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Low Carbon Development Scenario of Indonesia Energy Sector in 2020 & 2050

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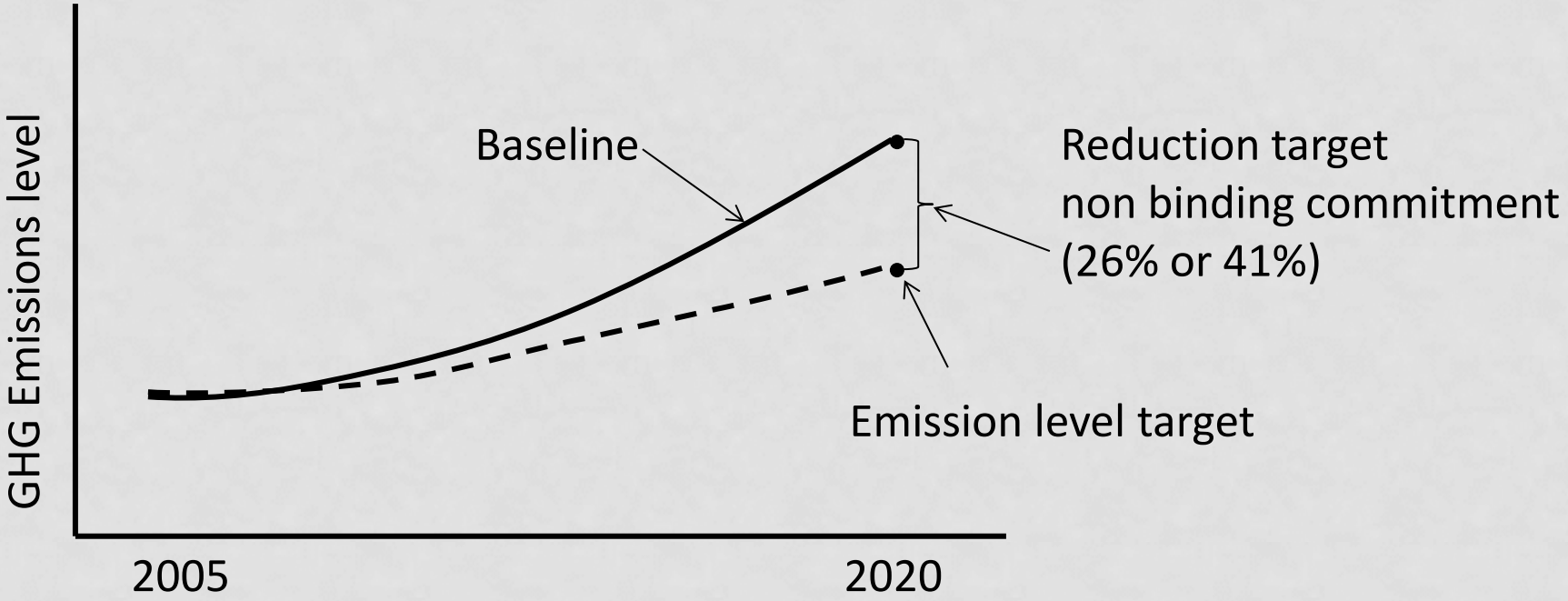
Outline

1. Introduction
2. Scenario Framework:
   - Socio Economic Development Scenario
   - Economic Output Structure
3. Supply Demand Energy Projection
4. Power Supply Mix and Transportation Scenario
5. GHG Emission Level and Mitigation Actions

Introduction

1

- LCDS is usually intended to assess long-term vision (2050).
- Particular emphasis in short-term (2020) is to address options for achieving GHG reduction target (National Action Plan) up to 26% below the baseline with domestic budget and further up to 41% with international support.
- This study is to evaluate the achievement of GHG reduction potential from the national action plan and provide alternatives mitigation action to achieve national emission target.
- Current energy supply mix (2010): role of new-renewable energy is still low (6.1%) while oil (44.34%), gas 43.30 %, coal 24.43%.
- Power sector is discussed in more detailed as there is a new plan that intends to revise power development plan (more coal will be deployed gradually).



Sector	Emission Reduction (Giga ton CO2e)		Total (41 %)
	26%	15%	
Forestry and Peatland	0.672	0.367	1.039
Waste	0.048	0.030	0.078
Agriculture	0.008	0.003	0.011
Industry	0.001	0.004	0.005
Energy	**0.038**	**0.018**	**0.056**
Total	**0.767**	**0.422**	**1.189**

