

BRUNEI DARUSSALAM

- Brunei Darussalam's primary energy demand will increase from 2.7 Mtoe in 2002 to 3.3 Mtoe in 2030, driven by the growth in the electricity and transport sectors.
- Brunei Darussalam's high dependence on oil and natural gas revenues have increased the economy's vulnerability to volatility in international energy prices; prompting the economy to diversify sources of export revenues.
- Focus is expected to be on industry development to diversify the variety of industrial activities through the creation of an investment friendly business environment.

RECENT ENERGY TRENDS AND ENERGY POLICY

Brunei Darussalam's primary energy consumption has grown annually at 1.8 percent from 2000 to 2003, with oil and gas as the main sources of energy in all economic sectors. The economy is highly dependent on oil and natural gas as export commodities which constitute 97 percent of export revenues and about 37 percent of GDP in 2005.¹⁴ Past trends in energy consumption showed that oil grew at an annual rate of 4.6 percent and actual oil consumption increased from 0.2 Mtoe in 1980 to 0.5 Mtoe in 2002.

Despite the declining trend of oil production from 12.2 Mtoe in 1980 to 9.7 Mtoe in 2002, natural gas production has been growing steadily at 1.2 percent per year over the last 3 years and has dominated the electricity generation mix, accounting for 99 percent in 2003.

The importance of the energy sector to the economy is reflected in the government's issuance of the 8th National Development Plan (NDP). The plan has emphasised the need to: 1) strengthen and expand the economy's oil and gas industry; 2) diversify non-oil intensive industries; 3) maximise the utilisation of indigenous resources; 4) improve people's living standards; and 5) protect the environment. Major policies to strengthen the hydrocarbon industry and diversify the non-oil intensive industries include: a) the development of the downstream oil and gas industry, particularly the petrochemical business which involves the production of gas-based products like ammonia, urea and methanol, and refinery derivatives like olefins and aromatics from naphtha; b) expansion of the current LNG production and export facilities; c) opening of new petroleum areas; d) expansion of electricity generation and grid extension; and e)

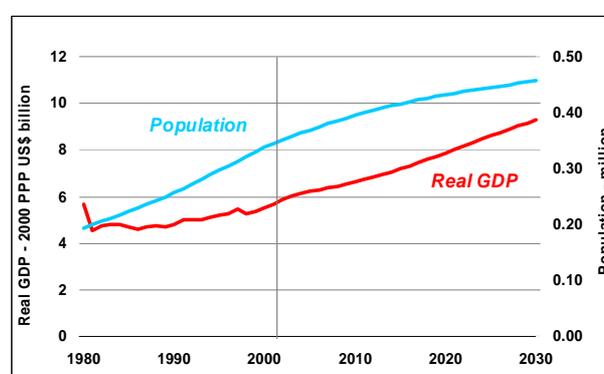
reduction of oil and gas industry methane emissions by curbing process venting and others.

ENERGY DEMAND DRIVERS

Brunei Darussalam's economy is expected to grow robustly at an annual rate of 1.7 percent over the outlook period, compared with 0.1 percent per year over the past two decade, as a result of increased revenue from rising oil prices, upsurge in personal spending and increased economic activity.

The economy's increasing awareness on family planning is expected to result in a marginal increase in population of about 0.95 percent per year through 2030, less than half the annual average growth rate of 2.8 percent observed over the last two decades.

Figure 7 GDP and Population



Source: Global Insights (2005)

Brunei Darussalam is considered a highly urbanised economy with an urbanisation level reaching 75 percent in 2002. Due to the economy's small demographic nature – with a land area of only about 5,765 square kilometres and population of 0.35 million – and the almost even distribution of economic development among the four regional districts have resulted in a fairly stabilised urban migration across the economy. Despite the high concentration of population in urban centres, it is projected by UN Habitat that Brunei Darussalam's urbanisation level will reach 87 percent in 2030.

