# COVID-19 & Coal Investment: briefings for China, India, Indonesia & Poland

**WORKING DRAFT DOCUMENT v2**

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# China: COVID-19 worst case public coal spending

## 1. Summary

- China remains, by a significant margin, both the world's top financier of coal investment and the world's most prodigious coal consumer.
- Business as usual (BAU) forms of Chinese coal support have continued through the COVID-19 pandemic (domestic support coordinated by provincial leadership and international support through the Belt and Road Initiative).
- In the short term, China has showed signs of accelerating the construction timeline of up to 73GW of new coal-fired generation plants (to reach the 13th Five Year Plan self-imposed cap of 1100GW). Many of these plants are already economically uncompetitive compared to renewable energy alternatives. Little movement is expected on domestic coal production.
- In the longer term, increasing the coal-fired electricity generation cap in the 14th Five-Year Plan (due in late 2020) may worsen China's electricity oversupply crunch, although this is unlikely as the central government remains committed to a 2°C target.

*Table 1. Summary of public Chinese COVID-19 coal support.*

| | **COVID coal support Jan-Aug (CNY billions)** | **Realistic worst-case for further COVID coal support (CNY billions)** |
|---|---|---|
| Direct support for new coal mining | 0 | 0 |
| Direct support for existing coal mining (BAU) | 63[1] | 94.6 / year[2] |
| Direct support for new coal plants | 200 (57.8 GW capacity) | 52.6 (15.2 GW capacity) |
| Additional coal plant annual operating costs | 3.89 / year | 1.02 / year |
| Direct support for existing coal plants (BAU) | 156.3[3] | 234.4 / year[4] |
| Direct support for coal transmission | 118.7 (speculative) | 31.2 (speculative) |
| Short-term job continuance support | 0.047 | 0 |
| Demand-side support for energy generation | Unclear | Unclear |
| **Total financial obligation** | **219.3 BAU<br>200.0 once-off + 118.7 speculative once-off<br>3.89 / year OPEX** | **329.0 / year BAU<br>52.6 once-off + 31.2 speculative once-off<br>1.02 / year OPEX** |

[1] Jan-May figure (39.4) extrapolated to 8 months; [2] Jan-May figure (39.4) extrapolated to 12 months; [3] Jan-Mar figure (58.6) extrapolated to 8 months; [4] Jan-Mar figure (58.6) extrapolated to 12 months.

## 2. Business as usual support

In 2017 Chinese (state-owned) banks financed in excess of CNY53.3bn in new domestic coal-fired generation, and CNY7.2bn in domestic coal mining (Chen and Gencsu, 2019). Part of the investment popularity of coal power in China can be explained by advance contracts which enable coal plants to continue offloading electricity onto provincial grids even when coal power is costlier than other sources. Chinese financing of foreign coal is substantial, to the tune of CNY64.8bn per year (Chen and Gencsu, 2019).

Public support is also provided to support household consumption of coal-generated energy. In 2017, CNY476m in budgetary transfers and tax exemptions are estimated to have been spent in support of coal-fired generation, of both power and heat.

In a recent paper, Xiang and Kuang (2020) use a subsidisation rate of 7.2% for China's coal production, calculated using 2013 measures by Xue et al. (2015). This figure takes the subsidisation figure of coal production at CNY26.8 per metric ton. According to the National Bureau of Statistics, Chinese national coal production reached 1.47bn metric tons from January to May 2020 (Xinhua, 2020). As such, Chinese coal production subsidies are estimated to total CNY39.4bn in the first five months of 2020, extrapolated to CNY63bn for January to August.

On coal consumption, Denjean et al. (2016) estimated subsidies valued at CNY252.4bn in 2014 and 120.8bn in 2015. BP Statistical Review of World Energy (2020) estimates 81.83EJ domestic coal consumption in 2014 and 80.13EJ in 2015. This is equivalent to 2.79bn tons of coal in 2014 and 2.73bn tons of coal in 2015. As such, China on average subsidises CNY67.36 per billion ton of coal. Meanwhile, China is estimated to have consumed 870m tons of coal in Q1 2020 (SteelGuru, 2020). Together this computes a subsidy of CNY58.6bn in Q1 2020.

## 3. COVID-19 support so far (January 2020 to August 2020)

### 3.1 Targeted coal support

As part of the COVID-19 stimulus effort, new coal plant projects introduced in China this year will provide an extra 40.8GW in energy capacity (Hale and Hook, 2020; GEM/CREA 2020). This has been boosted by a relaxation in the country's 'traffic-light' policy, designed to prevent the construction of excess coal plants (since economic forces are stymied by power purchase guarantees). In the 2020 permitting process, 17GW of coal-fired capacity have been advanced, of which 11GW have already begun construction. This totals for a 57.8GW of accelerated coal energy construction in 2020. According to SSEE estimates, the economic cost of a new coal plant is approximately USD500k per MW capacity. Many newly approved plants may have

been started from as far back as 2014 and previously put on hold. This means some finance may have already been committed. However, in a worst-case scenario, this puts the possible total overall economic cost of China's COVID coal construction stimulus to date at CNY200bn.

The construction of new coal-fired power plants will also bring additional costs in the form of operating expenditure. SSEE estimates show that the operating expenditure of coal plants is approximately USD9700 (CNY66,000) per MW per year. This puts the additional operating expenditure required for another 57.8GW of capacity at CNY3.89bn per year.

