

Progress Study on Impact of E-mobility on Emission Reduction in Thailand

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Inter-regional Workshop on Electrification of Mobility-Challenges and opportunities for transport, energy and spatial planning

Organized by The United Nations Economic Commission for Europe (UNECE)

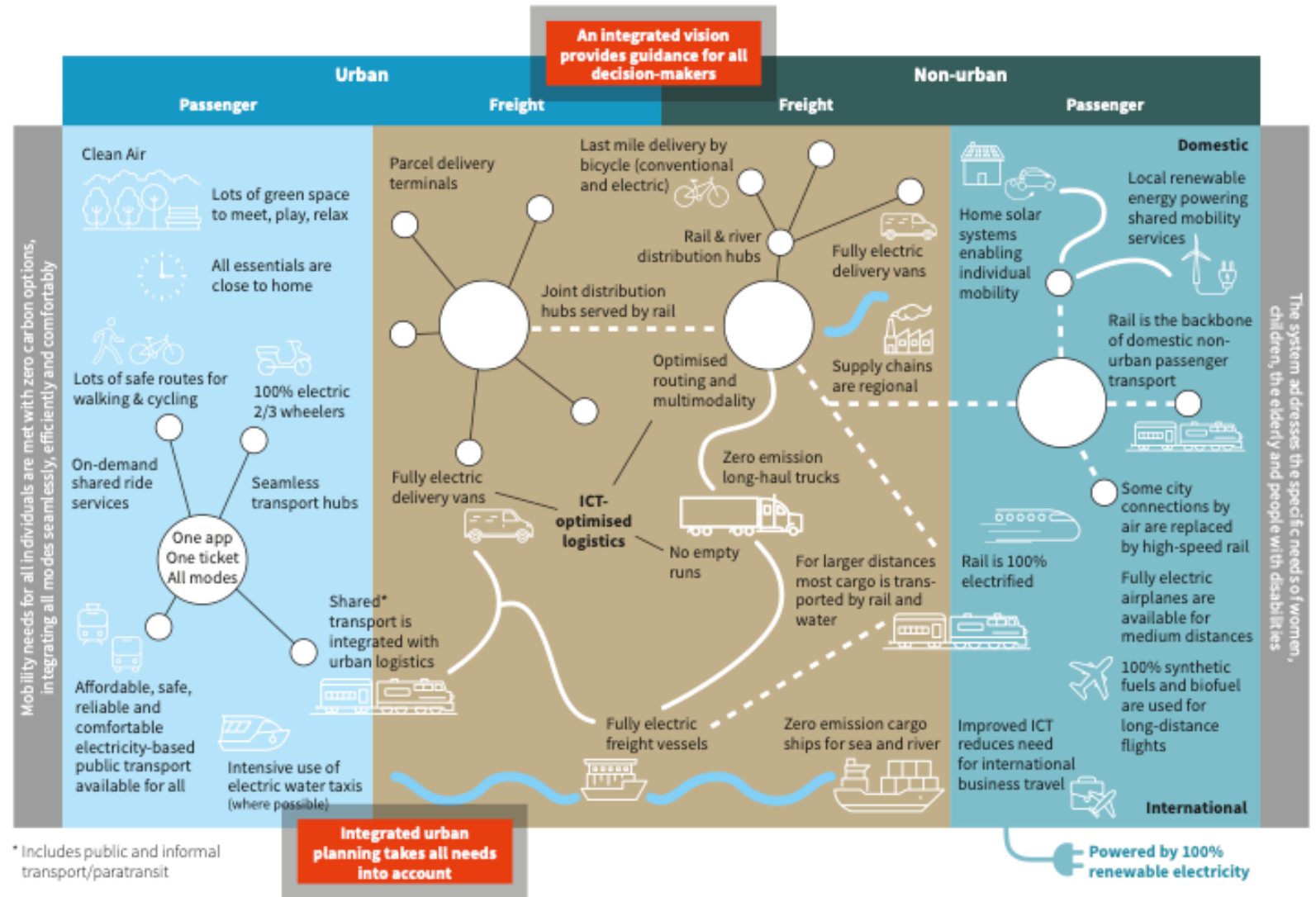
5 September 2022

Geneva, Switzerland

Council for Decarbonising Transport in Asia

“The Path to Zero: A Vision for Decarbonised Transport in Asia”

In our vision for 2050, the mobility needs of all citizens are met with zero-carbon options that are integrated in a seamless, efficient and convenient manner.



Current national EV policy and strategies in Thailand

National Electric Vehicle Policy Committee

Chaired by Deputy Prime Minister

Official order by office of Prime Minister on 7 Feb 2020

Key Drivers

- Air Pollution Reduction
- Greenhouse Gases Reduction
- New Industry Creation



 **Visions** : Thailand becomes the *global production* and *supplier hub* for electric vehicles and automotive parts.

Goal at 2030: 30% Zero Emission Vehicle (ZEV) production by 2030 in Thailand

National Incentive Schemes

Local Production Promotion

- EV Investment Scheme by Board of Investment
- *Reduce Import Tax/ Excise Tax for vehicles and auto parts*

Infrastructure Preparation

- Special electricity price for public charging operators
- *Planning public charging station locations (under planning)*

