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Energy Commission

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Ministry of Energy, Green Technology and Water

National Energy Balance 2011

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National Energy Balance 2011

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Preface

On the demand side, final energy demand increased by 4.8 percent, from 41,476 ktoe in 2010 to 43,455 ktoe in 2011. This increase in final energy demand was mainly attributed to the non-energy sector which consumed about 14.7 percent of the total final energy demand.

Despite the challenging international economic environment in 2011, the Malaysian economy recorded a steady growth rate of 5.1 percent (2010: 7.4 percent). Primary energy supply correspondingly recorded an increase of 3.2 percent from 76,809 ktoe in 2010 to 79,289 ktoe in 2011. The supply of crude oil and petroleum products, which increased by 7.7 percent, was the major contributor to the increase in the primary energy supply. Nevertheless, natural gas, with 45.1 percent share of the total primary energy supply, remained the dominant fuel in the country's energy supply mix.

On the demand side, final energy demand increased by 4.8 percent, from 41,476 ktoe in 2010 to 43,455 ktoe in 2011. This increase in final energy demand was mainly attributed to the non-energy sector which consumed about 14.7 percent of the total final energy demand.

In the power sector, coal overtook natural gas as the fuel with the biggest share of energy input for electricity generation, at 46.6 percent of the total input of 27,924 ktoe. Natural gas decreased its share to 39.3 percent compared to 45.6 percent in 2010. Hydro contributed 6.6 percent, an increase from its share in 2010 of 5.7 percent. The share of fuel oil and diesel increased significantly to 7.5 percent when compared to the previous year's share of only 1.9 percent.

Industrial energy intensity increased by 6.7 percent from 57.2 toe/RM million of GDP in 2010 to 61.1 toe/RM million of GDP in 2011. Malaysia's final energy intensity improved from 61.3 toe/RM million in 2010 to 61.1 toe/RM million, equivalent to a reduction of 0.3 percent.

The National Energy Balance (NEB) report shows that, generally over the years, Malaysia's demand for energy has been rising with our economic growth, although our final energy intensity has improved since 2002. In addressing this increasing energy demand challenge, more market-based mechanisms need to be introduced to incentivise optimal resource allocation as well as further improve energy efficiency and supply security.

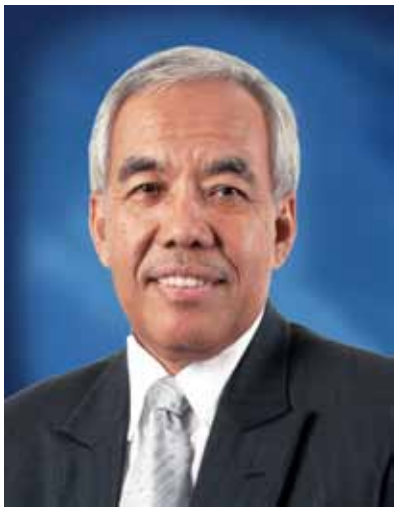
Reliable monitoring and projection of energy supply and consumption by the government and industry becomes indispensable for sound decision making. In this regard, accurate and timely national energy statistics of the NEB report is indeed the foundation for developing sound national energy policies. They will enable us to initiate and implement relevant and timely policy initiatives to meet our future energy demand requirements.

I wish to thank all relevant government agencies, power utilities, independent power producers, oil and gas companies, coal producers, cement and iron and steel manufacturers, and others, for your continuing support in the publication of the NEB.

Thank you.

YB DATUK SERI PANGLIMA DR. MAXIMUS JOHNITY ONGKILI
Minister of Energy, Green Technology and Water
Malaysia

Introduction



This 2nd publication of the National Energy Balance (NEB) report by the Energy Commission (ST) is a reflection of the added responsibility of being the main reference point for energy data in Malaysia apart from its roles as the nation's regulator of electricity and piped gas supplies. This report is a complete statistical publication for energy supply and demand of the nation, and is based on an energy balance format using similar energy units for all the reported data.

The NEB provides not only historical and statistical data on energy supply and demand, but also has energy indicators which show the performance of the energy sector in the country. The report covers three major areas, namely the Energy Supply, Transformation and Final Use, and includes natural gas, crude oil, petroleum products, coal and coke, electricity, hydropower and renewable energy.

As the focal point for energy data for Malaysia, ST has made collaborative arrangements, to provide monthly, quarterly and annual energy data to the relevant agencies such as the International Energy Agency (IEA), International Energy Forum Secretariat (IEFS), The Institute of Energy Economics, Japan (IEEJ), Asia Pacific Economic Cooperation (APEC) and ASEAN Centre for Energy (ACE). Additionally, ST also contributes annually to the ASEAN Energy Outlook Report, which is jointly prepared under Energy Supply Security Planning for ASEAN (ESSPA), an area of cooperation between IEEJ and ACE.

To ensure accurate, reliable and up-to-date data for the policy makers and other stakeholders of the energy sector, ST has undertaken various efforts towards strengthening relationships with data providers as it will be important to get their cooperation. Activities such as workshops, dialogue sessions and site visits have been regularly conducted with these entities, to identify and resolve issues pertaining to the gathering of energy data and statistics.

In this publication, efforts have been made to enhance the NEB coverage and scope by putting in renewable energy sources and presenting energy consumption by subsectors. Also included is data for biodiesel used in the transport sector.

The public can access the Malaysian Energy Information Hub (MEIH) to obtain historical data of energy demand and supply from 1978 till the present. The data can be downloaded in PDF or Excel format.

In 2013, we hope to integrate the data input system in the MEIH website, so as to enable all data providers of NEB to submit the data online through the MEIH website. This will improve data accuracy by minimising human error during the process of data entry by data providers.

I wish to express our gratitude to the Ministry of Energy, Green Technology and Water and all data providers for their support and contributions towards the preparation of this NEB report.

Thank you.

TAN SRI DATUK DR. AHMAD TAJUDDIN BIN ALI
Chairman of Energy Commission
Malaysia

Data Compilation

The first stage in compiling the overall 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 demand 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 actual sales data. It is necessary, therefore, to include two "statistical discrepancies" - the first to account for the difference in apparent inland delivery of primary supply mainly due to the difficulties in obtaining actual stock change data and difference in data compilation at source and the second 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 discrepancy also acts as a balancing tool to minimize 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 discrepancy. However, for electricity, distribution losses and the sector's own use of electricity are accounted for in the "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 distributors and final users. Only oil companies' stocks were 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 a producer in Sarawak are taken into account.

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

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

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

Executive Summary

Energy Overview

The Malaysian economy recorded a steady pace of growth of 5.1 percent in 2011, despite the challenging international economic environment. Growth was lower in the first half of the year, particularly in the second quarter, as the economy was affected by the overall weakness in the advanced economies and the disruptions in the global manufacturing supply chain arising from the natural disaster in Japan. Although the global economic environment became increasingly more challenging and uncertain in the second half of the year, Malaysia's economic growth improved due to stronger domestic demand.

With the positive and strong economic growth, Malaysia's energy supply and demand also rose in tandem. Total primary energy supply and final energy demand recorded a growth of 3.2 percent and 4.8 percent respectively when compared with that of the previous year. The lower growth rates of final energy demand compared with GDP indicates that Malaysia used energy more efficiently.

Primary Energy Supply

The Malaysian total primary energy supply in 2011 was recorded at 79,289 ktoe, a 3.2 percent growth from the previous year (2010: 3.0 percent). The growth was attributed to the higher imports of energy in order to meet local demand. The highest increase of imports was observed for natural gas as it recorded an increase of 26.3 percent to settle at 6,979 ktoe. The total increase of primary energy supply was attributed to the lower total exports of energy, as it declined by 6.6 percent to settle at 49,142 ktoe. This high drop was due to the lower export of crude oil which declined by 33.4 percent in 2011 compared to that in the previous year to register at 11,404 ktoe.

In 2011, the total crude oil and condensates production posted a decrease of 1.8 percent from that of 2010 to 28,325 ktoe or 569.8 thousand barrels per day. This was due to major scheduled maintenance and shutdown programmes that were carried out during this period, involving over 70 fields and 10 pipelines. These shutdowns were planned to coincide with tie-in work for new field development facilities that are expected to come on-stream in the next few years. Natural gas production remained stable, averaging at 7,299 million standard cubic feet per day (mmscfd) compared to 7,476 mmscfd in the previous year. A slight decrease was recorded for Peninsular Malaysia and Sabah with 13.2 percent and 3.2 percent negative growth rates respectively. Overall, the production of oil and gas was maintained by the addition of three new gas fields (Cilipadi, F9 and Melor & Laho) and three new oil fields (Dana, East Piatu and Sepat) that were brought on-stream in 2011. This increased the total number of producing fields in Malaysia to 124, comprising 76 oil fields and 48 gas fields.

The primary supply of crude oil was at 24,679 ktoe in 2011, an increase of 9.7 percent from 22,487 ktoe in 2010. The increase was mainly due to higher imports and lower exports during the 2011 period. The primary supply of natural gas which stood at 35,740 ktoe in 2011 is an increase of 0.8 percent from the 2010 level of 35,447 ktoe. The increase was mainly due to higher imports of natural gas in 2010. The primary supply of coal and coke in the country was stable at 14,772 ktoe in 2011 compared to 14,777 ktoe in 2010. Higher imports of coal and coke in 2011, which increased by 5.5 percent, was recorded in line with the increase in local demand especially from the power sector. In 2011, the primary supply of hydropower energy recorded an increase of 17.3 percent to 1,850 ktoe. This was due to the commissioning of Bakun Hydro that generated 300 MW in 3Q 2011 and 750 MW in 4Q 2011.

As of 1st January 2011, Malaysia's crude oil reserves stood at 5.858 billion barrels compared to 5.799 billion barrels in the previous year. This increase was due mainly from Peninsular Malaysia totalling 2.374 billion barrels compared to that in the previous year at 2.061 billion barrels. Meanwhile, as of 1st January 2011, Malaysia's natural gas reserves increased to 89.988 trillion standard cubic feet (tscf), from the 2010 level of 88.587 tscf. PETRONAS made two gas discoveries in the shallow water areas offshore of the west coast of Sabah. The first discovery was via the Zuhal East-1 well, which is located in the Samarang Asam Paya Block about 130 km southwest of Kota Kinabalu. The well was spudded in at a water depth of 38 m and reached a total depth of 2,336 m to confirm the presence of significant gas-bearing reservoirs. The current estimate of gas-initially-in-place is about 550 billion standard cubic feet (bscf).

Energy Transformation

The total oil refineries production in 2011 was recorded at 23,867 ktoe, an increase of 12.5 percent compared to the previous year (2010: 21,207 ktoe). All major petroleum products showed an upward trend except for Petrol, LPG and Kerosene. Of the total production, Diesel took up the highest share (37.4 percent), followed by Non-Energy (19.1 percent), Petrol (15.1 percent), ATF and AV GAS (14.5 percent), Refinery Gas (6.9 percent), LPG (2.8 percent), Fuel Oil (2.4 percent) and Kerosene (1.8 percent). Currently, Malaysia's total refinery capacity is 492 thousand barrels per day, excluding the condensates splitter capacity of 74.3 thousand barrels per day.

Liquefied Petroleum Gas (LPG) production from the Gas Processing Plant (GPP) increased to 2,434 ktoe compared to the previous level of 2,299 ktoe. The LPG production from the Liquefied Natural Gas (LNG) plants recorded a more than double drop to 214 ktoe in 2011 compared to the previous year's level of 451 ktoe. The Middle Distillate Synthesis (MDS) plant output also showed a downward trend of 20.9 percent to settle at 359 ktoe compared to the previous year's level of 454 ktoe. The petroleum products from MDS plant consisted of 70.2 percent Non-Energy products, 20.6 percent Diesel and 9.2 percent Kerosene.

Electricity

Malaysia's total installed electricity generation capacity as of 31st December 2011 was at 28,749 MW. Peninsular Malaysia had about 84.3 percent of the total, followed by Sarawak at 9.0 percent and Sabah at 6.7 percent. An additional 750 MW of major hydro capacities were recorded for 2011 in Sarawak. Gross electricity generation registered 123,561 GWh, an increase of 14.2 percent from the previous year (2010: 108,175 GWh). The electricity consumption was 107,330 GWh, an increase of 2.7 percent from the previous year (2010: 104,521 GWh). The peak demand for Peninsular Malaysia of 15,476 MW was recorded in the second quarter of the year (2Q 2011), while in Sarawak it was at 1,214 MW (in 3Q 2011) and in Sabah it was at 830 MW (2Q 2011). The calculated reserve margin for Peninsular Malaysia was 37.0 percent, 66.8 percent for Sarawak and 40.7 percent for Sabah.

In 2011, the total energy or fuel input to power stations increased by 0.8 percent to 27,924 ktoe. The biggest drop was observed for Natural Gas, as it decreased by 13.1 percent from the 2010 level at 12,628 ktoe to 10,977 ktoe in 2011. In order to meet the local demand, the power industry shifted to diesel and fuel oil. As a result, Fuel Oil and Diesel inputs in power station increased significantly by 782.4 percent and 136.4 percent respectively. Analysis by fuel share showed that Coal and Coke are the main fuel sources for electricity generation with 46.6 percent of the total fuel inputs, followed by Natural Gas at 39.3 percent, Hydropower at 6.6 percent, Fuel Oil at 4.0 percent and Diesel at 3.5 percent.

The total electricity consumption in the country remained robust with a growth rate of 2.7 percent. The agriculture sector showed the highest growth with 9.6 percent, followed by commercial at 4.8 percent and the remaining residential and industrial sectors both grew at 1.7 percent. The industrial sector was the main consumer of electricity in Malaysia with its share of 43.9 percent of the total consumption in 2011. This was followed by the commercial sector at 34.3 percent, residential sector at 21.4 percent, agriculture sector at 0.3 percent and transport sector at 0.2 percent.

Final Energy Demand

Total final energy demand in 2011 experienced an increase of 4.8 percent from the previous year to register at 43,455 ktoe. The increase was attributed to the high demand from the non-energy sector which grew 72.5 percent to settle at 6,377 ktoe. This was followed by the residential sector's demand growth of 4.2 percent. Demand from the transport sector also increased in 2011 by 1.4 percent to 17,070 ktoe. Analysis showed that the transport sector was still the main consumer of energy in the country with a share of 39.3 percent. This was followed by the industrial sector at 27.8 percent, non-energy sector at 14.7 percent, commercial sector at 9.7 percent, residential sector at 6.4 percent and the agriculture sector at 2.1 percent.

In 2011, the industrial GDP of Malaysia registered a positive growth of 2.7 percent compared to the previous year, with growth mainly coming from the manufacturing and construction sectors. In terms of energy efficiency, Malaysia's industrial energy intensity for 2011 was 61.3 toe/RM million, an increase of 6.7 percent from the previous year's intensity.

The total final energy demand by type of fuels shows that Petroleum Products constituted about 55.1 percent of total

energy demand, followed by Electricity at 21.3 percent, Natural Gas at 19.6 percent and Coal and Coke at 4.0 percent. All fuels experienced demand growth in 2011, except for Coal and Coke and total Petroleum Products. Natural Gas demand recorded the highest growth rate with 36.2 percent, followed by Electricity at 2.7 percent growth. Coal and Coke final demand decreased by 3.7 percent to 1,759 ktoe. Total demand for Petroleum Products also experienced a similar trend with a negative growth rate of 1.9 percent to register at 23,946 ktoe.

Final Demand for Petroleum Products

In 2011, the total final energy demand for Petroleum Products declined by 2.0 percent with the major drop coming from the Petrol and Fuel Oil. Final demand for Petrol dropped by 14.7 percent whilst demand for Fuel Oil and LPG decreased by 13.4 percent and 1.0 percent respectively. In terms of share, Diesel (36.4 percent) and Petrol (34.1 percent) continued to be the largest contributors to the total demand for Petroleum Products. This was followed by LPG (12.1 percent), ATF and AV GAS (10.7 percent), Non-Energy (4.9 percent), Fuel Oil (1.7 percent) and Kerosene (0.1 percent).

Outlook in 2012

Amid the more challenging external environment, Malaysia's economy is projected to experience a steady pace of growth of 4 – 5 percent in 2012. Domestic demand is expected to remain resilient and will continue to be the anchor for growth. The global oil and gas sector is expected to remain exciting in 2012, driven by dynamic business drivers such as oil price, energy demand outlook, global economic recovery and geopolitical uncertainties. Global oil demand is still projected to grow at a revised rate of 1.2 percent in 2012 compared to 1.5 percent in 2011. This downward revision is primarily attributed to weaker demand from Europe as well as higher oil prices. The majority of global oil demand growth will be from the emerging economies, with China contributing 25 percent of this growth in 2012. As for the power sector, the Government in 2011 passed the Renewable Energy (RE) Act, and launched a roadmap to increase the contribution of RE to the electricity generation mix from less than 1 percent currently to 5.5 percent by 2015. Under the Act, a Feed-in Tariff (FiT) mechanism will be implemented in December 2011, to be paid for by contributions of 1 percent of consumer electricity bills into an RE fund.

Key Economic and Energy Data

Key Economic and Energy Data

Table 1: Key Economic and Energy Data

	2011				
	1Q	2Q	3Q	4Q	Total
GDP at 2005 prices (RM million)*	170,667	174,887	181,357	184,440	711,351
GDP at current prices (RM million)*	211,394	217,956	224,687	230,419	884,456
GNI at 2005 prices (RM million)*	159,292	162,709	171,687	173,206	666,894
GNI at current prices (RM million)*	205,432	211,274	220,931	225,013	862,650
Population ('000 people)**	28,870	28,964	29,057	29,151	28,964
Primary Energy Supply (ktoe)	19,568	19,263	20,043	20,414	79,289
Final Energy Demand (ktoe)	10,506	11,043	11,215	10,692	43,455
Electricity Demand (ktoe)	2,171	2,377	2,382	2,305	9,235
Electricity Demand (GWh)	25,232	27,626	27,684	26,789	107,331
Per Capita					
GDP (at 2005 prices, RM million)*	5,912	6,038	6,241	6,327	24,560
Primary Energy Supply (toe)	0.678	0.665	0.690	0.700	2.737
Final Energy Demand (toe)	0.364	0.381	0.386	0.367	1.500
Electricity Demand (kWh)	874	954	953	919	3,706
Energy Intensity					
Primary Energy Supply (toe/GDP at 2005 prices (RM million))	114.7	110.1	110.5	110.7	111.5
Final Energy Demand (toe/GDP at 2005 prices (RM million))	61.6	63.1	61.8	58.0	61.1
Electricity Demand (toe/GDP at 2005 prices (RM million))	12.7	13.6	13.1	12.5	13.0
Electricity Demand (GWh/GDP at 2005 prices (RM million))	0.148	0.158	0.153	0.145	0.151

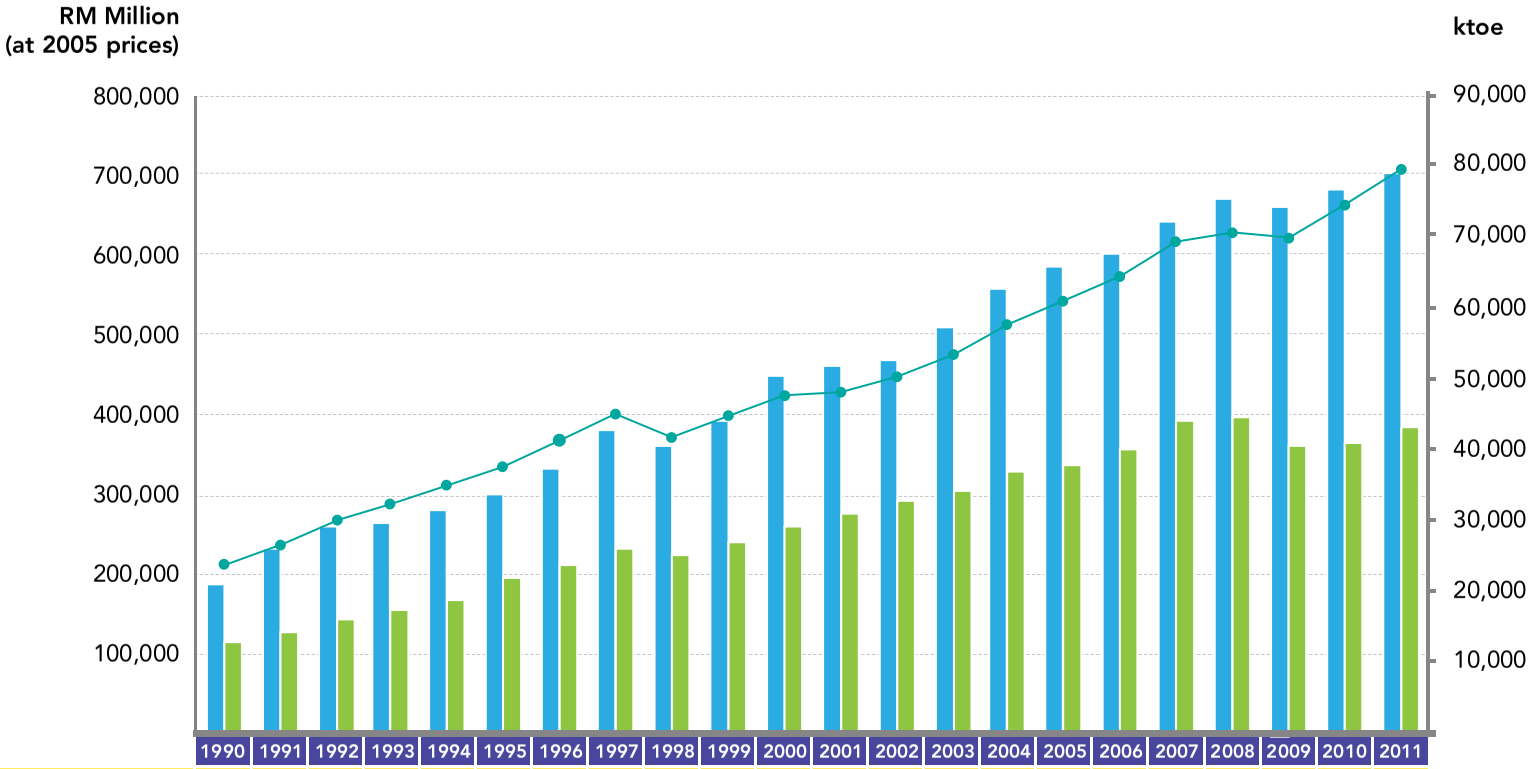
Note
(*) : Quarterly data from Department of Statistics Malaysia
(**) : Mid-year population from Department of Statistics Malaysia

Table 2: Key Economic and Energy Data by Region

Peninsular Malaysia	2005	2006	2007	2008	2009	2010	2011
GDP at 2005 prices (RM million)	459,893	486,659	517,780	544,320	534,023	577,044	606,634*
Population ('000 people)**	21,075	21,370	21,662	21,951	22,241	22,656	23,132
Final Energy Demand (ktoe)	32,195	34,390	37,921	38,530	34,521	35,593	35,970
Electricity Demand (ktoe)	6,366	6,669	7,030	7,307	7,567	8,145	8,427
Electricity Demand (GWh)	73,987	77,504	81,710	84,924	87,950	94,666	97,939
Per Capita							
GDP at 2005 prices (RM million)	21,822	22,773	23,903	24,797	24,011	25,470	26,225
Final Energy Demand (toe)	1.528	1.609	1.751	1.755	1.552	1.571	1.555
Electricity Demand (kWh)	3,511	3,627	3,772	3,869	3,955	4,178	4,234
Energy Intensity							
Final Energy Demand (toe/GDP at 2005 prices (RM million))	70.0	70.7	73.2	70.8	64.6	61.7	59.3
Electricity Demand (toe/GDP at 2005 prices (RM million))	13.8	13.7	13.6	13.4	14.2	14.1	13.9
Electricity Demand (GWh/GDP at 2005 prices (RM million))	0.161	0.159	0.158	0.156	0.165	0.164	0.161
Sabah	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
GDP at 2005 prices (RM million)	30,594	32,059	33,365	35,808	37,215	38,173	40,131*
Population ('000 people)**	3,076	3,099	3,125	3,154	3,184	3,207	3,316
Final Energy Demand (ktoe)	2,806	2,587	2,879	3,068	3,046	2,758	3,465
Electricity Demand (ktoe)	238	255	285	299	329	355	368
Electricity Demand (GWh)	2,766	2,969	3,317	3,474	3,818	4,127	4,275
Per Capita							
GDP at 2005 prices (RM million)	9,947	10,345	10,676	11,353	11,689	11,904	12,101
Final Energy Demand (toe)	0.912	0.835	0.921	0.973	0.957	0.860	1.045
Electricity Demand (kWh)	899	958	1,061	1,102	1,199	1,287	1,289
Energy Intensity							
Final Energy Demand (toe/GDP at 2005 prices (RM million))	91.7	80.7	86.3	85.7	81.9	72.3	86.3
Electricity Demand (toe/GDP at 2005 prices (RM million))	7.8	8.0	8.6	8.3	8.8	9.3	9.2
Electricity Demand (GWh/GDP at 2005 prices (RM million))	0.090	0.093	0.099	0.097	0.103	0.108	0.107
Sarawak	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
GDP at 2005 prices (RM million)	53,091	55,218	58,942	59,437	58,647	61,436	64,586*
Population ('000 people)**	2,327	2,363	2,399	2,435	2,471	2,507	2,516
Final Energy Demand (ktoe)	3,274	3,330	3,461	3,302	3,277	3,125	4,019
Electricity Demand (ktoe)	339	348	368	380	391	493	440
Electricity Demand (GWh)	3,940	4,045	4,277	4,416	4,544	5,730	5,116
Per Capita							
GDP at 2005 prices (RM million)	22,820	23,371	24,569	24,409	23,735	24,511	25,668
Final Energy Demand (toe)	1.407	1.409	1.443	1.356	1.326	1.247	1.597
Electricity Demand (kWh)	1,694	1,712	1,783	1,814	1,839	2,286	2,033
Energy Intensity							
Final Energy Demand (toe/GDP at 2005 prices (RM million))	61.7	60.3	58.7.0	55.6	55.9	50.9	62.2
Electricity Demand (toe/GDP at 2005 prices (RM million))	6.4	6.3	6.2	6.4	6.7	8.0	6.8
Electricity Demand (GWh/GDP at 2005 prices (RM million))	0.074	0.073	0.073	0.074	0.077	0.093	0.079

Note
(*) : Estimated based on data from Department of Statistics Malaysia
(**) : Mid-year population from Department of Statistics Malaysia