Of the 17GW of capacity committed so far in 2020, 7.9GW will require long-distance transmission from plants in the West to demand centres on the East coast (GEM/CREA, 2020). Much of this transmission need will be serviced by fourteen new UHV transmission projects, at a cost of CNY185.46bn (Power Technology, 2020). It is however unclear what degree of this new transmission apparatus will enable the supply of coal generated electricity versus renewable electricity, and whether the incremental transmission capacity would be required for renewable energy generation in the absence of coal. As a broad estimate, assuming that the new transmission will reflect China's existing energy mix, we can expect 64% of costs to enable coal generation, representing CNY118.69bn (IEA, 2020). Incremental transmission operating costs are neglected in this analysis.

However, in 2020 China has not (yet) accelerated coal exploration or the construction of new coal mines. Ostensibly, Beijing aims to reduce the number of coal mines in the country to no more than 5000, with a focus on scrapping small mines with a capacity of under 300 thousand tons per year (Argus, 2020; Reuters, 2020). While this may be accompanied by an expansion in capacity in major producing regions as officials seek to centralise production, no funding has yet been committed.

### 3.2 Broad economic support with coal as a beneficiary

According to the Chinese National Bureau of Statistics (CEIC, 2020), February 2020 brought a fall in coal mining and dressing employment in China from 3.2m to 2.65m, reaching a new record low. However, in some ways this fall was an acceleration of a labour market trend which began in November 2018 and as such, the net effect of COVID-19 on long-term coal mining employment remains unclear. Employment has since recovered to 2.67m, as the industry recovered from 57% of mines operational in February, to 83% operational by early March (GlobalData, 2020a).

Overall coal output in Jan-Feb of 2020 fell 6.3% year on year (from 513.67m tonnes to 489.03m tonnes). A 2017 report by the Chinese Academy of Social Sciences' Institute of Urban Environmental Studies and the Research Institute for Global Value Chains at the University of

International Business and Economics predicted that coal producers employ on average 11 people per 10,000 tonnes of coal output. A fall in output of 24.64m tonnes would therefore be reflected by a fall in employment of just over 27,000. As many Chinese workers do not pay into unemployment insurance schemes, analysts estimate that only half of those who lost their jobs in China during the pandemic will claim unemployment benefits (Reuters, 2020). Assuming homogeneity between Chinese workers broadly and those employed by the coal production industry, we expect that approximately 13,500 workers claimed a maximum of CNY1,815 each per month over January and February (Reuters, 2020) at a total cost of CNY47.7m.

## 4. 'Realistic worst-case scenario' for further COVID-19 coal support

In the worst-case scenario for further COVID coal support, it is likely that government stimulus will be directed almost exclusively to coal consumption rather than production. Coal mines have been designated "essential" status to continue operating during lockdown and restrictions (Liedtke, 2020), and overall production is expected to decline by 1.2% in 2020 as a result of China's strides towards closing small mines by the end of the year (and not as a result of COVID-19) (GlobalData, 2020b).

However, further support for new coal plant construction is a cause for concern. According to the joint study between GEM and CREA (2020), China has 97.8GW of coal capacity under construction and a further 151.8GW in planning. Meanwhile, the number of provincial grids given a green-light under the Chinese 'traffic-light' policy increased from 21/31 to 25/31 in 2020 (CarbonBrief, 2020). In July 2019, total Chinese coal capacity stood at 1027GW (Shearer et al., 2019). With 57.8GW of capacity already accelerated over 2020, there is room for a further 15.2GW of added coal capacity before China reaches its self-imposed 1100GW limit under the 13th Five-Year Plan (FYP). Using the SSEE estimate of USD500k per MW capacity, this means that China could potentially spend a further CNY52.6bn on new coal capacity this year. Considering operational expenditure of USD9715.34 per MW per year, this added capacity would incur an extra CNY1.02bn in annual costs to the Chinese economy. Costs may be higher considering power transmission – the expansion of capacity may mean that further investment in UHV grids is required. Maintaining the transmission investment ratio cited in *Section 3,* an additional 15.2 GW of capacity may bring additional transmission costs of CNY31.2bn.

Even more worrying, however, is commentary suggesting that this cap may be increased in late 2020 to up to 1400GW by 2035 to meet power demand under the 14th FYP from 2021-2025 (Shearer et al., 2019). While political rhetoric infers that such a scenario is unlikely, as the government remains committed to a warming target of 2° Celsius, such an increase would introduce potential to increase coal stimulus spending greatly in the aftermath of COVID-19

(energy oversupply concerns should also provide a continued damper on spending in the short term).

## 5. Existing alternative green narratives

Despite strong green rhetoric from Beijing over the past few years (Zhang and Orbie, 2019; Engels, 2018), and some praise from external commentators (Chao, 2017), in 2020, concerns have been raised over the country's re-acceleration of coal funding (Farand, 2020) and dropping of its climate targets for 2020 (Bloomberg, 2020). There are further worries from the academic world that already announced stimulus favours fossil fuels over clean energy, failing to seize on the momentum to accelerate the energy transition and boding badly for the upcoming 14th FYP (Gosens and Jotzo, 2020).

In recent months the China Council for International Cooperation on Environment and Development (CCICED) has provided the beginning threads of an alternative green recovery narrative, calling for a 14th FYP that protects the economy, enables ecological integrity, and prioritises the greening of the Belt and Road Initiative (CCICED, 2020). While other commentators have been understandably less optimistic, the CCICED believes that President Xi's reiteration that "green is gold" can be a source of confidence and hope in a green transition started by a green recovery.

