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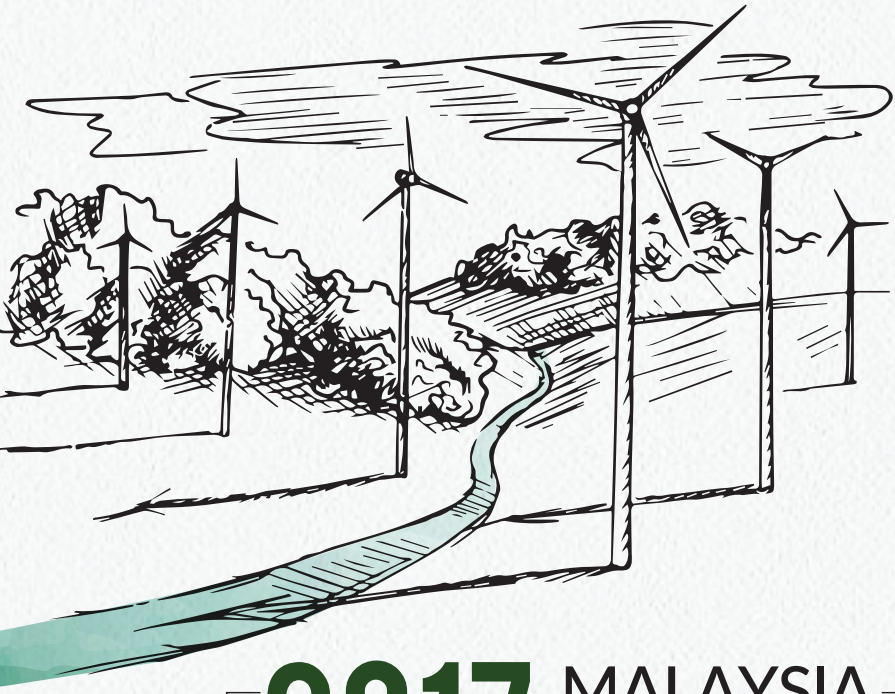
Energy Commission



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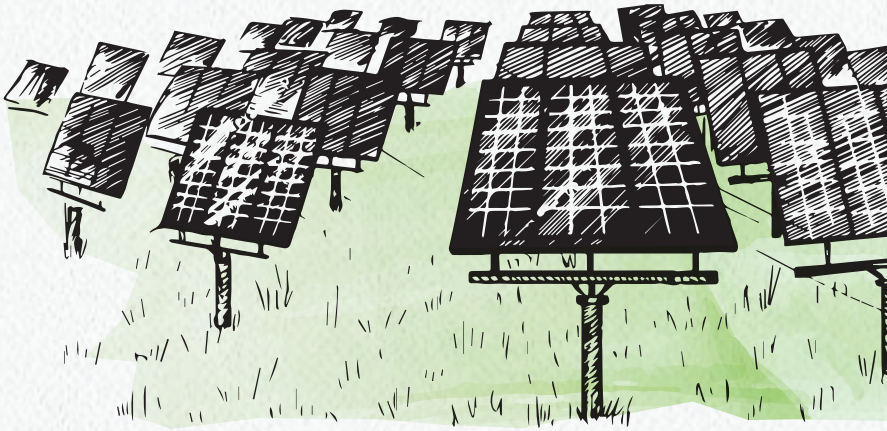

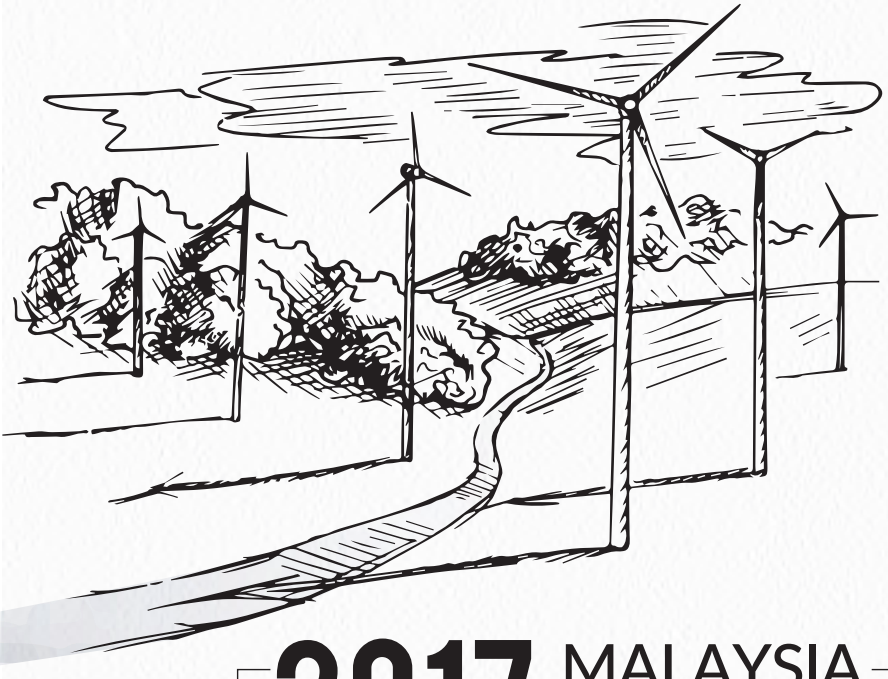

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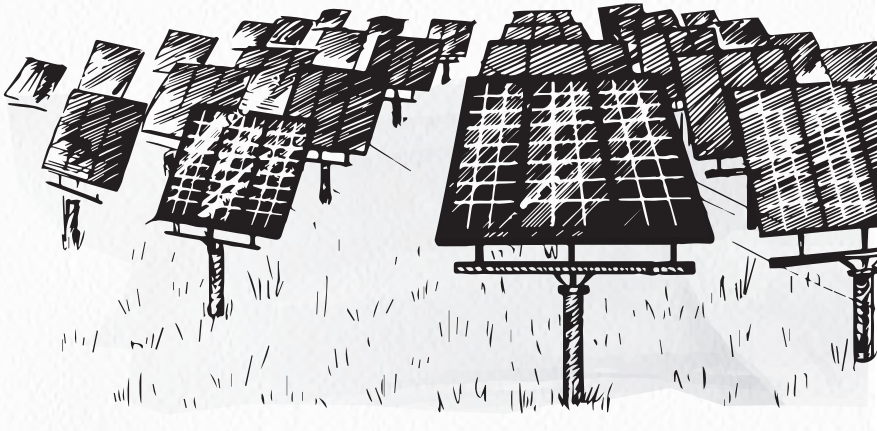

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PREFACE

Energy Commission was established on 1 May 2001, under the Energy Commission Act 2001. Fully operational in January 2002, the Energy Commission is primarily responsible for regulating the electricity and piped gas supply industries in Peninsular Malaysia and Sabah, delicately balancing the priorities of energy providers and the needs of consumers. The Energy Commission is committed to ensuring reliable, safe and cost effective supply of electricity and piped gas to all its consumers. Energy Commission also acts as the focal point for energy data and statistics in Malaysia, therefore the publication of Malaysia Energy Statistics handbook, amongst other publications falls under the responsibility of Energy Commission.

The Energy Statistics Handbook is a handy guide that summarises the key energy data and statistics in Malaysia. The data are updated annually, and disseminated to public through its publication every year. The information in this handbook is available in the MEIH (Malaysia Energy Information Hub) website (www.meih.st.gov.my) as well as in the 'MyEnergyStats' mobile application. The mobile application was developed by Energy Commission and was launched on 21st of November 2017. It can be downloaded from the Google Playstore or Apple Appstore for free.

This handbook consists of 10 sections, complete with tables and charts to give an overview on how the trend changes over the years. In brief, this handbook portrays the mechanism of energy in Malaysia, from the production of Primary Energy Supply, to how the energy supply is transformed (Energy Transformation), and finally the Energy Consumption by various end-users. It also includes Energy Prices, Energy Indicators, as well as the Energy Balance Tables as of year 2015. On top of that, this handbook also covers the Electricity and Piped Gas Supply Performance for the year 2016.

On the whole, this handbook is a comprehensive guide to our national energy data and statistics. It serves as a general reference for policy makers, public and private organizations, students and general public. It is made in pocket-size for convenience to carry around and delivering information instantaneously.

The information presented in this handbook is a supplement to the National Energy Balance 2015, Performance and Statistical Information on Electricity Supply Industry in Malaysia 2016 and Piped Gas Distribution Industry Statistics Malaysia 2016.

Inquiries about figures and graphs in this handbook could be addressed to:

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ENERGY PRICES

ELECTRICITY SUPPLY PERFORMANCE

PIPED GAS SUPPLY PERFORMANCE

Reserves of Crude Oil and Condensates

Year	Reserves of Crude Oil and Condensates By Region (Billion Barrels)			
	Peninsular Malaysia	Sarawak	Sabah	Total
1980	1.825	-	-	**1.825**
1981	2.313	-	-	**2.313**
1982	2.295	-	-	**2.295**
1983	2.570	-	-	**2.570**
1984	2.952	-	-	**2.952**
1985	3.066	-	-	**3.066**
1986	3.023	-	-	**3.023**
1987	2.906	-	-	**2.906**
1988	2.922	-	-	**2.922**
1989	3.054	-	-	**3.054**
1990	2.943	-	-	**2.943**
1991	3.045	-	-	**3.045**
1992	3.743	1.267	0.604	**5.614**
1993	4.279	1.205	0.631	**6.115**
1994	2.500	1.200	0.600	**4.300**
1995	2.455	1.067	0.590	**4.112**
1996	2.500	0.900	0.600	**4.000**
1997	2.700	0.680	0.470	**3.850**
1998	2.440	0.860	0.580	**3.880**
1999	2.080	0.830	0.510	**3.420**
2000	1.920	0.850	0.620	**3.390**
2001	1.920	0.850	0.620	**3.390**
2002	2.110	1.340	0.780	**4.230**
2003	2.040	1.300	1.210	**4.550**
2004	1.980	1.420	1.430	**4.830**
2005	1.770	1.560	1.970	**5.290**
2006	1.791	1.334	2.129	**5.254**
2007	1.452	0.889	1.975	**4.316**
2008	1.719	1.315	2.424	**5.458**
2009	1.781	1.388	2.348	**5.517**
2010	2.061	1.362	2.376	**5.799**
2011	2.374	1.492	1.992	**5.858**
2012	2.413	1.600	1.941	**5.954**
2013	2.335	1.592	1.923	**5.850**
2014	2.341	1.885	1.566	**5.792**
2015	2.205	1.693	2.009	**5.907**
2016	1.735	1.369	1.924	**5.028**

Source: PETRONAS

Reserves of Natural Gas

Year	Reserves of Natural Gas by Region in Trillion Standard Cubic Feet (TSCF)									Grand Total
	PENINSULAR			SABAH			SARAWAK			
	Non Associated	Associated	Total	Non Associated	Associated	Total	Non Associated	Associated	Total	
1980	17.960	6.220	**24.180**	-	0.970	**0.970**	14.640	1.880	**16.520**	**41.670**
1981	17.330	5.640	**22.970**	-	1.020	**1.020**	17.340	1.940	**19.280**	**43.270**
1982	18.330	6.290	**24.620**	1.170	1.150	**2.320**	18.910	2.280	**21.190**	**48.130**
1983	20.020	6.150	**26.170**	1.220	1.090	**2.310**	19.050	2.480	**21.530**	**50.010**
1984	18.760	6.050	**24.810**	1.200	1.100	**2.300**	18.930	2.560	**21.490**	**48.600**
1985	20.200	6.010	**26.210**	1.230	1.170	**2.400**	21.050	2.640	**23.690**	**52.300**
1986	20.510	6.070	**26.580**	1.290	1.080	**2.370**	21.180	2.830	**24.010**	**52.960**
1987	20.280	5.880	**26.160**	1.300	1.020	**2.320**	20.850	2.800	**23.650**	**52.130**
1988	20.780	5.580	**26.360**	1.210	1.030	**2.240**	20.120	2.860	**22.980**	**51.580**
1989	20.710	5.720	**26.430**	0.050	1.070	**1.120**	19.770	3.850	**23.620**	**51.170**
1990	21.350	6.080	**27.430**	1.320	1.030	**2.350**	23.840	3.310	**27.150**	**56.930**
1991	21.320	6.200	**27.520**	1.380	0.980	**2.360**	25.770	3.400	**29.170**	**59.050**
1992	22.500	6.700	**29.200**	1.800	1.100	**2.900**	31.900	3.800	**35.700**	**67.800**
1993	23.900	7.800	**31.700**	3.000	1.700	**4.700**	36.600	3.800	**40.400**	**76.800**
1994	26.600	7.900	**34.500**	2.900	1.200	**4.100**	37.900	4.200	**42.100**	**80.700**
1995	28.000	8.200	**36.200**	6.000	1.300	**7.300**	37.000	4.200	**41.200**	**84.700**
1996	28.300	8.300	**36.600**	4.900	1.200	**6.100**	33.200	4.300	**37.500**	**80.200**
1997	29.400	8.900	**38.300**	4.800	1.200	**6.000**	32.500	3.000	**35.500**	**79.800**
1998	27.700	8.900	**36.600**	4.900	1.200	**6.100**	40.600	3.700	**44.300**	**87.000**
1999	25.900	8.500	**34.400**	6.600	1.100	**7.700**	39.900	3.800	**43.700**	**85.800**
2000	25.300	8.400	**33.700**	6.700	1.300	**8.000**	37.400	3.400	**40.800**	**82.500**
2001	25.300	8.400	**33.700**	6.700	1.300	**8.000**	37.400	3.400	**40.800**	**82.500**
2002	24.900	8.400	**33.300**	6.800	1.200	**8.000**	42.600	3.400	**46.000**	**87.300**
2003	23.900	8.500	**32.400**	8.100	1.800	**9.900**	42.700	4.000	**46.700**	**89.000**
2004	21.740	9.520	**31.260**	7.750	1.880	**9.630**	42.750	3.380	**46.130**	**87.020**
2005	21.590	9.200	**30.790**	8.230	2.500	**10.730**	40.540	3.130	**43.670**	**85.190**
2006	23.170	9.650	**32.820**	8.210	2.750	**10.960**	41.240	2.930	**44.170**	**87.950**
2007	24.030	9.440	**33.469**	8.461	3.137	**11.598**	40.850	3.008	**43.858**	**88.925**
2008	24.190	9.269	**33.459**	9.132	3.584	**12.716**	38.974	2.861	**41.835**	**88.010**
2009	24.079	9.153	**33.232**	8.578	3.523	**12.101**	39.727	2.908	**42.635**	**87.968**
2010	25.139	9.280	**34.419**	8.681	3.787	**12.468**	39.187	2.513	**41.700**	**88.587**
2011	25.337	9.797	**35.134**	8.638	3.327	**11.965**	39.856	3.033	**42.889**	**89.988**
2012	26.144	9.594	**35.738**	9.801	3.502	**13.303**	39.901	3.180	**43.081**	**92.122**
2013	25.649	9.325	**34.974**	9.454	3.764	**13.218**	46.798	3.330	**50.123**	**98.315**
2014	25.242	9.688	**34.930**	10.029	3.724	**13.753**	48.955	3.024	**51.979**	**100.662**
2015	24.022	8.471	**32.493**	11.884	3.149	**15.032**	50.034	2.853	**52.888**	**100.413**
2016	20.428	6.793	**27.221**	10.915	2.521	**13.436**	45.336	1.770	**47.105**	**87.762**

Source: PETRONAS

Reserves of Coal as of 31st December 2016

Location	Reserves (Million Tonnes)			Coal Type
	Measured	Indicated	Inferred	
Sarawak				
1. Abok & Silantek, Sri Aman	7.25	10.60	32.40	Coking Coal, Semi-Anthracite and Anthracite
2. Merit-Pila, Kapit	170.26	107.02	107.84	Sub-Bituminous
3. Bintulu	6.00	0.00	14.00	Bituminous (partly coking coal)
4. Mukah - Balingian	86.95	170.73	646.53	Lignite, Hydrous Lignite and Sub-Bituminous
5. Tutoh Area	5.58	34.66	162.33	Sub-Bituminous
Subtotal	**276.04**	**323.01**	**963.10**	**-**
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	-
5. SW Malibau	-	23.23	-	-
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**			

Source: Department of Mineral and Geosciences Malaysia

Installed Capacity as of 31st December 2015 (MW)

		Hydro	Natural Gas	Coal	Diesel/ MFO	Biomass	Solar	Biogas	Others	Total
Peninsular Malaysia	TNB	2,149.1	4,150.0	-	-	-	-	-	-	**6,299.1**
	IPPs	-	6,345.5	8,066.0	-	-	-	-	-	**14,410.5**
	Co-Generation	-	876.1	-	-	90.7	-	69.5	-	**1,036.2**
	Self-Generation	2.1	-	-	399.0	351.8	1.0	4.9	-	**758.8**
	FiT	23.6	-	-	-	44.4	206.7	30.4	-	**305.1**
	Subtotal	**2,174.8**	**11,370.6**	**8,066.0**	**399.0**	**486.9**	**207.7**	**104.7**	**0.00**	**22,809.8**
Sabah	SESB	76.0	112.0	-	180.9	-	-	-	-	**368.9**
	IPPs	-	1,012.6	-	189.9	-	-	-	-	**1,202.5**
	Co-Generation	-	106.8	-	-	122.7	-	-	-	**229.5**
	Self-Generation	-	-	-	526.8	135.8	0.1	3.4	-	**666.1**
	FiT	6.5	-	-	-	43.0	18.1	2.7	-	**70.3**
	Subtotal	**82.5**	**1,231.4**	**0.00**	**897.6**	**301.5**	**18.3**	**6.1**	**0.0**	**2,537.3**
Sarawak	SEB	1,058.8	614.6	480.0	158.3	-	-	-	-	**2,311.7**
	IPPs	2,400.0	-	-	-	-	-	-	-	**2,400.0**
	Co-Generation	-	289.0	-	-	-	-	-	-	**289.0**
	Self-Generation	-	-	-	11.6	74.1	0.3	0.5	5.1	**91.5**
	Subtotal	**3,458.8**	**903.6**	**480.0**	**169.9**	**74.1**	**0.3**	**0.5**	**5.1**	**5,092.2**
	Total	**5,716.1**	**13,505.6**	**8,546.0**	**1,466.5**	**862.5**	**226.3**	**111.3**	**5.1**	**30,439.3**

Source: Power Utilities and IPPs and SEDA Malaysia
Note: Data exclude plants that are not in operation

Available Capacity as of 31st December 2015 (MW)

		Hydro	Natural Gas	Coal	Diesel/ MFO	Biomass	Total
Peninsular Malaysia	TNB	2,114.0	4,084.0	0.0	0.0	0.0	**6,198.0**
	IPPs	0.0	6,368.2	8,070.0	0.0	0.0	**14,438.2**
	Subtotal	**2,114.0**	**10,452.2**	**8,070.0**	**0.0**	**0.0**	**20,636.2**
Sabah	SESB	75.2	104.5	0.0	150.9	0.0	**330.6**
	IPPs	0.0	870.4	0.0	77.8	0.0	**948.2**
	FiT	6.5	0.0	0.0	0.0	63.8	**70.3**
	Subtotal	**81.7**	**974.9**	**0.0**	**228.7**	**63.8**	**1,349.1**
Sarawak	SEB	365.4	397.5	423.0	121.4	0.0	**1,307.3**
	IPPs	1,771.0	0.0	0.0	0.0	0.0	**1,771.0**
	Subtotal	**2,136.4**	**397.5**	**423.0**	**121.4**	**0.0**	**3,078.3**
	Total	**4,332.1**	**11,824.6**	**8,493.0**	**350.1**	**63.8**	**25,063.6**

