Suruhanjaya Tenaga
Energy Commission

NATIONAL ENERGY BALANCE

2021

Be Energy smart

NATIONAL ENERGY BALANCE

2021

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PREFACE

The energy landscape in Malaysia during 2021 exhibited a blend of strategic initiatives, regulatory adjustments, and global trends that impacted the nation's energy sector. There are significant developments that characterized the Malaysian energy landscape during this period.

The COVID-19 pandemic that first hit us in 2020 has impacted the energy demand and disrupted the supply chains in Malaysia. The Government responded with measures to support affected industries and adapt to changing energy consumption patterns. In 2021, Malaysia is slowly recovering from the pandemic as businesses were allowed to operate and COVID-19 vaccinations were rolled out in stages. Malaysia was also hit with severe flood in several regions which worsen the COVID-19 situation, however the Government handled it eloquently and victims were well compensated and taken care of. Malaysian economy remained resilient despite these unfortunate events, and we continue to prosper even when the backdrop is against us.

Energy in Malaysia is dominated by fossil fuels, particularly oil and natural gas, which account for a significant portion of the country's energy mix. In recent years, there has been a push towards increasing the use of renewable energy sources, such as solar and bioenergy, to reduce the country's reliance on fossil fuels and mitigate the impacts of climate change.

The Government's commitment to increasing the share of renewables in the energy mix aimed to reduce greenhouse gas (GHG) emissions and enhance sustainability. Malaysia has put forth its Nationally Determined Contribution (NDC) target of reducing 45% of GHG intensity by 2030 compared to 2005 levels. As a party to the Paris Agreement, our commitment as a nation is also shown with our target to achieve net zero GHG earliest by 2050. In line with this target, the energy sector has set an ambitious target of achieving 70% RE in its capacity mixed by 2050.

The Malaysian Government introduced and reinforced policies and targets aligned with the nation's commitment to the Paris Agreement. Initiatives focused on increasing the adoption of renewable energy, energy efficiency improvements, and reducing carbon intensity. The transition to cleaner energy sources gained momentum, with initiatives like net energy metering (NEM) and the Large-Scale Solar (LSS) program encouraging investments in solar energy projects. These programs aimed to enhance self-consumption and grid-connected renewable energy generation.

Ensuring energy security remained a priority. Malaysia sought to strengthen its energy infrastructure, enhance emergency response mechanisms, and secure diverse energy supply sources to mitigate potential disruptions. Malaysia's oil and gas sector, a key contributor to the economy, experienced challenges due to fluctuating global oil prices and pandemic-related disruptions. The Government explored strategies to optimize the sector's efficiency and value while diversifying revenue sources.

I would like to express my heartfelt gratitude to our honourable Prime Minister, Minister of Energy Transition and Water Transformation (PETRA), the Ministry of Energy Transition and Water Transformation (PETRA) and the Ministry of Economy for their continuous support and guidance in realising the National Energy Balance (NEB) each year. My appreciation also goes out to all our stakeholders and data providers for their contributions especially the timely and systematic way data is provided to the Commission. It is my sincere belief that this report will be a useful guide for policy makers and authorities to make sound decisions for the future of the country's energy landscape.

We look forward to working together again in the future.

Thank you.

Mohammed Rashdan bin Mohd Yusof
Chairman
Energy Commission

INTRODUCTION

In 2021, the Malaysian economy, like many others around the world, was dealing with the impacts of the COVID-19 pandemic. The pandemic had led to disruptions in various sectors, including tourism, manufacturing, and trade. The Government had implemented various measures to control the spread of the virus, including lockdowns and movement restrictions, which had economic implications.

Malaysia's GDP in 2021 has increased slightly by 3.4%, compared to the previous year (2020: - 5.5%) as we pave through the path to recovery. Rapid progress of the National COVID-19 Immunisation Programme also enabled economic sectors to gradually reopen in the third quarter of the year. Strong exports and continued policy aid for households and businesses also lent support to domestic growth.

Total primary energy supply (TPES) has increased in tandem with the economy, showing a slight growth of 0.2% to be at 94,401 ktoe (2020: - 4.6%) compared to the previous year. Natural gas, crude oil and renewable energy including biodiesel's supply has increased which contributed to the overall increase of the TPES. Malaysia is an energy exporter with total energy export of 56,899 ktoe. However, the total import of energy is also catching up whereby total energy import in 2021 was recorded at 53,381 ktoe. Natural gas and crude oil dominate the energy supply in Malaysia constituting of almost three-quarter of the TPES. Coal supply has quadrupled from two (2) decades ago due to reliance of imported coal for the power sector.

Total final energy consumption (TFEC) or also known as the energy demand was recorded at 57,250 ktoe in 2021, a slight increase of 0.1%. In terms of sectoral, the industry, residential and agriculture sectors showed positive demand growth, whilst transport, commercial and non-energy sector shown negative growth. The trend is highly driven by the measures taken by the Government during the year in curbing the spread of the COVID-19 virus. In May 2021, we have seen a surge in COVID-19 cases with emergence of new variants. The movement restrictions were heightened again, where Work from Home (WFH) measures are deployed by most employers and inter-state and certain inter-cities travel are not allowed. These resulted in lower demand in the Commercial sector, specifically the tourism sector, whilst the residential sector had seen higher demands due to more energy consumed at home.

Installed capacity recorded as of 31 December 2021 was 37,422 MW whereby it was 35,037 MW in 2020. YTL Power Generation Sdn Bhd which is a Combined Cycle Gas Turbine (CCGT) plant has retired in 30th June 2021, and Southern Power Generation was commercially operated on the 1st of January 2021. Natural gas and coal remained the dominant fuel in the capacity mix with their share of 40.1% and 35.5% respectively, followed by renewable energy, diesel/MFO and others with 22.5%, 1.2%, and 0.6% respectively. The Malaysian Government has set a rather ambitious target of 70% of renewable energy in the capacity mix by 2050, aligned with the nation's aspirations of becoming a net zero GHG emission earliest by 2050.

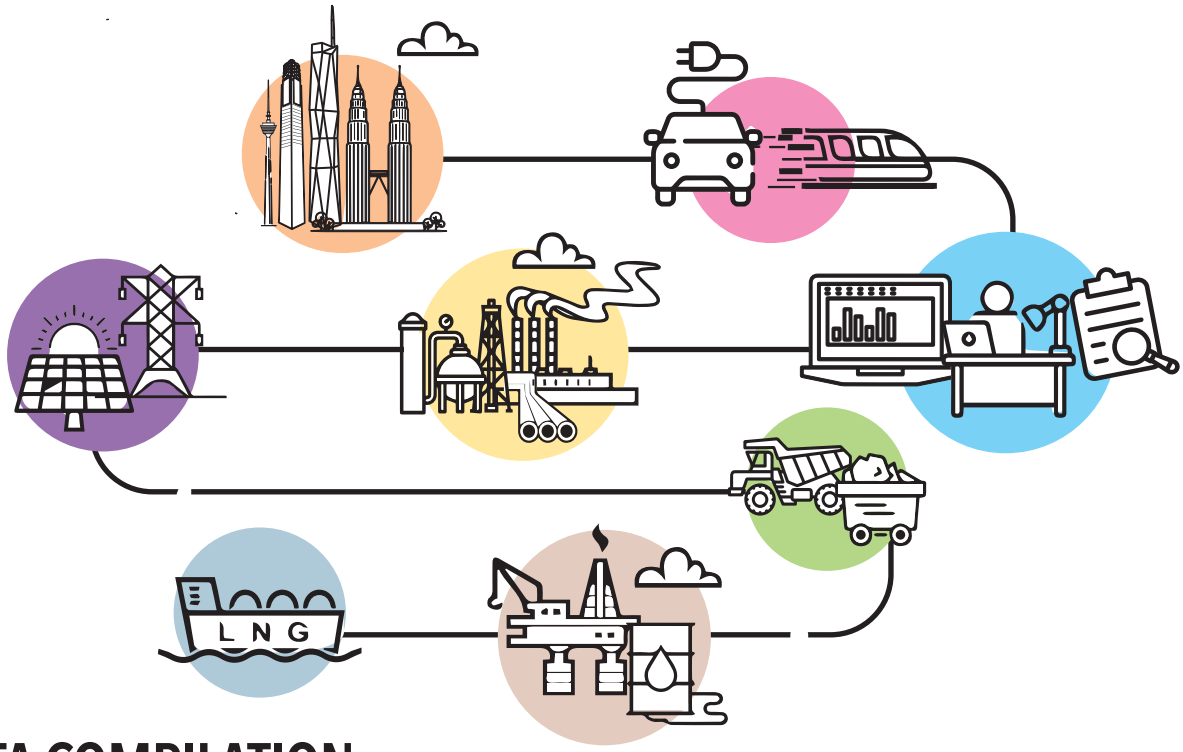
The total electricity generation (excluding self-generation plants) in 2021 posted a slight increase from 167,742 GWh to 172,341 GWh, or 2.7% increase from 2020 level. Coal constitutes of almost half of the generation mix, and the remaining half goes to predominantly natural gas with 30.7%, followed by renewable energy and oil with 19.6% and 0.5% share respectively. Coal was the most consumed fuel with total input to the power stations (excluding self-generation plants) of 21,525 ktoe, followed by natural gas, 9,936 ktoe, renewable energy, 2,990 ktoe, and diesel 236 ktoe.

Similar to electricity generation, electricity consumption trend also showed positive growth where it increased from 152,250 GWh to 154,705 GWh. The industry sector's electricity consumption increased by 3.1%, from 74,416 GWh to 76,756 GWh. The commercial sector's electricity consumption dropped from 40,451 GWh to 38,761 GWh. Residential sector's electricity consumption on the other hand posted a growth of 5.0%, increased from 36,306 GWh to 38,153 GWh.

Malaysia's primary energy intensity has reduced by 3.1% from 70.03 toe/RM Million to 67.88 toe/RM Million, and final energy intensity also dropped by 3.1%, from 42.50 toe/RM Million to 41.17 toe/RM Million. Electricity intensity also showed slight reduction from 0.113 GWh/RM Million to 0.111 GWh/RM Million.

I would like to take this opportunity to extend my sincere appreciation to our Prime Minister, Minister of Energy Transition and Water Transformation (PETRA), the Ministry of Energy Transition and Water Transformation (PETRA) and the Ministry of Economy for their invaluable efforts rendered to produce the National Energy Balance (NEB) 2021. I am also grateful to our Government Agencies, power utilities, independent power producers, oil and gas companies, iron and steel manufacturers, coal producers, cement manufacturers, and everyone involved for the continuous support in providing relevant and accurate data in a timely manner. We hope that this report will be a useful tool for reference and guidance in the formulation of policies, research, as well as energy planning for the future of our energy industry.

Dato' Ir. Ts. Abdul Razib bin Dawood
Chief Executive Officer
Energy Commission Malaysia



DATA COMPILATION

The first stage in compiling the overall energy balance is to rearrange the data to fit into a standard structure of commodity (or partial) balance. The commodity balance shows clearly the production, imports, exports, stock change and consumption for each energy commodity. The basic sequence adhered to in the overall balance is: -

Production + Imports - Exports +/- Stock change = Apparent inland deliveries (or consumption)

In practice, however, "Apparent inland deliveries" deduced from supply statistics hardly ever match the actual sales data. It is necessary, therefore, to include two "statistical discrepancies" - the first to account for the difference in apparent inland delivery of primary supply mainly due to the difficulties in obtaining the actual stock change data and difference in data compilation at source and the second is to account for the difference in secondary supply as the result of the transformation processes of one form of energy to another.

In addition, the statistical discrepancies also act as a balancing tool to minimise possible errors. In the case of oil and oil products, losses in transportation and distribution, as well as statistical errors are included in the statistical discrepancies. However, for electricity, distribution losses and the sector's own use of electricity are accounted for under "losses and own use".

Stock changes are not fully accounted for in the balance because it is not possible to obtain accurate stock data of energy commodities at the distributors' and users' levels. Only oil companies' stocks are readily available, and these would include stocks at refineries and depots. Therefore, the statistical discrepancy might also include unrecorded stock changes. Coal stocks at power stations and industry manufacturers are also considered in this report.

Primary Energy Supply = Production + Imports - Exports - Bunkers +/- Stock change

Energy Consumption = Gross inland consumption
= Final energy consumption + Consumption of the energy transformation sector + Distribution losses + Non-energy consumption

EXECUTIVE SUMMARY

ENERGY OVERVIEW

Malaysia is blessed with abundance of energy resources available within the country that is sufficient for domestic use as well as to be exported. Malaysia's energy is a healthy mix of well-diversified energy sources that balanced the nation's need for energy security, affordability and sustainability. Although Malaysia's reliance on fossil fuel is considerably high, our renewable energy (RE) has also multiplied.

Our economy showed a positive growth of 3.4% (2020: -5.5%) and is slowly recovering post COVID-19 pandemic. The Government's focus is to support Malaysia's transition throughout the pandemic and continued to deploy a wide range of tools to cushion shocks to the economy and financial system.

In 2021, the total primary energy supply increased by 0.2% (2020: - 4.6%) and a similar trend was observed for total final energy consumption, where it increased by 0.1% (2020: -14.0%).

PRIMARY ENERGY SUPPLY

Primary energy supply has increased in tandem with the economy by 0.2% as compared to year 2020 to register at 94,401 ktoe (2020: 94,194 ktoe). Increase in energy production and imports have contributed to the overall increase in total primary energy supply. Primary production grew from 105,054 ktoe to 107,281 ktoe, and import rose from 50,325 ktoe to 53,381 ktoe. Export of energy in 2021 was observed to be higher than that in 2021 by 16.2%.

No remarkable difference can be observed in terms of primary energy supply share, natural gas held the biggest share of 44.8%, followed by crude oil with 25.3%, coal and coke with 24.3%, renewable energy with 4.2% and petroleum products with 1.4%.

ENERGY TRANSFORMATION

Primary energy such as crude oil could not be used directly and must be transformed into usable energy sources first. Therefore, facilities have been built to transform these raw and crude primary energy sources into usable secondary energy sources. These secondary energy sources are consumed locally and exported to other countries. In general, there are three (3) types of energy transformation facilities in the country, which are gas plants, oil refineries and power stations.

In general, there are three (3) types of gas plants in Malaysia, namely liquefaction plant, regasification plant and gas-to-liquid plant. Liquefaction plant is referring to quantities of natural gas used for liquefaction to Liquefied Natural Gas (LNG) while the regasification plant reports the quantities of LNG used for vaporization to natural gas. The gas-to-liquid plant is a refinery process to convert natural gas or other gaseous hydrocarbons into liquid hydrocarbons such as petroleum products.

The liquefaction plants produced a total of 26,798 ktoe of LNG and 101 ktoe of LPG, an increase of 2.6% from 2020. The regasification plants output recorded at 1,996 ktoe, a reduction of 32.1% from 2020 level at 2,939 ktoe. The gas-to-liquid plants produced 1,681 ktoe of petroleum products, as compared to 2,439 ktoe produced in 2020.

Malaysia's total refinery capacity as of 31st of December 2021 was 799 thousand barrels per day which excludes 74.3 thousand barrels per day of condensates splitter. A total of 23,897 ktoe of crude oil was processed in the refinery plants as feedstock to produce petroleum products such as petrol, diesel, kerosene, LPG, fuel oil, Aviation Turbine Fuel (ATF) & Aviation Gasoline (AV GAS), and other non-energy products. A total of 21,483 ktoe of petroleum products was produced from these refineries. The crude oil consumed in the refinery in 2021 was higher than that in 2020 and this translates into higher output from the refineries.

ELECTRICITY

Total installed capacity in Malaysia for 2021 was 37,422 MW. Natural gas and coal are the dominant fuel, making up of three-quarters of the total installed capacity in Malaysia, followed by hydro 16.6%, solar 4.5%, Diesel/MFO 1.2%, Biomass 1.1%, Others (industrial waste heat) 0.6% and biogas 0.3%. In 2021, Southern Power Generation was commercially operated on the 1st of January 2021 whilst YTL Power Generation Sdn. Bhd., a CCGT plant was retired on 30th of June 2021. RE capacity totalled up to 22.5% in 2021. Malaysia is on track towards achieving its target of 31% of RE share in the national installed capacity mix by 2025. This target reinforced Malaysia's global climate commitments to reduce its economy-wide carbon intensity against GDP of 45% in 2030 as compared to 2005 level.

The peak demand, a point when the electricity consumption is at its highest at a time of a day, was recorded at 18,585 MW in Peninsular Malaysia a slight decline of 1.2% compared to 18,808 MW in 2020. On the other hand, Sabah and Sarawak recorded a rise, with 1,0003 MW and 4,1074 MW recorded as their peak demand in 2021.

The total electricity generation (excluding self-generation plants) in 2021 was recorded at 172,341 GWh an increase from 167,742 GWh, or 2.7%. Similar to the previous year, coal is the dominant fuel in the electricity generation mix with its share of 49.2%. This was followed by natural gas at 30.7%, renewable energy at 19.6%, and oil at 0.5%.

The total electricity consumption at 154,705 GWh, an increase of 1.6% compared to the previous year. Bulk of the total electricity is consumed in the Peninsular Malaysia, where more than 75% of usage comes from the region, followed Sarawak with 19.6 % and Sabah with the remainder of 3.8%. Sectoral wise, industry sector is the biggest consumer of electricity with total of 76,756 GWh of electricity consumption in 2021.This is followed by the commercial sector with 38,761 GWh, residential sector with 38,153 GWh, Agriculture with 683 GWh and Transport sector with 353 GWh. In 2021, industry sector's electricity consumption has seen growth as compared to shrinkage back in 2020, due to the ease of MCO that allowed certain businesses (especially essential services) to re-open. Residential sector's electricity consumption too was higher in 2021 due to Work from Home (WFH) measures that was undertaken by most employers at the time. Commercial sector on the other hand, observed a reduction as tourism sector was still restricted in 2021. Transport sector's electricity consumption saw a rise as numbers of Electric Vehicle (EV) take ups in the market rise as well.

FINAL ENERGY CONSUMPTION

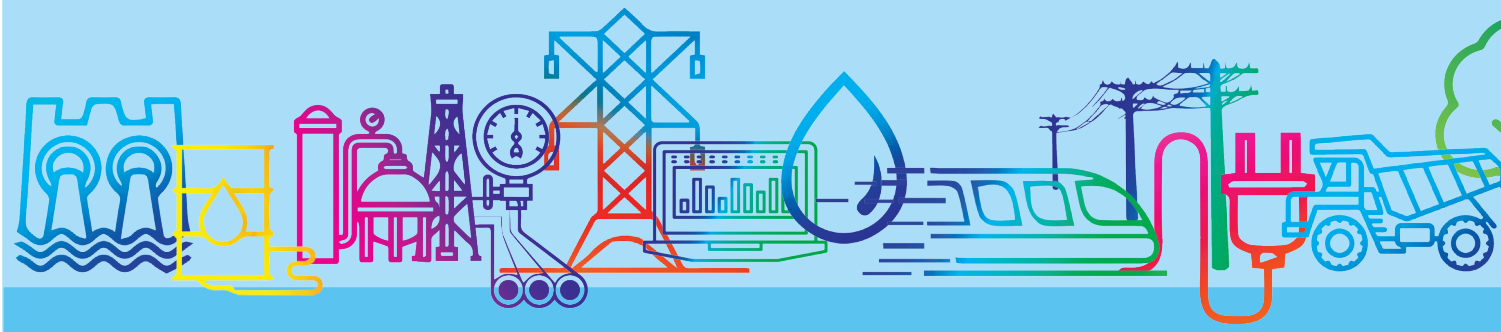
In 2021, the total energy consumption was reported to be 57,250 ktoe, a slight increase from 57,169 ktoe in 2020. Industry sector's energy consumption showed an upward trend mainly because of the loosening of Movement Control Order (MCO) towards essential services. Industry sector's total final energy consumption comes up to 19,157 ktoe compared to 17,714 ktoe in the previous year. Residential sector's energy consumption too saw an increase trend as higher energy is consumed at home, especially LPG and electricity consumption, due to working from home for most employees in 2021 as a measure to curb the spread of COVID-19 viruses. Residential sector's energy consumption was recorded at 4,168 ktoe in 2021, an increase of 2.0%. The commercial sector, on the contrary recorded a reduction mainly due to the slowdown of tourism sector, and this is observed from the lower consumption of petroleum products (specifically diesel and LPG) and electricity that had contributed to the overall decline in energy consumption in the commercial sector. Similarly, the transport sector joined the bandwagon. Lesser consumption of petroleum products (specifically petrol and Aviation Turbine Fuel (ATF)) due to travel restrictions during MCO had contributed to the overall decline of energy consumption in the transport sector, from 18,660 ktoe to 18,095 ktoe. In terms of share, the industry and transport sectors constitute almost two-third of the total energy consumption in 2021, followed by the non-energy sector, residential, commercial, fishery and agriculture and sectors with their share of 18.9%, 7.3%, 6.8% and 1.1% and 0.7% respectively.

Malaysia's final energy consumption per capita increased marginally from 1.75 toe per capita to 1.76 toe per capita. The final energy intensity dropped from 42.50 toe/RM Million to 41.17 toe/RM Million. Energy intensity can be an indicative of how efficient the energy is being used, however caution must be taken not to take this indication as a direct cause of efficiency as there are many other factors that could affect the efficiency of energy usage. Although in 2021, final energy elasticity and electricity elasticity were calculated to be 0.04 and 0.48 respectively, which indicates high elasticity with economic growth.

CONCLUSION

2021 was indeed a challenging year as Malaysia slowly recovers from the COVID-19 pandemic that hits nationwide in 2020. Apart from COVID-19, Malaysia experienced significant flooding in various states during the early months of 2021, with thousands of people being displaced from their homes and evacuated to safer areas, which make the situation even worse for the pandemic. There were also political developments going on in the country in 2021, whereby YB Dato' Sri Ismail Sabri bin Yaakob was sworn in as 9th Prime Minister of Malaysia on 21st of August 2021.

Despite all these, Malaysian economy remained resilient. The ease of MCO has allowed certain businesses to reopen where some sector began to thrive, whilst some barely managed to survive, and some were even forced into closure. The pandemic had impacted every sector in many ways and the Government played a critical part in ensuring the welfare of its Rakyat. Energy supply and demand which are closely linked to the economy began recovering and showing some growth in 2021. Malaysia continues to intensify its efforts to increase renewable energy in the energy system, in line with the nation's aspiration of becoming net zero GHG emission earliest by 2050 and its Nationally Determined Contribution (NDC) target of reducing 45% of GHG emission intensity by 2030 from 2005 level.



Key Economic and Energy Data

NATIONAL ENERGY BALANCE 2021

Table 1 : Key Economic and Energy Data

	2021				
	Q1	Q2	Q3	Q4	Total
GDP at Current Prices (RM million)*	371,510	374,464	378,178	424,747	**1,548,898**
GDP at 2015 Prices (RM million)*	344,005	337,770	337,286	371,583	**1,390,644**
GNI at Current Prices (RM million)*	364,869	363,119	374,005	404,752	**1,506,745**
Population ('000 people)**	32,552	32,576	32,579	32,592	**32,576**
Primary Energy Supply (ktoe)	23,614	23,541	22,473	24,773	**94,401**
Final Energy Consumption (ktoe)	14,610	13,359	13,620	15,660	**57,250**
Electricity Consumption (ktoe)	3,252	3,439	3,164	3,457	**13,311**
Electricity Consumption (GWh)	37,792	39,963	36,769	40,181	**154,705**
Per Capita					
GDP at Current Prices (RM)*	45,652	45,980	46,432	52,128	**47,547**
Primary Energy Supply (toe)	0.725	0.723	0.690	0.760	**2.898**
Final Energy Consumption (toe)	0.449	0.410	0.418	0.480	**1.757**
Electricity Consumption (kWh)	1,161	1,227	1,129	1,233	**4,749**
Energy Intensity					
Primary Energy Intensity (toe/GDP at 2015 prices (RM million))	68.64	69.70	66.63	66.67	**67.88**
Final Energy Intensity (toe/GDP at 2015 prices (RM million))	42.5	39.6	40.4	42.1	**41.2**
Electricity Intensity (toe/GDP at 2015 prices (RM million))	9.5	10.2	9.4	9.3	**9.6**
Electricity Intensity (GWh/GDP at 2015 prices (RM million))	0.110	0.118	0.109	0.108	**0.111**

Note (*): Quarterly data is from the Department of Statistics Malaysia
(**): Mid-year population is from the Department of Statistics Malaysia

Table 2 : Key Economic and Energy Data by Region

Peninsular Malaysia	2015	2016	2017	2018	2019	2020	2021
GDP at Current Prices (RM million)*	975,581	1,038,585	1,131,602	1,193,460	1,255,700	1,188,837	1,275,565
GDP at 2015 Prices (RM million)*	975,581	1,020,869	1,080,017	1,138,500	1,193,928	1,132,257	1,172,556
Population ('000 people)**	24,669	24,995	25,303	25,593	25,713	26,480	26,602
Final Energy Consumption (ktoe)	43,011	45,872	46,520	47,446	48,085	41,313	41,364
Electricity Consumption (ktoe)	9,531	10,026	10,004	10,378	10,776	10,172	10,184
Electricity Consumption (GWh)	110,770	116,529	116,272	120,617	125,241	118,221	118,365
Per Capita							
GDP at Current Prices (RM) *	39,547	41,551	44,722	46,632	48,835	44,896	47,950
Final Energy Consumption (toe)	1.744	1.835	1.839	1.854	1.870	1.560	1.555
Electricity Consumption (kWh)	4,490	4,662	4,595	4,713	4,871	4,465	4,449
Energy Intensity							
Final Energy Consumption (toe/GDP at 2015 prices (RM million))	44.1	44.9	43.1	41.7	40.3	36.5	35.3
Electricity Consumption (toe/GDP at 2015 prices (RM million))	9.8	9.8	9.3	9.1	9.0	9.0	8.7
Electricity Consumption (GWh/GDP at 2015 prices (RM million))	0.114	0.114	0.108	0.106	0.105	0.104	0.101

Notes (*): 1. GDP data by States is from the Department of Statistics Malaysia
2. GDP for Peninsular Malaysia includes Supra State (Supra State covers production activities that beyond the centre of predominant economic interest for any state)

(**): Mid-year population is from the Department of Statistics Malaysia

Table 2: Key Economic and Energy Data by Region

Sabah	2015	2016	2017	2018	2019	2020	2021
GDP at Current Prices (RM million)*	79,775	86,924	101,904	108,053	106,773	91,928	110,305
GDP at 2015 Prices (RM million)*	79,775	83,930	90,583	92,257	93,265	85,378	86,542
Population ('000 people)**	3,816	3,900	3,954	3,997	4,004	3,514	3,509
Final Energy Consumption (ktoe)	3,845	5,015	9,512	6,598	6,561	5,655	5,578
Electricity Consumption (ktoe)	499	487	477	484	514	505	507
Electricity Consumption (GWh)	5,805	5,665	5,545	5,630	5,974	5,869	5,894
Per Capita							
GDP at Current Prices (RM) *	20,908	22,291	25,776	27,031	26,669	26,161	31,438
Final Energy Consumption (toe)	1.008	1.286	2.406	1.651	1.639	1.609	1.590
Electricity Consumption (kWh)	1,521	1,453	1,402	1,408	1,492	1,670	1,680
Energy Intensity							
Final Energy Consumption (toe/GDP at 2015 prices (RM million))	48.2	59.8	105.0	71.5	70.3	66.2	64.5
Electricity Consumption (toe/GDP at 2015 prices (RM million))	6.3	5.8	5.3	5.3	5.5	5.9	5.9
Electricity Consumption (GWh/GDP at 2015 prices (RM million))	0.073	0.067	0.061	0.061	0.064	0.069	0.068

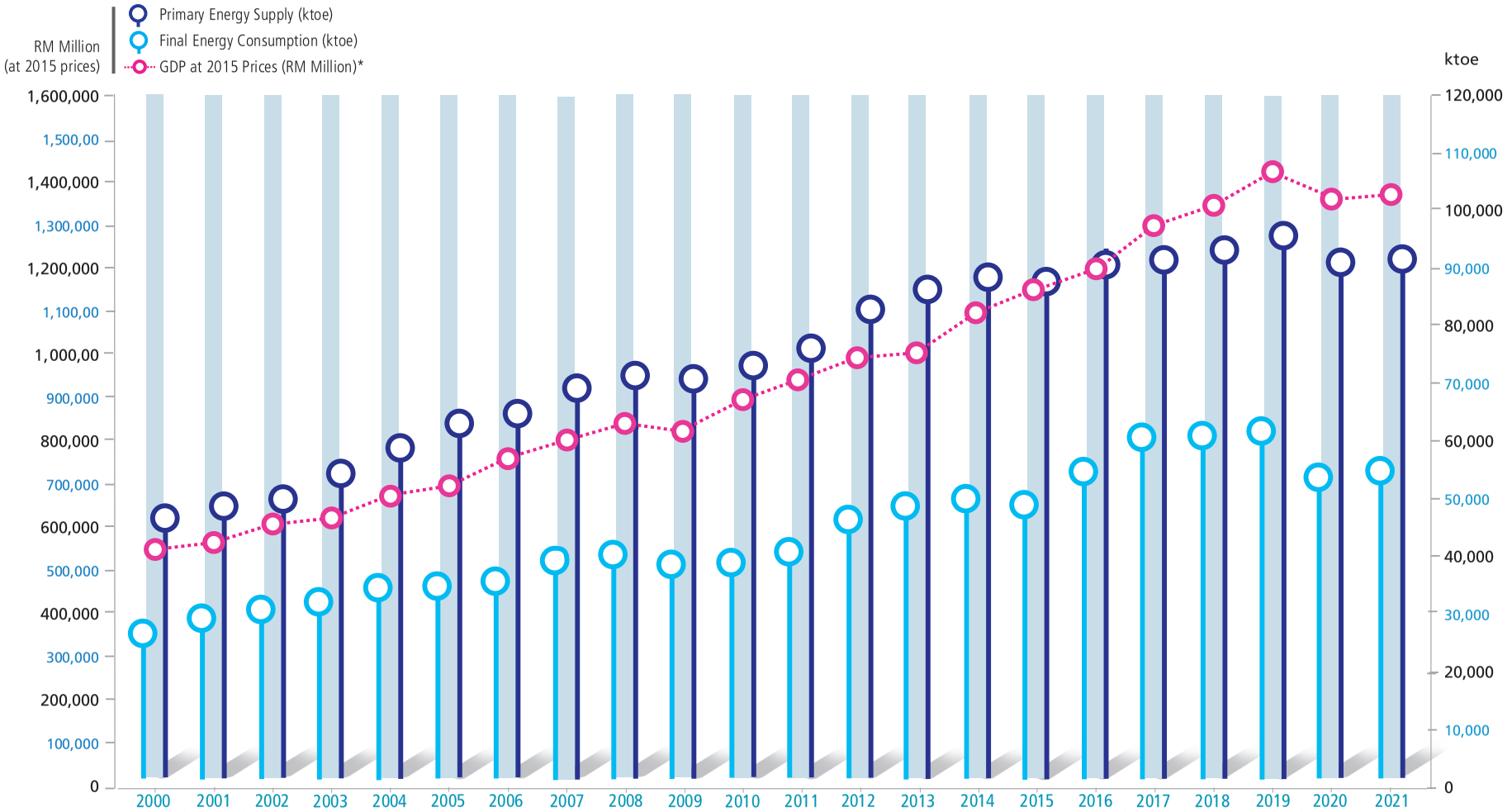
Notes (*): 1. GDP data by States is from the Department of Statistics Malaysia
2. GDP and population for Sabah includes WP Labuan
(**): Mid-year population is from the Department of Statistics Malaysia

