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Indonesia

Biofuels Annual

2010

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Report Highlights:

Indonesia's biofuel production increased from 0.3 million liters of bioethanol and 24 million liters of biodiesel in 2006 to 1 million liters of bioethanol and 400 million liters of biodiesel in 2010. The increase in production, however, is considered low as it accounts for only 9.4 percent of country's biofuel production capacity at nearly 4,500 million liter per year.

Post:

Jakarta

Executive Summary:

At the supply side, Indonesia's biofuels production capacity has shown significant progress, as can be seen from the increase in biodiesel plant capacity. This capacity increased from nearly 215 million liters in 2006 to current levels of nearly 4,300 million liters per year. Installed capacity of bioethanol plants also increased from 10 million liters in 2006 to current levels of 153 million liters per year.

While the use of biofuels is mandatory under Ministry of Energy and Mineral Resources (MEMR) Decree No. 32/2008, and many supporting policies have been enforced by the Government of Indonesia (GOI), the sales performance of Indonesian biofuels is relatively weak. This results in under utilization of Indonesia's biofuels production plants, which currently run at 9.3 percent of capacity for biodiesel and 13 percent for ethanol. Prolonged price disagreement between PERTAMINA and bioethanol producers as well as a failure to convince European Biofuel Board that Indonesian palm oil can satisfy EU's requirement on minimum carbon saving rate, will continue limiting Indonesian biofuel production growth.

In August 2010, a new Directorate General of New and Renewable Energy at the Ministry of Energy of Mineral Resources (MEMR) was established. Post expects that his office will push for more progressive program to boost domestic biofuels consumption. If the program runs well, we may see an increase in the use of Indonesian biofuel plants over the next five years.

Policy and Programs:

GOI has enacted and implemented several policies and programs aim at promoting biofuel development in Indonesia (*Dillon, HS; Laan, Tara; and Dillon, HS: 2008*).

- The government developed a strategic plan for energy security, announced in 2006 as the National Energy Policy (Presidential Regulation No. 5/2006). The National Energy Policy envisages liquid biofuels meeting at least five percent of domestic energy needs by 2025.
- In July 2006, the government developed a policy regime, to be known as Losari Concept, to increase biofuel production in support of its energy-security plans. As part of this plan, the MEMR announced that Indonesia intended to meet 10 percent of transport fuel usage with biofuels by 2010. The biofuels would be made from cassava, sugarcane, palm oil and castor oil. In relation to biodiesel, MEMR estimates that Indonesia's transport sector consumes around 15 billion liters of diesel. If 10 percent of this consumption was comprised of biodiesel, around 1.5 billion liters of the biodiesel would be required.
- To implement the objectives of the National Energy Policy and the Losari Concept, President Yudhoyono tasked selected cabinet members with duties to promote biofuels as alternatives to petroleum fuels (Presidential Decree No.10/2006 on Establishment of National Team for Biofuel Development, July 2006).
- GOI also announced in 2008 that it would provide special incentives for the biofuel investors, including:
 - A reduction in stamp duties;
 - Agreements with 50 countries to avoid double taxation;
 - Relief from import duties for goods used in the production of biofuels;

- An investment tax allowance in the form of a reduction in taxable income by a value equal to up to 30 percent of the realized investment spread over six years;
 - Accelerated depreciation and amortization;
 - A loss-carried-forward facility for a period of no more than 10 years;
 - A 10 per cent income tax on dividends, possibly lower if stipulated in the provisions of an existing applicable tax treaty; and
 - An exemption from the Value Added Tax for selected strategic goods.
- On 9 January 2007, the MEMR co-hosted an event in Jakarta, known as the Joint Initiative for Biofuel Development, at which 67 agreements for biofuel development were signed. Few of these projects were implemented, as escalating feedstock prices in 2007 and early 2008 made biofuel production increasingly unprofitable.
 - MEMR Decree No. 32/2008 that makes biofuel consumption mandatory, commencing in 2009. The ministerial decree states that a licensed biofuel entity that is performing the obligations for mandatory biofuel consumption may be given fiscal and non-fiscal incentives.
 - Presidential Decree No. 45/2009 declares that the government will guarantee provision and distribution of biofuel in Indonesia. The decree also states that the market price index of biofuel will be set by Ministry of Energy & Mineral Resources.
 - MEMR Decree 0219 K/12/MEM/2010 on the determination of biofuel market price index. Bio-diesel benchmark price is the export benchmark price of fatty acid methyl ester. Bio-ethanol benchmark price is Argus ethanol price (FOB Thailand) plus 5 percent.
 - In August 2010, the Government of Indonesia established a Directorate General of New & Renewable Energy under the MEMR. One of the new DG's primary objectives is to develop strong Indonesian biofuel production and consumption.

