



Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY



Low-Carbon Model Town in Khon Kaen Municipality

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and

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APEC Low-Carbon Model Town Project Wrap-up Symposium

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Introduction of Khon Kaen

Khon Kaen is commercial and political center of Isan (or Northeast Region Thailand). This is a dynamic city which has been one of the fastest-growing areas in Thailand.

Name of City: Khon Kaen Municipality

Status: City Municipality

District: Muang Khon Kaen

Province: Khon Kaen

Total Area: 46 km²

Population: 120,143 of registered

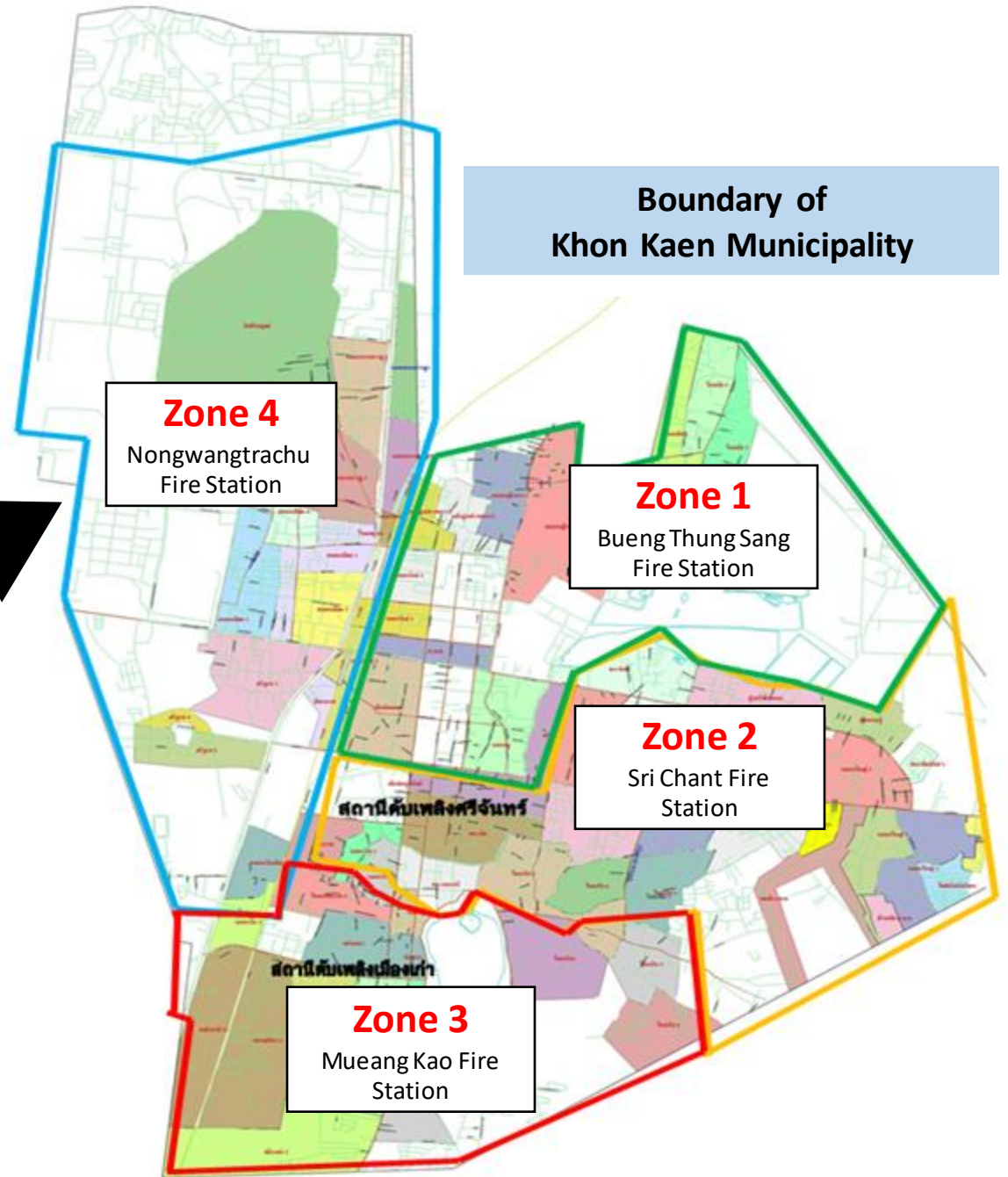
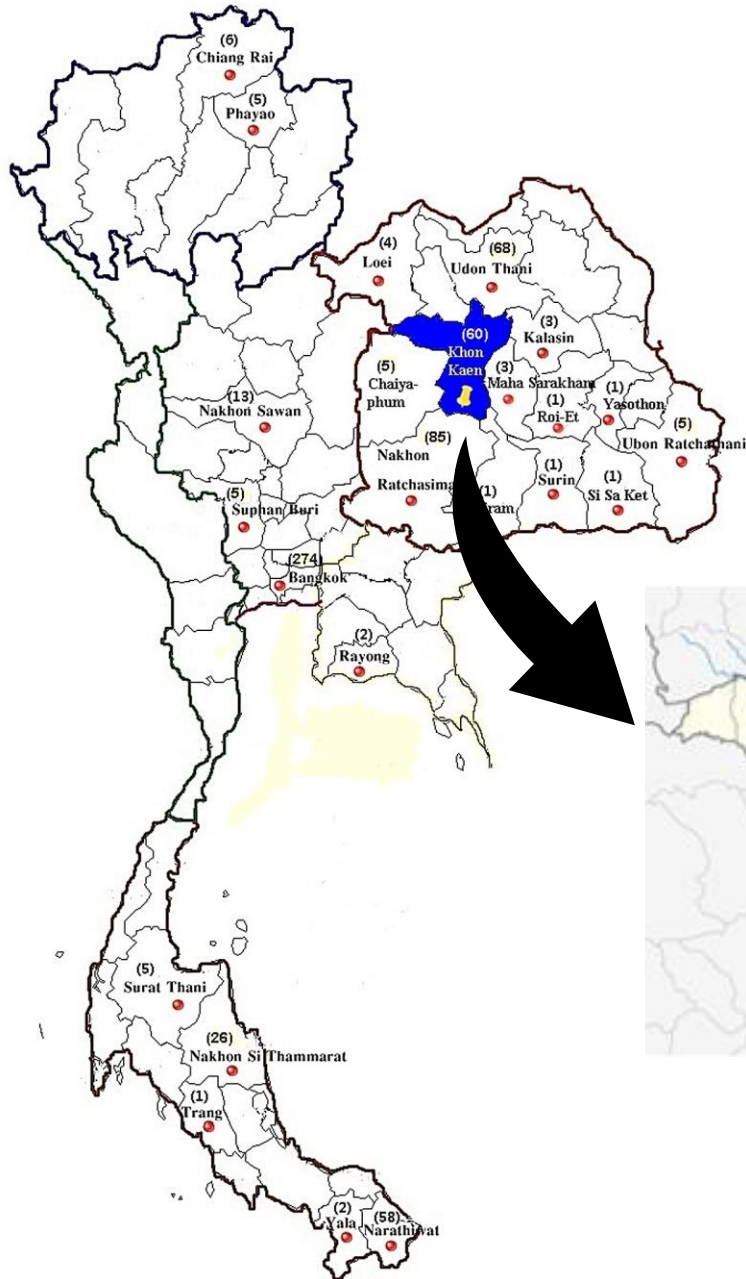
GPP: 200,00 Million THB

Reaching to Khon Kaen:

- By personal cars, bus, or train.
- By airplane (Khon Kaen International Airport).



