Suruhanjaya Tenaga
Energy Commission

NATIONAL ENERGY BALANCE 2020

Be Energy smart

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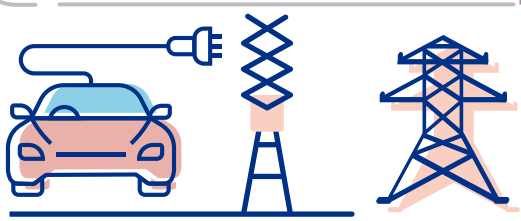

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DEFINITION

PREFACE

2020 is a historic year in this mid-century as the world battles with the COVID-19 pandemic and that has changed the whole perspective of life. The outbreak of the COVID-19 pandemic in early 2020 initially began as a health crisis that later brought about an unprecedented economic crisis. On 18 March 2020, Malaysia faced its first lockdown as a measure to contain the widespread virus from spreading. Most global economies were confronted by both supply and demand shocks following the measures imposed to contain the pandemic. During these tough times, businesses were forced to shut down and supplies of essential items were curbed, nevertheless the spirit of the *rakyat* never failed and many came through to help those in need. Over 6 million of COVID-19 deaths has been reported worldwide by the World Health Organisation (WHO). It was indeed a challenging year for Malaysia as well, but we remain resilient throughout the pandemic. The next five (5) years are crucial for the recovery of Malaysia.

The topic of environment and climate change became more prevalent after the pandemic and even more so after the COP26 in Glasgow. During the lockdown period, the Greenhouse Gas (GHG) emission and air pollution have plummeted, mostly due to little to no activities in the industry, commercial and transport sector. This however is not permanent as the trend will normalise once economic activities are back to business-as-usual (BAU). Increased awareness on climate change issues among Malaysians have also magnified the push for Government to take bold and proactive measures to combat climate change.

The energy sector is not excluded from being affected by the pandemic. Energy supply and demand in 2020 demonstrated a huge decline which was unequivocally expected. The Government nevertheless is committed in ensuring reliability and security of energy supply during the pandemic. As part of the Economic Stimulus Package (ESP), consumers of Tenaga Nasional Berhad (TNB) enjoyed a 6-month discount on the monthly electricity bill. The six (6) sectors identified as being most affected by the impact of COVID-19, which are hotels operators, travel agencies, local airlines offices, shopping malls, convention centres and theme parks, received a 6-month discount of 15%, while all residential, commercial, industrial and specific agriculture excluding the six (6) sectors mentioned above enjoyed a 6-month discount of 2%.

Malaysia has multiplied its renewable energy share in the installed capacity since 2018 with programs like Large Scale Solar (LSS), Feed in Tariff (FiT), Net Energy Metering (NEM) among others. The electricity generation mix is diversified with the right mix of fossil fuels and renewable energy. Albeit the high reliance on fossil fuels, particularly coal in the power sector, the Government has maximised its efforts in phasing down coal in achieving the goal of net zero greenhouse gas (GHG) emissions by 2050.

I would like to express my heartfelt gratitude to our honourable Prime Minister, Minister of Natural Resources, Environment and Climate Change, the Ministry of Natural Resources, Environment and Climate Change and the Economic Planning Unit (EPU) 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.

Dato' Azian Osman
Chairman of Energy Commission Malaysia

INTRODUCTION

In 2020, Malaysia's GDP has contracted by 5.6% in 2020 (2019: 4.3%) for an obvious reason which is the COVID-19 pandemic and the aftereffects that followed. Global production, demand and travel activities were severely disrupted, while heightened risk aversion among global investors led to financial market volatility. Substantial policy stimuli introduced by many economies, however, partially mitigated the economic impact of the pandemic.

Total primary energy supply (TPES) reduced by 4.6% (2018: 2.8%) compared to the previous year and this is an obvious trend to be expected during a crisis of sort. All of the fuel types recorded a decline which contributes to the overall decline of the TPES. Total import of energy reduced by 9.6% from the previous year. Natural gas is the leading fuel used in TPES with its share of 42.4%, followed by crude oil, petroleum products and others at 27.3%, coal and coke at 26.3% and renewable energy (RE) at 3.9%.

Similarly, total final energy consumption (TFEC) also reduced significantly by 14.0% (2019: 2.8%), from 66,483 ktoe to 57,169 ktoe. The COVID-19 pandemic impacted the economy severely, affecting the energy demand. Business closures during the lockdown period has driven the energy demand down substantially. The transport sector posted a huge reduction of 25.4% due to travel ban during the lockdown period. This reduction is also shown by huge drop of petrol and diesel consumption on the road, 19.0% and 19.5% respectively. The commercial sector and industry sector's final energy consumption reduced by 13.4% and 6.4% respectively, due to the lockdown period that refrain businesses and industries from operating as usual. Only the residential sector posted a positive growth in its final energy consumption, partly due to Work-From-Home (WFH) measures taken by most of the employers in Malaysia in 2020 as a way of curbing the virus spread.

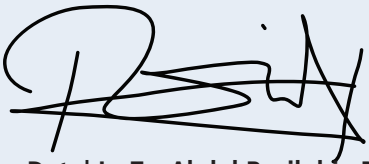
Installed capacity recorded as of 31 December 2020 was 35,037 MW. The capacity of power plants declines in 2020 due to retirement of three (3) natural gas fired power plants namely Tuanku Jaafar Power Plant, Pahlawan Power Sdn Bhd and Powertek Energy Sdn Bhd. Natural gas and coal remain as the dominant fuel, making up of three-quarters of the total installed capacity in Malaysia. RE capacity totalled up to 23.2% an increase from 21.5% in 2019. In the coming years, it is expected that the share of RE in the capacity mix to increase as the Government is committed in achieving the national target of having 31% or RE in the capacity mix by 2025, and further increase to 40% by 2035.

The total electricity generation (excluding self-generation plants) in 2020 posted a reduction from 171,672 GWh to 167,742 GWh, a reduction of 2.3% from 2019 level. Coal is the dominant fuel used to generate electricity with its share of 53.0%. This was followed by

natural gas at 28.8%, hydropower at 16.3%, renewables at 1.6% and oil at 0.4%. The similar trend is also observed in the electricity consumption, where it declined from 158,603 GWh to 152,250 GWh. The industry sector's electricity consumption reduced by 5.1%, from 78,427 GWh to 74,416 GWh. The commercial sector's electricity consumption also dropped from 45,713 GWh to 40,451 GWh. Residential sector's electricity consumption on the other hand posted a growth of 9.0%, increased from 33,322 GWh to 36,306 GWh.

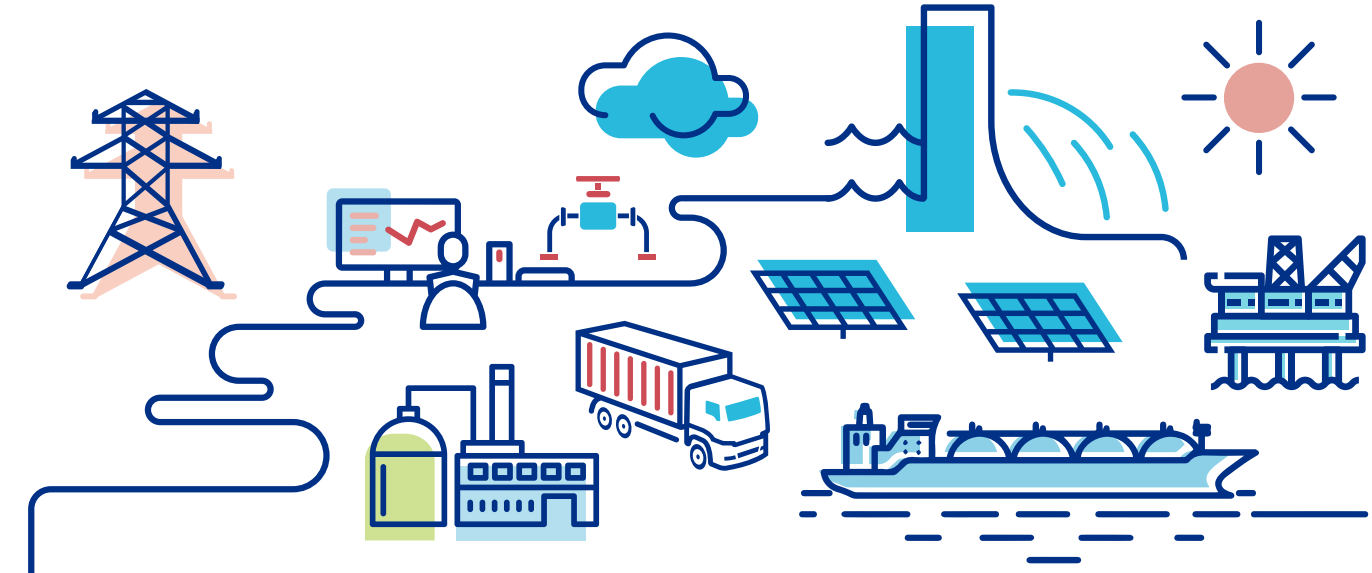
Malaysia's primary energy intensity slightly increased by 1.1% from 69.28 toe/RM Million to 70.03 toe/RM Million, whilst final energy intensity reduced by 9.0%, from 46.7 toe/RM Million to 42.5 toe/RM Million. Electricity intensity has slightly increased from 0.111 GWh/RM Million to 0.113 GWh/RM Million.

I would like to take this opportunity to extend my sincere appreciation to our Prime Minister, Minister of Natural Resources, Environment and Climate Change and the Economic Planning Unit (EPU) for their invaluable efforts rendered to produce the National Energy Balance (NEB) 2020. 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 (2) "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. It is extremely difficult to obtain stocks of all energy commodities at the distributors' and final users' level. Only oil companies' stocks are readily available, and these would include stocks at refineries and depots. The statistical discrepancy might thus also include unrecorded stock changes. Coal stocks at TNB power stations and at a producer in Sarawak are also considered in this report.

In summary, the flow of energy is represented by the following equations:-

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 a net exporter of energy. We have abundance of natural resources available in the country, sufficient for domestic use and the excess is exported. Although Malaysia is still dependent on fossil fuel for energy, nevertheless, our source of renewable energy (RE) has increased, and we are on track to achieving the national target of 31% share of RE in the capacity mix by 2025.

Our economy contracted by 5.6% (2019: 4.3%), following the COVID-19 pandemic that had hit globally. Most economies globally were confronted by both supply and demand shocks following the measures imposed to contain the pandemic. Malaysia was similarly affected by the pandemic. Widespread containment measures, international border closures and the consequent weak external demand environment exerted a large drag on domestic economic activity.

In 2020, the total primary energy supply reduced by 4.6% (2019: 2.8%) and similarly, the total final energy consumption reduced significantly by 14.0% (2019: 2.8%).

PRIMARY ENERGY SUPPLY

Primary energy supply dropped significantly by 4.5% from the previous year's level to register at 94,194 ktoe (2019: 98,681 ktoe). Generally, all fuels contribute to the overall reduction of the total primary energy supply. In 2020, import of energy is also lesser by 9.6% from the previous year. Primary production in total also recorded a drop from 109,340 ktoe to 105,054 ktoe or in percentage it dropped by 3.9%.

In terms of fuel share, no striking difference from 2019, natural gas has the biggest share of 42.4%, followed by crude oil, petroleum products and others at 27.3%, coal and coke at 26.3% and RE at 3.9%.

ENERGY TRANSFORMATION

Malaysia is blessed with ample energy resources such as oil and gas, therefore facilities have been built to transform these raw and crude primary energy sources into usable secondary energy sources. These secondary energy sources can be used locally or 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.

Generally, there are four (4) types of gas plants in Malaysia, namely Malaysia Liquified Natural Gas (MLNG) that transforms natural gas into Liquified Natural Gas (LNG), Gas Processing Plant – Liquified Petroleum Products (GPP-LPG) that transforms natural gas into Liquid Petroleum Gas (LPG), Middle Distillate Synthesis (MDS) plant that transforms natural gas into petroleum products and finally, the Regasification Gas Terminal (RGT) that transforms LNG into natural gas.

The MLNG and FLNG produced a total of 26,155 ktoe of LNG and 51 ktoe of LPG which showed a reduction of 9.9% from 2019. The MDS plant produced 441 ktoe of petroleum products where there was a slight increase from 425 ktoe in the previous year. Production of LPG from the GPP-LPG recorded slight decline from 2,2017 ktoe to 1,998 ktoe, while output from RGT plant showed an upward trend, from 2,663 ktoe to 2,939 ktoe.

As of 31 December 2020, Malaysia's total refinery capacity is at 492 thousand barrels per day which excludes 74.3 thousand barrels per day of condensates splitter. 22,974 ktoe of crude oil was processed in the refinery plant as feedstock to produce petroleum products such as petrol, diesel, kerosene, LPG, fuel oil, Aviation Turbine Fuel (ATF) & Aviation Gas (AV Gas), and other non-energy products. From the input, 20,745 ktoe of petroleum products is produced from the refineries in Malaysia. The refinery input and output has reduced compared to the previous year due to fluctuation of demand, especially during the COVID-19 outbreak. From the 20,745 ktoe total production, 44.3% is diesel, 24.5% is petrol, 11.9% is ATF & AV Gas ,9.4% is non-energy products, 5.8% is fuel oil, 3.2% is LPG while the remaining is kerosene and refinery gas.

ELECTRICITY

Total installed capacity in Malaysia for 2020 was 35,037 MW. Natural gas and coal are the dominant fuel, making up of three-quarters of the total installed capacity in Malaysia. RE capacity totalled up to 23.2% an increase from 21.5% in 2019. This is a positive indication that we are on track to achieve our national target of 31% RE in the capacity mix by 2025. In December 2020, NEM 3.0 was launched, with additional quota of 800 MW to give more opportunities for domestic, commercial and industry players to install solar on their rooftops to save on their electricity bills. In 2020, there are three power plants that has retired, namely the Tuanku Jaafar Power Plant, Pahlawan Power Sdn Bhd and Powertek Energy Sdn Bhd.

EXECUTIVE SUMMARY

The total electricity generation (excluding self-generation plants) in 2020 was recorded at 167,742 GWh, a reduction of 2.3% from 2019 level which was at 171,672 GWh. Coal is the dominant fuel used to generate electricity with its share of 53.0%. This was followed by natural gas at 28.8%, hydropower at 16.3%, renewables at 1.6% and oil at 0.4%. The total electricity consumption stood at 152,250 GWh in 2020, which showed a reduction of 4.0% from the 2019. From the total electricity consumption, Peninsular Malaysia tops the list at 77.6%, followed by Sarawak at 18.5% and Sabah at 3.9%. Almost half of Malaysia's total electricity consumption was taken up by the industry sector at 48.9% or 74,416 GWh. The commercial sector consumed 26.6% of total electricity consumption while the residential sector consumed 23.8%. The agriculture and transport sectors consumed 0.5% and 0.3% respectively. All sectors except for residential showed a negative growth of electricity consumption. The negative growth in most sectors are due to lockdown which causes premises to close and shut down their operations during the COVID-19 outbreak as a protective measure taken by the Government to contain the virus from spreading. The residential sector on the other hand showed an upward trend due to Work-From-Home (WFH) that was imposed by most employers in Malaysia during the lockdown period.

FINAL ENERGY CONSUMPTION

In 2020, the total energy consumption was reported to be 57,169 ktoe, a significant reduction of 14.0% compared to the year before. Only the agriculture and residential sectors showed an upward trend in consumption whereas the other sectors showed a decrease which is highly expected due to the pandemic. The transport sector posted a huge reduction of 25.4% due to travel ban during the lockdown period. The commercial and industry sector were badly affected by the pandemic too, which is shown in the reduction of energy consumption in these respective sectors. The commercial sector and industry sector's consumption reduced by 13.4% and 6.4% respectively. The residential sector's consumption rose by 22.3%, contributed by increase in LPG and electricity consumption in the residential sector in 2020. In terms of share, the industry and transport sectors still dominate, constituting more than 60% of the total energy consumption in 2020. It is then followed by the non-energy sector, residential, commercial, fishery and agriculture and sectors with their share of 20.6%, 7.2%, 7.1%, 0.6% and 1.0% respectively.

Malaysia's final energy consumption per capita has expectedly reduced to 1.755 toe per capita, a reduction of 14.0% from the previous year. The final energy intensity too has dropped from 46.68 toe/RM Million to 42.5 toe/RM Million. This however indicate a positive improvement in the energy efficiency. In 2020, final energy elasticity was observed to be 2.53, which shows that the final energy is inelastic with economic growth. Electricity on the other hand shows a better indication of elasticity with a value of 0.72.

CONCLUSION

The COVID-19 pandemic brings about unprecedented circumstances in Malaysia, as well as globally. Energy supply and demand reduced significantly in 2020. Nevertheless, Malaysia remained resilient and strong in dealing with the crisis. While economies normally take five (5) years or more to recover from a crisis, it is hopeful that Malaysia can withstand the impact and rise stronger from this. The vaccination program that was successfully rolled out in 2020 will be a catalyst towards normalising back the economy, as industries, commercial and transport sector starts their operation as business-as-usual (BAU). The importance of environment and climate change has been multiplied throughout this outbreak, and as such we will be seeing renewable energy multiplying as well in the energy mix, as the Government is committed in decarbonising the power sector.

02

KEY ECONOMIC AND ENERGY DATA

TABLE 1: KEY ECONOMIC AND ENERGY DATA

	2020				
	Q1	Q2	Q3	Q4	Total
GDP at current prices (RM million)*	367,722	302,348	368,633	379,297	**1,418,000**
GDP at 2015 prices (RM million)*	344,788	290,090	351,926	358,340	**1,345,144**
GNI at current prices (RM million)*	360,611	298,554	358,358	371,957	**1,389,480**
Population ('000 people)**	32,569	32,584	32,602	32,620	**32,584**
Primary Energy Supply (ktoe)	24,724	20,580	24,321	24,569	**94,194**
Final Energy Consumption (ktoe)	15,921	11,884	14,617	14,746	**57,169**
Electricity Consumption (ktoe)	3,395	3,021	3,328	3,356	**13,100**
Electricity Consumption (GWh)	39,452	35,108	38,682	39,008	**152,250**
PER CAPITA					
GDP at Current Prices (RM) per Capita*	45,163	37,116	45,228	46,511	**43,518**
Primary Energy Supply (toe) per Capita	0.759	0.632	0.746	0.753	**2.891**
Final Energy Consumption (toe) per Capita	0.489	0.365	0.448	0.452	**1.755**
Electricity Consumption (kWh) per Capita	1,211	1,077	1,186	1,196	**4,673**
ENERGY INTENSITY					
Primary Energy Intensity (toe/GDP at 2015 prices (RM million))	71.71	70.94	69.11	68.56	**70.03**
Final Energy Intensity (toe/GDP at 2015 prices (RM million))	46.2	41.0	41.5	41.2	**42.5**
Electricity Intensity (toe/GDP at 2015 prices (RM million))	9.8	10.4	9.5	9.4	**9.7**
Electricity Intensity (GWh/GDP at 2015 prices (RM million))	0.114	0.121	0.110	0.109	**0.113**

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

Notes (*): 1. GDP data by State 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

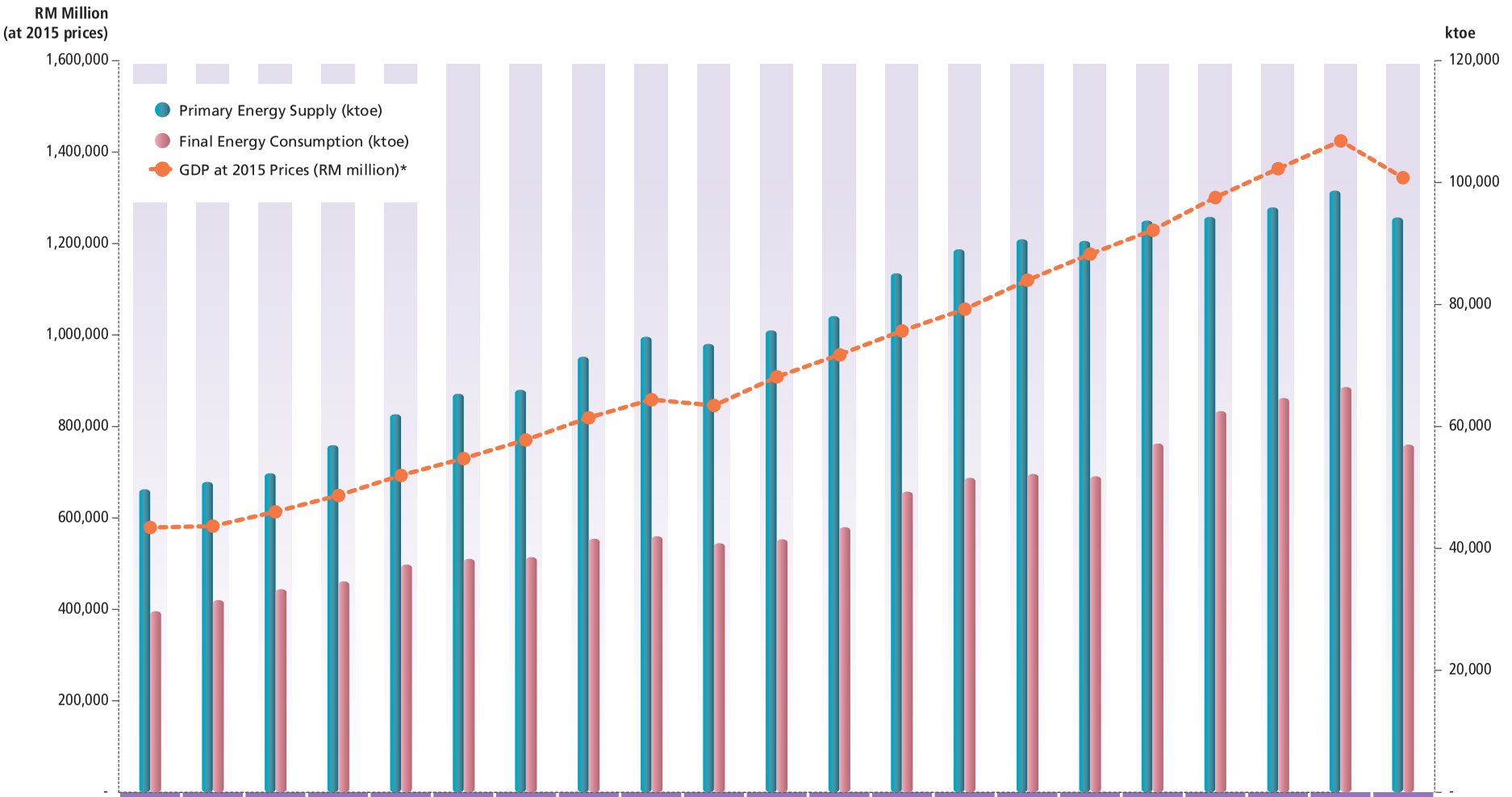
SABAH	2015	2016	2017	2018	2019	2020
GDP at Current Prices (RM million) *	79,775	86,924	101,904	108,053	106,773	91,928
GDP at 2015 prices (RM million) *	79,775	83,930	90,583	92,257	93,265	85,378
Population ('000 people) **	3,816	3,900	3,954	3,997	4,004	3,514
Final Energy Consumption (ktoe)	3,845	5,015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

