

INDONESIA REGIONAL OVERVIEW

Since the Asian Financial Crisis of the late 1990s, Indonesia's economy has grown at a rapid pace. As one of the leading developing economies, and a member of the G20 of the world's most influential economies, Indonesia has increasingly become a more active member of the global economy. Moreover, because of its abundant energy resources, Indonesia appears primed to become an even more prominent global player as a supplier of energy to a number of more developed regional partners including China, India, Korea, Singapore, and Japan. Indonesia has also sought to supply its own expanding economy.

However, Indonesia has struggled to fully capitalise on its ample energy resources primarily as it lacks the infrastructure needed to convert its immense energy resources into usable energy. This is especially true for its natural gas and geothermal reserves. As a result, production has not been able to keep pace with domestic consumption. Furthermore, the emission of greenhouse gases (GHG), if not immediately addressed, pose a significant threat for Indonesia.

Indonesia's growing middle class is expected to drive substantial increases in per capita carbon consumption, through the largely coal-fired expansion of the country's electrification rate, more widespread ownership of motor vehicles, and continued pressures related to land use and deforestation. Fuel and electricity subsidies, as well as the country's high rates of deforestation and degradation, have further exacerbated GHG emissions.

The risks that Indonesia faces from GHG-influenced climate change are high, but so are the benefits that the country could realise as an early adopter of (and market-maker for) a potentially lucrative new technology. As such, there is a significant opportunity for the implementation of carbon capture and storage (CCS) projects as part of a strategy to reduce GHG emissions.

MACROECONOMIC DEVELOPMENT

Indonesia's economy has experienced impressive growth over the past ten years, a trend that will continue for the foreseeable future. In 2012, Indonesia's Gross Domestic Product (GDP) will be almost double what it was in 2000. GDP is expected to increase by over 6 per cent in both 2011 and 2012. Government expenditure has increased in Indonesia significantly over the past five years, including a jump of roughly 38 per cent from 2007-2008.

While part of this increase in spending can be attributed to GDP growth, as well as the phasing out of austerity measures effectively mandated by the Asian Financial Crisis, energy subsidies have also played a major role in this expansion. Escalating world oil prices drove the cost of fuel subsidies from approximately US\$9.3 billion in 2007 to US\$18.7 billion in 2008, during the commodity price rally that immediately predated the cresting of the Global Financial Crisis. At that time, fuel subsidies comprised 13 per cent of the country's total budget (see Figure 2, next page).

In addition to fuel subsidies, the Indonesian Government also provides electricity subsidies, which though not as expensive as fuel subsidies, also represent a significant cost to the Government. This is in part because 20 per cent of power plant production was generated from oil-based fuel in 2010. It is expected that the Government will spend US\$7.3 billion on electricity subsidies, as well as US\$14.4 billion on fuel subsidies in 2011.

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In addition to constituting a large portion of the government's annual budget, Indonesia's subsidies also have a direct impact on the country's electrification rate, as prices for many consumers are well below the cost of generation, resulting in limited investment in the sector by privately owned entities. In 2011, only 66 per cent of Indonesians had access to electricity, with over 70 million people living without access to this basic good. In some areas, such as the West Papua province of Eastern Indonesia, the electrification ratio is currently around 40 per cent.

Figure 1: GDP and rate of GDP growth have increased since 2000 (in constant 2000 US\$, * projected).
Source: World Bank