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

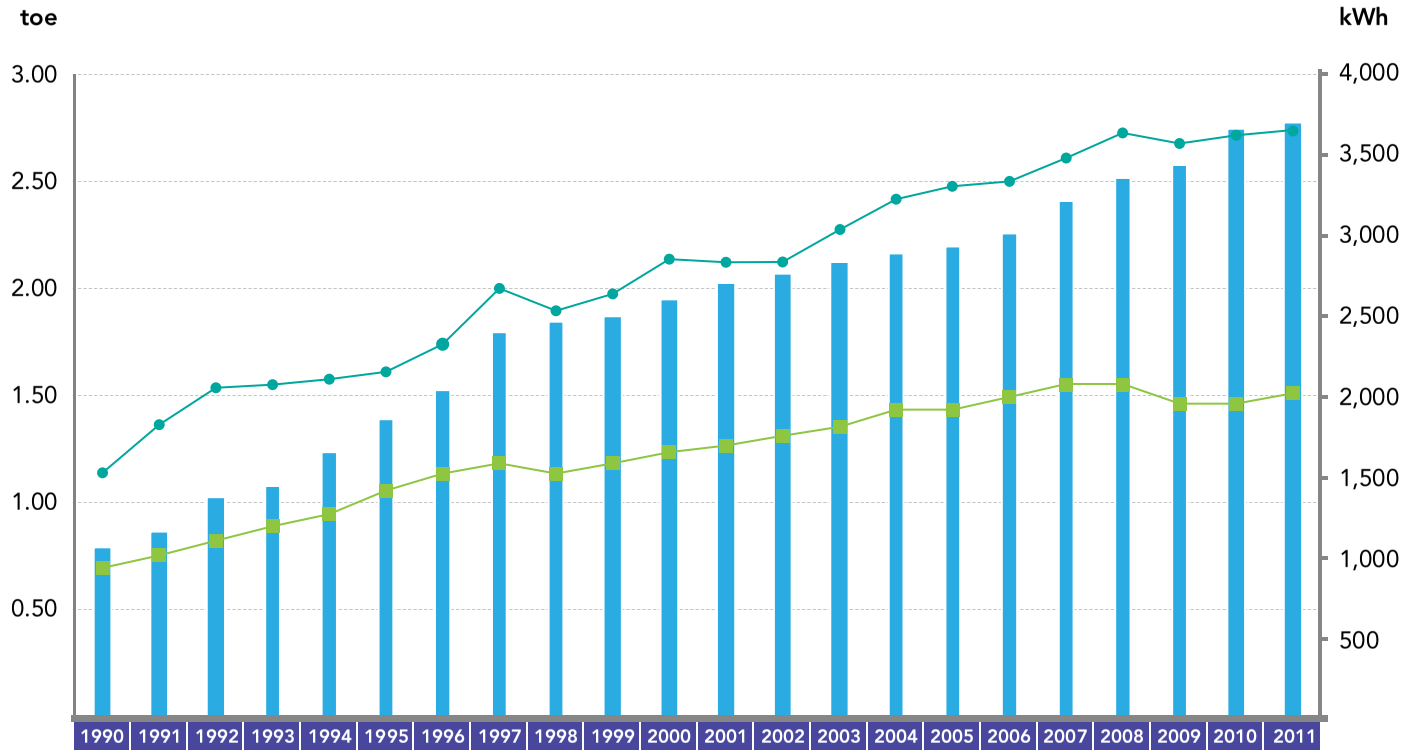


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Primary Energy Supply (ktoe)	21,471	26,335	29,291	29,925	31,662	33,879	37,840	43,173	40,996	44,534	50,710	51,979	53,196	57,565	62,836	66,211	67,021	72,389	76,032	74,583	76,809	79,289
Final Energy Demand (ktoe)	13,146	14,563	16,185	17,728	19,287	22,164	24,181	26,167	25,558	27,228	29,699	31,515	33,289	34,586	37,323	38,285	38,567	41,606	41,968	40,845	41,476	43,455
GDP at 2005 Prices (RM million)*	217,047	237,766	258,891	284,509	310,718	341,258	375,393	402,882	373,231	396,140	431,234	433,466	456,834	483,278	516,061	543,578	573,936	610,087	639,565	629,885	676,653	711,351

Note:
i) Primary Energy Supply does not include Renewable Energy (RE) except Hydropower

Source:
i) Department of Statistics Malaysia
ii) National Energy Balance 2010

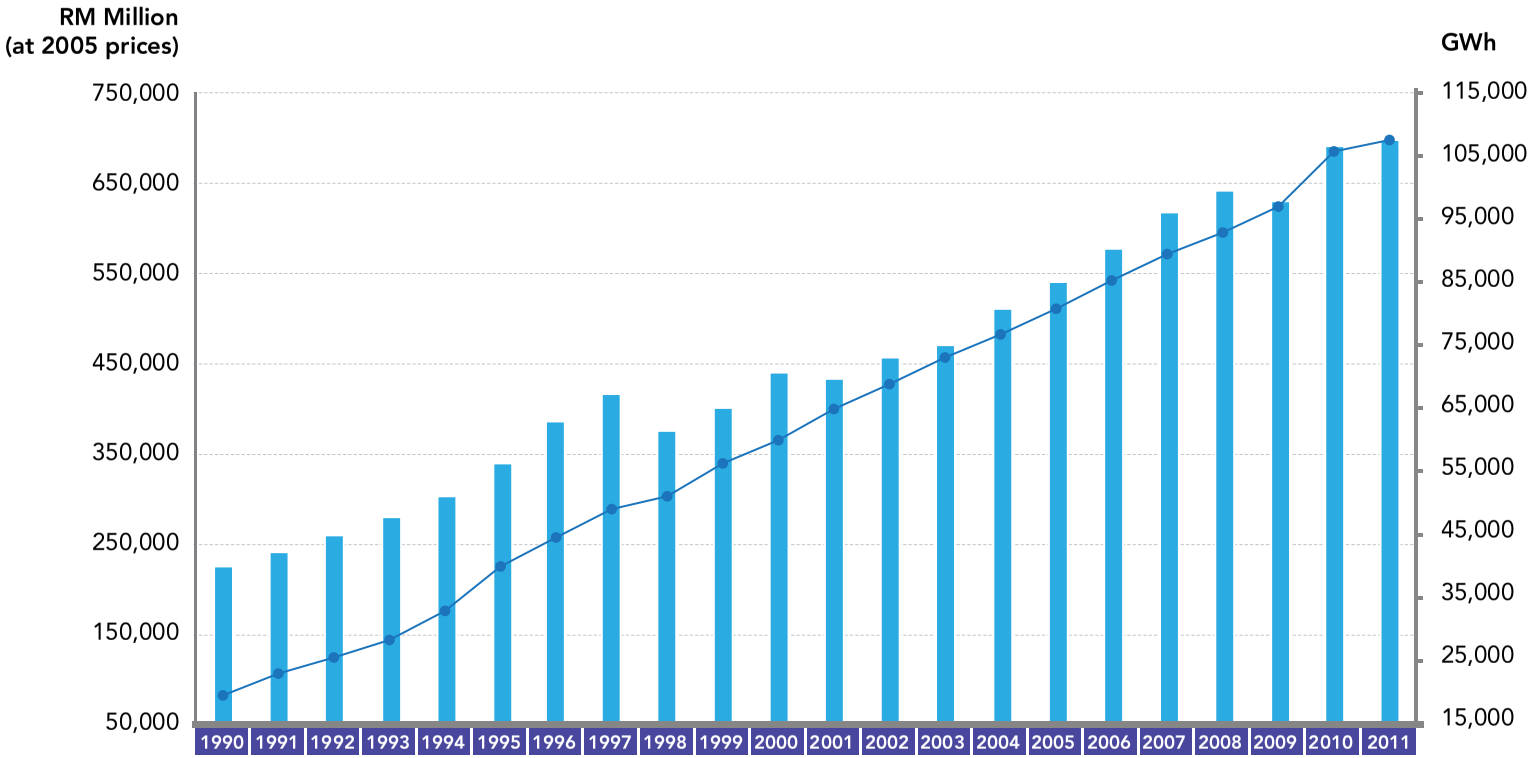
Figure 2: Primary Energy Supply, Electricity Demand and Final Energy Demand per Capita



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Electricity Demand per Capita (kWh)	1,101	1,178	1,358	1,460	1,700	1,902	2,080	2,359	2,406	2,472	2,603	2,695	2,783	2,898	2,980	3,048	3,150	3,285	3,370	3,452	3,700	3,706
Primary Energy Supply per Capita (toe)	1.19	1.39	1.54	1.53	1.58	1.64	1.79	2.00	1.85	1.97	2.16	2.15	2.15	2.27	2.43	2.50	2.50	2.66	2.76	2.67	2.72	2.74
Final Energy Demand per Capita (toe)	0.73	0.77	0.85	0.91	0.96	1.07	1.15	1.21	1.16	1.20	1.26	1.31	1.35	1.37	1.44	1.45	1.44	1.53	1.52	1.46	1.47	1.50

Source:
i) Department of Statistics Malaysia
ii) National Energy Balance 2010

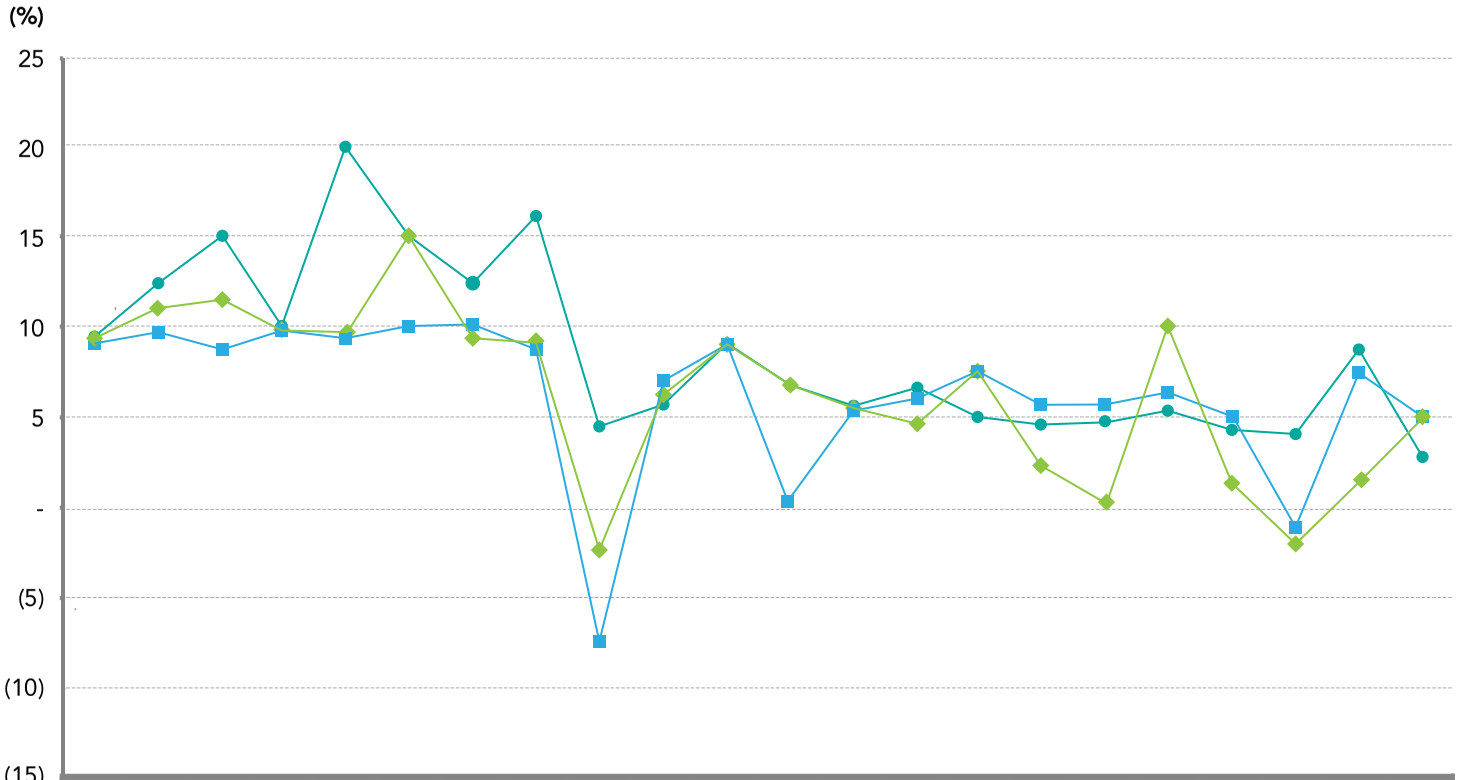
Figure 3: Trends in GDP and Electricity Consumption



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP at 2005 Prices (RM Million)	217,048	237,766	258,892	284,508	310,717	341,258	375,394	402,883	373,233	396,140	431,234	433,466	456,834	483,278	516,061	543,578	573,936	610,087	639,565	629,885	676,653	711,351
Electricity Demand (GWh)	19,932	22,373	25,778	28,474	34,076	39,225	43,897	50,952	53,195	55,961	61,168	65,015	68,827	73,371	77,195	80,705	84,517	89,294	92,815	96,302	104,519	107,331

Source:
i) Department of Statistics Malaysia
ii) National Energy Balance 2010

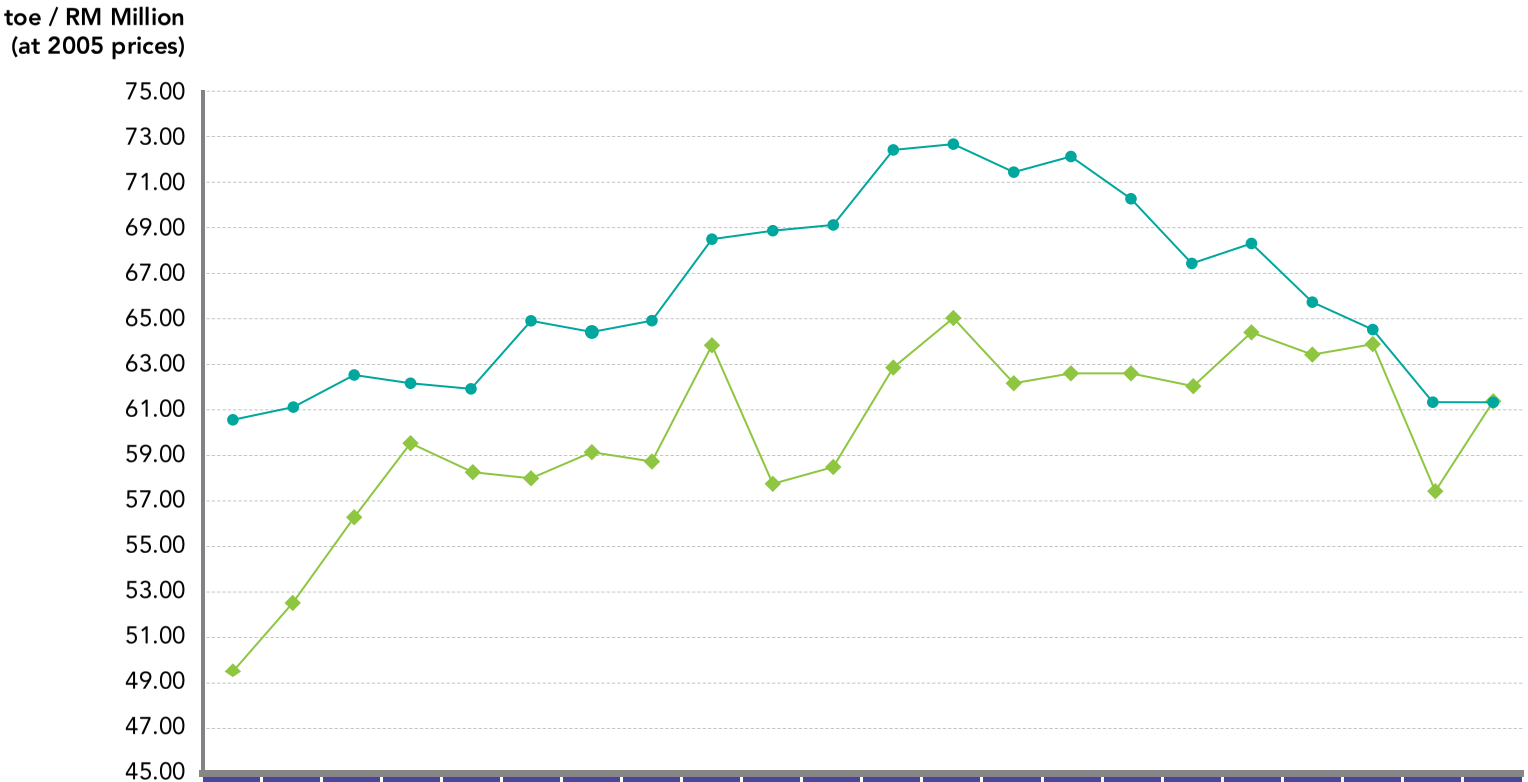
Figure 4: Annual Growth Rates of GDP, Final Energy Demand and Electricity Demand



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP at 2005 Prices	9.01	9.55	8.88	9.90	9.21	9.83	10.00	7.32	(7.36)	6.14	8.86	0.52	5.39	5.79	6.78	5.33	5.58	6.30	4.83	(1.51)	7.42	5.13
Final Energy Demand	8.70	10.78	11.14	9.53	8.79	14.92	9.10	8.21	(2.33)	6.53	9.08	6.11	5.63	3.90	7.91	2.58	0.74	7.88	0.87	(2.68)	1.54	4.77
Electricity Demand	9.70	12.24	15.22	10.46	19.67	15.11	11.91	16.07	4.40	5.20	9.30	6.29	5.86	6.60	5.21	4.55	4.72	5.65	3.94	3.76	8.53	2.69

Source:
i) Department of Statistics Malaysia
ii) National Energy Balance 2010

Figure 5: Final Energy Intensity

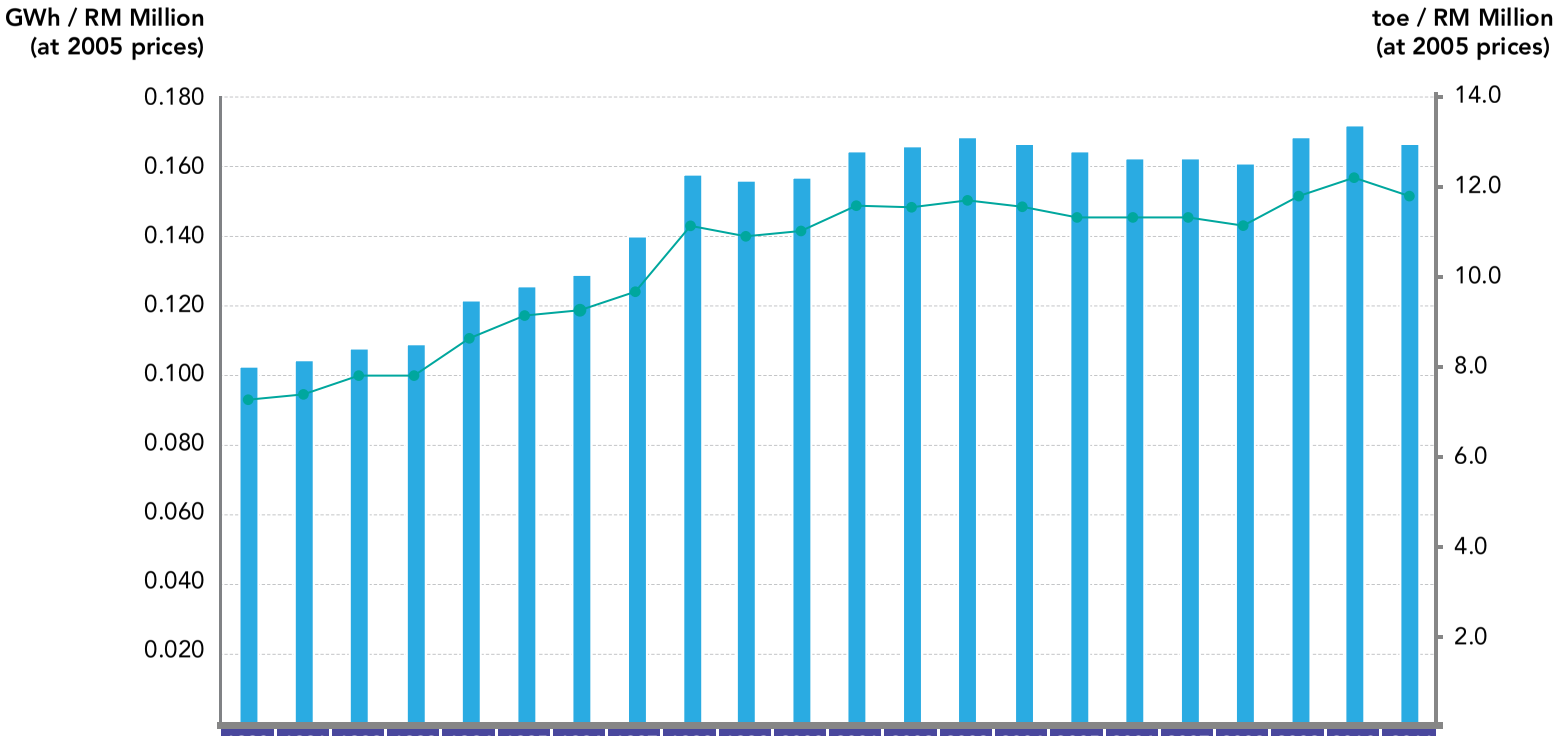


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Final Energy Intensity (toe / RM Million at 2005 Prices)*	60.57	61.25	62.52	62.31	62.07	64.95	64.42	64.95	68.48	68.73	68.87	72.70	72.87	71.57	72.32	70.43	67.20	68.20	65.62	64.85	61.30	61.09
Industrial Energy Intensity (toe / RM Million at 2005 Prices)**	49.43	52.37	56.22	59.68	58.10	57.92	59.07	58.91	63.60	57.91	58.43	62.45	64.90	62.15	62.74	62.80	61.95	64.68	63.23	63.89	57.24	61.08

Note:
Intensity = Quantity of energy required per unit output or activity
(*) : Final Energy Demand / GDP at 2005 prices
(**): Industrial Energy Demand / Industrial GDP at 2005 prices

Source:
i) Department of Statistics Malaysia
ii) National Energy Balance 2010

Figure 6: Electricity Intensity

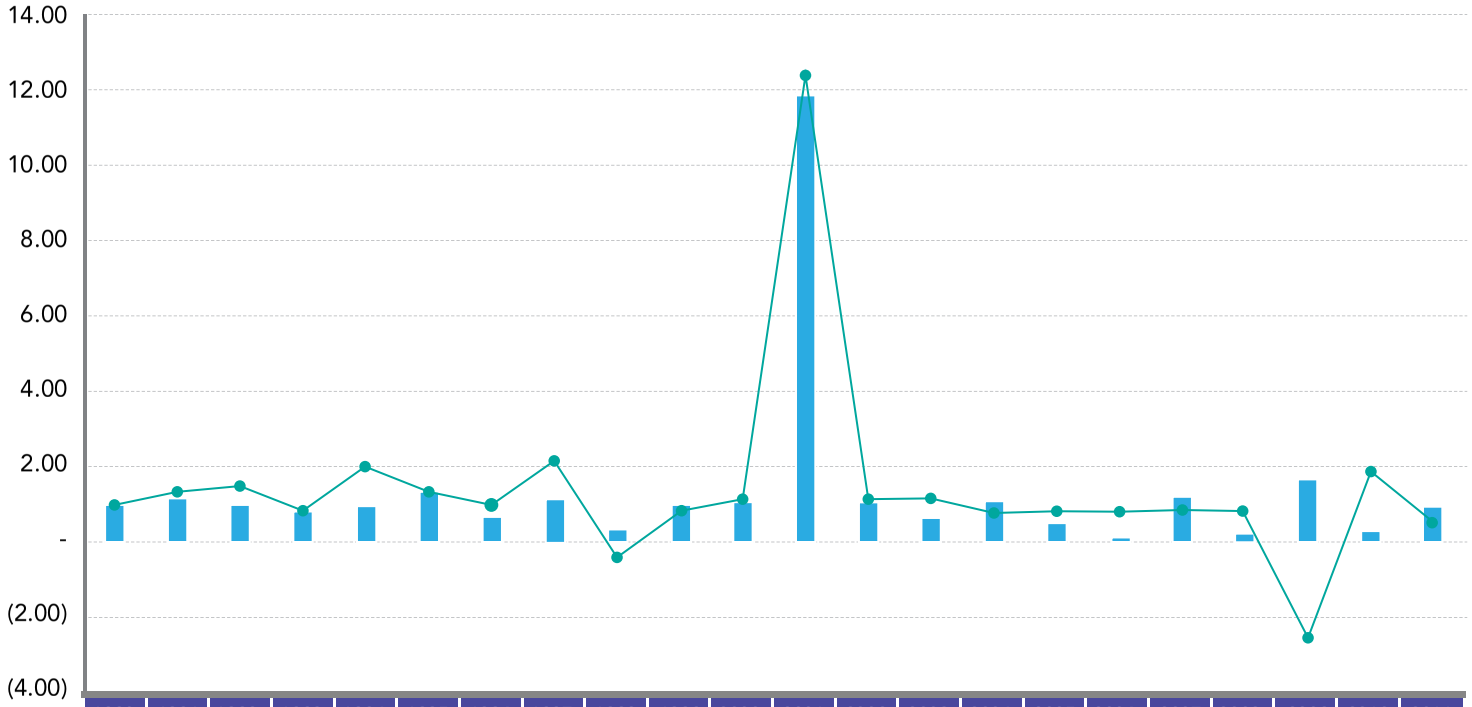


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Electricity Intensity (toe/GDP at 2005 Prices (RM Million))*	7.9	8.1	8.6	8.6	9.4	9.9	10.1	10.9	12.3	12.2	12.2	12.9	13.0	13.1	12.9	12.8	12.7	12.6	12.5	13.2	13.3	13.0
Electricity Intensity (GWh/GDP at 2005 Prices (RM Million))**	0.092	0.094	0.100	0.100	0.110	0.115	0.117	0.126	0.143	0.141	0.142	0.150	0.151	0.152	0.150	0.148	0.147	0.146	0.145	0.153	0.155	0.151

Note:
Intensity = Quantity of energy required per unit output or activity
(*) : Electricity Intensity (toe/ RM Million GDP) at 2005 prices
(**): Electricity Intensity (GWh/RM Million GDP) at 2005 prices

Sources:
i) Department of Statistics Malaysia
ii) TNB, SESB, SEB and IPPs
iii) National Energy Balance 2010

Figure 7: Final Energy and Electricity Elasticity

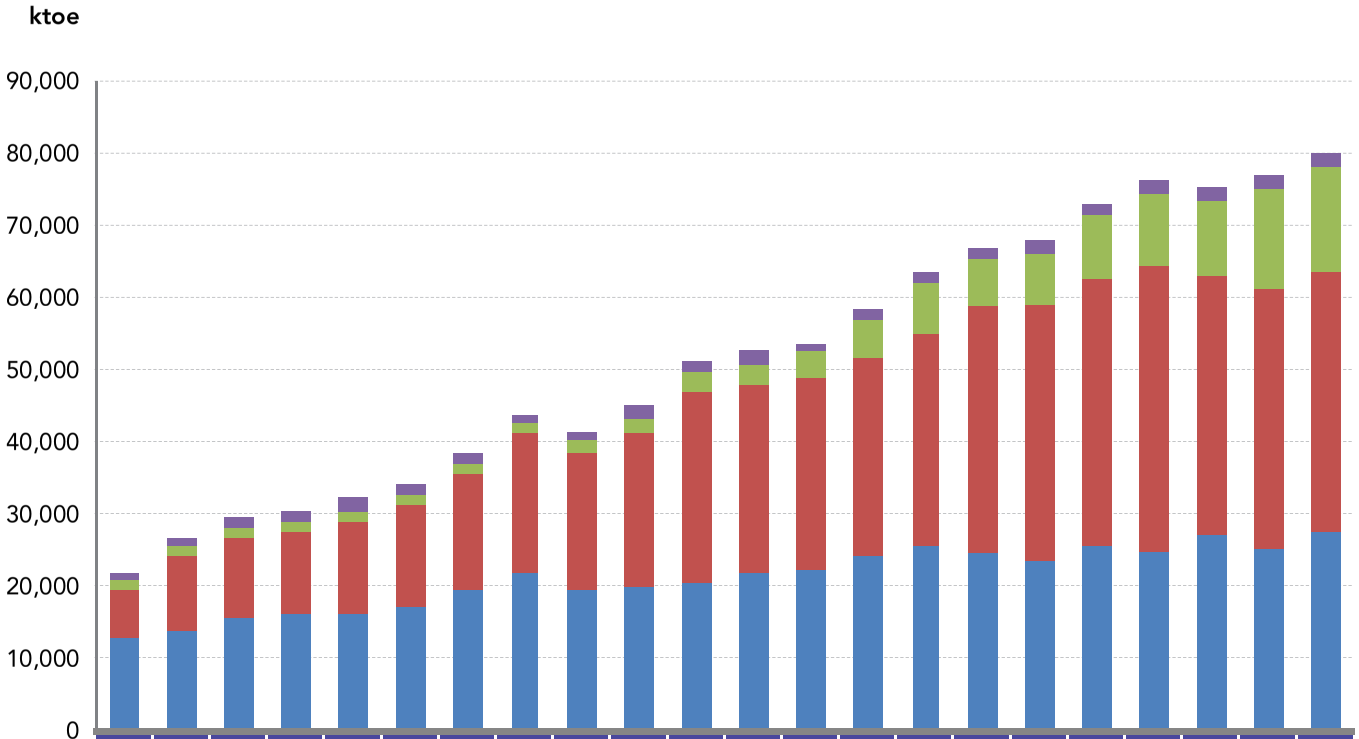


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Final Energy Elasticity	0.97	1.13	1.25	0.96	0.95	1.52	0.91	1.12	0.32	1.06	1.02	11.81	1.04	0.67	1.17	0.48	0.13	1.25	0.18	1.77	0.22	0.94
Electricity Elasticity	1.08	1.28	1.71	1.06	2.14	1.54	1.19	2.19	(0.60)	0.85	1.05	12.15	1.09	1.14	0.77	0.85	0.85	0.90	0.82	(2.48)	1.19	0.53

