# Beyond Fossil Fuels:

## Indonesia's fiscal transition

GSI REPORT

IISD
International Institute for Sustainable Development

Global Subsidies Initiative

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The IISD Global Subsidies Initiative (GSI) supports international processes, national governments and civil society organizations to align subsidies with sustainable development. GSI does this by promoting transparency on the nature and size of subsidies; evaluating the economic, social and environmental impacts of subsidies; and, where necessary, advising on how inefficient and wasteful subsidies can best be reformed. GSI is headquartered in Geneva, Switzerland, and works with partners located around the world. Its principal funders have included the governments of Denmark, Finland, New Zealand, Norway, Sweden, Switzerland and the United Kingdom, as well as the KR Foundation.

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The opinions expressed and the arguments employed in this report do not necessarily reflect those of the funder and the peer reviewers, nor should they be attributed to them.

# Abbreviations

| | |
|---|---|
| **BI** | Bank Indonesia |
| **BP MIGAS** | Badan Pelaksana Kegiatan Usaha Hulu Minyak dan Gas Bumi (The Upstream Oil and Gas Regulatory Agency) |
| **BPP** | Biaya Pokok Penyediaan (regional electricity supply costs) |
| **BRIICS** | Brazil, Russia, India, Indonesia, China and South Africa |
| **BPS** | Badan Pusat Statistik (Central Agency on Statistics) |
| **$CO_2$** | carbon dioxide |
| **DMO** | Domestic Market Obligation |
| **DPKK** | Dana Pengembangan Keahlian dan Ketrampilan (fees for hiring expatriates) |
| **DBH** | Dana Bagi Hasil (Revenue Sharing Fund) |
| **DPR** | People's Representative Council (Dewan Perwakilan Rakyat) |
| **EITI** | Extractive Industries Transparency Initiative |
| **EOR** | Enhanced Oil Recovery |
| **GDP** | gross domestic product |
| **GOI** | Government of Indonesia |
| **GSI** | Global Subsidies Initiative |
| **GW** | gigawatt |
| **IEA** | International Energy Agency |
| **IDR** | Indonesian rupiah |
| **IISD** | International Institute for Sustainable Development |
| **IRENA** | International Renewable Energy Agency |
| **IUP** | Izin Usaha Pertambangan (business mining permits) |
| **LKPP** | Laporan Keuangan Pemerintah Pusat (Central Government Financial Reports) |
| **MMBTU** | million British thermal unit |
| **MMSCFD** | million standard cubic feet per day |
| **MTOE** | million tonnes of oil equivalent |
| **NRE** | new and renewable energy |
| **OPEC** | Organization of Petroleum Exporting Countries |
| **PBBKB** | Pajak Atas Penggunaan Bahan Bakar Kendaraan Bermotor (motor vehicle fuel taxes) |
| **PGN** | Perusahaan Gas Negara (state-owned gas company) |
| **PKP2B** | Perjanjian Karya Perusahaan Pertambangan Batubara (coal contracts of work) |
| **PLN** | Perusahaan Listrik Negara (state-owned electricity company) |
| **PNBP** | Penerimaan Negara Bukan Pajak (non-tax state revenue) |

| | |
|---|---|
| **POD** | plan of development |
| **POR** | Pay Out Ratio |
| **Pph** | pajak penghasilan (income tax) |
| **PSC** | production sharing contract |
| **RE** | renewable energy |
| **RPJMN** | Rencana Pembangunan Jangka Menengah Nasional (National Medium-Term Development Plan) |
| **SKK MIGAS** | Satuan Kerja Khusus Pelaksana Kegiatan Usaha Hulu Minyak dan Gas Bumi (Special Taskforce for Upstream Oil and Gas Business Activities) |
| **SME** | small or medium-sized enterprise |
| **SOE** | state-owned enterprise |
| **TCF** | trillion cubic feet |
| **TOE** | tonnes of oil equivalent |
| **TSCF** | trillion standard cubic feet |
| **VAT** | value added tax |
| **USD** | United States dollar |

# Executive Summary

Indonesia is one of the few developing countries that can boast of reducing fiscal dependence on revenues from fossil fuel production while growing and diversifying both the economy and government revenue base. Meanwhile, the country faces several challenges in moving further towards a fiscal system supporting clean energy and a sustainable economy.

This report explores how Indonesia taxes and subsidizes the production and consumption of oil, gas, coal and electricity (most of which is generated using coal). The paper is a sister publication of the forthcoming IISD analysis of fiscal dependence on fossil fuels in Indonesia and other BRIICS countries (Brazil, Russia, India, China and South Africa) and follows the same methodology. This analysis has been prepared for both Indonesian and international readers: policy-makers, researchers, NGOs and everyone interested in fiscal policies and clean energy transitions.

## Fossil Fuels Account for Both Inflows and Outflows in the Budget

The Government of Indonesia (GOI) both taxes and subsidizes the production and consumption of oil, gas, coal and electricity. Figure ES1 provides a snapshot of taxes and subsidies related to fossil fuel production and consumption in Indonesia over 2014–2016. The estimates are represented as an annual average to smooth the impacts of world oil price fluctuations that significantly affect both revenue and subsidy values.

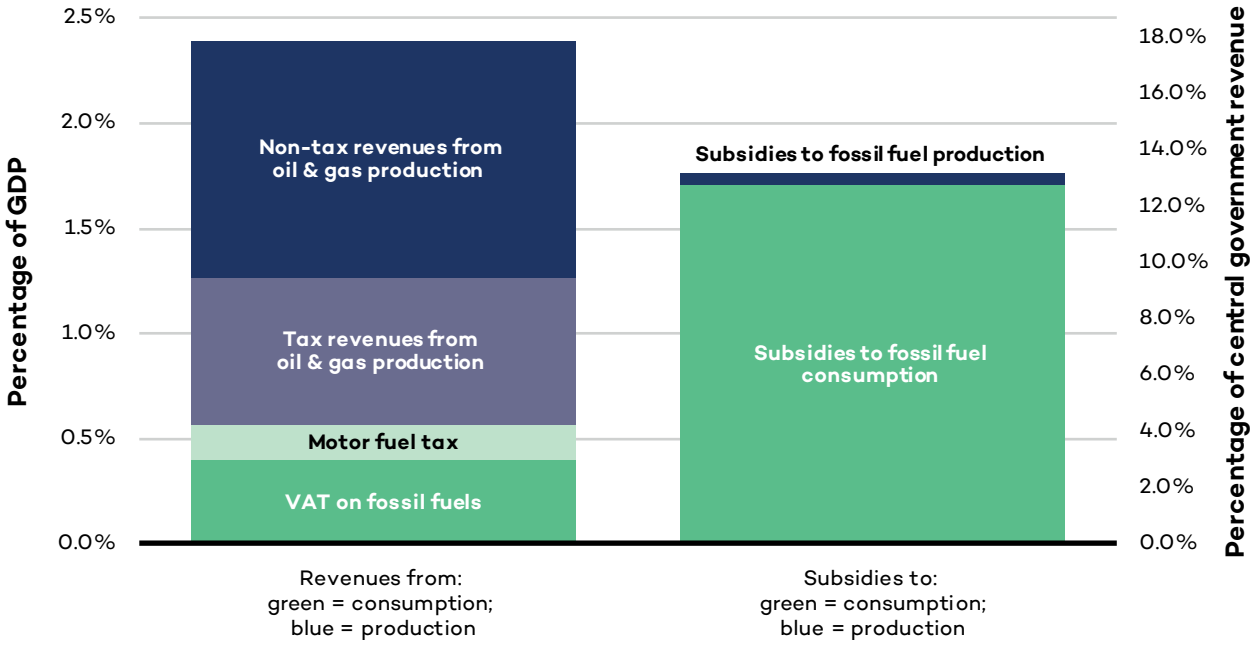
On the production side, total GOI revenue from fossil fuel production is much higher than the amount of financial supports to the same industry.[1] Indonesia's fiscal policies seek to capture resource rents associated with fossil fuel extraction. The value of coal and—especially—oil and gas can be much higher on the market than the cost of their extraction. Fossil fuel rents are profits above the norm, i.e., beyond those of other sectors. The government taxation policies aim at capturing these super-normal profits. In this context, GOI collects both tax (e.g., income and land tax) and non-tax revenue (so-called PNBP, e.g., equity oil and gas) from the extraction of fossil fuels.

On the consumption side, GOI also both taxes and subsidizes fossil fuels. The balance is a net subsidy to consumers since GOI support to fuel and electricity user is triple the value of taxes on energy consumption in Indonesia.

Due to the nature of resource rents, fossil fuel production plays a relatively bigger role in GOI revenue than in the overall economy of Indonesia. In 2014–2016, GOI revenues from fossil fuel production averaged IDR 190 trillion (USD 16 billion) per year (Ministry of Finance of Indonesia, 2017). This is equivalent to 1.8 per cent of Indonesia's GDP, or 13.6 per cent of total GOI revenue in 2014–2016. Over the same period, oil and gas extraction contributed only 3.7 per cent of GDP, while coal mining contributed only 2.1 per cent of GDP (calculated based on Bank of Indonesia, n.d.). Manufacturing, construction, trade and agriculture each play a bigger role in the Indonesian GDP than the extraction of fossil fuels (Statistics Indonesia, 2015).

[1] These financial supports are subsidies in terms of the World Trade Organization's Agreement on Subsidies and Countervailing Measures (Attwood et al., 2017).

**Figure ES1. Government revenues and subsidies related to fossil fuels and electricity in Indonesia, average for 2014–2016.**




*Source: Authors' representation based on data from Table 4 in this report.*

## The Use of Revenues From Upstream Oil & Gas Is Trapped by Consumption Subsidies

Many developing countries view fossil fuel rents as a resource for development, with the government in charge of redistributing these revenues for social causes. In the absolute majority of cases, Indonesia did not earmark fossil fuel revenues for specific spending purposes, recycling them in the budget. But in practice the amounts of revenues that GOI harvested as tax- and non-tax revenue from the oil and gas industry matched the value of its subsidies for fuel and electricity consumption (Figure ES2).

Fossil fuel subsidies are a very inefficient way of resource rents redistribution. In Indonesia, these subsidies have disproportionally benefited those who consume the most—rich households rather than the poor—and encouraged wasteful energy consumption (Beaton, Lontoh, & Wai-Poi, 2017). By their design, fuel subsidies increased when oil prices grew and thus acted as a pro-cyclical policy undermining economy gains and diversification. As consumption grew, so did the value of fuel and electricity subsidies, and in 2012–2014 it exceeded the total amount of GOI oil and gas revenues (Figure ES2).

At the end of 2014, Indonesia used the opportunity presented by the decline in international oil prices to eliminate some of these inefficient policies. GOI removed gasoline subsidies and reduced subsidies for diesel. However, the government still subsidizes electricity consumption and provides several supports to the production of oil, gas and coal (Braithwaite et al., 2010; Attwood et al. 2017). As for fuel consumption subsidies, GOI has not followed its original plan to adjust prices on a regular basis either. The last price adjustment for gasoline and diesel took place in early 2016 (Kompas, 2018; Platts, 2018b). In early 2018, with elections approaching in 2019 and oil prices again on the rise, the government committed to keeping prices stable until the end of 2019.

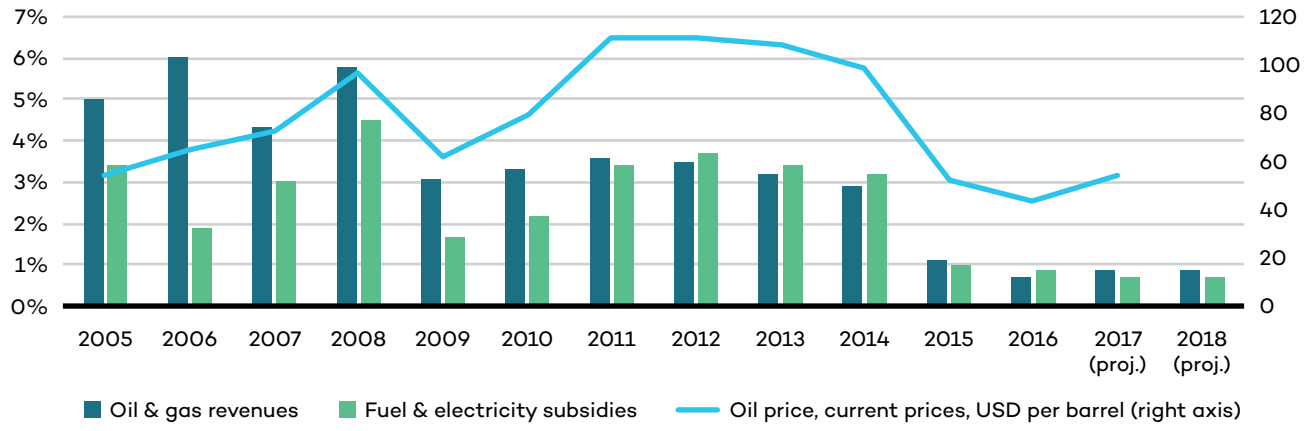
These decisions have effectively reintroduced subsidies (Varagur, 2018), though they are not reflected in the state budget. Instead, GOI expects the state-owned company Pertamina to cross-subsidize their cost, estimated

at IDR 24 trillion (USD 1.7 billion) in 2018, from profitable upstream operations (Primadhyta, 2018; Platts, 2018b). Some commentators see GOI's policy of handing over expiring PSCs to Pertamina as another measure to compensate the company for supplying domestic fuel market at regulated low prices. However, this trading of government support to Pertamina upstream activities in return for consumption subsidies is not transparent or clearly calculated and thus may be unsustainable.

Against this background, the question of optimal use of fossil fuel revenues is still open in Indonesia, especially since these revenues are waning (see next section of the Executive Summary). An example of their more productive use comes from fuel subsidy removal in the 2015 budget: that reform generated savings worth IDR 211 trillion (USD 15.6 billion) and enabled investment of a similar magnitude in safety nets, transport, infrastructure and transfers to villages (Pradiptyo et al., 2016).

Some regions in Indonesia, e.g., Bojonegoro and Musi Banyuasin, are exploring a different model of using oil and gas resource rents—sovereign wealth funds. This model allows them to collect oil and gas revenues, especially during the periods of high prices, and use them for government spending on various causes. The government of Aceh has also introduced a sovereign wealth fund and earmarks its additional revenue form natural resources for various social purposes. Global experience shows that sovereign wealth funds can be an effective tool for sustainable economic development (e.g., in Norway and Chile), but a lot depends on their design and administration.

**Figure ES2. Government revenues from upstream oil & gas vs. subsidies to fuel and electricity consumption in Indonesia, per cent of GDP**




*Source. Authors' representation based on IMF Article IV Consultation reports (based on audited data from the Ministry of Finance of Indonesia) and oil price data from BP (2018).*

## Revenues From Fossil Fuel Production Are in Rapid Decline

Government revenues from upstream oil and gas have rapidly declined in Indonesia, from 35 per cent of the total (7 per cent of GDP) in 2001 to just 6 per cent (less than 1 per cent of GDP) in 2016 (IMF 2004, IMF 2017) (Figure ES2). Resource rents are much lower for coal than for oil and gas, and overall coal plays a less significant role in GOI revenues.[2]

In the future, the decline in GOI revenues from fossil fuels is going to continue for two reasons. First, there is a long-standing downward trend in fossil fuel exports in Indonesia, as a result of decline in production and increase in domestic consumption. Second, the clean energy transition is already happening in some key export markets for fossil fuels such as Europe, China and India (Clark, 2017). The pace of clean energy transition is

[2] GOI revenues from coal are more difficult to analyze since they are reported together with revenues from other mining.

still uncertain, but it is likely to hamper demand for coal and perpetuate low prices for fossil fuels (Fattouh, Poudineh & West, 2018; Mercure et al., 2018; Carbon Tracker, 2017; International Renewable Energy Agency [IRENA], 2014, 2017).