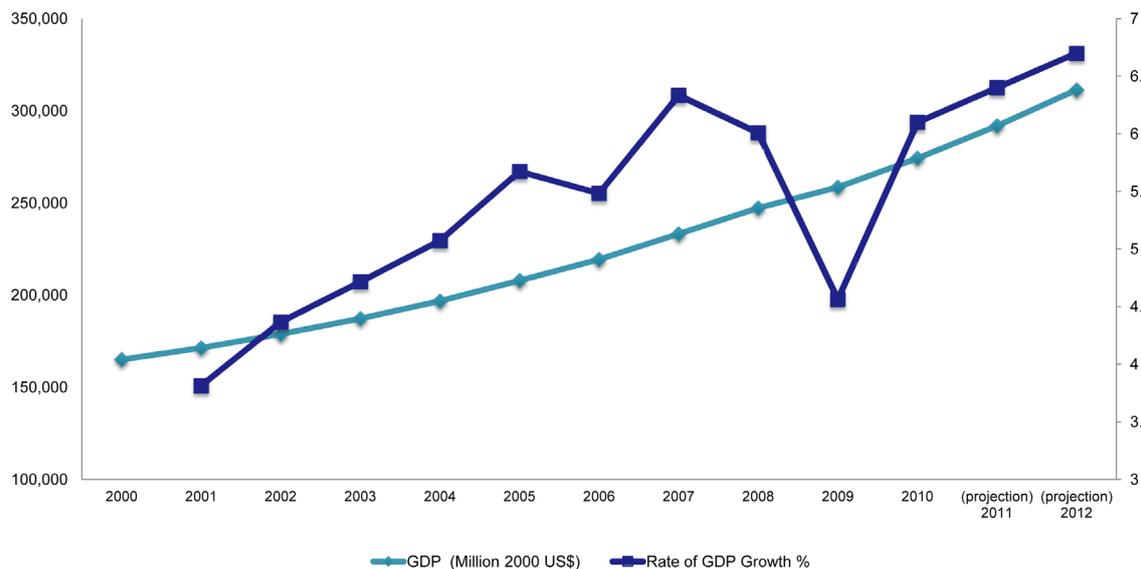
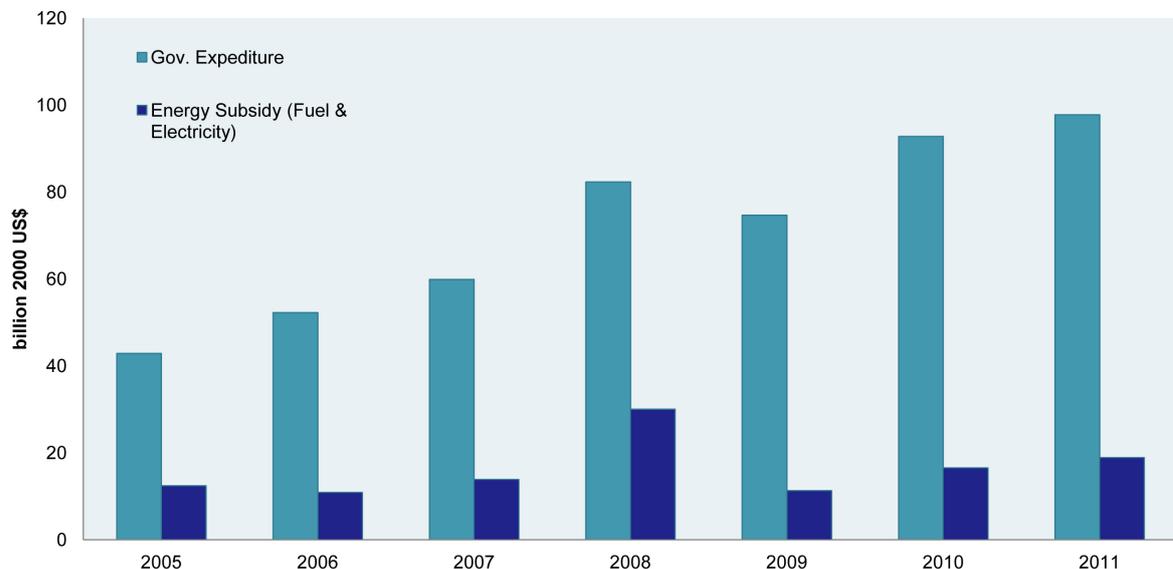
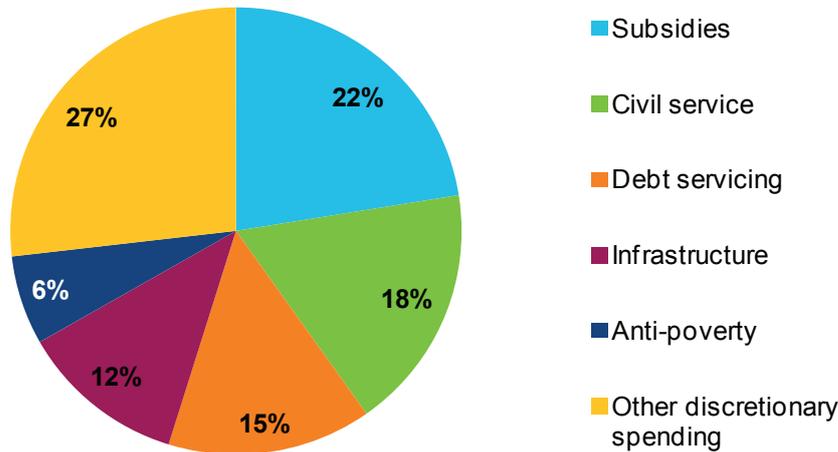