Note:
1. Final Energy Elasticity is a ratio between growths of energy consumption and economic growth
   Final Energy Elasticity = Growth Rate of Energy Consumption (%) / Growth Rate of GDP (%)

2. Electricity Elasticity is a ratio between growths of electricity consumption and economic growth
   Electricity Elasticity = Growth Rate of Electricity Consumption (%) / Growth Rate of GDP (%)

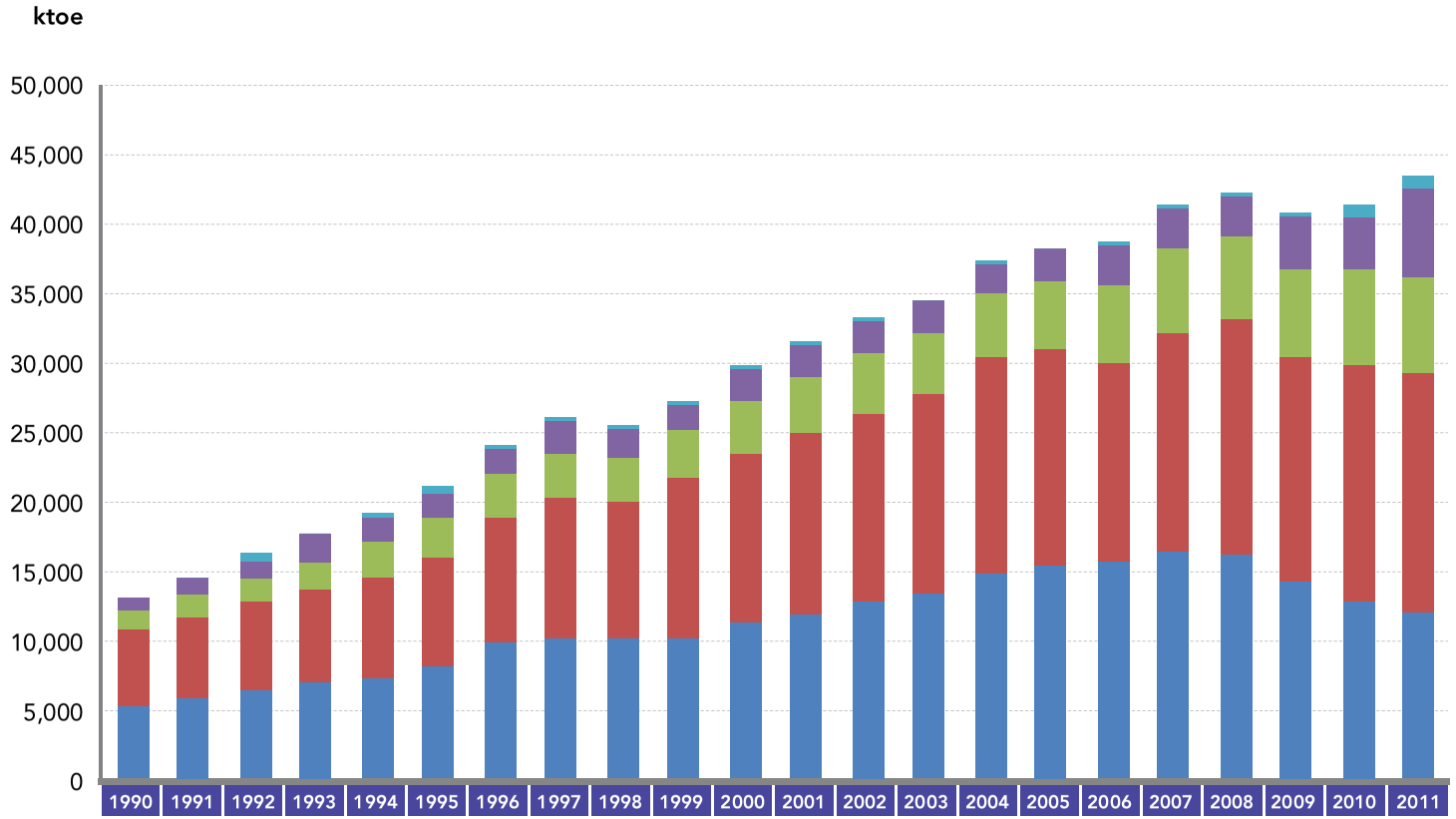
Figure 8: Primary Energy Supply



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Hydropower	915	1,053	997	1,262	1,652	1,540	1,243	790	1,113	1,668	1,612	1,687	1,329	1,056	1,329	1,313	1,567	1,522	1,964	1,627	1,577	1,850
Coal and Coke	1,326	1,564	1,640	1,352	1,563	1,612	1,677	1,622	1,731	1,940	2,486	2,970	3,624	5,316	7,109	6,889	7,299	8,848	9,782	10,623	14,777	14,772
Natural Gas	6,801	10,112	11,381	11,360	12,392	13,960	15,567	19,041	19,101	21,476	26,370	25,649	26,101	27,257	29,145	33,913	34,917	36,639	39,289	35,851	35,447	35,740
Crude Oil, Petroleum Products and Others	12,429	13,606	15,273	15,951	16,055	16,767	19,353	21,720	19,051	19,450	20,242	21,673	22,124	23,936	25,253	24,096	23,240	25,381	24,453	26,482	25,008	26,927

Source:
National Energy Balance 2010, oil and gas companies, power utilities, IPPs, cement, iron and steel manufacturers

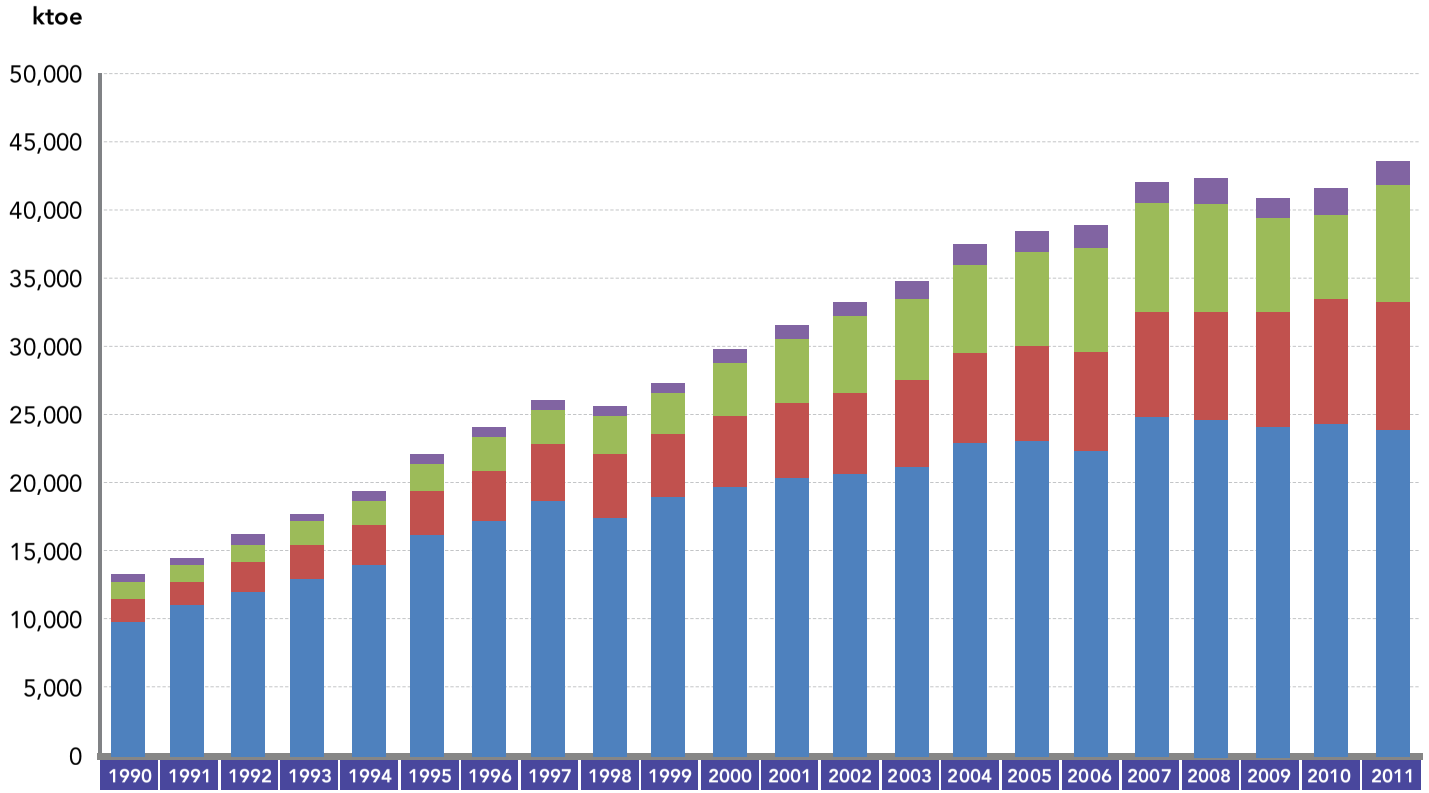
Figure 9: Final Energy Demand by Sectors



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agriculture	0	130	391	62	422	446	486	490	307	106	104	98	96	98	87	101	253	265	287	211	1,074	916
Non - Energy Use	838	1,071	1,222	2,027	1,817	1,994	1,744	2,298	2,023	1,799	2,250	2,378	2,511	2,345	2,183	2,173	2,819	2,958	2,876	3,868	3,696	6,377
Residential and Commercial	1,622	1,721	1,891	2,069	2,502	2,837	3,162	3,073	3,314	3,653	3,868	4,048	4,387	4,399	4,754	5,134	5,430	6,212	6,205	6,336	6,951	6,993
Transport	5,386	5,806	6,226	6,558	7,262	7,827	8,951	10,201	9,793	11,393	12,071	13,137	13,442	14,271	15,385	15,384	14,819	15,717	16,395	16,119	16,828	17,070
Industrial	5,300	5,835	6,455	7,012	7,283	8,060	9,838	10,106	10,121	10,277	11,406	11,852	12,854	13,472	14,914	15,492	15,248	16,454	16,205	14,312	12,928	12,100

Source:
i) Oil and gas companies, TNB, SESB, SEB, IPPs, cement, iron and steel manufacturers
ii) National Energy Balance 2010

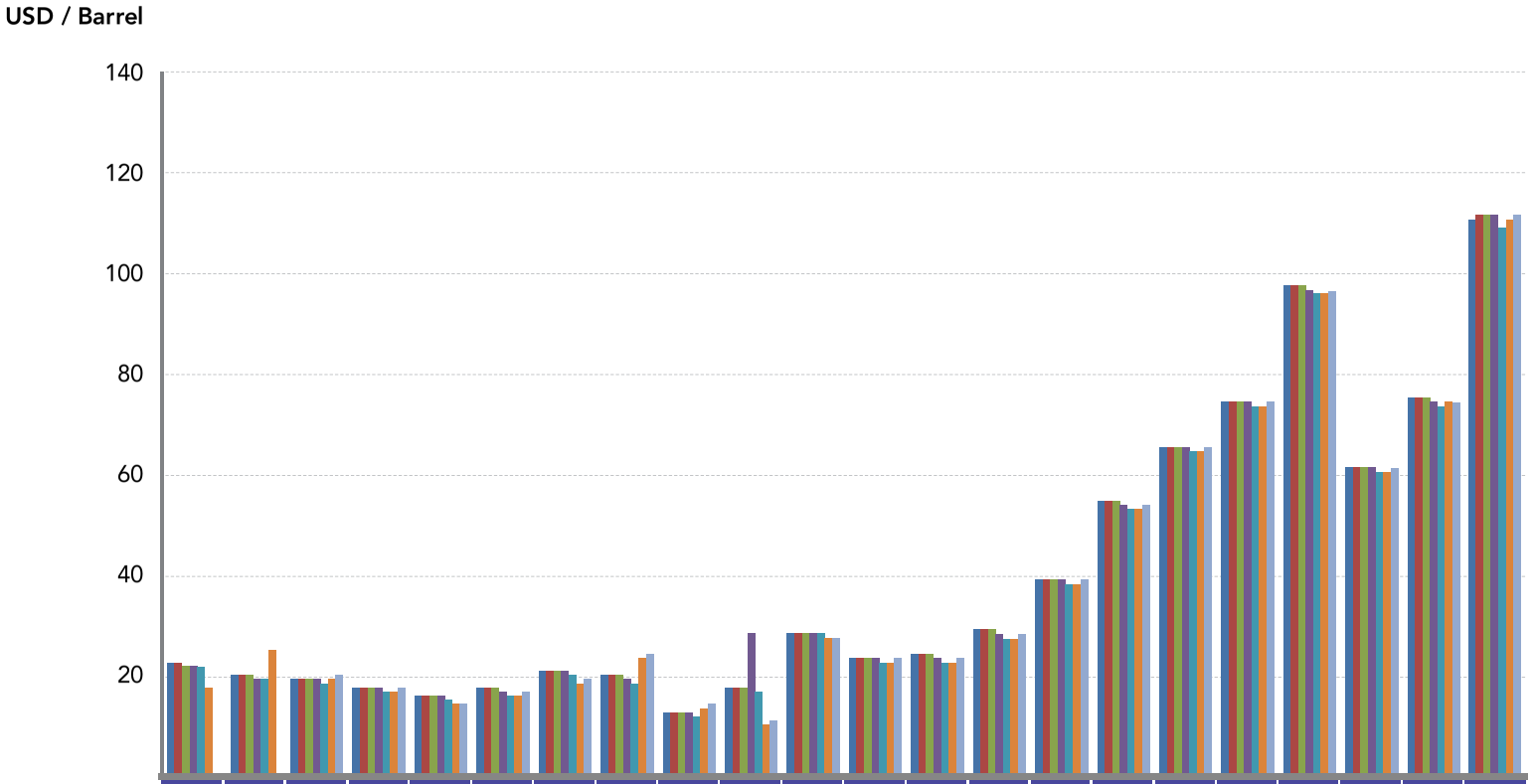
Figure 10: Final Energy Demand by Type of Fuels



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Coal and Coke	513	599	672	487	598	712	727	740	767	608	991	977	1,086	1,212	1,305	1,348	1,335	1,361	1,713	1,613	1,826	1,759
Natural Gas	1,069	1,099	1,344	1,701	1,660	1,654	2,079	2,465	2,726	3,032	3,862	4,620	5,642	5,886	6,490	6,981	7,562	7,709	7,818	6,802	6,254	8,515
Electricity	1,715	1,925	2,218	2,450	2,932	3,375	3,777	4,384	4,577	4,815	5,263	5,594	5,922	6,313	6,642	6,944	7,272	7,683	7,986	8,286	8,993	9,241
Petroleum Products and Others	9,825	10,914	11,927	13,075	13,894	16,142	17,203	18,578	17,488	18,782	19,582	20,323	20,638	21,175	22,886	23,012	22,394	24, 852	24,451	24,145	24,403	23,946

Source:
i) Oil and gas companies, TNB, SESB, SEB, IPPs, cement, iron and steel manufacturers
ii) National Energy Balance 2010

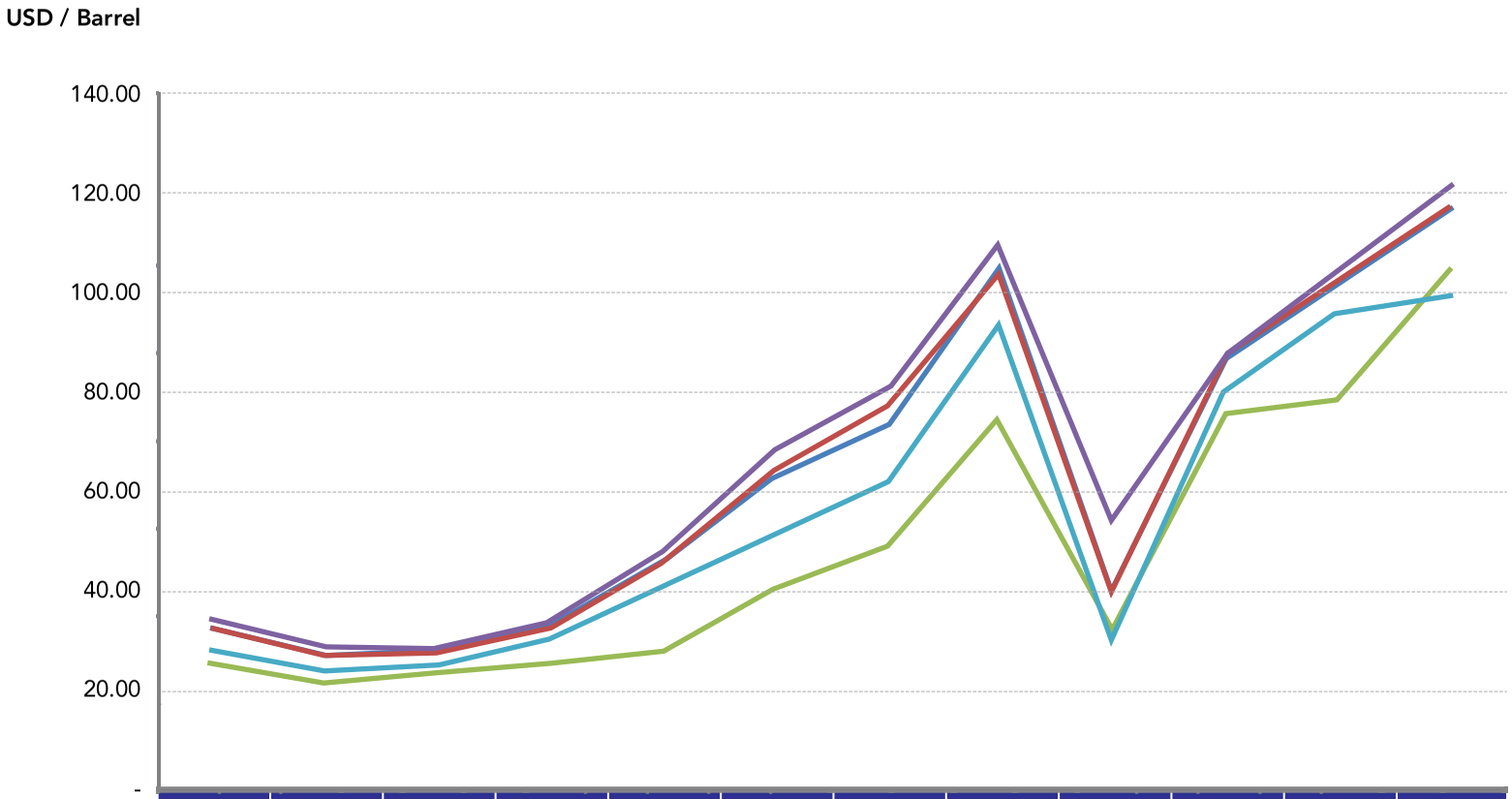
Figure 11: Official Selling Prices of Malaysian Crude Oil



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Tapis Blend	23.86	21.47	20.98	19.11	17.30	18.53	22.28	21.18	13.81	18.95	30.25	25.06	25.52	30.60	41.84	57.71	69.56	78.96	102.79	64.97	79.51	117.10
Labuan Crude	23.76	21.37	20.88	19.11	17.40	18.63	22.38	21.33	13.84	18.95	30.25	25.06	25.52	30.60	41.84	57.71	69.56	78.96	102.79	64.97	79.51	117.89
Miri Light Crude	23.56	21.17	20.68	18.91	17.20	18.43	22.18	21.28	13.83	18.95	30.25	25.06	25.52	30.60	41.84	57.71	69.56	78.96	102.79	64.97	79.51	117.90
Bintulu Crude	23.06	20.67	20.18	18.46	16.90	18.06	21.89	20.78	13.48	29.95	29.95	24.78	25.52	30.33	41.54	57.43	69.28	78.66	102.49	64.67	79.21	117.57
Terengganu Condensate	22.76	20.37	19.88	18.26	16.45	17.33	21.08	19.98	12.61	17.76	30.29	23.86	24.32	29.40	40.64	56.51	68.66	77.91	101.59	63.77	78.31	115.15
Bintulu Condensate	19.10	26.35	20.20	18.25	15.00	17.36	19.79	25.13	14.80	11.14	29.09	23.96	24.42	29.50	40.74	56.61	68.45	77.92	101.69	63.87	78.41	116.77
Dulang	0.00	0.00	21.15	19.20	15.40	18.16	20.30	25.66	15.57	11.84	29.18	24.68	25.23	29.99	41.17	57.41	68.96	78.59	102.49	64.67	79.21	117.57

Source:
PETRONAS

Figure 12: Ex-Singapore Prices of Major Petroleum Products

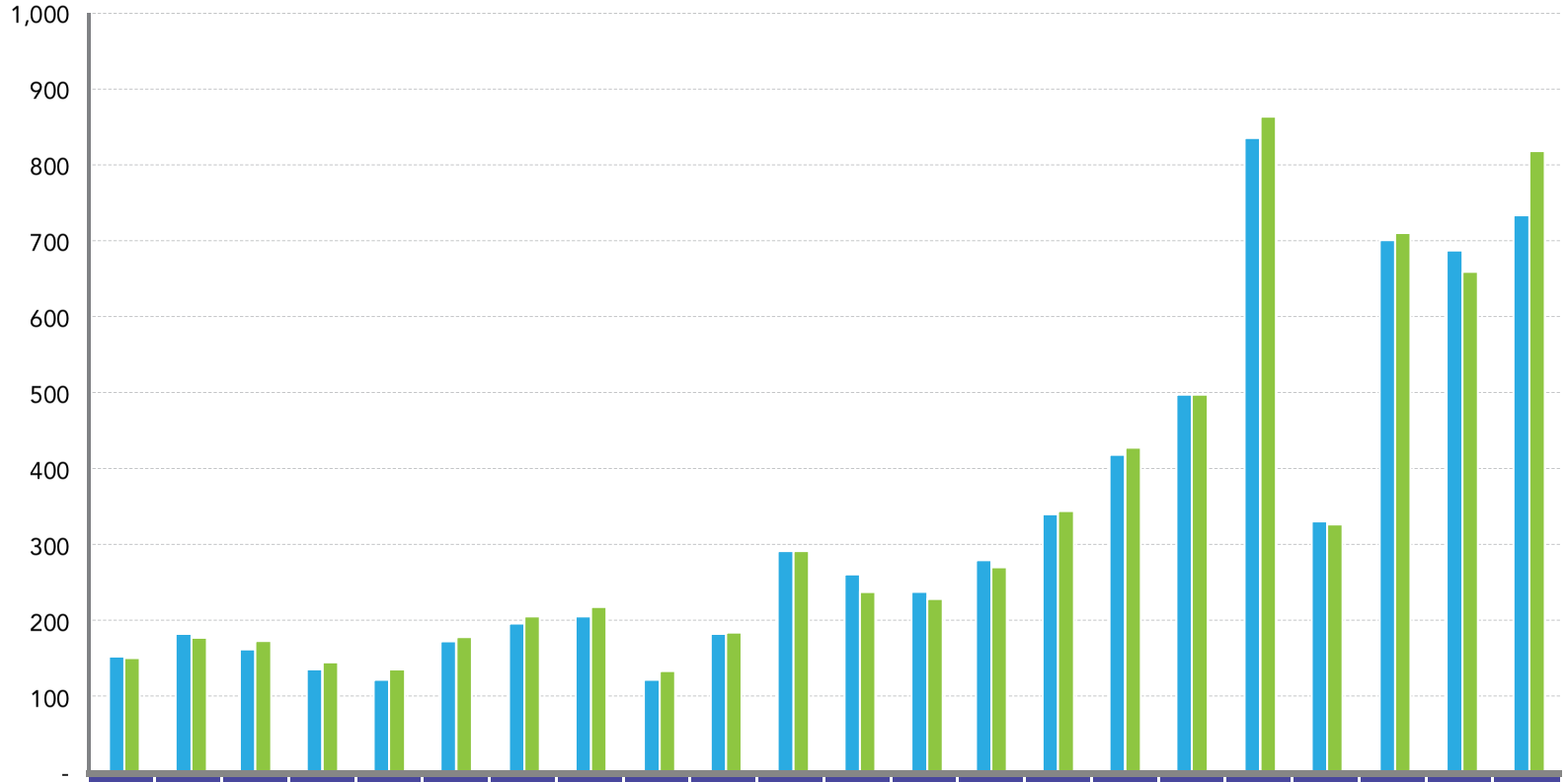


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Petrol (ULG 95)	32.64	27.43	28.04	34.69	47.23	62.38	73.20	104.05	39.25	86.55	103.15	117.00
Diesel	32.48	27.32	27.55	32.46	45.92	64.35	76.93	103.74	39.32	86.60	103.17	117.00
Fuel Oil	25.82	21.78	23.63	25.72	28.15	40.32	48.84	74.60	31.40	75.30	78.40	104.10
Kerosene	34.27	28.32	28.08	33.25	47.69	67.99	80.72	110.50	53.90	87.25	104.30	121.64
Naphtha	28.32	23.75	24.93	30.14	40.82	51.04	61.13	93.98	29.90	80.72	95.91	99.90