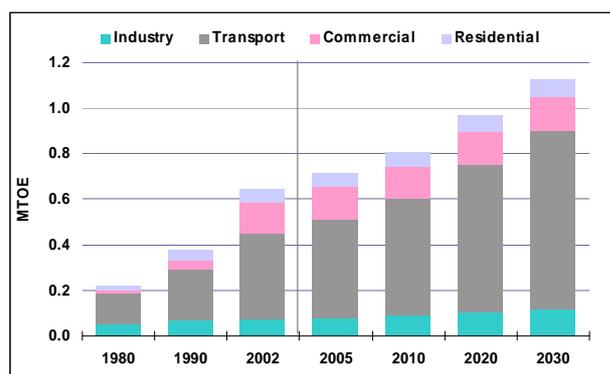
¹⁴ Brunei Darussalam is the 4th largest oil producer in the South East Asia and the 9th largest producer of natural gas in the world.

OUTLOOK

FINAL ENERGY DEMAND

Final energy demand, mainly oil and natural gas, is expected to grow at 2.0 percent per year over the outlook period, compared with annual growth in the previous two decades of 5.0 percent. The transport sector is projected to grow at an annual rate of 2.7 percent, followed by industry at 1.6 percent, residential at 1.3 percent, and commercial at 0.2 percent.

Figure 8 Final Energy Demand



Source: APERC Analysis (2006)

Industry

Energy demand in the industrial sector is projected to grow at an average annual rate of 1.6 percent in 2030, faster compared with the average annual growth of 1.3 percent over the past two decades. The faster growth will be mainly driven by expected developments in the energy-intensive petrochemical industry. Brunei Darussalam plans to diversify its economy, which is heavily dependent on the oil and gas industry, by developing the Sungai Liang Industrial Park, which includes a methanol plant with a production capacity of 2,500 tonnes per day that is expected to begin operation in 2010.¹⁵ Another project that has been proposed is an ammonia/urea plant with a daily production capacity of 2,000 tonnes of ammonia and 3,500 tonnes of urea. The economy plans to construct an aluminium smelting and elastomers industry over the outlook period.¹⁶ Electricity, the major energy source in the above mentioned plants, is projected to grow at an average annual rate of 1.8 percent. The share of electricity accounted for 36 percent of total industrial

¹⁵ In November 2005, agreement on the formation of a joint venture to construct a methanol production plant at the Sungai Liang Industrial Park signed between Brunei National Petroleum Company Sdn Bhd with two major Japanese companies, Mitsubishi Gas Chemical Company Inc and ITOCHU Corporation.

¹⁶ Perry (2005).

energy demand in 2002, and projected to slightly increase to 37 percent in 2030. However, oil is still expected to maintain the largest share, accounting for 62 percent of the total industrial energy demand in 2030.

Transport

Driven by income growth and increasing integration into regional economic trade activities, Brunei Darussalam's transport energy demand is expected to grow at a steady rate of 2.7 percent per year. Road transport sub-sector accounts for about 51 percent, while air transport about 49 percent of the total transport energy demand. With the steady growth, per capita transportation energy demand will increase from 1.1 toe in 2002 to 1.7 toe in 2030 – ranking the fourth largest in APEC after USA, Australia, and Canada.

By fuel, gasoline for passenger vehicles will grow moderately at an annual rate of 1.3 percent. The moderate growth for gasoline demand reflects a slow down in population growth towards the end of outlook period and the saturation of passenger vehicle ownership. As the level of vehicle ownership has already reached a high of 540 units per 1,000 inhabitants, no significant change in vehicle ownership is projected over the outlook period. By contrast, demand for diesel is expected to grow at a constant rate of 3.1 percent per year, driven mostly by the growth in freight transportation activities, particularly the increase in the number of diesel vehicles and marine transport. Demand for jet kerosene for air transport is projected to grow at the fastest rate of 4.5 percent per year. Such increase will be spurred by the economy's integration into economic activities within Southeast Asia, which would give rise to more international passenger travel and freight movements.

Residential and Commercial

Energy demand in the residential sector is projected to grow at an annual rate of 1.3 percent up to 2030. Although it is slower than the average annual growth rate of 5.2 percent over the past two decades, the growth rate of residential energy demand will be higher than that of GDP per capita.¹⁷ It will be mainly driven by national housing development projects, private housing development, and increase in the number of apartments. The shares of electricity and petroleum products in the total residential energy demand will remain unchanged. Electricity demand is projected to increase at 1.2

¹⁷ It is projected that GDP per capita will grow at an annual rate of 0.7 percent over the outlook period.

