

A network diagram with black nodes and lines, featuring several prominent blue nodes. The diagram is centered in the background of the slide.

Multi stakeholder Involvement in Scaling-up Low Carbon Technology Development in Developing Cities:

A Framing Presentation & Empirical study

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IGES
Kawasaki, February 4th, 2015**

Roadmap

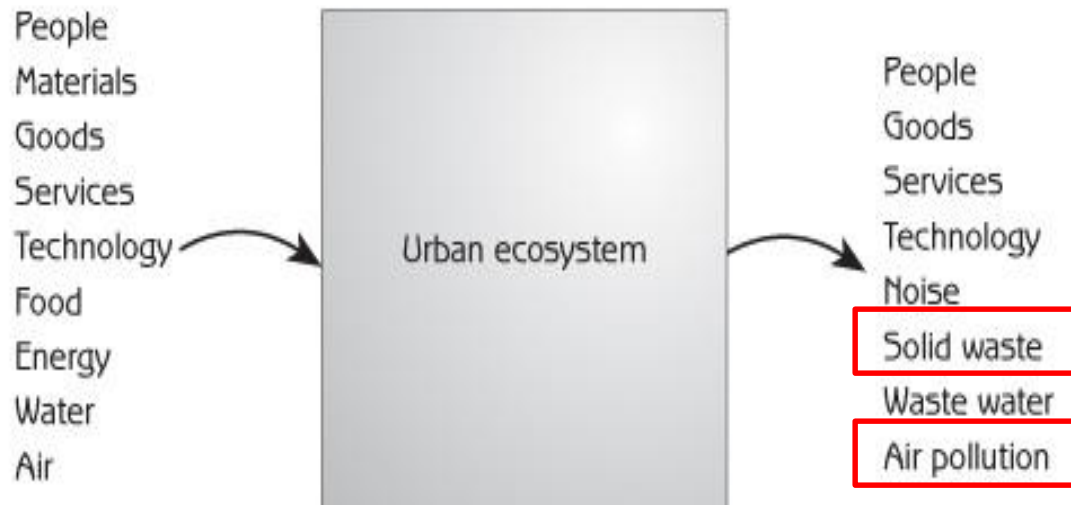
- **Starting Point: Cities**
- **Scaling Change**
- **Empirical Study**
- **Key Messages**

Where Do We Start?

- **New climate mechanisms like JCM: transfer low carbon technologies**
- **Raises critical question→**
- **How do we scale technologies and share what was learnt in the process?**

Start with Cities...

- **Cities are hubs of innovation**
- **Concentrate people, goods, services, and knowledge**
- **Compared to “ecosystems” with “metabolisms”. The Urban Ecosystem : A Good Metaphor for Climate Change**



Important Roles of Cities...

- Especially Important in Emerging Economies in Asia
- Even more important in ASEAN

Over the past 25 years, the countries with the fastest-growing urban populations have been low- and middle-income countries.