Source: Power Utilities and IPPs

Key Economic and Energy Data

	2015				
	1Q	2Q	3Q	4Q	Total
GDP at current prices (RM million)*	277,456	283,175	292,552	303,955	1,157,138
GDP at 2010 prices (RM million)*	254,524	260,972	269,384	277,924	1,062,804
GNI at current prices (RM million)*	269,751	278,569	281,960	294,848	1,125,128
Population ('000 people)**	30,896	30,996	31,095	31,196	30,996
Primary Energy Supply (ktoe)	22,050	22,820	22,953	22,365	90,188
Final Energy Consumption (ktoe)	12,790	13,028	13,240	12,748	51,806
Electricity Consumption (ktoe)	2,731	2,885	2,884	2,875	11,375
Electricity Consumption (GWh)	31,737	33,533	33,513	33,415	132,199
Per Capita					
GDP at Current Prices (RM)*	35,921	36,543	37,633	38,974	37,332
Primary Energy Supply (toe)	0.714	0.736	0.738	0.717	2.910
Final Energy Consumption (toe)	0.414	0.420	0.426	0.409	1.671
Electricity Consumption (kWh)	1,027	1,082	1,078	1,071	4,265
Energy Intensity					
Primary Energy Supply (toe/GDP at 2010 prices (RM million))	86.6	87.4	85.2	80.5	84.9
Final Energy Consumption (toe/GDP at 2010 prices (RM million))	50.3	49.9	49.2	45.9	48.7
Electricity Consumption (toe/GDP at 2010 prices (RM million))	10.7	11.1	10.7	10.3	10.7
Electricity Consumption (GWh/GDP at 2010 prices (RM million))	0.125	0.128	0.124	0.120	0.124

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

Key Economic and Energy Data by Region

Peninsular Malaysia	2010	2011	2012	2013	2014	2015
GDP at Current Prices (RM million)*	672,787	739,349	793,280	835,888	910,073	959,245
GDP at 2010 Prices (RM million)*	672,787	709,030	752,858	789,217	839,023	881,202
Population ('000 people)**	22,754	23,099	23,417	23,868	24,157	24,458
Final Energy Consumption (ktoe)	35,593	35,968	36,683	41,859	42,470	43,011
Electricity Consumption (ktoe)	8,145	8,427	8,791	9,108	9,315	9,531
Electricity Consumption (GWh)	94,666	97,939	102,174	105,861	108,259	110,770
Per Capita						
GDP at Current Prices (RM)*	29,569	32,008	33,876	35,021	37,674	39,221
Final Energy Consumption (toe)	1.564	1.557	1.567	1.754	1.758	1.759
Electricity Consumption (kWh)	4,161	4,240	4,363	4,435	4,482	4,529
Energy Intensity						
Final Energy Consumption (toe/GDP at 2010 prices (RM million))	52.9	50.7	48.7	53.0	50.6	48.8
Electricity Consumption (toe/GDP at 2010 prices (RM million))	12.1	11.9	11.7	11.5	11.1	10.8
Electricity Consumption (GWh/GDP at 2010 prices (RM million))	0.141	0.138	0.136	0.134	0.129	0.126

Note (*) : 1. GDP data by States from Department of Statistics Malaysia
2. GDP for Peninsular Malaysia including Supra State (Supra State covers production activities that are beyond the centre of predominant economic interest for any state)
(**) : Mid-year population from Department of Statistics Malaysia

Sabah	2010	2011	2012	2013	2014	2015
GDP at Current Prices (RM million)*	61,516	69,672	71,347	72,361	77,593	78,993
GDP at 2010 prices (RM million)*	61,516	63,191	65,390	67,775	71,166	75,540
Population ('000 people)**	3,348	3,435	3,523	3,703	3,767	3,831
Final Energy Consumption (ktoe)	2,758	3,466	4,671	4,097	4,128	3,845
Electricity Consumption (ktoe)	355	368	425	439	423	499
Electricity Consumption (GWh)	4,127	4,275	4,943	5,097	4,919	5,805
Per Capita						
GDP at Current Prices (RM)*	18,373	20,284	20,250	19,542	20,601	20,620
Final Energy Consumption (toe)	0.824	1.009	1.326	1.106	1.096	1.004
Electricity Consumption (kWh)	1,233	1,245	1,403	1,377	1,306	1,515
Energy Intensity						
Final Energy Consumption (toe/GDP at 2010 prices (RM million))	44.8	54.8	71.4	60.4	58.0	50.9
Electricity Consumption (toe/GDP at 2010 prices (RM million))	5.8	5.8	6.5	6.5	5.9	6.6
Electricity Consumption (GWh/GDP at 2010 prices (RM million))	0.067	0.068	0.076	0.075	0.069	0.077

Note (*) : 1. GDP data by States from Department of Statistics Malaysia
2. GDP for Peninsular Malaysia including Supra State (Supra State covers production activities that are beyond the centre of predominant economic interest for any state)
(**) : Mid-year population from Department of Statistics Malaysia

Sarawak	2010	2011	2012	2013	2014	2015
GDP at Current Prices (RM million)*	87,131	102,713	106,625	110,365	118,801	118,900
GDP at 2010 prices (RM million)*	87,131	92,700	94,013	98,089	102,318	106,063
Population ('000 people)**	2,487	2,528	2,570	2,643	2,675	2,708
Final Energy Consumption (ktoe)	3,125	4,086	5,358	5,628	5,612	4,951
Electricity Consumption (ktoe)	493	445	795	1,043	1,304	1,344
Electricity Consumption (GWh)	5,730	5,172	9,237	12,118	15,152	15,624
Per Capita						
GDP at Current Prices (RM)*	35,033	36,671	36,585	37,120	38,253	39,172
Final Energy Consumption (toe)	1.256	1.616	2.085	2.130	2.098	1.828
Electricity Consumption (kWh)	2,304	2,046	3,594	4,586	5,665	5,771
Energy Intensity						
Final Energy Consumption (toe/GDP at 2010 prices (RM million))	35.9	44.1	57.0	57.4	54.8	46.7
Electricity Consumption (toe/GDP at 2010 prices (RM million))	5.7	4.8	8.5	10.6	12.7	12.7
Electricity Consumption (GWh/GDP at 2010 prices (RM million))	0.066	0.056	0.098	0.124	0.148	0.147

Note (*) : 1. GDP data by States from Department of Statistics Malaysia
2. GDP for Peninsular Malaysia including Supra State (Supra State covers production activities that are beyond the centre of predominant economic interest for any state)
(**) : Mid-year population from Department of Statistics Malaysia

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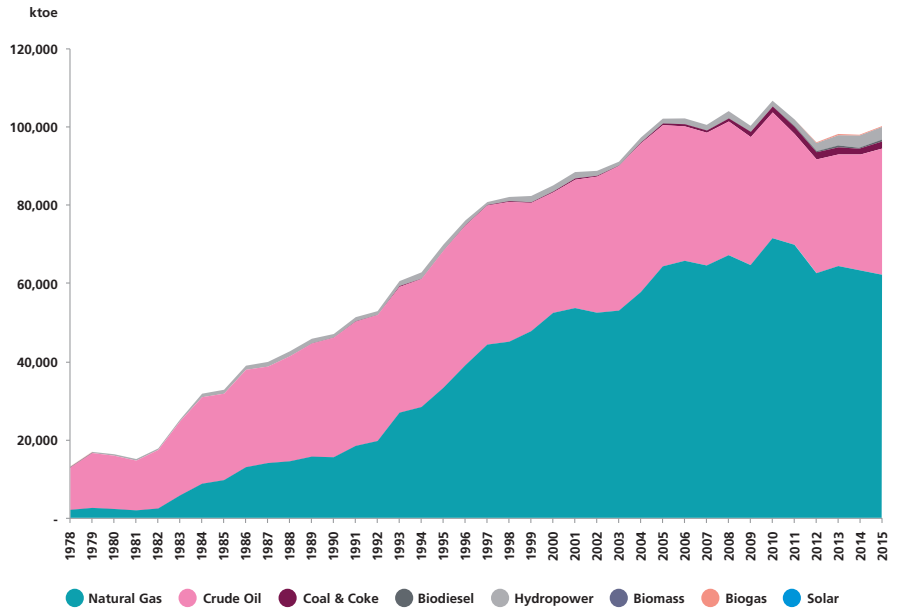
Primary Production by Fuel Type



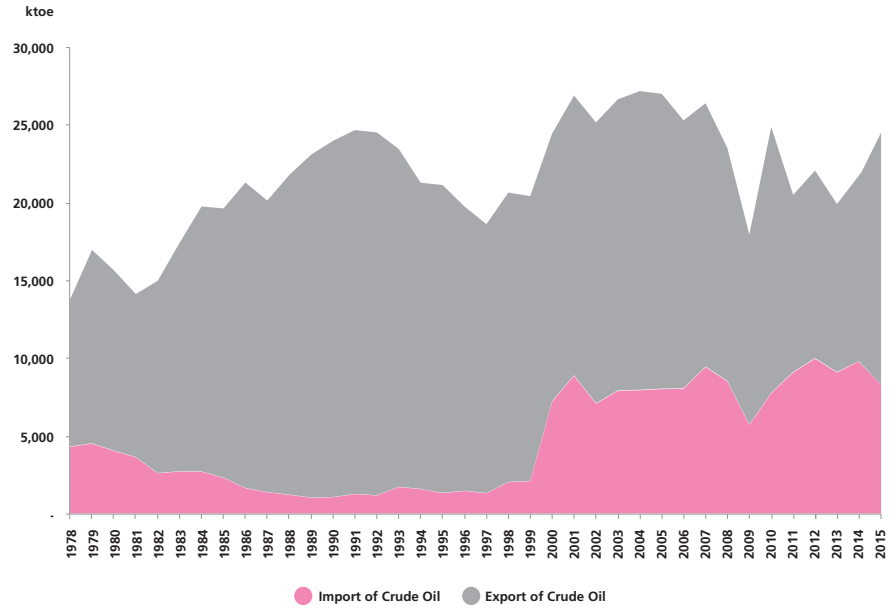
Source: National Energy Balance 2015

1 Crude Oil 50.1%
2 Natural Gas 47.5%
3 Hydropower 2.2%
4 Coal & Coke 0.1%
5 Biodiesel 0.0%
6 Biomass 0.0%
7 Solar 0.0%
8 Biogas 0.0%

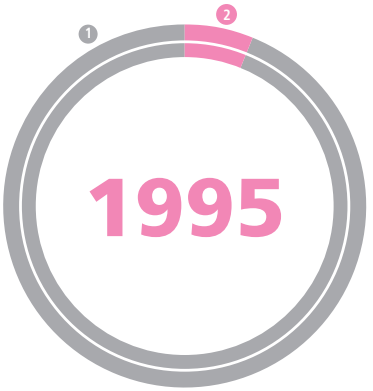
1 Natural Gas 61.7%
2 Crude Oil 32.2%
3 Hydropower 3.6%
4 Coal & Coke 1.6%
5 Biodiesel 0.7%
6 Biomass 0.2%
7 Solar 0.1%
8 Biogas 0.0%

Year	Primary Production (ktoe)								
	Natural Gas	Crude Oil	Coal & Coke	Biodiesel	Hydropower	Biomass	Biogas	Solar	Total
1978	2,034	10,920	-	-	244	-	-	-	13,198
1979	2,524	14,115	-	-	296	-	-	-	16,935
1980	2,245	13,707	-	-	383	-	-	-	16,335
1981	1,891	12,815	-	-	403	-	-	-	15,109
1982	2,379	15,048	-	-	394	-	-	-	17,821
1983	5,737	19,045	-	-	454	-	-	-	25,236
1984	8,715	22,207	-	-	913	-	-	-	31,835
1985	9,629	22,187	-	-	1,019	-	-	-	32,835
1986	12,950	24,979	-	-	1,070	-	-	-	38,999
1987	14,002	24,742	-	-	1,212	-	-	-	39,956
1988	14,455	26,923	15	-	1,288	-	-	-	42,681
1989	15,645	28,967	76	-	1,203	-	-	-	45,891
1990	15,487	30,629	70	-	915	-	-	-	47,101
1991	18,390	31,843	126	-	1,053	-	-	-	51,412
1992	19,644	32,264	53	-	997	-	-	-	52,958
1993	26,898	32,218	264	-	1,262	-	-	-	60,642
1994	28,335	32,798	89	-	1,652	-	-	-	62,874
1995	33,268	35,090	85	-	1,540	-	-	-	69,983
1996	39,031	35,744	153	-	1,243	-	-	-	76,171
1997	44,318	35,600	153	-	790	-	-	-	80,861
1998	45,054	35,784	221	-	1,113	-	-	-	82,172
1999	47,746	32,835	174	-	1,668	-	-	-	82,423
2000	52,432	30,839	242	-	1,612	-	-	-	85,125
2001	53,659	32,851	344	-	1,687	-	-	-	88,541
2002	52,465	34,838	223	-	1,329	-	-	-	88,855
2003	53,010	37,026	107	-	1,056	-	-	-	91,199
2004	57,768	38,041	241	-	1,329	-	-	-	97,379
2005	64,337	36,127	430	-	1,313	-	-	-	102,207
2006	65,752	34,386	569	-	1,568	-	-	-	102,275
2007	64,559	33,967	576	-	1,517	-	-	-	100,619
2008	67,191	34,195	791	-	1,964	-	-	-	104,141
2009	64,661	32,747	1,348	-	1,627	-	-	-	100,383
2010	71,543	32,163	1,511	-	1,577	-	-	-	106,794
2011	69,849	28,325	1,838	176	1,850	-	-	-	102,038
2012	62,580	29,115	1,860	253	2,150	183	4	11	96,156
2013	64,406	28,576	1,824	480	2,688	297	6	38	98,315
2014	63,091	29,545	1,694	612	3,038	181	12	63	98,236
2015	62,119	32,440	1,614	684	3,582	189	18	75	100,721

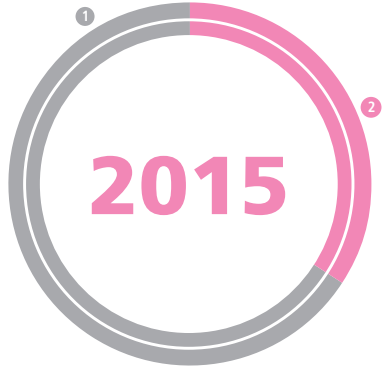
Import and Export of Crude Oil



Source: National Energy Balance 2015



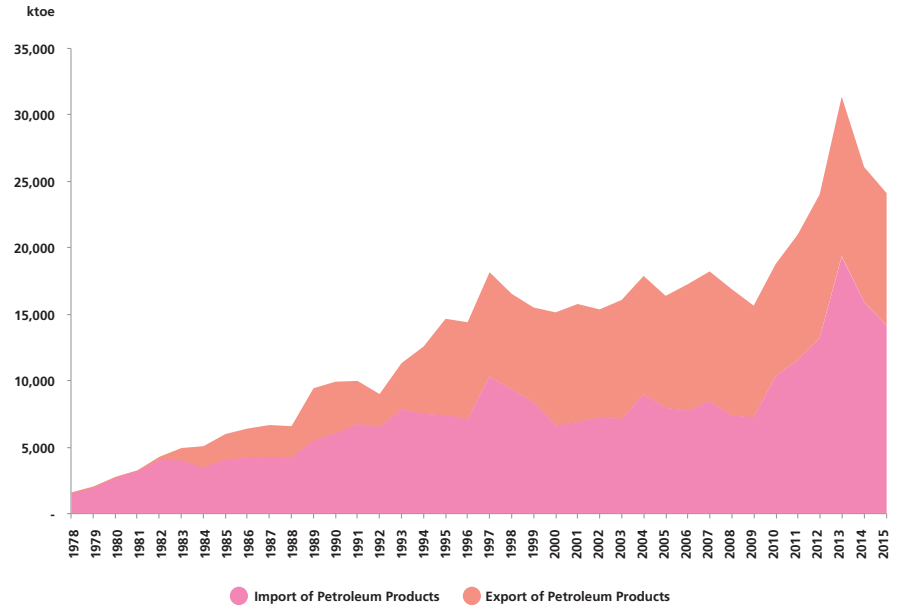
1 Export of Crude Oil **93.8%**
2 Import of Crude Oil **6.2%**



1 Export of Crude Oil **65.8%**
2 Import of Crude Oil **34.2%**

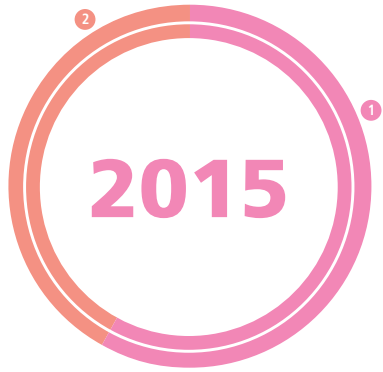
Year	Import and Export of Crude Oil (ktoe)	
	Import of Crude Oil	Export of Crude Oil
1978	4,303	9,472
1979	4,508	12,455
1980	4,034	11,619
1981	3,622	10,497
1982	2,587	12,392
1983	2,709	14,720
1984	2,690	17,073
1985	2,302	17,338
1986	1,625	19,683
1987	1,360	18,784
1988	1,198	20,593
1989	1,012	22,090
1990	1,047	22,949
1991	1,244	23,444
1992	1,159	23,374
1993	1,703	21,766
1994	1,566	19,726
1995	1,315	19,833
1996	1,446	18,315
1997	1,300	17,322
1998	2,014	18,640
1999	2,081	18,355
2000	7,218	17,254
2001	8,890	18,018
2002	7,083	18,100
2003	7,921	18,747
2004	7,953	19,245
2005	8,031	18,994
2006	8,048	17,262
2007	9,453	16,962
2008	8,519	15,001
2009	5,718	12,235
2010	7,760	17,125
2011	9,104	11,404
2012	9,995	12,086
2013	9,101	10,823
2014	9,780	11,899
2015	8,379	16,114

Import and Export of Petroleum Products



Source: National Energy Balance 2015

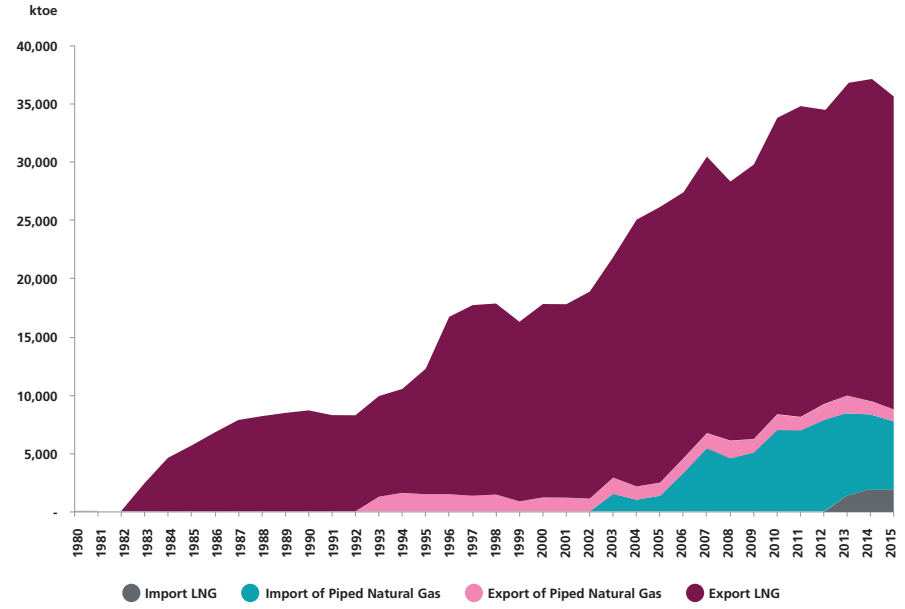
1 Import of Petroleum Products **50.5%**
2 Export of Petroleum Products Oil **49.5%**