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 Department of Statistics Malaysia

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

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

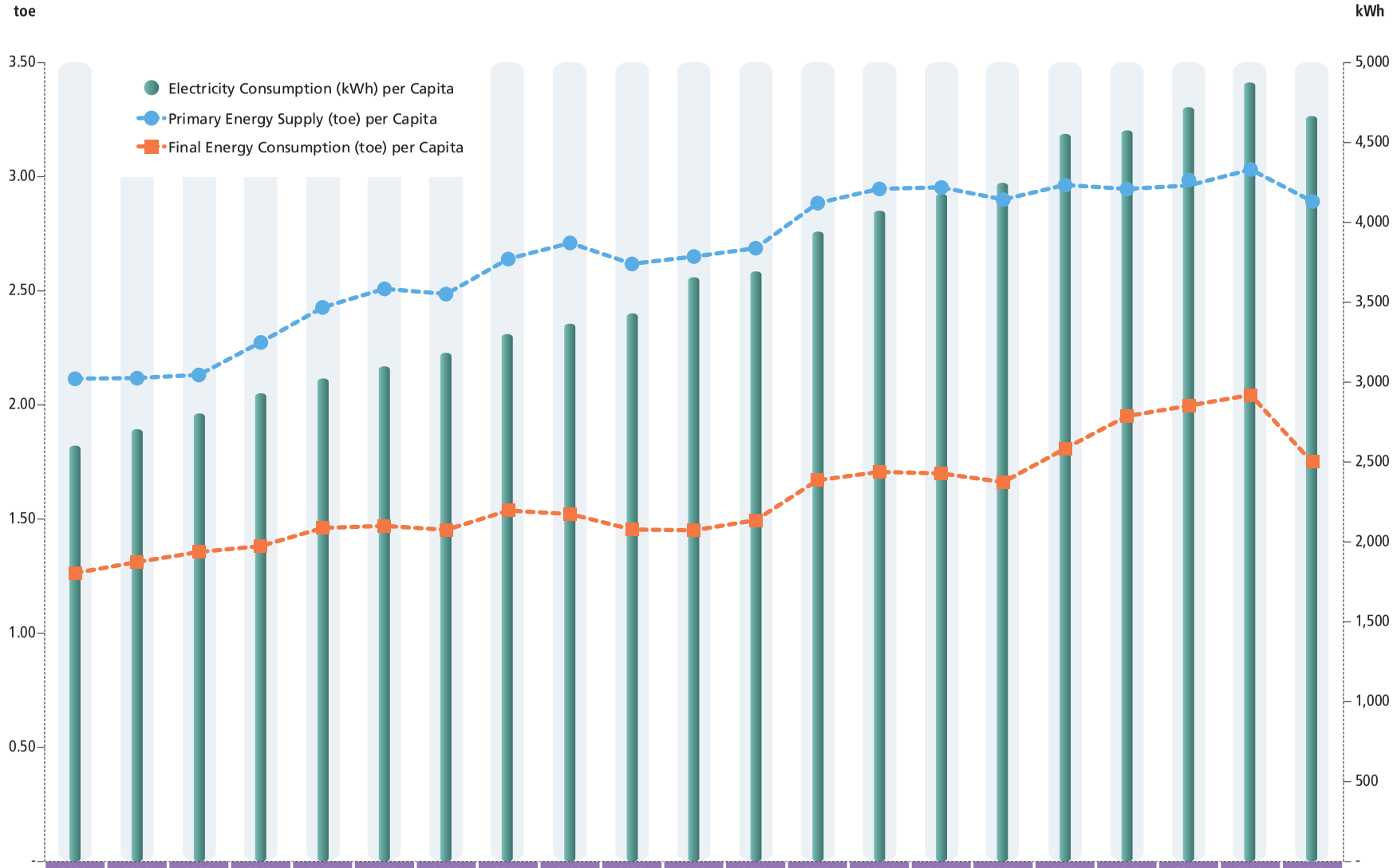
FIGURE 1: TRENDS IN GDP, PRIMARY ENERGY SUPPLY AND FINAL ENERGY CONSUMPTION



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
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

Source: GDP data is by the Department of Statistics Malaysia
Note : GDP at 2015 Prices (RM Million) for 1990 until 2014 were estimated by the Energy Commission

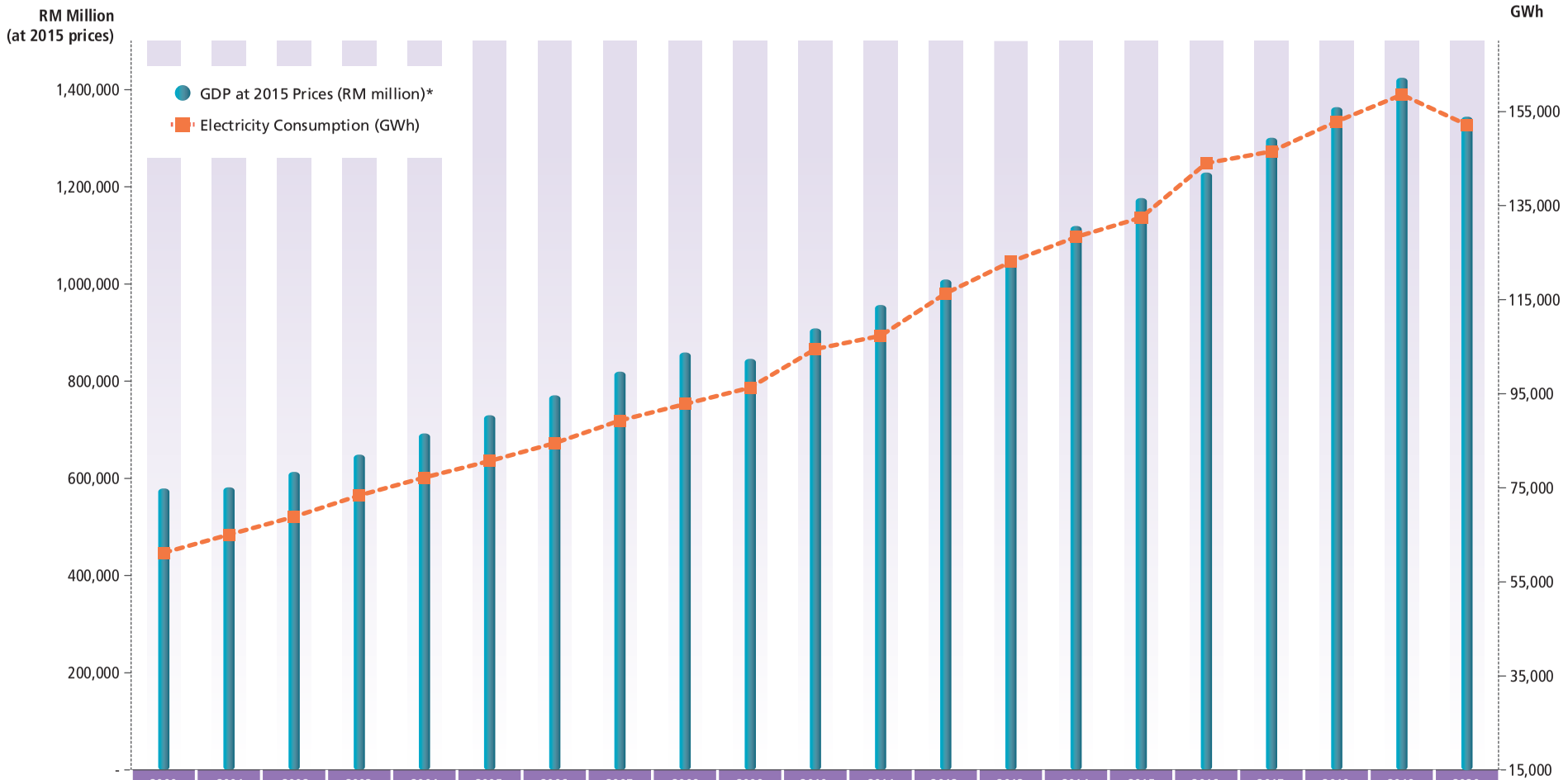
FIGURE 2: PRIMARY ENERGY SUPPLY, ELECTRICITY CONSUMPTION AND FINAL ENERGY CONSUMPTION PER CAPITA



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
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

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

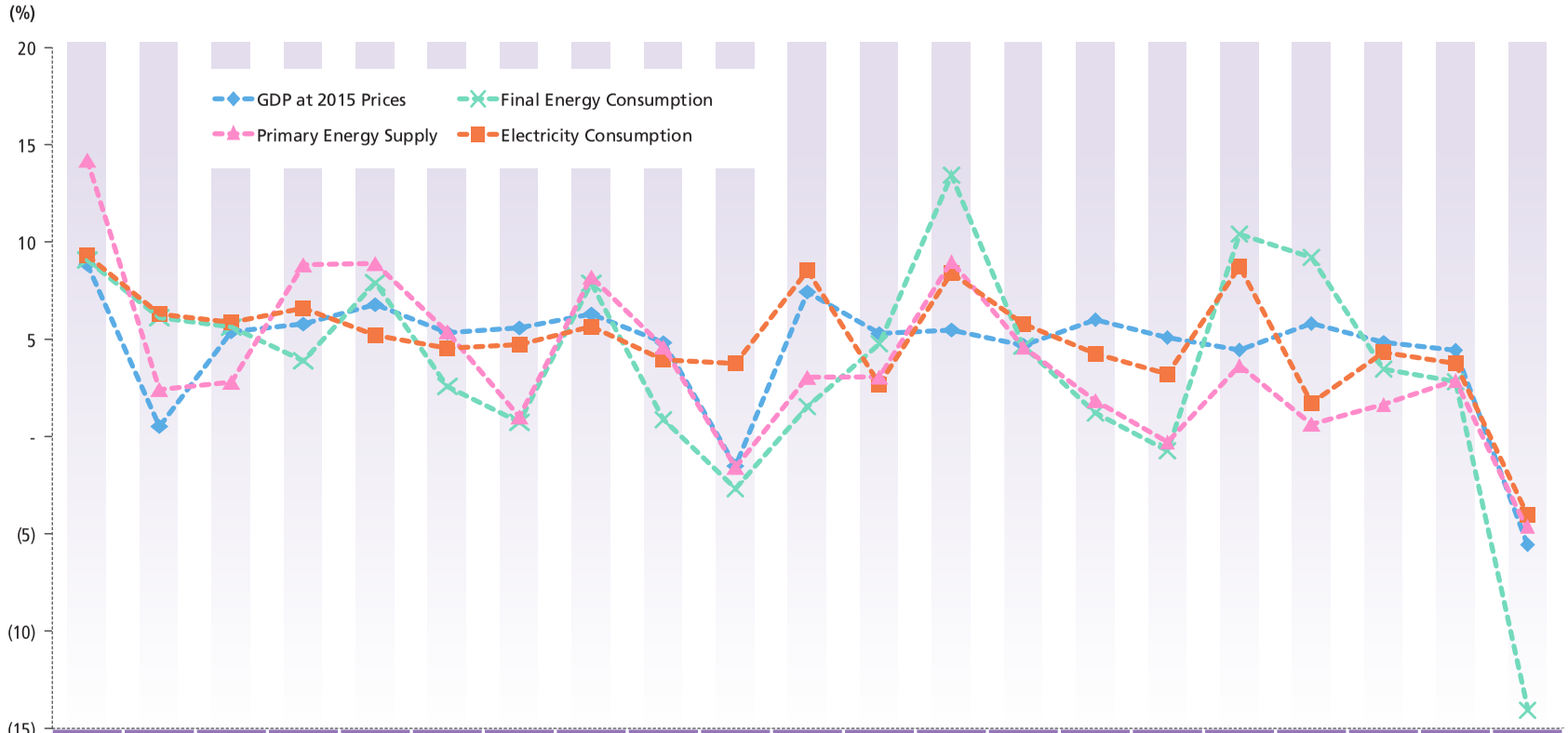
FIGURE 3: TRENDS IN GDP AND ELECTRICITY CONSUMPTION



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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

Source: GDP data is from the Department of Statistics Malaysia
Note : GDP at 2015 Prices (RM Million) for 1990 until 2014 were estimated by the Energy Commission

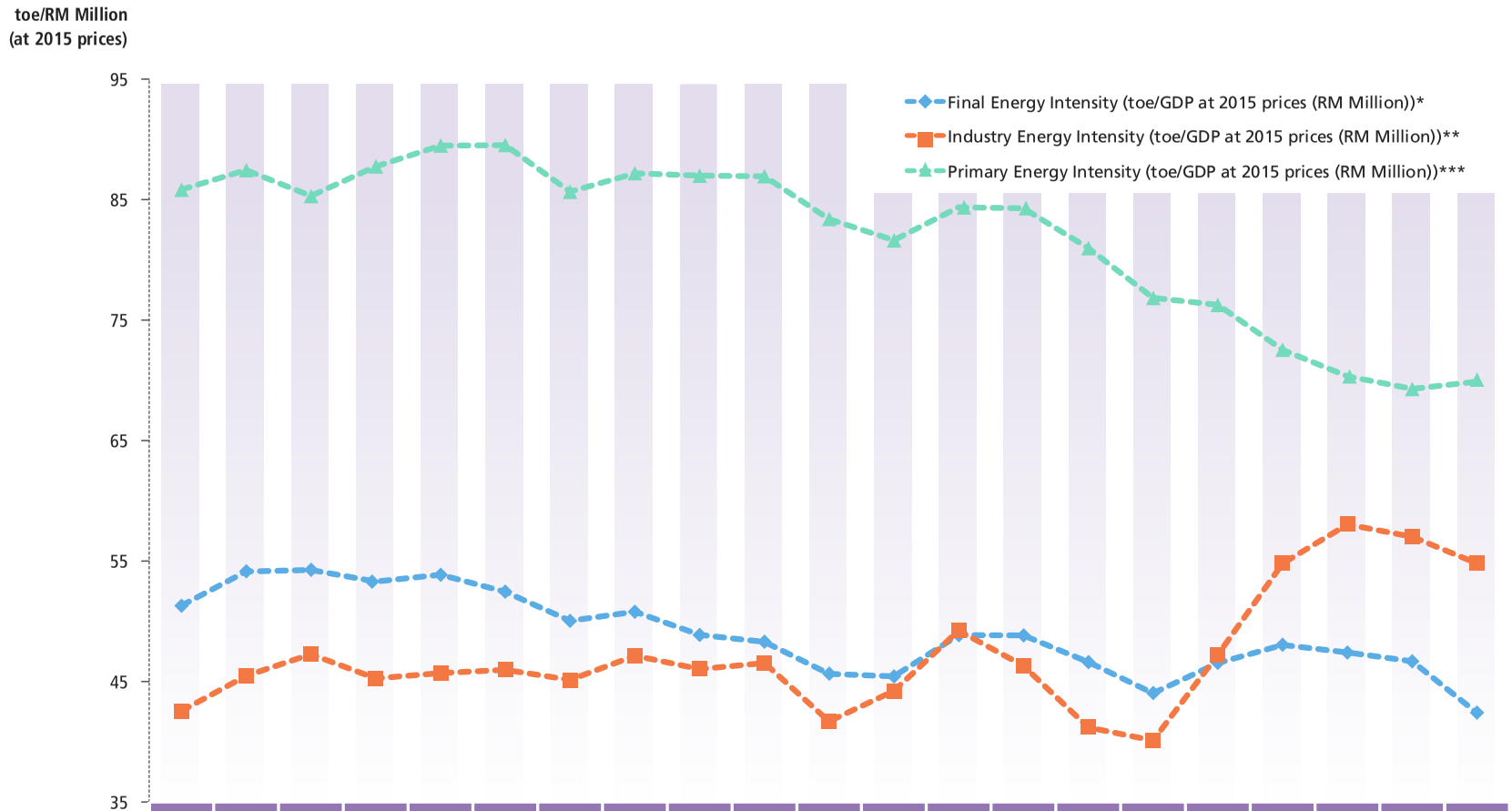
FIGURE 4: ANNUAL GROWTH RATES OF GDP, PRIMARY ENERGY SUPPLY, FINAL ENERGY CONSUMPTION AND ELECTRICITY CONSUMPTION



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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)
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)
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)
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)

Source: GDP data is from the Department of Statistics Malaysia
Note : GDP growth rates at 2015 Prices (RM Million) for 1990 until 2014 were estimated by the Energy Commission

FIGURE 5: PRIMARY AND FINAL ENERGY INTENSITY

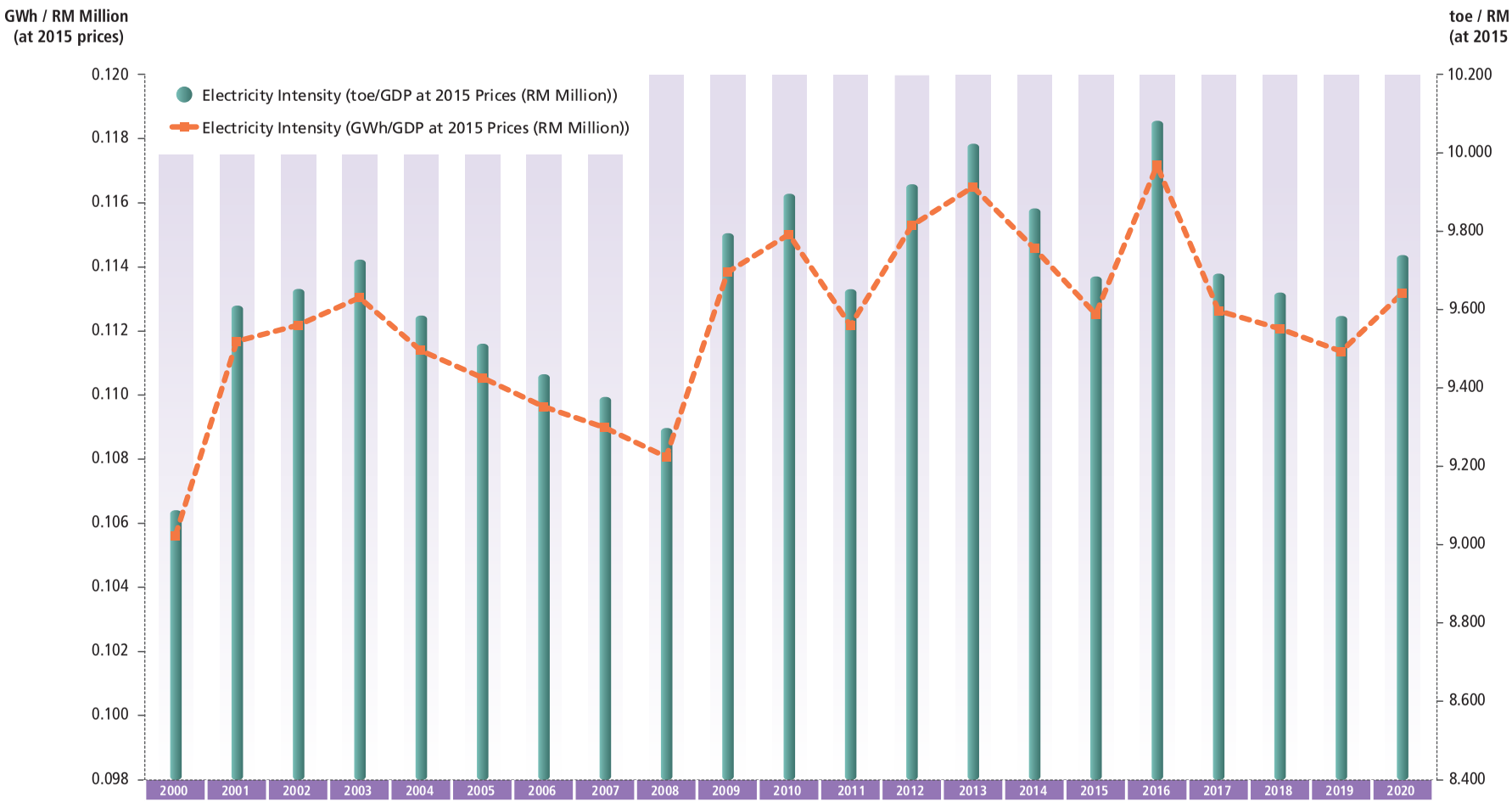


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Final Energy Intensity (toe/GDP at 2015 prices (RM Million))*	51.29	54.14	54.27	53.29	53.86	52.45	50.04	50.79	48.87	48.29	45.65	45.42	48.85	48.83	46.62	44.04	46.55	48.04	47.41	46.69	42.50
Industry Energy Intensity (toe/GDP at 2015 prices (RM Million))**	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
Primary Energy Intensity (toe/GDP at 2015 prices (RM Million))***	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