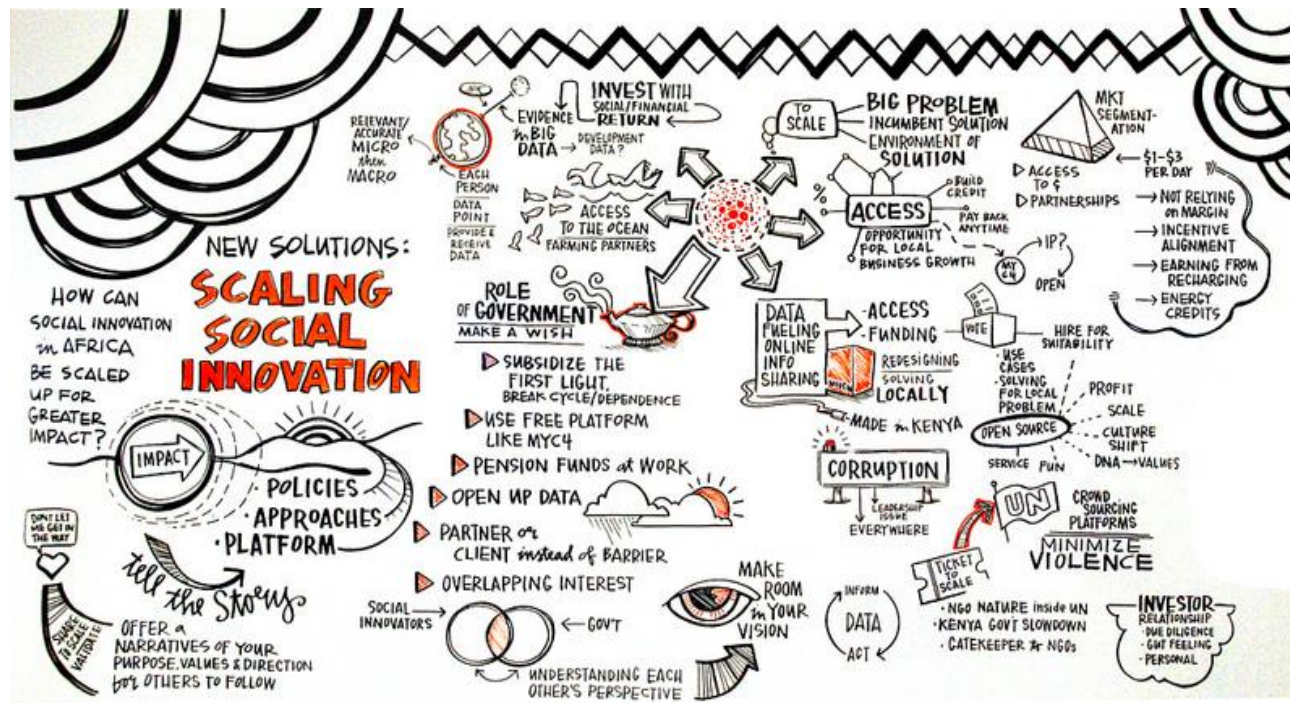
| | Urban population 1980 | Urban population 2005 | Percentage point change, 1980–2005 |
|-----------------------|--------------------------|--------------------------|---------------------------------------|
| | (percent of total) | | |
| Botswana | 16.5 | 57.4 | 40.9 |
| Cape Verde | 23.5 | 57.3 | 33.8 |
| Angola | 24.3 | 53.3 | 29.0 |
| Gabon | 54.7 | 83.6 | 28.9 |
| Oman | 44.3 | 71.5 | 27.2 |
| Indonesia | 22.1 | 48.1 | 26.0 |
| The Gambia | 28.4 | 53.9 | 25.5 |
| Malaysia | 42.0 | 67.3 | 25.3 |
| Philippines | 37.5 | 62.7 | 25.2 |
| São Tomé and Príncipe | 33.5 | 58.0 | 24.6 |

Source: United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2005 Revision* (2006).

- However: (i) Cities do not always grow sustainably; (ii) Expanding ecological footprints; (iii) Signs of unsustainable growth

Scaling to Sharing

- Beyond transferring technologies to enabling a process
- A process that is supported by institutions and made fluid by knowledge
- *Spreads change not only within but across cities*
- This Process can be Messy → need to be simplified



Source: World Economic Forum, 2014

Can we Simplify this Process?

1. Build capacity

2. Engage stakeholders

3. Mobilize resources

4. Share learnings

1. Build Capacity

- What are existing and needed capacities?
- How can needed capacities be built?
- What processes can help build these capacities?
- What processes can consolidate existing capacities?

2. Engage Stakeholders

- Who are the key actors and organizations?
- What are their interests and resources?
- Is there sufficient coordination and communication?
- What are possible points of contention and how might they be reconciled?

3. Mobilize Resources

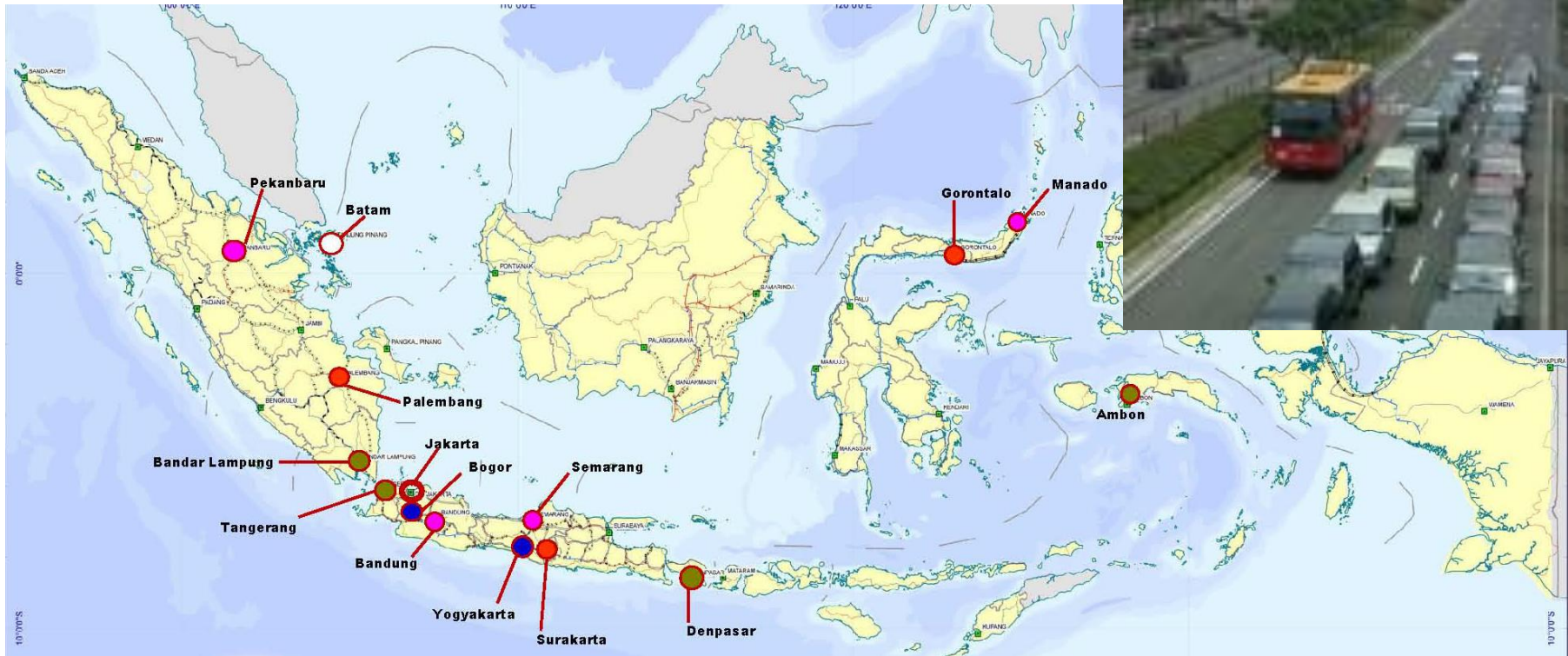
- What are the main sources of funding?
- Are these sources sufficient or are outside resources needed?
- What is the funding cycle?
- What about other human and technological resources besides funding?

