

***ENERGY COMMODITIES FOR ECONOMIC GROWTH OF BRUNEI***

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## ***ENERGY COMMODITIES FOR ECONOMIC GROWTH OF BRUNEI***

Saiful Islam and Zawawi Bahari\*

### **Abstract**

This paper is on importance of energy commodities such as oil and natural gas for economic growth of Brunei. The analysis focuses on dependence on oil and gas, need for diversifying the economy, and the new official energy strategy of Brunei. Based on the data from 2000 to 2010, this paper finds that economic growth of Brunei has been fuelled by exports of oil and gas. When export prices of oil and gas were high, the contribution of the sector was also high, as evident in 2008. Similarly, when prices were low, oil and gas contributions to GDP was also low as evident in the early 2000s and in 2009.

Oil and gas are finite resources that have historically been vulnerable to significant price swings. Brunei is looking to develop non-oil sectors like financial services, knowledge-based activities, in order to diversify its economy from oil and gas. However, development efforts for a non-oil, non-state sector have been limited by the small domestic market, a shortage of skilled manpower, and a relatively high labor cost.

This paper finds also that the Brunei economy still remains heavily dependent on oil and gas in terms of their contribution to GDP, to exports and to government revenue. The oil and gas production accounted for 62 percent of nominal GDP, 96 percent of total exports and 87 percent of government revenue in 2010. The government has formulated long term energy strategy for the period up to 2035. This new official energy strategy of Brunei is calling for a significant increase in oil and gas production output in the decades to come.

### **1. Introduction**

Energy commodities such as oil and natural gas are critical inputs to a very wide variety of production processes of modern economies. They are the chief drivers of any economy for its growth and for improving the living standards of people. This is seen clearly in the recent development and growth in China and other countries, resulting in high demand for oil, coal and natural gas. Overall global energy (all forms of energy) use is estimated to grow by about 40 percent by 2020, as demand rises from about 215 million oil equivalent barrels per day to almost 300 million oil equivalent barrels per day. The economic growth of China and many other countries are examples of the energy consumption and economic growth.

Brunei Darussalam (henceforth Brunei) is also dependent on energy commodities for its economic growth and for improving the living standards of its people. The economic growth of Brunei has been driven by energy exports, as we have shown elsewhere (Islam 2011). Brunei produces large amounts of

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\* We would like to thank Energy Department at the Prime Minister's Office for sending us the slides and posters on Brunei Energy White Paper for this article. These slides and posters were displayed at the *Brunei Energy Expo 2011* in September. Details of the white paper are not available yet to the public.

crude oil and natural gas, which is primarily used for export. Oil production in Brunei dates to 1929 when the first commercial drilling began. Brunei has also small resources of carbonate rocks, coal, kaolin, sand and gravel, and silica sand (ABARE, 2005). However, detailed information on these resources is not available.

The excessive dependence on energy export revenues has represented a major challenge for the sustainability of growth of Brunei in the long run. This paper analyses the role of energy commodities in economic growth of Brunei. The paper specifically looks at the extent of dependence on oil and natural gas, in terms of their contribution to GDP, to export earnings and to government revenue. The economy is also dependent on government to finance its development programs, which is in turn highly dependent on oil and gas income. The paper then proceeds to identify the need for diversifying the economy to reduce dependence on oil and gas sector. Finally it turns to address the new energy strategy of Brunei formulated by the government for the period up to 2035.

## **2. Dependence on Energy Commodities**

Brunei is a tiny country bordering the South China Sea and Malaysia. It became a British protectorate in 1888 and achieved independence in 1984. The country became a constitutional monarchy and is ruled by His Majesty, Sultan Hassanal Bolkiah Mu'izzaddin. Brunei has a land area of 5765 square kilometers. In 2010 the population was a scant 414,400 people, the labor force 198,800 (Brunei Government, 2011a). Historically, Brunei has relied upon foreign workers to meet critical labor needs. It has a very low unemployment rate of 2.7 percent.

