

Low-Carbon Model Town in Banda Aceh City

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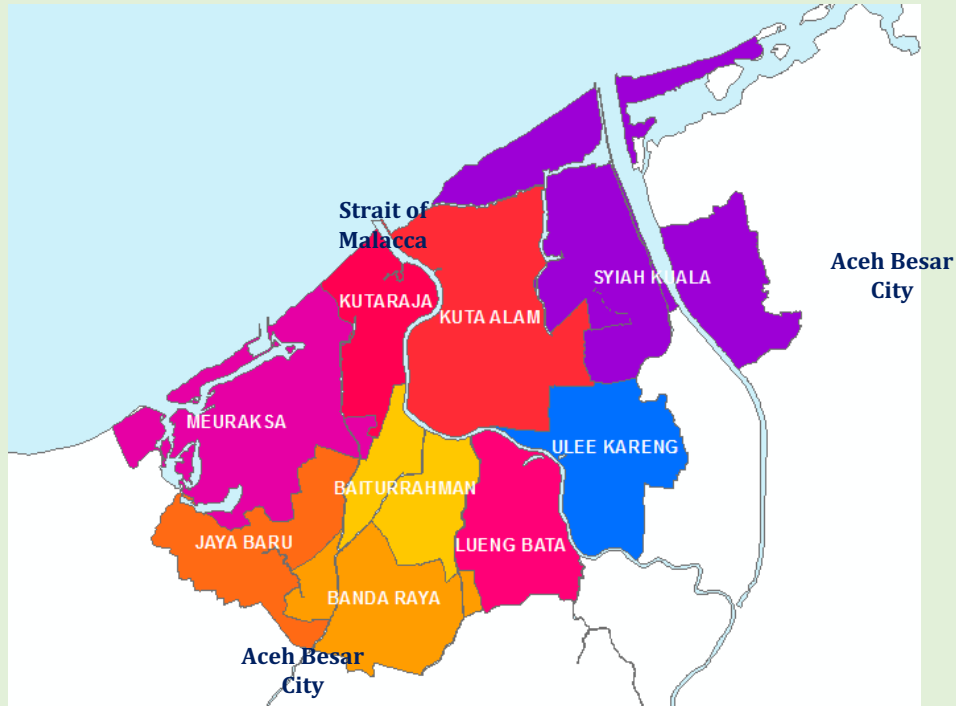
Urban Development Planning Agency



APEC Low-Carbon Model Town Project Wrap-up Symposium


10 September 2021

Introduction of Banda Aceh



Area: 61 km²	9 Sub District 90 villagges	Elavation: 0,8 m Above sea level
Population: 252.890 Inhabitant	Human Development Index (HDI): 84.37	
Inflation (%): 3.46	Ekonomic growth(%): 4.49**	
	GDP per Capita: 4.471 USD 66.18 M IDR	

 **94 %**
Clean Water Coverage

 **99,27 %**
Liveble House

 **88 %**
Waste Collection Service Coverage

 **14,33 %**
Green open space

 **91,72 %**
Liveable houses

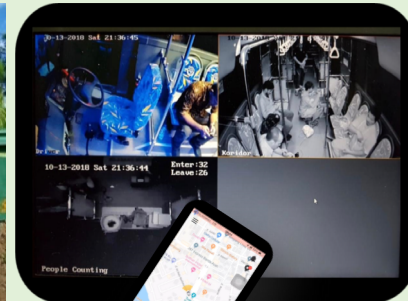
Low-Carbon Model Development in Banda Aceh City

Mission VI (Medium term development 2017 – 2022)

Realizing the City of Banda Aceh to be an environmentally friendly, green, clean, resilient, and sustainable