4. Share Learnings

- How will performance be assessed?
- What processes and mechanisms are in place for sharing performance and experiences?
- Do existing processes and mechanisms reach all necessary stakeholders?
- How can they reach other cities?

Empirical Study – 1: Transport Sector in Indonesia

BRT Program in Indonesia offers a good example to analyze scaling-up technology transfer



BRT (Semi-BRT) already implemented in 15 cities in Indonesia as of January 2014

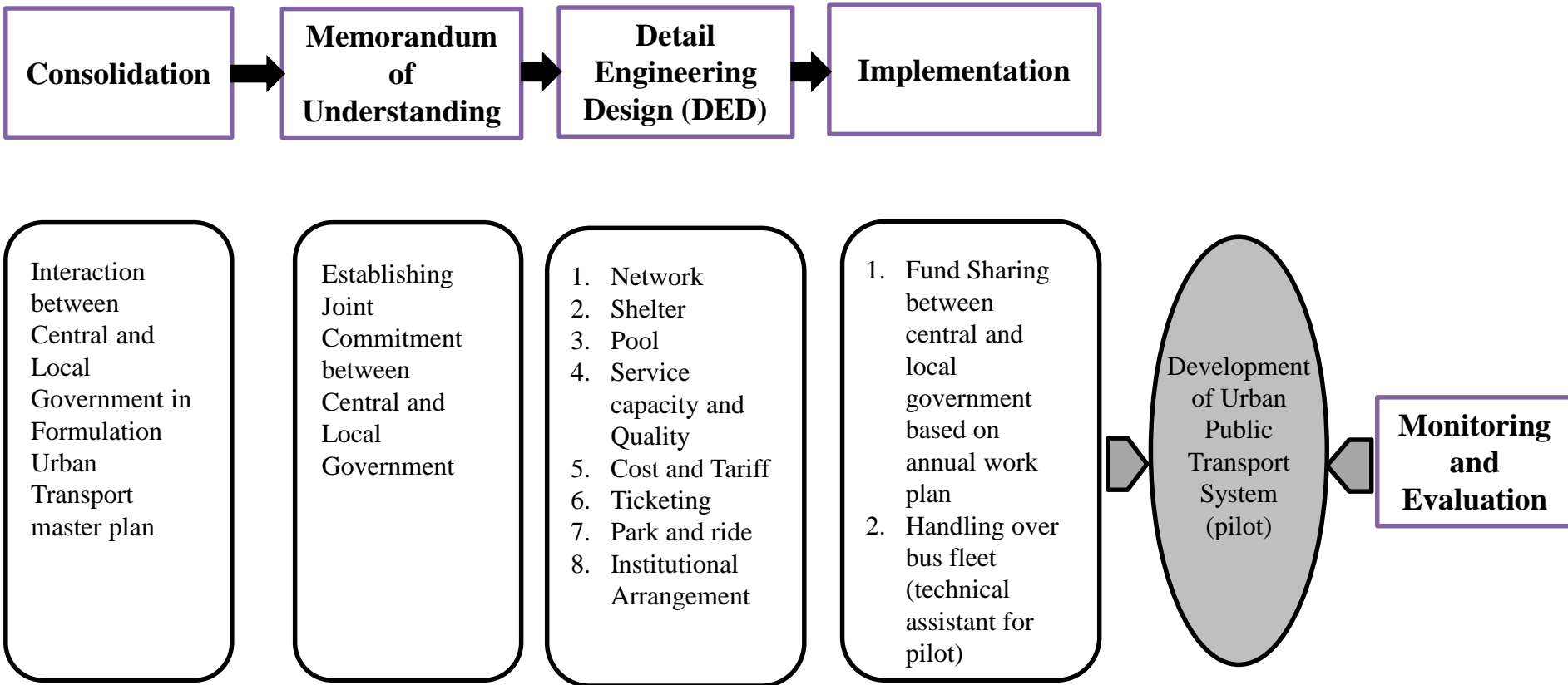
Scaling-up Technology Transfer BRT in Indonesia