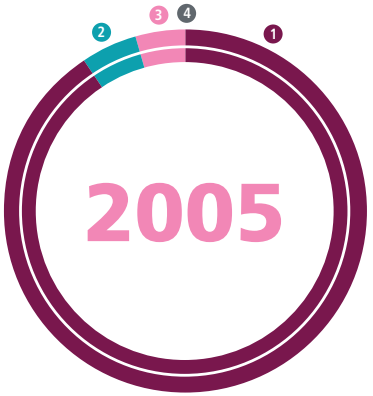
1 Import of Petroleum Products **58.2%**
2 Export of Petroleum Products **41.8%**

Year	Import and Export of Petroleum Products (ktoe)	
	Import of Petroleum Products	Export of Petroleum Products
1978	1,450	170
1979	1,888	177
1980	2,658	132
1981	3,160	123
1982	4,011	291
1983	3,981	976
1984	3,418	1,676
1985	4,062	1,949
1986	4,162	2,257
1987	4,259	2,425
1988	4,211	2,388
1989	5,490	3,960
1990	6,031	3,913
1991	6,728	3,272
1992	6,499	2,513
1993	7,835	3,507
1994	7,492	5,094
1995	7,411	7,261
1996	7,095	7,317
1997	10,331	7,840
1998	9,360	7,194
1999	8,357	7,161
2000	6,619	8,533
2001	6,881	8,900
2002	7,220	8,158
2003	7,116	8,972
2004	8,980	8,912
2005	7,961	8,435
2006	7,734	9,535
2007	8,452	9,780
2008	7,376	9,527
2009	7,243	8,419
2010	10,359	8,431
2011	11,579	9,421
2012	13,243	10,785
2013	19,383	11,983
2014	16,009	10,399
2015	14,218	10,220

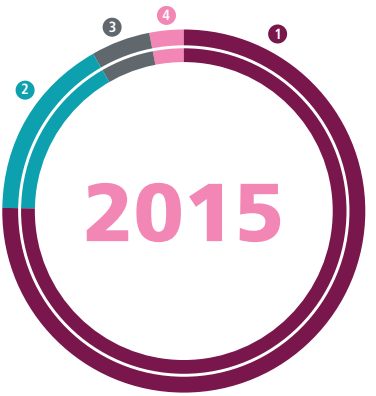
Import and Export of Piped Natural Gas and Liquefied Natural Gas (LNG)



Source: National Energy Balance 2015



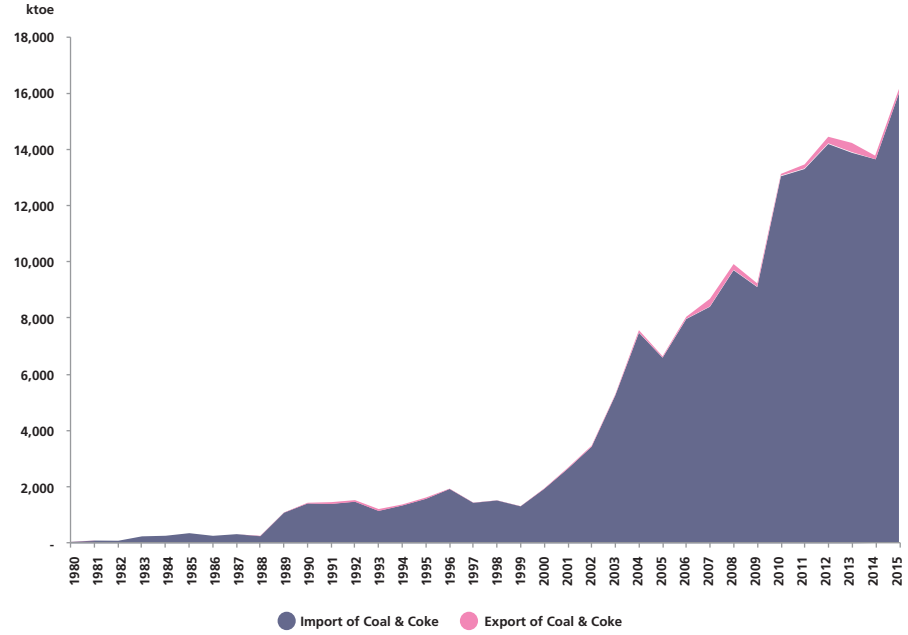
1. Export LNG **90.6%**
2. Import of Piped Natural Gas **5.1%**
3. Export of Piped Natural Gas **4.3%**
4. Import LNG **0.0%**



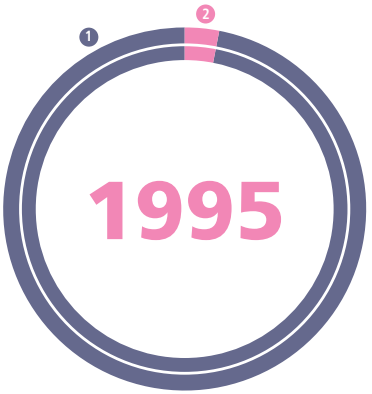
1. Export LNG **75.3%**
2. Import of Piped Natural Gas **16.5%**
3. Import LNG **5.2%**
4. Export of Piped Natural Gas **3.0%**

Year	Import and Export of Piped Natural Gas and LNG (ktoe)			
	Import of Piped Natural Gas	Export of Piped Natural Gas	Export of LNG	Import of LNG
1980	-	8	-	-
1981	-	10	-	-
1982	-	11	-	-
1983	-	2	2,416	-
1984	-	-	4,603	-
1985	-	-	5,658	-
1986	-	-	6,788	-
1987	-	-	7,855	-
1988	-	-	8,184	-
1989	-	-	8,464	-
1990	-	-	8,686	-
1991	-	-	8,278	-
1992	-	1	8,262	-
1993	-	1,258	8,654	-
1994	-	1,589	8,938	-
1995	-	1,474	10,790	-
1996	-	1,474	15,251	-
1997	-	1,340	16,396	-
1998	-	1,444	16,429	-
1999	-	860	15,445	-
2000	-	1,198	16,633	-
2001	-	1,178	16,636	-
2002	-	1,098	17,803	-
2003	1,501	1,402	18,965	-
2004	999	1,143	22,944	-
2005	1,340	1,134	23,707	-
2006	3,313	1,257	22,874	-
2007	5,435	1,295	23,777	-
2008	4,565	1,524	22,277	-
2009	5,055	1,166	23,606	-
2010	7,013	1,340	25,487	-
2011	6,979	1,147	26,856	-
2012	7,866	1,368	25,547	-
2013	7,098	1,497	27,089	1,450
2014	6,472	1,129	27,835	2,019
2015	5,941	1,062	27,057	1,873

Import and Export of Coal and Coke

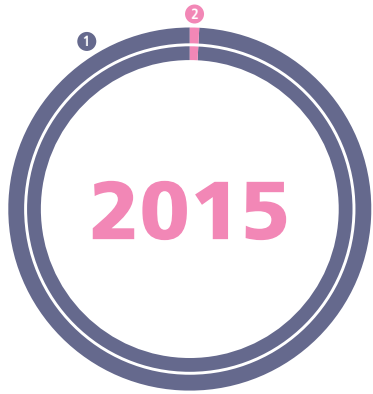


Source: National Energy Balance 2015



1 Import of Coal & Coke **96.9%**

2 Export of Coal & Coke **3.1%**

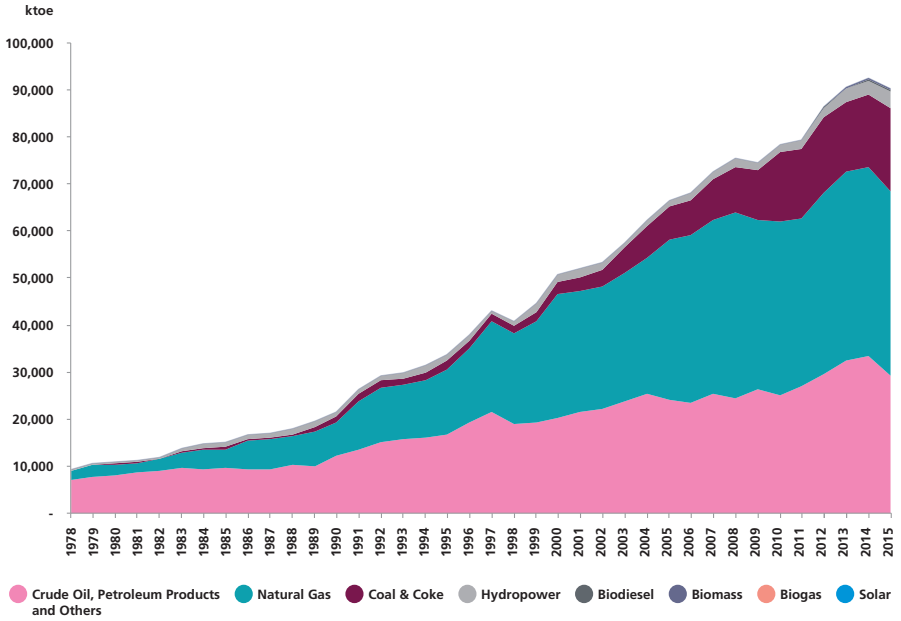


1 Import of Coal & Coke **99.0%**

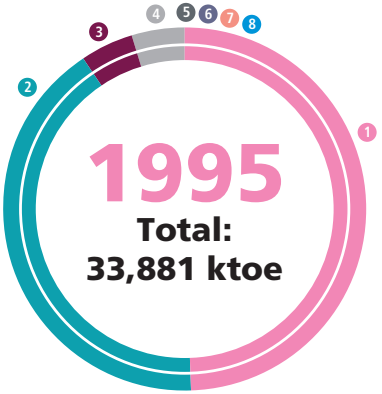
2 Export of Coal & Coke **1.0%**

Year	Import and Export of Coal and Coke (ktoe)	
	Import of Coal and Coke	Export of Coal and Coke
1980	53	-
1981	99	-
1982	93	-
1983	249	-
1984	270	-
1985	362	-
1986	268	-
1987	327	-
1988	260	15
1989	1,093	11
1990	1,424	28
1991	1,407	66
1992	1,485	60
1993	1,158	70
1994	1,351	40
1995	1,588	50
1996	1,938	15
1997	1,446	9
1998	1,529	7
1999	1,321	8
2000	1,943	19
2001	2,665	34
2002	3,442	37
2003	5,268	36
2004	7,498	85
2005	6,612	44
2006	7,988	71
2007	8,425	273
2008	9,725	206
2009	9,126	119
2010	13,073	62
2011	13,330	141
2012	14,221	233
2013	13,909	326
2014	13,704	114
2015	16,051	156

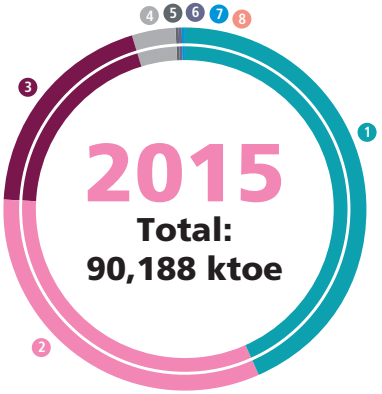
Total Primary Energy Supply by Fuel Type



Source: National Energy Balance 2015



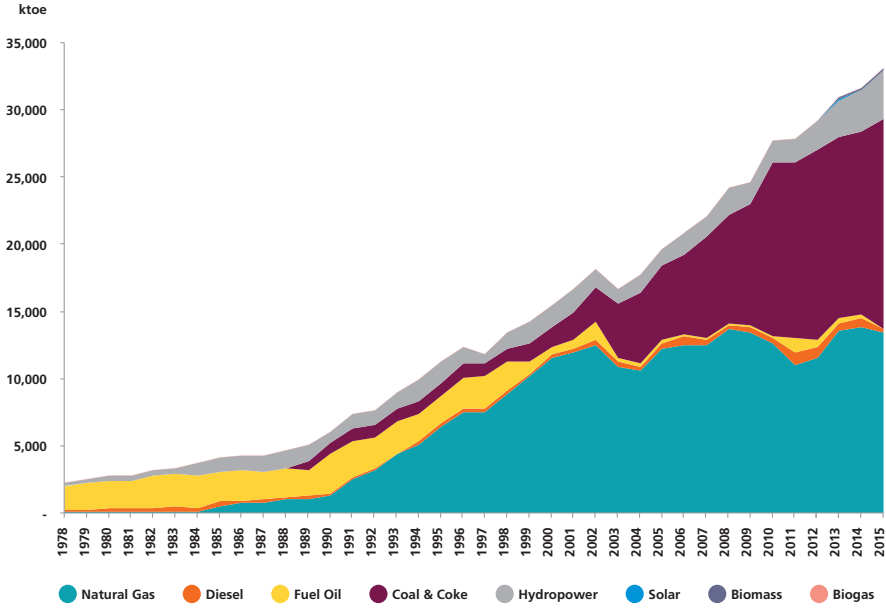
1. Crude Oil, Petroleum Products and Others **49.5%**
2. Natural Gas **41.2%**
3. Coal & Coke **4.8%**
4. Hydropower **4.5%**
5. Biodiesel **0.0%**
6. Biomass **0.0%**
7. Biogass **0.0%**
8. Solar **0.0%**



1. Natural Gas **43.6%**
2. Crude Oil, Petroleum Products and Others **32.4%**
3. Coal & Coke **19.3%**
4. Hydropower **4.0%**
5. Biodiesel **0.4%**
6. Biomass **0.2%**
7. Solar **0.1%**
8. Biogas **0.0%**

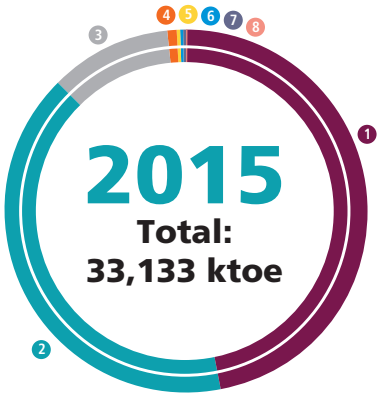
Year	Total Primary Energy Supply by Fuel Type (ktoe)								
	Crude Oil, Petroleum Products and Others	Natural Gas	Coal and Coke	Hydropower	Biodiesel	Biomass	Biogas	Solar	Total
1978	7,022	2,021	23	244	-	-	-	-	9,310
1979	7,691	2,515	33	296	-	-	-	-	10,535
1980	8,261	2,237	53	383	-	-	-	-	10,934
1981	8,873	1,881	99	403	-	-	-	-	11,256
1982	9,171	2,368	93	394	-	-	-	-	12,026
1983	9,718	3,319	249	454	-	-	-	-	13,740
1984	9,412	4,112	270	913	-	-	-	-	14,707
1985	9,715	3,971	362	1,019	-	-	-	-	15,067
1986	9,346	6,162	268	1,070	-	-	-	-	16,846
1987	9,543	6,147	327	1,212	-	-	-	-	17,229
1988	10,232	6,271	260	1,288	-	-	-	-	18,051
1989	10,177	7,181	1,158	1,203	-	-	-	-	19,719
1990	12,434	6,801	1,326	915	-	-	-	-	21,476
1991	13,608	10,112	1,564	1,053	-	-	-	-	26,337
1992	15,275	11,381	1,640	997	-	-	-	-	29,293
1993	15,949	11,360	1,352	1,262	-	-	-	-	29,923
1994	16,051	12,392	1,563	1,652	-	-	-	-	31,658
1995	16,769	13,960	1,612	1,540	-	-	-	-	33,881
1996	19,354	15,567	1,677	1,243	-	-	-	-	37,841
1997	21,718	19,041	1,622	790	-	-	-	-	43,171
1998	19,053	19,101	1,731	1,113	-	-	-	-	40,998
1999	19,450	21,476	1,940	1,668	-	-	-	-	44,534
2000	20,242	26,370	2,486	1,560	-	-	-	-	50,658
2001	21,673	25,649	2,970	1,687	-	-	-	-	51,979
2002	22,126	26,101	3,642	1,329	-	-	-	-	53,198
2003	23,953	27,257	5,316	1,056	-	-	-	-	57,582
2004	25,298	29,145	6,631	1,329	-	-	-	-	62,403
2005	24,264	33,913	6,889	1,313	-	-	-	-	66,379
2006	23,435	35,776	7,299	1,568	-	-	-	-	68,078
2007	25,576	36,639	8,848	1,510	-	-	-	-	72,573
2008	24,494	39,289	9,782	1,964	-	-	-	-	75,529
2009	26,482	35,851	10,623	1,627	-	-	-	-	74,583
2010	25,008	36,936	14,777	1,577	-	-	-	-	78,298
2011	26,903	35,740	14,772	1,850	24	-	-	-	79,289
2012	29,502	38,648	15,882	2,150	115	183	4	11	86,495
2013	32,474	39,973	15,067	2,688	188	297	6	38	90,731
2014	33,422	40,113	15,357	3,038	300	181	12	63	92,486
2015	29,164	39,365	17,406	3,582	389	189	18	75	90,188

Fuel Input to Power Stations by Fuel Type



Source: National Energy Balance 2015

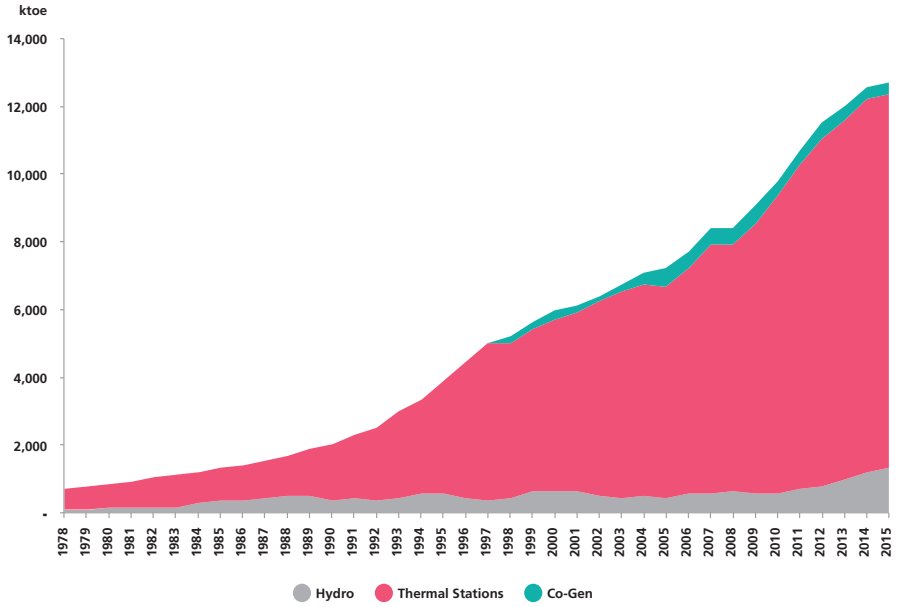
1 Natural Gas **57.0%**
2 Fuel Oil **18.4%**
3 Hydropower **13.7%**
4 Coal & Coke **8.5%**
5 Diesel **2.4%**
6 Solar **0.0%**
7 Biomass **0.0%**
8 Biogas **0.0%**



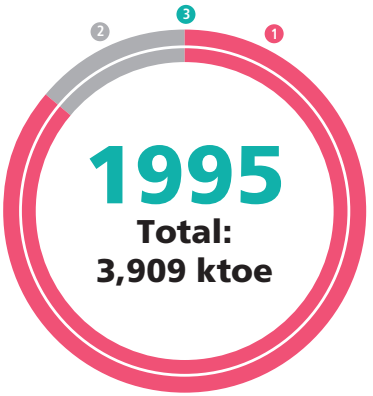
1 Coal & Coke **47.2%**
2 Natural Gas **40.4%**
3 Hydropower **10.8%**
4 Diesel **0.8%**
5 Fuel Oil **0.3%**
6 Solar **0.2%**
7 Biomass **0.2%**
8 Biogas **0.1%**