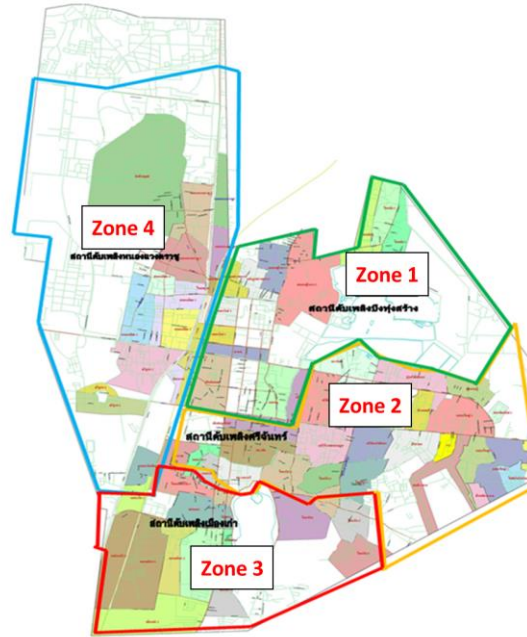
Introduction of Khon Kaen



Introduction of Khon Kaen Municipality



Administrative:



Zone	No. of Community
1	17
2	28
3	31
4	19
Total	95

Climate:

Tropical savanna climate

Economic:

Rely on tourism, and industry.

Environmental:

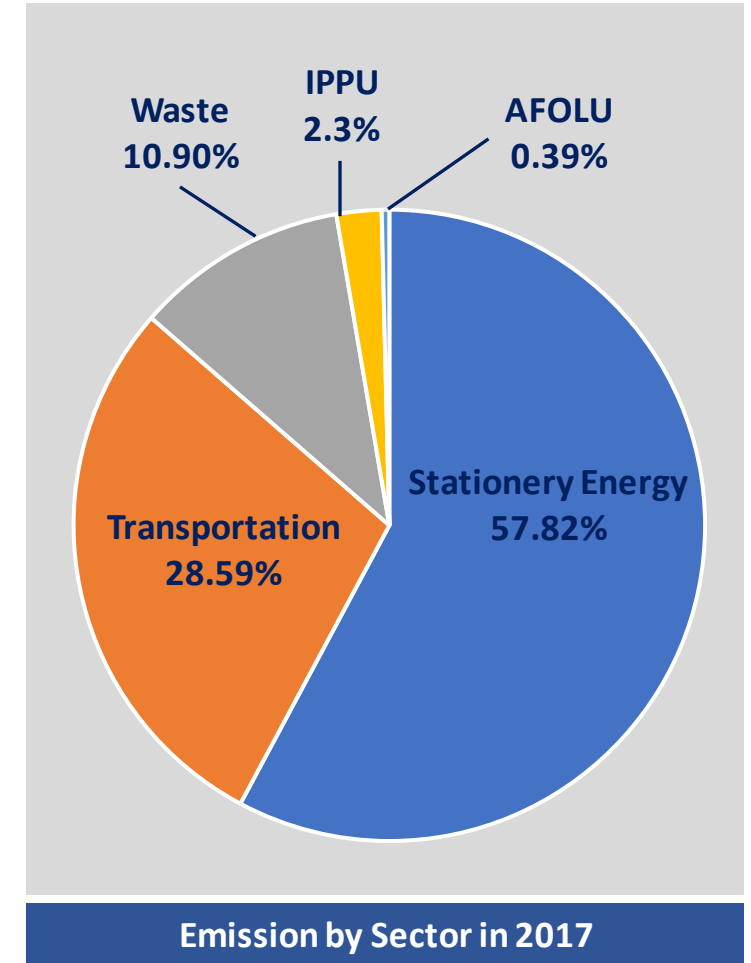
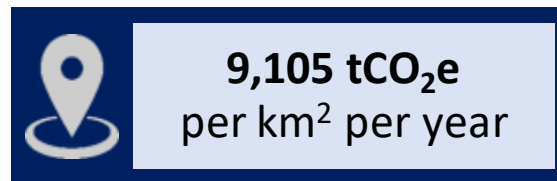
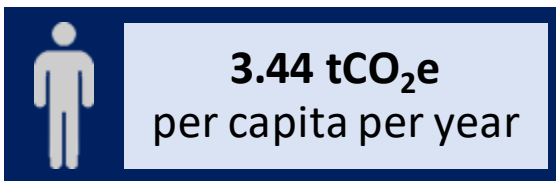
Waste generated is around 210 tons/day – composition is:

- 59% is Organic waste
- 23% is Plastic / Foam waste
- 6% is Paper waste
- 2% is Fabric waste
- 10% is others

CO₂ Reduction Results and Roadmap

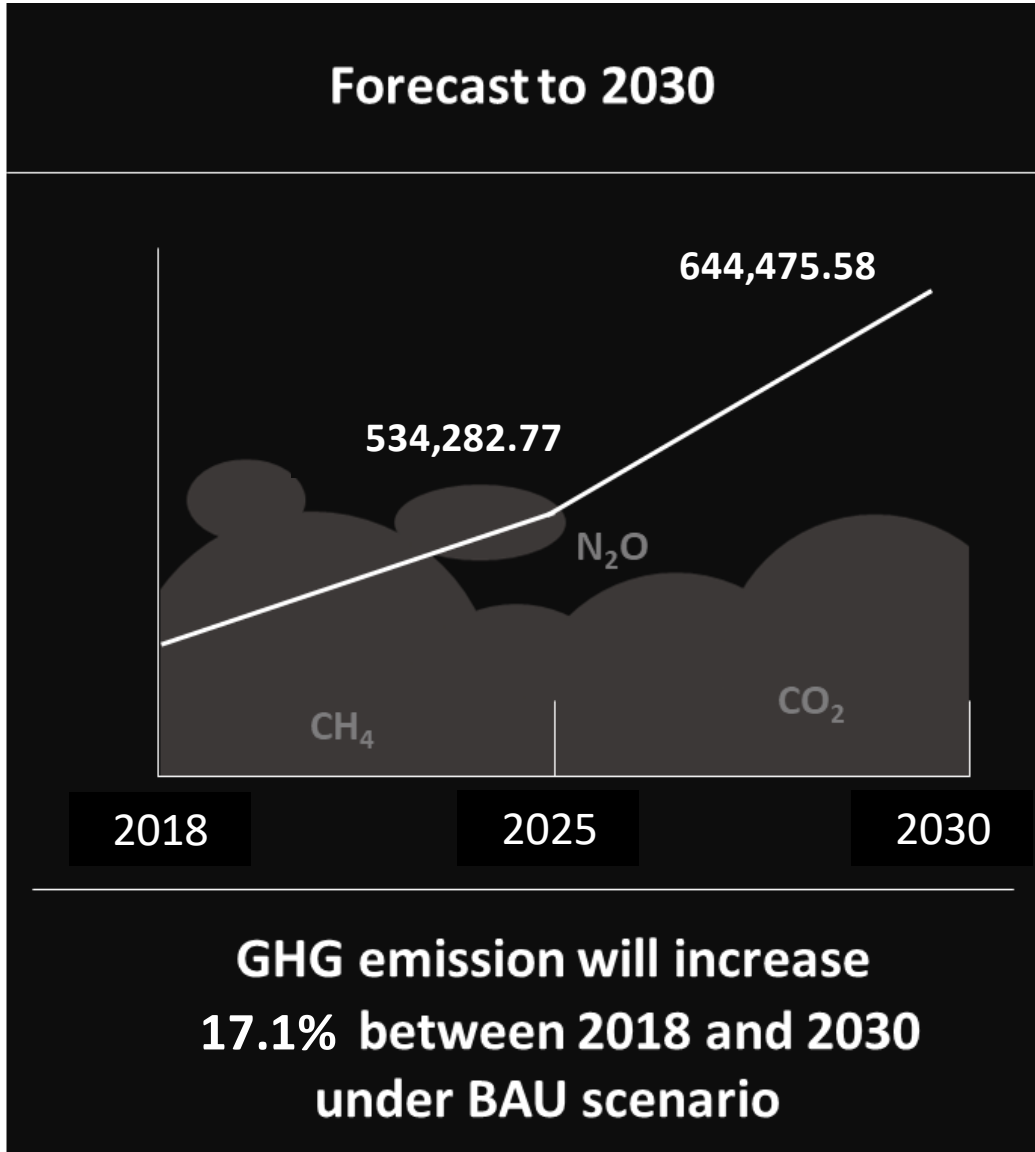
City Carbon Footprint (CCF)* between 2013 and 2017 by using *GPC Standard* and reporting the results with BASIC+ level