Brunei is very prosperous as it enjoys a vast presence of oil and gas resources. It is one of the wealthiest countries in Asia, with a nominal GDP per capita of B\$40,703 in 2010. As the source of its wealth is its massive oil and gas resources, the industrial structure dominates the structure of the economy with 67 percent. The services sector follows with 32 percent, while the agricultural sector is negligible with 1 percent (Brunei Government 2011a). In this section, we closely look at the dependence on oil and gas sector in terms of their contribution to GDP, exports and government revenue.

Brunei experienced modest economic growth over the last ten years, except in 2008 and 2009. For 2008, GDP at constant prices recorded a negative growth of 1.9 percent. In 2009, the economy contracted by 1.8 percent (Table 1). This was due to contraction of 6.2 percent in 2008 and 4.6 percent in 2009 in the oil and gas sector, as both oil and gas mining and LNG manufacturing sub-sectors contracted (Brunei Government, 2010a). Real GDP growth had shown a positive improvement in 2010, growing at 2.6 percent, reflecting increased production of oil and gas and government development spending. GDP growth also slowed to 0.5 percent and 0.4 percent in 2004 and 2005 respectively, owing to temporarily lower oil and gas production as production facilities were repaired and upgraded (WTO, 2008). However, dependence on oil and gas has been reduced since 2000, as a range of non-oil sectors has been developed.

In terms of contribution to GDP, the share of oil and gas sector had increased from 57.5 percent in 2000 to 62 percent in 2010. The share had increased to 70 percent in 2008, due to higher prices of oil and gas. Since 2008, total GDP had decreased by 17.3 percent from B\$20,397.9 million in 2008 to B\$16,867.3 million in 2010 (Table 2). As a result, per capita GDP also fell from B\$51,251 (US\$36,092) in 2008 to B\$40,703 (US\$31,553) in 2010. On the other hand, the share of non-oil sector increased from about 30 percent in 2008 to 38 percent in 2010 (Table 2).

Table 1: Growth in Real GDP, Oil and Non-oil Sectors for Brunei, 2000 - 2010

Year	B\$ million at 2000 prices			Annual % change		
	Real GDP	Oil & gas GDP	Non-oil & gas GDP	Real GDP	Oil & gas GDP	Non-oil & gas GDP
2000	10346.0	5950.4	4395.6	-	-	-
2001	10630.0	5967.7	4662.2	2.7	0.3	6.1
2002	11041.5	6155.8	4885.7	3.9	3.2	4.8
2003	11362.1	6432.3	4929.8	2.9	4.5	0.9
2004	11419.4	6365.3	5054.2	0.5	-1.0	2.5
2005	11463.7	6201.3	5262.5	0.4	-2.6	4.1
2006	11967.8	6469.9	5497.9	4.4	4.3	4.5
2007	11986.2	6023.7	5962.6	0.2	-6.9	8.5
2008	11753.8	5650.5	6103.4	-1.9	-6.2	2.4
2009	11546.4	5388.5	6157.9	-1.8	-4.6	0.9
2010	11846.5	5504.6	6341.9	2.6	2.1	2.9

Sources: Brunei Government, *Brunei Darussalam Statistical Yearbook 2005 and 2010* Editions, Department of Economic Planning and Development, Prime Minister's Office.

Table 2: Share of Oil and Non-oil Sectors in Current GDP for Brunei, 2000 - 2010 (B\$ million)

Year	GDP	Oil & gas	% of GDP	Non-oil & gas	% of GDP
2000	10346.0	5950.4	57.5	4395.6	42.5
2001	10035.5	5352.3	53.3	4683.1	46.7
2002	10463.1	5531.6	52.9	4931.5	47.1
2003	11424.2	6530.2	57.2	4894.0	42.8
2004	13305.8	8236.4	61.9	5069.3	38.1
2005	15864.1	10540.5	66.4	5323.5	33.6
2006	18225.8	12491.0	68.5	5734.7	31.5
2007	18458.4	12332.9	66.8	6125.5	33.2
2008	20397.9	14300.0	70.1	6097.9	29.9
2009	15611.4	9417.0	60.3	6194.3	39.7
2010	16867.3	10461.8	62.0	6405.5	38.0

Sources: Brunei Government, *Brunei Darussalam Statistical Yearbook 2005 and 2010* Editions, Department of Economic Planning and Development, Prime Minister's Office.