Year	Fuel Input to Power Stations by Fuel Type (ktoe)								
	Natural Gas	Diesel	Fuel Oil	Coal & Coke	Hydropower	Solar	Biomass	Biogas	Total
1978	21	145	1,842	-	244	-	-	-	2,252
1979	24	247	1,930	-	296	-	-	-	2,497
1980	33	287	2,059	-	383	-	-	-	2,762
1981	36	273	2,097	-	403	-	-	-	2,809
1982	35	333	2,358	-	394	-	-	-	3,120
1983	59	461	2,370	-	454	-	-	-	3,344
1984	81	321	2,351	-	913	-	-	-	3,666
1985	539	345	2,174	-	1,019	-	-	-	4,077
1986	703	239	2,213	-	1,070	-	-	-	4,225
1987	818	183	2,086	-	1,212	-	-	-	4,299
1988	990	233	2,051	71	1,288	-	-	-	4,633
1989	1,004	319	1,888	602	1,203	-	-	-	5,016
1990	1,361	116	2,873	813	915	-	-	-	6,078
1991	2,533	164	2,687	963	1,053	-	-	-	7,400
1992	3,144	160	2,352	968	997	-	-	-	7,621
1993	4,374	87	2,388	884	1,262	-	-	-	8,995
1994	5,119	249	1,957	925	1,652	-	-	-	9,902
1995	6,414	265	2,073	957	1,540	-	-	-	11,249
1996	7,489	284	2,354	950	1,243	-	-	-	12,320
1997	7,531	185	2,482	882	790	-	-	-	11,870
1998	8,886	275	2,130	964	1,113	-	-	-	13,368
1999	10,162	172	950	1,332	1,668	-	-	-	14,284
2000	11,580	191	592	1,495	1,612	-	-	-	15,470
2001	11,922	278	730	1,994	1,687	-	-	-	16,611
2002	12,424	476	1,363	2,556	1,329	-	-	-	18,148
2003	10,893	340	289	4,104	1,056	-	-	-	16,682
2004	10,545	272	274	5,327	1,329	-	-	-	17,747
2005	12,271	298	275	5,541	1,313	-	-	-	19,698
2006	12,524	617	171	5,964	1,567	-	-	-	20,843
2007	12,549	314	199	7,486	1,522	-	-	-	22,070
2008	13,651	299	181	8,069	1,964	-	-	-	24,164
2009	13,390	384	205	9,010	1,627	-	-	-	24,616
2010	12,628	415	125	12,951	1,577	-	-	-	27,696
2011	10,977	981	1,103	13,013	1,850	-	-	-	27,924
2012	11,533	811	550	14,138	2,150	11	65	4	29,262
2013	13,520	623	392	13,527	2,688	38	164	6	30,958
2014	13,860	622	269	13,648	3,038	63	96	12	31,608
2015	13,378	279	101	15,627	3,582	75	74	17	33,133

Electricity Generation by Plant Type



Source: National Energy Balance 2015



1 Thermal Stations **86.3%** 3 Co-Gen **0.0%**

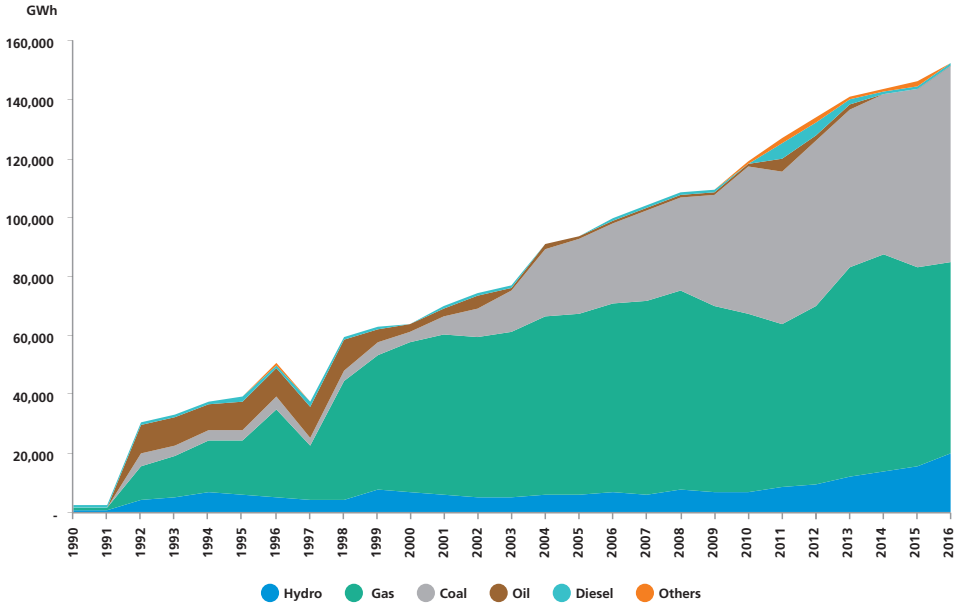
2 Hydro **13.7%**

1 Thermal Stations **86.9%** 3 Co-Gen **2.5%**

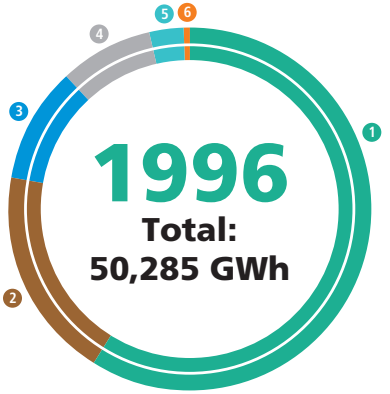
2 Hydro **10.6%**

Year	Electricity Generation by Plant Type (ktoe)			
	Hydro	Thermal Stations	Co-Gen	Total
1978	77	633	-	710
1979	94	695	-	789
1980	120	744	-	864
1981	133	795	-	928
1982	128	885	-	1,013
1983	149	948	-	1,097
1984	294	888	-	1,182
1985	321	964	-	1,285
1986	351	1,036	-	1,387
1987	423	1,075	-	1,498
1988	488	1,176	-	1,664
1989	451	1,399	-	1,850
1990	343	1,636	-	1,979
1991	379	1,904	-	2,283
1992	375	2,146	-	2,521
1993	419	2,568	-	2,987
1994	561	2,801	-	3,362
1995	535	3,374	-	3,909
1996	446	3,975	-	4,421
1997	333	4,644	-	4,977
1998	417	4,596	207	5,220
1999	647	4,762	200	5,609
2000	599	5,132	224	5,955
2001	607	5,333	172	6,112
2002	456	5,771	157	6,384
2003	435	6,134	179	6,748
2004	501	6,215	359	7,075
2005	446	6,259	509	7,214
2006	554	6,687	499	7,740
2007	558	7,366	461	8,385
2008	642	7,321	460	8,423
2009	574	7,957	560	9,091
2010	540	8,864	387	9,791
2011	656	9,648	442	10,746
2012	779	10,253	530	11,562
2013	1,003	10,627	424	12,054
2014	1,152	11,075	402	12,629
2015	1,346	11,047	317	12,710

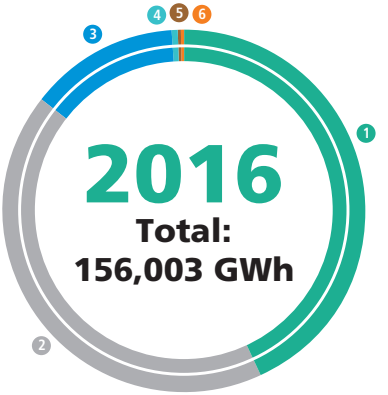
Electricity Generation Mix



Source: Energy Commission



1 Gas 58.9%
2 Oil 18.9%
3 Hydro 10.3%
4 Coal 8.3%
5 Diesel 3.2%
6 Others 0.4%

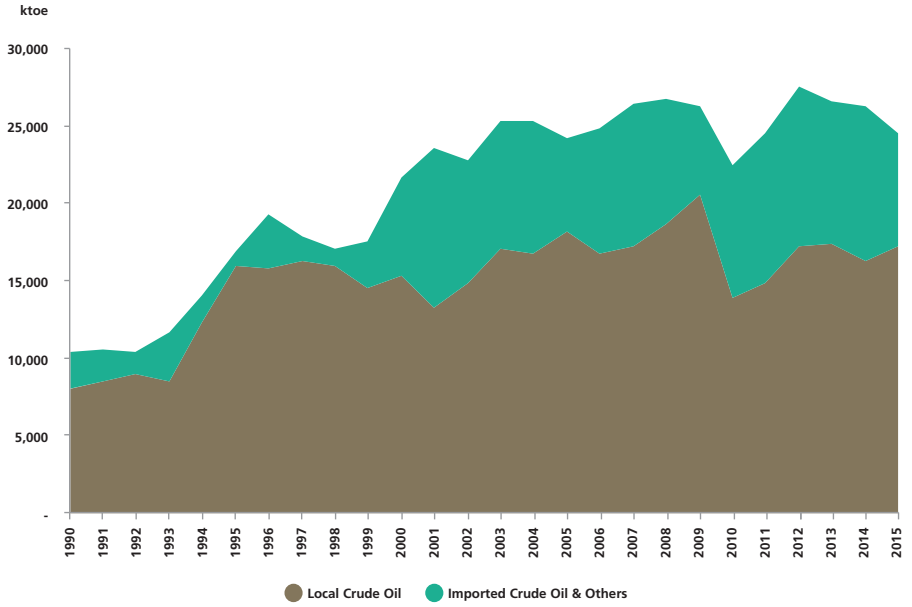


1 Gas 43.5%
2 Coal 42.5%
3 Hydro 13.0%
4 Diesel 0.4%
5 Oil 0.3%
6 Others 0.3%

Year	Electricity Generation Mix (GWh)						
	Hydro	Gas	Coal	Oil	Diesel	Others	Total
1990	518	623	-	367	585	-	**2,093**
1991	762	525	-	379	612	-	**2,278**
1992	4,286	11,398	3,837	9,724	862	-	**30,107**
1993	4,853	13,905	3,880	9,820	865	-	**33,323**
1994	6,483	17,491	4,081	8,756	988	-	**37,799**
1995	6,184	17,726	3,974	9,687	1,249	-	**38,820**
1996	5,184	29,641	4,177	9,510	1,584	189	**50,285**
1997	4,134	18,387	2,460	10,784	1,300	-	**37,065**
1998	4,457	40,223	3,655	10,339	971	-	**59,645**
1999	7,552	45,988	4,522	4,220	747	-	**63,029**
2000	6,994	50,314	4,038	2,383	552	-	**64,281**
2001	6,066	54,066	6,238	2,531	831	-	**69,732**
2002	5,415	53,979	9,559	4,465	746	-	**74,164**
2003	5,090	56,478	13,435	1,221	976	-	**77,200**
2004	5,573	61,363	22,627	1,130	729	-	**91,422**
2005	6,007	61,396	25,231	1,048	348	-	**94,030**
2006	6,323	64,768	26,626	1,265	643	50	**99,675**
2007	5,957	65,568	30,856	1,091	677	63	**104,212**
2008	7,807	67,779	31,029	1,048	601	66	**108,330**
2009	6,890	63,370	37,644	1,041	685	132	**109,762**
2010	6,361	61,342	49,401	933	726	170	**118,933**
2011	8,056	55,732	52,302	4,295	5,108	1,576	**127,069**
2012	9,251	60,992	55,615	2,279	4,344	1,596	**134,077**
2013	11,799	71,174	53,663	1,571	1,741	1,318	**141,266**
2014	13,540	74,466	53,693	376	756	995	**143,827**
2015	15,524	67,900	60,129	595	877	1,196	**146,221**
2016	20,342	67,942	66,246	423	563	487	**156,003**

Notes:
1. Hydro is inclusive of Mini Hydro
2. Oil is inclusive of Distillate
3. Others is inclusive of Biomass, Solar, Biogas, Industrial Process Waste Heat and Gas, and Industrial Waste.

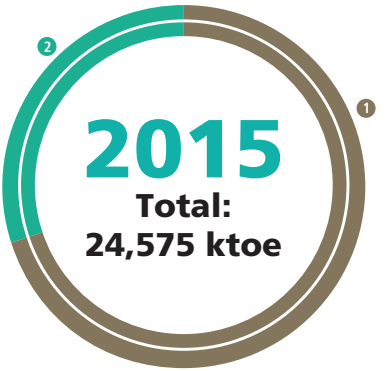
Input of Crude Oil in Refineries



Source: National Energy Balance 2015

1 Local Crude Oil **94.3%**

2 Imported Crude Oil & Others **5.7%**

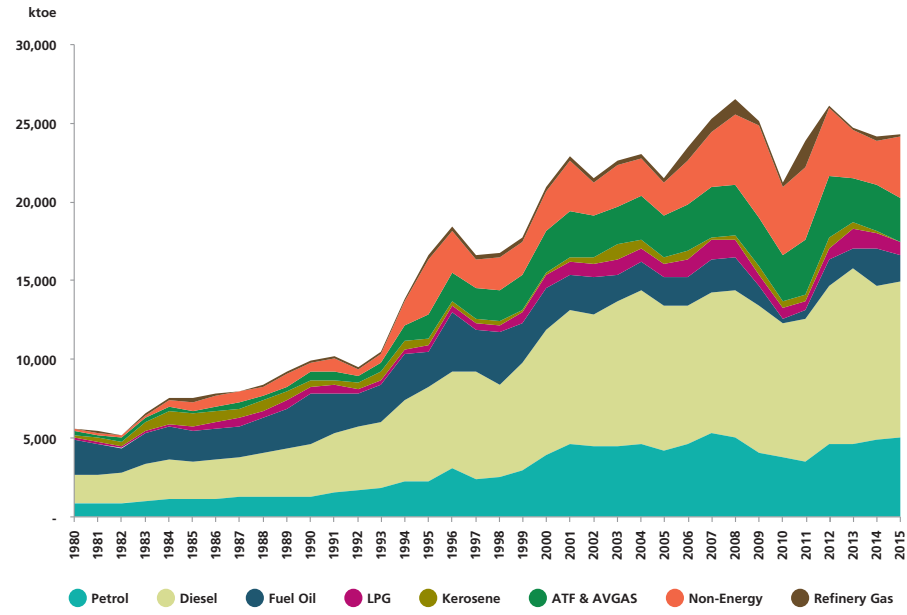


1 Local Crude Oil **70.2%**

2 Imported Crude Oil & Others **29.8%**

Year	Input of Crude Oil in Refineries (ktoe)		
	Local Crude Oil	Imported Crude Oil & Others	Total
1990	8,072	2,342	10,414
1991	8,476	2,113	10,589
1992	9,016	1,409	10,425
1993	8,502	3,195	11,697
1994	12,326	1,853	14,179
1995	15,991	969	16,960
1996	15,879	3,501	19,380
1997	16,382	3,224	19,606
1998	15,942	1,347	17,289
1999	14,595	4,437	19,032
2000	15,421	6,743	22,164
2001	13,299	10,546	23,845
2002	14,838	8,032	22,870
2003	17,127	8,322	25,449
2004	16,810	8,764	25,574
2005	18,216	6,271	24,487
2006	16,797	8,113	24,910
2007	17,320	9,251	26,571
2008	18,638	8,138	26,776
2009	20,685	5,812	26,497
2010	14,003	8,706	22,709
2011	14,874	9,904	24,777
2012	17,213	10,347	27,560
2013	17,365	9,289	26,654
2014	16,351	10,066	26,417
2015	17,249	7,327	24,575

Production of Petroleum Products from Refineries



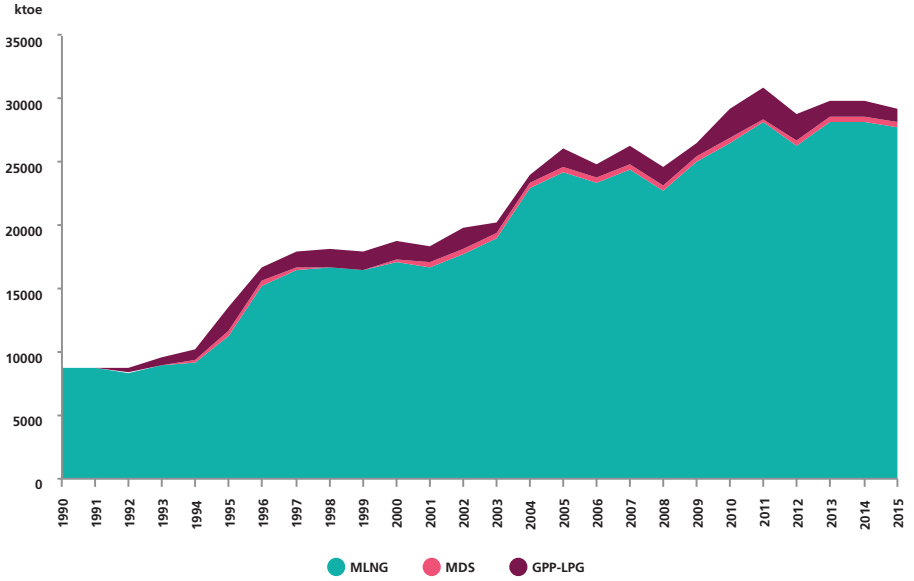
Source: National Energy Balance 2015

1 Diesel 36.0%
2 Non-Energy 20.3%
3 Petrol 13.9%
4 Fuel Oil 13.3%
5 ATF & AVGAS 9.5%
6 LPG 2.6%
7 Refinery Gas 2.3%
8 Kerosene 2.2%

1 Diesel 40.7%
2 Petrol 20.7%
3 Non-Energy 15.9%
4 ATF & AVGAS 11.7%
5 Fuel Oil 7.0%
6 LPG 3.2%
7 Refinery Gas 0.7%
8 Kerosene 0.0%

