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Ministry of Energy and Mineral Resources
Republic of Indonesia

Hybrid Power Plant of Wind and Solar, located in East Sumba, East Nusa Tenggara

Thanks to Muhamad Habibi, Photo Competition of Ministry of Energy and Mineral Resources in 2017

2018

HANDBOOK OF ENERGY & ECONOMIC STATISTICS OF INDONESIA

(Final Edition)

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Preface

The update on the Handbook of Energy & Economy Statistics of Indonesia, is an effort of the Center for Data and Information Technology on Energy Mineral Resources (CDI-EMR) to provide accurate and reliable data and information on energy and economy joined into a book. Such energy and economic data and information are kept by various sources, at many locations, and generally in avariety of formats unready for energy analysis. In addition, the data and information are generally not provided with sufficient explanation or clarification. The standardization of energy and economic data is a critical problem. Currently, researchers at various institutions, do not have common terminology on energy economy. In some cases, disagreement may arise over a different use of terminology. This subsequently leads to inaccurate energy analysis.

The Current problem related to energy data in Indonesia is the unavailability of demand-side data. To date, energy data are actually derived from supply-side data. In other words, consumption data are assumed to be identical with sales data. Such assumption maybe quite accurate, provided there is no disparity between domestic and international energy prices. The disparity in energy prices will contribute to the misuse of energy. Thus, the sales data of an energy commodity cannot be regarded the same as the consumption data of the commodity. For that reason, this statistics handbook, presents the energy consumption data made by computations based on a number of energy parameters.

We hope the process to standardize the energy and economic data and information in the future will be continued as a part of updating the Handbook, The CDI-EMR will continue to coordinate with all relevant parties within the Ministry of Energy and Mineral Resources (MEMR) as well as with statistical units outside the MEMR.

We would like to appreciate all parties involved for their thorough work and patience in preparing this book. May God the Almighty always guides us in utilizing our energy resources wisely for the maximum benefit of the Indonesian people.

Jakarta, January 2019
Head of Center for Data and Information
Technology on Energy and Mineral Resources

Introduction

Handbook of Energy and Economic Statistics of Indonesia contains the data on Indonesia's energy and economy from 2008 through 2018. This handbook covering estimated energy demand of every sector. The tables and annexes are arranged as follows:

A. Tables

The tables are shown in 6 Main Categories, as follows:

- Table 1 Energy and Economic Indicators
- Table 2 Indonesia's Energy Balance Table
- Table 3 Energy Supply and Demand
- Table 4 Energy Price
- Table 5 Energy Demand by Sector
- Table 6 Energy Supply by Energy Resources

B. Annexes

Annex 1. Methodology and Table Explanation, clarifying the methodologies adopted in preparing the tables data.

Annex 2. Glossary, containing important terms used in the tables and the respective units.

Annex 3. Conversion Factors, presenting the list of multiplication factors used to convert various original units of energy into BOE (Barrel Oil Equivalent).

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Indonesia's Concise Energy Profile 2018

A. SOCIO ECONOMY

Territorial Area :	8,300,000	km^2
Land Area[1] :	1,916,862	km^2
Population :	265,015	Thousand People
Household :	67,945	Thousand Households

GDP Nominal

Total Amount :	14,837	Trillion Rupiah
Per Capita :	55,987	Thousand Rupiah per Year

B. ENERGY PRODUCTION

Primary Energy Production

Crude Oil :	281,826	Thousand Barrels
Natural Gas (net) :	2,563	BSCF
Coal :	557,773	Thousand Tonnes
Hydro Power :	21,636	GWh
Geothermal :	101,465	Thousand Tonnes Geothermal Steam

[1]) Sources : Statistic Indonesia 2018

C.	**FINAL ENERGY CONSUMPTION**	**936.33**	**Million BOE**
	Energy Consumption by Type (excluding non-energy use)		
	Coal :	100.51	Million BOE
	Fuel :	450.78	Million BOE
	Gas :	95.64	Million BOE
	Electricity :	156.98	Million BOE
	Briquette :	0.04	Million BOE
	LPG :	64.46	Million BOE
	Biomass :	67.75	Million BOE
	Biogas :	0.17	Million BOE
	Energy Consumption by Sector	**936.33**	
	Industry :	334.47	Million BOE
	Household :	151.21	Million BOE
	Commerce :	43.15	Million BOE
	Transportation :	391.40	Million BOE
	Other Sectors :	16.10	Million BOE
	Non Energy :	95.69	Million BOE
D.	**RATIO ELECTRIFICATION 2018**	**98.3**	**%**

01

ENERGY & ECONOMIC INDICATORS

2018 Handbook of Energy & Economic Statistics of Indonesia

1.1 GDP and Energy Indicator

	Unit	2008	2009	2010	2011		2012	2013	2014	2015	2016	2017	2018
GDP at 2010 Constant Price	Trillion Rupiahs	-	-	6,864	7,288		7,727	8,156	8,565	8,983	9,435	9,913	10,425
GDP Nominal	Trillion Rupiahs	4,949	5,606	6,864	7,832		8,616	9,546	10,570	11,526	7,832	8,616	9,546
GDP Nominal per Capita	Thousand Rupiahs	21,365	26,485	27,029	33,461		33,582	32,464	41,916	45,120	47,957	51,887	55,987
Population	Thousand	231,631	234,757	238,519	241,991		245,425	248,818	252,165	255,462	258,705	261,891	265,015
Number of Households	Thousand	59,509	60,446	61,384	62,246		63,097	63,938	64,767	65,582	66,385	67,173	67,945
Primary Energy Supply	Thousand BOE	979,961	1,009,276	1,075,175	1,204,636		1,242,479	1,221,019	1,241,900	1,305,185	1,274,193	1,334,739	1,466,057
Primary Energy Supply per Capita	BOE / capita	4.23	4.30	4.51	4.98		5.06	4.91	4.92	5.11	4.93	5.10	5.53
Final Energy Consumption	Thousand BOE	598,106	604,536	669,597	753,142		816,875	747,855	761,386	758,097	736,695	780,600	868,581
Final Energy Consumption per Capita	BOE / capita	2.58	2.58	2.81	3.11		3.33	3.01	3.02	2.97	2.85	2.98	3.28

	Growth (%)					Growth (%)					
	2008-2009	2009-2010	2010-2011	2011-2012		2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
GDP at 2010 Constant Price	-	-	6.49	6.23		5.81	209.16	4.88	5.03	5.07	5.17
GDP Nominal	13.29	14.99	15.14	11.03		-1.99	30.85	9.05	7.64	9.53	9.19
GDP Nominal per Capita	23.97	2.05	23.80	0.36		-3.33	29.12	7.64	6.29	8.19	7.90
Population	1.35	1.60	1.46	1.42		1.38	1.35	1.31	1.27	1.23	1.19
Number of Households	1.58	1.55	1.40	1.37		1.33	1.30	1.26	1.22	1.19	1.15
Primary Energy Supply	2.99	6.53	12.04	3.14		-1.73	1.16	5.67	-2.37	4.75	9.84
Final Energy Consumption	1.08	10.76	12.48	8.46		-8.45	1.81	-0.43	-2.82	5.96	11.27
Final Energy Consumption per Capita	-0.27	9.02	10.86	6.94		-9.70	0.46	-1.72	-4.04	4.67	9.96

Source: Statistics Indonesia - BPS
Note: Primary Energy Supply and Final Energy Consumption which are calculated is commercial energy (excluded biomass)

2018 Handbook of Energy & Economic Statistics of Indonesia

1.2 Macro Economic

Year	GDP at 2010 Constant Price					GDP at 2010 Constant Price			GDP Nominal (Current Prices)	Index GDP Deflator
	GDP	Private Consumption	Government Consumption	Fixed Capital Formation		Stock Change	Export of Goods and Services	Import of Goods and Services		
	Billion Rupiahs	Billion Rupiahs	Billion Rupiahs	Billion Rupiahs		Billion Rupiahs	Billion Rupiahs	Billion Rupiahs	Billion Rupiahs	
2008[1])	-	-	-	-		-	-	-	4,948,688	-
2009[1])	-	-	-	-		-	-	-	5,606,203	-
2010	6,864,133	3,786,063	618,178	2,127,841		129,095	1,667,918	1,537,720	6,864,133	100
2011	7,287,635	3,977,289	652,292	2,316,359		118,207	1,914,268	1,768,822	7,831,726	107
2012	7,727,083	4,195,788	681,819	2,527,729		174,183	1,945,064	1,910,299	8,615,704	111
2013	8,156,498	4,423,417	727,812	2,654,375		124,454	2,026,114	1,945,867	9,546,134	117
2014	8,564,867	4,651,018	736,283	2,772,471		163,583	2,047,887	1,987,114	10,569,705	123
2015	8,982,517	4,881,631	775,427	2,911,356		112,848	2,004,467	1,862,939	11,526,333	128
2016	9,434,632	5,126,028	774,298	3,041,587		133,400	1,973,040	1,817,369	12,406,774	131
2017	9,912,704	5,379,752	790,789	3,228,763		126,884	2,146,803	1,964,602	13,587,213	137
2018	10,425,316	5,651,230	828,714	3,444,118		197,370	2,285,872	2,201,127	14,837,357	142

Source : Statistics Indonesia - BPS
Note : [1]) Data is not available for constant 2010 prices

1.3 Price Index

Year	Wholesale Price Index[1]			Consumer Price Index[2]	Coal Price Index for Power Plant[3]
	Export	Import	General		
2008	209.00	235.00	246.00	109.78	100.00
2009	134.10	156.61	162.71	115.06	149.69
2010	137.80	160.90	170.59	125.17	134.23
2011	154.11	177.37	183.31	129.91	142.80
2012	163.15	189.17	192.69	135.49	152.53
2013	145.16	134.43	128.76	146.84	191.84
2014	138.73	137.37	132.44	111.53	205.32
2015	130.47	134.19	138.26	122.99	135.41
2016	133.31	128.10	149.16	126.71	124.94
2017	144.69	135.00	156.09	131.28	159.97
2018	162.29	147.35	164.60	135.39	156.79

Source : 1. BPS, Statistics Indonesia
2. PLN Statistics

Note : 1) Starting 2009 Wholesale Price Index using 2005 as base year (2005=100), Starting November 2013 using 2010 as base year (2010=100)
2) Since January 2014, CPI has been based on a consumption pattern obtained from 2012 Cost of Living Survey in 82 cities (2012=100)
3) the unit is (Rp/Ton)

1.4 Population and Employment

Year	Population	Labor Force	Household	Unemployment	Unemployment Percentage (toward labor force)
	Thousand People	Thousand People	Thousand Household	Thousand People	(%)
2008	231,631	111,947	59,509	9,395	8.39
2009	234,757	113,833	60,446	8,963	7.87
2010	238,519	116,528	61,384	8,320	7.14
2011	241,991	117,370	62,630	7,700	6.56
2012	245,425	118,053	63,097	7,245	6.14
2013	248,818	118,193	63,938	7,389	6.25
2014	252,165	121,873	64,767	7,245	5.94
2015	255,462	114,819	65,582	7,561	6.58
2016	258,705	118,412	66,385	7,032	5.94
2017	261,891	121,020	67,173	7,040	5.82
2018	265,015	127,070	67,945	6,870	5.41

Source : Statistics Indonesia - BPS

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1.5 International Trade

Year	Balance of Trade		Balance of Payment		Balance of Payment		Exchange Rate Rupiah to US$	US$ Deflator[1)]
	Export	Import	Current Account		Capital and Financial Account	Overall Balance		
	Million US$		Million US$		Million US$			
2008	137,020	129,197	-637		-5,915	-6,552	10,950	1.22
2009	119,646	88,714	10,628		4,852	15,481	9,400	1.10
2010	158,074	127,447	5,144		26,620	31,765	8,991	1.11
2011	200,788	190,948	1,685		13,636	15,321	9,068	1.03
2012	207,073	207,621	-24,418		-24,368	491	9,670	1.05
2013	197,060	200,548	-29,115		22,010	-7,105	12,189	1.07
2014	175,981	178,179	-4,159		5,087	928	12,440	1.09
2015	150,366	142,695	-17,519		16,860	-659	13,795	1.10
2016	145,186	135,653	-16,790		28,617	11,826	13,436	1.11
2017	168,828	156,986	-16,196		28,732	12,536	13,548	1.13
2018	180,215	188,711	-31,060		25,201	-5,859	14,038	1.16

Source : Statistics Indonesia - BPS
Note : 1) Derived from World Economic Outlook Database, April 2018, IMF

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1.6 Share of Primary Energy Supply Mix

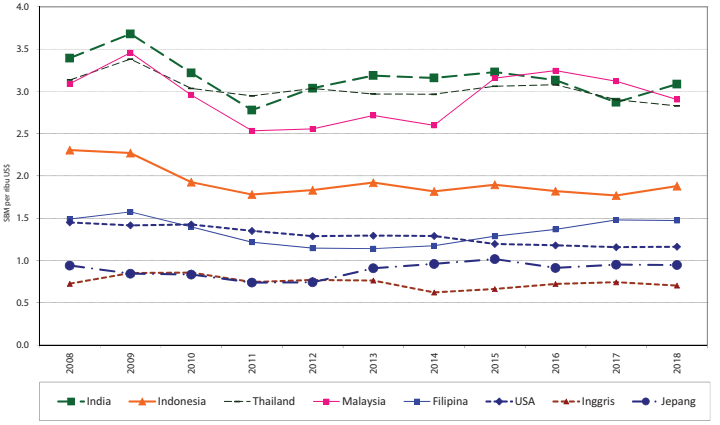
By Type (excluding Biomass)

(%)

Type of Energy	2008	2009	2010	2011	2012		2013	2014	2015	2016	2017	2018
Oil	48.63	47.35	43.24	46.77	47.43		48.13	47.06	46.57	41.93	42.52	38.81
Coal	22.92	23.43	26.24	27.74	27.77		24.79	25.76	27.94	29.85	30.53	32.97
Gas	24.08	24.87	25.11	21.73	20.88		22.12	21.85	21.11	21.75	20.61	19.67
Hydropower	2.99	2.79	3.86	2.32	2.35		3.15	3.06	2.68	3.57	3.57	2.74
Geothermal	1.37	1.48	1.42	1.26	1.22		1.25	1.30	1.25	1.38	1.52	1.78
Solar	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	0.02
Wind	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	0.03
Other Renewables	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	2.03
Biofuel	0.01	0.08	0.13	0.19	0.35		0.56	0.96	0.46	1.53	1.25	1.94
Biogas	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	0.01

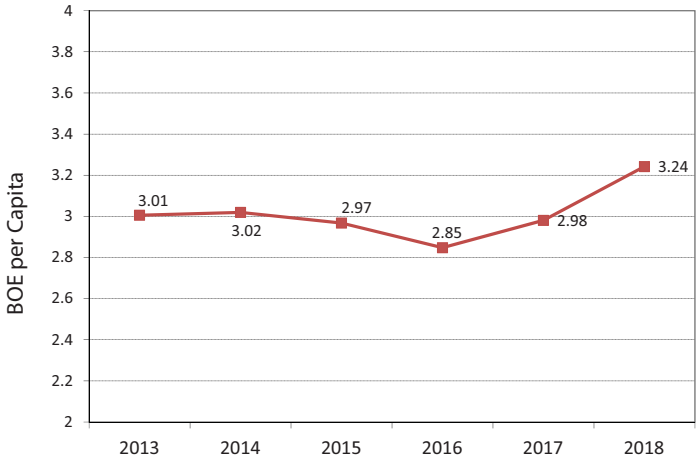
Note : Oil including crude oil, petroleum product, and LPG
Coal including coal and briquette
Gas including natural gas and LNG
Solar PP including solar photovoltaic (PV), solar-powered street lightning and solar-powered energy saving lamp
Other renewables including biomass, biogas, waste, and hybrid PP
Biomass including firewood and charcoal
Biofuel : liquid biofuel (biodiesel)