Bioethanol and Biodiesel:

Production

Prior to 2006, the only production of ethanol was for industrial purposes, such as the production of cosmetics, paint, and pharmaceuticals. After the enactment of Presidential Regulation No. 5/2006, mandating the use biofuels at 5 percent of domestic energy needs by 2025, the country began producing bioethanol at 0.3 and 1 million liter in 2006 and 2007 respectively. Bioethanol production continues rising to 1.2 and 1.72 million liters in 2008 and 2009 respectively, as the MEMR enacted Ministerial Decree No. 32/2008 specifically regulates the provision and distribution of biofuels by PERTAMINA, Indonesia's state-owned petroleum production company. Indonesia, however, is expected to experience significant drop in bioethanol production by 0.72 million liters in 2010 as PERTAMINA stop selling biopremium and biopertamax. Owing to this situation, whether producers will continue producing bioethanol in 2011 is still questionable. There are currently 5 bio ethanol producers in Indonesia, with a combined installed capacity at 153 million liter per year.

The feedstock currently used for ethanol production in Indonesia is molasses that sources from

domestic sugar refining. 4.5 metric ton of molasses is required to produce 1,267 liters of fuel ethanol. Motivated by limited and discrete supply of molasses, Medco Group, a large Indonesian petroleum company, has indicated that it has taken steps to establish a 25,000 hectare sweet sorghum plantation in the Papua region of Indonesia for ethanol production. Medco has indicated that once ethanol is produced from this facility, it will likely be exported regionally as well as used domestically within Indonesia. The Government of Indonesia has also identified cassava and sugar cane as potential feedstocks for ethanol production.

The production of Indonesian biodiesel has started in 2006. There are currently 20 biodiesel producers with installed capacity stand at 4.3 million kiloliter per year. All these producers extract fatty acid methylester (FAME) from crude palm oil with the conversion rate stand at 1.1 MT of CPO : 1 kilo liter of FAME. Slow sales of biodiesel by PERTAMINA have resulted in low utilization of Indonesian biodiesel plants, which currently stands at 9.3 percent of total production capacity.

Biodiesel production in 2010 is estimated to reach 400 million liters. APROBI expects the production will rise to 500 million liters in 2011 as PERTAMINA will add number of gas station that is selling biosolar and GOI plan to have additional biosolar subsidy of IDR 1.18 billion. Post, however, predicts for the 2011 production to stay stagnant at 400 million liters due to the gloomy prospect of export to Europe.

In April 2010, PERTAMINA and a state-owned electricity company, PT PLN, signed two separate memorandums of understanding with state-owned plantation companies for the development of renewable energy sources.

Three state plantation firms – PT Perkebunan Nusantara (PTPN) III, IV and V — will begin the construction of three biodiesel plants in Dumai, Riau province of Sumatra this year. It is expected that in 2012 the plants will be capable of biodiesel production. PERTAMINA has agreed to purchase the biodiesel from the plants and to prepare a storage facility for the biodiesel at the port in Dumai.

Consumption

While biofuel consumption is mandatory not only for motor vehicles but also for industry and power plant, transportation has so far become the only sector that using biofuel in Indonesia. GOI initiated biofuel program for power plant in 2009. The progress, however, has been scaled back for economic and technical reasons.

