AIM ExSS & EndUse Modelling of DKI Jakarta Decarbonization

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Decarbonization of DKI Jakarta

This poster presents the results of the Low Carbon Development Strategy (LCDS) DKI Jakarta study presents various pathways in order to achieve a low carbon society in 2050, which includes the development of the power sector, energy, waste, and AFOLU (Agriculture Forestry and Other Land Use).

Low carbon development is important to be implemented in large cities like DKI Jakarta, which is one of the metropolitan cities in Indonesia. The city's population, economic characteristics, and transportation condition of DKI Jakarta will obviously impact GHG emissions levels. The purpose and objective of the analysis is to use a methodology or approach developed to explore mitigation actions to achieve DKI Jakarta's Low Carbon Society

https://www.iges.or.jp/en/pub/aaa/en-4

Methodology

Decarbonization of DKI Jakarta is developed using two approaches, namely non-linear programming AIM-ExSS (Extended Snap Shot) and AIM-EndUse model based on GAMS (General Algebraic Modeling System) v.23.3. The AIM-ExSS simulation gives the snapshot projection of population, GDP, energy consumption (electricity and non-electricity) and associated GHG emission (electricity and non-electricity). Moreover, especially for the power sector, the decarbonization pathway is developed by the AIM-EndUse model

Two projection scenarios have been developed :

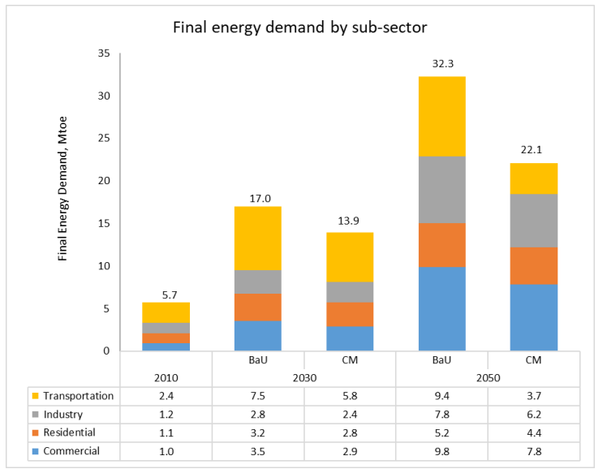
1. The business as usual (BAU)
2. The countermeasure (CM)

Socio-economic

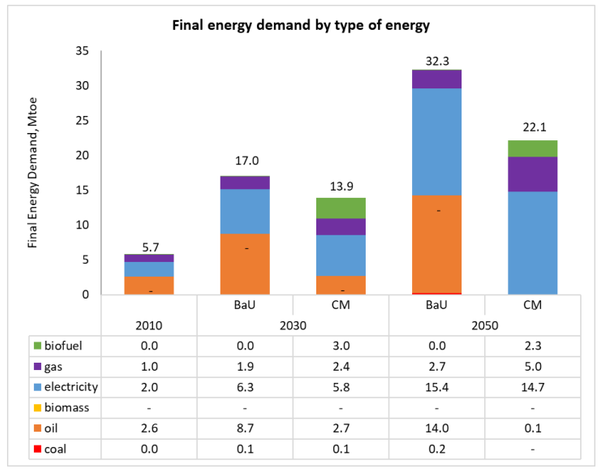
Socio-economic indicator assumptions: the city's population at the same growth 1% per year, and the average GDP annual growth rate is 6% (2015-2030), 5.5% (2030-2040), 5% (2040-2050).

Energy Demand and the Associated GHG emissions

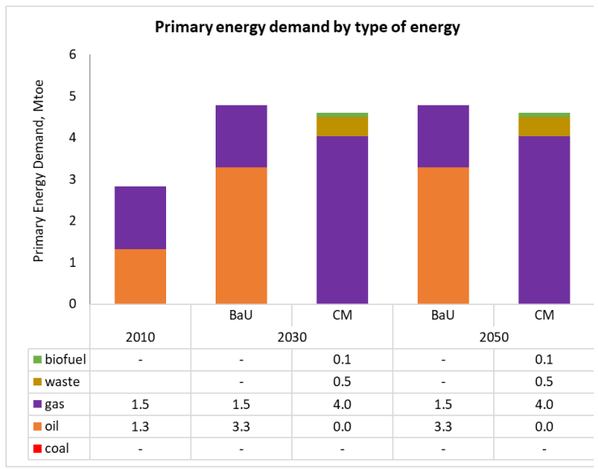
- The largest energy consumer in DKI Jakarta is transportation (2010). The energy demand growth of the commercial sub-sector will be similar to that of the transport sector (2050)
- A mix of energy supply in 2030 & 2050 is expected to experience a shift where electricity and gas consumption will be comparable to oil fuels.
- Under the CM scenario, there will be a transition in energy use from oil fuels to fuels with lower carbon content (gas and biodiesel)
- Mitigation actions of those two power plants (Muara Karang and Tanjung Priok) located in DKI Jakarta, which are connected to the JAMALI Grid, are considered as NPS (Non-Party Stakeholder) mitigation