1.7. Comparison of Primary Energy Intensity in Some Countries



Note : GDP Primary Energy Consumption using US$ fix rate in year 2000
Sources : BP Statistical Review of World Energy 2018 and World Economic Outlook Database April 2019, IMF

1.8. Intensity of Final Energy Consumption per Capita



02

ENERGY BALANCE TABLE

2018 Handbook of Energy & Economic Statistics of Indonesia

Indonesia Energy Balance Table 2018

(Thousand BOE)

		Hydro Power	Geother-mal	Solar & Solar PV	Wind	Other Renewables	Solar - Powered Street Lighting & Energy Saving Lamp	Biomass		Coal	Bri-quette	Natural Gas	Crude Oil	Petroleum Fuel	Biofuel[1])	Biogas	LPG	Electri-city	LNG	Total
1	**Primary Energy Supply**	**40,205**	**26,041**	**359**	**466**	**29,758**	**9**	**67,751**		**483,336**	**0**	**413,373**	**340,967**	**180,875**	**28,381**	**167**	**47,183**	**0**	**-125,063**	**1,533,808**
	a. Production	40,205	26,041	359	466	29,758	9	67,751		2,342,646	0	460,281	281,826	0	40,011	167	0	0	0	3,289,520
	b. Import	0	0	0	0	0	0	0		22,969	0	0	113,055	165,725	0	0	47,453	0	0	349,201
	c. Export	0	0	0	0	0	0	0		-1,496,858	0	-46,908	-74,449	-2,244	-11,630	0	-4	0	-125,063	-1,757,156
	d. Stock Change	0	0	0	0	0	0	0		-385,421	0	0	20,535	17,394	0	0	-266	0	0	-347,758
2	**Energy Transformation**	**-40,205**	**-26,041**	**-359**	**-466**	**-29,758**	**-9**	**0**		**-382,830**	**36**	**-279,979**	**-334,281**	**270,737**	**-24,327**	**0**	**17,282**	**173,979**	**153,612**	**-502,610**
	a. Refinery	0	0	0	0	0	0	0		0	0	-3,801	-334,281	275,171	0	0	7,530	0	0	-55,381
	b. Gas Processing	0	0	0	0	0	0	0		0	0	-179,391	0	0	0	0	9,752	0	180,174	10,534
	b. LNG Regasification	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	-25,666	-25,666
	c. Coal Processing Plant	0	0	0	0	0	0	0		-42	36	0	0	0	0	0	0	0	0	-6
	d. Biofuel Blending													24,327	-24,327	0				0
	e. Power Plant	-40,205	-26,041	-359	-466	-29,758	-9	0		-382,788	0	-96,788	0	-28,761	0	0	0	173,979	-896	-432,092
	- State Own Utility (PLN)	-19,929	-7,454	-22	0	-695	0	0		-254,021	0	-83,589	0	-28,750	0	0	0	115,672	-896	-279,685
	- Independent Power Producer (Non-PLN)	-11,329	-18,587	-73	-461	-95	0	0		-128,767	0	-13,198	0	-11	0	0	0	48,075	0	-124,445
	- Off Grid	-58	0	-265	-5	-28,967	-9	0		0	0	0	0	0	0	0	0	7,298	0	-22,006
	- IO	-8,889	0															2,933		-5,956
3	**Own Use and Losses**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**-43,737**	**-6,686**	**-834**	**0**	**0**	**0**	**-19,800**	**-28,549**	**-99,607**
	a. During Transformation	0	0	0	0	0	0	0		0	0	-3,801	-6,686	0	0	0	0	-6,346	0	-16,832
	b. Energy Use/ Own Use	0	0	0	0	0	0	0		0	0	-39,937	0	0	0	0	0	0	0	-39,937
	c. Transmission & Distribution	0	0	0	0	0	0	0		0	0	0	0	-834	0	0	0	-13,454	-28,549	-42,837
4	**Final Energy Supply**	**0**	**0**	**0**	**0**	**0**	**0**	**67,751**		**100,506**	**36**	**89,657**	**0**	**450,778**	**4,054**	**167**	**64,465**	**154,179**	**0**	**931,591**
5	**Statistics Discrepancy**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**-5,989**	**0**	**0**	**4,054**	**0**	**0**	**-2,805**	**0**	**-4,741**
6	**Final Energy Consumption**	**0**	**0**	**0**	**0**	**0**	**0**	**67,751**		**100,506**	**36**	**95,646**	**0**	**450,778**	**0**	**167**	**64,465**	**156,984**	**0**	**936,332**
	a. Industry	0	0	0	0	0	0	43,405		100,506	36	95,177	0	37,073	0	0	934	57,337	0	334,467
	b. Transportation	0	0	0	0	0	0	0		0	0	234	0	390,996	0	0	0	168	0	391,397
	c. Household	0	0	0	0	0	0	23,020		0	0	203	0	3,043	0	167	61,819	62,963	0	151,214
	d. Commercial	0	0	0	0	0	0	1,326		0	0	32	0	3,566	0	0	1,712	36,516	0	43,153
	e. Other Sector	0	0	0	0	0	0	0		0	0	0	0	16,100	0	0	0	0	0	16,100
7	**Non Energy Use**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**25,568**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**25,568**

Note : [1]) Biofuel consists of biodiesel

03

ENERGY SUPPLY AND DEMAND

2018 Handbook of Energy & Economic Statistics of Indonesia

3.1 Primary Energy Supply by Sources

(BOE)

Year	Coal	Crude Oil & Product	Natural Gas & Product	Hydro Power	Geother-mal	Solar & Solar PV		Wind	Other Renewables	Solar - Powered Street Lighting & Energy Saving Lamp	Biomass	Biofuel	Biogas	Total
2008	224,587,657	476,595,356	236,001,544	29,292,012	13,423,610	n.a		n.a	n.a	n.a	114,085,558	60,407	n.a	1,094,046,143
2009	236,439,000	477,929,923	251,035,250	28,126,827	14,973,198	n.a		n.a	n.a	n.a	109,029,170	771,965	n.a	1,118,305,332
2010	282,156,213	464,852,996	269,942,185	41,510,591	15,266,074	n.a		n.a	n.a	n.a	107,822,916	1,446,623	n.a	1,182,997,598
2011	334,142,760	563,378,573	261,708,332	27,957,823	15,119,152	n.a		n.a	n.a	n.a	105,354,823	2,328,869	n.a	1,309,991,890
2012	345,000,022	589,342,626	259,456,414	29,211,020	15,129,340	n.a		n.a	n.a	n.a	99,383,737	4,339,870	n.a	1,341,864,860
2013	302,694,000	587,652,963	270,134,751	38,494,094	15,245,038	n.a		n.a	n.a	n.a	95,374,094	6,798,481	n.a	1,316,395,279
2014	319,956,003	584,459,891	271,375,371	37,950,252	16,191,566	n.a		n.a	n.a	n.a	92,873,723	11,966,513	n.a	1,328,006,955
2015	364,619,216	607,791,169	275,465,640	35,040,466	16,337,878	n.a		n.a	n.a	n.a	84,768,404	5,938,648	n.a	1,389,961,420
2016	380,310,000	534,207,126	277,169,757	45,452,580	17,537,710	n.a		n.a	n.a	n.a	79,987,014	19,516,272	n.a	1,354,180,457
2017	407,526,000	567,528,788	275,142,227	47,599,892	20,259,621	n.a		n.a	n.a	n.a	75,001,916	16,682,032	n.a	1,409,740,476
2018	483,336,000	569,024,765	288,310,815	40,204,916	26,040,932	359,291		466,082	29,757,578	8,795	67,750,663	28,381,188	166,718	1,533,807,744

Note : Changes in Biofuel Assumptions as Biodiesel (pure)

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3.2 Final Energy Consumption by Sector

3.2.1 Energy Consumption (included Biomass)

(BOE)

Sector	2008	2009	2010	2011	2012		2013	2014	2015	2016	2017	2018
Industrial	320,302,447	304,791,448	349,040,463	375,210,044	369,704,681		283,560,959	291,220,893	310,591,553	266,940,061	281,461,433	334,466,969
Households	152,899,088	143,915,035	144,699,597	145,569,638	147,629,368		149,215,259	152,605,345	148,979,638	149,262,123	149,026,174	151,214,131
Commercial	28,218,800	29,558,720	30,935,244	34,131,850	37,135,487		39,236,140	40,249,580	42,446,465	40,278,613	42,296,648	43,153,003
Transportation	185,668,882	209,968,398	230,345,870	277,512,762	329,520,051		341,409,711	342,781,960	309,291,960	339,526,341	361,695,092	391,397,487
Other	25,068,604	25,293,606	22,340,493	27,220,338	33,709,215		31,105,254	28,694,657	32,836,385	20,392,052	20,840,166	16,100,231
Final Energy Consumption	712,157,822	713,527,207	777,361,667	859,644,632	917,698,803		844,527,323	855,552,435	844,146,000	816,399,190	855,319,513	936,331,822
Non - Energy Utilization	21,774,142	28,434,245	28,381,515	28,306,244	29,147,610		28,369,578	28,468,567	29,928,818	25,158,961	21,746,922	25,567,691

3.2.2 Commercial Energy Consumption (excluded Biomass)

(BOE)

Sector	2008	2009	2010	2011	2012		2013	2014	2015	2016	2017	2018
Industrial	276,067,010	260,270,375	305,723,179	331,486,317	326,972,929		239,162,167	246,033,257	265,763,115	222,962,823	237,124,804	291,062,440
Households	84,477,281	80,832,849	81,632,635	85,426,266	92,489,973		99,687,947	106,398,267	110,511,916	114,874,684	119,976,525	128,194,339
Commercial	26,824,281	28,171,174	29,554,636	32,758,145	35,768,650		37,876,138	38,896,378	41,100,028	38,938,908	40,963,642	41,826,662
Transportation	185,668,882	209,968,398	230,345,870	277,512,762	329,520,051		341,409,711	342,781,960	309,291,960	339,526,341	361,695,092	391,397,487
Other	25,068,604	25,293,606	22,340,493	27,220,338	33,709,215		31,105,254	28,694,657	32,836,385	20,392,052	20,840,166	16,100,231
Final Energy Consumption	598,106,059	604,536,402	669,596,813	754,403,828	818,460,818		749,241,218	762,804,518	759,503,404	736,694,808	780,600,229	868,581,159
Non - Energy Utilization	21,774,142	28,434,245	28,381,515	28,306,244	29,147,610		28,369,578	28,468,567	29,928,818	25,158,961	21,746,922	25,567,691

Note : Final Energy Consumption is Exclude Non Energy Utilization

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3.3 Final Energy Consumption by Type

(Thousand BOE)

Year	Biomass	Coal	Natural Gas	Fuel	Bio Gasoil[1])		Biogas	Briquette	LPG	Electricity	Total
2008	114,052	94,035	90,840	311,938	6,392		n.a	155	15,658	79,089	712,158
2009	108,991	82,587	90,153	309,000	15,694		n.a	220	24,384	82,499	713,527
2010	107,765	137,489	87,023	294,249	27,939		n.a	123	32,067	90,707	777,362
2011	105,241	144,502	94,190	334,727	45,804		n.a	121	37,060	97,998	859,645
2012	99,238	123,022	97,512	389,030	59,227		n.a	130	42,883	106,656	917,699
2013	95,286	42,729	98,546	378,049	67,025		n.a	130	47,801	114,962	844,527
2014	92,748	55,064	97,417	363,713	72,868		n.a	58	51,942	121,743	855,552
2015	84,643	70,228	95,354	395,428	19,737		n.a	50	54,361	124,344	844,146
2016	79,704	63,504	76,194	332,511	75,343		n.a	107	56,626	132,411	816,399
2017	74,719	58,800	87,857	356,329	79,427		n.a	107	61,299	136,781	855,320
2018	67,751	100,506	95,646	336,949	113,829		167	36	64,465	156,984	936,332

Note : [1]) Bio Gasoil Consumption is blending product of biodiesel

3.4 Share of Final Energy Consumption by Sector

(%)

Year	Industry	Household	Commercial	Transportation	Other
2008	46.16	14.12	4.48	31.04	4.19
2009	43.05	13.37	4.66	34.73	4.18
2010	45.66	12.19	4.41	34.40	3.34
2011	43.94	11.32	4.34	36.79	3.61
2012	39.95	11.30	4.37	40.26	4.12
2013	31.92	13.31	5.06	45.57	4.15
2014	32.25	13.95	5.10	44.94	3.76
2015	34.99	14.55	5.41	40.72	4.32
2016	30.27	15.59	5.29	46.09	2.77
2017	30.38	15.37	5.25	46.34	2.67
2018	33.51	14.76	4.82	45.06	1.85

Note : Excluded biomass

3.5 Share of Final Energy Consumption by Type

(%)

Year	Coal	Natural Gas	Fuel	Biofuel	Biogas	LPG	Electricity
2008	15.75	15.19	52.15	1.07	n.a	2.62	13.22
2009	13.70	14.91	51.11	2.60	n.a	4.03	13.65
2010	20.55	13.00	43.94	4.17	n.a	4.79	13.55
2011	19.17	12.49	44.37	6.07	n.a	4.91	12.99
2012	15.05	11.91	47.53	7.24	n.a	5.24	13.03
2013	5.72	13.15	50.46	8.95	n.a	6.38	15.34
2014	7.23	12.77	47.68	9.55	n.a	6.81	15.96
2015	9.25	12.55	52.06	2.60	n.a	7.16	16.37
2016	8.63	10.34	45.14	10.23	n.a	7.69	17.97
2017	7.55	11.26	45.65	10.18	n.a	7.85	17.52
2018	11.58	11.01	38.79	13.11	0.02	7.42	18.07

Note : Excluded biomass

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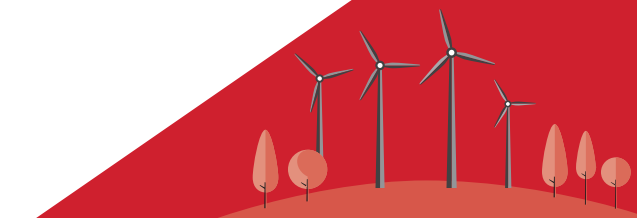
ENERGY PRICES



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4.1 Crude Oil Price

(US$ per Barrel)

Crude Oil Type	2008	2009	2010	2011	2012		2013	2014	2015	2016	2017	2018
SLC	99.90	64.14	81.44	113.63	115.59		108.15	98.63	49.39	40.98	51.98	68.20
Arjuna	97.61	61.18	78.91	112.47	111.75		104.23	94.82	48.54	39.35	51.20	67.65
Attaka	101.03	62.74	80.75	114.38	114.47		107.57	97.96	51.20	41.82	52.86	69.78
Cinta	94.58	59.74	77.02	110.50	114.07		106.51	96.83	48.22	40.00	50.59	66.65
Duri	84.57	55.12	75.07	107.57	112.31		104.44	94.67	47.60	37.63	49.47	65.76
Widuri	94.98	59.72	77.12	110.55	114.16		106.05	97.03	48.44	40.13	50.76	66.82
Belida	101.05	62.30	80.28	114.14	115.19		109.69	99.63	52.62	43.15	53.33	70.25
Senipah Condensate	94.27	60.33	78.76	109.02	108.97		106.48	98.25	52.92	43.44	53.31	69.57
Average[1)]	96.13	61.58	79.40	111.55	112.73		105.85	96.51	49.21	40.13	51.19	67.47