- **Originally from South America (Curitiba-Brazil and Bogota-Columbia)**
- **Started to be implemented in Indonesia in Jakarta since January 2004 (Jakarta's First Corridor)**
- **Scaling-up within the city (Jakarta): up to 12 Corridors in 2015**
- **Scaling-up across city: 15 cities in Indonesia (as of January 2014)
– a joint cooperation between National and Local City Government**

Overview of Bus Rapid Transit (BRT)

- **BRT has many “Pros” : Flexibility (can change the route and easily expanded); Low capital cost but high capacity; very short construction period.**
- **BRT has many technical merits: exclusive/segregated lanes; elevated boarding; good ticketing system; efficient scheduling**
- **But not all BRTs perform up to their potential. Many of the reasons for the varying performance appear to be technical in nature.**
- **However, technical issues are often a symptom of deeper problems in underlying governance structures**

The Cooperation between National Government and City Government (sub-national level) (MOT, 2014)



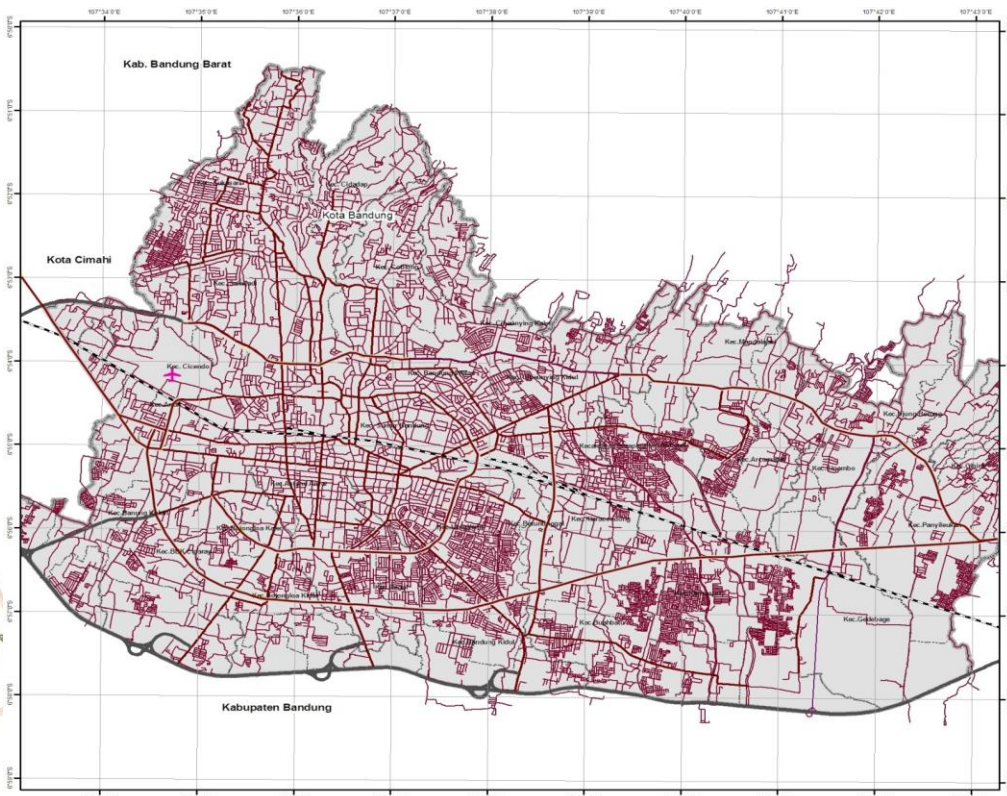
The National Guidelines for Scaling-up BRT System

1. Ministry of Transport- Directorate Land Transportation
SK.687/AJ.206/DRJD/2002 on “Technical Guidelines on Fixed Route and Schedule of Public Transport Services in Urban Areas
2. Guidelines for Improvement of Public Transport in Medium Size Cities
3. Financing Mechanism for development of urban transport system
4. Standardization of transfer facilities and supporting facilities of road based public transport system in Urban Areas
5. Guidelines for Implementation of Smart Card System