Table 2: Key Economic and Energy Data by Region

Sarawak	2015	2016	2017	2018	2019	2020	2021
GDP at Current Prices (RM million)*	121,585	124,189	138,804	146,246	150,265	137,235	163,028
GDP at 2015 Prices (RM million)*	121,585	124,513	130,169	133,010	136,759	127,509	131,545
Population ('000 people)**	2,702	2,739	2,766	2,792	2,806	2,454	2,466
Final Energy Consumption (ktoe)	4,951	6,331	6,458	10,614	11,838	10,201	10,307
Electricity Consumption (ktoe)	1,344	1,878	2,126	2,290	2,356	2,423	2,620
Electricity Consumption (GWh)	15,624	21,831	24,703	26,618	27,382	28,161	30,446
Per Capita							
GDP at Current Prices (RM) *	45,007	45,464	47,055	47,645	48,738	51,966	53,352
Final Energy Consumption (toe)	1.833	2.312	2.335	3.802	4.219	4.157	4.181
Electricity Consumption (kWh)	5,784	7,971	8,930	9,535	9,758	11,477	12,348
Energy Intensity							
Final Energy Consumption (toe/GDP at 2015 prices (RM million))	40.7	50.8	49.6	79.8	86.6	80.0	78.4
Electricity Consumption (toe/GDP at 2015 prices (RM million))	11.1	15.1	16.3	17.2	17.2	19.0	19.9
Electricity Consumption (GWh/GDP at 2015 prices (RM million))	0.129	0.175	0.190	0.200	0.200	0.221	0.231

Notes (*): 1. GDP data by States is from the Department of Statistics Malaysia
(**): Mid-year population is from the Department of Statistics Malaysia

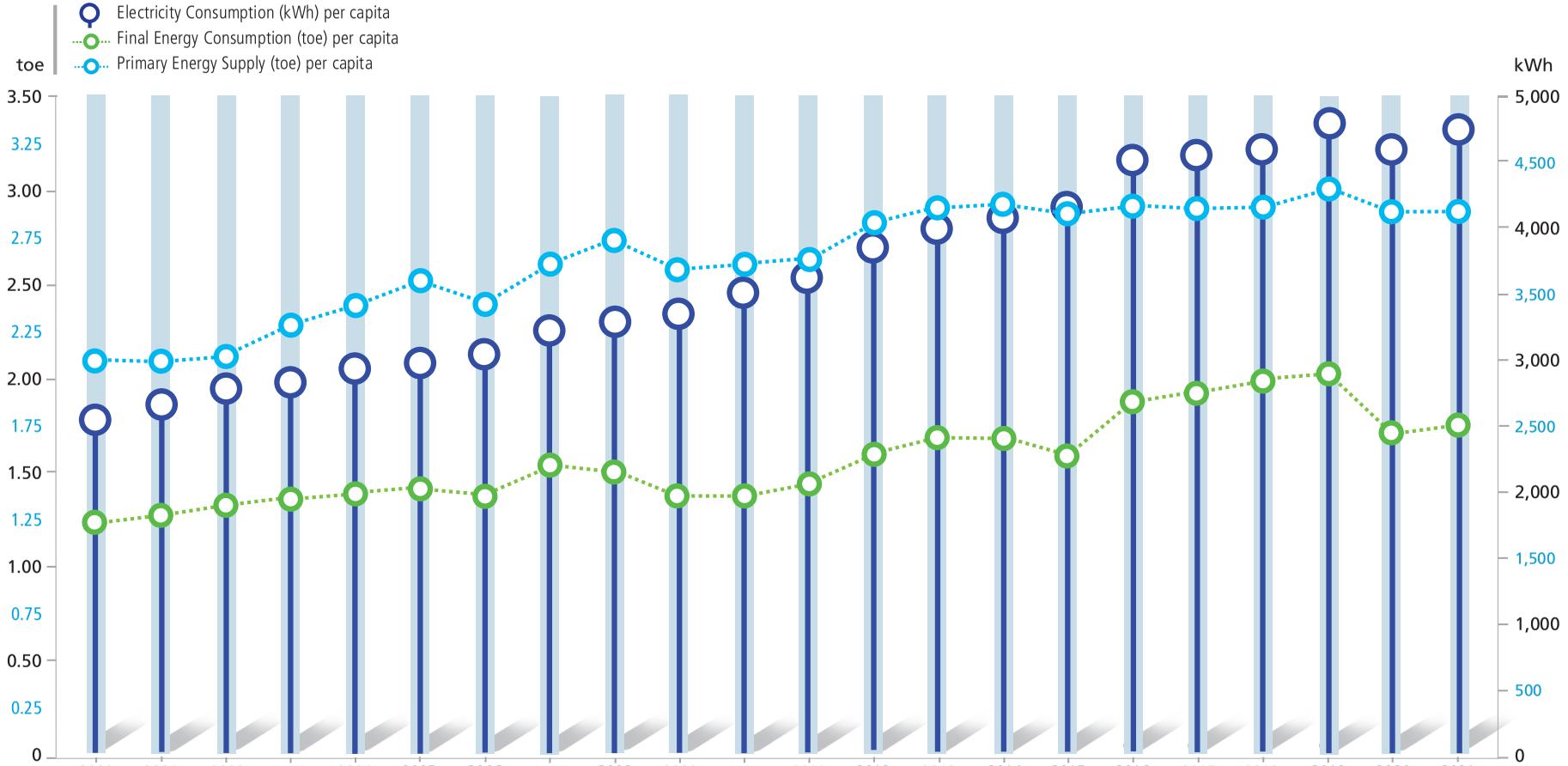
Figure 1 : Trends in GDP, Primary Energy Supply and Final Energy Consumption



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Primary Energy Supply (ktoe)	49,697	50,899	52,323	56,944	62,008	65,344	66,009	71,426	74,709	73,530	75,772	78,095	85,124	89,046	90,691	90,441	93,747	94,345	95,909	98,681	94,194	94,401
Final Energy Consumption (ktoe)	29,699	31,515	33,289	34,586	37,323	38,285	38,567	41,606	41,968	40,845	41,476	43,455	49,291	51,583	52,209	51,829	57,219	62,489	64,658	66,483	57,169	57,250
GDP at 2015 Prices (RM Million)*	579,073	582,071	613,450	648,960	692,981	729,932	770,698	819,242	858,826	845,828	908,629	956,731	1,009,097	1,056,462	1,119,920	1,176,941	1,229,312	1,300,769	1,363,766	1,423,952	1,345,144	1,390,644

Source: GDP data is from the Department of Statistics Malaysia
Note: GDP at 2015 Prices (RM Million) for 2000 until 2014 were estimated by the Energy Commission

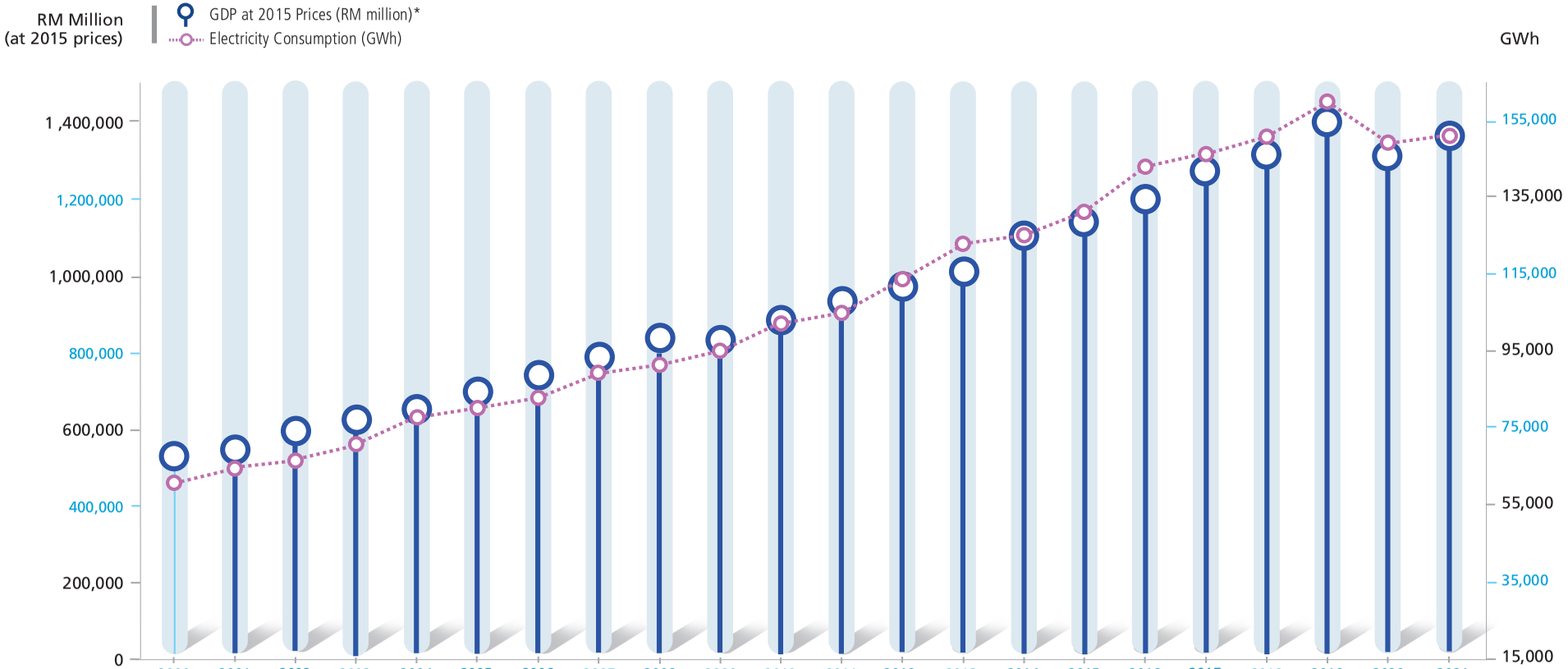
Figure 2 : Primary Energy Supply, Electricity Consumption and Final Energy Consumption Per Capita



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Electricity Consumption (kWh) per capita	2,603	2,705	2,804	2,930	3,022	3,099	3,183	3,300	3,367	3,429	3,656	3,693	3,943	4,074	4,179	4,248	4,553	4,576	4,721	4,877	4,673	4,749
Final Energy Consumption (toe) per capita	1.26	1.31	1.36	1.38	1.46	1.47	1.45	1.54	1.52	1.45	1.45	1.50	1.67	1.71	1.70	1.66	1.81	1.95	2.00	2.04	1.75	1.76
Primary Energy Supply (toe) per capita	2.12	2.12	2.13	2.27	2.43	2.51	2.49	2.64	2.71	2.62	2.65	2.69	2.88	2.95	2.95	2.90	2.96	2.95	2.96	3.03	2.89	2.90

Source: Population data is from the Department of Statistics Malaysia
Note: Data shown is based on the Energy Commission's calculation

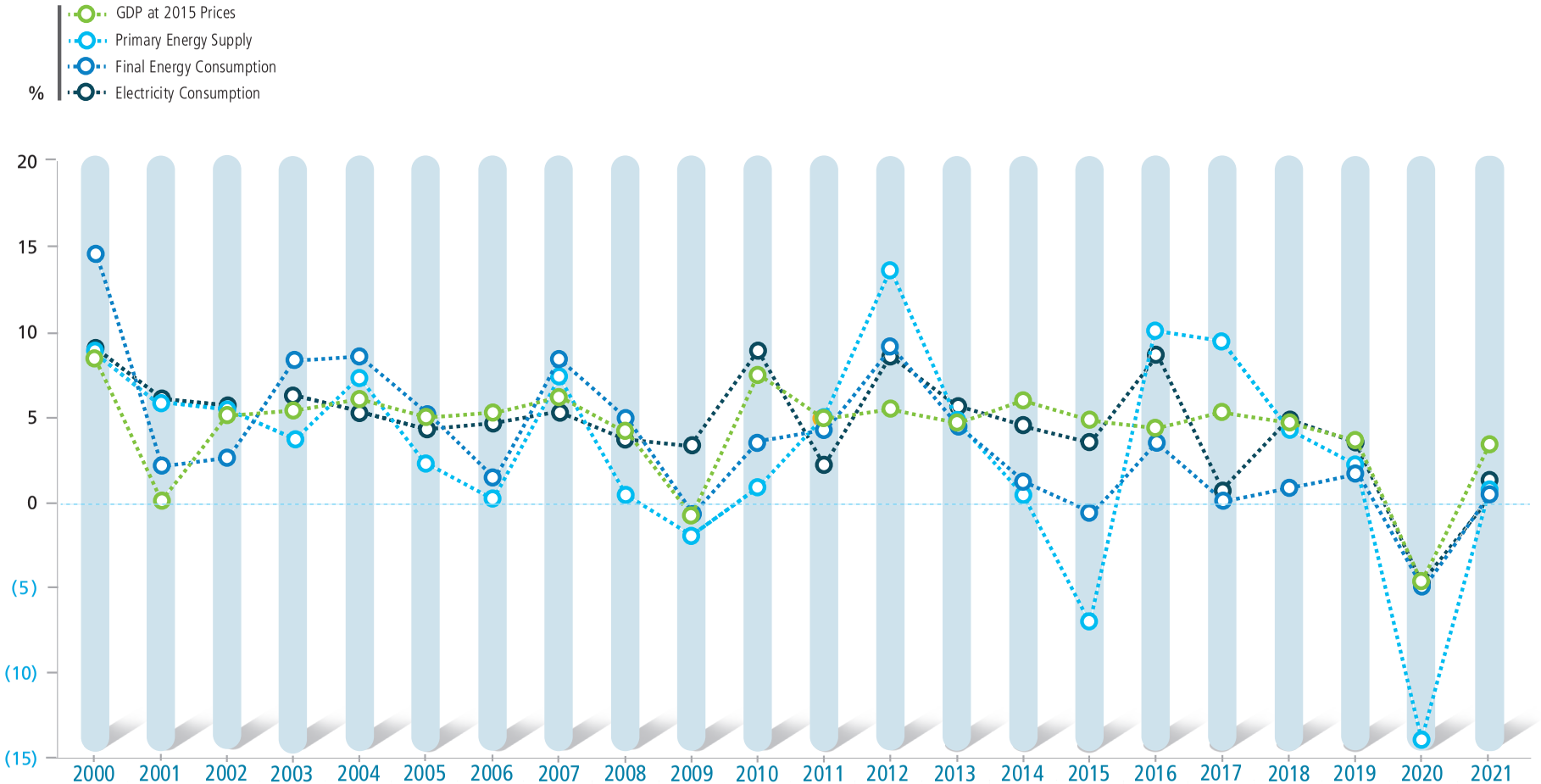
Figure 3 : Trends in GDP and Electricity Consumption



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GDP at 2015 Prices (RM million)*	579,073	582,071	613,450	648,960	692,981	729,932	770,698	819,242	858,826	845,828	908,629	956,731	1,009,097	1,056,462	1,119,920	1,176,941	1,229,312	1,300,769	1,363,766	1,423,952	1,345,144	1,390,644
Electricity Consumption (GWh)	61,168	65,015	68,827	73,371	77,195	80,705	84,517	89,294	92,815	96,302	104,519	107,331	116,350	123,079	128,333	132,464	144,042	146,521	152,867	158,608	152,250	154,705

Source: GDP data is from the Department of Statistics Malaysia
Note: GDP at 2015 Prices (RM Million) for 2000 until 2014 were estimated by the Energy Commission

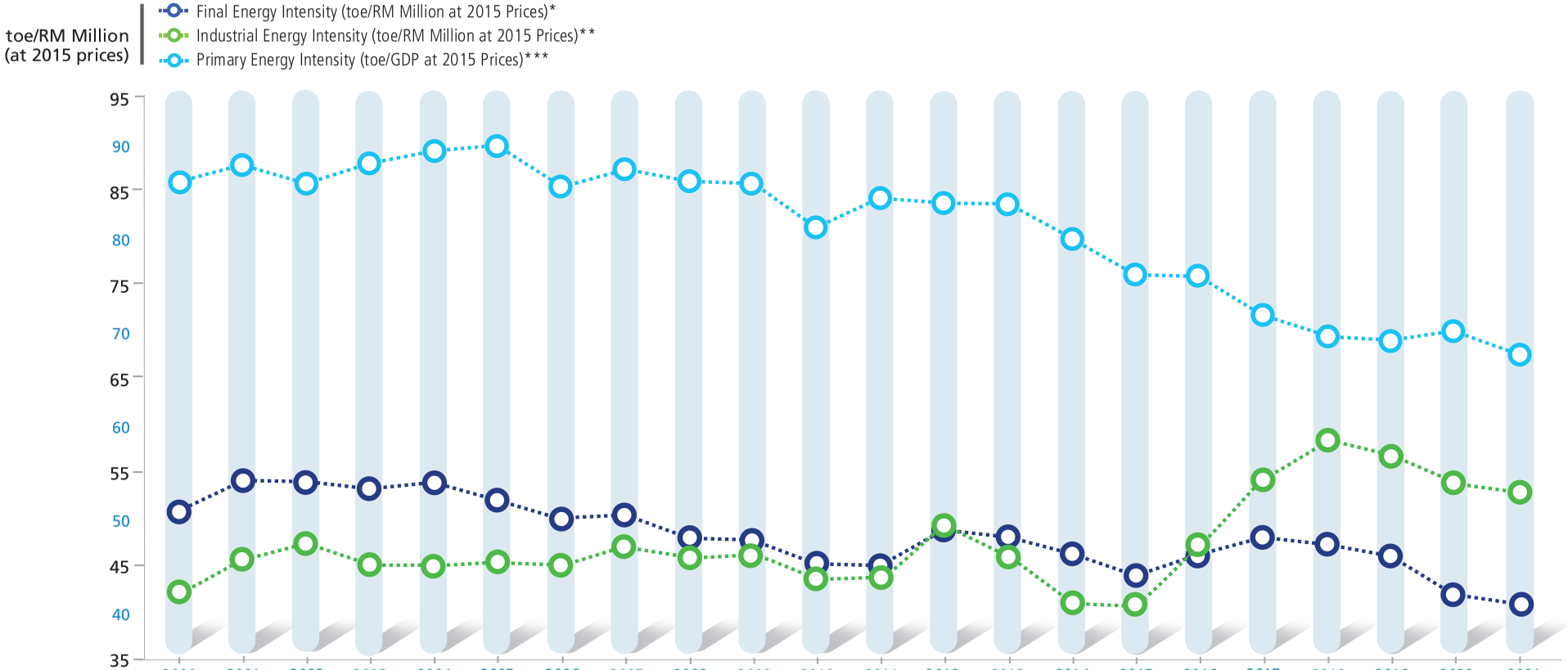
Figure 4 : Annual Growth Rates of GDP, Primary Energy Supply, Final Energy Consumption and Electricity Consumption



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GDP at 2015 Prices	8.86	0.52	5.39	5.79	6.78	5.33	5.58	6.30	4.83	(1.51)	7.42	5.29	5.47	4.69	6.01	5.09	4.45	5.81	4.84	4.41	(5.53)	3.38
Primary Energy Supply	14.21	2.42	2.80	8.83	8.89	5.38	1.02	8.21	4.60	(1.58)	3.05	3.07	9.00	4.61	1.85	(0.28)	3.66	0.64	1.66	2.89	(4.55)	0.22
Final Energy Consumption	9.08	6.11	5.63	3.90	7.91	2.58	0.74	7.88	0.87	(2.68)	1.54	4.77	13.43	4.65	1.21	(0.73)	10.40	9.21	3.47	2.82	(14.01)	0.14
Electricity Consumption	9.30	6.29	5.86	6.60	5.21	4.55	4.72	5.65	3.94	3.76	8.53	2.69	8.40	5.78	4.27	3.22	8.74	1.72	4.33	3.76	(4.01)	1.61

Source: GDP data is from the Department of Statistics Malaysia
Note: GDP at 2015 Prices (RM Million) for 2000 until 2014 were estimated by the Energy Commission

Figure 5 : Primary and Final Energy Intensity

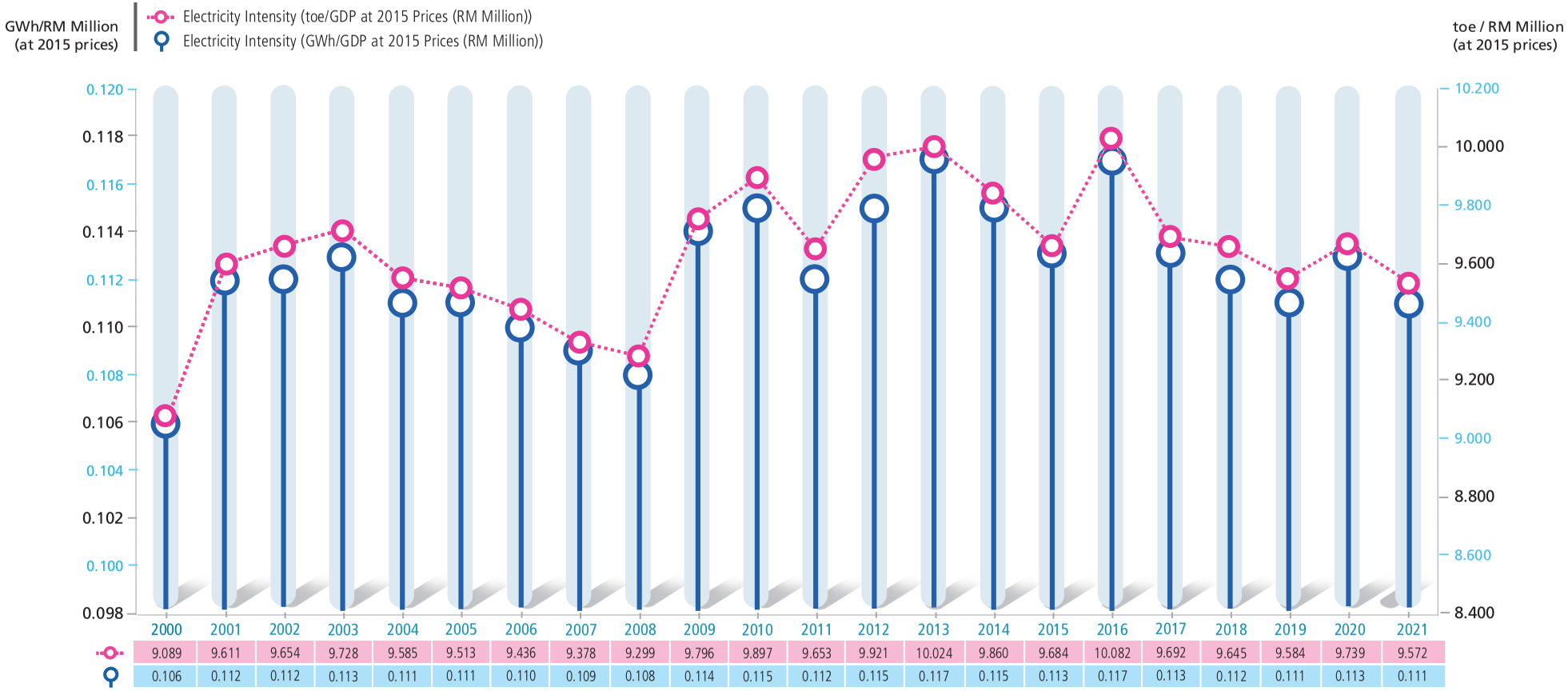


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Final Energy Intensity (toe/RM Million at 2015 Prices)*	51.29	54.14	54.27	53.29	53.86	52.45	50.04	50.79	48.87	48.29	45.65	45.42	48.85	48.83	46.62	44.04	46.55	48.04	47.41	46.69	42.50	41.17
Industrial Energy Intensity (toe/RM Million at 2015 Prices)**	42.55	45.48	47.26	45.26	45.69	45.97	45.13	47.14	46.04	46.53	41.69	44.22	49.23	46.31	41.20	40.12	47.23	54.80	58.04	57.02	54.90	53.53
Primary Energy Intensity (toe/GDP at 2015 Prices)***	85.82	87.44	85.29	87.75	89.48	89.52	85.65	87.19	86.99	86.93	83.39	81.63	84.36	84.29	80.98	76.84	76.26	72.53	70.33	69.30	70.03	67.88

Source: GDP data is from the Department of Statistics Malaysia

Notes:
1. Measurement in ktoe is based on the Energy Commission's calculations
2. Intensity = Quantity of energy required per unit output or activity
3. (*): Final Energy Intensity = Final Energy Consumption (including non-energy use) / GDP at 2015 prices
4. (**): Industrial Energy Intensity = Industry Energy Consumption / Industry GDP at 2015 prices
5. (***) Primary Energy Intensity = Primary Energy Supply / GDP at 2015 prices

Figure 6 : Electricity Intensity

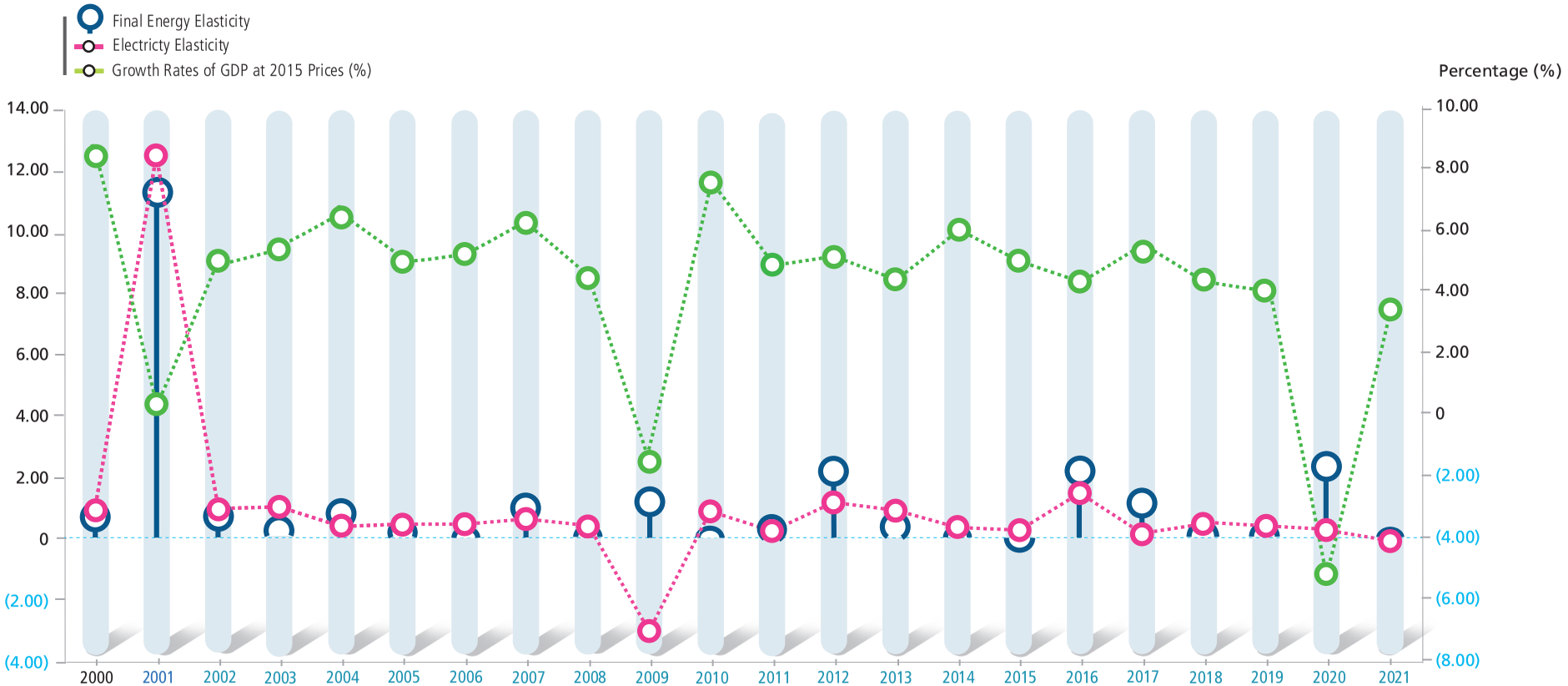


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
toe/GDP at 2015 Prices (RM Million)	9.089	9.611	9.654	9.728	9.585	9.513	9.436	9.378	9.299	9.796	9.897	9.653	9.921	10.024	9.860	9.684	10.082	9.692	9.645	9.584	9.739	9.572
GWh/GDP at 2015 Prices (RM Million)	0.106	0.112	0.112	0.113	0.111	0.111	0.110	0.109	0.108	0.114	0.115	0.112	0.115	0.117	0.115	0.113	0.117	0.113	0.112	0.111	0.113	0.111