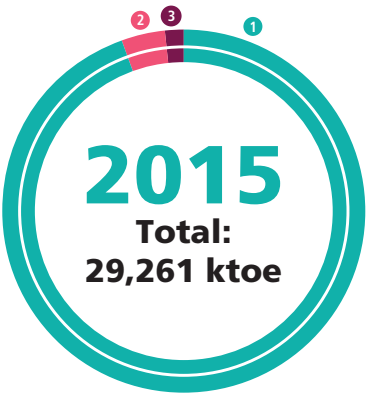
Year	Production of Petroleum Products from Refineries (ktoe)								
	Petrol	Diesel	Fuel Oil	LPG	Kerosene	ATF & AVGAS	Non-Energy	Refinery Gas	Total
1980	933	1,748	2,257	83	232	214	136	90	**5,693**
1981	916	1,765	1,979	75	275	218	139	86	**5,453**
1982	949	1,921	1,554	86	286	256	144	79	**5,275**
1983	1,031	2,384	1,986	111	542	259	124	119	**6,556**
1984	1,205	2,539	2,044	142	812	258	430	178	**7,608**
1985	1,187	2,387	1,952	315	712	201	567	209	**7,530**
1986	1,220	2,410	1,962	447	694	314	676	122	**7,845**
1987	1,283	2,495	2,013	477	682	293	700	117	**8,060**
1988	1,384	2,722	2,172	504	612	294	598	151	**8,437**
1989	1,357	3,062	2,446	531	591	357	749	126	**9,219**
1990	1,347	3,350	3,106	491	360	613	561	151	**9,979**
1991	1,611	3,681	2,547	526	390	548	772	168	**10,243**
1992	1,724	4,048	2,110	200	541	412	324	143	**9,502**
1993	1,816	4,249	2,375	244	576	517	600	106	**10,483**
1994	2,316	5,108	2,887	319	563	980	1,468	162	**13,803**
1995	2,320	6,011	2,212	431	360	1,587	3,380	385	**16,686**
1996	3,134	6,174	3,696	371	292	1,899	2,554	331	**18,451**
1997	2,491	6,744	2,716	371	265	2,000	1,783	203	**16,573**
1998	2,545	5,926	3,233	449	285	1,985	2,117	192	**16,732**
1999	3,056	6,712	2,603	617	210	2,140	2,159	230	**17,727**
2000	3,893	8,059	2,532	838	239	2,660	2,492	241	**20,954**
2001	4,623	8,462	2,269	875	283	2,954	3,120	331	**22,917**
2002	4,460	8,401	2,332	897	414	2,570	2,127	294	**21,495**
2003	4,584	9,062	1,763	932	983	2,367	2,623	262	**22,576**
2004	4,724	9,611	1,813	897	591	2,693	2,455	215	**22,999**
2005	4,245	9,161	1,777	822	521	2,553	2,157	202	**21,438**
2006	4,607	8,752	1,933	1,118	537	2,938	2,750	849	**23,484**
2007	5,285	9,033	1,990	1,228	234	3,138	3,461	938	**25,307**
2008	5,066	9,364	1,994	1,208	245	3,139	4,475	991	**26,482**
2009	4,052	9,415	1,144	732	565	3,085	5,905	195	**25,093**
2010	3,874	8,370	327	697	483	2,892	4,357	210	**21,210**
2011	3,599	8,925	571	665	419	3,457	4,572	1,659	**23,867**
2012	4,708	10,033	1,608	702	654	3,917	4,318	197	**26,137**
2013	4,702	11,063	1,286	1,252	387	2,750	3,089	195	**24,724**
2014	4,918	9,725	2,340	1,102	100	2,916	2,826	192	**24,119**
2015	5,031	9,890	1,692	780	6	2,841	3,869	172	**24,281**

Conversion in Gas Plants



Source: National Energy Balance 2015

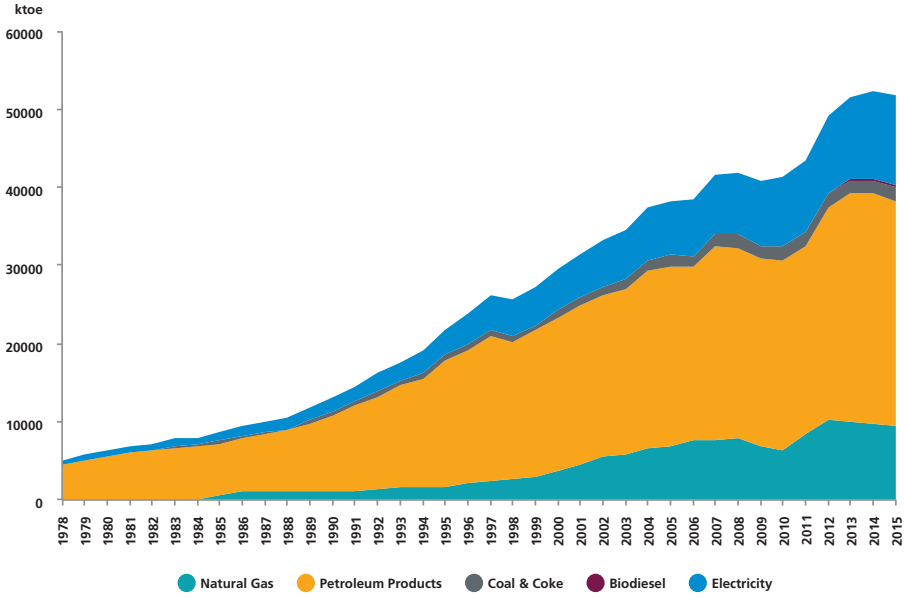
1 MLNG **82.9%**
2 GPP-LPG **14.0%**
3 MDS **3.1%**



1 MLNG **94.6%**
2 GPP-LPG **3.9%**
3 MDS **1.5%**

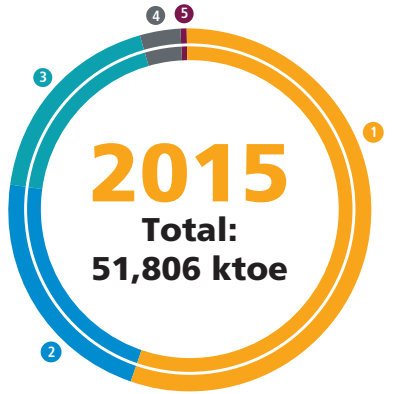
Year	Input:	Conversion in Gas Plants (ktoe)		
	Natural Gas	MLNG	MDS	GPP-LPG
1990	9,797	8,761	-	-
1991	11,715	8,749	-	-
1992	11,681	8,425	-	392
1993	13,005	9,019	39	529
1994	14,634	9,087	238	948
1995	17,088	11,244	421	1,900
1996	20,822	15,251	344	1,212
1997	24,945	16,396	389	1,258
1998	23,138	16,688	-	1,526
1999	24,116	16,417	-	1,472
2000	26,093	17,231	164	1,482
2001	25,703	16,636	513	1,310
2002	25,571	17,803	445	1,504
2003	27,940	18,965	443	790
2004	33,176	22,944	513	520
2005	36,447	24,254	460	1,319
2006	35,378	23,450	464	1,036
2007	38,141	24,355	417	1,483
2008	38,193	22,793	481	1,362
2009	37,098	25,004	426	1,012
2010	40,246	26,601	454	2,299
2011	40,737	28,130	359	2,434
2012	40,042	26,231	486	2,035
2013	39,678	28,209	478	1,174
2014	39,193	28,213	420	1,250
2015	38,323	27,683	423	1,155

Final Energy Consumption by Fuel Type



Source: National Energy Balance 2015

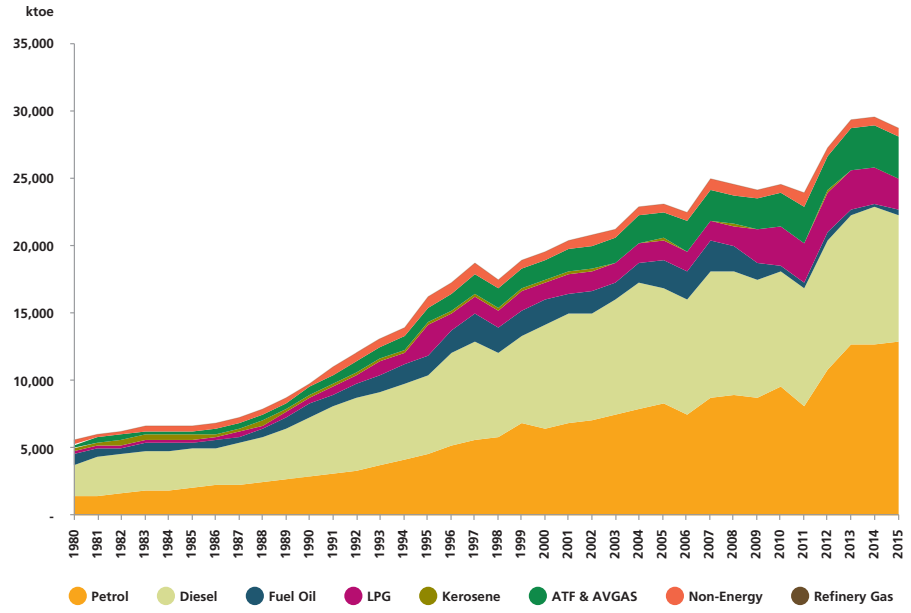
1 Petroleum Products 73.8%
2 Electricity 15.4%
3 Natural Gas 7.5%
4 Coal & Coke 3.3%
5 Biodiesel 0.0%



1 Petroleum Products 55.4%
2 Electricity 22.0%
3 Natural Gas 18.5%
4 Coal & Coke 3.4%
5 Biodiesel 0.7%

Year	Final Energy Consumption by Fuel Type (ktoe)					
	Natural Gas	Petroleum Products	Coal & Coke	Biodiesel	Electricity	Total
1978	31	4,456	23	-	604	**5,114**
1979	33	5,032	33	-	684	**5,782**
1980	35	5,550	53	-	747	**6,385**
1981	39	6,041	99	-	800	**6,979**
1982	46	6,228	93	-	866	**7,233**
1983	45	6,621	249	-	935	**7,850**
1984	134	6,622	270	-	1,019	**8,045**
1985	515	6,656	362	-	1,079	**8,612**
1986	1,056	6,880	268	-	1,164	**9,368**
1987	1,132	7,271	327	-	1,253	**9,983**
1988	1,058	7,816	189	-	1,393	**10,456**
1989	1,070	8,635	595	-	1,548	**11,848**
1990	1,069	9,825	513	-	1,715	**13,122**
1991	1,099	10,914	599	-	1,925	**14,537**
1992	1,344	11,927	672	-	2,218	**16,161**
1993	1,701	13,076	487	-	2,450	**17,714**
1994	1,660	13,894	598	-	2,932	**19,084**
1995	1,654	16,142	712	-	3,375	**21,883**
1996	2,079	17,203	727	-	3,777	**23,786**
1997	2,465	18,578	740	-	4,384	**26,167**
1998	2,726	17,487	767	-	4,577	**25,557**
1999	3,023	18,782	608	-	4,815	**27,228**
2000	3,863	19,582	991	-	5,263	**29,699**
2001	4,620	20,323	977	-	5,594	**31,514**
2002	5,643	20,638	1,086	-	5,922	**33,289**
2003	5,886	21,175	1,212	-	6,313	**34,586**
2004	6,490	22,886	1,305	-	6,642	**37,323**
2005	6,981	23,012	1,348	-	6,944	**38,285**
2006	7,562	22,398	1,335	-	7,272	**38,567**
2007	7,709	24,852	1,361	-	7,683	**41,605**
2008	7,818	24,451	1,713	-	7,986	**41,968**
2009	6,802	24,145	1,613	-	8,286	**40,846**
2010	6,254	24,403	1,826	-	8,993	**41,476**
2011	8,515	23,922	1,759	24	9,235	**43,455**
2012	10,206	27,215	1,744	115	10,011	**49,291**
2013	10,076	29,190	1,539	188	10,590	**51,583**
2014	9,641	29,517	1,709	300	11,042	**52,209**
2015	9,566	28,699	1,778	389	11,375	**51,806**

Final Energy Consumption for Petroleum Products



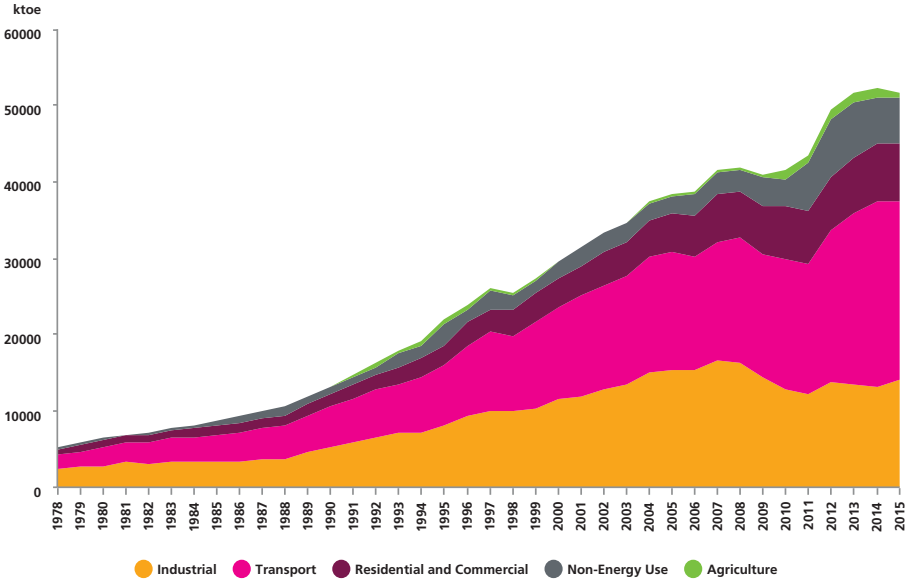
Source: National Energy Balance 2015

1 Diesel **36.0%**
2 Petrol **28.2%**
3 LPG **13.7%**
4 Fuel Oil **9.3%**
5 ATF & AVGAS **7.2%**
6 Non-Energy **4.4%**
7 Kerosene **1.1%**
8 Refinery Gas **0.0%**

1 Petrol **44.6%**
2 Diesel **32.7%**
3 ATF & AVGAS **10.9%**
4 LPG **7.9%**
5 Non-Energy **2.2%**
6 Fuel Oil **1.7%**
7 Kerosene **0.0%**
8 Refinery Gas **0.0%**

Year	Final Energy Consumption for Petroleum Products (ktoe)								
	Petrol	Diesel	Fuel Oil	LPG	Kerosene	ATF & AVGAS	Non-Energy	Refinery Gas	Total
1980	1,317	2,368	846	121	351	255	269	23	5,550
1981	1,423	2,811	734	124	368	285	270	26	6,041
1982	1,529	3,094	422	135	364	346	314	24	6,228
1983	1,756	3,051	604	174	352	338	320	26	6,621
1984	1,925	2,901	528	188	357	371	315	37	6,622
1985	2,088	2,773	554	229	310	288	386	28	6,656
1986	2,178	2,803	489	271	301	429	382	27	6,880
1987	2,297	3,026	529	330	269	435	358	27	7,271
1988	2,451	3,275	598	379	255	459	366	33	7,816
1989	2,585	3,816	785	415	211	499	313	11	8,635
1990	2,901	4,421	883	548	203	628	229	10	9,823
1991	3,135	4,873	945	612	180	690	467	12	10,914
1992	3,326	5,291	1,088	733	160	764	565	-	11,927
1993	3,666	5,339	1,293	1,119	149	875	625	10	13,076
1994	4,139	5,643	1,392	926	152	978	654	10	13,894
1995	4,548	5,810	1,506	2,215	177	1,160	718	8	16,142
1996	5,205	6,735	1,770	1,215	197	1,335	742	4	17,203
1997	5,586	7,314	1,978	1,245	169	1,439	843	4	18,578
1998	5,854	6,252	1,678	1,301	165	1,619	615	4	17,488
1999	6,793	6,506	1,792	1,523	162	1,424	579	3	18,782
2000	6,387	7,627	1,875	1,362	131	1,574	622	3	19,581
2001	6,827	8,116	1,497	1,392	99	1,762	626	4	20,323
2002	6,948	8,042	1,589	1,542	92	1,785	633	6	20,637
2003	7,360	8,539	1,256	1,437	93	1,852	632	7	21,176
2004	7,839	9,262	1,463	1,542	86	2,056	626	11	22,885
2005	8,211	8,672	1,953	1,510	81	2,010	564	10	23,011
2006	7,517	8,540	1,901	1,520	79	2,152	672	12	22,393
2007	8,600	9,512	2,202	1,474	76	2,155	823	9	24,851
2008	8,842	9,167	1,963	1,475	75	2,112	818	-	24,452
2009	8,766	8,634	1,291	2,506	30	2,120	799	-	24,146
2010	9,560	8,388	478	2,920	19	2,380	657	-	24,402
2011	8,155	8,712	414	2,892	19	2,553	1,178	-	23,923
2012	10,843	9,410	768	2,892	38	2,521	743	-	27,215
2013	12,656	9,568	329	2,946	31	2,998	662	-	29,190
2014	12,705	10,161	246	2,632	23	3,158	592	-	29,517
2015	12,804	9,377	498	2,261	4	3,134	621	-	28,699

Final Energy Consumption by Sector



Source: National Energy Balance 2015

1 Industrial **36.8%**
2 Transport **35.8%**
3 Non-Energy Use **13.7%**
4 Residential and Commercial **11.7%**
5 Agriculture **2.0%**

1 Transport **45.2%**
2 Industrial **27.0%**
3 Residential and Commercial **14.6%**
4 Non-Energy Use **11.5%**
5 Agriculture **1.7%**

Year	Final Energy Consumption by Sector (ktoe)					
	Industry	Transport	Residential and Commercial	Non-Energy Use	Agriculture	Total
1978	2,273	1,928	712	201	-	5,114
1979	2,599	2,135	794	254	-	5,782
1980	2,870	2,398	826	291	-	6,385
1981	3,221	2,587	884	287	-	6,979
1982	3,165	2,794	942	332	-	7,233
1983	3,301	3,170	1,040	339	-	7,850
1984	3,304	3,300	1,099	342	-	8,045
1985	3,489	3,377	1,123	623	-	8,612
1986	3,430	3,726	1,233	979	-	9,368
1987	3,709	3,929	1,297	1,048	-	9,983
1988	3,722	4,278	1,435	1,021	-	10,456
1989	4,704	4,684	1,495	965	-	11,848
1990	5,276	5,386	1,622	838	-	13,122
1991	5,809	5,806	1,721	1,071	130	14,537
1992	6,455	6,226	1,867	1,222	391	16,161
1993	7,012	6,558	2,055	2,027	62	17,714
1994	7,283	7,262	2,300	1,817	422	19,084
1995	8,060	7,827	2,556	2,994	446	21,883
1996	9,443	8,951	3,162	1,744	486	23,786
1997	10,106	10,201	3,072	2,298	490	26,167
1998	10,121	9,793	3,313	2,023	307	25,557
1999	10,277	11,393	3,653	1,799	106	27,228
2000	11,406	12,071	3,868	2,250	104	29,699
2001	11,852	13,137	4,048	2,378	98	31,513
2002	12,854	13,442	4,387	2,511	96	33,290
2003	13,472	14,271	4,399	2,345	98	34,585
2004	14,914	15,385	4,754	2,183	87	37,323
2005	15,492	15,384	5,134	2,173	101	38,284
2006	15,248	14,819	5,424	2,819	258	38,567
2007	16,454	15,717	6,196	2,958	281	41,606
2008	16,205	16,395	6,205	2,876	287	41,968
2009	14,312	16,119	6,336	3,868	211	40,846
2010	12,928	16,828	6,951	3,696	1,074	41,477
2011	12,100	17,070	6,993	6,377	916	43,456
2012	13,919	19,757	7,065	7,497	1,053	49,291
2013	13,496	22,357	7,403	7,277	1,051	51,584
2014	13,162	24,327	7,458	6,217	1,045	52,209
2015	13,989	23,435	7,559	5,928	895	51,806

Energy Balance Table in 2015 (ktoe)

Commercial Energy Balance for Malaysia 2015 (Kilo Tonnes of Oil Equivalent)

ENERGY SOURCE	NATURAL GAS	LNG	CRUDE OIL (1/)	OTHERS (2/)	TOTAL PETROLEUM PRODUCTS	PETROLEUM			
						PETROL	DIESEL	FUEL OIL	LPG
PRIMARY SUPPLY									
1. Primary Production	62,119	0	32,440	0	**0**	0	0	0	0
2. Gas Flaring, Reinjection & Use	-2,450	0	0	0	**0**	0	0	0	0
3. Imports	5,941	1,873	8,379	13	**14,218**	7,582	4,558	958	351
4. Exports	-1,062	-27,057	-16,075	-39	**-10,220**	-401	-5,385	-1,408	-272
5. Bunkers	0	0	0	0	**-346**	0	-2	-344	0
6. Stock Change	0	0	57	0	**567**	79	491	-81	161
7. Statistical Discrepancy	0	0	170	0	**0**	0	0	0	0
8. Primary Supply	**64,549**	**-25,184**	**24,971**	**-26**	**4,219**	**7,259**	**-338**	**-876**	**239**
TRANSFORMATION									
9. Gas Plants									
9.1 MLNG	-35,635	27,634	0	0	**49**	0	0	0	49
9.2 MDS	-862	0	0	0	**423**	0	118	0	0
9.3 GPP-LPG (3&4/)	-1,826	0	0	0	**1,155**	0	0	0	1,155
Subtotal	**-38,323**	**27,634**	**0**	**0**	**1,627**	**0**	**118**	**0**	**1,204**
10. Refineries	0	0	-24,575	26	**24,281**	5,031	9,890	1,692	780
11. Power Stations & Self-Generation									
11.1 Hydro Stations	0	0	0	0	**0**	0	0	0	0
11.2 Thermal Stations	-13,378	-1,873	0	0	**-380**	0	-279	-101	0
11.3 Self-Generation (5/)	-1,739	0	0	0	**-51**	0	-51	0	0
Subtotal	**-15,118**	**-1,873**	**0**	**0**	**-431**	**0**	**-330**	**-101**	**0**
12. Losses & Own Use	-1,542	-577	-396	0	**-1,404**	0	0	-16	0
13. Statistical Discrepancy	0	0	0	0	**407**	514	37	-201	38
14. Secondary Supply	**-54,983**	**25,184**	**-24,971**	**26**	**24,480**	**5,545**	**9,715**	**1,373**	**2,021**
FINAL USE									
15. Residential	1	0	0	0	**675**	0	0	0	674
16. Commercial	24	0	0	0	**767**	0	140	0	627
17. Industry	4,808	0	0	0	**2,185**	181	1,387	491	123
18. Transport	264	0	0	0	**22,760**	12,554	7,068	4	0
19. Agriculture	0	0	0	0	**190**	0	187	3	0
20. Fishery	0	0	0	0	**664**	69	595	0	0
21. Non-Energy Use	4,470	0	0	0	**1,458**	0	0	0	837
22. Total Final Use	**9,566**	**0**	**0**	**0**	**28,699**	**12,804**	**9,377**	**498**	**2,261**
ELECTRICITY OUTPUT									
Main Activity Producer									
Gross Electricity Generation - GWh	65,580	0	0	0	**1,556**	0	767	789	0
Autoproducer									
Gross Electricity Generation - GWh	4,382	0	0	0	**183**	0	183	0	0

1/ Crude production includes Condensates comprising Pentane and Heavier Hydrocarbons.
2/ Others Refer to Non-Crude Energy Forms (consist of Imported Light Diesel, Slop Reprocess, Crude Residuum & Middle East Residue) Which are Used as Refinary Intake.
3/ GPP-LPG Extracts Liquid Products i.e Condensates, Ethane, Butane, 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 2013.

