Bangkok Master Plan on Climate Change2013-2023

Bangkok Metropolitan Administration Secretariat
JICA Expert Team

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Climate Change and Bangkok

- ✓ Climate change is one of the largest challenges to the current and future development of human society.
- ✓ For Bangkok, climate change has become a big and real challenge.
- ✓ At the same time, expanding economic and social activities in Bangkok has caused large emission of GHGs.

Future vision of Bangkok

- ✓ BMA in partnership with the national government ministries and agencies, take a major responsibility to mitigate and adapt to climate change.
- ✓ BMA endeavors to establish well balanced action to harness economic and social development and climate change concerns.
- ✓ BMA takes comprehensive approach to the low carbon and climate change-resilient urban development and action oriented approach to the implementation of the Master Plan, as a vehicle in evolving nature
- ✓ BMA promotes actions by citizens, the private sector, academia, as well as other key players to mitigate and adapt to climate change.
- ✓ BMA, as a leading City of Southeast Asia and the world, takes proactive measures to mitigate and adapt to climate change in short, and mid, and long term.

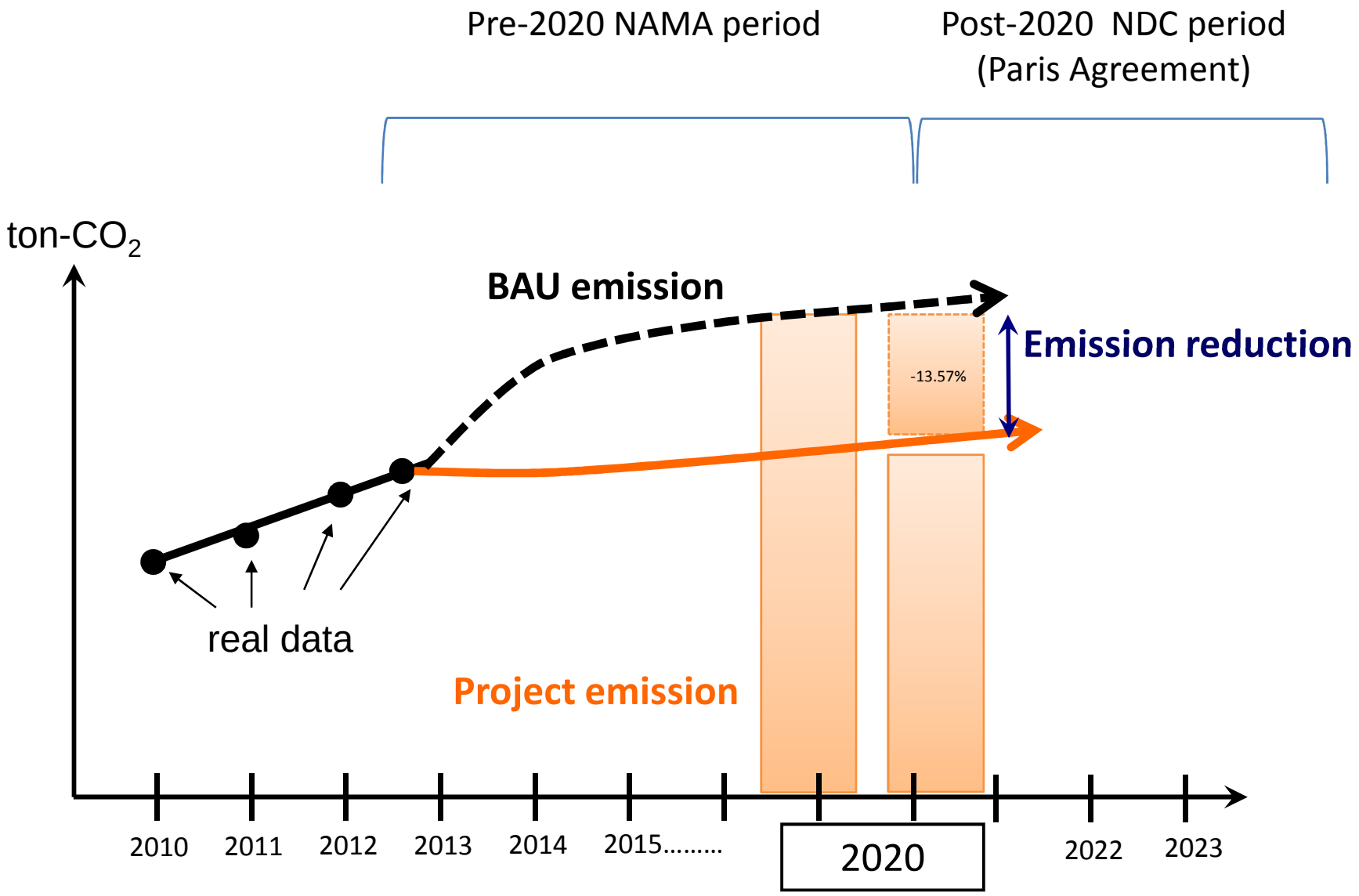
Scope of the Master Plan

(1) Environmental Sustainable Transport;
(2) Energy Efficiency and Alternative Energy;
(3) Efficient Solid waste management and Wastewater Treatment,
(4) Green Urban Planning; and
(5) Adaptation planning.