The preceding two paragraphs suggest that economic growth of Brunei is determined by production of oil and gas and their prices. The influence of global prices of oil and gas on nominal GDP of Brunei is shown in Figure 1 in terms of their indexes (2000=100). This figure shows the relationship between average oil price and nominal GDP, as price of natural gas (LNG) follows oil prices. When oil and gas prices were high, the contribution of the sector to the economy was also high, as evident in 2008, when the average price during the year was US\$100.99 per barrel (Brunei Government, 2010b, p. 48). Correspondingly, when prices were low, oil and gas contributions to GDP were also low as evident in the early 2000s and in 2009.

The trend in real GDP growth is also indicative of the consequence of production of oil and gas. As shown in Figure 2 (index 2000 =100), the positive economic growth of the economy is incumbent upon the level of oil and gas production. Any shortfall in production will lead to negative growth rates as evident in 2008 and 2009.

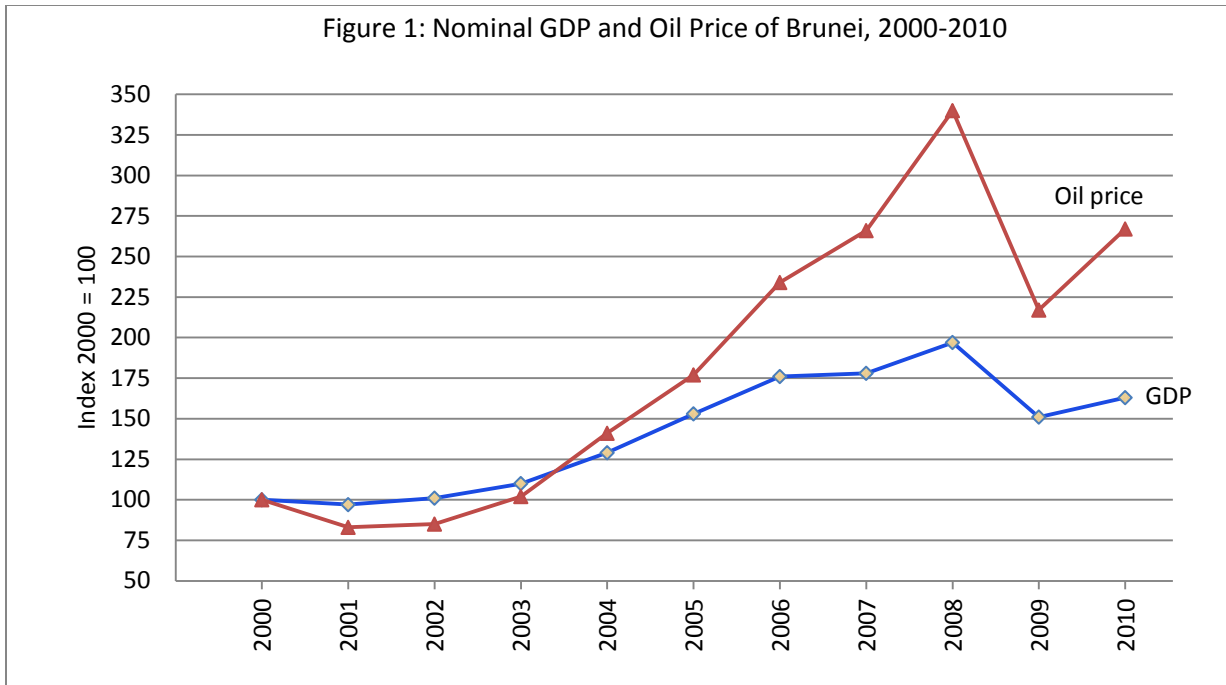
The effects of the dependence on energy commodities (oil and gas) are not only limited to the structure of the economy, but also government finance. The Government relies mainly on revenue in the form of taxes, incomes and royalties from the oil and gas companies. As shown in Table 3, from 2001 to 2010, these revenue sources together constituted, on average, 89 per cent of the total revenues collected.