Scenario Framework

2

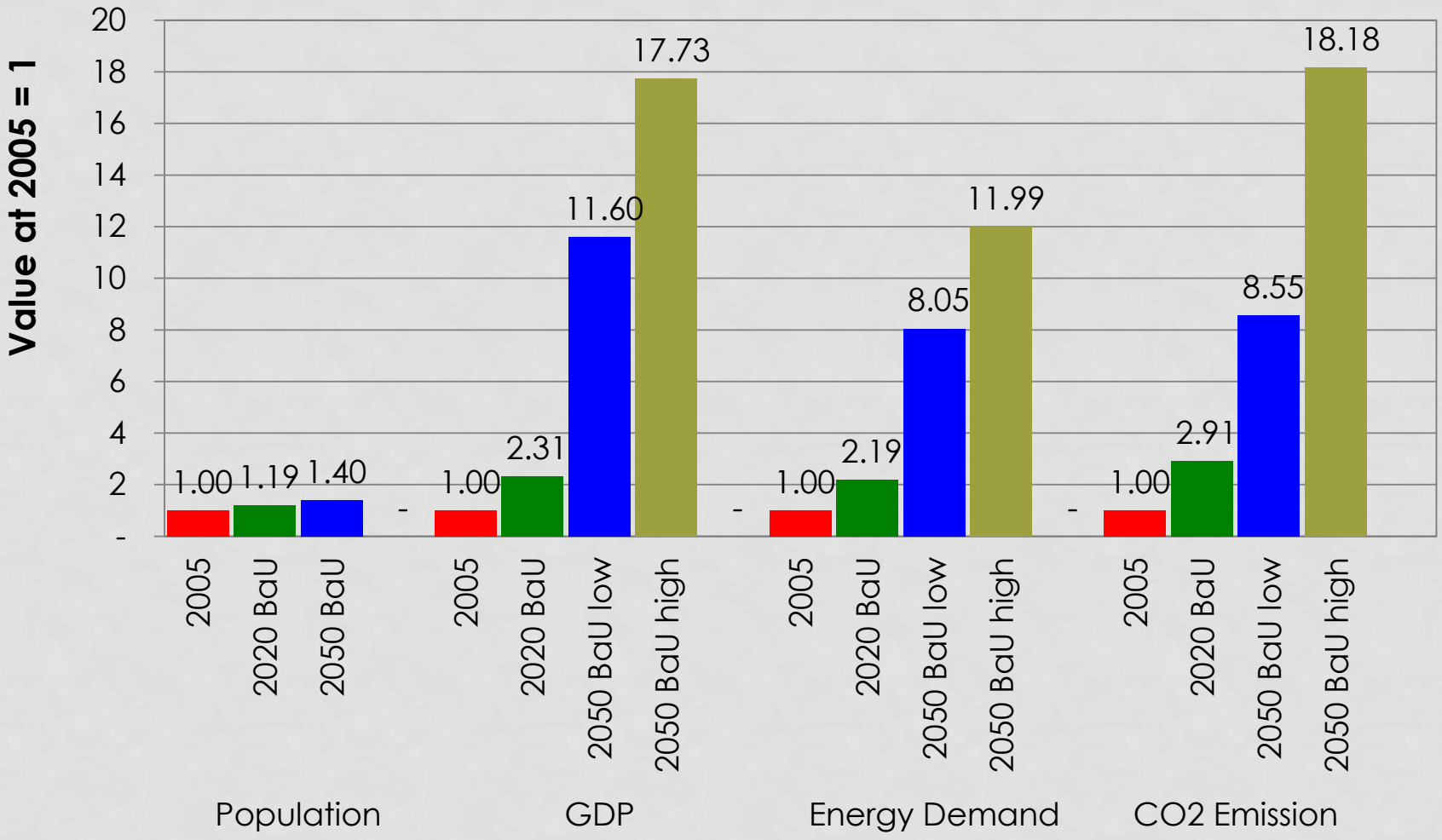
Scenario Framework

- **Projection Scenario**
  2020 and 2050 (low GDP) and 2050 (high GDP)

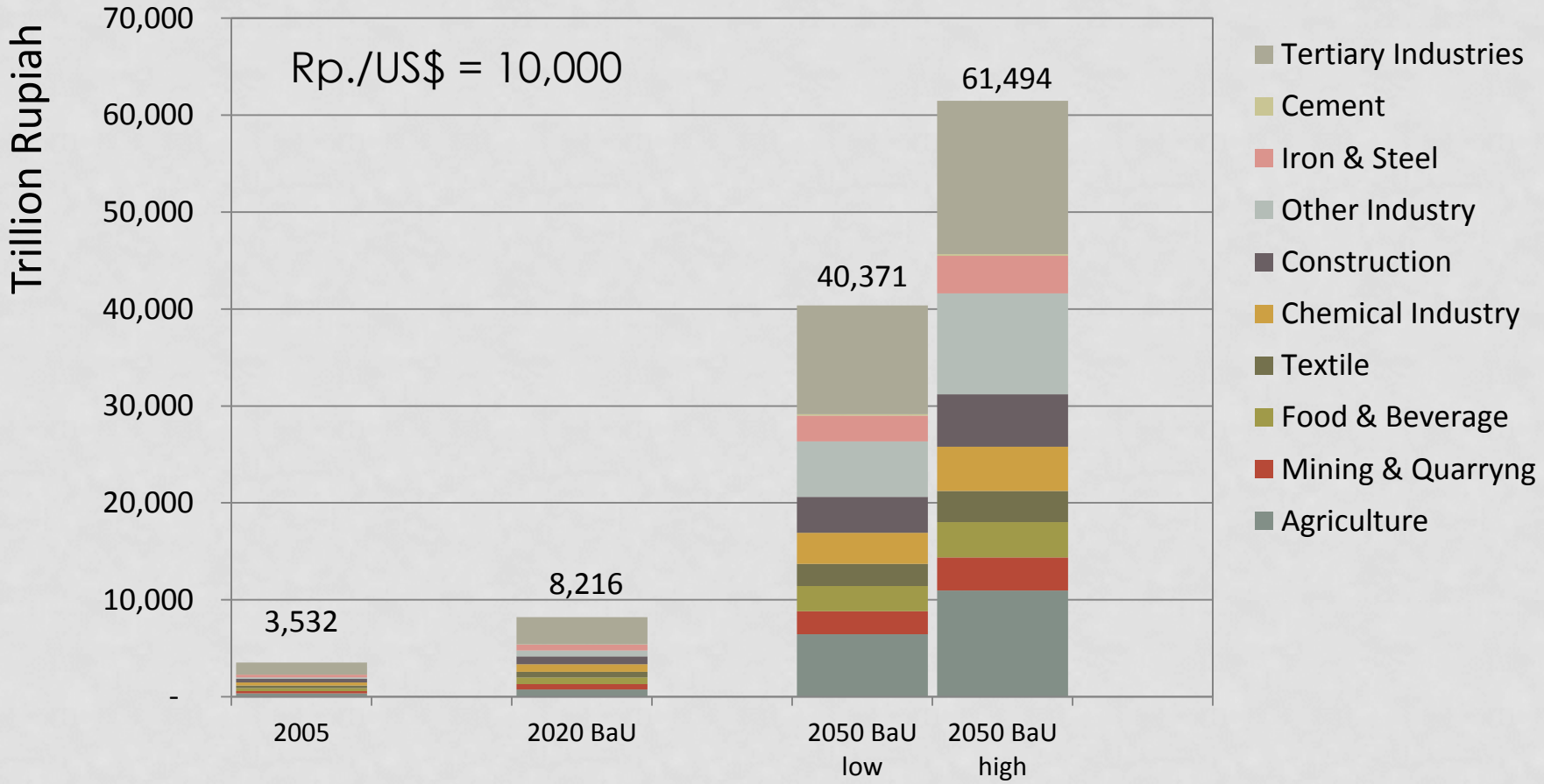
- **Baseline scenario**:
  Projection of GHG emission under expected socio-economic development in Indonesia without additional countermeasures to reduce GHG emission from energy.