Source: 1. GDP data is from the Department of Statistics Malaysia
2. Regulators, Utilities and IPPs

Notes: 1. Measurement in ktoe is based on the Energy Commission's calculations
2. Intensity = Quantity of energy required per unit output or activity

Figure 7 : Final Energy and Electricity Elasticity



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Final Energy Elasticity	1.02	11.81	1.04	0.67	1.17	0.48	0.13	1.25	0.18	1.77	0.21	0.90	2.45	0.99	0.20	(0.14)	2.34	1.58	0.72	0.64	2.53	0.04
Electricty Elasticity	1.05	12.15	1.09	1.14	0.77	0.85	0.85	0.90	0.82	(2.48)	1.15	0.51	1.54	1.23	0.71	0.63	1.96	0.30	0.89	0.85	0.72	0.48
Growth Rates of GDP at 2015 Prices (%)	8.86	0.52	5.39	5.79	6.78	5.33	5.58	6.30	4.83	(1.51)	7.42	5.29	5.47	4.69	6.01	5.09	4.45	5.81	4.84	4.41	(5.53)	3.38

Note : 1) Final Energy Elasticity = Ratio between growths of energy consumption with economic growth

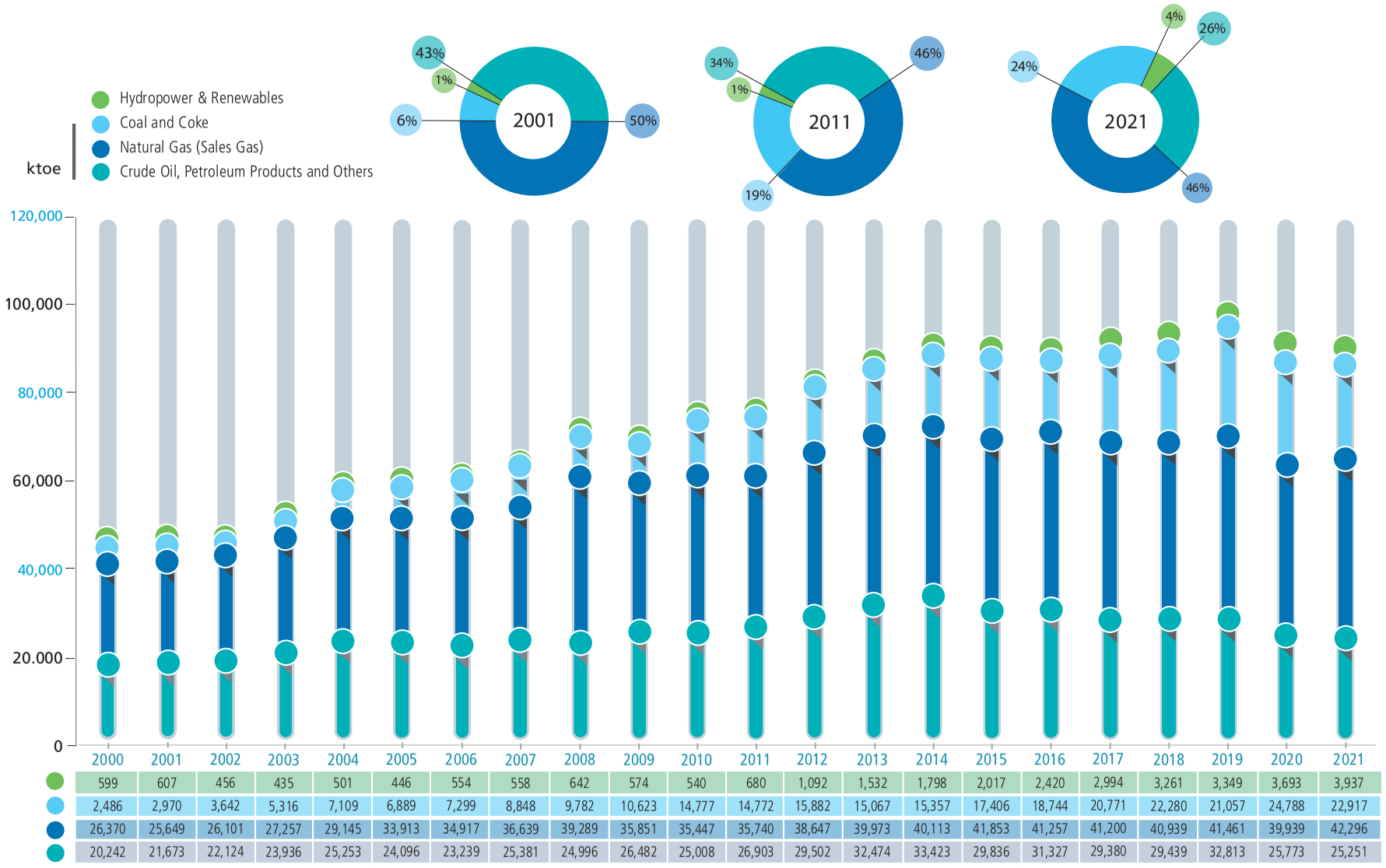
$$\text{Final Energy Elasticity} = \frac{\text{Growth Rate of Energy Consumption (\%)}}{\text{Growth Rate of GDP (\%)}}$$

2) Electricity Elasticity = Ratio between growths of electricity consumption with economic growth

$$\text{Electricity Elasticity} = \frac{\text{Growth Rate of Electricity Consumption (\%)}}{\text{Growth Rate of GDP (\%)}}$$

3) GDP growth rates at 2015 prices (RM Million) for 2000 until 2014 was estimated by the Energy Commission

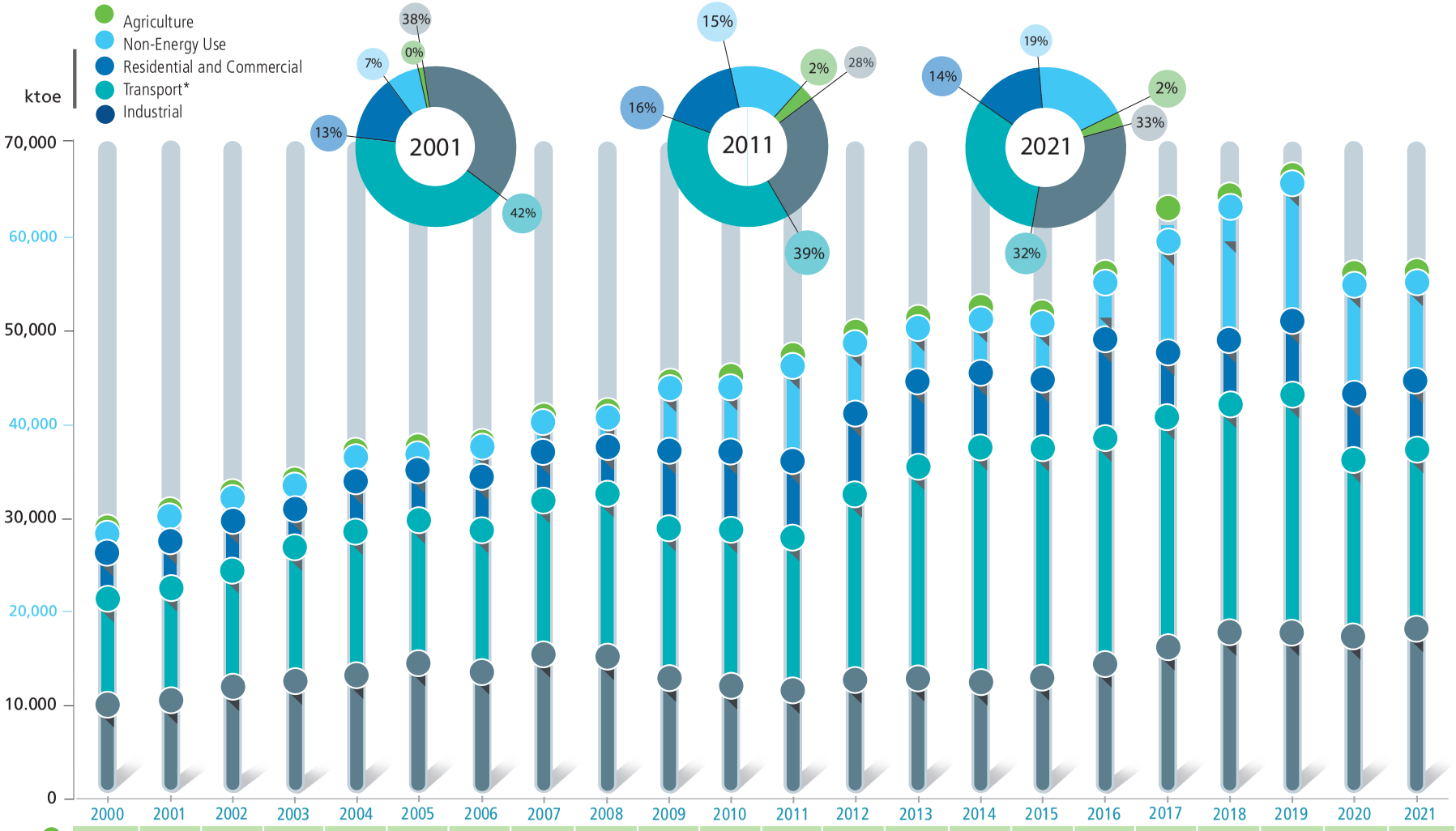
Figure 8 : Primary Energy Supply



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Hydropower & Renewables	599	607	456	435	501	446	554	558	642	574	540	680	1,092	1,532	1,798	2,017	2,420	2,994	3,261	3,349	3,693	3,937
Coal and Coke	2,486	2,970	3,642	5,316	7,109	6,889	7,299	8,848	9,782	10,623	14,777	14,772	15,882	15,067	15,357	17,406	18,744	20,771	22,280	21,057	24,788	22,917
Natural Gas (Sales Gas)	26,370	25,649	26,101	27,257	29,145	33,913	34,917	36,639	39,289	35,851	35,447	35,740	38,647	39,973	40,113	41,853	41,257	41,200	40,939	41,461	39,939	42,296
Crude Oil, Petroleum Products and Others	20,242	21,673	22,124	23,936	25,253	24,096	23,239	25,381	24,996	26,482	25,008	26,903	29,502	32,474	33,423	29,836	31,327	29,380	29,439	32,813	25,773	25,251

Note : Oil and gas companies, power utilities, IPPs, cement, iron and steel manufacturers

Figure 9 : Final Energy Consumption by Sectors



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Agriculture	104	98	96	98	87	101	258	281	287	211	1,074	916	1,053	1,051	1,045	895	415	674	1,021	927	867	1,045
Non-Energy Use	2,250	2,378	2,511	2,345	2,183	2,173	2,819	2,957	2,876	3,868	3,696	6,377	7,497	7,277	6,217	5,928	8,729	12,517	13,262	13,631	11,805	10,869
Residential and Commercial	3,868	4,048	4,387	4,399	4,754	5,134	5,424	6,197	6,205	6,336	6,951	6,993	7,065	7,403	7,459	7,600	8,051	7,796	7,773	8,000	8,123	8,084
Transport*	12,071	13,137	13,442	14,271	15,385	15,293	14,819	15,717	16,395	16,119	16,828	17,070	19,757	22,357	24,327	23,435	24,004	24,039	23,555	25,004	18,660	18,095
Industrial	11,406	11,852	12,854	13,472	14,914	15,583	15,248	16,454	16,205	14,312	12,928	12,100	13,919	13,496	13,162	13,971	16,019	17,463	19,046	18,921	17,714	19,157

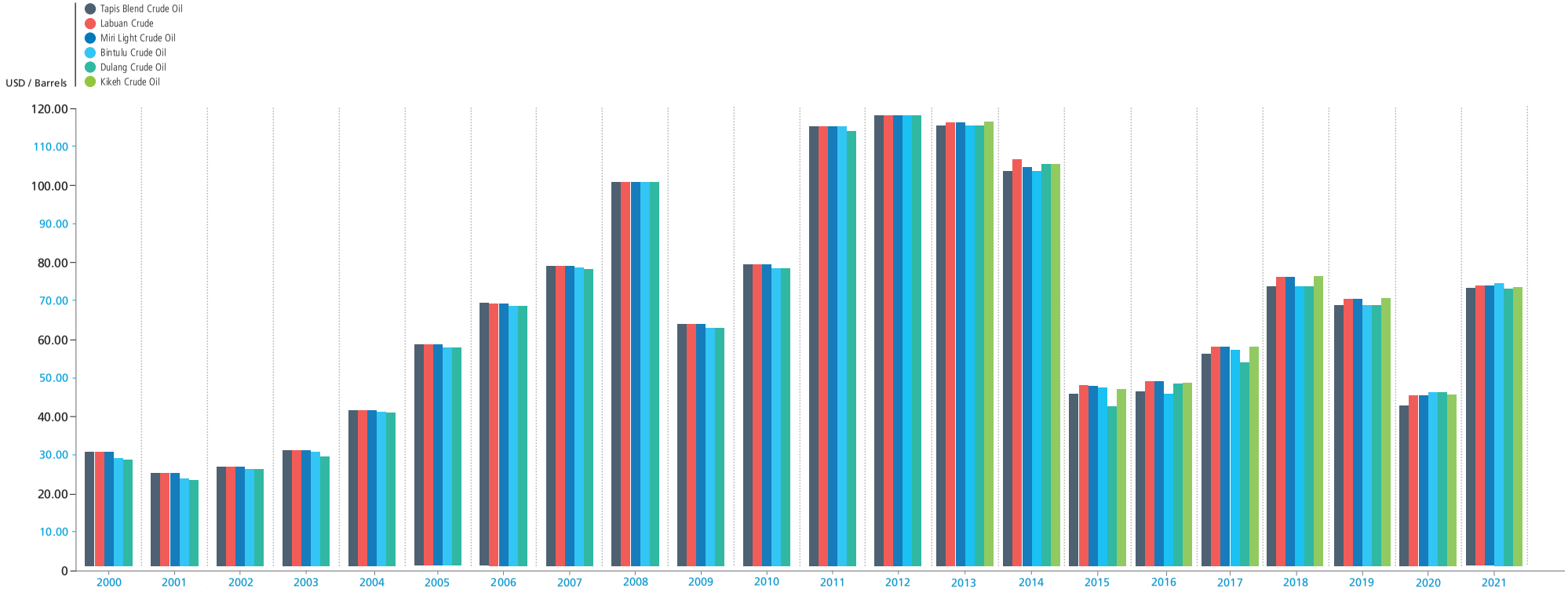
Source: Oil and gas companies, TNB, SESB, SEB, IPPs, cement, iron and steel manufacturers
Note (*): Transport sector includes international aviation

Figure 10 : Final Energy Consumption by Fuel Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Coal and Coke	991	977	1,086	1,212	1,305	1,348	1,335	1,362	1,713	1,613	1,826	1,759	1,744	1,539	1,709	1,778	1,785	1,804	1,808	1,706	1,338	1,392
Natural Gas	3,862	4,620	5,643	5,886	6,490	6,981	7,562	7,709	7,818	6,802	6,254	8,515	10,206	10,076	9,641	9,566	12,304	16,838	18,851	18,647	16,631	17,815
Electricity	5,263	5,594	5,922	6,313	6,642	6,944	7,272	7,683	7,986	8,286	8,993	9,236	10,011	10,590	11,042	11,397	12,394	12,607	13,153	13,647	13,100	13,311
Petroleum Products and Others	19,582	20,323	20,638	21,175	22,886	23,012	22,398	24,852	24,451	24,145	24,403	23,946	27,329	29,379	29,817	29,087	30,737	31,241	30,845	32,483	26,100	24,731

Source: Oil and gas companies, TNB, SESB, SEB, IPPs, cement, iron and steel manufacturers

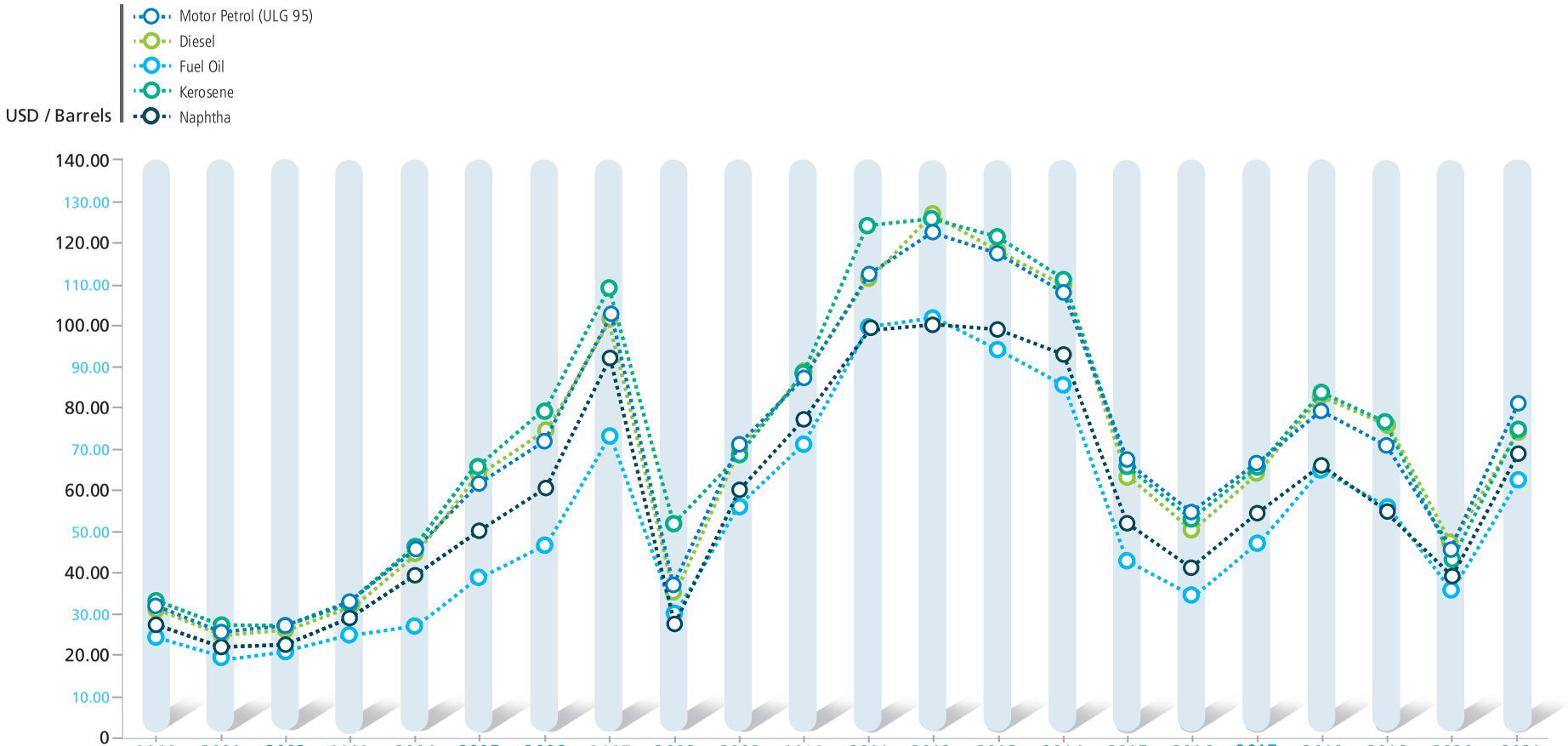
Figure 11 : Official Selling Prices of Malaysian Crude Oil



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Tapis Blend Crude Oil	30.25	25.06	25.52	30.60	41.84	57.71	69.56	78.96	102.79	64.97	79.51	115.33	118.22	115.30	103.26	45.12	45.43	56.30	73.84	68.93	43.65	72.30
Labuan Crude	30.25	25.06	25.52	30.60	41.84	57.71	69.56	78.96	102.79	64.97	79.51	115.33	118.66	116.60	106.41	47.73	47.63	57.90	75.24	70.33	45.05	73.43
Miri Light Crude Oil	30.25	25.06	25.52	30.60	41.84	57.71	69.56	78.96	102.79	64.97	79.51	115.33	118.56	116.30	104.89	47.63	47.63	57.90	75.24	70.33	45.05	73.43
Bintulu Crude Oil	29.95	24.78	25.22	30.33	41.54	57.43	69.28	78.66	102.49	64.67	79.21	115.03	118.36	115.40	103.13	47.35	45.13	57.50	73.84	68.93	45.85	74.14
Dulang Crude Oil	29.18	24.68	25.23	29.99	41.17	57.41	68.96	78.59	102.49	64.67	79.21	114.23	118.16	115.70	105.46	42.98	47.23	54.97	73.84	69.93	45.85	72.88
Kikeh Crude Oil	-	-	-	-	-	-	-	-	-	-	-	-	-	116.60	105.66	46.96	47.63	57.90	75.24	70.33	45.05	73.43

Source: PETRONAS

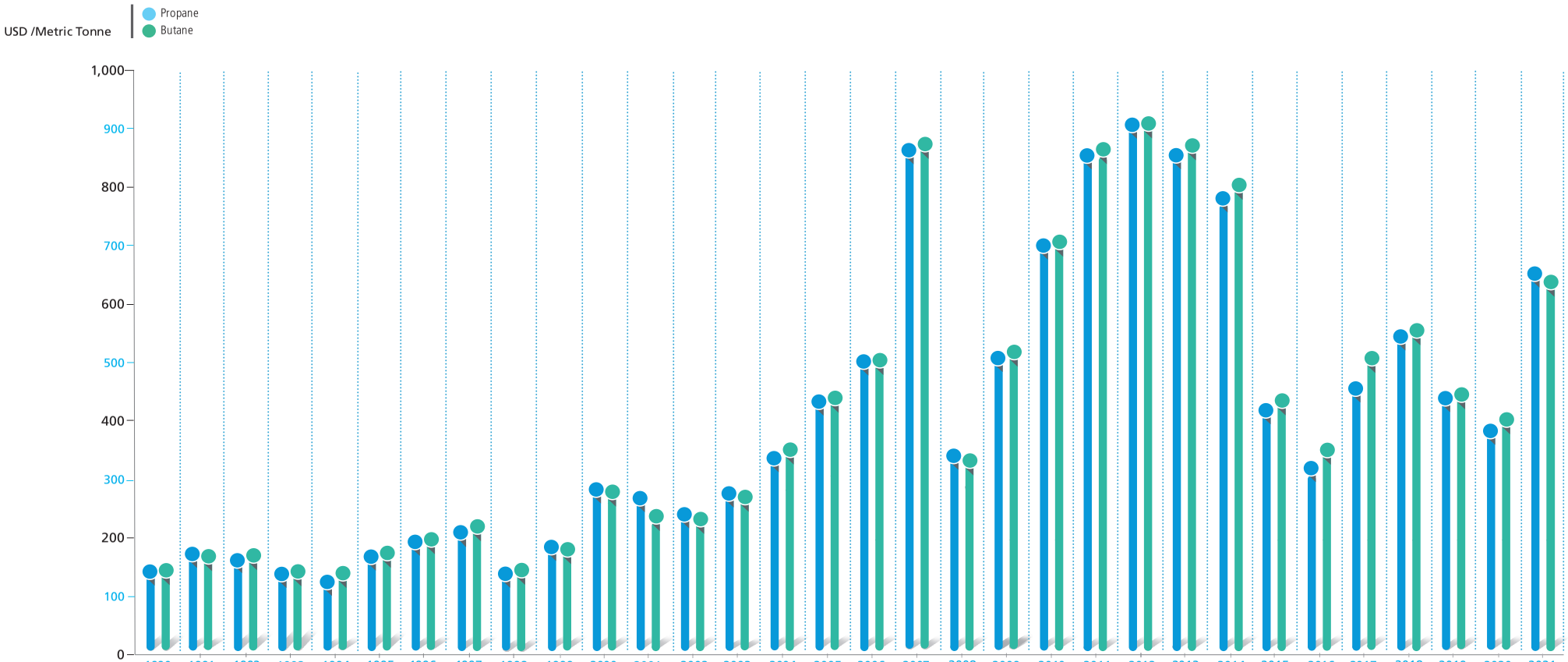
Figure 12 : Ex-Singapore Prices of Major Petroleum Products



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Motor Petrol (ULG 95)	32.64	27.43	28.04	34.69	47.23	62.38	73.20	104.05	39.25	70.38	88.41	119.79	123.42	119.00	110.97	69.17	56.26	67.99	80.23	72.49	46.70	80.50
Diesel	32.48	27.32	27.55	32.46	45.92	64.35	76.93	103.74	39.32	70.42	90.35	126.28	128.10	123.27	112.69	64.47	52.24	65.65	84.33	77.23	48.42	76.12
Fuel Oil	25.82	21.78	23.63	25.72	28.15	40.32	48.84	74.60	31.40	58.12	72.85	100.68	103.92	96.35	87.31	44.52	35.62	49.99	65.98	57.63	38.21	63.21
Kerosene	34.27	28.32	28.08	33.25	47.69	67.99	80.72	110.50	53.90	70.14	90.18	125.71	126.79	122.85	112.50	64.69	53.00	65.27	85.04	77.24	44.82	75.25
Naphtha	28.32	23.75	24.93	30.14	40.82	51.04	62.13	93.98	29.90	60.96	79.24	102.49	103.57	100.99	94.40	52.62	42.65	53.79	67.29	56.90	40.55	70.77

Source: PETRONAS
Note: Data shown are prices Ex-Singapore, in USD per Barrel, taken from Industry Sources

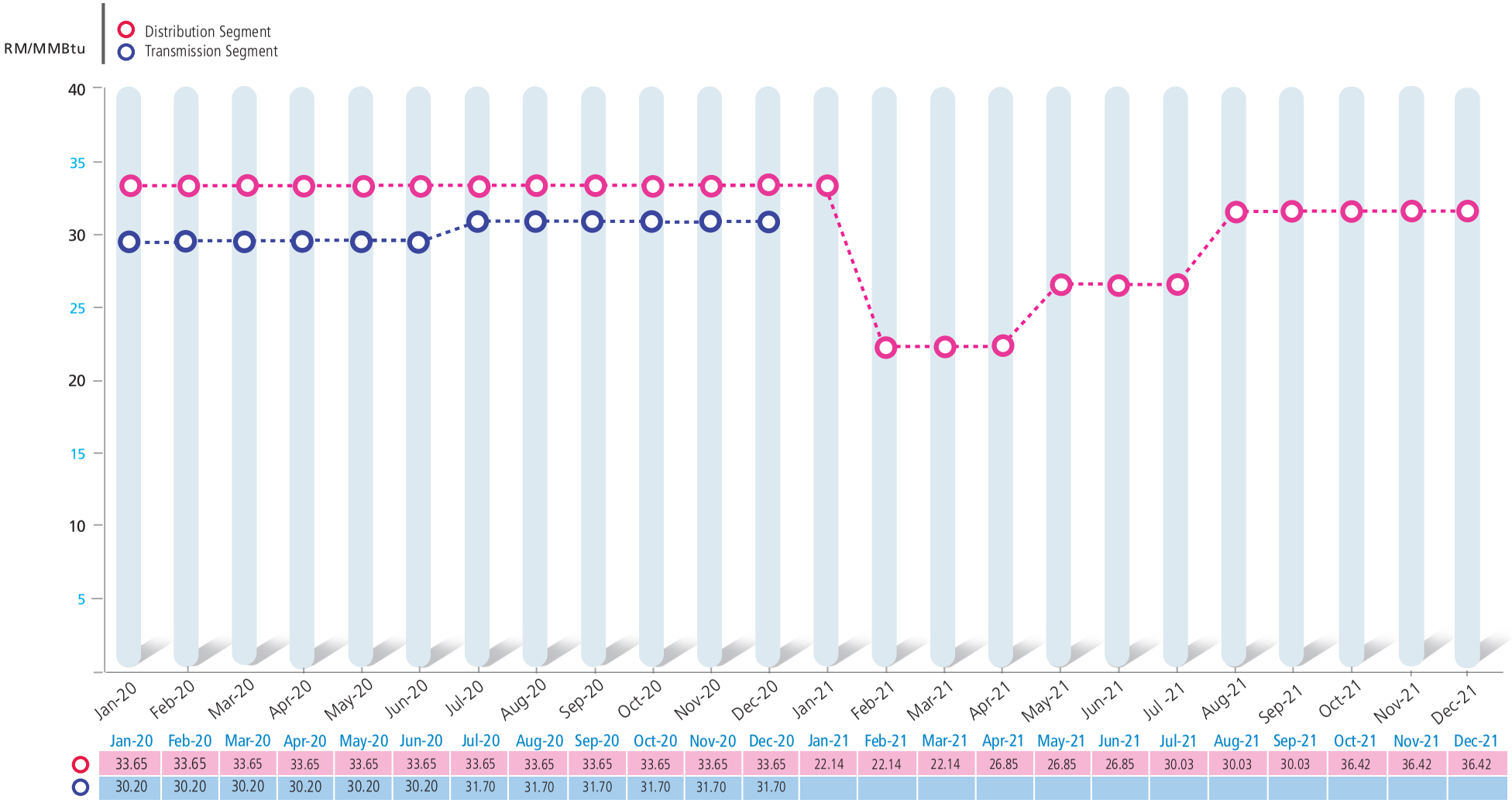
Figure 13 : Annual Liquefied Petroleum Gas (LPG) Contract Prices – Arab Gulf