Finance Minister Liu Kun has pledged further fiscal expansion to stem downward pressure on growth (Raiser and Eckardt, 2020). With 400GW of excess coal power capacity and at least $80bn of wasted investment in 360 new coal plants installed 2015 to 2019 (GEM/CREA, 2020), the argument against coal would be clear-cut were it not for inefficient market-disrupting subsidies. Meanwhile, the prospects for renewable energy to provide domestic economic strength are strong and could catalyse an upgrade of the industrial supply chain (Liu et al., 2019). With China already facing a coal overcapacity electricity supply crisis, the economic case seems strongly in favour of clean investments over fossil fuels – direct supporting evidence in the form of comparative stimulus modelling would seal the case.

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# India: COVID-19 worst case public coal spending

## 1. Summary

- BAU public funding of coal is substantial in India. Support manifests in market subsidies, and in financing support for the operations and capital outlays of State-Owned Enterprises (SOEs).
- So far, public pandemic-induced stimulus measures have mainly focused on coal mining reform, coal import substitution, and large-scale capital injection into new coal enabling infrastructure (e.g. coal transport). Notably, there has not been significant fiscal stimulus directed to new coal-fired power generation.
- Further stimulus measures in the coming months may enable further import substitution and/or shift forward existing plans for investment in coal-fired power generation.

*Table 2. Summary of public Indian COVID-19 coal support.*

| | **COVID coal support Jan-Aug (INR crore)** | **Realistic worst-case for further COVID coal support (INR crore)** |
|---|---|---|
| Direct support for new coal mining | 37,000[1] + import substitution costs – new block revenue | Import substitution costs |
| Direct support for existing coal mining (BAU) | At least 21,635[2] | At least 32,453[3] / year |
| Direct support for coal transportation | 18,000 | 0 |
| Direct support for new coal plants | 0 | Shifting forward 65,000 by one year (8.75GW) |
| Direct support for existing coal plants (BAU) | At least 26,186[4] | At least 39,279[5] / year |
| Short-term unemployment support | 40.4 | 0 |
| **Total financial obligation** | **47,821 BAU<br>18,000 once-off (excl substitution costs and new block revenue)** | **71,732 / year BAU<br>65,000 once-off, shifted forward (excl substitution costs)** |

[1] 32,000 for non-transport coal enabling infrastructure + 5,000 for commercial concessions; [2] 18,467 for direct SOE capital investment support + 883 for administrative overheads + 12,122 for sales tax concessions + 981 for effective coal washing subsidies. Applied over 8 months. 3,550 of loan guarantees excluded; [3] Jan-Mar figure (21,635) extrapolated to 12 months; [4] 21,000 for NTPC + 2,342 for Damodar Valley Corporation + 15,937 conservative value for PGIC, REC, and administrative support. Applied over 8 months; [5] Jan-Mar figure (26,186) extrapolated to 12 months.

## 2. Business as usual support

Prior to the 2020 pandemic, almost half of India's commercial energy supply came from coal (Tongia and Gross, 2019). Coal India Limited, which is 66% government controlled (Financial Express, 2020), holds a monopoly over Indian coal mining and provided nearly 85% of coal output. The industry monopoly structure has subsequently pushed the cost of coal-fired generation 50% higher in India than in the US on a kWh basis (accounting for the cost of coal itself, government levies, and transportation).

### 2.1 Coal mining, supply, and distribution

Government funding for domestic coal mining, supply, and distribution increased marginally in the 2020/21 budget (released March 2020), providing INR18,467 crore of direct SOE capital investment support, INR883 crore for administrative overheads, and over INR13,000 crore in taxation subsidies.

Mining SOE capital outlays included INR9,500 crore for Coal India, INR2,300 crore for Singareni Collieries, and INR6,667 crore for (Ministry of Coal, 2020). The federal government also continues to provide INR3,550 crore of coal loan guarantees (Ministry of Coal, 2020).

Alongside direct support of coal mining SOEs, the Indian government invests considerable capital into the development and operation of the domestic coal sector through the Indian Ministry of Coal (MoC). This BAU support totals INR882.61 crore in 2020/21, consisting of INR700 crore for coal and lignite exploration, INR95 crore on conservation, safety and infrastructure development in coal mining, INR25 crore for coal R&D, and INR40.28 crore for general Ministry of Coal operations (administration and secretariat).

Finally, Indian coal production benefits from several direct and indirect taxation subsidies. Foremostly, Indian coal faces a concessional sales tax (GST) of 5% rather than 18% on similar commodities, bringing a total subsidy of INR12,122 crore in 2018 (IISD, 2018). IISD also identifies other effective subsidies for coal including cost savings through non-compliance of producers with coal-washing requirements (~INR981 crore in 2018).

### 2.2 Coal-fired electricity generation

The Ministry of Power (MoP) budget for 2020/21 provides a total of INR49,969 crore in support for state-owned power generation and distribution facilities (99.8% of which comes through the *Internal and Extra Budgetary Resources* (IEBR) program) (MoP, 2020).

Approximately INR21,000 crore will support the National Thermal Power Corporation (NTPC), which provides 85% of installed generation capacity in India and 78% of actual generation

(NTPC, 2019). To meet expanding domestic electricity demand, the NTPC is dramatically expanding both its coal and renewable energy generation capacity. The group ostensibly targets an additional 31.1GW in renewables and 36.9GW in coal and gas by 2032, however as of August 2019 only 1.2GW of renewables were under construction compared to 18.1GW in coal and 0GW of gas (NTPC, 2019). As such, it is unclear what percentage of NTPC MoP support in 2020/21 will finance further coal works. INR2,342 crore will fund the Damodar Valley Corporation (98% coal capacity), bringing total coal electricity generation SOE support to at most INR23,342 crore.