Figure 2: Energy subsidies constitute a large portion of Indonesian Government expenditure and vary significantly year to year. Green energy development will remain modest as long as the Government indirectly subsidises fossil fuels¹. Source: BPS, ESDM, V&P Research



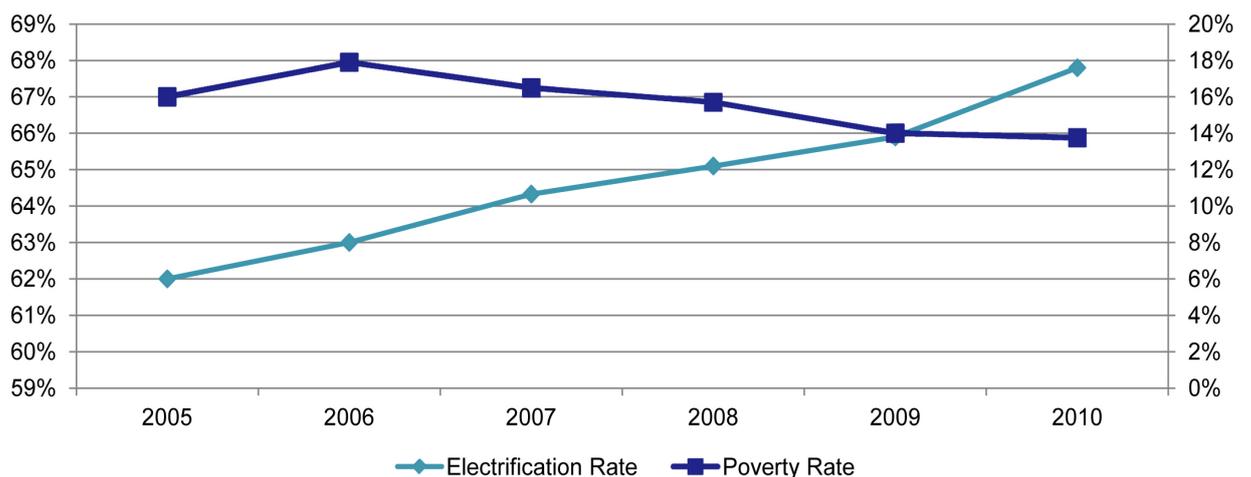
¹NB: Energy subsidy is compiled from actual fuel subsidy and budgeted electricity subsidy.

Figure 3: Subsidies and spending on Indonesia's civil service continues to dominate the State Budget. Source: V&P Research, Press Reports



A key achievement for Indonesia has been substantial and near constant reductions in the poverty rate. In 2010, 13.3 per cent of Indonesians lived below the poverty line, a marked improvement from 2000, where approximately 20 per cent of the population lived in poverty. In some respects the government's success in tackling poverty constrains its ability to make difficult but necessary decisions on fiscal expenditures such as fuel and electricity subsidies. The government's long-term use of subsidies is an important element in the reduction of poverty.

Figure 4: Improvements in electrification and poverty rates since 2005. Source: BPS



A World Bank study in 2011 entitled, *Indonesia Economic Quarterly* indicates that although an end to or reduction of subsidies would certainly affect the poor, Indonesia's wealthiest households consume 84 per cent of subsidised gasoline compared to the poorest households that consume 1 per cent of subsidised gasoline. Further, nearly two-thirds of the poorest households do not consume any gasoline whatsoever.

As a result, while subsidies are maintained to empower and provide relief to the country's poorest, the state electricity company, Pusat Listrik Negara (PLN) takes its losses primarily from a section of the population that could otherwise afford electricity.