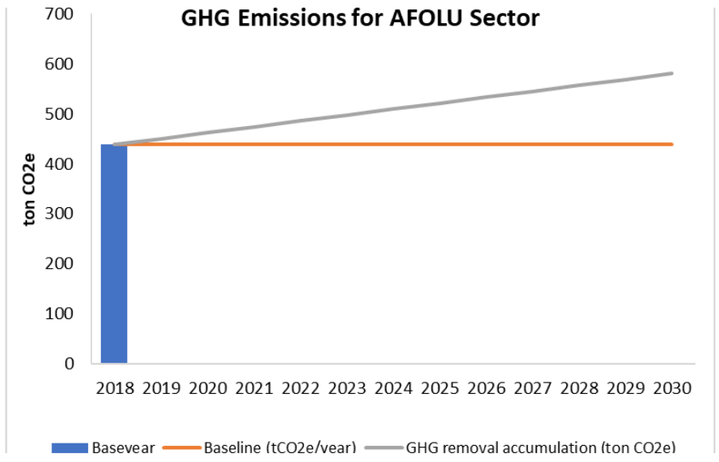
	2010	2030 BaU	2030 CM	2050 BaU	2050 CM
Transportation	2.4	7.5	5.8	9.4	3.7
Industry	1.2	2.8	2.4	7.8	6.2
Residential	1.1	3.2	2.8	5.2	4.4
Commercial	1.0	3.5	2.9	9.8	7.8

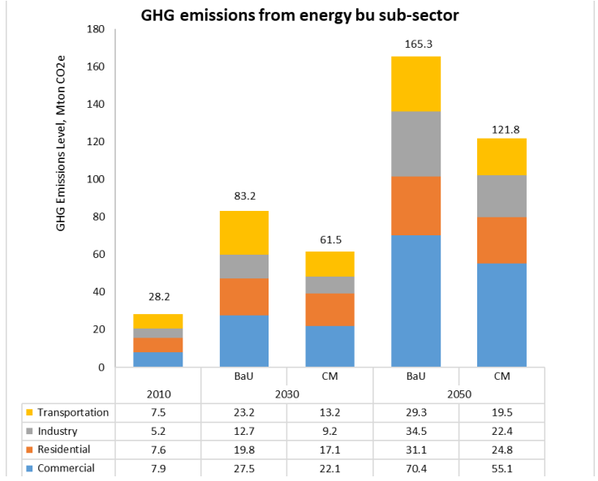


	2010	2030 BaU	2030 CM	2050 BaU	2050 CM
biofuel	0.0	0.0	3.0	0.0	2.3
gas	1.0	1.9	2.4	2.7	5.0
electricity	2.0	6.3	5.8	15.4	14.7
biomass	-	-	-	-	-
oil	2.6	8.7	2.7	14.0	0.1
coal	0.0	0.1	0.1	0.2	-

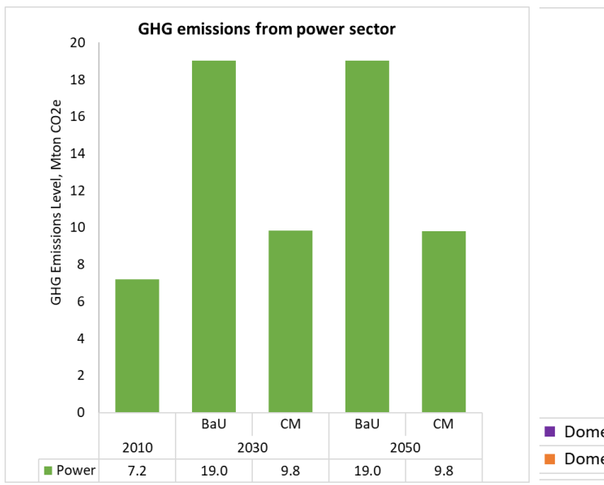


	2010	2030 BaU	2030 CM	2050 BaU	2050 CM
biofuel	-	-	0.1	-	0.1
waste		-	0.5	-	0.5
gas	1.5	1.5	4.0	1.5	4.0
oil	1.3	3.3	0.0	3.3	0.0
coal	-	-	-	-	-