Usage Promotion

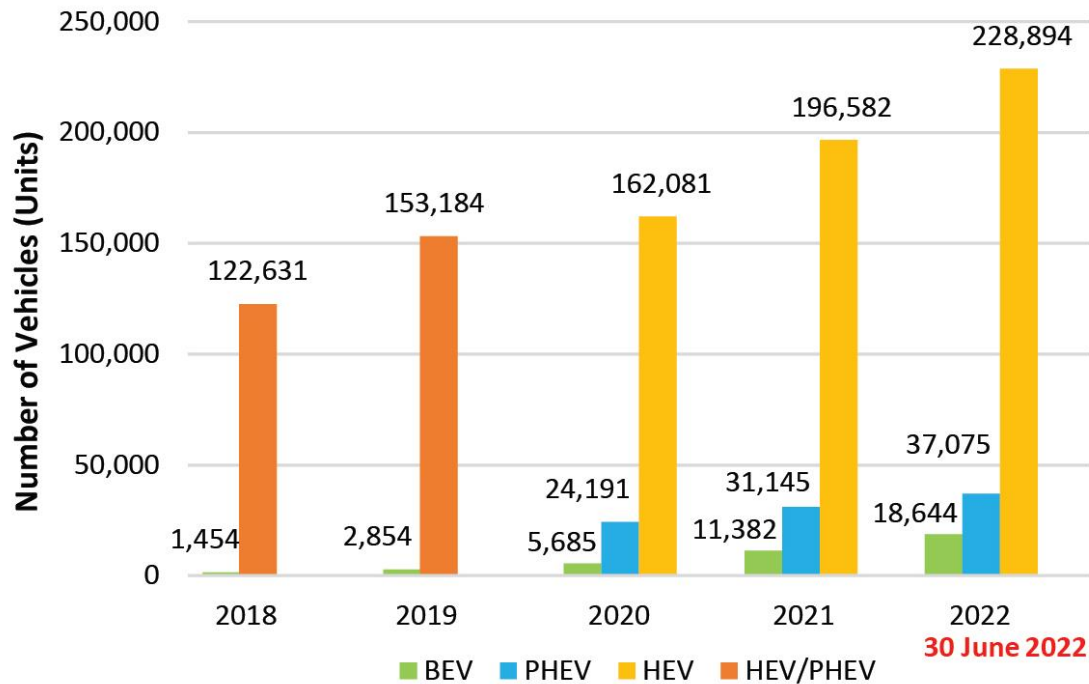
- Cheaper annual vehicle registration fee
- Government EV fleet policy
- *User subsidy*

Current national EV policy and strategies in Thailand

Current EV Status in Thailand

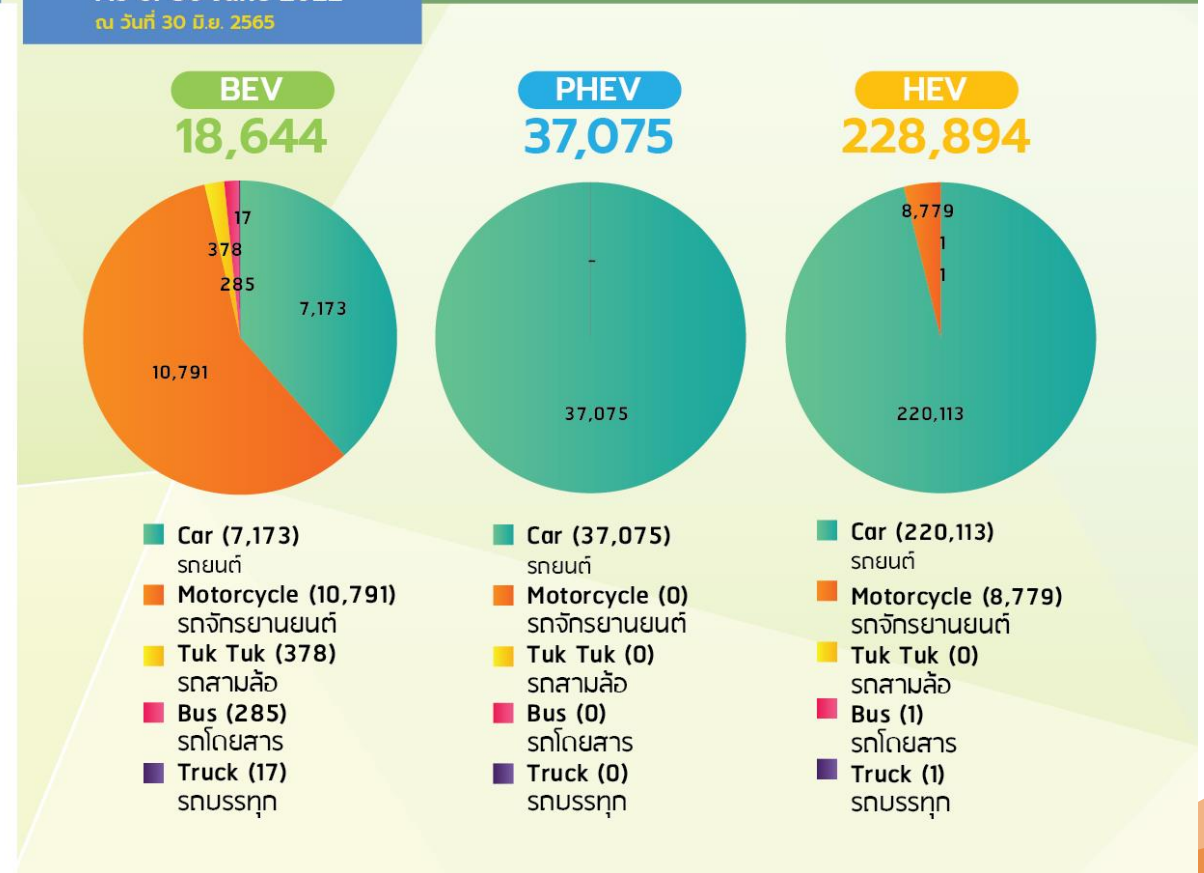
Accumulated Number of xEV Registration
จำนวนยานยนต์ไฟฟ้าสะสม