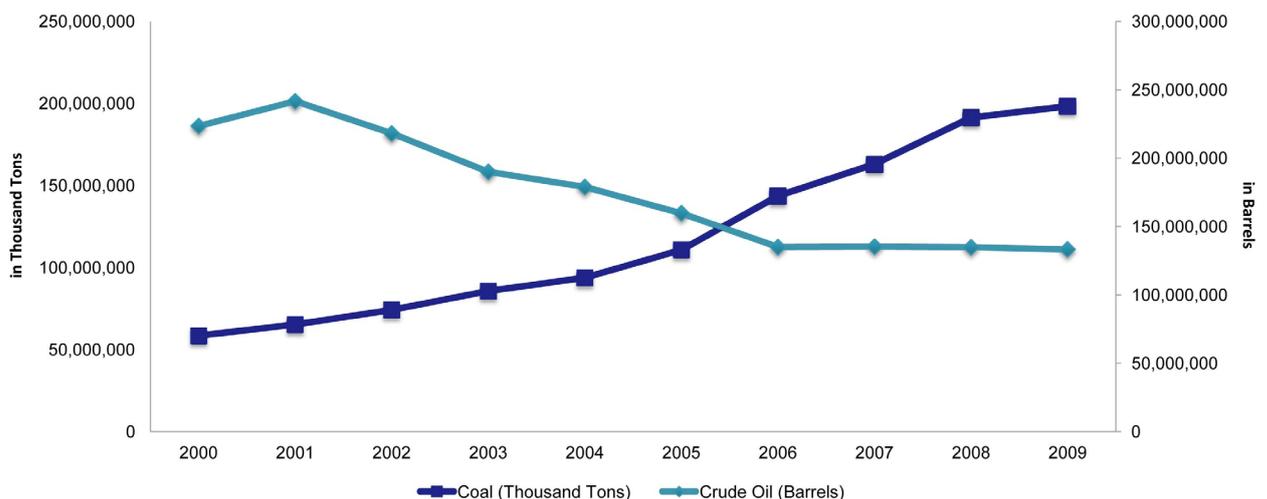
ENERGY USE: TRENDS, CURRENT LEVELS AND PROJECTIONS

In 2009, the largest contributor to Indonesia's primary energy supply was crude oil at 495 million barrels of oil equivalent (BOE)², followed by biomass which was at 279 million BOE. Energy from coal has been growing rapidly over the past ten years. By 2009, 231 million BOE of Indonesia's primary energy supply came from coal, a 247 per cent increase since 2000. Natural gas and geothermal energy have also grown over that same period, but at a much slower rate. Hydropower was responsible for 28 million BOE, three million more than in 2000.

Crude oil

Indonesia's oil exports have steadily decreased over the past 10 years as a result of increasing domestic consumption and diminishing oil supplies. In 2000, Indonesia exported 223.5 million barrels of crude oil, compared to 133.3 million barrels in 2009 and this decline is expected to continue for the foreseeable future. For the most part, Indonesian oil fields are old, and new discoveries have been unable to offset these declines. In 2000, Indonesia had 5.1 billion barrels in proven oil reserves, however in 2010, Indonesia had only 4.2 billion barrels, or 0.3 per cent of total world oil reserves. As a result of the declining domestic production, oil imports will need to grow in order to meet Indonesia's increasing energy demand.

Figure 5: Coal exports have risen sharply in recent years as demand from China and India has skyrocketed. By contrast, oil exports have lagged. Source: ESDM



