

PHILIPPINES

- *The Philippines' primary energy demand is projected to more than double from 44Mtoe in 2002 to 111Mtoe in 2030, growing annually at 3.4 percent; buoyed mainly by high growth in the demand for petroleum products in the transport sector.*
- *Robust economic growth stimulated by increasing population and demographic changes will further expand the economy's energy demand.*
- *The economy will remain a net energy importer despite efforts to expand the energy resource supply base with renewable energy technologies and alternative fuels.*
- *Between US\$68-87 billion in new investment will be required to finance the economy's projected expansion of energy infrastructure; 69 percent or US\$61 billion of which will be allocated to the electricity sector.*

RECENT ENERGY TRENDS AND ENERGY POLICY

Over the last two decades, the Philippines' total primary energy consumption increased annually at 3.5 percent. Between 2002 and 2004, oil accounted the largest share at 38 percent, mainly from the transport sector, increasing at 7.2 percent annually over the same period. Industrial energy consumption has also increased due to renewed interests in metal mining as a result of rising international metal prices. The continued expansion of industrial activities between 2002 and 2004 has increased the aggregate consumption of oil, coal and electricity by as much as 1.0 percent per year. Heightened economic activities as a result of improved income, living standards, and increased personal consumption and spending have subsequently contributed to the high energy consumption growth in the commercial sector.⁹⁰

The economy has moderate reserves⁹¹ of oil, natural gas and coal and supplies half of the total domestic energy requirements. Increasing energy consumption has exerted pressure on the economy's indigenous energy production, particularly for oil, natural gas and coal. Coal production increased and reached the highest level of 2 million tonnes⁹² in 2004, supplied mostly by the Semirara Coal Corporation. Natural gas production likewise

increased from 376 MMCF in 2000 to 94,803 MMCF in 2003, while oil production (from condensate) increased more than six times from 0.3 million barrels in 2000 to 4.86 million barrels in 2003 when the Malampaya oil and gas field started commercial operation in 2001. As a result of these developments, imports have been reduced and the economy's energy self-sufficiency has improved from 50.2 percent in 2002 to 51.9 percent in 2004.

Despite increases in indigenous energy production and improvement in self-sufficiency, rising demand for oil and coal have continued to increase the economy's import dependence thus prompting government to pursue further improvement in policy measures and programmes. Aside from the regular programmes included in the Philippine Energy Plan, the government has initiated legislative measures that would guarantee reduction of import dependence through aggressive promotion for exploration and development of indigenous energy resources, enhanced utilisation of natural gas, continued reforms in the electricity sector, energy efficiency improvements, promotion of alternative fuels in the transport sector and fiscal reforms. These measures are aimed at ensuring adequate, reliable and affordable supply of energy to the economy, with the highest regard on environment and sustainable development. With the government programmes and institutional changes in place, the government hopes to achieve a greater degree of energy self sufficiency over the outlook period.

ENERGY DEMAND DRIVERS

GDP grew steadily at 2.4 percent over the last two decades and is expected to maintain a growth rate of 4.1 percent over the outlook period. The service sector is expected to lead the economy's GDP growth accounting for 60 percent of the total incremental growth of GDP between 2002 and 2030.

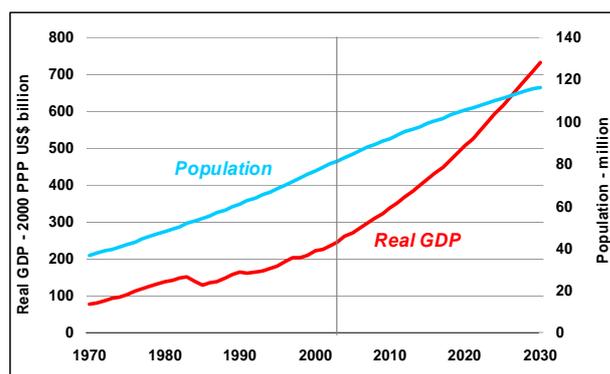
⁹⁰ Despite the strong economic growth, the uptrend in GDP growth suffered a slight decline, mainly as a result of heightened oil prices and government's decision to cut back on public services and infrastructure spending to reduce the economy's budget deficit. The slump however was later revived by increased remittances from Filipinos working overseas - now reaching over US\$11.6 billion representing 13.5 percent of GDP in 2004 (World Bank).