Mitigation Targets by Sector

Sector	Reduced GHG Emission/absorbed GHG against BAU in 2020*
Transport	-16.75%
Energy	-13.22 %
Waste and Wastewater	-4.06%
Green Urban Planning	+8.89 %

GHG emission prospects in BAU and with mitigation actions



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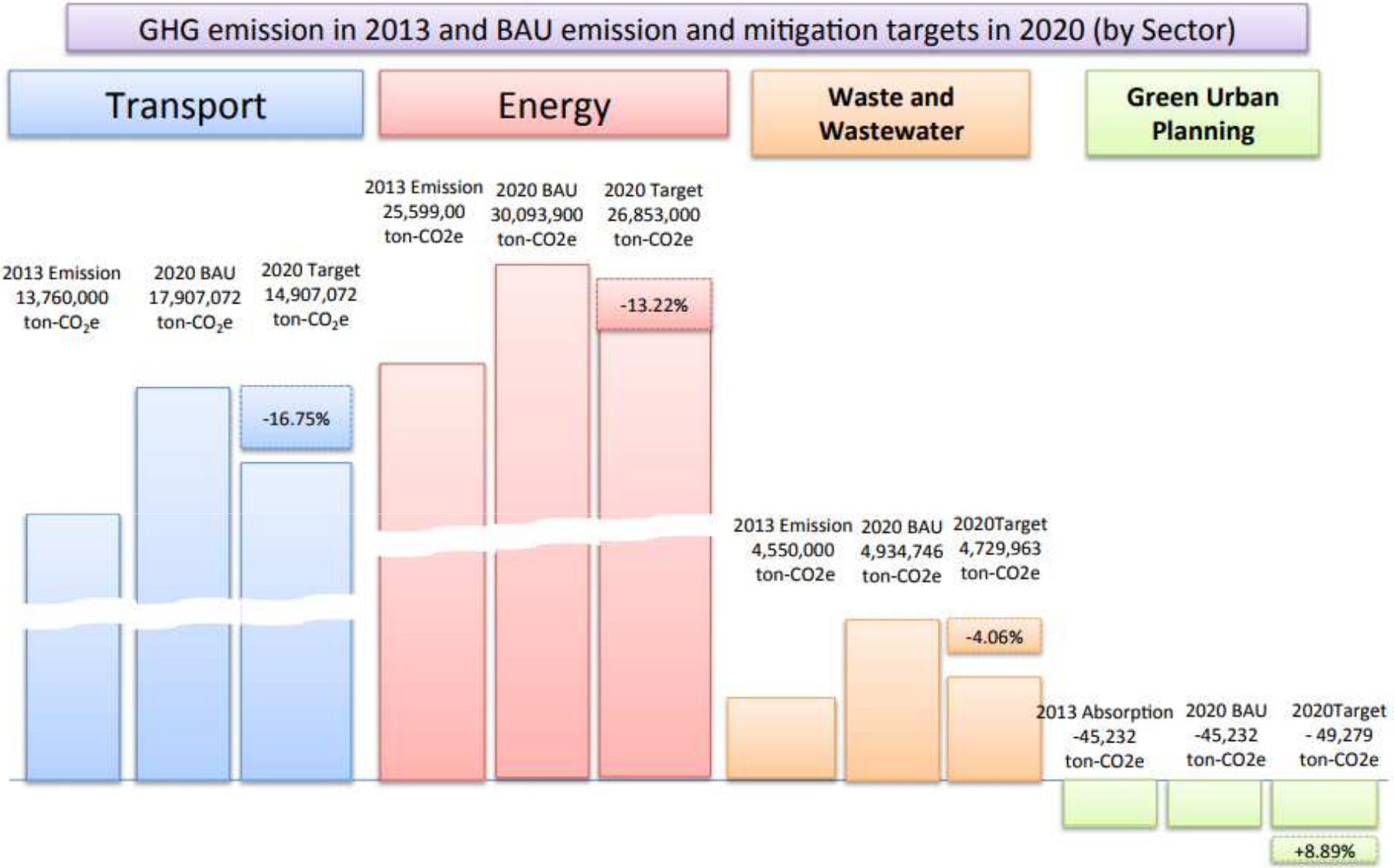