Sources: Oil and Gas Statistics - Directorate General of Oil and Gas
Note : [1)] Arithmatic Average Indonesian Crude Oil Price from 52 type of crude

4.2 International Gas Price

(US$/MMBTU)

Year	LNG	Natural Gas			
	CIF on Japan	CIF ON Uni Eropa	UK (Heren NBP Index)	USA (Henry Hub)	Canada (Alberta)
2008	12.55	11.56	10.79	8.85	7.99
2009	9.06	8.52	4.85	3.89	3.38
2010	10.91	8.01	6.56	4.39	3.69
2011	14.73	10.61	9.03	4.01	3.47
2012	16.75	11.03	9.46	2.76	2.27
2013	16.17	10.72	10.63	3.71	2.93
2014	16.33	9.11	8.22	4.35	3.87
2015	10.31	6.61	6.53	2.60	2.01
2016	6.94	4.93	4.69	2.46	1.55
2017	8.10	5.62	5.80	2.96	1.60
2018	10.05	6.82	8.06	3.13	1.12

Source : BP Statistical Review of World Energy, 2019

4.3 Average Price of LPG, LNG, and Coal FOB Export

Year	LPG	LNG	Coal[1)]
	US$/Thousand Tons	US$/MMBTU	US$/Ton
2008	785.94	9.28	54.76
2009	545.49	6.95	70.70
2010	n.a	7.10	91.74
2011	n.a	10.40	118.40
2012	n.a	10.13	95.48
2013	n.a	9.63	82.92
2014	n.a	9.50	72.62
2015	n.a	6.57	60.13
2016	n.a	3.80	61.84
2017	n.a	4.81	85.92
2018	n.a	6.51	98.96

Sources: 1. Directorate General of Oil and Gas
2. Bank Indonesia
Note : [1)] Arithmatic average of Indonesian Coal Price Reference from Directorate General of Mineral and Coal

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4.4 Energy Retail Price per Energy Unit[1])

Year	Gasoline RON 88		Avtur		Kerosene		Gasoil CN 48			LPG 3 Kg		LPG 12 Kg		LPG 50 Kg	
	Thou-sand Rp/ BOE	US$/ BOE	Thou-sand Rp/ BOE	US$/ BOE	Thou-sand Rp/ BOE	US$/ BOE	Thou-sand Rp/ BOE	US$/ BOE		Thousand Rp/BOE	US$/BOE	Thousand Rp/BOE	US$/BOE	Thousand Rp/BOE	US$/BOE
2008[2)]	917	84	1,562	143	389	35	770	70		499	46	663	61	860	79
2009[2)]	775	82	949	101	422	45	695	74		499	53	686	73	860	91
2010	772	82	1,124	125	422	47	694	77		499	55	686	76	863	96
2011	772	85	1,455	161	422	47	694	76		499	55	686	76	863	95
2012	772	80	1,591	165	422	35	694	72		499	52	686	71	1,316	136
2013[2)]	954	78	1,694	139	422	35	775	64		499	41	747	61	1,569	129
2014[2)]	1,157	93	1,524	123	422	34	885	71		499	40	1,211	97	1,548	124
2015[2)]	1,238	90	1,562	113	422	31	1,052	76		499	36	1,317	95	1,084	79
2016[2)]	1,129	84	1,227	91	422	31	815	61		499	37	1,317	98	967	72
2017[2)]	1,110	82	1,410	104	422	31	794	59		499	37	1,317	97	1,128	83
2018	1,110	79	1,713	122	422	30	794	57		499	36	1,317	94	1,205	86

Note : [1)] At the official selling point
[2)] Revised data

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4.4 Energy Retail Price per Energy Unit[1]) (continued)

Year	Coal		Electricity (Average)			Electricity (Average)			
			Household			Industry		Commercial	
	Thousand Rp/ BOE	US$/BOE	Thousand Rp/ BOE	US$/BOE		Thousand Rp/ BOE	US$/BOE	Thousand Rp/ BOE	US$/BOE
2008	114	10	959	88		1,015	93	1,387	127
2009	171	18	961	102		1,051	112	1,453	155
2010	154	17	1,005	112		1,078	120	1,524	170
2011	163	18	1,008	111		1,135	125	1,551	171
2012	174	18	1,030	107		1,158	120	1,575	163
2013	219	18	1,129	93		1,299	107	1,822	149
2014	235	19	1,237	99		1,595	128	2,065	166
2015	155	11	1,365	99		1,864	135	2,095	152
2016	143	11	1,376	102		1,716	128	1,959	146
2017	183	14	1,723	127		1,776	131	2,032	150
2018	179	13	1,798	128		1,770	126	2,029	145

Note : [1]) At the official selling point

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ENERGY DEMAND BY SECTORS

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5.1.1 Energy Consumption in Industrial Sector

(in Original Unit)

Year	Biomass	Coal	Briquette	Gas	Fuel			Fuel			LPG	Electricity
					Kerosene	Gasoil CN 48		IDO	Fuel Oil	Total Fuel		
	Thousand Tons			MMSCF	Kilo Liter			Kilo Liter			Thousand Tons	GWh
2008	19,250	22,389	43	623,616	451,457	4,639,187		130,909	3,947,933	9,169,487	132	47,969
2009	19,375	19,664	62	654,428	273,095	4,969,575		106,861	3,575,286	8,924,817	69	46,204
2010	18,851	32,736	35	635,361	162,577	4,323,835		92,656	2,994,912	7,573,980	77	50,985
2011	19,028	34,405	34	666,195	113,409	5,686,105		107,511	3,134,555	9,041,580	73	54,725
2012	18,596	29,291	36	685,751	78,987	7,632,801		76,676	2,905,168	10,693,632	73	60,176
2013	19,321	10,174	36	689,312	72,018	7,217,679		66,244	1,672,420	9,028,360	81	64,381
2014	19,665	13,110	16	683,177	55,503	6,525,236		50,953	1,596,283	8,227,975	88	65,909
2015	19,508	16,721	14	679,728	43,950	7,952,501		44,423	1,395,820	9,436,694	92	64,079
2016	19,138	15,120	30	562,243	34,211	4,422,629		35,294	1,696,881	6,189,014	96	68,145
2017	19,294	14,000	30	627,499	35,067	5,006,170		82,275	1,761,804	6,885,316	104	72,238
2018	18,889	23,930	10	672,298	34,265	3,635,682		59,633	1,851,741	5,581,320	110	93,535

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5.1.2 Energy Consumption in Industrial Sector

(in Energy Unit)

(Thousand BOE)

Year	Biomass	Coal	Briquette	Gas	Fuel			Fuel			LPG	Electricity	Total
					Kerosene	Gasoil CN 48		IDO	Fuel Oil	Total Fuel			
2008	44,235	94,035	155	90,227	2,676	30,095		865	27,482	61,118	1,127	29,405	320,302
2009	44,521	82,587	220	89,101	1,619	32,238		706	24,888	59,451	588	28,323	304,791
2010	43,317	137,489	123	85,729	964	28,049		612	20,848	50,473	655	31,254	349,040
2011	43,724	144,502	121	91,342	672	36,886		710	21,820	60,089	623	33,547	375,210
2012	42,732	123,022	130	94,013	468	49,515		507	20,223	70,713	621	36,888	369,705
2013	44,399	42,729	130	95,431	427	46,822		438	11,642	59,328	693	39,466	283,561
2014	45,188	55,064	58	94,230	329	42,330		337	11,112	54,108	753	40,402	291,221
2015	44,828	70,228	50	92,150	261	51,589		294	9,717	61,859	788	39,281	310,592
2016	43,977	63,504	107	75,820	203	28,690		233	11,812	40,938	821	41,773	266,940
2017	44,337	58,800	107	87,556	208	32,476		544	12,264	45,491	888	44,282	281,461
2018	43,405	100,506	36	95,177	203	23,585		394	12,890	37,073	934	57,337	334,467

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5.1.3 Share of Energy Consumption in Industrial Sector

(%)

Year	Coal	Briquette	Gas	Fuel		Fuel			LPG	Electricity
				Kerosene		Gasoil CN 48	IDO	Fuel Oil		
2008	34.06	0.06	32.68	0.97		10.90	0.31	9.95	0.41	10.65
2009	31.73	0.08	34.23	0.62		12.39	0.27	9.56	0.23	10.88
2010	44.97	0.04	28.04	0.32		9.17	0.20	6.82	0.21	10.22
2011	43.59	0.04	27.94	0.20		11.13	0.21	6.58	0.19	10.12
2012	37.62	0.04	29.24	0.14		15.14	0.15	6.19	0.19	11.28
2013	17.87	0.05	40.48	0.18		19.58	0.18	4.87	0.29	16.50
2014	22.38	0.02	38.88	0.13		17.20	0.14	4.52	0.31	16.42
2015	26.42	0.02	35.20	0.10		19.41	0.11	3.66	0.30	14.78
2016	28.48	0.05	34.01	0.09		12.87	0.10	5.30	0.37	18.74
2017	24.80	0.05	36.92	0.09		13.70	0.23	5.17	0.37	18.67
2018	34.53	0.01	32.70	0.07		8.10	0.14	4.43	0.32	19.70

5.2.1 Energy Consumption in Household Sector

(in Original Unit)

Year	Biomass	Gas	Kerosene	LPG	Biogas	Electricity
	Thousand Tons	MMSCF	Kilo Liter	Thousand Tons	Million m^3	GWh
2008	30,441	729	6,764,523	1,582	n.a	50,184
2009	29,776	722	4,091,982	2,671	n.a	54,945
2010	27,452	751	2,436,009	3,564	n.a	59,825
2011	27,445	635	1,699,298	4,144	n.a	65,112
2012	26,173	748	1,183,526	4,824	n.a	72,133
2013	23,996	681	1,079,100	5,377	n.a	77,211
2014	21,553	636	831,641	5,843	n.a	84,086
2015	20,108	648	658,537	6,115	n.a	88,682
2016	16,740	761	512,604	6,370	n.a	93,635
2017	12,642	983	525,429	6,896	n.a	94,457
2018	10,018	1,131	513,411	7,252	26	102,712

5.2.2 Energy Consumption in Household Sector

(in Energy Unit)

(Thousand BOE)

Year	Biomass	Gas	Kerosene	LPG	Biogas	Electricity	Total
2008	68,422	131	40,096	13,487	n.a	30,763	152,899
2009	63,082	130	24,255	22,767	n.a	33,682	143,915
2010	63,067	135	14,439	30,386	n.a	36,673	144,700
2011	60,143	114	10,072	35,326	n.a	39,914	145,570
2012	55,139	134	7,015	41,123	n.a	44,217	147,629
2013	49,527	122	6,396	45,839	n.a	47,330	149,215
2014	46,207	114	4,929	49,810	n.a	51,545	152,605
2015	38,468	116	3,903	52,130	n.a	54,362	148,980
2016	34,387	137	3,038	54,302	n.a	57,398	149,262
2017	29,050	177	3,114	58,783	n.a	57,902	149,026
2018	23,020	203	3,043	61,819	167	62,963	151,214

5.2.3 Share of Energy Consumption in Household Sector

(%)

Year	Gas	Kerosene	LPG	Biogas	Electricity
2008	0.15	47.46	15.97	n.a	36.42
2009	0.16	30.01	28.17	n.a	41.67
2010	0.17	17.69	37.22	n.a	44.92
2011	0.13	11.79	41.35	n.a	46.72
2012	0.15	7.58	44.46	n.a	47.81
2013	0.12	6.42	45.98	n.a	47.48
2014	0.11	4.63	46.81	n.a	48.45
2015	0.11	3.53	47.17	n.a	49.19
2016	0.12	2.64	47.27	n.a	49.97
2017	0.15	2.60	49.00	n.a	48.26
2018	0.16	2.37	48.22	0.13	49.12

5.3.1 Energy Consumption in Commercial Sector

(in Original Unit)

Year	Biomass	Gas	Fuel				LPG	Electri-city
			Kero-sene	Gasoil CN 48	IDO	Total		
	Thou-sand Tons	MMSCF	Kilo Liter				Thou-sand Tons	GWh
2008	607	1,989	373,533	668,005	702	1,042,241	122	30,785
2009	604	4,067	225,957	715,578	573	942,109	121	33,322
2010	601	5,364	134,515	622,597	497	757,609	120	37,073
2011	598	7,185	93,834	818,752	577	913,164	130	39,942
2012	595	9,050	65,354	1,099,061	411	1,164,826	134	41,574
2013	592	7,915	59,587	1,039,286	355	1,099,229	149	45,820
2014	589	8,057	45,923	939,580	273	985,777	162	48,452
2015	586	7,990	36,364	1,145,095	238	1,181,697	169	49,879
2016	583	179	28,306	636,822	189	665,317	176	54,002
2017	580	182	29,014	720,847	441	750,303	191	56,202
2018	577	181	28,350	523,508	320	552,179	201	59,570

5.3.2 Energy Consumption in Commercial Sector

(in Energy Unit)

(Thousand BOE)

Year	Bio-mass	Gas	Fuel				LPG	Electri-city	Total
			Kero-sene	Gasoil CN48	IDO	Total-Fuel			
2008	1,395	357	2,214	4,333	5	6,552	1,044	18,871	28,219
2009	1,388	730	1,339	4,642	4	5,985	1,029	20,426	29,559
2010	1,381	963	797	4,039	3	4,839	1,026	22,726	30,935
2011	1,374	1,290	556	5,311	4	5,871	1,112	24,485	34,132
2012	1,367	1,625	387	7,130	3	7,520	1,139	25,485	37,135
2013	1,360	1,422	353	6,742	2	7,098	1,269	28,088	39,236
2014	1,353	1,447	272	6,095	2	6,369	1,379	29,701	40,250
2015	1,346	1,435	216	7,428	2	7,645	1,444	30,576	42,446
2016	1,340	32	168	4,131	1	4,300	1,504	33,103	40,279
2017	1,333	33	172	4,676	3	4,851	1,628	34,452	42,297
2018	1,326	32	168	3,396	2	3,566	1,712	36,516	43,153

5.3.3 Share of Energy Consumption in Commercial Sector

(%)

Year	Gas	Fuel			LPG	Electricity
		Kerosene	Gasoil CN 48	IDO		
2008	1.33	8.25	16.15	0.02	3.89	70.35
2009	2.59	4.75	16.48	0.01	3.65	72.51
2010	3.26	2.70	13.67	0.01	3.47	76.89
2011	3.94	1.70	16.21	0.01	3.39	74.74
2012	4.54	1.08	19.93	0.01	3.18	71.25
2013	3.75	0.93	17.80	0.01	3.35	74.16
2014	3.72	0.70	15.67	0.00	3.55	76.36
2015	3.49	0.52	18.07	0.00	3.51	74.39
2016	0.08	0.43	10.61	0.00	3.86	85.01
2017	0.08	0.42	11.42	0.01	3.97	84.10
2018	0.08	0.40	8.12	0.01	4.09	87.30

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5.4.1 Energy Consumption in Transportation Sector

(in Original Unit)