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Propane	155.96	186.89	167.13	140.02	129.13	178.62	204.42	210.35	126.50	191.07	299.29	269.29	244.58	288.84	348.61	430.79	510.27	858.00	340.00	504.37	708.01	828.03	914.12	856.70	790.70	416.70	323.60	467.50	544.20	434.50	397.40	649.80
Butane	156.13	182.19	179.95	147.67	140.90	183.82	207.21	222.21	134.55	190.84	299.46	239.43	238.48	278.46	355.33	442.89	514.00	887.50	335.00	521.43	716.81	871.12	917.45	884.10	810.50	436.50	356.10	502.00	541.60	441.60	404.10	631.40

Note: Yearly LPG contract prices - Arab Gulf, in USD per Metric Tonne, taken from Industry Sources.
Source: PETRONAS

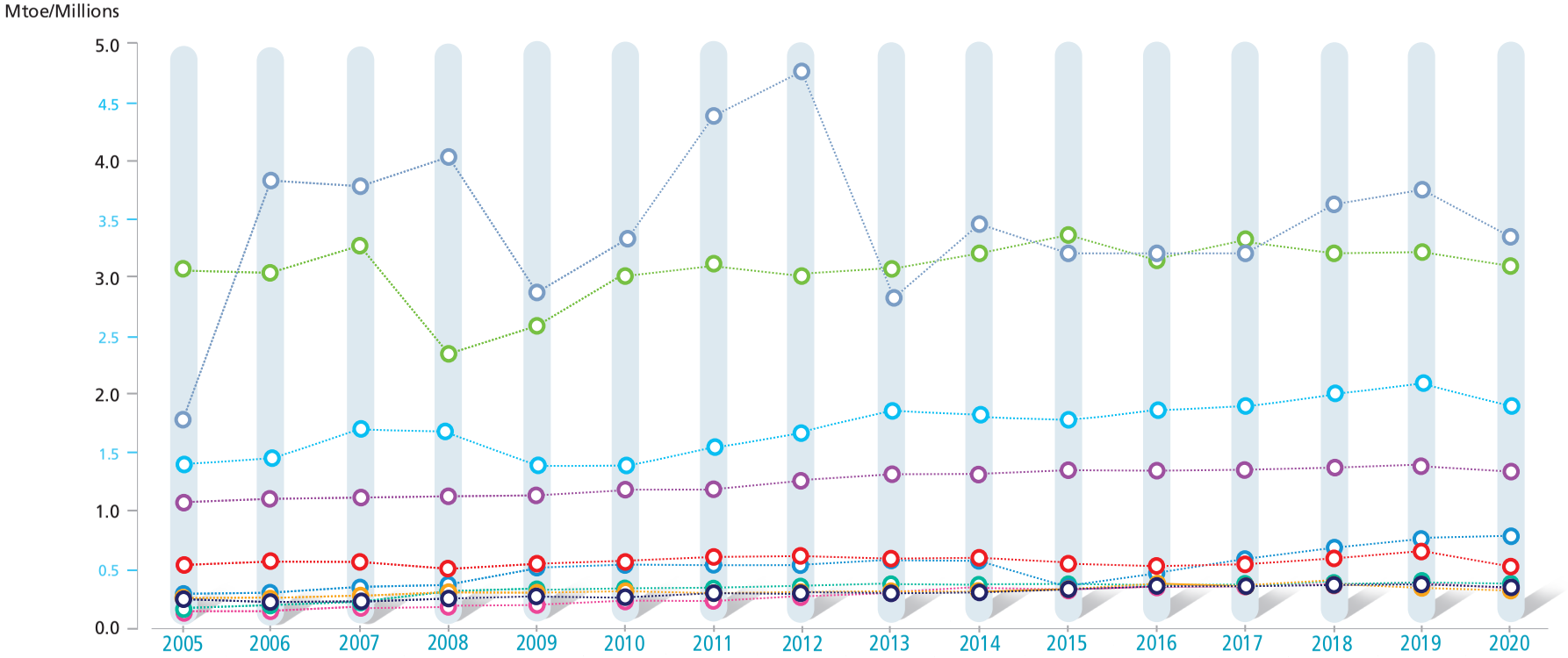
Figure 14 : Regulated Piped Gas Prices



	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
○	33.65	33.65	33.65	33.65	33.65	33.65	33.65	33.65	33.65	33.65	33.65	33.65	22.14	22.14	22.14	26.85	26.85	26.85	30.03	30.03	30.03	36.42	36.42	36.42
○	30.20	30.20	30.20	30.20	30.20	30.20	31.70	31.70	31.70	31.70	31.70	31.70												

Source: PETRONAS, Gas Malaysia Energy and Services Sdn Bhd
Note: Starting in January 2021, gas prices for the transmission segment are based on market prices.

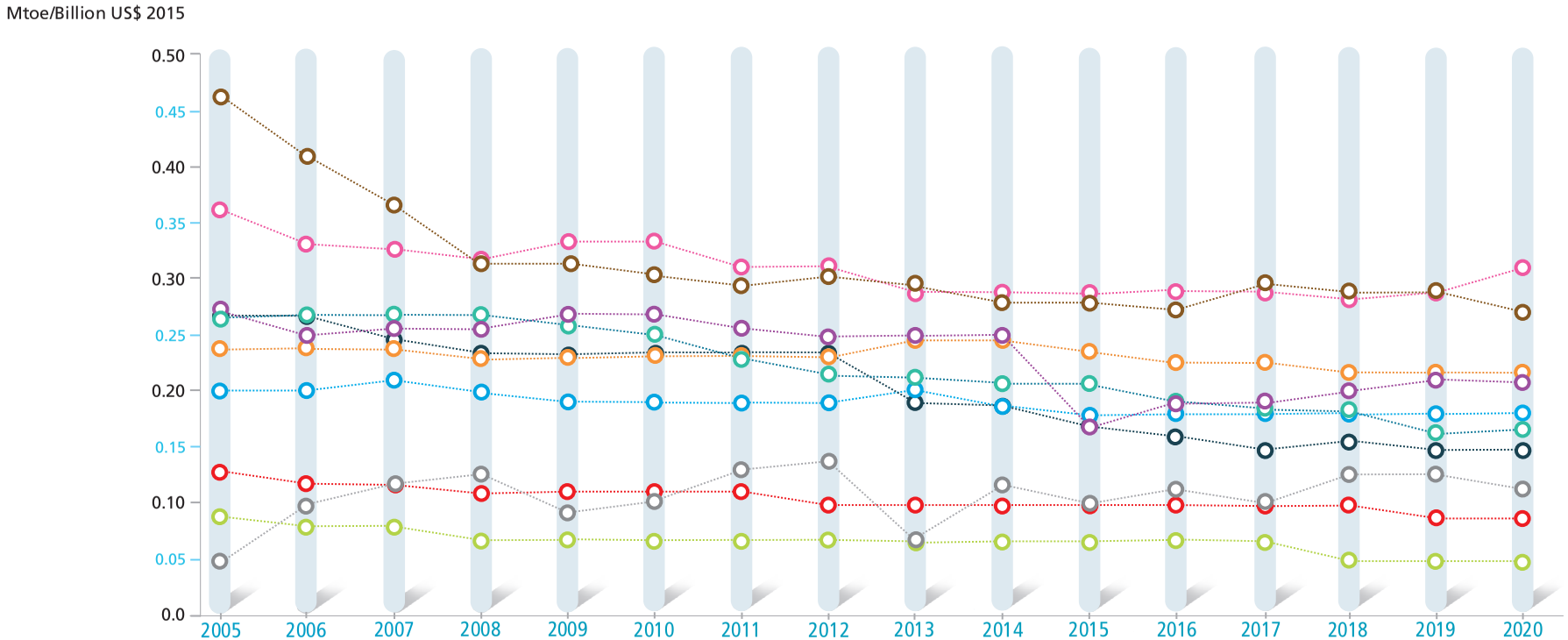
Figure 15 : Final Energy Consumption Per Capita in ASEAN



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Brunei Darussalam	1.75	3.82	3.79	4.01	2.89	3.36	4.44	4.73	2.74	3.50	3.16	3.16	3.16	3.58	3.67	3.44
Cambodia	0.25	0.25	0.26	0.26	0.28	0.29	0.29	0.30	0.31	0.32	0.34	0.36	0.37	0.38	0.42	0.43
Indonesia	0.58	0.60	0.60	0.57	0.58	0.61	0.64	0.65	0.60	0.60	0.58	0.54	0.55	0.58	0.60	0.55
Lao People's Democratic Republic	0.31	0.33	0.35	0.39	0.39	0.39	0.39	0.39	0.41	0.42	0.45	0.43	0.43	0.44	0.42	0.42
Malaysia	1.45	1.50	1.65	1.62	1.44	1.48	1.53	1.60	1.79	1.74	1.67	1.80	1.94	1.98	2.02	1.87
Myanmar	0.27	0.26	0.26	0.25	0.25	0.25	0.26	0.28	0.29	0.30	0.31	0.32	0.37	0.37	0.38	0.37
Philippines	0.26	0.25	0.26	0.26	0.26	0.27	0.26	0.26	0.28	0.28	0.30	0.32	0.34	0.33	0.34	0.30
Singapore	3.15	3.14	3.25	2.46	2.61	3.01	3.16	3.01	3.13	3.27	3.40	3.18	3.30	3.23	3.24	3.11
Thailand	1.08	1.10	1.10	1.11	1.17	1.26	1.26	1.34	1.40	1.40	1.43	1.41	1.43	1.45	1.47	1.39
Vietnam	0.42	0.42	0.45	0.48	0.51	0.55	0.55	0.55	0.58	0.61	0.43	0.53	0.55	0.63	0.67	0.68

Source: World Energy Balances, 2022 Edition, International Energy Agency (IEA)

Figure 16 : Final Energy Intensity in ASEAN



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Brunei Darussalam	0.05	0.10	0.11	0.12	0.09	0.10	0.13	0.14	0.08	0.11	0.10	0.11	0.10	0.12	0.12	0.11
Cambodia	0.36	0.33	0.32	0.31	0.33	0.33	0.31	0.31	0.29	0.29	0.29	0.29	0.29	0.28	0.29	0.31
Indonesia	0.27	0.27	0.25	0.23	0.23	0.23	0.22	0.22	0.19	0.19	0.17	0.16	0.15	0.16	0.15	0.15
Lao People's Democratic Republic	0.26	0.27	0.27	0.27	0.26	0.25	0.23	0.22	0.22	0.21	0.21	0.19	0.18	0.18	0.16	0.17
Malaysia	0.20	0.20	0.21	0.20	0.18	0.18	0.18	0.18	0.20	0.18	0.17	0.18	0.18	0.18	0.18	0.18
Myanmar	0.46	0.41	0.37	0.32	0.31	0.30	0.29	0.30	0.29	0.28	0.28	0.27	0.29	0.28	0.27	0.26
Philippines	0.13	0.12	0.12	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09
Singapore	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05
Thailand	0.24	0.24	0.23	0.23	0.24	0.24	0.24	0.24	0.25	0.25	0.24	0.23	0.23	0.22	0.22	0.22
Vietnam	0.27	0.25	0.26	0.26	0.27	0.27	0.26	0.25	0.25	0.25	0.17	0.19	0.19	0.20	0.21	0.21

Source: World Energy Balances, 2022 Edition, International Energy Agency (IEA)

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Table 3 : Production and Resources of Oil as of 1st January 2021

Region	Resources (Billion Barrel)			Production (Thousand Barrel per day)		
	Crude Oil	Condensates	Total	Crude Oil	Condensates	Total
Peninsular Malaysia	1.086	0.206	**1.292**	135.38	31.76	**167.13**
Sabah	1.238	0.105	**1.342**	192.77	10.84	**203.61**
Sarawak	1.235	0.561	**1.796**	88.82	61.02	**149.84**
Total	**3.559**	**0.871**	**4.430**	**416.96**	**103.62**	**520.58**

Source : PETRONAS

Table 4 : Refinery Licensed Capacity

Refinery Plants	Location	Start-up date	Thousand Barrels/Day
Hengyuan Refining Company (formerly known as Shell Refining Co. (FOM) Bhd)	Port Dickson, Negeri Sembilan	1963	**155**
Petron Malaysia (previously owned by ESSO Malaysia Bhd)	Port Dickson, Negeri Sembilan	1960	**88**
PETRONAS	Kertih, Terengganu*	1983	**49**
PETRONAS	Melaka	1994	**100**
Malaysia Refining Company Sdn Bhd (PETRONAS / ConocoPhillips)	Melaka	1998	**100**
Kemaman Bitumen Company	Kemaman, Terengganu	2003	**28**
Pengerang RAPID	Pengerang, Johor	NA	**279**
Total			**799**

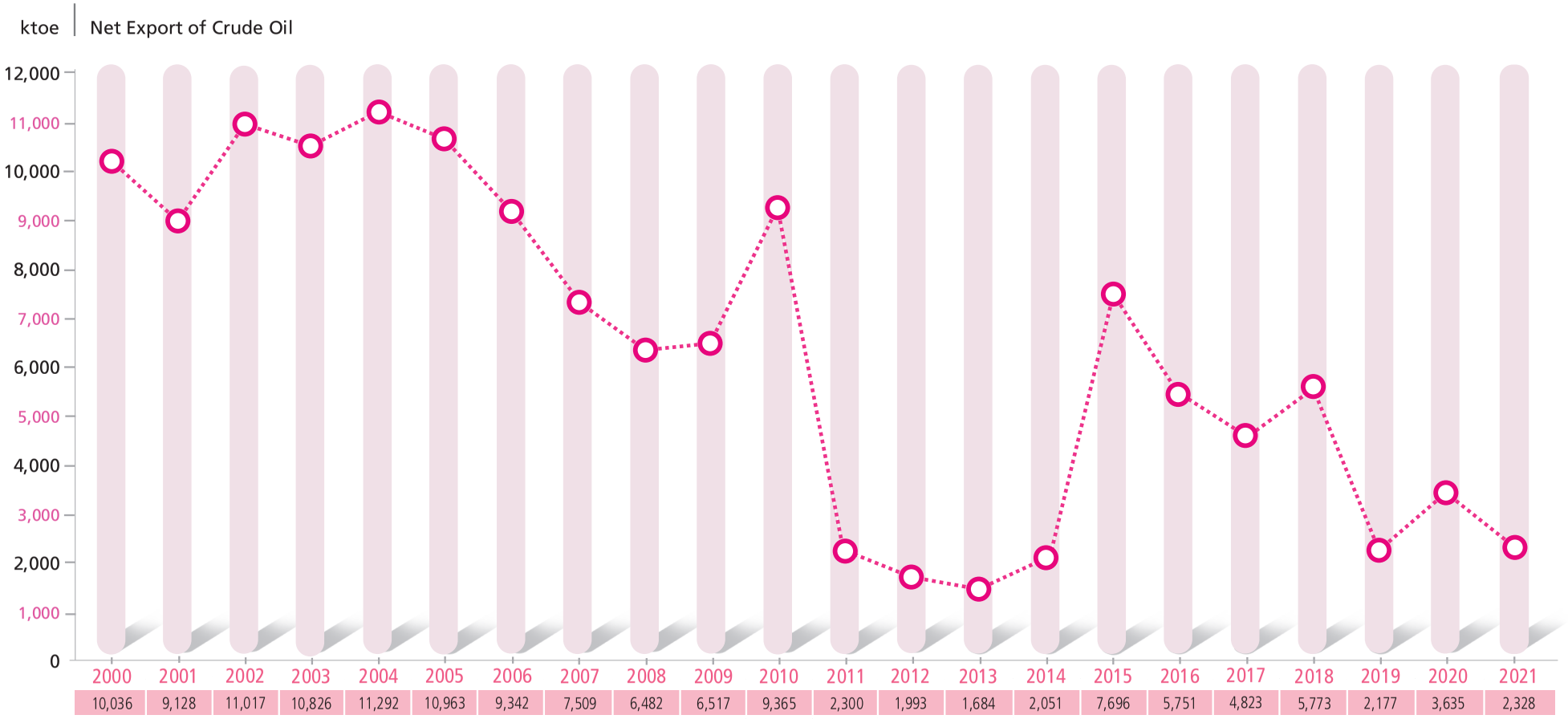
Source : PETRON, PETRONAS & SHELL
Note (*): Excludes condensate splitter of 74,300 bpd

Table 5 : Breakdown on Sales of Petroleum Products in Thousand Barrels, 2021

Petroleum Products	Peninsular Malaysia	Sabah	Sarawak	Total
Petrol	75,361	3,344	3,034	**81,740**
Diesel	51,985	5,401	4,241	**61,627**
Fuel Oil	2,256	3	25	**2,283**
Kerosene	659	3	4	**665**
LPG	13,087	863	807	**14,757**
ATF & AV Gas	6,838	261	222	**7,321**
Non-Energy	2,809	189	400	**3,399**
Total	**152,995**	**10,064**	**8,733**	**171,792**

Source: Oil companies

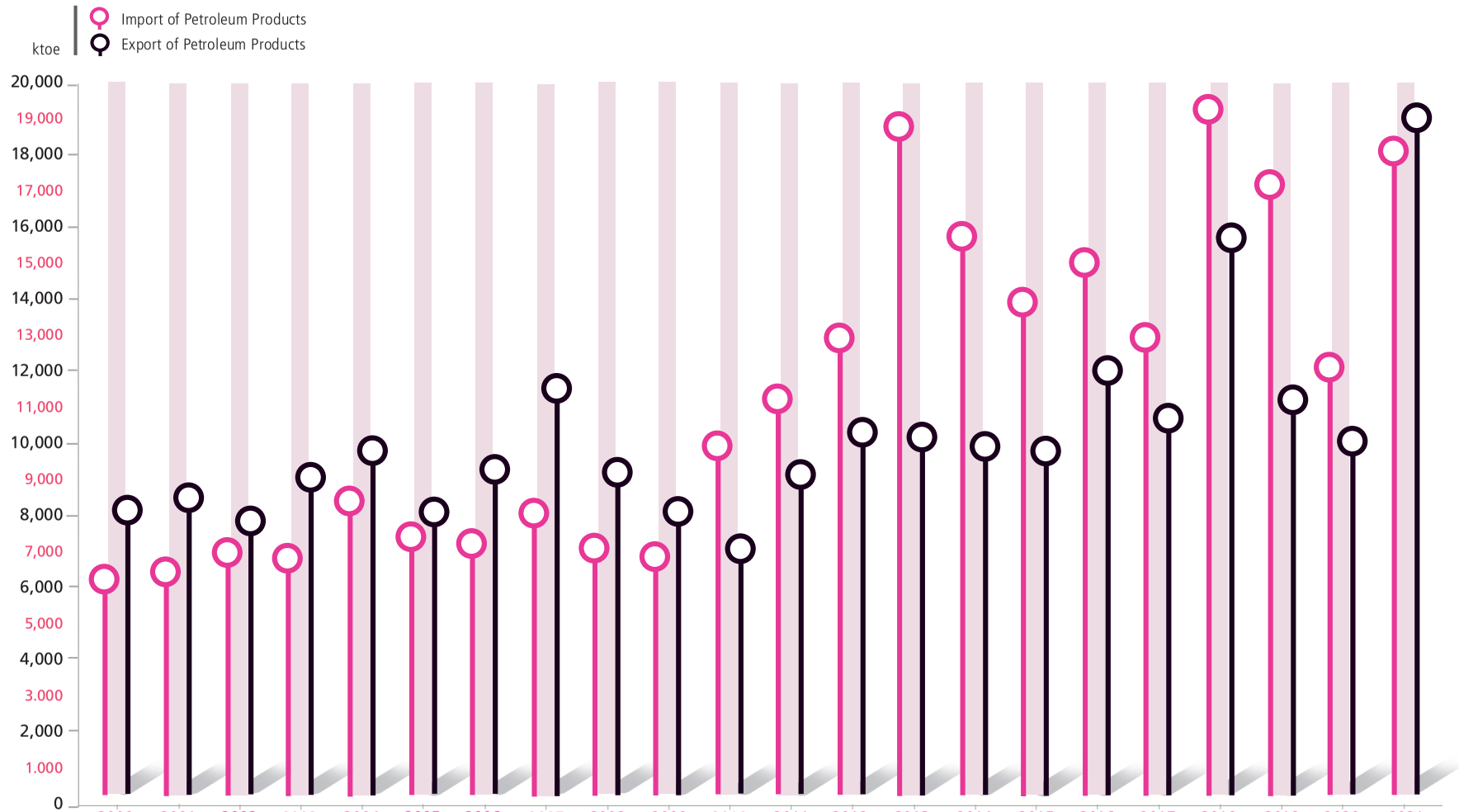
Figure 17 : Net Export of Crude Oil



2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
10,036	9,128	11,017	10,826	11,292	10,963	9,342	7,509	6,482	6,517	9,365	2,300	1,993	1,684	2,051	7,696	5,751	4,823	5,773	2,177	3,635	2,328

Source: Department of Statistics Malaysia and Oil companies
Note: Measurement in ktoe is based on the Energy Commission's calculation

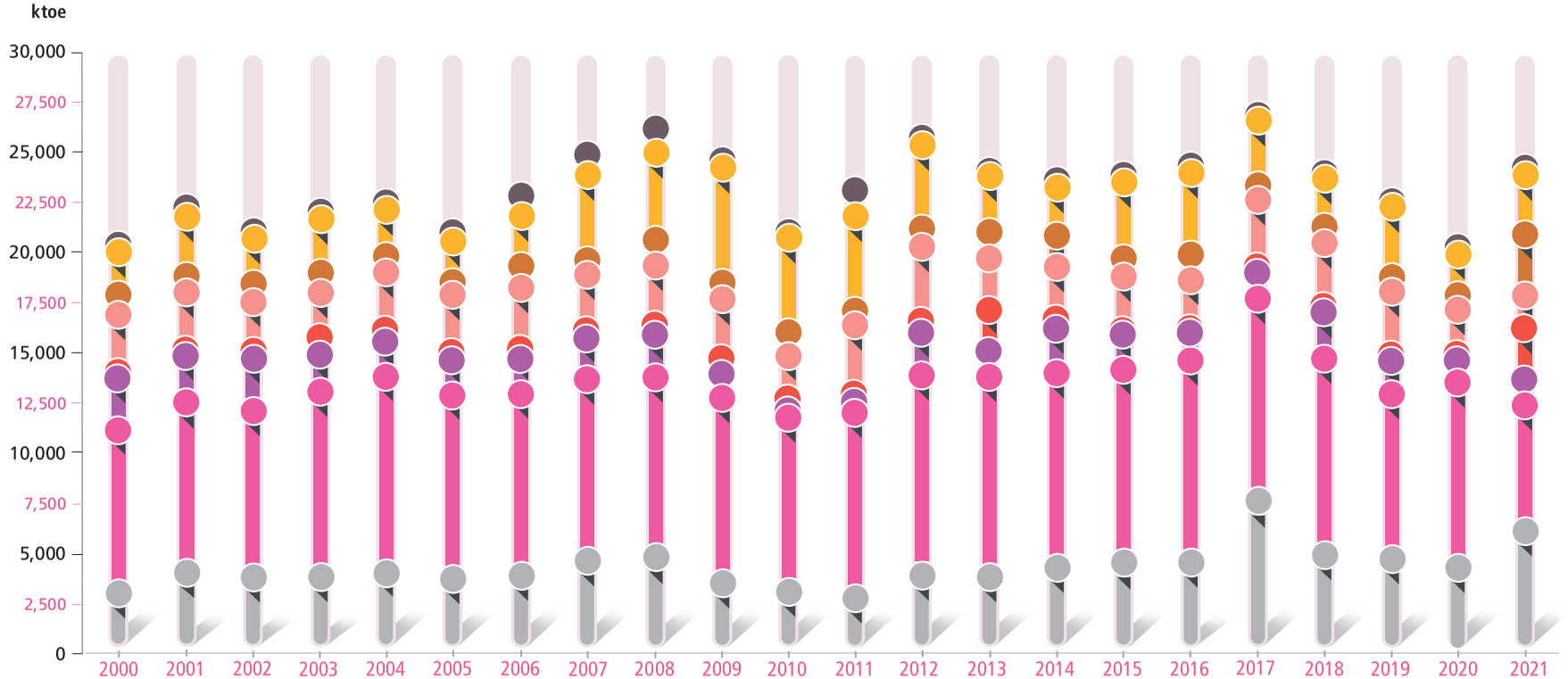
Figure 18 : Export and Import of Petroleum Products



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
♀	6,619	6,881	7,220	7,116	8,980	7,961	7,734	8,452	7,376	7,243	10,359	11,579	13,242	19,383	16,009	14,218	15,341	13,252	19,764	17,662	12,586	18,329
♀	8,533	8,900	8,158	8,972	8,912	8,435	9,535	9,780	9,527	8,419	8,431	9,421	10,784	10,679	10,399	10,220	12,214	11,063	16,028	11,779	10,590	19,260

Source: Department of Statistics Malaysia and Oil companies
Note : Measurement in ktoe is based on the Energy Commission's calculation

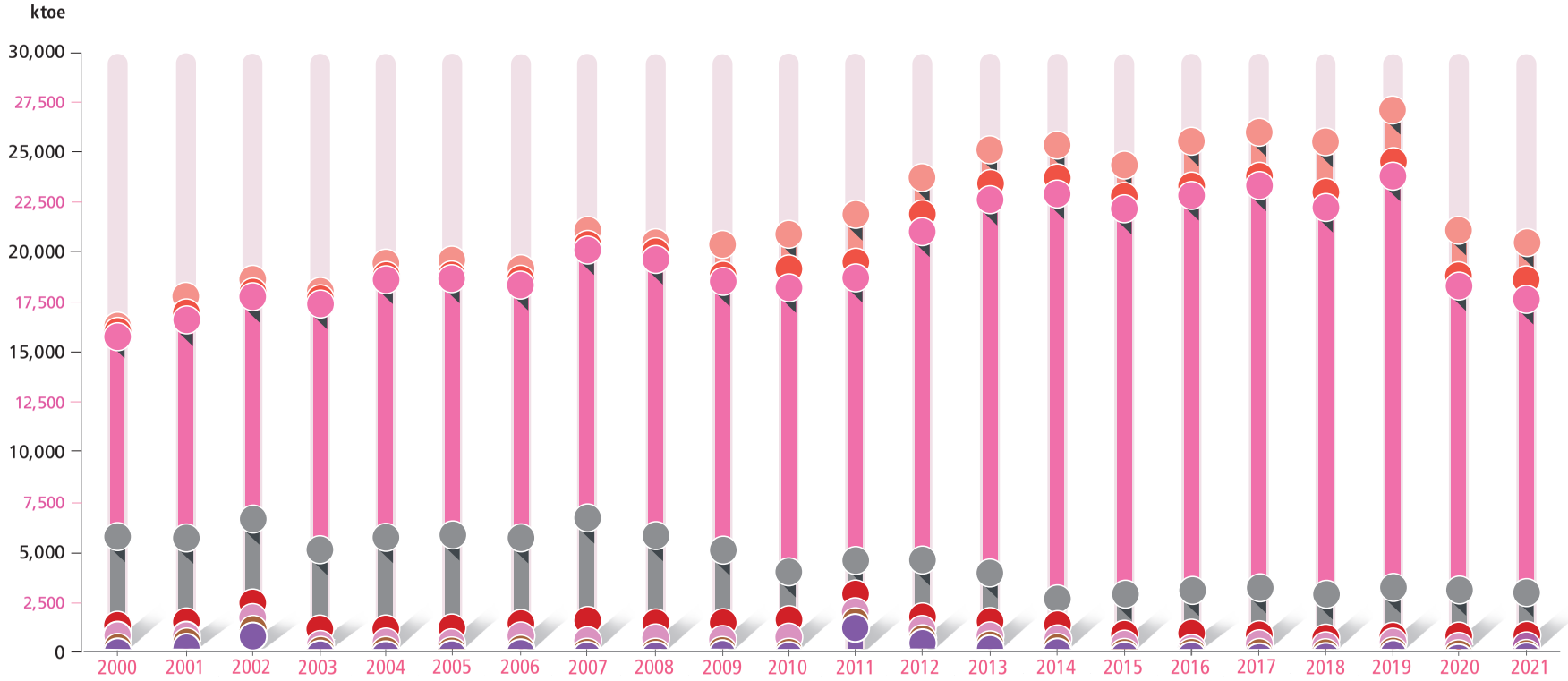
Figure 19 : Production of Petroleum Products From Refineries



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Refinery Gas	241	331	294	262	215	202	849	938	991	195	209	1,659	197	195	192	172	201	174	130	147	156	155
Non-Energy	2,492	3,020	2,127	2,623	2,455	2,157	2,750	3,461	4,475	5,905	4,357	4,572	4,318	3,089	2,826	3,869	4,339	3,100	2,550	3,708	1,954	2,762
LPG	838	875	897	932	897	822	1,118	1,228	1,208	732	697	665	702	1,252	1,102	780	1,285	832	900	560	672	1,755
ATF & AV Gas	2,660	2,954	2,570	2,367	2,693	2,553	2,938	3,138	3,139	3,085	2,891	3,457	3,918	2,750	2,916	2,841	2,548	3,255	3,451	3,470	2,459	2,386
Kerosene	239	283	414	983	591	521	537	234	245	565	483	419	654	387	100	6	4	10	18	8	12	10
Fuel Oil	2,532	2,269	2,332	1,763	1,813	1,777	1,933	1,990	1,994	1,144	327	571	1,608	1,286	2,340	1,692	1,479	1,725	2,432	1,388	1,204	1,497
Diesel	8,059	8,462	8,401	9,062	9,611	9,161	8,752	9,033	9,364	9,415	8,369	8,925	10,033	11,063	9,725	9,890	9,988	9,877	9,665	8,484	9,199	6,157
Petrol	3,893	4,623	4,460	4,584	4,724	4,245	4,607	5,285	5,066	4,052	3,873	3,599	4,708	4,702	4,918	5,031	5,044	8,253	5,524	5,317	5,089	6,760

Note : Oil companies

Figure 20 : Final Consumption for Petroleum Products



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Non-Energy	737	723	735	730	707	632	699	846	831	1,874	2,035	2,471	2,159	2,001	1,744	1,458	2,647	2,680	2,811	2,812	2,611	1,764
Agriculture	104	98	95	98	87	101	254	266	267	189	1,049	890	1,023	1,019	988	854	368	625	968	870	808	986
Transport	12,059	13,121	13,409	14,226	15,328	15,193	14,700	15,566	16,186	15,871	16,562	16,756	19,329	21,859	23,750	22,760	23,379	23,473	22,957	24,215	17,771	17,203
Industrial	5,283	5,009	4,884	4,812	5,331	5,547	5,136	6,089	5,265	4,437	2,798	1,996	3,108	2,660	1,511	2,186	2,423	2,688	2,437	2,761	2,616	2,498
Commercial	723	729	810	673	709	756	765	1,266	894	1,026	1,246	1,019	877	915	877	767	925	601	448	553	543	461
Residential	675	644	702	637	724	783	844	820	1,009	750	712	791	715	736	647	674	605	798	789	623	960	993
Co-generations	183	159	172	170	123	87	34	83	63	92	201	199	25	23	25	51	46	226	154	71	56	37
Power Stations	783	1,008	1,839	629	546	573	788	513	480	589	540	2,084	1,316	1,015	891	380	320	246	204	536	166	244

Note : Oil companies

Natural Gas

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Table 6 : Production and Resources of Natural Gas as of 1st January 2021

Region	Resources			Production
	Trillion standard cubic feet (Tscf)			Million standard cubic feet per day (MMscf/d)
	Associated	Non-Associated	Total	
Peninsular Malaysia	5.885	14.362	**20.246**	1,813.76
Sabah	1.518	8.157	**9.675**	777.25
Sarawak	1.971	44.139	**46.110**	3,952.17
Total	**9.374**	**66.658**	**76.032**	**6,543.18**

Source : PETRONAS
Notes (*)**:** Refers to the amount of gas produced/generated from associated fields.