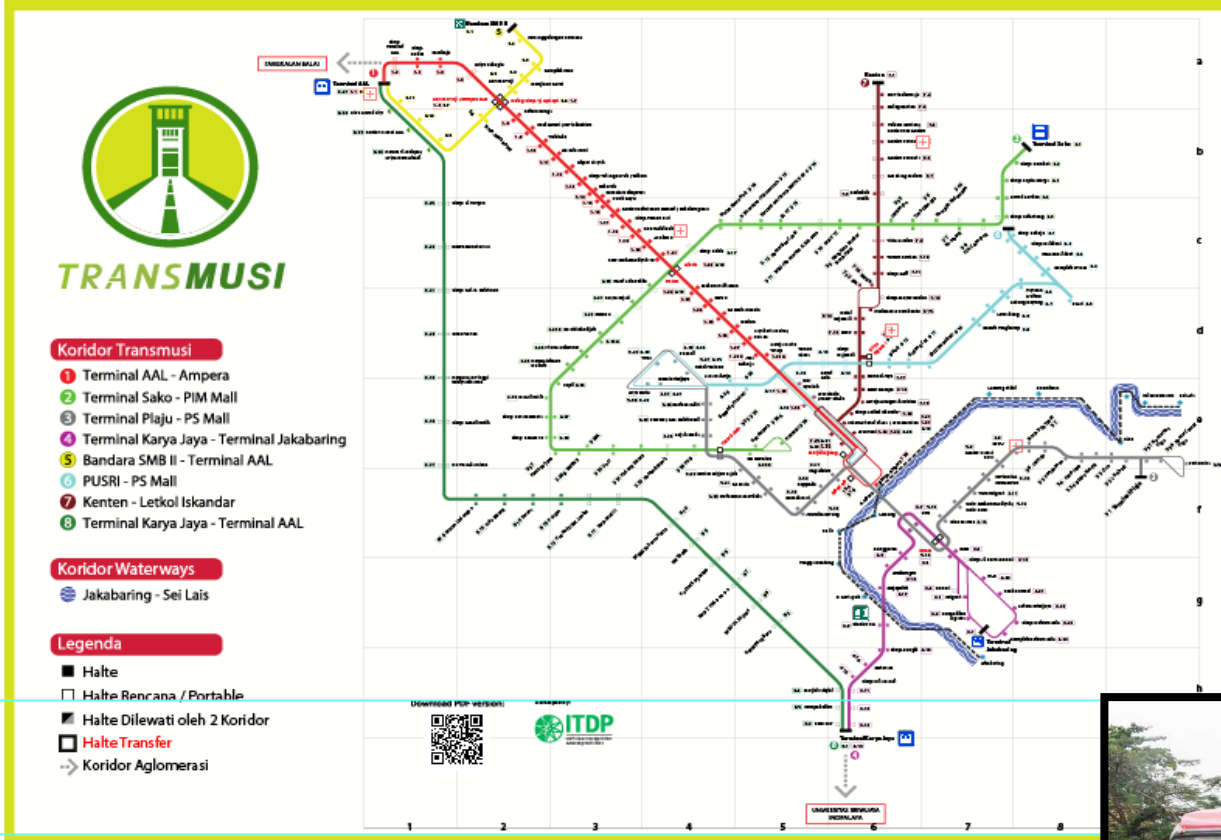
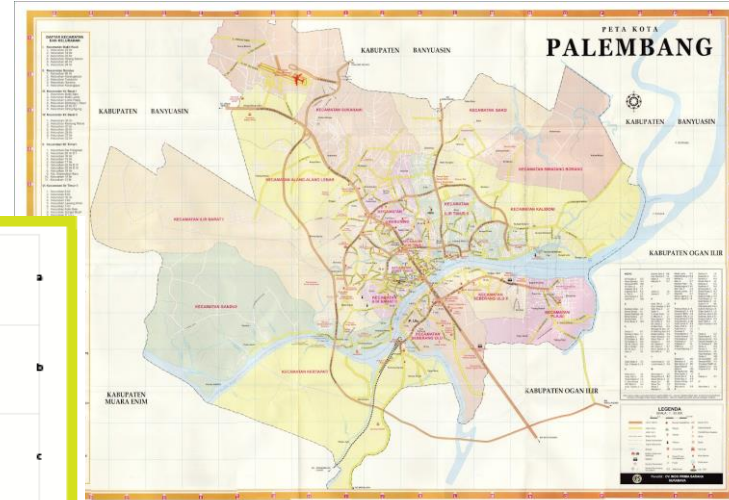
Current institutional arrangement of BRT in Indonesia