GHG emission in 2013 and BAU emission and mitigation targets in 2020 (by Sector)
Transport
Energy
Waste and Wastewater
Green Urban Planning
2013 Emission 13,760,000 ton-CO2e
2020 BAU 17,907,072 ton-CO2e
2020 Target 14,907,072 ton-CO2e
-16.75%
2013 Emission 25,599,00 ton-CO2e
2020 BAU 30,093,900 ton-CO2e
2020 Target 26,853,000 ton-CO2e
-13.22%
2013 Emission 4,550,000 ton-CO2e
2020 BAU 4,934,746 ton-CO2e
2020Target 4,729,963 ton-CO2e
-4.06%
2013 Absorption -45,232 ton-CO2e
2020 BAU -45,232 ton-CO2e
2020Target - 49,279 ton-CO2e
+8.89%

GHG Quantification by sector

I. Current status of GHG emission

1. Scope and coverage of the GHG emission
2. Basic methodologies for GHG calculation
3. Results of Calculation by data collection

II. BAU of GHG emission

1. BAU Scenario
2. Methodologies for Calculation

III. Mitigation target in the XXX Sector in 2020

1. Mitigation Scenario
2. Methodologies for Calculation

Reference to Key Policy and Planning Dcouments at the Nation Level
(Quotation from Dr. Wongkot Presentation in the process of developing the Master Plan)

Ministry of Energy

National Energy Plans 2015-2036

- -1- PDP Power
- -2- EEDP Energy Efficiency
- -3- AEDP Renewable Energy
- -4- Oil
- -5- Gas

Ministry of Natural Resources and Environment

National Plan

1. National Strategy on Climate Change BE 2551-2555 (A.D. 2008-2012)
2. Thailand Climate Change Master Plan 2012 – 2050
3. (draft) National Strategy on Climate Change BE 2556-2560 (A.D. 2013-2017)

NAMAs

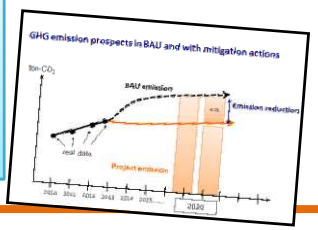
Target: 7 to 20% of GHG reduction (or 24 to 74 MtCO2 reduction) in energy sector by 2020
Pledged: 9 December 2014 to COP20
Status: Under tracking "2013 results" in first five main measures by Ministry of energy's climate change working group

City Level

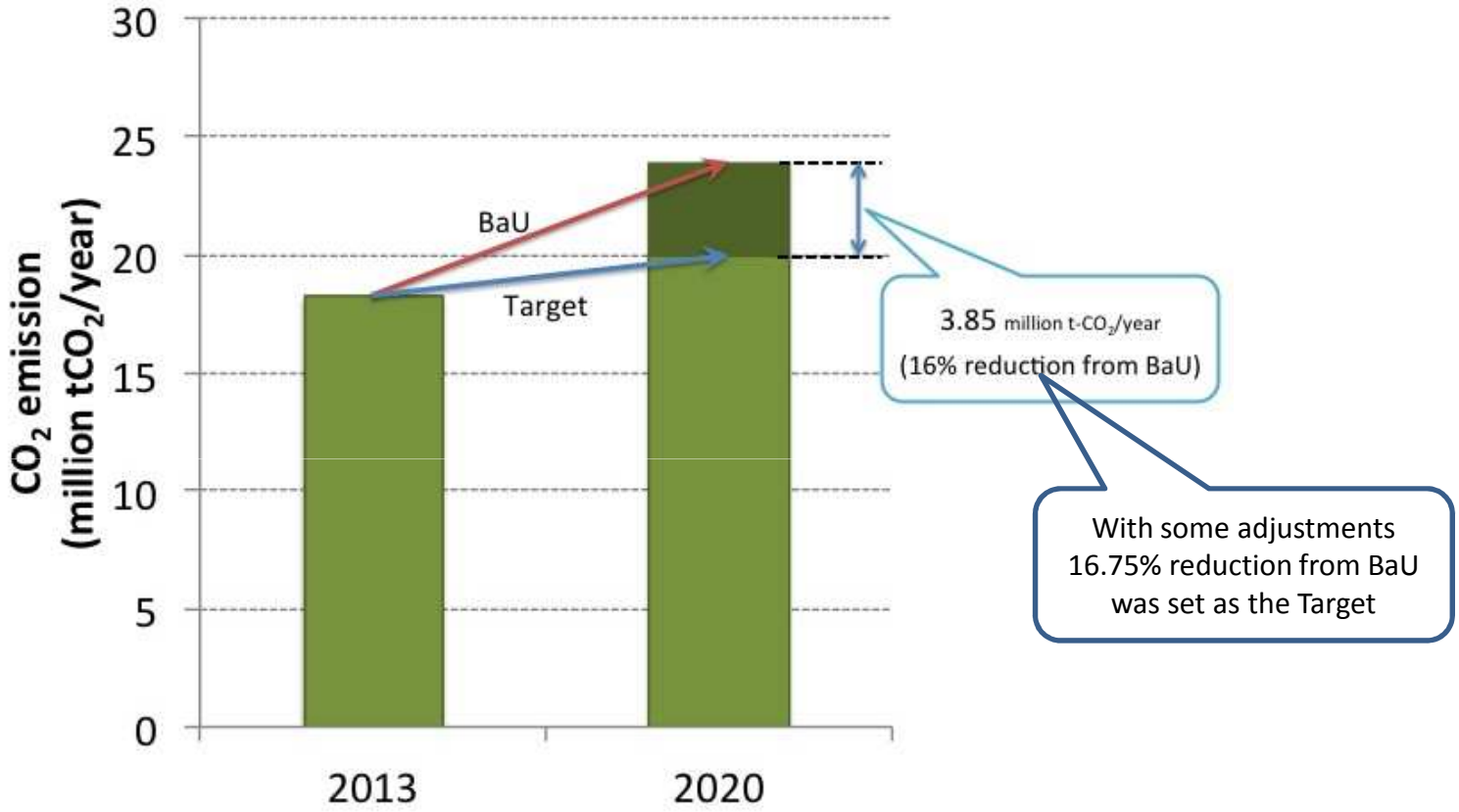
Bangkok Master Plan on Climate Change Plan 2013-2023