- **Counter Measure (CM) scenario**:
  Introduction of low-carbon measures which are already available. Assumptions are based on the official target (RAN-GRK, reduce 38 $MtCO_2$ in energy sector).

Baseline Development Scenario (Socio Economic, Energy Demand and CO_2)



Gross output of production sector

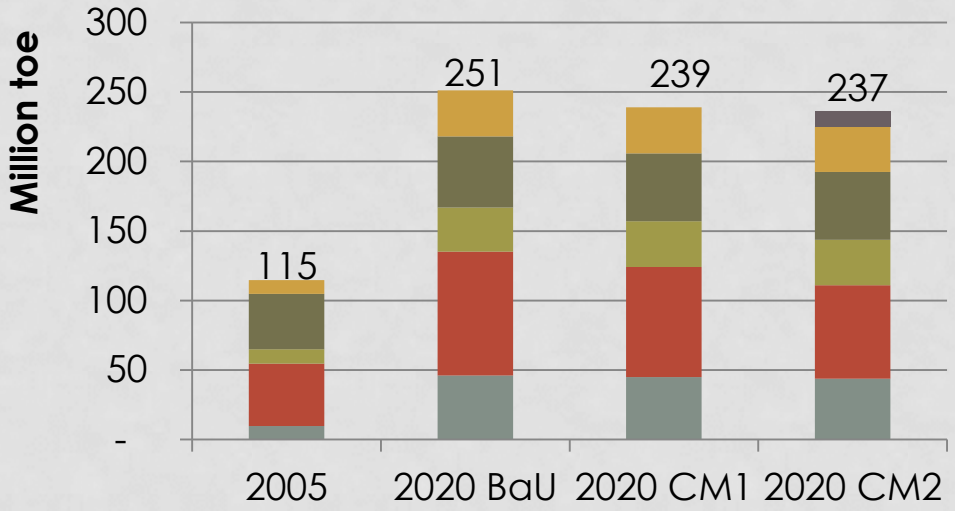


- Gross output: 2.31 times (2020), 11.6 (2050 Low GDP) and17.73 (GDP) from 2005.
- The highest contributor is Secondary industries

Supply Demand Energy Projection

3

Final Energy Demand Projection (2020)