Source:
Energy Commission

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

USD / Metric Tonne

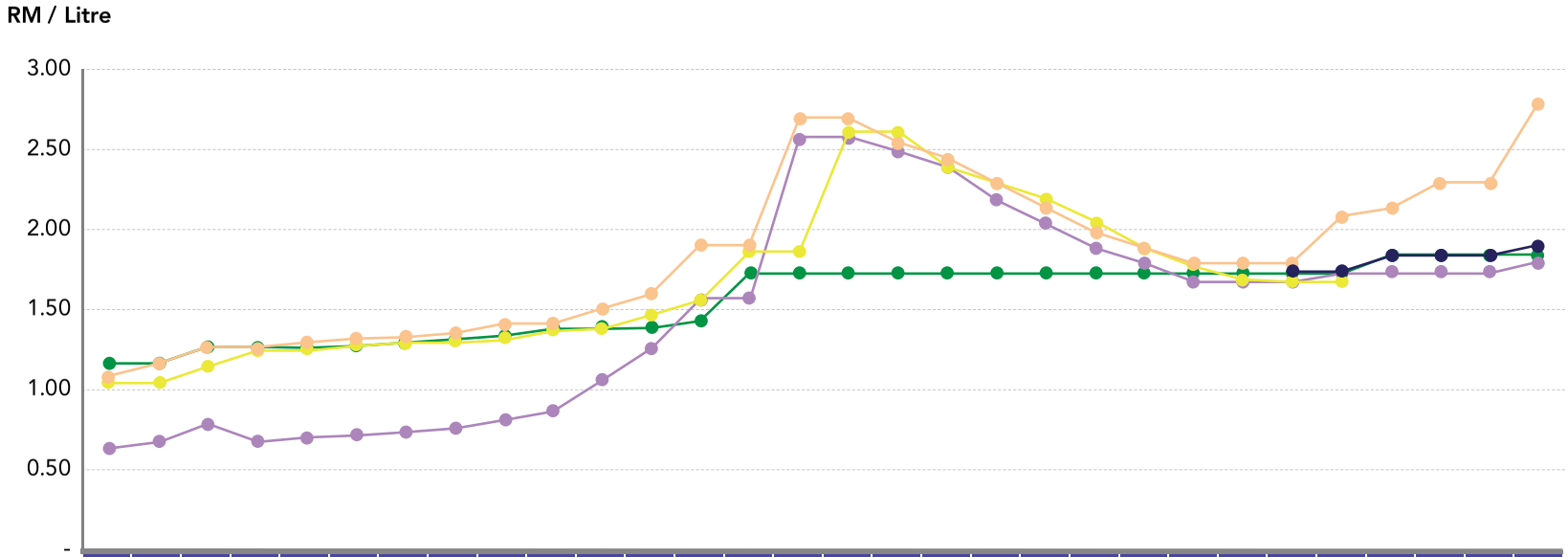


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Propane	155	186	167	140	129	178	204	210	126	191	299	269	244	288	348	430	510	858	340	720	705	770
Butane	156	182	179	147	140	183	207	222	134	190	299	239	238	278	355	442	514	887	335	730	680	820

Note:
Historical prices have been revised as per revision by Platts

Source:
Platts

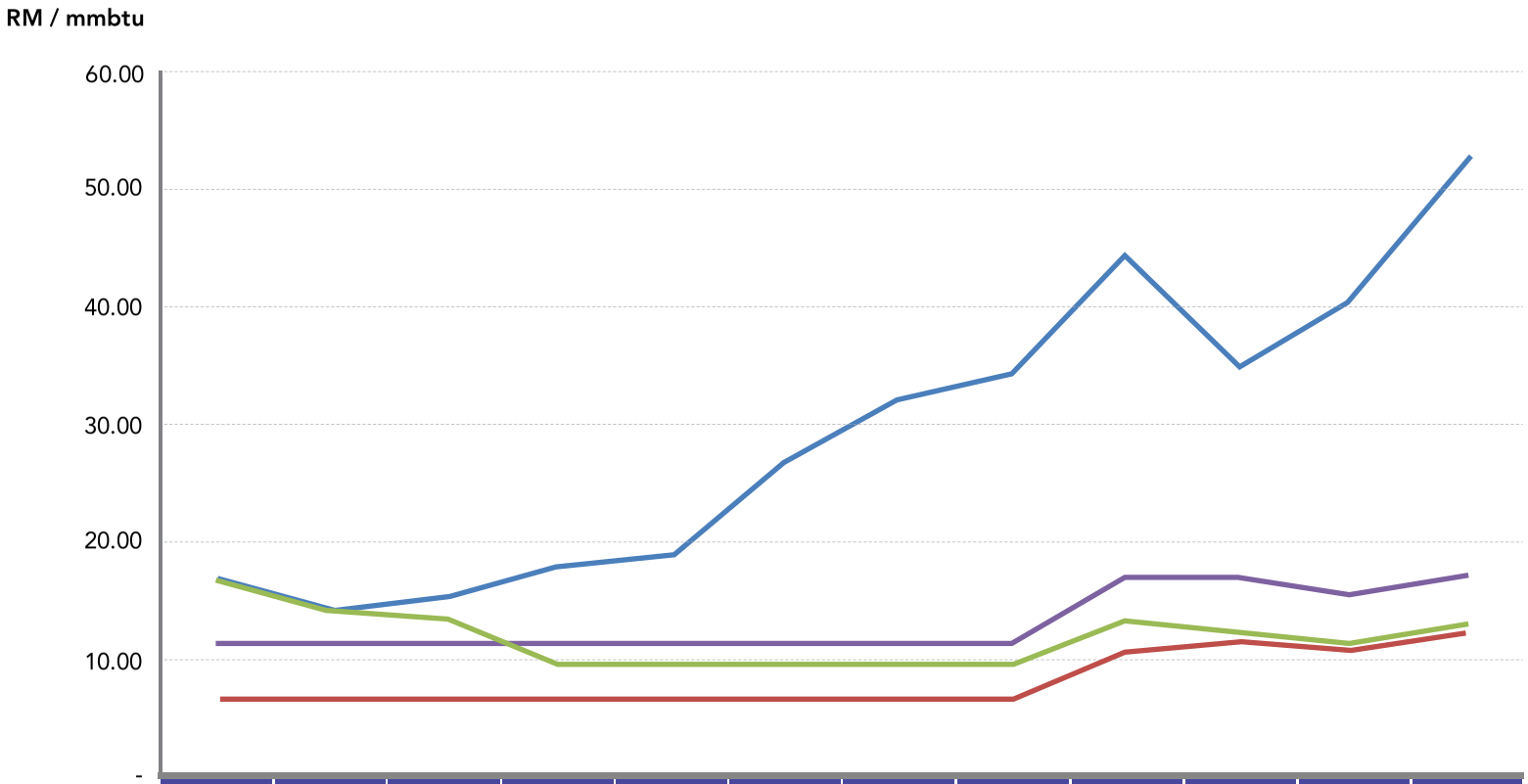
Figure 14: Retail Fuel Prices in Malaysia



	1-Jan-94	1-Oct-00	20-Oct-01	5-Nov-01	1-May-02	1-Nov-02	1-Mar 03	1-May-04	1-Oct-04	1-Mar-05	5-May-05	1-Jul-05	3-Feb-06	6-Apr-06	5-Jun-08	6-Jun-08	3-Aug-08	5-Sept-08	5-Oct-08	1-Nov-08	8-Nov-08	8-Dec-08	5-Dec-08	2-May-09	1-Sep-09	6-Jul-10	1-Nov-10	1-Dec-10	4-Dec-10	Oct-11
RON 97	1.10	1.20	1.30	1.30	1.32	1.33	1.35	1.37	1.42	1.42	1.52	1.62	1.92	1.92	2.70	2.70	2.55	2.45	2.30	2.15	2.00	1.90	1.80	1.80	1.80	2.10	2.15	2.30	2.30	2.80
RON 95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.75	1.75	1.85	1.85	1.85	1.90
RON 92	1.06	1.06	1.16	1.26	1.26	1.28	1.29	1.31	1.33	1.38	1.38	1.48	1.58	1.88	1.88	2.62	2.62	2.40	2.30	2.20	2.05	1.90	1.80	1.70	1.70	1.70	-	-	-	-
DIESEL	0.65	0.70	0.80	0.70	0.72	0.74	0.76	0.78	0.83	0.88	1.08	1.28	1.58	2.58	2.58	2.50	2.40	2.05	2.20	2.05	1.90	1.80	1.70	1.70	1.70	1.75	1.75	1.75	1.75	1.80
LPG	1.18	1.18	1.28	1.28	1.28	1.29	1.31	1.33	1.35	1.40	1.40	1.40	1.45	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.85	1.85	1.85	1.85	1.85

Source:
Ministry of Domestic Trade, Co-Operatives and Consumerism

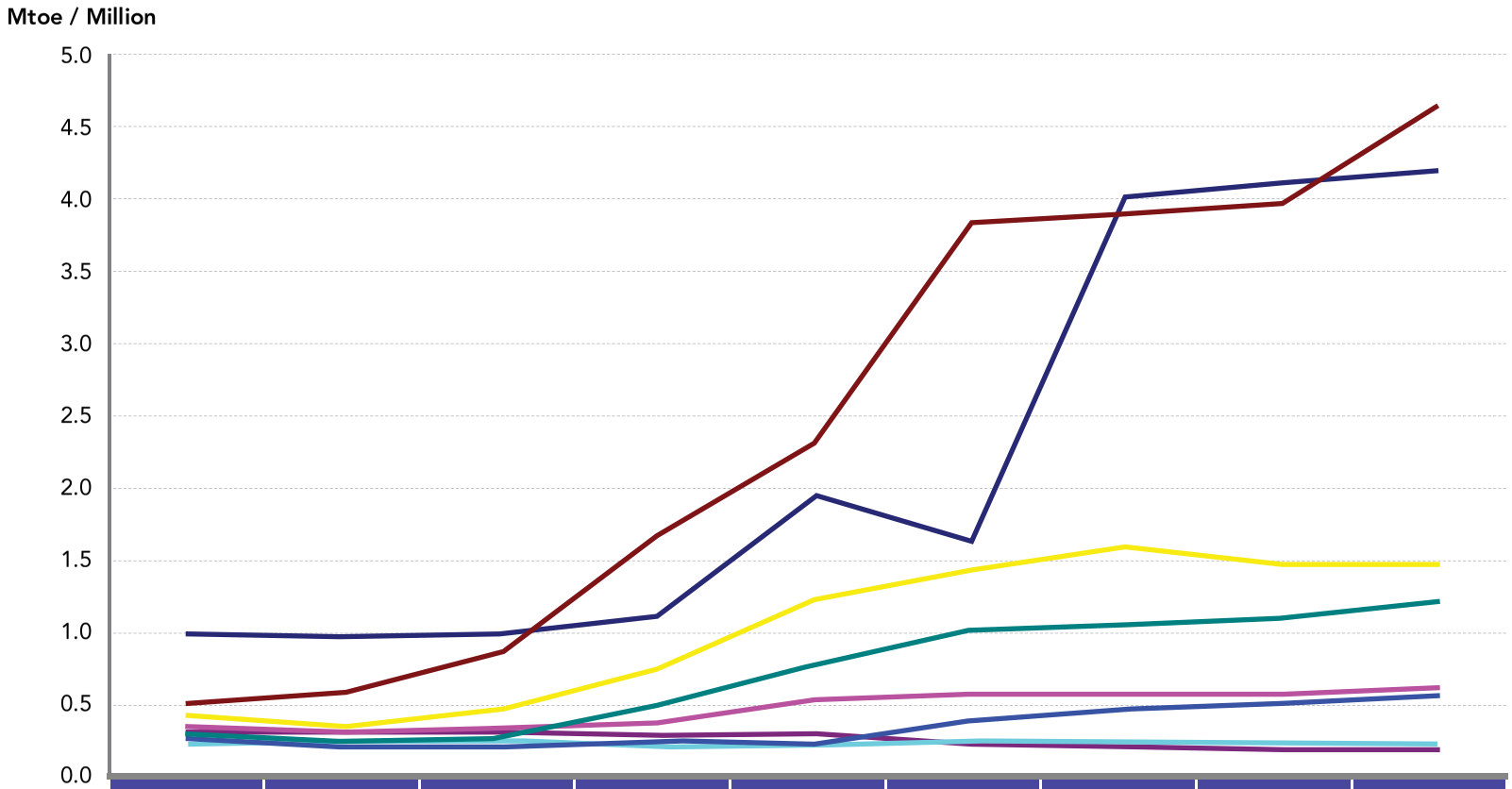
Figure 15: Average Annual Natural Gas Price in Malaysia



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gas Price to Singapore	16.72	14.10	15.30	17.74	18.92	26.76	31.77	34.10	44.41	34.58	40.42	52.47
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
Gas Price to Non-Power Sector - GMSB	16.72	14.10	13.40	9.40	9.40	9.40	9.40	9.40	12.98	12.21	11.05	12.80
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

Source:
Energy Commission

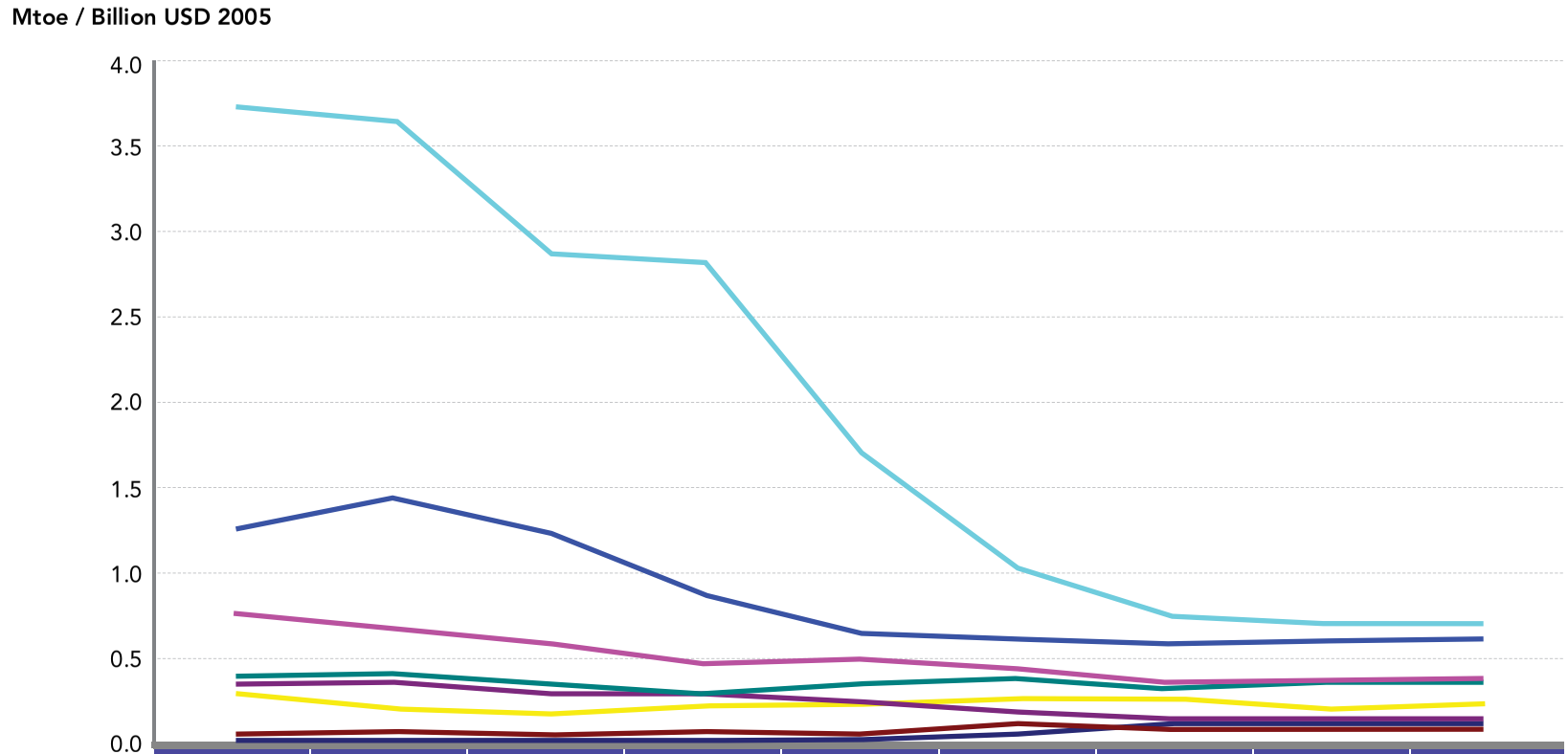
Figure 16: Final Energy Demand per Capita in ASEAN



	1971	1973	1980	1990	2000	2005	2008	2009	2010
Brunei	1.000	1.000	1.050	1.167	1.933	1.675	4.025	4.125	4.250
Indonesia	0.264	0.267	0.329	0.433	0.564	0.591	0.599	0.617	0.652
Malaysia	0.416	0.397	0.528	0.766	1.264	1.441	1.612	1.531	1.526
Myanmar	0.267	0.254	0.254	0.239	0.255	0.280	0.263	0.265	0.269
Philippines	0.347	0.368	0.351	0.321	0.311	0.268	0.249	0.250	0.255
Singapore	0.519	0.636	0.888	1.670	2.368	3.865	3.917	3.994	4.651
Thailand	0.252	0.271	0.320	0.506	0.799	1.046	1.078	1.133	1.224
Vietnam	0.285	0.286	0.243	0.243	0.323	0.429	0.488	0.524	0.558

Source: Energy Balances of Non-OECD Countries, 2012 Edition, International Energy Agency (IEA)

Figure 17: Final Energy Intensity in ASEAN



	1971	1973	1980	1990	2000	2005	2008	2009	2010
Brunei	0.024	0.021	0.025	0.051	0.067	0.070	0.165	0.172	0.170
Indonesia	0.790	0.710	0.614	0.532	0.531	0.470	0.414	0.412	0.415
Malaysia	0.304	0.248	0.236	0.253	0.270	0.273	0.272	0.267	0.252
Myanmar	3.729	3.667	2.883	2.848	1.753	1.082	0.791	0.762	0.740
Philippines	0.406	0.396	0.315	0.319	0.292	0.222	0.186	0.188	0.182
Singapore	0.099	0.101	0.092	0.102	0.097	0.135	0.127	0.136	0.141
Thailand	0.424	0.419	0.363	0.325	0.367	0.396	0.369	0.399	0.403
Vietnam	1.301	1.498	1.278	0.905	0.681	0.668	0.629	0.648	0.653

Source:
Energy Balances of Non-OECD Countries, 2012 Edition, International Energy Agency (IEA)

Oil

Oil

Table 3: Production and Reserves of Oil as of 1st January 2011

Region	Reserves in billion barrels			Production in thousand barrels per day		
	Crude Oil	Condensates	Total	Crude Oil	Condensates	Total
Peninsular Malaysia	2.048	0.326	2.374	207.7	35.8	243.5
Sabah	1.874	0.118	1.992	134.0	0.0	134.0
Sarawak	1.007	0.485	1.492	119.3	73.0	192.3
Total	**4.929**	**0.929**	**5.858**	**461.0**	**108.8**	**569.8**

Source:
PETRONAS

Table 4: Refinery Licensed Capacity

	Location	Startup date	Thousand barrels/day
SHELL Refining Co. (FOM) Bhd	Port Dickson, Negeri Sembilan	1963	155
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:
ESSO, PETRONAS & SHELL

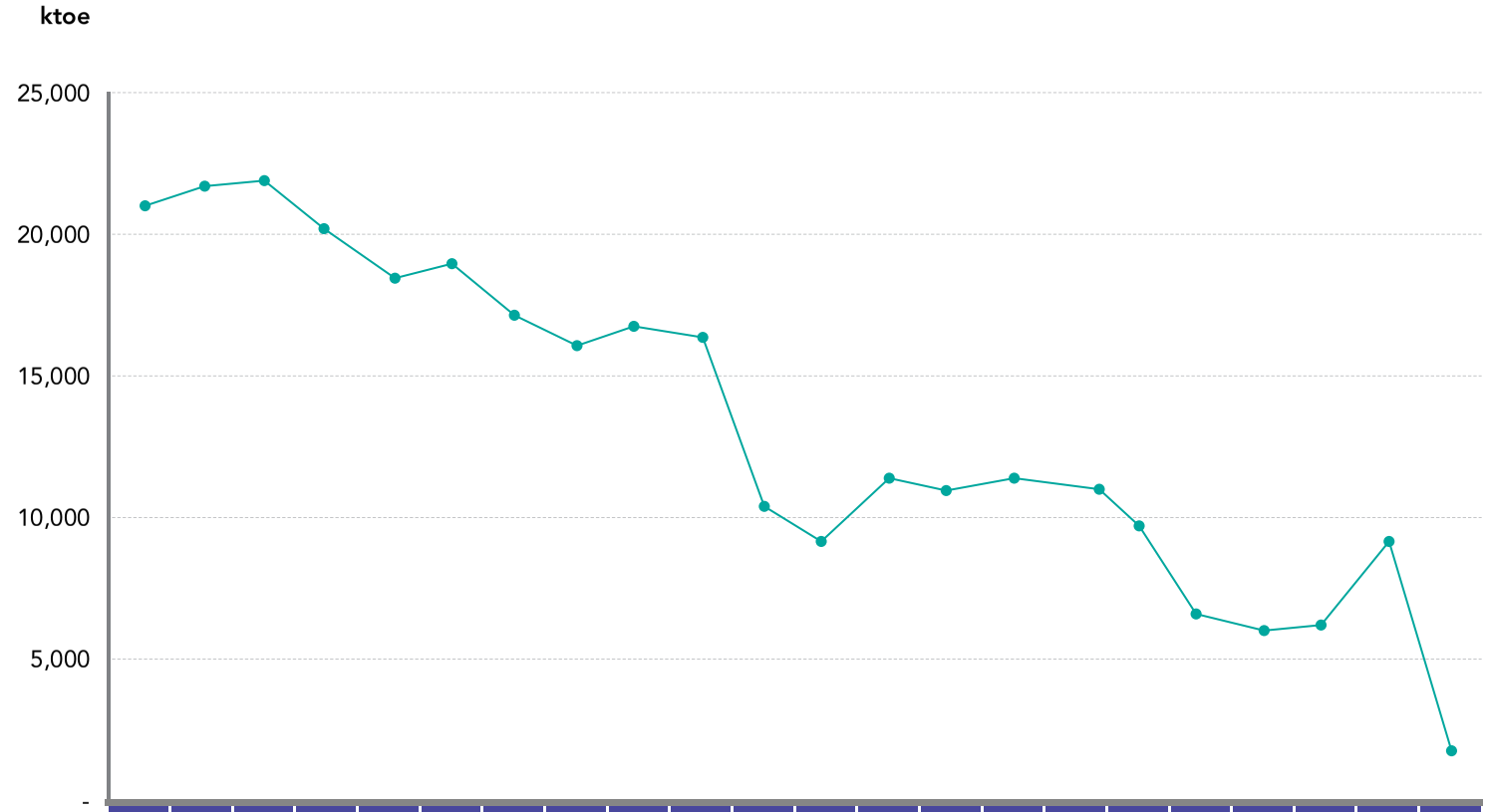
Note (*):
Excludes condensate splitter of 74,300 bpd

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

Petroleum Products	Peninsular Malaysia	Sabah	Sarawak	Total
Petrol	71,469	4,438	4,974	**80,881**
Diesel	44,704	8,293	11,336	**64,333**
Fuel Oil	2,268	484	0	**2,752**
Kerosene	157	11	8	**175**
LPG	20,635	1,309	1,320	**23,264**
ATF & AV GAS	18,946	396	215	**19,557**
Non-Energy	13,753	438	671	**14,862**
Total	**171,932**	**15,370**	**18,523**	**205,824**

Source:
Oil companies

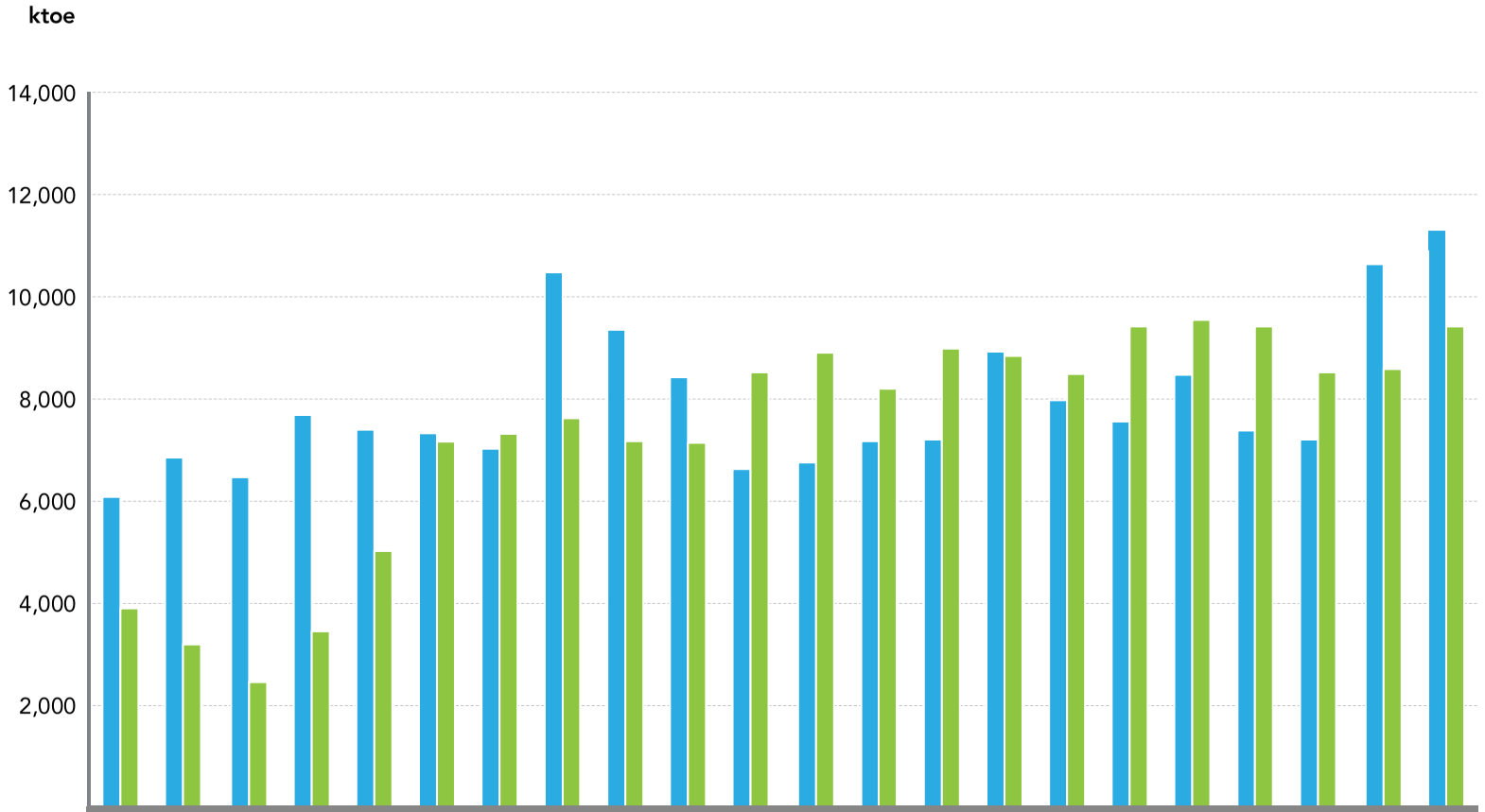
Figure 18: Net Export of Crude Oil



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Net Export of Crude Oil	21,902	22,200	22,215	20,063	18,160	18,518	16,859	16,022	16,626	16,274	10,036	9,128	11,017	10,826	11,292	10,963	9,214	6,804	6,482	6,517	9,365	2,300