Between 2018-2022
ระหว่างปี 2561-2565

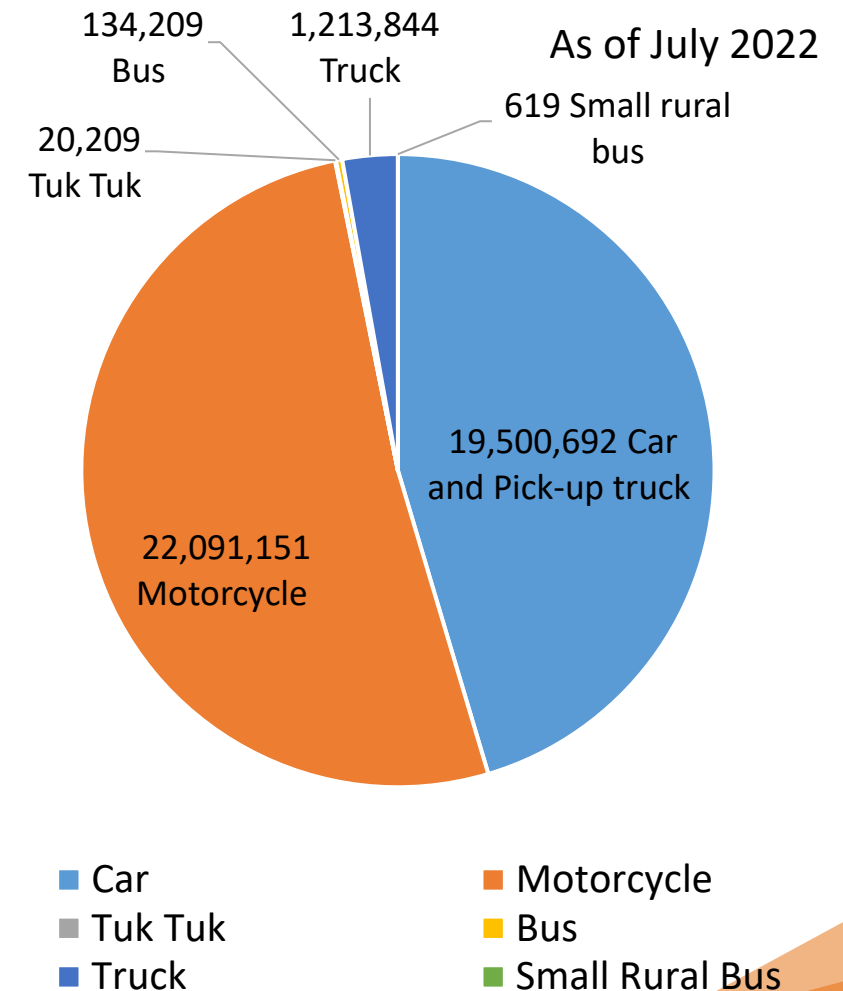
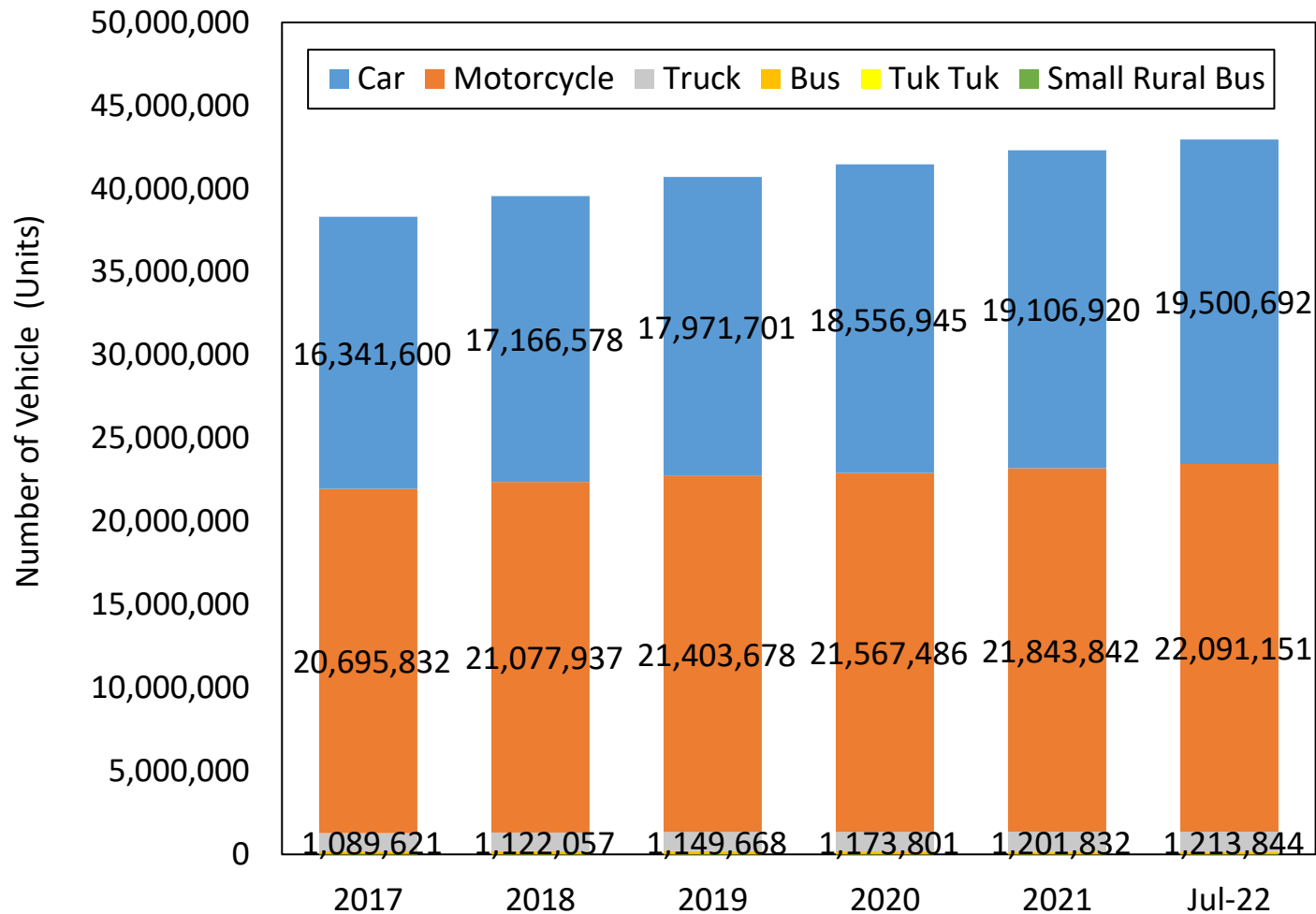


