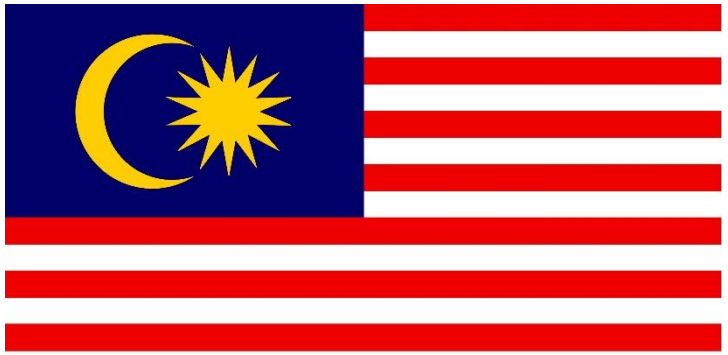
Malaysia
COUNTRY REPORT



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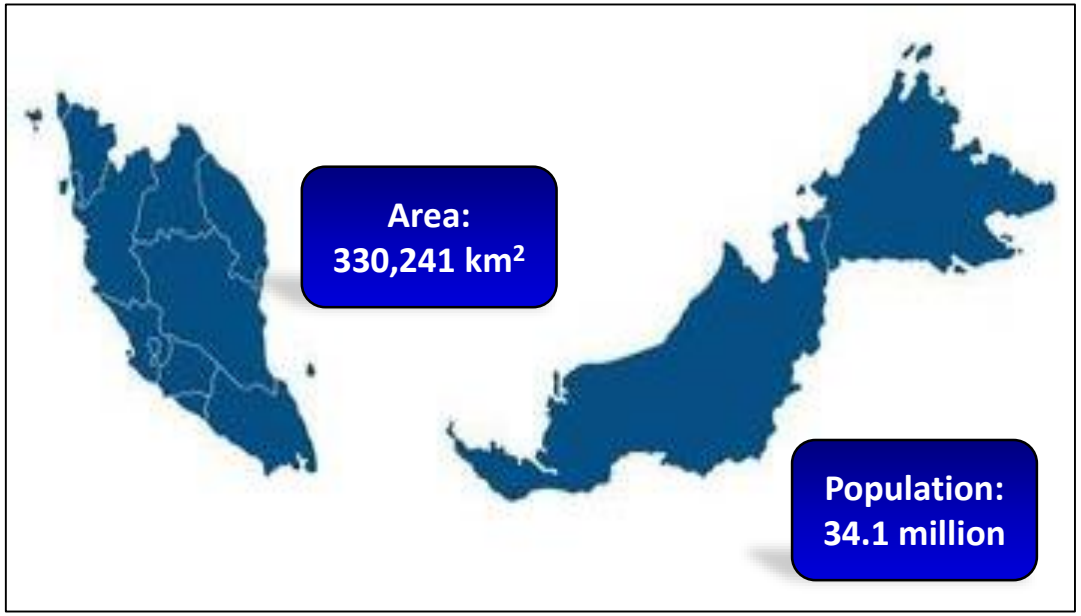
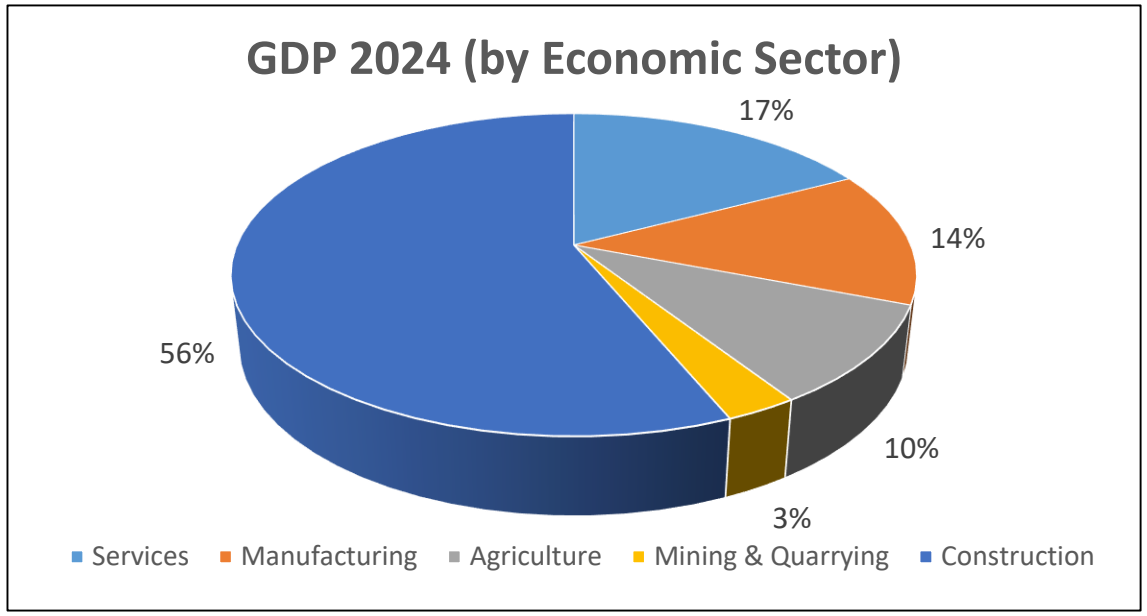
MINISTRY OF ENERGY TRANSITION AND WATER TRANSFORMATION (PETRA), MALAYSIA

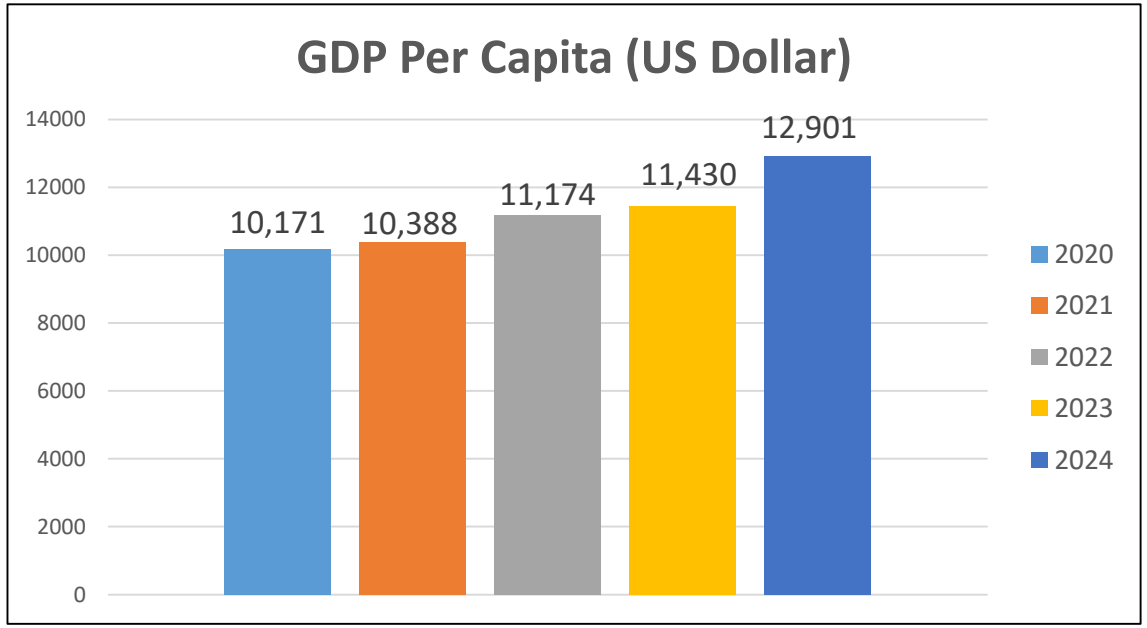
PREPARED FOR JICA TRAINING FOR ENERGY POLICY (JFY2025)