Source:
Department of Statistics Malaysia and oil companies

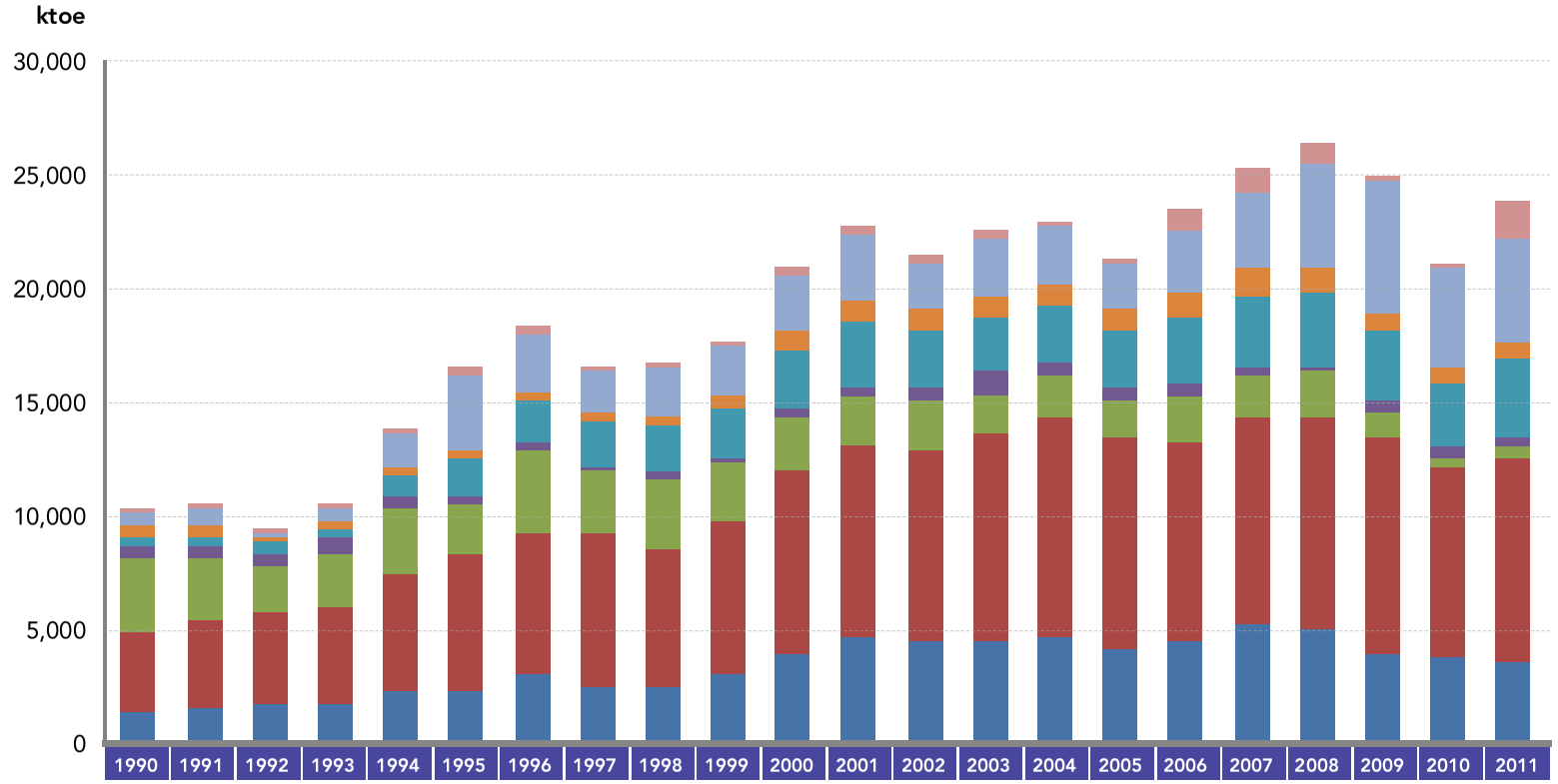
Figure 19: Import and Export of Petroleum Products



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Import of Petroleum Products	6,031	6,728	6,499	7,835	7,492	7,411	7,095	10,331	9,360	8,357	6,619	6,881	7,220	7,116	8,980	7,971	7,734	8,452	7,376	7,243	10,359	11,580
Export of Petroleum Products	3,913	3,272	2,513	3,507	5,094	7,261	7,317	7,840	7,194	7,161	8,533	8,900	8,158	8,972	8,912	8,435	9,535	9,780	9,527	8,419	8,431	9,421

Source:
Department of Statistics Malaysia and oil companies

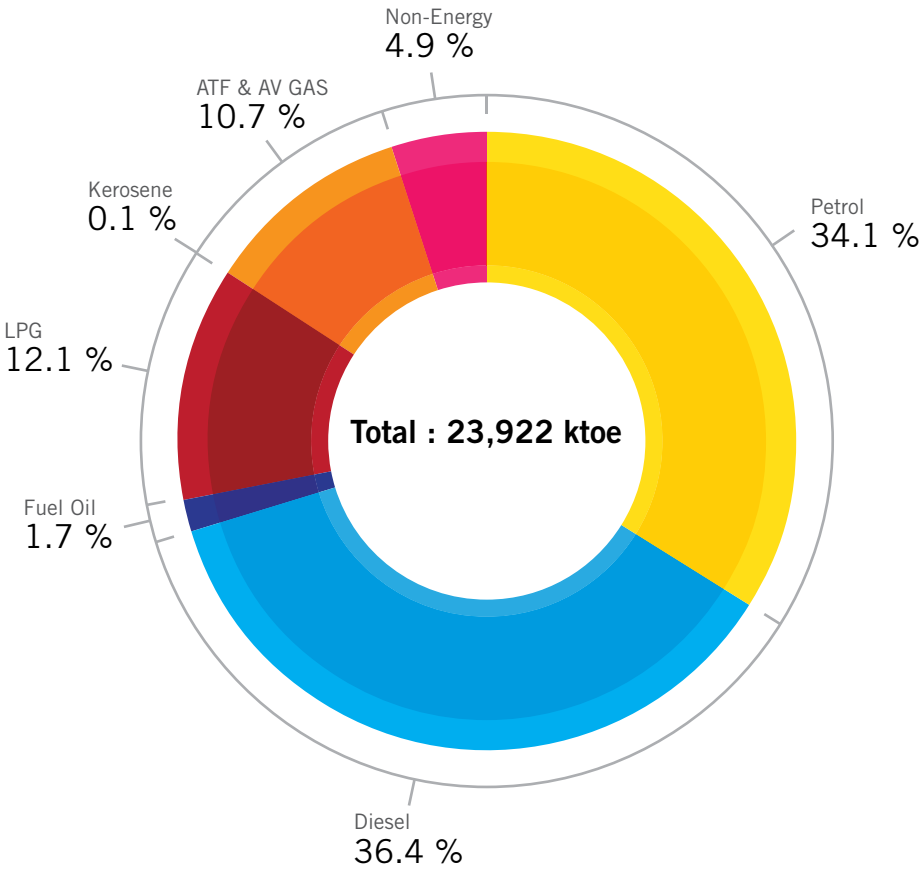
Figure 20: Production of Petroleum Products from Refineries



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Refinery Gas	158	174	143	106	162	385	331	203	192	230	241	311	294	262	215	202	849	938	991	195	210	1,659
Non-Energy	585	798	324	600	1,468	3,380	2,554	1,783	2,117	2,159	2,492	3,020	2,127	2,632	2,455	2,157	2,750	3,461	4,475	5,905	209	4,572
ATF & AV GAS	640	567	200	244	319	431	371	371	449	617	838	875	897	932	897	822	1,118	1,228	1,208	732	697	665
Kerosene	376	403	412	517	980	1,587	1,899	2,000	1,985	2,140	2,660	2,954	2,570	2,367	2,693	2,553	2,938	3,138	3,139	3,085	2,891	3,457
LPG	512	544	541	576	563	360	292	265	285	210	239	283	414	983	591	521	537	234	245	565	483	419
Fuel Oil	3,241	2,633	2,110	2,375	2,887	2,212	3,696	2,716	3,233	2,603	2,532	2,269	2,332	1,763	1,813	1,777	1,933	1,990	1,994	1,144	327	571
Diesel	3,496	3,805	4,048	4,249	5,108	6,011	6,174	6,744	5,926	6,712	8,059	8,462	8,401	9,062	9,611	9,161	8,752	9,033	9,364	9,415	8,369	8,925
Petrol	1,406	1,665	1,724	1,816	2,316	2,320	3,134	2,491	2,545	3,056	3,893	4,623	4,460	4,584	4,724	4,245	4,607	5,285	5,066	4,052	3,873	3,599

Source:
Oil companies

Figure 21: Final Consumption of Petroleum Products



Source:
Oil companies

Natural Gas

Natural Gas

Table 6: Reserves and Production of Natural Gas as of 1st January 2011

Region	Reserves			Production
	Trillion standard cubic feet (Tscf)			Million standard cubic feet per day (mmscfd)
	Associated	Non-Associated	Total	
Peninsular Malaysia	9.797	25.337	35.134	2,385.73
Sabah	3.327	8.638	11.965	433.61
Sarawak	3.033	39.856	42.889	4,479.49*
Total	**16.157**	**73.831**	**89.988**	**7,298.84**

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

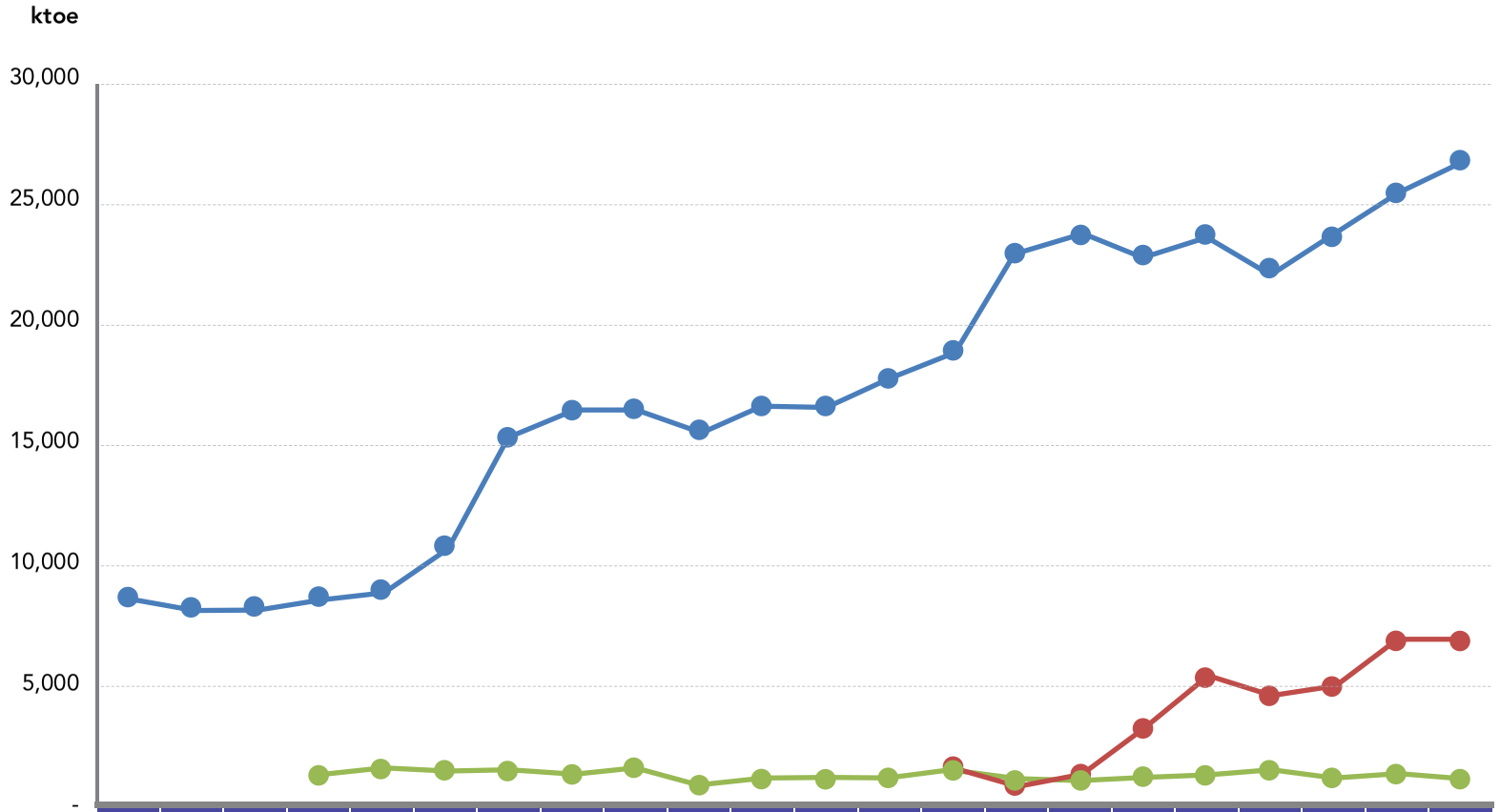
Source:
PETRONAS

Table 7: Consumption of Natural Gas in mmscf

Sectors	Peninsular Malaysia	Sabah	Sarawak	Malaysia
Residential	17	-	229	**246**
Commercial	884	-	306	**1,190**
Industry	156,333	6,984	653	**163,970**
Non-Energy	69,220	38,916	40,830	**148,966**
Transport	10,371	-	-	**10,371**
Power Stations	405,229	29,308	35,824	**470,361**
Total	**642,054**	**75,208**	**77,842**	**795,104**

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

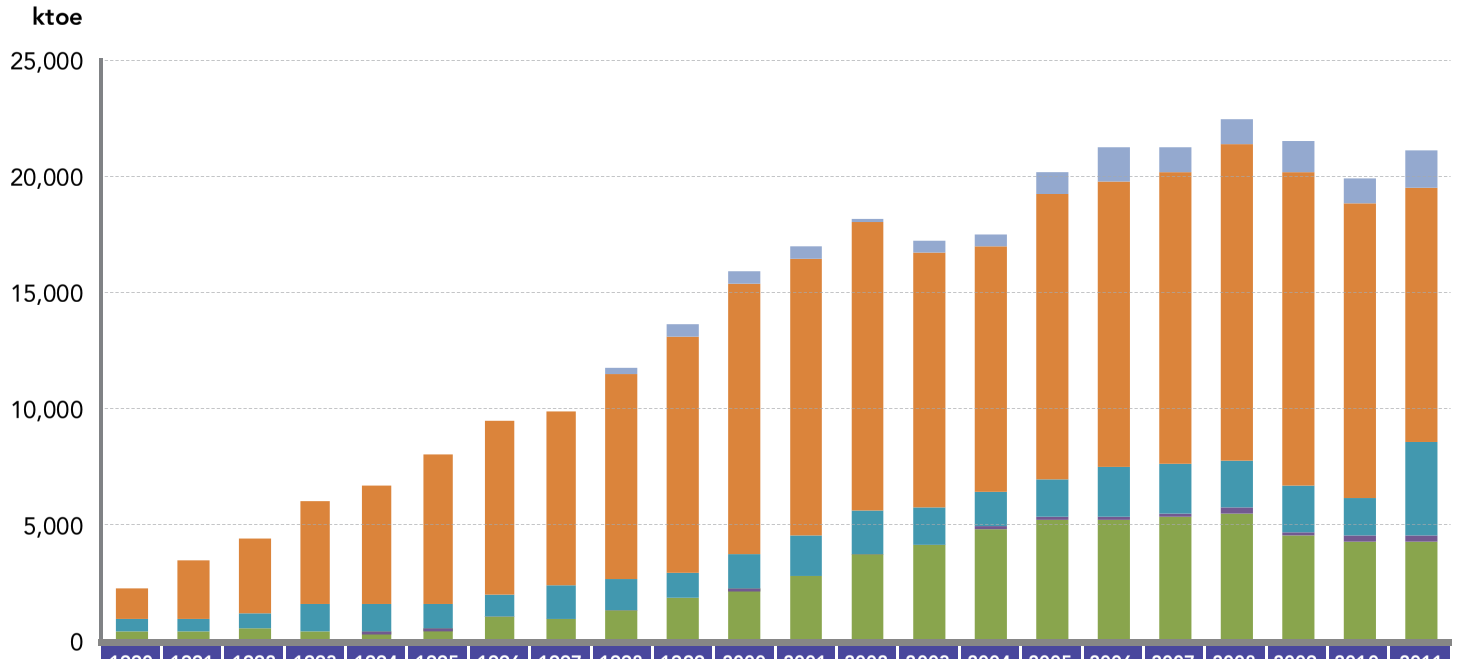
Figure 22: Import and Export of Natural Gas and LNG



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Export LNG	8,686	8,278	8,262	8,654	8,938	10,790	15,251	16,396	16,429	15,445	16,633	16,636	17,803	18,965	22,944	23,707	22,874	23,777	22,277	23,606	25,487	26,856
Import Natural Gas	-	-	-	-	-	-	-	-	-	-	-	-	-	1,501	999	1,340	3,313	5,435	4,565	5,055	7,013	6,979
Export Natural Gas	-	-	1	1,258	1,589	1,474	1,474	1,340	1,444	860	1,198	1,178	1,098	1,402	1,143	1,134	1,257	1,295	1,524	1,166	1,340	1,147

Source:
Department of Statistics Malaysia, gas companies and others

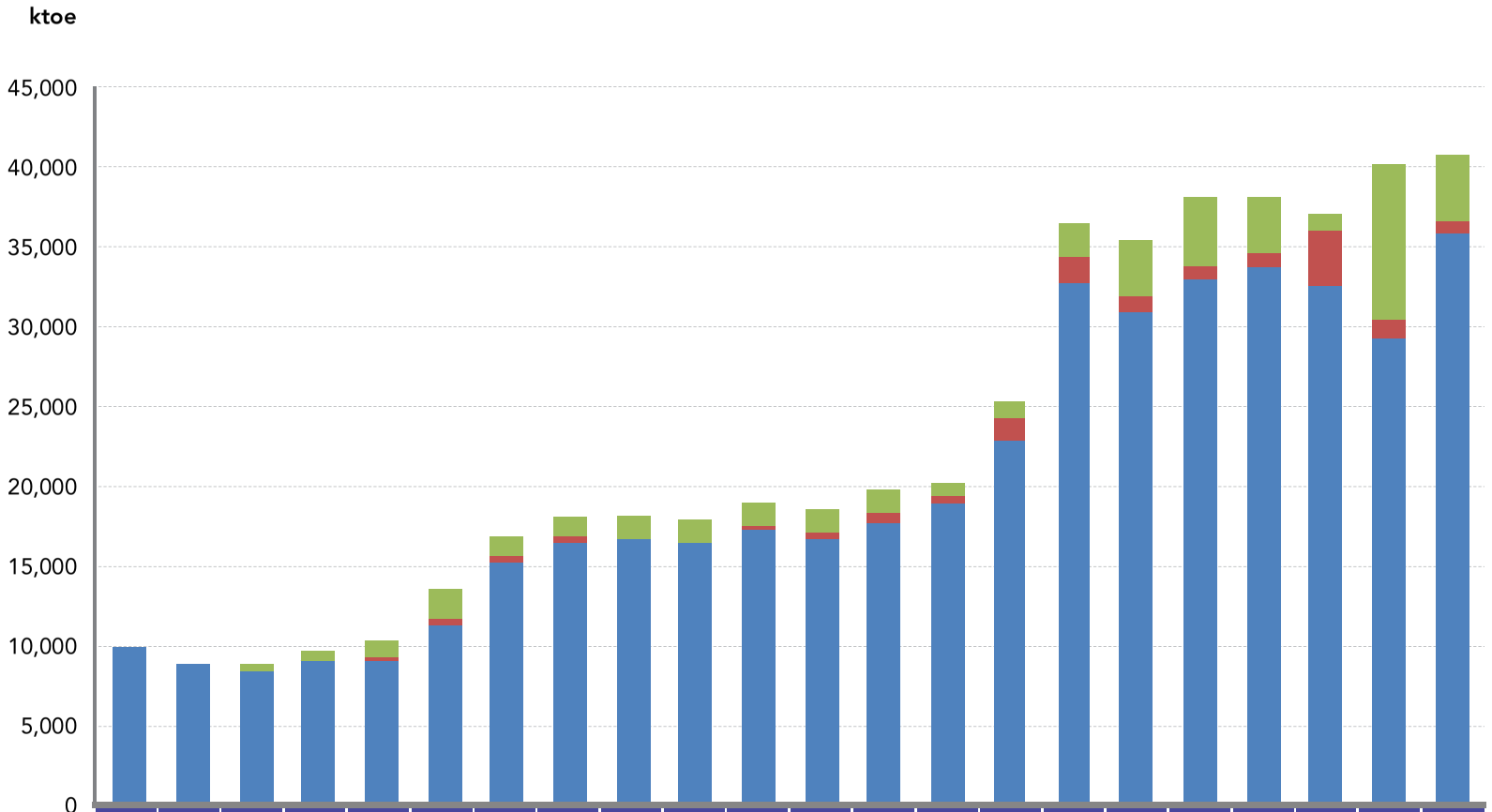
Figure 23: Natural Gas Consumption by Sectors



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Self-Generation	-	-	-	-	-	-	-	-	271	488	530	495	128	469	568	923	1,431	1,140	1,030	1,385	1,031	1,697
Power Stations	1,361	2,533	3,144	4,374	5,119	6,414	7,489	7,531	8,886	10,162	11,580	11,922	12,424	10,893	10,545	12,271	12,330	12,476	13,651	13,390	12,628	10,956
Non-Energy	609	604	657	1,141	1,163	1,064	870	1,378	1,282	1,118	1,512	1,655	1,775	1,616	1,476	1,541	2,110	2,112	2,046	1,995	1,661	3,967
Transport	-	-	-	-	5	5	4	5	4	-	7	14	28	40	54	95	120	147	194	236	247	272
Industrial	452	487	679	552	484	577	1,197	1,074	1,430	1,891	2,327	2,937	3,824	4,207	4,937	5,317	5,301	5,416	5,541	4,544	4,310	4,300
Commercial	4	4	4	4	4	4	4	4	6	9	12	10	11	18	18	23	24	28	31	25	30	32
Residential	4	4	4	4	4	4	4	4	4	5	4	4	4	5	5	5	5	6	6	2	6	7

Source:
PETRONAS, Gas Companies, Power Utilities, IPPs and Self-Generation Plants

Figure 24: Conversion in Gas Plants



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GPP - LPG	-	-	392	529	948	1,900	1,212	1,258	1,526	1,472	1,482	1,310	1,504	790	1,225	2,043	3,506	4,288	3,507	991	9,844	4,071
MDS	-	-	-	39	238	421	344	389	-	-	164	513	445	443	1,271	1,567	876	799	920	3,610	1,057	851
LNG	9,797	8,749	8,425	9,019	9,087	11,244	15,251	16,396	16,688	16,417	17,231	16,636	17,803	18,965	22,944	32,837	30,996	33,054	33,766	32,497	29,345	35,815

Note:
MDS commenced pre-commercialization operation in year 2000

Source:
Oil and gas companies

Coal

Coal

Table 8: Production and Reserves of Coal as of 31st December 2011

Location	Reserves (Million Tonnes)			Coal Type	Production
	Measured	Indicated	Inferred		(metric tonnes)
Sarawak					
1. Abok & Silantek, Sri Aman	7.25	10.60	32.40	Coking Coal, Semi-Anthracite and Anthracite	183,556
2. Merit-Pila, Kapit	170.26	107.02	107.84	Sub-Bituminous	405,658
3. Mukah - Balingian	86.95	170.73	646.53	Lignite, Hydrous Lignite and Sub-Bituminous	2,326,575
4. Bintulu	6.00	0.00	14.00	Bituminous (partly coking coal)	
5. Tutoh Area	5.58	34.66	162.33	Sub-Bituminous	
Subtotal	**276.04**	**323.01**	**963.10**		**2,915,789**
Sabah					
1. Salimpopon	4.80	14.09	7.70	Sub-Bituminous	
2. Labuan			8.90	Sub-Bituminous	
3. Maliau			215.00	Bituminous	
4. Malibau		17.90	25.00	Bituminous	
5. SW Malibau		23.23		Bituminous	
6. Pinangan West Middle Block			42.60	Bituminous	
Subtotal	**4.80**	**55.22**	**299.20**		
Selangor					
1. Batu Arang			17.00	Sub-Bituminous	
Subtotal	**0.00**	**0.00**	**17.00**		
Total	**280.84**	**378.23**	**1,279.30**		
Grand Total		**1,938.37**			**2,915,789**

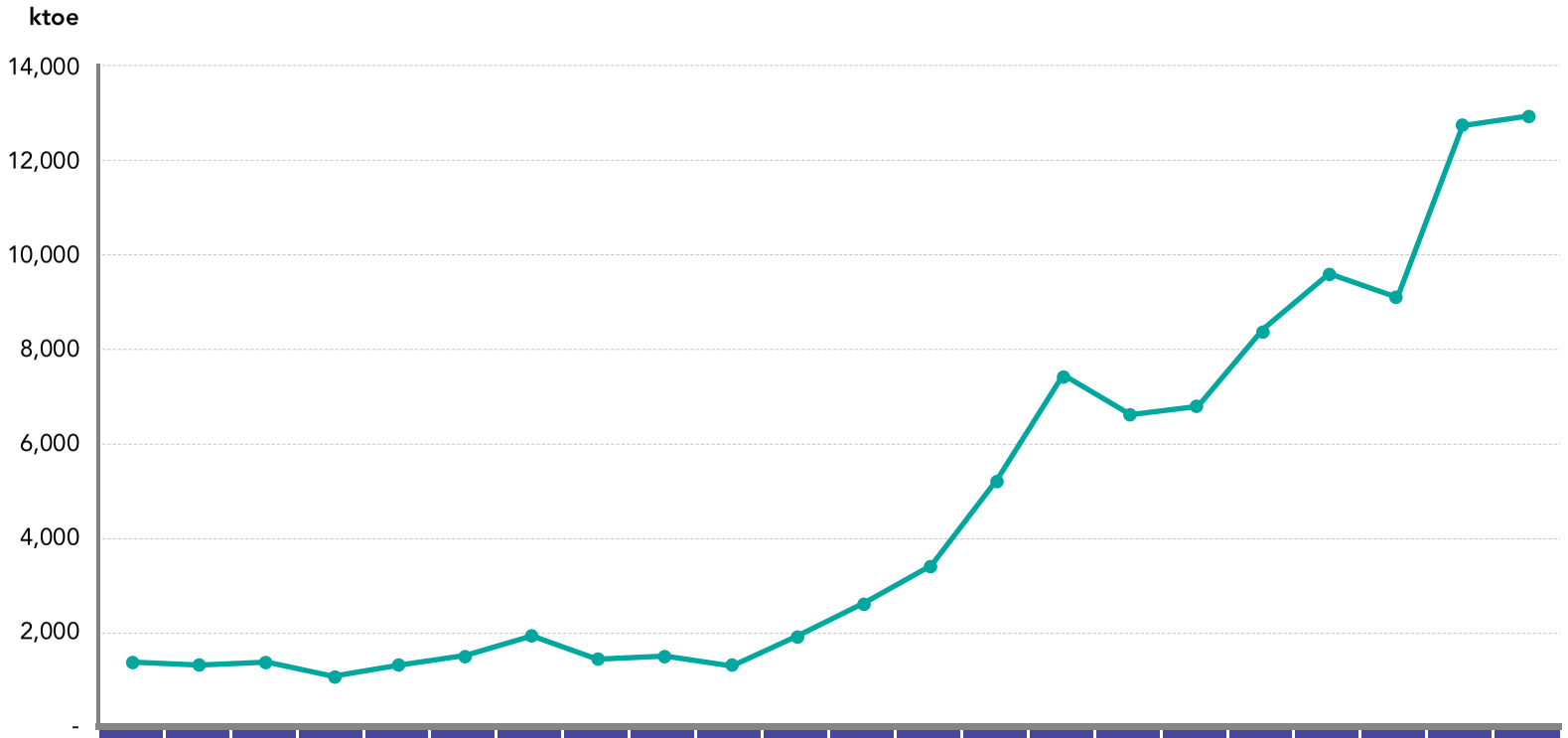
Source:
Department of Mineral and Geosciences Malaysia

Table 9: Consumption of Coal in metric tonnes

Sectors	Peninsular Malaysia	Sabah	Sarawak	Malaysia
Industry	2,657,398	-	105,982	2,763,380
Power Stations	18,421,481	-	2,220,883	20,642,364
Total	**21,078,879**	**0**	**2,326,865**	**23,405,744**