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

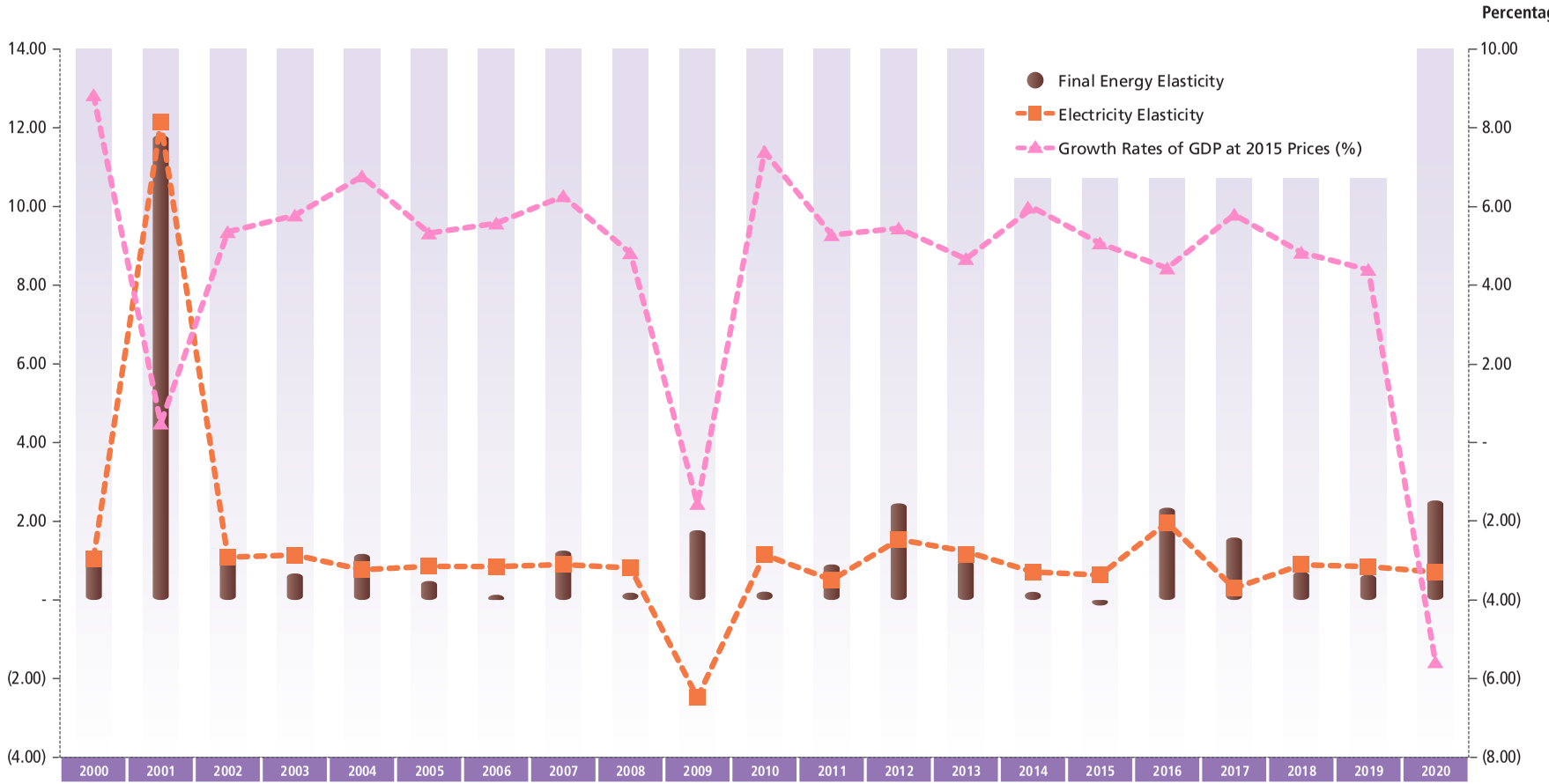


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
●	9.089	9.611	9.654	9.728	9.585	9.513	9.436	9.378	9.299	9.796	9.897	9.653	9.921	10.024	9.860	9.684	10.082	9.692	9.645	9.584	9.739
▬	0.106	0.112	0.112	0.113	0.111	0.111	0.110	0.109	0.108	0.114	0.115	0.112	0.115	0.117	0.115	0.113	0.117	0.113	0.112	0.111	0.113

Sources: 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
●	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
■	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
▲	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)

Notes: 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

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

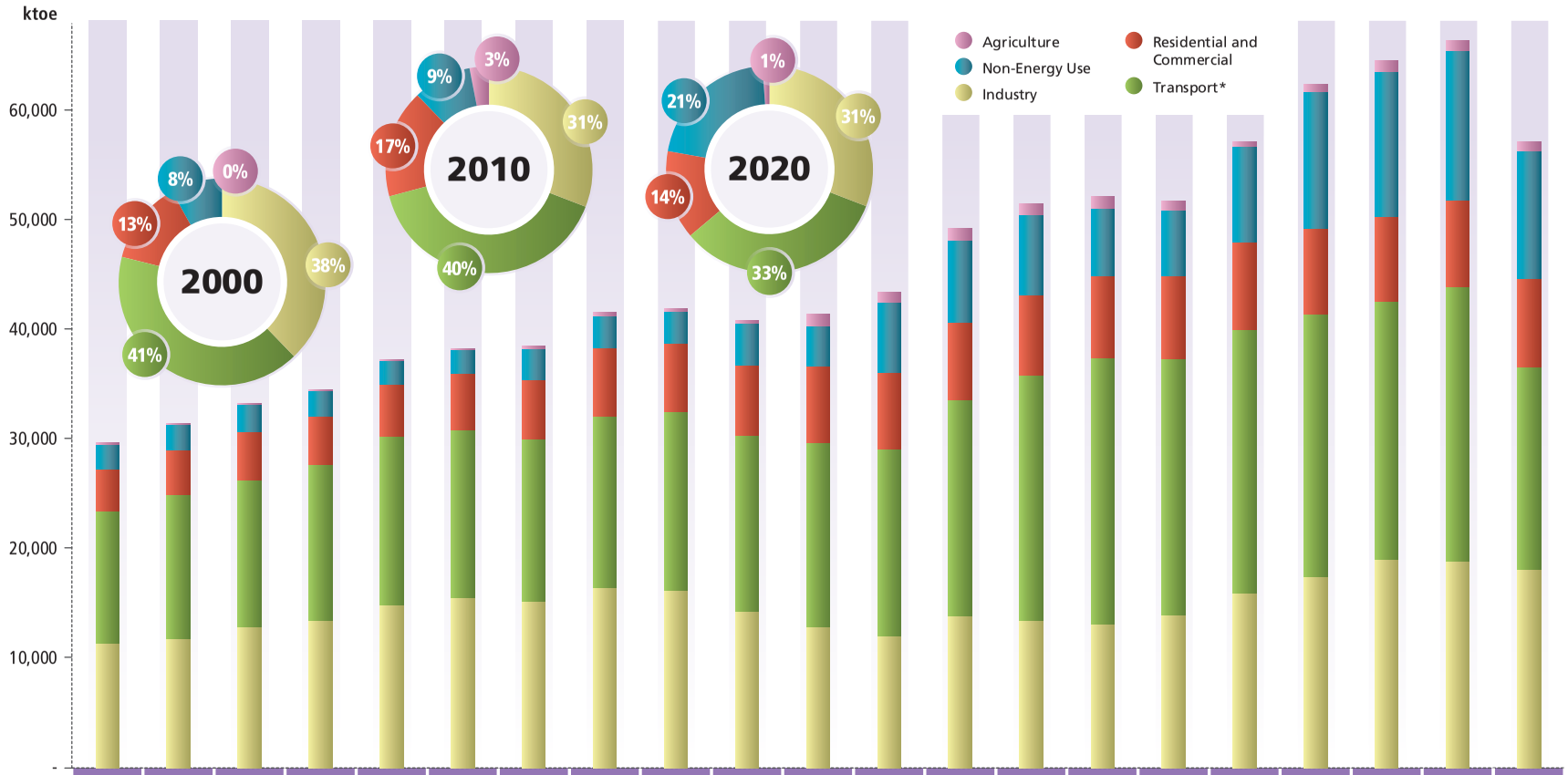
3. GDP growth rates at 2015 prices (RM Million) for 1990 until 2014 was estimated by the Energy Commission

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
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
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
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
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	29,429	32,813	25,773

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

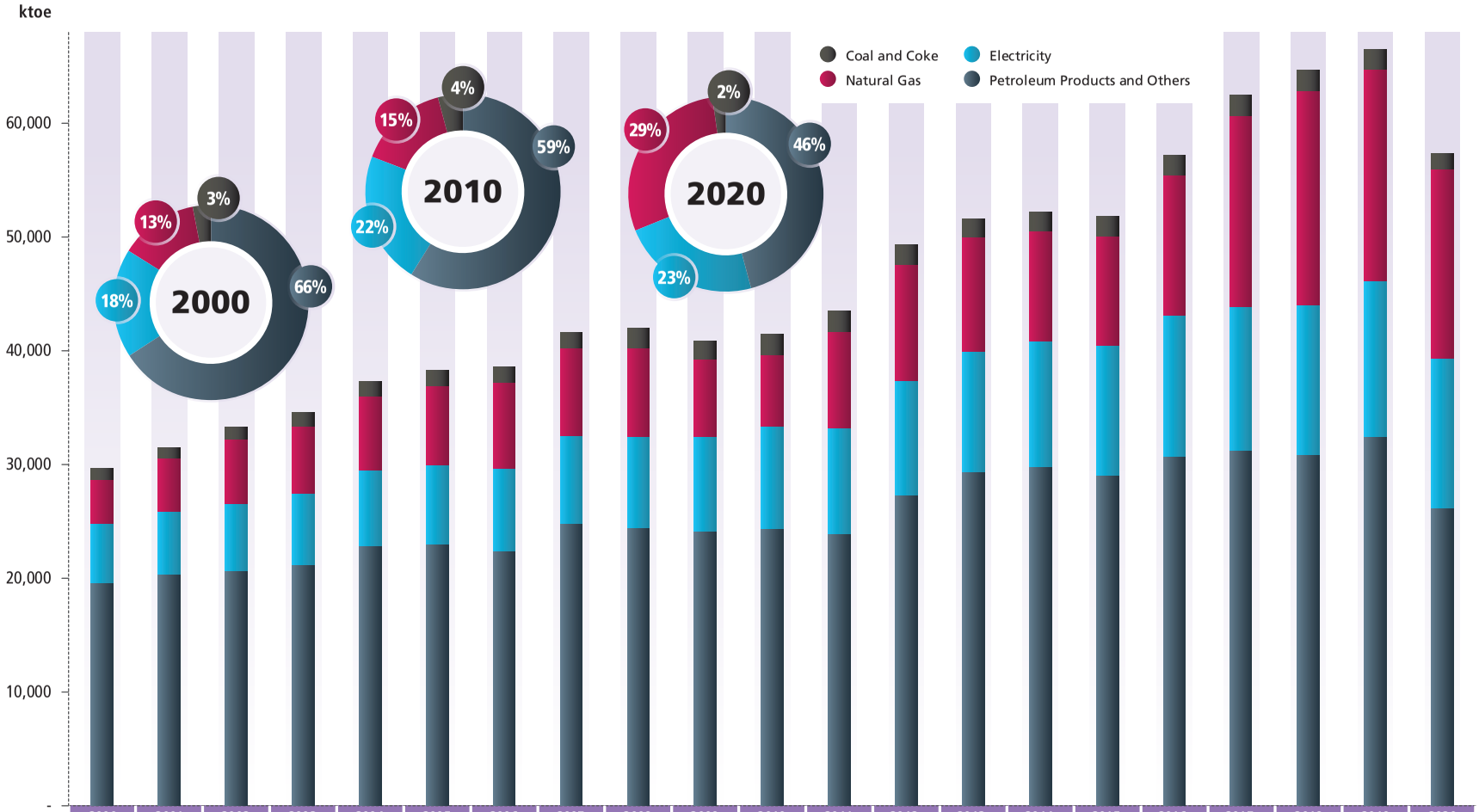
FIGURE 9: FINAL ENERGY CONSUMPTION BY SECTORS



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
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
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
Industry	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

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

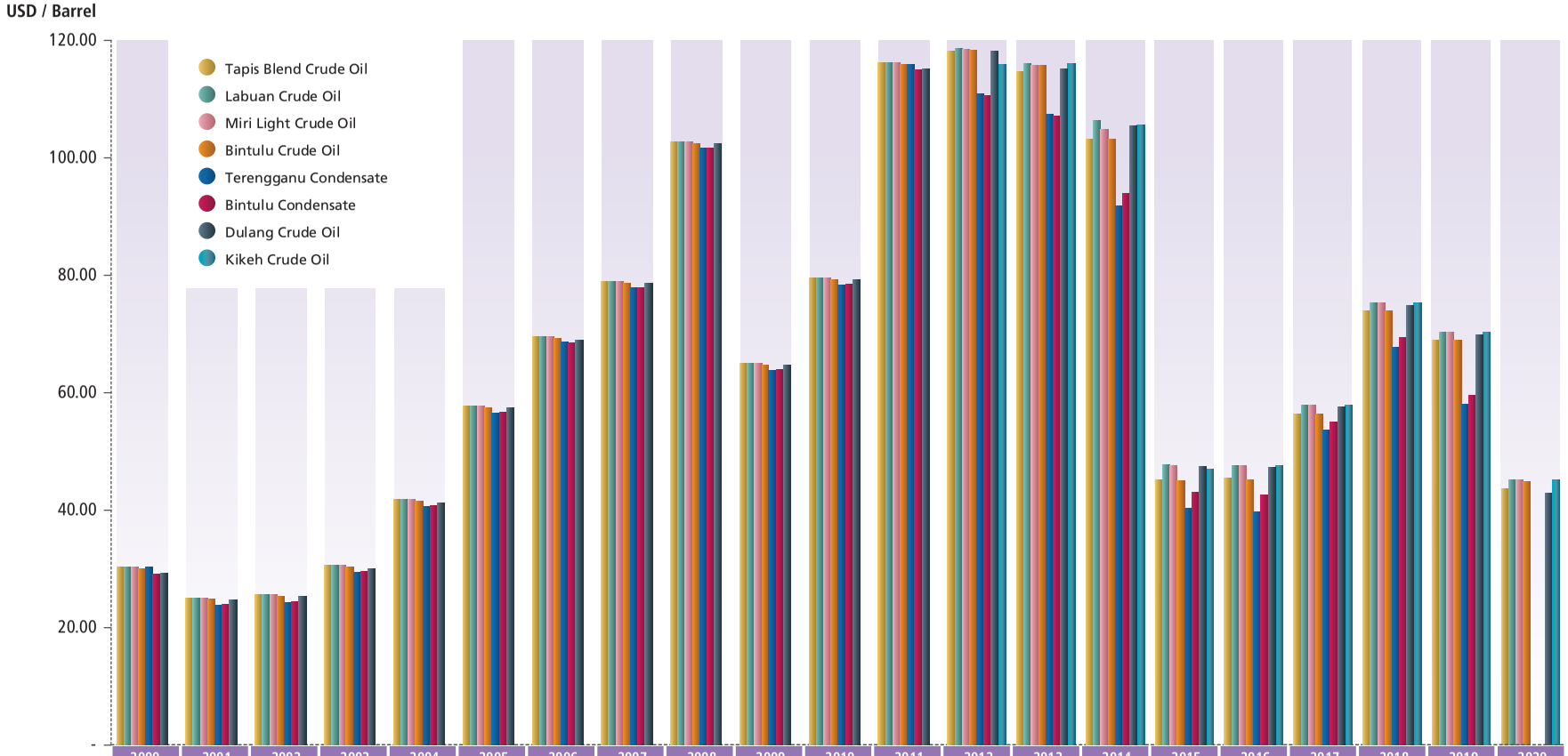
FIGURE 10: FINAL ENERGY CONSUMPTION BY FUEL TYPE



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
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
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

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

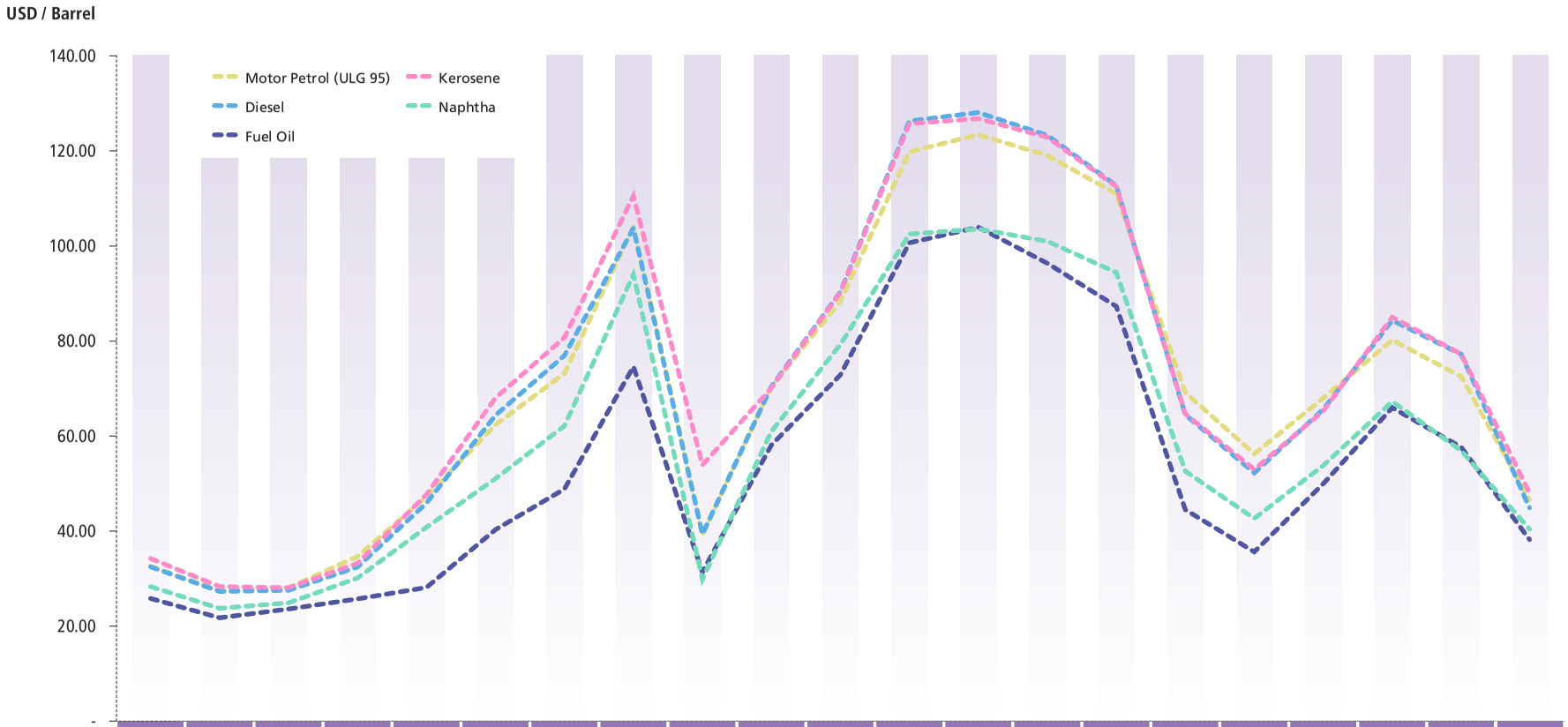
FIGURE 11: OFFICIAL SELLING PRICES OF MALAYSIAN CRUDE OIL



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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	116.25	118.22	114.70	103.26	45.12	45.43	56.30	73.84	68.93	43.65
Labuan Crude Oil	30.25	25.06	25.52	30.60	41.84	57.71	69.56	78.96	102.79	64.97	79.51	116.25	118.66	116.00	106.41	47.73	47.63	57.90	75.24	70.33	45.05
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	116.25	118.56	115.70	104.89	47.63	47.63	57.90	75.24	70.33	45.05
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	115.95	118.36	115.70	103.13	44.94	45.13	56.30	73.84	68.93	44.85
Terengganu Condensate	30.29	23.86	24.32	29.40	40.64	56.51	68.66	77.91	101.59	63.77	78.31	115.95	110.92	107.40	91.82	40.28	39.76	53.57	67.71	58.08	-
Bintulu Condensate	29.09	23.96	24.42	29.50	40.74	56.61	68.45	77.92	101.69	63.87	78.41	115.05	110.62	107.10	93.99	42.98	42.56	54.97	69.41	59.58	-
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	115.15	118.16	115.10	105.46	47.35	47.23	57.50	74.84	69.93	42.85
Kikeh Crude Oil	-	-	-	-	-	-	-	-	-	-	-	-	115.94	116.00	105.66	46.96	47.63	57.90	75.24	70.33	45.05