Accumulated Number of xEV Registration in 2022
จำนวนยานยนต์ไฟฟ้าสะสม

As of 30 June 2022
ณ วันที่ 30 มิ.ย. 2565

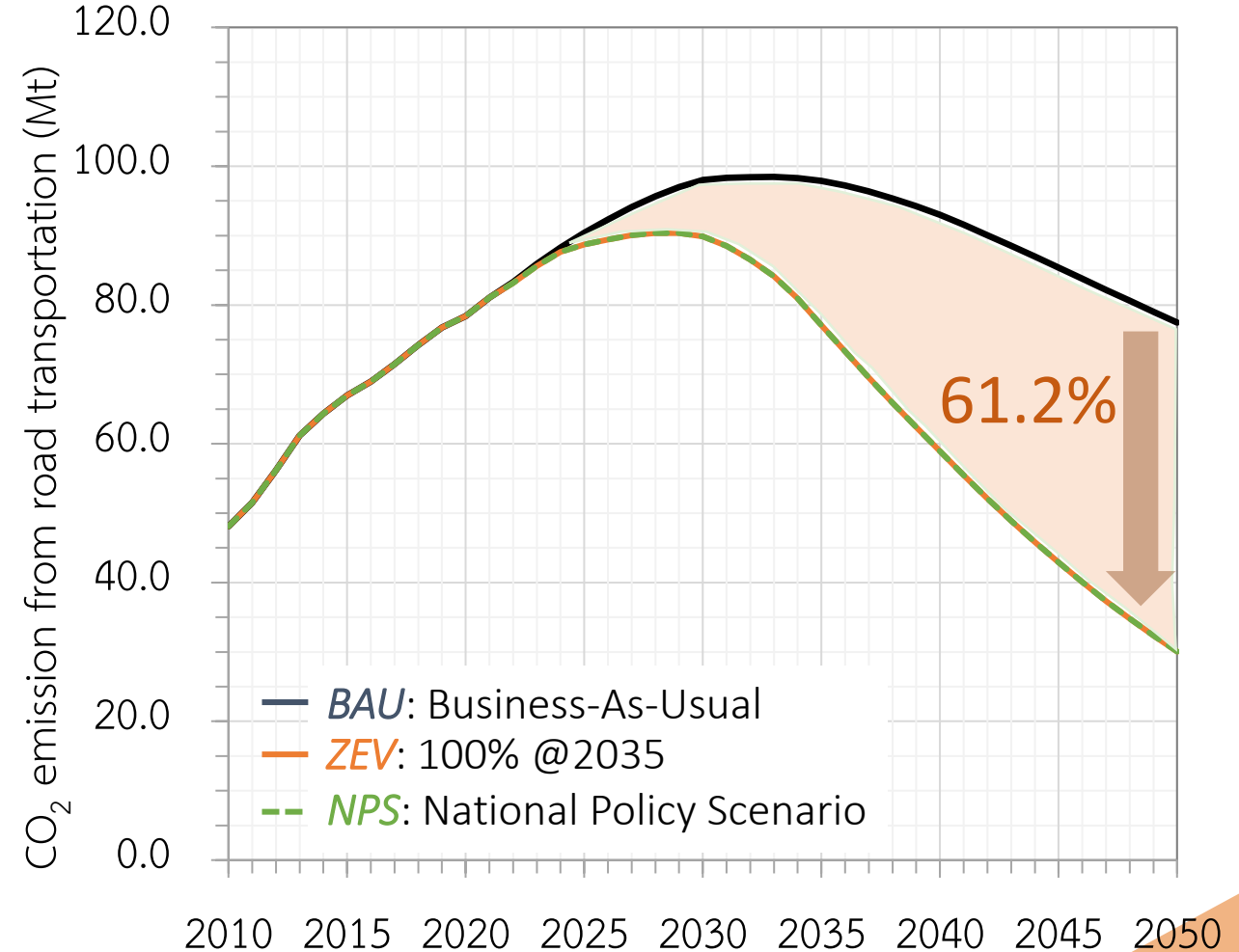
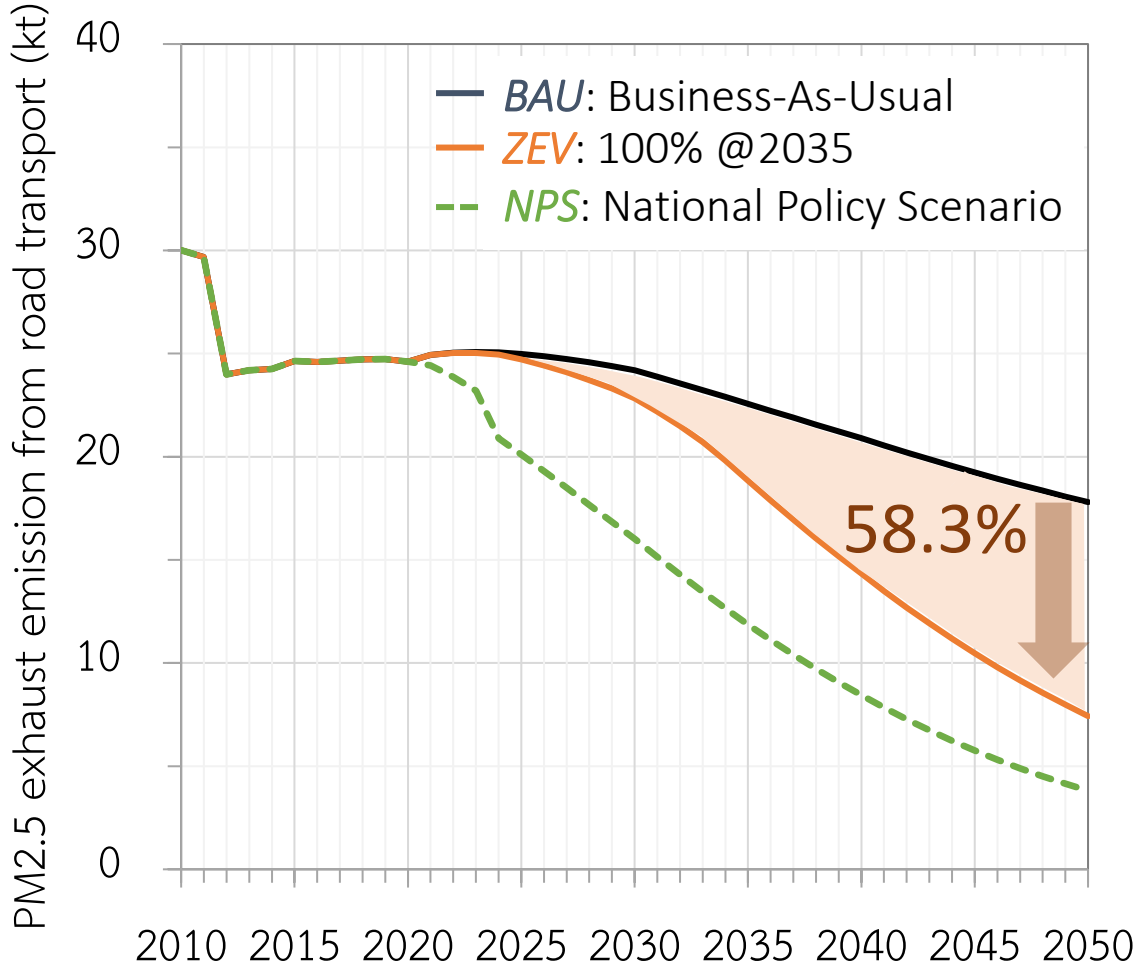