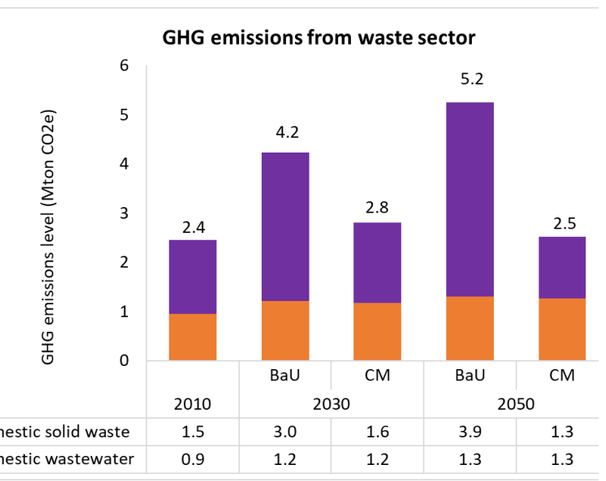




	2010	2030 BaU	2030 CM	2050 BaU	2050 CM
Transportation	7.5	23.2	13.2	29.3	19.5
Industry	5.2	12.7	9.2	34.5	22.4
Residential	7.6	19.8	17.1	31.1	24.8
Commercial	7.9	27.5	22.1	70.4	55.1



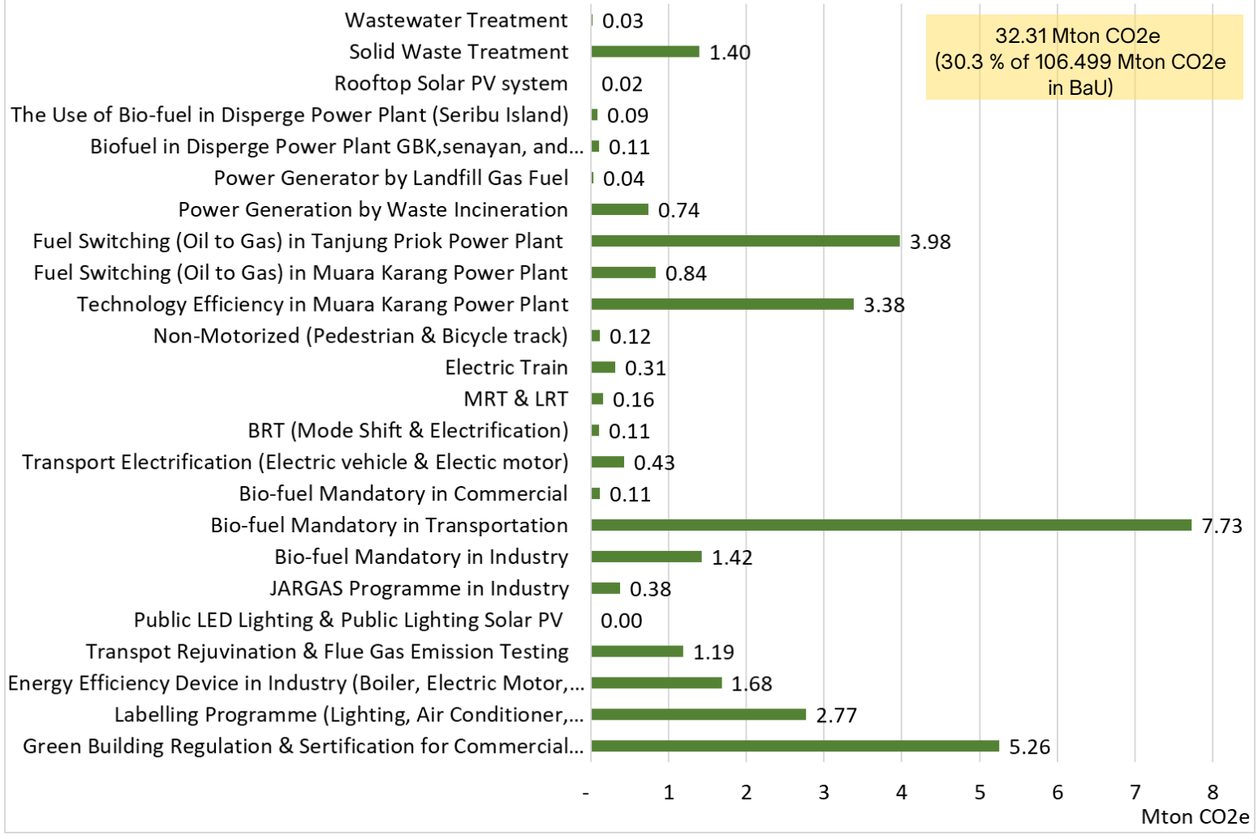
	2010	2030 BaU	2030 CM	2050 BaU	2050 CM
Power	7.2	19.0	9.8	19.0	9.8