Source: PETRONAS

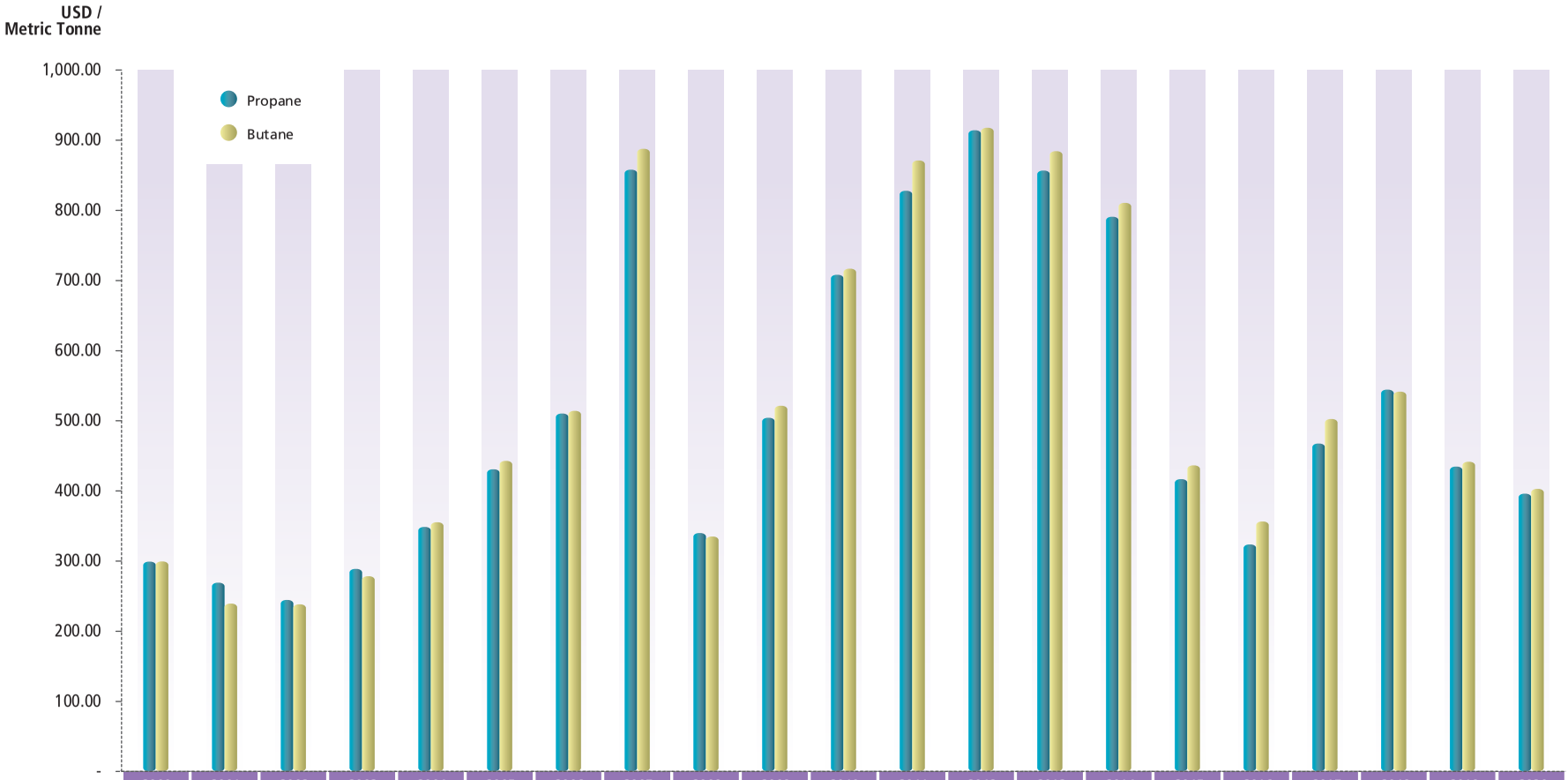
FIGURE 12: EX-SINGAPORE PRICES OF MAJOR PETROLEUM PRODUCTS



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
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
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
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

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



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Propane	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	856.79	790.70	416.75	323.67	467.56	544.24	434.58	397.4
Butane	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	884.14	810.58	436.57	356.17	502.06	541.65	441.67	404.13

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

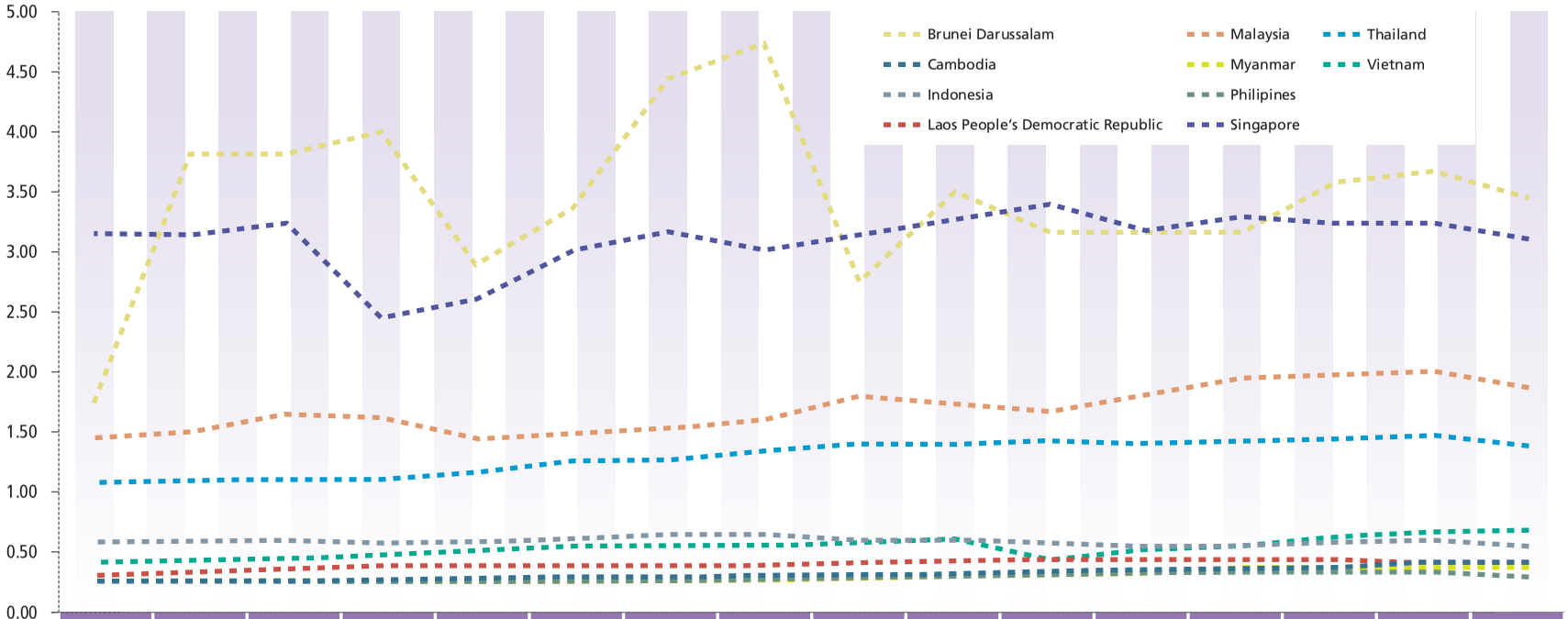
FIGURE 14: AVERAGE ANNUAL PRICES OF NATURAL GAS IN MALAYSIA

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gas Price to Power Sector	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	10.36	11.30	10.70	12.45	13.70	13.70	15.20	18.95	18.95	21.95	24.95	27.95	-
Gas Price to Non-Power Sector-GMB	16.72	14.10	13.40	9.40	9.40	9.40	9.40	9.40	12.98	12.21	11.05	12.80	14.05	14.05	15.55	17.80	21.05	23.80	26.80	29.80	33.65
Gas Price to Non-Power Sector-PGB	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	16.55	16.77	15.35	17.10	18.35	18.35	19.85	22.10	25.10	28.10	31.10	34.10	30.95

Source: Energy Commission
Note : Starting Jan 2020, gas price for power is based on market price

FIGURE 15: FINAL ENERGY CONSUMPTION PER CAPITA IN ASEAN

Mtoe / Millions

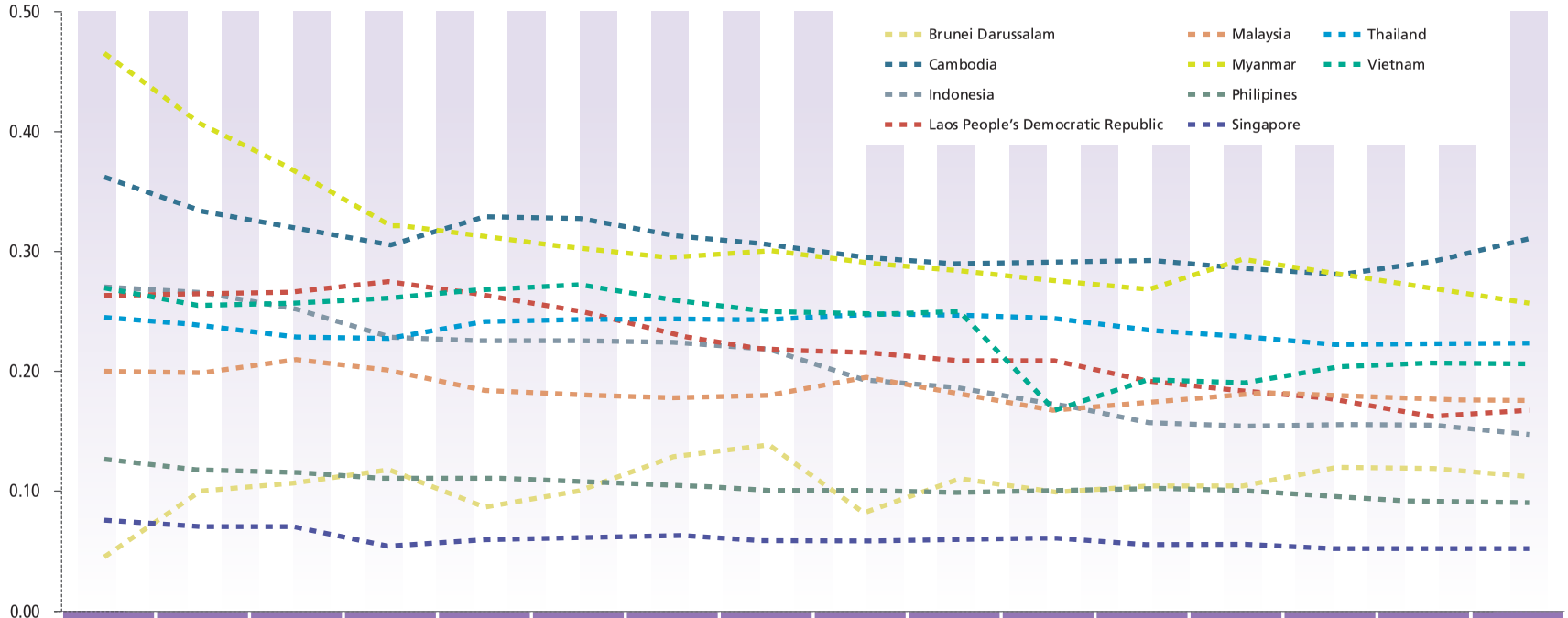


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Brunei Darussalam	1.75	3.82	3.79	4.01	2.89	3.36	4.44	4.73	2.74	3.50	3.16	3.16	3.16	3.58	3.67	3.44
Cambodia	0.25	0.25	0.26	0.26	0.28	0.29	0.29	0.30	0.31	0.32	0.34	0.36	0.37	0.38	0.42	0.43
Indonesia	0.58	0.60	0.60	0.57	0.58	0.61	0.64	0.65	0.60	0.60	0.58	0.54	0.55	0.58	0.60	0.55
Laos 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
Philipines	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

Mtoe / Billion US$ 2015



	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
Laos 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
Philipines	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)

03

OIL

TABLE 3: RESOURCES AND PRODUCTION OF OIL AS OF 1 JANUARY 2020

REGION	RESOURCES (BILLION BARREL)			PRODUCTION (THOUSAND BARRELS PER DAY)		
	CRUDE OIL	CONDENSATES	TOTAL	CRUDE OIL	CONDENSATES	TOTAL
Peninsular Malaysia	1.080	0.226	**1.306**	154.23	25.61	**179.85**
Sabah	1.336	0.115	**1.451**	205.21	9.81	**215.03**
Sarawak	1.249	0.521	**1.770**	99.22	62.82	**162.04**
TOTAL	**3.665**	**0.862**	**4.527**	**458.66**	**98.25**	**556.91**

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**
TOTAL			**492**

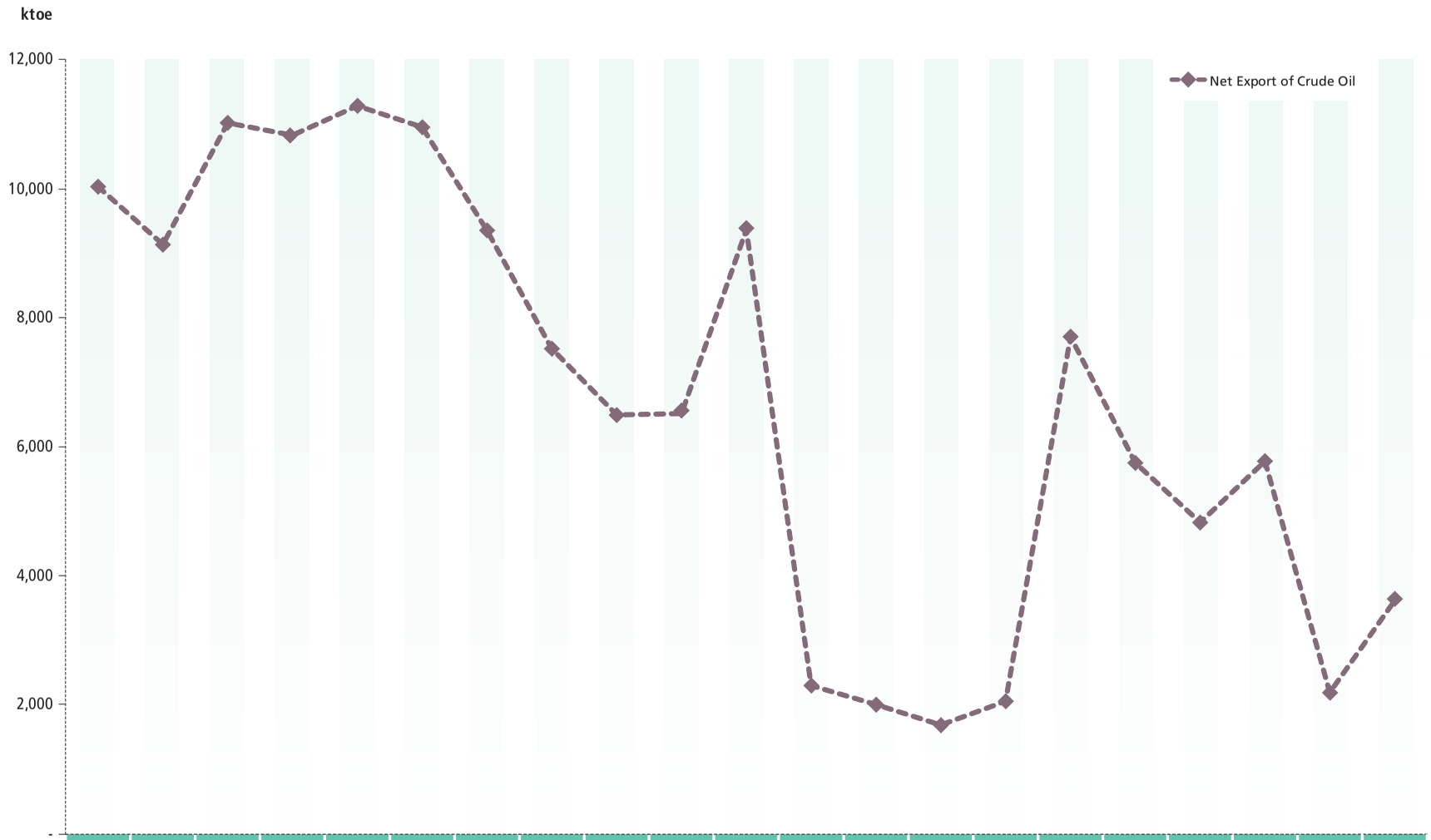
Source : PETRON, PETRONAS & HRC
Note (*): Excludes condensate splitter of 74,300 bpd

TABLE 5: BREAKDOWN ON SALES OF PETROLEUM PRODUCTS IN THOUSAND BARRELS

PETROLEUM PRODUCTS	PENINSULAR MALAYSIA	SABAH	SARAWAK	TOTAL
Petrol	80,997	3,102	3,099	**87,199**
Diesel	49,745	4,879	4,060	**58,685**
Fuel Oil	2,250	6	0	**2,255**
Kerosene	381	1	2	**384**
LPG	13,038	840	834	**14,712**
ATF & AV Gas	8,637	368	229	**9,234**
Non-Energy	3,169	169	450	**3,788**
TOTAL	**158,216**	**9,366**	**8,676**	**176,258**

Source: Oil companies

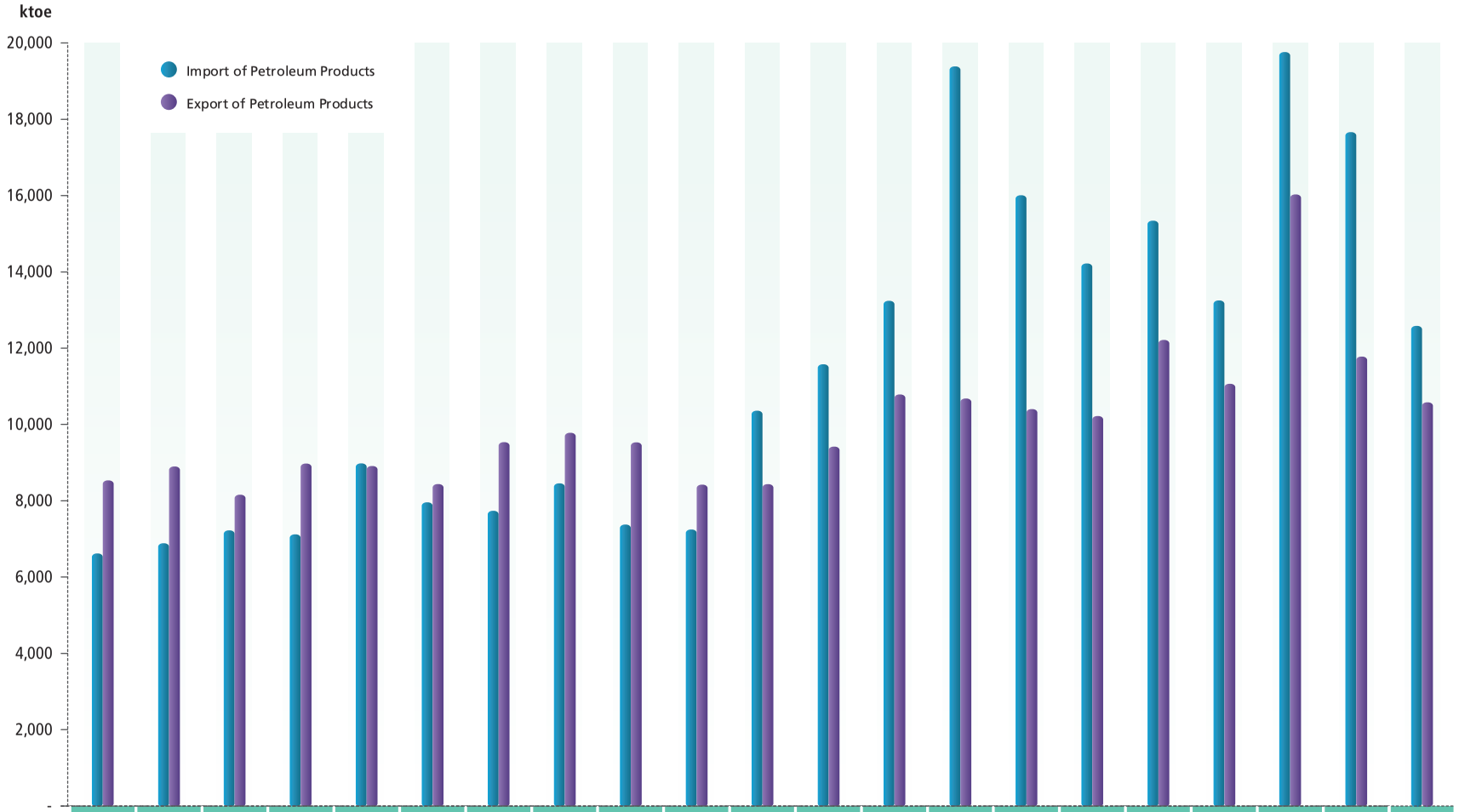
FIGURE 17: NET EXPORT OF CRUDE OIL



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
◆	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