Year	Gas	Fuel								Fuel						Electricity
		Avgas	Avtur	Gasoline RON 88	Gasoline RON 92	Gasoline RON 95+98+100	Gasoil RON 90	Gasoil CN 51	Gasoil CN 53	Kero-sene	Gasoil CN 48	IDO	Fuel Oil	Bio Gasoil	Total Fuel	
	MMSCF	Kilo Liter								Kilo Liter						GWh
2008	691	2,003	2,635,670	19,156,257	314,216	114,789	n.a	1,289	n.a	2,986	7,582,589	5,223	76,787	931,179	30,822,987	81
2009	1,066	1,687	2,760,678	20,908,221	480,380	104,388	n.a	1,955	n.a	1,807	8,122,597	4,264	69,539	2,306,017	34,761,532	111
2010	1,088	2,231	3,527,382	22,391,362	670,364	113,812	n.a	4,434	n.a	1,075	7,067,157	3,697	58,251	4,306,887	38,146,652	89
2011	1,006	2,316	3,562,126	24,766,975	625,162	294,639	n.a	6,392	n.a	750	9,293,739	4,290	60,967	7,060,848	45,678,205	88
2012	856	2,606	3,898,832	27,612,171	666,461	149,424	n.a	12,297	n.a	522	12,475,546	3,059	56,505	9,130,039	54,007,463	108
2013	1,031	2,868	4,159,010	28,622,924	850,408	158,714	n.a	23,053	n.a	476	11,797,043	2,643	32,528	10,332,005	55,981,673	129
2014	1,152	1,499	4,229,094	28,822,039	1,062,920	154,888	n.a	33,305	n.a	367	10,665,269	2,033	31,048	11,232,729	56,235,192	155
2015	1,368	3,070	4,336,624	27,269,723	2,761,956	278,758	379,959	38,552	n.a	291	12,998,085	1,772	27,149	3,042,511	51,138,449	205
2016	1,140	3,172	4,875,486	21,033,867	4,780,929	366,168	5,805,228	105,889	136,311	226	7,228,632	1,408	33,004	11,614,329	55,984,649	223
2017	512	2,964	5,371,183	12,120,404	6,188,300	379,998	14,487,098	391,895	178,695	232	8,182,410	3,283	34,267	12,243,837	59,584,565	236
2018	1,302	3,630	5,717,729	10,417,811	5,643,055	385,977	17,706,790	666,191	199,901	227	5,942,394	2,379	36,016	17,546,916	64,269,017	274

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5.4.2 Energy Consumption in Transportation Sector

(in Energy Unit)

(Thousand BOE)

Year	Gas	Fuel								Fuel							Electric-ity	Total
		Avgas	Avtur	Gasoline RON 88	Gasoline RON 92	Gasoline RON 95+98+100	Gasoil RON 90	Gasoil CN 51		Gasoil CN 53	Kerosene	Gasoil CN 48	IDO	Fuel Oil	Bio Gasoil	Total Fuel		
2008	124	11	15,526	111,633	1,831	669	n.a	8		n.a	18	49,189	35	535	6,041	185,495	50	185,669
2009	191	9	16,262	121,843	2,799	608	n.a	13		n.a	11	52,692	28	484	14,959	209,709	68	209,968
2010	195	12	20,779	130,486	3,907	663	n.a	29		n.a	6	45,845	24	405	27,939	230,096	54	230,346
2011	181	13	20,983	144,330	3,643	1,717	n.a	41		n.a	4	60,289	28	424	45,804	277,278	54	277,513
2012	154	14	22,967	160,910	3,884	871	n.a	80		n.a	3	80,930	20	393	59,227	329,300	66	329,520
2013	185	16	24,499	166,800	4,956	925	n.a	150		n.a	3	76,529	17	226	67,025	341,146	79	341,410
2014	207	8	24,912	167,960	6,194	903	n.a	216		n.a	2	69,187	13	216	72,868	342,480	95	342,782
2015	246	17	25,546	158,914	16,095	1,624	2,214	250		n.a	2	84,320	12	189	19,737	308,921	126	309,292
2016	205	18	28,720	122,575	27,861	2,134	33,830	687		884	1	46,893	9	230	75,343	339,185	137	339,526
2017	92	16	31,640	70,632	36,062	2,214	84,424	2,542		1,159	1	53,080	22	239	79,427	361,459	144	361,695
2018	234	20	33,681	60,710	32,885	2,249	103,186	4,322		1,297	1	38,549	16	251	113,829	390,996	168	391,397

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5.4.3 Share of Energy Consumption in Transportation Sector

(%)

Year	Gas	Fuel										Fuel					Electricity
		Avgas	Avtur	Gasoline RON 88	Gasoline RON 92	Gasoline RON 95+98+100	Gasoline RON 90		Gasoil CN 51	Gasoil CN 53	Kerosene	Gasoil CN 48	IDO	Fuel Oil	Bio Gasoil	Total Fuel	
2008	0.07	0.01	8.36	60.12	0.99	0.36	0.00		0.00	0.00	0.01	26.49	0.02	0.29	3.25	99.91	0.03
2009	0.09	0.00	7.75	58.03	1.33	0.29	0.00		0.01	0.00	0.01	25.10	0.01	0.23	7.12	99.88	0.03
2010	0.08	0.01	9.02	56.65	1.70	0.29	0.00		0.01	0.00	0.00	19.90	0.01	0.18	12.13	99.89	0.02
2011	0.07	0.00	7.56	52.01	1.31	0.62	0.00		0.01	0.00	0.00	21.72	0.01	0.15	16.51	99.92	0.02
2012	0.05	0.00	6.97	48.83	1.18	0.26	0.00		0.02	0.00	0.00	24.56	0.01	0.12	17.97	99.93	0.02
2013	0.05	0.00	7.18	48.86	1.45	0.27	0.00		0.04	0.00	0.00	22.42	0.01	0.07	19.63	99.92	0.02
2014	0.06	0.00	7.27	49.00	1.81	0.26	0.00		0.06	0.00	0.00	20.18	0.00	0.06	21.26	99.91	0.03
2015	0.08	0.01	8.26	51.38	5.20	0.53	0.72		0.08	0.00	0.00	27.26	0.00	0.06	6.38	99.88	0.04
2016	0.06	0.01	8.46	36.10	8.21	0.63	9.96		0.20	0.26	0.00	13.81	0.00	0.07	22.19	99.90	0.04
2017	0.03	0.00	8.75	19.53	9.97	0.61	23.34		0.70	0.32	0.00	14.68	0.00	0.07	21.96	99.93	0.04
2018	0.06	0.01	8.61	15.51	8.40	0.57	26.36		1.10	0.33	0.00	9.85	0.00	0.06	29.08	99.90	0.04

5.5.1 Energy Consumption in Other Sectors

(in Original Unit)

Year	Mogas	Kerosene	Gasoil CN 48	IDO	Fuel Oil	Total Fuel
	Kilo Liter					
2008	586,829	309,096	2,353,575	19,553	634,896	3,903,950
2009	638,725	186,978	2,521,190	15,961	574,968	3,937,821
2010	687,512	111,310	2,193,590	13,839	481,634	3,487,886
2011	760,454	77,647	2,884,703	16,058	504,091	4,242,954
2012	847,814	54,080	3,872,311	11,453	467,202	5,252,859
2013	878,849	49,308	3,661,709	9,894	268,954	4,868,714
2014	884,962	38,001	3,310,415	7,611	256,710	4,497,699
2015	837,299	30,091	4,034,503	6,635	224,472	5,133,000
2016	645,831	23,423	2,243,710	5,272	272,888	3,191,124
2017	372,149	24,009	2,539,755	12,289	283,329	3,231,531
2018	319,872	23,460	1,844,472	8,907	297,792	2,494,503

5.5.2 Energy Consumption in Other Sectors

(in Energy Unit)

(Thousand BOE)

Year	Mogas	Kerosene	Gasoil CN 48	IDO	Fuel Oil	Total Fuel
2008	3,420	1,832	15,268	129	4,420	25,069
2009	3,722	1,108	16,355	105	4,002	25,294
2010	4,006	660	14,230	91	3,353	22,340
2011	4,432	460	18,713	106	3,509	27,220
2012	4,941	321	25,120	76	3,252	33,709
2013	5,121	292	23,754	65	1,872	31,105
2014	5,157	225	21,475	50	1,787	28,695
2015	4,879	178	26,172	44	1,563	32,836
2016	3,764	139	14,555	35	1,900	20,392
2017	2,169	142	16,476	81	1,972	20,840
2018	1,864	139	11,965	59	2,073	16,100

5.5.3 Share of Energy Consumption in Other Sectors

(%)

Year	Mogas	Kerosene	Gasoil CN 48	IDO	Fuel Oil*)
2008	13.64	7.31	60.90	0.52	17.63
2009	14.72	4.38	64.66	0.42	15.82
2010	17.93	2.95	63.70	0.41	15.01
2011	16.28	1.69	68.75	0.39	12.89
2012	14.66	0.95	74.52	0.22	9.65
2013	16.47	0.94	76.37	0.21	6.02
2014	17.97	0.78	74.84	0.18	6.23
2015	14.86	0.54	79.70	0.13	4.76
2016	18.46	0.68	71.38	0.17	9.32
2017	10.41	0.68	79.06	0.39	9.46
2018	11.58	0.86	74.32	0.37	12.88

06

ENERGY SUPPLY BY ENERGY RESOURCES

6.1.1 Coal Resources and Reserves

as of December 2018

(Million Tons)

Province	Resources					Reserves
	Hypothetic	Inferred	Indicated	Measured	Total	
Banten	5.47	32.92	12.68	6.50	57.57	7.22
Central Java	0.00	0.82	0.00	0.00	0.82	0.00
East Java	0.00	0.08	0.00	0.00	0.08	0.00
Aceh	0.00	138.51	314.22	821.24	1,273.97	570.97
North Sumatera	0.00	7.00	1.84	5.78	14.62	0.00
Riau	3.86	521.22	810.61	525.71	1,861.39	581.26
West Sumatera	1.19	156.70	77.06	241.62	476.57	118.14
Jambi	140.31	2,959.85	2,093.83	2,262.16	7,456.15	2,357.35
Bengkulu	0.00	183.34	193.08	181.01	557.43	177.61
South Sumatera	3,099.45	13,062.94	13,686.41	12,100.88	41,949.67	10,077.62
Lampung	0.00	122.95	8.21	3.53	134.69	11.74
West Kalimantan	2.26	375.69	6.85	3.70	388.50	0.00
Central Kalimantan	22.54	5,209.69	2,576.00	2,292.51	10,100.75	2,698.97
South Kalimantan	0.00	6,817.37	4,949.01	7,607.01	19,373.38	5,110.61
East Kalimantan	887.99	13,144.99	26,589.91	23,693.35	64,316.24	16,837.10
North Kalimantan	25.79	1,267.53	918.09	1,017.93	3,229.34	1,340.24
West Sulawesi	11.46	16.00	0.78	0.16	28.41	1.80
South Sulawesi	10.66	13.90	7.63	0.44	32.63	0.33
Southeast Sulawesi	0.64	0.00	0.00	0.00	0.64	0.00
Central Sulawesi	0.52	1.98	0.00	0.00	2.50	0.00
North Maluku	8.22	0.00	0.00	0.00	8.22	0.00
West Papua	93.66	32.82	0.00	0.00	126.48	0.00
Papua	7.20	2.16	0.00	0.00	9.36	0.00
TOTAL	**4,321.21**	**44,068.47**	**52,246.21**	**50,763.52**	**151,399.41**	**39,890.95**

Source : Geological Agency

6.1.2 Coal Supply

(Ton)

Year	Production [1)]	Export	Import
2008	240,249,968	191,430,218	106,931
2009	256,181,000	198,366,000	68,804
2010	275,164,196	208,000,000	55,230
2011	353,270,937	272,671,351	42,449
2012	386,077,357	304,051,216	77,786
2013	474,371,369	356,357,973	609,875
2014	458,096,707	381,972,830	2,442,319
2015	461,566,080	365,849,610	3,007,934
2016	456,197,775	331,128,438	3,898,932
2017	461,248,184	297,741,135	4,532,308
2018	557,772,940	356,394,687	5,468,706

Sources: 1. Directorate General of Mineral and Coal
2. Ministry of Trade and BPS for Import Data
Note : [1]) The type of coal produced in Indonesia is only steam coal

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6.1.3 Indonesia Coal Export by Destination

(Thousand Tons)

Year	China	India	Japan	Korea	Taiwan	Hongkong	Malaysia		Philippines	Thailand	Spain	Others	Total
2008	8,394	14,683	26,948	15,035	14,887	10,936	7,107		4,385	8,429	3,882	76,742	191,430
2009	27,266	20,784	25,262	18,362	17,238	9,664	8,499		4,439	7,468	4,500	54,886	198,366
2010	44,056	18,640	25,776	20,643	14,590	9,415	11,307		7,248	7,175	2,128	47,021	208,000
2011	50,347	30,976	26,073	18,900	16,517	10,660	12,407		6,828	7,391	4,077	88,495	272,671
2012	68,821	31,648	25,738	16,542	16,391	10,669	13,459		7,130	5,721	6,208	101,725	304,051
2013	49,859	41,834	21,709	13,635	14,399	4,990	9,066		7,609	5,253	796	187,207	356,358
2014	67,807	60,284	31,232	20,170	15,689	13,697	10,772		10,274	8,497	5,675	137,876	381,973
2015	41,898	79,111	23,252	14,111	10,643	7,263	7,719		11,816	9,380	3,846	156,810	365,850
2016	53,887	56,277	29,798	13,574	12,784	6,475	11,265		13,434	8,720	3,532	121,381	331,128
2017	48,279	44,407	20,776	16,581	8,957	5,262	13,017		9,452	4,716	2,235	124,060	297,741
2018	63,429	49,967	23,081	18,731	7,615	3,423	12,701		12,212	6,611	3,227	155,398	356,395

Source : Directorate General of Mineral and Coal

6.1.4 Coal Sales

(Ton)

Year	Total	Iron & Steel	Power Plant	Cement, Textile & Fertilizer	Pulp & Paper	Briquette	Others
2008	53,473,252	245,949	31,041,000	6,842,403	1,251,000	43,000	14,049,899
2009	56,295,000	256,605	36,570,000	6,900,000	1,170,000	61,463	11,336,932
2010	67,180,051	335,000	34,410,000	6,308,000	1,742,000	34,543	24,350,508
2011	79,557,800	166,034	45,118,519	5,873,144	1,249,328	33,939	28,366,165
2012	82,142,862	289,371	52,815,519	6,640,000	2,670,701	36,383	19,690,889
2013	72,070,000	300,000	61,860,000	7,190,000	1,460,000	36,383	1,223,617
2014	76,180,001	298,000	63,054,000	7,187,400	1,458,170	15,623	4,166,808
2015	86,814,099	399,000	70,080,000	7,180,000	4,310,000	13,174	4,831,925
2016	90,550,000	390,000	75,400,000	10,540,000	4,190,000	30,000	n.a
2017	97,030,000	300,000	83,000,000	9,802,000	3,898,000	30,000	n.a
2018	115,080,000	1,750,000	91,140,000	19,030,000	3,150,000	10,000	n.a

Source : Directorate General of Mineral and Coal

6.2.1 Oil Reserves

as of 1 January

(Billion Barrels)

Year	Proven	Potential	Total
2008	3.75	4.47	8.22
2009	4.30	3.70	8.00
2010	4.23	3.53	7.76
2011	4.04	3.69	7.73
2012	3.74	3.67	7.41
2013	3.69	3.86	7.55
2014	3.62	3.75	7.37
2015	3.60	3.70	7.31
2016	3.31	3.94	7.25
2017	3.17	4.36	7.53
2018	3.15	4.36	7.51