In particular, coal consumption has a limited future since coal is costly and increasingly less competitive compared with solar and wind resources, especially when air pollution and health impacts are included in true cost calculations for different energy types (Attwood et al., 2017). These trends hold true both for Indonesia's export markets and Indonesia itself.

The clean energy transition raises a question about "stranding" of government assets and government revenue expectations in Indonesia. Both Climate Policy Initiative (2014) and IRENA (2017) put the estimate of the value of fossil fuel assets at risk of stranding in Indonesia in the range of USD 200–300 billion, with most of the value concentrated in the upstream sector. As an example, a major gas field in the East Natuna Production Sharing Contract (PSC) would be very costly to develop, in part due to the fact that its gas has one of the world's highest levels of $CO_2$. GOI and state-owned companies like Pertamina support the development of these assets at the risk of stranding and also accumulate the end-of-life liabilities for them, which may strain public coffers.

## Beyond Fossil Fuels: Conclusions and recommendations

Indonesia's experience has demonstrated that a country can continue its economic growth and replace revenues from oil and gas production with revenues from other sources. While GOI revenues from upstream oil and gas production dropped from 35 per cent of the total in 2001 to just 6 per cent in 2016, Indonesia's rates of GDP growth (at 3–4 per cent per year) and budget deficit (at 2–3 per cent) remained largely unchanged (IMF 2004, 2017).

Nonetheless, not all of Indonesia's transition experience has been smooth and consistent. Indonesia has often implemented concurrent policies that came in conflict with each other. One instance mentioned above is the reform of fossil fuel consumption subsidies at the end of 2014 which is challenged by the reintroduction of price caps on retail oil products in early 2018. Another example is the push for near-universal electrification and boost in electricity supply through the use of coal that disregards the negative impacts of coal on air pollution and public health.

Policy-makers in Indonesia and other countries may benefit from lessons learned on Indonesia's record of taxing and subsidizing energy. The observations that stand out from this analysis are the following.

**1) Fiscal transition away from tax and non-tax revenues from oil, gas and coal extraction requires a transparent and comprehensive discussion.** Indonesia is a member of the Extractive Industries Transparency Initiative (EITI), which has helped to improve transparency over the fiscal revenues from the extractive sector in the country. However, to offer maximum insights, this transparency and discussion should be extended to the taxation of fossil fuel consumption and subsidies to both fossil fuel production and consumption.

**2) Fossil fuel subsidies are an inefficient mechanism for redistribution of the declining export rents from fossil fuels.** To enable efficient allocation of resources and a level playing field for various energy types, such subsidies should be phased out, while vulnerable energy consumers should receive more targeted assistance. For example, as part of its recent subsidy reforms, the Indonesia government launched a social assistance scheme called the Productive Family Program (*Program Keluarga Produktif*), which introduced smart cards for families with school-age children and for health needs (Beaton et al., 2017).

**3) Compared with other BRIICS countries, Indonesia underutilizes the fiscal space it can create by taxing energy consumption.** Fuel consumption taxes (VAT and motor fuel tax) generate just a third of the value of fuel and electricity subsidies (0.57 per cent of GDP vs. 1.7 per cent of GDP on annual average over

2014–2016). Domestic prices and taxes for fossil fuels should reflect their full costs, including negative external effects such as pollution and health impacts.

**4) Revenues from the taxation of fossil fuel production and consumption as well as savings from subsidy reforms should be invested in productive uses supporting social development and economic diversification.** For several decades, the Indonesian government stimulated the development of manufacturing, financial and other sectors and as they grew, they also became bigger taxpayers. Investment of resource rents should be visible and in line with the interests of vulnerable groups, decreasing their cost of living by as much as or more than the additional costs created. Areas of such investment include social safety nets, health care, education and other public services, infrastructure, energy efficiency and renewable energy. Such investments should create new sustainable jobs and support a transition path, including in rural areas and areas currently depending on fossil fuels.

**5) Renewable energy can be one of the sectors driving diversification of the Indonesian economy and its fiscal transition away from fossil fuels.** Renewable energy technologies have become much more cost-competitive and, internationally, compare extremely favourably to fossil fuels in terms of costs as well as impacts on air pollution and public health. The Government of Indonesia has already introduced a target to increase the share of renewable energy in the energy supply mix from 7 per cent in 2015 to 23 per cent by 2025, but is experiencing difficulties meeting it (Bridle et al., 2018). Indonesia is well endowed with renewable energy resources such as geothermal, solar and wind. For the geothermal sector in Indonesia, fiscal treatment is similar to that of the oil and gas sector in terms of schemes for both tax and non-tax revenues. Revenues from the geothermal sector are stable compared with volatile oil and gas revenues, but their size is proportional to their minor role in energy production. To grow the renewable energy sector in Indonesia, it is necessary to phase out both consumption and production subsidies to fossil fuels and electricity and create a better investment climate (Bridle et al. 2018).

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# Introduction

Indonesia is one of the few developing countries that can boast of reducing fiscal dependence on revenues from fossil fuel production while diversifying both the government revenue base and the economy in general. Since the beginning of the 21st century, Indonesia has experienced a drop in government revenues from upstream oil and gas—from 35 per cent of the total revenues (7 per cent of GDP) in 2001 to just 6 per cent (less than 1 per cent of GDP) in 2016. Meanwhile, Indonesia's rates of GDP growth (at 3–4 per cent per year) and budget deficit (at 2–3 per cent) remained largely unchanged (IMF, 2004, 2017).

In Indonesia, the decline in revenues from the upstream oil and gas sector occurred due to a combination of factors. First, the volatility of oil prices played a role, though both 2001 and 2016 were years of relatively low oil prices compared with their peak levels in 2011–2014. Second, Indonesia's exports of oil declined as production shrank while domestic consumption increased, with oil and gas prices on the domestic market being much lower than internationally. Third, other sectors increased their contribution as a result of economic diversification and growth.

Over the long term, Indonesia (but also other resource-rich countries) will be exposed to one more factor that can reduce the role and the fiscal contribution of the fossil fuel sector in their economies: the clean energy transition (Fattouh, Poudineh & West 2018). As the costs of renewable energy plummet and climate policies and health regulations internalize the true costs of fossil fuels, demand for oil, gas and coal is projected to decline, barring unexpected progress in carbon capture and storage technologies (Mercure et al., 2018, Carbon Tracker, 2017; IRENA, 2014, 2017).

There is still high uncertainty about the pace of the low-carbon transition, but its direction clearly indicates the switch from fossil fuels to renewable energy—and this switch has already been happening faster than expected in some key export markets for fossil fuels such as Europe, China and India (Clark, 2017).

The decline of any industry—and the fossil fuel industry is no exception—is a highly challenging prospect. That is why the Paris Agreement on climate change calls for a just transition for workers currently dependent on the fossil fuel sector (United Nations Framework Convention on Climate Change [UNFCCC], 2015). To be manageable and bring positive results, the clean energy transition should also help reduce dependence of resource-rich developing countries on revenues from the exports of fossil fuels (Manley, Cust & Cecchinato 2017; Schloesser 2017).

Even though Indonesia's story of the diminishing role of the oil and gas sector is not rooted in the clean energy transition, it is of high interest to both Indonesia and other developing countries as a record of the feasibility of such transitions in a lower-middle-income economy. Certain mechanics of reducing the fiscal and economic dependence on fossil fuels can be common for past transitions unrelated to the switch to clean energy, and future transitions determined by it.

A lot of previous research focused on the macroeconomic and political drivers of Indonesia's diversification beyond fossil fuels (Usui, 1997; Rosser, 2007). Further, the work of the Extractive Industries Transparency Initiative (EITI)—of which Indonesia is a member—and the Natural Resource Governance Institute has helped to improve transparency over the fiscal revenues from the extractive sector in the country (EITI, 2015; Natural Resources Governance Institute, 2015).

Building on this existing analysis as well as the long-standing work of the Global Subsidies Initiative (GSI), Indonesia's Central Government Financial Reports (LKPP), IMF Article IV consultations reports and many other sources, **this publication makes a first attempt at an integrated analysis of how Indonesia both taxes and subsidizes production and consumption of oil, gas, coal and electricity** (most of which is generated with coal). The paper also explores lessons learned from Indonesia's reduction of fiscal dependence on fossil fuels.

Chapter 1 reviews the state of play in the oil, gas and coal sectors and in particular the role of state-owned enterprises. Chapter 2 focuses on the dynamics of government revenue from fossil fuels vs. its expenditure on fuel and electricity subsidies. Chapter 3 looks at the Indonesian policies linked to economic diversification.

The analysis has been prepared to offer lessons learned from Indonesia's fiscal transition away from declining oil and gas rents to Indonesia's own coal sector as well as fossil fuel sectors in other developing countries. These insights can be valuable for policy-makers in both Indonesia and other developing countries as well as other stakeholders from industry, labour, civil society and academia. This report is a sister publication of the forthcoming IISD report *Beyond Fossil Fuels: Fiscal Transitions in BRIICS* and follows the same methodology.

# Chapter 1. State of Play in Fossil Fuel Production in Indonesia


### CHAPTER SUMMARY

Production of gas and (especially) oil has been stagnating in Indonesia for many years, while coal production grew rapidly from late 1990s until plateauing in 2013–2017. As Indonesia's population and economy has grown, so too has domestic consumption of oil, gas and coal. As a result of these demand and supply dynamics, in 2004 Indonesia turned from being a net exporter to a net importer of oil. It remains a net exporter of gas, but could become a net importer in the next few years. Meanwhile, the country is the world's largest exporter of thermal coal.

Energy exports remain a significant source of revenue and current exchange for Indonesia, especially for coal (USD 15.9 billion in 2015) and natural gas (USD 10.3 billion in 2015), while the value of oil exports is smaller than that of oil and oil product imports.

The Government of Indonesia is implementing a number of reforms aimed at increasing the value added from fossil fuels in the economy. These reforms include fuel price controls and market supply obligations and enhancing the role of PT Pertamina, the state-owned oil and gas company. Due to these reforms, producers struggle to make profits in Indonesia's domestic energy market, which also reduces the profit tax base for the government.

The recent plunges in international prices for oil (a drop in 2015 until a moderate rebound in 2018) and for coal (in 2015–2016) give a preview of some possible implications of the global low-carbon energy transition. On the global scale, the decline in oil prices has restricted investment in upstream oil and gas. Indonesia has been hit hard, as many large fields are in natural decline, most remaining oil and gas resources are located in more remote and higher-cost areas, and the investment climate for oil and gas remains uncertain. For coal, Indonesian producers also saw their margins shrink. Continued investment in the fossil fuel sector in Indonesia increases the country's exposure to the risk of asset stranding.


## 1.1 The Global Shifts in Energy Supply

As the global costs of renewable energy plummet and climate policies and health regulations internalize the true costs of fossil fuels, demand for oil, gas and coal is projected to decline over the medium term (Mercure et al., 2018; Carbon Tracker, 2017; IRENA, 2014, 2017). What is uncertain is the exact timeline and pace of this decline (Fattouh, et al., 2018).

The decline of fossil fuel demand also involves potential stranding of fossil fuel assets, barring unexpected progress in carbon capture and storage technologies (Caldecott, Howarth & McSharry, 2013; Schloesser 2017). In the strict sense, stranded assets are assets that lose value, or generate new liabilities, before they reach the end of their planned economic life. In the context of Asian countries, stranding often occurs as a result of overcapacity driven by investments and subsidies in fossil fuel assets, especially in the coal sector (Hao, 2016; Singh & Upadhyay, 2018).

Globally, an estimate from the Climate Policy Initiative (2014) puts the value of assets at risk of stranding at up to USD 15 trillion for both fossil fuel extraction and power. This modelling was conducted under assumption that the world will meet its climate targets and also under higher oil price assumptions, hence resulting in higher values of stranded assets. More recently, IRENA (2017) estimated the value at the risk of stranding at USD 7 trillion for fossil fuel-extracting assets and USD 1.9 trillion for fossil fuel power generation, under their delayed climate action scenario.

Both Climate Policy Initiative (2014) and IRENA (2017) estimate the value of fossil fuel assets at risk of stranding in Indonesia to be in the range of USD 200–300 billion, with most of the value concentrated in the upstream oil and gas sector.

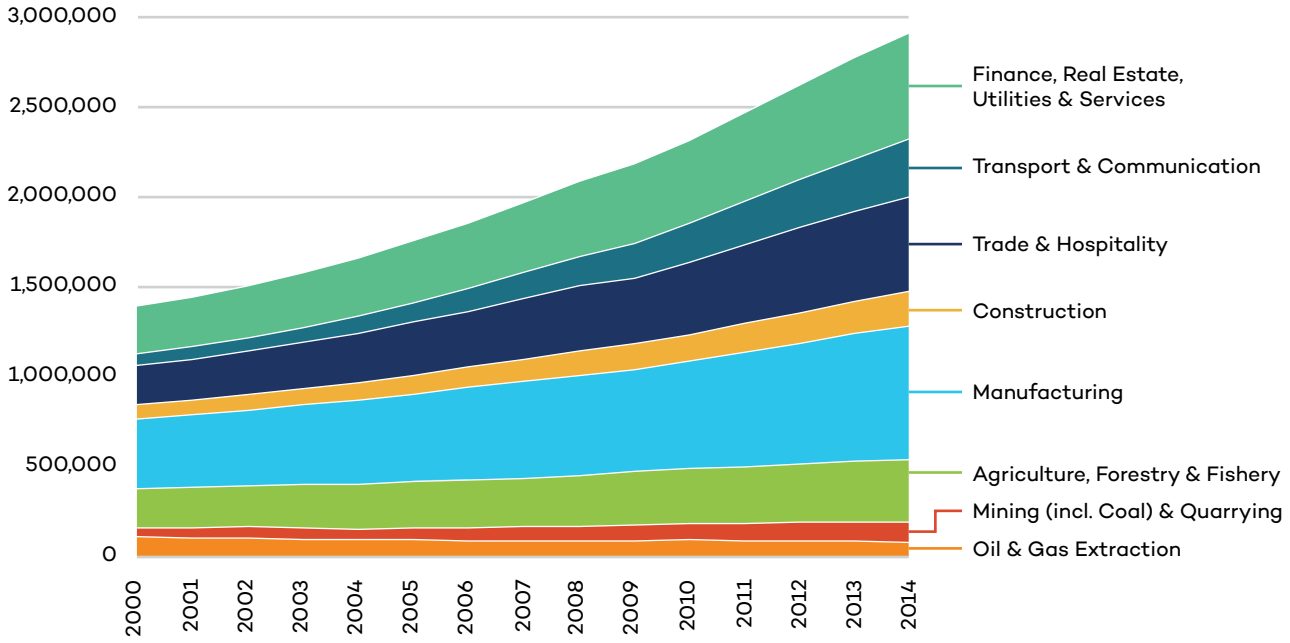
The recent plunges in international prices for oil (a drop in 2015 until a moderate rebound in 2018) and for coal (in 2015–2016) give a preview of some possible implications of the global low-carbon energy transition. The oil price declines hit the profitability of major oil and gas companies hard. In 2015, all oil and gas companies saw their profits shrinking. Total, Chevron and Shell experienced downturns in excess of 50 per cent while profits of BP and ConocoPhillips shrank by over 100 per cent (Katadata & Anjangi, 2016, based on data from company reports and Bloomberg Index). This resulted in a major decline in revenues received by host governments from the oil and gas sector, a situation which is likely to continue unless global oil prices increase significantly for a sustained period of time.