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

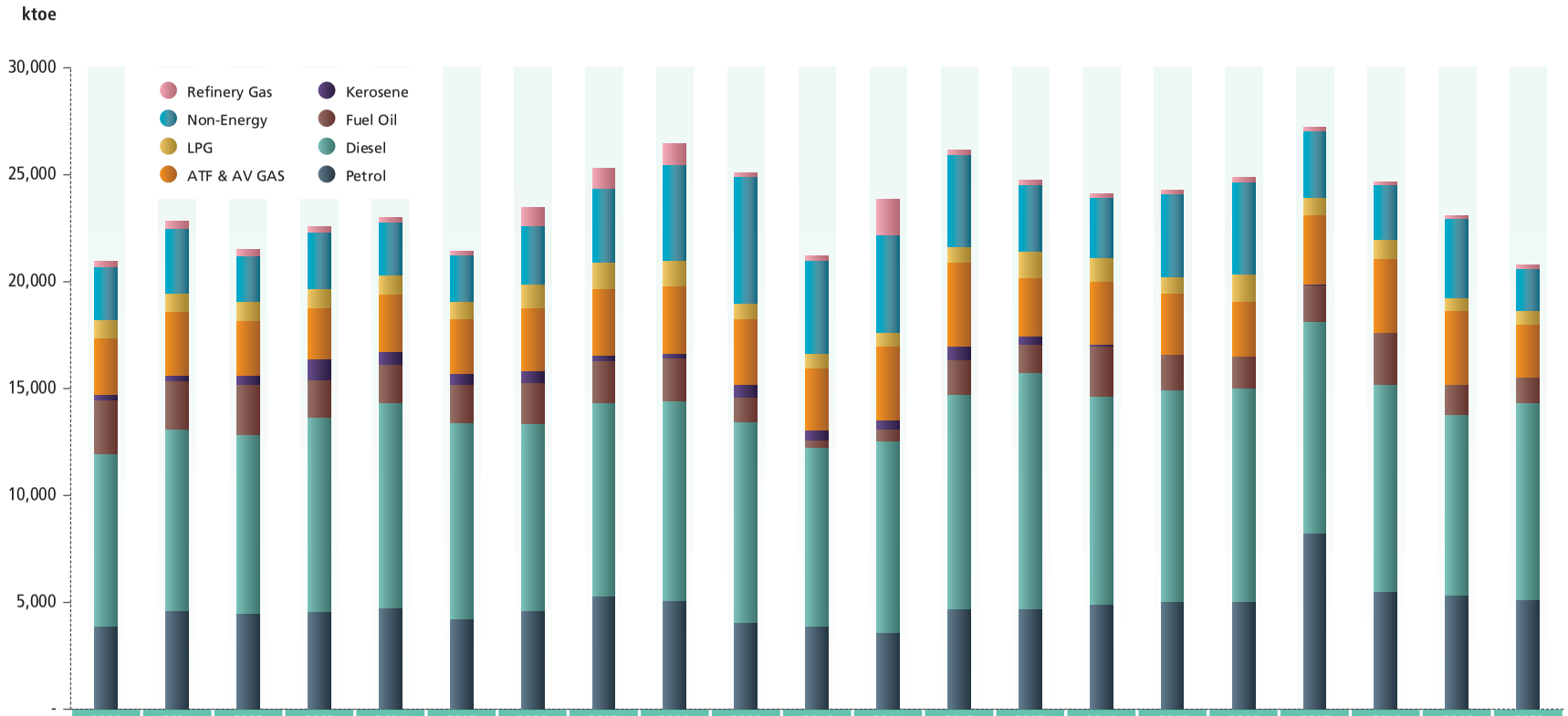
FIGURE 18: EXPORT AND IMPORT OF PETROLEUM PRODUCTS



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
●	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
●	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

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

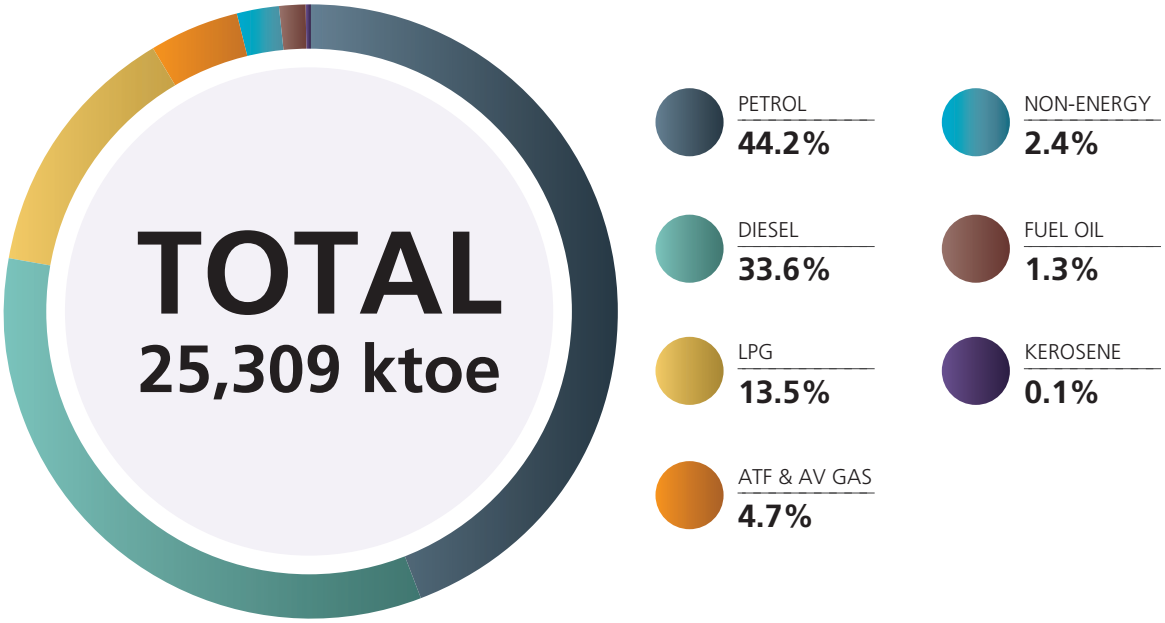
FIGURE 19: PRODUCTION OF PETROLEUM PRODUCTS FROM REFINERIES



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Refinery Gas	241	331	294	262	215	202	849	938	991	195	209	1,659	197	195	192	172	201	174	130	147	156
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
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
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
Kerosene	239	283	414	983	591	521	537	234	245	565	483	419	654	387	100	6	4	10	18	8	12
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
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
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

Source: Oil companies

FIGURE 20: FINAL CONSUMPTION FOR PETROLEUM PRODUCTS



Source: Oil Companies

04

NATURAL GAS

TABLE 6: RESOURCES AND PRODUCTION OF NATURAL GAS AS OF 1 JANUARY 2020

REGION	RESOURCES			PRODUCTION
	TRILLION STANDARD CUBIC FEET (TSCF)			MILLION STANDARD CUBIC FEET PER DAY (MMSCF/D)
	ASSOCIATED	NON-ASSOCIATED	TOTAL	
Peninsular Malaysia	5.701	14.612	**20.313**	1,617.74
Sabah	1.605	8.945	**10.550**	520.18
Sarawak	1.151	43.248	**44.399**	3,972.85
TOTAL	**8.457**	**66.805**	**75.262**	**6,110.78**

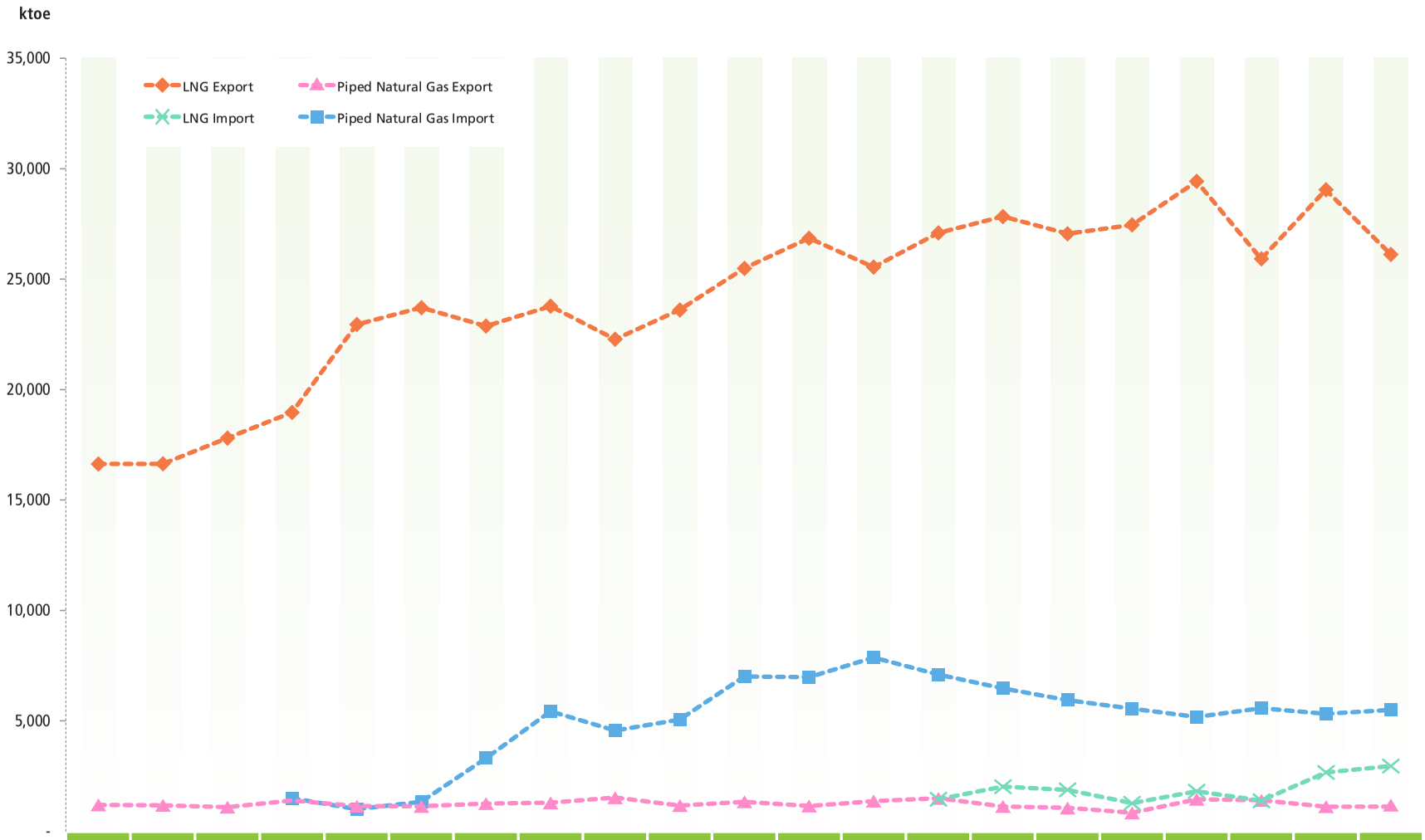
Source : PETRONAS
Notes (*): 1. Refers to the amount of gas produced / generated from associated fields
2. 1 cubic feet = 0.028317 cubic metre
3. Associated Gas: Natural gas produced in association with oil
4. Non-Associated Gas: Natural gas produced from a gas reservoir not associated with oil

TABLE 7: CONSUMPTION OF NATURAL GAS IN MMSCF

SECTORS	PENINSULAR MALAYSIA	SABAH	SARAWAK	MALAYSIA
Residential	26	-	-	**26**
Commercial	525	21	-	**546**
Industry	206,764	72,892	985	**280,642**
Non-energy	35,868	70,955	243,808	**350,631**
Transport	2,471	-	-	**2,471**
Power Stations	307,854	45,259	30,842	**383,955**
Co-Generation	41,688	-	-	**41,688**
TOTAL	**595,195**	**189,128**	**275,635**	**1,059,958**

Source: PETRONAS, Gas Companies, Power Utilities, IPPs and Self-Generation Plants
Note : Consumption of natural gas in Sarawak in 2020 is estimated by the Energy Commission

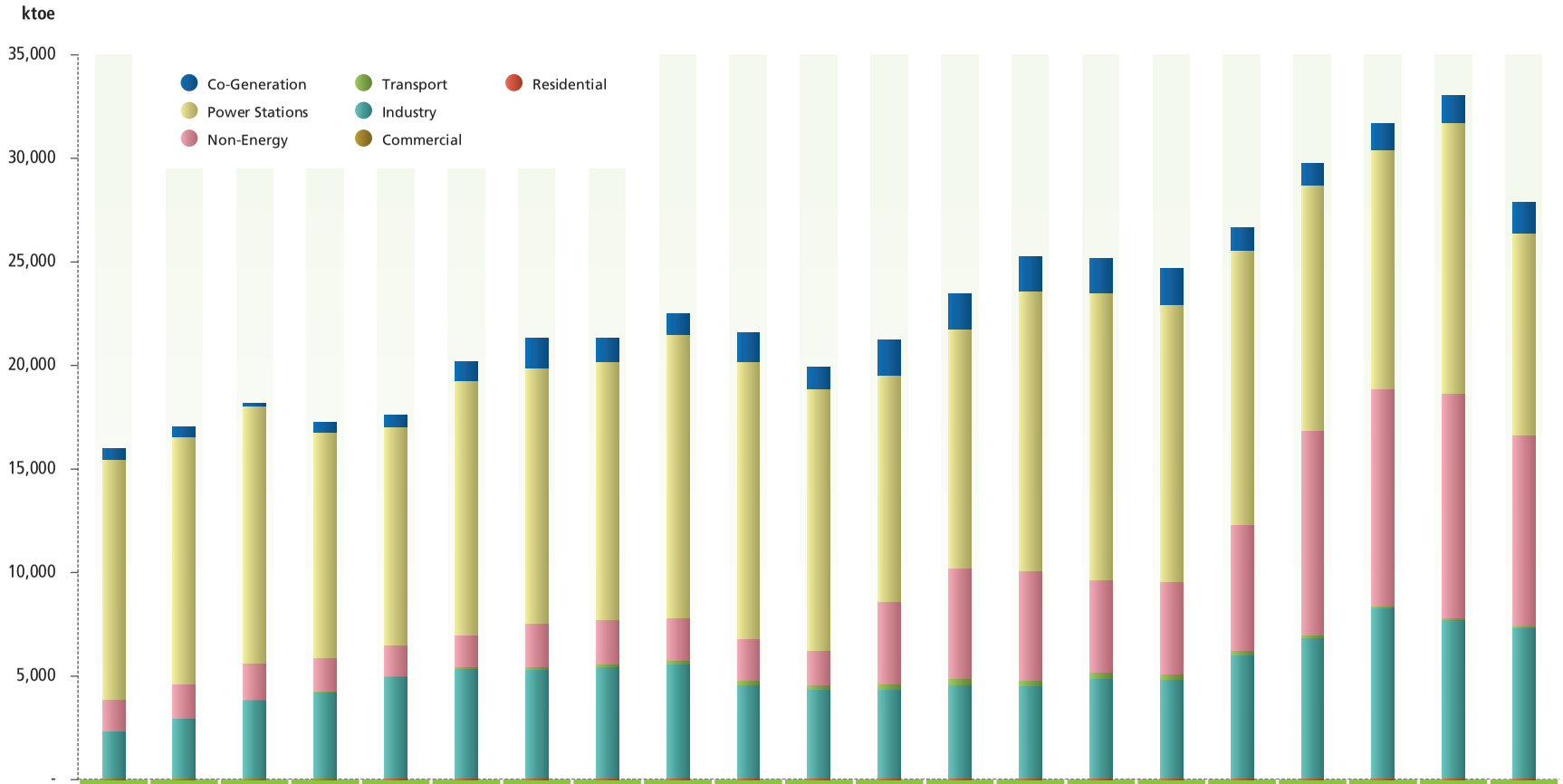
FIGURE 21: EXPORT AND IMPORT OF PIPED NATURAL GAS AND LNG



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
Piped Natural Gas Export	1,198	1,178	1,098	1,402	1,143	1,134	1,257	1,295	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
LNG Import	-	-	-	-	-	-	-	-	-	-	-	-	-	1,450	2,019	1,873	1,275	1,815	1,383	2,663	2,939

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

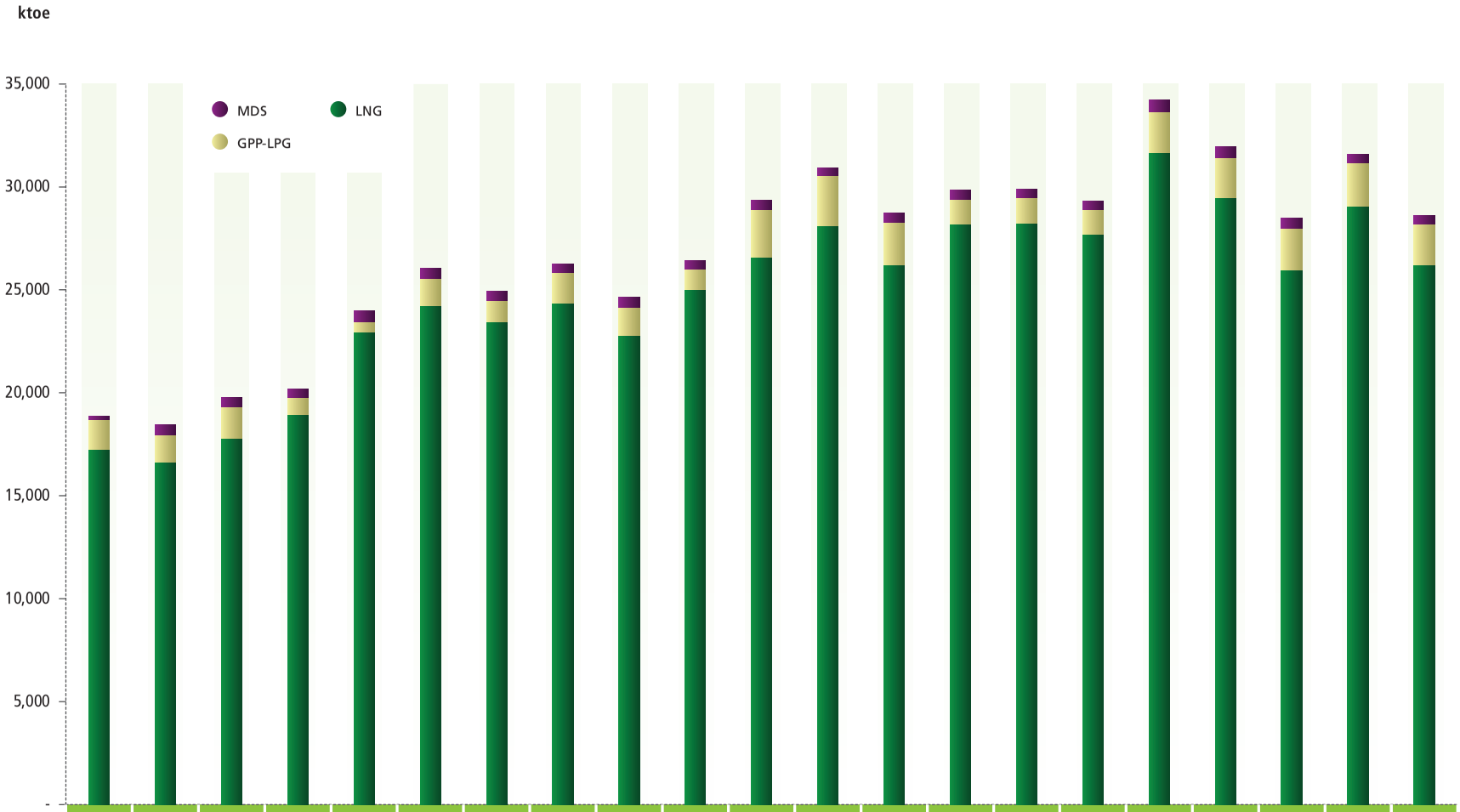
FIGURE 22: NATURAL GAS CONSUMPTION BY SECTORS



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
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
Transport	7	14	28	40	54	95	120	147	194	236	247	272	292	289	276	264	208	148	121	98	65
Industry	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
Commercial	12	10	11	18	18	23	24	28	31	25	30	32	22	22	22	24	24	25	24	23	14
Residential	4	4	4	5	5	5	5	6	6	2	6	7	1	1	1	1	1	1	1	1	1