⁹¹ In 2002, proven oil reserves were estimated at 24 MCM, natural gas at 107 BCM, and coal 399 million tonnes. The Philippines is also the world's second largest geothermal energy producer for electricity generation, next to the US.

⁹² Average annual coal production over the last two decades was only 1.2 million tonnes.

Despite government's efforts to limit population increase, population is expected to continue growing at a moderate rate of 1.4 percent over the outlook period. Social and economic opportunities in the Philippines, for the last two decades have been concentrated in Metro Manila or the National Capital Region (NCR) and this trend of internal migration is expected to continue over the outlook period. Based on UN Habitat statistics, the economy's urbanisation level will increase from 60 percent in 2002 to 76 percent in 2030.⁹³

Figure 86 GDP and Population



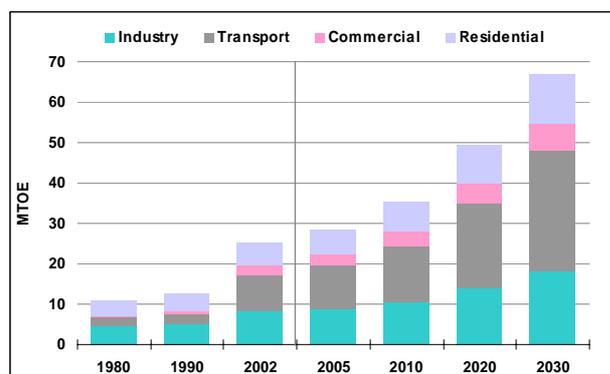
Source: Global Insights (2005)

OUTLOOK

FINAL ENERGY DEMAND

The Philippines' total final energy demand is projected to grow more than two-fold from 25.2 Mtoe in 2002 to 67.1 Mtoe in 2030, at an average annual rate of 3.6 percent. The transport sector will account for the major share at 44 percent, followed by industrial (27 percent), residential (19 percent) and commercial (10 percent).

Figure 87 Final Energy Demand



Source: APERC Analysis (2006)

Industry

Energy demand in the industrial sector is projected to grow at an average annual rate of 2.9 percent until 2030, an increase from the average annual growth of 2.5 percent over the past two decades. The higher industrial value-added growth at 4.4 percent per year will result in the slightly higher growth in energy demand of the sector. Expected developments in the energy-intensive mining industry, due to the increased investor confidence following the Supreme Court ruling on the Mining Act of 1995, will also contribute to the faster growth in demand. Major developments in the mining industry include the commercial operation of the Malampaya gas field and the start up of gold, copper and nickel mining operations nationwide. The economy also expects to see robust growth in the petrochemical industry, which is expected to grow at 4.0 percent per year over the outlook period.

The share of renewable energy is projected to remain the largest, but will contract from 48 percent in 2002 to 33 percent in 2030. The share of bagasse, which is largely used in cogeneration in the sugar industry, is expected to decrease as it is gradually replaced by commercial fuels. The share of oil is also projected to decrease from 25 percent in 2002 to 22 percent in 2030, as oil is replaced by other fuels. The demand for natural gas, which is expected to begin in 2007, is projected to grow at an annual rate of 6.3 percent over the outlook period. With the completion and operation of the Batangas-Manila natural gas pipeline in 2007, industries along the pipeline route are expected to source their fuel requirements from the pipeline, consequently replacing fuel oil. As a result of these new connections, natural gas is expected to account for about 8 percent of the total industrial energy demand in 2030. Electricity, on the other hand, is projected to grow at the fastest rate of 4.7 percent per year, as more industries utilize electrical equipment. The share will increase from 16 percent in 2002 to 27 percent in 2030.