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

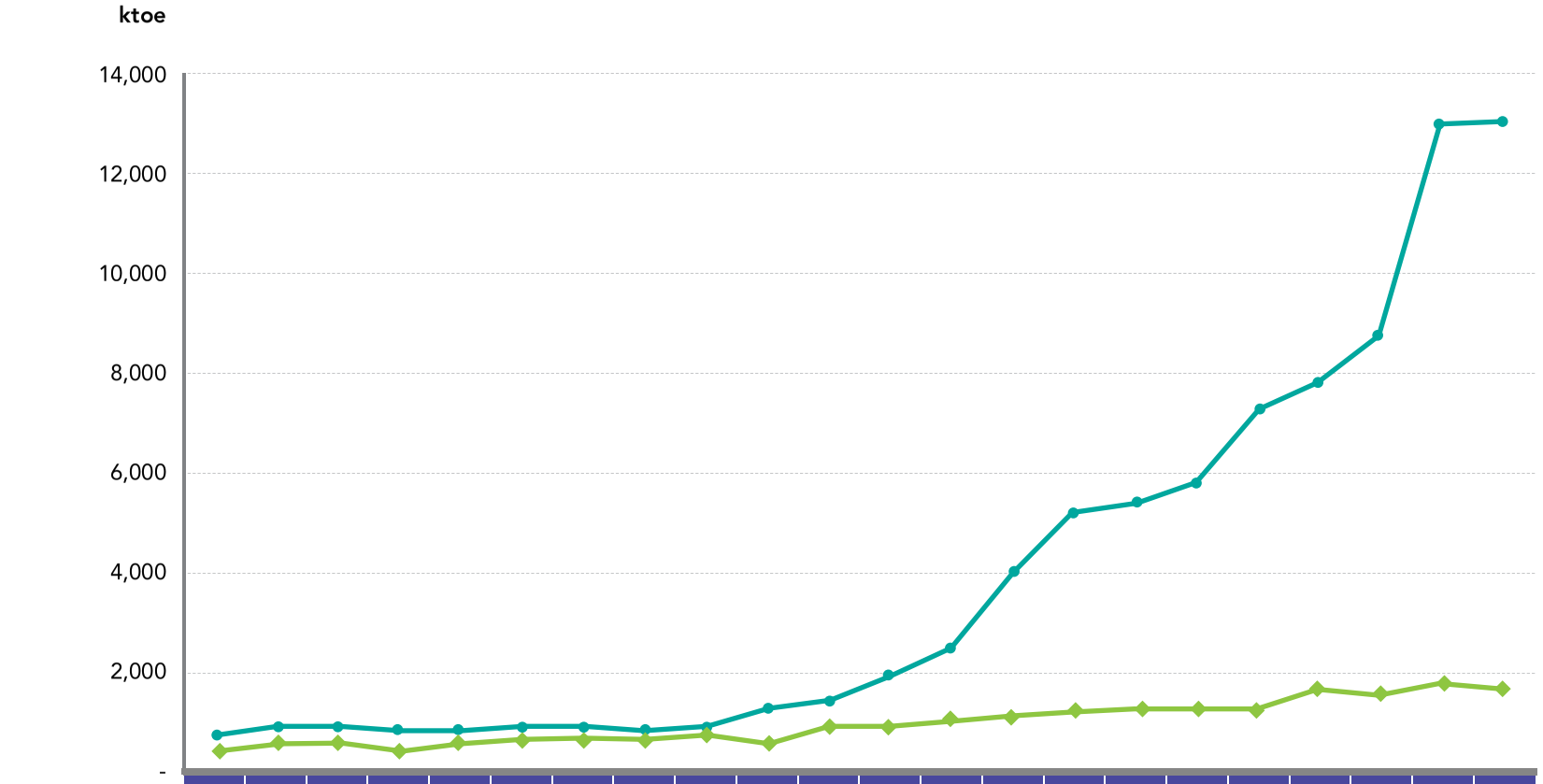
Figure 25: Net Import of Coal



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Net Import Coal	1,396	1,341	1,425	1,088	1,311	1,538	1,923	1,437	1,522	1,313	1,924	2,631	3,405	5,232	7,413	6,568	6,751	8,357	9,519	9,007	13,011	13,189

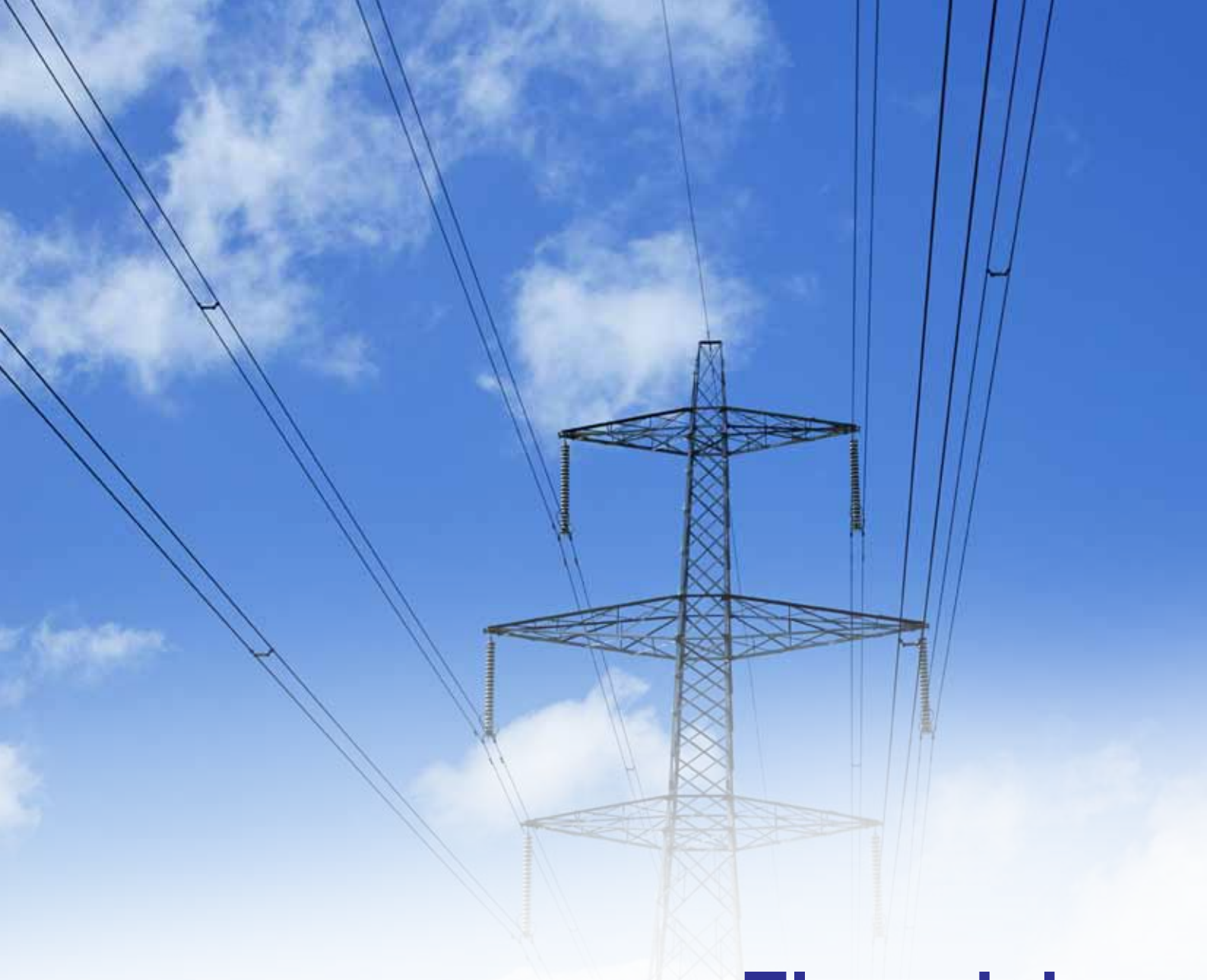
Source:
Department of Statistics Malaysia, Power Utilities, IPPs, cement, iron and steel manufacturers

Figure 26: Coal Consumption by Sectors



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Power Stations	813	963	968	884	925	957	950	882	964	1,332	1,495	1,994	2,556	4,104	5,327	5,541	5,963	7,486	8,069	9,010	12,951	13,013
Industry	513	599	672	487	598	712	727	740	767	608	991	977	1,086	1,212	1,305	1,348	1,335	1,361	1,713	1,613	1,826	1,759

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



Electricity

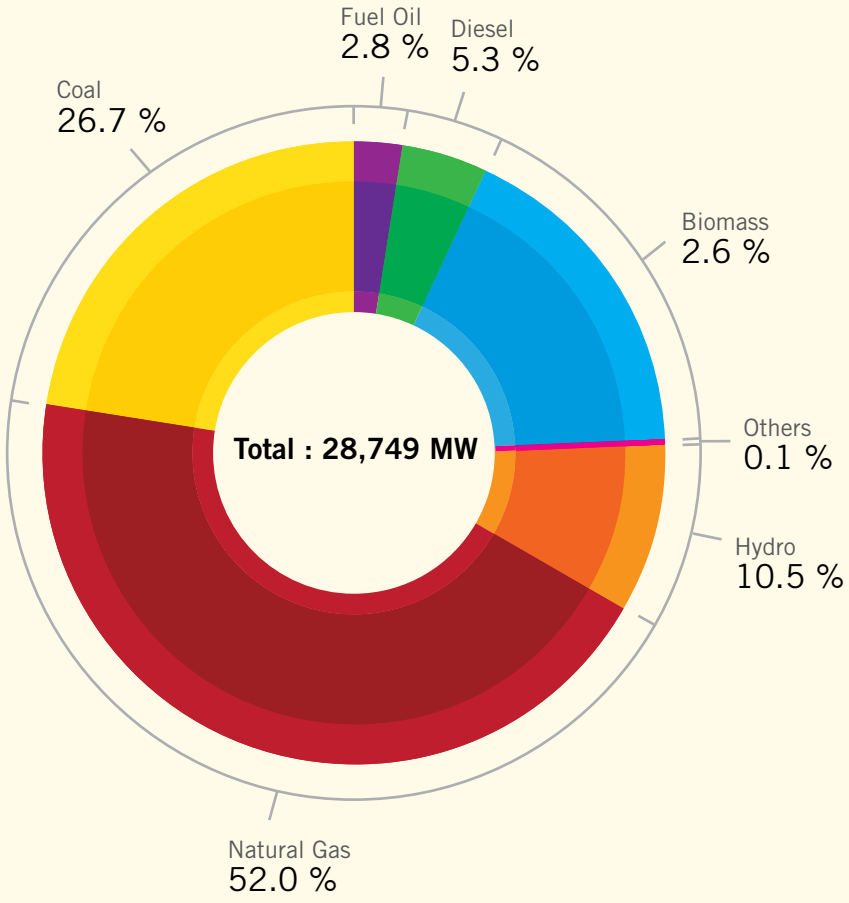
Electricity

Table 10: Installed Capacity as of 31st December 2011 in MW

		Hydro	Natural Gas	Coal	Fuel Oil	Diesel	Biomass	Others	Total
Peninsular Malaysia	TNB	1,911	5,075	-	-	68	-	-	7,054
	IPPs	20	7,469	7,200	600	-	-	-	15,289
	Co-Generation	-	783	-	35	7	105	13	943
	Self-Generation	-	31	-	-	516	387	-	933
	SREP	6	-	-	-	-	9	8	23
	Subtotal	**1,937**	**13,358**	**7,200**	**635**	**591**	**500**	**21**	**24,242**
Sabah	SESB	70	107	-	-	259	-	-	435
	IPPs	-	480	-	175	-	-	-	655
	Co-Generation	-	42	-	-	50	79	-	171
	Self-Generation	-	6	-	-	499	129	-	634
	SREP	7	-	-	-	-	30	-	37
	Subtotal	**77**	**634**	**-**	**175**	**808**	**238**	**-**	**1,932**
Sarawak	SEB	101	675	480	-	102	-	-	1,358
	IPPs	900	-	-	-	-	-	-	900
	Co-Generation	-	289	-	-	-	-	1	290
	Self-Generation	-	-	-	-	12	14	-	26
	Subtotal	**1,001**	**964**	**480**	**-**	**114**	**14**	**1**	**2,574**
Grand Total		**3,015**	**14,956**	**7,680**	**810**	**1,513**	**752**	**22**	**28,749**

Source:
Power Utilities and IPPs

Figure 27: Installed Capacity as of 31st December 2011



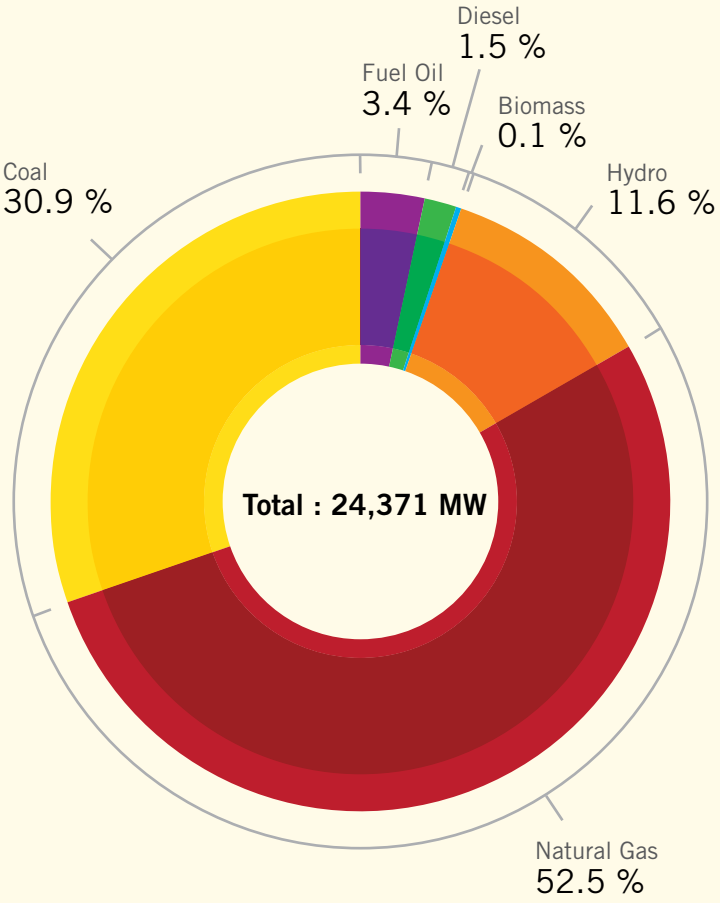
Source:
Power Utilities and IPPs

Table 11: Available Capacity as of 31st December 2011 in MW

		Hydro	Natural Gas	Coal	Fuel Oil	Diesel	Biomass	Total
Peninsular Malaysia	TNB	1,882	4,671	-	-	62	-	6,615
	IPPs	20	6,977	7,051	560	-	-	14,608
	Subtotal	**1,902**	**11,648**	**7,051**	**560**	**62**	**-**	**21,223**
Sabah	SESB	70	107	-	-	259	-	435
	IPPs	7	480	-	175	-	26	688
	Subtotal	**77**	**587**	**-**	**175**	**259**	**26**	**1,123**
Sarawak	SEB	96	571	470	88	50	-	1,275
	IPPs	750	-	-	-	-	-	750
	Subtotal	**846**	**571**	**470**	**88**	**50**	**-**	**2,025**
Grand Total		**2,825**	**12,806**	**7,521**	**823**	**371**	**26**	**24,371**

Source:
Power Utilities and IPPs

Figure 28: Available Capacity as of 31st December 2011



Source:
Power Utilities and IPPs

Table 12: Installed Capacity of Major Hydro Power Stations

Power Station	Installed Capacity (MW)	Total (MW)
Peninsular Malaysia		
Terengganu		
1. Stesen Janakuasa Sultan Mahmud Kenyir	4 x 100.0	400.0
Perak		
1. Stesen Janakuasa Temenggor	4 x 87.0	348.0
2. Stesen Janakuasa Bersia	3 x 24.0	72.0
3. Stesen Janakuasa Kenering	3 x 40.0	120.0
4. Chenderoh	3 x 10.7 + 1 x 8.4	40.5
5. Sg. Piah Hulu	2 x 7.3	14.6
6. Sg. Piah Hilir	2 x 27.0	54.0
Pahang		
1. Stesen Janakuasa Sultan Yussuf, Jor	4 x 25.0	100.0
2. Stesen Janakuasa Sultan Idris II, Woh	3 x 50.0	150.0
3. Cameron Highland Scheme*		11.9
Kelantan		
1. Pergau	4 x 150.0	600.0
2. Kenerong Upper	2 x 6.0	12.0
3. Kenerong Lower	2 x 4.0	8.0
Subtotal		**1,931.0**
Sabah		
1. Tenom Pangi	3 x 22.0	66.0
Subtotal		**66.0**
Sarawak		
1. Batang Ai	4 x 23.5	94.0
2. Bakun		750.0
Subtotal		**844.0**
Total		**2,841.0**

Source:
TNB, SESB and SEB

Note (*):
Cameron Highland Scheme includes Odak, Habu, Kg. Raja, Kg. Terla and Robinson Falls stations

Table 13: Installed Capacity of Mini Hydro Power Stations

Power Station	Total (MW)
Peninsular Malaysia	
Kedah	
1. Sg. Tawar Besar	0.540
2. Sg. Mempelam	0.397
3. Sg. Mahang	0.483
Perak	
1. Sg. Tebing Tinggi	0.178
2. Sg. Asap	0.110
3. Sg. Kinjang	0.349
4. Sg. Bil	0.258
Pahang	
1. Sg. Sempam G2	0.450
2. Sg. Pertang	0.492
3. Sg. Perdak	0.364
Kelantan	
1. Sg. Renyok G1	0.800
2. Sg. Renyok G2	0.800
3. Sg. Sok	0.588
4. Sg. Rek	0.270
Terengganu	
1. Sg. Brang	0.422
Subtotal	**6.501**
Sabah	
1. Carabau (Ranau)	2.000
2. Melangkap (Kota Belud)	1.000
3. Sayap (Kota Belud)	1.000
4. Bombalai (Tawau)	1.100
5. Merotai (Tawau)	1.100
6. Kiau (Kota Belud)	0.375
7. Naradau (Ranau)	1.760
Subtotal	**8.335**
Sarawak	
1. Sg. Pasir	0.760
2. Penindin	0.352
3. Sebako	0.333
4. Lundu	0.352
5. Kalamuku 1	0.500
6. Kalamuku 2	0.500
7. Sg. Keijin	0.500
8. Sg. Kota 1	2.000
9. Sg. Kota 2	2.000
Subtotal	**7.297**
Total	**22.133**

Source:
TNB, SESB and SEB

Table 14: Transmission Network in Circuit – kilometers

Utility	500 KV	275 KV	132 KV	66 KV
TNB	1,094	8,431	11,672	-
SESB	-	492	1,780	123
SEB	-	867	235	-

Source:
TNB, SESB and SEB

Table 15: Distribution Network in Circuit – kilometers

Utility	Overhead Lines	Underground Cables
TNB	477,191	379,661
SESB	7,761	1,317
SEB	20,254	6,450

Source:
TNB, SESB and SEB

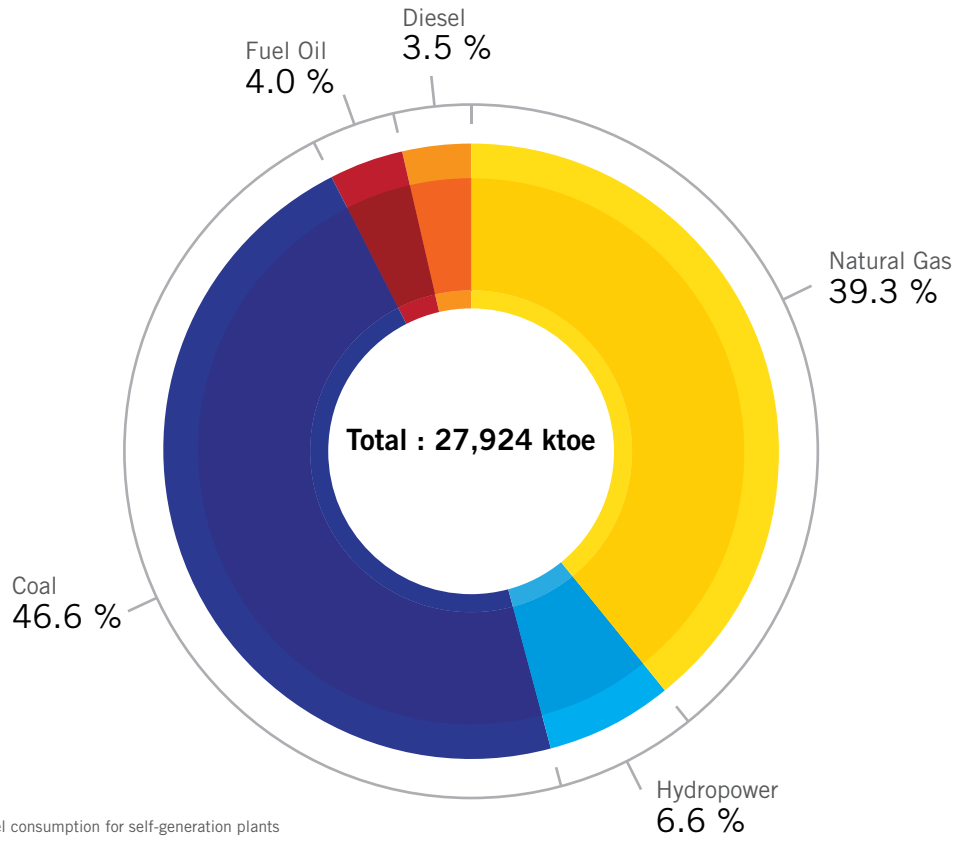
Table 16: Breakdown on Electricity (Gross Generation, Consumption, Available Capacity, Peak Demand and Reserve Margin) for Malaysia

Region	Electricity Gross Generation		Electricity Consumption		Available Capacity**	Peak Demand	Reserve Margin
	GWh	%	GWh	%	MW	MW	%
Peninsular Malaysia	110,654	89.6	97,939	91.3	21,223	15,476	37.13
Sabah*	4,956	4.0	4,275	4.0	1,123	830	35.31
Sarawak	7,950	6.4	5,116	4.8	2,025	1,214	66.80
Total	**123,561**	**100.0**	**107,330**	**100.0**	**24,371**		

Source:
TNB, SESB, SEB and IPPs

Note (*) : Most diesel units in SESB are aged sets hence they are derated due to thermal limitations. However, 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.
(**) : Available Capacity for Peninsular Malaysia was based on Tested Annual Available Capacity (TAAC), Available Capacity for Sabah was based on Dependable Capacity.

Figure 29: Energy Input in Power Stations



Note:
Figures exclude fuel consumption for self-generation plants

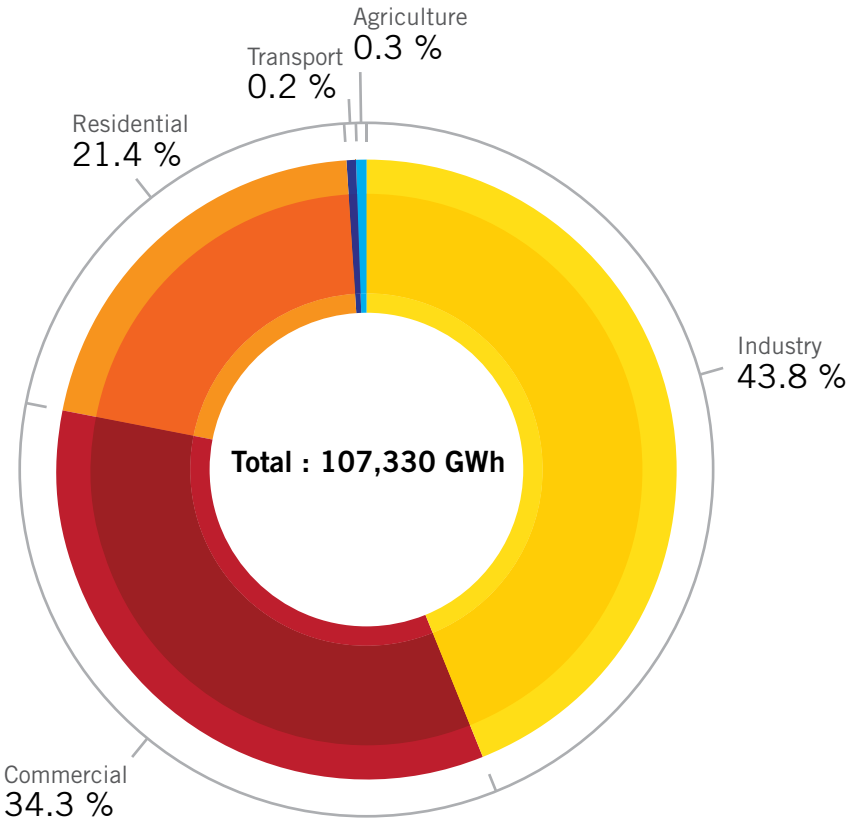
Source:
Power utilities and IPPs

Table 17: Electricity Consumption by Sectors in GWh

Region	Industry		Commercial		Residential		Transport		Agriculture		Total
	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%	GWh
Peninsular Malaysia	44,092	93.8	33,272	90.3	20,055	87.5	214	100.0	305.8	100.0	97,939
Sabah	1,146	2.4	1,742	4.7	1,387	6.0	-	-	-	-	4,275
Sarawak	1,779	3.8	1,846	5.0	1,490	6.5	-	-	-	-	5,116
Total	**47,017**	**100.0**	**36,860**	**100.0**	**22,933**	**100.0**	**214**	**100.0**	**306**	**100.0**	**107,330**