Source: PETRONAS, Gas Companies, Power Utilities, IPPs and Self-Generation Plants
Note : Consumption of natural gas in Sarawak in 2020 is estimated by the Energy Commission

FIGURE 23: 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
MDS	164	513	445	443	513	460	464	417	481	426	454	359	486	478	420	423	573	509	501	425	441
GPP-LPG	1,482	1,310	1,504	790	520	1,319	1,036	1,483	1,362	1,012	2,299	2,434	2,035	1,174	1,250	1,155	1,997	1,961	2,022	2,107	1,998
LNG	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	25,973	29,074	26,206

Source: Oil and gas companies
Note : MDS commenced pre-commercialisation operation in year 2000

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COAL

TABLE 8: RESOURCES AND PRODUCTION OF COAL AS OF 31 DECEMBER 2020

LOCATION	RESOURCES (MILLION TONNES)	COAL TYPE	PRODUCTION
	MEASURED		(METRIC TONNES)
SARAWAK			
1. Abok & Silantek, Sri Aman	7.25	Coking Coal, Semi-Anthracite and Anthracite	4,719
2. Merit-Pila, Kapit	170.26	Sub-Bituminous	421,867
3. Bintulu	6.00	Bituminous (partly coking coal)	-
4. Mukah - Balingian	86.95	Lignite, Hydrous Lignite and Sub-Bituminous	2,551,662
5. Tutoh Area	5.58	Sub-Bituminous	-
SUBTOTAL	**276.04**		**2,978,248**
SABAH			
1. Salimpopon	4.80	Sub-Bituminous	
2. Labuan		Sub-Bituminous	
3. Maliau		Bituminous	
4. Malibau			
5. SW Malibau			
6. Pinangan West Middle Block		Bituminous	
SUBTOTAL	**4.80**		
SELANGOR			
1. Batu Arang		Sub-Bituminous	
SUBTOTAL	**0.00**		
TOTAL	**280.84**		**2,978,248**

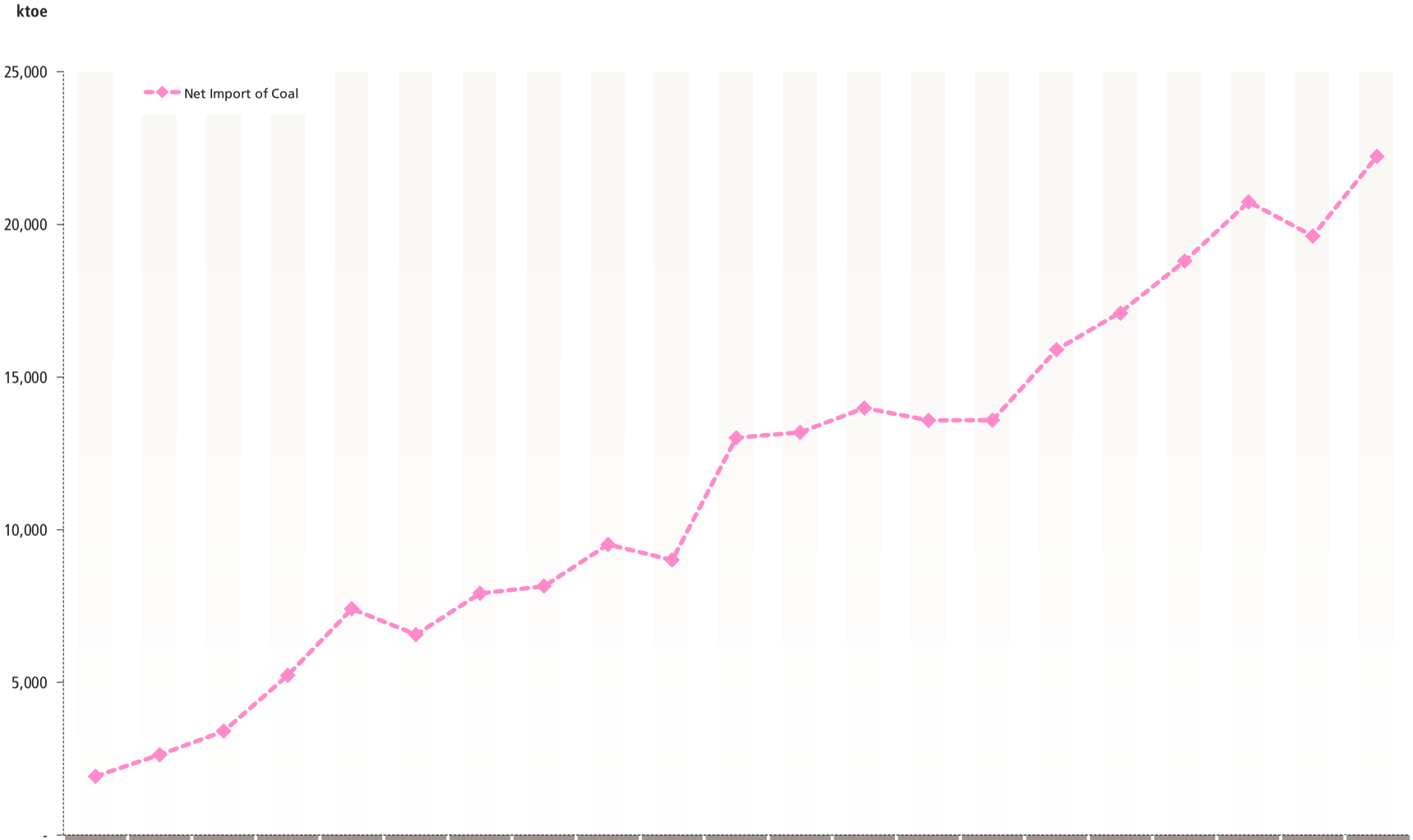
Source: Department of Mineral and Geosciences Malaysia

TABLE 9: CONSUMPTION OF COAL IN METRIC TONNES

SECTORS	PENINSULAR MALAYSIA	SABAH	SARAWAK	MALAYSIA
Industry	2,001,400	-	120,326	**2,121,726**
Power Stations	34,514,263	-	2,684,066	**37,198,329**
TOTAL	**36,515,663**	**-**	**2,804,392**	**39,320,055**

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

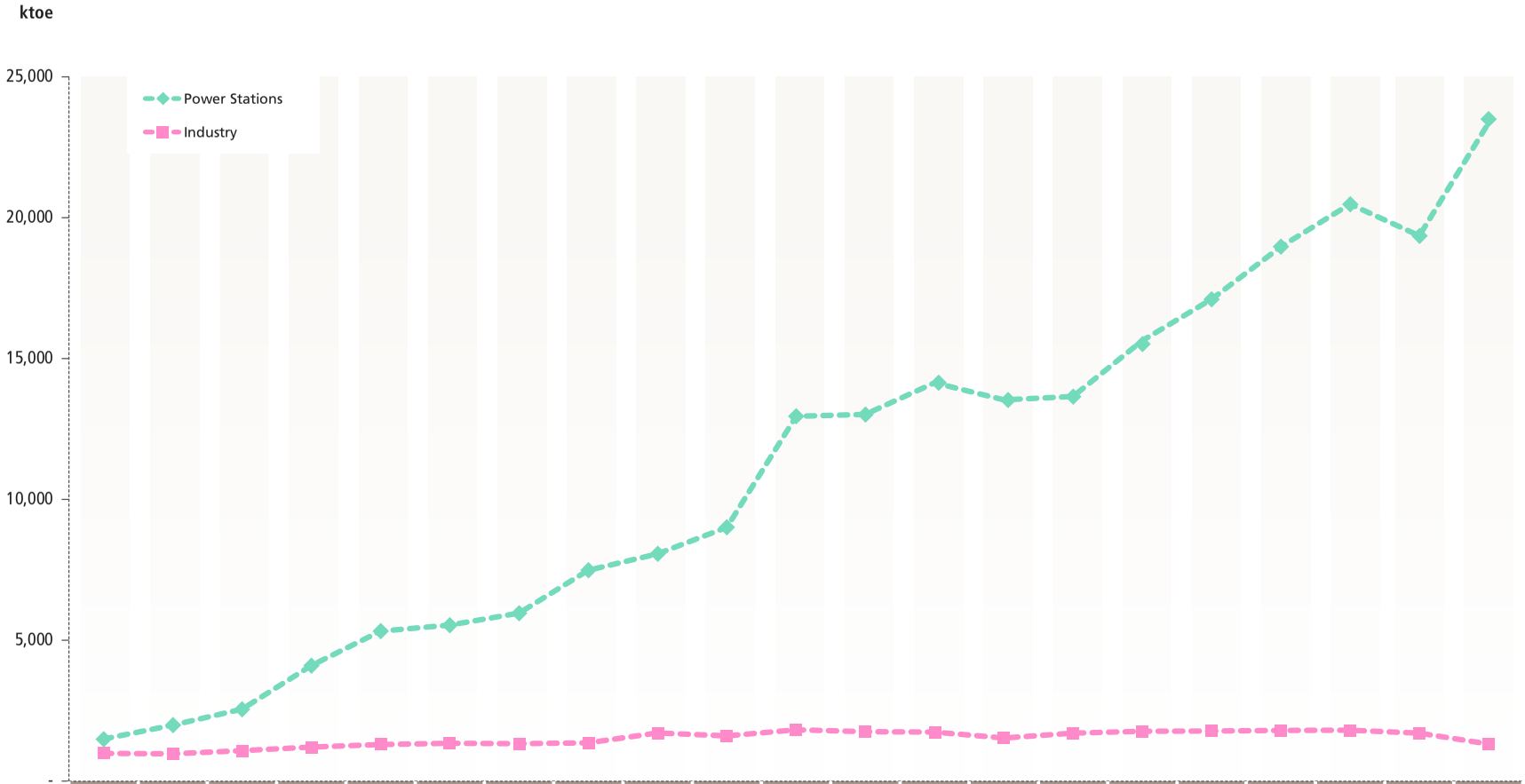
FIGURE 24: NET IMPORT OF COAL



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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

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
Power Stations	1,495	1,994	2,556	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
Industry	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

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

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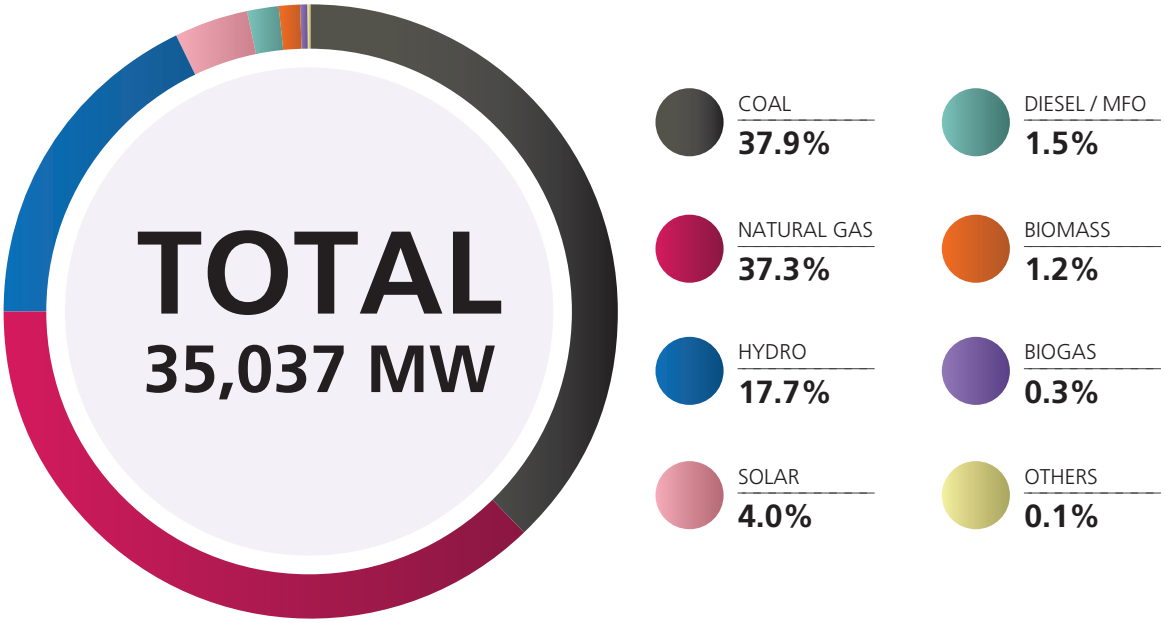
ELECTRICITY

TABLE 10: INSTALLED CAPACITY AS OF 31 DECEMBER 2020, IN MW

		HYDRO	NATURAL GAS	COAL	DIESEL/ MFO	BIOMASS	SOLAR	BIOGAS	OTHERS	TOTAL
PENINSULAR MALAYSIA	TNB	2,555.1	1,973.0	0.0	0.0	0.0	0.0	0.0	0.0	**4,528.1**
	IPPs	20.0	8,064.4	12,180.0	0.0	0.0	0.0	0.0	0.0	**20,264.4**
	Co-Generation	0.0	836.5	0.0	0.0	5.6	0.0	0.0	20.9	**863.0**
	Self-Generation	2.1	9.1	0.0	55.1	133.5	11.9	0.0	0.0	**211.7**
	FiT	63.8	0.0	0.0	0.0	44.9	288.3	101.0	0.0	**498.0**
	LSS	0.0	0.0	0.0	0.0	0.0	776.9	0.0	0.0	**776.9**
	NEM	0.0	0.0	0.0	0.0	0.0	227.5	0.0	0.0	**227.5**
	SUBTOTAL	**2,641.0**	**10,883.1**	**12,180.0**	**55.1**	**183.9**	**1,304.5**	**101.0**	**20.9**	**27,369.5**
SABAH	SESB	81.1	112.0	0.0	236.4	0.0	29.9	0.0	0.0	**459.3**
	IPPs	0.0	1,012.6	0.0	0.0	0.0	0.0	0.0	0.0	**1,012.6**
	Co-Generation	0.0	65.0	0.0	0.0	36.7	0.0	0.0	0.0	**101.7**
	Self-Generation	0.0	4.4	0.0	124.6	113.9	0.0	4.6	0.0	**247.5**
	FiT	6.5	0.0	0.0	0.0	25.8	34.4	9.6	0.0	**76.3**
	LSS	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**
	SUBTOTAL	**87.6**	**1,194.1**	**0.0**	**361.0**	**176.4**	**114.3**	**14.2**	**0.0**	**1,947.5**
SARAWAK	SEB	3,459.8	584.0	1,104.0	102.5	0.0	0.1	0.0	0.0	**5,250.4**
	Co-Generation	0.0	397.0	0.0	0.0	0.0	0.0	0.0	0.0	**397.0**
	Self-Generation	0.0	0.0	0.0	14.7	52.2	0.0	0.5	5.1	**72.5**
	SUBTOTAL	**3,459.8**	**981.0**	**1,104.0**	**117.2**	**52.2**	**0.1**	**0.5**	**5.1**	**5,719.9**
	TOTAL	**6,188.4**	**13,058.1**	**13,284.0**	**533.2**	**412.6**	**1,418.9**	**115.7**	**25.9**	**35,036.9**
	SHARE (%)	**17.7%**	**37.3%**	**37.9%**	**1.5%**	**1.2%**	**4.0%**	**0.3%**	**0.1%**	**100.0%**

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

FIGURE 26: INSTALLED CAPACITY AS OF 31 DECEMBER 2020



Source: Power Utilities, IPPs, SEDA Malaysia and Ministry of Utilities Sarawak

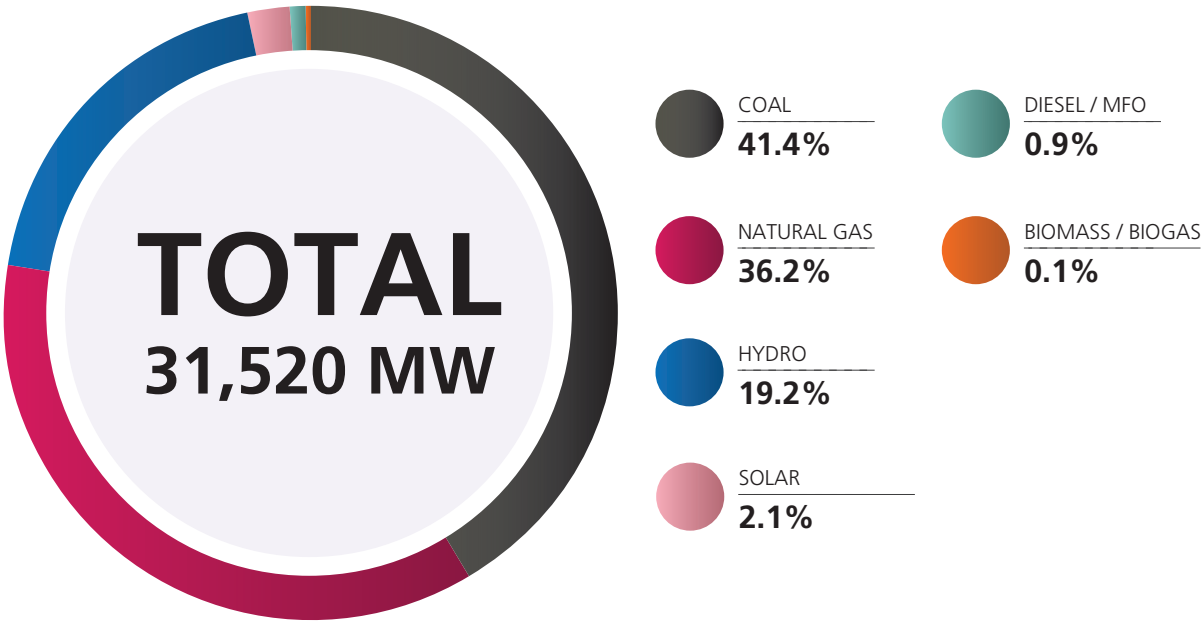
TABLE 11: AVAILABLE CAPACITY AS OF 31 DECEMBER 2020, IN MW

		HYDRO	NATURAL GAS	COAL	DIESEL / MFO	BIOMASS/ BIOGAS	SOLAR	TOTAL
PENINSULAR MALAYSIA	TNB	2,532.0	1,970.0	0.0	0.0	0	0.0	**4,502.0**
	IPPs	0.0	7,922.0	12,054.0	0.0	0	0.0	**19,976.0**
	LSS	0.0	0.0	0.0	0.0	0	579.0	**579.0**
	SUBTOTAL	**2,532.0**	**9,892.0**	**12,054.0**	**0.0**	**0.0**	**579.0**	**25,058.0**
SABAH	SESB	72.3	101.2	0.0	187.3	0	0.0	**360.7**
	IPPs	0.0	865.0	0.0	0.0	0	0.0	**865.0**
	FiT	6.5	0.0	0.0	0.0	35.4	34.4	**76.3**
	LSS	0.0	0.0	0.0	0.0	0	49.2	**49.2**
	SUBTOTAL	**78.8**	**966.2**	**0.0**	**187.3**	**35.4**	**83.6**	**1,351.2**
SARAWAK	SEB	3,445.8	566.0	1,001.0	98.5	0	0.1	**5,111.4**
	SUBTOTAL	**3,445.8**	**566.0**	**1,001.0**	**98.5**	**0.0**	**0.1**	**5,111.4**
	TOTAL	**6,056.6**	**11,424.2**	**13,055.0**	**285.8**	**35.4**	**662.7**	**31,519.6**

Note : 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 31 DECEMBER 2020



Source: Power Utilities and IPPs

TABLE 12: INSTALLED CAPACITY OF MAJOR HYDRO POWER STATIONS

STATION	INSTALLED CAPACITY (MW)	TOTAL (MW)
PENINSULAR MALAYSIA		
1. TERENGGANU		
- Stesen Jana Kuasa Sultan Mahmud Kenyir	4 x 100	**400.0**
- Stesen Jana Kuasa Hulu Terengganu	2 x 125	**250.0**
- Stesen Jana Kuasa 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 25	**75.0**
SUBTOTAL		**75.0**
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		**6,060.0**

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

TABLE 13: INSTALLED CAPACITY OF MINI HYDRO POWER STATIONS

STATION	TOTAL (MW)
PENINSULAR MALAYSIA	
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	
- Sungai Renyok G1	0.80
- Sungai Renyok G2	0.80
- Sungai Sok	0.56
- Sungai Lata Rek	0.25
5. TERENGGANU	
- Sungai Berang	0.36
- Sungai Cheralak	0.48
SUBTOTAL	**20.36**
SABAH	
- Sayap (Kota Belud)	1.00
- Melangkap (Kota Belud)	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	
- Sungai Pasir	0.40
- Penindin	0.28
- Sebako	0.16
- Lundu	0.14
- Kalamuku 1	0.50
- Kalamuku 2	0.50
- Sungai 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 14: TRANSMISSION NETWORK IN CIRCUIT – KILOMETRES