Note : Total may not necessarily add up due to rounding

PRODUCTS											
KEROSENE	ATF & AV GAS	NON-ENERGY	REFINERY GAS	COAL & COKE	HYDRO POWER	SOLAR	BIOMASS	BIOGAS	BIODIESEL	ELECTRICITY	TOTAL
0	0	0	0	1,614	3,582	75	189	18	684	0	**100,721**
0	0	0	0	0	0	0	0	0	0	0	**-2,450**
0	554	216	0	16,051	0	0	0	0	0	1	**46,477**
-42	-549	-2,162	0	-156	0	0	0	0	-182	-0	**-54,791**
0	0	-0	0	0	0	0	0	0	0	0	**-346**
-4	96	-174	0	10	0	0	0	0	-114	0	**520**
0	0	0	0	-112	0	0	0	0	0	0	**58**
-46	**101**	**-2,120**	**0**	**17,406**	**3,582**	**75**	**189**	**18**	**389**	**1**	**90,188**
0	0	0	0	0	0	0	0	0	0	0	**-7,953**
44	0	262	0	0	0	0	0	0	0	0	**-439**
0	0	0	0	0	0	0	0	0	0	0	**-671**
44	**0**	**262**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-9,063**
6	2,841	3,869	172	0	0	0	0	0	0	0	**-269**
0	0	0	0	0	-3,582	0	0	0	0	1,346	**-2,235**
0	0	0	0	-15,627	0	-75	-74	-17	0	11,047	**-20,378**
0	0	0	0	0	0	-107	-115	-1	0	317	**-1,695**
0	**0**	**0**	**0**	**-15,627**	**-3,582**	**-182**	**-189**	**-18**	**0**	**12,711**	**-24,308**
0	0	-1,216	-172	0	0	0	0	0	0	-1,079	**-4,998**
0	192	-173	0	0	0	0	0	0	0	-258	**255**
50	**3,033**	**2,741**	**0**	**-15,627**	**-3,582**	**-182**	**-189**	**-18**	**0**	**11,374**	**-38,489**
0	0	0	0	0	0	0	0	0	0	2,435	**3,110**
0	0	0	0	0	0	0	0	0	0	3,659	**4,449**
4	0	0	0	1,778	0	0	0	0	0	5,218	**13,989**
0	3,134	0	0	0	0	0	0	0	389	23	**23,435**
0	0	0	0	0	0	0	0	0	0	40	**231**
0	0	0	0	0	0	0	0	0	0	0	**664**
0	0	621	0	0	0	0	0	0	0	0	**5,928**
4	**3,134**	**621**	**0**	**1,778**	**0**	**0**	**0**	**0**	**389**	**11,375**	**51,806**
0	0	0	0	63,474	13,924	273	268	62	0	0	**145,137**
0	0	0	0	0	0	0	418	3	0	0	**4,986**

Energy Flow Chart 2015 (ktoe)

PRIMARY SUPPLY

Primary Supply*		
Crude Oil	24,971	27.7%
Petroleum Products & Others	4,194	4.7%
Natural Gas	39,364	43.6%
Coal and Coke	17,406	19.3%
Hydropower	3,582	4.0%
Renewables	671	0.7%
Total	90,188	100%

Primary Production		
Crude Oil	32,440	32.2%
Natural Gas	62,119	61.7%
Coal and Coke	1,614	1.6%
Hydropower	3,582	3.6%
Renewables	966	1.0%
Total	100,721	100%

Imports		
Crude Oil & Others	8,393	18.1%
Natural Gas & LNG	7,814	16.8%
Petroleum Products	14,218	30.6%
Coal and Coke	16,051	34.5%
Total	46,477	100%

Exports		
Crude Oil & Others	16,114	29.4%
Natural Gas	1,062	1.9%
Petroleum Products	10,220	18.7%
Coal and Coke	156	0.3%
LNG	27,057	49.4%
Renewables	182	0.3%
Total	54,791	100%

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

TRANSFORMATION

Gas Plant Input	
LNG	35,635
MDS	862
GPP-LPG	1,826

Oil Refineries Input	
Local	17,249
Import	7,327

Power Stations & Self Generation Input	
Natural Gas	16,990
Diesel	330
Fuel Oil	101
Coal and Coke	15,627
Hydro	3,582
Renewables	389

FINAL USE

Gas Plant Output	
LNG	27,634
LPG (from LNG)	49
Diesel	118
Kerosene	44
Non-Energy	262
LPG	1,155

Oil Refineries Output	
Petrol	5,031
Diesel	9,890
Fuel Oil	1,692
Kerosene	6
ATF & AV GAS	2,841
Non-Energy	3,869
Refinery Gas	172

Power Stations & Self Generation Output	
Thermal	11,047
Self-Generation	317
Hydro	1,346

Final Use by Sector		
Residential	3,110	6.0%
Commercial	4,449	8.6%
Industry	13,989	27.0%
Transport	23,435	45.2%
Agriculture	231	0.4%
Fishery	664	1.3%
Non-Energy Use	5,928	11.4%
Total	51,806	100%

Final Use by Fuel		
Natural Gas	9,566	18.5%
Petroleum Products	29,087	56.1%
Coal and Coke	1,778	3.4%
Electricity	11,375	22.0%
Total	51,806	100%

Year	Average Annual Growth Rates (%)			
	GDP at 2010 Prices	Primary Energy Supply	Final Energy Consumption	Electricity Consumption
1990	9.00	8.90	8.70	9.70
1991	9.55	22.65	10.78	12.24
1992	8.89	11.22	11.14	15.22
1993	9.89	2.16	9.53	10.46
1994	9.21	5.80	8.79	19.67
1995	9.83	7.00	14.92	15.11
1996	10.00	11.69	9.10	11.91
1997	7.32	14.09	8.21	16.07
1998	(7.36)	(5.04)	(2.33)	4.40
1999	6.14	8.63	6.53	5.20
2000	8.86	13.87	9.08	9.30
2001	0.52	2.50	6.11	6.29
2002	5.39	2.34	5.63	5.86
2003	5.79	8.21	3.90	6.60
2004	6.78	9.16	7.91	5.21
2005	5.33	5.37	2.58	4.55
2006	5.58	1.22	0.74	4.72
2007	6.30	8.01	7.88	5.65
2008	4.83	5.03	0.87	3.94
2009	(1.51)	(1.91)	(2.68)	3.76
2010	7.42	2.98	1.54	8.53
2011	5.29	3.23	4.77	2.69
2012	5.47	9.09	13.43	8.40
2013	4.69	4.90	4.65	5.78
2014	6.01	1.94	1.21	4.27
2015	4.97	(2.49)	(0.77)	3.01

Year	Per Capita			
	GDP at Current Prices (RM)	Primary Energy Supply (toe)	Final Energy Consumption (toe)	Electricity Consumption (kWh)
1990	7,107	1.19	0.73	1,101
1991	7,871	1.42	0.79	1,206
1992	8,538	1.54	0.85	1,352
1993	9,491	1.53	0.90	1,453
1994	10,485	1.57	0.96	1,692
1995	11,622	1.64	1.07	1,897
1996	12,917	1.78	1.14	2,068
1997	13,986	1.98	1.20	2,341
1998	13,702	1.84	1.14	2,382
1999	14,184	1.94	1.19	2,443
2000	15,783	2.16	1.26	2,603
2001	15,266	2.16	1.31	2,706
2002	16,246	2.17	1.36	2,804
2003	17,402	2.30	1.38	2,930
2004	19,311	2.46	1.46	3,022
2005	20,870	2.54	1.47	3,099
2006	22,478	2.52	1.45	3,183
2007	24,589	2.68	1.54	3,300
2008	27,929	2.76	1.52	3,367
2009	25,385	2.66	1.45	3,429
2010	28,733	2.69	1.45	3,656
2011	31,372	2.73	1.50	3,693
2012	32,913	2.93	1.67	3,943
2013	33,713	3.00	1.71	4,074
2014	36,161	3.02	1.71	4,194
2015	37,332	2.91	1.67	4,265

Year	Energy Intensity			
	Primary Energy Supply (toe/GDP at 2010 Prices (RM Million))	Final Energy Consumption (toe/GDP at 2010 Prices (RM Million))	Electricity Consumption (toe/ GDP at 2010 Prices (RM Million))	Electricity Consumption (GWh/ GDP at 2010 Prices (RM Million))
1990	81.49	49.89	6.51	0.076
1991	91.24	50.45	6.67	0.078
1992	93.20	51.50	7.06	0.082
1993	86.64	51.33	7.09	0.082
1994	83.94	51.13	7.77	0.090
1995	81.78	53.50	8.15	0.095
1996	83.03	53.06	8.29	0.096
1997	88.27	53.50	8.96	0.104
1998	90.48	56.41	10.10	0.117
1999	92.61	56.62	10.01	0.116
2000	96.87	56.73	10.05	0.117
2001	98.78	59.89	10.63	0.124
2002	95.92	60.03	10.68	0.124
2003	98.12	58.95	10.76	0.125
2004	100.30	59.58	10.60	0.123
2005	100.34	58.02	10.52	0.122
2006	96.19	55.35	10.44	0.121
2007	97.74	56.18	10.37	0.121
2008	97.93	54.05	10.29	0.120
2009	97.54	53.42	10.84	0.126
2010	93.51	50.49	10.95	0.127
2011	91.67	50.24	10.68	0.124
2012	94.81	54.03	10.97	0.128
2013	95.00	54.01	11.09	0.129
2014	91.34	51.56	10.91	0.127
2015	84.86	48.74	10.70	0.124

Year	Energy Elasticity	
	Final Energy	Electricity
1990	0.97	1.08
1991	1.13	1.28
1992	1.25	1.71
1993	0.96	1.06
1994	0.95	2.14
1995	1.52	1.54
1996	0.91	1.19
1997	1.12	2.19
1998	0.32	(0.60)
1999	1.06	0.85
2000	1.02	1.05
2001	11.81	12.15
2002	1.04	1.09
2003	0.67	1.14
2004	1.17	0.77
2005	0.48	0.85
2006	0.13	0.85
2007	1.25	0.90
2008	0.18	0.82
2009	1.77	(2.48)
2010	0.21	1.15
2011	0.90	0.51
2012	2.45	1.54
2013	0.99	1.23
2014	0.20	0.71
2015	(0.16)	0.61

Final Energy Consumption per Capita in ASEAN

Unit: Mtoe/Millions	1990	2000	2005	2010	2012	2013	2014	2015
Brunei	1.167	1.900	1.575	3.275	4.725	2.750	3.600	2.338
Indonesia	0.446	0.580	0.600	0.621	0.647	0.648	0.649	0.632
Malaysia	**0.769**	**1.276**	**1.481**	**1.512**	**1.639**	**1.821**	**1.782**	**1.701**
Myanmar	0.223	0.237	0.259	0.249	0.274	0.286	0.318	0.329
Philippines	0.317	0.308	0.266	0.254	0.252	0.262	0.273	0.294
Singapore	1.670	2.078	3.130	3.018	3.102	3.648	3.155	3.091
Thailand	0.510	0.812	1.065	1.279	1.375	1.430	1.416	1.443
Vietnam	0.243	0.323	0.426	0.555	0.556	0.569	0.612	0.634

Source: Energy Balances of Non-OECD Countries, 2017 Edition, International Energy Agency (IEA)

Final Energy Intensity in ASEAN

Unit: Mtoe/Billion USD 2010	1990	2000	2005	2010	2012	2013	2014	2015
Brunei	0.037	0.048	0.047	0.096	0.132	0.078	0.105	0.072
Indonesia	0.258	0.265	0.232	0.195	0.183	0.176	0.172	0.165
Malaysia	**0.170**	**0.183**	**0.186**	**0.167**	**0.168**	**0.181**	**0.170**	**0.156**
Myanmar	0.805	0.493	0.303	0.201	0.197	0.192	0.198	0.200
Philippines	0.208	0.191	0.145	0.119	0.110	0.109	0.108	0.111
Singapore	0.074	0.062	0.079	0.065	0.062	0.062	0.062	0.060
Thailand	0.204	0.232	0.246	0.249	0.249	0.253	0.253	0.250
Vietnam	0.545	0.410	0.412	0.416	0.381	0.378	0.379	0.377

Source: Energy Balances of Non-OECD Countries, 2017 Edition, International Energy Agency (IEA)

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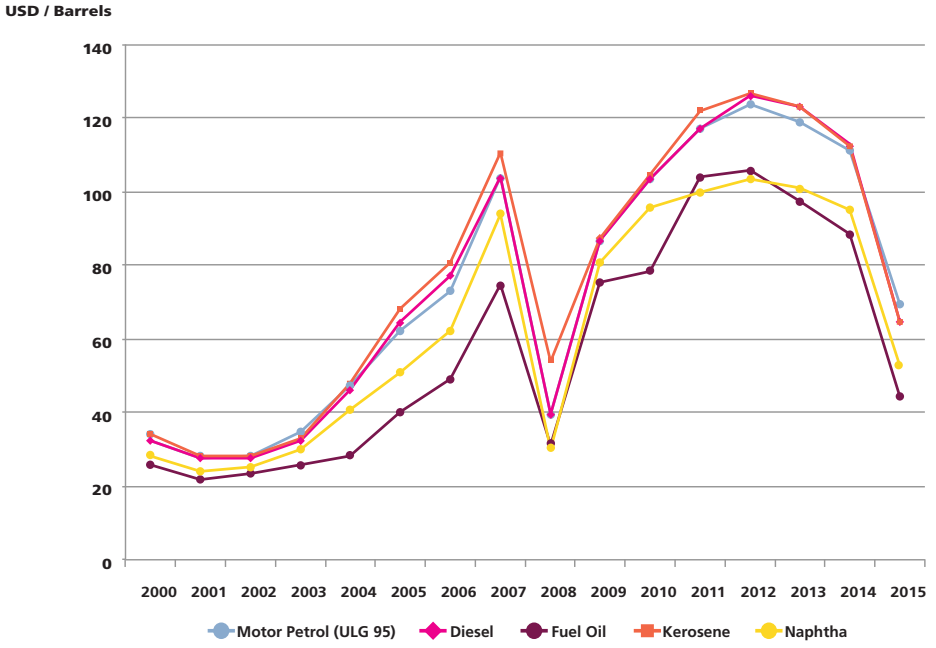
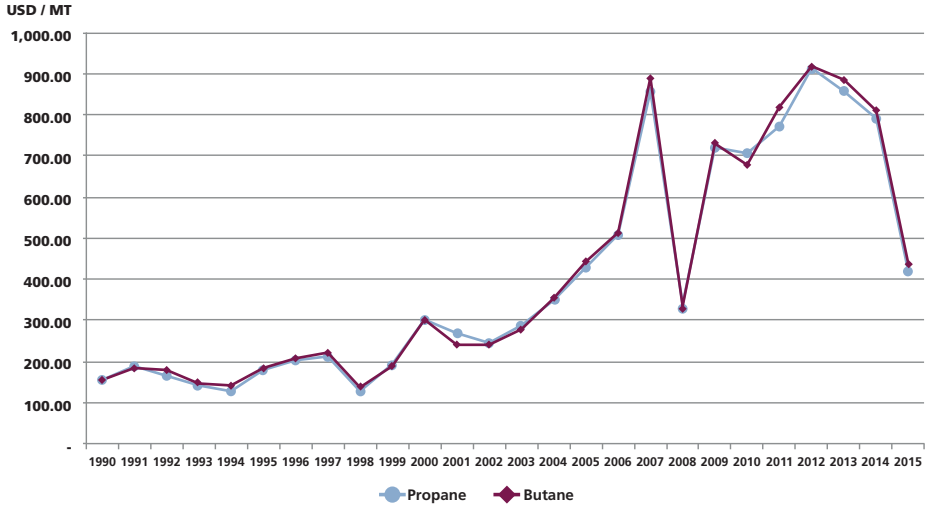
Ex-Singapore Prices of Major Petroleum Products



Unit: USD / Barrels	Motor Petrol (ULG 95)	Diesel	Fuel Oil	Kerosene	Naphtha
2000	32.64	32.48	25.82	34.27	28.32
2001	27.43	27.32	21.78	28.32	23.75
2002	28.04	27.55	23.63	28.08	24.93
2003	34.69	32.46	25.72	33.25	30.14
2004	47.23	45.92	28.15	47.69	40.82
2005	62.38	64.35	40.32	67.99	51.04
2006	73.20	76.93	48.84	80.72	62.13
2007	104.05	103.74	74.60	110.50	93.98
2008	39.25	39.32	31.40	53.90	29.90
2009	86.55	86.60	75.30	87.25	80.72
2010	103.15	103.17	78.40	104.30	95.91
2011	117.00	117.10	104.10	121.64	99.90
2012	123.42	126.15	105.72	126.79	103.57
2013	119.00	123.27	97.44	122.85	100.99
2014	110.97	112.69	88.40	112.50	94.90
2015	69.17	64.47	44.52	64.69	52.62