1 cubic feet = 0.028317 cubic metre
Associated Gas: Natural gas produced in association with oil.
Non-Associated Gas: Natural gas produced from a gas reservoir not associated with oil.

Table 7 : Gas Processing Plants Capacity, 2021

Refinery Plants	Location	Start-up date	Plant Capacity
PETRONAS LNG Complex	Bintulu, Sarawak	1978	29.3 million tonnes per annum (MTPA)
PETRONAS Gas Processing Plant (GPP)	Kerteh, Terengganu	1984	2,000 million standard cubic feet/day (MMscfd)
Shell Middle Distillate Synthesis (SMDS)	Bintulu, Sarawak	1993	500,000 thousand tonnes/year
PETRONAS Regasification Terminal Sungai Udang (RGTSU)	Sungai Udang, Melaka	2013	500 million standard cubic feet/day (MMscfd)
PETRONAS Floating LNG SATU	Offshore Sabah	2016	1.2 million tonnes per annum (MTPA)
PETRONAS Regasification Terminal Pengerang (RGTP)	Pengerang, Johor	2017	490 million standard cubic feet/day (MMscfd)
PETRONAS Floating LNG DUA	Offshore Sabah	2021	1.5 million tonnes per annum (MTPA)

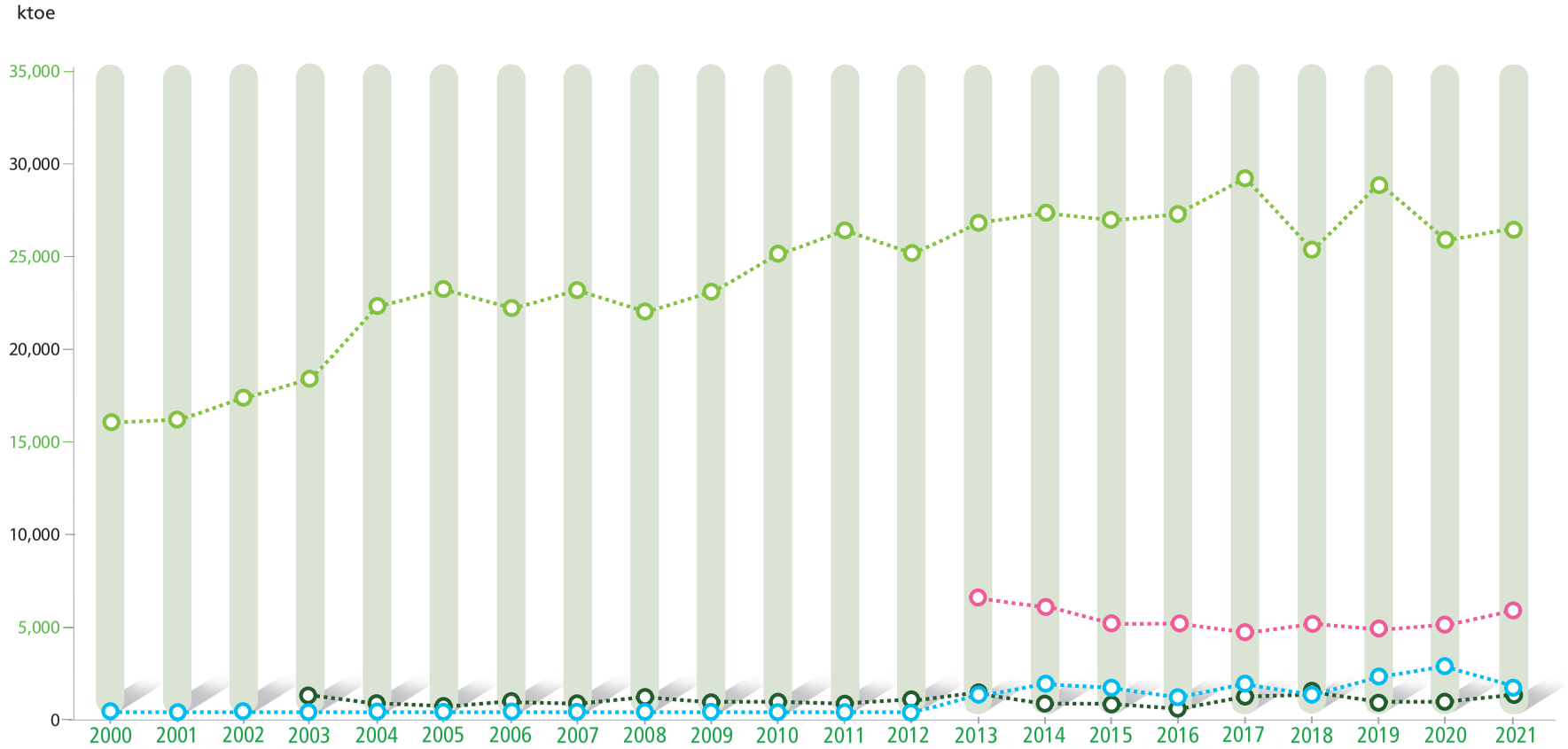
Source : PETRONAS, Shell MDS

Table 8 : Consumption of Natural Gas in MMscf, 2021

Sectors	Peninsular Malaysia	Sabah	Sarawak	Malaysia
Residential	23	-	-	**23**
Commercial	407	29	-	**435**
Industry	250,274	79,153	985	**330,412**
Non-energy	45,497	59,960	241,811	**347,268**
Transport	1,343	-	-	**1,343**
Power Stations	299,565	37,392	26,637	**363,594**
Co-Generation	2,481	162	14,531	**17,174**
Total	**599,590**	**176,695**	**283,965**	**1,060,250**

Source: Power utilities, IPPs, PETRONAS and gas distribution companies

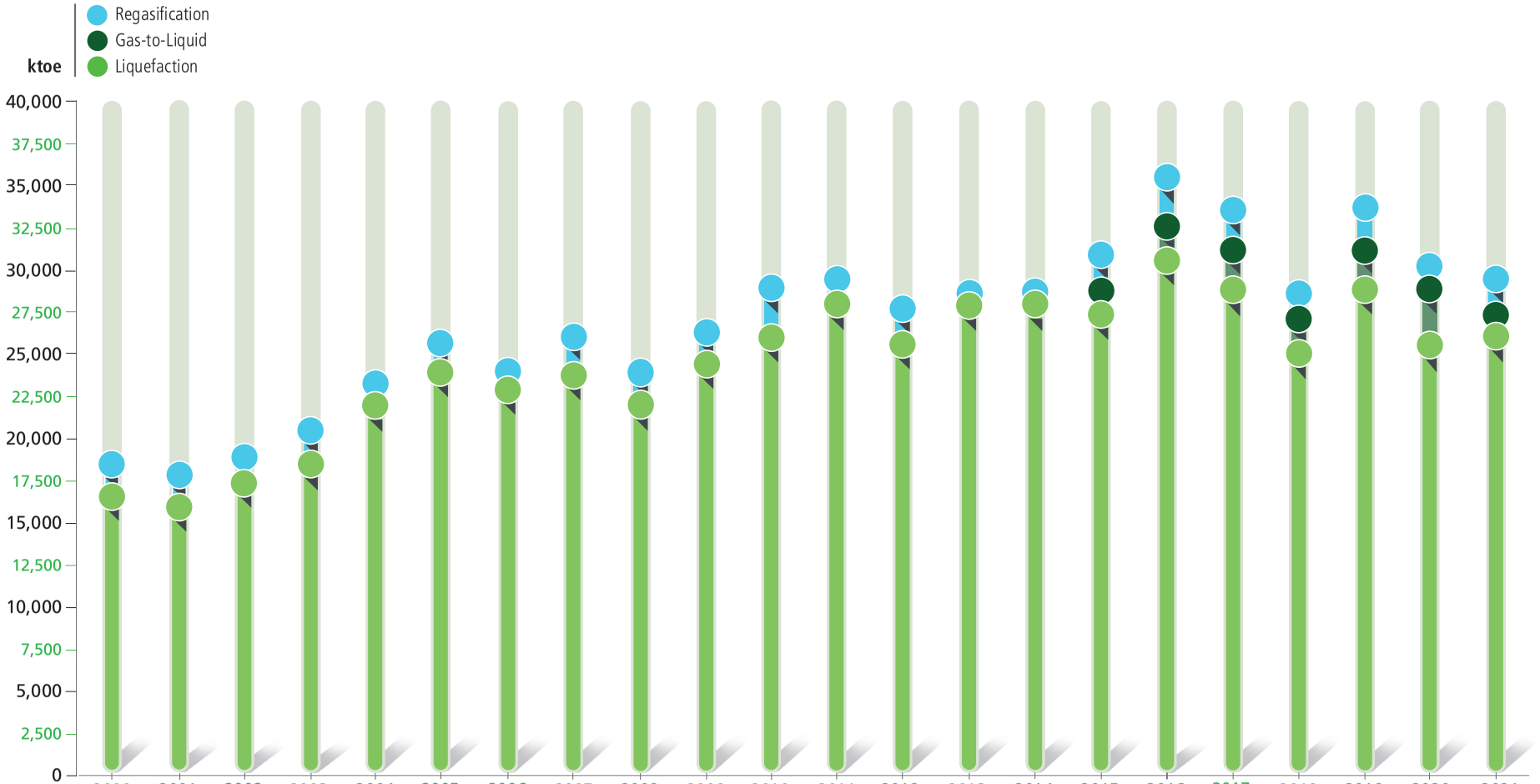
Figure 21 : Export and Import of Piped Natural Gas and LNG



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
LNG Export	16,633	16,636	17,803	18,965	22,944	23,707	22,874	23,777	22,277	23,606	25,487	26,856	25,547	27,089	27,835	27,057	27,457	29,428	25,920	29,044	26,155	26,798
Piped Natural Gas Import	-	-	-	1,501	999	1,340	3,313	5,435	4,565	5,055	7,013	6,979	7,866	7,098	6,472	5,941	5,557	5,183	5,573	5,325	5,519	6,049
Piped Natural Gas Export	1,198	1,178	1,098	1,402	1,143	1,134	1,257	1,257	1,524	1,166	1,340	1,147	1,368	1,497	1,129	1,062	841	1,452	1,407	1,114	1,179	1,569
LNG Import	-	-	-	-	-	-	-	-	-	-	-	-	-	1,450	2,019	1,873	1,275	1,815	1,383	2,663	2,939	1,996

Source: Department of Statistics Malaysia, gas companies and others
Note: Measurement in ktoe is based on the Energy Commission's calculation

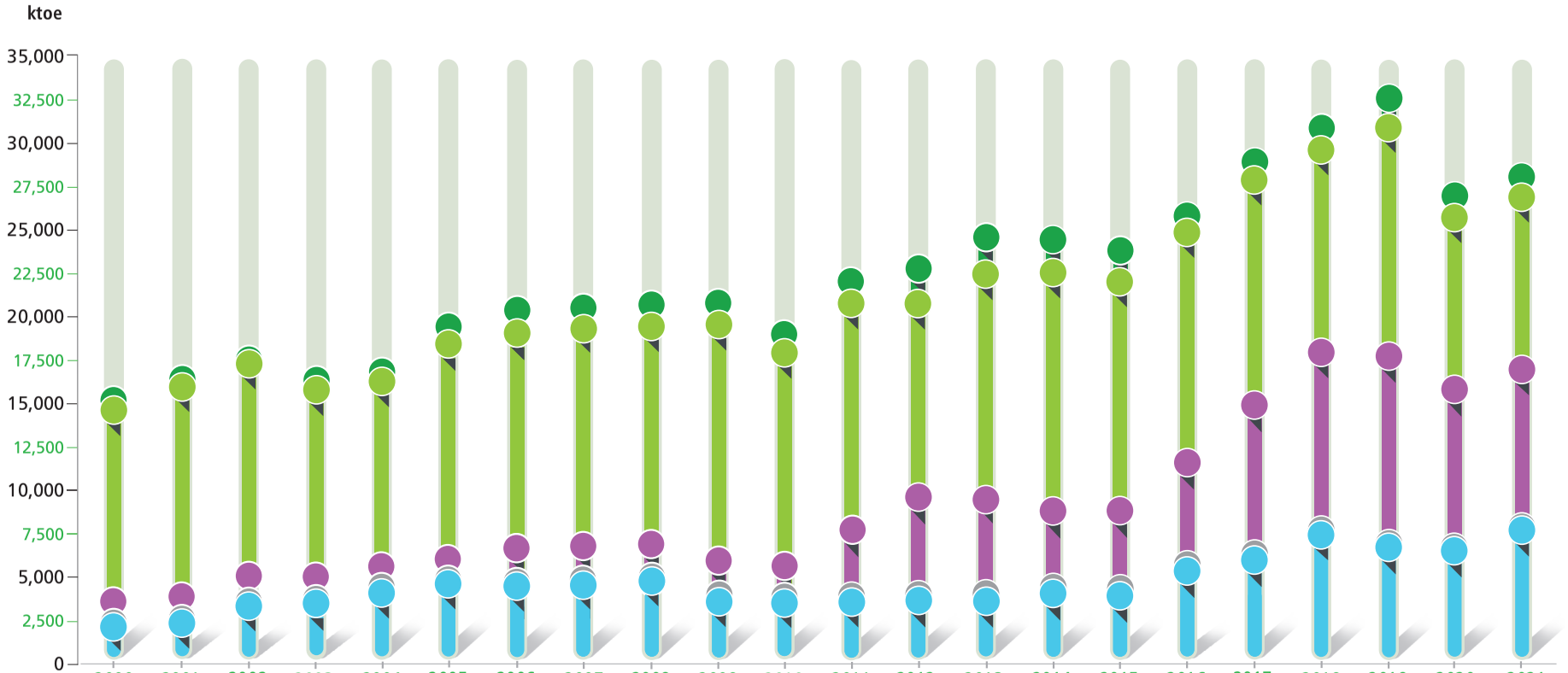
Figure 22 : Conversion in Gas Plants



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Regasification	1,646	1,823	1,949	1,233	1,033	1,779	1,500	1,900	1,843	1,438	2,753	2,793	2,521	1,652	1,670	1,578	2,570	2,470	2,523	2,532	2,439	1,681
Gas-to-Liquid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,873	1,277	1,815	1,383	2,663	2,939	1,996
Liquefaction	17,231	16,636	17,803	18,965	22,944	24,254	23,450	24,355	22,793	25,004	26,601	28,130	26,231	28,209	28,213	27,722	31,658	29,468	25,920	29,044	26,155	26,798

Source: Oil and gas companies

Figure 23 : Natural Gas Consumption by Sectors



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Co-Generation	530	495	128	469	568	923	1,431	1,140	1,030	1,385	1,031	1,697	1,734	1,650	1,678	1,739	1,094	1,038	1,274	1,333	1,395	1,186
Power Stations	11,580	11,922	12,424	10,893	10,545	12,271	12,330	12,476	13,651	13,390	12,628	10,956	11,533	13,520	13,860	13,378	13,260	11,872	11,542	13,072	9,841	9,936
Non-Energy	1,512	1,655	1,775	1,616	1,476	1,541	2,110	2,112	2,046	1,995	1,661	3,967	5,336	5,276	4,472	4,470	6,083	9,837	10,451	10,819	9,193	9,105
Transport	7	14	28	40	54	95	120	147	194	236	247	272	292	289	276	264	208	148	121	98	65	35
Industrial	2,327	2,937	3,824	4,207	4,937	5,317	5,301	5,416	5,541	4,544	4,310	4,300	4,556	4,488	4,869	4,808	5,989	6,827	8,255	7,706	7,358	8,663
Commercial	12	10	11	18	18	23	24	28	31	25	30	32	22	22	22	24	24	25	24	23	14	11
Residential	4	4	4	5	5	5	5	6	6	2	6	7	1	1	1	1	1	1	1	1	1	1

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Table 9 : Production and Resources of Coal as of 31st December 2021

Location	Resources (Million Tonnes)	Coal Type	Production
	Measured		(metric tonnes)
SARAWAK		Coking Coal, Semi-Anthracite and	
1. Abok & Silantek, Sri Aman	7.25	Anthracite	32,940
2. Merit-Pila, Kapit	168.89	Sub-Bituminous	470,050
3. Bintulu	6.00	Bituminous (partly coking coal)	-
4. Mukah - Balingian	84.15	Lignite, Hydrous Lignite and Sub-Bituminous	2,607,615
5. Tutoh Area	5.58	Sub-Bituminous	-
Total	**271.87**		**3,110,605**

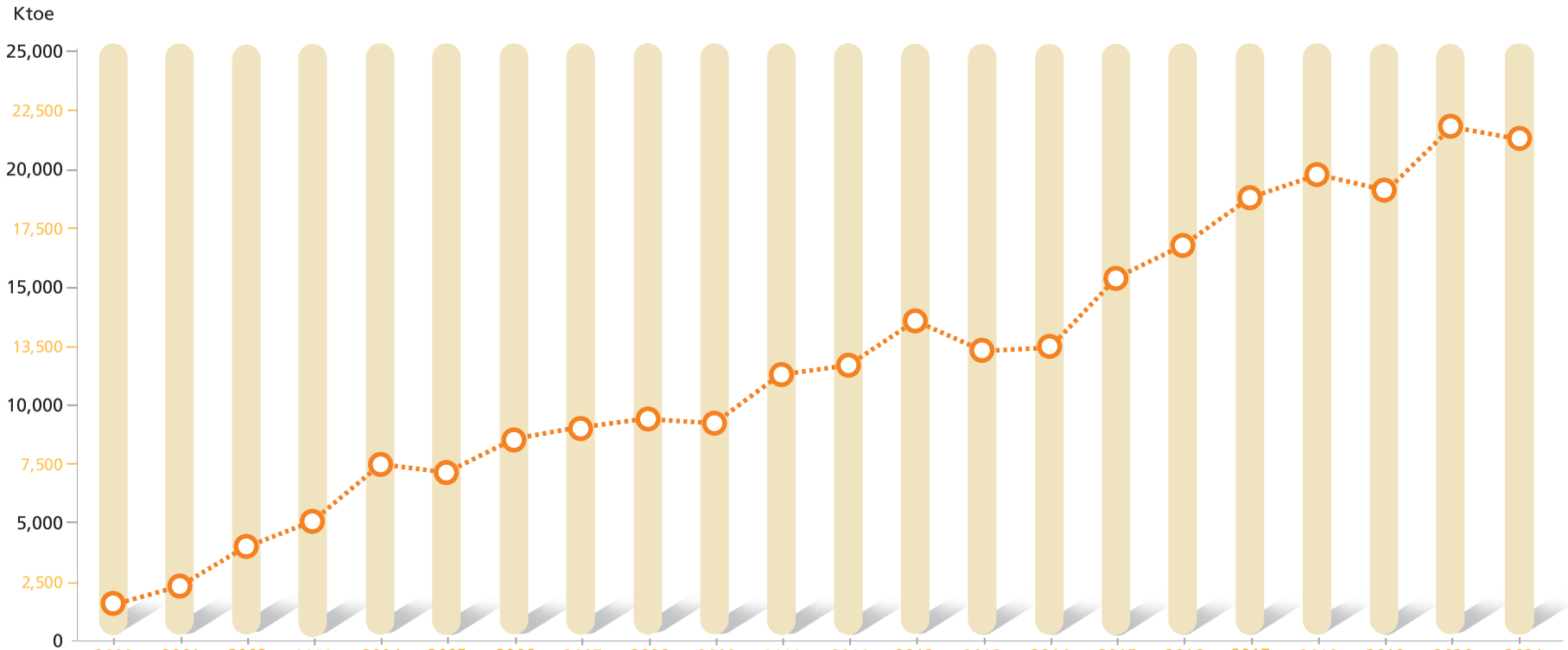
Source: Department of Mineral and Geosciences Malaysia

Table 10: Consumption of Coal in metric tonnes, 2021

Sectors	Peninsular Malaysia	Sabah	Sarawak	Malaysia
Industry	2,077,156	-	130,753	**2,207,909**
Power Stations	31,198,001	-	2,945,823	**34,143,824**
Total	**33,275,158**	**0**	**3,076,575**	**36,351,733**

Source: Power Utilities, IPPs, cement, iron and steel manufacturers

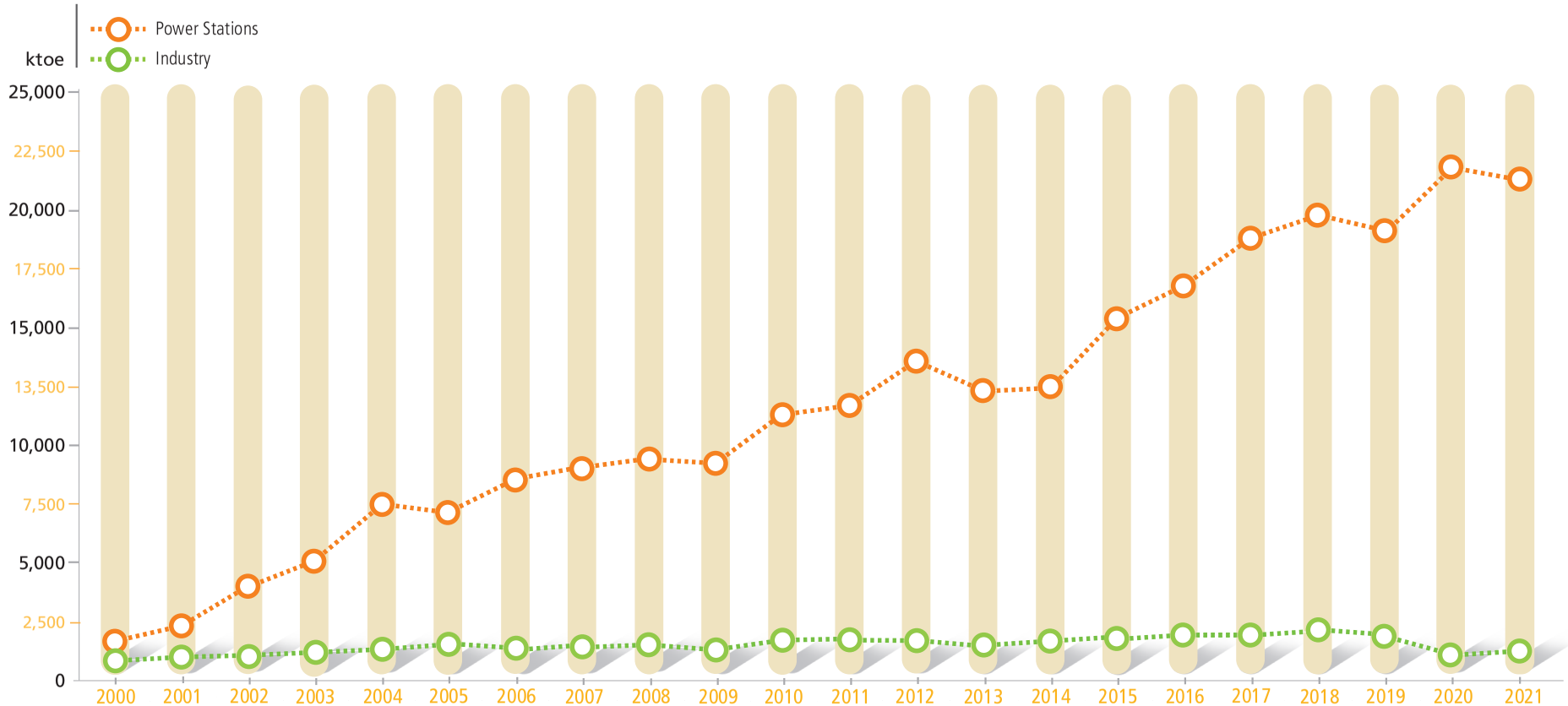
Figure 24 : Net Import of Coal



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Net Import of Coal	1,924	2,631	3,405	5,232	7,413	6,568	7,917	8,152	9,519	9,007	13,011	13,189	13,988	13,583	13,590	15,895	17,128	18,799	20,743	19,622	22,235	20,355

Source: Department of Statistics Malaysia, Power Utilities, IPPs, cement, iron and steel manufacturers
Note: Measurement In ktoe is based on the Energy Commission's calculation

Figure 25 : Coal Consumption by Sectors



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Power Stations	1,495	1,994	2556	4,104	5,327	5,541	5,964	7,486	8,069	9,010	12,951	13,013	14,138	13,527	13,648	15,627	17,101	18,967	20,472	19,351	23,451	21,525
Industry	991	997	1,086	1,212	1,305	1,348	1,335	1,362	1,713	1,613	1,826	1,759	1,744	1,539	1,709	1,778	1,785	1,804	1,808	1,706	1,338	1,392

Source: Power Utilities, IPPs, cement, iron and steel manufacturers

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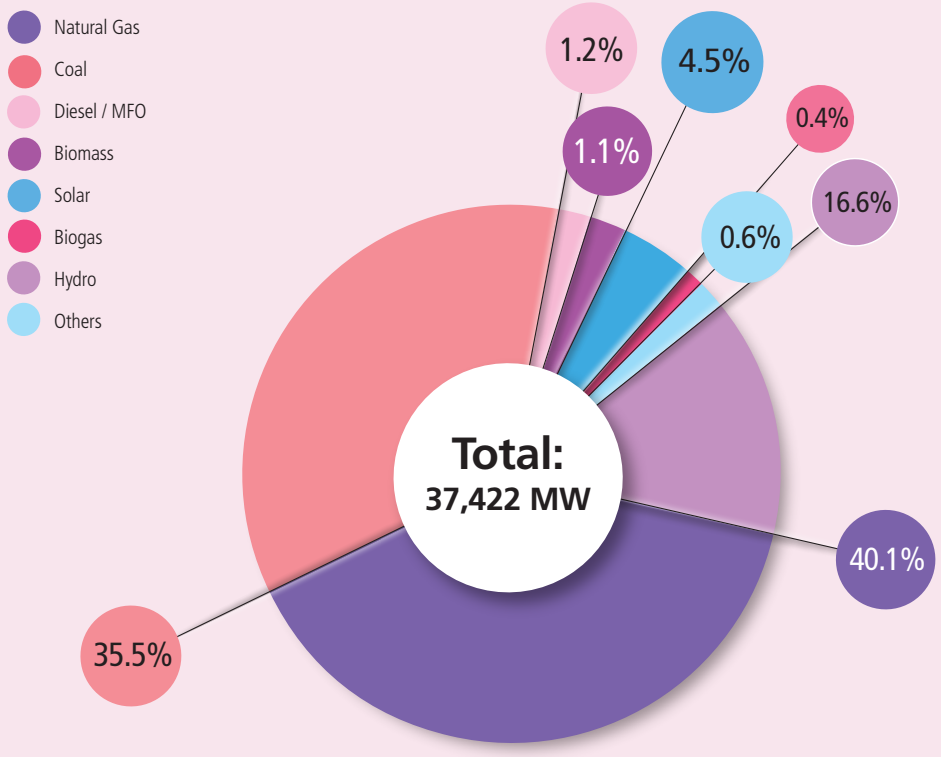
Table 11 : Installed Capacity as of 31st December 2021, in MW