COUNTRY PROFILE AND INDICATORS

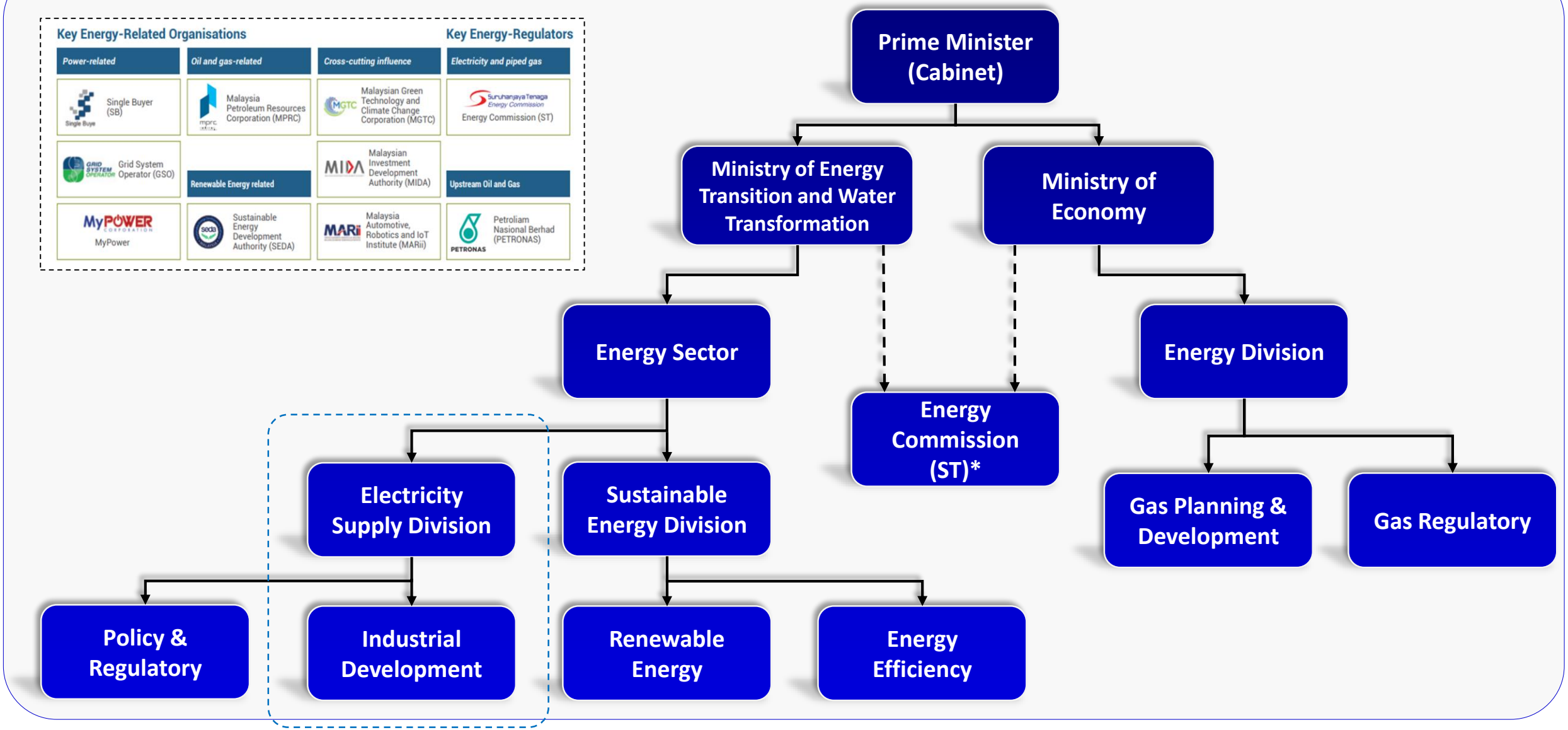




	2020	2021	2022	2023	2024
Population (million)	32.4	32.6	32.7	33.4	34.1
Labour force (million)	15.7	15.8	16	16.4	17.3
Employment (million)	15	15.1	15.4	16.2	16.8
Unemployment rate (%)	4.5	4.6	3.9	3.4	3.2



ENERGY GOVERNANCE STRUCTURE IN MALAYSIA



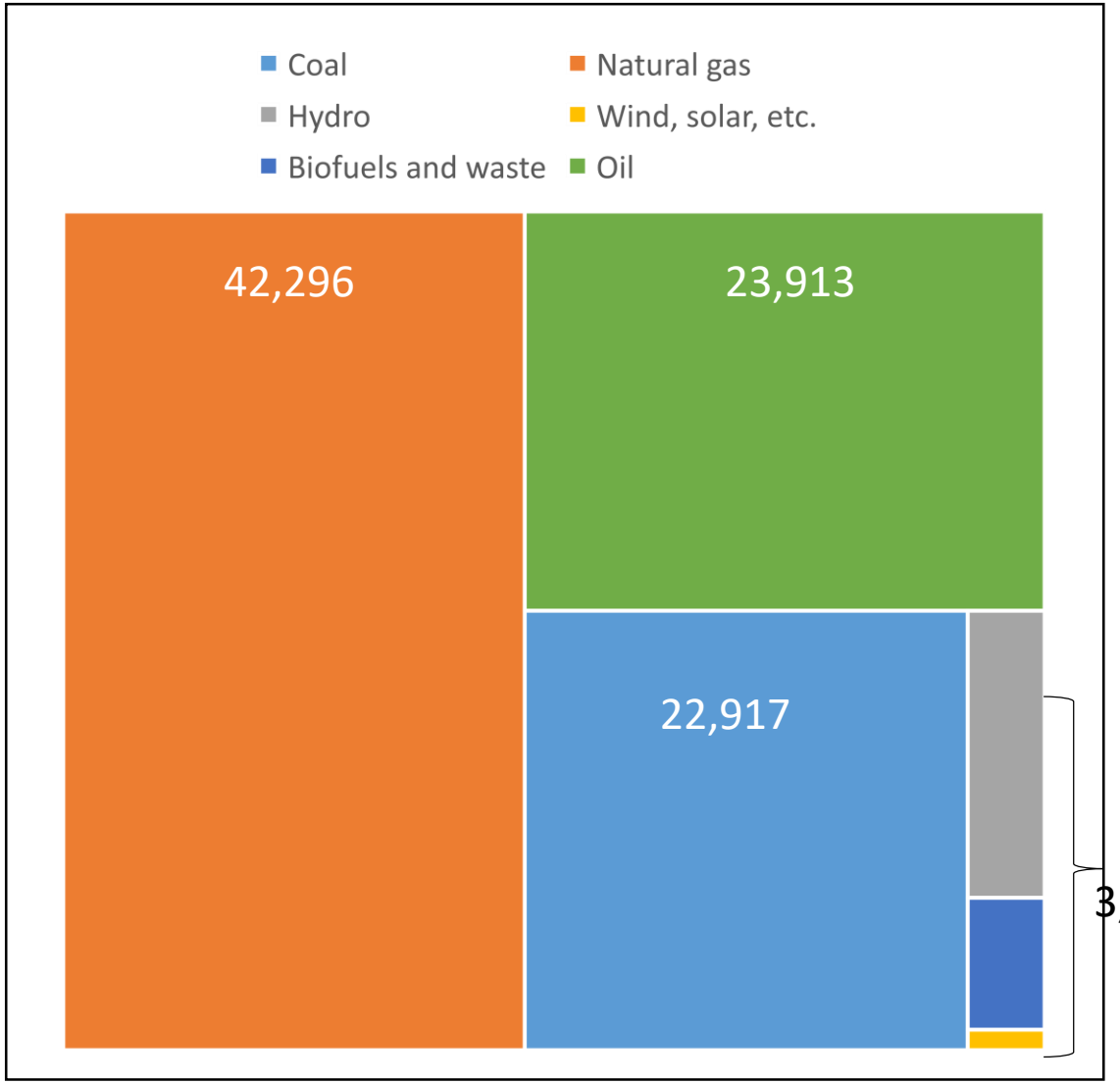
*Energy Commission is a regulatory body under the Energy Commission Act 2001 responsible for regulating the energy sector, specifically the electricity and piped gas supply industries, in Peninsular Malaysia.