The dependence of Brunei on oil and natural gas is also evident in its export figures since oil and gas exports contributed well over 90 percent of total. In 2008, for example, oil and gas exports together accounted for 97.8 percent (B\$14,616 million) of its total exports (B\$14,942 million). In comparison, the exports of oil and gas in 2000 were B\$6,042 million which was 89.7 percent of total exports (Table 4). The increase in oil and gas exports between 2000 and 2008 was again primarily due to price increases as well as increases in the volume of their exports (Hashim, 2010). Also, quite obviously the production of oil and gas and their exports go hand in hand and, as mentioned above, this is by far the principal source of government finance.

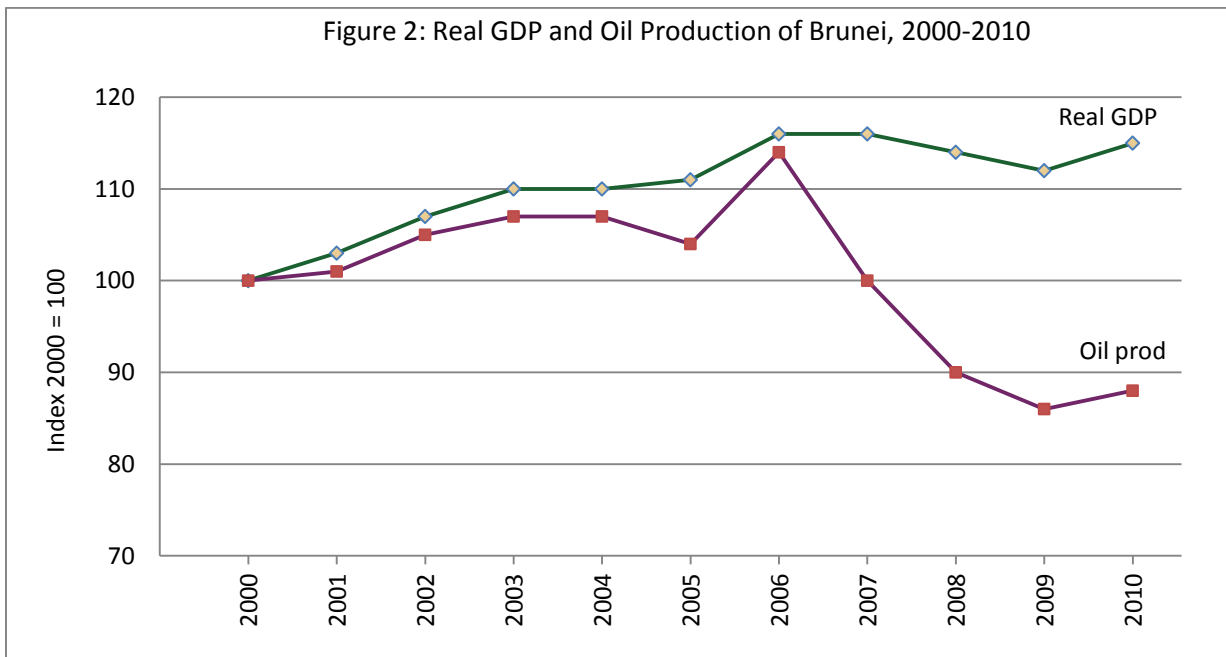
Major trading partners of Brunei are mainly linked to its oil and gas exports. These include Japan, South Korea, ASEAN, Australia and China. About 90 percent of LNG (liquefied natural gas) exports of Brunei go to Japan and the remaining 10 percent to South Korea (see our another paper, Islam and Odano 2010 for details). ASEAN, in particular Malaysia and Thailand, are the main sources of imports providing foodstuffs and manufactured products. Other sources of imports include Japan, some European countries, and most notably China. Imports from Japan, some European countries, and the USA are mainly in the form of machinery and transport equipments.