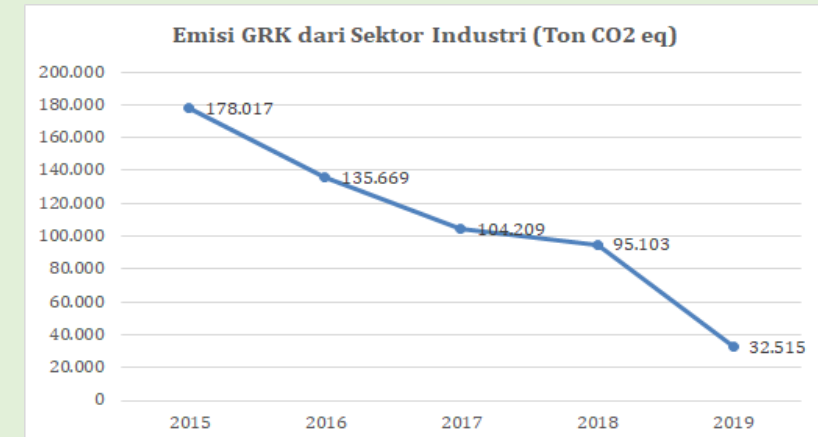
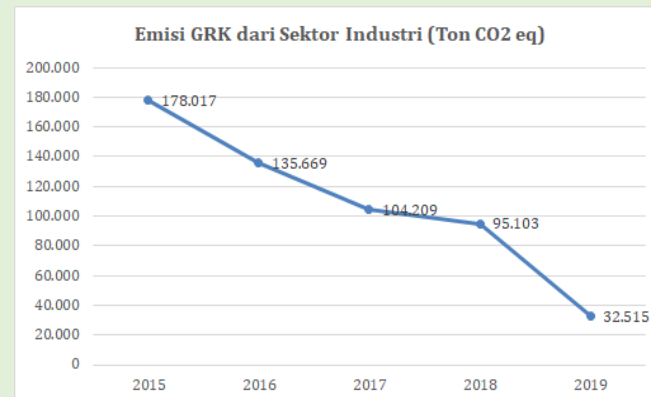
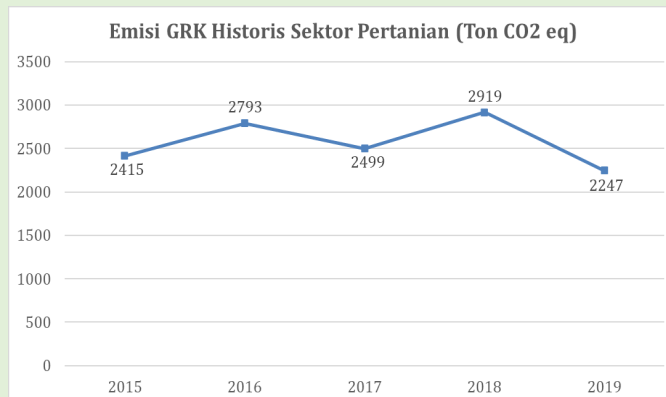
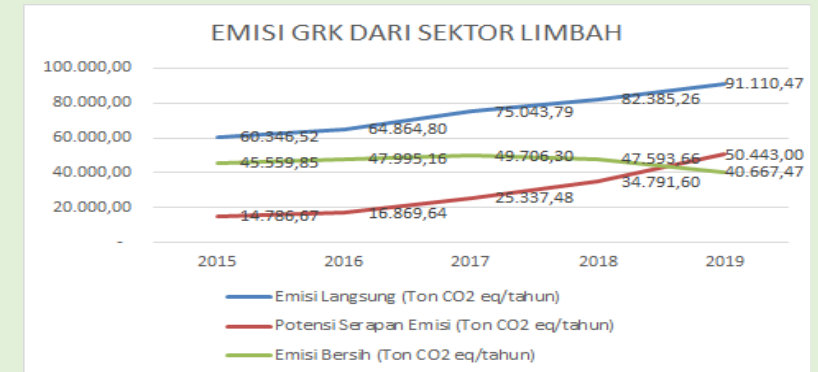
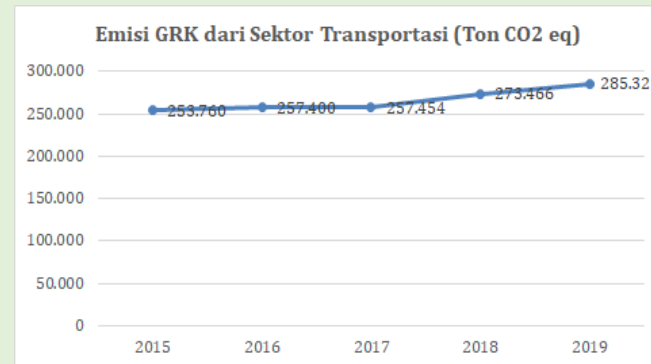
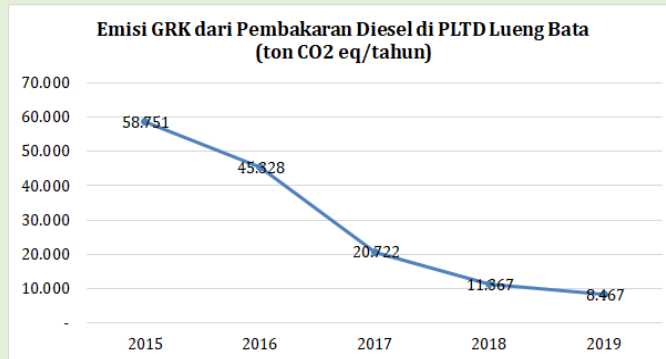
Focus on :