Significant MoP support in 2020/21 will finance operations and expansion of the Power Grid Corporation of India (PGIC), to the tune of INR10,500 crore (30% YoY decrease), and the Rural Electrification Corporation (REC), to the tune of INR5,500 crore (39% YoY decrease) (MoP, 2020).[1] It is unclear what proportion of support will be used to enable new coal-fired generation facilities. Similarly, it is unclear what proportion of INR15,874 crore in MoP core administrative costs enable coal support and could be otherwise eliminated in the event of a 100% renewable energy investment landscape (MoP, 2020). A conservative 50% estimate for coal-specific enabling support through the PGIC, REC, and general admin gives INR15,937 crore.

## 3. COVID-19 support so far (January 2020 to August 2020)

### 3.1 Targeted coal support

In support of domestic economic stimulus efforts, the Indian government has allocated INR50,000 crores towards coal enabling infrastructure development for Coal India, with 18,000 (36%) assigned to investment in mechanised coal transfer (i.e. conveyer belts) from mines to rail transport (PIB New Delhi, 2020). This targeted subsidy aims to help enable a long-coveted decrease in coal imports in favour of domestic production, and to facilitate evacuation of record high coal stocks at Coal India (Modi, 2020a).[2]

Given record inventories of around 78million tonnes, in May 2020 Coal India began coordinating an 'import substitution drive' to encourage generation companies to swap coal imports for domestic production (Sengupta, 2020). This program was supported with written

[1] This is in addition to indirect assistance of coal provided through consumption-side subsidies including in transmission and distribution.
[2] Although the Indian government has spoken at length about decreasing coal imports in the past, coal imports have grown consistently over the past five years reaching 249m tonnes in 2019-20. This all-time high reflects a 9.2% 3-year CAGR and a 2.7% 5-year CAGR (MoC, 2020). However, the new economic perils of COVID-19 have been cited as a reason for "greater resolve" on the part of government (Modi, 2020a).

instruction from Coal Minister Pralhad Joshi and direction from Prime Minister Modi (Press Trust of India, 2020; Modi, 2020c). In July, the drive was already proving successful, with a 43.2% total reduction in coal imports compared to July 2019 (Press Trust of India, 2020).

In terms of market reform, in May, a significant announcement by Prime Minister Narendra Modi confirmed that commercial coal mining will soon be permitted in India, with up to 50 new coal blocks (later revised to 41) to be auctioned under a revenue sharing mechanism (CCC, 2020; Modi, 2020b; PIB New Delhi, 2020). This is expected to raise significant new revenue for state and federal governments in the medium term; however, given long construction and deployment lead times it is unlikely that any new revenue will help to finance COVID relief. In the short-term, new capital investment to the order of INR33,000 crore over five years is likely to serve as an economic boon.

Additional liberalization of the coal sector worth INR 5,000 crore has been promised to Coal India consumers (PIB New Delhi, 2020). This relief will come in the form of commercial concessions.

### 3.2 Broad economic support with coal as a beneficiary

Due to mandatory lockdowns, Singareni Collieries Company Ltd (SCCL) was forced to close 22 of its 27 coal mines in April 2020.[3] Consequently, 20,000 coal miners and 8,000 more employees were laid off (Energy World, 2020). According to the ILO's India Wage Report, mining and quarrying constitutes secondary level employment. This employment sector provides an average daily wage of INR357 for regular workers and INR168 for casual workers (ILO, 2018). Assuming that additional SCCL employees qualify as regular employees, coal miners are casual employees, and each works 260 days per year, the consolidated impact for one year is INR161.6 crore. Under the Employees State Insurance Corporation, an unemployed worker may receive 25% of their past two year's salary for three months if they have been subscribed to ESIC for 2 years (ESIC, 2018). Therefore, the upper bound cost to cover unemployment benefits could reach INR40.4 crore.

[3] Other reported mine closures have been minor. For instance, South Eastern Coalfields, the largest producing subsidiary of Coal India, enforced quarantine restrictions on 83 of its employees who had been exposed to a carrier of the coronavirus (Global Energy Monitor, 2020). Assuming these workers were quarantined for 14 days and earned comparable, casual wages to those stated in the ILO report (2018), we could expect a cost of only INR200,000.

## 4. ‘Realistic worst-case scenario’ for further COVID-19 coal support

A realistic worst-case scenario for India would involve the federal government (i) maintaining their current stance on already announced policies (the 41 new mining blocks have not been sold yet; INR50,000 crores to coal enablers has not yet been spent), (ii) bearing the financial costs of prolonged import substitution, and (iii) an acceleration of SOE investment into construction of new coal generation plants.

Regarding import substitutions, significant shifts in coal supply will come at cost to the Indian economy. Either domestic supply prices will be artificially depressed to incentivise short-term shifts while long-term capacity is firmed, or SOEs will accept inferior coal, with negative implications to efficiency. In both cases the scale of the cost is impossible to deduce without knowledge of prior import supply contracts and new domestic supply contracts.