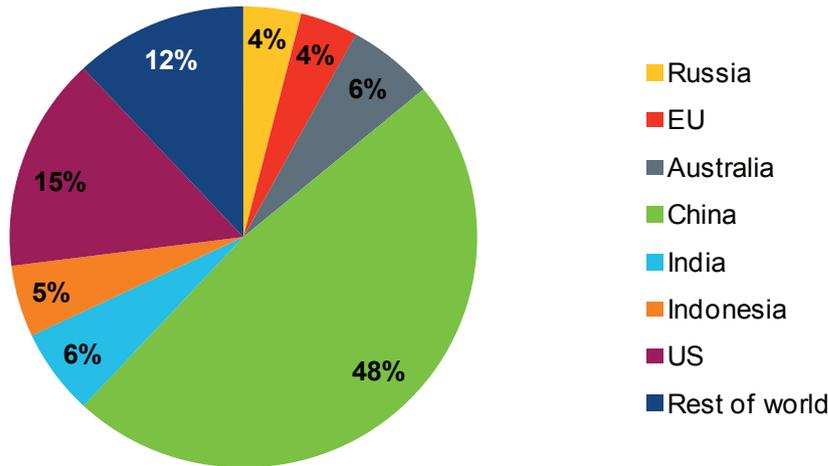
Coal

Indonesia is one of the world's leading exporters of coal. The country's coal exports increased by nearly 400 per cent over the past decade. From 2010, Indonesia had 105 gigatonnes of proven coal reserves with the bulk of these reserves located on the islands of Sumatra and Kalimantan.

²Barrel of oil equivalent (BOE) describes the energy released by burning one barrel of crude oil.

In global terms, Indonesia is becoming an increasingly important player in the coal trade with its 19.4 per cent increase in coal production from 2009 to 2010 the largest in the world. It is currently behind China, the United States, India, and Australia in total coal production, but leads the world in the export of thermal coal, used to generate electricity.

Figure 6: Indonesia's share of global coal production. Source: BP Statistical Review of World Energy



Renewable energy

Indonesia's renewable energy production remains limited. While it has the potential to increase renewable energy production, development is expected to be underutilised due to existing fuel and electricity subsidies. With an increase of 0.1 per cent from 2009 to 2010, Indonesia's renewable energy sector growth falls significantly short of the 15.5 per cent growth experienced on average by all other countries in the same time period. Countries with comparable renewable energy production include New Zealand, the Philippines, and the Netherlands however all have significantly fewer renewable energy resources.

Figure 7: Rising export of palm oil. Source: ESDM

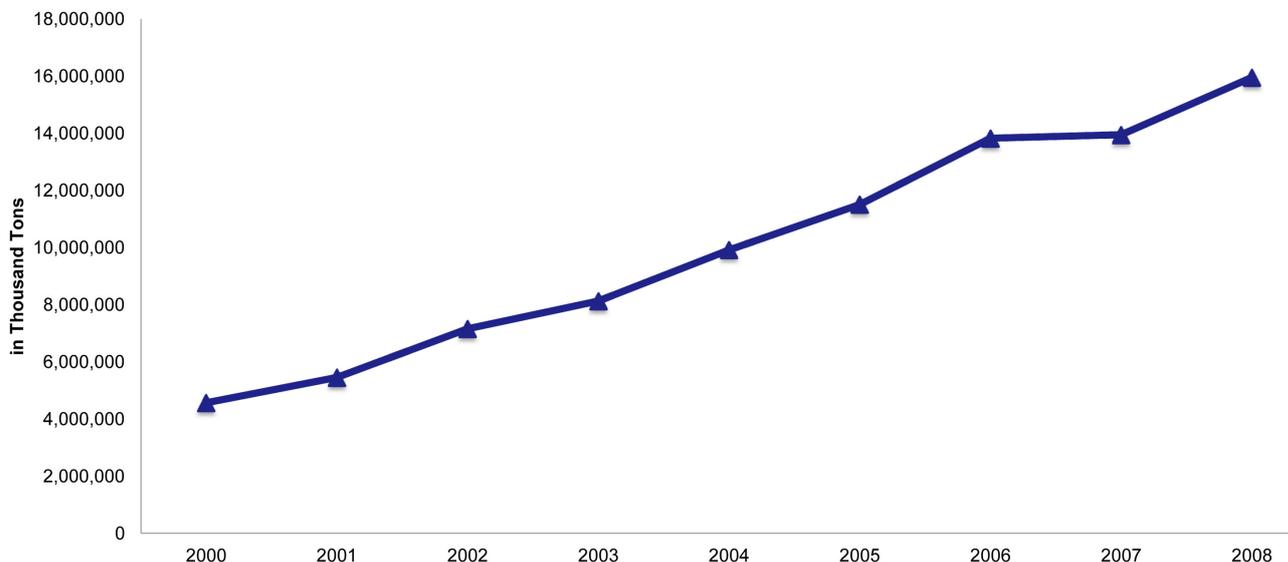
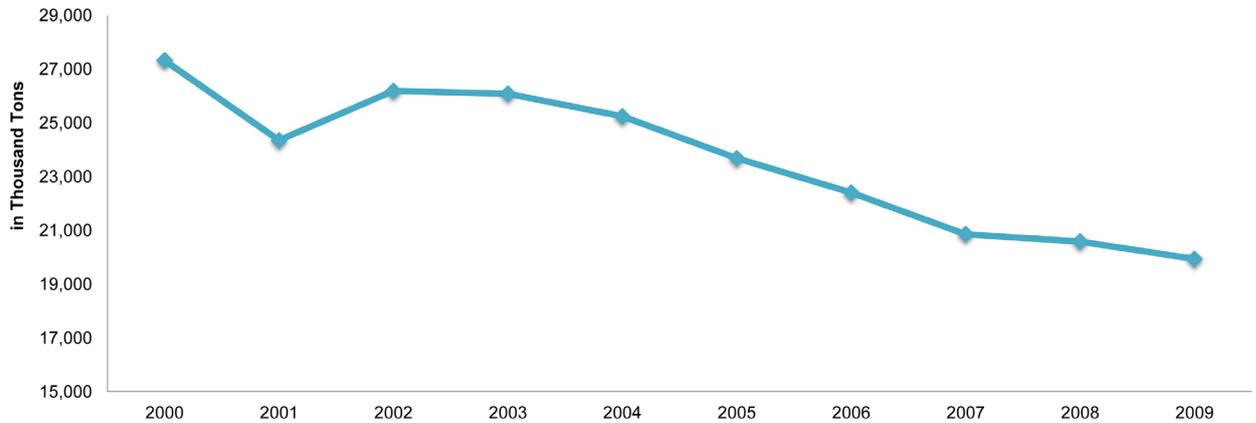