	2010	2030 BaU	2030 CM	2050 BaU	2050 CM
Domestic solid waste	1.5	3.0	1.6	3.9	1.3
Domestic wastewater	0.9	1.2	1.2	1.3	1.3

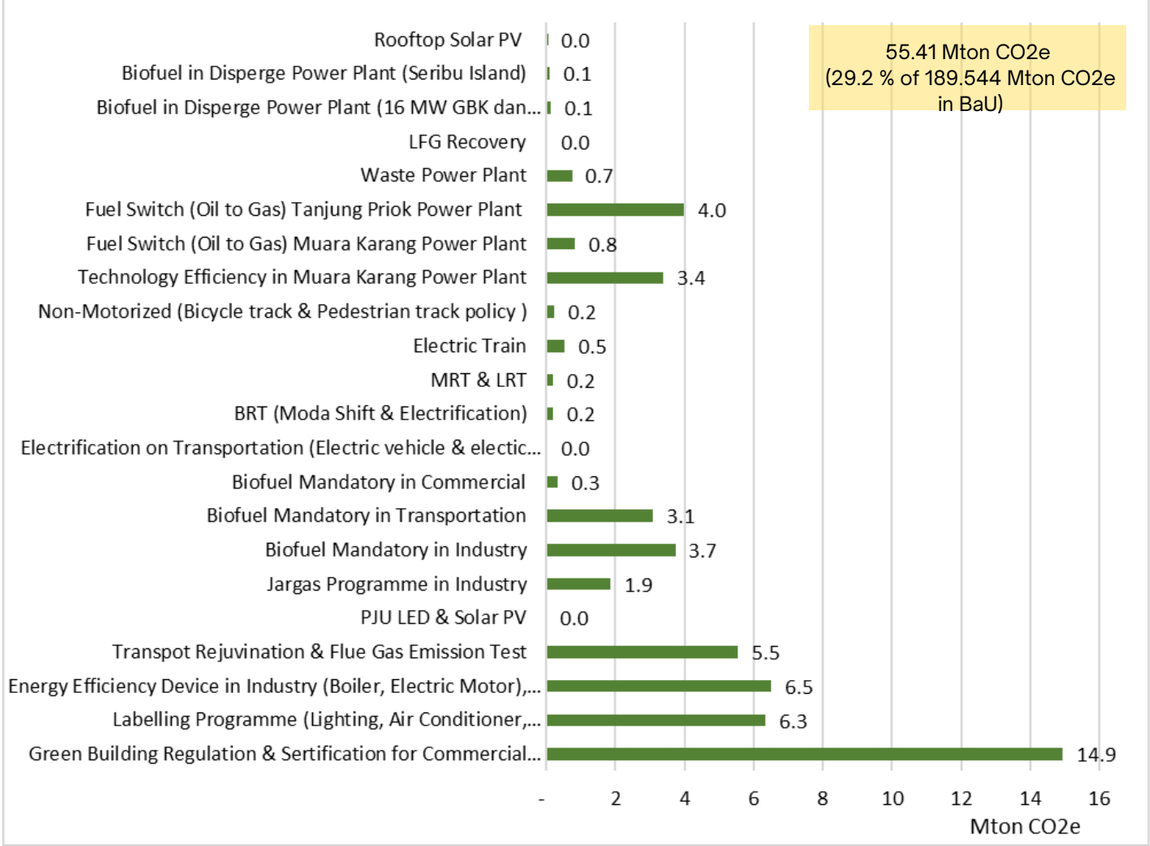
GHG Emissions Reduction Target

2030



32.31 Mton CO2e
(30.3 % of 106.499 Mton CO2e in BaU)

2050



55.41 Mton CO2e
(29.2 % of 189.544 Mton CO2e in BaU)

Key Findings

- The major GHG emissions reduction is achieved under the CM scenario as the end-user efficiency improvement measures, fuel switching to fuel with lower carbon, change of transport mode, deployment of advanced technology such as electric vehicles fueled using renewable sources, construction of street lighting using LED, promotion of solar PV system, efficiency measures and fuel switching (oil to gas) in power plant, treatment of domestic solid waste, wastewater treatment, and increase of carbon sink through planting in DKI Jakarta.
- The priority targets of mitigation actions by 2030 are aligned with mitigation actions in the Indonesian NDC roadmap. Furthermore, mitigation actions to achieve long-term targets (LCS) are aligned with the continuation scenario of NDC Indonesia
- There are still rooms for improvement on mitigation action from the **energy sector** and **waste sector** to achieve GHG emissions reduction target in 2030 and 2050.

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