Current status of vehicle registration in Thailand



KMUTT study on PM_{2.5} and CO₂ emissions reduction under national policy

Emissions reduction potential from road transport in Thailand

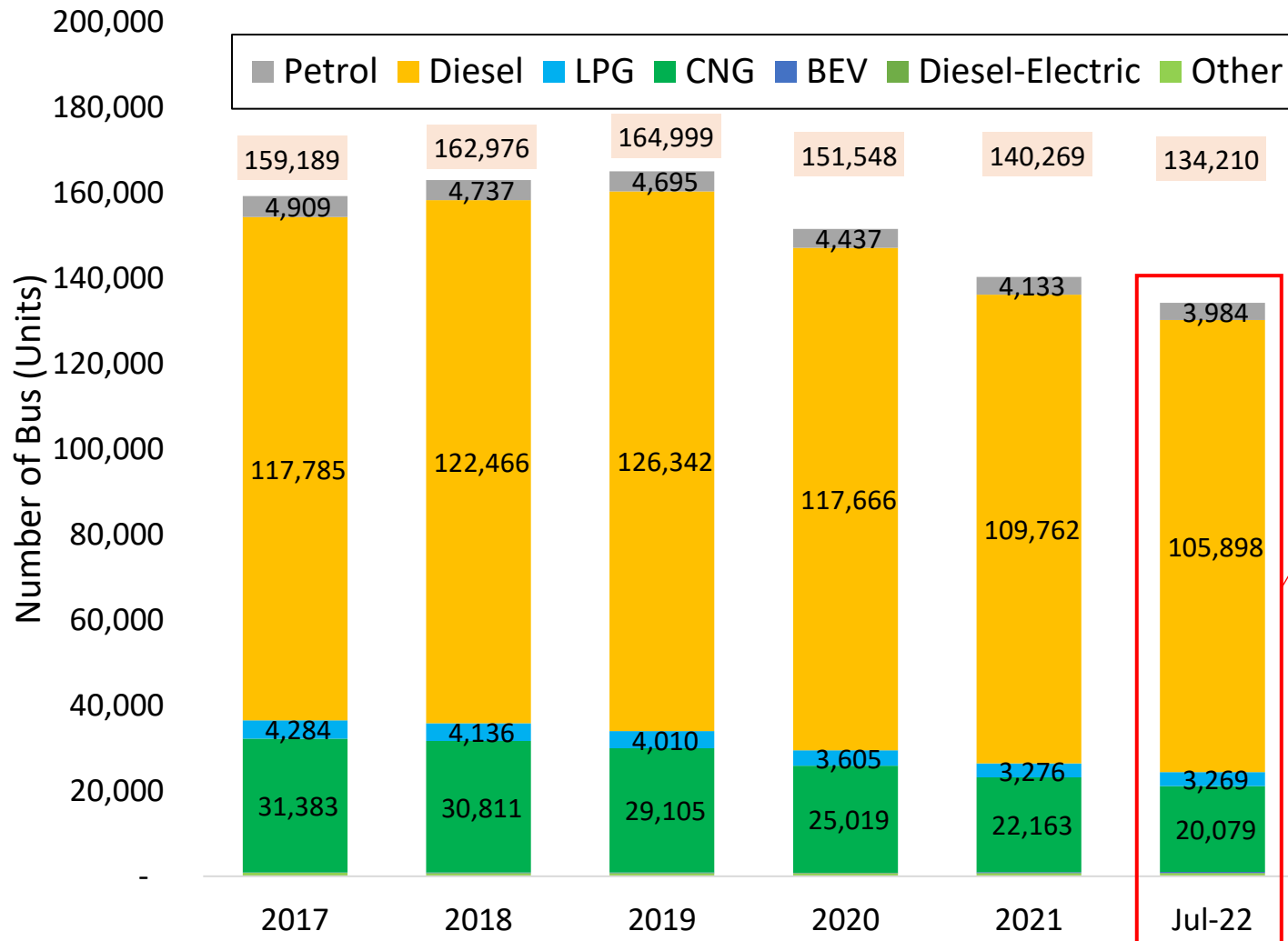


The analysis results are under review, please do not reference.