PAST DEMAND AND SUPPLY

Primary Energy Supply (by Source)

	2019	2020	2021
Net Export of Crude Oil	2,177	3,635	2,328
Net Export of LNG	26,381	23,216	24,802
Net Export of Natural Gas	(4,211)	(4,340)	(4,480)
Net Export of Electricity	143	29	246
Net Import of Petroleum products	5,882	1,997	(930)
Net Import of coal and Coke	19,622	22,235	20,355

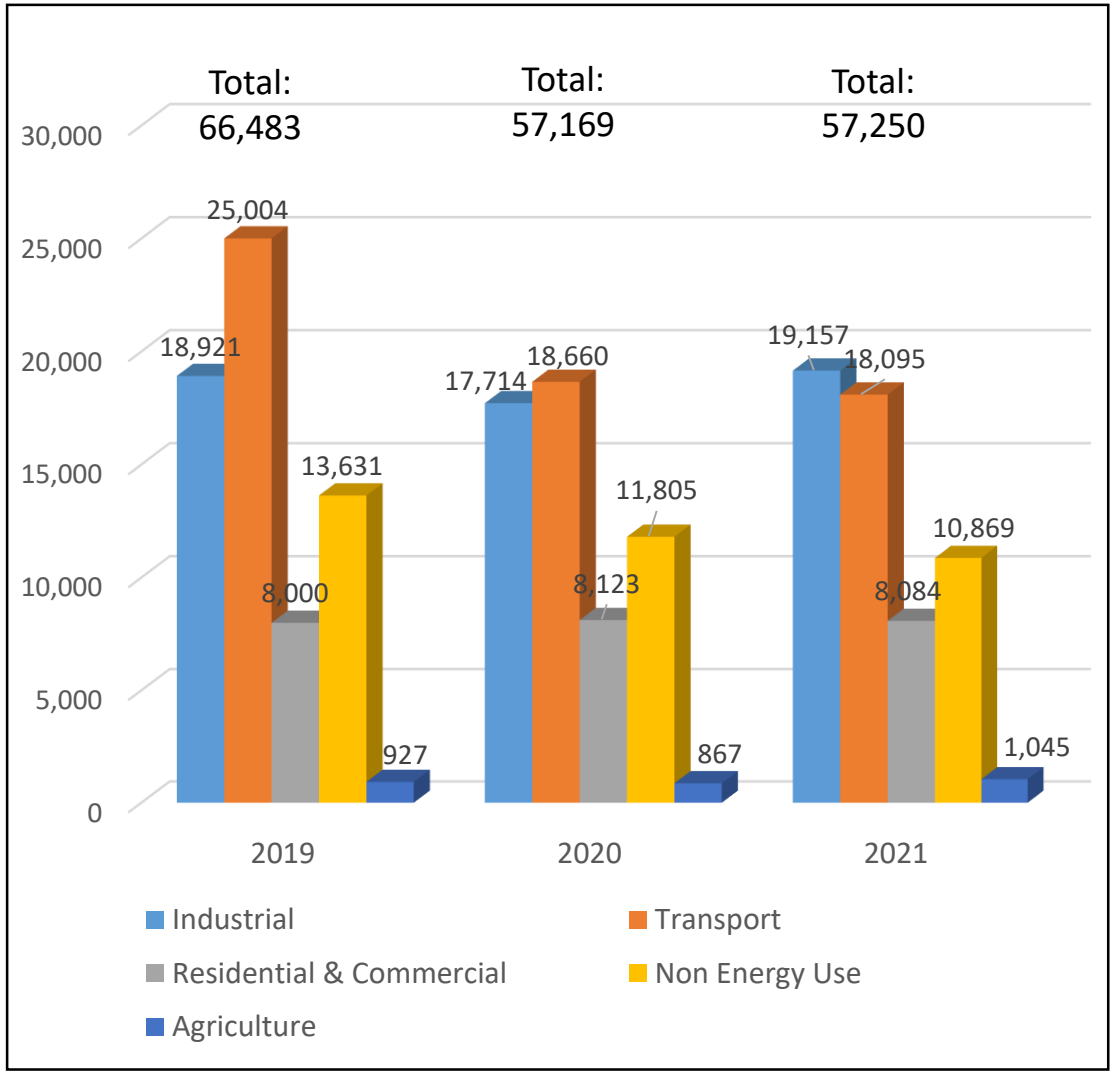
Primary Energy Supply (by Energy Source)



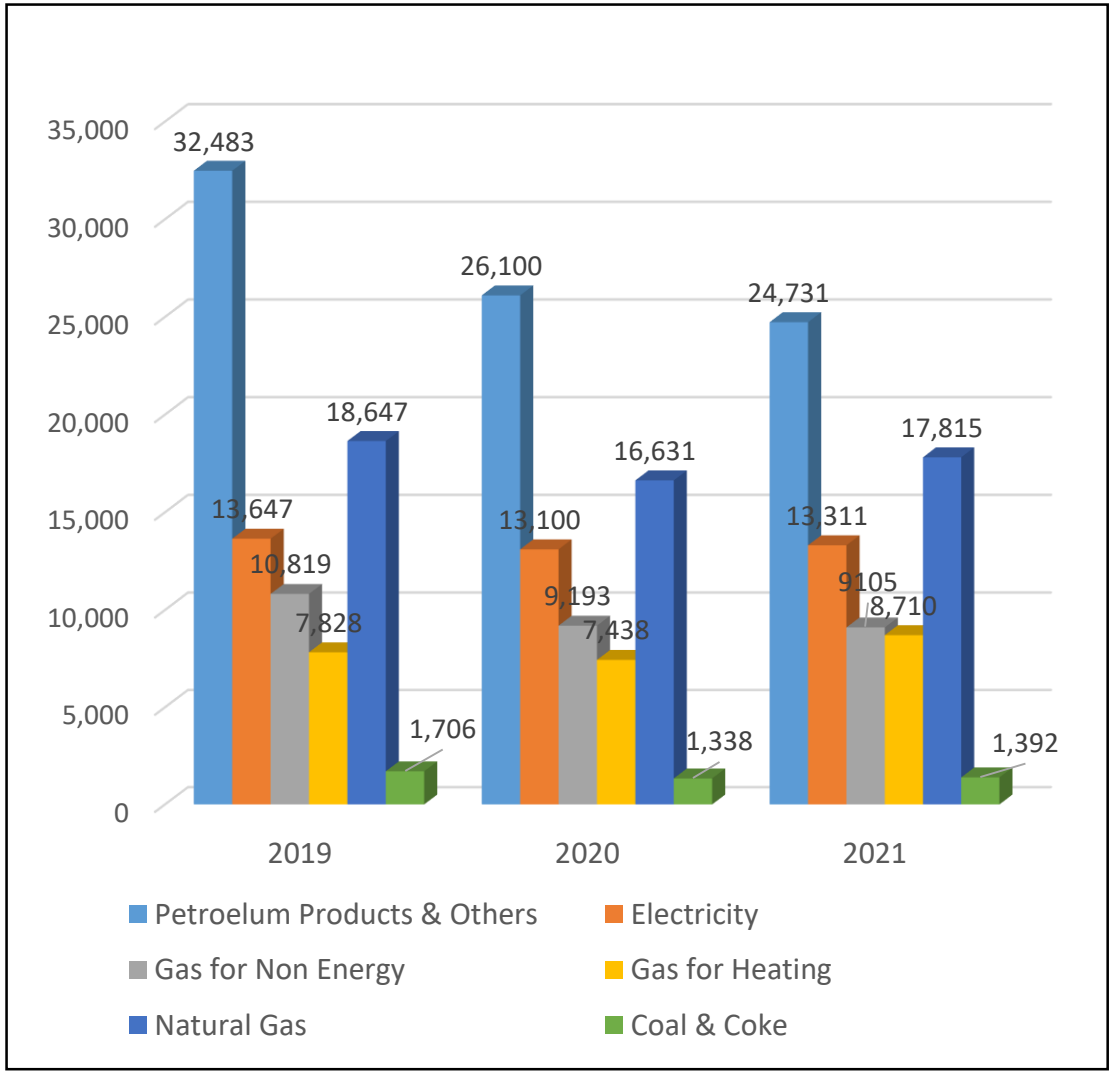
*Data as of 1 January 2022
** Unit: ktoe

PAST DEMAND AND SUPPLY

Final Energy Consumption (by Sector)



Final Energy Consumption (by Energy Source)