New support of coal-fired generation seems unlikely but is possible. Domestic electricity narratives in 2020 have been dominated by calls for greater renewable energy investment. A recent, highly reported note from the Institute for Energy Economics and Financial Analysis (IEEFA) states that new investment in coal power is “wealth destructive” and that no private player “would still fund a new coal power plant in India” (Buckley, 2020). In the context of these narratives, and with an absence of loud contrary voices, it is hard to imagine the Indian government committing stimulus to plans for new coal fired generation. It is however conceivable that authorities would direct SOEs (mainly NTPC) to shift planned new coal investment forward, perhaps by a calendar year. This would suggest a forward shift in 8.75GW of coal investment at a cost of approximately INR65,000 crore (assuming that the Indian government investment target of 70GW in new coal between 2018/2019 and 2026/27 is evenly distributed over an 8 year period and noting that 7.8 GW of new coal came online in 2019) (CEA, 2018).

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# Poland: COVID-19 worst case public coal spending

## 1. Summary

- Polish BAU public support of coal mining and generation enables the continued operation of otherwise loss-making enterprises.
- So far, public pandemic-induced stimulus measures for coal have been minor. Some broad-base economic support has buoyed employment in coal mining, but this has been of small magnitude.
- Stimulus measures in the coming months are unlikely to provide significant support to coal mining, generation, transport, or the non-power coal sector.
- Renewable and nuclear energy COVID-19 recovery narratives have both begun to emerge in Poland. Each are significant in potential size and impact.

## 2. Business as usual support

### 2.1 General background

As of late 2018, 82,800 people were employed in Polish hard coal mining, and another 8,600 in lignite mining (Euracoal, 2019). Polish coal production is significant at 62 million tonnes in 2019, accounting for ~95% of European Union (EU) coal production (Eurostat, 2020). Due to its geologically deep and difficult to recover reserves, Polish coal is also relatively expensive to produce (estimated at PLN 223 – PLN 298 per ton compared to PLN 223 per ton for supplied Russian coal [Kość, 2020]) and as a result, state-owned electricity generation companies are believed to intentionally overpay for domestic coal to artificially buoy otherwise unsustainable mining operations. Despite growing stockpiles of domestic coal, Poland imported 19.3 million tons of foreign coal in 2018 (Kość, 2020).

Poland generates more coal-fired electricity than any other EU nation and as much as all other EU countries combined excluding Germany. While many neighbouring countries, including Germany, have a plan to phase out coal, Poland does not (Jones and More, 2020). Poland's reliance on coal, and a lack of strong wind and solar resources have kept electricity prices high.[4]

Poland is the only EU member state which has not committed to net-zero carbon emissions by 2050 (Strupczewski and Baczynska, 2019).

[4] Poland's wholesale electricity was 73% more expensive than Germany's in the first half of the year, and second only to Greece for Europe's most expensive (Jones and More, 2020).

### 2.2 Government support of coal

BAU public subsidisation of conventional (coal and gas) power generation over the period 2013-2018 averaged PLN4.8bn per year, the far majority of which was funded under the EU ETS (Stoczkiewicz, 2020). Subsidy of existing coal generation in 2021 is expected to include PLN5.4bn through EU-funded capacity payments at a net cost of PLN3.9bn once decreased prices are accounted for. These payments are set to continue until at least 2025, at which point new exclusions prohibiting support of generation with >550g CO2/KWh will come into place (EC, 2019). Other forms of coal generation subsidy include free CO2 permits, reserve payments, non-compliance with air pollution limits, and misuse of European Investment Bank funding. A now outdated 2017 WISE-Europa study projected that without significant reform Polish subsidy of coal-fired electricity generation may reach PLN5.4bn per year over the period 2017-2030, including PLN2.9bn on capacity payments, PLN2.3bn on free emission allowances, and PLN0.16bn on reserve power costs (WISE-Europa, 2017).

Public support of the coal mining sector is significant but difficult to ascertain following from a 2016 industry restructure. As previously discussed, generators cross-subsidise loss making domestic production to support coal miner employment. The magnitude of these subsidies is unclear. A reasonable estimate could consider the reported prices of Polish coal production in comparison to imports. Without reform, WISE-Europa's 2017 study projects PLN6.4bn in annual support for coal mining to 2030, consisting of PLN3.2bn in support of mining pensions, PLN2.4bn in mine recapitalisations, and PLN0.8bn in restructuring costs.

## 3. COVID-19 support so far (January 2020 to August 2020)

So far, targeted coal sector COVID-19 support has been relatively light. This positive reality has been mostly shaped by (i) limitations on the use of tied European Commission (EC) funding for fossil investment, (ii) a complex and shrinking coal mining industry, and (iii) a universal acknowledgement of the economic fallibility of new coal-fired generation following from PKN Orlen's announcement that Poland's supposed 'final coal plant' will now be gas-fired (Walstad, 2020).

The extent of announced COVID coal mining support has so far been limited to PLN1.75bn in preferential credit to enable the JWS mining group to "continue investing and maintain liquidity" (Polityka Insight, 2020).

Otherwise, horizontal support policies (i.e. broad economic support with coal as a beneficiary) have likely provided some support to the sector, but specific details have not been released publicly. In early summer, over 6,000 miners were infected with the Coronavirus, leading to the closure of twelve 'hotspot' mines for a period of three weeks. In contradistinction to all other furloughed professional groups, the furloughed miners were fully compensated by the

government over their mandatory lockdown period (Wilczek, 2020). Assuming an average monthly wage of PLN6,810 (Salary Explorer, 2020; Czarnecka, 2020), employment support totalled PLN30.65m.