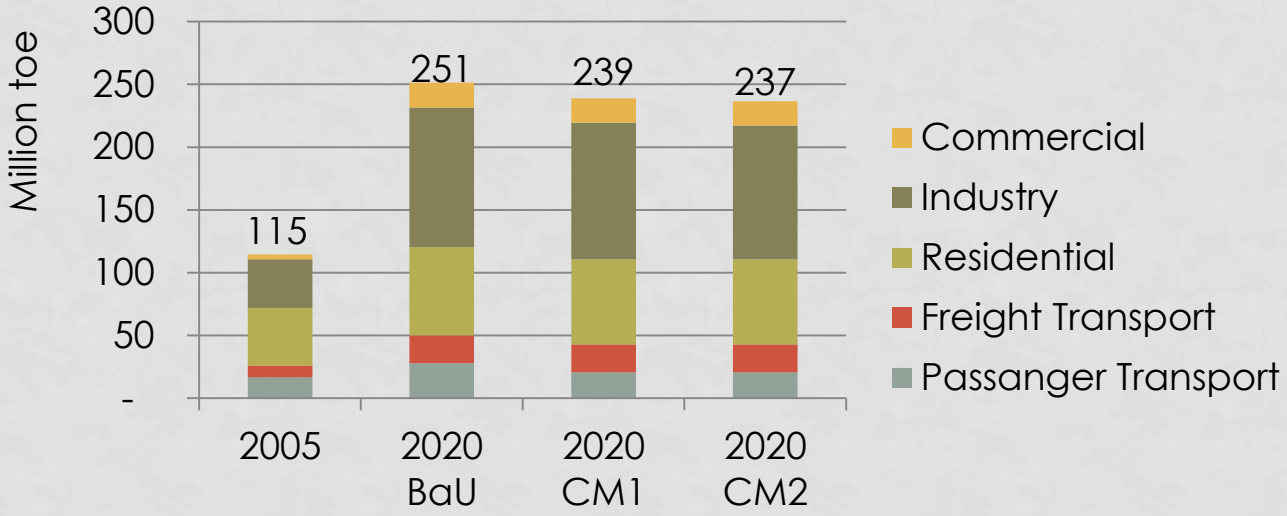
By Fuel

Difficult in moving away from oil

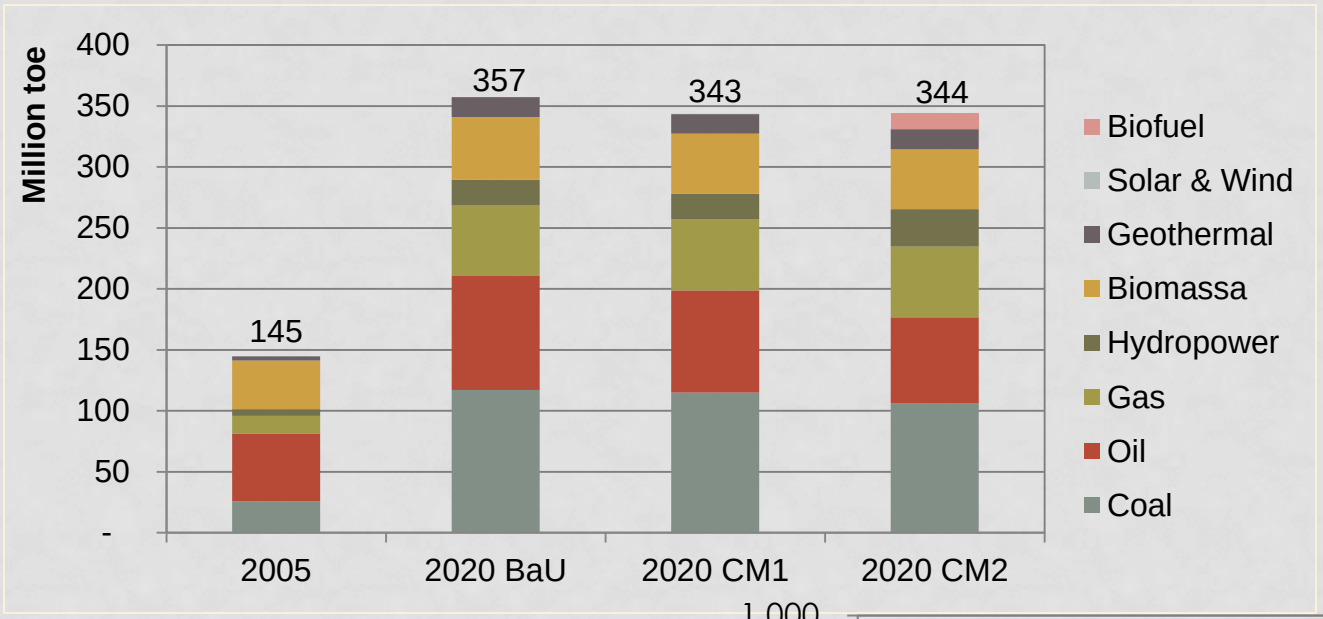
Biomass is used in rural residential

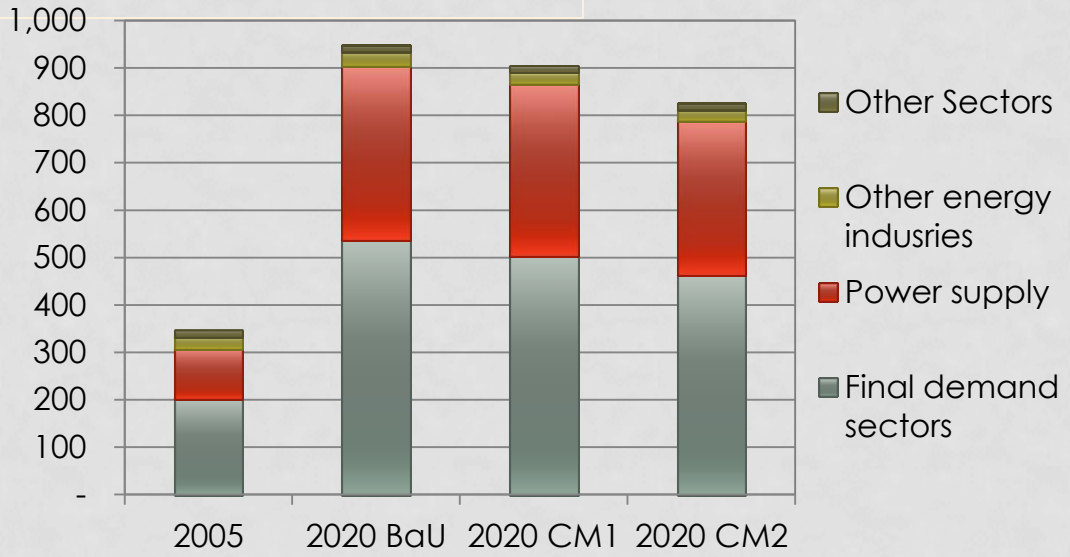
By Sector

Industrial sector is main consumer



Primary Energy Supply and CO2 Emission Projection (2020)