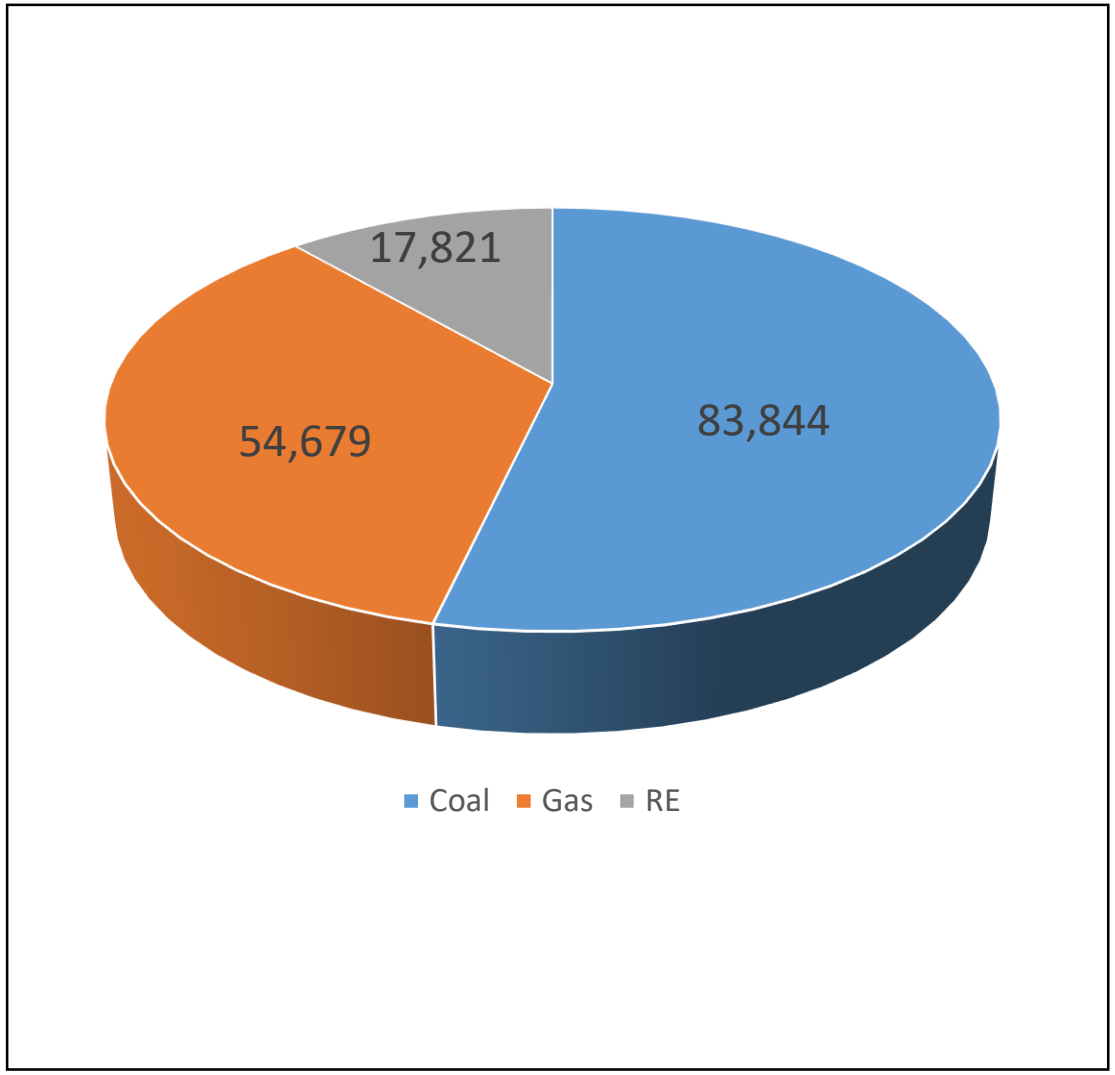


*Data as of 1 January 2022

** Unit: ktoe

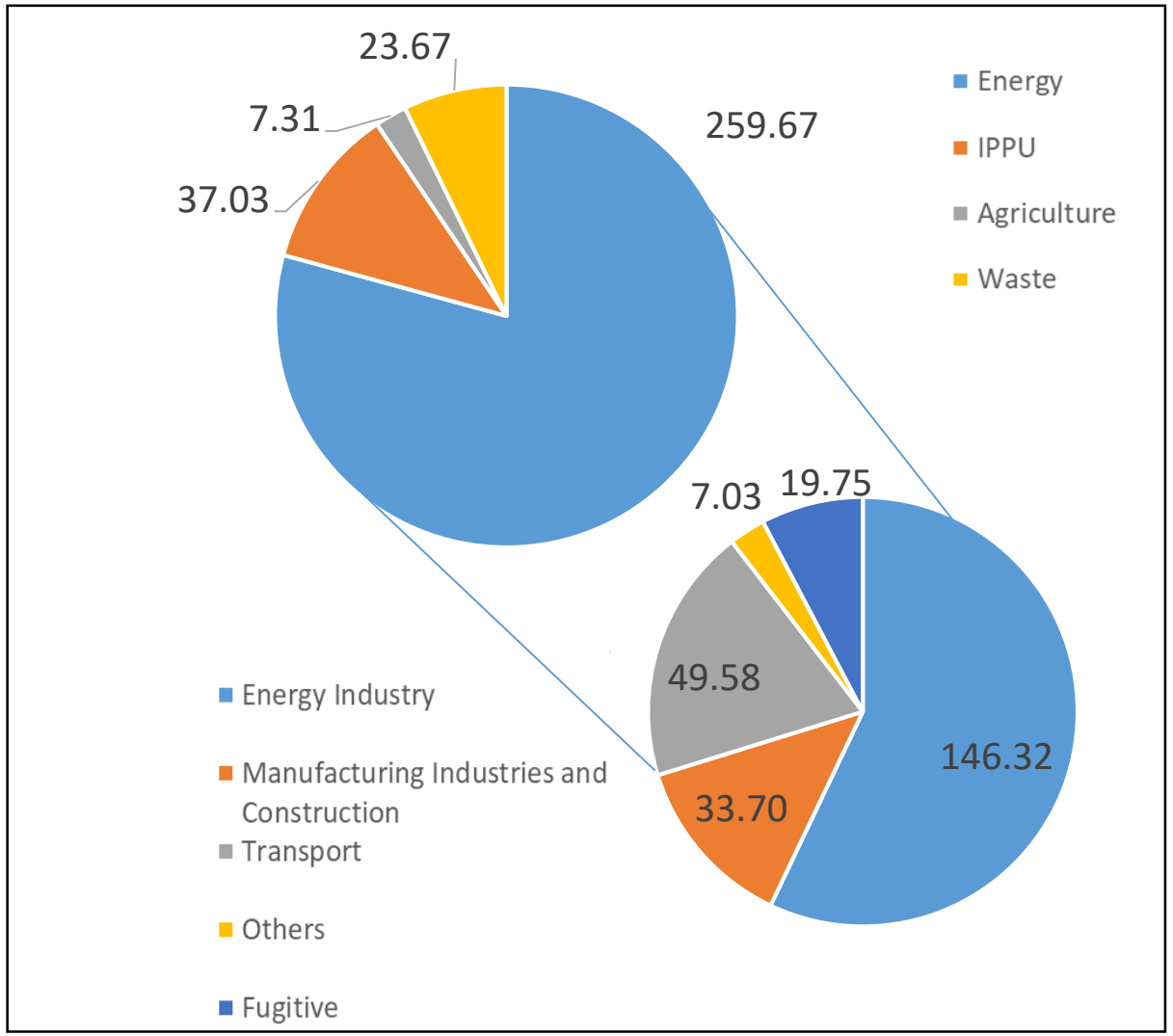
ENERGY DEMAND AND SUPPLY

Electricity Generation (by Energy Source)