Source : Directorate General of Oil and Gas

6.2.2 Refinery Capacity in 2018

(MBSD)

Refinery	Refinery Capacity
Dumai	177.00
Musi	127.30
Cilacap	348.00
Balikpapan	260.00
Balongan	125.00
Cepu	3.80
Kasim	10.00
Tuban (TPPI)	100.00
Total	**1,151.10**

Source : Directorate General of Oil and Gas

6.2.3 Crude Oil Supply and Demand

Year	Production	Export	Import	Oil Refinery Input	
	Thousand bbl	Thousand bbl	Thousand bbl	Crude	Thousand bpd
2008	357,501	134,872	97,006	n.a	885
2009	346,313	132,223	120,119	320,766	905
2010	344,888	134,473	101,093	299,116	819
2011	329,265	135,572	96,862	321,002	879
2012	314,666	106,485	95,968	299,257	820
2013	300,830	104,791	118,334	300,134	822
2014	287,902	93,080	121,993	309,445	848
2015	286,814	115,017	136,666	367,791	1,008
2016	304,167	125,516	148,361	323,910	887
2017	292,374	102,678	141,616	323,665	887
2018	281,826	74,449	113,055	334,281	916

Source : Directorate General of Oil and Gas

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6.2.4 Domestic Oil Fuels Sales

(Kilo Liter)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Avgas	2,003	1,687	2,231	2,316	2,606	2,868	1,499	3,070	3,172	2,964	3,630
Avtur	2,635,670	2,760,678	3,527,382	3,562,126	3,898,832	4,159,010	4,229,094	4,336,624	4,875,486	5,371,183	5,717,729
Gasoline RON 88	19,699,070	21,441,130	23,078,874	25,527,429	28,459,985	29,501,773	29,707,002	28,107,022	21,679,698	12,492,553	10,737,683
Kerosene	7,901,596	4,779,818	2,845,486	1,984,939	1,382,469	1,260,490	971,434	769,233	598,769	613,750	599,712
Gasoil CN 48	26,999,434	26,691,227	27,653,973	26,391,275	25,079,718	23,715,716	21,440,501	26,130,183	14,531,793	16,449,182	11,946,056
IDO	180,997	145,192	167,733	133,589	91,600	79,137	60,870	53,069	42,163	98,288	71,239
Fuel Oil	4,969,526	4,480,563	4,316,705	3,904,580	3,428,875	1,973,903	1,884,040	1,647,441	2,002,773	2,079,400	2,185,549
Gasoline RON 95 [1)]	114,789	104,388	113,812	294,639	149,424	158,714	154,888	278,758	366,168	379,998	385,977
Gasoline RON 92	297,982	460,148	670,364	625,162	666,461	850,408	1,062,920	2,761,956	4,780,929	6,188,300	5,643,055
Gasoline RON 90	n.a	n.a	n.a	n.a	n.a	n.a	n.a	379,959	5,805,228	14,487,098	17,706,790
Gasoil CN 53	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	136,311	178,695	199,901
Gasoil CN 51 [2)]	1,289	1,955	4,434	6,392	12,297	23,053	33,305	38,552	105,889	391,895	666,191
Bio Gasoil	931,179	2,306,017	4,306,887	7,060,848	9,130,039	10,332,005	11,232,729	3,042,511	13,220,539	12,243,837	18,182,154
Total Fuel	**63,793,783**	**63,298,849**	**66,687,881**	**69,493,296**	**72,302,305**	**72,057,077**	**70,778,283**	**67,548,378**	**68,148,918**	**70,977,143**	**74,045,667**

Sources : Directorate General of Oil and Gas
Note : [1)] Addition of domestic sales of gasoline RON 98 since 2016
[2)] Source data from PT Pertamina (Persero) for 2008 to 2015

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6.2.5 Crude Oil Refinery Production

(Thousand Barrels)

Year	Gasoline RON 88	Avtur + JP5	Avgas	Kerosene	Gasoil CN 48		IDO	Fuel Oil	Gasoline RON 95,98 & 100	Gasoline RON 92	Gasoil CN 51 & 53	Total Fuel
2008	72,404	11,229	24	48,031	92,812		2,036	23,084	387	1,523	3	251,533
2009	74,751	16,672	0	29,476	110,698		1,213	18,843	774	2,832	31	255,289
2010	66,820	15,710	7	18,985	107,351		1,377	21,515	668	3,301	15	235,748
2011	64,460	17,061	7	14,378	116,391		1,352	20,276	736	2,446	28	237,135
2012	67,684	19,050	0	10,808	123,483		1,135	15,047	514	2,487	122	240,330
2013	68,174	18,623	0	9,827	123,726		927	13,879	566	2,651	517	238,892
2014	70,829	19,938	0	7,332	129,502		1,107	12,243	545	3,629	382	245,508
2015	71,733	20,240	0	4,977	129,306		972	11,979	672	8,770	242	248,891
2016	68,878	22,794	0	6,459	123,818		969	18,309	592	24,432	503	266,753
2017[1)]	49,925	22,917	0	6,041	133,920		876	9,734	604	39,085	577	263,678
2018	53,984	26,255	0	5,958	139,783		714	11,921	779	36,877	1,870	278,142

Source : Directorate General of Oil and Gas
Notes : [1)] Revised Data

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6.2.5 Crude Oil Refinery Production (Continued)

(Thousand Barrels)

Year	Secondary Fuel				Non Fuel		Lubricant	LPG	HOMC	Total Production
	Naphtha	LOMC	LSWR	Total						
2008	28,270	0	30,033	58,303	14,130		3,067	8,054	10,871	345,959
2009	23,820	63	31,691	55,510	15,642		2,772	8,119	7,498	344,831
2010	22,321	187	29,522	52,030	19,189		2,027	7,602	4,982	321,578
2011	28,613	0	24,021	52,634	27,499		3,065	9,143	11,908	341,384
2012	23,293	59	26,451	49,803	41,448		2,988	7,288	10,405	352,263
2013	23,793	0	24,487	48,281	21,726		2,697	6,635	6,564	324,795
2014	21,985	243	26,946	49,174	30,460		2,529	6,362	8,544	342,578
2015	13,500	0	24,713	38,213	29,895		0	8,084	4,498	329,581
2016	15,914	0	24,798	40,712	13,604		2,019	10,297	6,904	340,289
2017[1)]	18,165	0	24,581	42,746	24,986		2,457	10,062	8,254	352,182
2018	19,334	349	23,870	43,553	22,601		2,787	10,289	6,763	364,135

Source : Directorate General of Oil and Gas
Notes : [1)] Revised Data

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6.2.6 Import of Refined Products

(Thousand KL)

Year	Avtur	Avgas	Gasoline RON 88	Gasoline RON 95	Gasoline RON 92		DPK & HOMC	Gasoil	Fuel Oil	IDO	Total Fuel
2008	769	0	8,572	17	40		390	12,284	2,573	28	24,673
2009	172	1	10,263	32	120		1,301	8,505	1,909	8	22,311
2010	577	0	12,283	48	381		1,535	10,637	549	7	26,017
2011	816	2	15,248	36	319		157	13,573	998	0	31,149
2012	710	2	17,621	36	213		525	12,455	420	0	31,982
2013	950	2	18,340	60	268		1,015	11,947	107	6	32,695
2014	981	0	18,829	64	619		1,125	11,475	174	7	33,274
2015	1,202	0	16,274	171	1,781		998	7,318	148	6	27,898
2016[1)]	994	2	11,645	265	3,829		67	5,708	282	43	22,835
2017[1)]	1,870	3	10,065	290	7,502		967	6,794	681	48	28,220
2018	1,467	4	9,214	118	9,265		447	6,499	893	47	27,954

Source : Directorate General of Oil and Gas
Notes : 1) Revised Data

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6.2.7 Export of Refined Products

(Thousand Barrels)

Year	Gasoline RON 88	Avtur	Kerosene	Gasoil CN 48	Fuel Oil	Gasoline RON 92		Gasoline RON 95	Total Fuel	Naphtha	Lubricant	Other Product	Total
2008	38	3	0	1,861	64	0		0	1,967	5,372	0	30,308	37,647
2009	130	424	427	759	304	0		0	2,044	3,182	0	31,849	37,075
2010	24	3	1,436	1,519	600	0		0	3,582	3,955	0	29,257	36,794
2011	80	9	2,701	113	0	0		7	2,909	1,316	65	26,108	30,399
2012	69	13	1,917	92	0	60		0	2,152	0	301	25,862	28,315
2013	0	9	1,632	0	4,319	84		13	6,057	1,092	0	19,693	26,843
2014	0	13	401	148	3,215	159		0	3,936	5,339	0	23,342	32,616
2015[1)]	0	15	589	0	1,377	15		0	1,997	2,550	0	19,208	23,755
2016[1)]	0	15	0	1	2,167	9		0	2,192	0	0	10,666	12,858
2017[1)]	0	15	0	8	2,981	4		0	3,008	0	0	11,814	14,822
2018	0	16	0	4	2,011	0		0	2,031	0	0	9,771	11,801

Source : Directorate General of Oil and Gas
Notes : [1)] Revised Data

6.2.8 Indonesia Crude Oil Export by Destination

(Thousand Barrels)

Year	Japan	USA	Korea	Taiwan	Singapore	Others	Total
2008	37,724	4,740	12,289	1,981	15,083	63,053	134,872
2009	25,783	5,264	19,394	2,160	11,649	67,974	132,223
2010	23,407	4,779	17,607	1,961	10,576	76,143	134,473
2011	39,913	5,729	19,546	1,889	12,661	33,613	113,352
2012	49,376	2,149	15,601	300	10,034	29,025	106,485
2013	43,042	5,872	10,096	3,257	11,108	31,415	104,791
2014	32,625	6,811	7,586	5,272	13,680	27,106	93,080
2015	26,634	13,648	8,481	5,244	15,567	45,444	115,017
2016	18,404	9,943	6,619	6,525	13,581	70,445	125,516
2017	11,901	11,986	7,466	7,543	12,371	51,410	102,678
2018	9,943	10,235	7,122	6,172	7,222	33,754	74,449

Source : Directorate General of Oil and Gas

6.2.9 LPG Supply and Demand

(Ton)

Year	Production			Export	Import	Sales
	Gas Refinery	Oil Refinery	Total			
2008	910,663	780,103	1,690,766	100,531	415,000	1,843,817
2009	1,430,671	694,547	2,125,218	88,463	917,171	2,922,080
2010	1,828,743	649,628	2,478,371	279	1,621,959	3,761,086
2011	1,580,598	704,842	2,285,439	76,566	1,991,774	4,347,465
2012	1,824,297	377,242	2,201,539	205	2,573,670	5,030,547
2013	1,447,055	563,935	2,010,990	286	3,299,808	5,607,430
2014	1,831,683	547,445	2,379,128	483	3,604,009	6,093,138
2015	1,631,599	675,808	2,307,407	392	4,025,600	6,376,990
2016	1,410,169	831,398	2,241,567	580	4,475,929	6,642,633
2017	1,162,575	865,366	2,027,941	360	5,461,934	7,190,871
2018	1,143,958	883,305	2,027,263	434	5,566,572	7,562,184

Source : Directorate General of Oil and Gas

6.3.1 Natural Gas Reserves

as of 1 January

(TSCF)

Year	Proven	Potential	Total
2008	112.50	57.60	170.10
2009	107.34	52.29	159.63
2010	108.40	48.74	157.14
2011	104.71	48.18	152.89
2012	103.35	47.35	150.70
2013	101.54	48.85	150.39
2014	100.26	49.04	149.30
2015	97.99	53.34	151.33
2016	101.22	42.84	144.06
2017	100.37	42.35	142.72
2018	96.06	39.49	135.55

Source : Directorate General of Oil and Gas

6.3.2 Natural Gas Production

(MMSCF)

Year	Associated	Non-Associated	Total
2008	472,897	2,412,431	2,885,328
2009	467,570	2,593,326	3,060,897
2010	471,507	2,936,086	3,407,592
2011	472,552	2,783,827	3,256,379
2012	405,465	2,769,175	3,174,639
2013	352,561	2,768,277	3,120,838
2014	304,693	2,871,098	3,175,791
2015	376,669	2,739,473	3,116,142
2016	467,813	2,602,426	3,070,239
2017	497,079	2,466,105	2,963,184
2018	577,270	2,419,532	2,996,802

Source : Directorate General of Oil and Gas

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6.3.3 Natural Gas and LNG Supply and Demand

Year	Natural Gas Production	Gas Lift and Reinjection	Flare	Net Production of Natural Gas	Own Use	Utilization		Utilization							Export LNG
						LNG Plant		LPG Plant	Refinery	City Gas[1]	LNG Domestic	Indus-try[2]	Electri-city	Export Pipeline Gas	
	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)		(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(Ton)
2008	2,885,328	154,890	113,701	2,616,737	143,252	1,270,854		13,196	29,727	2,718	n.a	623,616	221,236	234,964	20,579,632
2009	3,060,897	154,800	172,922	2,733,174	175,024	1,221,502		17,806	35,566	4,790	n.a	654,428	231,521	294,109	19,932,902
2010	3,407,592	174,844	184,893	3,047,855	205,378	1,427,917		20,866	34,038	6,115	n.a	635,361	269,003	333,993	24,184,380
2011	3,256,379	185,997	179,460	2,890,922	198,463	1,293,151		14,289	37,476	7,896	n.a	666,195	248,871	335,510	21,971,547
2012	3,174,639	191,886	230,353	2,752,401	189,384	1,019,569		28,141	39,782	9,896	37,091	685,751	289,424	358,325	18,212,204
2013	3,120,838	156,154	237,295	2,727,389	217,416	1,040,992		26,647	38,866	8,669	58,610	689,312	302,958	335,164	19,250,004
2014	3,175,791	176,267	311,614	2,687,910	219,652	978,978		29,757	41,992	8,974	76,989	683,177	319,491	342,669	18,186,393
2015	3,116,142	168,045	273,402	2,674,695	214,306	919,723		24,801	47,384	1,015	106,066	687,560	305,484	306,679	19,071,196
2016	3,070,239	170,421	262,773	2,637,045	202,571	913,303		24,805	105,138	1,796	151,329	562,243	337,055	282,741	20,228,742
2017	2,963,184	182,030	229,128	2,552,026	212,108	841,862		22,418	50,033	2,167	146,909	627,499	297,649	272,356	19,220,548
2018	2,996,802	163,226	270,762	2,562,814	222,365	968,994		29,842	42,322	3,065	147,894	672,298	263,534	261,180	19,060,681

Source : Directorate General of Oil and Gas
Note : [1]) Since 2011, city gas sales include small customer but exclude commercial industry
[2]) Since 2011, Industry include commercial industry

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6.3.4 City Gas Sales and Utilization

Year	Sales (Million m^3)				Number of Customer		Number of Customer			
	Household	Industry and Commercial	Transporta-tion	Total	Household		Small Customer[1)]	Commer-cial Industry[2)]	Commer-cial[1)]	Total
2008	20	5,693	12	5,725	82,123		n.a	1,099	1,498	84,720
2009	19	8,034	11	8,065	83,519		n.a	1,180	1,593	86,292
2010	20	8,431	29	8,481	85,326		n.a	1,216	1,592	88,134
2011	18	4,997	27	5,043	86,167		n.a	1,246	1,641	89,054
2012	21	5,212	23	5,256	87,437		n.a	1,253	1,674	90,364
2013	19	5,159	28	5,206	88,613		1,395	1,582	n.a	91,590
2014	18	5,302	31	5,351	92,858		1,405	1,786	n.a	96,049
2015	18	4,765	37	4,820	107,690		1,480	1,906	n.a	111,076
2016	22	4,638	31	4,690	127,246		1,500	2,081	n.a	130,827
2017	28	4,708	14	4,749	192,489		1,490	2,242	n.a	196,221
2018	32	4,939	35	5,007	218,583		1,470	2,290	n.a	222,343