Transport

Energy demand in the transport sector is characterised by a heavy reliance on the road transport sub-sector, which accounts for 90 percent of total passenger and 50 percent of freight movement. In urban areas such as Metro Manila, reliance on road transport is high due to the growing number of passenger vehicles, the most popular of which are the 'FX' taxis and passenger 'jeepneys'. Road transport accounts for most of the inter-city travel between Manila and the various provinces in Luzon, including the islands of Visayas and

⁹³ In contrast, the government has initiated plans to decentralize the economy by establishing growth centres/regions, through which rural areas are developed into urban centres to discourage internal migration to the major urban cities.

Mindanao as these islands are linked by provincial highways and bridges which cut travel time by almost half compared with that of marine transport. Traditionally, inter-island travel is undertaken through roll-on-roll-off (RORO) vessels which virtually connect all the islands in the archipelago.

Over the outlook period, road transport energy demand is expected to grow at an annual rate of 4.6 percent, and account for 90 percent of total transport energy demand in 2030. The growth is mainly as a result of the planned decongestion of Metro Manila to distribute economic development and provide new opportunities for growth in other regions. Likewise, increasing income, at an annual rate of 2.8 percent, is projected to contribute to the annual incremental growth in passenger vehicle stocks at 88 thousand vehicles per year. This will translate to a substantial growth in gasoline demand, growing at 4.0 percent per year. Likewise, energy demand for freight transport is expected to grow substantially as a result of increased industrial activity. The amount of freight traffic is projected to increase, in turn driving the demand for diesel at an annual rate of 5.0 percent through 2030.

Residential and Commercial

With the increase in population and income growth, energy demand in the residential sector is projected to grow at 2.9 percent per year, faster than that of 1.9 percent over the past two decades. In 2002, the Philippines' residential energy consumption was dominated by biomass (from rice and coconut residues, and wood waste) at 58 percent. However due to the expanded access to electricity and the availability of commercial fuels, the share of biomass in total residential energy demand is projected to decrease from 58 percent in 2002 to 28 percent in 2030. Consequently, limited growth in biomass is expected at a modest rate of 0.2 percent due to the continued use in rural areas as a fuel for cooking. Electricity on the other hand is projected to grow the fastest at 6.5 percent per year and will account for the largest share in total residential energy demand at 56 percent in 2030. As an alternative to kerosene and biomass for cooking, LPG is expected to grow at an annual rate of 3.3 percent and will account for about 14 percent of the total residential energy demand in 2030.

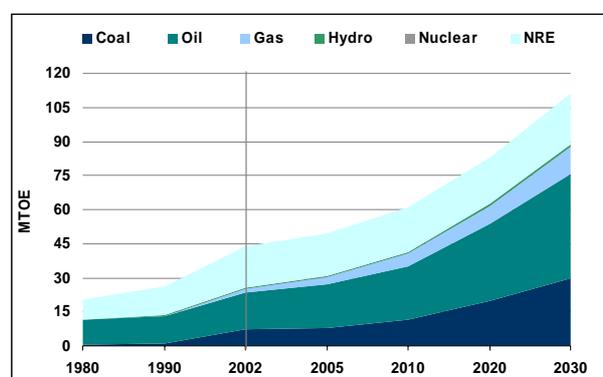
Over the outlook period, commercial energy demand is expected to grow at 3.7 percent per year, mainly as a result of expanded use of electricity in the sector, accounting for 60 percent of the total commercial demand growth. Due to the increasing demand for cooling and lighting in commercial buildings, the share of electricity is expected to

increase from 35 percent in 2002 to 60 percent in 2030, growing at an annual rate of 5.7 percent. LPG is expected to account for the second largest share in total commercial energy demand but with a decreasing share from 20 percent in 2002 to 19 percent in 2030, at an annual rate of 3.4 percent. As a result of the substitution with the aforementioned energy sources, the combined share of diesel and heavy fuel oil is expected to decrease from 44 percent in 2002 to 21 percent in 2030.