*Data as of 1 April 2025
** Unit: GwH

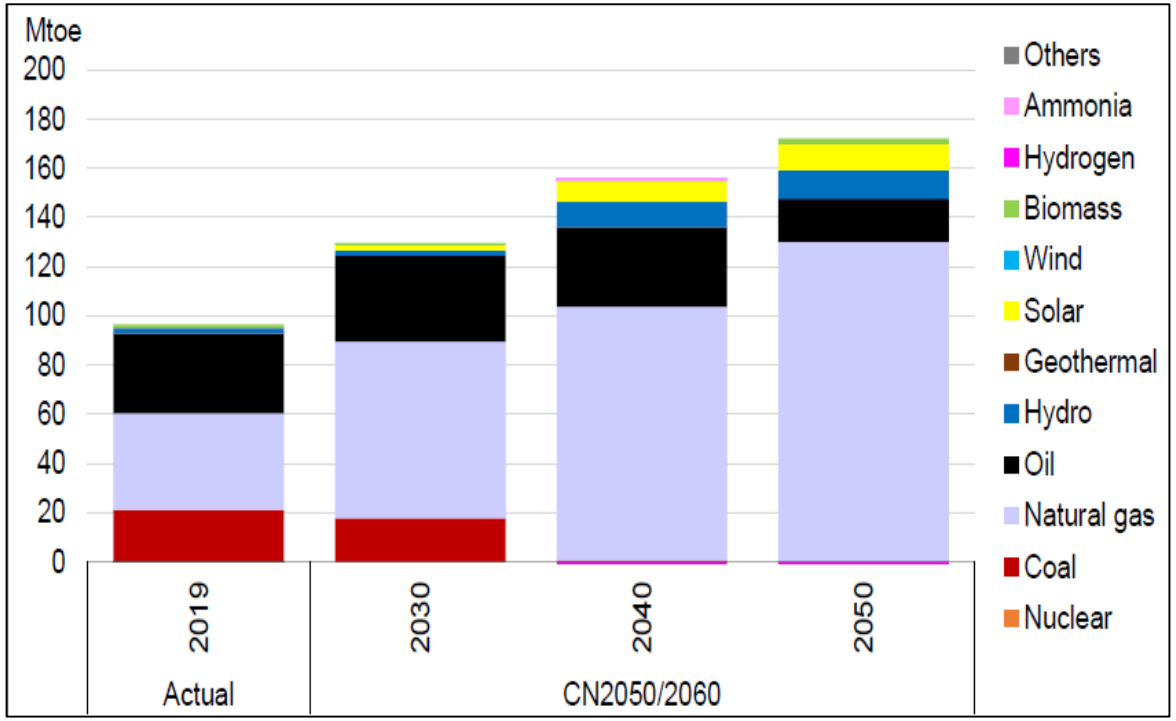
CO2 Emission (by Sector)



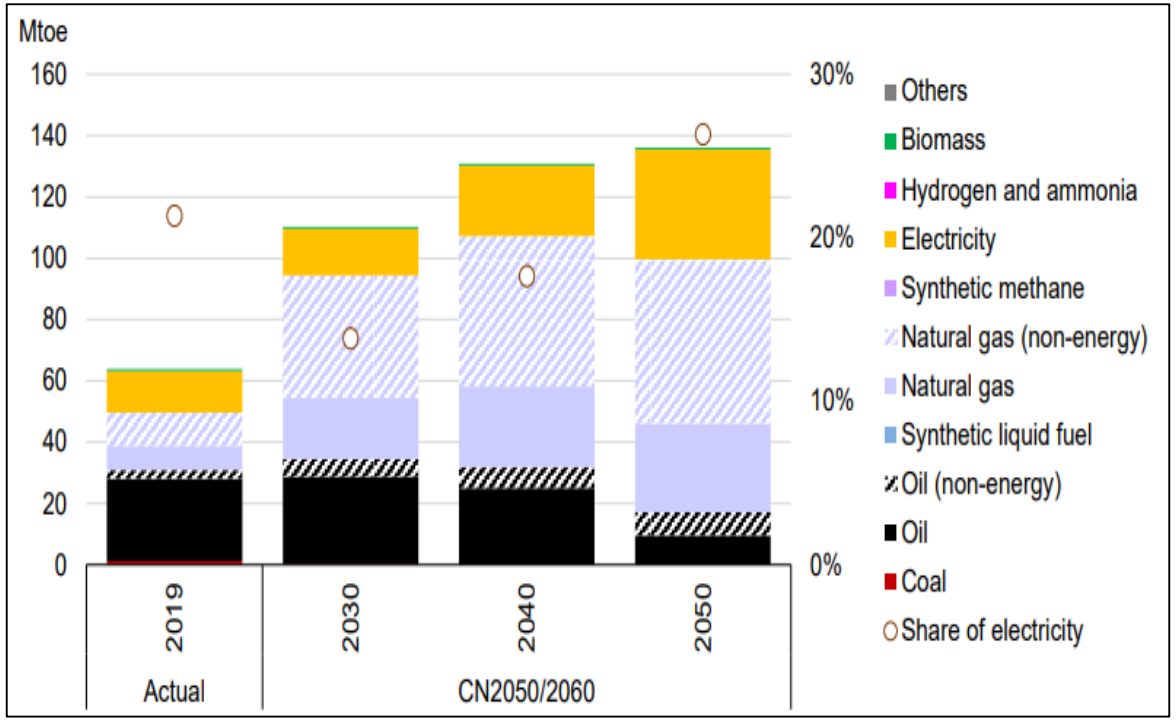
*Data as of 1 January 2022
** Unit: Mt CO2

ENERGY DEMAND AND SUPPLY OUTLOOK

Primary Energy Supply (by Energy Source)*



Final Energy Consumption (by Sector)*

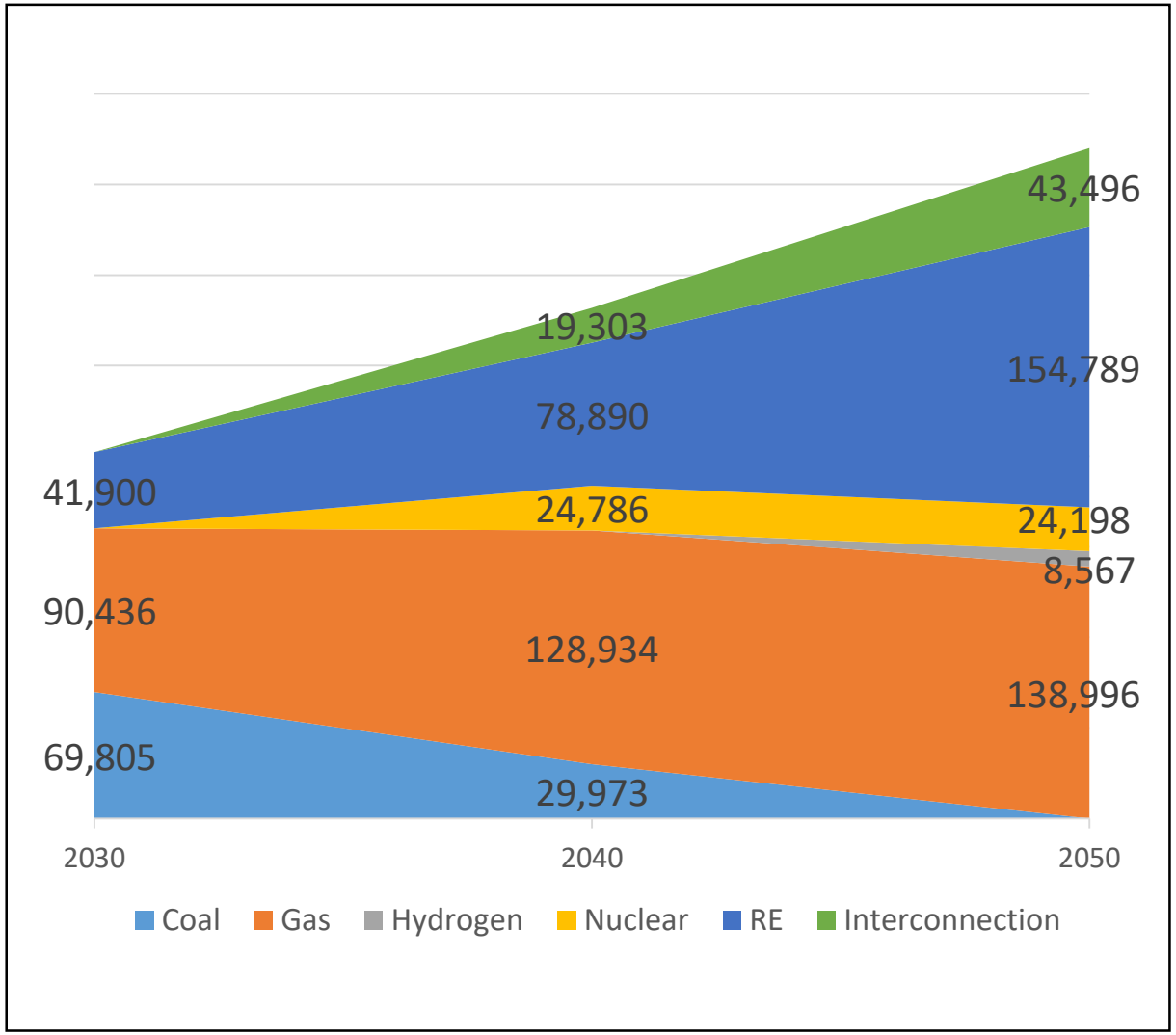


*Economic Research Institute for ASEAN and East Asia (ERIA). (2025). Decarbonisation of ASEAN Energy Systems: Optimum Technology Selection Model Analysis up to 2060. Retrieved from https://www.eria.org/publications/decarbonisation-of-asean-energy-systems--optimum-technology-selection-model-analysis-up-to-2060---updated-2024