## 4. 'Realistic worst-case scenario' for further COVID-19 coal support

Summer rumours suggested that the Polish government may use the pandemic as an opportunity to cut jobs in mining, but these have been flatly denied by officials. In reality, some inefficient Polish mines are no longer economic to run and only remain solvent due to cross-subsidisation by generators. It is conceivable that Polish officials may look to close the most inefficient mines in the medium term while directing new subsidies to the remaining mines. Whether this will be politically tenable remains to be seen.

Otherwise, in line with the rationale expressed in *Section 3*, scope for new fiscal coal support is low in Poland in 2020/21.

## 5. Existing alternative green narratives

Opportunities for renewable energy investment and nuclear energy investment have both received some discussion in Poland in place of coal stimulus. The EC's €750bn recovery plan earmarks 30% to 'green' recovery projects, including through a new €17.5bn Just Transition Fund targeted to lower income and higher emissions EU member states. The recovery plan, excluding the Just Transition fund, is expected to bring Poland approximately €26m in new grants and €30.6bn in new loans (ING, 2020). The Just Transition fund is likely to bring an additional €1.75bn if Poland does not commit to a net-zero emissions target, or €3.5bn if it does.[5]

### 5.1 State of renewable energy

Renewable energy system (RES) investment in Poland is already non-trivial. Over the period 2014-2020 over one thousand projects to improve renewable power sector infrastructure were subsidised at a cost of PLN3.6bn (Stoczkiewicz, 2020).

In recent years in Poland, small public RES investments have catalysed many multiples of additional private investment. WISE-Europa Institute's (2020) analysis of Polish investments estimates that between 2013 and 2019, approximately €10.8bn was channelled into direct renewable energy investments, enabling 8.6 GW of new capacity. Importantly, ~83% of

[5] Under the Fund's allocation rules, Poland was originally earmarked €8bn (or 20%) of total Just Transition funding (EC, 2020a). Subsequent EC negotiations brought changes to the Fund's total size (from €40bn to €17.5bn) but maintenance of allocation rules (EC, 2020b). Under the conditions of the deal, members are only entitled to 50% of their allocated funds if they have not committed to a 2050 net-zero target (Khan and Shotter, 2020).

funding for these investments was sourced through private channels and ~80% of installed capacity was enabled by private energy companies and prosumers rather than government and SOEs. Public financial support (~17%) came mostly from public European funds (European Investment Bank and the European Bank for Reconstruction and Development).

Renewable electricity generation in Poland is looking up, with solar capacity increasing by 900MW last year (Jones and More, 2020). On the 1st of July 2020, the Polish Government issued a Letter of Intent to further develop offshore wind. In its National Energy and Climate Plan (NECP), Poland identified offshore wind as one of key technologies to meet its goals for renewable energy for 2030. By 2030, Poland aims to have installed 3.8 GW of offshore wind, with 10 GW of new capacity awarded contracts for difference (Offshore WIND, 2020).

Poland's RES auction scheme also shows strength with 78 TWh sold in 2019 at a total value of PN16.2bn (lowest accepted bid at PLN162.83/MWh or €38/MWh) (Squire Patton Boggs, 2019). Solar PV auction offers fell from a minimum of PLN289.99/MWh in 2018 to PLN269/MWh in 2019 (Wolf Theiss, 2020).

### 5.2 State of nuclear power

Poland does not currently rely on any nuclear electricity generation; however, the possibilities of the technology have been widely debated for many decades in both the public sector and the private sector. Recently the Polish Ministry of Energy (Ministerstwo Energii) has significantly accelerated efforts to bring nuclear energy into the mix. The ministry's November 2018 National Climate Plan (Ministry of Energy, 2020) proposes six new nuclear plants of total size 9 GW and an estimated service life of 60 to 80 years. Construction of the first plant(s) could begin eminently, with first generation ostensibly in 2023. Polish government officials claim, "overwhelming support for nuclear power among Poles" and see the technology as an effective mechanism for achieving a net zero future (World Nuclear News, 2020). While the plans have brought significant criticism from Poland's neighbours (Schulz, 2020), promises of technical support from the US strengthens the feasibility of the proposal (Polish Press Agency, 2020). It is conceivable that the Polish government would attempt to accelerate new nuclear construction plans as a form of economic stimulus. The costs of this measure could total €9bn for one new plant and associated grid upgrades, with approximately 50% financed with public funds.[6] Note that nuclear investment is not a permissible use of Just Transition Funds (Abnett, 2020).

[6] In 2019 energy minister Krzysztof Tchorzewski cited an estimated total investment cost of €54bn for 6 nuclear plants providing a total of 9 GW in capacity (World Nuclear News, 2020). In the same statement the minister estimated that the country would need around €27bn in supporting foreign investment. It is assumed that domestic private capital would not have the requisite technology-specific knowledge to provide significant support.

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# Indonesia: COVID-19 fossil stimulus spending

## 1. Summary

- Indonesia is the world's fourth biggest coal producer and the biggest gas supplier in Southeast Asia.
- The government is expected to fall far short on its national commitment to increase the renewable share of the energy mix by 23% by 2025 (Suharsono et al., 2019). Coal and oil still make up the vast majority of the country's electricity generation.
- As a result of the COVID-19 pandemic, the Indonesian economy has contracted for the first time since the 'Asian Financial Crisis' in 1999 (Sihombing, 2020) and compared to Q2 FY19, exports (mainly coal and palm oil) fell 11.66% in FY20.
- As of September 2020, Indonesia had committed USD 6.8 bn in unconditional stimulus to fossil industries, with 3.9 USD bn directly funding oil and gas.
- The next stage of Indonesian recovery spending should leverage the nation's vast renewable energy resource endowment to catalyse economic recovery in the short-term, establish new industry and jobs for the medium-term, and protect the climate in the long-term. Additional opportunities for productive spending include accelerated electric vehicle support, and significant natural capital support to preserve biodiversity and one of the world's most important carbon sinks.