### **3. Diversification with Non-Energy Sector**

As discussed in section 2, the economy of Brunei is strongly dependent upon oil and gas exports. Historically and globally, the dependency upon a narrow range of natural resource exports has proven a fragile base for long term development. The Brunei government has recently formulated a 30 year development framework: the *Wawasan Brunei 3035*. This framework seeks to provide guidance to the nation on how it can place the country in the top ten globally in terms of quality of life and income per capita (Brunei Government 2008, pp. 12-13). In order to achieve the *Wawasan 2035*, the government recognizes that there is a need to diversify the economy away from the oil and gas sector. Economic diversification, and finding viable strategies to broaden the economic base, is therefore one of the most pressing policy concerns for Brunei.



Source: Source: *Brunei Economic Bulletin*, Vol. 7, Issue 2, December 2010; and *Brunei Darussalam Statistical Yearbook 2005 and 2010* editions.



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Table 3: Government Revenue from Oil and Non-oil sectors in Brunei, 2001 to 2010-11  
(B\$ million)

Year (April-March)	Total revenue	Oil & gas sector revenue	Non-oil revenue	Oil & gas as a % of total revenue
2001	4232	3623	609	86
2002	4268	3697	571	87
2003-04	6369	5550	820	87
2004-05	6404	5815	589	91
2005-06	8484	7775	709	92
2006-07	9310	8602	708	92
2007-08	10042	8841	1200	88
2008-09	11378	10551	827	93
2009-10	6393	5590	803	87

Sources: International Monetary Fund, *Brunei Darussalam: Statistical Appendix*, IMF Country Report No. 11/140, June 2011; International Monetary Fund, *Brunei Darussalam: Statistical Appendix*, IMF Country Report No. 08/165, May 2008.

Note: From 2004, financial year of Brunei changed from a calendar year to April-March. 2003-04 financial year is from January 2003 to March 2004.

Table 4: Export Earnings from Oil and Non-oil Sectors in Brunei, 2000 - 2010 (B\$ million)

Year	Total export	Oil & gas exports	Non-oil exports	Oil & gas as % of total export
2000	6733.5	6041.5	692.0	89.7
2001	6521.7	5826.4	695.3	89.3
2002	6628.7	5834.9	793.8	88.0
2003	7704.3	6742.3	962.0	87.5
2004	8562.7	7826.8	735.9	91.4
2005	10397.7	9794.1	603.6	94.2
2006	12117.1	11671.7	445.4	96.3
2007	11556.4	11110.8	445.6	96.1
2008	14941.9	14615.5	326.4	97.8
2009	10434.9	10023.6	411.3	96.1
2010	12117.6	11527.9	589.7	95.1

Source: Brunei Government, *Brunei Darussalam External Trade Statistics 2008* (Department of Economic Planning and Development, Prime Minister's Office, 2009); Brunei Government, *Brunei Darussalam Statistical Yearbook 2010* (Department of Economic Planning and Development, Prime Minister's Office).

There are two reasons for Brunei to diversify its economy: the need to reduce risks, and create jobs. A brief discussion of two reasons is shown here.

**Reducing risk:** Dependence on oil and gas export is risky, because changes in the international price of oil and gas have had a dramatic effect on the economy of Brunei over the past years. In 2000, price of oil was US\$29.70 per barrel, then increased to US\$100.99 per barrel in 2008, then decreased to US\$64.54 per barrel in 2009 and US\$79.27 per barrel in 2010 (Brunei Government 2010b). With the fluctuations in price of oil and LNG, GDP of Brunei has also fluctuated. But the economy of Brunei remains wholly dependent on demand for oil from foreign countries. Another risk is the decline in production of oil and gas (Figure 2). It now appears that the declines are due to the age of the fields (80 years since 1929) and declining productivity capacity (Lawrey, 2010). These risks make it important to find new economic drivers and/or to resolve the on-going issue of access to Block J.