- Green Transport
- Green Energy
- Green Waste
- Green Open Space



CO₂ reduction results and roadmap

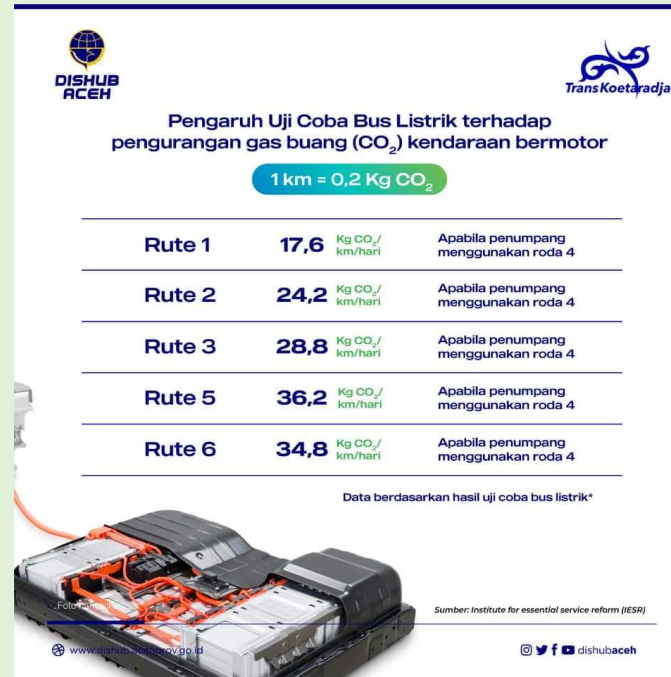
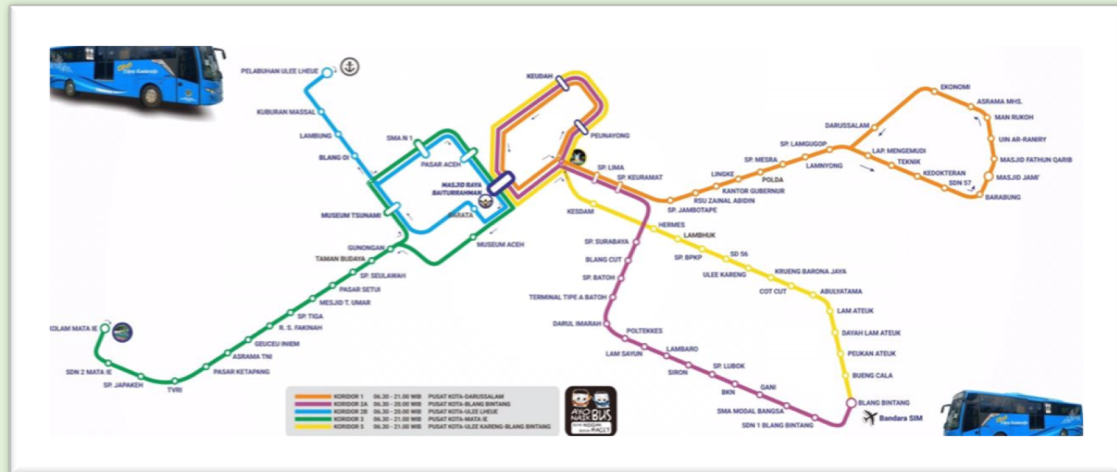
- The source of greenhouse gases (GHG) emissions is obtained from energy sector, transportation, industry, waste and agriculture. In which the latest available data as shown on the figure respectively.



Notable achievements

GREEN TRANSPORTATION

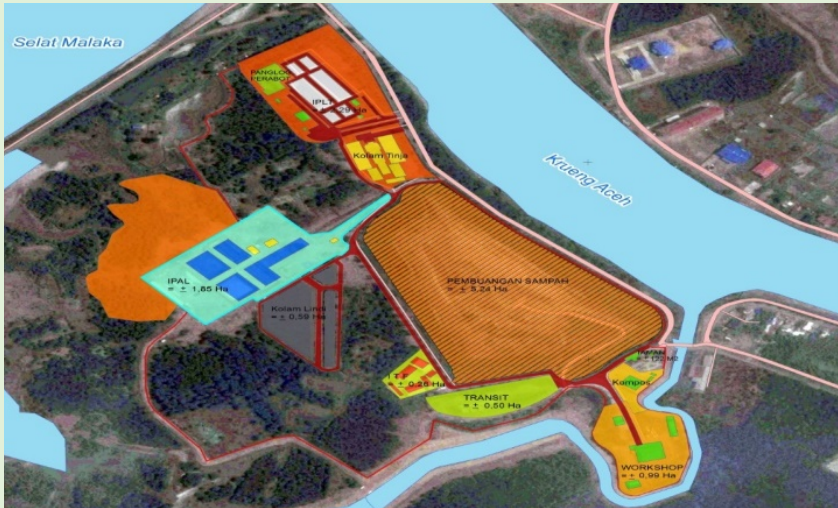
BUS ROUTE OF BRT TRANS KOETARADJA



**6 corridors
5 route for feeder bus
(electric bus)**



GREEN WASTE



Gampong Jawa Sanitary Landfill

- 238 ton solid waste per day
- 1,9% recycled, reused 10,5%, 84% to Sanitary Landfill

WASTE COLLECTING POINT



- Waste Collecting Point is a waste collection system according to community participation
- Implemented in 11 villages and 34 schools

