

## Prospects for coal and clean coal technology in the Philippines

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This report on the use and prospects for coal in the Philippines is the latest in a series examining coal and clean coal technology prospects in the major economies in the Association of Southeast Asian Nations (ASEAN).

Economic growth is modest by the standards of the industrialising Asian nations, and far behind the likes of China. The average economic growth of around 4% is enviable by OECD standards but, for the region, is fairly modest and has not kept pace with the rise in population.

In 2009 coal accounted for 15% of the country's primary energy supply, equivalent to 8.5 Mtce.

The Philippines is the world's second largest producer of geothermal energy (behind Indonesia). In 2010, the country's geothermal plants produced 8.5 Mtce, generating 8.5 TWh out of a total generation of 67.7 TWh.

The key energy demand region (of which there are three) is the northern group of islands called Luzon where the capital Manila is located and where most of the country's population and economic activity occurs. However, a great deal of the population still relies on biomass waste which accounts for 18% of primary energy. In 2009, biomass provided 10 Mtce.

The Government's Philippines Energy Plan recognises the need to diversify the energy sector and to become more energy independent. The plan aims to increase the use of indigenous energy resources by 2030. While there is interest in expanding renewable energy, fossil fuels are currently the key energy resources and dominate primary energy demand with around 86%.

The main driver for energy policy in the Philippines is achieving energy independence through use of indigenous energy resources while promoting reforms in the power market. However, the geographical nature of the Philippines with around 7100 islands covering 300,000 km<sup>2</sup> with 20 active volcanoes and mountainous terrain makes it difficult to provide the entire population of 94 million with electricity.

A major issue is the increasing energy demand, coupled with a population growing which is at an annual rate of 2.3%. Electricity shortages remain a major problem. However, the government programme for energy development places more focus on renewable energy, but whether this will satisfy the growing demand for reliable

electricity is questionable.

The country remains reliant on oil imports. Historically, the Philippines has been dependent on imported oil to meet its energy demand. In recent years the Government has undertaken several measures to encourage a greater understanding of the country's resources. Hydrocarbon reserves have been identified in recent years with a Norwegian-funded study finding twelve basins with gas and oil deposits.

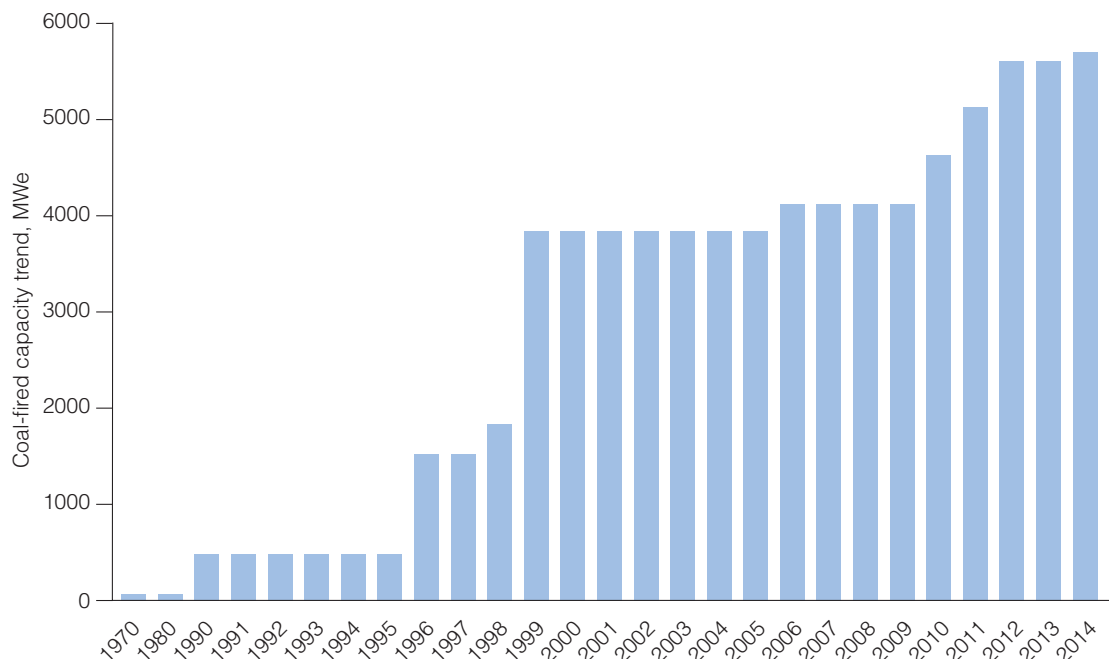
Estimates for coal reserves from several studies are wide ranging and contradictory. However, with estimates of 316 Mt to as much as 19,000 Mt, the potential is considerable. In addition, there is potentially up to 270 Gt of coal resources. Of the known 316 Mt that is economically recoverable, most are coals that are higher in moisture with 170 Mt being subbituminous coal, 105 Mt being lignite (brown coal). The Philippines also has 41 Mt of bituminous coal and anthracite.