UTILITY	500 kV	275 kV	132 kV	66 kV
TNB	2,176	9,406	12,697	-
SESB	-	598	2,240	103
SEB	377	1,559	454	-

Source: TNB, SESB and SEB

TABLE 15: DISTRIBUTION NETWORK IN CIRCUIT – KILOMETRES

UTILITY	OVERHEAD LINES	UNDERGROUND CABLES
TNB	379,468	323,844
SESB	9,840	1,612
SEB	27,634	9,540

Source: TNB, SESB and SEB

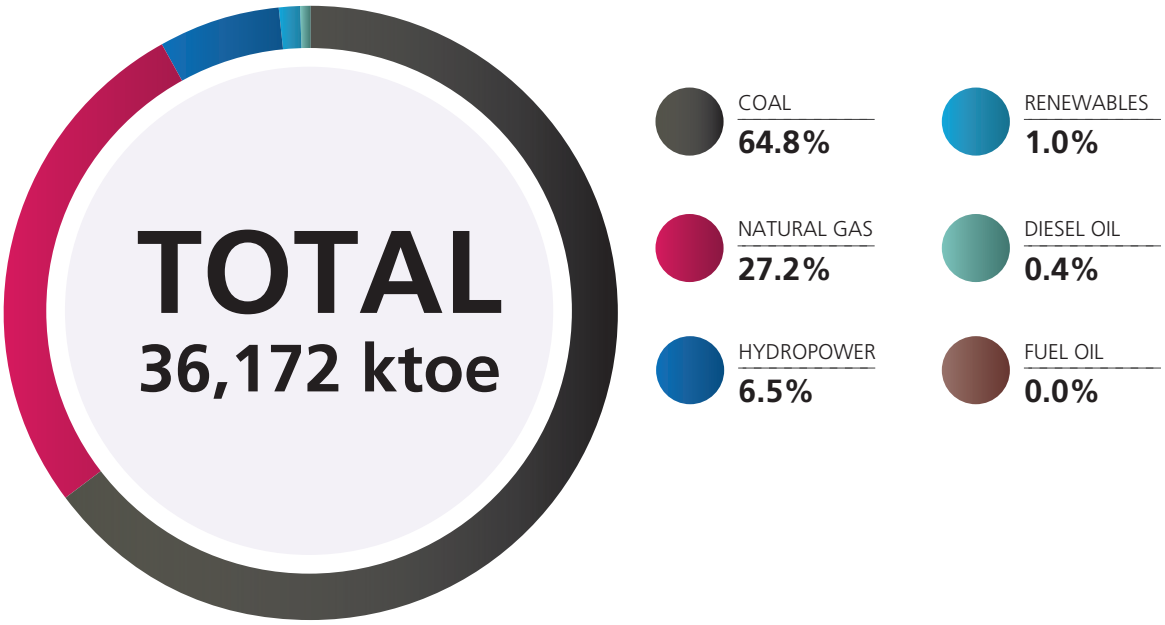
TABLE 16: GROSS GENERATION, CONSUMPTION, AVAILABLE CAPACITY, PEAK DEMAND AND RESERVE MARGIN FOR ELECTRICITY IN MALAYSIA

REGION	ELECTRICITY GROSS GENERATION		ELECTRICITY CONSUMPTION		AVAILABLE CAPACITY	PEAK DEMAND	RESERVE MARGIN
	GWh	%	GWh	%	MW	MW	%
PENINSULAR MALAYSIA	136,449	78.4	118,222	77.6	25,058	18,808	33.2
SARAWAK	30,293	17.4	28,158	18.5	5,111	3,664	39.5
SABAH	7,262	4.2	5,870	3.9	1,351	987	36.9
TOTAL	**174,004**	**100.0**	**152,250**	**100.0**	**31,624**		

Source : TNB and IPPs, SESB and SEB

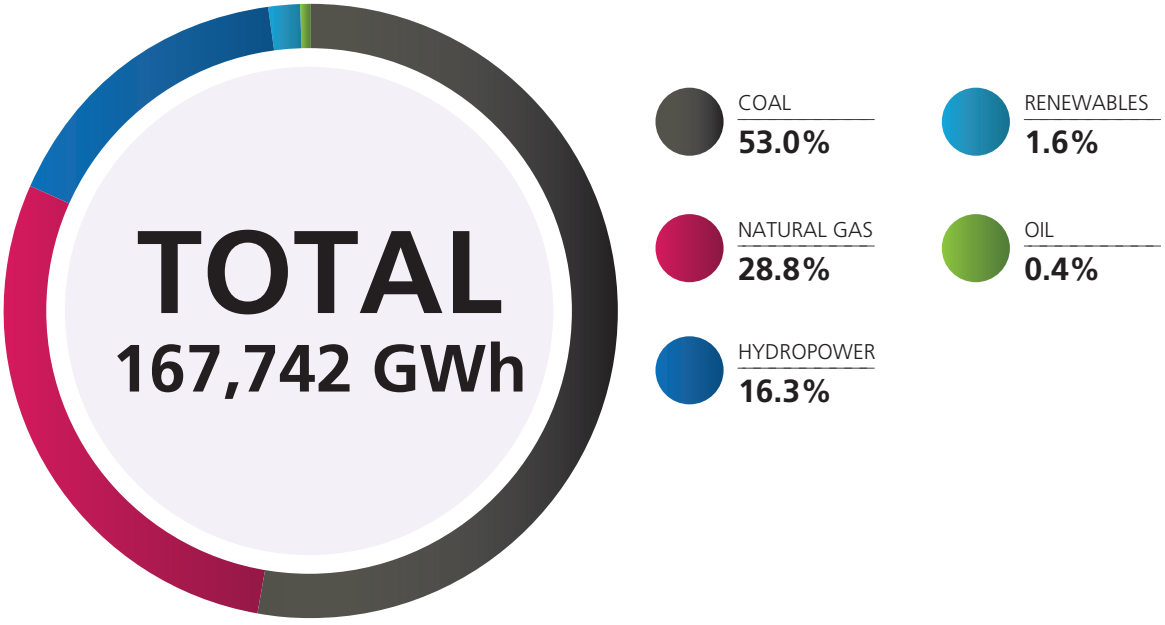
Notes :
1. Most diesel units in SESB are aged sets hence they are derated due to thermal limitations. Therefore, during operational state, some generating units are not available due to maintenance outages as well as random breakdowns; the actual operation capacity available to system operation for dispatch 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, 2020



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

FIGURE 29: GENERATION MIX BY FUEL TYPES, 2020



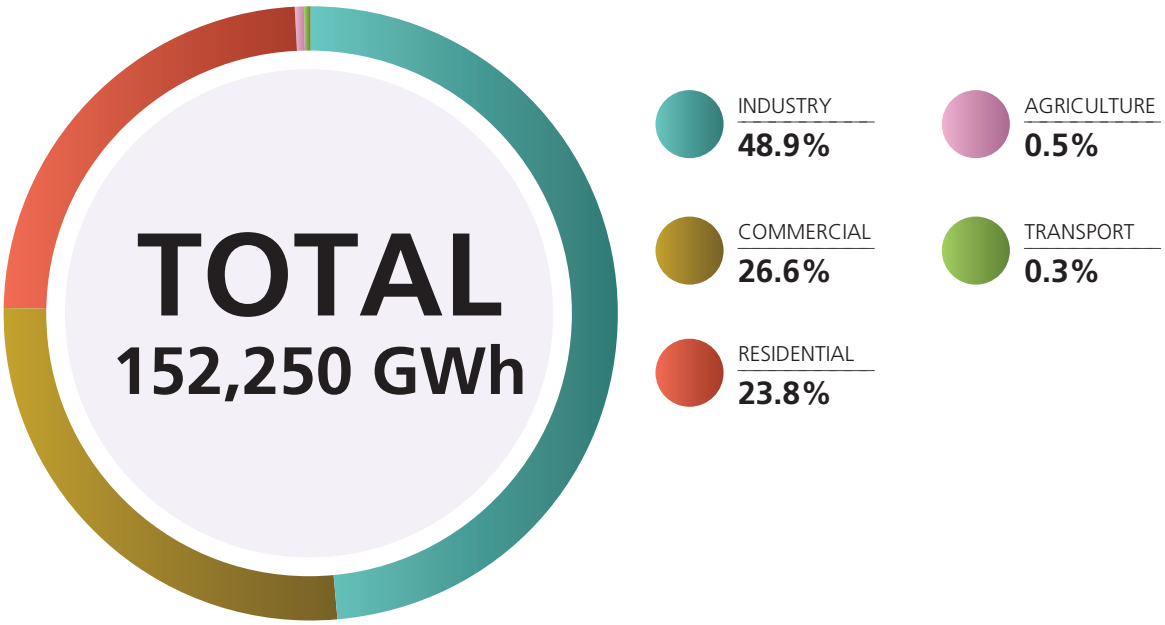
Source: Power utilities and IPPs
Note : Figures exclude electricity generation for self-generation plants

TABLE 17: ELECTRICITY CONSUMPTION BY SECTORS IN GWh

REGION	INDUSTRY		COMMERCIAL		RESIDENTIAL		TRANSPORT		AGRICULTURE		TOTAL
	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%	GWh
PENINSULAR MALAYSIA	49,987	67.2	35,698	88.3	31,459	86.7	390	100.0	687.7	100.0	**118,222**
SARAWAK	22,847	30.7	2,581	6.4	2,730	7.5	-	-	-	-	**28,158**
SABAH	1,582	2.1	2,171	5.4	2,117	5.8	-	-	-	-	**5,870**
TOTAL	**74,416**	**100.0**	**40,451**	**100.0**	**36,306**	**100.0**	**390**	**100.0**	**688**	**100.0**	**152,250**

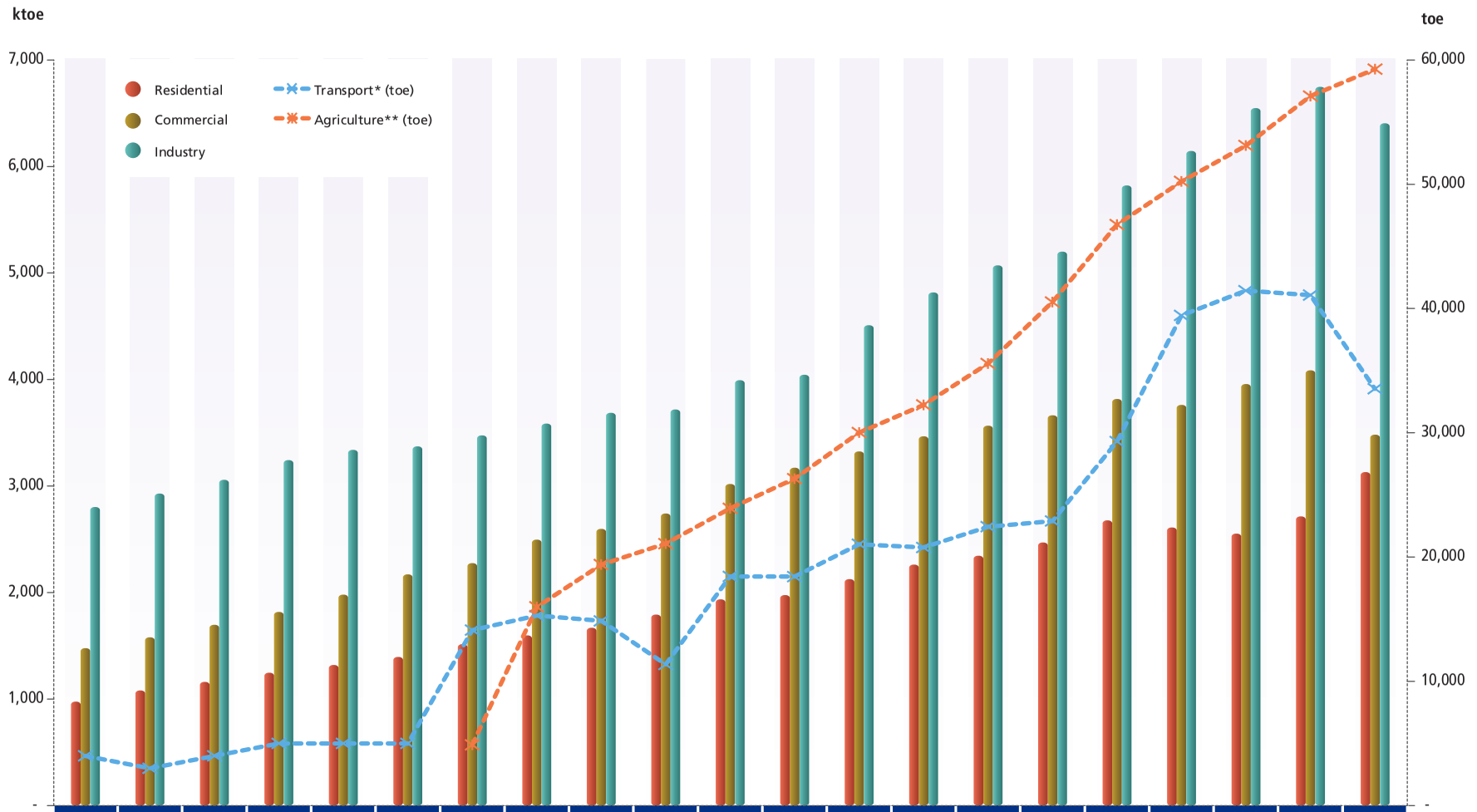
Source: Power utilities, IPPs and Self-Generators

FIGURE 30: ELECTRICITY CONSUMPTION BY SECTORS IN 2020



Source: Power utilities, IPPs and Self-Generators

FIGURE 31: ELECTRICITY CONSUMPTION BY SECTORS IN 2020



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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
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
Industry	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
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
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

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

TABLE 18: ELECTRICITY GENERATION AND INSTALLED CAPACITY OF RENEWABLE ENERGY BY PUBLIC LICENSEE BY REGION IN 2020

REGION	TYPE OF PRIME MOVER	INSTALLED CAPACITY (MW)	UNIT GENERATED (MWh)
PENINSULAR MALAYSIA	Major Hydro - TNB	2,536.10	4,635,780
	Mini Hydro - IPP	20.00	121,570
	Mini Hydro - FiT	63.80	260,680
	Mini Hydro - TNB	18.99	56,440
	Solar - FiT	288.32	404,159
	Solar - LSS	776.86	1,217,330
	Solar - NEM	188.47	278,969
	Biogas - FiT	101.00	388,469
	Biomass - FiT	44.85	90,818
	SUBTOTAL	**4,038.39**	**7,454,216**
SABAH	Major Hydro - SESB	75.00	411,450
	Mini Hydro - SESB	6.06	10,270
	Mini Hydro - FiT	6.50	8,007
	Solar - FiT	34.38	52,510
	Solar - LSS	50.00	90,910
	Biogas - FiT	9.60	38,688
	Biomass - FiT	25.80	77,905
	Solar - NEM	0.03	37
	Biomass - Co-Gen	29.20	32,410
	SUBTOTAL	**236.57**	**722,186**
SARAWAK	Major Hydro - SEB	3,452.00	21,746,000
	Mini Hydro - SEB	7.82	26,400
	Solar	0.09	74
	SUBTOTAL	**3,459.91**	**21,772,474**
	GRAND TOTAL	**7,734.87**	**29,948,875**

Source: Energy Commission, TNB, SESB, SEB, Ministry of Utilities 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 19: ELECTRICITY GENERATION AND INSTALLED CAPACITY OF RENEWABLE ENERGY BY PRIVATE LICENSEE BY REGION IN 2020

REGION	TYPE OF PRIME MOVER	INSTALLED CAPACITY (MW)	UNIT GENERATED (MWh)
PENINSULAR MALAYSIA	Biomass - Co-Gen	5.56	8,220
	Biomass - Self-Gen	133.53	253,680
	Solar - Self-Gen	11.88	14,940
	Mini Hydro-Self-Gen	2.13	4,120
	Subtotal	**153.10**	**280,960**
SABAH	Solar - SESB	29.88	-
	Biomass - Co-Gen	7.50	11,220
	Biomass - Self-Gen	113.92	125,700
	Biogas - Self-Gen	4.64	13,470
	Subtotal	**155.94**	**150,390**
SARAWAK	Biomass - Self-Gen	52.20	123,888
	Biogas-Self -Gen	0.50	1,337
	Subtotal	**52.70**	**125,225**
GRAND TOTAL		**361.74**	**556,575**

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

07

KEY ENERGY STATISTICS

TABLE 20: PRIMARY ENERGY SUPPLY IN KTOE

	Crude Oil	Petroleum Products & Others	Natural Gas	Coal and Coke	Hydropower & Renewables	Total	Annual Growth Rate (%)	Share (%)			
								Crude Oil and Petroleum Products & Others	Natural Gas	Coal and 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

TABLE 21: 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)	298	1,997	22,235

TABLE 22: CONVERSION IN GAS PLANTS IN KTOE

	INPUT	GAS PLANTS			
	NATURAL GAS	MLNG	GPP - LPG	MDS	RGT
2000	26,093	17,231	1,482	164	N.A
2001	25,703	16,636	1,310	513	N.A
2002	25,571	17,803	1,504	445	N.A
2003	27,940	18,965	790	443	N.A
2004	33,176	22,944	520	513	N.A
2005	36,447	24,254	1,319	460	N.A
2006	35,378	23,450	1,036	464	N.A
2007	38,141	24,355	1,483	417	N.A
2008	38,193	22,793	1,362	481	N.A
2009	37,098	25,004	1,012	426	N.A
2010	40,246	26,601	2,299	454	N.A
2011	40,737	28,130	2,434	359	N.A
2012	40,042	26,231	2,035	486	N.A
2013	39,678	28,209	1,174	478	N.A
2014	39,193	28,213	1,250	420	N.A
2015	40,773	39,957	1,826	862	1,873
2016	39,665	31,658	1,997	573	1,277
2017	38,296	29,468	1,961	509	1,815
2018	32,980	25,920	2,022	501	1,383
2019	33,968	29,044	2,107	425	2,663
2020	34,410	26,155	1,998	441	2,939

Notes: 1. N.A means not applicable
2. Middle Distillate Synthesis (MDS) commenced pre-commercialisation operation in year 2000
3. MLNG plant produced LPG in the year 2003
4. RGT refers to Regasification Gas Terminal

TABLE 23: 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

TABLE 24: 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	Natural Gas	Hydropower	Coal	Renewables			Fuel and Diesel Oil	Natural Gas	Hydropower	Coal & Coke	Renewables	Total Electricity Generated
2000	592	191	11,580	1,612	1,495	-	15,470	8.3	5.1	74.9	10.4	9.7	-	5,731
2001	730	278	11,922	1,687	1,994	-	16,611	7.4	6.1	71.8	10.2	12.0	-	5,940
2002	1,363	476	12,424	1,329	2,556	-	18,148	9.3	10.1	68.5	7.3	14.1	-	6,191
2003	289	340	10,893	1,056	4,104	-	16,682	(8.1)	3.8	65.3	6.3	24.6	-	6,568
2004	274	272	10,545	1,329	5,327	-	17,747	6.4	3.1	59.4	7.5	30.0	-	6,716
2005	275	298	12,271	1,313	5,541	-	19,698	11.0	2.9	62.3	6.7	28.1	-	6,706
2006	171	617	12,524	1,567	5,964	-	20,843	5.8	3.8	60.1	7.5	28.6	-	7,240
2007	199	314	12,549	1,522	7,486	-	22,070	5.9	2.3	56.9	6.9	33.9	-	8,385
2008	181	299	13,651	1,964	8,069	-	24,164	9.5	2.0	56.5	8.1	33.4	-	8,422
2009	205	384	13,390	1,627	9,010	-	24,616	1.9	2.4	54.4	6.6	36.6	-	8,531
2010	125	415	12,628	1,577	12,951	-	27,696	12.5	1.9	45.6	5.7	46.8	-	9,404
2011	1,103	981	10,977	1,850	13,013	-	27,924	0.8	7.5	39.3	6.6	46.6	-	10,193
2012	550	811	11,533	2,150	14,138	80	29,262	4.8	4.7	39.4	7.3	48.3	0.3	11,032
2013	392	623	13,520	2,688	13,527	208	30,958	5.8	3.3	43.7	8.7	43.7	0.7	11,630
2014	269	622	13,860	3,038	13,648	171	31,608	2.1	2.8	43.8	9.6	43.2	0.5	12,227
2015	101	279	13,378	3,582	15,627	166	33,134	4.8	1.1	40.4	10.8	47.2	0.5	12,393
2016	155	165	13,260	4,499	17,101	168	35,348	6.7	0.9	37.5	12.7	48.4	0.5	12,944
2017	99	147	11,872	6,240	18,967	184	37,509	6.1	0.7	31.7	16.6	50.6	0.5	13,375
2018	17	187	11,542	2,265	20,472	276	34,759	(7.3)	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

TABLE 25: FINAL ENERGY CONSUMPTION BY SECTORS IN KTOE

	Industry	Transport	Residential and Commercial	Non-Energy Use	Agriculture	Total	Annual Growth Rate (%)	Industry including Agriculture & Non-Energy	Industry GDP*	Industry 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

Note (*): 1. Defined as total GDP for Agriculture, Forestry and Fishing, Mining and Quarrying, Manufacturing and Construction
2. Industry GDP for year 1990-2014 was calculated by the Energy Commission