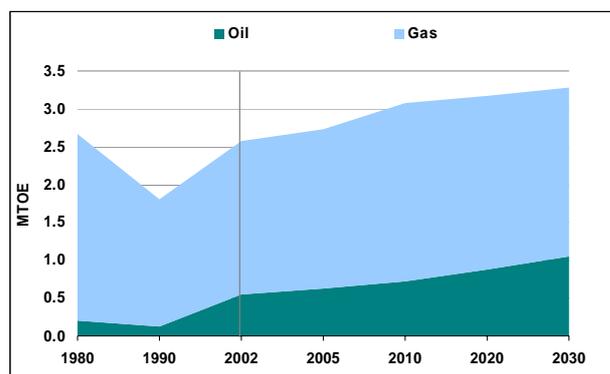
percent per year over the outlook period, accounting for 58 percent of the total residential energy demand in 2030. LPG, the dominant fuel among the petroleum products used in the residential sector, is expected to increase at 1.5 percent and will account for 42 percent of total residential energy demand in 2030.

In Brunei Darussalam, electricity is the only energy source utilised in the commercial sector. Over the outlook period, demand for electricity is expected to grow at 0.2 percent annually, much lower than the average annual growth rate of 12.2 percent in the past two decades. The slower growth in electricity demand is mainly due to the offsetting effects of two factors: higher economic development¹⁸ and lower population growth¹⁹.

PRIMARY ENERGY DEMAND

Over the outlook period, Brunei Darussalam’s primary energy demand is projected to grow at an annual rate of 0.9 percent. Oil is projected to grow at the fastest rate of 2.3 percent per year followed by natural gas at 0.3 percent.

Figure 9 Primary Energy Demand



Source: APERC Analysis (2006)

Natural gas demand will be largely driven by the electricity sector and will account for 68 percent of total primary energy demand in 2030. To meet the rising electricity demand, the economy will continue to rely on natural gas because of the abundance. Brunei Darussalam is expected to increase the capacity of natural gas-fired electricity generation from 633 MW in 2002 to 1,036 MW in 2030.

Oil will be the main fuel utilised by all sectors with the transport sector accounting for the largest share at 89 percent, followed by industry (8 percent) and residential (3 percent) over the outlook period.

¹⁸ Over the past two decades GDP has increased at 0.14 percent annually; however, it is projected that GDP will grow at 1.7 percent annually through 2030.

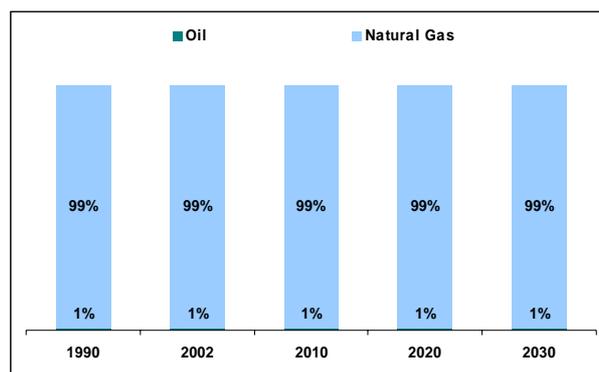
¹⁹ APERC projects that population would increase at an annual growth rate of 0.9 percent over the outlook period.

ELECTRICITY

The electricity generation of Brunei Darussalam will increase by 26 percent from 2.7 TWh in 2002 to 3.1 TWh in 2030. Despite the substantial growth projected, per capita final electricity demand is expected to decrease from 6,580 kWh in 2002 to 5,990 kWh in 2030.

Over the outlook period, natural gas will maintain the dominant share in the electricity generation mix at 99 percent.