Year	Emission by Scope (Unit: tCO ₂ e)					
	Stationery Combustion	Transportation	Waste	IPPU	AFOLU	Total
2013	212,651.89	80,743.82	80,166.65	7,875.28	1,137.73	382,575.38
2014	215,206.98	154,741.55	86,057.50	7,992.57	1,253.90	465,252.50
2015	226,252.29	98,768.23	84,413.15	7,905.45	1,375.26	418,714.38
2016	236,234.41	105,854.45	77,470.79	9,579.31	1,513.86	430,652.81
2017	239,076.54	118,214.43	45,078.71	9,497.45	1,613.15	413,480.28



Remark * The CCF was evaluated under the project of “Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand”; funded by gef which commits to collaborate with TGO and UNDP. The project timeline is between 2016 and 2021.

CO₂ Reduction Results and Roadmap



Base Year:

2017

Year of Consideration:

between 2018 and 2030

Condition:

BAU Scenario

Assumption Applied for Forecast:



Stationery Energy sector has CO₂ emission growth rate at **3.04%** per year between 2018 and 2030.



Transportation sector has the highest of CO₂ emission growth rate at **4.85%** per year between 2018 and 2030.



Waste sector has CO₂ emission growth rate at **2.86%** per year between 2018 and 2030.



IPPU sector has negligible CO₂ emission growth rate.



AFOLU sector has negligible CO₂ emission growth rate.

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	Low Emission Measures (Study)	Short-term (2020-2022)	Medium-term (2023-2025)	Long-term (2026-2030)	Expect of CO ₂ Reduction (tCO ₂ e)
Energy Efficiency Measures					
1	Replace with LED bulbs to increase lighting efficiency	✓			42,695.36
2	Install new lighting equipment for public roads	✓			
3	Create new implementation framework with private sector to enhance future EE projects		✓		
Alternative Energy Measures					
4	Install new lighting equipment, solar cell, for public area	✓			57,756.00
5	Production of biodiesel	✓			
6	Energy production from solar energy (self-consumption)	✓			
Waste Management Measures					
7	Establish waste management stations to produce compost	✓			20,468.62
8	Install composting bin at household	✓			
9	Promote 3Rs activity	✓			
Transportation Management Measures					
10	Promote and enhance biodiesel for vehicle	✓			59,955.57
11	Promote and enhance gasohol for vehicle	✓			
12	Establish LRT	✓			
13	Promote walking and cycling		✓		
14	Promote private EV vehicle			✓	
15	EV vehicle for public transportation			✓	
Agricultural and Forestry Management					
16	Increase green area				1,452.00
Total Expect CO₂ Reduction (tCO₂e)					182,327.05

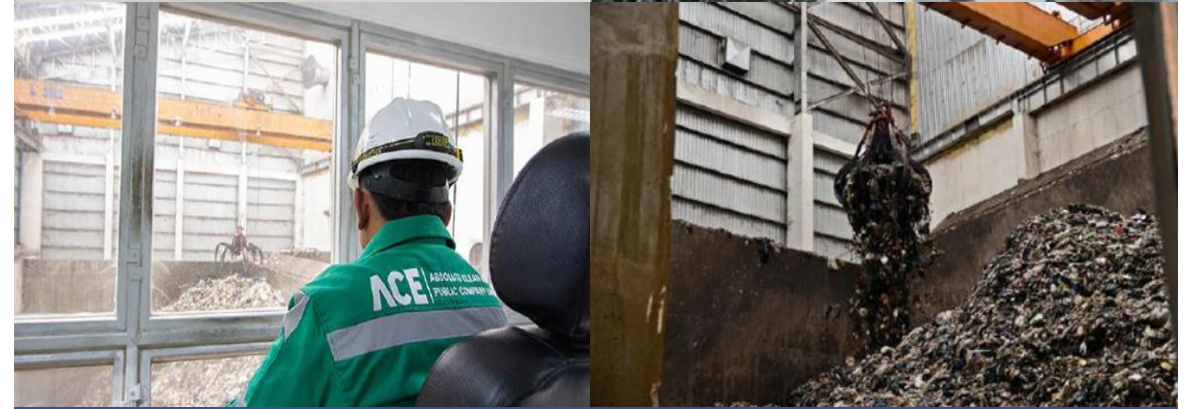
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Project of Recycle Waste Segregation