Power Supply Mix & Transportation Scenario

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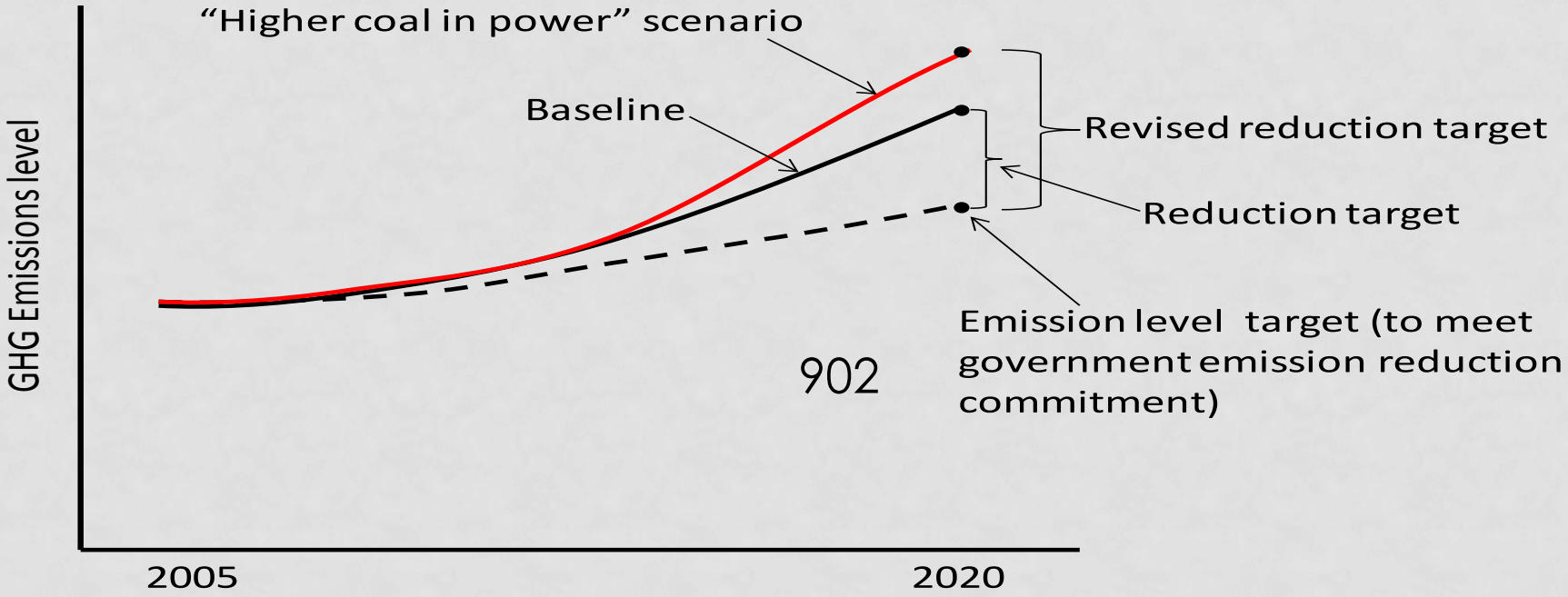
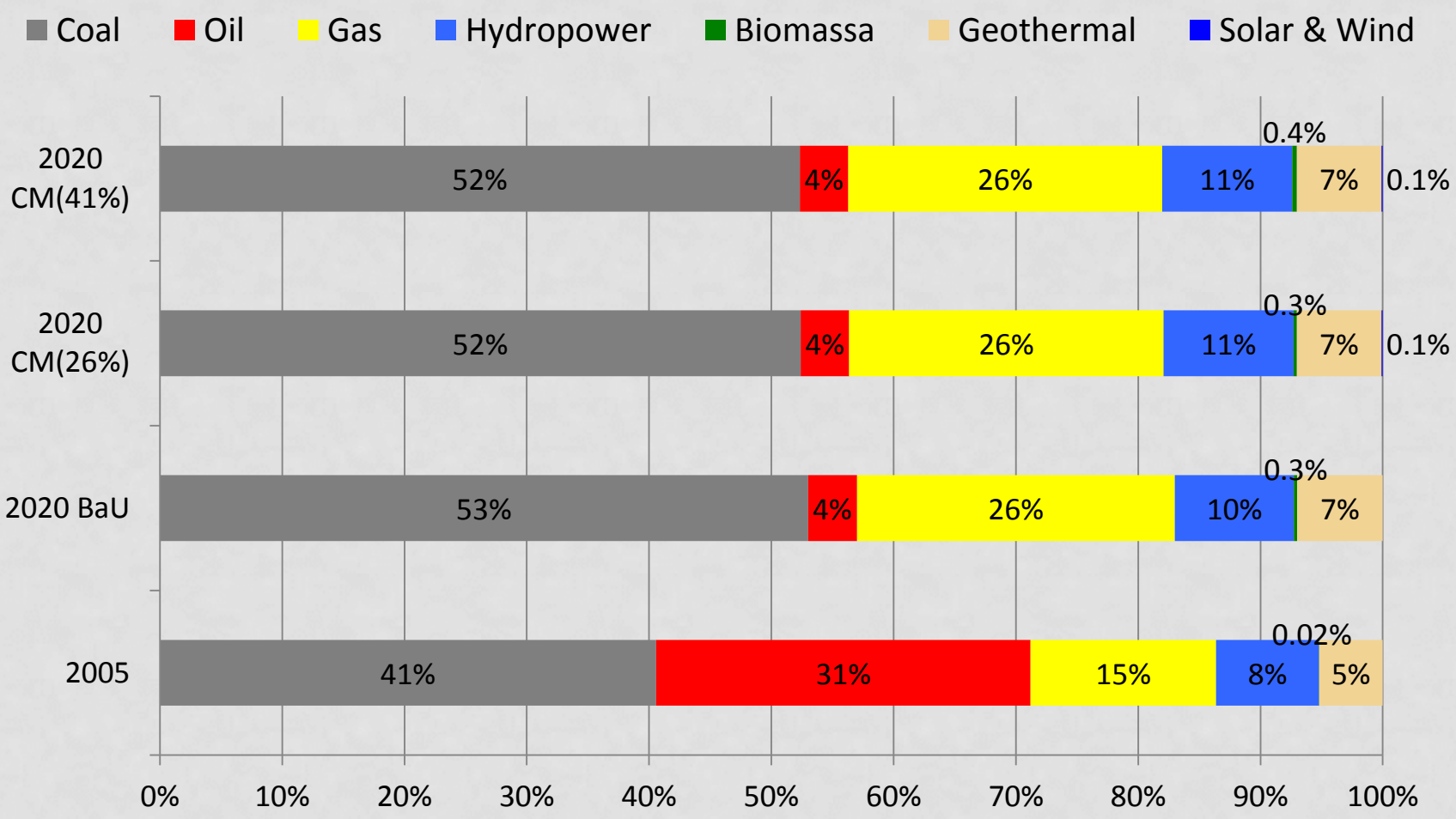


Type of energy	Base year 2005	RUPTL 2009-2018	Revised PLN plan*
Coal	40.7%	53%	65%
Oil	30.6%	4%	3%
Natural gas	15.1%	26%	20%
hydro	8.4%	10%	5%
geothermal	5.2%	7%	7%

RUPTL 2009 - 2018	Coal	Oil	Natural Gas	Hydropower	Biomass	Geothermal
Efficiency	28%	33%	38%	18%	29%	16%
Transportation Loss	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%
Share	53.0%	4.0%	26.0%	9.7%	0.3%	7.0%

