Handoko Subawi

Hydrocarbon

Energy Security, Fuel, Petrochemicals, Carbon Fiber

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1. Energy feedstocks

1.1. Crude oil

The proved oil reserves is mainly located in Middle East countries. This cover 48% world oil reserves. The global oil reserves to production (R/P) ratio achieves 83 years in 2011. The highest consumption rate of oil in the world was observed in Asia Pacific at about 32% (Table.1.).

Table.1. Proved oil reserves, production and consumption

Million tons, 2011	proven oil reserves	production	consumption
North America	43,500	670	1,026
S. & Cent. America	65,080	380	289
Europe & Eurasia	28,220	839	898
Middle East	159,020	1,301	371
Africa	26,480	417	158
Asia Pacific	8,260	388	1,316
World	330,560	3,995	4,059

Source: British Petroleum (2012), rearranged.

In fact, the five biggest oil producers in the world consists of Saudi Arabia, Russia, United States, Iran, and China with production rate achieved 13%, 13%, 9%, 5%, and 5% respectively. They covered 45% of world oil production in 2011. However, both United States and China were net oil importer countries in 2011.

In the other hand, the five biggest oil consumers in the world consists of United States, China, Japan, India and Russia with consumption rate achieved 21%, 11%, 5%, 4%, and 3% respectively. They covered 44% of world oil consumption in 2011. Japan and India depend on imported oil

for their economic activities. Table.2 lists projected global hydrocarbons demand in 2010 compared to 2005 demand.

Table.2. Global hydrocarbons demand

No	Products	Demand in 2005 (million bpd)	Demand in 2010 (million bpd)
1	Naphtha	5,2	5,7
2	Gasoline	20,9	22,3
3	Kerosene	6,6	7,7
4	Diesel	22,2	25,1
5	Fuel Oil	9,2	9,1
6	Others	8,8	9,6
	Total	72,9	79,5

The global oil price increased sharply during economic crisis in 2008. In 2011 the world brent oil price touched three digits at US$ 111 per barrel (Table.3.). High increase of crude oil influenced other economic indicators to stimulate alternative sources of other energy for long term in the future.

Table.3. Spot crude oil price

year	Brent, $/bbl	Dubai, $/bbl	Nigerian Forcados, $/bbl	West Texas Intermediate, $/bbl
1974	-	10.41	-	-
1975	-	10.70	-	-
1976	12.80	11.63	12.87	12.00
1977	13.92	12.38	14.21	14.00
1978	14.02	13.03	13.65	15.00
1979	31.61	29.75	29.25	25.00
1980	36.83	35.69	36.98	38.00
1981	35.93	34.32	36.18	36.00

1982	32.97	31.80	33.29	34.00
1983	29.55	28.78	29.54	30.00
1984	28.78	28.06	28.14	29.00
1985	27.56	27.53	27.75	28.00
1986	14.43	13.10	14.46	15.00
1987	18.44	16.95	18.39	19.00
1988	14.92	13.27	15.00	15.97
1989	18.23	15.62	18.30	19.68
1990	23.73	20.45	23.85	24.50
1991	20.00	16.63	20.11	21.54
1992	19.32	17.17	19.61	20.57
1993	16.97	14.93	17.41	18.45
1994	15.82	14.74	16.25	17.21
1995	17.02	16.10	17.26	18.42
1996	20.67	18.52	21.16	22.16
1997	19.09	18.23	19.33	20.61
1998	12.72	12.21	12.62	14.39
1999	17.97	17.25	18.00	19.31
2000	28.50	26.20	28.42	30.37
2001	24.44	22.81	24.23	25.93
2002	25.02	23.74	25.04	26.16
2003	28.83	26.78	28.66	31.07
2004	38.27	33.64	38.13	41.49
2005	54.52	49.35	55.69	56.59
2006	65.14	61.50	67.07	66.02
2007	72.39	68.19	74.48	72.20
2008	97.26	94.34	101.43	100.06
2009	61.67	61.39	63.35	61.92
2010	79.50	78.06	81.05	79.45
2011	111.26	106.18	113.65	95.04

Source: British Petroleum (2012).

Indonesia is nowadays becoming net oil importer country. The proven oil reserves reaches 800 million tons in 2011. However the consumption rate as much as 64 million tons oil per annum is more than the production at 46 million per annum. Indonesia proven oil reserve to oil

poduction remains 18 years since 2011. Table.4. lists poduction of variety of oil fuels in Indonesia.

Table.4. Indonesia oil fuel production

Year	Premium (barrel)	Pertamax (barrel)	Pertamax Plus (barrel)	ADO (barrel)
1996	60,815,000	-	-	89,382,000
1997	63,373,000	-	-	22,600,000
1998	59,403,000	-	-	93,296,000
1999	62,450,271	-	-	84,286,847
2000	69,243,864	-	-	91,154,347
2001	66,533,951	-	-	89,656,135
2002	68,975,134	-	-	89,282,621
2003	64,367,803	2,282,000	617,000	89,816,867
2004	70,260,076	3,010,000	300,000	98,034,112
2005	71,013,010	1,699,754	431,836	94,632,874
2006	71,822,000	1,631,764	414,563	88,892,000
2007	71,337,000	2,754,000	951,000	82,120,000
2008	72,404,000	1,523,000	387,000	92,812,000
2009	72,799,000	2,050,000	647,000	107,353,000
2010	66,820,000	3,301,000	668,000	107,351,000
2011	64,460,000	2,446,000	736,000	119,568,000

Source: Ministry of Energy and Mineral Resources (2012).

Table.4. Production of oil fuel, 1996-2011 (continued)

Year	IDO (barrel)	Kerosin (barrel)	Lubricant (barrel)
1996	6,302,000	55,535,000	1,792,641
1997	27,315,000	49,378,000	1,121,000