The same trend can be observed for coal, though it typically generates much less revenue for the government. In 2014–2016, some of Indonesia's coal export markets—in particular China—reduced their demand for coal and coal prices decreased. Over the medium term, Indonesia is also faced with a possibility of coal oversupply in the export market.

## 1.2 Trends in Indonesia's Oil and Gas Sector

Historically, the oil and gas sector in Indonesia has been a significant contributor to economic growth and GOI budget. However, its role in the economy has declined over the last decades (Figure 1). Now manufacturing, construction, trade and agriculture each play a bigger role in Indonesian GDP than the extraction of fossil fuels (Statistics Indonesia, 2015).

**Figure 1. Indonesia's GDP at 2000 constant market prices by industrial origin (billion rupiahs), 2000-2014.**



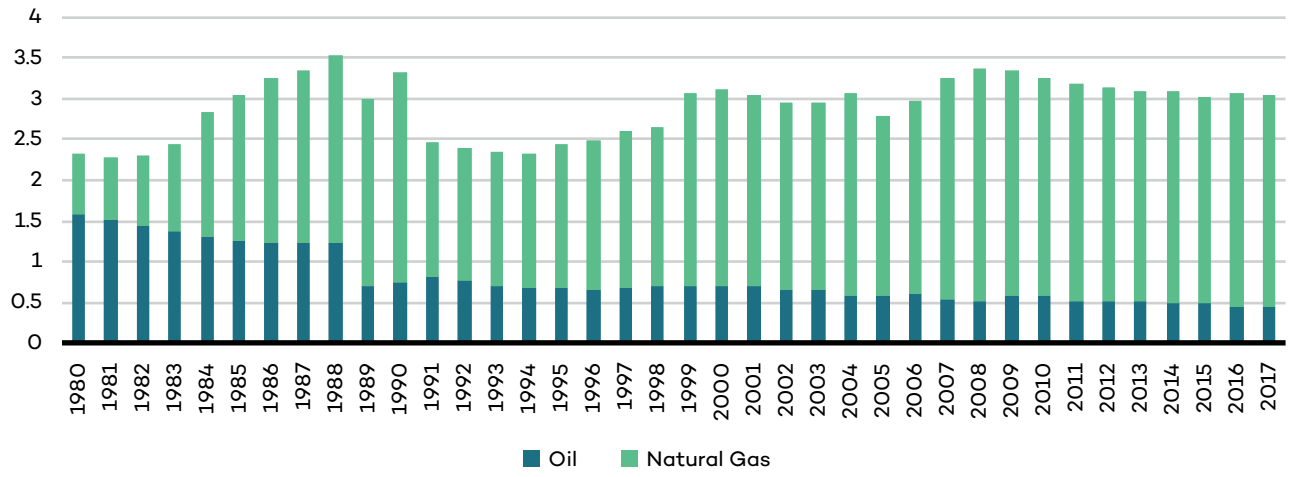

*Source: Authors' presentation based on Statistics Indonesia, 2015.*

## Declining Oil and Gas Reserves, Production and the Risk of Asset Stranding

Most of Indonesia's existing oil and gas production is from onshore or near shore fields that are aging, and as a result in most cases production levels are in natural decline. Indonesia's long-term National Energy Plan from 2015–2050 sees Enhanced Oil Recovery (EOR) as a major contribution towards offsetting the natural decline in oil production from existing wells. Meanwhile, EOR is costly and may not be affordable under low oil prices.

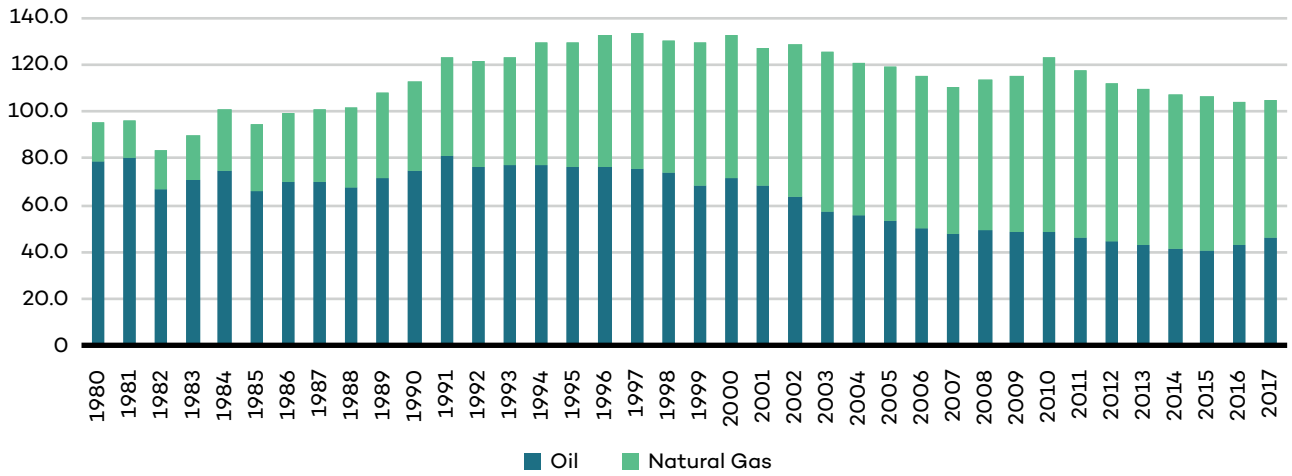
Figures 2 and 3 illustrate the overall declining reserves and production of oil in Indonesia over 1980–2017. Meanwhile, gas reserves and production first increased and then remained relatively stable over the same period.

**Figure 2. Proved reserves of oil and natural gas in Indonesia, billion tonnes of oil equivalent (btoe)**




*Source: Authors' representation based on BP, 2018.*

**Figure 3. Production of oil and natural gas in Indonesia, million tonnes of oil equivalent (mtoe)**




*Source: Authors' representation based on BP, 2018.*

Oil and gas production in Indonesia is managed through **production sharing contracts (PSCs)**. Since the 1970s, PSCs have been by far the most common type of cooperation contract for oil and gas exploration and production in the Indonesian upstream sector. PSCs are the main way in which GOI seeks to extract economic rent from development of the country's oil and gas resources. The value of fossil fuels can be much higher on the market than the cost of their extraction. Fossil fuel rents are profits above the norm, i.e., beyond those of other sectors.

The general concept of a PSC is that contractors bear all the risks and costs of exploration and are only able to recover these costs if production results from this. Another key feature of the PSC system is the sharing of oil and gas production between the production sharing contractors ("contractors") and GOI.

The oil and gas production shared is known as equity oil and equity gas, a major form of the so-called non-tax revenue or PNBP for GOI (see Annex I for details). Equity Oil or Gas refers to the oil and gas that remains after cost recovery (and any investment credit) and is split between GOI and the contractor. For oil, GOI's share of equity oil in most older PSCs is 85 per cent, leaving 15 per cent for the contractor). In more recent PSCs GOI share of equity oil decreases to 65 per cent in the case of offshore, remote PSCs located in Eastern Indonesia (PriceWaterhouseCoopers [PwC], 2018). For gas, GOI share of equity gas is 70 per cent, leaving 30 per cent for the contractor. The contractors' share of equity oil or gas is envisaged to enable them to recover their exploration and production costs. Contractors also receive an after-tax equity interest in the remaining production.

Prior to 2002, all PSCs were signed by the contractors with the government state-owned company Pertamina (acting on behalf of the government). Law No.22/2001 on Oil and Gas distinguished between the Government of Indonesia as the regulator and Pertamina as operator, so since 2002 PSCs have been signed with the Upstream Oil and Gas Regulatory Agency (BP MIGAS) and more recently with the Special Taskforce for Upstream Oil and Gas Business Activities (SKK MIGAS), executive bodies operating on behalf of the government.

In January 2017, the government introduced a new PSC scheme based on sharing a gross production split aimed at incentivizing exploration and production activities and giving contractors more freedom over their expenditure and procurement. SKK MIGAS still retains ultimate control over the management of the operations. Under this scheme, there is no cost recovery mechanism and the production split is agreed between the government and the contractor during the plan of development (POD) approval process. Depending on the field economics, the government can subsequently adjust this production split by a maximum 5 per cent. This gross production split applies to all new PSCs and also to PSCs extended after their initial period expires (PWC 2017, 2018).

However, not all existing PSCs are producing. Text Box 1 provides one such example of a PSC at the risk of stranding.

### Text Box 1. East Natuna PSC

The East Natuna PSC further illustrates the risk of asset stranding. This major gas field is located in the Riau Islands and it has remained undeveloped for many years, despite the fact that it has proven gas reserves of 46 trillion cubic feet (tcf) and contains one of Asia's largest gas fields. The gas in this field has one of the world's highest levels of carbon dioxide ($CO_2$), at 72 per cent, and would require expenditure well in excess of USD 20 billion to develop. The ongoing low oil and gas prices constrain the commercial case for developing this huge field. One other constraint is that the field is far from major centres of demand.

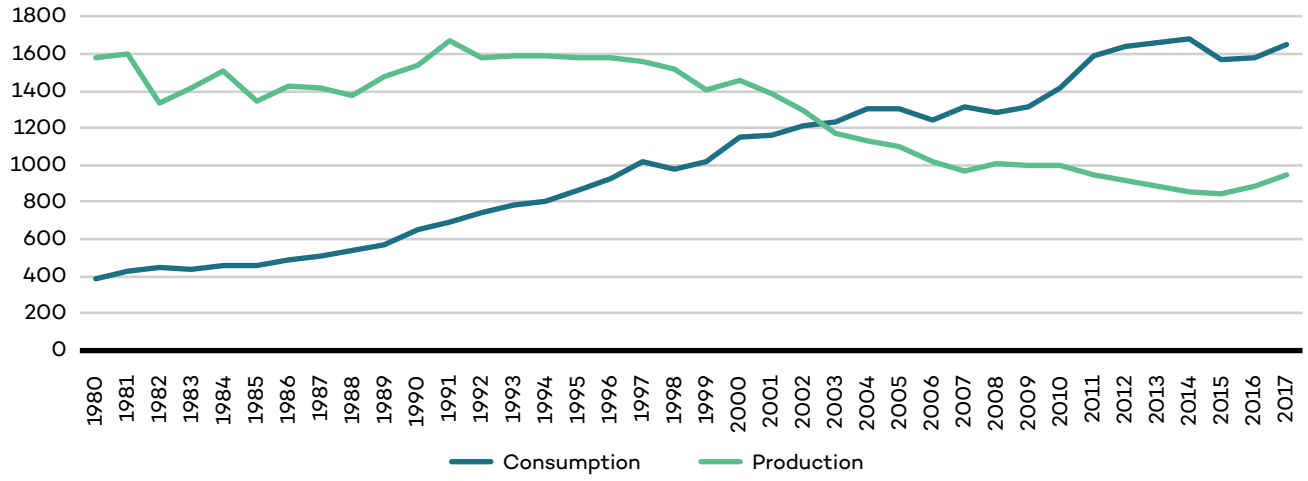
Various groups of companies have formed consortiums to jointly develop this huge, high-cost field, but none to date has been able to agree sufficiently attractive terms with the government. The government recently introduced a new gross production split scheme as an alternative to the existing production sharing contract scheme, in which the profit split between government and contractors slides up and down depending on various factors, including the $CO_2$ content. However, applying this scheme has still not convinced the current consortium of oil and gas contractors this would be sufficient to develop East Natuna. Further, developing fields with high $CO_2$ content can emit considerable amounts of greenhouse gases into the atmosphere, seriously jeopardizing Indonesia's climate commitments under its Intended Nationally Determined Contribution and the Paris Agreement on climate change.

## Production vs. Consumption of Oil and Gas

As Indonesia's population and domestic energy consumption grew (Figures 4 and 5) and the oil and gas reserves were getting depleted, the government started treating them as strategic resources for domestic consumption rather than as export commodities to generate revenues (Natural Resources Governance Institute, 2015). In 2004, due to the increase in domestic demand, Indonesia turned from being a net exporter to a net importer of oil (Figure 4 and Text Box 2 on the relationship with the Organization of Petroleum Exporting Countries [OPEC]).

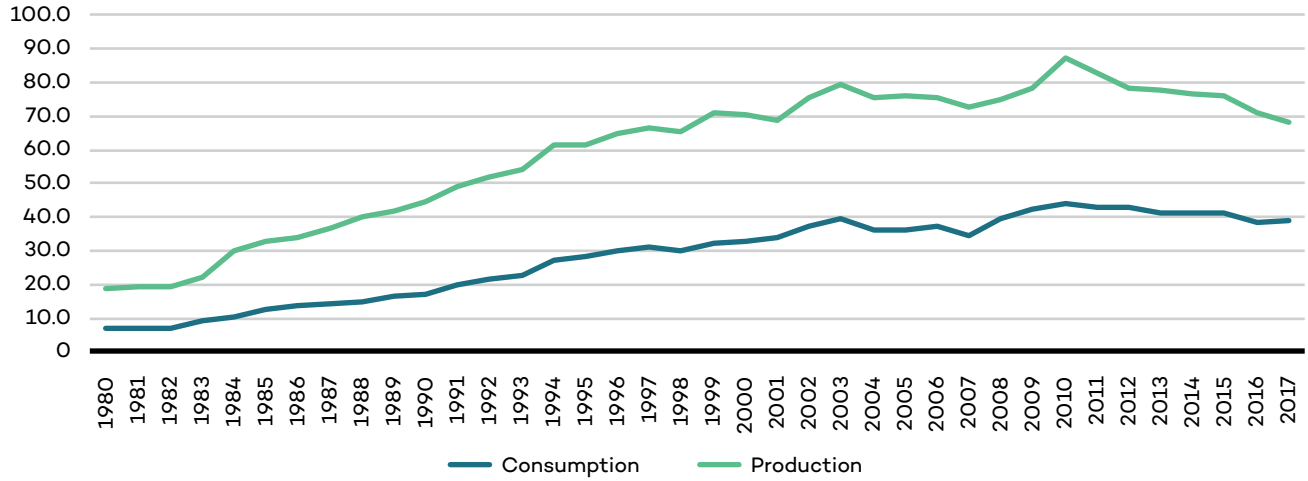
In 2018, the country was still a net exporter of natural gas. However, Indonesia is also likely to become a net importer of gas in the form of LNG in the next few years (Figure 5).