Source : PT. PGN (Persero)
Note : [1]) Changing category of customer from Commercial to Small Customer since 2013
[2]) Changing names of Commercial to Small Customer Since 2013

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6.4.1 Power Plant Installed Capacity

(MW)

Year	On Grid									On Grid							Sub Total
	Hydro PP[1)]	Steam PP	Gas PP	Combined Cycle PP	Geothermal PP[1)]	Diesel PP[2)]	Gas Engine PP	Wind PP[1)]		Mycro Hydro PP [1)]	Mini Hydro PP [1)]	Solar PP [1)]	Coal Gasification PP	Waste PP [1)]	Biogas PP [1)]	Biomass PP [1)]	
2008	3,690.80	12,294.00	3,068.97	8,009.97	1,052.00	3,272.98	66.84	0.26		0.69	6.03	0.00	0.00	0.00	0.00	0.00	31,462.54
2009	3,694.95	12,594.00	3,135.88	8,009.97	1,189.00	3,256.36	71.00	1.06		0.69	6.03	0.00	0.00	0.00	0.00	0.00	31,958.94
2010	3,719.69	12,981.50	3,821.57	7,590.32	1,189.00	4,569.89	92.84	0.34		0.69	13.53	0.19	0.00	0.00	0.00	0.00	33,979.56
2011	3,880.83	16,318.00	4,236.02	8,480.97	1,226.00	5,471.93	169.54	0.93		5.93	57.66	1.16	41.00	26.00	0.00	0.00	39,915.97
2012	4,078.24	19,714.00	4,343.82	9,461.11	1,336.00	5,973.58	198.74	0.93		6.71	61.46	4.09	41.00	26.00	0.00	0.00	45,245.67
2013	5,058.87	23,812.53	4,389.08	9,852.21	1,343.50	5,935.00	448.12	0.63		29.69	77.05	9.02	6.00	26.00	0.00	0.00	50,987.69
2014	5,059.06	25,104.23	4,310.50	10,146.11	1,403.50	6,206.99	610.74	1.12		30.46	139.87	9.02	6.00	36.00	0.00	0.00	53,063.60
2015	5,079.06	27,229.73	4,310.50	10,146.11	1,438.50	6,274.79	818.74	1.12		30.46	151.17	9.02	6.00	36.00	0.00	0.00	55,531.20
2016	5,124.06	29,880.23	4,420.50	10,146.11	1,643.50	6,274.79	1,852.74	1.12		65.76	192.57	16.02	6.00	36.00	0.00	0.00	59,659.40
2017	5,124.06	30,208.23	4,420.50	10,146.11	1,808.50	6,278.79	2,406.97	1.12		65.76	260.32	17.02	6.00	36.00	12.80	0.90	60,793.08
2018	4,431.59	31,587.17	5,348.44	11,220.10	1,948.30	4,630.90	2,357.66	143.03		98.39	267.79	24.42	0.00	15.65	40.35	142.02	62,255.81

6.4.1 Power Plant Installed Capacity (Continued)

(MW)

Year	Off Grid							Off Grid						Grand Total
	Hydro PP	Micro Hydro PP	Mini Hydro PP	Solar PP + PV	Wind PP	Biomass PP		Biogas PP	Waste PP	Hybrid PP	Solar-Powered Street Lighting	Solar-Powered Energy Saving Lamp	Sub Total	
2018	938.00	6.38	0.00	28.20	0.48	1,616.52		68.26	0.00	3.58	0.00	7.58	2,668.99	64,924.80

Sources: 1. PLN Statistics - PT PLN (Persero)
2. Electricity Statistics - Directorate General of Electricity
3. Directorate General of New Renewable Energy and Energy Conservation

Note : [1]) Source from Directorat General of New Renewable Energy and Energy Conservation
[2]) Diesel PP includes captive power
[3]) As a result off - grid power plant inventory

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6.4.2 Power Plant Production

(GWh)

Year	PLN									PLN				
	Hydro PP	Geo-thermal PP	Solar PP	Diesel PP	Steam PP					Combined Gas-Steam PP	Gas PP	Gas Engine PP	Wind PP	Sub-Total
					Coal	Oil	Gas	Total						
2008	10,739.97	3,390.66	0.10	10,211.54	41,311.31	10,185.78	855.87	52,352.96		35,730.72	5,620.93	0.00	0.00	118,046.88
2009	10,306.91	3,504.47	0.10	10,431.81	43,137.63	9,030.99	795.22	52,963.84		34,746.69	8,674.48	0.00	0.00	120,628.30
2010	15,827.35	3,398.02	0.50	11,925.81	46,685.40	6,712.32	1,009.30	54,407.02		36,811.70	9,266.08	73.56	0.03	131,710.07
2011	10,315.55	3,487.39	0.72	16,125.11	54,949.55	6,382.67	1,003.02	62,335.23		40,409.68	10,017.71	48.00	0.00	142,739.38
2012	10,524.61	3,557.54	2.85	18,913.02	66,633.26	2,391.14	4,798.64	73,823.04		34,568.51	8,310.26	55.12	0.00	149,754.95
2013	13,013.95	4,345.09	5.48	18,919.32	75,192.74	1,054.86	5,602.06	81,849.66		36,492.63	8,957.86	381.75	0.00	163,965.74
2014	11,163.62	4,285.37	6.81	21,862.00	83,397.00	759.00	5,856.00	90,012.00		38,799.83	9,117.00	51.10	0.00	175,296.73
2015	10,004.86	4,391.55	5.28	18,858.61	85,191.37	11,419.14	145.56	96,756.07		39,316.00	5,907.05	1,232.81	0.00	176,472.22
2016	13,885.79	3,958.09	8.78	19,121.70	92,681.82	1,091.51	4,488.35	98,261.69		42,376.70	3,745.35	2,450.85	0.00	183,808.96
2017	12,425.12	4,095.98	5.84	16,452.79	101,333.33	285.33	4,159.01	105,777.68		38,468.46	4,117.20	81.91	0.00	181,424.98
2018	10,728.68	4,012.81	4.56	15,018.82	110,034.99	516.60	3,846.21	114,397.79		39,016.81	5,357.21	157.45	0.00	188,698.46

Source : 1. PLN Statistics - PT PLN (Persero)
2. Electricity Statistics - Directorate General of Electricity

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6.4.2 Power Plant Production (Continued)

(GWh)

Year	PLN Purchase from IPP & PPU									PLN Purchase from IPP & PPU						Total On Grid
	Hydro PP	Geo-thermal PP	Solar PP	Diesel PP	Steam PP					Combined Gas-Steam PP	Gas PP	Wind PP	Biogas PP	Waste PP	Sub-Total	
					Coal	Gas	Bio-mass	Total								
2008	788.28	4,918.37	0.00	427.97	20,182.03	89.69	55.13	20,326.85		3,591.46	1,336.46	0.27	0.00	0.00	31,389.66	149,436.54
2009	1,076.94	5,790.78	0.00	393.30	22,775.72	2.34	62.59	22,840.64		4,394.70	1,668.88	3.67	0.00	0.00	36,168.92	156,797.22
2010	1,628.87	5,958.91	0.02	368.66	21,791.67	98.92	94.72	21,985.30		6,512.40	1,618.39	3.61	0.00	0.00	38,076.16	169,786.23
2011	2,103.35	5,884.07	0.05	350.38	26,140.42	153.77	186.00	26,480.19		4,179.21	1,646.53	4.69	0.00	30.86	40,679.32	183,418.70
2012	2,274.50	5,858.86	0.16	279.05	35,533.00	133.64	237.77	35,904.41		4,519.47	1,691.13	4.61	0.00	30.86	50,563.05	200,318.00
2013	3,908.83	5,068.51	0.02	387.82	36,058.77	146.68	143.54	36,348.98		4,938.76	1,529.03	0.10	0.00	40.76	52,222.79	216,188.53
2014	3,997.67	5,753.33	0.00	417.84	36,135.01	137.02	205.23	36,477.26		4,980.82	1,595.46	0.00	0.00	35.54	53,257.93	228,554.66
2015	3,735.67	5,655.87	0.00	633.15	39,466.12	115.38	461.06	40,042.57		5,329.57	2,089.84	3.70	0.00	19.39	57,509.77	233,982.00
2016	4,791.10	6,697.87	12.31	585.82	42,698.51	128.73	584.09	43,411.34		5,831.68	2,767.14	5.69	0.00	5.92	64,102.95	247,911.91
2017	6,207.27	8,667.85	23.21	2,110.37	46,631.12	258.00	0.00	46,889.11		5,704.43	3,001.76	0.00	0.00	590.44	72,644.26	254,069.24
2018	6,098.70	10,005.97	15.43	2,409.82	49,977.88	241.67	0.00	50,219.55		4,945.77	3,881.94	187.98	38.89	622.46	78,426.53	267,124.99

Source : 1. PLN Statistics - PT PLN (Persero)
2. Electricity Statistics - Directorate General of Electricity

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6.4.2 Power Plant Production (Continued)

(GWh)

Year	Off Grid							Off Grid					Total Off Grid	Grand Total
	Hydro PP	Micro Hydro PP	Mini Hydro PP	Solar PP and PV	Wind PP	Biomass PP		Biogas PP	Waste PP	Hybrid PP	Solar-Powered Street Lighting	Solar-Powered Energy Saving Lamp		
2008	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	149,436.54
2009	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	156,797.22
2010	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	169,786.23
2011	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	183,418.70
2012	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	200,318.00
2013	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	216,188.53
2014	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	228,554.66
2015	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	233,982.00
2016	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	247,911.91
2017	n.a	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	n.a	n.a	n.a	254,069.24
2018	4,785.30	23.54	0.00	56.20	2.10	11,325.07		478.37	0.00	5.33	4.61	9.73	16,690.26	283,815.24

Source : 1. PLN Statistics - PT PLN (Persero)
2. Electricity Statistics - Directorate General of Electricity

6.4.3 Import of Electricity

(GWh)

Year	Country of Origin	Micro Hydro PP
2008	-	-
2009	Malaysia	1.26
2010	Malaysia	2.22
2011	Malaysia	2.54
2012	Malaysia	2.99
2013	Malaysia	3.03
2014	Malaysia	8.99
2015	Malaysia	12.75
2016	Malaysia	692.70
2017	Malaysia	1,119.47
2018	Malaysia	1,495.89

Source : PLN Statistics - PT PLN (Persero)

6.4.4 Electricity Sales

(GWh)

Year	Electricity Sales / Tariff Segment							
	House-hold	Commer-cial	Industry	Street Lighting	Social	Govern-ment	Transpor-tation	Total
2008	50,184	22,845	47,969	2,761	3,082	2,096	81	129,019
2009	54,945	24,715	46,204	2,888	3,384	2,335	111	134,582
2010	59,825	27,069	50,985	3,000	3,700	2,630	89	147,297
2011	65,112	30,093	54,725	3,068	3,994	2,787	88	159,867
2012	72,133	30,880	60,176	3,141	4,496	3,057	108	173,991
2013	77,211	34,369	64,381	3,251	4,939	3,261	129	187,541
2014	84,086	36,128	65,909	3,394	5,446	3,484	155	198,602
2015	88,682	36,773	64,079	3,448	5,941	3,717	205	202,846
2016	93,635	39,852	68,145	3,498	6,631	4,022	223	216,004
2017	94,457	41,459	72,238	3,527	7,095	4,121	236	223,134
2018	97,832	43,753	76,947	3,627	7,781	4,403	274	234,618

Source : PLN Statistics - PT PLN (Persero)

6.4.5 National Electricity System Performance

Year	Average Thermal Efficiency	Capacity Factor	Load Factor	Peak Load	Trans-mission & Distribution Losses
	(%)	(%)	(%)	(MW)	(%)
2008	31.96	52.62	80.77	21,120	10.46
2009	29.95	53.71	76.37	23,438	9.93
2010	29.46	55.90	77.78	24,917	9.70
2011	29.23	55.67	78.53	26,665	9.41
2012	26.87	51.96	79.18	28,882	9.21
2013	27.18	54.72	80.04	30,834	9.91
2014	26.80	50.94	78.26	33,321	9.71
2015	26.92	50.53	80.02	33,381	9.77
2016	30.33	51.92	62.62	32,204	9.48
2017	27.02	51.98	74.93	38,797	9.75
2018	26.61	52.73	75.76	37,944	9.55

Source : 1. PLN Statistics - PT PLN (Persero)
2. Directorate General of Electricity

6.5.1 Geothermal Resources and Reserves

as of December 2018

(MW)

No	Location	Resources		Reserves			Total
		Speculative	Hypothetical	Possible	Probable	Proven	
1	Sumatera	2,776.00	1,689.00	3,889.00	1,083.00	1,028.00	10,465.00
2	Jawa	1,190.00	1,460.00	3,708.00	516.00	1,820.00	8,694.00
3	Bali	70.00	22.00	122.00	110.00	30.00	354.00
4	Nusa Tenggara	225.00	210.00	829.00	121.00	12.50	1,397.50
5	Kalimantan	151.00	18.00	13.00	0.00	0.00	182.00
6	Sulawesi	1,360.00	362.00	1,041.00	180.00	120.00	3,063.00
7	Maluku	560.00	91.00	497.00	6.00	2.00	1,156.00
8	Papua	75.00	0.00	0.00	0.00	0.00	75.00
Total		**6,407.00**	**3,852.00**	**10,099.00**	**2,016.00**	**3,012.50**	**25,386.50**

Source : Geological Agency

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6.5.2 Geothermal Power Plant Capacity 2018

(MWe)

No	Working Area	Location	IPB Owner		Turbine Capacity	Operator Steam Area	Operator PLTP	Total Capacity
1	PLTP Kamojang	West Java	PT Pertamina Geothermal Energy (PGE)		1 x 30 MWe	PGE	PLN	235.0
					2 x 55 MWe			
					1 x 60 MWe		PGE	
					1 x 35 MWe		PGE	
2	PLTP Lahendong	North Sulawesi	PT Pertamina Geothermal Energy (PGE)		4 x 20 MWe	PGE	PLN	120.0
					2 x 20 MWe		PGE	
3	PLTP Sibayak	North Sumatra	PT Pertamina Geothermal Energy (PGE)		1 x 10 MWe	PGE	PT Dizamatra Powerindo	12.0
					2 MWe (Monoblock)			
4	PLTP Salak	West Java	PT Pertamina Geothermal Energy (PGE)		3 x 60 MWe	CGS	PLN	376.8
					3 x 65.6 MWe		SEGS	
5	PLTP Darajat	West Java	PT Pertamina Geothermal Energy (PGE)		1 x 55 MWe	CGI	PLN	270.0
					1 x 94 MWe		SEGD II	
					1 x 121 MWe		SEGD II	
6	PLTP Wayang Windu	West Java	PT Pertamina Geothermal Energy (PGE)		1 x 110 MWe	SE	SEGWWL	227.0
					1 x 117 MWe			
7	PLTP Dieng	Central Java	PT Geo Dipa Energy (GDE)		1 x 60 MWe	GDE	GDE	60.0
8	PLTP Ulubelu	Lampung	PT Pertamina Geothermal Energy (PGE)		2 x 55 MWe	PGE	PLN	220.0
					2 x 55 MWe			
9	PLTP Ulumbu	NTT	PT PLN (Persero)		4 x 2.5 MWe	PLN	PLN	10.0
10	PLTP Mataloko	NTT	PT PLN (Persero)		1 x 2.5 MWe	PLN	PLN	2.5
11	PLTP Patuha	West Java	PT Geo Dipa Energy (GDE)		1 x 55 MWe	GDE	GDE	55.0
12	PLTP Sarulla	North Sumatra	PT Pertamina Geothermal Energy (PGE) and Joint Operation Contract (JOC) Sarulla Operation Limited (SOL)		3 x 110 Mwe	SOL	SOL	330.0
13	PLTP Karaha	West Java	PT Pertamina Geothermal Energy (PGE)		1 X 30 Mwe	PGE		30.0
							Total	**1,948.3**