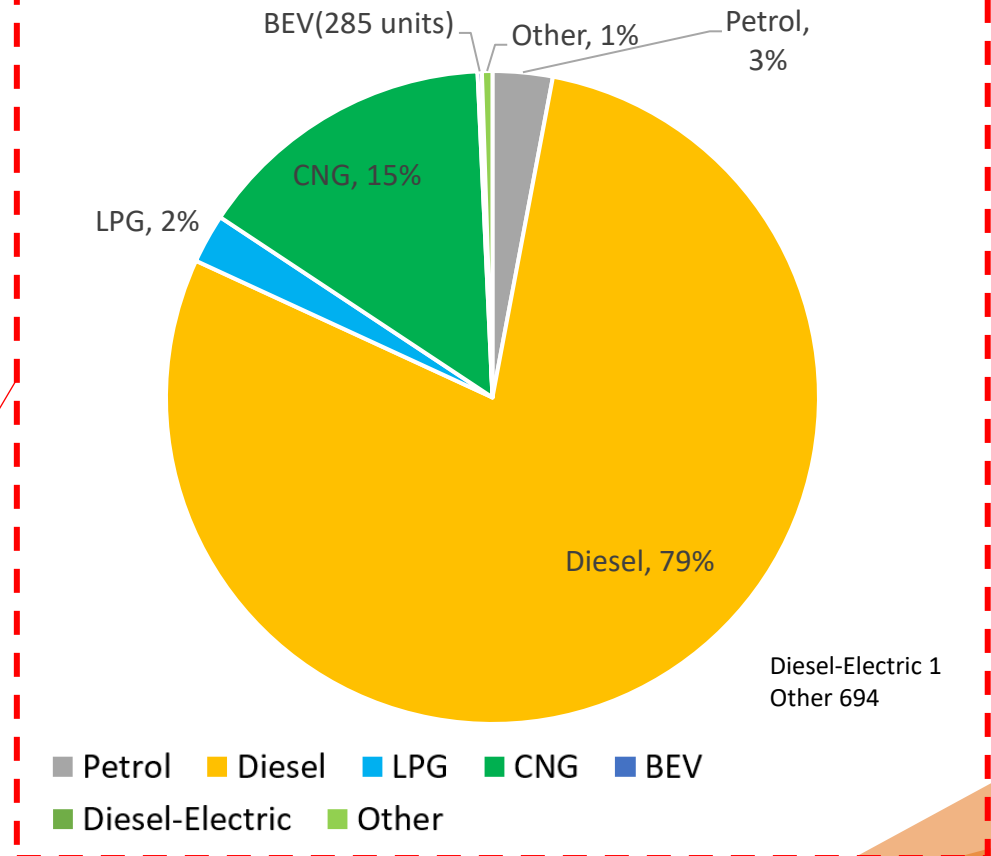
Source: A Feasibility Study on the Replacement of Current Diesel Vehicle by Electric, CNC, and Euro 6 Exhaust Emission Standard Vehicles in the Bangkok Metropolitan Region for Ambient PM_{2.5} Concentration Reduction, Funded by National Research Council for Thailand joint with National Institute of Development Administration (NIDA), 2022.