**Figure 4. Production vs. consumption of oil in Indonesia, thousand barrels daily**




*Source: Authors' representation based on BP, 2018.*

**Figure 5. Production vs. consumption of natural gas in Indonesia, billion cubic feet per day**

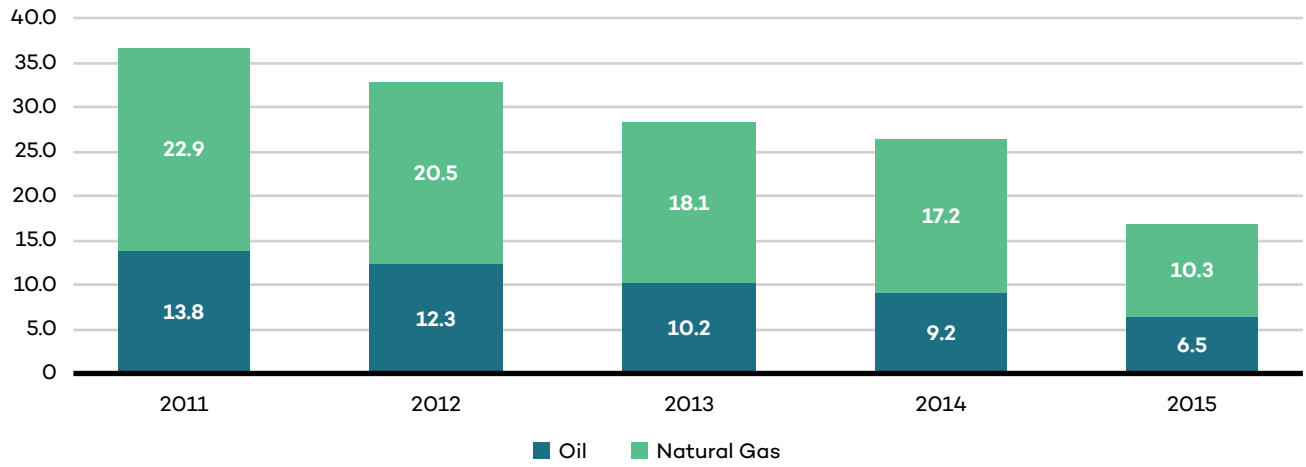



*Source: Authors' representation based on BP, 2018.*

Natural gas exports stood at about USD 10.3 billion in 2015 and oil exports at about USD 6.5 billion, representing a decline in value from previous years (Figure 6). While oil and gas exports still play a significant role in GOI's generation of foreign exchange, Indonesia is also importing comparably large amounts of oil and oil products.

There is a big differential between export and domestic prices for Indonesian oil and gas. Domestically, the government continues to regulate fuel prices to keep them low (see Section 2.4 in this chapter for a discussion of subsidies for fuel consumers). GOI applies a Domestic Market Obligation (DMO) for both oil and gas. For oil, DMO requires PSC contractors to supply 25 per cent of total production to the domestic market out of their pre-tax equity share of production. For the first five years, a contractor is paid full value for its DMO oil by SKK MIGAS, and this is reduced to 10 per cent of that price for subsequent years. For gas, a DMO of 25 per cent applies to more recent PSCs, but there is no discounting of the full price of DMO gas after five years.

**Figure 6. Oil and natural gas export value in Indonesia, USD billion**




*Source: EITI Indonesia Contextual Report 2015.*

The two most recent National Energy Policies of Indonesia—from 2006 and from 2014— gradually reoriented natural gas from exports to in-country use (International Energy Agency [IEA], n.d.a, n.d.b). In order to implement this policy, GOI decided to set lower—i.e., subsidized—prices for gas used by selected strategic industries to increase their competitiveness both in international markets for exports, and in the domestic market to replace imports. In 2016, the President issued a decree that sanctioned the Minister of Energy to intervene and request a reduction of the gas price by up to a third (USD 3) from typically about USD 9 per million British thermal unit (mmbtu), for seven selected domestic industries, including power plants and manufacturing.

Making natural gas cheaper for select industrial consumers undermines the commercial profitability of gas extraction, and in many cases gas suppliers refused to implement these price decreases, stating that current prices were locked in to existing long-term sales contracts. The Ministry of Energy is struggling to find ways to bring gas prices down (and cannot expect gas producers to reduce prices, most of which are set in long-term sales contracts). Thus GOI has been looking for ways to compensate gas producers for selling gas at a lower domestic price. One option under consideration in 2018 included introduction of an upstream subsidy that can set off the loss of income downstream, namely a reduction of non-tax state revenue (PNBP) from the gas sector.

### Text Box 2. Indonesia and OPEC

Indonesia then being a net exporter, joined the Organization of Petroleum Exporting Countries (OPEC) for the first time in 1962. That was just two years after OPEC was formed and as it was widening its membership beyond the first five founding countries. In 2004 Indonesia became a net importer of oil and decided to halt its membership in OPEC in 2008.

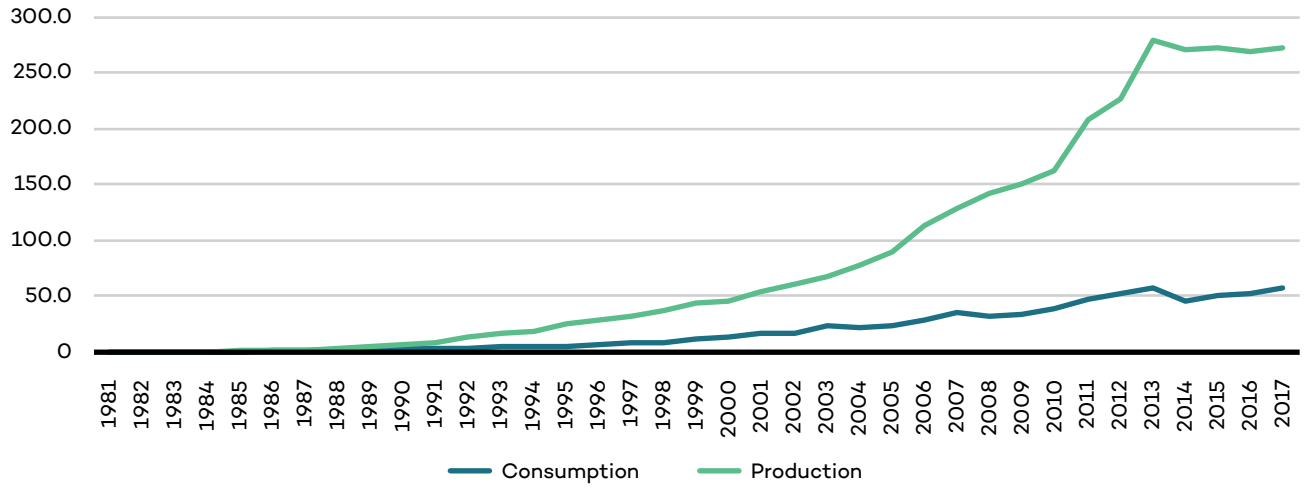
GOI reactivated its OPEC membership in early 2016, with the likely aim of broadening its sources of oil imports and securing better terms from other OPEC members. However, GOI suspended its membership later that year as OPEC was seeking a 5 per cent cut in production from all of its members. It is believed that Indonesia was reluctant to agree to this cut. More recently in December 2017, the Vice Minister of Energy and Mineral Resources announced that that GOI received and, for undisclosed reasons, turned down an offer from OPEC to reactivate Indonesia's membership (Petromindo, 2017).

## 1.3 Trends in Indonesia's Coal Sector

In contrast to its oil and gas endowment, Indonesia's coal reserves are plentiful. Most of these reserves are steam (thermal) coal and accessible through the application of open-cast mining which is much less costly than underground mining. At the end of 2016, coal resources totalled 128 billion tonnes, and coal reserves totalled 28.5 billion tonnes. Indonesia's coal reserves-to-production ratio indicates that at the current rate of extraction, proved Indonesian reserves of coal will last for 60 years (BP, 2017).

The coal mining industry took off in the mid-1990s, and production increased from 77 million tonnes in 2000 to 456 million tonnes in 2016. During much of this time, approximately 80 per cent of production was exported, making Indonesia the world's largest exporter of steam coal (Schloesser et al., 2017). Figure 7 provides more detail on coal production and consumption dynamics in Indonesia.

**Figure 7. Production vs. consumption of natural gas in Indonesia, mtoe**




*Source: Authors' representation based on BP, 2018.*

Coal exports play a significant role in GOI's generation of foreign exchange. Coal exports stood at about USD 15.9 billion in 2015, representing a decline in value from previous years, predominantly due to lower export prices (Figure 8). In 2014–2016, some of Indonesia's coal export markets—in particular China—reduced their demand and prices decreased. However, the decline in commodity prices over the past few years has not hit the coal industry as hard as the decline in oil and gas prices has affected the production of the oil and gas sectors.

Over the medium term, Indonesia is faced with a possibility of coal oversupply in the export market, but the timeline and pace of this trend is uncertain.

The government has also been considering an increase in domestic coal consumption (see Text Box 3). To manage this shift and enforce price caps on domestic coal sales, the government decided to cap both coal production and exports under the National Medium-Term Development Plan (RPJMN), for the period 2015–2019 (BPKP, 2015).

In 2015, GOI introduced a coal Domestic Market Obligation (DMO) which requires a minimum of 25 per cent of coal production be made available for the domestic power sector. However, these caps have been lifted every year since their introduction, since private coal companies were rushing to supply export markets that provide more lucrative returns (Prakoso, 2017). Table 1 gives details on both the planned and the actual split between domestic consumption and exports of coal.

In March 2018, GOI introduced a ceiling price for coal consumption by domestic power plants at USD 70 per tonne, while providing some compensation to mining companies in the form of higher production ceilings. In the light of this development, Indonesian coal producers are likely to continue the rush for exports since the price differential remains considerable (Platts, 2018a).

### Text box 3. Demand for coal from the domestic electricity sector

Domestic consumption of coal is expected to increase because of the projected rapid growth in electricity demand in Indonesia. On the one hand, existing consumers are increasing their demand. On the other, new consumers get access to the grid. Indeed, a key target set by President Joko Widodo soon after he took office in 2014 was to increase Indonesia's electrification ratio from 87 per cent in 2014 to close to 97 per cent by 2019. In early 2018, this ratio was at 93 per cent.

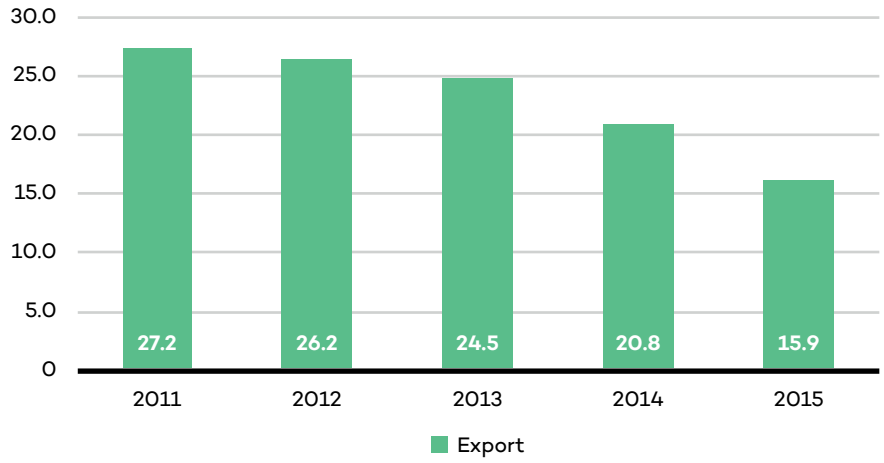
While GOI has aggressive targets for increasing the use of renewable energy in the national energy supply mix, they are likely to be unachievable (Bridle et al., 2018, also see Section 3.3 of this report for more detail). In the near term, it is clear that GOI continues to see coal as having the largest share in the fuel supply mix for power generation. Coal currently fuels 57 per cent of the 60,000 GW of power generating capacity in Indonesia, supporting baseload demand. However, the GOI view of coal as the cheapest way to boost electricity supply disregards the negative impacts of coal on air pollution and public health. If these external negative costs as well as subsidies to coal are taken into account, renewables have lower costs of electricity generation in Indonesia than coal (Attwood et al., 2017).

**Table 1. Indonesia's coal cap: plan and practice, Mt**

| | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| Production cap according to RPJMN 2015–19 | 425 | 419 | 413 | 406 | 400 |
| Production, actual | 461 | 456 | 461 | — | — |
| Domestic sales according to RPJMN 2015-19 | 102 | 111 | 121 | 131 | 240 |
| Domestic sales, actual | 87 | 91 | 97 | — | — |
| Exports according to RPJMN 2015–19 | 323 | 308 | 292 | 275 | 160 |
| Exports, actual | 366 | 331 | 298 | — | — |

*Source: RPJMN 2015–2019 indicators from BPKP (2015), factual indicators based on Ministry of Energy and Mineral Resources of Indonesia (2018).*

**Figure 8. Coal export value in Indonesia, USD billion**




*Source: EITI Indonesia Contextual Report 2015.*

## 1.4 The Role of SOEs in Indonesia's Fossil Fuel Sector

There are two state-owned enterprises (SOE) active in the exploration and production of oil and gas: PT Pertamina and PT Perusahaan Gas Negara (PGN). When it comes to extraction, Pertamina and PGN produce less oil and gas than all PSC contractors combined, but they also have other roles, representing GOI in some PSCs as explained above. Pertamina has a much bigger presence than PGN in terms of its oil and gas production. PGN's main activities focus on gas transmission and distribution, but it also has a subsidiary company (PT Saka Energy), which is involved in gas production and has minority stakes in several gas-producing PSCs.

Coal mining is mostly private in Indonesia, but there is one large SOE, PT BUKIT ASAM (Persero) Tbk, that is involved in coal mining. Coal-fired power generation is to a large extent within the remit of another SOE, PT Perusahaan Listrik Negara (PLN).

Importantly, Law No. 19/2003 mandates that SOEs are intended not only to seek profits but also to act in the public interest and provide guidance and help to small and medium-sized enterprises (SME), cooperatives and community groups. This obligates SOEs to implement partnership and community development programs and conduct public services. An example of the latter is Pertamina's obligation to distribute subsidized fuels throughout Indonesia, primarily diesel oil, gasoline and 3 kg liquefied petroleum gas (LPG) bottles.

### Pertamina Taking Over Expiring PSCs

In recent years GOI has taken steps to increase Pertamina's presence in the oil and gas sector, and to increase its share of oil and gas production in order to secure better bankability and more revenues for the company. The policies enhancing the role of Pertamina are also seen as a compensation for the GOI requirement to supply oil products at below-market prices domestically (see Section 2.4 on subsidies to fuel consumers).

In this context, GOI gave Pertamina priority in taking over the operatorship of oil- and gas-producing PSCs when they expire (a PSC usually lasts for 30 years and can then be extended for 20 years). During the period 2015–2025, 31 PSCs will give Pertamina the opportunity to increase its oil and gas reserves and its production levels significantly.

The most notable example to date has been Pertamina's takeover of the Mahakam PSC in East Kalimantan from Total and INPEX at the end of 2017. This is currently the largest gas-producing PSC in Indonesia,

producing at a rate of 1,360 million standard cubic feet per day (mmscfd). Pertamina had the opportunity to take over eight other PSCs that expired in 2018. However, these are not all attractive for Pertamina, as the new gross split scheme will apply to all these expired blocks, which Pertamina and most other industry players have some concerns about. In addition, in many instances, Pertamina will also take on responsibility for funding abandonment and site restoration costs when these older fields cease production, as the current operators did not have these obligations included in their production sharing contracts. To address this issue, GOI has just issued a new regulation obliging all PSCs to set aside funds for these abandonment costs in future, and they controversially seek to apply these retroactively to existing PSCs that do not have these obligations.

## Pertamina Taking Over PGN

GOI has also recently taken the initiative to merge Pertamina and PGN via a transfer of a 57 per cent share in PGN from GOI to Pertamina. In addition, a new Pertamina holding company is to be established, with several subsidiary companies reporting to it that are active in sectors such as gas storage, gas transmission and distribution, oil and gas exploration and production, oil refining, oil distribution and marketing. A major aim is to increase efficiency and remove unnecessary duplication in areas where Pertamina and PGN currently compete, which are primarily in gas pipeline transmission and distribution, and, to a lesser extent, in upstream gas production. Time will tell whether the merger can indeed enhance the sector's performance or, on the contrary, encourage inefficiencies.

# Chapter 2. Government Revenues and Subsidies Related to Fossil Fuels


## CHAPTER SUMMARY

The Government of Indonesia (GOI) both taxes and subsidizes production and consumption of oil, gas, coal and electricity.