Supported by: Municipality / gef, UNDP, and TGO

CO₂ Reduction: 667 TCO₂e between January 2018 and July 2021



Project of RDF Development

Supported by: Municipality

CO₂ Reduction: 96,007 TCO₂e between November 2016 and July 2021

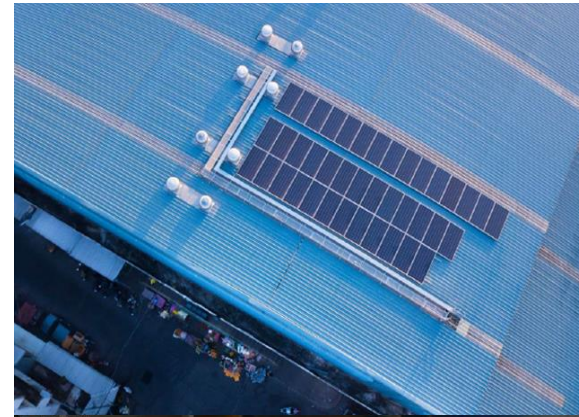
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Project of Solar Cell Installation at Wastewater Treatment Plant

Supported by: Municipality / gef, UNDP, and TGO

CO₂ Reduction: 22 TCO₂e between August 2019 and July 2021



Project of Solar Rooftop Installation at Municipal Market

Supported by: Municipality / gef, UNDP, and TGO

CO₂ Reduction: 23 TCO₂e between August 2019 and July 2021

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Project of Establish Waste Management Station