| Location | Institution | Operator |
|--------------------------|--|---|
| Jakarta (2004) | Special Task Unit (UPTB) - Under transport agency * | Consortium of Existing Public Transport Operator |
| Bogor (2007) | Special Task Unit (UPTD) – Under transport Agency | City-owned Company |
| Bandung (2007) | Special Task Unit (UPTD) – Under transport agency | Private company and Stated-owned company (DAMRI) |
| Yogyakarta (2008) | Special Task Unit (UPTD) – Under transport Agency | Private Company (consortium of existing operators/ 4 cooperation) and stated-owned company (Damri) |
| Pekanbaru (2009) | Special Task Unit (UPTD) – Under transport Agency | |
| Palembang (2010) | Special Task Unit (UPTD) – Under transport Agency | Sub-National (Provincial) owned Company (Province) |
| Gorontalo (2010) | Special Task Unit (UPTD) – Under transport Agency | Stated-owned company (DAMRI) |
| Surakarta (2010) | Special Task Unit (UPTD) – Under transport Agency | Stated-owned company (DAMRI) |
| Bandar Lampung (2011) | Special Task Unit (UPTD) – Under transport Agency | Private Company (Consortium of 37 Angkot Operator) |

Case Study 1: Trans Metro Bandung



Case Study 2: Transmusi Palembang



Application of Analytical Framework

| No | Components | Trans Metro Bandung | Trans Musi Palembang |
|----|-------------------------------|--|--|
| 1 | Building Capacity | - | Technical cooperation with International Agencies. <ul style="list-style-type: none"> • Infrastructure development - INDII • Operation and Maintenance - GIZ |
| 2 | Stakeholder engagement | Horizontal conflict with incumbent operators (Angkot-Minibus type) | No conflict |
| 3 | Mobilize Resource | <ul style="list-style-type: none"> • Within the city • Horizontal Coordination within city governments | <ul style="list-style-type: none"> • Involvement of provincial owned company (BUMD) • Horizontal coordination within city governments. • Vertical Coordination with Provincial Government |

Results 1: Technical Differences and Operational Performance

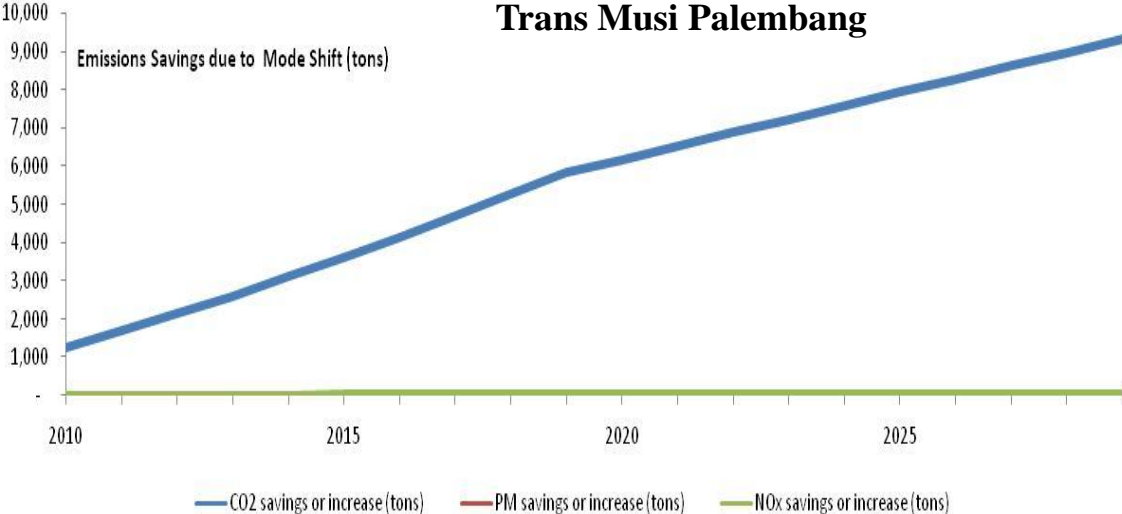
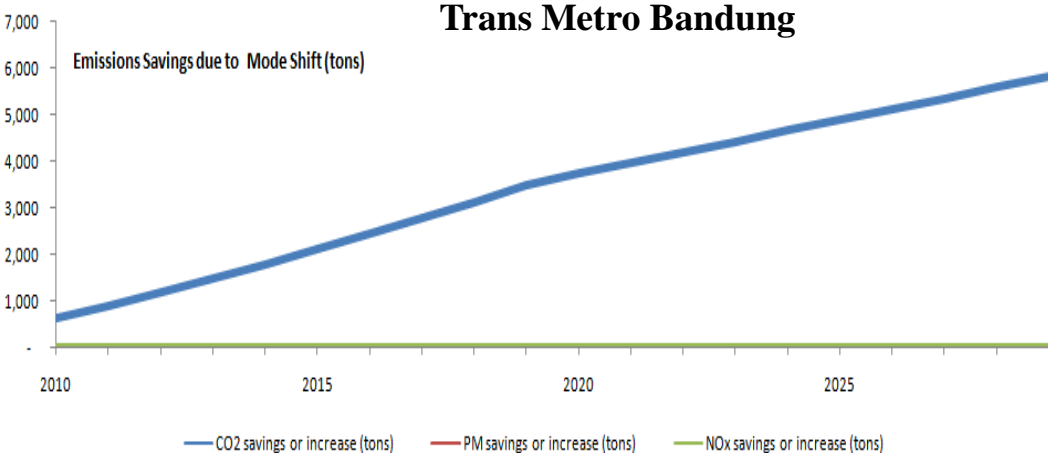
| No | Components | Trans Metro Bandung | Trans Musi Palembang |
|----------|--|--------------------------------------|---------------------------|
| A | Infrastructure | | |
| | <i>(1) Dedicated right of way (lane)</i> | <i>No (mixed traffic)</i> | <i>No (mixed traffic)</i> |
| | (2) No of corridors (2014) | 2 | 8 |
| | (3) Integrated facilities with other modes | No | Yes |
| | (4) Integrated facilities with other facilities (commercials, office, etc) | No | Yes |
| B | Level of Services | | |
| | (1) No of Fleet (unit) | 20 | 180 |
| | (2) Headway (minutes) | 20-30 | 10-15 |
| | <i>(3) Onboard GPS system</i> | <i>No (Manual with Handy Talkie)</i> | <i>Yes</i> |