On the production side, GOI collects both tax (e.g., income and land tax) and non-tax revenue (so-called PNBP, e.g., equity oil and gas) from the extraction of fossil fuels. In 2014–2016, GOI revenues from fossil fuel production averaged IDR 190 trillion (USD 16 billion) per year. This is equivalent to 1.8 per cent of Indonesia's GDP or 13.6 per cent of total GOI revenue in 2014–2016. Government revenues from upstream oil and gas have rapidly declined in Indonesia, from 35 per cent of the total (7 per cent of GDP) in 2001 to just 6 per cent (less than 1 per cent of GDP) in 2016. Resource rents are much lower for coal than for oil and gas, and overall coal plays a less significant role in GOI revenues. GOI also provides financial supports (that is subsidies in the WTO sense) to fossil fuel production, at the level of IDR 5 trillion (USD 0.4 billion) or 0.05 per cent of GDP.

On the consumption side, GOI also both taxes and subsidizes fossil fuels. The balance is a net subsidy to consumers, since fuel consumption taxes (VAT and motor fuel tax) generate just a third of the value of subsidies. In particular, GOI revenues from fuel consumption taxes averaged at IDR 63 trillion or USD 5 billion (0.6 per cent of GDP) while subsidies to fuel and electricity averaged IDR 190 trillion or USD 16 trillion (1.7 per cent of GDP) over 2014–2016.

Even though Indonesia did not earmark fossil fuel revenues, it is obvious that the amounts that GOI harvested as tax- and non-tax revenue from the oil and gas industry matched the value of its subsidies for fuel and electricity consumption. Fossil fuel subsidies are a very inefficient way of resource rents redistribution, as they benefit the rich much more than the poor and encourage wasteful consumption. At the end of 2014, Indonesia removed gasoline subsidies and reduced subsidies for diesel. However, the government has not followed its original plan to adjust prices on a regular basis and in early 2018 committed to keeping prices stable until the end of 2019. These decisions have effectively reintroduced subsidies, with their cost burden of IDR 24 trillion (USD 1.7 billion) in 2018 borne by state-owned oil company Pertamina. Indonesia also continues to subsidize electricity consumption.

In this context, the question of optimal use of fossil fuel revenues is still an open one in Indonesia, especially since these revenues are waning. An example of their more productive use comes from fuel subsidy removal in the 2015 budget: that reform generated savings worth IDR 211 trillion (USD 15.6 billion) and enabled investment of a similar magnitude in safety nets, transport, infrastructure and transfers to villages.

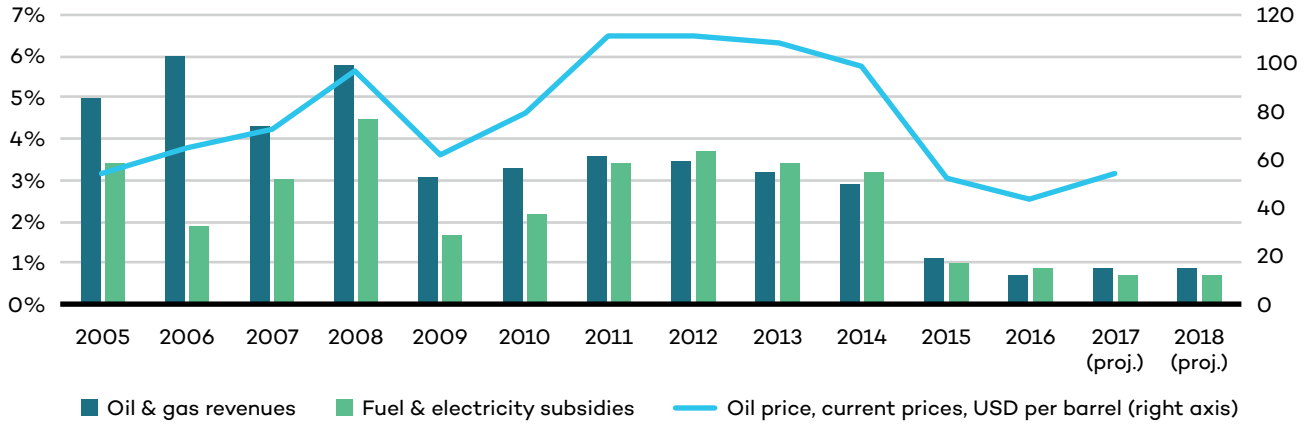

## 2.1 Key Trends in Fossil Fuel-Related Elements of Indonesia's Budget

Due to the nature of resource rents, fossil fuel production plays a relatively bigger role in GOI revenue than in the overall economy of Indonesia. In 2014-2016, GOI revenues from fossil fuel production averaged at IDR 190 trillion or USD 16 billion per year (Ministry of Finance of Indonesia, 2017). This is equivalent to 1.8 per cent of Indonesia's GDP or 13.6 per cent of total GOI revenue in 2014-2016[1]. Over the same period, oil and gas extraction contributed only 3.7 per cent of the GDP while coal mining contributed only 2.1 per cent of the GDP (calculated based on Bank of Indonesia n.d.).

[1] Hereinafter some estimates are represented as an annual average to smooth the impacts of world oil price fluctuations that significantly affect both revenue and subsidy values.

Since the beginning of the 21st century, Indonesia has experienced a drop in government revenues from upstream oil and gas—from 35 per cent of the total revenues (7 per cent of GDP) in 2001 to just 6 per cent (less than 1 per cent of GDP) in 2016 (IMF 2004, IMF 2017, see Figure 9). This decline has happened mainly due to decrease of gas export value as explained in Chapter 1. GOI revenues from fossil fuel extraction are likely to decline further due to this trend and clean energy transition (see Introduction and Chapter 1).

**Figure 9. Government revenues from upstream oil & gas vs. subsidies to fuel and electricity consumption in Indonesia, percentage of GDP**




*Source. Authors' representation based on IMF Article IV Consultation reports (based on audited data from the Ministry of Finance of Indonesia) and 2017 (projections for 2017 and 2018 by the Ministry of Finance of Indonesia) and oil price data from BP (2018). Government revenues from upstream oil & gas include corporate income tax and various non-tax schemes for oil and gas, but exclude land and building tax from upstream oil and gas as well as dividends from Pertamina and PGN. Hence the total amounts are slightly smaller than under full reporting for relevant years by EITI (2015) as well as in Figure 10 and Table 4 in Section 2.4. Subsidies to energy consumption include both fuel and electricity subsidies. Both GOI revenues from oil and gas production and subsidies correlate with the fluctuations in the world oil price. A drop in subsidies in 2006 is a result of an attempt to reduce subsidies in 2005.*

## 2.2 Government Revenues From Fossil Fuel Production

GOI derives both tax (e.g., income tax) and non-tax revenue (so-called PNBP, e.g., equity oil and gas) from the production of oil, gas and coal (see Table 2 and Annex I for more detail).

**Table 2. Tax and non-tax revenue from fossil fuel extraction in Indonesia**

| Tax revenue from fossil fuel extraction: | Non-tax revenue (PNBP) |
|---|---|
| • Income tax (Pph)<br>• Land and building tax (PBB)<br>• Other taxes | • Equity oil & gas<br>• General mining revenue:<br>  • Land rent<br>  • Royalties<br>• Dividends from fossil fuel SOEs: Pertamina, PGN, Bukit Asam<br>• Other PNBPs:<br>  • Crude oil revenue (domestic market obligation, recorded in volume units)<br>  • Signature and production bonuses<br>  • Fees for hiring expatriates (DPKK)<br>  • Data fees<br>  • Abandonment and site restoration fees |

*Source: Based on Ministry of Finance of Indonesia, 2016; EITI, 2015; PriceWaterhouseCoopers, 2018.*

## Revenues From Upstream Oil and Gas

Together, both tax and non-tax revenues form the so-called "government take." Indonesia has one of the highest "government takes" from the upstream oil and gas industry in the world. It amounts to 81 per cent (for comparison, in Norway the government take is 76 per cent and in Brazil just 56 per cent: see Martén, Whittaker, & de Bourio, 2015).

Historically, receipts from the upstream oil and gas sector have been the most volatile part of government revenue. The Ministry of Finance of Indonesia reports them separately (Ministry of Finance of Indonesia, 2016). Further, most government revenue from upstream oil and gas comes in the form of non-tax revenues (PNBP). One form of such non-tax revenue are *equity oil* and *equity gas*[2] from PSCs with privately owned international and Indonesian companies (see Section 1.2. for details). Non-tax revenue also comprises *domestic market obligations (DMOs), fees for hiring expatriates, signature bonuses, production bonuses, data fees, abandonment and site restoration fees*.

The state-owned company Pertamina plays an increasingly significant role in generating government revenues from the upstream oil and gas sector. GOI has entered into Pertamina Petroleum Contracts with Pertamina for each of its oil and gas work areas. These resemble the PSCs that GOI has with privately owned oil and gas companies, and GOI generates revenue from Pertamina way similar to its revenue generation from these production sharing contractors. GOI also receives income from the dividends that Pertamina pays to GOI as its shareholder (see Table 3).

As described in Section 1.4, Pertamina is now in the process of taking over many expiring PSCs and also merging with PGN. These two developments will result in a rapid expansion of Pertamina's oil and gas production, enabling Pertamina to be the sole state-owned company active in upstream oil and gas production. In future, this will result in GOI having a greater reliance on Pertamina for the revenue it can expect to receive from the oil and gas sector. This development may add to the uncertainty GOI will face regarding the level of income it can expect to receive from the sector for two reasons.

Firstly, GOI will need to balance its demands for dividend income with Pertamina's own interests in retaining funds for future exploration and development programs. Secondly, there may be some doubt about Pertamina's operating efficiency and its ability to maintain oil and gas production from the expired PSCs it is taking over now. In particular, if GOI continues to regulate domestic fuel prices and expects Pertamina to absorb the cost of these consumer subsidies, the company's profit base will be undermined.

**Table 3. Government revenue in the form of dividends of state-owned fossil fuel companies**

| SOE | Government ownership | Dividends paid to Government of Indonesia in 2016 | Dividends paid to Government of Indonesia in 2017 |
|---|---|---|---|
| PT Pertamina | 100% | IDR 6.8 trillion = USD 511 million | IDR 11.6 trillion = USD 867 million |
| PT PGN | 100% | IDR 1.3 trillion = USD 95 million | IDR 1 trillion = USD 78 million |
| PT Bukit Asam | 65% | IDR 0.4 trillion = USD 33 million | IDR 0.4 trillion = USD 32 million |
| PT PLN | 100% | IDR 2.1 trillion = USD 161 million | IDR 2.2 trillion = USD 161 million |

*Source: Ministry of Finance of Indonesia (2017).*

[2] For terms in italics, please refer to Annex 1 of the report.

### Revenues From Coal Mining

In the coal sector, resource rents are typically much lower than in upstream oil and gas. Therefore there are no equivalents of PSCs for coal, and non-tax revenues from the coal sector (e.g., royalties and dividends) are less significant for GOI budget than those from oil and gas.

Coal contracts of work (CCoWs or PKP2Bs) were introduced in the 1960s as a framework for foreign investment in the mining sector. They included tax rates, royalty rates and other terms relevant to the exploration and production of coal. Later in 2009, a new mining law required CCoWs to be converted into business mining permits (IUPs) when they expired.

The state's main sources of revenue from coal mining are as follows (PriceWaterHouseCoopers, 2018; Ministry of Finance of Indonesia, 2016):

- Coal royalties: In most CCoWs and IUPs these are set at between 3 per cent to 7 per cent of selling price, depending on coal grade.
- Corporate income tax.
- VAT: Applied to most services and goods acquired, and also to coal sales.
- Dividends from GOI's equity in PT Bukit Assam Batubara a state-owned company.
- Dead Rent: Producers are required to pay for the reservation of concession areas.
- Land and building taxes (PBB).
- Import taxes: VAT on the value of imports.

The Ministry of Finance reports data on general mining revenues that is merged for coal mining and mining of other minerals. In 2015-2016, for both coal and other minerals, tax revenues averaged roughly IDR 30 trillion (USD 2.5 billion) per year, and non-tax revenues were about the same level (EITI, 2015). Of this, tax and non-tax revenues from coal can be assumed at approximately 40 per cent. Thus, GOI collects tax and non-tax revenues from coal on the order of IDR 25 trillion (USD 2 billion) per year.

## 2.3 Government Revenues From Fossil Fuel Consumption

Government revenue from fossil fuel consumption in Indonesia is limited and mostly outweighed by subsidies to energy consumers (see Section 2.4).

### Revenues From the Consumption of Liquid Fuels

For oil and gas, the downstream sector includes oil refining, gas processing, storage, distribution and marketing. The majority of these activities are still dominated heavily by Pertamina, though in recent years there has been some competition from private companies, especially in oil supplies to industrial and commercial users and mining companies, and, to a very limited extent, in retailing, where Pertamina's market share is in excess of 90 per cent.

A VAT of 10 per cent is included in the fuel price to consumers. Regional governments are able to impose local taxes in the form of motor vehicle fuel taxes (PBBKB) up to a maximum of 10 per cent. Generally the rate is set at 5 per cent.

### Revenues From the Consumption of Coal and Coal-Based Electricity

For coal and coal-based electricity, subsidies also outweigh government revenues (see Section 2.4). The biggest revenue line is dividends paid by PLN, the state-owned electricity monopoly (IDR 3.96 trillion or USD 295.9 million in 2015, see Table 3). Another revenue line that the Ministry of Finance reports separately is VAT on coal (IDR 1 trillion or USD 73 million in 2017). Electricity is exempt from VAT except for households with high consumption (6,600 volt-ampere and more) (PriceWaterHouseCoopers 2017).

## 2.4 Government Revenues From Fossil Fuels vs. Fossil Fuel Subsidies

In the absolute majority of cases, Indonesia did not earmark fossil fuel revenues for specific spending purposes, recycling them in the budget. But in practice the amounts of revenue that GOI harvested as tax- and non-tax revenue from the oil and gas industry matched the value of its subsidies for fuel and electricity consumption. Figure 10 presents these estimates as annual averages in 2014–2016 to smooth the impacts of world oil price fluctuations that significantly affect both revenue and subsidy values. Table 4 breaks down the same numbers by year. Importantly, not all subsidies to fossil fuels, especially in the extraction and fossil fuel power generation sector, can be quantified due to lack of reporting.

Fossil fuel subsidies are a very inefficient way of resource rent redistribution (Text Box 4). In Indonesia, these subsidies have disproportionally benefited those who consume the most—i.e., rich households rather than the poor—and encouraged wasteful energy consumption (Beaton, et al., 2017). By their design, fuel subsidies increased in value when oil prices grew and thus acted as a pro-cyclical policy undermining economic gains and diversification. As consumption grew, so did the value of fuel and electricity subsidies, and in 2012–2014 they exceeded the total amount of GOI oil and gas revenues (Figure 9).

At the end of 2014, Indonesia used the opportunity presented by the decline in international oil prices to eliminate some of these inefficient policies. GOI removed gasoline subsidies and reduced subsidies for diesel. However, GOI has not followed its original plan to adjust prices on a regular basis. The last price adjustment for gasoline and diesel took place in early 2016 (Kompas, 2018; Platts, 2018b). In early 2018, with elections approaching in 2019 and oil prices again on the rise, the government committed to keeping prices stable until the end of 2019.

These decisions have effectively reintroduced subsidies (Varagur, 2018), though they are not reflected in the state budget. Instead, GOI expects the state-owned company Pertamina to cross-subsidize their cost, estimated at IDR 24 trillion (USD 1.7 billion) in 2018, from profitable upstream operations (Primadhyta, 2018; Platts, 2018b). Some commentators see GOI's policy of handing over expiring PSCs to Pertamina as another measure to compensate the company for supplying domestic fuel market at regulated low prices. However, this trading of support to Pertamina upstream activities in return for consumption subsidies is not transparent or clearly calculated and thus may be unsustainable.