**Creating Jobs:** Brunei has young and rapidly growing population. Creating jobs for the Brunei youth is a key policy priority for the government to reduce unemployment. Traditionally, the government sector has been a major source of employment for Bruneians, but this approach to job creation creates overstuffed bureaucracies and is increasingly expensive to maintain (Economist Intelligence Unit, 2010). Oil and gas production is not a labor-intensive business, and therefore another reason to diversify is the imperative to create more jobs in the labor intensive industries. The oil and gas sector provides employment for only 3 percent of the population. If Brunei does not find new sectors, unemployment could be a problem in the near future. Brunei, with a small population of 0.4million, has prioritized sectors that create desirable, high quality jobs for its nationals, such as knowledge-based industries, high value-added downstream activities, and *halal* food industries as stated in its long term development plan – *Wawasan Brunei 2035*.

One of the key challenges in private-sector job creation is that average incomes for Brunei national are relatively high. Brunei cannot compete on wage costs unless it offers projects that largely employ expatriate workers (who are, in general far lower paid than Brunei citizens). Thus, some diversification projects that make sense from a macroeconomic point of view will not generate many jobs for nationals, while diversification projects that are designed to employment the maximum number of Brunei citizens will not necessarily be the globally competitive projects. Again, Brunei with the highest average incomes are more likely to focus on high-wage, high-status sectors including financial services, medium-and high-tech industries and creative industries. In this context, Brunei has intensified its efforts to diversify these sectors. However, the small population of Brunei (0.4 million) means that the resident skill base may be limited for successful diversification of these sectors.

#### **4. Energy Strategy for the Period up to 2035**

Despite the efforts to intensify economic diversification, energy commodities (oil and gas) remain a dominant key driver of economic growth of Brunei. The government has set out a long-term vision for the country and the energy sector in its first ever Energy White paper. The white paper is in line with the Government visions in *Wawasan Brunei 2035*. The outline of the Energy White paper (Brunei Government 2011b) was revealed in the Brunei Energy Expo 2011 in September

Under the program, key points of which were made public at the Brunei Energy Expo 2011, the GDP of the country is set to increase from the current B\$16 billion per annum to B\$64 billion, with the contribution of energy sector to rise from B\$10 billion to B\$45 billion in 2035. To achieve this, Brunei



aims to increase production to 800,000 barrels of oil equivalent per day of oil and gas production, up from the present figure of 400,000 barrels, but will also target massive growth in downstream industries.

The three core elements of the plan set out in the white paper are the need to strengthen and grow upstream and downstream activities in hydrocarbons (meaning oil and gas); to ensure secure, reliable and efficient supply and use of energy; and maximize economic spin-offs from the energy industry, with these targets to be achieved by 2030. The plan also foresees an additional 50,000 new jobs being created as a result of the expansion program, with 5000 of these to be filled by local professionals.

The Energy White Paper has 10 key performance indicators under the three core elements. Its first is to sustain reserve replacement ratio of more than one; (2) double oil production from 400,000 barrels of oil equivalent per day to 800,000; (3) increase economic output from the downstream industry from under B\$0.5 billion to more than B\$5.0 billion; (4) reduce energy intensity by 25 percent; (5) improve the reliability of electricity supply by six times; (6) expand share of renewable in electricity to 10 percent; (7) increase local contents in the total energy spending to 60 percent; (8) create 50,000 employment opportunities; (9) produce 5,000 Bruneian professionals; and (10) develop five Bruneian companies to compete regionally. Details of the white paper are not available yet to the public (January 2012).

A few observations can be made on some of the key points of the energy white paper. The white paper touched on the necessity of reducing energy intensity by 25 percent (key performance indicator 4). According to EIA figures, energy intensity (energy usage per dollar of real GDP) for Brunei is 24,189 Btu per 2005 U.S. dollars (in 2008). This is much higher than Indonesia (6,942), Malaysia (6,762), Japan (5,474), Singapore (10,431), Philippines (4,426), and Thailand (7,849). The high energy intensity of Brunei suggests that Brunei consumes energy inefficiently. Compared to Japan, even to Malaysia, Indonesia, Singapore, Philippines, and Thailand, Brunei burns more energy to produce the same output. Consequently, the white paper touched on the necessity of reducing energy intensity by 25 percent by the year 2030.