		Major Hydro	Mini Hydro	Natural Gas	Coal	Diesel / MFO	Biomass	Solar	Biogas	Others	Total
Peninsular Malaysia	TNB	2,536.1	20.2	1,973.0	0.0	0.0	0.0	0.0	0.0	0.0	**4,529.3**
	IPPs	0.0	20.0	9,666.8	12,180.0	0.0	0.0	0.0	0.0	0.0	**21,866.8**
	Co-Generation	0.0	0.0	757.5	0.0	0.0	12.4	0.0	0.0	233.9	**1,003.8**
	Self-Generation	0.0	2.1	9.1	0.0	54.5	131.9	10.7	0.0	0.0	**208.3**
	FiT	0.0	67.8	0.0	0.0	0.0	44.9	288.1	114.7	0.0	**515.5**
	RE Non-FiT	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	**0.1**
	LSS	0.0	0.0	0.0	0.0	0.0	0.0	859.4	0.0	0.0	**859.4**
	NEM	0.0	0.0	0.0	0.0	0.0	0.0	426.8	0.0	0.0	**426.8**
	Sub Total	**2,536.1**	**110.1**	**12,406.4**	**12,180.0**	**54.5**	**189.2**	**1,585.1**	**114.7**	**233.9**	**29,410.1**
Sabah	SESB	72.0	7.6	112.0	0.0	152.4	0.0	29.9	0.0	0.0	**373.9**
	IPPs	0.0	0.0	1,012.6	0.0	0.0	0.0	0.0	0.0	0.0	**1,012.6**
	Co-Generation	0.0	0.0	65.0	0.0	0.0	37.0	0.0	0.0	0.0	**102.0**
	Self-Generation	0.0	0.0	4.4	0.0	126.2	113.9	0.0	4.6	0.0	**249.2**
	FiT	0.0	20.0	0.0	0.0	0.0	13.8	34.4	9.6	0.0	**77.8**
	LSS	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	**50.0**
	NEM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
	Sub Total	**72.0**	**27.6**	**1,194.0**	**0.0**	**278.6**	**164.7**	**114.3**	**14.2**	**0.0**	**1,865.5**
Sarawak	SEB	3,452.0	18.9	1,005.0	1,104.0	102.1	0.0	0.1	0.0	0.0	**5,682.1**
	Co-Generation	0.0	0.0	389.0	0.0	0.0	0.0	0.0	0.0	0.0	**389.0**
	Self-Generation	0.0	0.0	0.0	0.0	12.5	57.6	0.0	0.5	5.1	**75.7**
	Sub Total	**3,452.0**	**18.9**	**1,394.0**	**1,104.0**	**114.6**	**57.6**	**0.1**	**0.5**	**5.1**	**6,146.8**
Total		**6,060.1**	**156.6**	**14,994.5**	**13,284.0**	**447.7**	**411.5**	**1,699.5**	**129.4**	**238.9**	**37,422.3**
Share (%)		**16.2%**	**0.4%**	**40.1%**	**35.5%**	**1.2%**	**1.1%**	**4.5%**	**0.3%**	**0.6%**	**100.0%**

Source: Power Utilities, IPPs, SEDA Malaysia and Ministry of Utility and Telecommunication Sarawak
Note: Excluding plants that are not in operation

Figure 26 : Installed Capacity As of 31st December 2021



Note: Power Utilities, IPPs, SEDA Malaysia and Ministry of Utility and Telecommunication Sarawak

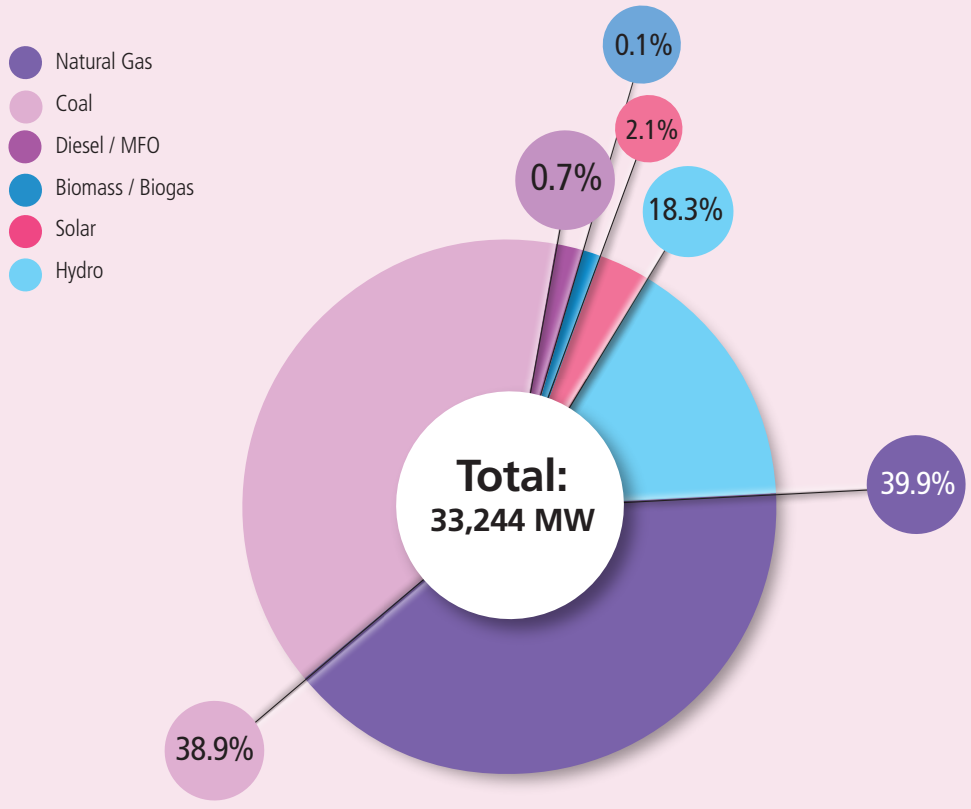
Table 12 : Available Capacity As of 31st December 2021, in MW

	Hydro	Natural Gas	Coal	Diesel / MFO	Biomass / Biogas	Solar	Total
Peninsular Malaysia	2,532.0	11,403.0	11,947.0	0.0	0.0	609.0	**26,491.0**
Sabah	98.0	968.5	0.0	128.5	35.4	83.6	**1,313.9**
Sarawak	3,456.9	883.0	1,001.0	98.1	0.0	0.1	**5,439.1**
Total	**6,086.9**	**13,254.5**	**12,948.0**	**226.6**	**35.4**	**692.7**	**33,244.0**

Notes: 1. Available Capacity for Peninsular Malaysia is based on Tested Annual Available Capacity (TAAC),
2. Available Capacity for Sabah is based on Dependable Capacity
3. Bakun hydro acquisition by SEB in Q3 2017

Source: Power Utilities and IPPs

Figure 27 : Available Capacity As of 31st December 2021



Source: Power Utilities and IPPs

Table 13 : Installed Capacity of Major Hydro Power Stations

Station	Installed Capacity (MW)	Total (MW)
Peninsular Malaysia		
1. Terengganu		
- Stesen Janakuasa Sultan Mahmud Kenyir	4 x 100	400.0
- Stesen Janakuasa Hulu Terengganu	2 x 125	250.0
- Stesen Janakuasa Tembat	2 x 7.5	15.0
2. Perak		
- Stesen Janakuasa Temenggor	4 x 87	348.0
- Stesen Janakuasa Bersia	3 x 24	72.0
- Stesen Janakuasa Kenering	3 x 40	120.0
- Chenderoh	3 x 10.7 + 1 x 8.4	40.5
- Sg. Piah Hulu	2 x 7.3	14.6
- Sg. Piah Hilir	2 x 27	54.0
3. Pahang		
- Stesen Janakuasa Sultan Yussuf, Jor	4 x 25	100.0
- Stesen Janakuasa Sultan Idris II, Woh	3 x 50	150.0
- Stesen Janakuasa Ulu Jelai	2 x 186	372.0
4. Kelantan		
- Pergau	4 x 150	600.0
Subtotal		**2,536.1**
Sabah		
- Tenom Pangi	3 x 24	72.0
Subtotal		**72.0**
Sarawak		
- Batang Ai	4 x 27	108.0
- Bakun	8 x 300	2,400.0
- Murum	4 x 236	944.0
Subtotal		**3,452.0**
Total		**6,060.1**

Source: TNB, SESB and SEB
Notes: Exclude plants that are not in operation or in rehabilitation.

Table 14 : Installed Capacity of Mini Hydro Power Stations

Station	Total(MW)
1. Kedah	
- Sungai Tawar Besar	0.55
- Sungai Mempelam	0.38
- Sungai Mahang	0.45
2. Perak	
- Sungai Tebing Tinggi	0.15
- Sungai Asap	0.11
- Sungai Kinjang	0.33
- Sungai Bil	0.23
- Sungai Kenas	0.50
- Sungai Chempias	0.12
- Sungai Temelong	0.80
3. Pahang	
- Stesen Janakuasa Cameron Highlands Scheme2 -Odak, Habu,Kg Raja, Kg Terla, Robinson Falls	10.60
- Sungai Perdak	0.27
- Sungai Mentawak	0.50
- Sungai Pertang	0.34
- Sungai Sia	0.52
- Sungai Sempam	1.25
4. Kelantan	
- Sg Renyok G1	0.80
- Sg Renyok G2	0.80
- Sg Sok	0.56
Sg Lata Rek	0.25
5. Terengganu	
- Sg Berang	0.36
- Sg Cheralak	0.48
Subtotal	**20.36**
Sabah	
- Sayap (Kota Belud)	1.00
- Melangkap	1.00
- Bombalai (Tawau)	1.00
- Merotai (Tawau)	1.00
- Kiau (Kota Belud)	0.35
- Naradau (Ranau)	1.76
- Carabau (Ranau)	2.00
Subtotal	**8.11**
Sarawak	
- Sg Pasir	0.40
- Penindin	0.28
- Sebako	0.16
- Lundu	0.14
- Kalamuku 1	0.50
- Kalamuku 2	0.50
- Sg Kota	4.00
- Long Banga*	0.16
Subtotal	**6.14**
Total	**34.61**

Source: TNB, SESB and SEB
Notes: 1. * Micro hydro Project Long Banga owned by SEB
2. Exclude plants that are not in operation or in rehabilitation.

Table 15 : Transmission Network in Circuit – Kilometres, 2021

Utility	500 kV	275 kV	132 kV	66 kV
TNB	2,567	9,526	12,760	-
SESB	-	807	2,244	103
SEB	753	3,100	1,200	-

Source: TNB, SESB and SEB

Table 16 : Distribution Network in Circuit – Kilometres, 2021

Utility	Overhead Lines	Underground Cables
TNB	392,894	330,241
SESB	12,820	1,710
SEB	28,427	10,320

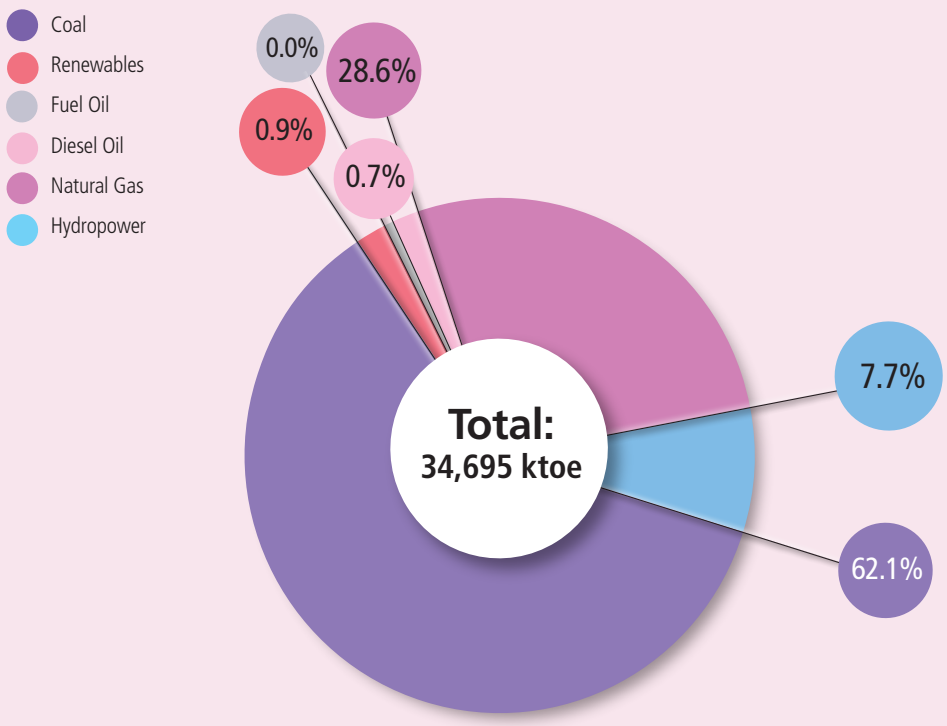
Source: TNB, SESB and SEB

Table 17 : Gross Generation, Consumption, Available Capacity, Peak Demand and Reserve Margin for Electricity in Malaysia, 2021

Region	Electricity Gross Generation		Electricity Consumption		Available Capacity**	Peak Demand	Reserve Margin
	GWh	%	GWh	%	MW	MW	%
Peninsular Malaysia	138,423	77.5	118,365	76.5	26,491	18,585	42.5
Sarawak	32,881	18.4	30,446	19.7	5,439	4,107	32.4
Sabah*	7,276	4.1	5,894	3.8	1,314	1,003	31.0
Total	**178,580**	**100.0**	**154,705**	**100.0**	**33,244**		

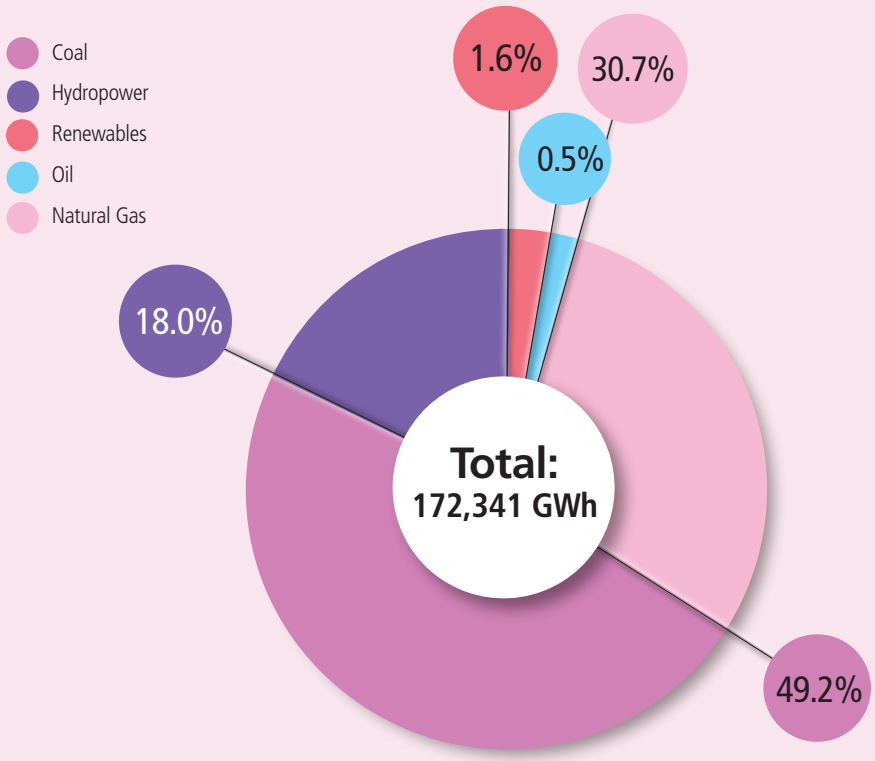
Source: TNB and IPPs, SESB and SEB
Notes: 1. Most diesel units in SESB are aged sets hence they are derated due to thermal limitations. Therefore, during operational state, some generating units are not available due to maintenance outages as well as random breakdowns; the actual operation capacity available to system operation for dispatch was very limited.
2. Available Capacity for Peninsular Malaysia was based on Tested Annual Available Capacity (TAAC), Available Capacity for Sabah is based on Dependable Capacity
3. Peak demand for Sarawak is the co-incidental peak

Figure 28: Energy Input in Power Stations, 2021



Note: Figures exclude fuel consumption for self-generation plants
Source: Power utilities and IPPs

Figure 29: Generation Mix by Fuel Types, 2021



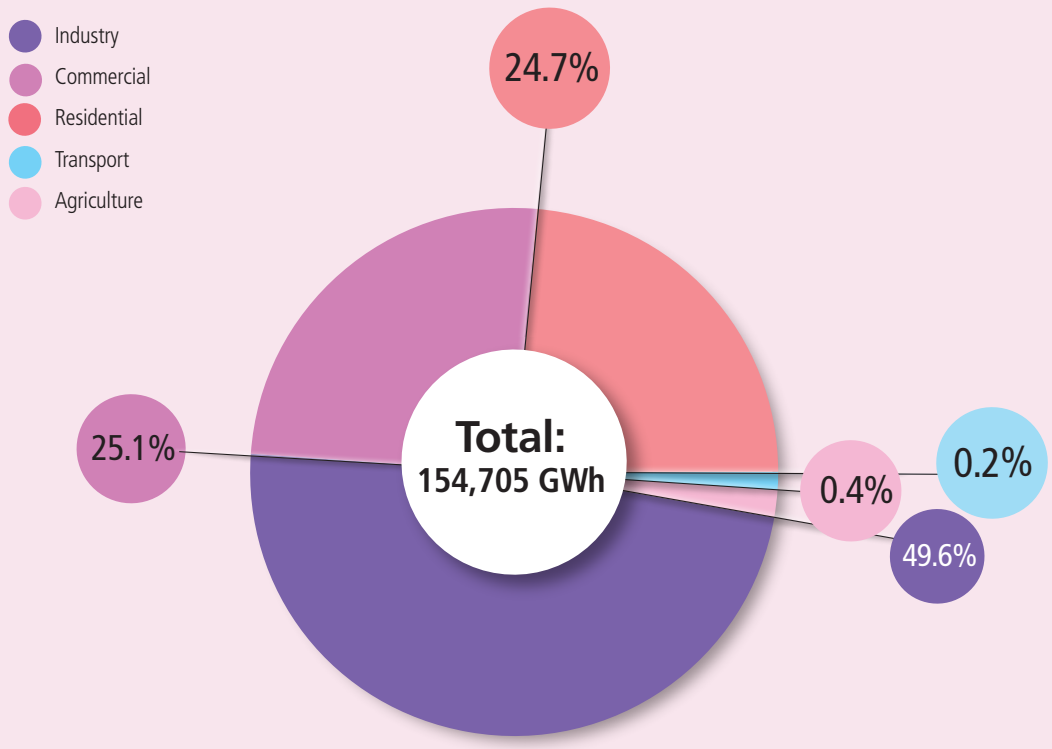
Note: Figures exclude electricity generation for self-generation plants
Source: Power utilities and IPPs

Table 18 : Electricity Consumption by Sectors in GWh

Region	Industry		Commercial		Residential		Transport		Agriculture		Total
	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%	GWh
Peninsular Malaysia	50,345	65.6	33,974	87.7	33,010	86.5	353	100.0	682.9	100.0	**118,365**
Sarawak	24,849	32.4	2,621	6.8	2,976	7.8	-	-	-	-	**30,446**
Sabah	1,561	2.0	2,166	5.6	2,167	5.7	-	-	-	-	**5,894**
Total	**76,756**	**100.0**	**38,761**	**100.0**	**38,153**	**100.0**	**353**	**100.0**	**683**	**100.0**	**154,705**

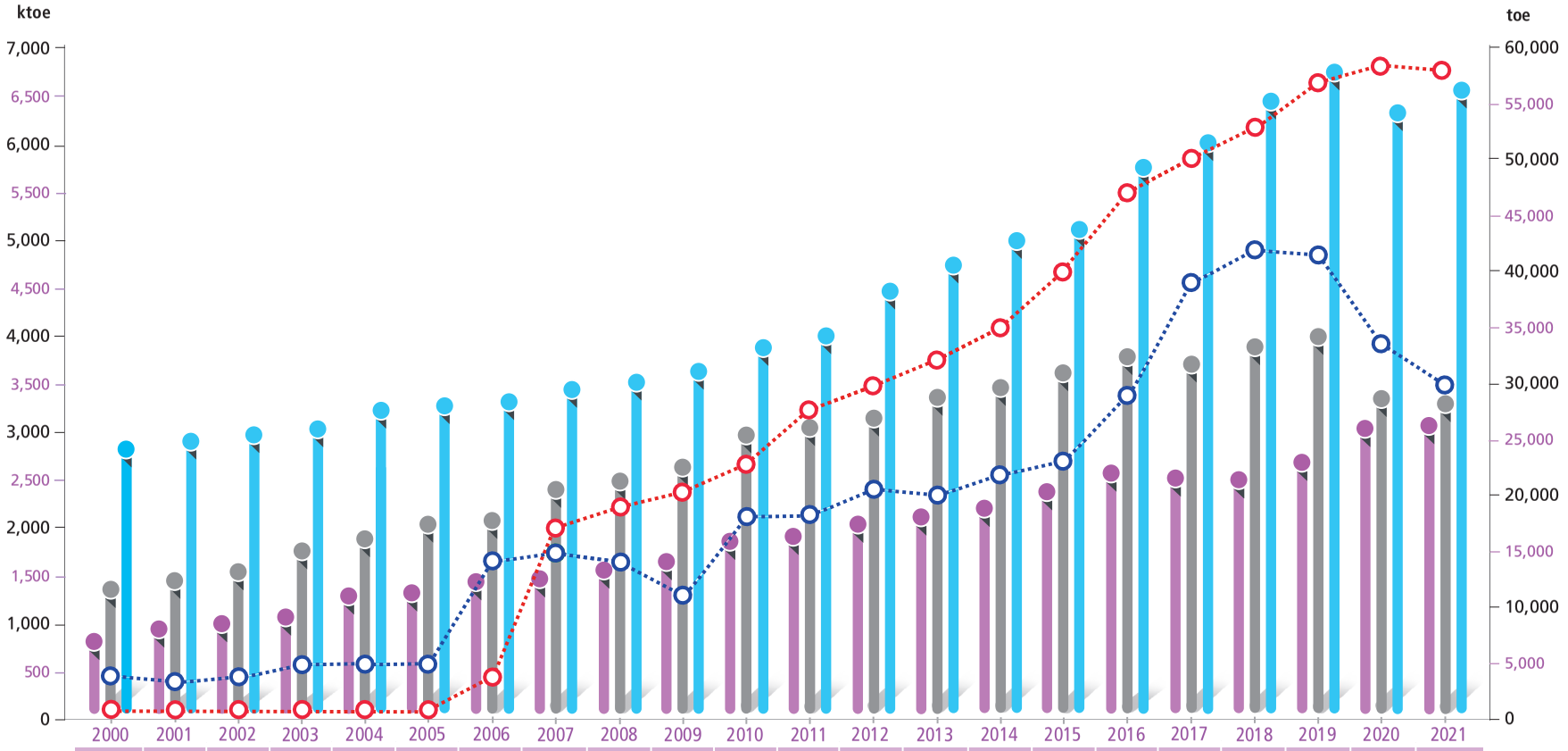
Source: Power utilities, IPPs and Self-Generators

Figure 30 : Electricity Consumption by Sectors in 2021



Source: Power utilities, IPPs and Self-Generators

Figure 31 : Electricity Consumption by Sectors in 2021



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Residential	975	1,081	1,161	1,248	1,319	1,395	1,515	1,598	1,668	1,792	1,937	1,974	2,126	2,262	2,346	2,471	2,679	2,610	2,553	2,715	3,124	3,174
Commercial	1,478	1,579	1,698	1,818	1,979	2,172	2,277	2,496	2,598	2,743	3,020	3,172	3,325	3,466	3,566	3,663	3,817	3,762	3,958	4,086	3,480	3,443
Industrial	2,805	2,930	3,059	3,242	3,340	3,371	3,475	3,587	3,687	3,719	3,994	4,045	4,509	4,818	5,072	5,200	5,822	6,145	6,547	6,748	6,403	6,604
Transport* (toe)	4,000	3,000	4,000	5,000	5,000	5,000	14,117	15,295	14,862	11,358	18,439	18,428	21,027	20,774	22,443	22,901	29,291	39,451	41,439	41,080	33,540	30,380
Agriculture** (toe)	-	-	-	-	-	-	4,886	15,991	19,393	21,080	23,920	26,312	30,014	32,240	35,578	40,526	46,747	50,228	53,113	57,088	59,167	58,757

Source : TNB, SEB, SESB, Co-Generators and Land Public Transport Agency (APAD)
Note (*): From 2006 until 2018 data were collected directly from train operators
(**): Effective from 1st June 2006, TNB has introduced Specific Agriculture Tariff; previously Agriculture was under the Commercial Tariff

Table 19 : Electricity Generation and Installed Capacity of Renewable Energy by Public Licensee by Region in 2021

Region	Type of Prime Mover	Installed Capacity (MW)	Unit Generated (MWh)
Peninsular Malaysia	Major Hydro - TNB	2,536.10	6,798,789
	Mini Hydro - IPP	20.00	111,483
	Mini Hydro - FiT	67.80	271,820
	Mini Hydro - TNB	20.16	41,421
	Solar - FiT	288.13	402,308
	Solar - LSS	859.36	1,546,596
	Solar - NEM	426.84	523,472
	Biogas - FiT	114.71	422,153
	Biomass - FiT	44.85	106,699
	Subtotal	**4,377.94**	**10,224,742**
Sabah	Major Hydro - SESB	72.00	360,014
	Mini Hydro-SESB	7.60	14,752
	Mini Hydro - FiT	20.00	17,289
	Solar - FiT	34.38	48,933
	Solar - LSS	50.00	79,910
	Biogas - FiT	9.60	32,988
	Biomass - FiT	13.80	53,690
	Solar -NEM	0.03	42
	Biomass - Public Co-Gen	29.45	35,361
	Subtotal	**236.86**	**642,980**
Sarawak	Major Hydro - SEB	3,452.00	23,336,010
	Mini Hydro -SEB	18.92	30,260
	Solar	0.09	74
	Subtotal	**3,471.01**	**23,366,344**
Grand Total		**8,085.81**	**34,234,066**

Source: Energy Commission, TNB, SESB, SEB, Ministry of Utility and Telecommunication Sarawak and SEDA Malaysia
Notes: 1. Public Licensee is a licensee generates for his own use as well as to supply to others
2. NEM Generation data is based on net generation exported to the grid

Table 20 : Electricity Generation and Installed Capacity of Renewable Energy by Private Licensee by Region in 2021

Region	Type of Prime Mover	Installed Capacity (MW)	Unit Generated (MWh)
Peninsular Malaysia	Biomass - Private Co-Gen	12.44	13,306
	Biomass - Self-Gen	131.95	249,267
	Solar - Self-Gen	10.66	13,430
	Mini Hydro-Self-Gen	2.13	4,116
	Subtotal	**157.18**	**280,119**
Sabah	Solar - SESB	29.88	24,342
	Biomass - Private Co-Gen	7.50	7,396
	Biomass - Self-Gen	113.92	125,705
	Biogas - Self-Gen	4.64	13,471
	Subtotal	**155.94**	**170,914**
Sarawak	Biomass - Self-Gen	57.60	96,342
	Biogas-Self -Gen	0.50	1,004
	Subtotal	**58.10**	**97,346**
Grand Total		**371.23**	**548,379**

Source: Energy Commission and Ministry of Utility and Telecommunication Sarawak
Note: 1. Private Licensee is a licensee that generates electricity for his own use only

Key Energy Statistics

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Table 21 : Primary Energy Supply in ktoe

	Crude Oil	Petroleum Products & Others	Natural Gas	Coal & Coke	Hydropower & Renewables	Total	Annual Growth Rate (%)	Share (%)			
								Crude Oil and Petroleum Products & Others	Natural Gas	Coal & Coke	Hydropower & Renewables
2000	21,673	(1,431)	26,370	2,486	599	49,697	14.2	40.7	53.1	5.0	1.2
2001	23,590	(1,917)	25,649	2,970	607	50,899	2.4	42.6	50.4	5.8	1.2
2002	22,647	(523)	26,101	3,642	456	52,323	2.8	42.3	49.9	7.0	0.9
2003	25,344	(1,408)	27,257	5,316	435	56,944	8.8	42.0	47.9	9.3	0.8
2004	25,335	(82)	29,145	7,109	501	62,008	8.9	40.7	47.0	11.5	0.8
2005	24,339	(243)	33,913	6,889	446	65,344	5.4	36.9	51.9	10.5	0.7
2006	24,910	(1,671)	34,917	7,299	554	66,009	1.0	35.2	52.9	11.1	0.8
2007	26,571	(1,190)	36,639	8,848	558	71,426	8.2	35.5	51.3	12.4	0.8
2008	26,776	(1,780)	39,289	9,782	642	74,709	4.6	33.5	52.6	13.1	0.9
2009	26,386	96	35,851	10,623	574	73,530	(1.6)	36.0	48.8	14.4	0.8
2010	22,487	2,521	35,447	14,777	540	75,772	3.0	33.0	46.8	19.5	0.7
2011	24,679	2,224	35,740	14,772	680	78,095	3.1	34.4	45.8	18.9	0.9
2012	28,053	1,449	38,647	15,882	1,092	85,123	9.0	34.7	45.4	18.7	1.3
2013	27,154	5,320	39,973	15,067	1,532	89,046	4.6	36.5	44.9	16.9	1.7
2014	26,765	6,658	40,113	15,357	1,798	90,691	1.8	36.9	44.2	16.9	2.0
2015	24,971	4,865	41,853	17,406	2,017	91,112	0.5	32.7	45.9	19.1	2.2
2016	27,757	3,570	41,257	18,744	2,420	93,747	2.9	33.4	44.0	20.0	2.6
2017	27,471	1,909	41,200	20,771	2,994	94,345	0.6	31.1	43.7	22.0	3.2
2018	25,735	3,694	40,939	22,280	3,261	95,909	1.7	30.7	42.7	23.2	3.4
2019	25,523	7,290	41,461	21,057	3,349	98,680	2.9	33.3	42.0	21.3	3.4
2020	23,101	2,672	39,939	24,788	3,693	94,194	(4.5)	27.4	42.4	26.3	3.9
2021	23,913	1,338	42,296	22,917	3,937	94,401	0.2	26.7	44.8	24.3	4.2

Table 22 : Net Import and Export of Energy in ktoe

	Net Export of Crude Oil	Net Export of LNG	Net Export of Natural Gas	Net Export of Electricity	Net Import of Petroleum products	Net Import of coal and Coke
2000	10,036	16,633	1,198	-	(1,914)	1,924
2001	9,128	16,636	1,163	-	(2,019)	2,631
2002	11,017	17,803	1,098	3	(936)	3,405
2003	10,826	18,965	(99)	17	(1,856)	5,232
2004	11,292	22,944	144	45	68	7,413
2005	10,963	22,299	(206)	192	(474)	6,568
2006	9,342	22,873	(2,404)	200	(1,798)	7,917
2007	7,509	23,777	(4,140)	195	(1,329)	8,152
2008	6,482	22,277	(3,041)	41	(1,609)	9,519
2009	6,517	23,606	(3,889)	8	(1,177)	9,007
2010	9,365	26,857	(4,183)	(32)	1,930	13,011
2011	2,300	26,856	(5,832)	(31)	2,159	13,189
2012	1,993	25,547	(6,498)	(7)	2,458	13,988
2013	1,684	25,639	(5,602)	(16)	7,400	13,583
2014	2,051	25,816	(5,343)	-	5,611	13,590
2015	7,696	25,145	(4,879)	(1)	3,998	15,895
2016	5,751	26,182	(4,716)	57	3,128	17,128
2017	4,823	27,613	(3,731)	96	2,189	18,799
2018	5,773	24,537	(4,167)	128	3,735	20,743
2019	2,177	26,381	(4,211)	143	5,882	19,622
2020	3,635	23,216	(4,340)	29	1,997	22,235
2021	2,328	24,802	(4,480)	246	(930)	20,355

Table 23 : Conversion in Gas Plants in ktoe

	Input:	Gas Plants		
	Natural Gas	Liquefaction	Regasification	Gas-to-Liquid
2000	26,093	17,231	NA	1,646
2001	25,703	16,636	NA	1,823
2002	25,571	17,803	NA	1,949
2003	27,940	18,965	NA	1,233
2004	33,176	22,944	NA	1,033
2005	36,447	24,254	NA	1,779
2006	35,378	23,450	NA	1,500
2007	38,141	24,355	NA	1,900
2008	38,193	22,793	NA	1,843
2009	37,098	25,004	NA	1,438
2010	40,246	26,601	NA	2,753
2011	40,737	28,130	NA	2,793
2012	40,042	26,231	NA	2,521
2013	39,678	28,209	NA	1,652
2014	39,193	28,213	NA	1,670
2015	40,773	39,957	1,873	1,578
2016	39,665	31,658	1,277	2,570
2017	38,296	29,468	1,815	2,470
2018	32,980	25,920	1,383	2,523
2019	33,968	29,044	2,663	2,532
2020	34,410	26,155	2,939	2,439
2021	37,002	26,798	1,996	1,681

Note: 1. NA means not applicable
2. Liquefaction refers to quantities of natural gas used for liquefaction to LNG and the amount of LNG produced.
3. Regasification refers to quantities of LNG used for vaporization to natural gas and the amount of natural gas produced.
4. Gas-to-Liquid refers to a refinery process to convert natural gas or other gaseous hydrocarbons into liquid hydrocarbons such as petroleum products.