The government still subsidizes electricity consumption: similarly to Pertamina, the state-owned electricity monopoly PLN is required to supply electricity to consumers at a loss and therefore receives compensation from the government (PLN, 2017). Electricity subsidies amounted to IDR 50.6 trillion (USD 3.7 billion) in 2017 (Ministry of Finance of Indonesia 2017). Further, GOI also provides several supports to the production of oil, gas and coal that qualify as subsidies under the Agreement on Subsidies and Countervailing Measures of the World Trade Organization (Braithwaite et al., 2010; Attwood et al., 2017).

### Text Box 4. Indonesia's subsidies to fossil fuel consumption as an inefficient redistribution policy

Despite their objective of benefiting poorer households, fossil fuel subsidies in Indonesia increasingly benefit the rich. The country's fossil fuel subsidies have been delivered through regulated low prices for fossil fuels and electricity, with compensation to energy marketing companies directly from the central budget.

In 2004, the poorest half of Indonesians received only a quarter of all subsidy spending on gasoline and diesel; by 2014, this share had fallen to one-fifth. Conversely, the share of subsidies enjoyed by the richest 20 per cent of Indonesians increased over this period from 44 per cent to 50 per cent (Beaton, et al., 2017).

Indonesia had several attempts to reform its fossil fuel consumer subsidies. In several cases, subsidy reforms allowed for the gradual expansion of Indonesia's social protection system—but they were also typically one-off price increases, the impact of which was quickly diluted by inflation, growing consumption and rising world oil prices (Beaton, et al., 2017).

However, it proved difficult for GOI to phase out subsidies during the period of high oil prices on the world market for two reasons. First, pass-through of these high prices on the domestic market would result in shocks for consumers. Second, oil and gas revenues have acted as a "cushion" against fossil fuel subsidy reform. According to Venables (2016, p. 173), "normally, if a government embarks upon an economic strategy that imposes large costs across its economy, change will eventually be forced upon the government by the decline of revenue. However, resource rents provide a cushion."

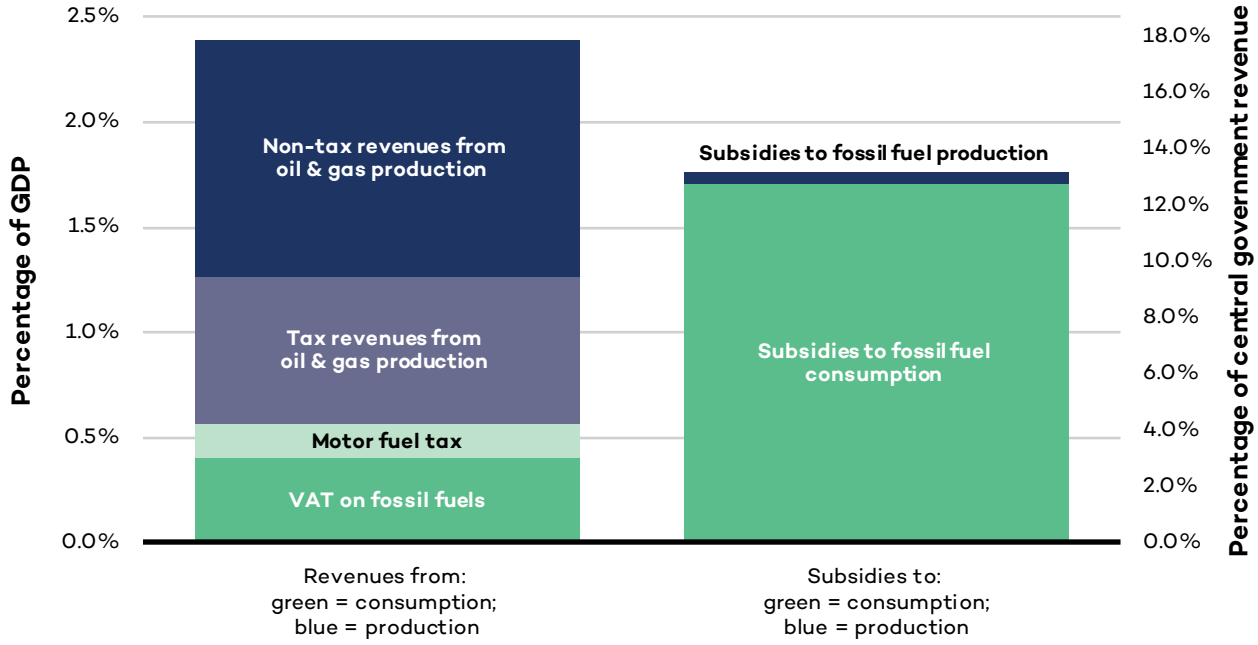
At the end of 2014, when oil prices dropped, Indonesia implemented a large-scale reduction of its subsidies for gasoline and diesel consumption. As a result, it saved IDR 211 trillion (USD 15.6 billion) on fossil fuel subsidies, equal to 10.6 per cent of all government expenditure. The fuel subsidy savings in 2015 were reallocated to major investments in social welfare and infrastructure through increased budgets for ministries (IDR 148 trillion or USD 10.1 billion), state-owned enterprises (IDR 63 trillion or USD 4.5 billion) and transfers for regions and villages (IDR 35 trillion or USD 2.5 billion) (Pradiptyo et al., 2016). However, with elections approaching in 2019 and oil prices again on the rise, in early 2018 Indonesia regulated fossil fuel price caps again, effectively re-introducing subsidies (Varagur, 2018).

IISD's Global Subsidies Initiative has published extensively on the scale of Indonesia's subsidies to both production and consumption of fossil fuels (Braithwaite et al., 2010; Lontoh & Beaton, 2015; Pradiptyo, 2016; Attwood et al., 2017 and other publications), and we refer the reader to this body of work for a detailed discussion of Indonesia's energy subsidies: https://www.iisd.org/gsi/where-we-work/indonesia.

Table 4 and Figure 10 juxtapose fossil fuel subsidies and revenues in terms of their percentage of GDP (left axis in Figure 10) and of national government revenue (right axis in Figure 9). For trends over time, see Figure 9 in Section 2.1. Though Figure 9 and Table 4 rely on different methodologies to sum up multiple elements of government revenue from fossil fuels, the trends they exhibit are the same: revenues from fossil fuel production decline and can hardly cover the costs of subsidies to fuel and electricity consumption.

On annual average in 2014–2016, GOI revenues from fossil fuel production and its subsidies for fuel and electricity consumption were almost the same, at IDR 190 trillion (USD 16 billion) per year (1.8 per cent of Indonesia's GDP). Over the same period, revenues from fossil fuel consumption totaled IDR 63 trillion (USD 5 billion) or 0.6 per cent of GDP. Meanwhile, subsidies to fossil fuel production reached IDR 5 trillion (USD 0.4 billion) or 0.05 per cent of GDP.

**Figure 10. Government revenues and subsidies related to fossil fuels and electricity in Indonesia, average for 2014–2016.**




*Source: Authors' representation based on data from Table 4. Not all revenues and subsidies related to fossil fuels can be quantified due to lack of reporting.*

**Table 4. Quantified government revenues from fossil fuels vs. quantified fossil fuel subsidies in Indonesia, per cent of GDP**

| Fiscal operations, per cent of GDP | Category | Jurisdiction | Key measures | 2014 | 2015 | 2016 | Average for 2014–2016 |
|---|---|---|---|---|---|---|---|
| National government revenue excluding grants | Benchmark | National (central) | Total national government revenue excluding grants | 14.6 | 13 | 12.5 | 13.4 |
| Corporate income tax revenues from oil & gas production | Fossil fuel production | National (central) | See Section 2.2 | 0.83 | 0.43 | 0.29 | 0.52 |
| Land and building tax from oil companies | Fossil fuel production | National (central) | See Section 2.2 | 0.19 | 0.22 | 0.12 | 0.18 |
| Non-tax revenues from oil & gas production | Fossil fuel production | National (central) | See Section 2.2 | 2.05 | 0.68 | 0.36 | 1.03 |
| Tax and non-tax revenue from coal production | Fossil fuel production | National (central) | See Section 2.2 | No data (coal data aggregated with data on government revenue from general mining) | | | |
| Dividends from energy SOEs: Pertamina, PGN & PLN | Fossil fuel production (including fossil fuel-based electricity generation) | National (central) | See Section 2.2 and Table 3 | No data | 0.11 | 0.08 | 0.09 |
| **Total revenues from fossil fuel production** | **Fossil fuel production** | **National (central)** | **See Section 2.2** | **3.07** | **1.44** | **0.85** | **1.82** |

| Fiscal operations, per cent of GDP | Category | Jurisdiction | Key measures | 2014 | 2015 | 2016 | Average for 2014–2016 |
|---|---|---|---|---|---|---|---|
| **Subsidies (budgetary transfer and tax exemptions) to fossil fuel production** | **Fossil fuel production** | **National (central)** | **Tax exemptions for stimulating investments in new oil and gas developments** | **0.05** | **0.05** | **0.04** | **0.05** |
| 10% VAT on gasoline, diesel, kerosene and LPG | Fossil fuel consumption | National (central) | Estimates for VAT on diesel, gasoline, kerosene and LPG sales only | 0.44 | no data | 0.33 | 0.39 |
| 10% VAT on coal | Fossil fuel consumption | National (central) | See Section 2.3<br>VAT on coal | 0.00 | 0.01 | 0.01 | 0.01 |
| Specific taxes on fossil fuel use | Fossil fuel consumption | Subnational (local) | See Section 2.3<br>5% motor fuel tax (regional, no specific taxes at the national level) | 0.19 | no data | 0.14 | 0.17 |
| **Total revenues from fossil fuel consumption** | **Fossil fuel consumption** | **National and subnational** | **See Section 2.3** | **0.63** | **no data** | **0.58** | **0.57** |
| **Subsidies (budgetary transfers and tax exemption) to fossil fuel consumption** | **Fossil fuel consumption** | **National (central)** | **See Sections 2.1, 2.3 and Text Box 3 in Chapter 3**<br>**Budgetary transfers for keeping fuel prices below market levels** | **3.24** | **1.03** | **0.86** | **1.71** |

*Sources: Ministry of Finance of Indonesia 2016; Ministry of Finance of Indonesia, 2017; OECD analysis of budgetary support and tax expenditures (n.d.), World Bank (n.d.); Open Data, author calculations bases on liquid fuel prices and consumption volumes. Not all revenues and subsidies related to fossil fuels can be quantified due to lack of reporting.*

# Chapter 3. Diversification Away From Fossil Fuels: Past & present


### CHAPTER SUMMARY

Like many other resource-rich developing nations, Indonesia first treated its fossil fuel industry as an export cash cow, with the government in charge of redistributing these export rents to support development. However, the GOI reconsidered this attitude first for oil, then for natural gas. Now this reconsideration is also due for coal.

For several decades, the Indonesian government explored different avenues to invest some fossil fuel revenues in economic diversification. Some of these policies have been productive, such as the development of manufacturing, financial and other sectors; as those grew, they also became bigger taxpayers. Others have been inefficient and inconsistent, as GOI has often implemented concurrent policies that came in conflict with each other. One instance mentioned in Chapter 2 is the decade-long history of fossil fuel consumption subsidies; even when finally reformed at the end of 2014, they re-emerged with the reintroduction of price caps on retail oil products in early 2018. Another example is the push for near-universal electrification and boost in electricity supply through the use of coal that disregards the negative impacts of coal on air pollution and public health. Policy inconsistency also hinders the development of Indonesia's renewable energy sector, which otherwise has the potential to be a driver in diversifying Indonesia's economy and tax base further away from fossil fuels.

Against this background, the question of the use of fossil fuel revenues for economic diversification is still open in Indonesia, especially since these revenues are waning. An example of their productive use comes from fuel subsidy removal in the 2015 budget: that reform generated savings worth IDR 211 trillion (USD 15.6 billion) and enabled investment of a similar magnitude in safety nets, transport, infrastructure and transfers to villages.

Some regions in Indonesia, e.g., Bojonegoro and Musi Banyuasin, are exploring a new model of using oil and gas resource rents in the form of sovereign wealth funds. This model allows them to collect oil and gas revenues, especially during the periods of high prices, and use them for government spending on various causes. The government of Aceh has also introduced a sovereign wealth fund and earmarks its additional revenue from natural resources for various social purposes. Global experience shows that sovereign wealth funds can be an effective tool for sustainable economic development (e.g., in Norway and Chile), but a lot depends on their design and administration.


Indonesia's record of economic diversification is a function of both internal and external factors. The internal factors include the changes in national production and consumption (as described in Sections 1.2 and 1.3 in Chapter 1) and national policies aimed at economic diversification (see Section 3.1. below). The external factors can be summarized as those resulting in affecting Indonesia's budget and wider economy, including financial crises and changes in the global market for oil, gas and coal, especially the price dynamics. These factors are all interconnected, and cause-and-effect relationships are not always easy to establish.

## 3.1 National Policies Aimed at Economic Diversification

Like most resource-rich developing countries, GOI has viewed its oil, gas and coal endowment as a resource for development. Article 33 (3) of Indonesia's Constitution states that "The land, the water and the natural resources within them shall be controlled by the State and shall be used for the greatest prosperity of the people" (The 1945 Constitution of the Republic of Indonesia).

Yet, both in Indonesia and in other resource-rich developing countries, there are competing suggestions of how to deliver the use of resources "for the greatest prosperity of the people." In this respect, researchers note a paradigm shift in how the Government of Indonesia prioritized the use of its oil and gas reserves.

In earlier years, *oil and gas development was export-oriented and perceived as an export cash cow of the government*. The government was then in charge of redistributing these resource rents according to national priorities – a task that has proven difficult for most developing resource-rich countries (Venables, 2016). A typical example of inefficient redistribution of fossil fuel revenue is the use of fiscal space generated by oil rents in Indonesia to provide subsidies for fossil fuel consumption, as described in Chapter 2 and Text Box 4. On top of benefitting the rich more than the poor, fuel and electricity subsidies also stimulated their wasteful consumption, thus leading to faster depletion of Indonesia's resource endowment.

However, *as Indonesia's population and domestic energy consumption grew while the oil and gas deposits were getting depleted, the government started treating its fossil fuel reserves as strategic resources for domestic consumption* rather than as commodities to generate export revenues. The two most recent National Energy Policies of Indonesia—from 2006 and from 2014—gradually reoriented national oil and gas supply from exports to in-country use (IEA n.d. A, IEA n.d.). Similarly, while coal is still being mostly produced for exports, there are early attempts to reorient its supply for domestic market. To implement this reorientation, the Government of Indonesia relied on two policies. Firstly, GOI restricted the export of gas and coal, by establishing DMOs for both fuels (see Sections 1.2 and 1.3). Secondly, GOI stimulated the expansion of domestic downstream industrial capacity in an effort to create more value added from natural gas.

However, economic realities in Indonesia have seen far from consistent implementation of either "export cash cow" or "source of domestic consumption" views of fossil fuel resources. The DMO for coal is a good example: since its introduction of a cap on coal exports in 2015, the government has relaxed it each year (see Section 1.3).