** Unit: Mtoe

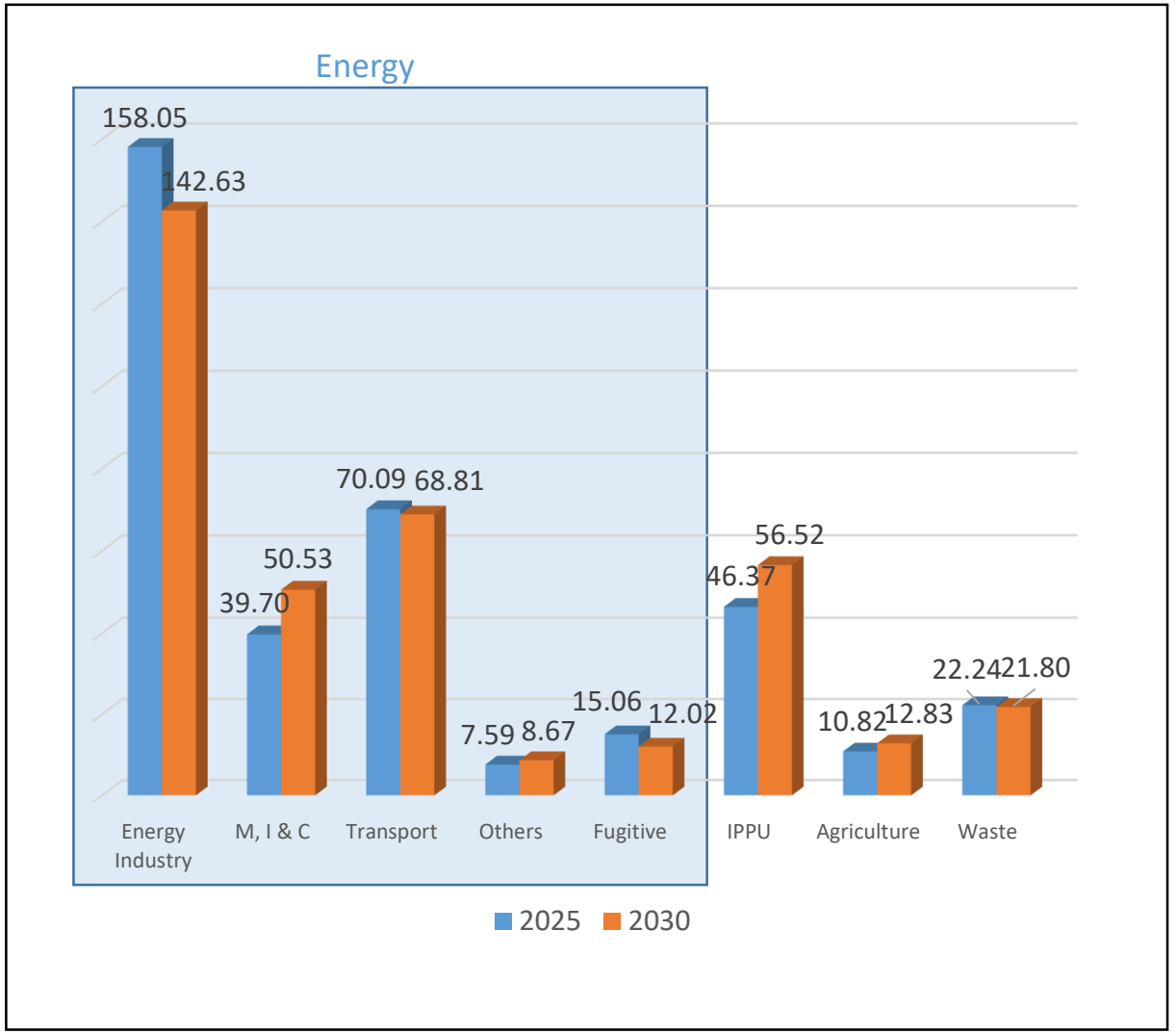
ENERGY DEMAND AND SUPPLY OUTLOOK

Electricity Generation (by energy source)



*Data as of 1 April 2025
** Unit: GwH

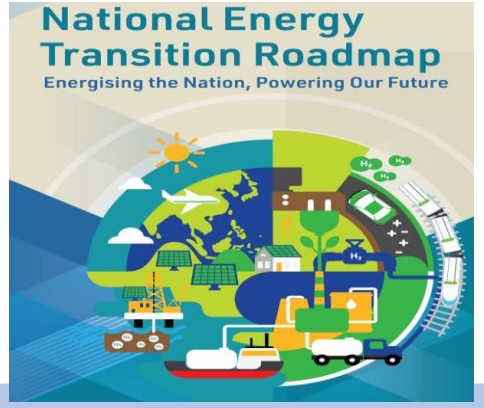
CO2 Emission (by sector)



*Data as of 1 January 2025
** Unit: Mt CO2

ENERGY CURRENT POLICIES AND MEASURES

- A comprehensive framework guiding the energy sector until 2040.
- Aims to achieve a **sustainable and prosperous energy sector**, while also promoting energy efficiency and reducing reliance on fossil fuels.
- Focuses on a pragmatic transition towards a cleaner energy mix, embracing green technologies and promoting responsible energy consumption.



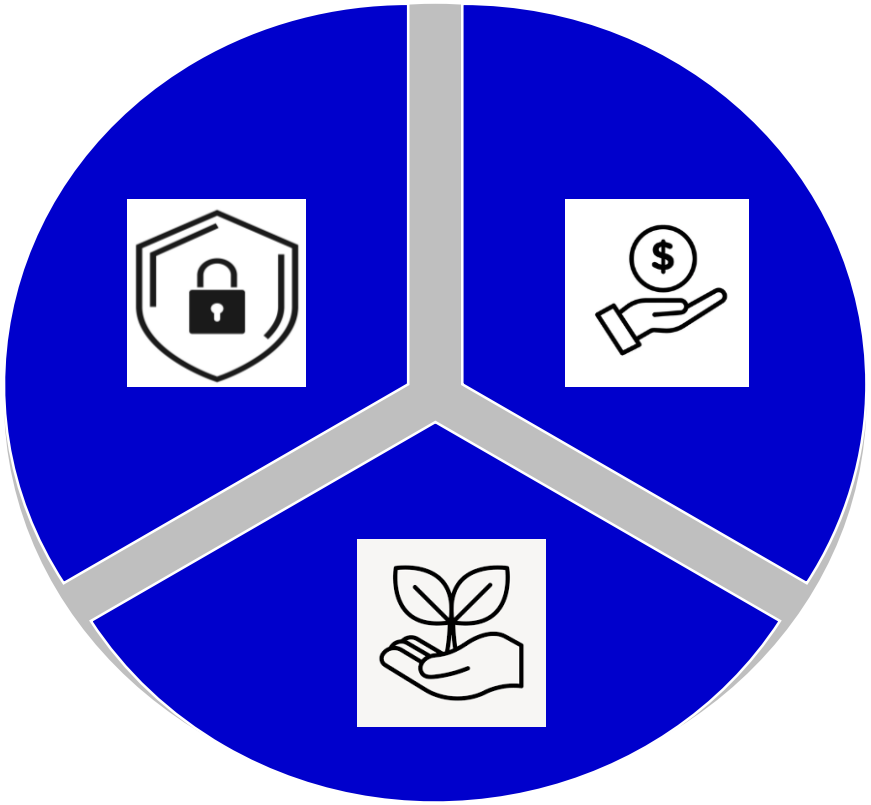
- A roadmap to steer Malaysia's shift from traditional fossil fuels based economy to a **high-value green economy**.
- NETR establishes the pathway for national energy mix, GHG emission reduction and energy transition initiatives.
- 6 energy transition levers namely energy efficiency, renewable energy, hydrogen, bioenergy, green mobility, and carbon capture and storage (CCS)

- Malaysia introduced a t**argeted electricity subsidy**, shifting from a blanket subsidy to one focused on electricity consumption levels.
- Hence, the government is now providing subsidies to households with lower consumption, while removing subsidies for those using more electricity.
- This aims to encourage energy efficiency and reduce the financial burden on the government.