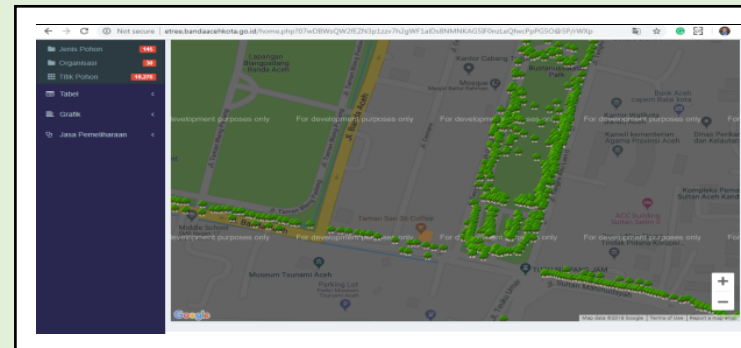
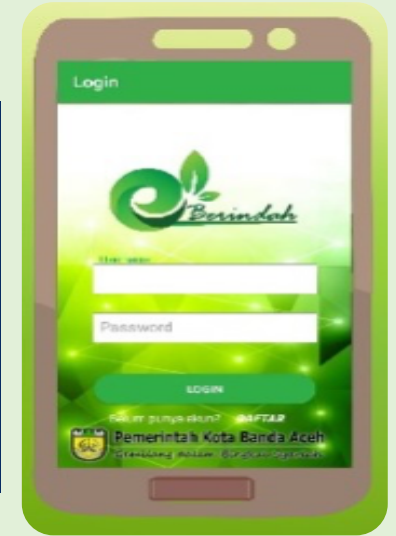
GREEN OPEN SPACE

- **Target 30%** Green Open space of total area (20% public, 10% privat)
- **Eksisting 14,33%** public gree space
- **Urban Forest**
- **Green corridor**



Hutan Kota Tibang

e-Berindah: application for monitoring and evaluating cleanliness based on community participation



- Banda Aceh tree database
- Displays information about the tree such as tree species, age, donor and tree coordinates.

The utilization of solar panel and LED lamp for street lighting and in government building to introduce solar energy and LED



Introducing a cold box system that uses solar energy for fishermen to store fish



UTILIZATION OF METHANE GAS FROM SANITARY LANDFILL



Collecting methane gases (20 pipe vertical)



Distributed for ±200 poor household around sanitary landfil



ENERGY SAVING LIGHTING

- 11.660 Street lighting
- 12% Lamp of LED
- 86% Lamp of Mercury
- 2% Lamp using Solar panel