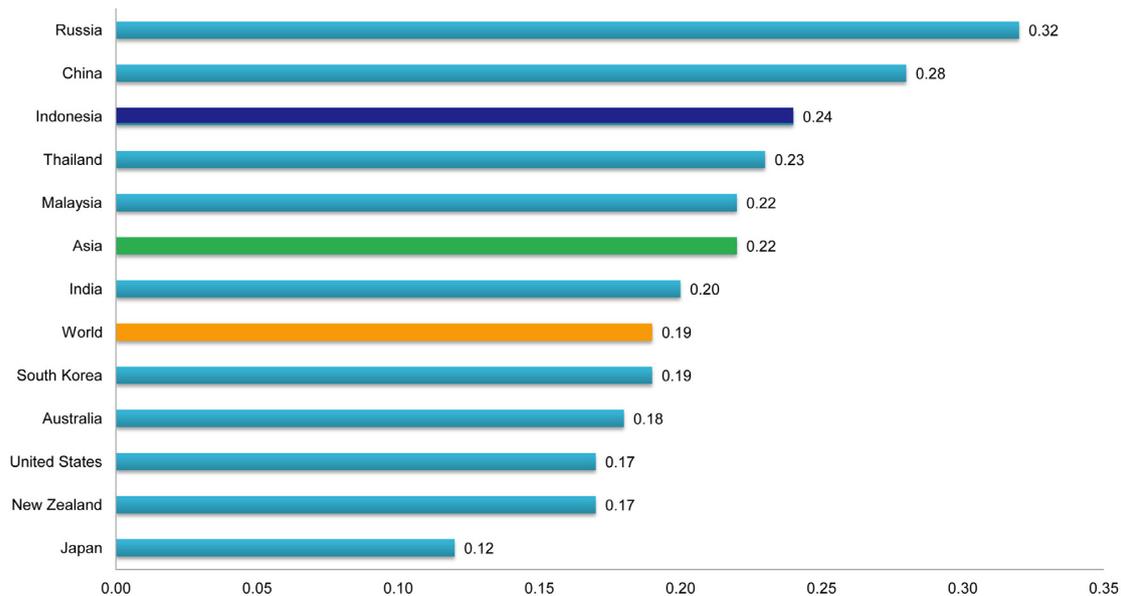
Figure 8: Declining export of LNG in the past decade. Source: ESDM



Though the country possesses 28,000 MW of geothermal reserves (12 billion BOE – the largest reserves in the world), the use of this energy source is small relative to oil, coal, and natural gas. In 2009, only 1.2 per cent of Indonesia’s primary energy supply came from geothermal energy, and the energy source’s rate of growth has been modest. Geothermal energy grew from 9.6 million BOE in 2000 to 15 million BOE in 2009.