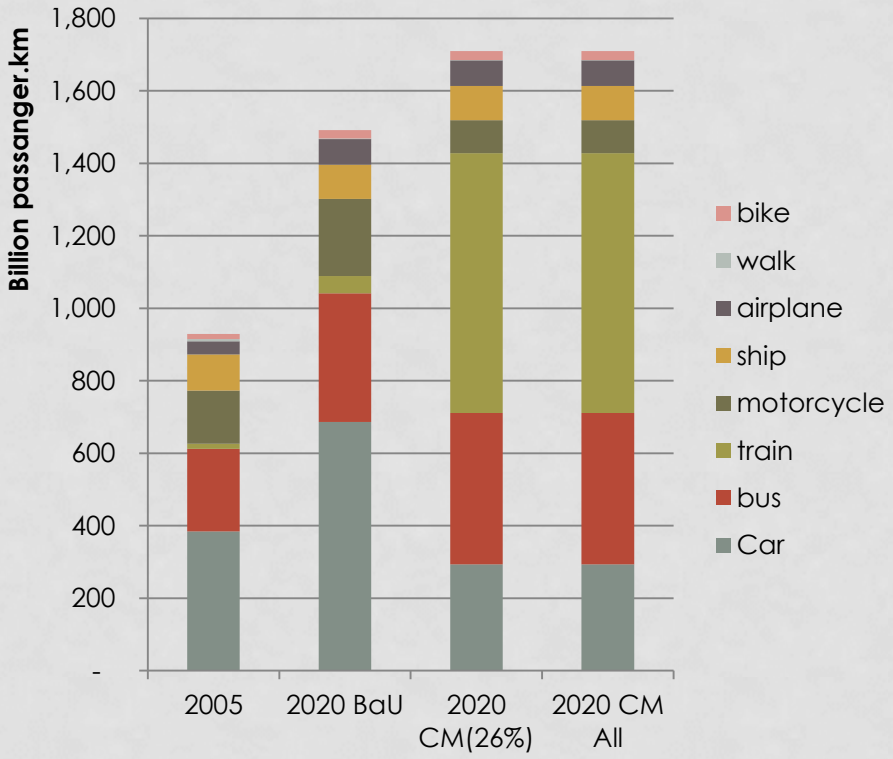
Energy Supply Mix in Power Generation



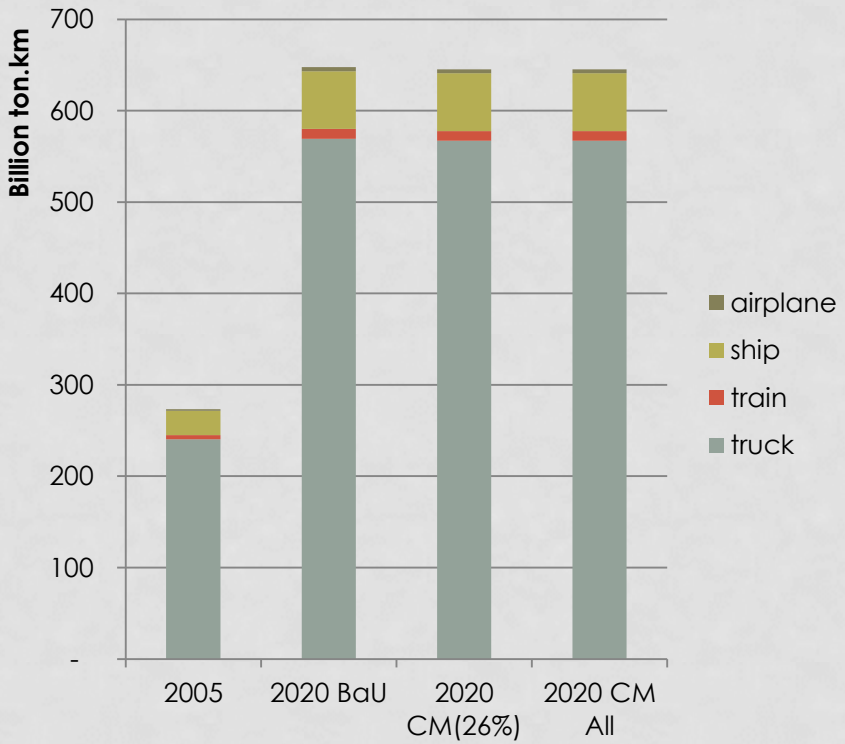
Projected Transport Volume

- Both modal share and transport volume of private vehicle increase in 2020 Baseline.
- In 2020 CM, it is assumed that share of train increasevolume of train become larger.
- Freight transport volume increases proportionally with growth of secondary industries.

Passenger transport



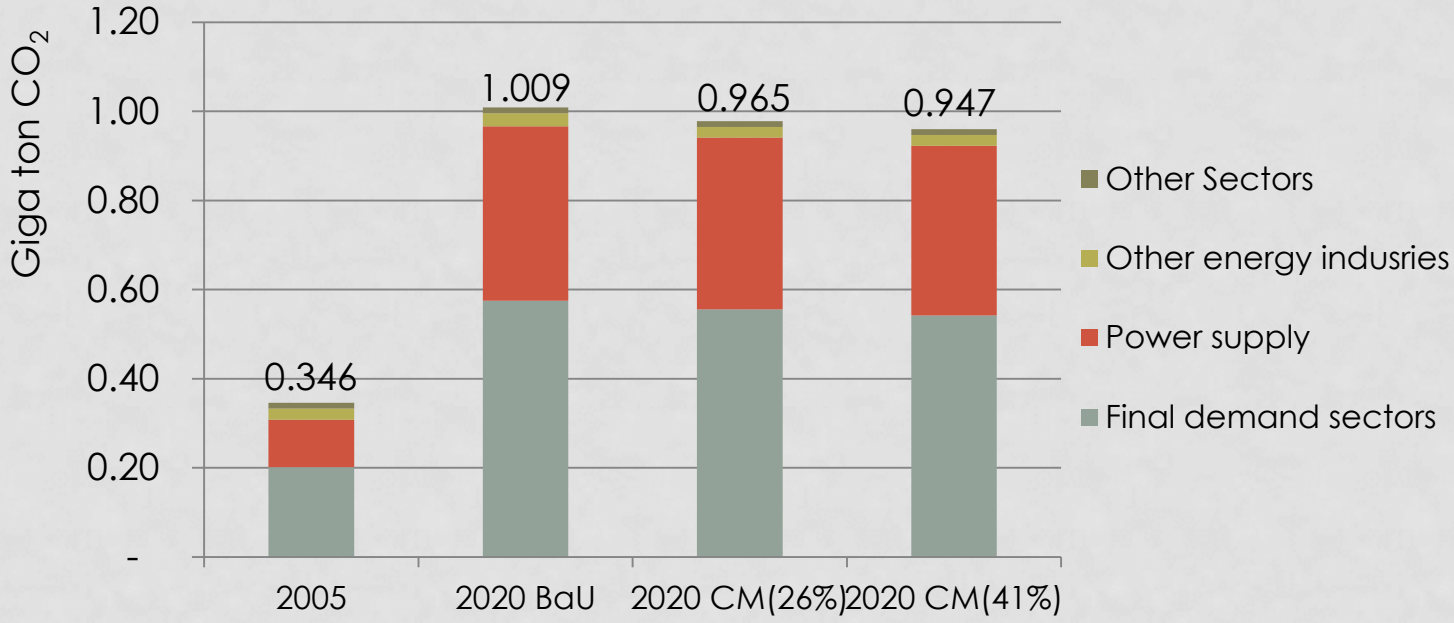
Freight transport



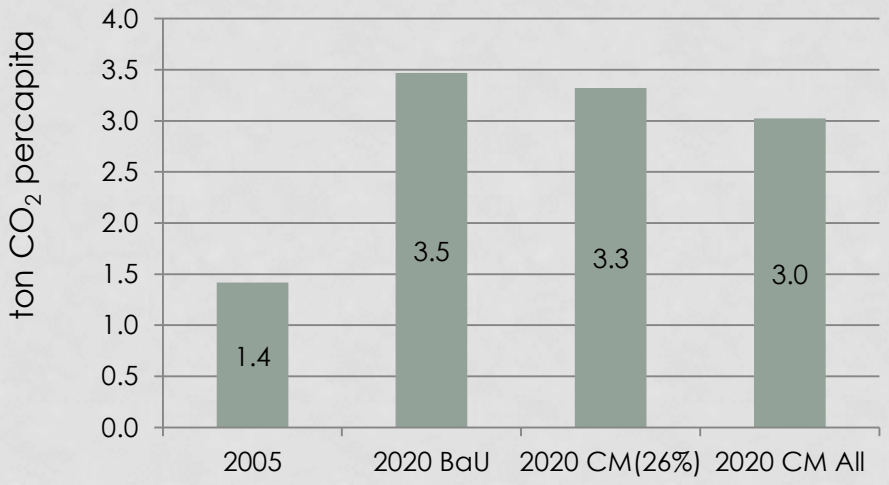
GHG Emission Level and Mitigation Actions