Figure 10 Electricity Generation Mix

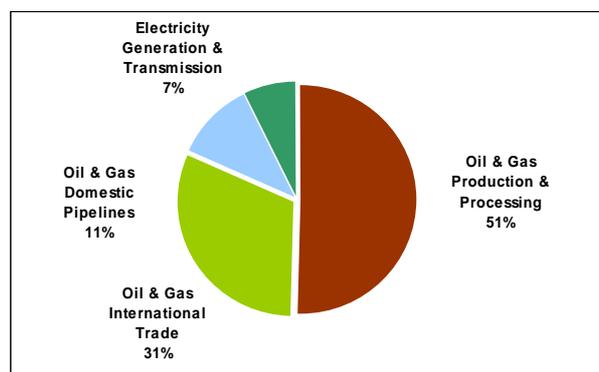


Source: APERC Analysis (2006)

INVESTMENT REQUIREMENTS

Brunei Darussalam’s projected growth in energy demand will require the necessary investments for the development of energy supply, transformation, transport, and downstream infrastructures at a cost of between US\$ 3.3-4.4 billion by 2030. Half of the total investment requirement is expected to be utilised for oil and gas production, processing and petrochemical infrastructure development reaching US\$1.4-2.2 billion in the same period.

Figure 11 Investment Requirements

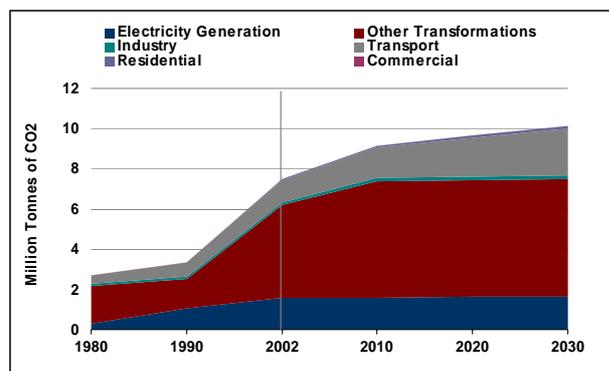


Source: APERC Analysis (2006)

CO₂ EMISSIONS

The addition of technologies to reduce emissions from oil and natural gas production is expected to result in slower growth of CO₂ emissions over the outlook period. For the period 2002 to 2030, CO₂ emissions would grow at 1.1 percent and reach a total of 10.1 million tonnes of CO₂ by 2030.

Figure 12 CO₂ Emissions by Sector



Source: APERC Analysis (2006)

MAJOR ISSUES

Brunei Darussalam's high dependence on oil and gas for export revenues has prompted the government to pursue measures that might maximise the economy's potential revenues from indigenous resources. A number of projects have emerged such as the Brunei Darussalam Methanol Consortium which recently concluded a joint venture agreement on gas supply and marketing, which resulted in the start of the development of the first methanol plant in the economy. The plant is expected to produce approximately 850,000 tonnes of methanol per year, most of which will be exported to Asian markets.

In addition, the Brunei Economic Development Board (BEDB) has initiated plans to develop the Sungai Liang area into a world class industrial park with shared infrastructure and utilities (including a power plant and a marine terminal) to service manufacturing and downstream projects including ammonia/urea, methanol, elastomers and aluminium smelting plants. A 500MW power plant will be built in the Sungai Liang region.

IMPLICATIONS

Expansion of the oil and natural gas sectors will further increase the economy's dependency on these energy resources, while at the same time increasing the volume of CO₂ emissions from electricity generation. As oil and natural gas reserves gradually deplete, the government may have to embark on new

alternative initiatives to secure energy supply, such as renewables.

REFERENCES

- APERC (2005). *APEC Energy Overview*. Tokyo.
- EDMC (2006). *APEC Energy Database*. Website: www.ieej.or.jp/apec.
- Ministry of Finance, Department of Economic Planning and Development (2002). *Brunei Darussalam Statistical Year Book 2003*.
- Ministry of Finance, Department of Economic Planning and Development (2000). *Brunei Darussalam Eighth National Development Plan (2001-2005)*.
- Prime Minister's Office, Department of Electrical Services (2006). Website: www.des.gov.bn.
- Prime Minister's Office, Petroleum Unit (2006). Website: www.petroleum-unit.gov.bn.