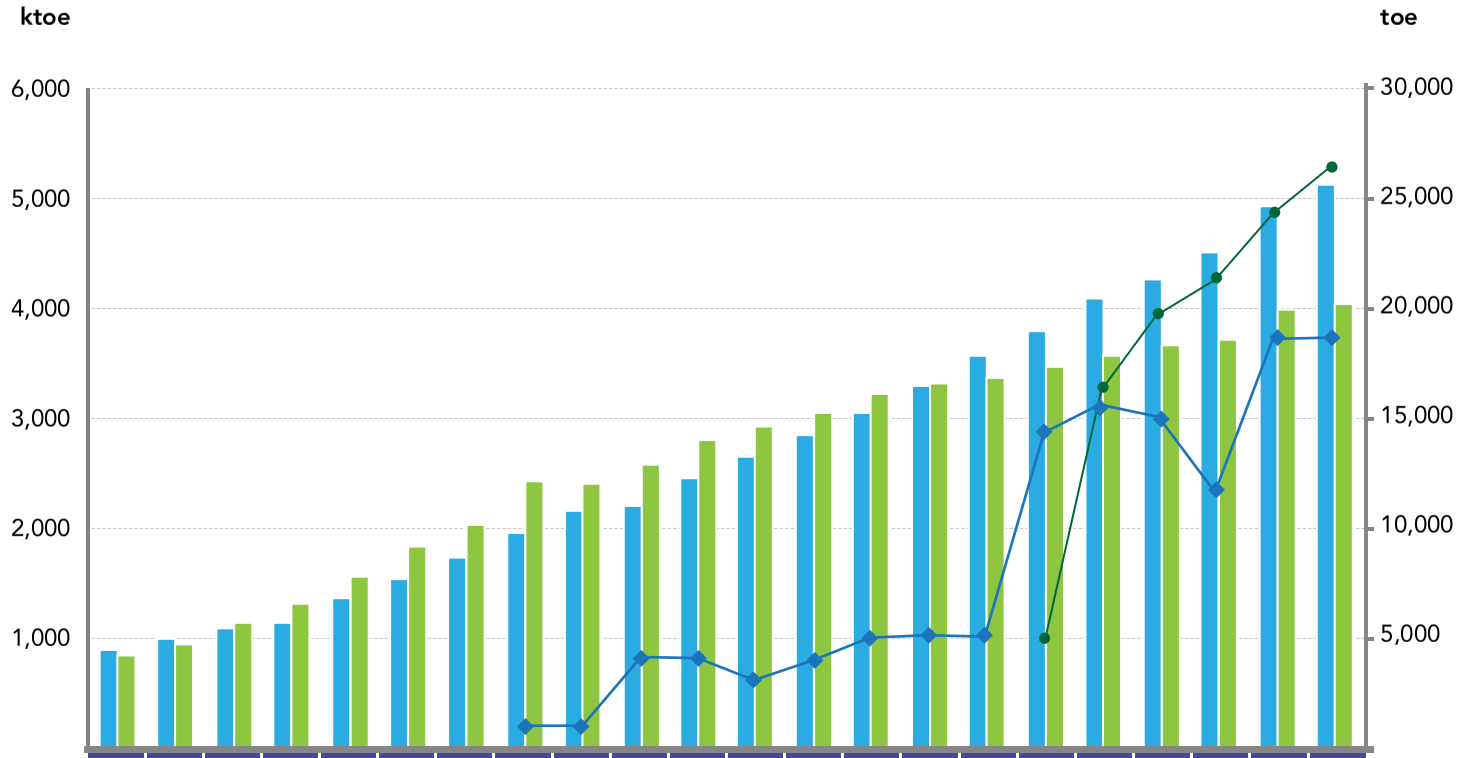
Source:
Power utilities, IPPs and Self-Generators

Figure 30: Electricity Consumption by Sectors in 2011



Source:
Power utilities, IPPs, Self-Generators and Land Public Transport Commission (SPAD)

Figure 31: Electricity Consumption by Sectors



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Residential & Commercial	885	988	1,081	1,147	1,365	1,549	1,747	1,961	2,165	2,220	2,453	2,660	2,859	3,066	3,298	3,567	3,792	4,094	4,266	4,535	4,957	5,146
Industrial	830	937	1,137	1,303	1,567	1,826	2,029	2,422	2,411	2,591	2,805	2,930	3,059	3,242	3,340	3,371	3,475	3,587	3,687	3,719	3,994	4,045
Transport* (toe)	-	-	-	-	-	-	-	1,000	1,000	4,000	4,000	3,000	4,000	5,000	5,000	5,000	14,117	15,295	14,862	11,358	18,439	18,428
Agriculture**(toe)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,886	15,991	19,393	21,080	23,920	26,312

Source:
TNB, SEB, SESB, Co-Generators and Land Public Transport Commission (SPAD)

Note (*) : Data for year 2006 to 2009 were collected directly from train operators
(**): Effective from 1st June 2006, TNB has introduced Specific Agriculture Tariff; previously Agriculture was under the Commercial Tariff

Table 18: Electricity Generation and Installed Capacity of Renewable Energy by Public Licensee by Region in 2011

Region	Type of Prime Mover	Installed Capacity (MW)	Unit Generated (MWh)
Peninsular Malaysia	Land Fill Gas	2.00	5,613
	Mini Hydro	45.98	38,780
	Solar	0.80	666
	Palm Oil Mill Effluent (POME)	2.00	2,030
	Subtotal	**48.78**	**47,089**
Sabah	Palm Shell & Empty Fruit Bunch (EFB)	35.20	165,425
	Wood Waste	10.00	4
	Mini Hydro	17.34	47,841
	Palm Oil Waste	14.00	69,483
	Subtotal	**76.54**	**282,753**
Sarawak	Mini Hydro	6.00	7,021
	Solar	0.02	15
	Subtotal	**6.02**	**7,036**
Grand Total		**131.3**	**336,879**

Source:
Energy Commission, TNB, SESB, SEB and Ministry of Public Utilities Sarawak

Table 19: Electricity Generation and Installed Capacity of Renewable Energy by Private Licensee by Region in 2011

Region	Type of Prime Mover	Installed Capacity (MW)	Unit Generated (MWh)
Peninsular Malaysia	Agricultural Waste	100.32	49,367
	Industrial Waste Heat	9.45	29,055
	Subtotal	**109.77**	**78,422**
Sabah	Agricultural Waste	6.50	12,008
	Wood Waste	57.00	254,856
	Empty Fruit Bunch (EFB)	7.50	12,618
	Subtotal	**71.00**	**279,482**
Sarawak	Palm Oil Waste	7.40	12,533
	Wood / Sawmill Dust	11.00	40,385
	Mini Hydro	5.50	10,211
	Subtotal	**23.90**	**63,129**
Grand Total		**204.67**	**421,033**

Source:
Energy Commission, TNB, SESB, SEB and Ministry of Public Utilities Sarawak

Key Energy Statistics

Table 20: Primary Energy Supply in ktoe

Year	Crude Oil	Petroleum Products & Others	Natural Gas	Coal & Coke	Hydropower	Total	Annual Growth Rate (%)	Share (%)			
								Crude Oil, Petroleum Products & Others	Natural Gas	Coal & Coke	Hydropower
1990	8,783	3,646	6,801	1,326	915	21,471	8.9	57.9	31.7	6.2	4.3
1991	9,443	4,163	10,112	1,564	1,053	26,335	22.7	51.7	38.4	5.9	4.0
1992	10,175	5,098	11,381	1,640	997	29,291	11.2	52.1	38.9	5.6	3.4
1993	10,135	5,816	11,360	1,352	1,262	29,925	2.2	53.3	38.0	4.5	4.2
1994	13,605	2,450	12,392	1,563	1,652	31,662	5.8	50.7	39.1	4.9	5.2
1995	16,159	608	13,960	1,612	1,540	33,879	7.0	49.5	41.2	4.8	4.5
1996	18,255	1,098	15,567	1,677	1,243	37,840	11.7	51.1	41.1	4.4	3.3
1997	17,917	3,803	19,041	1,622	790	43,173	14.1	50.3	44.1	3.8	1.8
1998	17,132	1,919	19,101	1,731	1,113	40,996	(5.0)	46.5	46.6	4.2	2.7
1999	17,643	1,807	21,476	1,940	1,668	44,534	8.6	43.7	48.2	4.4	3.7
2000	21,673	(1,431)	26,370	2,486	1,612	50,710	13.9	39.9	52.0	4.9	3.2
2001	23,590	(1,917)	25,649	2,970	1,687	51,979	2.5	41.7	49.3	5.7	3.2
2002	22,647	(523)	26,101	3,642	1,329	53,196	2.3	41.6	49.1	6.8	2.5
2003	25,344	(1,408)	27,257	5,316	1,056	57,565	8.2	41.6	47.3	9.2	1.8
2004	25,335	(82)	29,145	7,109	1,329	62,836	9.2	40.2	46.4	11.3	2.1
2005	24,339	(243)	33,913	6,889	1,313	66,211	5.4	36.4	51.2	10.4	2.0
2006	24,909	(1,673)	35,776	7,299	1,568	67,879	2.5	34.2	52.7	10.8	2.3
2007	26,571	(1,190)	36,639	8,848	1,517	72,385	6.6	35.1	50.6	12.2	2.1
2008	26,776	(2,323)	39,289	9,782	1,964	75,488	4.3	32.4	52.0	13.0	2.6
2009	26,386	96	35,851	10,623	1,627	74,583	(1.2)	35.5	48.1	14.2	2.2
2010	22,487	2,521	35,447	14,777	1,577	76,809	3.0	32.6	46.1	19.2	2.1
2011	24,679	2,248	35,740	14,772	1,850	79,289	3.2	34.0	45.1	18.6	2.3

Table 21: Net Import and Export of Energy in ktoe

Year	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
1990	21,902	8,686	-	5	2,618	1,396
1991	22,200	8,278	-	2	3,456	1,341
1992	22,215	8,262	1	2	3,986	1,425
1993	20,063	8,654	1,258	(2)	4,328	1,088
1994	18,160	8,928	1,589	(4)	2,398	1,311
1995	18,518	10,790	1,474	2	150	1,538
1996	16,859	15,251	1,474	1	778	1,923
1997	16,022	16,396	1,340	(1)	2,491	1,437
1998	16,626	16,429	1,444	(1)	2,164	1,522
1999	16,274	15,445	1,177	-	1,196	1,313
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

Table 22: Conversion in Gas Plants in ktoe

Year	Input	Output		
	Natural Gas	LNG	GPP - LPG	MDS
1990	9,797	9,797	n.a	n.a
1991	11,715	8,749	n.a	n.a
1992	11,681	8,425	392	n.a
1993	13,005	9,019	529	39
1994	14,634	9,087	948	238
1995	17,088	11,244	1,900	421
1996	20,822	15,251	1,212	344
1997	24,945	16,396	1,258	389
1998	23,138	16,688	1,526	n.a
1999	24,116	16,417	1,472	n.a
2000	26,093	17,231	1,482	164
2001	25,703	16,636	1,310	513
2002	25,571	17,803	1,504	445
2003	27,940	18,965	790	443
2004	33,176	22,944	1,225	1,271
2005	36,447	32,837	2,043	1,567
2006	35,378	30,996	3,506	876
2007	38,141	33,054	4,288	799
2008	38,194	33,766	3,507	920
2009	37,098	32,497	991	3,610
2010	40,246	29,345	9,844	1,057
2011	40,737	35,815	4,071	851

Note:
n.a means not applicable
Middle Distillate Synthesis (MDS) commenced pre-commercialization operation in year 2000
MLNG plant produced LPG in year 2003

Table 23: Conversion in Refineries in ktoe

Year	Input		Total Input	Output								Total Output
	Local Crude Oil	Imported Crude Oil & Others		Petrol	Diesel	Fuel Oil	Kerosene	ATF & AV GAS	LPG	Non-Energy	Refinery Gas	
1990	7,736	2,244	9,980	1,406	3,496	3,241	512	376	256	585	158	10,030
1991	8,199	2,044	10,243	1,665	3,805	2,633	544	403	567	798	174	10,589
1992	9,016	1,409	10,425	1,724	4,048	2,110	541	412	200	324	143	9,502
1993	8,502	3,195	11,697	1,816	4,249	2,375	576	517	244	600	106	10,483
1994	12,326	1,853	14,179	2,316	5,108	2,887	563	980	319	1,468	162	13,803
1995	15,991	969	16,960	2,320	6,011	2,212	360	1,587	431	3,380	385	16,686
1996	15,879	3,501	19,380	3,134	6,174	3,696	292	1,899	371	2,554	331	18,451
1997	16,382	1,535	17,917	2,491	6,744	2,716	365	2,000	371	1,783	203	16,673
1998	15,942	1,190	17,132	2,545	5,926	3,233	285	1,985	449	2,117	192	16,732
1999	14,595	3,048	17,643	3,056	6,712	2,603	210	2,140	617	2,159	230	17,727
2000	15,421	6,252	21,673	3,893	8,059	2,532	239	2,660	838	2,492	241	20,954
2001	13,299	10,290	23,589	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	8,254	25,381	4,584	9,062	1,763	983	2,367	932	2,623	262	22,576
2004	16,810	8,524	25,334	4,724	9,611	1,813	591	2,693	897	2,455	215	22,999
2005	18,216	6,123	24,339	4,245	9,161	1,777	521	2,553	822	2,157	202	21,438
2006	16,797	8,112	24,909	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	5,701	26,386	4,052	9,415	1,144	565	3,085	732	5,905	195	25,093
2010	14,003	8,484	22,487	3,874	8,369	327	483	2,891	697	4,357	209	21,207
2011	14,874	9,806	24,679	3,599	8,925	571	419	3,457	665	4,572	1,659	23,867

Table 24: Conversion in Power Stations (excluding co-generation & private licensed plants) in ktoe

Year	Input					Total Input	Annual Growth Rate (%)	Input Share (%)				Output
	Fuel Oil	Diesel	Natural Gas	Hydro power*	Coal			Fuel Oil and Diesel	Natural Gas	Hydro power	Coal	Total Electricity Generated
1990	2,873	116	1,361	915	813	6,078	21.2	49.2	22.4	15.1	13.4	1,979
1991	2,687	164	2,533	1,053	963	7,400	21.8	38.5	34.2	14.2	13.0	2,283
1992	2,352	160	3,144	997	968	7,621	3.0	33.0	41.3	13.1	12.7	2,521
1993	2,388	87	4,374	1,262	884	8,995	18.0	27.5	48.6	14.0	9.8	2,987
1994	1,957	249	5,119	1,652	925	9,902	10.1	22.3	51.7	16.7	9.3	3,362
1995	2,073	265	6,414	1,540	957	11,249	13.6	20.8	57.0	13.7	8.5	3,909
1996	2,354	284	7,489	1,243	950	12,320	9.5	21.4	60.8	10.1	7.7	4,421
1997	2,482	185	7,531	790	882	11,870	(3.7)	22.5	63.4	6.7	7.4	4,977
1998	2,130	275	8,886	1,113	964	13,368	12.6	18.0	66.5	8.3	7.2	5,013
1999	950	172	10,162	1,668	1,332	14,284	6.9	7.9	71.1	11.7	9.3	5,409
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

Note (*):
Figures calculated from average efficiency of thermal stations of respective year

Table 25: Final Energy Consumption by Sectors in ktoe

Year	Industrial	Transport	Residential and Commercial	Non-Energy Use	Agriculture	Total	Annual Growth Rate (%)	Industrial including Agriculture & Non-Energy	Industrial GDP*	Industrial Energy Intensity (toe/RM Million at 2005 Prices)
1990	5,300	5,386	1,622	838	-	13,146	11.0	6,138	124,168	49
1991	5,835	5,806	1,721	1,071	130	14,563	10.8	7,036	134,346	52
1992	6,455	6,226	1,891	1,222	391	16,185	11.1	8,068	143,502	56
1993	7,012	6,558	2,069	2,027	62	17,728	9.5	9,101	152,503	60
1994	7,283	7,262	2,502	1,817	422	19,286	8.8	9,522	163,886	58
1995	8,060	7,827	2,837	1,994	446	21,164	9.7	10,500	181,278	58
1996	9,838	8,951	3,162	1,744	486	24,181	14.3	12,068	204,301	59
1997	10,106	10,201	3,073	2,298	490	26,168	8.2	12,894	218,870	59
1998	10,121	9,793	3,314	2,023	307	25,558	(2.3)	12,451	195,779	64
1999	10,277	11,393	3,653	1,799	106	27,228	6.5	12,182	210,345	58
2000	11,406	12,071	3,868	2,250	104	29,699	9.1	13,760	235,479	58
2001	11,852	13,137	4,048	2,378	98	31,513	6.1	14,328	229,439	62
2002	12,854	13,442	4,387	2,511	96	33,290	5.6	15,461	238,235	65
2003	13,472	14,271	4,399	2,345	98	34,585	3.9	15,915	256,074	62
2004	14,914	15,385	4,754	2,183	87	37,323	7.9	17,184	273,885	63
2005	15,492	15,384	5,134	2,173	101	38,284	2.6	17,766	282,884	63
2006	15,248	14,819	5,430	2,819	253	38,569	0.7	18,320	295,711	62
2007	16,454	15,717	6,212	2,958	265	41,606	7.9	19,677	304,216	65
2008	16,205	16,395	6,205	2,876	287	41,968	0.9	19,368	306,331	63
2009	14,312	16,119	6,336	3,868	211	40,846	(2.7)	18,391	287,869	64
2010	12,928	16,828	6,951	3,696	1,074	41,477	1.5	17,698	309,165	57
2011	12,100	17,070	6,993	6,377	916	43,456	4.8	19,393	317,519	61

Note (*):
Defined as total GDP for Agriculture, Forestry and Fishing, Mining and Quarrying, Manufacturing and Construction

Table 26: Final Energy Consumption by Type of Fuels in ktoe

Year	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 (%)
1990	9,825	1,715	*609*	*460*	1,069	513	13,122	12,513	8.2
1991	10,914	1,925	*604*	*495*	1,099	599	14,537	13,933	11.3
1992	11,927	2,218	*657*	*687*	1,344	672	16,161	15,504	11.3
1993	13,075	2,450	*1,141*	*560*	1,701	487	17,713	16,572	6.9
1994	13,894	2,932	*1,163*	*497*	1,660	598	19,084	17,921	8.1
1995	16,142	3,375	*1,064*	*590*	1,654	712	21,883	20,819	16.2
1996	17,203	3,777	*870*	*1,209*	2,079	727	23,786	22,916	10.1
1997	18,578	4,384	*1,378*	*1,087*	2,465	740	26,167	24,789	8.2
1998	17,488	4,577	*1,282*	*1,444*	2,726	767	25,558	24,276	(2.1)
1999	18,782	4,815	*1,118*	*1,905*	3,023	608	27,228	26,110	7.6
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*	*3,867*	5,642	1,086	33,288	31,513	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	1,361	41,605	39,493	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)

Table 27: Final Consumption of Petroleum Products in ktoe

Year	Diesel	Petrol	Fuel Oil	LPG	Kerosene	ATF & AV GAS	Non-Energy & Others	Total
1990	4,421	2,901	883	548	203	628	239	9,823
1991	4,873	3,135	945	612	180	690	479	10,914
1992	5,291	3,326	1,088	733	160	764	565	11,927
1993	5,339	3,666	1,293	1,119	149	875	635	13,076
1994	5,643	4,139	1,392	926	152	978	664	13,894
1995	5,810	4,548	1,506	2,215	177	1,160	726	16,142
1996	6,735	5,205	1,770	1,215	197	1,335	746	17,203
1997	7,314	5,586	1,978	1,245	169	1,439	847	18,578
1998	6,252	5,854	1,678	1,301	165	1,619	619	17,488
1999	6,506	6,793	1,792	1,523	162	1,424	582	18,782
2000	7,627	6,387	1,875	1,362	131	1,574	625	19,581
2001	6,827	8,116	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	7,360	8,539	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

Table 28: Selected Energy and Economic Indicators (1990-2011)

Year	GDP at 2005 Prices (RM million)*	Population ('000 people)*	Primary Energy Supply (ktoe)	Final Energy Demand (ktoe)	Electricity Demand (ktoe)	Electricity Demand (GWh)	Average Annual Growth (%)				Per Capita				Energy Intensity				Energy Elasticity	
							GDP at 2005 Prices	Primary Energy Supply	Final Energy Demand	Electricity Demand	GDP at 2000 Prices (RM)	Primary Energy Supply per Capita (toe)	Final Energy Demand per Capita (toe)	Electricity Demand per Capita (kWh)	Primary Energy Supply (toe/GDP at 2005 Prices (RM Million))	Final Energy Demand (toe/GDP at 2005 Prices (RM Million))	Electricity Demand (toe/GDP at 2005 Prices (RM Million))	Electricity Demand (GWh/GDP at 2005 Prices (RM Million))	Final Energy	Final Electricity
1990	217,047	18,102	21,471	13,146	1,715	19,932	9.01	8.90	8.70	9.70	11,990	1.19	0.73	1,101	98.92	60.57	7.9	0.092	0.97	1.08
1991	237,766	18,986	26,335	14,563	1,925	22,373	9.55	22.65	10.78	12.24	12,523	1.39	0.77	1,178	110.76	61.25	8.1	0.094	1.13	1.28
1992	258,891	18,985	29,291	16,185	2,218	25,778	8.88	11.22	11.14	15.22	13,637	1.54	0.85	1,358	113.14	62.52	8.6	0.100	1.25	1.71
1993	284,509	19,503	29,925	17,728	2,450	28,474	9.90	2.16	9.53	10.46	14,588	1.53	0.91	1,460	105.18	62.31	8.6	0.100	0.96	1.06
1994	310,718	20,049	31,662	19,287	2,932	34,076	9.21	5.80	8.79	19.67	15,498	1.58	0.96	1,700	101.90	62.07	9.4	0.110	0.95	2.14
1995	341,258	20,624	33,879	22,164	3,375	39,225	9.83	7.00	14.92	15.11	16,547	1.64	1.07	1,902	99.28	64.95	9.9	0.115	1.52	1.54
1996	375,393	21,101	37,840	24,181	3,777	43,897	10.00	11.69	9.10	11.91	17,790	1.79	1.15	2,080	100.80	64.42	10.1	0.117	0.91	1.19
1997	402,882	21,595	43,173	26,167	4,384	50,952	7.32	14.09	8.21	16.07	18,656	2.00	1.21	2,359	107.16	64.95	10.9	0.126	1.12	2.19
1998	373,231	22,107	40,996	25,558	4,577	53,195	(7.36)	(5.04)	(2.33)	4.40	16,883	1.85	1.16	2,406	109.84	68.48	12.3	0.143	0.32	(0.60)
1999	396,140	22,636	44,534	27,228	4,815	55,961	6.14	8.63	6.53	5.20	17,500	1.97	1.20	2,472	112.42	68.73	12.2	0.141	1.06	0.85
2000	431,234	23,495	50,710	29,699	5,263	61,168	8.86	13.87	9.08	9.30	18,354	2.16	1.26	2,603	117.59	68.87	12.2	0.142	1.02	1.05
2001	433,466	24,123	51,979	31,515	5,594	65,015	0.52	2.50	6.11	6.29	17,969	2.15	1.31	2,695	119.91	72.70	12.9	0.150	11.81	12.15
2002	456,834	24,727	53,196	33,289	5,922	68,827	5.39	2.34	5.63	5.86	18,475	2.15	1.35	2,783	116.44	72.87	13.0	0.151	1.04	1.09
2003	483,278	25,320	57,565	34,586	6,313	73,371	5.79	8.21	3.90	6.60	19,087	2.27	1.37	2,898	119.11	71.57	13.1	0.152	0.67	1.14
2004	516,061	25,905	62,836	37,323	6,642	77,195	6.78	9.16	7.91	5.21	19,921	2.43	1.44	2,980	121.76	72.32	12.9	0.150	1.17	0.77
2005	543,578	26,477	66,211	38,285	6,944	80,705	5.33	5.37	2.58	4.55	20,530	2.50	1.45	3,048	121.81	70.43	12.8	0.148	0.48	0.85
2006	573,936	26,832	67,021	38,567	7,272	84,517	5.58	1.22	0.74	4.72	21,390	2.50	1.44	3,150	116.77	67.20	12.7	0.147	0.13	0.85
2007	610,087	27,186	72,389	41,606	7,683	89,294	6.30	8.01	7.88	5.65	22,441	2.66	1.53	3,285	118.65	68.20	12.6	0.146	1.25	0.90
2008	639,565	27,541	76,032	41,968	7,986	92,815	4.83	5.03	0.87	3.94	23,222	2.76	1.52	3,370	118.88	65.62	12.5	0.145	0.18	0.82
2009	629,885	27,895	74,583	40,845	8,286	96,302	(1.51)	(1.91)	(2.68)	3.76	22,581	2.67	1.46	3,452	118.41	64.85	13.2	0.153	1.77	(2.48)
2010	676,653	28,251	76,809	41,476	8,993	104,519	7.42	2.98	1.54	8.53	23,891	2.72	1.47	3,700	113.80	61.30	13.3	0.155	0.21	1.19
2011	711,351	28,964	79,289	43,455	9,235	107,331	5.13	3.23	4.77	2.69	24,560	2.74	1.50	3,706	111.79	61.09	13.0	0.151	0.94	0.53

Source (*):
Monthly Statistical Bulletin, Bank Negara Malaysia (GDP at 2005 Prices (RM Million) for 1990 until 2004 by Energy Commission)

Table 29: Energy Balance Table in 2011 (kilo tonnes of oil equivalent)

Commercial Energy Balance for Malaysia 2011 (Thousand Tonnes of Oil Equivelent)																		
Energy Source	NATURAL GAS	LNG	CRUDE OIL (1/)	OTHERS (2/)	TOTAL PETROLEUM PRODUCTS	Petroleum Products								COAL & COKE	HYDRO POWER	BIODIESEL	ELECTRICITY	TOTAL
						Petrol	Diesel	Fuel Oil	LPG	Kerosene	ATF & AV GAS	Non-Energy	Refinery Gas					
Primary Supply																		
1. Primary Production	69,849	0	28,325	0	0	0	0	0	0	0	0	0	0	1,838	1,850	176	0	102,039
2. Gas Flaring, Reinjection & Use	-13,085	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-13,085
3. Imports	6,979	0	9,104	218	11,580	4,169	3,766	1,470	537	148	496	993	0	13,330	0	0	32	41,244
4. Exports	-1,147	-26,856	-11,404	-120	-9,421	0	-4,450	-340	-992	-702	-682	-2,255	0	-141	0	-51	-1	-49,142
5. Bunkers	0	0	0	0	-201	0	-14	-187	0	0	0	0	0	0	0	0	0	-201
6. Stock Change	0	0	-1,693	0	137	13	1,542	0	1	5	-825	-599	0	-372	0	-101	0	-2,030
7. Statistical Discrepancy	0	0	347	0	0	0	0	0	0	0	0	0	0	117	0	0	0	465
8. Primary Supply	**62,596**	**-26,856**	**24,679**	**98**	**2,095**	**4,182**	**845**	**943**	**-453**	**-549**	**-1,011**	**-1,861**	**0**	**14,772**	**1,850**	**24**	**31**	**79,289**
Transformation																		
9. Gas Plants																		
9.1 LNG	-35,815	27,916	0	0	214	0	0	0	214	0	0	0	0	0	0	0	0	-7,686
9.2 MDS	-851	0	0	0	359	0	74	0	0	33	0	252	0	0	0	0	0	-492
9.3 GPP-LPG (3&4/)	-4,071	0	0	0	2,434	0	0	0	2,434	0	0	0	0	0	0	0	0	-1,636
Subtotal	**-40,737**	**27,916**	**0**	**0**	**3,008**	**0**	**74**	**0**	**2,648**	**33**	**0**	**252**	**0**	**0**	**0**	**0**	**0**	**-9,814**
10. Refineries	0	0	-24,679	-98	23,869	3,599	8,925	571	665	419	3,457	4,572	1,659	0	0	0	0	-909
11. Power Stations & Self-Generation																		
11.1 Hydro Stations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1,850	0	656	-1,194
11.2 Thermal Stations	-10,977	0	0	0	-2,084	0	-981	-1,103	0	0	0	0	0	-13,013	0	0	9,648	-16,426
11.3 Self-Generation (5/)	-1,721	0	0	0	-199	0	-199	0	0	0	0	0	0	0	0	0	442	-1,479
Subtotal	**-12,698**	**0**	**0**	**0**	**-2,283**	**0**	**-1,180**	**-1,103**	**0**	**0**	**0**	**0**	**0**	**-13,013**	**-1,850**	**0**	**10,635**	**-19,210**
12. Losses & Own Use	-646	-1,059	0	0	-3,386	0	0	-18	0	0	0	-1,746	-1,623	0	0	0	-1,100	-6,191
13. Statistical Discrepancy	0	0	0	0	620	374	48	20	31	115	107	-40	-36	0	0	0	-320	290
14. Secondary Supply	**-54,081**	**26,856**	**-24,679**	**-98**	**21,827**	**3,973**	**7,868**	**-529**	**3,345**	**568**	**3,564**	**3,039**	**0**	**-13,013**	**-1,850**	**0**	**9,205**	**-35,833**
Final Use																		
15. Residential	6	0	0	0	791	0	0	0	781	10	0	0	0	0	0	0	1,974	2,771
16. Commercial	31	0	0	0	1,019	0	390	37	592	0	0	0	0	0	0	0	3,172	4,222
17. Industrial	4,300	0	0	0	1,996	160	1,281	321	225	9	0	0	0	1,759	0	0	4,045	12,100
18. Transport	272	0	0	0	16,756	7,995	6,169	39	0	0	2,553	0	0	0	0	24	18	17,070
19. Agriculture	0	0	0	0	890	0	873	17	0	0	0	0	0	0	0	0	26	916
20. Non-Energy Use	3,906	0	0	0	2,471	0	0	0	1,293	0	0	1,178	0	0	0	0	0	6,377
21. Total Final Use	**8,515**	**0**	**0**	**0**	**23,922**	**8,155**	**8,712**	**414**	**2,892**	**19**	**2,553**	**1,178**	**0**	**1,759**	**0**	**24**	**9,236**	**43,455**

1/ Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2/ Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residium & Middle East Residue) which are used as refinery intake.
3/ GPP-LPG Extracts Liquid Products i.e. Condensates, Ethane, Butane and Propane from Natural Gas. Ethane is not included under LPG production.
4/ Butane and Propane as MTBE Feedstocks are presented as Non-Energy use under LPG column. Ethane is presented under Natural Gas column.
5/ Estimated figures based from the Energy Commission, Statistics of Electricity Supply Industry in Malaysia 2011.
Note : Total may not necessarily add up due to rounding.