Supported by: Municipality / gef, UNDP, and TGO

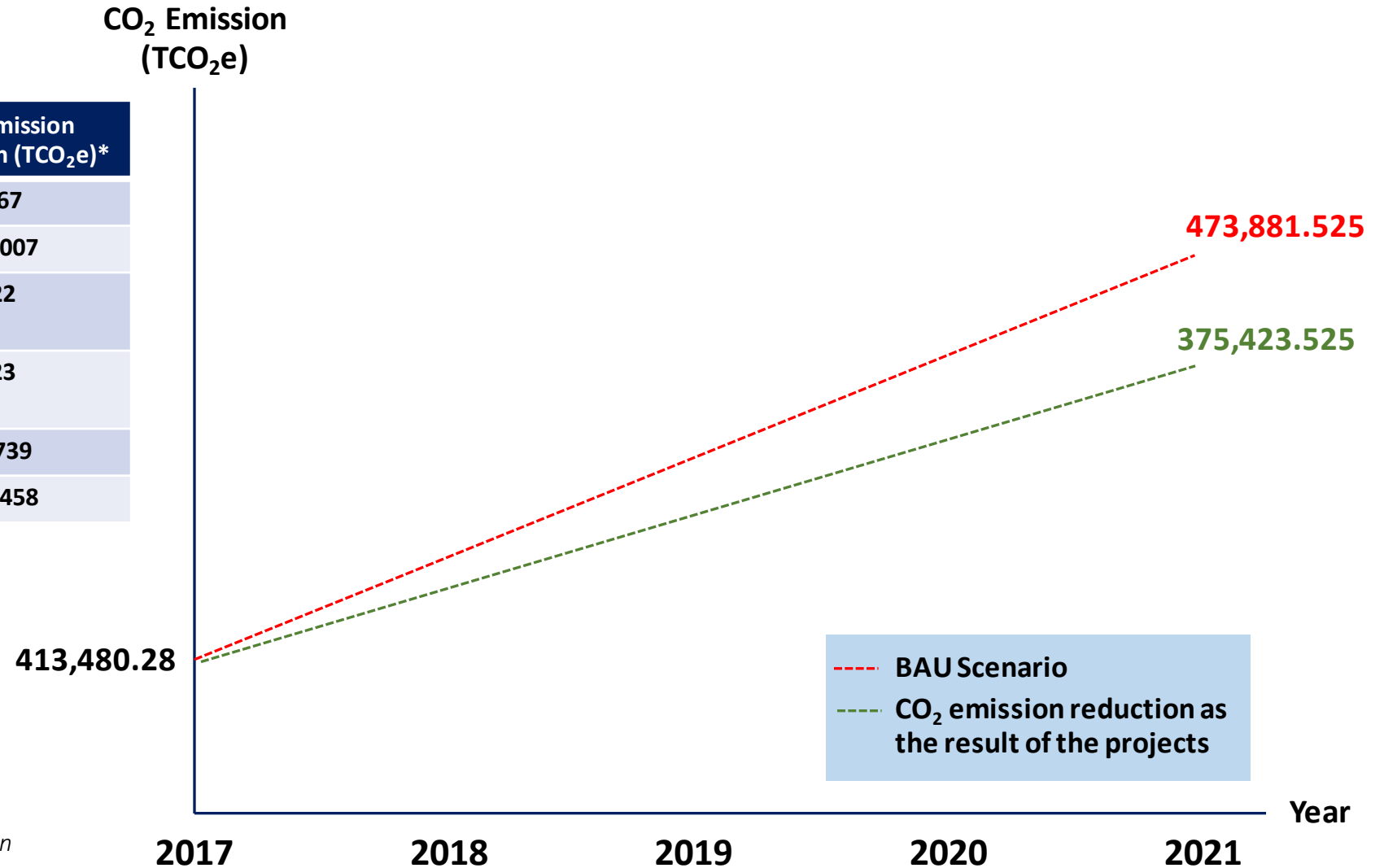
CO₂ Reduction: 1,739 TCO₂e October 2018
and July 2021

Low-Carbon Model Development in Khon Kaen Municipality

Project	CO2 Emission Reduction (TCO ₂ e)*
Recycle Waste Segregation	667
RDF Development	96,007
Solar Cell Installation at Wastewater Treatment Plant	22
Solar Cell Installation at Municipal Market	23
Establish Waste Management Station	1,739
Total	98,458

Almost **21%** reduction of CO₂ emission in 2021 compared with BAU scenario.

Remark * The CO₂ emission reduction was evaluated under the project of "Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand"; funded by gef which commits to collaborate with TGO and UNDP.



Notable Achievements



1.) Expansion this initiative to additional CO₂ reduction projects ex. Low Carbon City Project by gef, UNDP, and TGO.

2.) Partnership among local stakeholders (ex. people sector, private, and public sector) to tackle with climate change challenge.



4.) Expansion to other studying of transportation projects ex. Khon Kaen Light Rail Transit (LRT) or Khon Kaen Smart City Development.



3.) The direct and/or indirect CO₂ reduction as the result of different projects related.



5.) Creation of new waste management framework at community level or considered as source of waste.



6.) Being an initiative point and/or inspiration and/or best practice for other sectors in terms of CO₂ reduction ex. youth.

Self-assessment results by LCT-I system

None of self-assessment due to the project is currently in the developing phase.

Low-Carbon Model Town in Images



The Municipality was awarded the “Clean Energy for Life” which a reward granted by Power Development Fund under the Office of Energy Regulatory Commission (ERC)

(Source: <https://sdg.kku.ac.th/1053>)



6MW of RDF Power Plant

(Source: <https://www.ace-energy.co.th/>)



Solar rooftop installation at Municipal market and public building
(Source: Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand)



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Thank you for your attention !