GOI has appointed PERTAMINA as a sole blender and distributor of biofuel. It has started commercial sales of bioethanol (Bio Premium & Bio Pertamina) and biodiesel (Bio Solar) since 2006. PERTAMINA, therefore, is the only customer of Fuel Ethanol (FE) and Fatty Acid Methyl Ester (FAME) that produced by Indonesian biofuel producers. FE and FAME are then blended with conventional gasoline and diesel oil to produce B1 or B3 bioethanol and B5 biodiesel.

Consumption figure, as illustrated in bioethanol and biodiesel table, is derived from PERTAMINA's purchase of FE and FAME. The figure, corresponding to the sales of PERTAMINA's biofuel, has been

on the uptrend since 2006, except for FE that drop in 2010.

Bioethanol sales volume increased from only 1.64 million liters in 2006 to 126.05 million liters in 2009. PERTAMINA, however, stops selling bioethanol in 2010 due to lack of supply from FE producers. Unprofitable purchase prices set by PERTAMINA is seen as a primary reason that producers do not supply ethanol to this state-owned oil company. This price problem, if it is not fairly resolved by the government, will hamper the continuation of Indonesian bioethanol program.

Sales of biodiesel demonstrate more robust performance as it increased from 217.05 million liters in 2006 to 2,680 million liters in 2010. The figure is expected to further rise to 4,000 million liters at best in 2011.

Trade

There has no fuel ethanol that is exported to other countries, and its production so far can satisfy domestic consumption thereby keeping imported fuel ethanol at zero level.

EU Renewable Energy Directive, initiated in 2003, sets target of 20 percent renewable energy share in EU energy mix by 2020. Insufficient local biofuel feedstock such as rapeseed oil provides room for Indonesia to export biodiesel to European countries. The data showed that Indonesia exported 42 and 200 million liter of biodiesel in 2006 and 2009 respectively. The refinement of EU RED in 2009, however, create export barriers as EU claimed that Indonesian biodiesel, which derived from palm oil, cannot be used in Euro zone due to palm oil's carbon saving level that below EU's threshold level at 39 percent.

GOI has taken the following counter efforts to loosen this export barrier

- Conducting own calculation of palm oil carbon saving rate based on EU RED method. The calculation concludes that Indonesian palm oil can satisfy EU's minimum requirement of carbon saving rate (Rosediana: 2010).
- Establishing bilateral approach to non-rapeseed producing countries in Euro area such as Italy and Netherlands to gain export market access in these countries.

While Indonesian Biofuel Producers Association (APROBI) hasn't released official figure, post estimates Indonesian biodiesel export will rise to 325 million liters in 2010. The estimate is based on the fact that EU RED will be officially enforced next year so that Indonesia can secure this year biodiesel export.

Whether Indonesia can keep exporting biodiesel to Europe next year is depend on the success of GOI in convincing European Biofuel Board that palm oil can satisfy carbon saving rate requirement. Netherland, Italy, and Spain are accounting for more than 80 percent of Indonesian biodiesel export. Indonesia, therefore, will experience biodiesel export drop in 2011. The drop, however, would not be so excessive since those three European countries are not rapeseed producing countries. Post estimates a 40 percent export drop of Indonesian biodiesel to 195 million liters in 2011.

Ending Stock

The expanding biofuel production amidst low domestic market absorption and limited export market has resulted in increasing ending stock level of biofuel within 2006-2010 periods, except for ending stock of biodiesel that is predicted to decrease from 100 million liters in 2009 to 41 million liters in 2010.

Constant production volume in combine with lower export but higher domestic usage would slightly increase country's biodiesel ending stock to 46 million liters in 2011.