*Table 1. Summary of Indonesian support of fossil industries in 2020.*

| Category | Fossil fuel support Jan-Sep 2020 (USD bn) |
|---|---|
| BAU support to oil[7] | 1.0 |
| BAU support to coal production[2] | 0.5 |
| BAU support to gas[2] | 3.2 |
| Oil-powered electricity generation support | 0.2 |
| Coal-powered electricity generation support | 2.1 |
| Natural gas-powered electricity generation support | 0.7 |
| State oil company support | 3 |
| Airline and airport subsidies | 0.8 |
| **Total COVID-19 direct fossil spending excluding BAU**<br>*as a % of recovery stimulus spending*<br>*as a % of total stimulus spending* | **6.8**<br>*33.2%*<br>*8.4%* |
| **Total COVID-19 direct fossil spending including BAU** | **11.5** |

[7] Annual figures applied with a factor of 0.75 to incorporate sub annual Jan-Sep period.

# 2. Business as usual support

## 2.1 Indonesian climate and energy context

As the largest ASEAN economy and a member of the G20 and APEC, Indonesia has the potential to play a leading role in influencing the region's energy and broader climate agenda. ASEAN contains 8.5% of the world's population (U.S. Census Bureau, 2020), and emits 4% of the world's GHGs (World Bank, 2020). The region is one of the world's fastest growing markets, and if ASEAN were a country, it is expected to be the fourth-largest economy by 2050 (Vinayak et al., 2020).

The Indonesian economy is highly fossil-intensive. The nation is the world's fourth largest coal producer, fourth largest biogas producer, and most prominent supplier of gas in Southeast Asia. The country's support of and subsidies to fossil fuel industries are significant (see IEA, 2020). Indonesia obtains ~74% of its electricity from fossil fuels (IEA, 2018), about half of which are made up of coal and oil supplies the far majority of transportation energy needs (Mafira, 2020). Land Use, Land Use Change, and Forestry (LULUCF) is a significant contributor to national emissions yet changes here represent some of the lowest-cost opportunities for reducing future emissions.

Unfortunately, the country is falling drastically short under all 'fair' interpretations of 1.5 C emissions pathways (see Climate Action Tracker, 2020). Following a 2009 G20 announcement (Yudhoyono, 2009), Indonesia planned to reduce total greenhouse gas (GHG) emissions by 26% below a "business as usual" (BAU) scenario by 2020 without international financial aid, and 41% with aid. Under the Paris Agreement, Indonesia now pledges to reach 2030 GHG emissions of 2.046 GtCO2e, 29% below the 2030 "business as usual scenario" of 2.881 GtCO2e (Republic of Indonesia, 2015). The nation promises to decrease emissions even further to 1.700 GtCO2e (41% below BAU) if in receipt of an unspecified but significant quantum of international aid (Republic of Indonesia, 2015). While it seems that Indonesia is on track to at least meet the 29% target, the BAU assumption is exceptionally generous - 29% below 2030 BAU is equivalent to a 535% increase above 1990 levels excluding LULUCF. Prior to COVID-19 the international community had been pushing for an upward ratchet of emissions reduction commitments (Wijaya et al., 2017).

The Indonesian primary energy mix in 2018 stood at approximately 33% oil, 24% coal, 17% natural gas, 10% biofuels (which induce considerable LULUCF-related emissions in the country), and 11% wind, solar, and hydro (IEA, 2018). By 2025, the National Energy Plan (NEP) seeks to limit oil's share of primary energy supply to at most 23%, while keeping coal

above 30%, natural gas above 22%, and new and renewable energy[8] above 23% (Republic of Indonesia, 2014). Plans to reshape the nation's electricity mix are deemed by many as insufficient (West, 2018; IESR, 2019; Gorman, 2020) but nevertheless signal a significant opportunity to increase domestic renewable energy investment. The nation targets a 2025 power generation mix of 23% new and renewable energy, 54.6% coal, 22% gas and 0.4% diesel fuel (Republic of Indonesia, 2020).

### 2.2 Fossil fuel mining, supply, and distribution

Indonesia struggles to detach itself from a system of regulation and taxes which heavily subsidise 'dirty' energy production. This is partly a consequence of the state budget's reliance on revenue from the fossil fuel industry - the state oil company PLN contributed Rp 181 trillion (USD 12.7 bn) to the state budget in 2019 (Suharsono, 2020).

State-owned mining company PT Bukit Asam invested Rp 1.96 tr (USD 147 m) a year over 2016 and 2017, while the government provided a further Rp 96.3 bn (USD 6.7 m) for R&D, technology, and training in coal exploration, mining, and processing, totalling USD 153.7 m per year. (Suharsono and Gençsü, 2019).

In 2018, the Indonesian government introduced further protection for coal production and consumption, setting a maximum price on coal sold to power plants, as well as a minimum domestic allocation of production for 2018-2019 of around 20%. In effectively controlling the market price, this acts as a significant subsidy for the state utility company PLN. The government further increased their subsidies to electricity consumption in reaction to the increased price for fuel in power plants. Again, as 60% of PLN's power plants are coal power, this acts as an indirect subsidy to coal. In its 2020 annual budget, the government earmarked subsidies to a value of Rp 18.8 tn (USD 1.3 bn) in oil and Rp 52 tn (USD 4.2 bn) in LPG (Hartarti and Putra, 2019).