Source: Platts

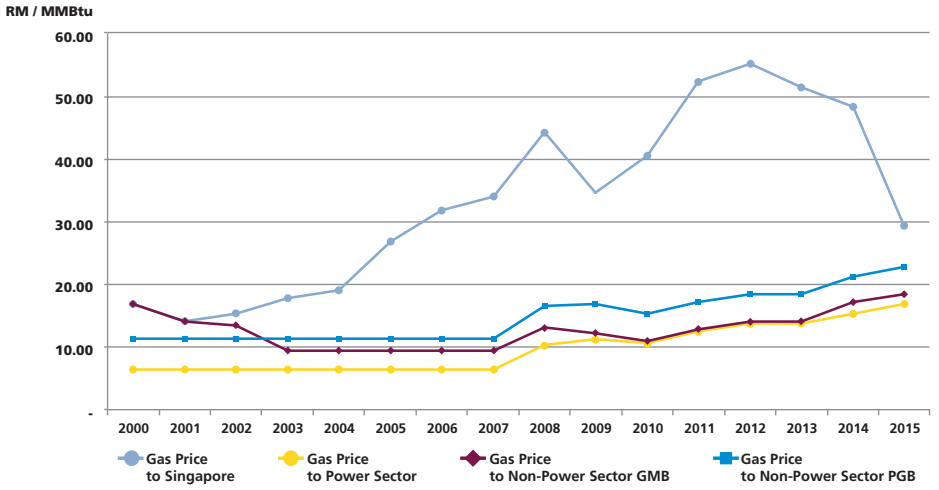
Annual Liquefied Petroleum Gas (LPG) Contract Prices – Arab Gulf



Unit: USD / MT	Propane	Butane
1990	155.96	156.13
1991	186.89	182.19
1992	167.13	179.95
1993	140.02	147.67
1994	129.13	140.90
1995	178.62	183.82
1996	204.42	207.21
1997	210.35	222.21
1998	126.50	134.55
1999	191.07	190.84
2000	299.29	299.46
2001	269.29	239.43
2002	244.58	238.48
2003	288.84	278.46
2004	348.61	355.33
2005	430.79	442.89
2006	510.27	514.00
2007	858.00	887.50
2008	340.00	335.00
2009	720.00	730.00
2010	705.00	680.00
2011	770.00	820.00
2012	914.12	917.45
2013	856.79	884.14
2014	790.70	810.58
2015	416.75	436.57

Source: Platts

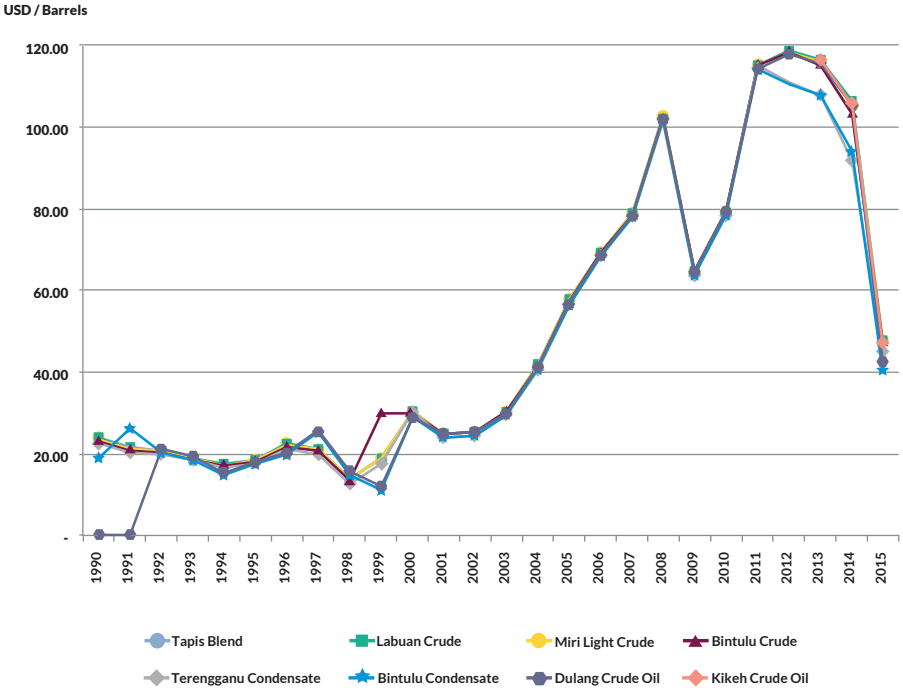
Average Annual Natural Gas Prices in Malaysia



Unit: RM / MMBtu	Gas Price to Singapore	Gas Price to Power Sector	Gas Price to Non-Power Sector GMB	Gas Price to Non-Power Sector PGB
2000	16.72	6.40	16.72	11.32
2001	14.10	6.40	14.10	11.32
2002	15.30	6.40	13.40	11.32
2003	17.74	6.40	9.40	11.32
2004	18.92	6.40	9.40	11.32
2005	26.76	6.40	9.40	11.32
2006	31.77	6.40	9.40	11.32
2007	34.10	6.40	9.40	11.32
2008	44.41	10.36	12.98	16.55
2009	34.58	11.30	12.21	16.77
2010	40.42	10.70	11.05	15.35
2011	52.47	12.45	12.80	17.10
2012	55.08	13.70	14.05	18.35
2013	51.36	13.70	14.05	18.35
2014	48.28	15.20	Jan-Apr 14.05	Jan-Apr 18.35
			May-Oct 15.55	May-Oct 19.85
			Nov-Dec 17.05	Nov-Dec 21.35
2015	29.21	Jan-Jun 15.20	Jan-Jun 17.05	Jan-Jun 21.35
		Jul-Dec 16.70	Jul-Dec 18.55	Jul-Dec 22.85
2016	21.43	Jan-Jun 18.20	Jan-Jun 20.55	Jan-Jun 24.35
		Jul-Dec 19.70	Jul-Dec 21.55	Jul-Dec 25.85

Source: Energy Commission

Official Selling Prices of Malaysian Crude Oil



Official Selling Prices of Malaysian Crude Oil (USD/Barrels)

Unit: USD / Barrels	Tapis Blend	Labuan Crude	Miri Light Crude	Bintulu Crude	Terengganu Condensate	Bintulu Condensate	Dulang Crude Oil	Kikeh Crude Oil
1990	23.86	23.76	23.56	23.06	22.76	19.10	-	-
1991	21.47	21.37	21.17	20.67	20.37	26.35	-	-
1992	20.98	20.88	20.68	20.18	19.88	20.20	21.15	-
1993	19.11	19.11	18.91	18.46	18.26	18.25	19.20	-
1994	17.30	17.40	17.20	16.90	16.45	15.00	15.40	-
1995	18.53	18.63	18.43	18.06	17.33	17.36	18.16	-
1996	22.28	22.38	22.18	21.89	21.08	19.79	20.30	-
1997	21.18	21.33	21.28	20.78	19.98	25.13	25.66	-
1998	13.81	13.84	13.83	13.48	12.61	14.80	15.57	-
1999	18.95	18.95	18.95	29.95	17.76	11.14	11.84	-
2000	30.25	30.25	30.25	29.95	30.29	29.09	29.18	-
2001	25.06	25.06	25.06	24.78	23.86	23.96	24.68	-
2002	25.52	25.52	25.52	25.22	24.32	24.42	25.23	-
2003	30.60	30.60	30.60	30.33	29.40	29.50	29.99	-
2004	41.84	41.84	41.84	41.54	40.64	40.74	41.17	-
2005	57.71	57.71	57.71	57.43	56.51	56.61	57.41	-
2006	69.56	69.56	69.56	69.28	68.66	68.45	68.96	-
2007	78.96	78.96	78.96	78.66	77.91	77.92	78.59	-
2008	102.79	102.79	102.79	102.49	101.59	101.69	102.49	-
2009	64.97	64.97	64.97	64.67	63.77	63.87	64.67	-
2010	79.51	79.51	79.51	79.21	78.31	78.41	79.21	-
2011	115.33	115.33	115.33	115.03	115.03	114.13	114.23	-
2012	118.22	118.66	118.56	118.36	110.92	110.62	118.16	-
2013	115.30	116.60	116.30	115.40	108.00	107.70	115.70	116.60
2014	103.26	106.41	104.89	103.13	91.82	93.99	105.46	105.66
2015	45.12	47.73	47.63	47.35	44.94	40.28	42.98	46.96

Source: Petronas

Average Selling Prices of TNB

TNB	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Mining (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2011	27.97	39.10	29.77	20.21	20.87	38.48	32.48
2012	28.93	40.98	30.89	20.81	21.53	39.64	33.83
2013	29.15	40.76	31.00	20.55	21.55	39.35	33.87
2014	32.28	47.10	35.88	23.99	25.06	45.29	38.86
2015	32.67	47.68	36.56	25.00	25.49	45.86	39.45
2016	33.21	46.76	37.13	25.34	25.57	45.78	39.55

Source: TNB

Average Selling Prices of SESB

SESB	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Average (sen/kWh)
2011	23.83	29.27	22.43	24.99	26.20
2012	25.10	31.41	24.68	18.66	29.10
2013	25.30	33.59	28.81	18.75	29.10
2014	29.32	39.25	32.90	23.31	32.60
2015	29.14	37.63	30.80	25.54	32.60
2016	28.86	38.21	31.36	23.09	33.41

Source: SESB

Average Selling Prices of SEB

SEB	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Average (sen/kWh)
2011	31.20	31.20	24.70	47.10	29.40
2012	31.20	32.00	24.90	47.00	29.70
2013	31.30	32.00	25.10	47.10	29.90
2014	31.30	32.00	25.10	47.10	29.80
2015	28.25	31.72	24.48	n/a	28.50
2016	28.30	30.53	24.15	47.12	28.20

Source: SEB

Average Selling Prices of PLN, Indonesia

PLN, Indonesia	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2011	21.1	32.4	23.7	27.0	-	24.3
2012	21.1	32.4	23.7	27.0	-	24.3
2013	21.1	32.4	23.7	27.0	-	24.3
2014	21.1	32.4	23.7	27.0	24.3	25.7
2015*	41.3	47.2	37.2	-	-	39.7

*Note: *Currency Exchange Rate is based on the rate as of 31st December 2015*
Source: Energy Commission

Average Selling Prices of Taipower, Taiwan

Taipower, Taiwan	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2011	30.1	35.9	25.7	12.5	-	28.4
2012	30.1	35.9	25.7	12.5	-	28.4
2013	29.9	35.9	28.2	13.6	-	30.2
2014	29.9	35.9	28.2	13.6	-	30.2
2015*	-	-	-	-	-	36.8

*Note: *Currency Exchange Rate is based on the rate as of 31st December 2015*
Source: Energy Commission

Average Selling Prices of EGAT, Thailand

EGAT, Thailand	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2012	37.8	-	-	-	-	35.9
2013	38.9	36.0	-	-	-	37.5
2014	44.5	41.3	-	-	37.4	43.2
2015*	-	-	-	-	-	47.3

*Note: * 1. Calculated based on year 2014 tariff*
2. Currency Exchange Rate is based on the rate as of 31st December 2015
Source: Energy Commission

Average Selling Prices of CLP, Hong Kong

CLP, Hong Kong	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2011	-	-	-	-	-	39.7
2012	-	-	-	-	-	39.3
2013	-	-	-	-	-	39.3
2014	-	-	-	-	-	53.0
2015*	-	-	-	-	-	48.4

*Note: *Currency Exchange Rate is based on the rate as of 31st December 2015*
Source: Energy Commission

Average Selling Prices of MERALCO, Philippines

MERALCO, Philippines	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2012	81.4	72.0	57.3	8.5	-	70.4
2013	81.4	72.0	57.3	8.5	-	70.4
2014	81.4	72.0	57.3	8.5	-	70.4
2015*	-	-	-	-	-	69.9

*Note: *Currency Exchange Rate is based on the rate as of 31st December 2015*
Source: Energy Commission

Average Selling Prices of TEPCO, Japan

TEPCO, Japan	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2012	86.6	-	-	-	-	87.6
2013	78.9	86.9	-	-	-	79.6
2014	81.0	86.9	-	-	-	88.0
2015*	-	-	-	-	-	101.5

*Note: *Currency Exchange Rate is based on the rate as of 31st December 2015*
Source: Energy Commission

Average Selling Prices of KEPCO, Korea

KEPCO, Korea	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2011	33.4	28.4	22.7	24.3	12.1	24.9
2012	34.9	31.8	26.3	27.8	12.7	28.1
2013	34.9	31.8	26.3	27.8	12.7	28.1
2014	34.6	31.8	26.3	27.8	12.7	28.1
2015*	45.3	47.8	39.3	-	-	40.8

*Note: *Currency Exchange Rate is based on the rate as of 31st December 2015*
Source: Energy Commission

Average Selling Prices of Singapore Power

Singapore Power	Domestic (sen/kWh)	Commercial (sen/kWh)	Industry (sen/kWh)	Public Lighting (sen/kWh)	Agriculture (sen/kWh)	Average (sen/kWh)
2011	57.5	52.6	49.8	-	-	56.9
2012	57.5	52.6	49.8	-	-	56.9
2013	57.5	52.6	49.8	-	-	56.9
2014	57.5	52.6	49.8	-	-	56.9
2015*	-	-	-	-	-	63.4

*Note: *Currency Exchange Rate is based on the rate as of 31st December 2015*
Source: Energy Commission

Number of Customers of TNB, SESB and SEB, 2010 – 2016

		Domestic	Commercial	Industry	Public Lighting	Mining	Others (Including Agriculture)	Free Units	TOTAL
2010	TNB	6,128,224	1,224,414	25,580	50,122	17	1,080	2,218	**7,431,655**
	SESB	364,376	68,877	2,971	4,302	-	-	-	**440,526**
	SEB	424,550	72,921	923	6,811	-	-	-	**505,205**
	TOTAL	**6,917,150**	**1,366,212**	**29,474**	**61,235**	**17**	**1,080**	**2,218**	**8,377,386**
2011	TNB	6,288,281	1,281,108	26,203	53,075	20	1,166	2,264	**7,652,117**
	SESB	384,384	72,288	2,865	4,516	-	-	-	**464,053**
	SEB	444,340	76,222	947	7,042	-	-	-	**528,551**
	TOTAL	**7,117,005**	**1,429,618**	**30,015**	**64,633**	**20**	**1,166**	**2,264**	**8,644,721**
2012	TNB	6,456,647	1,334,371	27,599	56,715	22	1,241	2,271	**7,878,866**
	SESB	403,387	75,375	2,903	4,820	-	-	-	**486,485**
	SEB	461,422	79,278	970	7,383	-	-	-	**549,053**
	TOTAL	**7,321,456**	**1,489,024**	**31,472**	**68,918**	**22**	**1,241**	**2,271**	**8,914,404**
2013	TNB	6,503,417	1,334,856	27,954	61,121	27	1,494	-	**7,928,869**
	SESB	422,964	79,188	2,937	5,128	-	-	-	**510,217**
	SEB	483,106	82,160	985	7,669	-	-	-	**573,920**
	TOTAL	**7,409,487**	**1,496,204**	**31,876**	**73,918**	**27**	**1,494**	**0**	**9,013,006**
2014	TNB	6,710,032	1,404,501	24,852	63,340	29	1,574	-	**8,204,328**
	SESB	442,516	82,472	2,906	5,349	-	-	-	**533,243**
	SEB	498,601	85,188	984	8,152	-	-	-	**592,925**
	TOTAL	**7,651,149**	**1,572,161**	**28,742**	**76,841**	**29**	**1,574**	**0**	**9,330,496**
2015	TNB	6,920,122	1,475,306	27,672	65,888	28	1,627	-	**8,490,643**
	SESB	460,321	85,581	2,756	5,596	-	-	-	**554,254**
	SEB	516,084	88,297	1,004	8,939	-	-	-	**614,324**
	TOTAL	**7,896,527**	**1,649,184**	**31,432**	**80,423**	**28**	**1,627**	**0**	**9,659,221**
2016	TNB	6,989,968	1,464,815	27,556	67,808	34	1,808	2,529	**8,554,518**
	SESB	478,049	90,510	1,545	5,906	-	-	-	**576,010**
	SEB	536,466	91,359	1,013	9,457	-	4	-	**638,299**
	TOTAL	**8,004,483**	**1,646,684**	**30,114**	**83,171**	**34**	**1,812**	**2,529**	**9,768,827**

Transmission System Capacity of TNB, SESB and SEB, 2013 – 2016

	2013			2014			2015			2016		
	TNB	SESB	SEB	TNB	SESB	SEB	TNB	SESB	SEB	TNB	SESB	SEB
TRANSMISSION SYSTEM LINES/CABLES (km)												
500 kV	668	-	-	668	-	-	722	-	-	784	-	-
275 kV	8,534*	492	1,188	8,714*	493	1,235	9,517	493	1,204	9,518	598	1,331
132 kV	11,891	1,809	398	12,088	1,829	372	12,151	1,921	384	12,175	2,045	388
66 kV	-	119	-	-	119	-	-	119	-	-	119	-
TRANSMISSION SUBSTATIONS												
Number	404	39	27	414	36	28	419	41	38	427	101	31
Capacity (MVA)	95,960	3,657	6,356	99,478	4,497	6,440	103,545	4,513	10,574	104,780	4,985	7,315
PERFORMANCE												
System Minutes	0.35	26.53	261.09	0.31	161.09	62.91	0.64	108.87	34.69	1.43	14.07	56.08
Number of Incidents of Trippings	2	3	20	1	5	26	1	10	29	9	12	76
Unsupplied Energy (MWh)	238	93	6,018	50	1,911	1,754	187	1,364	1,176	423	232	2,140

*Note: * Including 627.64 cct-km 500 kV lines energized at 275kV*

Distribution System Capacity of TNB, SESB and SEB, 2013 – 2016

	2013			2014			2015			2016		
	TNB	SESB	SEB	TNB	SESB	SEB	TNB	SESB	SEB	TNB	SESB	SEB
DISTRIBUTION SYSTEM LINES/CABLES (km)												
Overhead Lines	487,385	8,904[a]	22,350	516,780	9,038[a]	23,210	532,403	9,350[a]	24,031	532,403	9,394	24,681
Underground Cables	555,272	729[a]	6,969	678,026	903[a]	7,274	697,159	764[a]	7,688	697,159	1,374[a]	8,122
DISTRIBUTION SUBSTATIONS												
Number	68,509	6,619	10,365	70,286	6,781	10,927	74,417	6,762	11,435	74,417	7,382	12,522
Capacity (MVA)	127,217	5,864	4,002	128,717	5,865	4,174	131,465	4,294	4,339	131,465[b]	5,969	8,735

Note:
[a] Only 11kV and 33 kV
[b] Data was obtained from TNB Integrated Annual Report 2016

Performance Highlights of TNB, SESB and SEB, 2013-2016

	2013			2014			2015			2016		
	TNB	SESB	SEB	TNB	SESB	SEB	TNB	SESB	SEB	TNB	SESB	SEB
Peak Demand (MW)	16,562	874	1,466	16,901	908	2,036	16,822	914	2,288	17,788	945	3,005
Total Units Generated (GWh)	24,914	1,357	6,572	28,409	1,323	6,494	27,374	1,071	7,913	24,046	882	10,144
Total Units Sold (GWh)	101,105	4,670	10,420	103,465	4,776	13,440	105,562	5,109	14,038	110,198	5,189	20,627
Sales Revenue of Electricity (RM Million)	33,857	1,382	2,266	40,202	1,636	2,752	41,646	1,668	2,911	43,583	1,734	4,140
Installed Capacity (MW)*	6,866	495[a]	1332[b]	6,616	401[a]	1551[b]	6,299	328[a]	2,176[b]	6,107	331[a]	2,262
Total Number of Employees	34,972[c]	2,788	4,040	36,105[c]	2,975	4,174	35,896[c]	3,096	4,307	35,588[c]	3,282	4,468
Revenue Per Employee (RM Million)	0.97	0.50	0.56	1.11	0.55	0.66	1.16	0.54	0.68	1.22	0.53	0.93
Unit Sold Per Employee (GWh)	2.89	1.68	2.58	2.87	1.61	3.59	2.94	1.65	3.26	3.10	1.58	4.77
Installed Capacity Per Employee (MW)	0.20	0.18	0.33	0.18	0.13	0.37	0.19	0.11	0.52	0.17	0.10	0.51
Total Purchased Units(GWh)	86,767	3,866	5,414	86,335	4,479	8,457	87,816	4,881	7,721	97,839	5,152	12,158
Total Units Exported (GWh)	17[d]	-	-	17[d]	-	-	3[d]	-	-	62[d]	-	693
Total Units Imported (GWh)	220[d]	-	-	22[d]	-	-	13[d]	-	-	30[d]	-	-