Bangkok Metropolitan Administration (BMA)

Target: 5 sectors (Energy, Transport, Waste mgt., Green Urban Planning, Adaptation planning) Under JICA support



BMA emission reduction target of the transport sector



With reference to AEDP, EEDP, as well as the Sustainable Development Transport Master Plan, the following BaU and the mitigation targets were identified.

BMA ER target = (The national target)* x (Indicator: fuel consumption ratio of BMA/Total Thailand)**

= 12 million t-CO2/year x 0.321 (32.1%)

Source: * OTP and ** DOEB

Mitigation target in the Energy Sector

Results of Calculation

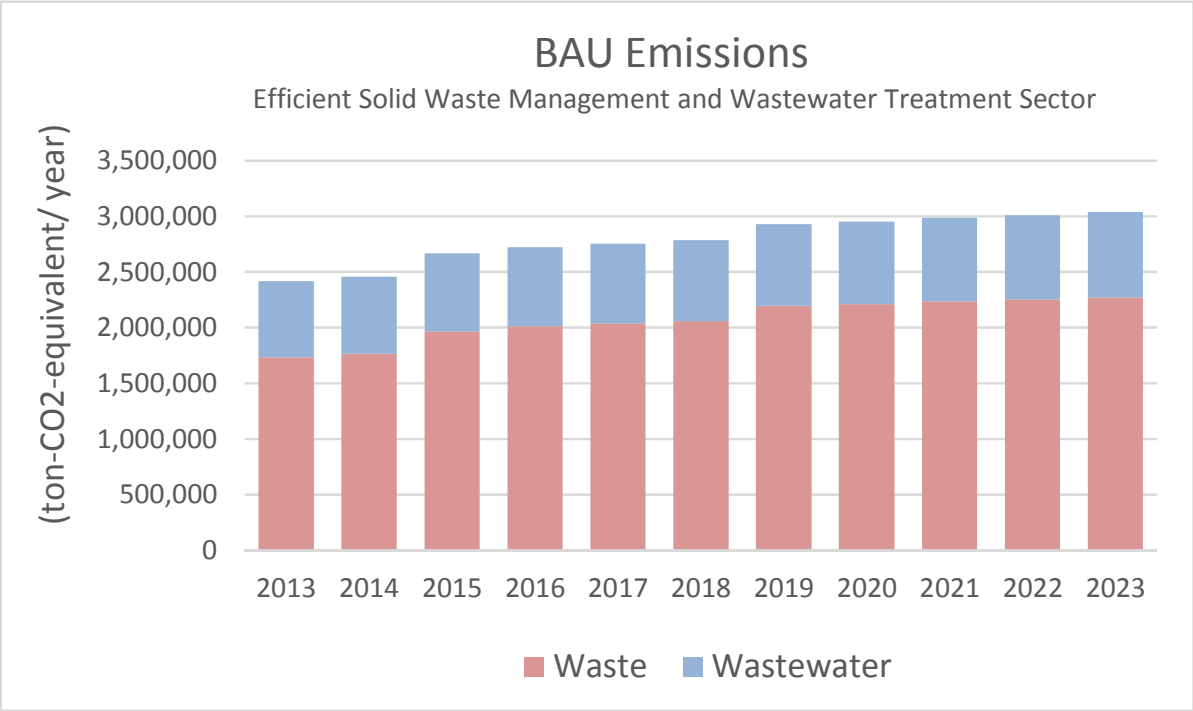
Mitigation Target in2020 (& 2023)