ENERGY ISSUES AND CHALLENGES

ENERGY SECURITY

- Heavily reliant on fossil fuels (imported coal, depleted domestic natural gas & LNG) for electricity generation. **This dependence can pose risks to energy security**, especially with fluctuating global oil prices and geopolitical tensions.
- Transitioning to more diversified energy sources, such as RE (solar) requires sufficient grid infrastructure and connectivity. Ensuring stable and secure energy supply **requires high investment in grid modernization and the integration of renewable energy** sources especially solar in Malaysia.



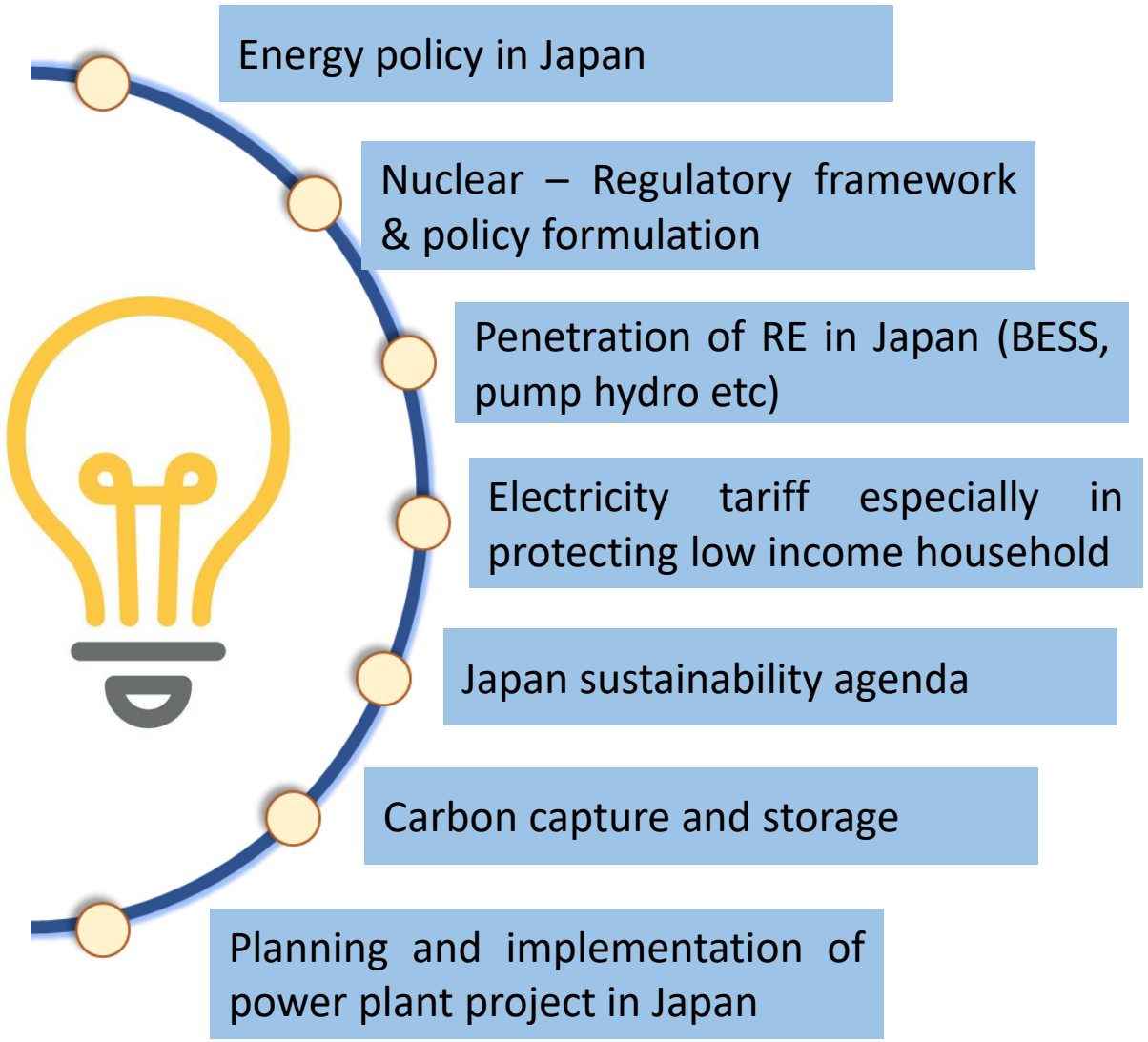
ENERGY AFFORDABILITY

- **Balancing electricity tariff while maintaining affordability for consumers is critical**. The government must navigate the challenge of keeping energy affordable, especially for low-income households and SME, while also incentivizing investments in cleaner energy technologies, which may initially come at a higher cost.
- Hence, Malaysia's energy transition **must address the cost implications**, especially as it transitions to renewable sources (e.g. nuclear, BESS & hydrogen) as well as investment to the grid which may have higher upfront costs.

ENERGY SUSTAINABILITY

- Formulating policies that balance energy development with environmental conservation **is essential but often politically and socially challenging**.
- Transitioning to a more sustainable energy mix involves significant investments in renewable energy technologies like solar, and biomass. While Malaysia has set targets for 70% of RE in installed capacity in 2050, there are many challenges in achieving these targets due **to inadequate regulatory frameworks, financing issues, and the need for technological advancements.**

ENERGY EXPECTATIONS FROM THIS PROGRAM



As a policy maker who works in the planning and regulation of the electricity supply sector in Peninsular Malaysia, the expectations from this program are:

- ❑Able to **bridge the gap between government policies and public understanding** - how stakeholders engagement and public supports gained in order to bring them together in the wake of urgent needs for energy transition;
- ❑Addressing the **technical, economic, and social hurdles** that can hinder the progress of energy transition - how developed country such as Japan equipped themselves with know-how in advancing RE such as BESS and pump hydro;
- ❑Balancing the needs of energy transition and people well being – **just energy transition**; and
- ❑Learning to ensure that our future energy ecosystem is **sustainable and resilience** against global market crisis as well as climate change.