Results 2: Technical Differences and Operational Performance

| No | Components | Trans Metro Bandung | Trans Musi Palembang |
|----------|--|---------------------|--|
| C | Supporting System | | |
| | <i>(1) Automatic fare collection</i> | - | <i>Yes – Integrated with several banks</i> |
| | <i>(2) Information system</i> | <i>No</i> | <i>Yes</i> |
| | (3) Fare subsidy | Yes | No |
| D | Service Performance | | |
| | (1) Ridership (passengers/day) | 1200 | 15,000-17,000 |
| | <i>(2) CO₂ Reduction (ton/year)</i> | <i>3,196</i> | <i>4,939</i> |

Results 3: Estimated Differences in CO₂

CO₂ saving due to Mode Shift (estimated by using TEEMP tool)



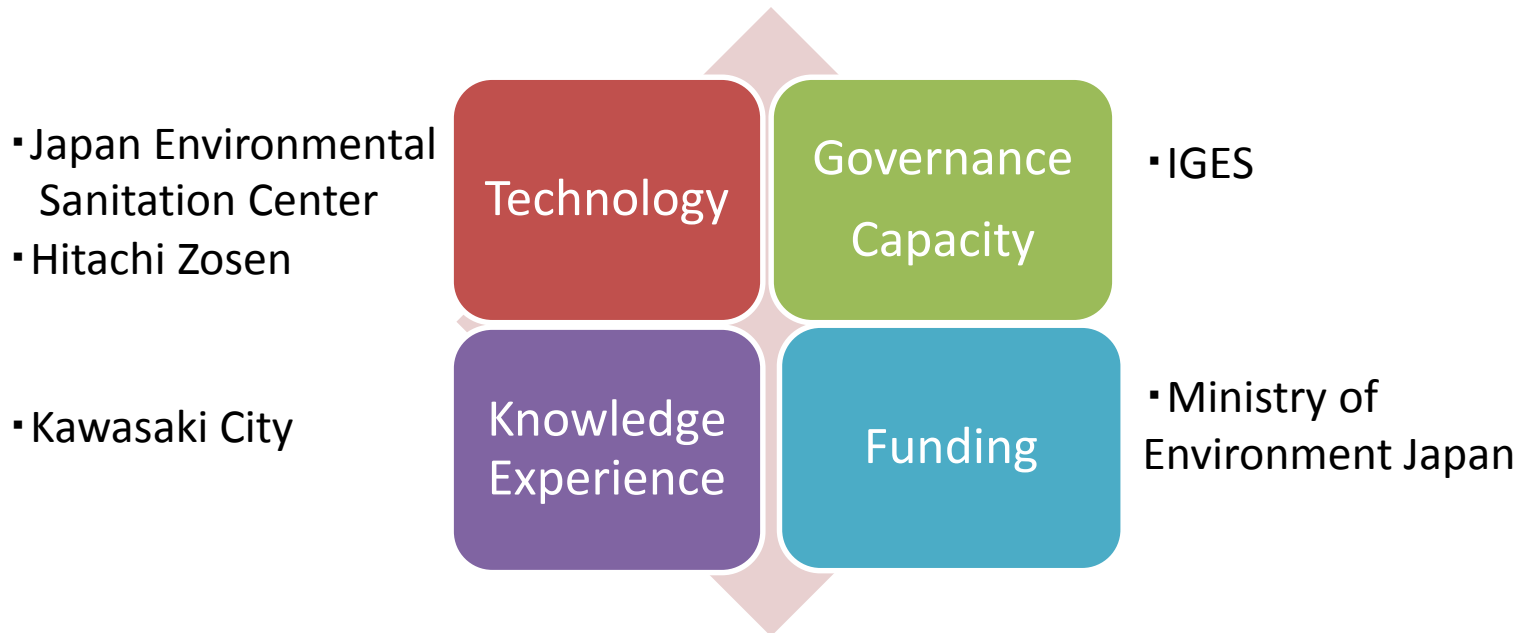
Empirical Study-2 (Waste sector in Bandung)