	Base Year (2010)	2020	(2023)
BAU Emission	23.580 million ton-CO2e	30.939 million ton-CO2e	33.384 million ton-CO2e
Emission with Mitigation Actions		26.853 million ton-CO2e 13.22% (Reduction against BAU emission in 2020)	27.229 million ton-CO2e 18.44 % (Reduction against BAU emission in 2023)

Waste and wastewater

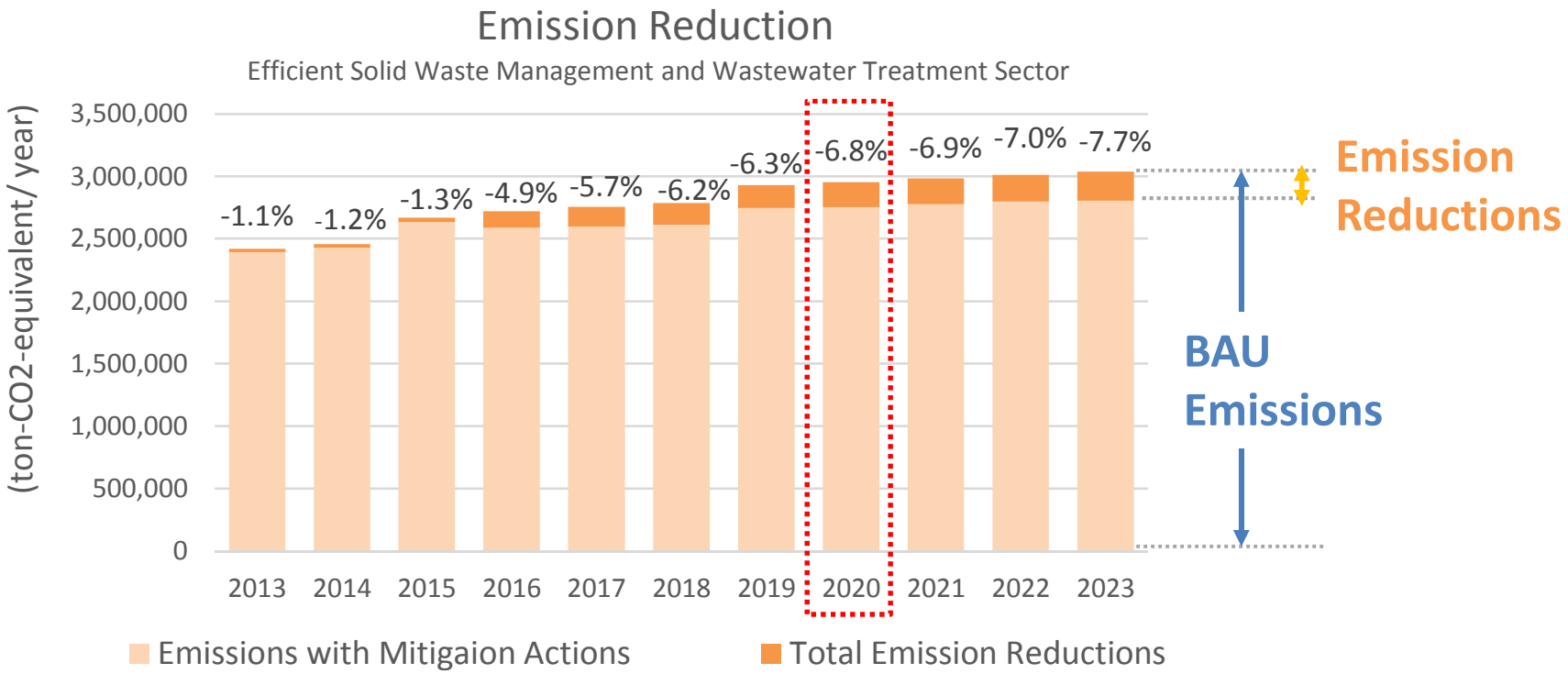
Methodologies for Calculation

- Assumptions:
  - Assumptions are principally based on BMA's future plans, e.g. most waste will be continuously treated at landfill sites in coming years while some are converted to compost or incinerated at waste incineration plant.
  - Waste and wastewater is expected to increase in line with growing population.
- Some BAU emissions are estimated using the available data.