Source : Directorate General of New Renewable Energy and Energy Conservation

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6.5.3 Geothermal Steam Production

(Thousand Tonnes Geothermal Steam)

Year	Pertamina Field						KOB Field			KOB Field			PT PLN (Persero) Field			PT Geo Dipa Energy Field			Total
	Kamojang	Sibayak	Lahendong	Ulubelu	Karaha	Sub Total	Salak	Darajat		Wayang Windu	Sarulla	Sub Total	Ulumbu	Mataloko	Sub Total	Dieng	Patuha	Sub Total	
2008	12,099.52	288.76	2,349.48	0.00	0.00	14,737.76	24,481.94	13,487.50		6,665.06	0.00	44,634.49	0.00	0.00	0.00	1,644.16	0.00	1,644.16	61,016.41
2009	12,612.26	497.92	2,664.55	0.00	0.00	15,774.72	24,538.21	13,977.25		12,989.35	0.00	51,504.81	0.00	0.00	0.00	780.46	0.00	780.46	68,059.99
2010	12,446.13	548.41	2,964.18	0.00	0.00	15,958.73	24,271.62	14,264.43		13,675.17	0.00	52,211.22	0.00	0.00	0.00	1,221.30	0.00	1,221.30	69,391.25
2011	12,470.00	310.00	2,510.00	0.00	0.00	15,290.00	24,673.07	14,131.34		13,523.00	0.00	52,327.42	0.00	0.00	0.00	1,106.00	0.00	1,106.00	68,723.42
2012	10,878.38	160.36	3,261.67	1,393.11	0.00	15,693.53	24,513.43	14,282.79		13,232.81	0.00	52,029.02	0.00	0.00	0.00	1,047.18	0.00	1,047.18	68,769.73
2013	11,255.70	238.67	3,840.63	5,574.85	0.00	20,909.85	23,728.31	10,678.23		13,378.14	0.00	47,784.67	253.18	0.00	253.18	347.93	0.00	347.93	69,295.63
2014	10,488.89	183.98	4,138.17	6,174.10	0.00	20,985.14	24,306.89	13,856.26		13,143.32	0.00	51,306.47	261.41	0.00	261.41	205.10	839.91	1,045.01	73,598.03
2015	11,974.08	0.37	4,692.81	6,044.08	0.00	22,711.33	24,754.95	13,916.10		7,850.24	0.00	46,521.29	382.28	41.18	423.47	1,769.57	2,837.43	4,607.00	74,263.08
2016	12,678.72	0.00	3,294.50	6,718.31	0.00	22,691.53	24,575.45	13,952.11		13,612.64	0.00	52,140.19	339.28	0.00	339.28	1,392.69	3,153.18	4,545.87	79,716.86
2017	12,522.29	0.00	6,058.61	10,187.28	0.00	28,768.19	24,654.81	13,871.36		13,526.42	4,876.71	56,929.30	609.62	0.00	609.62	2,834.79	2,947.29	5,782.08	92,089.19
2018	14,305.25	0.00	5,524.55	9,923.05	1,333.60	31,086.45	24,819.55	12,721.60		13,221.54	13,593.39	64,356.08	544.90	0.00	544.90	2,510.60	2,966.89	5,477.49	101,464.93

Source : Directorate General of New Renewable Energy and Energy Conservation

6.6.1 Biofuel Industry Capacity in 2018

(KL)

Province	Biodiesel	Bioethanol
Banten	12,000	0
West Java	857,699	0
East Java	2,228,736	40,000
Bali	360	0
Riau	4,528,735	0
Batam	0	0
North Sumatera	1,773,563	0
South Sumatera	885,058	0
West Sumatera	35,000	0
West Kalimantan	0	0
East Kalimantan	419,540	0
Central Kalimantan	402,299	0
South Kalimantan	440,517	0
North Sulawesi	475,862	0
TOTAL	**12,059,369**	**40,000**

Source : Directorate General of New Renewable Energy and Energy Conservation

6.6.2 Biodiesel & Biogas Supply

(Thousand KL)

Year	Production (Thousand KL)	Export (Thousand KL)	Domestic (Thousand KL)	Biogas (m^3)
2008	n.a	n.a	n.a	n.a
2009	190	70	119	n.a
2010	243	20	223	n.a
2011	1,812	1,453	359	n.a
2012	2,221	1,552	669	n.a
2013	2,805	1,757	1,048	n.a
2014	3,961	1,629	1,845	n.a
2015	1,653	329	915	n.a
2016	3,656	477	3,008	n.a
2017	3,416	187	2,572	n.a
2018	6,168	1,793	3,750	25,700

Source : Directorate General of New Renewable Energy and Energy Conservation

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ANNEX

METHODOLOGY AND TABLE EXPLANATION

GENERAL METHODS

Data shown in the tables of Indonesia's energy and economic statistics are consolidated from various statistics of regular publication. The data are harmonized in format and definition as well as cover an estimate of energy demand calculated by using the macro-economic approach. These data are sourced from the statistics published by Statistics Indonesia, technical units within the Ministry of Energy and Mineral Resources, energy companies, energy associations, and some international agencies.

Statistics books used as the sources of the energy and economic data consolidation are as follows:

a. Crude Oil and Oil Products
   - Indonesia's Oil and Gas Statistics, Directorate General of Oil and Gas

b. Natural Gas (Production, utilization, and flaring)
   - Indonesia's Oil and Gas Statistics, Directorate General of Oil and Gas
   - PT PGN Annual Report

c. Coal
   - Indonesia's Coal Statistics, Directorate General of Mineral and Coal
   - Indonesia's Mineral and Coal Statistics, Directorate of Mineral and Coal Enterprises

d. Biomass
   - National Survey on Social & Economic Issues (*Survei Sosial dan Ekonomi Nasional.* SUSENAS) Statistics Indonesia, 1993, 1996, 1999, 2002

e. LPG
   - Indonesia's Oil and Gas Statistics, Directorate General of Oil and Gas

f. Electricity
   - PLN Statistics
   - Statistics of Electricity, Directorate General of Electricity

g. General
   - Indonesia Statistics, Statistics Indonesia
   - Finance and Economic Statistics, Bank Indonesia (www.bi.go.id)
   - Trade Statistics, Ministry of Trade

h. Renewable Energy
   - Renewable Energy Statistics, Directorate General of New Renewable Energy and Energy Conservation

TABLE 2: ENERGY BALANCE TABLE

Energy balance table is a table of energy input-output system. The rows indicate the activities of an energy commodity which consist of four main elements, namely primary energy activity, transformation, own use & losses, and energy consumption, while the columns indicate the types of energy. Energy balance is presented to fully depict the energy activities in a region.

ENERGY BALANCE

DEFINITIONS BY COLUMN

Each column of the energy balance table represents one type of energy. It begins from the left with renewable energy, followed by solid energy, gaseous energy, liquid energy, and electricity.

RENEWABLE ENERGY

Hydropower is energy derived from flowing water. Hydropower plants consist of two basic configurations: with dams and reservoirs, or without. Hydropower dams with a large reservoir can store water over short or long periods to meet peak demand. The amount of hydro energy required to generate electricity is equivalent to that of fossil energy to do the same.

Geothermal energy is good energy produced from the magma inside the earth in the volcanic areas. The hot and high pressure steam emitted from the production well head can be utilized to propel the steam turbine in a geothermal power plant or be used directly for drying agriculture products.

Solar power is the conversion of energy from sunlight into electricity, either directly using photovoltaics (PV), indirectly using concentrated solar power, or a combination of both. Concentrated solar power systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. Photovoltaic cells convert light into an electric current using the photovoltaic effect. The amount of solar energy required to generate electricity is equivalent to that of fossil energy to do the same.

Wind power is the use of air flowing through wind turbines to provide the mechanical power to turn electric generators and, traditionally, to do other work like milling or pumping. Wind power is, as an alternative to burning fossil fuels, plentiful, renewable, widely distributed, and clean. It produces no greenhouse gas emissions during operation, consumes no water, and uses little land. The net effects of wind power on the environment are far less problematic than those of fossil fuel sources. The amount of wind energy required to generate electricity is equivalent to that of fossil energy to do the same.

Other renewable energy is generally used in small-capacity power plants, for example biomass power plants (PLTBm), biogas power plants (PLTBg), waste power plants (PLTSa), and hybrid power plants. PLTBm is a thermal power plant that uses fuel wood as primary energy, while PLTBg uses oil palm waste and livestock manure as primary energy, and PLTSa uses waste. The amount of other renewable energy required to generate electricity is equivalent to that of fossil energy to do the same.

Solar-powered energy-saving lamp (*Lampu Tenaga Surya Hemat Energi*/ LTSHE) is a lighting device in the form of integrated lights with batteries whose energy is sourced from photovoltaic solar power plants. The LTSHE works by capturing the energy from the sun in solar panels, converts the solar energy into electrical energy which is then stored in a battery. The electrical energy inside this battery is then used to turn on the lights. Meanwhile, solar-powered street lighting (*Penerangan Jalan Umum Tenaga Surya*/PJUTS) is a street lighting lamp that uses sunlight as the source of electrical energy.

Biomass is a renewable, organic material-based fuel. Biomass includes, among others, firewood (wood, wood waste, charcoal), agriculture wastes (rice hulls,

rice straw, palm fronds, coconut shell, etc.), urban solid waste, and industrial waste. The data of biomass consumption in the household sector has been calculated based on the approach of the National Socio-Economic Survey (*Survei Sosial Ekonomi Nasional* / SUSENAS) and the share of biomass use in the household sector.

SOLID ENERGY

Coal consists of hard coal and lignite. Data on the volume of coal is only available in aggregate number. In the energy balance table, the conversion factor used is the average of Indonesian coal calorific factor (4,276 BOE per Ton Coal). Detailed category and specification of coal available in Indonesia are as follows:

- **Hard coal is a type of coal that has a calorific value of more than 5,700** kcal/kg (23.26 MJ/kg). Hard coal consists of steam coal, coking coal, bituminous coal, and anthracite.
- **Steam coal is a type of coal that is used in boiler, steam generator and** furnace. This category includes anthracite and bituminous coal. Steam coal has a gross calorific value of more than 23,865.0 kJ/kg (5,700 kcal/kg), lower than that of coking coal.
- **Coking coal is a type of coal that is used to produce material that reduces** coke in blast furnace. Its gross calorific value is higher than 23,865 kJ/kg (5,700 kcal/kg), ash free. Sub-bituminous coal is a type of coal that has a gross calorific value between 17,435.0 kJ/kg (4,165 kcal/kg) and 23,865.0 kJ/kg (5,700 kcal/kg). Anthracite is a type of coal that has similar characteristics to those of steam coal.
- **Lignite is a type of coal that has a gross calorific value of less than 4,165** kcal/kg (17.44 MJ/kg) and volatile matter of more than 31%, dry basis. Lignite is often called low-rank coal or brown coal.
- **Coke is the product of high temperature carbonization of steam coal.** Coke is used as reducing agent in steel plants.
- **Briquettes is the fuel produced by briquetting sub-bituminous coal,** lignite, or peat through the process of carbonization or powdering. Briquette is more convenient to use and has better quality than its raw materials.

GASEOUS ENERGY

Gaseous energy includes natural gas and town gas. Natural gas generally consists of methane mined from underground accumulation, and associated gas from oil production, as well as coal bed methane. Town gas includes all kinds of gas, such as gas produced from carbonization process, gasification of petroleum oils, and chemical conversion of hydrocarbon fossil fuels.

LIQUID

Crude oil is a mineral oil consisting of a mixture of hydrocarbons with blackish green color and a range of density and viscosity. It is the raw material for producing oil fuels (*Bahan Bakar Minyak*/BBM) and petrochemical products.

Condensate is a kind of liquid hydrocarbon which includes Natural Gas Liquid (NGL). NGL consists of ethane, propane, butane, pentane, and natural gasoline.

OIL FUELS/Petroleum Products (BBM). The energy balance table contains petroleum products used for energy, namely Avgas, Avtur, Mo-gas (Motor gasoline), Gasoil, Marine Diesel Fuel (MDF/IDO), Fuel Oil, and Kerosene. Detailed description of each fuel is as follows:

Avgas (aviation gasoline) is aircraft fuel that consists of light hydrocarbons distilling between 100°C and 250°C. The distilled product contains at least 20% of the volume at 143°C.

Avtur is jet aircraft fuel which consists of hydrocarbon middle distillates having similar distillation and flash point characteristics as those of kerosene, with a maximum aromatic content of 20% of the volume. It has a freezing point of less than –47°C and octane number between 80–145 RON.

Mogas (motor gasoline) is a light hydrocarbon used in the internal combustion engine of motorized vehicles (excluding aircrafts). Mogas is distilled at a temperature between 35°C and 215°C and processed in Reformer, Catalytic Cracking, or Blending with aromatic fraction to achieve a high octane number. In the Indonesian markets, three gasoline types are available, namely RON 88, RON 92, and RON 95.

Diesel Oil is a refinery product containing heavy gasoil. This type of fuel is obtained from the lowest fraction of crude oil distilled at atmospheric pressure, while the heavy gasoil is obtained from the vacuum residue of crude oil distilled at atmospheric pressure. On the market, diesel oil is divided into Gasoil CN 48 (*Minyak Solar*) and Industrial Diesel Oil (IDO/*Minyak Diesel*). Fuel Oil (FO) is oil made from the distillation of residue. This type of fuel includes all kinds of residues including those from blending. FO has viscosity of about 10 cSt at SOT. Its flash point is higher than SOT and its density is more than 0.9.

Kerosene is the fuel produced from crude oil distillation having volatility between the volatility of gasoline and that of gasoil. It has a distillation range between 150°C and 300°C, where a minimum of 65% of the volume is distilled at 250°C. It has specific gravity of 0.8 and flash point of over 38°C.

LPG is light hydrocarbon fraction of crude oil, produced at oil refinery, consisting of either propane (C_3H_8) and butane (C_4H_{10}) or a mixture of both. In addition to oil refinery, LPG is also produced from natural gas purification.

Electricity is the electric power generated by various kinds of power plants, such as Hydro Power Plant (*Pembangkit Listrik Tenaga Air*/PLTA), Geothermal Power Plant (*Pembangkit Listrik Tenaga Panas Bumi*/PLTP), Solar Power Plant (*Pembangkit Listrik Tenaga Surya*/PLTS), Wind Power Plant (*Pembangkit Listrik Tenaga Bayu*/PLTB), Biomass Power Plant (*Pembangkit Listrik Tenaga Biomassa*/PLTBm), Biogas Power Plant (*Pembangkit Listrik Tenaga Biogas*/PLTBg), Waste Power Plant (*Pembangkit Listrik Tenaga Sampah*/PLTSa), Gas Power Plant (*Pembangkit Listrik Tenaga Gas*/PLTG), Gas Steam Power Plant (*Pembangkit Listrik Tenaga Gas Uap*/PLTGU), Coal Steam Power Plant (*Pembangkit Listrik Tenaga Uap*/PLTU), and Diesel Power Plant (*Pembangkit Listrik Tenaga Diesel*/PLTD), etc. The capacity data displayed in the table is in accordance with those stated in the power plant construction permit.