TABLE 26: FINAL ENERGY CONSUMPTION BY TYPE OF FUEL IN KTOE

	Petroleum Products and Others	Electricity	*Gas for Non-Energy*	*Gas for Heating*	Natural Gas	Coal and 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)

TABLE 27: 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

TABLE 28: SELECTED ENERGY AND ECONOMIC INDICATORS (2000-2020)

	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
2000	370,817	579,073	23,495	49,697	29,699	5,263	61,168	8.86	14.21	9.08
2001	366,841	582,071	24,031	50,899	31,515	5,594	65,015	0.52	2.42	6.11
2002	398,714	613,450	24,543	52,323	33,289	5,922	68,827	5.39	2.80	5.63
2003	435,708	648,960	25,038	56,944	34,586	6,313	73,371	5.79	8.83	3.90
2004	493,223	692,981	25,542	62,008	37,323	6,642	77,195	6.78	8.89	7.91
2005	543,578	729,932	26,046	65,344	38,285	6,944	80,705	5.33	5.38	2.58
2006	596,784	770,698	26,550	66,009	38,567	7,272	84,517	5.58	1.02	0.74
2007	665,340	819,242	27,058	71,426	41,606	7,683	89,294	6.30	8.21	7.88
2008	769,949	858,826	27,568	74,709	41,968	7,986	92,815	4.83	4.60	0.87
2009	712,857	845,828	28,082	73,530	40,845	8,286	96,302	(1.51)	(1.58)	(2.68)
2010	821,434	908,629	28,589	75,772	41,476	8,993	104,519	7.42	3.05	1.54
2011	911,733	956,731	29,062	78,095	43,455	9,235	107,331	5.29	3.07	4.77
2012	971,252	1,009,097	29,510	85,124	49,291	10,011	116,350	5.47	9.00	13.43
2013	1,018,614	1,056,462	30,214	89,046	51,583	10,590	123,079	4.69	4.61	4.65
2014	1,106,443	1,119,920	30,709	90,691	52,209	11,042	128,333	6.01	1.85	1.21
2015	1,176,941	1,176,941	31,186	90,441	51,829	11,397	132,464	5.09	(0.28)	(0.73)
2016	1,249,698	1,229,312	31,634	93,747	57,219	12,394	144,042	4.45	3.66	10.40
2017	1,372,310	1,300,769	32,023	94,345	62,489	12,607	146,521	5.81	0.64	9.21
2018	1,447,760	1,363,766	32,382	95,909	64,658	13,153	152,866	4.84	1.66	3.47
2019	1,512,738	1,423,952	32,523	98,681	66,483	13,647	158,608	4.41	2.89	2.82
2020	1,418,000	1,345,144	32,584	94,194	57,169	13,100	152,250	(5.53)	(4.55)	(14.01)

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	
Electricity Consumption	GDP at Current Prices (RM)	Primary Energy Supply (toe)	Final Energy Consumption (toe)	Electricity Consumption (kWh)	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
9.30	15,783	2.12	1.26	2,603	85.82	51.29	9.09	0.106	1.02	1.05
6.29	15,265	2.12	1.31	2,705	87.44	54.14	9.61	0.112	11.81	12.15
5.86	16,246	2.13	1.36	2,804	85.29	54.27	9.65	0.112	1.04	1.09
6.60	17,402	2.27	1.38	2,930	87.75	53.29	9.73	0.113	0.67	1.14
5.21	19,310	2.43	1.46	3,022	89.48	53.86	9.58	0.111	1.17	0.77
4.55	20,870	2.51	1.47	3,099	89.52	52.45	9.51	0.111	0.48	0.85
4.72	22,478	2.49	1.45	3,183	85.65	50.04	9.44	0.110	0.13	0.85
5.65	24,589	2.64	1.54	3,300	87.19	50.79	9.38	0.109	1.25	0.90
3.94	27,929	2.71	1.52	3,367	86.99	48.87	9.30	0.108	0.18	0.82
3.76	25,385	2.62	1.45	3,429	86.93	48.29	9.80	0.114	1.77	(2.48)
8.53	28,733	2.65	1.45	3,656	83.39	45.65	9.90	0.115	0.21	1.15
2.69	31,372	2.69	1.50	3,693	81.63	45.42	9.65	0.112	0.90	0.51
8.40	32,913	2.88	1.67	3,943	84.36	48.85	9.92	0.115	2.45	1.54
5.78	33,713	2.95	1.71	4,074	84.29	48.83	10.02	0.117	0.99	1.23
4.27	36,031	2.95	1.70	4,179	80.98	46.62	9.86	0.115	0.20	0.71
3.22	37,739	2.90	1.66	4,248	76.84	44.04	9.68	0.113	(0.14)	0.63
8.74	39,505	2.96	1.81	4,553	76.26	46.55	10.08	0.117	2.34	1.96
1.72	42,854	2.95	1.95	4,576	72.53	48.04	9.69	0.113	1.58	0.30
4.33	44,708	2.96	2.00	4,721	70.33	47.41	9.64	0.112	0.72	0.89
3.76	46,513	3.03	2.04	4,877	69.30	46.69	9.58	0.111	0.64	0.85
(4.01)	43,518	2.89	1.75	4,673	70.03	42.50	9.74	0.113	2.53	0.72

TABLE 29: ENERGY BALANCE TABLE IN 2020 (KILOTONNES OF OIL EQUIVALENT)

ENERGY SOURCE	NATURAL GAS	LNG	CRUDE OIL (1/)	OTHERS (2/)	TOTAL PETROLEUM PRODUCTS	PETROL	DIESEL	FUEL OIL	LPG
PRIMARY SUPPLY									
1. Primary Production	72,579	0	26,783	0	**0**	0	0	0	0
2. Gas Flaring, Reinjection & Use	(13,763)	0	0	0	**0**	0	0	0	0
3. Imports	5,519	2,939	6,969	75	**12,586**	6,914	2,812	216	539
4. Exports	(1,179)	(26,155)	(10,604)	(5)	**(10,590)**	(1,773)	(3,866)	(442)	(257)
5. Bunkers	0	0	0	0	**(546)**	0	(131)	(415)	0
6. Stock Change	0	0	(23)	0	**1,286**	900	578	(183)	365
7. Statistical Discrepancy	0	0	(24)	0	**0**	0	0	0	0
8. Primary Supply	**63,156**	**(23,216)**	**23,101**	**70**	**2,736**	**6,042**	**(607)**	**(824)**	**647**
TRANSFORMATION									
9. Gas Plants									
9.1 MLNG	(32,996)	26,155	0	0	**51**	0	0	0	51
9.2 MDS	(1,008)	0	0	0	**441**	0	92	0	0
9.3 GPP-LPG (3&4/)	(3,345)	0	0	0	**1,998**	0	0	0	1,998
9.4 RGT	2,939	(2,939)	0	0	**0**	0	0	0	0
SUBTOTAL	**(34,410)**	**23,216**	**0**	**0**	**2,491**	**0**	**92**	**0**	**2,049**
10. Refineries	0	0	(22,974)	(70)	**20,745**	5,089	9,199	1,204	672
11. Power Stations & Self-Generation									
11.1 Hydro Stations	0	0	0	0	**0**	0	0	0	0
11.2 Thermal Stations	(9,841)	0	0	0	**(166)**	0	(154)	(12)	0
11.3 Self-Generation (5/)	(1,395)	0	0	0	**(56)**	0	(56)	0	0
SUBTOTAL	**(11,236)**	**0**	**0**	**0**	**(222)**	**0**	**(210)**	**(12)**	**0**
12. Losses & Own Use	(879)	0	(127)	0	**(533)**	0	0	(18)	0
13. Statistical Discrepancy	0	0	0	0	**92**	58	42	(12)	55
14. Secondary Supply	**(46,525)**	**23,216**	**(23,101)**	**(70)**	**22,573**	**5,146**	**9,123**	**1,162**	**2,776**
FINAL USE									
15. Residential	1	0	0	0	**960**	0	0	0	958
16. Commercial	14	0	0	0	**543**	0	214	41	288
17. Industry	7,358	0	0	0	**2,616**	101	2,009	296	179
18. Transport	65	0	0	0	**17,771**	11,029	5,542	0	0
19. Agriculture	0	0	0	0	**261**	0	260	1	0
20. Fishery	0	0	0	0	**547**	57	490	0	0
21. Non-Energy Use	9,193	0	0	0	**2,611**	0	0	0	1,998
22. Total Final Use	**16,631**	**0**	**0**	**0**	**25,309**	**11,188**	**8,516**	**338**	**3,423**
ELECTRICITY OUTPUT									
Main Activity Producer									
Gross Electricity Generation - GWh	48,262	0	0	0	**670**	0	670	0	0
Autoproducer									
Gross Electricity Generation - GWh	5,429	0	0	0	**176**	0	176	0	0

KEROSENE	ATF & AV GAS	NON-ENERGY	REFINERY GAS	COAL & COKE	HYDRO POWER	SOLAR	BIOMASS	BIOGAS	BIODIESEL	ELECTRICITY	TOTAL
0	0	0	0	1,878	2,348	181	232	142	912	0	**105,054**
0	0	0	0	0	0	0	0	0	0	0	**(13,763)**
1	761	1,344	0	22,235	0	0	0	0	0	2	**50,325**
(40)	(1,166)	(3,046)	0	0	0	0	0	0	(298)	(135)	**(48,967)**
0	0	0	0	0	0	0	0	0	0	0	**(546)**
8	(833)	451	0	708	0	0	0	0	177	0	**2,148**
0	0	0	0	(33)	0	0	0	0	0	0	**(57)**
(31)	**(1,238)**	**(1,252)**	**0**	**24,788**	**2,348**	**181**	**232**	**142**	**791**	**(134)**	**94,194**
0	0	0	0	0	0	0	0	0	0	0	**(6,790)**
35	0	314	0	0	0	0	0	0	0	0	**(566)**
0	0	0	0	0	0	0	0	0	0	0	**(1,347)**
0	0	0	0	0	0	0	0	0	0	0	**0**
35	**0**	**314**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**(8,703)**
12	2,459	1,954	156	0	0	0	0	0	0	0	**(2,299)**
0	0	0	0	0	(2,348)	0	0	0	0	2,348	**0**
0	0	0	0	(23,451)	0	(176)	(54)	(137)	0	12,085	**(21,739)**
0	0	0	0	0	0	(5)	(178)	(5)	0	539	**(1,100)**
0	**0**	**0**	**0**	**(23,451)**	**(2,348)**	**(181)**	**(232)**	**(142)**	**0**	**14,972**	**(22,839)**
0	0	(359)	(156)	0	0	0	0	0	0	(1,267)	**(2,806)**
17	(21)	(45)	0	0	0	0	0	0	0	(471)	**(379)**
63	**2,438**	**1,865**	**0**	**(23,451)**	**(2,348)**	**(181)**	**(232)**	**(142)**	**0**	**13,234**	**(37,026)**
2	0	0	0	0	0	0	0	0	0	3,124	**4,085**
0	0	0	0	0	0	0	0	0	0	3,480	**4,038**
31	0	0	0	1,338	0	0	0	0	0	6,403	**17,714**
0	1,199	0	0	0	0	0	0	0	791	34	**18,660**
0	0	0	0	0	0	0	0	0	0	59	**320**
0	0	0	0	0	0	0	0	0	0	0	**547**
0	0	613	0	0	0	0	0	0	0	0	**11,805**
32	**1,199**	**613**	**0**	**1,338**	**0**	**0**	**0**	**0**	**791**	**13,100**	**57,169**
0	0	0	0	88,875	27,295	2,044	169	427	0	0	**167,742**
0	0	0	0	0	4	15	623	15	0	0	**6,262**

TABLE 30: ENERGY BALANCE TABLE IN 2020 (PETAJOULES)

ENERGY BALANCE TABLE IN 2020 (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	3,037	0	1,121	0	**0**	0	0	0	0
2. Gas Flaring, Reinjection & Use	(576)	0	0	0	**0**	0	0	0	0
3. Imports	231	123	292	3	**527**	289	118	9	23
4. Exports	(49)	(1,094)	(444)	0	**(443)**	(74)	(162)	(18)	(11)
5. Bunkers	0	0	0	0	**(23)**	0	(5)	(17)	0
6. Stock Change	0	0	(1)	0	**54**	38	24	(8)	15
7. Statistical Discrepancy	0	0	(1)	0	**0**	0	0	0	0
8. Primary Supply	**2,642**	**(971)**	**967**	**3**	**114**	**253**	**(25)**	**(34)**	**27**
TRANSFORMATION									
9. Gas Plants									
9.1 MLNG	(1,381)	1,094	0	0	**2**	0	0	0	2
9.2 MDS	(42)	0	0	0	**18**	0	4	0	0
9.3 GPP-LPG (3&4/)	(140)	0	0	0	**84**	0	0	0	84
9.4 RGT	123	(123)	0	0	**0**	0	0	0	0
SUBTOTAL	**(1,440)**	**971**	**0**	**0**	**104**	**0**	**4**	**0**	**86**
10. Refineries	0	0	(961)	(3)	**868**	213	385	50	28
11. Power Stations & Self-Generation									
11.1 Hydro Stations	0	0	0	0	**0**	0	0	0	0
11.2 Thermal Stations	(412)	0	0	0	**(7)**	0	(6)	(0)	0
11.3 Self-Generation (5/)	(58)	0	0	0	**(2)**	0	(2)	0	0
SUBTOTAL	**(470)**	**0**	**0**	**0**	**(9)**	**0**	**(9)**	**(0)**	**0**
12. Losses & Own Use	(37)	0	(5)	0	**(22)**	0	0	(1)	0
13. Statistical Discrepancy	0	0	0	0	**4**	2	2	(1)	2
14. Secondary Supply	**(1,947)**	**971**	**(967)**	**(3)**	**944**	**215**	**382**	**49**	**116**
FINAL USE									
15. Residential	0	0	0	0	**40**	0	0	0	40
16. Commercial	1	0	0	0	**23**	0	9	2	12
17. Industry	308	0	0	0	**109**	4	84	12	7
18. Transport	3	0	0	0	**744**	461	232	0	0
19. Agriculture	0	0	0	0	**11**	0	11	0	0
20. Fishery	0	0	0	0	**23**	2	21	0	0
21. Non-Energy Use	385	0	0	0	**109**	0	0	0	84
22. Total Final Use	**696**	**0**	**0**	**0**	**1,059**	**468**	**356**	**14**	**143**
ELECTRICITY OUTPUT									
Main Activity Producer									
Gross Electricity Generation - GWh	48,262	0	0	0	**670**	0	670	0	0
Autoproducer									
Gross Electricity Generation - GWh	5,429	0	0	0	**176**	0	176	0	0

PRODUCTS											
KEROSENE	ATF & AV GAS	NON-ENERGY	REFINERY GAS	COAL & COKE	HYDRO POWER	SOLAR	BIOMASS	BIOGAS	BIODIESEL	ELECTRICITY	TOTAL
0	0	0	0	79	98	8	10	6	38	0	4,395
0	0	0	0	0	0	0	0	0	0	0	(576)
0	32	56	0	930	0	0	0	0	0	0	2,106
(2)	(49)	(127)	0	0	0	0	0	0	(12)	(6)	(2,049)
0	0	0	0	0	0	0	0	0	0	0	(23)
0	(35)	19	0	30	0	0	0	0	7	0	90
0	0	0	0	(1)	0	0	0	0	0	0	(2)
(1)	(52)	(52)	0	1,037	98	8	10	6	33	(6)	3,941
0	0	0	0	0	0	0	0	0	0	0	(284)
1	0	13	0	0	0	0	0	0	0	0	(24)
0	0	0	0	0	0	0	0	0	0	0	(56)
0	0	0	0	0	0	0	0	0	0	0	0
1	0	13	0	0	0	0	0	0	0	0	(364)
1	103	82	7	0	0	0	0	0	0	0	(96)
0	0	0	0	0	(98)	0	0	0	0	98	0
0	0	0	0	(981)	0	(7)	(2)	(6)	0	506	(910)
0	0	0	0	0	0	(0)	(7)	(0)	0	23	(46)
0	0	0	0	(981)	(98)	(8)	(10)	(6)	0	626	(956)
0	0	(15)	(7)	0	0	0	0	0	0	(53)	(117)
1	(1)	(2)	0	0	0	0	0	0	0	(20)	(16)
3	102	78	0	(981)	(98)	(8)	(10)	(6)	0	554	(1,549)
0	0	0	0	0	0	0	0	0	0	131	171
0	0	0	0	0	0	0	0	0	0	146	169
1	0	0	0	56	0	0	0	0	0	268	741
0	50	0	0	0	0	0	0	0	33	1	781
0	0	0	0	0	0	0	0	0	0	2	13
0	0	0	0	0	0	0	0	0	0	0	23
0	0	26	0	0	0	0	0	0	0	0	494
1	50	26	0	56	0	0	0	0	33	548	2,392
0	0	0	0	88,875	27,295	2,044	169	427	0	0	167,742
0	0	0	0	0	4	15	623	15	0	0	6,262

08

ENERGY FLOW CHART

ENERGY FLOW CHART

All units in the Energy Flow Chart are in ktoe

PRIMARY SUPPLY

PRIMARY SUPPLY* (94,194)

42.4%	NATURAL GAS 39,939	2.8%	PETROLEUM PRODUCTS & OTHERS 2,672
26.3%	COAL AND COKE 24,788	2.5%	HYDROPOWER 2,348
24.5%	CRUDE OIL 23,101	1.4%	RENEWABLES 1,345

PRIMARY PRODUCTION (105,054)

69.1%	NATURAL GAS 72,579	1.8%	COAL AND COKE 1,878
25.5%	CRUDE OIL 26,783	1.4%	RENEWABLES 1,466
2.2%	HYDROPOWER 2,348		

IMPORTS (50,325)

44.2%	COAL AND COKE 22,235	16.8%	NATURAL GAS & LNG 8,458
25.0%	PETROLEUM PRODUCTS 12,586	14.0%	CRUDE OIL & OTHERS 7,046

EXPORTS (48,967)

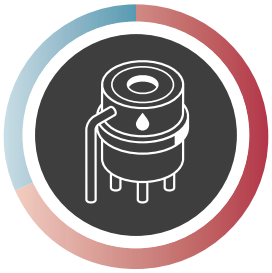
53.4%	LNG 26,155	2.4%	NATURAL GAS 1,179
21.9%	CRUDE OIL & OTHERS 10,744	0.6%	RENEWABLES 298
21.6%	PETROLEUM PRODUCTS 10,590	0.0%	COAL AND COKE -

TRANSFORMATION

GAS PLANT INPUT

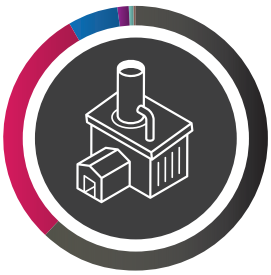
LNG	32,996
GPP-LPG	3,345
MDS	1,008

OIL REFINERIES INPUT



LOCAL	15,739
IMPORT	7,235

POWER STATIONS & SELF GENERATION INPUT



COAL AND COKE	23,451
NATURAL GAS	11,236
HYDRO	2,348
RENEWABLES	554
DIESEL	210
FUEL OIL	12

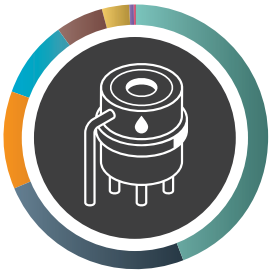
Notes (*): Primary Supply = Primary Production - Flaring + Imports - Exports - Bunkers (+-) Stock Change (+-) Statistical Discrepancy

FINAL USE

GAS PLANT OUTPUT

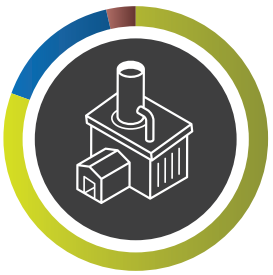
LNG	26,155
LPG	1,998
NON-ENERGY	314
DIESEL	92
LPG (FROM LNG)	51
KEROSENE	35

OIL REFINERIES OUTPUT



DIESEL	9,199
PETROL	5,089
ATF & AV GAS	2,459
NON-ENERGY	1,954
FUEL OIL	1,204
LPG	672
REFINERY GAS	156
KEROSENE	12

POWER STATIONS & SELF GENERATION OUTPUT



THERMAL	12,085
HYDRO	2,348
SELF-GENERATION	539

FINAL USE BY SECTOR (57,169)

32.6%	TRANSPORT 18,660	7.1%	COMMERCIAL 4,038
31.0%	INDUSTRY 17,714	1.0%	FISHERY 547
20.6%	NON-ENERGY USE 11,805	0.6%	AGRICULTURE 320
7.1%	RESIDENTIAL 4,085		

FINAL USE BY FUEL (57,169)

45.7%	PETROLEUM PRODUCTS 26,100	22.9%	ELECTRICITY 13,100
29.1%	NATURAL GAS 16,631	2.3%	COAL AND COKE 1,338

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 rigorous accounting unit, while the "tonnes oil equivalent" (1 toe= 41.84 Gigajoules) was chosen as the final unit for presentation 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 LNG, MDS and GPP-LPG 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 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 is 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 Reserve Margin = $\frac{\text{Installed Capacity – Peak Demand}}{\text{Peak Demand}}$
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 Reserves	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 Reserves	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 Reserves	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

Note:- 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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