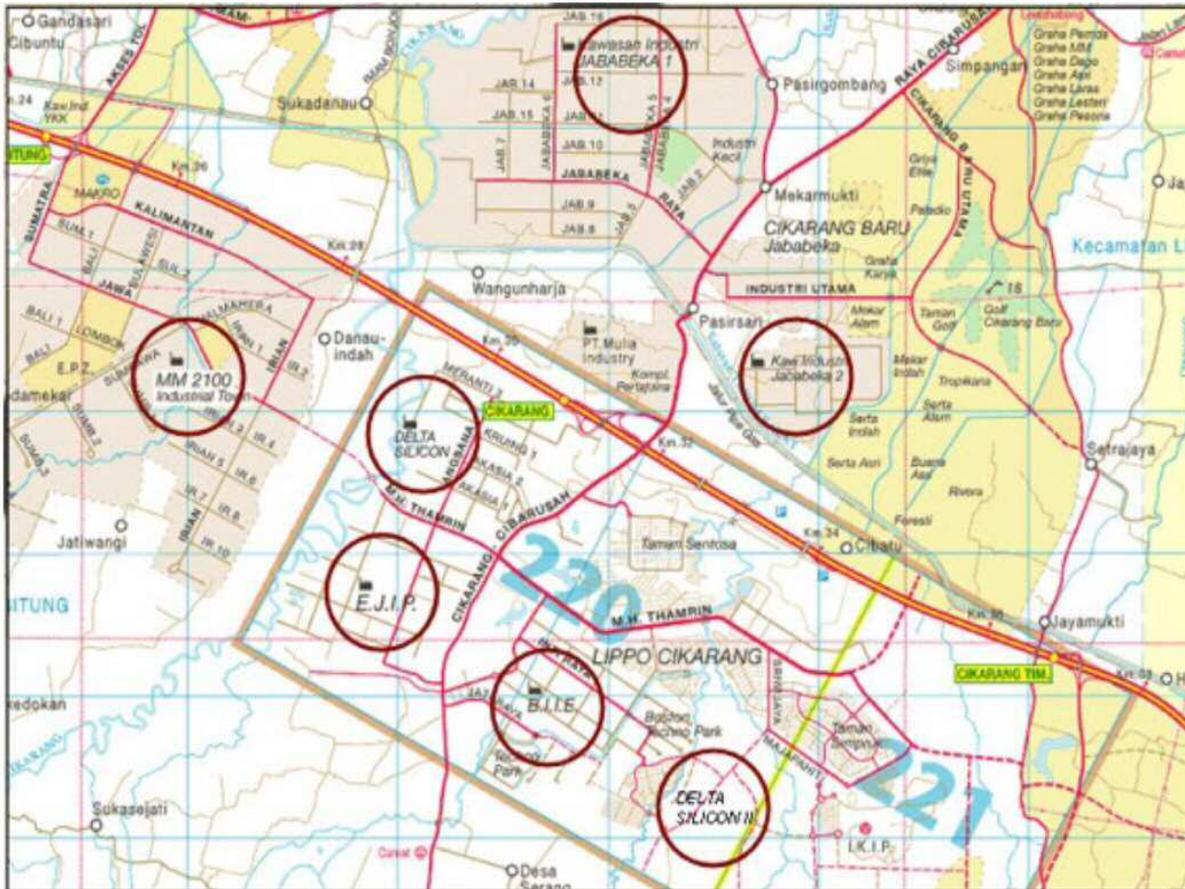
INDUSTRIAL PARK SELECTION



*MODELING:
EXISTING CITY-WIDE SIMULATION: JAKARTA*



West Java Industrial Estates and Their Typical Industries



Cikarang	Typical Industries
Jababeka Cikarang Delta Silicon Cikarang EJIP (East Jakarta Ind. Park) Hyundai Cikarang MM22100 Cikarang	Plastic Packaging Metal Production Automotive Spare-part Electronic Component Chemical Product (Detergent, Chemical for Lab.) Paper Packaging

Karawang/Bekasi	Typical Industries
Surya Cipta	Automotive Food and Beverages

Banten	Typical Industries
Krakatau Industrial Estate Cilegon (KIEC)	Petrochemical Electricity

Outside Industrial Estate

- Automotive (Honda, Toyota, Suzuki, Mitsubishi, etc.)
- Paper Industry (Pindodeli – Karawang)
- Textile raw material (Indo-Bharat Rayon, Viscose Rayon, Indorama, etc.)
- Textile industry in Bandung Regency (industrial cluster)



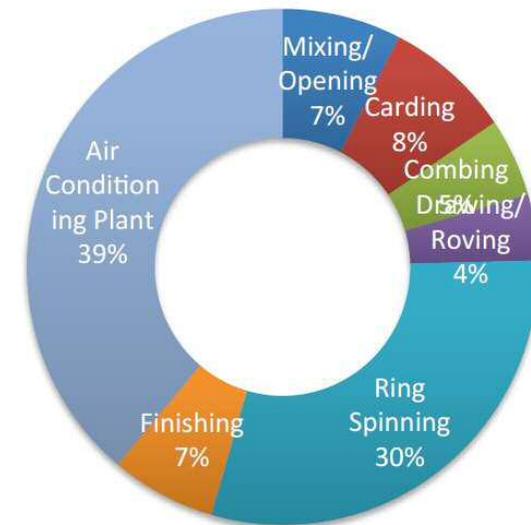
Energy Efficiency and Conservation Potential in Textile Industry

	Fiber Making & Spinning	Knitting & Weaving	Dyeing & Finishing	Sewing & Garment	TOTAL
% Energy Use	8%	8%	80%	4%	100%
	EE&C Potential for each type industry				EE&C Potential for Textile Industry
2015	2.50%	2.50%	12%	0%	10%
2025	20%	20%	35%	0%	30%

cooling and temperature control systems 39%

Energy use in the textile industry:

- electricity for: machinery, cooling and temperature control systems, lighting, office equipment, etc.;
- oil for boilers (generate steam);
- LPG, coal, and natural gas.





Challenge / Opportunities

ITB – NIES research is not limited to the current scope/activity but also will include:

1. Symbiosis between industries and surrounding establishments (other industries/consumers)
2. Promoting the results of current research and relevant ideas to other industries (individual as well as to industrial park or region)
3. Integrating the plant level information for developing LCD Model in industrial park, city, regional (province) and national level

Thank You

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