## 3. COVID-19 support so far (January 2020 to September 2020)

### 3.1 Targeted coal support

With the Indonesian economy contracting for the first time since the Asian Financial Crisis in 1999 (Sihombing, 2020), and exports (of which much is coal and palm oil) falling by 11.66%, the Indonesian government has made significant efforts to support its energy sector. In April 2020, Indonesian coal exports dropped to their lowest levels since October 2010 - as a major

[8] *New and renewable energy (NER)* includes nuclear energy, liquefied and gasified coal, coalbed methane, and imported hydrogen.

fossil fuel exporter, the Indonesian economy is highly vulnerable to these changes in energy demand. Extrapolated to 12 months based on January to March figures, Indonesia's coal exports are estimated to be 420 mn tonnes (Reuters, 2020). Despite the recent global drop in crude oil prices, neither the government nor the state-owned company PT Pertamina show any inclination to lower retail oil prices (Ramli, 2020), possibly in a move to protect PT Pertamina's finances (Suharsono, 2020).

Further, in July 2020, the government made changes to its mining laws to attract further investments into the sector. Regional governments' rights to issue permits have been withdrawn and the right now rests solely with the national government. Changes include making the government responsible for issuing mining permits as well as creating and granting new permits and licences, for example for the exploration of radioactive materials (Medina, 2020a).

The state utility company PLN was given Rp 5 tn (USD 0.34 bn) early in the pandemic in additional subsidies, and has also received Rp 45 tn (USD 3 bn) in compensation payments for loss of revenue (Medina, 2020a). With coal, oil, and natural gas making up 57%, 5%, and 21% of Indonesia's energy generation mix (IEA, 2020), respectively, the government's total COVID-19 period operational support to these sectors equates to USD 1.9 bn, USD 0.17 bn, and USD 0.7 bn. The state oil company PT Pertamina received additional compensation payments of (USD 3 bn). A smaller share, Rp 2.7 tn (USD 0.183 bn), was provided as subsidies to the national biodiesel program (Medina, 2020a).

Writing in September 2020, the Indonesian Administration is working on passing an omnibus law for the coal sector where all holders of the Coal Mining Work Agreement (PKP2B) signed before 2010 ("PP-23") will be granted an automatic extension with no need to undergo an auction process and the 25,000 ha. concession area limit will be lifted. There is also a plan for a 0% royalty tax if these companies invest in coal gasification facilities (OECD, 2020).

### 3.2 Broad economic support with coal as a beneficiary

Among the hardest hit industries in Indonesia is its vital tourism sector, which is expected to suffer more than USD 10 bn in revenue losses this year (Suhartono et al., 2020). As part of its efforts to revitalise this industry, the Indonesian government provided Rp 98.5 bn (USD 0.006 bn) for travel incentives, to support airlines and travel agencies. (Medina, 2020b). Further airline support has been provided through a jet fuel discount from the state oil company PT Pertamina to nine airports at a value of Rp 265 bn (USD 0.018 bn) (Medina, 2020a). In a bid to encourage domestic tourism, air fares have also been reduced by 30% between March and May 2020 (Medina, 2020b). Further support to transport included a grant to the major public railway operator of Rp 3.5 tn (USD 0.238 bn) and to the national carrier Garuda Indonesia of

Rp 8.5 tn (USD 0.578 bn). This totals to USD 0.84 bn of economic support to fossil-operators in the tourism sector, through which fossil fuel production, particularly oil, will benefit.

## 4. Alternative green narratives

With the State budget heavily supported by the fossil fuel industry, Indonesia has struggled to decouple its economic development from 'dirty' energy. In 2017, it is thought that 1.8% of the country's GDP was generated directly from fossil fuel production (Gerasimchuk and Braithwaite, 2019). However, the trend since the start of the millenium indicates progress - the fossil fuel revenue share of the State budget has declined significantly amidst stable economic growth (Gerasimchuk and Braithwaite, 2019).

Meanwhile, Indonesia's renewable energy endowment is strong. The country's estimated solar potential amounts to more than 500 GW, and according to the International Renewable Energy Agency, the country could comfortably develop up to 3.1 GW annually up to 2030 (IRENA, 2017). This would be sufficient to meet the national energy target of 23 % renewable energy share by 2025 (Suharsono et al., 2019). Further, the country has high hopes in biofuel production, with an expected bioenergy potential of 32.6 GW (Suharsono et al., 2019). Current biofuel production capacity rests at 1.8 GW with further developments uncertain due to a recent EU regulation change to no longer count palm-oil based biofuels towards Member States' emissions reduction targets (Suharsono et al., 2019; European Union, 2018). Despite this, the Indonesian government has invested Rp 2.78 tr (USD 183 m) into the national biodiesel program.

COVID-19 presents a number of opportunities to use green investments to catalyse both short-term economic recovery and long-term national prosperity. The national government is allegedly preparing a USD 1 bn rooftop solar programme (Harsono, 2020; Tumiva and Citraningrum, 2020), expected to cost Rp 15 tn (USD 1.07 bn) annually, generating 22,000 jobs. Additional high leverage green stimulus opportunities include utility-scale renewable energy investments, accelerated electric vehicle support programs, infrastructure investments to capture fugitive oil and gas emissions at the source of extraction, and large scale natural capital initiatives.

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