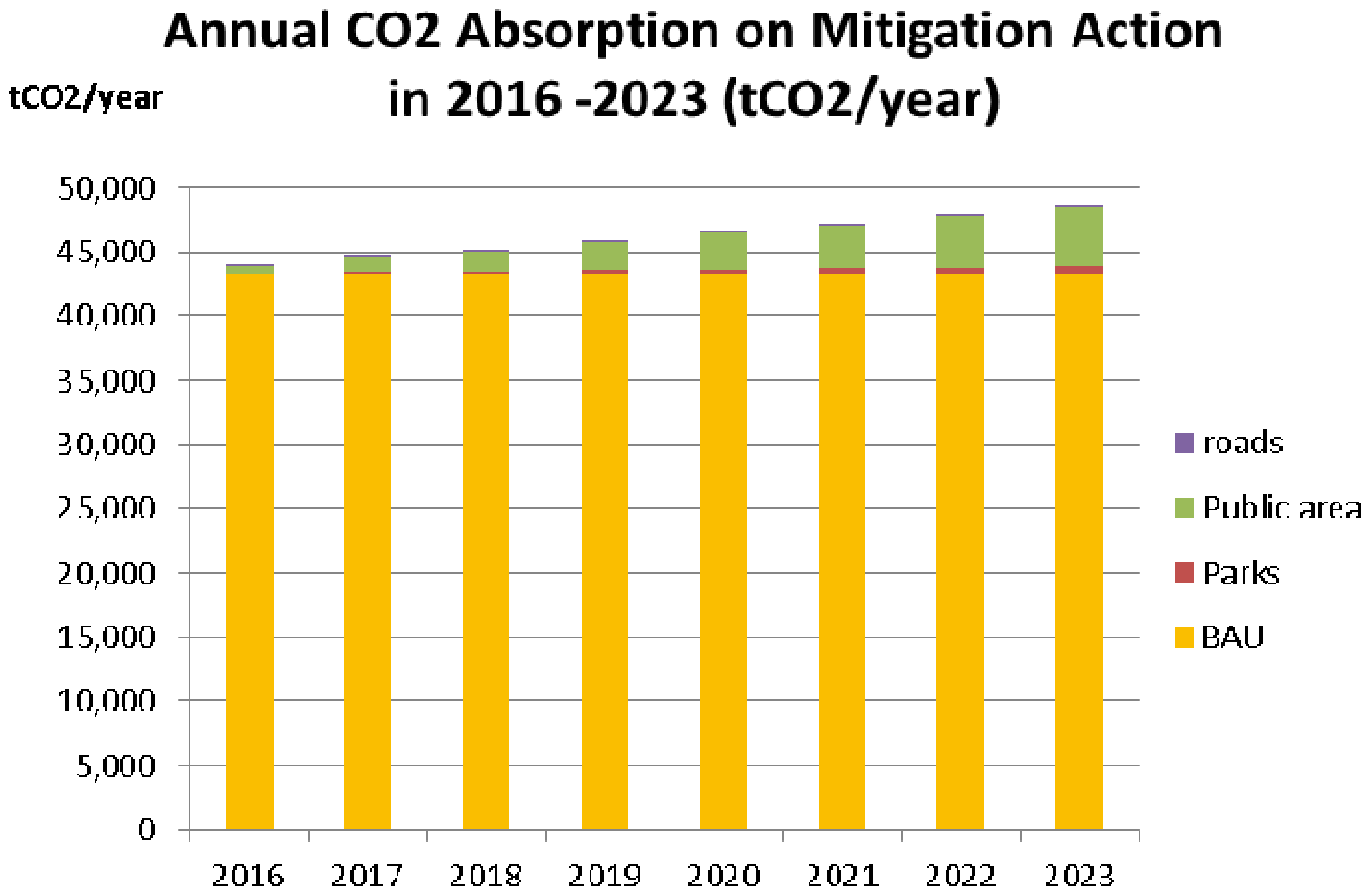


Waste and wastewater

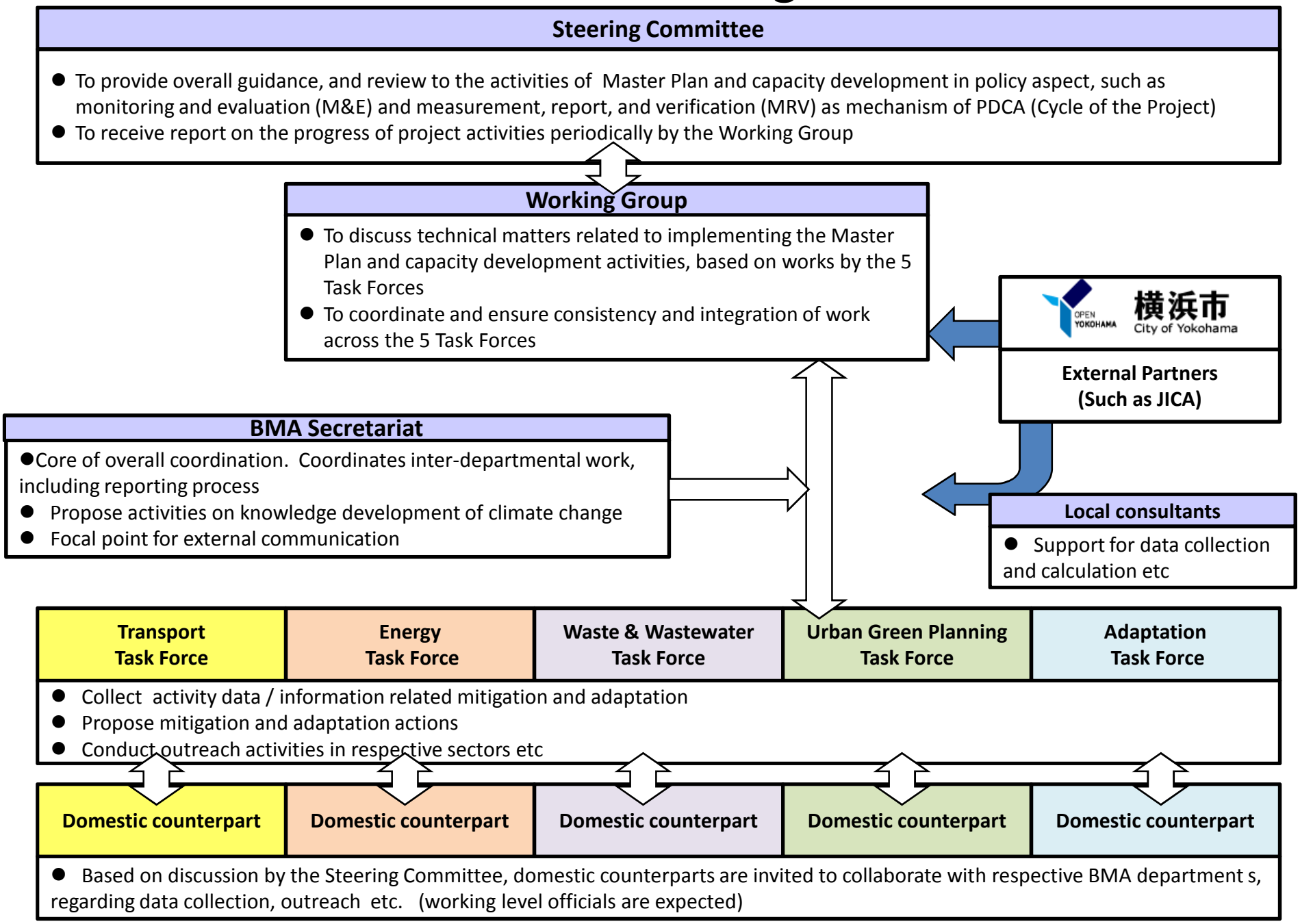
- A bottom-up approach was applied
  (mitigation reduction target is aggregated by the amount of expected emission reduction of each mitigation action)
- Quantifiable mitigation actions were identified based on MRV-ability and data availability
- Appropriate activity data and emission factor were identified and selected
  - BMA's actual data
  - Estimated value based on reasonable and conservative assumptions
  - Default data provided by IPCC Guidelines, etc.