PRIMARY ENERGY DEMAND

Oil is expected to dominate the economy's primary energy demand at 41 percent, followed by coal at 27 percent and renewables (mostly from biomass) at 20 percent.

Figure 88 Primary Energy Demand



Source: APERC Analysis (2006)

The economy's energy import dependence is expected to increase from 51 percent in 2002 to 68 percent in 2030, importing most of oil and coal requirements for the transport and electricity sectors.

The increasing share of coal will be attributed to the expected growth in the cement industry and the electricity sector. The share of biomass on the other hand is expected to decrease from 42 percent in 2002 to 20 percent in 2030 because of the continuing shift to electricity and LPG for cooking in the residential sector.

Due to the environmental reason, the electricity sector will increase use of natural gas from 1.8 Mtoe in 2002 to 11.8 Mtoe in 2030, growing at an annual rate of 6.5 percent through 2030. The industry sector will also increase the use of natural gas from 0.6 Mtoe in 2002 to 1.4 Mtoe in 2030 as a chemical feedstock.

ELECTRICITY

Electricity demand is projected to grow annually at 5.7 percent over the outlook period. The fastest growth in electricity demand is expected in the residential sector, increasing annually at 6.5 percent, followed by commercial at 5.7 percent and industry at

4.7 percent by 2030. Despite government efforts to expand the economy’s mass transport system, contribution to electricity demand in the transport sector will be negligible over the outlook period.

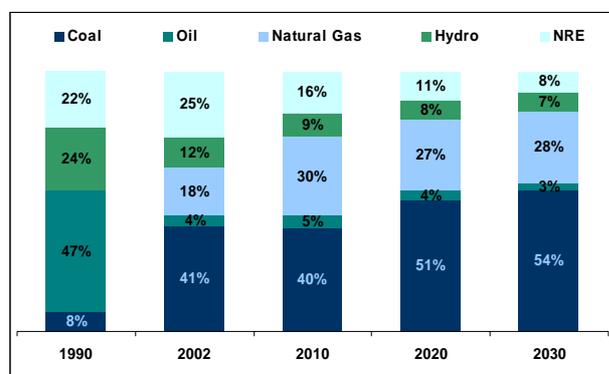
The economy’s electricity generation mix has historically been dominated by oil which accounted for 47 percent in 1990, followed by hydro (24 percent), renewables (22 percent) and coal (8 percent).

Over the outlook period, significant changes are expected particularly with the entry of natural gas which will account for an increasing share from 18 percent in 2002 to 28 percent in 2030.

Due to coal’s abundance in both domestic and regional supply, and cost competitive advantage over other fossil fuels, coal is projected to account for the largest share in electricity generation mix and will increase from 41 percent in 2002 to 54 percent in 2030, at an annual growth rate of 6.2 percent.

Despite the aggressive promotion of renewables for electricity generation and increased capacity, the share of renewables in the electricity generation mix is projected to decrease from 25 percent in 2002 to 8 percent in 2030, at 0.8 percent per year.

Figure 89 Electricity Generation Mix

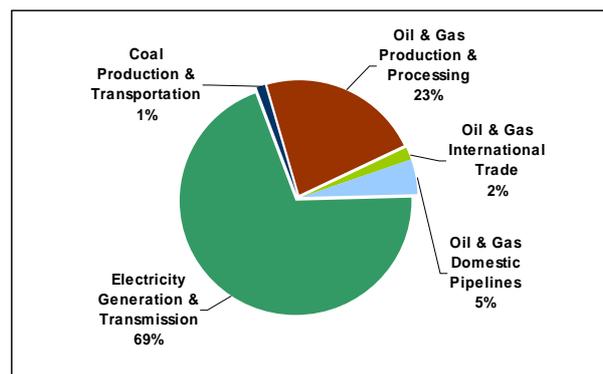


Source: APERC Analysis (2006)

INVESTMENT REQUIREMENTS

The projected growth in energy demand will require the development of energy supply, transformation, transport, and downstream energy infrastructure at an estimated cost of between US\$68-87 billion by 2030. Major investment is expected in electricity generation and transformation reaching as high as US\$61 billion in the same period.