LCTI-1 Evaluation of Banda Aceh

LCT-1 SHEET1. DEMAND

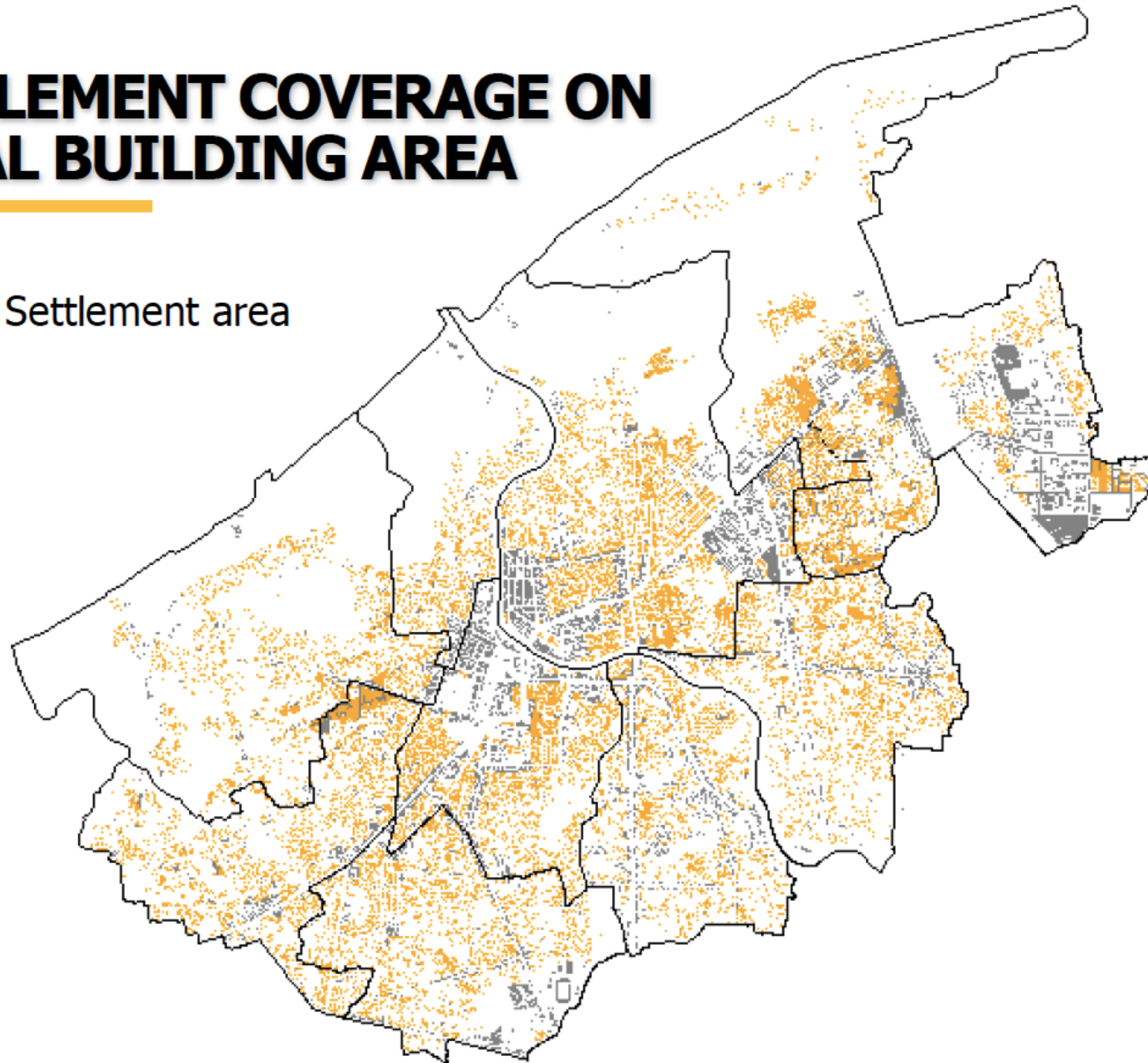
1. Town structure

- Building covers around 16% of total city area
- Residential area covers around more 60% of total building
- Most building are in used
- Bus Rapid Transit Transkutaraaja has been established, but it has has not influenced the land use yet.
- BRT is not integrated with vertical development currently

SETTLEMENT COVERAGE ON TOTAL BUILDING AREA



Settlement area



LCTI SHEET1. DEMAND

2. Building

- Banda Aceh has not established system or criteria for thermal performance and energy saving equipment performance yet.
- The use natural energy has not commenced yet. But the planning for such policy has been intruding in planning document such as Regional Action Plan for Green Gases Reduction (RAD GRK) 2013-2018 and Regional Action Plan for Green Gases Reduction (RAD GRK) 2020-2025 and also Greenhouse Gases Reduction – Trikarsa Bogor, and master plan for smart compact City 2016-2021
- There is already effort to formulate green construction guideline

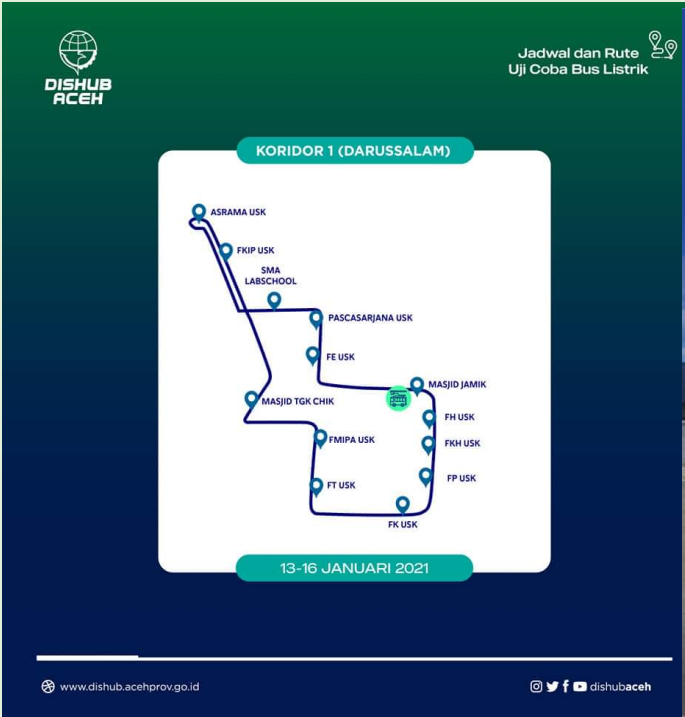
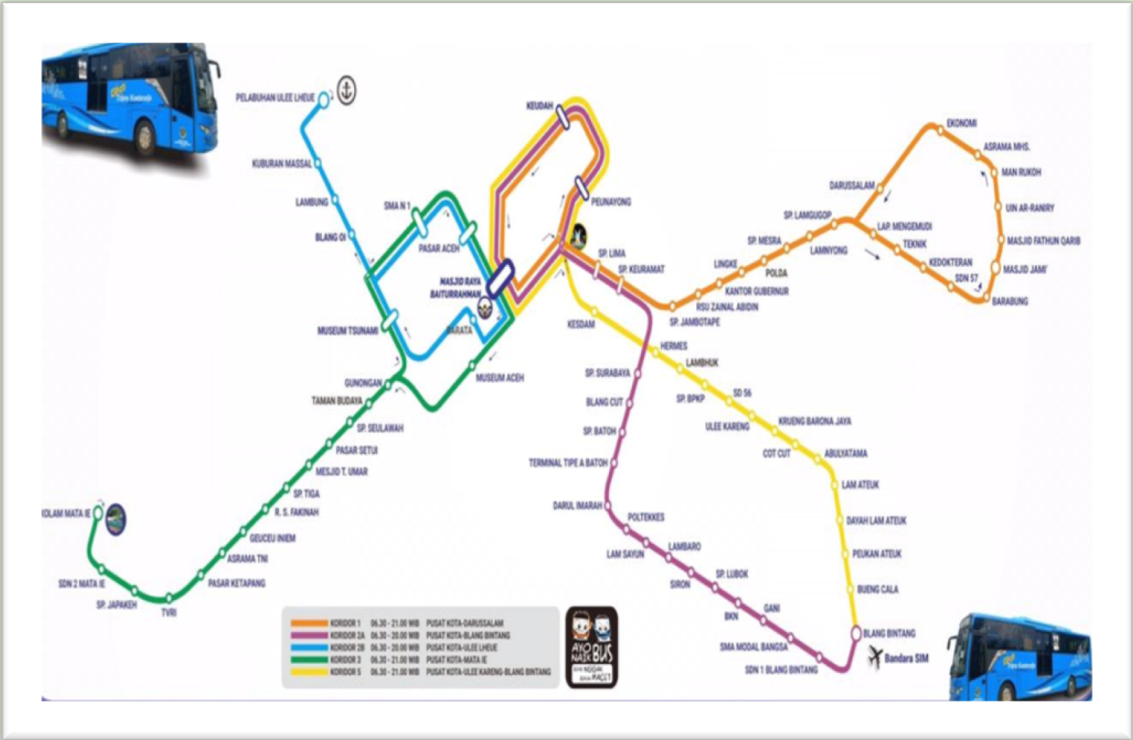
LCTI-1 SHEET 1. DEMAND