LNG (Liquefied Natural Gas) is the liquid produced by liquefying natural gas at a temperature of -160T to facilitate its transportation over very long distances.

Total is the sum of all columns in certain row. In the energy transformation row, the total of all columns indicates the efficiency of the transformation process.

DEFINITIONS BY ROW

Total Primary Energy Supply equals domestic production plus import minus export minus bunker and minus/plus stock change. Data on bunker and stock change are not available. Production refers to the total gross primary energy produced (extracted) from the earth. Import refers to the energy obtained from other countries, not including energy in transit. Export refers to the energy sold to other countries.

Domestic supply is defined as indigenous production + from other sources + imports – exports – international marine bunker – international aviation bunker ± stock change. Production is defined as the capture, extraction, or manufacture of fuel or energy in a form that is ready for general use.

ENERGY TRANSFORMATION

Transformation refers to the transformation process of primary energy into final energy. Transformation includes the processes in LPG plants, and carbonizing plants. Input has a negative sign while production has a positive sign.

Oil Refining refers to the processing of crude oil and condensate to produce oil fuels such as naphtha, avgas, avtur, gasoil, IDO, mogas, kerosene, fuel oil, LPG, etc. The consumption of energy such as natural gas and naphta is also included.

Gas Processing (at LNG plants and LPG plants) refers to the process of liquefaction or purification of natural gas to produce LNG or LPG.

Power Generation is the transformation of energy into electric power. The row records the quantity of consumed fuels (coal, oil fuels, natural gas, hydropower, geothermal power, biomass, wind, photovoltaic (solar energy), biogas, waste, etc.) and the amount of electricity generated which includes

the electricity from on-grid and off-grid systems. The data on electricity production from off-grid power plants are obtained through a data capacity approach. In 2018, data on production and electricity capacity from off-grid power plants emerged as a result of off-grid power plant inventory with the aim of calculating the national energy mix.

Biofuel Blending is the quantity of liquid biofuels which are not delivered for the final consumption but are instead used by other petroleum products as reported in the oil questionnaire.

LNG Regasification is a process of converting Liquefied Natural Gas (LNG) at a temperature of -162°C back to natural gas at atmospheric temperature.

OWN USE AND LOSSES

Own Use and Losses include own uses and losses in primary energy production and transformation processes.

- **Losses in Production are losses that occur due to transportation,** distribution, and transfer by pipe. Own use in Production includes all energy consumed in the field (off-road transportation, genset, boiler, etc.), while all energy consumed in transportation is computed in the Transportation Sector.
- **Losses in Oil Refining are losses that occur due to transportation,** distribution, and transfer by pipe. Own use in Oil Refining is all energy consumed in the oil refining processes.
- **Losses in Gas Processing are losses that occur due to transportation,** distribution, and transfer by pipe. Own use in Gas Processing is all energy consumed in the gas processing.
- **Losses in Electricity System are losses occurred in transformer,** transmission, and distribution network.
- **Own use in Electricity Generation is all energy consumed within a power** plant area.

Statistical Difference is the difference between net supply (production + import – export – transformation input + transformation production – own use and losses) and total final consumption (household, commercial, industry, and transportation).

FINAL ENERGY CONSUMPTION

Total Final Energy Consumption is the quantity of energy consumption by household, commerce, industry, and transportation sectors as well as non-energy consumption.

Household consumption refers to all energy consumption by households, excluding consumption by private cars.

Commercial consumption refers to the energy consumption by commercial units such as the markets, hotels, restaurants, financial institutions, government agencies, schools, hospitals, etc.

Industry consumption refers to the energy consumption by the following industrial subsectors (excluding transportation): iron and steel, chemical, non-iron metal, non-metal production, machine and equipment, non-energy mining and quarrying, food, paper, wood, petrochemical, textile, etc.

Transportation consumption refers to the energy consumption by all transportation activities in all economic sectors. Transportation subsectors are air transportation, land transportation (motor-cycles, cars, buses, and trucks), ferries, and railway transportation. The consumption by the fishery, construction, and mining subsectors is also included in the transportation consumption.

Non-energy consumption refers to the energy consumption for non-energy uses, such as hydrocarbons or coal used as lubricating oils or raw materials (naphtha, natural gas, and cokes), and gas used as raw material for petrochemical products (methanol and ammonia/urea).

02

ANNEX

GLOSSARY

Avgas
Aviation gasoline; special high-octane gasoline for aircraft reciprocating engines; has high stability, low freezing point, and a rather flat distillation curve.

Avtur
Aviation turbine fuel; special fuel for turbine/jet aircraft; special kerosene with a distillation range of 150°C - 250°C.

Biomass
Collective name for firewood, agriculture waste (rice husks, rice stems, palm fronds, coconut shells), black liquor, wood chips, wood barks.

BOE (Barrel Oil Equivalent)
Calorific equivalent of a barrel of crude oil.

Captive Power Plant
A power plant owned by an industry to produce electricity for its own use.

Coal
Sedimentary rocks originated from piles of wood since millions of years ago.

Coal Transformation
Processing of coal (coking coal, steam coal, sub-bituminous coal, and lignite) to produce coke, blast furnace gas, and briquette.

Commercial
A group of energy consumers which uses energy for lighting, air conditioning, mechanical equipment, cooking appliance, and water heating, but not including consumption for vehicles/ transportation. Energy consumers included in this group are commercial and general businesses, such as market, hotel, restaurant, financial institution, government agency, school, hospital, etc.

Condensate
Liquid extracted from natural gas; may be in the form of liquid petroleum gas or natural gasoline.

Conversion Factor
Factors used to convert physical units, such as liter, barrel, ton, and cubic meter, to energy units, such as Joule, BTU, ton coal equivalent (TCE), or barrel or ton oil equivalent (BOE or TCE).

Crude Oil
A mixture of hydrocarbons occurring in liquid phase in the subsurface reservoir and one that remains liquid under atmospheric pressure.

Diesel Oil
A refinery product which contains heavy gasoil, and available as gasoil CN 48 or Industrial Diesel Oil (IDO).

DPPU
Depo Pengisian Bahan Bakar Pesawat Udara (Aircraft Refueling Depot), a depot serving avgas and avtur for aircraft consumption.

Electricity
Electric power generated by electric power plants, such as Hydro Power Plant (PLTA), Geothermal Power Plant (PLTP), Solar Power Plant (PLTS), Wind Power Plant (PLTB), Gas Power Plant (PLTG), Gas Steam Power Plant (PLTGU), Coal Steam Power Plant (Coal PLTU), Diesel Power Plant (PLTD), etc.

Energy Balance Table
The energy system's input-output table; the rows indicate the activities of an energy commodity which consists of four main elements, namely primary energy, transformation, own use & losses, and energy consumption. The columns indicate the type of energy commodity.

Final Energy
Energy which can be directly consumed by user.

Final Energy Consumption
Energy consumption of the four sectors of energy consumers, namely household sector, commercial sector, industry sector, and transportation sector as well as the consumption of energy as raw material and reduction agent. In compiling the Energy Planning of Riau, the household sector is combined with the commercial sector due to the limited data obtained.

Final Stock
Total stock at the end of the year.

Fuel Oil
The lowest order of refinery product; heavy distillate, residue, and their mixture which are used as the fuel in industrial furnace and electric power plant.

Gasoil CN 48
A type of diesel oil with Cetane Number 48 used as the fuel for high-speed diesel engine.

Gasoline
(see mogas)

Gas Process
At LNG plant or LPG plant; liquefaction or purification process to produce LNG and LPG.

GDP at Constant Price
Added value of goods and services computed on the basis of prices in a certain year.

GDP, Nominal (based on current price)
Added value of goods and services computed on the basis of prices in each year.

Goods and Services Export
All transfer and sale of goods and services from a resident of a country to a resident of another country, including those conducted in the same country or in another country. Value of goods export is based on FOB.

Government Consumption
Expenditures for employee expenses, depreciation and purchase of goods and services (including travel expenses, maintenance and other routine expenditures), spent by central government or regional governments, but excluding revenue from the production of goods and services.

Household
A group of energy consumers which uses energy for cooking, lighting, and household appliances, but excluding energy consumption for private cars.

Hydropower
Hydropower is energy derived from flowing water. Hydropower plants consist of two basic configurations: with dams and reservoirs, or without. Hydropower dams with a large reservoir can store water over short or long periods to meet peak demand.

Import
Purchase from other countries, excluding goods in transit.

Industrial Diesel Oil (IDO)
A type of diesel oil used as fuel in low or medium-speed industrial diesel engine (and marine engine).

Industry
A group of energy consumers which uses energy for industrial processes, such as steam boiling, direct heating, lighting, and the driving force of mechanical equipment, but does not include the energy used for electricity generation by industries; such as iron and steel, chemical, non-iron metal, non-metal production, food, paper, wood, construction, textile etc.

Initial Stock
Total stock at the beginning of the year.

International Bunker
The energy consumption for international shipping; supplied to international ships for all ships bearing any flag.

Kerosene
A type of oil fuel produced from distillation process; its volatility lies between the volatility of motor gasoline (mogas) and that of diesel oil; used as fuel for lighting, kitchen stove, and outboard engine.

Losses in Electricity Generation
Losses that occur in transformer, transmission, and distribution network.

LPG
Liquefied Petroleum Gas; light hydrocarbons from crude oil; produced from oil refinery process or purification process of natural gas; consisting of either propane (C_3H_8) and butane (C_4H_{10}) or a mixture of both.

LNG Regasification
A process of converting Liquefied Natural Gas (LNG) at -162°C temperature back to natural gas at atmospheric temperature.

LSWR
Low Sulphur Waxy Residue; a by-product of oil refining.

Mogas
Motor gasoline; light hydrocarbon oil used in internal combustion engine, except aircraft engine; available in the market as gasoline RON 88, gasoline RON 90, gasoline RON 92, and gasoline RON 95.

Natural Gas
All kinds of hydrocarbon gas produced from wells; a mixture of hydrocarbon gas and vapor occurring naturally which main components are methane, ethane, propane, butane, pentane, and hexane; mined from underground accumulation either directly or as associated gas in oil mining.

Natural Gas Liquid
(see Condensate)

Non-energy Consumption
Non-energy consumption includes consumption of lubricating oil, raw material for petrochemical industry (naphtha, natural gas, and coke), and gas consumed as chemical raw materials (methanol and ammonia/urea).

Non-renewable Energy
Energy which reserves cannot be brought back into original condition; generally consists of fossil energy.

Oil Refinery
Crude oil or condensate processing unit to produce oil fuels, such as naphtha, avgas, avtur, gasoil CN 48, IDO, mogas, kerosene, fuel oil, LPG, etc.

Other Oil Products (OOP)
Other refinery products, such as naphtha, lubricating oil, bitumen, paraffin, etc. (sulphur, grease).

Own Use and Losses
A category that includes energy losses and the energy used in primary energy production field and in each transformation.

Own Use in Electricity Generation
Own use refers to the amount of energy consumed in power plant and in the transmission and distribution sub-stations.

Own Use and Losses in Gas Processing
Losses that occur due to transportation, distribution, and transfer by pipe. Own use refers to the amount of energy consumed in gas processing.

Own Use and Losses in Oil Refinery
Losses that occur due to transportation, distribution, and transfer by pipe. Own use refers to the amount of energy consumes in oil refinery processes.

Own Use and Losses in Production Field
Losses that occur due to transportation, distribution, and transfer by pipe. Own use refers to the amount of energy consumed in production field.

PLN Power Plant
Electric power plant owned by PT PLN (Persero) to produce electricity for sale to the public.

Primary Energy
Energy in its original form extracted by means of mining, dam, or renewable energy utilization.

Private Sector Power Plant
Power plant owned by private sector to produce electricity for sale to the public. Known as Independent Power Producer (IPP).

Production
Total gross primary energy extracted/produced.

Renewable Energy
Energy which reserve can be brought back into original condition.

SBM
(see BOE)

Secondary Energy
Energy which has undergone transformation process into other form of energy.

SPBU
Stasiun Pengisian BBM Umum, public oil fuel refueling station, which sells gasoline (RON 88, RON 90, RON 92, and RON 95) and gasoil (CN 48).

Solar-Powered Energy Saving Lamp
A lighting device in the form of integrated lights with batteries whose energy is sourced from photovoltaic solar power plants.

Solar-Powered Street Lighting
A street lighting lamp that uses sunlight as a source of electrical energy.

Statistical Difference
Difference between net supply (production + import – export – international bunker – stock change – consumption for transformation + production from transformation – own use – losses) and total final consumption.

Stock Change
Difference between the stock in the beginning and at the end of the year. Stock decrease in energy balance is shown by positive sign which means there is an increase in supply, while stock increase is shown by negative sign which means there is a decrease in supply.

Sub-bituminous coal
A type of coal which has calorific value of 5,000–6,000 kcal/kg.

Total Energy Balance
Total of all columns in a certain row. In transformation row, the total of columns indicates efficiency of the transformation process.

Total Final Energy Consumption
Sum of energy consumption in the following sectors: household, commercial, industry, transportation, and non-energy consumption.

Total Primary Energy Supply
Local production plus import less export less bunker and less or plus stock change.

Transportation
A group of energy consumers which uses energy for transportation vehicles.

03

ANNEX

CONVERSION FACTOR

Energy	Original Unit	Multiplier Factor to BOE (Barrel Oil Equivalent)
Coal		
Anthracite	Ton	4.9893
Imported Coal	Ton	4.2766
Kalimantan Coal	Ton	4.2000
Ombilin Coal	Ton	4.8452
Tanjung Enim Coal	Ton	3.7778
Lignite	Ton	3.0649
Riau Peat	Ton	2.5452
Briquette	Ton	3.5638
Biomass		
Charcoal	Ton	4.9713
Firewood	Ton	2.2979
Natural Gas	MSCF	0.1796
Gas Products		
City Gas	Thousand KCal	0.0007
CNG	Thousand KCal	0.0007
LNG	Ton	8.0532
LNG	MMBTU	0.1796
LPG	Ton	8.5246

CONVERSION FACTOR (continued)

Energy	Original Unit	Multiplier Factor to BOE (Barrel Oil Equivalent)
Oil		
Condensate	Barrel	0.9545
Crude Oil	Barrel	1.0000
Oil Fuel		
Aviation Gasoil (Avgas)	Kilo Liter	5.5530
Aviation Turbine Gas (Avtur)	Kilo Liter	5.8907
Super TT	Kilo Liter	5.8275
Premix	Kilo Liter	5.8275
Premium	Kilo Liter	5.8275
Kerosene	Kilo Liter	5.9274
ADO	Kilo Liter	6.4871
IDO	Kilo Liter	6.6078
FO	Kilo Liter	6.9612
Oil Products		
Other Oil Products	Barrel	1.0200
Refinery Fuel		
Refinery Fuel Gas (RFG)	Barrel	1.6728
Refinery Fuel Oil (RFO)	Barrel	1.1236
Feed Stock	Barrel	1.0423
Electric Power	MWh	0.6130

Source : Neraca Energi 1990-1994, Department of Mining and Energy

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