Figure 90 Investment Requirements

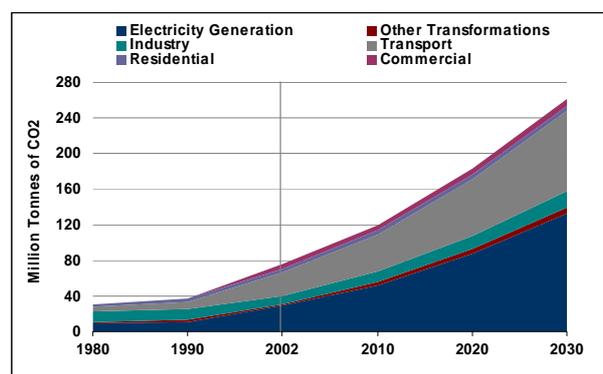


Source: APERC Analysis (2006)

CO₂ EMISSIONS

Measures to move away from fossil fuels, improvement in energy efficiency and conservation, and other emission reduction programmes would contribute to the slower growth in CO₂ emissions despite the economy’s robust energy demand growth. Over the outlook period, CO₂ emissions are expected to grow at 4.6 percent per year and will reach a total of 262 million tonnes of CO₂ in 2030.

Figure 91 CO₂ Emissions by Sector



Source: APERC Analysis (2006)

MAJOR ISSUES

REDUCING IMPORT DEPENDENCY

Despite government efforts to expand the economy’s domestic energy production, the Philippines is still expected to remain a net energy importer over the outlook period.

Since the economy’s oil imports are mostly utilised in the transport sector, reducing oil dependence in the sector will remain the biggest challenge. To this end, the economy has aggressively introduced and promoted the use of biofuels such as coco methyl ester (CME), ethanol, gasohol, alcohols and LPG for transport. The success of the programme however hinges on the economic viability of establishing new production facilities, increasing

biofuel feedstocks, and the issuance of necessary incentives to attract prospective investors.

IMPLICATIONS

ENERGY SECURITY

The Philippines has been very active in promoting investments in the upstream and downstream energy sectors. The Public Contracting Rounds which the economy has initiated starting in 2003 has generated more areas in oil, natural gas and geothermal for new investments. New service contracts have also been awarded which would expect further increases in future supply for oil, natural gas and geothermal. The success of this programme together with other legislative measures expects to help improve the economy's self sufficiency or import dependency in the next 30 years.

However, despite these efforts, the economy still lags behind other APEC member economies in terms of foreign capital flow. The business sector still considers the slow privatisation process in the electricity sector, delays in the economy's fiscal and political reforms, including the slow process of legislative approval of important energy measures, as contributory factors to the lack of investor interests. The lack of appropriate energy infrastructure will contribute the biggest bottleneck in terms of delivery of energy to all economic sectors.

The economy may also have to rethink the role of natural gas in the economy's electricity generation mix as the primary fuel with due consideration on the current and projected resource potential and the necessary infrastructure development against that of coal, which is a more abundant and cost competitive energy resource.

The Philippines has foreseen the need to forge ties with international communities especially with the ASEAN on the posing threat of global energy supply shortages. The economy is an active member of the APEC, ASEAN, Asian Cooperation Dialogue (ACD), as well as other bilateral undertakings which translated into numerous agreements, MOUs and joint cooperation with other economies. For example, an MOU was signed in 2005 between the Philippines and Indonesia to cooperate in the long-term coal, oil and gas supply, including geothermal development. Maintaining cooperation and facilitation of trade could guarantee the security of supply across regions.

ALTERNATIVE FUELS

The economy is aggressively promoting the development of alternative fuels from indigenous

agricultural wastes. The main problem however the economy may face in the future is the conflict between energy security and food security. If left unchecked, feedstock for ethanol and coco methyl ester will compete with the current demand for sugar and coconut products (both important export commodities) and might result again to unwarranted imports and increased prices.

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