3. Transportation

- BRT already operating at 6 corridors and 5 route for electric Bus (try out)
- Bicycle lane exist but does not properly. Bicycle use only for sport on holiday.
- The new bridge, fly over and underpass already build in some inter section
- Banda Aceh has not formulated subsidy system for low carbon vehicle yet
- Eco driving has been implemented but limited scale
- Traffic congestion in peak hour.

LCTI-1 SHEET 1. DEMAND

3. Transportation



LCTI-1 SHEET 1. DEMAND

3. Transportation



LCTI-1 SHEET 2. SUPPLY

4. Area Energy System

- Banda Aceh city has not establish plan for area energy system

5. Untapped Energy

- There are several efforts to introduce untapped energy in small scale for example the utilization of methane from black water treatment plant and landfill to produce energy for surrounding poor household



LCTI-1 SHEET 2. SUPPLY

6. Renewable Energy

- The utilization of solar panel and LED lamp for street lighting and in government building to introduce solar energy and LED
- The utilization of solar panel and LED lamp for street lighting and in government building to introduce solar energy and LED
- Introducing a cold box system that uses solar energy to store fish



7. Multi-Energy System

LCTI-1 SHEET 3. DEMAND & SUPPLY

8. Energy Management System

- The Government still has not introduced energy management of building/area and AEMS (Area energy management system)
- Smart micro has not been introduced yet.

LCTI-1 SHEET 3. DEMAND & SUPPLY

9. Greenery

- Target 30% Green Open space of total area (20% public, 10% privat)
- Eksisting 14,33% public gree space
- Urban Forest
- Green corridor

10. Greenery

- Water usage concept has not been deveped yet.
- Recycled waste water is used in some fasilities
- Recyled waste water from black water treatment plant is used for watering green corridor



LCTI-1 SHEET 4. ENVIRONMENT AND RESOURCES

11. Waste Management

- 238 ton solid waste per day
- 1,9% recycled, reused 10,5%, 84% to Sanitary Landfill
- Waste reduction target in waste masterplan
- Government regulation for waste reduction
- Waste bank at school and other public facilities to separate plastic waste
- Full waste separation has not been implemented yet
- Plastic waste separation by scavenger for waste recycling



LCTI-1 SHEET 4. ENVIRONMENT AND RESOURCES

12. Pollution

- Effort to reduce air pollution has been implemented in small scale by the utilization of emission control facility which control emission from public transportation and freight vehicle
- The city government has established sanitation regulation to reduce contamination

LCTI-1 SHEET 4. ENVIRONMENT AND RESOURCES

12. Pollution

- Reduce water pollution by developing waste water treatment Plant (WWTP) in Gampong Jawa
- 5 WWTP's are functional currently (communal and market)