Arguably, the lack of consistency and clarity over Indonesia's fossil fuel sector has been one of the factors that slowed down its development and thus, inadvertently, prevented its excessive dominance in Indonesia's economy. Many recent laws and regulations have tended to be unclear and on occasions conflicting. Much of this applies to the extractive sector generally, in which policies and regulations affecting supply chains have not been sufficiently monitored and enforced. In particular, the prolonged ongoing process of revising the Oil and Gas Law by the GOI and People's Representative Council (DPR) has created much uncertainty in the investor community that will continue until the main new objectives are announced and the revised law is finally issued. The management of natural resources has also suffered from a lack of coordination between relevant ministries. A positive development, though, has been GOI's decision to sign up for the EITI which provides much greater visibility on revenue flows between private companies and SOEs in the extractive sector and GOI.

Against this background, the question of the use of fossil fuel revenues for economic diversification is still open in Indonesia, especially since these revenues are waning. An example of their productive use comes from fuel subsidy removal in the 2015 budget: that reform generated savings worth IDR 211 trillion (USD 15.6 billion) and enabled investment of a similar magnitude in safety nets, transport, infrastructure and transfers to villages (see Section 2.4).

From 2015, there has also been a focus on increasing not just infrastructure capacity across the country, but also the efficiency of the domestic supply chains, in an attempt to improve the competitiveness of Indonesia's export industries. GOI's National Medium-Term Development Plan (RPJMN) for 2015–2019 recognizes the need to improve Indonesia's competitiveness, and to help achieve this, there is a target to reduce logistics costs from 24 per cent of GDP in 2015 to 19 per cent in 2019. Also, further steps are being taken to diversify away from reliance on fossil fuels by setting a target to increase the growth rate of non-oil exports from 8 per cent in 2015 to 14 per cent in 2019 and increase the share of manufacturing in total exports from 44 per cent in 2015 to 65 per cent in 2019 (BPKP, 2015). The real benefits of these initiatives are still to be seen.

## 3.2 Economic Diversification in Response to External Factors

Both Indonesian and foreign experts often speak of economic reforms in Indonesia as a series of policies which follow Sadli's Law (Patunru & Rahardja, 2015). Named after Mohammad Sadli, a leading economist and former Mines and Energy Minister of Indonesia during the country's great rise out of poverty in the 1970s, the law says: "good times make for bad policy, and bad times make for good policy." For this reason, there are two distinct periods to consider in Indonesia's history.

*The first period dates from the mid-1980s up to 2000*. During these years, the international oil price halved from about USD 27 per barrel in 1985 to about USD 14 per barrel the following year. It remained at this low level until 1998 and increased to USD 20 per barrel by 2000. This drop in oil prices resulted in a dramatic loss of fiscal revenue for Indonesia (see Figure 9 in Section 2.1). The Asian financial crisis of 1997 also added pressures on Indonesia's government budget.

In response, in the mid-1980s GOI implemented several economic reforms to encourage industrial development and create a more diversified tax base, to compensate for the dramatic fall in oil revenue. In particular, GOI strongly supported the creation of the Association of Southeast Asian Nations (ASEAN) free trade area and also promoted the Bogor Declaration at Asia-Pacific Economic Cooperation (APEC). Both initiatives prioritized greater economic integration with Indonesia's neighbouring countries. Combined, these steps helped to increase the productivity of the manufacturing sector, which helped to replace some of the lost state oil revenue. At the end of the 1990s, GOI again was quick to introduce economic reforms to recover from the Asian financial crisis and to comply with the IMF program.

*The second period lasts from the early 2000s until today.* In the early 2000s, the price of oil started to increase quickly to USD 36 per barrel in 2004, to USD 61 in 2006, to USD 94 in 2008, peaking at USD 109 in 2012. The fall in oil prices was then very sudden, from USD 96 per barrel in 2014, to USD 50 in 2015, leveling out at USD 40 in 2016, and starting a slow increase only at the end of 2017.

Up until the oil price peak in 2012, GOI saw its revenue from the oil and gas sector increase again, and did not feel there was the same urgent need to seek out other revenue sources. There appears to be a missed opportunity during this period—there was no apparent look forward into the long term that might have prompted GOI to take advantage of the rapidly rising state oil revenues to introduce a policy for saving some of these revenues for future generations, or to introduce mechanisms to deal with commodity price volatility. Rather, right until the oil price drop in late 2014, some of these windfall revenues were used to subsidize domestic prices of fossil fuels as described in Section 2.4 and Text Box 4 in Chapter 2.

## 3.3 Diversification of the Energy Mix

The Long Term Energy Plan issued by the National Energy Council in 2016 sets the target for New and Renewable Energy to meet 31 per cent of national energy demand by 2050, with the share of oil reducing from 46 per cent in 2015 to 25 per cent in 2025 and 20 per cent in 2050, gas remaining fairly constant at 23 per cent in 2015 to 22 per cent in 2025 and 24 per cent in 2050), and coal increasing from 26 per cent in 2015, to 30 per cent in 2025 and then falling back to 25 per cent in 2050.

In accordance with this long-term vision and in the run-up to the Paris Agreement on climate change, Indonesia announced its unconditional commitment to reduce its emissions by 29 per cent relative to the "business-as-usual" scenario by 2030. Indonesia also committed to increase its emissions reduction target to 41 per cent by 2030 (Government of Indonesia, 2016).

The implementation of these long-term energy transition goals includes the intermediary target, announced already in 2015, to triple the share of new and renewable energy (NRE) in the national energy supply mix,

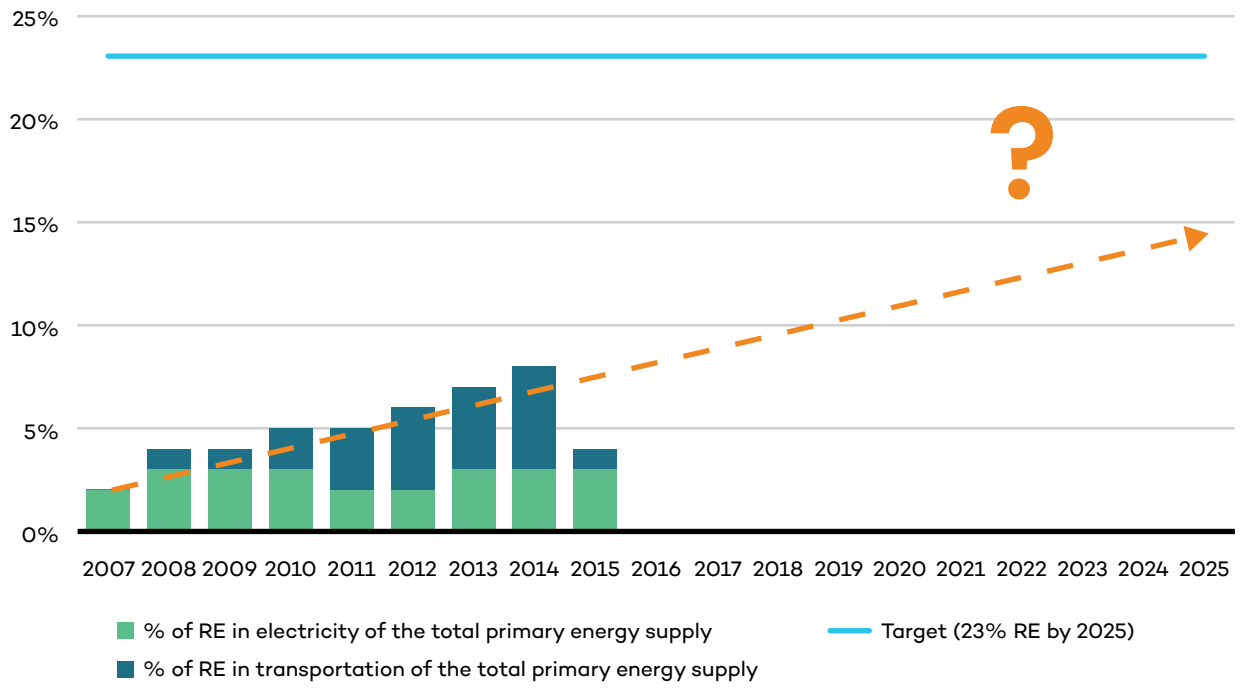
from its share of just 7 per cent in 2015 to 23 per cent by 2025 (Figure 11). The NRE target includes not only electricity generation from renewable sources, but also biofuels used in transport. This policy objective, if it is fulfilled, is likely to reduce the size of the domestic market for fossil fuels. However, progress to date has been slow, and below the stated expectations, raising some questions about GOI's commitments to achieving these aggressive targets for NRE (Bridle et al., 2018). In 2017, the Supreme Audit Agency of Indonesia raised concerns about deficiencies of renewable energy policies in Indonesia (Aisyah & Singgih, 2017 )

The reasons for this under-achievement include difficulties that project developers encounter in acquiring land permits, resistance from established fuel suppliers (notably coal mining companies supplying domestic power plants), a lack of sufficient fiscal and other incentives from government for NRE and the continuing regulation of energy prices. On the one hand, regulated prices for fossil fuels give them a price advantage over some NRE sources, especially as fuel for large-scale power generation. On the other hand, regulated low electricity prices make it very hard for NRE projects to be commercially viable (Bridle at al., 2018). In addition, there is a general reluctance by local banks to fund RE projects, and those that do charge high interest rates.

Overall though, Indonesia is well endowed with renewable energy resources, in particular, geothermal, solar and wind. Internationally, the costs of renewable energy generation have reached parity with traditional electricity technologies such as thermal coal (Bridle et al., 2018). Renewables compare extremely favourably with coal and other fossil fuels when air pollution and health impacts are included in true cost calculations (Attwood et al., 2017).

Fiscal revenues from the NRE sector in Indonesia are proportional to its relatively small size. Renewables energy producers benefit from some tax exemptions but are mostly subject to the same range of taxes as other electricity producers, starting with the income tax. For the geothermal sector, fiscal treatment is similar to that of the oil and gas sector in terms of schemes for both tax and non-tax revenues. Therefore, NRE in Indonesia has the potential for a bigger contribution to the budget if its share in the energy mix is increased, especially as fiscal revenues from renewables are not exposed to the same volatility as oil and gas revenues. For comparison, non-tax revenue from the oil and gas sector amounted to IDR 44 trillion (USD 3.3 billion) in 2016 and IDR 78 trillion (USD 6.1 billion) in 2017, with variance determined by oil and gas prices on the world market. Meanwhile, non-tax revenue from the geothermal sector remained stable and amounted to IDR 0.9 trillion (USD 70 million) in both 2016 and 2017 (Ministry of Finance of Indonesia, 2017).

**Figure 11. Is Indonesia on track to meet its 23 per cent new & renewable energy target by 2025?**



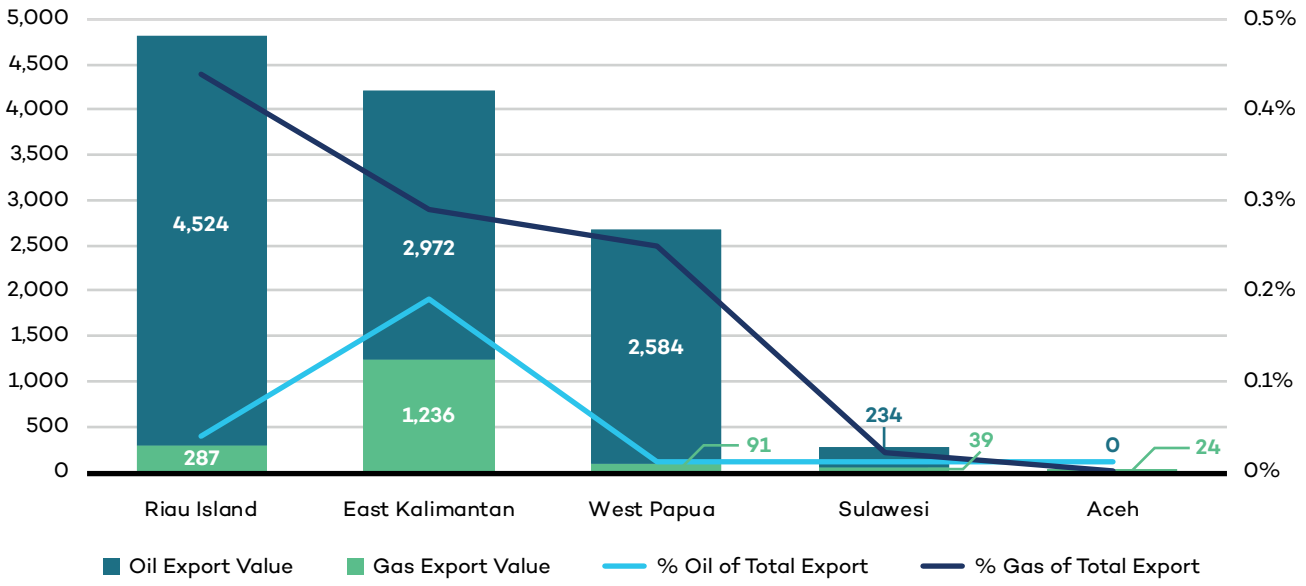

*Source: Bridle et al., 2018, based on data from PLN.*

## 3.4 Diversification Challenges at the Regional Level

Indonesia is a unitary state subdivided into provinces that are made up of regencies and cities (see Annex II for further detail). Some regions of Indonesia are more vulnerable to the decline in fossil fuel production.

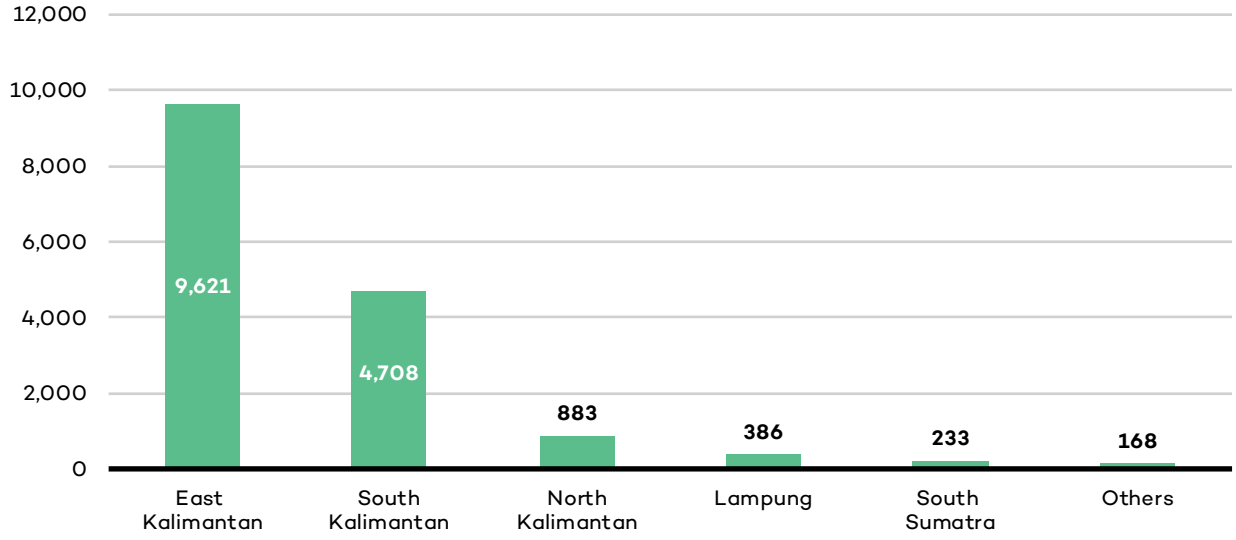
Figures 12 and 13 show how the majority of the exports of oil, gas and coal come from just a few provinces, and the inevitable high reliance these provinces will have on the continued high volumes (and prices) of exports of these commodities for their revenue and employment. For instance, the provinces of Riau island of Sumatra and East Kalimantan together account for 69 per cent of the total value of Indonesia's oil exports—the provinces of East Kalimantan, Riau Islands and West Papua account for virtually all of Indonesia's gas exports (98 per cent). With regards to coal, exports are spread a bit more evenly across several provinces, though the majority are from three provinces in the island of Kalimantan and the provinces from the island of Sumatra.