KMUTT study on transition to electric bus

Accumulative Bus Registration in Thailand

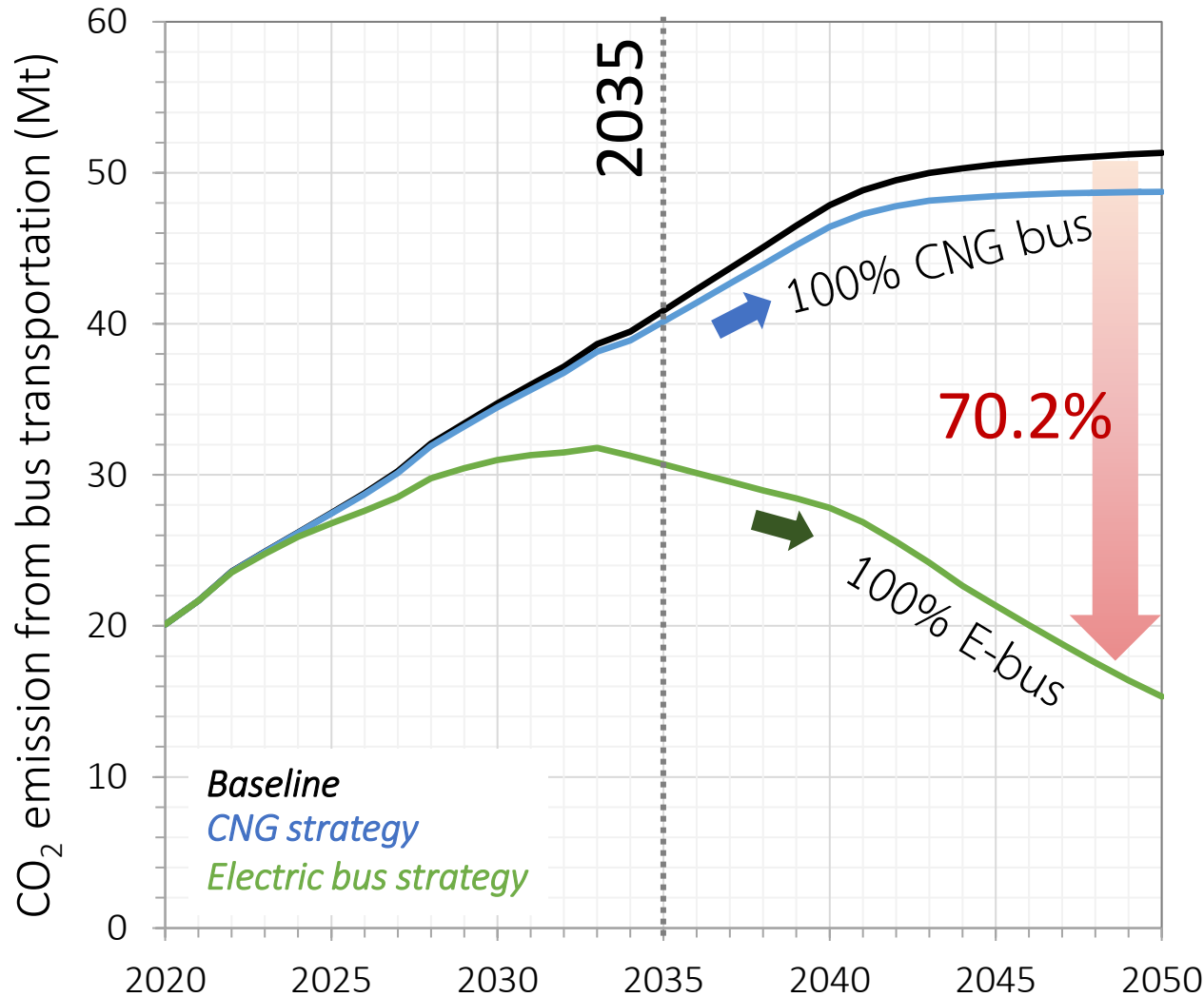


Bus by fuel types in Thailand as of 31 July 2022



KMUTT study on transition to electric bus

CO₂ reduction by electric bus promotion (well-to-wheel)



Based on the considered scenarios, after 2035 all new registered bus are powered by *CNG* or *electricity*.

The projection of the baseline scenario was based on *ratio of buses registered in Thailand* in 2022.

Emission factor

Electricity (Consumption): 481 gCO₂/kWh

Electric bus: 589 gCO₂/km

CNG bus: 1937 gCO₂/km

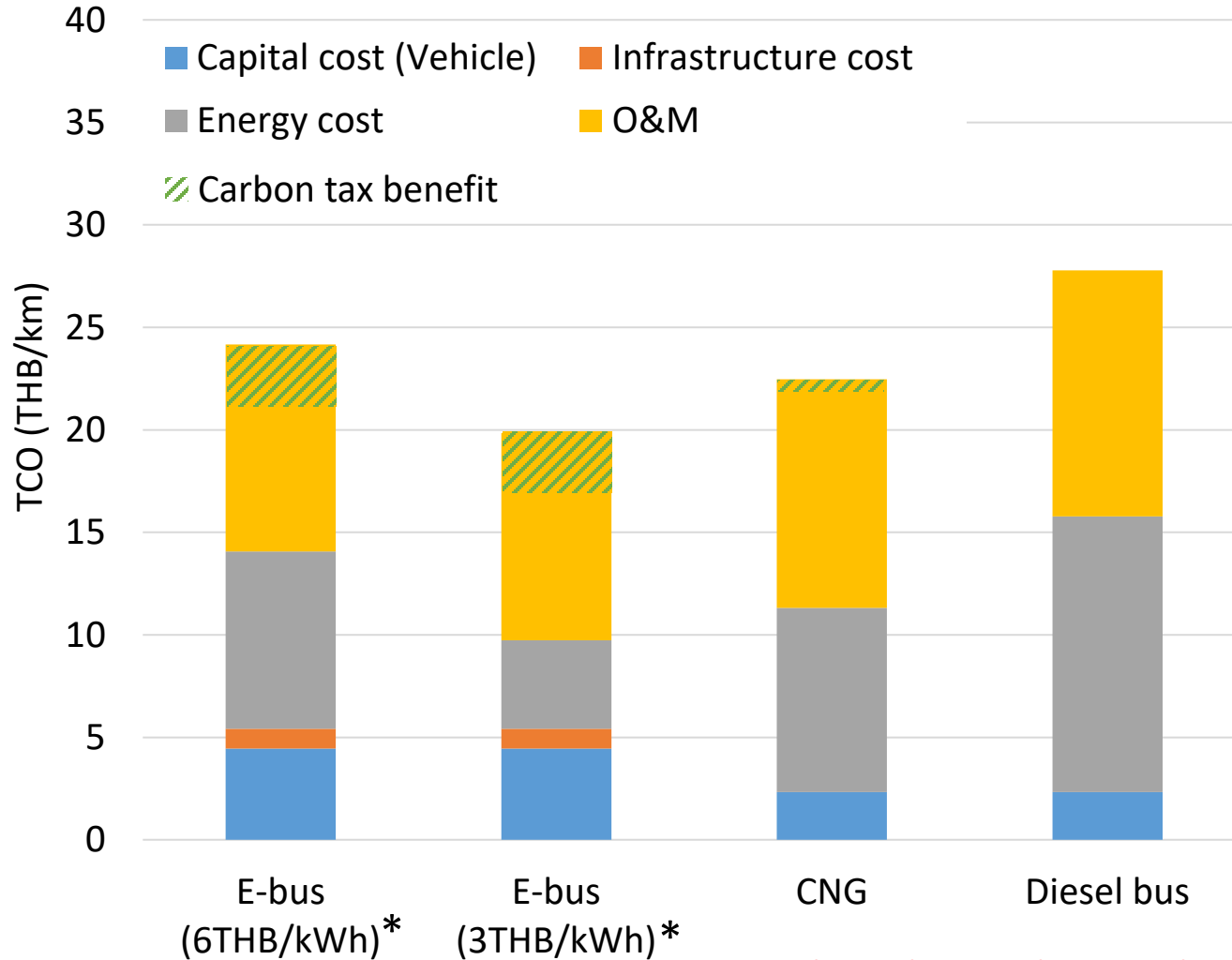
Diesel bus: 2073 gCO₂/km

The analysis results are under review, please do not reference.