LCTI-1 SHEET 5. GOVERNANCE

13. Policy Framework

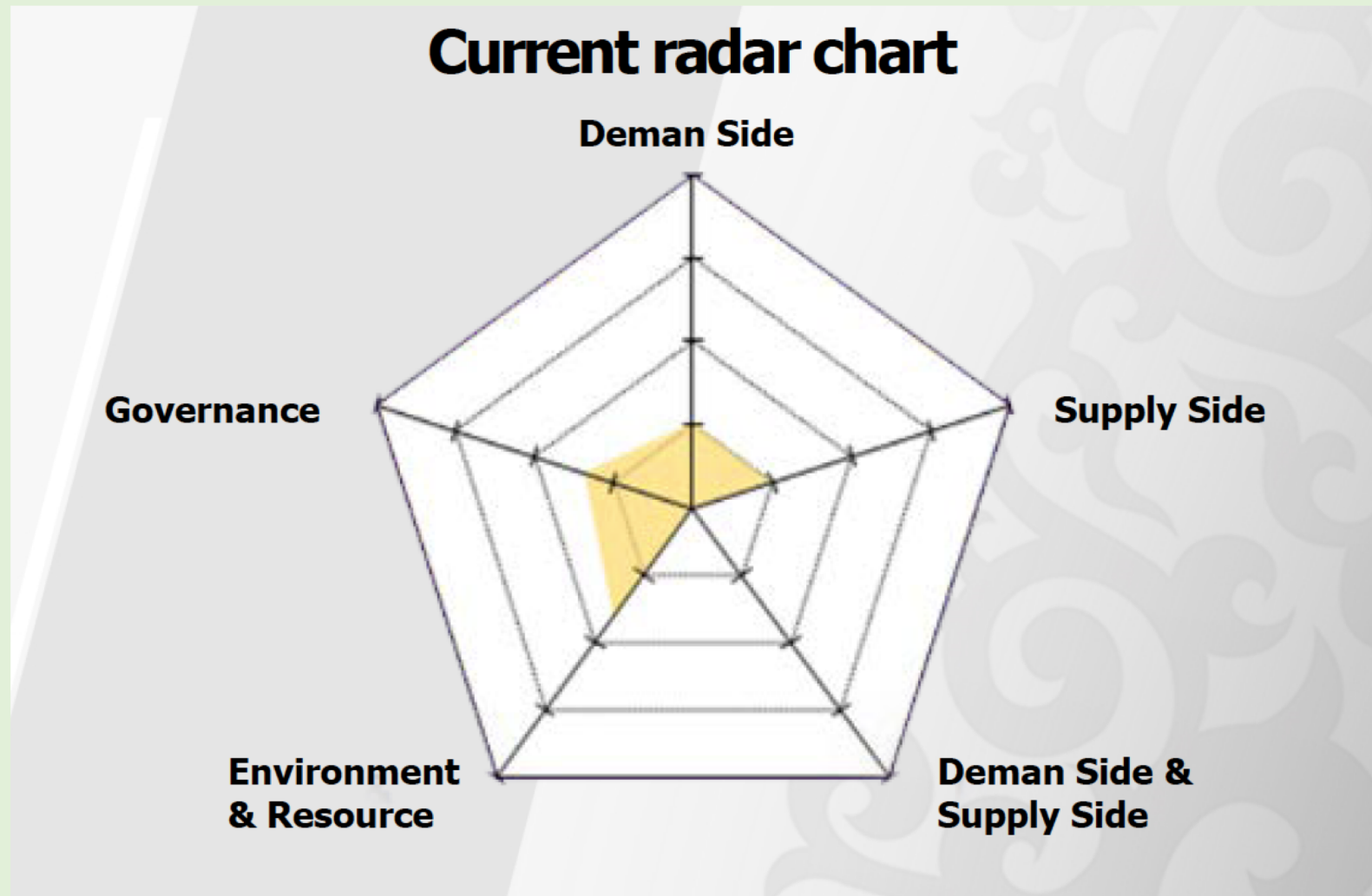
- Effort toward low carbon town are integrated into planning document. In doing so, the Banda Aceh city also establish cooperation with international agency such as CityNet, CDIA, UCLG etc.
- The city government assigns regular budget to extend green space
- DDR is integrated into planning document
- The conservation of coastal are
- Sanitation master plan as guideline to counter flood and developing drainage infrastructure

LCTI-1 SHEET 5. GOVERNANCE

14. Education and Management

- Cooperation with Green Community
- Community participation program is planned in document such as Smart Compact City Master Plan and The Action Plan Green House Gas Emission Reduction
- Community association for green planning called P2KH (Green City development Program) consist of city official, green community and academician to function green city. But the community does not function well in the last few year. It is necessary to empower the community.