The white paper touched on the necessity of energy conservation for energy consumers throughout Brunei. As part of this strategy, the government has implemented (since 1 January 2012) the new residential electricity tariff – “three-tier tariff” system to avoid future wastage. In the bottom tier, which ranges up to 100 units of energy usage, users will be charged one cent per unit of energy they consume. In the middle tier, which ranges from 100 to 500 units of energy usage, users will be charged 15 cents instead of the previous rate of six cents. In the top tier, users will be charged 35 cents per unit of energy used. This 3-tiered tariff based on the Singapore model, is expected to ensure that each user will be accountable for their own energy usage. It is also expected that the tariff will influence the users to really start on conserving energy and make more efficient use of their energy consumption. This energy-saving will directly reduce the use of local oil and gas which will in turn enable Brunei to export more and for use in the downstream industry to increase the government revenue and provide more job opportunities for Bruneians (Borneo Bulletin, 21 September 2011).

The new official energy strategy of Brunei is calling for a significant increase in oil and gas production output in the decades to come. Currently, the major external risk for Brunei is the possibility of an export slowdown, as growth in industrialized countries (Japan) softens. A key internal, long term risk is the slower-than-announced pace of the economic diversification program of the government. The current external risk of an export slow down will disappear in the long term because of expected

growing demand for oil and gas from Asian countries. The economies of the Asian populous (China, India, Indonesia) and other developing countries are growing fast; their huge size of both population and large GDP asks for much larger amount of energy. The fast economic growth scenario implies Brunei have to have much more energy production (oil and gas).

Much of what is set out in the white paper will depend on the ability of Brunei to maximize the life spans of existing fields and identifying and developing new resources. There have been some very promising offshore finds in recent years (one at the Geronggong field, another at the Selangkir and Iron Duke, and another one in Lempuyang well in Block L), with further deepwater research projects being conducted that could well locate the resources needed to meet the ambitious targets set by the white paper. What needs to be clarified is the overall cost of the project, how much of this cost will be met by the state and to what degree the private sector will be expected to participate.

If Brunei can boost its oil and gas production to the levels set out in the white paper, many of the remaining elements of the program will fall into place as the Sultanate will have energy to burn for its downstream industries, and an export capacity sufficient to generate the revenue needed to develop them.

## **5. Concluding Remarks**

The above discussion suggests some important results:

- a. Economic growth of Brunei has been fuelled by exports of energy commodities (oil and gas). This is explained in the paper by the extent of dependence of the economy of Brunei on oil and natural gas in terms of their contribution to GDP, to export earnings and to government revenue. The oil and gas production accounted for 62 percent of current GDP, 96 percent of total exports and 87 percent of government revenue in 2010.
- b. Economy is dependent on the government, which is in turn dependent on oil and gas income.
- c. Diversification efforts are intensified by the government to reduce risks that stem from its economic dependence on the oil and gas sector. A major risk is fluctuations in international prices of oil and gas, which in turn affect GDP growth. Another risk is the decline of production of oil and gas, due to the age of the oil fields. As shown in this paper, the economic growth of the economy is also incumbent upon the level of oil and gas production.
- d. Development efforts for a non-oil, non-state sector have been limited by the small domestic market, a shortage of skilled manpower, and a relatively high labor cost.
- e. The new official energy strategy of Brunei is also calling for a significant increase in oil and gas production output in the decades to come. The GDP of Brunei is set to increase from the current B\$16 billion per annum to B\$64 billion, with the contribution of energy sector to rise from B\$10 billion to B\$45 billion in 2035. To achieve this, Brunei aims to increase production to 800,000 barrels of oil equivalent per day of oil and gas production, up from the present figure of 400,000 barrels.

Brunei will continue to rely on energy exports in the foreseeable future as its chances for a successful diversification of exports are quite meager. Energy will thus remain the key source of export revenue for financing economic growth of Brunei.

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