5

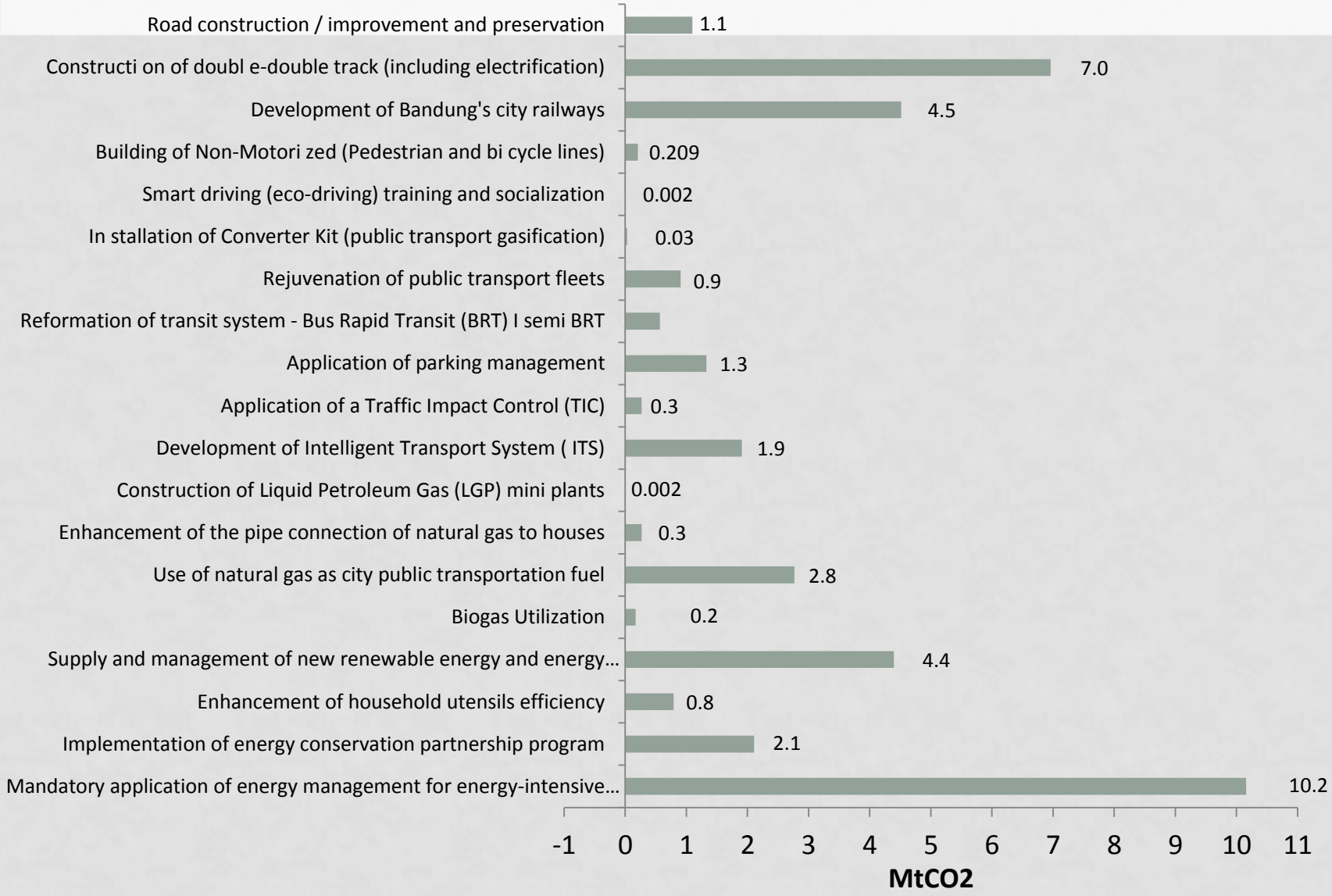
CO_2 Emission in Energy Sector



CO_2 emission intensity



CO_2 reduction by measures



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