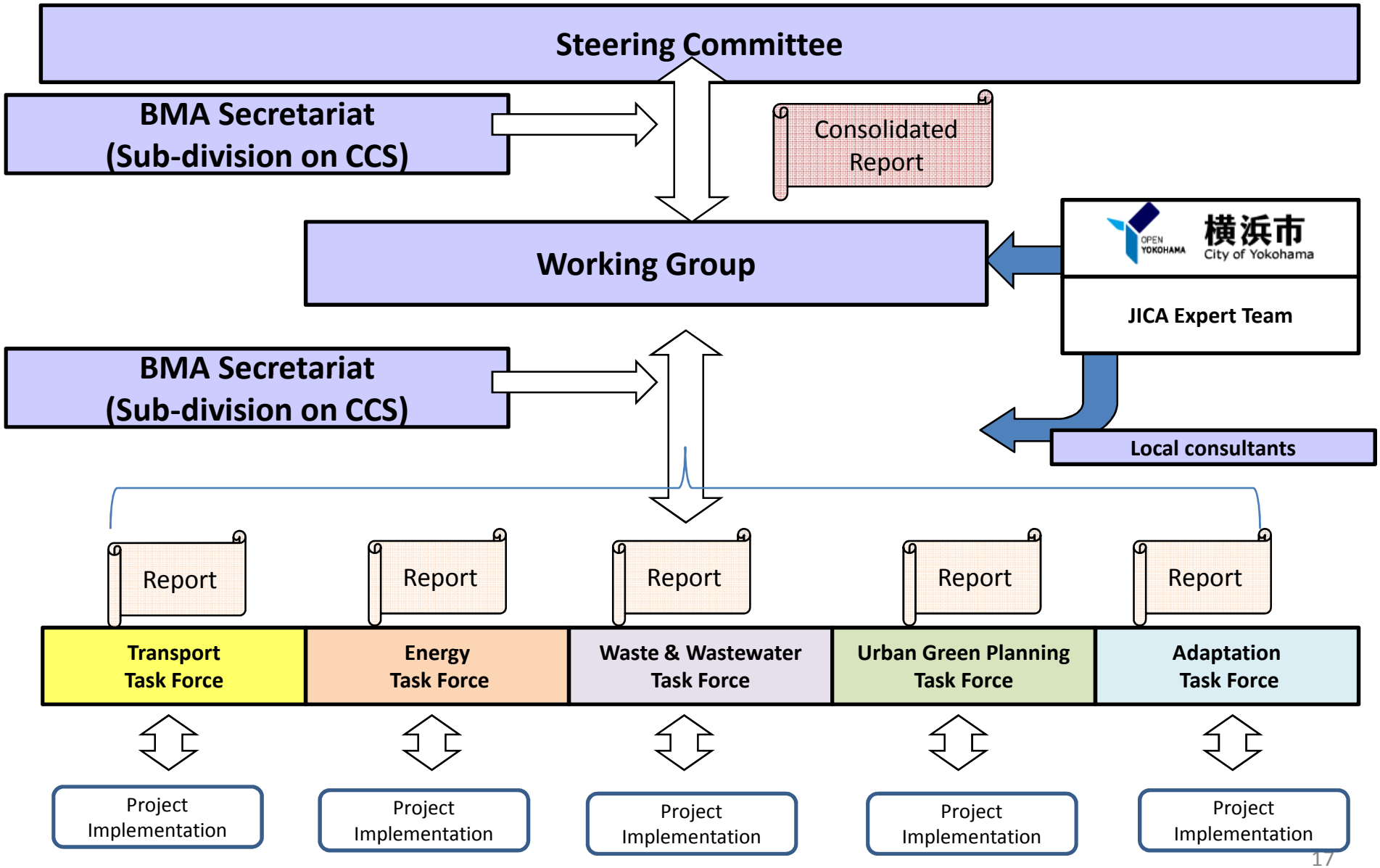
Green Urban Planning
Annual CO2 Absorption by Mitigation Action



Institutional Arrangement



Tracking the progress of the Master Plan by
Measurement, Report and Verification (MRV) & Monitoring and Evaluation (M&E)



Mitigation Projects under the Bangkok Master Plan

- ✓ In order to realize the mitigation targets in the respective sectors, projects/activities were proposed and are now in the process of implementation.
- ✓ For example, in the transport sector, the development of MRT and Monorail (royal authorities and BMA are in charge) is included, with expectation 950,000 t-CO2e emission reduction by the end of 2020.

Mitigation Projects under the Bangkok Master Plan

Title	**Development of MRT (and Monorail)**
Details	● Purple line (Bang Yai - Bang Sue) (MRTA, 23.0 km, Short term (2015)) ● Purple line (Bang Sue - Rat Burana) (MRTA, 19.8 km, Long term (2019)) ● Blue line (Hua Lumphong - Bang Khae, Bang Sue - Tha Phra) (MRTA, 27.0 km, (2017)) ● Green line (Bearing - Samut Prakarn) (MRTA, 12.8 km, (2018)) ● Green line (Mo Chit - Saphan Mai - Cucot) (MRTA, 18.4 km (2018)) ● Green line (Samut Prakarn - Bang Poo) (MRTA, 7.0 km (2019)) ● Pink line (Kae Rai - Min Buri) (MRTA, 36.0 km,(2017)) ● Orange line (Taling Chan - Min Buri) (MRTA, 37.5 km(2019)) ● ARL (Don Mueng- Phaya Thai) (SRT, 21.8 km (2019)) ● Dark Red Line (Hua Lumphong - Bang Sue-Rang Sit-Thammasat) (SRT, 42.8 km(2016)) ● Dark Red Line (Hua Lumphong-Bang Born) (SRT, 18.0 km,(2019)) ● Light Red Line (Bang Sue-Phaya Thai- Makkasan - Huamak) (SRT, 19.0 km,(2016)) ● Light Red Line (Bang Sue-Taling Chan) (SRT, 15.0 km, (2016)) ● Light Red Line (Taling Chan-Salaya) (SRT, 14.0 km, (2019))
Emission Reduction (Ex Ante)	**950,000 CO2e ton /year** * Source: MRV Demonstration Study (DS) using a Model Project 2012, Modal Shift through Construction of Mass Rapid Transit (MRT) System, Final Report, JWA & ALMEC Consortium for MRV Demonstration Study
Current Status	Some of the new lines opened already and reduction have already taken place ➔ Necessary to quantify GHG as Ex Post MRV

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