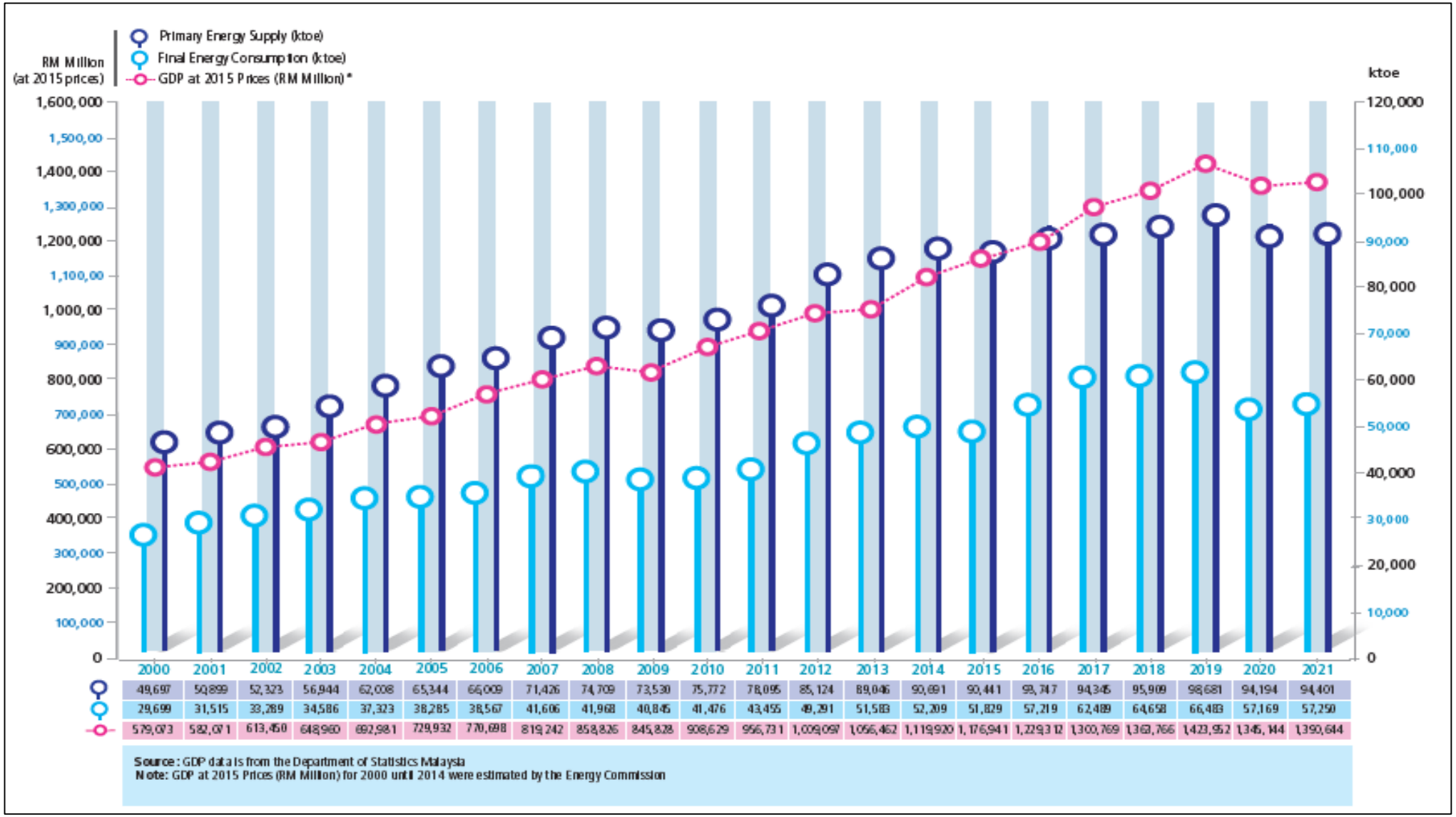
ARIGATOU GOZAIMASU

TERIMA KASIH

THANK YOU

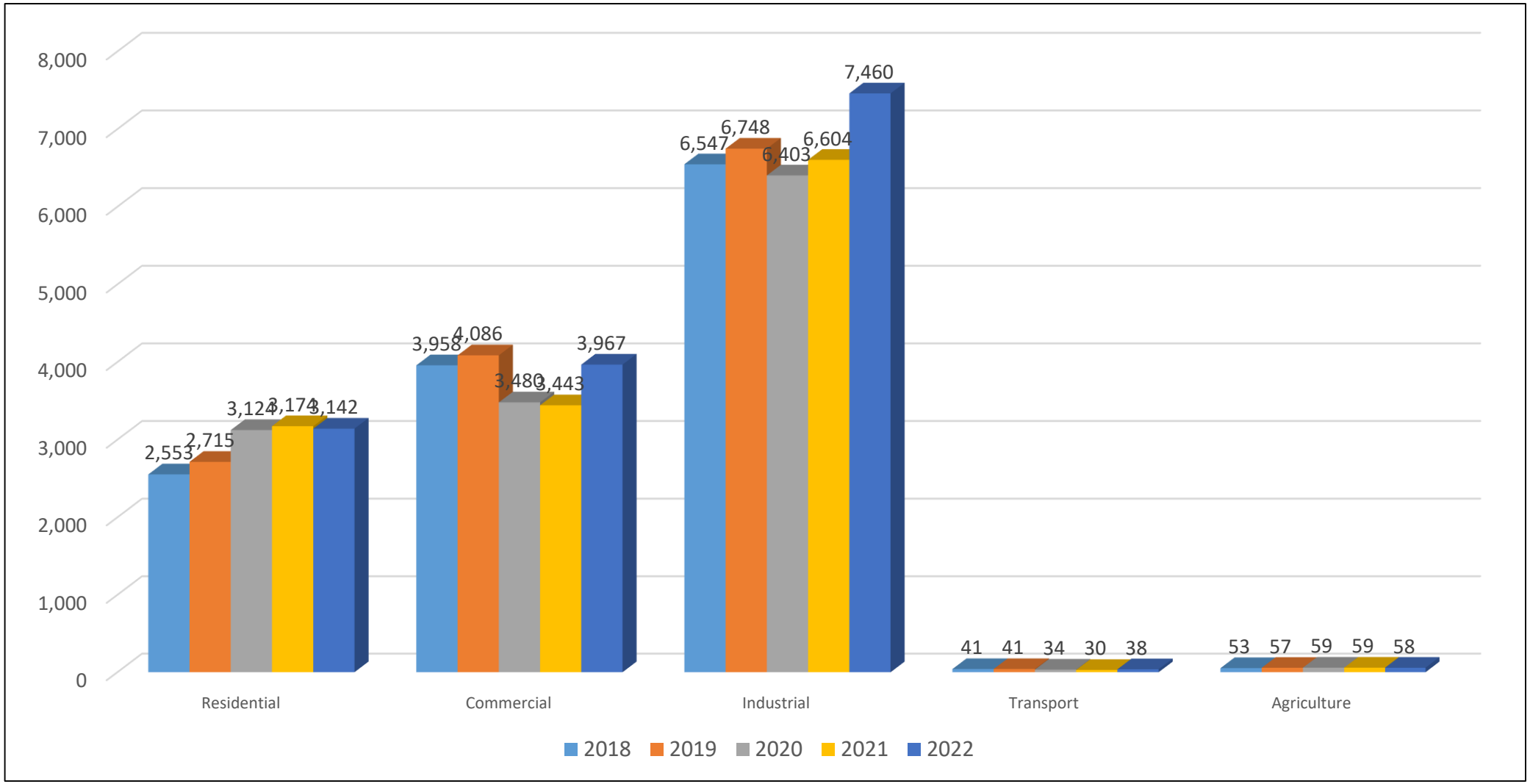
APPENDIX

Trends in GDP, Primary Energy Supply and Final Energy Consumption



APPENDIX

Final Electricity Consumption by Sectors from 2018 to 2022 (ktoe)

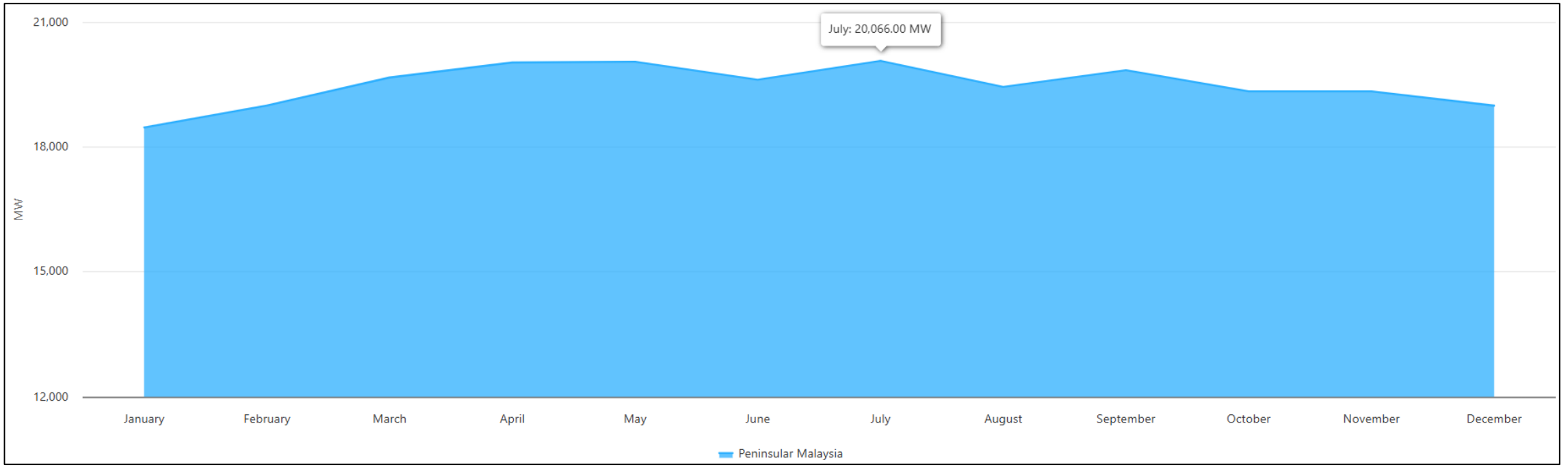


APPENDIX

System Generation and Demand for 2024

Highest Demand Recorded	Highest Energy Recorded	Installed Capacity	Reserved Margin
20,066 MW 25 Jul 2024	428,610 MWh	25,952 MW	29%

Highest System Demand Profile for 2024



APPENDIX

The Trend of GHG Emissions in Electricity Industries, 1990-2021