Bio-kerosene:

Currently Indonesia is exploring the development of bio-kerosene as a substitute for kerosene. The use of kerosene as a primary fuel source for cooking is relatively common throughout Indonesia, although liquid petroleum gas (LPG) has become more frequently used. However, LP is not always available and a number of accidents involving LP gas have been reported, resulting in the continued demand for kerosene. Currently the price for kerosene (about 4,000 RPH/liter) makes it difficult for poor families to afford. As a result, the MEMR is working to develop bio-kerosene as a substitute for kerosene and LPG. The primary feedstock used in MEMR's research includes jatropha and oil palm. Currently there is no commercial jatropha oil production in Indonesia. However, several hundred acres of jatropha have been planted in the West Java and feasibility studies on the commercial uses of jatropha oil are being conducted by the Government of Indonesia. The MEMR currently forecasts that by 2025, 4.07 kiloliters of bio-kerosene will be produced.

Biomass for Heat and Power:

Biomass power plants are usually located only on oil palm plantations. Oil palm estates and plantations in isolated areas that often generate their own electricity by using empty palm fruit bunches as feedstock. Estimates for biomass feedstock in Indonesia:

- Forest : 15.45 million m³/ year
- Oil palm plantations : 64 million ton/year
- Agriculture : 144.5 ton/year

Notes on Statistical Data:

- There has no official biofuel statistic released by Government of Indonesia. The production and export figure is obtained from Indonesian Biofuel Producers Association (APROBI) that they are presented in the seminar or conference. While Indonesian Central Statistical Agency (BPS) releases biodiesel export data under the HS Code: 3824909000, the figure is so much different with APROBI's number. FAS Jakarta is more confident with APROBI's figure since they are the business players who really know the industry.
- Biofuel consumption figure is derived from PERTAMINA's sales of biopremium, biopertamax, and biosolar based on the assumption of blending ratio of 1 and 3 percent for bioethanol and 5 percent for biodiesel.

Glossary:

Solar : diesel fuel
 Bio-Solar : mixture of up to five percent biodiesel and diesel
 Premium : gasoline with 88 octane numbers
 Bio-Premium : mixture of up to 2.5 percent bio-ethanol and Premium
 Pertamina : gasoline with 92 octane numbers
 Pertamina Plus : gasoline with 95 octane numbers
 Bio-Pertamax : mixture of up to 2.5 percent bio-ethanol and Pertamina

Tables

Conventional & Advanced Bioethanol (million liters)						
CY	2006	2007	2008	2009	2010	2011
Production	0.30	1.00	1.20	1.72	1.00	NA
Imports	0.00	0.00	0.00	0.00	0.00	NA
Exports	0.00	0.00	0.00	0.00	0.00	NA
Consumption	0.05	0.66	1.20	1.26	0.65	NA
Ending Stocks	0.25	0.59	0.59	1.05	1.40	NA
Production Capacity (Conventional Fuel)						
No. of Biorefineries	2	2	4	5	5	5
Capacity (million liters)	10	13	102	153	153	153
Production Capacity (Advanced Fuel)						
No. of Biorefineries						
Capacity						
Co-product Production (1,000 MT)						
Product Y						
Product Z						
Feedstock Use (1,000 MT)						
Feedstock A (Molasses)	1.07	3.55	4.26	6.12	3.55	NA
Feedstock B						
Feedstock C						
Feedstock D						

Conventional & Advanced Biodiesel (million liters)

CY	2006	2007	2008	2009	2010	2011
Production	24	35	110	350	400	400
Imports	0	0	0	0	0	0
Exports	42	0	0	200	325	195
Consumption	11	44	46	120	134	200
Ending Stocks	15	6	70	100	41	46
Production Capacity (Conventional Fuel)						
No. of Biorefineries	2	7	14	20	20	20
Capacity (million liters)	215	1,709	3,138	4,277	4,277	4,277
Production Capacity (Advanced Fuel)						
No. of Biorefineries	0	0	0	0	0	0
Capacity	0	0	0	0	0	0
Feedstock Use (1,000 MT)						
Feedstock A (CPO)	26	38	121	385	440	440
Feedstock B						
Feedstock C						
Feedstock D						

Source: Indonesian Biofuel Producers Association, PERTAMINA, and MEMR

Notes:

- Bioethanol consumption is derived from PERTAMINA's sales of bio-pertamax and bio-premium. The blending ratio was 3 percent in 2006 and 2010, and 1 percent within 2007 – 2009 periods.
- Biodiesel consumption is derived from PERTAMINA's sales of biosolar. The blending ratio is 5 percent.
- Number of Molasses is obtained by using the formula $[(\text{bioethanol production} / 1,267 \text{ liters}) \times 4.5]$
- Number of CPO is obtained by using the formula $[\text{biodiesel production} \times 1.1]$

Additional Information on Indonesian Energy Development

Energy Consumption in Transportation Sector
(in Original Unit)

Year	Gas	Fuel										Fuel				Electricity
		Avgas	Avtur	Premium	Bio Premium	Pertamax	Bio Pertamax	Pertamax Plus	Bio Solar	Kerosene	ADO	IDO	Fuel Oil	Total Fuel		
	MMSCF	Kilo Liter										Kilo Liter				GWh
2000	968	3.550	1.202.717	12.059.026	0	0	0	0	0	0	4.708	9.365.388	48.356	71.474	22.755.220	44
2001	773	3.430	1.473.503	12.705.861	0	0	0	0	0	0	4.642	9.941.771	46.704	74.546	24.250.457	49
2002	654	3.488	1.597.291	13.323.304	0	0	0	0	0	0	4.414	9.782.952	44.148	71.517	24.827.114	53
2003	599	3.556	1.929.351	13.746.726	0	371.238	0	107.441	0	0	4.442	9.422.642	38.393	57.994	25.681.783	53
2004	471	3.416	2.437.923	15.337.655	0	487.562	0	121.866	0	0	4.477	10.830.594	35.394	61.075	29.319.962	55
2005	238	3.070	2.322.634	16.621.765	0	248.875	0	99.326	0	0	4.297	10.060.316	29.242	43.634	29.433.160	55
2006	233	3.390	2.428.078	15.941.837	1.624	505.730	16	128.289	217.048	0	3.788	8.826.588	15.864	45.136	28.117.389	67
2007	273	2.163	2.520.040	16.962.198	55.970	472.284	9.956	158.070	877.457	0	3.741	8.514.215	8.588	38.714	29.623.396	85
2008	691	2.003	2.635.670	18.653.344	44.016	297.982	16.200	114.789	929.393	0	2.986	8.911.926	5.124	27.831	31.641.264	81

Source: Ministry of Energy and Mineral Resources

Energy Price per Energy Unit

Year	Gasoline (Premium)		Avtur		Avgas		Kerosene	
	Rp/BOE	US\$/BOE	Rp/BOE	US\$/BOE	Rp/BOE	US\$/BOE	Rp/BOE	US\$/BOE
2000	178.035	18,55	179.945	18,75	306.141	31,91	50.191	5,23
2001	225.368	21,67	332.728	31,99	884.207	85,02	63.640	6,12
2002	248.820	27,83	354.797	39,69	766.613	85,75	67.483	7,55
2003	313.707	37,06	601.287	71,03	1.150.909	135,96	309.087	36,51
2004	310.596	33,43	580.746	62,51	1.118.885	120,44	303.674	32,69
2005	492.028	50,05	806.228	82,02	2.067.906	210,37	398.713	40,56
2006	772.201	85,61	974.757	108,07	2.423.480	268,68	337.416	37,41
2007	772.201	81,98	1.048.206	111,29	2.849.871	302,57	337.416	35,82
2008	911.626	83,25	1.561.727	142,62	4.246.083	387,77	386.623	35,31