Confirmation of the coal resources beyond those currently identified is needed if the Philippines is to reduce its reliance on imports. With coal scattered over many islands, developing the infrastructure and mine facilities might prove difficult. For this reason, domestic coal production is concentrated in Semirara where 96% of the country's coal production occurs. The coal here comprises of subbituminous and bituminous rank coals.

The Philippines depends on imports for about three-quarters of its coal supply, and is a regular participant in the international seaborne market as a buyer. The increase in imported coal occurred in the 1990s due to the building of a number of large coal-fired power stations designed to burn imported coals. More recently in 2010, demand for coal from the power sector was 12.5 Mt and could yet increase to 16–20 Mt by 2015, and 30–40 Mt by 2030.

There is currently 6.5 Mt/y domestic production which means that imports could increase from the current 11 Mt/y to 41.5 Mt/y. Policy incentives to develop new mines are being provided by the government – however most of the permits given are for small-scale mining. This is unlikely to increase coal production to the scale needed, resulting in potential future coal shortages and increasing coal imports.

Since the 1970s the Philippines has suffered ongoing



Capacity build of coal-fired capacity in Philippines since 1970

blackouts which continue today in some areas. With any system, investment in generating capacity must be carried out with investment in network and distribution. Supply-side constraints regarding electricity supply still blight many parts of the country. The southernmost region, Mindanao has a power grid that operates with a narrow reserve margin, even when hydropower is plentiful. The Luzon and Visayas grids are also exhibiting increasing signs of stress. One option to increase electricity supply is to increase coal-fired power plant utilisation from the current 50% to 75%. As a result this could add an additional 14% power to national generation. However, the growth in electricity demand is spread widely across many islands, and so increased utilisation of capacity in one region may not be sufficient to serve the needs of another region.

Although the energy sector has undergone deregulation and privatisation of generators this has yet to trickle down in benefits to energy consumers. The Philippines has one of the highest prices for electricity in Asia and is still heavily subsidised. The introduction of feed-in tariffs for increasing renewables, while a laudable policy, is likely to

meet widespread opposition if electricity prices increase further. Roughly 13% of the population live on less than US\$ 1 a day, and a third live below the poverty line.

The potential to adapt and retrofit current stations with high efficiency upgrades is good, given the fleet of subcritical stations. Either way, the prospects for coal demand appear positive providing this demand can be met from expanded indigenous production or from imports. Coal demand from the power sector could increase in 2015 as the development of new generating capacity pushes consumption up to 16–20 Mt and, over the long term, to a possible 30–40 Mt by 2030. The opportunity to adopt cleaner coal technologies is good, especially with high efficiency coal plants using the latest air pollution technology. While air pollution regulations exist, they must be adhered to and strengthened.

Each issue of *Profiles* is based on a detailed study undertaken by IEA Clean Coal Centre, the full report of which is available separately. This particular issue of *Profiles* is based on the report:

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