Source: UNESCAP, Study report for transitioning to electric public transport (bus) in Thailand, 2022.

KMUTT study on transition to electric bus

Total Cost of Ownership and Cost-Benefit Analysis



B/C ratio

Type of bus	Without carbon tax benefit	With carbon tax benefit
Diesel	0.97	0.97
CNG	1.20	1.21
Electric (6 THB/kWh)	1.12	1.24
Electric (3 THB/kWh)	1.36	1.45

- Energy cost is one of the most influential factors that impact the overall cost.
- TCO of the electric bus was the lowest if the electricity cost remain 3 THB/kWh.

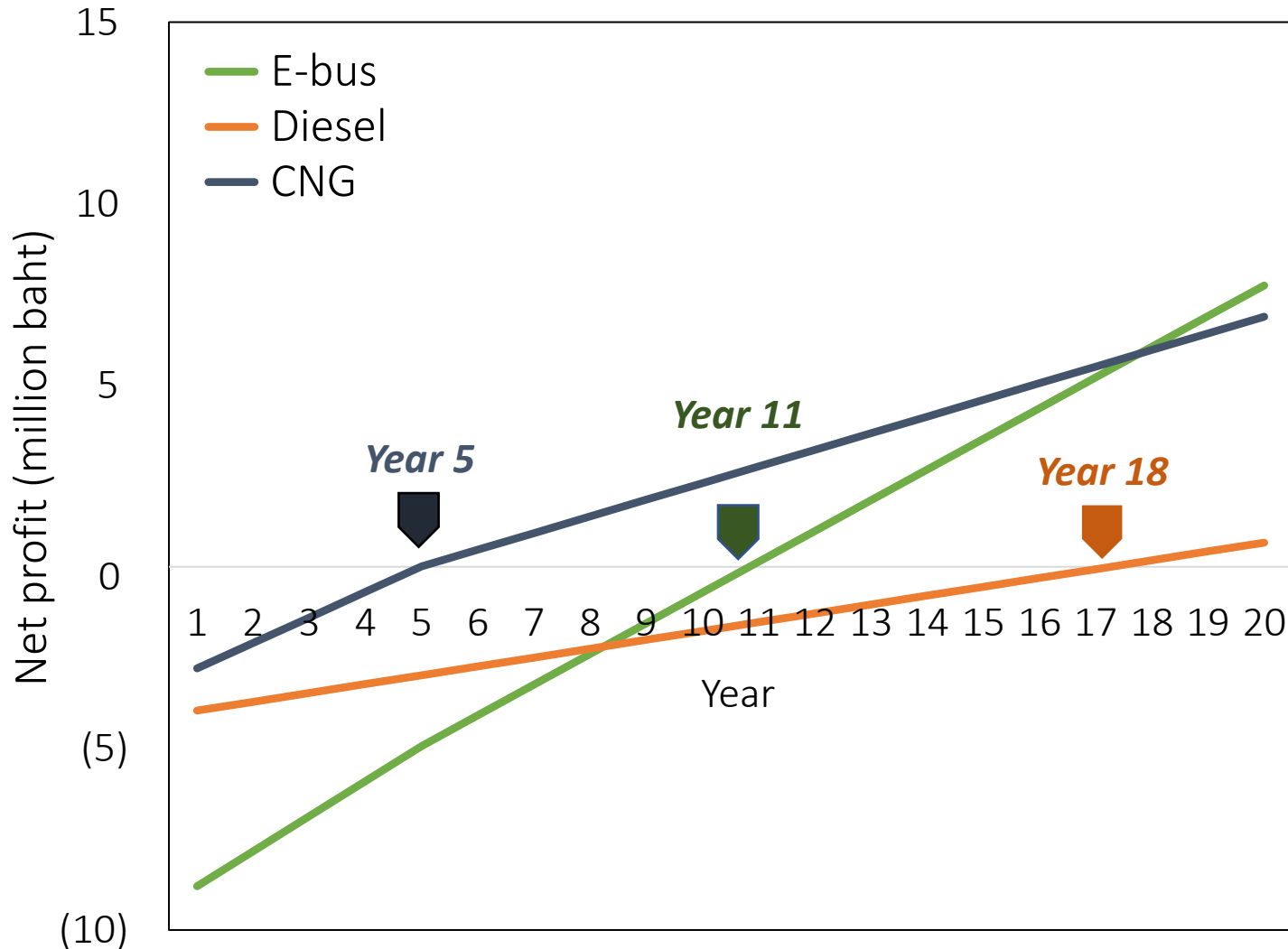
*Electricity cost

The analysis results are under review, please do not reference.

Source: UNESCAP, Study report for transitioning to electric public transport (bus) in Thailand, 2022.

KMUTT study on transition to electric bus

Break-even point analysis of Diesel, CNG and Electric bus (6 THB/kWh)



- Electric bus can **reach** the **break even point** within **11 years**.
- The **main barrier** to implementing new Electric bus is **investment cost** at the 1st year which approximately **3 times higher** compared to the other.

The analysis results are under review, please do not reference.

Source: UNESCAP, Study report for transitioning to electric public transport (bus) in Thailand, 2022.

Summary

- Following the **100%ZEV at 2035 scenarios**, it can help reducing **PM2.5** and **CO₂ emissions** in 2050 by **58.3** and **61.2 percent**, respectively, compared to the BAU scenario.
- Following the **Electric bus strategy scenarios by 2035**, it can help reducing **CO₂ emissions** in 2050 from **50 Mt/year** to **15 Mt/year**, respectively.
- TCO of the electric bus is found to be the lowest when receive the **subsidy of electricity cost** and **carbon tax benefit**.
- The transition to electric mobility in public transport can be accelerated, the support from government is needed ex. electricity cost and carbon price.

Thank you

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