Year	Coal		Electricity (Average)					
			Household		Industry		Commercial	
	Rp/BOE	US\$/BOE	Rp/BOE	US\$/BOE	Rp/BOE	US\$/BOE	Rp/BOE	US\$/BOE
2000	35.961	3,75	338.238	35,25	493.507	51,43	620.734	64,69
2001	46.673	4,49	413.785	39,79	590.000	56,73	737.210	70,89
2002	51.384	5,75	640.767	71,67	722.577	80,83	966.998	108,17
2003	53.973	6,38	852.333	100,69	865.122	102,20	1.078.972	127,46
2004	53.956	5,81	909.886	97,94	912.153	98,19	1.113.083	119,82
2005	58.820	5,98	918.515	93,44	929.641	94,57	1.133.295	115,29
2006	78.523	8,71	926.020	102,66	1.013.442	112,35	1.092.023	121,07
2007	79.212	8,41	932.724	99,03	1.013.573	107,61	1.260.212	133,79
2008	114.397	10,45	959.231	87,60	1.014.741	92,67	1.387.403	126,70

Note: *) Based on Current Price

Source: Ministry of Energy and Mineral Resources

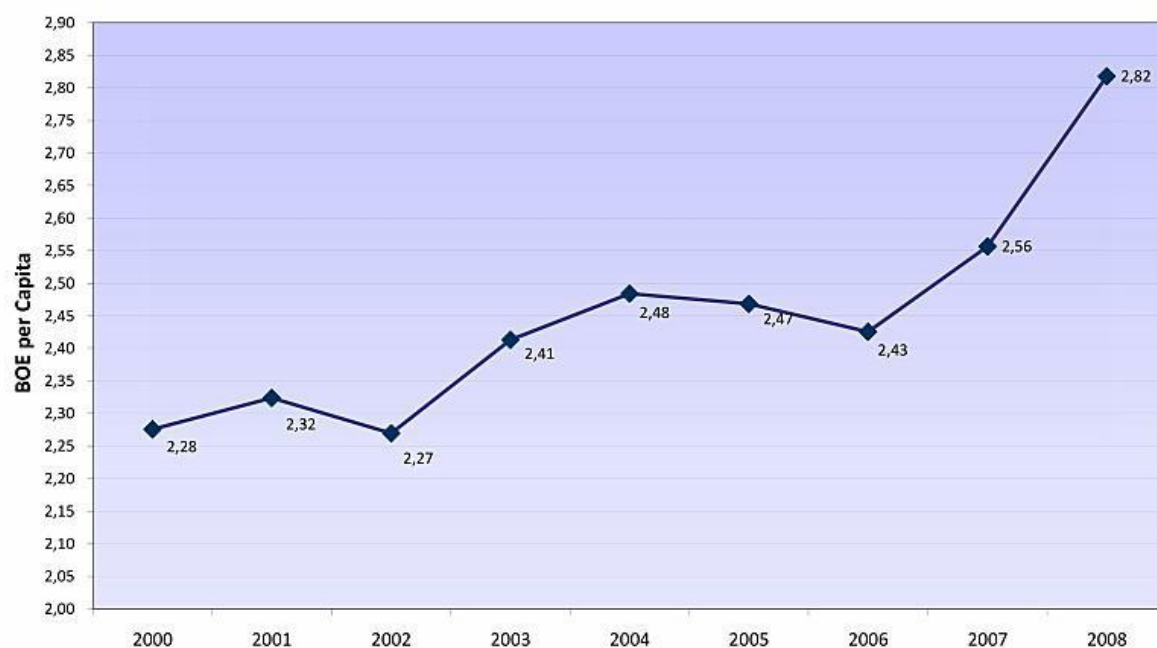
Final Energy Consumption by Sector

Energy Consumption (Included Biomass)										(BOE)
Sector	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Industrial	251,895,942	252,158,714	245,108,900	275,308,517	263,294,377	262,687,070	280,187,757	300,675,120	360,688,169	
Households	296,573,110	301,347,223	303,032,794	309,046,165	314,114,684	313,772,025	312,715,871	319,333,000	317,032,982	
Commercial	20,670,389	21,449,843	21,752,300	22,397,122	25,412,327	26,234,764	26,194,683	27,896,499	27,984,294	
Transportation	139,178,658	148,259,584	151,498,823	156,232,909	178,374,391	178,452,407	170,127,492	179,135,822	191,257,453	
Other	29,213,878	30,585,607	29,998,546	28,445,436	31,689,809	29,102,166	25,936,873	24,912,051	24,842,951	
Final Energy Consumption	737,531,977	753,800,971	751,391,363	791,430,149	812,885,588	810,248,432	815,162,676	851,952,492	921,805,849	
Non Energy Utilization	40,393,109	48,524,092	48,534,290	48,317,775	62,375,806	54,352,435	64,786,077	64,759,190	111,963,006	