LCTI-1 SELF EVALUATION RESULT



FUTURE PLAN OF LOW CARBON DEVELOPMENT

FUTURE PLAN OF LOW CARBON DEVELOPMENT

Assesment Item

- Bus Rapid Transit Transkutaraja separated lane
- Improving the coverage area of BRT Transkutaraja
- Transit Oriented Development (TOD) along the BRT line
- Establishing system for energy saving construction, including in measuring thermal performance, energy saving equipment performance and natural.
- Establishing green construction guidelines
- Promoting low carbon vehicle and eco driving
- Introducing area energy
- Increasing the utilization of renewable energy

FUTURE PLAN OF LOW CARBON DEVELOPMENT

Assessment Item

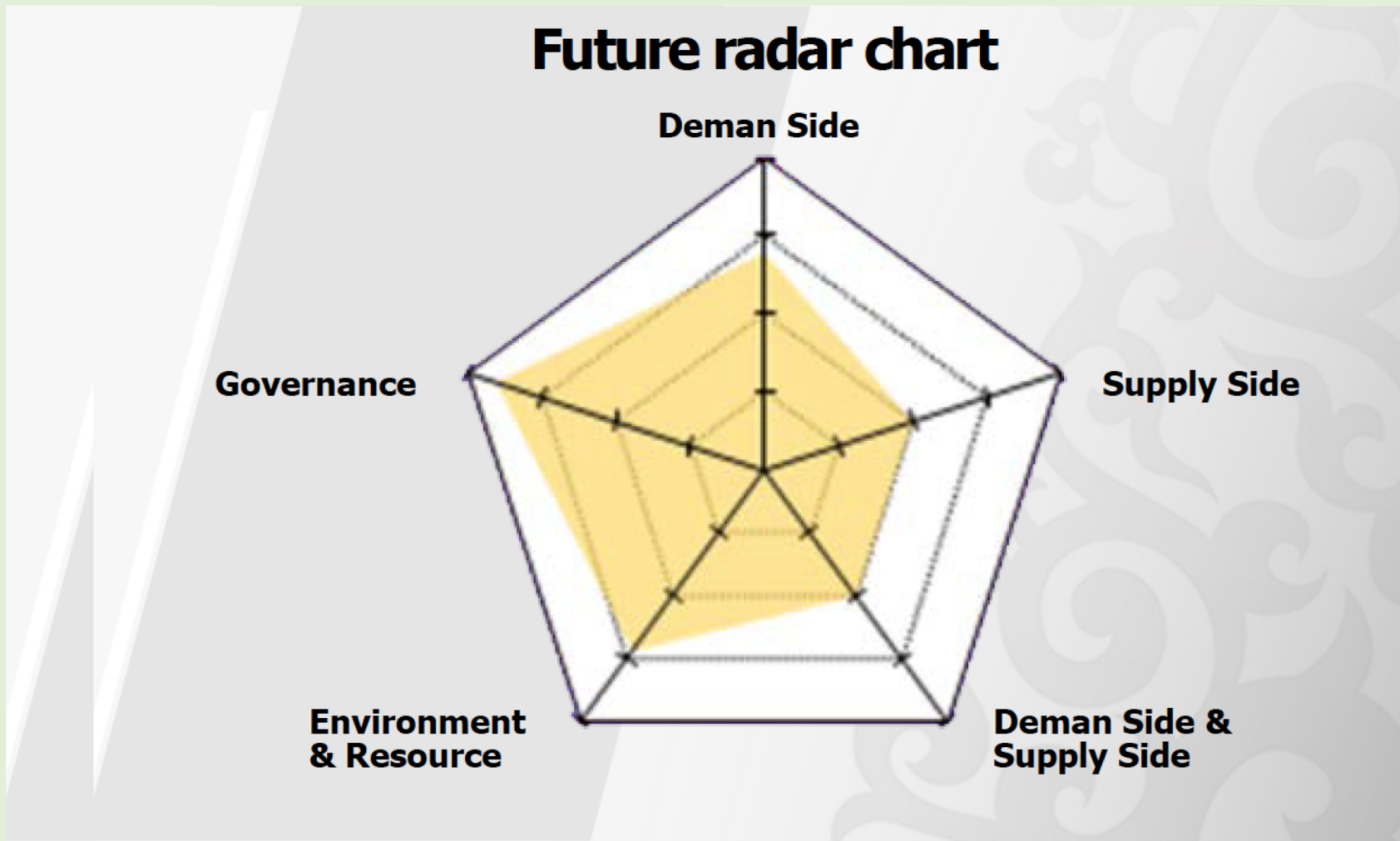
- Introducing multi energy system
- Intruducing energy management, area energy management system, and smart micro grid
- Ektending greenery
- Improving the effort to reduce water usage and increase water reuse
- Optimizing waste reduction effort
- Increasing waste reuse and recycling
- Improving emission measurement and monitoring facilities
- Regular check of water pollution
- Increasing the effort to reduce soil contamination

FUTURE PLAN OF LOW CARBON DEVELOPMENT

Assessment Item

- Establishing the goal for low carbon town and carry actual effort
- Secure budget for low carbon town
- Establishing Business/Life Contingency Plan in pilot area
- Implementing development based on spatial master plan
- Carrying education for low carbon town
- Increasing the role of community association

LCTI-1 SELF EVALUATION RESULT



Low-Carbon Model Town in Vedio





PEMERINTAH
KOTA BANDA ACEH

*Thank
you*



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