A. Target Study

Technology: Large Scale Biodigester (organic waste)



Project : JCM Project for developing a low carbon Society under Collaboration between Bandung and Kawasaki



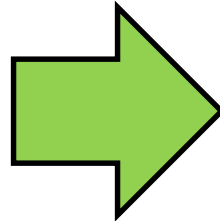
Small To Large scale

B. Current Situation → Future Expectation

Small scale biodigesters (250-500 kg/day) & Under construction of 2 ton/day (ADB Project)



Current



Future

(eg. Biodigester Plant in Niigata, Japan)

Quick Study – 3 Components of Scaling Technology

- Interview survey was conducted from 6 – 16 January 2015
- Questionnaire consist of 4 sub-project in Waste Sector : Biodigester ADB, Biodigester CSR, PLTSA (Insinerator) and Eco-Office
- Focus on: (a) Building Capacity; (B) Stakeholder engagement and (C) mobilize resources
- Questionnaire distributed to 7 agencies:
 - Environmental Management Agency (EMA/BPLH)
 - City owned company on solid waste management (PD-Kebersihan)
 - City Planning Agency (Bappeda)
 - Parks and Funeral Agency (Diskamtam)
 - Road and Drainage Agency
 - International Cooperation Office
 - Law Division
 - Spatial Planning (Distarcip)

Building Capacity (1)

Current Situation:

There is a problem of operator for small scale biodigester:

- Operator by community (high uncertainty)
- Ownership and Responsibilities

Large Scale Biodigester:

- Need a working group – dedicated team (with City Mayor Decree)
- International Consortium - need a guidelines
- Regulator to support operation of biodigester
- Operator for Biodigester → need training on the competency
- Waste separation:
 - (1) Step by step process on the regulation
 - (2) Awareness and campaign
- Selling by product: (a) Energy and (b) Fertilizer

Stakeholder Engagement (2)

Current Situation:

- Bandung has no agency for solid waste management
- Operation on solid waste management: PD Kebersihan (City Owned Company)

Identify the Stakeholder for Large Scale Biodigester

- Planning: Bappeda; BPLHD
- Construction: PD Kebersihan, Distarcip
- Waste Separation & regulation: BPLHD
- Operator: PD Kebersihan & SPC
- Others: International Cooperation Division; Law Division
- Selling by product Energy: ????? (Bappeda, PLN, MEMR)
- Fertilizer: Agricultural Agency and Parks Agency

Key Important points for Biodigester Project (JCM)

- **No clear rule on ownership of new development.** Cross-sector coordination must be done properly to avoid **Conflict of Interest**
- Leadership of city mayor is important to solve the conflict among agencies

C. Potential Resource for Project?

Current Situation:

- Biodigester-ADB: Loan at National Level and grant from national (sub-national) to city Government
- Biodigester-CSR: CSR fund from the company (national companies)
- Incinerator: Private Investment – Public Private Partnership (PPP) Scheme

Current Problem

- Grant & CSR fund: Hand over the asset → maintenance & operation cost?
- PPP: Tipping Fee must be calculated carefully to avoid overburden to Annual City Budget (APBD)

Key Important points for future Biodigester (JCM)

- Use the local components efficiently to reduce construction cost (capital expenditure)
- Tipping Fee must be calculated carefully to avoid overburden to Annual City Budget (APBD) (operational expenditure)
- Harmonizing the cycle of annual budgeting system in local city & multiyear project with international consortium
- How to create an SPC & International Consortium between BUMD (PDK) & International company

Key Messages

- **New tech transfer mech. raises question how do we scale and share?**
- **Cities increasingly important for low carbon tech transfer, especially in Asia**
- **They can enable process focused on scaling and sharing**
- **It is useful to map this process and simplify with four sets of questions**
- **BRT Program in Indonesia can be a good example of technology transfer in mitigation on transport sector**

Key Messages

- **Building technical capacity is key element and capacity building by external organization may help; learning the experiences from other cities also important. *A City to City Cooperation could play an important role for Share Learning of Technology Transfer***
- **Stakeholder engagement: Engagement of existing agencies, operators and marginal group from the beginning stage may remove conflict**
- **Mobilize resource such as vertical collaboration with provincial governments are helpful to solve the local problems**
- **Performance evaluation of current project is necessary to improve the services and expand the program**

Thank you so much!

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