Table 24 : Conversion in Refineries in ktoe

	Input:			Output:								
	Local Crude Oil	Imported Crude Oil & Others	Total Input	Petrol	Diesel	Fuel Oil	Kerosene	ATF & AV GAS	LPG	Non - Energy	Refinery Gas	Total Output
2000	15,421	6,743	22,164	3,893	8,059	2,532	239	2,660	838	2,492	241	20,954
2001	13,299	10,546	23,845	4,623	8,462	2,269	283	2,954	875	3,020	331	22,817
2002	14,838	8,032	22,870	4,460	8,401	2,332	414	2,570	897	2,127	294	21,495
2003	17,127	8,322	25,449	4,584	9,062	1,763	983	2,367	932	2,623	262	22,576
2004	16,810	8,764	25,574	4,724	9,611	1,813	591	2,693	897	2,455	215	22,999
2005	18,216	6,271	24,487	4,245	9,161	1,777	521	2,553	822	2,157	202	21,438
2006	16,797	8,113	24,910	4,607	8,752	1,933	537	2,938	1,118	2,750	849	23,484
2007	17,320	9,251	26,571	5,285	9,033	1,990	234	3,138	1,228	3,461	938	25,307
2008	18,638	8,138	26,776	5,066	9,364	1,994	245	3,139	1,208	4,475	991	26,482
2009	20,685	5,812	26,497	4,052	9,415	1,144	565	3,085	732	5,905	195	25,093
2010	14,003	8,706	22,709	3,873	8,369	327	483	2,891	697	4,357	209	21,206
2011	14,874	9,904	24,777	3,599	8,925	571	419	3,457	665	4,572	1,659	23,867
2012	17,213	10,347	27,560	4,708	10,033	1,608	654	3,918	702	4,318	197	26,138
2013	17,365	9,289	26,654	4,702	11,063	1,286	387	2,750	1,252	3,089	195	24,724
2014	16,351	10,066	26,417	4,918	9,725	2,340	100	2,916	1,102	2,826	192	24,119
2015	17,249	7,327	24,575	5,031	9,890	1,692	6	2,841	780	3,869	172	24,281
2016	18,170	9,353	27,524	5,044	9,988	1,479	4	2,548	1,285	4,339	201	24,888
2017	17,647	9,605	27,252	8,253	9,877	1,725	10	3,255	832	3,100	174	27,226
2018	16,144	9,409	25,553	5,524	9,665	2,432	18	3,451	900	2,550	130	24,670
2019	17,209	7,999	25,208	5,317	8,484	1,388	8	3,470	560	3,708	147	23,082
2020	15,739	7,235	22,974	5,089	9,199	1,204	12	2,459	672	1,954	156	20,745
2021	17,828	6,069	23,897	6,760	6,157	1,497	10	2,386	1,755	2,762	155	21,483

Table 25 : Conversion in Power Stations (Exclude Co-Generation & Private Licensed Plants) in ktoe

	Input:						Total Input	Annual Growth Rate (%)	Input Share (%)					Output:
	Fuel Oil	Diesel Oil	Natutral Gas	Hydro Power	Coal	Renewables			Fuel and Diesel Oil	Natural Gas	Hydo Power	Coal & Coke	Renewables	Total Electricity Generated
2000	592	191	11,580	599	1,495	-	14,457	9.0	5.4	80.1	4.1	10.3	-	5,731
2001	730	278	11,922	607	1,994	-	15,531	7.4	6.5	76.8	3.9	12.8	-	5,940
2002	1,363	476	12,424	456	2,556	-	17,275	11.2	10.6	71.9	2.6	14.8	-	6,191
2003	289	340	10,893	435	4,104	-	16,061	(7.0)	3.9	67.8	2.7	25.6	-	6,568
2004	274	272	10,545	501	5,327	-	16,919	5.3	3.2	62.3	3.0	31.5	-	6,716
2005	275	298	12,271	446	5,541	-	18,831	11.3	3.0	65.2	2.4	29.4	-	6,706
2006	171	617	12,524	554	5,964	-	19,830	5.3	4.0	63.2	2.8	30.1	-	7,240
2007	199	314	12,549	558	7,486	-	22,842	6.4	2.4	59.5	2.6	35.5	-	8,385
2008	181	299	13,651	642	8,069	-	22,842	8.2	2.1	59.8	2.8	35.3	-	8,422
2009	205	384	13,390	574	9,010	-	23,563	3.2	2.5	56.8	2.4	38.2	-	8,531
2010	125	415	12,628	540	12,951	-	26,659	13.1	2.0	47.4	2.0	48.6	-	9,404
2011	1,103	981	10,977	656	13,013	-	26,730	0.3	7.8	41.1	2.5	48.7	-	10,193
2012	550	811	11,533	779	14,138	80	27,891	4.3	4.9	41.4	2.8	50.7	0.3	11,032
2013	392	623	13,520	1,003	13,527	208	29,273	5.0	3.5	46.2	3.4	46.2	0.7	11,630
2014	269	622	13,860	1,152	13,648	171	29,722	1.5	3.0	46.6	3.9	45.9	0.6	12,227
2015	101	279	13,378	1,346	15,627	166	30,898	4.0	1.2	43.3	4.4	50.6	0.5	12,393
2016	155	165	13,260	1,723	17,101	168	32,572	5.4	1.0	40.7	5.3	52.5	0.5	12,944
2017	99	147	11,872	2,287	18,967	184	33,556	3.0	0.7	35.4	6.8	56.5	0.5	13,375
2018	17	187	11,542	2,265	20,472	276	34,759	3.6	0.6	33.2	6.5	58.9	0.8	13,939
2019	19	517	13,072	2,251	19,351	287	35,497	2.1	1.5	36.8	6.3	54.5	0.8	13,127
2020	12	154	9,841	2,348	23,451	367	36,172	1.9	0.5	27.2	6.5	64.8	1.0	14,433
2021	8	236	9,936	2,676	21,525	314	34,695	(2.3)	0.7	28.6	7.7	62.0	0.9	14,828

Table 26 : Final Energy Consumption by Sectors in ktoe

	Industrial	Transport	Resdential and Commercial	Non-Energy Use	Agriculture	Total	Annual Growth Rate (%)	Industrial including Agiculture & Non - Energy	Industry GDP*	Industryry Energy Intensity (toe/RM Million at 2015 Prices)
2000	11,406	12,071	3,868	2,250	104	**29,699**	**9.1**	**13,760**	323,348	**42.55**
2001	11,852	13,137	4,048	2,378	98	**31,513**	**6.1**	**14,328**	315,054	**45.48**
2002	12,854	13,442	4,387	2,511	96	**33,290**	**5.6**	**15,461**	327,133	**47.26**
2003	13,472	14,271	4,399	2,345	98	**34,585**	**3.9**	**15,915**	351,628	**45.26**
2004	14,914	15,385	4,754	2,183	87	**37,323**	**7.9**	**17,184**	376,085	**45.69**
2005	15,583	15,293	5,134	2,173	101	**38,284**	**2.6**	**17,857**	388,442	**45.97**
2006	15,248	14,819	5,424	2,819	258	**38,568**	**0.7**	**18,325**	406,056	**45.13**
2007	16,454	15,717	6,197	2,957	281	**41,606**	**7.9**	**19,692**	417,734	**47.14**
2008	16,205	16,395	6,205	2,876	287	**41,968**	**0.9**	**19,368**	420,639	**46.04**
2009	14,312	16,119	6,336	3,868	211	**40,846**	**(2.7)**	**18,391**	395,287	**46.53**
2010	12,928	16,828	6,951	3,696	1,074	**41,477**	**1.5**	**17,698**	424,530	**41.69**
2011	12,100	17,070	6,993	6,377	916	**43,456**	**4.8**	**19,393**	438,593	**44.22**
2012	13,919	19,757	7,065	7,497	1,053	**49,291**	**13.4**	**22,469**	456,449	**49.23**
2013	13,496	22,357	7,403	7,277	1,051	**51,584**	**4.7**	**21,824**	471,292	**46.31**
2014	13,162	24,327	7,459	6,217	1,045	**52,210**	**1.2**	**20,424**	495,773	**41.20**
2015	13,971	23,435	7,600	5,928	895	**51,829**	**(0.7)**	**20,794**	518,360	**40.12**
2016	16,019	24,004	8,051	8,729	415	**57,219**	**10.4**	**25,164**	532,752	**47.23**
2017	17,463	24,039	7,796	12,517	674	**62,489**	**9.2**	**30,654**	559,332	**54.80**
2018	19,046	23,555	7,773	13,262	1,021	**64,657**	**3.5**	**33,329**	574,231	**58.04**
2019	18,921	25,004	8,000	13,631	927	**66,483**	**2.8**	**33,479**	587,196	**57.02**
2020	17,714	18,660	8,123	11,805	867	**57,169**	**(14.0)**	**30,386**	553,448	**54.90**
2021	19,157	18,095	8,084	10,869	1,045	**57,250**	**0.1**	**31,070**	580,446	**53.53**

Note (*): 1. Defined as total GDP for Agriculture, Forestry and Fishing, Mining and Quarrying, Manufacturing and Construction
2. Industry GDP for year 2000-2014 was calculated by the Energy Commission

Table 27 : Final Energy Consumption by Type of Fuel in ktoe

	Petroleum Products and Others	Electricity	*Gas for Non-Energy*	*Gas for Heating*	Natural Gas	Coal & Coke	Total	Total (excl. Non-Energy)	Annual Growth Rate (%)
2000	19,582	5,263	*1,512*	*2,350*	3,862	991	**29,698**	28,186	**8.0**
2001	20,323	5,594	*1,655*	*2,965*	4,620	977	**31,514**	29,859	**5.9**
2002	20,638	5,922	*1,775*	*3,868*	5,643	1,086	**33,289**	31,514	**5.5**
2003	21,175	6,313	*1,616*	*4,270*	5,886	1,212	**34,586**	32,970	**4.6**
2004	22,886	6,642	*1,476*	*5,014*	6,490	1,305	**37,323**	35,847	**8.7**
2005	23,012	6,944	*1,541*	*5,440*	6,981	1,348	**38,285**	36,744	**2.5**
2006	22,398	7,272	*2,120*	*5,442*	7,562	1,335	**38,567**	36,447	**(0.8)**
2007	24,852	7,683	*2,112*	*5,597*	7,709	1,362	**41,606**	39,494	**8.4**
2008	24,451	7,986	*2,046*	*5,772*	7,818	1,713	**41,968**	39,922	**1.1**
2009	24,145	8,286	*1,995*	*4,807*	6,802	1,613	**40,846**	38,851	**(2.7)**
2010	24,403	8,993	*1,661*	*4,593*	6,254	1,826	**41,476**	39,815	**2.5**
2011	23,946	9,236	*3,906*	*4,609*	8,515	1,759	**43,456**	39,550	**(0.7)**
2012	27,329	10,011	*5,336*	*4,870*	10,206	1,744	**49,290**	43,954	**11.1**
2013	29,379	10,590	*5,276*	*4,800*	10,076	1,539	**51,584**	46,308	**5.4**
2014	29,817	11,042	*4,472*	*5,168*	9,641	1,709	**52,209**	47,737	**3.1**
2015	29,087	11,397	*4,470*	*5,096*	9,566	1,778	**51,829**	47,359	**(0.8)**
2016	30,737	12,394	*6,083*	*6,221*	12,304	1,785	**57,219**	51,136	**8.0**
2017	31,241	12,607	*9,837*	*7,001*	16,838	1,804	**62,490**	52,653	**3.0**
2018	30,845	13,153	*10,451*	*8,400*	18,851	1,808	**64,657**	54,206	**2.9**
2019	32,483	13,647	*10,819*	*7,828*	18,647	1,706	**66,483**	55,664	**2.7**
2020	26,100	13,100	*9,193*	*7,438*	16,631	1,338	**57,169**	47,976	**(13.8)**
2021	24,731	13,311	*9,105*	*8,710*	17,815	1,392	**57,250**	48,145	**0.4**

Table 28 : Final Consumption for Petroleum Products in ktoe

	Diesel	Petrol	Fuel Oil	LPG	Kerosene	ATF & AV Gas	Non-Energy & Others	Total
2000	7,627	6,387	1,875	1,362	131	1,574	625	**19,581**
2001	8,116	6,827	1,497	1,392	99	1,762	630	**20,323**
2002	8,042	6,948	1,589	1,542	92	1,785	639	**20,637**
2003	8,539	7,360	1,256	1,437	93	1,852	639	**21,176**
2004	9,262	7,839	1,463	1,542	86	2,056	637	**22,885**
2005	8,672	8,211	1,953	1,510	81	2,010	574	**23,011**
2006	8,540	7,517	1,901	1,520	79	2,152	684	**22,393**
2007	9,512	8,600	2,202	1,474	76	2,155	832	**24,851**
2008	9,167	8,842	1,963	1,475	75	2,112	818	**24,452**
2009	8,634	8,766	1,291	2,506	30	2,120	799	**24,146**
2010	8,388	9,560	478	2,920	19	2,380	657	**24,402**
2011	8,712	8,155	414	2,892	19	2,553	1,178	**23,923**
2012	9,410	10,843	768	2,892	38	2,521	743	**27,215**
2013	9,568	12,656	329	2,946	31	2,998	662	**29,190**
2014	10,161	12,705	246	2,632	23	3,158	592	**29,517**
2015	9,377	12,804	498	2,261	4	3,134	621	**28,699**
2016	9,254	13,411	513	3,497	5	3,019	650	**30,348**
2017	9,388	13,437	579	3,514	5	3,220	719	**30,862**
2018	9,756	13,041	387	3,309	6	3,121	789	**30,409**
2019	10,583	13,811	446	3,017	12	3,261	705	**31,835**
2020	8,516	11,188	338	3,423	32	1,199	613	**25,309**
2021	8,800	10,529	342	2,637	59	985	552	**23,905**

Table 29 : Selected Energy and Economic Indicators (2000-2021)

	GDP at Current Prices (RM Million)*	GDP at 2015 Prices (RM Million)*	Population ('000 people)*	Primary Energy Supply (ktoe)	Final Energy Consumption (ktoe)	Electricity Consumption (ktoe)	Electricity Consumption (GWh)	Average Annual Growth (%)			
								GDP at 2015 Prices	Primary Energy Supply	Final Energy Consumption	Electricity Consumption
2000	370,817	579,073	23,495	49,697	29,699	5,263	61,168	8.86	14.21	9.08	9.30
2001	366,841	582,071	24,031	50,899	31,515	5,594	65,015	0.52	2.42	6.11	6.29
2002	398,714	613,450	24,543	52,323	33,289	5,922	68,827	5.39	2.80	5.63	5.86
2003	435,708	648,960	25,038	56,944	34,586	6,313	73,371	5.79	8.83	3.90	6.60
2004	493,223	692,981	25,542	62,008	37,323	6,642	77,195	6.78	8.89	7.91	5.21
2005	543,578	729,932	26,046	65,344	38,285	6,944	80,705	5.33	5.38	2.58	4.55
2006	596,784	770,698	26,550	66,009	38,567	7,272	84,517	5.58	1.02	0.74	4.72
2007	665,340	819,242	27,058	71,426	41,606	7,683	89,294	6.30	8.21	7.88	5.65
2008	769,949	858,826	27,568	74,709	41,968	7,986	92,815	4.83	4.60	0.87	3.94
2009	712,857	845,828	28,082	73,530	40,845	8,286	96,302	(1.51)	(1.58)	(2.68)	3.76
2010	821,434	908,629	28,589	75,772	41,476	8,993	104,519	7.42	3.05	1.54	8.53
2011	911,733	956,731	29,062	78,095	43,455	9,235	107,331	5.29	3.07	4.77	2.69
2012	971,252	1,009,097	29,510	85,124	49,291	10,011	116,350	5.47	9.00	13.43	8.40
2013	1,018,614	1,056,462	30,214	89,046	51,583	10,590	123,079	4.69	4.61	4.65	5.78
2014	1,106,443	1,119,920	30,709	90,691	52,209	11,042	128,333	6.01	1.85	1.21	4.27
2015	1,176,941	1,176,941	31,186	90,441	51,829	11,397	132,464	5.09	(0.28)	(0.73)	3.22
2016	1,249,698	1,229,312	31,634	93,747	57,219	12,394	144,042	4.45	3.66	10.40	8.74
2017	1,372,310	1,300,769	32,023	94,345	62,489	12,607	146,521	5.81	0.64	9.21	1.72
2018	1,447,760	1,363,766	32,382	95,909	64,658	13,153	152,867	4.84	1.66	3.47	4.33
2019	1,512,738	1,423,952	32,523	98,681	66,483	13,647	158,608	4.41	2.89	2.82	3.76
2020	1,418,000	1,345,144	32,584	94,194	57,169	13,100	152,250	(5.53)	(4.55)	(14.01)	(4.01)
2021	1,548,898	1,390,644	32,576	94,401	57,250	13,311	154,705	3.38	0.22	0.14	1.61

Source (*): GDP and Population data is from the Department of Statistics Malaysia
Note: GDP at 2015 Prices (RM Million) for 2000 until 2014 was calculated by the Energy Commission

Per Capita				Energy Intensity				Energy Elasticity	
GDP at Current Prices (RM) per Capita	Primary Energy Supply (toe) per Capita	Final Energy Consumption (toe) per Capita	Elecricity Consumption (kWh) per Capita	Primary Energy Supply (toe/GDP at 2015 Prices (RM Million))	Final Energy Consumption (toe/GDP at 2015 Prices (RM Million))	Electricity Consumption (toe/GDP at 2015 Prices (RM Million))	Electricity Consumption (GWh/GDP at 2015 Prices (RM Million))	Final Energy	Electricity
15,783	2.12	1.26	2,603	85.82	51.29	9.09	0.106	1.02	1.05
15,265	2.12	1.31	2,705	87.44	54.14	9.61	0.112	11.81	12.15
16,246	2.13	1.36	2,804	85.29	54.27	9.65	0.112	1.04	1.09
17,402	2.27	1.38	2,930	87.75	53.29	9.73	0.113	0.67	1.14
19,310	2.43	1.46	3,022	89.48	53.86	9.58	0.111	1.17	0.77
20,870	2.51	1.47	3,099	89.52	52.45	9.51	0.111	0.48	0.85
22,478	2.49	1.45	3,183	85.65	50.04	9.44	0.110	0.13	0.85
24,589	2.64	1.54	3,300	87.19	50.79	9.38	0.109	1.25	0.90
27,929	2.71	1.52	3,367	86.99	48.87	9.30	0.108	0.18	0.82
25,385	2.62	1.45	3,429	86.93	48.29	9.80	0.114	1.77	(2.48)
28,733	2.65	1.45	3,656	83.39	45.65	9.90	0.115	0.21	1.15
31,372	2.69	1.50	3,693	81.63	45.42	9.65	0.112	0.90	0.51
32,913	2.88	1.67	3,943	84.36	48.85	9.92	0.115	2.45	1.54
33,713	2.95	1.71	4,074	84.29	48.83	10.02	0.117	0.99	1.23
36,031	2.95	1.70	4,179	80.98	46.62	9.86	0.115	0.20	0.71
37,739	2.90	1.66	4,248	76.84	44.04	9.68	0.113	(0.14)	0.63
39,505	2.96	1.81	4,553	76.26	46.55	10.08	0.117	2.34	1.96
42,854	2.95	1.95	4,576	72.53	48.04	9.69	0.113	1.58	0.30
44,708	2.96	2.00	4,721	70.33	47.41	9.64	0.112	0.72	0.89
46,513	3.03	2.04	4,877	69.30	46.69	9.58	0.111	0.64	0.85
43,518	2.89	1.75	4,673	70.03	42.50	9.74	0.113	2.53	0.72
47,547	2.90	1.76	4,749	67.88	41.17	9.57	0.111	0.04	0.48

Table 30 : Energy Balance Table in 2021 (kilo tonnes of oil equivalent)

Energy Balance for Malaysia 2021 (kilo tonnes of oil equivalent)

Energy Source	Natural Gas	LNG	Crude Oil (1/)	Others (2/)	Total Petroleum Products	Petroleum			
						Petrol	Diesel	Fuel Oil	LPG
Primary Supply									
1. Primary Production	75,819	0	25,389	0	0	0	0	0	0
2. Gas Flaring, Reinjection & Use	-13,202	0	0	0	0	0	0	0	0
3. Imports	6,049	1,996	6,557	92	18,329	11,133	5,704	26	354
4. Exports	-1,569	-26,798	-8,885	-58	-19,260	-7,802	-5,330	-588	-798
5. Bunkers	0	0	0	0	-654	0	-106	-549	0
6. Stock Change	0	0	784	0	2,969	464	2,425	19	96
7. Statistical Discrepancy	0	0	68	0	0	0	0	0	0
8. Primary Supply	**67,098**	**-24,802**	**23,913**	**34**	**1,385**	**3,795**	**2,693**	**-1,092**	**-349**
Transformation									
9. Gas Plants									
9.1 Liquefaction (3/)	-36,283	26,798	0	0	101	0	0	0	101
9.2 Regasification (4/)	1,996	-1,996	0	0	0	0	0	0	0
9.3 Gas-to-Liquid (5/)	-2,715	0	0	0	1,681	0	118	0	1,212
Subtotal	**-37,002**	**24,802**	**0**	**0**	**1,782**	**0**	**118**	**0**	**1,313**
10. Refineries	0	0	-23,897	-34	21,483	6,760	6,157	1,497	1,755
11. Power Stations & Self-Generation									
11.1 Hydro Stations	0	0	0	0	0	0	0	0	0
11.2 Themal Stations	-9,936	0	0	0	-244	0	-236	-8	0
11.3 Self-Generation (6/)	-1,185	0	0	0	-37	0	-37	0	0
Subtotal	**-11,122**	**0**	**0**	**0**	**-281**	**0**	**-273**	**-8**	**0**
12. Losses & Own Use	-1,159	0	-16	0	-475	0	0	-18	0
13. Statistical Discrepancy	-1	0	0	0	10	-26	104	-36	-83
14. Secondary Supply	**-49,283**	**24,802**	**-23,913**	**-34**	**22,520**	**6,734**	**6,107**	**1,435**	**2,986**
Final Use									
15. Residential	1	0	0	0	993	0	0	0	990
16. Commercial	11	0	0	0	461	0	149	33	279
17. Industry	8,663	0	0	0	2,498	93	1,883	309	156
18. Transport	35	0	0	0	17,203	10,379	5,839	0	0
19. Agriculture	0	0	0	0	371	0	371	0	0
20. Fishery	0	0	0	0	615	57	558	0	0
21. Non-Energy Use	9,105	0	0	0	1,764	0	0	0	1,212
22. Total Final Use	**17,815**	**0**	**0**	**0**	**23,905**	**10,529**	**8,800**	**342**	**2,637**
Electricity Output									
Main Activity Producer									
Gross Electricity Generation-GWh	**52,976**	**0**	**0**	**0**	**807**	**0**	**807**	**0**	**0**
Autoproducer									
Gross Electricity Generation-GWh	**5,443**	**0**	**0**	**0**	**168**	**0**	**168**	**0**	**0**

1. Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2. Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residuum & Middle East Residue) Which are Used as Refinary Intake.
3. Report quantities of natural gas used for liquefaction to LNG and the amount of LNG produced.
4. Report quantities of LNG used for vaporization to natural gas and the amount of natural gas produced.
5. Gas-to-liquid is a refinery process to convert natural gas or other gaseous hydrocarbons into liquid hydrocarbons such as petroleum products.
6. Estimated figures based from the Energy Commission, Statistics of Electricity Supply Industry in Malaysia 2021.