Commercial Energy Consumption (Excluded Biomass)										(BOE)
Sector	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Industrial	192,914,655	196,972,955	192,803,789	225,141,109	216,377,677	218,766,597	233,511,599	258,567,087	316,452,732	
Households	87,963,563	89,023,979	86,568,222	88,669,268	90,689,214	89,065,250	84,529,554	87,716,652	84,788,576	
Commercial	19,218,814	20,005,525	20,315,203	20,967,212	23,989,565	24,819,117	24,786,114	26,494,973	26,589,775	
Transportation	139,178,658	148,259,584	151,498,823	156,232,909	178,374,391	178,452,407	170,127,492	179,135,822	191,257,453	
Other	29,213,878	30,585,607	29,998,546	28,445,436	31,689,809	29,102,166	25,936,873	24,912,051	24,842,951	
Final Energy Consumption	468,489,567	484,847,650	481,184,583	519,455,933	541,120,657	540,205,537	538,891,632	576,826,585	643,931,487	
Non Energy Utilization	40,393,109	48,524,092	48,534,290	48,317,775	62,375,806	54,352,435	64,786,077	64,759,190	111,963,006	

Source: Ministry of Energy and Mineral Resources

Intensity of Final Energy Consumption per Capita



Source: Ministry of Energy and Mineral Resources

Share of Final Energy Consumption by sector

(%)

Year	Industry	Household	Commercial	Transportation	Other
2000	41,18	18,78	4,10	29,71	6,24
2001	40,63	18,36	4,13	30,58	6,31
2002	40,07	17,99	4,22	31,48	6,23
2003	43,34	17,07	4,04	30,08	5,48
2004	39,99	16,76	4,43	32,96	5,86
2005	40,50	16,49	4,59	33,03	5,39
2006	43,33	15,69	4,60	31,57	4,81
2007	44,83	15,21	4,59	31,06	4,32
2008	49,14	13,17	4,13	29,70	3,86

Note: Commercial Energy (excluded biomass)

Source: Ministry of Energy and Mineral Resources

Share of Final Energy Consumption by Type

(%)

Year	Coal	Natural Gas	Fuel	LPG	Electricity
2000	7,3	17,6	63,6	1,7	9,8
2001	7,3	16,2	64,7	1,6	10,2
2002	7,6	16,0	64,1	1,7	10,5
2003	12,6	16,6	59,1	1,6	10,2
2004	9,8	15,1	62,6	1,6	10,9
2005	11,7	15,3	59,9	1,5	11,6
2006	15,8	14,8	55,4	1,7	12,3
2007	20,3	13,3	52,2	1,8	12,4
2008	25,4	13,7	46,7	2,4	11,9

Source: Ministry of Energy and Mineral Resources

Supply of Primary Energy

By Type

(%)

Type of Energy	2000	2001	2002	2003	2004	2005	2006	2007	2008
Crude Oil and Fuel Export/Import	43,52	42,42	42,32	40,37	43,52	42,32	39,14	38,51	37,01
Coal	9,42	11,44	11,48	14,58	13,24	14,89	17,54	20,97	26,24
Natural Gas and Export/Import (LPG & LNG)	16,54	16,53	17,65	18,05	16,39	16,39	16,75	14,92	15,71
Hydropower	2,54	2,82	2,34	2,03	2,13	2,32	2,07	2,31	2,36
Geothermal	0,96	0,96	0,96	0,92	0,97	0,94	0,95	0,93	1,09
Biomass	27,02	25,83	25,25	24,05	23,75	23,15	23,55	22,36	17,59