Notes: 1. GWh = Gigawatt Hours
2. MW = Megawatt
*3. * = Including generation capacities of TNB Generation Sdn. Bhd. and TNB Hydro Sdn. Bhd.*
[a] = TNB employees excluding TNB wholly owned subsidiaries and TNB majority owned subsidiaries
[b] = Data from Licensing Unit, Energy Commission
[c] = Dependable Capacity
[d] = Data Source : Single Buyer

Revenue, Asset Size, Employment and Annual Investment of TNB and SESB, 2010 – 2016

		Revenue (RM Billion)	Asset Size (RM Billion)	Employment	Annual Investment (RM Billion)
TNB	2010	28.4	60.0	25,571	3.8
	2011	30.2	60.5	26,732	4.6
	2012	33.3	62.5	28,105	4.9
	2013	34.8	69.1	29,269	5.6
	2014	39.8	71.0	30,065	6.5
	2015	40.3	73.1	29,602	7.7
	2016	41.3	74.9	28,807	6.6
SESB	2010	1.1	2.6	2,617	0.3
	2011	1.1	4.0	2,614	0.3
	2012	1.4	4.0	2,675	0.3
	2013	1.5	3.9	2,759	0.3
	2014	1.7	5.7	2,975	0.2
	2015	1.9	6.3	3,092	0.3
	2016	2.1	6.4	3,282	0.4

Source: TNB, SESB

Scheduled and Unscheduled Interruptions of TNB, SESB and SEB, 2010 - 2016

	TNB	SESB	SEB
2010	101,126	24,173	8,003
2011	83,347	25,334	7,759
2012	75,271	26,841	7,881
2013	79,372	28,849	7,994
2014	70,629	22,739	9,496
2015	63,920	19,585	6,158
2016	58,175	20,105	7,550

Performance of Distribution System in Peninsular Malaysia, 2011 - 2016

Year	2011	2012	2013	2014	2015	2016
Electricity Supply Interruptions per 1,000 Customers						
Scheduled Interruptions	0.19	0.11	0.09	0.17	0.17	0.16
Unscheduled Interruptions	10.60	9.45	9.92	8.47	7.25	6.68
SAIDI, SAIFI & CAIDI						
SAIDI (Minutes/Customer/Year) by Voltage Level	69.11	60.46	60.35	56.64	51.49	49.29
SAIFI (Number of Interruptions/Customer/Year) by Voltage Level	0.97	0.81	0.87	0.92	0.83	0.90
CAIDI (Minutes/Interrupted Customer/Year) by Voltage Level	71.62	74.64	69.37	61.58	62.04	54.77

System Average Interruption Duration Index (SAIDI) by State in Peninsular Malaysia, 2011 – 2016

SAIDI (Minutes/Customer/Year) by State	2011	2012	2013	2014	2015	2016
Johor	78.05	61.77	70.84	57.98	58.98	49.39
Kedah	87.18	81.36	74.38	84.34	57.42	60.82
Kelantan	72.78	72.35	69.61	56.23	56.18	67.90
Melaka	43.52	45.64	38.11	45.27	42.48	38.04
Negeri Sembilan	55.94	54.60	69.96	53.79	56.86	51.03
Pahang	88.95	62.15	63.70	68.94	62.61	57.22
Perak	119.73	83.61	78.95	69.04	51.64	46.23
Perlis	37.80	35.24	36.79	38.94	34.09	35.98
Pulau Pinang	76.56	73.29	68.89	50.40	54.49	51.05
Selangor	61.34	56.69	54.42	55.84	50.74	54.67
Terengganu	54.26	50.29	44.64	43.33	41.46	39.65
WP Kuala Lumpur	33.45	33.69	35.85	32.96	32.36	32.39
WP Putrajaya/Cyberjaya	0.22	8.48	0.99	0.17	0.63	0.13
Peninsular Malaysia	**69.11**	**60.46**	**60.35**	**56.65**	**51.49**	**49.29**

System Average Interruption Frequency Index (SAIFI) by State in Peninsular Malaysia, 2011 – 2016

SAIFI (Number of Interruptions/Customer/ Year) by State	2011	2012	2013	2014	2015	2016
Johor	0.95	0.12	0.94	0.83	0.70	0.70
Kedah	1.32	0.29	1.11	1.65	1.20	1.40
Kelantan	1.48	0.24	1.26	1.21	1.25	1.45
Melaka	0.60	0.15	0.56	0.71	0.58	0.64
Negeri Sembilan	0.64	0.10	0.73	0.78	0.77	0.78
Pahang	1.24	0.19	1.42	1.49	1.44	1.56
Perak	1.81	0.21	1.10	1.08	0.80	0.94
Perlis	0.48	0.05	0.47	0.43	0.46	0.57
Pulau Pinang	1.06	0.16	1.00	0.81	0.83	0.82
Selangor	0.86	0.12	0.76	0.74	0.74	0.84
Terengganu	1.29	0.16	1.03	1.05	0.87	1.01
WP Kuala Lumpur	0.44	0.03	0.37	0.67	0.48	0.57
WP Putrajaya/Cyberjaya	0.00	0.00	0.01	0.08	0.01	0.15
Peninsular Malaysia	**0.97**	**0.81**	**0.87**	**0.92**	**0.83**	**0.90**

Customer Average Interruption Duration Index (CAIDI) by State in Peninsular Malaysia, 2011 – 2016

CAIDI (Minutes/Interrupted Customer/Year) by State	2011	2012	2013	2014	2015	2016
Johor	77.25	73.07	75.36	69.86	84.26	70.56
Kedah	55.55	47.45	67.01	51.12	47.85	43.44
Kelantan	89.94	54.80	55.25	46.47	44.94	46.83
Melaka	89.32	73.74	68.05	63.76	73.24	59.44
Negeri Sembilan	79.68	82.21	95.84	68.96	73.84	65.42
Pahang	42.69	57.46	44.86	46.27	43.48	36.68
Perak	65.39	66.52	71.77	63.93	64.55	49.18
Perlis	95.73	72.67	78.28	90.56	74.11	63.12
Pulau Pinang	64.43	67.06	68.89	62.22	65.65	62.26
Selangor	63.07	66.77	71.61	75.46	68.57	65.08
Terengganu	83.62	49.12	43.34	41.27	47.66	39.26
WP Kuala Lumpur	62.88	98.59	96.89	49.19	67.42	56.82
WP Putrajaya/Cyberjaya	52.00	35.78	99.00	2.13	63.00	0.87
Peninsular Malaysia	**71.62**	**74.64**	**69.37**	**61.58**	**62.04**	**54.77**

Performance of Distribution System in Sabah, 2011 - 2016

Year	2011	2012	2013	2014	2015	2016
Electricity Supply Interruptions per 1,000 Customers						
Scheduled Interruptions	4.17	4.74	3.70	2.11	1.81	2.34
Unscheduled Interruptions	50.42	51.11	45.90	39.84	33.32	32.15
SAIDI, SAIFI & CAIDI						
SAIDI (Minutes/Customer/Year)	494.64	556.86	423.99	777.26	379.26	311.01
SAIFI (Number of Interruption/Customer/ Year)	17.20	14.69	12.25	13.44	9.63	8.60
CAIDI (Minutes/Interrupted Customer/Year)	28.76	37.91	34.61	57.83	39.38	36.16

Performance of Distribution System in Sarawak, 2011 – 2016

Year	2011	2012	2013	2014	2015	2016
Electricity Supply Interruptions per 1,000 Customers						
Scheduled Interruptions	3.37	2.79	3.30	5.10	1.88	4.85
Unscheduled Interruptions	11.31	11.57	10.62	10.92	8.15	6.98
SAIDI, SAIFI & CAIDI						
SAIDI (Minutes/Customer/Year)	160	132	168	189	143	119
SAIFI (Number of Interruptions/Customer/ Year)	1.73	1.80	2.08	2.00	1.69	1.46
CAIDI (Minutes/Interrupted Customer/Year)	92.37	73.33	80.77	94.50	84.62	81.51

Number of Natural Gas Customers of GMB and SEC by Sector, 2008 -2016

		Domestic	Commercial	Industry	Total
2008	GMB	7,032	464	630	8,126
	SEC	-	-	13	13
2009	GMB	7,960	456	640	9,056
	SEC	-	-	11	11
2010	GMB	10,433	489	686	11,608
	SEC	-	-	11	11
2011	GMB	10,541	536	704	11,781
	SEC	-	-	12	12
2012	GMB	11,932	565	709	13,206
	SEC	-	-	12	12
2013	GMB	12,455	630	740	13,825
	SEC	-	-	18	18
2014	GMB	12,568	799	771	14,138
	SEC	-	-	20	20
2015	GMB	12,571	862	795	14,228
	SEC	-	-	22	22
2016	GMB	12,339	935	819	14,093
	SEC	-	-	23	23

Natural Gas Consumption by Sector of GMB and SEC (mmBtu), 2008 – 2016

		Domestic	Commercial	Industry	Total
2008	GMB	17,839	1,001,105	110,606,270	111,625,214
	SEC	-	-	185,388	185,388
2009	GMB	18,565	934,766	106,359,785	107,313,116
	SEC	-	-	52,335	52,335
2010	GMB	19,838	1,006,564	116,579,760	117,606,162
	SEC	-	-	62,236	62,236
2011	GMB	20,073	1,021,176	123,587,690	124,628,939
	SEC	-	-	66,795	66,795
2012	GMB	24,546	990,892	126,364,815	127,380,253
	SEC	-	-	74,684	74,684
2013	GMB	36,627	961,562	137,246,099	138,244,288
	SEC	-	-	93,582	93,582
2014	GMB	37,616	992,935	146,311,939	147,342,490
	SEC	-	-	233,723	233,723
2015	GMB	28,710	1,021,607	157,720,218	158,770,535
	SEC	-	-	294,387	294,387
2016	GMB	24,738	1,007,563	162,451,003	163,483,304
	SEC	-	-	284,156	284,156

Natural Gas Pipe Length (km), 2008 - 2016

	Peninsular		Sabah	
	Polyethylene Pipe	Stainless Steel Pipe	Polyethylene Pipe	Stainless Steel Pipe
2008	428.35	1,014.44	6.50	1.30
2009	508.20	1,097.76	6.56	1.30
2010	534.16	1,174.28	6.56	1.30
2011	551.58	1,239.89	6.56	1.30
2012	556.36	1,261.69	6.72	1.30
2013	558.42	1,330.12	6.72	1.30
2014	563.60	1,429.64	6.72	1.30
2015	567.04	1,472.70	6.78	1.30
2016	571.00	1,543.00	6.78	1.30

Performance Highlights of GMB and SEC, 2011 – 2016

		Demand (mmBtu)	Sales of Gas (RM'000)	Total Number of Employees	Revenue Per Employee (RM'000)	Unit Sold Per Employee (mmBtu)
2011	GMB	124,628,939	1,976,553	358	5,521	348,126
	SEC	66,795	1,800	61	30	1,095
2012	GMB	127,380,253	2,099,592	364	5,768	349,946
	SEC	74,684	2,003	62	32	1,205
2013	GMB	138,244,288	2,288,465	385	5,944	359,076
	SEC	93,582	2,702	63	43	1,485
2014	GMB	147,342,490	2,745,024	402	6,828	366,524
	SEC	233,723	7,316	74	99	3,158
2015	GMB	158,770,535	3,594,520	451	7,970	352,041
	SEC	294,387	9,789	74	132	3,978
2016	GMB	163,483,304	3,973,843	430	9,241	380,194
	SEC	284,124	9,872	80	123	3,552

Number of Supply Interruptions in Peninsular Malaysia and Sabah, 2008 - 2016

Year	GMB	SEC
2008	145	0
2009	150	0
2010	114	0
2011	124	0
2012	97	0
2013	79	0
2014	**78**	**0**
2015	22	0
2016	**14**	**0**

Gas Supply Interruptions per 1,000 Customers, 2008 - 2016

Year	Peninsular Malaysia	Sabah
2008	5.05	0.00
2009	3.75	0.00
2010	3.19	0.00
2011	3.14	0.00
2012	2.21	0.00
2013	1.95	0.00
2014	2.48	0.00
2015	1.55	0.00
2016	0.99	0.00

SAIDI, SAIFI, CAIDI

	SAIDI (Minutes/Customer/Year)		SAIFI (Disruptions/Customer/Year)		CAIDI (Minute/Disruption)	
	Peninsular	Sabah	Peninsular	Sabah	Peninsular	Sabah
2008	0.0470	0.0000	0.0007	0.0000	64.1300	0.0000
2009	0.2489	0.0000	0.0046	0.0000	54.4100	0.0000
2010	0.6299	0.0000	0.0037	0.0000	169.2700	0.0000
2011	0.3630	0.0000	0.0039	0.0000	90.9600	0.0000
2012	0.7489	0.0000	0.0029	0.0000	260.9000	0.0000
2013	0.1480	0.0000	0.0022	0.0000	66.8300	0.0000
2014	0.1492	0.0000	0.0021	0.0000	70.7100	0.0000
2015	0.0874	0.0000	0.0016	0.0000	54.0500	0.0000
2016	0.5812	0.0000	0.0010	0.0000	575.2300	0.0000

Industrial sales Volume by Industry Grouping of GMB (mmBtu), 2009-2016

	2009	2010	2011	2012	2013	2014	2015	2016
Non-Metallic Industry	10,760,327	11,602,722	12,151,278	12,322,733	12,643,979	13,494,149	12,479,020	12,270,125
Basic Metal Industry	9,803,361	10,863,821	11,695,310	11,318,185	11,119,585	10,874,986	10,765,579	10,730,111
Electrical & Electronic	1,845,244	2,164,326	2,083,166	200,274	1,984,425	2,027,958	1,873,005	14,325,025
Machinery & Equipment	204,805	259,997	258,548	243,448	259,167	246,215	251,223	10,856,212
Rubber products	24,569,581	27,570,080	29,308,071	32,875,665	37,581,300	41,489,234	50,052,506	31,258,184
Food, Beverages & Tobacco	29,070,546	31,631,345	33,315,737	34,421,384	37,763,632	40,743,034	42,438,744	32,817,174
Fabricated Metal Products	3,113,530	3,567,352	3,678,646	3,749,109	4,480,214	4,621,397	4,742,804	3,742,369
Chemical Products	8,786,263	9,507,405	9,823,832	9,467,377	10,410,346	11,333,511	11,858,331	10,845,667
Glass Products	7,313,217	8,250,511	9,033,533	7,793,642	8,299,467	8,119,994	6,821,966	18,996,952
Others	10,892,911	10,329,196	12,239,570	12,173,028	12,706,395	14,212,054	16,437,040	16,609,184
Total	**106,359,785**	**115,746,755**	**123,587,691**	**124,564,845**	**137,248,510**	**147,162,532**	**157,720,218**	**162,451,003**

The net calorific value (NCV) was chosen as the basis of calculations rather than the gross calorific value (GCV). The Joule was used as the rigorous accounting unit, while the "tonne oil equivalent" (1 toe= 41.84 Gigajoules) was chosen as the final unit for presentation in the Energy Balance.

COMMERCIAL 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/ conversions process within the country.
Primary Production (1)	Refers to the quantity of fuels extracted. Data for natural gas excludes the amount of reinjected and flared gas. Gross production of hydro is shown in conventional fuel equivalent input.
Gas Flaring, Reinjection & Use (2)	Refers to the quantity of gas flared, 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 increases while a positive sign indicates net decreases 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.

Note:

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 OF 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.
Average Selling Price	Formula to calculate the Average Selling Price is as below; **Average Selling Price = $\frac{\text{Revenue by Customer Categories}}{\text{Unit Sold by Customer Categories}}$**

NOTES OF 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.

CONVERSION COEFFICIENTS AND EQUIVALENCE

TJ/1000 TONNES[1]			
Hard coal	29.3076	Lignite/brown coal	11.2834
Coke/oven coke	26.3768	Peat	9.5250
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 oil	42.4960
Crude petroleum (domestic)	43.3000	Residual fuel oil	41.4996
Plant condensate	44.3131	Naphtha	44.1289
Aviation gasoline (AVGAS)	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 cubic metre

Definition

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

Natural Gas	Is a mixture of gaseous hydrocarbons (mainly methane), which occurs in either gas fields or in association with crude oil in oil fields.
Liquefied Natural Gas (LNG)	Is a natural gas that is liquefied for ocean transportation and export.
Crude Oil	Is a natural product that is extracted from mineral deposits and consists essentially of many different non-aromatic hydrocarbons (paraffinic, cyclonic, etc.).
Aviation gasoline (AVGAS)	Is a special blended grade of gasoline for use in aircraft engines of the piston type. Distillation range normally falls within 30°C and 200°C.
Liquefied petroleum gas (LPG)	Commercial LPG consists essentially of a mixture of propane and butane gases which are held in the liquid state by pressure or refrigeration.
Motor gasoline (Mogas)	Petroleum distillate used as fuel in spark- ignition internal combustion engines. Distillation range is within 30°C and 250°C.
Aviation turbine Fuel (ATF)	Fuel for use in aviation gas turbines mainly refined from kerosene. Distillation range from 150°C and 250°C.
Kerosene	Is a straight-run fraction from crude oil, with boiling range from150°C to 250°C. Its main uses are for domestic lighting and cooking.
Diesel oil (or gas oil)	Distillation falls within 200°C and 340°C. Diesel fuel for high-speed diesel engines (i.e. automotive) 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) material.
Fuel oil	Heavy distillates, residues or blends of these, used as fuel for production of heat and power. Fuel oil production at the refinery is essentially a matter of selective blending of available components rather than of special processing. Fuel oil viscosities vary widely depending on the blend of distillates and residues.
Non-energy products	Refer mainly to naphtha, bitumen and lubricants, which are obtained by the refinery process from petroleum but used for non-energy purposes. Naphtha is a refined or party refined light distillate, which is further, blended into motor gasoline or used as feed-stock in the chemical industry. Bitumen is a viscous liquid or solid, non-volatile and possesses waterproofing and adhesive properties. Lubricating oil is used for lubricating purposes and has distillation range from 380°C to 500°C.
Refinery gas	The gas released during the distillation of crude oil and comprises methane, ethane, propane and butane. Most refinery gas is retained in the refinery and used as fuel in plant operations.
Coal and coke	Solid fuels consisting essentially of carbon, hydrogen, oxygen 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 in the absence of air.

Hydropower	Is the inferred primary energy available for electricity production and is shown in terms of conventional fossil fuel equivalent using the average thermal efficiency of conversion for the year, i.e. the hypothetical amount of fossil fuel, which would be needed to produce the same amount of electricity in existing thermal power plants.
Electricity Production	Production of electricity refers to production from public utilities as well as independent power producers (IPPs) and private installations & co-generation plants which obtain licenses from the Electricity and Gas Supply Department of 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. Estimates were made using average conversion efficiency to obtain the fuel input into private installations.

Notes

Notes

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