Note: Total may not necessarily add up due to rounding

Products											
Kerosene	ATF & AV Gas	Non-Energy	Refinery Gas	Coal & Coke	Hydro Power	Solar	Biomass	Biogas	Biodiesel	Electricity	Total
0	0	0	0	1,961	2,676	186	150	99	1,001	0	107,281
0	0	0	0	0	0	0	0	0	0	0	-13,202
3	434	676	0	20,355	0	0	0	0	0	3	53,381
-42	-1,536	-3,163	0	-0	0	0	0	0	-246	-84	-56,899
0	0	0	0	0	0	0	0	0	0	0	-654
8	-222	180	0	566	0	0	0	0	71	0	4,390
0	0	0	0	35	0	0	0	0	0	0	103
-30	**-1,325**	**-2,307**	**0**	**22,917**	**2,676**	**186**	**150**	**99**	**827**	**-81**	**94,401**
0	0	0	0	0	0	0	0	0	0	0	-9,384
0	0	0	0	0	0	0	0	0	0	0	0
42	0	308	0	0	0	0	0	0	0	0	-1,034
42	**0**	**308**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-10,418**
10	2,386	2,762	155	0	0	0	0	0	0	0	-2,448
0	0	0	0	0	-2,676	0	0	0	0	2,676	0
0	0	0	0	-21,525	0	-183	-35	-96	0	12,152	-19,867
0	0	0	0	0	0	-3	-115	-3	0	537	-806
0	**0**	**0**	**0**	**-21,525**	**-2,676**	**-186**	**-150**	**-99**	**0**	**15,365**	**-20,673**
0	0	-301	-155	0	0	0	0	0	0	-1,567	-3,217
37	-75	90	0	0	0	0	0	0	0	-406	-396
89	**2,311**	**2,859**	**0**	**-21,525**	**-2,676**	**-186**	**-150**	**-99**	**0**	**13,392**	**-37,151**
3	0	0	0	0	0	0	0	0	0	3,174	4,168
0	0	0	0	0	0	0	0	0	0	3,443	3,916
56	0	0	0	1,392	0	0	0	0	0	6,604	19,157
0	985	0	0	0	0	0	0	0	827	30	18,095
0	0	0	0	0	0	0	0	0	0	59	430
0	0	0	0	0	0	0	0	0	0	0	615
0	0	552	0	0	0	0	0	0	0	0	10,869
59	**985**	**552**	**0**	**1,392**	**0**	**0**	**0**	**0**	**827**	**13,311**	**57,250**
0	**0**	**0**	**0**	**84,730**	**31,101**	**2,126**	**160**	**440**	**0**	**0**	**172,341**
0	**0**	**0**	**0**	**0**	**4**	**13**	**596**	**14**	**0**	**0**	**6,239**

Table 31 : Energy Balance Table in 2021 (Petajoules)

Energy Balance for Malaysia 2021 (Petajoules)									
Energy Source	Natural Gas	LNG	Crude Oil (1/)	Others (2/)	Total Petroleum Products	Petroleum			
						Petrol	Diesel	Fuel Oil	LPG
Primary Supply									
1. Primary Production	3,172.3	0.0	1,062.3	0.0	0.0	0.0	0.0	0.0	0.0
2. Gas Flaring, Reinjection & Use	-552.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. Imports	253.1	83.5	274.4	3.8	766.9	465.8	238.7	1.1	14.8
4. Exports	-65.6	-1,121.2	-371.8	-2.4	-805.8	-326.4	-223.0	-24.6	-33.4
5. Bunkers	0.0	0.0	0.0	0.0	-27.4	0.0	-4.4	-22.9	0.0
6. Stock Change	0.0	0.0	32.8	0.0	124.2	19.4	101.4	0.8	4.0
7. Statistical Discrepancy	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0
8. Primary Supply	**2,807.4**	**-1,037.7**	**1,000.5**	**1.4**	**57.9**	**158.8**	**112.7**	**-45.7**	**-14.6**
Transformation									
9. Gas Plants									
9.1 Liquefaction (3/)	-1,518.1	1,121.2	0.0	0.0	4.2	0.0	0.0	0.0	4.2
9.2 Regasification (4/)	83.5	-83.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9.3 Gas-to-Liquid (5/)	-113.6	0.0	0.0	0.0	70.3	0.0	5.0	0.0	50.7
Subtotal	**-1,548.2**	**1,037.7**	**0.0**	**0.0**	**74.6**	**0.0**	**5.0**	**0.0**	**54.9**
10. Refineries	0.0	0.0	-999.9	-1.4	898.9	282.8	257.6	62.6	73.4
11. Power Stations & Self-Generation									
11.1 Hydro Stations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11.2 Themal Stations	-415.7	0.0	0.0	0.0	-10.2	0.0	-9.9	-0.3	0.0
11.3 Self-Generation (6/)	-49.6	0.0	0.0	0.0	-1.5	0.0	-1.5	0.0	0.0
Subtotal	**-465.3**	**0.0**	**0.0**	**0.0**	**-11.8**	**0.0**	**-11.4**	**-0.3**	**0.0**
12. Losses & Own Use	-48.5	0.0	-0.7	0.0	-19.9	0.0	0.0	-0.8	0.0
13. Statistical Discrepancy	0.0	0.0	0.0	0.0	0.4	-1.1	4.4	-1.5	-3.5
14. Secondary Supply	**-2,062.0**	**1,037.7**	**-1,000.5**	**-1.4**	**942.2**	**281.7**	**255.5**	**60.0**	**124.9**
Final Use									
15. Residential	0.0	0.0	0.0	0.0	41.6	0.0	0.0	0.0	41.4
16. Commercial	0.5	0.0	0.0	0.0	19.3	0.0	6.2	1.4	11.7
17. Industry	362.5	0.0	0.0	0.0	104.5	3.9	78.8	12.9	6.5
18. Transport	1.5	0.0	0.0	0.0	719.8	434.2	244.3	0.0	0.0
19. Agriculture	0.0	0.0	0.0	0.0	15.5	0.0	15.5	0.0	0.0
20. Fishery	0.0	0.0	0.0	0.0	25.7	2.4	23.4	0.0	0.0
21. Non-Energy Use	381.0	0.0	0.0	0.0	73.8	0.0	0.0	0.0	50.7
22. Total Final Use	**745.4**	**0.0**	**0.0**	**0.0**	**1,000.2**	**440.5**	**368.2**	**14.3**	**110.3**
Electrcity Output									
Main Activity Producer									
Gross Electricity Generation-GWh	**52,976.1**	**0.0**	**0.0**	**0.0**	**807.1**	**0.0**	**807.1**	**0.0**	**0.0**
Autoproducer									
Gross Electricity Generation-GWh	**5,442.8**	**0.0**	**0.0**	**0.0**	**168.1**	**0.0**	**168.1**	**0.0**	**0.0**

1. Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2. Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residuum & Middle East Residue) Which are Used as Refinary Intake.
3. Report quantities of natural gas used for liquefaction to LNG and the amount of LNG produced.
4. Report quantities of LNG used for vaporization to natural gas and the amount of natural gas produced.
5. Gas-to-liquid is a refinery process to convert natural gas or other gaseous hydrocarbons into liquid hydrocarbons such as petroleum products.
6. Estimated figures based from the Energy Commission, Statistics of Electricity Supply Industry in Malaysia 2021.

Note: Total may not necessarily add up due to rounding

Products				Coal & Coke	Hydro Power	Solar	Biomass	Biogas	Biodiesel	Electricity	Total
Kerosene	ATF & AV Gas	Non-Energy	Refinery Gas								
0.0	0.0	0.0	0.0	82.0	112.0	7.8	6.3	4.1	41.9	0.0	4,488.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-552.4
0.1	18.1	28.3	0.0	851.6	0.0	0.0	0.0	0.0	0.0	0.1	2,233.5
-1.7	-64.3	-132.3	0.0	-0	0.0	0.0	0.0	0.0	-10.3	-3.5	-2,380.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.4
0.4	-9.3	7.5	0.0	23.7	0.0	0.0	0.0	0.0	3.0	0.0	183.7
0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	4.3
-1.3	**-55.4**	**-96.5**	**0.0**	**958.8**	**112.0**	**7.8**	**6.3**	**4.1**	**34.6**	**-3.4**	**3,949.7**
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-392.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.8	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-43.3
1.8	**0.0**	**12.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**-435.9**
0.4	99.8	115.6	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-102.4
0.0	0.0	0.0	0.0	0.0	-112.0	0.0	0.0	0.0	0.0	112.0	0.0
0.0	0.0	0.0	0.0	-900.6	0.0	-7.7	-1.5	-4.0	0.0	508.5	-831.2
0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-4.8	-0.1	0.0	22.5	-33.7
0.0	**0.0**	**0.0**	**0.0**	**-900.6**	**-112.0**	**-7.8**	**-6.3**	**-4.1**	**0.0**	**642.9**	**-865.0**
0.0	0.0	-12.6	-6.5	0.0	0.0	0.0	0.0	0.0	0.0	-65.6	-134.6
1.5	-3.2	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-17.0	-16.6
3.7	**96.7**	**119.6**	**0.0**	**-900.6**	**-112.0**	**-7.8**	**-6.3**	**-4.1**	**0.0**	**560.3**	**-1,554.4**
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	132.8	174.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	144.1	163.8
2.3	0.0	0.0	0.0	58.2	0.0	0.0	0.0	0.0	0.0	276.3	801.5
0.0	41.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.6	1.3	757.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	18.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.7
0.0	0.0	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	454.8
2.5	**41.2**	**23.1**	**0.0**	**58.2**	**0.0**	**0.0**	**0.0**	**0.0**	**34.6**	**556.9**	**2,395.3**
0.0	**0.0**	**0.0**	**0.0**	**84,729.8**	**31,101.0**	**2,126.2**	**160.4**	**440.1**	**0.0**	**0.0**	**172,340.7**
0.0	**0.0**	**0.0**	**0.0**	**0.0**	**4.1**	**13,4**	**596.4**	**14.5**	**0.0**	**0.0**	**6,239.4**

Energy Flow Chart

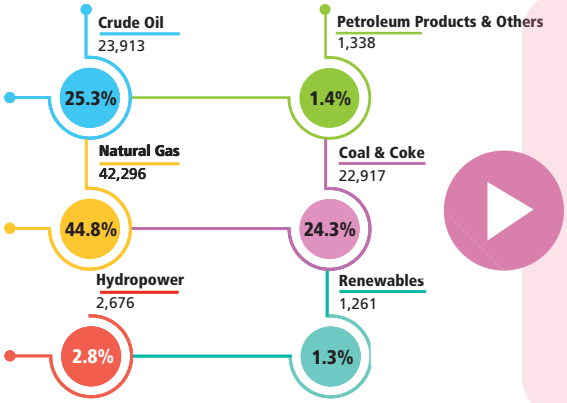
NATIONAL ENERGY BALANCE 2021

Energy Flow Chart

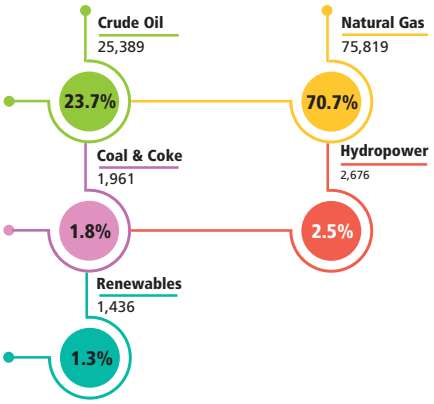
All units in the Energy Flow Chart are in ktoe

PRIMARY SUPPLY

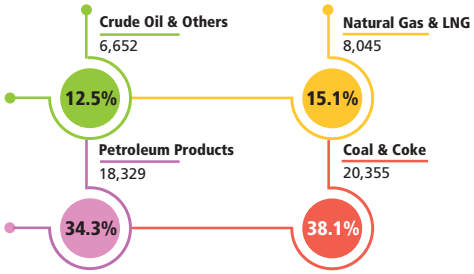
Primary Supply* (94,401)



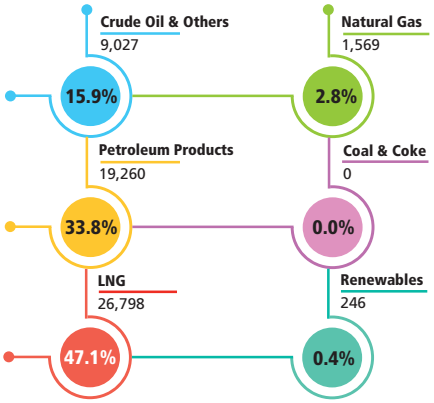
Primary Production (107,281)



Imports (53,381)

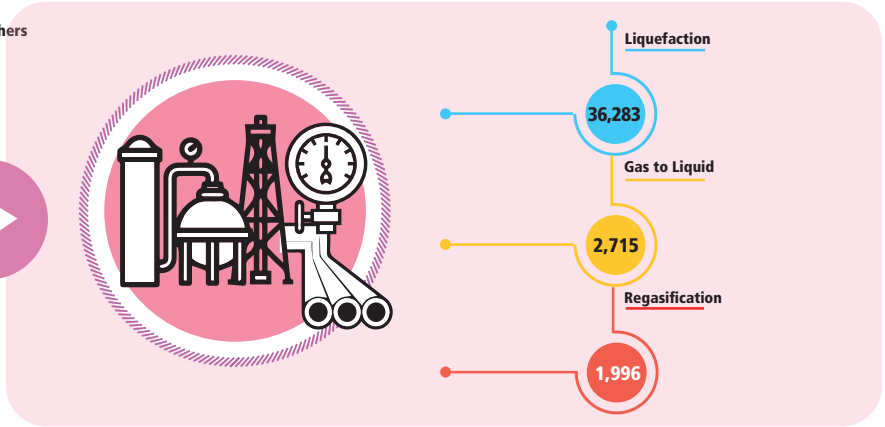


Exports (56,899)

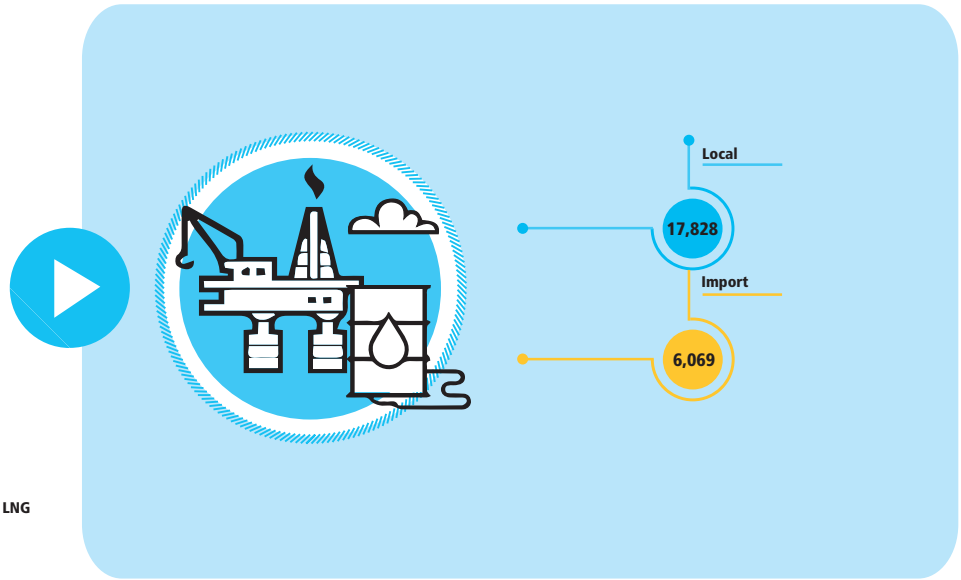


TRANSFORMATION

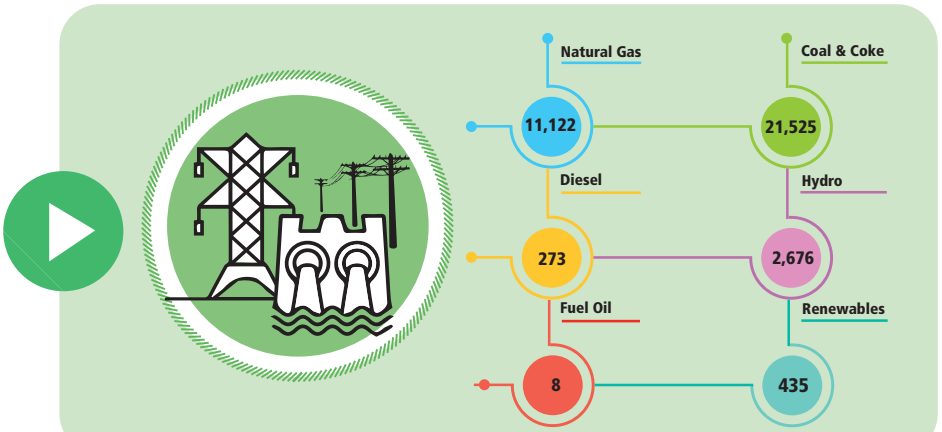
Gas Plant Input



Oil Refineries Input



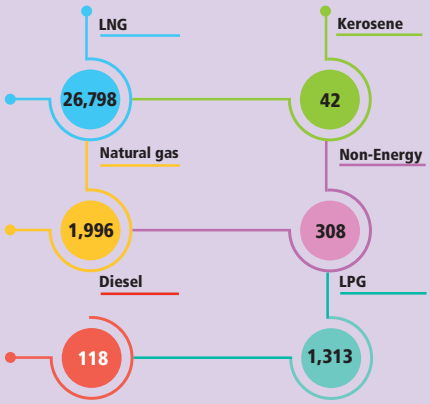
Power Stations & Self Generation Input



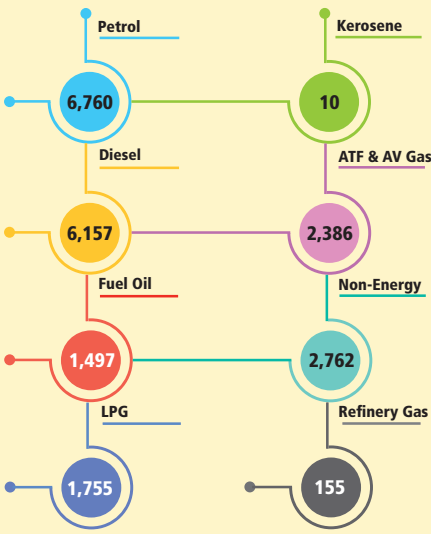
Note*: Primary Supply = Primary Production - Flaring + Imports - Exports - Bunkers (+-) Stock Exchange (+-) Statistical Discrepancy

FINAL USE

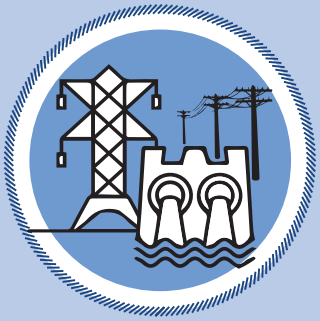
Gas Plant Output

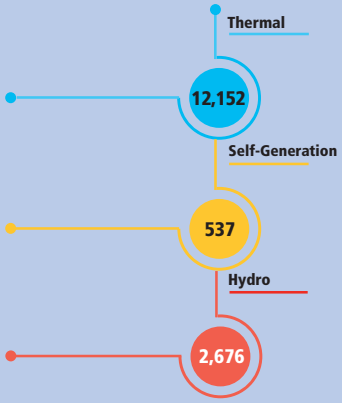


Oil Refineries Output

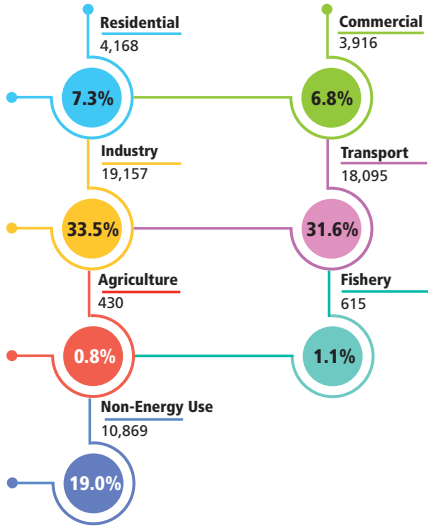


Power Stations & Self Generation Output

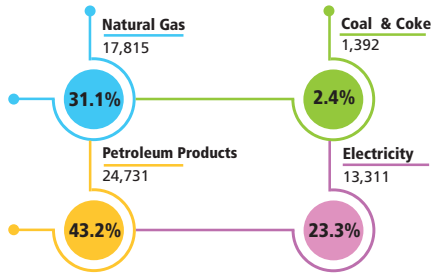




Final Use by Sector (57,250)



Final Use by Fuel (57,250)



Notes On Energy Balance

The net calorific value (NCV) was chosen as the basis of calculations rather than the gross calorific value (GcV). THe Joule was used as the rigorousaccountingunit, while the "tonnes oil equivalent" (toe+ 41.84 Gigajoules)was chosen as the final unit for persentation in the Energy Balance.

Energy Balance Format

The rows of the Energy Balance tables contain the following items:

Primary Supply	refers to supply of energy that has not undergone the transformations / conversion process within the country
Primary Production (1)	refers to the quantity of fuels extracted. Data for natural gas excludes the amount of reinjected and flared gas. Gross production of hydro is shown in conventional fuel equivalent input.
Gas Flaring, Reinjection & Use (2)	refers to the quantity of gas flared, reinjected into the gas fields and use for production purpose.
Imports (3) and Exports (4)	refer to the amount of primary and secondary energy obtained from or supplied to other countries. In the energy balance format, imports always carry a positive and export a negative sign.
Bunkers (5)	refer to the amount of fuels delivered to ocean-going ships of all flags engaged in international traffic.
Stock Change (6)	refers to the difference between the amounts of fuel in stocks at the beginning and end of year and should ideally cover producers, importers and Industry consumers. At this stage, however, only oil companies' stock are taken into account. A negative sign indicates net increase while a positive sign indicates net decrease in stocks.
Total	under primary supply, 'total' is the addition of columns to obtain total availability. Under transformation, 'total' is the addition of columns to obtain transformation and conversion losses.
Gas Plants (9)	shows the input of natural gas into the Liquefaction, Regasification and Gas-to-Liquid plants and their respective outputs.
Refineries (10), power stations and Co-generation & Private licensees (11)	show the input of any energy product (negative sign) for the purpose of converting it to one or more secondary products (positive sign).
Losses and Own Use (12)	refers to losses of electrical energy and natural gas which occur outside the utilities and plants (i.e. distribution losses) and the consumption of energy by utilities and plants for operating their installation (i.e. electricity for operating auxiliary equipment and petroleum products used in the crude distillation process respectively). It does not, however, include conversion loss that is accounted for in the 'total' column.
Secondary Supply (14)	refers to the supply of energy from the transformation process and after deducting the energy sector's own use and losses, including power station use.
Residential and Commercial (15 & 16)	not only refers to energy used within households and commercial establishments but includes Government buildings and institutions
Industry (17)	is a very broad-based sector ranging from manufacturing to mining and construction. Diesel sales through distributors are assumed to be to Industry consumers.
Transport (18)	basically refers to all sales of motor gasoline and diesel from service stations and sales of aviation fuel. It also includes diesel and motor gasoline sold directly to the Government and military.
Agriculture (19)	covers agriculture and forestry.
Fishery (20)	may involve the capture of wild fish or raising fish through fish farming or aquaculture.
Non-Energy Use (21)	use of products resulting from the transformation process for non-energy purpose (i.e. bitumen/lubricants, asphalt/greases) and use of energy products (such as natural gas) as Industry feedstocks
Final use (22)	refer to the quantity of energy of all kinds delivered to the final user.

I) Non-commercial energy such as firewood and other biomass fuels have been excluded in the energy balance until more reliable data are made available.
II) The output side of the final user's equipment of device i.e. useful energy will not be dealt with in the balance as it will involve assessing the efficiencies of end - use equipment operating under various different conditions.

Notes On Electricity

Reserve Margin	Total capacity margin is defined as the amount of installed generation available over and above system peak load $$\text{Reserve Margin} = \frac{\text{Installed Capacity} - \text{Peak Demand}}{\text{Peak Demand}}$$
Peak Demand	The maximum power consumption registered by a customer or a group of customers or a system in a stated period of time such as a month or a year. The value may be the maximum instantaneous load or more usually, the average load over a designated interval of time, such as half an hour and is normally stated in kilowatts or megawatts
Installed Capacity	Installed capacity is defined as the maximum possible capacity (nameplate rating) that can be provided by the plant.
Dependable Capacity	The maximum capacity, modified for ambient limitations for a specified period of time, such as a month or a season.
Available Capacity	Available capacity refers to the Latest Tested Net Capacity. It is the dependable capacity, modified for equipment limitation at any time.
Unit Generated (Gross Generation)	The total amount of electric energy produced by generating units and measured at the generating terminal in kilowatt-hours (kWh) or megawatt hours (MWh)
Unit Sent Out From Station(s) (Net Generation)	The amount of gross generation less the electrical energy consumed at the generating station(s) for station service or auxiliaries.

Notes On Coal

Measured Resources	Refers to coal for which estimates of the rank and quantity have been computed to a high degree of geologic assurance, from sample analyses and measurements from closely spaced and geologically well-known sample sites.
Indicated Resources	Refers to coal for which estimates of the rank, quality, and quantity have been computed to a moderate degree of geologic assurance, partly from sample analyses and measurements and partly from reasonable geologic projections.
Inferred Resources	Refers to coal of a low degree of geologic assurance in unexplored extensions of demonstrated resources for which estimates of the quality and size are based on geologic evidence and projection. Quantitative estimates are based on broad knowledge of the geologic character of the bed or region where few measurements or sampling points are available and on assumed continuation from demonstrated coal for which there is geologic evidence

Notes On GDP

GDP Definition	GDP can be measured by using three approaches namely Production, Expenditure and Income Approach. Conceptually, GDP by these three approaches produce the same results.
Production Approach	GDP based on Production Approach is defined as value of total production of goods and services produced in the economy after deducting value of intermediate consumption. This approach is also known as value added approach.
Expenditure Approach	GDP based on Expenditure Approach is the summation of Private Final Consumption, Government Final Consumption, Gross Fixed Capital Formation, Changes in Inventories and Valuables, Exports of goods and services minus Imports of goods and services. This approach measures value of goods and services used by final users on goods and services produced by resident.
Income Approach	GDP based on Income Approach is the summation of all incomes accruing the production in economy. Thus, this method enables factors of income and the return to factors of production to be measured by economic activity. The income components are Compensation of Employees, Gross Operating Surplus and Taxes Less Subsidies on Production and Imports. GDP by Income Approach is calculated as follows: GDP by Income Approach = CE + GOS + (T - S) where; CE - Compensation of Employees GOS - Gross Operating Surplus (T - S) - Taxes Less Subsidies on Production and Imports

Notes On GNI

Definition	The Gross national income (GNI) consists of: the personal consumption expenditure, the gross private investment, the Government consumption expenditures, the net income from assets abroad (net income receipts), and the gross exports of goods and services, after deducting two components: the gross imports of goods and services, and the indirect business taxes. The GNI is similar to the gross national product (GNP), except that in measuring the GNP one does not deduct the indirect business taxes.
Measuring GNI	As GNI is an add up of Net Income from abroad and the GDP, one can calculate the GNI by the following formula: $GNI = GDP + (FL - DL) + NCI$ When FL and DL are respectively the foreign and domestic income from labor, and NCI the net capital inflow. For example, if a country A's nominal GDP is $20,000, the domestic income from labor $3,000 and the foreign income from labor $5,000, and the country received a $10,000 donation from another country's charity organization, the GNI of country A would be $32,000.

Conversion Coefficients and Equivalence

TJ/1000 Tonnes'

Hard coal	29.3076	Lignite/brown coal	11.2834
Coke/oven coke	26.3768	Peat	9.525
Gas coke	26.3768	Charcoal	28.8888
Brown coal coke	19.6361	Fuelwood 2	13.4734
Pattern fuel briquettes	29.3076	Lignite briquettes	19.6361

Natural Gas Products (TJ/1000 Tonnes)

Liquefied Natural Gas (LNG)	45.1923	Natural Gas	1TJ/ million scf 0.9479 mmbtu/GJ
Butane	50.393	Ethane	1,067.82 GJ/mscf
Propane	49.473	Methane	1,131.31 GJ/mscf

Electricity

Electricity	3.6 TJ/GWh

Petroleum Products (TJ/1000 Tonnes)

Crude Petroleum (imported)	42.6133	Gas Oil/Diesel	42.4960
Crude Petroleum (domestic)	43.3000	Residual Fuel Oil	41.4996
Plant Condensate	44.3131	Naphtha	44.1289
Aviation Gasoline (AV GAS)	43.9614	White/Industry Spirit	43.2078
Liquefied Petroleum Gas (LPG)	45.5440	Lubricants	42.1401
Petrol	43.9614	Bitumen (Asphalt)	41.8000
Natural Gas	44.8992	Petroleum Waxes	43.3334
Aviation Turbine Fuel (ATF)	43.1994	Petroleum Coke	36.4000
Kerosene	43.1994	Other Petroleum Products	42.4960

1,000 Tonnes Oil Equivalent (toe) = 41.84 TJ

Notes: 1. Unless otherwise indicated
2. Assuming 9.7 TJ/1000 cu m

Crude Oil and Petroleum Products (Barrels to Tonnes)

Product	Barrels/tonne
Crude Oil - Import	7.33
- Local	7.60
Petrol	8.55
Diesel	7.50
Fuel Oil	6.60
Kerosene	7.90
Liquefied Petroleum Gas (LPG)	11.76
Aviation Turbine Fuel (ATF)	7.91
Aviation Gasoline (AV GAS)	9.05
Non-Energy	6.50

Definition

The sources of energy covered in the Energy Balances are as below:

Natural Gas	Is a mixture of gaseous hydrocarbons (mainly methane), which occur in either gas fields or in association with crude oil in oil fields.
LNG	Is natural gas that is liquefied for ocean transportation and export
Crude Oil	Is natural product that is extracted from mineral deposits and consists essentially of many different non-aromatic hydrocarbons (paraffinic, cyclonic, etc.)
Aviation Gasoline (AV GAS)	Is a special blended grade of gasoline for use in aircraft engines of the piston type. Distillation range normally falls within 30°C and 200°C.
Liquefied Petroleum Gas (LPG)	Commercial LPG consists essentially of a mixture of propane and butane gases which are held in the liquid state by pressure or refrigeration.
Petrol	Petroleum distillate used as fuel in spark- ignition internal combustion engines. Distillation range is within 30°C and 250°C.
Aviation Turbine Fuel (ATF)	Fuel for use in aviation gas turbines mainly refined from kerosene. Distillation range within 150°C and 250°C.
Kerosene	Is a straight-run fraction from crude oil, with boiling range from150°C to 250°C. Its main uses are for domestic lighting and cooking.
Diesel (or Gas Oil)	Distillation falls within 200 C to 340 C. Diesel fuels for high-speed diesel engines (i.e. automotive) are more critical of fuel quality than diesel for stationary and marine diesel engines. Marine oil usually consists of a blend of diesel oil and some residual (asphaltic) material.
Fuel Oil	Heavy distillates, residues or blends of these, used as fuel for production of heat and power. Fuel oil production at the refinery is essentially a matter of selective blending of available components rather than of special processing. Fuel oil viscosities vary widely depending on the blend of distillates and residues..
Non-Energy Products	Refer mainly to naphtha bitumen and lubricants, which are obtained by the refinery process from petroleum but used for non-energy purposes. Naphtha is a refined or party refined light distillate, which is further, blended into motor gasoline or used as feed-stock in the chemical industry. Bitumen is a viscous liquid or solid, non-volatile and possesses waterproofing and adhesive properties. Lubricating oil is used for lubricating purposes and has distillation range within 380°C to 500°C.
Refinery Gas	The gas released during the distillation of crude oil and comprises methane, ethane, propane and butane. Most refinery gas is retained in the refinery and used as fuel in plant operations.
Coal and Coke)	Solid fuels consisting essentially of carbon, hydrogen, oxygen sulphur. Coal in the energy balances is mainly bituminous coal (medium grade in terms of energy content) and some anthracite (high quality hard coal). Coke is obtained from coal by heating at high temperature in the absence of air.
Hydropower	Is the inferred primary energy available for electricity production and is shown in terms of conventional fossil fuel equivalent using the average thermal efficiency of conversion for the year, i.e. the hypothetical amount of fossil fuel, which would be needed to produce the same amount of electricity in existing thermal power plants.
Electricity Production	Production of electricity refers to production from public utilities as well as independent power producers (IPPs) and private installations & co-generation plants which obtain licenses from the Electricity Supply and Market Regulation Department. Figures for 'fuel input' into power stations & co-generation plants were only available for TNB, SEB, SESB, IPPs as well as GDC Sdn Bhd. Estimates were made using average conversion efficiency to obtain the fuel input into private installations.

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