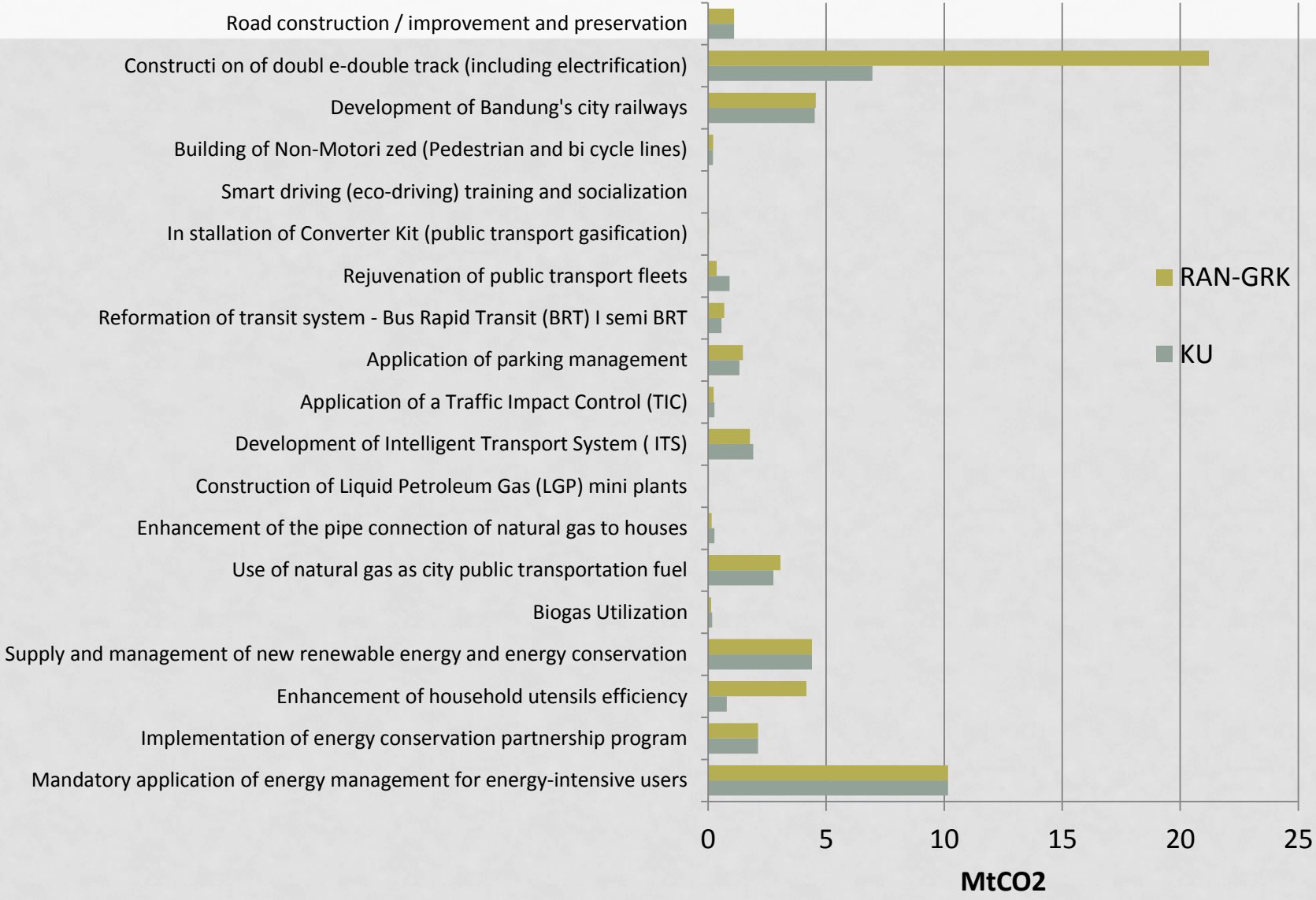

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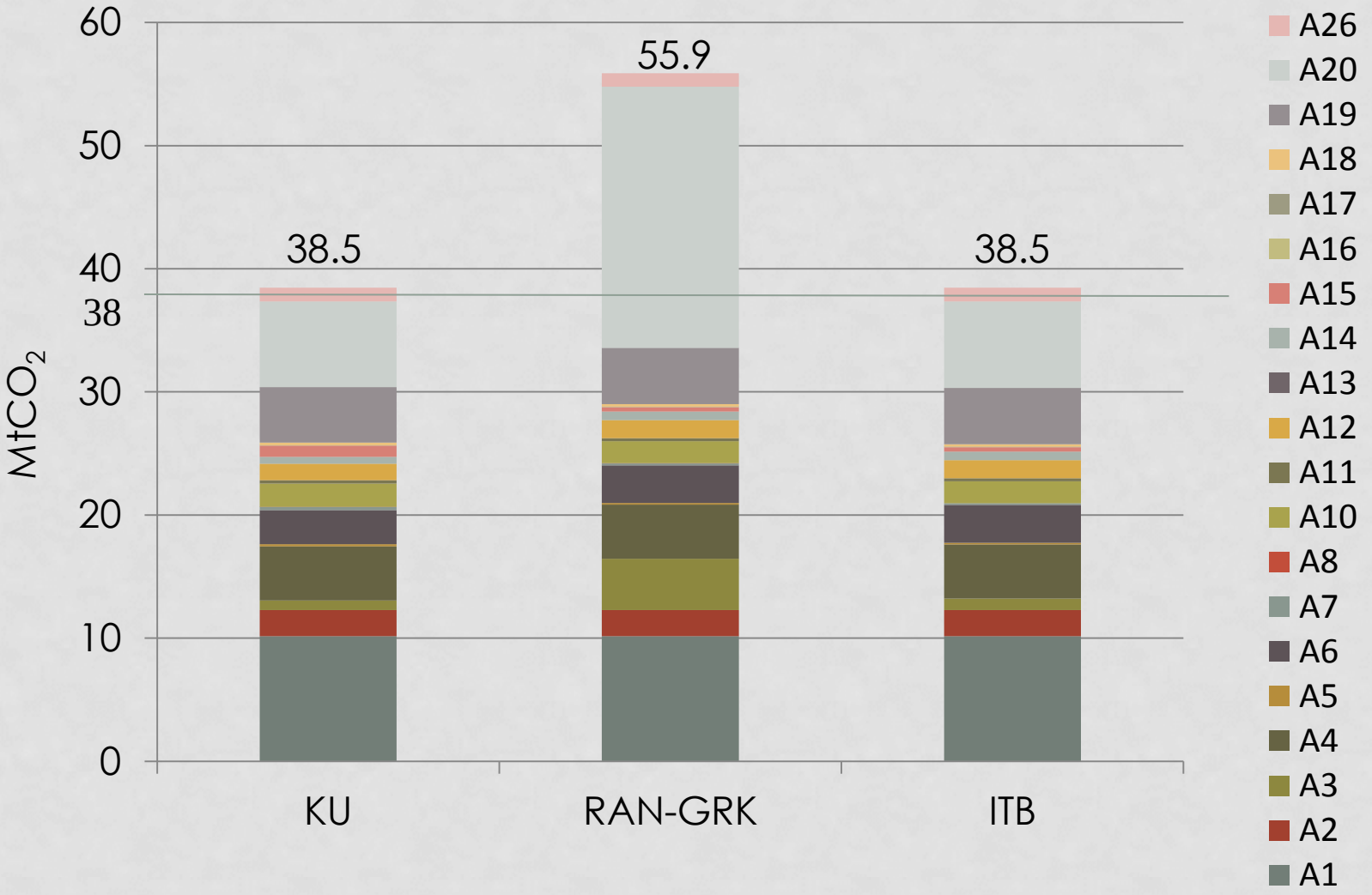

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Thank You