Table 30: Energy Balance Table in First Quarter (1Q) of 2011 (kilo tonnes of oil equivalent)

Commercial Energy Balance for Malaysia 2011 (Thousand Tonnes of Oil Equivelent)																		
Energy Source	NATURAL GAS	LNG	CRUDE OIL (1/)	OTHERS (2/)	TOTAL PETROLEUM PRODUCTS	Petroleum Products								COAL & COKE	HYDRO POWER	BIODIESEL	ELECTRICITY	TOTAL
						Petrol	Diesel	Fuel Oil	LPG	Kerosene	ATF & AV GAS	Non-Energy	Refinery Gas					
Primary Supply																		
1. Primary Production	18,134	0	7,603	0	0	0	0	0	0	0	0	0	0	407	467	18	0	26,629
2. Gas Flaring, Reinjection & Use	-3,333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3,333
3. Imports	1,726	0	2,466	16	2,378	926	769	243	190	1	106	142	0	3,760	0	0	8	10,354
4. Exports	-319	-7,255	-3,587	-103	-2,656	0	-1,417	-61	-311	-176	-312	-379	0	-92	0	0	0	-14,012
5. Bunkers	0	0	0	0	-62	0	-6	-56	0	0	0	0	0	0	0	0	0	-62
6. Stock Change	0	0	175	0	151	8	481	0	-2	3	-188	-151	0	-245	0	-18	0	64
7. Statistical Discrepancy	0	0	119	0	0	0	0	0	0	0	0	0	0	-189	0	0	0	-70
8. Primary Supply	**16,208**	**-7,255**	**6,776**	**-87**	**-189**	**934**	**-174**	**126**	**-123**	**-171**	**-394**	**-387**	**0**	**3,641**	**467**	**0**	**7**	**19,568**
Transformation																		
9. Gas Plants																		
9.1 LNG	-9,407	7,430	0	0	63	0	0	0	63	0	0	0	0	0	0	0	0	-1,914
9.2 MDS	-272	0	0	0	109	0	20	0	0	11	0	79	0	0	0	0	0	-163
9.3 GPP-LPG (3&4/)	-1,115	0	0	0	620	0	0	0	620	0	0	0	0	0	0	0	0	-495
Subtotal	**-10,794**	**7,430**	**0**	**0**	**792**	**0**	**20**	**0**	**683**	**11**	**0**	**79**	**0**	**0**	**0**	**0**	**0**	**-2,572**
10. Refineries	0	0	-6,776	87	6,490	1,032	2,425	152	197	123	931	1,235	395	0	0	0	0	-199
11. Power Stations & Self-Generation																		
11.1 Hydro Stations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-467	0	161	-306
11.2 Thermal Stations	-2,720	0	0	0	-311	0	-127	-184	0	0	0	0	0	-3,204	0	0	2,337	-3,897
11.3 Self-Generation (5/)	-440	0	0	0	-51	0	-51	0	0	0	0	0	0	0	0	0	111	-381
Subtotal	**-3,160**	**0**	**0**	**0**	**-362**	**0**	**-178**	**-184**	**0**	**0**	**0**	**0**	**0**	**-3,204**	**-467**	**0**	**2,498**	**-4,695**
12. Losses & Own Use	-155	-175	0	0	-940	0	0	-4	0	0	0	-540	-395	0	0	0	-213	-1,483
13. Statistical Discrepancy	-0	0	0	0	8	-6	-49	-23	-30	40	93	-17	0	0	0	0	-122	-114
14. Secondary Supply	-14,110	7,255	-6,776	87	5,989	1,026	2,218	-60	850	174	1,024	756	0	-3,204	-467	0	2,163	-9,062
Final Use																		
15. Residential	2	0	0	0	196	0	0	0	196	1	0	0	0	0	0	0	456	654
16. Commercial	8	0	0	0	227	0	82	3	142	0	0	0	0	0	0	0	734	969
17. Industrial	1,086	0	0	0	426	24	288	59	53	2	0	0	0	437	0	0	970	2,919
18. Transport	65	0	0	0	4,008	1,936	1,439	2	0	0	630	0	0	0	0	0	4	4,077
19. Agriculture	0	0	0	0	237	0	235	2	0	0	0	0	0	0	0	0	6	243
20. Non-Energy Use	938	0	0	0	705	0	0	0	336	0	0	369	0	0	0	0	0	1,643
21. Total Final Use	**2,098**	**0**	**0**	**0**	**5,799**	**1,960**	**2,044**	**66**	**727**	**2**	**630**	**369**	**0**	**437**	**0**	**0**	**2,171**	**10,506**

1/ Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2/ Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residium & Middle East Residue) which are used as refinery intake.
3/ GPP-LPG Extracts Liquid Products i.e. Condensates, Ethane, Butane and Propane from Natural Gas. Ethane is not included under LPG production.
4/ Butane and Propane as MTBE Feedstocks are presented as Non-Energy use under LPG column. Ethane is presented under Natural Gas column.
5/ Estimated figures based from the Energy Commission, Statistics of Electricity Supply Industry in Malaysia 2011.
Note : Total may not necessarily add up due to rounding.

Table 31: Energy Balance Table in Second Quarter (2Q) of 2011 (kilo tonnes of oil equivalent)

Commercial Energy Balance for Malaysia 2011 (Thousand Tonnes of Oil Equivelent)																		
Energy Source	NATURAL GAS	LNG	CRUDE OIL (1/)	OTHERS (2/)	TOTAL PETROLEUM PRODUCTS	Petroleum Products								COAL & COKE	HYDRO POWER	BIODIESEL	ELECTRICITY	TOTAL
						Petrol	Diesel	Fuel Oil	LPG	Kerosene	ATF & AV GAS	Non-Energy	Refinery Gas					
Primary Supply																		
1. Primary Production	17,091	0	6,522	0	0	0	0	0	0	0	0	0	0	405	422	47	0	24,487
2. Gas Flaring, Reinjection & Use	-3,373	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3,373
3. Imports	1,676	0	1,665	0	3,534	1,217	1,064	486	136	145	197	287	0	2,711	0	0	15	9,601
4. Exports	-238	-6,739	-3,167	0	-2,190	0	-876	-42	-248	-176	-76	-773	0	-39	0	-6	0	-12,380
5. Bunkers	0	0	0	0	-82	0	-6	-75	0	0	0	0	0	0	0	0	0	-82
6. Stock Change	0	0	336	0	284	58	569	0	0	-7	-202	-133	0	-534	0	-40	0	45
7. Statistical Discrepancy	0	0	38	0	0	0	0	0	0	0	0	0	0	927	0	0	0	965
8. Primary Supply	**15,156**	**-6,739**	**5,394**	**0**	**1,546**	**1,275**	**751**	**369**	**-112**	**-38**	**-81**	**-619**	**0**	**3,469**	**422**	**0**	**15**	**19,263**
Transformation																		
9. Gas Plants																		
9.1 LNG	-8,641	6,849	0	0	56	0	0	0	56	0	0	0	0	0	0	0	0	-1,736
9.2 MDS	-251	0	0	0	123	0	23	0	0	10	0	90	0	0	0	0	0	-128
9.3 GPP-LPG (3&4/)	-816	0	0	0	576	0	0	0	576	0	0	0	0	0	0	0	0	-240
Subtotal	**-9,707**	**6,849**	**0**	**0**	**756**	**0**	**23**	**0**	**632**	**10**	**0**	**90**	**0**	**0**	**0**	**0**	**0**	**-2,103**
10. Refineries	0	0	-5,394	0	5,392	753	1,968	142	127	48	725	1,260	369	0	0	0	0	-2
11. Power Stations & Self-Generation																		
11.1 Hydro Stations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-422	0	155	-266
11.2 Thermal Stations	-2,727	0	0	0	-734	0	-354	-380	0	0	0	0	0	-3,033	0	0	2,522	-3,972
11.3 Self-Generation (5/)	-415	0	0	0	-50	0	-50	0	0	0	0	0	0	0	0	0	109	-356
Subtotal	**-3,142**	**0**	**0**	**0**	**-784**	**0**	**-404**	**-380**	**0**	**0**	**0**	**0**	**0**	**-3,033**	**-422**	**0**	**2,786**	**-4,594**
12. Losses & Own Use	-149	-110	0	0	-723	0	0	-4	0	0	0	-386	-334	0	0	0	-249	-1,230
13. Statistical Discrepancy	0	0	0	0	-115	95	10	-71	-4	-15	11	-106	-36	0	0	0	-176	-290
14. Secondary Supply	**-12,998**	**6,739**	**-5,394**	**0**	**4,525**	**848**	**1,598**	**-312**	**755**	**43**	**736**	**857**	**0**	**-3,033**	**-422**	**0**	**2,362**	**-8,220**
Final Use																		
15. Residential	2	0	0	0	195	0	0	0	192	3	0	0	0	0	0	0	510	707
16. Commercial	8	0	0	0	246	0	94	4	147	0	0	0	0	0	0	0	820	1,074
17. Industrial	1,038	0	0	0	520	68	348	47	54	2	0	0	0	436	0	0	1,036	3,030
18. Transport	69	0	0	0	4,367	2,055	1,655	2	0	0	656	0	0	0	0	0	5	4,441
19. Agriculture	0	0	0	0	255	0	251	3	0	0	0	0	0	0	0	0	6	261
20. Non-Energy Use	1,042	0	0	0	489	0	0	0	250	0	0	239	0	0	0	0	0	1,531
21. Total Final Use	**2,158**	**0**	**0**	**0**	**6,071**	**2,123**	**2,348**	**57**	**643**	**5**	**656**	**239**	**0**	**436**	**0**	**0**	**2,377**	**11,043**

1/ Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2/ Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residium & Middle East Residue) which are used as refinery intake.
3/ GPP-LPG Extracts Liquid Products i.e. Condensates, Ethane, Butane and Propane from Natural Gas. Ethane is not included under LPG production.
4/ Butane and Propane as MTBE Feedstocks are presented as Non-Energy use under LPG column. Ethane is presented under Natural Gas column.
5/ Estimated figures based from the Energy Commission, Statistics of Electricity Supply Industry in Malaysia 2011.
Note : Total may not necessarily add up due to rounding.

Table 32: Energy Balance Table in Third Quarter (3Q) of 2011 (kilo tonnes of oil equivalent)

Commercial Energy Balance for Malaysia 2011 (Thousand Tonnes of Oil Equivelent)																		
Energy Source	NATURAL GAS	LNG	CRUDE OIL (1/)	OTHERS (2/)	TOTAL PETROLEUM PRODUCTS	Petroleum Products								COAL & COKE	HYDRO POWER	BIODIESEL	ELECTRICITY	TOTAL
						Petrol	Diesel	Fuel Oil	LPG	Kerosene	ATF & AV GAS	Non-Energy	Refinery Gas					
Primary Supply																		
1. Primary Production	17,303	0	6,992	0	0	0	0	0	0	0	0	0	0	479	370	50	0	25,193
2. Gas Flaring, Reinjection & Use	-3,494	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3,494
3. Imports	1,806	0	2,000	202	3,045	1,012	962	360	116	2	124	468	0	2,947	0	0	0	10,001
4. Exports	-301	-6,020	-2,231	-10	-2,311	0	-858	-60	-180	-176	-157	-880	0	-9	0	-17	0	-10,900
5. Bunkers	0	0	0	0	-46	0	-1	-45	0	0	0	0	0	0	0	0	0	-46
6. Stock Change	0	0	-1,084	0	185	74	488	0	0	6	-191	-192	0	234	0	-26	0	-692
7. Statistical Discrepancy	0	0	-3	0	0	0	0	0	0	0	0	0	0	-16	0	0	0	-19
8. Primary Supply	**15,315**	**-6,020**	**5,674**	**192**	**872**	**1,086**	**592**	**255**	**-64**	**-167**	**-225**	**-604**	**0**	**3,634**	**370**	**6**	**0**	**20,043**
Transformation																		
9. Gas Plants																		
9.1 LNG	-8,392	6,526	0	0	55	0	0	0	55	0	0	0	0	0	0	0	0	-1,811
9.2 MDS	-183	0	0	0	72	0	14	0	0	7	0	51	0	0	0	0	0	-111
9.3 GPP-LPG (3&4/)	-1,154	0	0	0	632	0	0	0	632	0	0	0	0	0	0	0	0	-522
Subtotal	**-9,728**	**6,526**	**0**	**0**	**758**	**0**	**14**	**0**	**686**	**7**	**0**	**51**	**0**	**0**	**0**	**0**	**0**	**-2,444**
10. Refineries	0	0	-5,674	-192	5,736	800	2,101	132	156	105	856	1,152	434	0	0	0	0	-130
11. Power Stations & Self-Generation																		
11.1 Hydro Stations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-370	0	148	-222
11.2 Thermal Stations	-2,834	0	0	0	-571	0	-288	-283	0	0	0	0	0	-3,198	0	0	2,622	-3,981
11.3 Self-Generation (5/)	-415	0	0	0	-49	0	-49	0	0	0	0	0	0	0	0	0	111	-353
Subtotal	**-3,249**	**0**	**0**	**0**	**-619**	**0**	**-336**	**-283**	**0**	**0**	**0**	**0**	**0**	**-3,198**	**0**	**0**	**2,881**	**-4,556**
12. Losses & Own Use	-170	-506	0	0	-836	0	0	-6	0	0	0	-396	-434	0	0	0	-415	-1,928
13. Statistical Discrepancy	0	0	0	0	312	210	-139	120	32	61	6	23	0	0	0	0	-83	229
14. Secondary Supply	**-13,147**	**6,020**	**-5,674**	**-192**	**5,350**	**1,010**	**1,640**	**-38**	**874**	**173**	**862**	**830**	**0**	**-3,198**	**-370**	**0**	**2,383**	**-8,828**
Final Use																		
15. Residential	2	0	0	0	197	0	0	0	194	3	0	0	0	0	0	0	523	722
16. Commercial	8	0	0	0	272	0	118	5	148	0	0	0	0	0	0	0	815	1,094
17. Industrial	1,057	0	0	0	622	41	314	206	59	3	0	0	0	435	0	0	1,033	3,148
18. Transport	71	0	0	0	4,283	2,055	1,590	1	0	0	636	0	0	0	0	6	5	4,364
19. Agriculture	0	0	0	0	213	0	209	4	0	0	0	0	0	0	0	0	7	221
20. Non-Energy Use	1,031	0	0	0	635	0	0	0	409	0	0	226	0	0	0	0	0	1,666
21. Total Final Use	**2,168**	**0**	**0**	**0**	**6,223**	**2,096**	**2,231**	**217**	**810**	**6**	**636**	**226**	**0**	**435**	**0**	**6**	**2,383**	**11,215**

1/ Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2/ Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residium & Middle East Residue) which are used as refinery intake.
3/ GPP-LPG Extracts Liquid Products i.e. Condensates, Ethane, Butane and Propane from Natural Gas. Ethane is not included under LPG production.
4/ Butane and Propane as MTBE Feedstocks are presented as Non-Energy use under LPG column. Ethane is presented under Natural Gas column.
5/ Estimated figures based from the Energy Commission, Statistics of Electricity Supply Industry in Malaysia 2011.
Note : Total may not necessarily add up due to rounding.

Table 33: Energy Balance Table in Fourth Quarter (4Q) of 2011 (kilo tonnes of oil equivalent)

Commercial Energy Balance for Malaysia 2011 (Thousand Tonnes of Oil Equivelent)																		
Energy Source	NATURAL GAS	LNG	CRUDE OIL (1/)	OTHERS (2/)	TOTAL PETROLEUM PRODUCTS	Petroleum Products								COAL & COKE	HYDRO POWER	BIODIESEL	ELECTRICITY	TOTAL
						Petrol	Diesel	Fuel Oil	LPG	Kerosene	ATF & AV GAS	Non-Energy	Refinery Gas					
Primary Supply																		
1. Primary Production	17,321	0	7,208	0	0	0	0	0	0	0	0	0	0	548	592	61	0	25,730
2. Gas Flaring, Reinjection & Use	-2,885	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2,885
3. Imports	1,771	0	2,973	0	2,624	1,014	971	381	95	1	69	95	0	3,192	0	0	9	11,288
4. Exports	-290	-6,843	-2,419	-7	-2,264	0	-1,299	-177	-253	-176	-136	-224	0	0	0	-27	0	-11,850
5. Bunkers	0	0	0	0	-12	0	-1	-11	0	0	0	0	0	0	0	0	0	-12
6. Stock Change	0	0	-1,120	0	-482	-126	4	0	4	3	-244	-122	0	173	0	-17	0	-1,447
7. Statistical Discrepancy	0	0	194	0	0	0	0	0	0	0	0	0	0	-604	0	0	0	-411
8. Primary Supply	**15,917**	**-6,843**	**6,836**	**-7**	**-134**	**887**	**-324**	**193**	**-155**	**-172**	**-311**	**-251**	**0**	**4,028**	**592**	**17**	**8**	**20,414**
Transformation																		
9. Gas Plants																		
9.1 LNG	-9,376	7,111	0	0	41	0	0	0	41	0	0	0	0	0	0	0	0	-2,224
9.2 MDS	-145	0	0	0	55	0	17	0	0	5	0	33	0	0	0	0	0	-90
9.3 GPP-LPG (3&4/)	-986	0	0	0	606	0	0	0	606	0	0	0	0	0	0	0	0	-380
Subtotal	**-10,508**	**7,111**	**0**	**0**	**702**	**0**	**17**	**0**	**647**	**5**	**0**	**33**	**0**	**0**	**0**	**0**	**0**	**-2,695**
10. Refineries	0	0	-6,836	7	6,251	1,014	2,431	145	186	143	945	926	460	0	0	0	0	-578
11. Power Stations & Self-Generation																		
11.1 Hydro Stations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-592	0	192	-400
11.2 Thermal Stations	-2,697	0	0	0	-468	0	-213	-255	0	0	0	0	0	-3,578	0	0	2,168	-4,575
11.3 Self-Generation (5/)	-451	0	0	0	-49	0	-49	0	0	0	0	0	0	0	0	0	110	-390
Subtotal	**-3,148**	**0**	**0**	**0**	**-517**	**0**	**-262**	**-255**	**0**	**0**	**0**	**0**	**0**	**-3,578**	**-592**	**0**	**2,470**	**-5,365**
12. Losses & Own Use	-171	-268	0	0	-887	0	0	-4	0	0	0	-423	-460	0	0	0	-223	-1,550
13. Statistical Discrepancy	0	0	0	0	415	75	226	-5	33	29	-3	59	0	0	0	0	50	465
14. Secondary Supply	**-13,827**	**6,843**	**-6,836**	**7**	**5,963**	**1,089**	**2,412**	**-120**	**866**	**178**	**942**	**595**	**0**	**-3,578**	**-592**	**0**	**2,297**	**-9,723**
Final Use																		
15. Residential	2	0	0	0	202	0	0	0	199	3	0	0	0	0	0	0	485	689
16. Commercial	8	0	0	0	274	0	96	24	155	0	0	0	0	0	0	0	802	1,085
17. Industrial	1,118	0	0	0	428	27	331	8	60	2	0	0	0	450	0	0	1,007	3,003
18. Transport	68	0	0	0	4,098	1,950	1,485	33	0	0	631	0	0	0	0	17	5	4,187
19. Agriculture	0	0	0	0	185	0	177	8	0	0	0	0	0	0	0	0	6	191
20. Non-Energy Use	896	0	0	0	642	0	0	0	298	0	0	344	0	0	0	0	0	1,538
21. Total Final Use	**2,091**	**0**	**0**	**0**	**5,829**	**1,976**	**2,088**	**73**	**712**	**5**	**631**	**344**	**0**	**450**	**0**	**17**	**2,305**	**10,692**

1/ Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2/ Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residium & Middle East Residue) which are used as refinery intake.
3/ GPP-LPG Extracts Liquid Products i.e. Condensates, Ethane, Butane and Propane from Natural Gas. Ethane is not included under LPG production.
4/ Butane and Propane as MTBE Feedstocks are presented as Non-Energy use under LPG column. Ethane is presented under Natural Gas column.
5/ Estimated figures based from the Energy Commission, Statistics of Electricity Supply Industry in Malaysia 2011.
Note : Total may not necessarily add up due to rounding.

Energy Flow Chart

Energy Flow Chart

Primary Supply

Primary Supply*		
Crude Oil	24,679	31.1%
Petroleum Products & Others	2,247	2.8%
Natural Gas	35,740	45.1%
Coal & Coke	14,772	18.6%
Hydropower	1,850	2.3%
Total	**79,289**	**100.0%**

Primary Production		
Crude Oil	28,501	27.9%
Natural Gas	69,849	68.5%
Coal & Coke	1,838	1.8%
Hydropower	1,850	1.8%
Total	**102,039**	**100.0%**

Imports		
Crude Oil & Others	9,354	22.7%
Natural Gas	6,979	16.9%
Petroleum Products	11,580	28.1%
Coal & Coke	13,330	32.3%
Total	**41,244**	**100.0%**

Exports		
Crude Oil & Others	11,525	23.5%
Natural Gas	1,147	2.3%
Petroleum Products	9,472	19.3%
Coal & Coke	141	0.3%
LNG	26,856	54.7%
Total	**49,142**	**100.0%**

Transformation

Gas Plant Input	
LNG	35,815
MDS	851
GPP-LPG	4,071

Gas Plant Output	
LNG	27,916
LPG (from LNG)	214
Diesel	74
Kerosene	33
Non-Energy	252
LPG	2,434

Oil Refineries Input	
Local	14,874
Import	9,806

Oil Refineries Output	
Petrol	3,599
Diesel	8,925
Fuel Oil	571
Kerosene	419
ATF & AV GAS	3,457
Non-Energy	4,572
Refinery Gas	1,659

Power Stations & Self-Generation Input	
Natural Gas	12,698
Diesel	1,180
Fuel Oil	1,103
Coal	13,013
Hydro	1,850

Power Stations & Self-Generation Output	
Thermal	9,648
Self-Generation	442
Hydro	656

Final Use

Final Use by Sector		
Residential	2,771	6.4%
Commercial	4,222	9.7%
Industrial	12,100	27.8%
Transport	17,070	39.3%
Agriculture	916	2.1%
Non-Energy Use	6,377	14.7%
Total	**43,455**	**100.0%**

Final Use by Fuel		
Natural Gas	8,515	19.6%
Petroleum Products	23,945	55.1%
Coal & Coke	1,759	4.0%
Electricity	9,235	21.3%
Total	**43,455**	**100.0%**

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

Notes on Energy Balance

The net calorific value (NCV) is chosen as the basis of calculations rather than the gross calorific value (GCV). Joule is used as the rigorous accounting unit, while the "tonne oil equivalent" (1 toe= 41.84 Gigajoules) is 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 equipment input.
Gas Flaring, Reinjection & Use (2)	refers to the quantity of gas flared, re-injected 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 industrial consumers. At this stage, however, only oil companies' stocks 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)	shows 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.
Industrial (17)	is a very broad-based sector ranging from manufacturing to mining and construction. Diesel sales through distributors are assumed to be to industrial 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, forestry and fishing.
Non-energy use (20)	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 industrial feed stocks.
Final use (21)	refer to the quantity of energy of all kinds delivered to the final user.

I) Non-commercial energy such as firewood and other biomass fuels have been excluded in the energy balance until more reliable data are made available.

II) The output side of the final user's equipment of device i.e. useful energy, will not be dealt with in the balance as it will involve assessing the efficiencies of end-use equipment operating under various different conditions.

Notes on Electricity

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

Notes on Coal

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

Notes on GDP

Definition	GDP is a measure of the total value of production of all resident producing units of a country in a specified period, before deducting allowances for consumption of fixed capital. A producing unit is considered as resident in a country if it maintains a centre of economic interest in the economic territory of that country. The economic territory of a country consists of the geographic territory administered by a government within which persons, goods and capital circulate freely. GDP can be measured in three but equivalent ways, namely, the sum of value added, the sum of final expenditures and the sum of incomes. In Malaysia, Department of Statistics Malaysia (DOSM) compiles annual GDP estimates using the sum of value added and sum of final expenditure approaches.
Measuring GDP	The sum of value added (or production) based GDP is the sum of the differences between the values of the gross output of resident producing units measured in producers' values and the values of their intermediate consumption measured in purchasers' values plus import duties. The difference between gross output and intermediate consumption is value added. This approach shows the contribution of individual economic activities to the total GDP.
	Income based estimates – summing up the incomes generated (i.e salaries and wages, gross operating surplus of enterprises and mixed income generated by households that engage in production)
	The sum of final expenditures (expenditure) approach is to sum up the expenditure values of the final users of goods and services measured in purchasers' values, less the c.i.f. values of the import of goods and services. It is calculated by estimating the values of private consumption expenditure, government consumption expenditure, gross fixed capital formation, change in stocks and exports of goods and services, less imports of goods and services. These are termed `final demand' or 'final expenditure' categories.

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[1]			
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/Industrial Spirit**	43.2078
Liquefied Petroleum Gas (LPG)	45.5440	**Lubricants**	42.1401
Motor Gasoline	43.9614	**Bitumen (Asphalt)**	41.8000
Natural Gasoline	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
Motor Gasoline	8.55
Diesel	7.50
Fuel Oil	6.60
Kerosene	7.90
LPG	11.76
ATF	7.91
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 fields.
LNG	Is natural gas that is liquefied for ocean transportation and export.
Crude Oil	Is natural gas that is liquefied for 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 30^0 C and 250^0 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.
Motor Gasoline (mogas)	Petroleum distillate used as fuel in spark-ignition internal combustion engines. Distillation range is within 30^0 C and 250^0 C.
Aviation Turbine Fuel (ATF)	Fuel for use in aviation gas turbines mainly refined from kerosene. Distillation range from 150^0 C and 250^0 C.
Kerosene	Is a straight-run fraction from crude oil, with boiling range from 150^0 C to 250^0 C. Its main uses are for domestic lighting and cooking.
Diesel (or Gas Oil)	Distillation falls within 200^0 C and 340^0 C. Diesel fuel for high-speed diesel engines (i.e. automative) is 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) materials.
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 partly refined light distillate, which is further, blended into motor gasoline or used as feedstock 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 from 380^0 C to 500^0 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 and sulphur. Coal in the energy balance 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.
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 Department of Electricity Supply and Market Regulation, Energy Commission. Figures for 'fuel input' into power stations & co-generation plants were only available for Tenaga Nasional Berhad, SEB, SESB, IPPs as well as GDC Sdn. Bhd. Estimations were made using average conversion efficiency to obtain the fuel input into private installations.

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