By Type (excluded Biomass)

(%)

Type of Energy	2000	2001	2002	2003	2004	2005	2006	2007	2008
Crude Oil and Fuel Export/Import	59,64	57,20	56,62	53,16	57,08	55,07	51,20	49,60	44,92
Coal	12,91	15,43	15,36	19,20	17,37	19,37	22,94	27,01	31,84
Natural Gas and Export/Import (LPG & LNG)	22,66	22,28	23,61	23,76	21,49	21,33	21,91	19,21	19,06
Hydropower	3,47	3,80	3,13	2,67	2,79	3,02	2,70	2,98	2,86
Geothermal	1,32	1,29	1,28	1,21	1,27	1,22	1,25	1,20	1,32

Source: Ministry of Energy and Mineral Resources

Primary Energy Supply by Sources

(BOE)

Year	Coal	Crude Oil & Product	Natural Gas & Product	Hydro Power	Geothermal	Biomass	Total
2000	93,831.548	433,360.999	164,649.922	25,248.631	9,596.400	269,054.110	995,741.609
2001	119,125.379	441,731.352	172,083.907	29,380.607	9,960.940	268,970.034	1,041,252.219
2002	122,879.411	452,817.870	188,822.314	25,038.179	10,248.040	270,230.078	1,070,035.892
2003	164,950.173	456,647.707	204,142.054	22,937.538	10,375.200	272,005.374	1,131,058.046
2004	151,543.284	498,117.696	187,553.776	24,385.647	11,077.000	271,806.233	1,144,483.636
2005	173,673.093	493,636.985	191,189.376	27,034.841	10,910.460	270,042.895	1,166,487.651
2006	205,779.290	459,333.373	196,599.386	24,256.796	11,182.742	276,335.944	1,173,487.530
2007	258,174.000	474,042.813	183,623.636	28,450.964	11,421.759	275,199.938	1,230,913.109
2008	322,933.800	455,612.264	193,352.098	29,060.287	13,423.610	277,962.458	1,292,344.517

Source: Ministry of Energy and Mineral Resources

Share of Energy Consumption in Transportation Sector

Year	Gas	Fuel								Fuel					Electricity
		Avgas	Avtur	Premium	Bio Premium	Pertamax	Bio Pertamax	Pertamax Plus	Bio Solar	Kerosene	ADO	IDO	Fuel Oil	Total Fuel	
2000	0,125	0,014	5,09	50,49	0,000	0,000	0,000	0,000	0,000	0,020	43,65	0,23	0,36	99,86	0,02
2001	0,094	0,013	5,85	49,94	0,000	0,000	0,000	0,000	0,000	0,019	43,50	0,21	0,35	99,89	0,02
2002	0,078	0,013	6,21	51,25	0,000	0,000	0,000	0,000	0,000	0,017	41,89	0,19	0,33	99,90	0,02
2003	0,069	0,013	7,27	51,28	0,000	1,385	0,000	0,401	0,000	0,017	39,12	0,16	0,26	99,91	0,02
2004	0,047	0,011	8,05	50,11	0,000	1,593	0,000	0,398	0,000	0,015	39,39	0,13	0,24	99,93	0,02
2005	0,024	0,010	7,67	54,28	0,000	0,813	0,000	0,324	0,000	0,014	36,57	0,11	0,17	99,96	0,02
2006	0,025	0,011	8,41	54,61	0,006	1,732	0,000	0,439	0,828	0,013	33,66	0,06	0,18	99,95	0,02
2007	0,027	0,007	8,29	55,18	0,182	1,536	0,032	0,514	3,178	0,012	30,83	0,03	0,15	99,94	0,03
2008	0,065	0,006	8,12	56,84	0,134	0,908	0,049	0,350	3,152	0,009	30,23	0,02	0,10	99,91	0,03

Source: Ministry of Energy and Mineral Resources