With an estimated 75,000 MW, or 32 billion BOE, Indonesia also possesses significant hydropower potential. In 2009, hydropower contributed 28.7 million BOE to Indonesia’s primary energy supply, itself a small amount relative to the 496 million barrels of oil used during the same period.

Figure 9: Indonesia is relatively energy efficient, with an energy intensity level below world and Asia averages. This is largely the result of Indonesia’s heavy reliance on oil-based fuels. Source: Enerdata.net



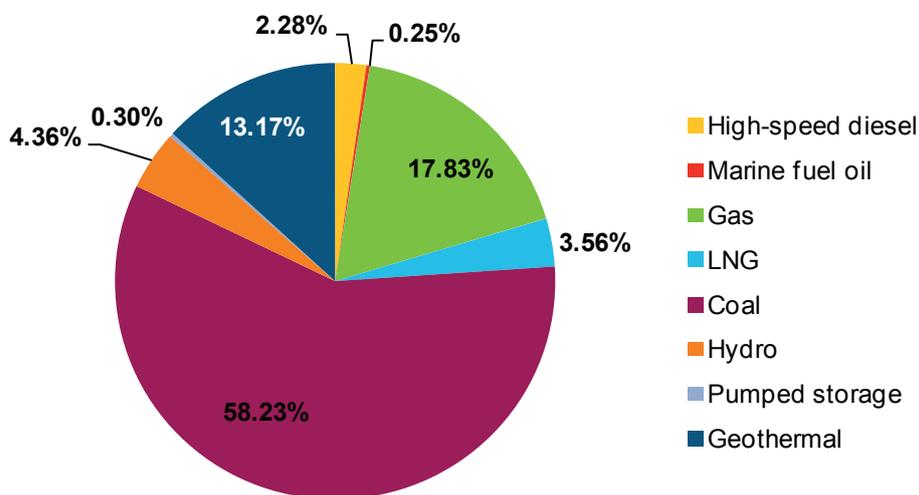
Palm oil, which can be used to produce biodiesel in addition to its primary use as an edible, is one of Indonesia’s main export commodities. In 2006, Indonesia surpassed Malaysia as the world’s leading palm oil producer. In 2008 alone, Indonesia exported 15.9 mega tonnes of palm oil.

Natural gas

Indonesia exports a significant amount of natural gas and was the world's leading liquefied natural gas (LNG) exporter until 2006, when it was exceeded by Qatar. LNG exports have decreased each year for the past decade and will soon be surpassed by projects expected to come online in Australia and Papua New Guinea.

The Indonesian Government has not renewed several LNG export contracts, in order to divert this energy to domestic consumption. With its vast reserves totalling 16 trillion BOE, and the remote nature of many of Indonesia's richest gas prospects (far offshore, distant from major demand centres), natural gas is likely to play a key role in Indonesia's energy future.

Figure 10: PLN expects coal to become Indonesia's dominant source for electrical power. Source: PLN Electricity Supply Business Plan (Rencana Usaha Penyediaan Tenaga Listrik - RUPTL)



Energy intensity

With an energy intensity of 0.24 koe/\$05p³, Indonesia ranks well below the world average. Indonesia currently lags behind OECD countries in energy efficiency. China, Kuwait and Thailand have comparable energy intensity.

Future energy mix

In 2006, President Susilo Bambang Yudhoyono pledged that Indonesia's energy mix in 2025 would be less reliant on fossil fuels. Under his plan (regulation no.5/2006), oil will contribute less than 20 per cent to Indonesia's energy consumption in 2025, down from a current level of more than 45 per cent of total energy consumption. Coal, which is viewed by many stakeholders both on the policy and commercial side of the debate, as the key commodity for Indonesia's drive to cheaply increase electrification rates, would also fall below business as usual (BAU) projections (see Figure 11b on page 8).