**Figure 12.** **Oil and natural gas export value by provinces in Indonesia in 2015, USD million**




*Source: Adapted from Foreign Trade Statistics by SITC code 2015-2016 (EITI, 2015).*

**Figure 13.** **Coal export value by provinces in Indonesia in 2015, USD million**




*Source: Adapted from Foreign Trade Statistics by SITC code 2015-2016 (EITI, 2015).*

The decentralization policy introduced by GOI in the early 2000s ruled that resource-rich regions should receive greater fiscal benefits from oil, gas and mining extraction in their areas. It also granted more decision-making power to local government regarding administrative and fiscal affairs. This prompted the introduction of many new local taxes and levies, and in the case of mining, a sudden sharp increase in the granting of mining licences.

Regions that produce oil and gas are allocated 15.5 per cent and 30.5 per cent of the central government's income from oil and gas production respectively through the Revenue Sharing Fund (DBH):

- Oil: 3.1 per cent goes to the province, 6.2 per cent goes to regency where the oil is produced, and 6.2 per cent goes to other regencies/cities in the same province.
- Gas: 6.1 per cent goes to the province, 12.2 per cent goes to the regency where the gas in produced, and 12.2 per cent goes to other regencies/cities in the same province.

State revenue from coal mining is also shared with the regions. With regard to land rent, 64 per cent goes to the producing regency with 16 per cent going to the province, leaving 20 per cent to the central government. In the case of royalties, both the producing regency and neighbouring regencies each receive 32 per cent, leaving 16 per cent to the producing province and 20 per cent to central government.

Table 5 illustrates the value of the DBH transfers to the regions. This shows the DBH payments to the 10 largest recipient regions in each extractive subsector (oil and natural gas separately, and coal mining merged with mining of other minerals).

**Table 5. Largest recipient regions of oil and gas sector and mineral and coal sector DBH in 2015, IDR million.**

| OIL | | NATURAL GAS | | MINERAL AND COAL | |
|---|---|---|---|---|---|
| **Region** | **Transfer from DBH** | **Region** | **Transfer from DBH** | **Region** | **Transfer from DBH** |
| **Riau Province** | **1,048,999** | **East Kalimantan Province** | | **East Kalimantan Province** | **1,790,176** |
| • Bengkalis Regency | 1,040,512 | • Kutai Kartanegara Regency | 1,158,774 | • Kutai Kartanegara Regency | 1,343,942 |
| • Siak Regency | 563,820 | • East Kutai Regency | 1,045,952 | • East Kutai Regency | 1,603,274 |
| • Rokan Hilir Regency | 563,511 | • North Penajam Paser Regency | 201,283 | • Paser Regency | 657,185 |
| • Kampar Regency | 460,671 | • Bontang City | 192,664 | • West Kutai Regency | 619,716 |
| | | • Samarinda City | 187,067 | • Samarinda City | 508,681 |
| **East Kalimantan Province** | **303,850** | | | | |
| • Kutai Kartanegara Regency | 302,138 | **South Sumatra Province** | | **South Kalimantan Province** | **801,079** |
| | | • Musi Banyuasin Regency | 580,973 | • Tanah Bumbu Regency | 446,311 |
| **East Java Province** | **398,399** | • South Sumatera Regency | 367,740 | | |
| • Bojonegoro Regency | 770,182 | | | **North Kalimantan Province** | |
| | | **West Papua** | **574,339** | • Berau Regency | 778,275 |
| **West Papua** | **246,602** | | | | |
| | | **Riau Island Province** | **220,317** | **West Papua** | |
| | | | | • Mimika Regency | 588,823 |
| | | **Aceh Darussalam Province** | **215,365** | | |

*Note: Including earmarks of 0.5 per cent for Oil and Gas DBH.*

*Source: Adapted from EITI, 2015.*

Estimates of employment in Indonesia's fossil fuel extraction industry differ between sources. According to the Central Agency on Statistics (BPS), the number of workers in the "extractives industry" (i.e., oil and gas, and mining—disaggregated statistics by extractive subsector are not available), in 2015 was relatively low, equivalent to 1.15 per cent of the total workforce in Indonesia, at 1.3 million workers (EITI, 2015). There is a general trend in the reduction of jobs in extractive industries due to automation. Oil and gas is a more technology-intensive sector than mining and thus employs fewer workers.

While the number of jobs in the oil and gas sector is relatively small compared with the total Indonesian labour force, their concentration can have negative implications for certain communities currently facing a decline in fossil fuel extraction. Katadata, an Indonesian research and media agency, has conducted some research for the Indonesian Petroleum Association (IPA) on the impact that declining oil and gas investment is having on the economies of the regions dependent on upstream oil and gas (drawing on information from the Central Agency on Statistics (BPS), Ministry of Finance and a survey). They focused on 10 regencies in 6 provinces (mostly the same as indicated in Table 5). According to the Katadata research, between 2014 and 2015, in most cases these regencies suffered a decline in income from the DBH in the range of 58 per cent and higher (Katadata, 2016). In addition, declining oil and gas investment has led to a reduction in expenditure on locally produced goods and services (as well as those purchased overseas). This has resulted in extensive redundancies, close to 50,000 jobs according to the research. The highest number of layoffs have been in oil and gas-producing provinces that have industrial zones, where more than 10,000 employees were laid off during 2015.

Economic diversification is therefore critical for future development of Indonesia's fossil fuel-extraction regions, though recognition of this by the central government (with the exception of the Bank of Indonesia) has been slow (see Text Box 5). Some of the regional governments are exploring the option of sovereign wealth funds (SWFs) to reinvest their oil and gas revenues and support their economic diversification. This model allows them to collect oil and gas revenues, especially during periods of high prices, and use them for government spending on various causes. Global experience shows that SWFs can be an effective tool for sustainable economic development (successes include Norway and Chile), but a lot depends on their design and administration.

Two first initiatives on establishing regional SWFs come from Musi Banyuasin in South Sumatra and Bojonegoro in East Java. Musi Banyuasin is home to one of Indonesia's largest oil, gas and coal reserves. The UN Development Programme (UNDP) is providing assistance to the local government to establish an SWF (UNDP, 2017). Bojonegoro produces close to 20 per cent of Indonesia's oil. Its government is also exploring the options of managing resource rents from the field discovered in 2001, one of the biggest oil discoveries made in Indonesia in the past 30 years. The World Bank is providing assistance to Bojonegoro's government to establish an SWF, drawing on some Latin American countries' experience (Natural Resource Governance Institute, 2012). The government of Aceh has also introduced an SWF and earmarks its additional revenue from natural resources for various social purposes.

It remains to be seen how quickly these examples will be replicated by other local governments. GOI and the People's Representative Council have been discussing the possibilities of establishing a national Dana Ketahanan Energi (or DKE, an SWF) for the past few years. In 2015, the National Energy Council (DEN) proposed collecting revenue for the DKE from sales of oil products taking advantage of the low global oil prices. This does not appear to have been implemented as yet, and the recent increase in oil prices may have stalled this initiative with the re-emergence of fuel consumption subsidies (see Section 2.4 and Text Box 4).

### Text Box 5. In search of alternative pathways for Indonesian regions dependent on natural resource extraction

Bank Indonesia (BI) is Indonesia's Central Bank. In February 2018, BI instructed its regional representatives to identify alternative source of economic activities, other than natural resource-based commodities, in the regions heavily dependent on these commodities. The aim is to enable these BI representatives to provide better advice to the respective regional governments in managing their local economies. However, no specific activities are being proposed besides tourism, which is constrained in some locations due to local leaders not wishing to provide access to local land or resources. This appears to be the first occasion when Indonesia's central government has acknowledged the need to find alternative economic activities in regions which are now suffering from a decline in oil and gas investment and production. More policies for a just transition and economic diversification are needed for these regions.

# Conclusions and Recommendations

Fossil fuel revenues have played a key role in Indonesia's economic development for the past decades. Now these revenues are rapidly declining, due largely both to the factors leading to lower commodity prices on the world market, and decreasing exports in light of the growing domestic demand and the natural decline in production from many aging oil fields. GOI is still assessing the economic and social impacts of this continuing trend, and how best to address these impacts at both a national and regional level.

Policy-makers in Indonesia and in other countries may benefit from lessons learned on Indonesia's record of taxing and subsidizing energy. The observations that stand out from this analysis are the following.

**1) Fiscal transition away from tax and non-tax revenues from oil, gas and coal extraction requires a transparent and comprehensive discussion.** Indonesia is a member of the Extractive Industries Transparency Initiative (EITI), which has helped improve transparency over the fiscal revenues from the extractive sector in the country. However, to offer maximum insights, this transparency and discussion should be extended to the taxation of fossil fuel consumption and subsidies to both fossil fuel production and consumption.

**2) Fossil fuel subsidies are an inefficient mechanism for redistribution of the declining export rents from fossil fuels.** To enable efficient allocation of resources and a level playing field for various energy types, such subsidies should be phased out while vulnerable energy consumers should receive more targeted assistance. For example, as part of its recent subsidy reforms, the Indonesia government launched a social assistance scheme called the Productive Family Program (Program Keluarga Produktif), which introduced smart cards for families with school-age children and for health needs (Beaton et al., 2017).

**3) Compared with other BRIICS countries, Indonesia underutilizes the fiscal space it can create by taxing energy consumption.** Fuel consumption taxes (VAT and motor fuel tax) generate just a third of the value of fuel and electricity subsidies (0.57 per cent of GDP vs. 1.7 per cent of GDP on annual average over 2014–2016). Domestic prices and taxes for fossil fuels should reflect their full costs, including negative external effects such as pollution and health impacts.

**4) Revenues from the taxation of fossil fuel production and consumption as well as savings from subsidy reforms should be invested in productive uses supporting social development and economic diversification.** For several decades, the Indonesian government stimulated the development of manufacturing, financial and other sectors, and as they grew they also became bigger taxpayers. Investment of resource rents should be visible and in line with the interests of vulnerable groups, decreasing their cost of living by as much as or more than the additional costs created. Areas of such investment include social safety nets, healthcare, education and other public services, infrastructure, energy efficiency and renewable energy. Such investments should create new sustainable jobs and support a transition path, including in rural areas and areas currently depending on fossil fuels.

**5) Renewable energy can be one of the sectors driving diversification of the Indonesian economy and its fiscal transition away from fossil fuels.** Renewable energy technologies have become much more cost-competitive and, internationally, compare extremely favourably to fossil fuels in terms of costs as well as impacts on air pollution and public health. The Government of Indonesia has already introduced a target to increase the share of renewable energy in the energy supply mix from 7 per cent in 2015 to 23 per cent by 2025, but is experiencing difficulties meeting it (Bridle et al., 2018). Indonesia is well endowed with renewable energy resources such as geothermal, solar and wind. For the geothermal sector in Indonesia, fiscal treatment is similar to that of the oil and gas sector in terms of schemes for both tax and non-tax revenues. Revenues from the geothermal sector are stable compared with volatile oil and gas revenues, but their size is proportional to their minor role in the energy production. To grow the renewable energy sector in Indonesia, it is necessary to phase out both consumption and production subsidies to fossil fuels and electricity and create a better investment climate (Bridle et al., 2018).

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# Annex 1. Government Revenue From Upstream Oil and Gas

## Non-Tax Revenue

- **Equity oil:** A key feature of the Production Sharing Contract ("PSC") system is the sharing of oil and gas production between the production sharing contractors ("contractors") and the Government of Indonesia (GOI). The oil and gas production shared is known as *equity oil* and *equity gas*. GOI's share of equity oil in most PSCs is 85 per cent (leaving 15 per cent for the contractor) and its share of equity gas is 70 per cent (leaving 30 per cent for the contractor).

  Contractors are allocated slightly higher percentage shares in some specific instances. These equity oil shares are paid after deduction of *cost recovery* (see next paragraph). In most cases, GOI's equity oil is sold by Pertamina either to local refineries or overseas (if the crude specification is not suitable for local refinery needs), and equity gas is sold either by Pertamina or contractors on GOI's behalf.

  It should be noted that under the PSC system the contractor is entitled to recover all allowable operating costs related to exploration, development and production activities. However, this cost recovery is only permitted when a project commences production. Exploration costs incurred at other sites within the same PSC, other than where production is taking place, are recoverable. If there is no production from any site within a PSC, there is no opportunity to recover any of the exploration costs. All equipment brought into Indonesia for oil and gas exploration and production belongs to the government and most of it is eligible for cost recovery.
- **Dividends from fossil fuel SOEs:** Pertamina, PGN, Bukit Asam.
- **Domestic Market Obligation (DMO):** The obligation to deliver part the contractor's share in the form of oil and/or natural gas to fulfill domestic needs. For oil, DMO requires PSC contractors to supply 25 per cent of total production to the domestic market out of their pre-tax equity share of production. For the first five years, a contractor is paid full value for its DMO oil by SKK MIGAS, and this is reduced to 10 per cent of that price for subsequent years. For gas, a DMO of 25 per cent applies to more recent PSCs, but there is no discounting of the full price of DMO gas after five years. DMO is recorded as revenue in physical volume units.
- **Other upstream oil and gas revenue sources:** GOI obtains further revenue from various payments Contractors are required to make, these include:
  - Fees for hiring expatriates (known as DPKK): A charge of USD 1,200 per annum for each expatriate hired.
  - Signature bonuses: In most cases signature bonuses are paid in the range of USD 1 to USD 41 million by a contractor when it is awarded a PSC.
  - Production bonuses: Contractor pays this when it achieves a specific pre-agreed level of production.
  - Data fees: Fees paid when a contractor obtains data from GOI to decide whether to bid for new acreage.
  - Abandonment and site restoration fees: In more recently issued PSCs, contractors pay this to GOI for environmental cleanup after a site has been abandoned.

## Tax Revenue

Tax revenue from the upstream sector is generated through various means:

- **Corporate income tax and branch profit tax:** Paid by contractors.
- **Withholding taxes:** Paid on various transactions such as foreign payments of interest, domestic payments of dividends and interest, employee salaries, etc.
- **Land and building tax (PBB):** The land and building tax object of the oil and gas sector is based on the concept of the land and/or buildings within the working area.
- **PSC Transfers:** These transfers to other parties are taxed at 5 per cent of gross proceeds and during the exploitation stage at 7 per cent of gross proceeds (Govt Regulation No. 79 of 2010) unless the transfer is to a national company.
- Other regional taxes.

# Annex 2. Regional Structure of Indonesia

Indonesia is divided into 34 provinces (formerly called Daerah Tingkat I – level 1 region). Provinces are made up of regencies and cities (formerly called Daerah Tingkat II – level 2 regions), which are in turn subdivided into subdistricts. Provinces, regencies and cities have their own local governments and parliamentary bodies.

Current numbers are as follows:

**Upper tier of local government:**

- 34 Provinces (*Provinsi*)
- 5 provinces have a special status
- Capital Region of Jakarta
- DKI Jakarta
- Aceh
- Yogyakarta
- Papua
- West Papua

**Lower tier of local government:**

- 416 Regencies (*Kabupaten*)
- 98 Cities (*Kota*)

Regencies and cities are divided into subdistricts (*kecamatan*) numbering 6,543 at present. Subdistricts are made up of villages (*desa*) or urban communities (*kelurahan*), counting 75,244. Those at the same level, villages enjoy more power in local matters than urban communities.

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