According to projections by the PLN, coal will produce 58 per cent of Indonesia's electrical energy in 2019. This is a dramatic increase from its current level of 46 per cent. Electricity from geothermal energy will also grow over the next decade. The PLN projects geothermal energy, which produced 10,000 GWh of power in 2010, will increase by nearly 400 per cent to 49,000 GWh in 2019.

³koe = kilogram oil equivalent, \$05p = constant 2005 international dollar (using purchasing power parity rates).

INDONESIA'S ENERGY MIX IN 2025

Figure 11a: Business as usual scenario

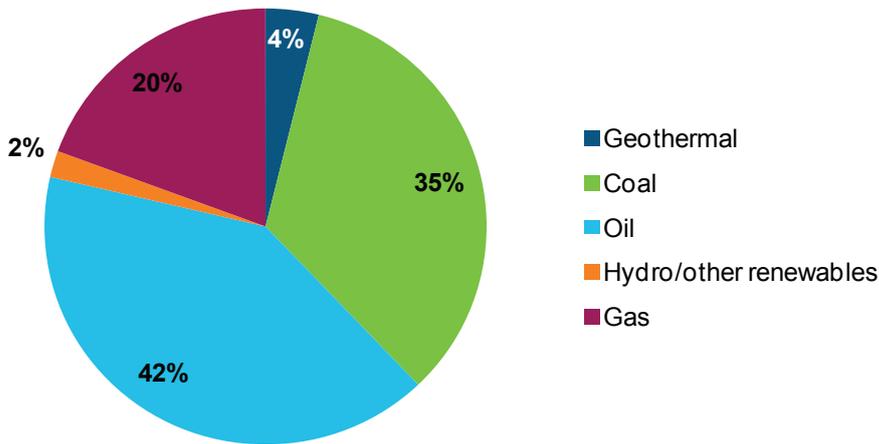
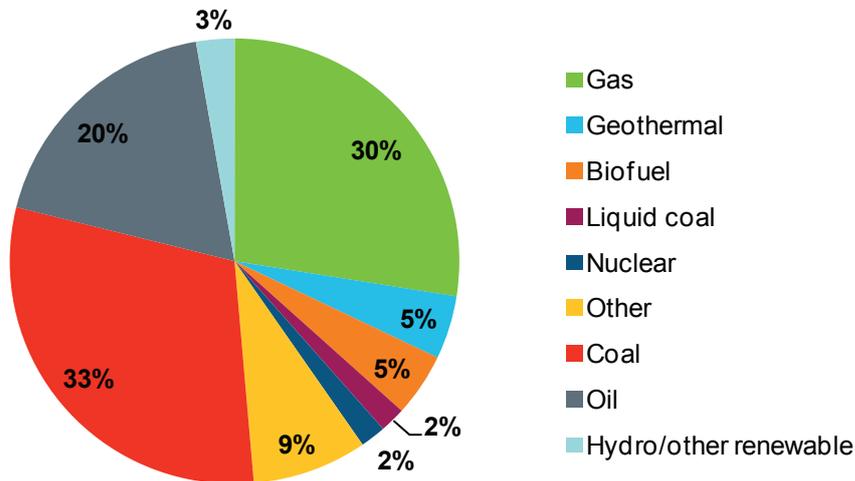


Figure 11b: Significant reduction in oil consumption under President Yudhoyono's energy mix plan (relative to the Ministry of Energy's BAU projections). Source: ESDM, State Secretariat.





ACRONYMS

BAU	Business as Usual
BOE	Barrels of Oil Equivalent
BPS	Statistics Indonesia (Badan Pusat Statistik)
CCS	Carbon Dioxide Capture and Storage
ESDM	Ministry of Energy and Mineral Resources (Kementerian Energi dan Sumber Daya Mineral)
G20	Group of Twenty
GDP	Gross Domestic Product
GHG	Greenhouse Gasses
LNG	Liquefied Natural Gas
PLN	State Electricity Company (Pusat Listrik Negara)
RUPTL	Electricity Supply Business Plan (Rencana Usaha Penyediaan Tenaga Listrik)

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