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G20 coal subsidies: Tracking government support to a fading industry

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G20 coal subsidies

Tracking government support to a fading industry

Ipek Gençsü, Shelagh Whitley, Leo Roberts, Christopher Beaton, Han Chen, Alex Doukas, Anna Geddes, Ivetta Gerasimchuk, Lourdes Sanchez and Anissa Suharsono



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Cover photo: A truck is loaded with coal in an open cast mine being overseen by an Australian construction company. Credit: Chris Stowers © Panos.

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Acronyms

| | |
|----------------|--------------------------------------------------------|
| CCS | carbon capture and storage |
| CEIC | China Energy Investment Corporation |
| EU | European Union |
| EU | ETS European Union Emissions Trading Scheme |
| G20 | Group of 20 countries |
| GHG | greenhouse gas |
| Gt | gigatonne |
| IEA | International Energy Agency |
| IISD | International Institute for Sustainable Development |
| IMF | International Monetary Fund |
| IPCC | Intergovernmental Panel on Climate Change |
| kWh | kilowatt hour |
| MDB | multilateral development bank |
| MW | megawatt |
| NRDC | Natural Resources Defense Council |
| OCI | Oil Change International |
| ODI | Overseas Development Institute |
| OECD | Organisation for Economic Co-operation and Development |
| PM | particulate matter |
| PPCA | Powering Past Coal Alliance |
| R&D | research and development |
| SDGs | Sustainable Development Goals |
| SOE | state-owned enterprise |
| UNFCCC | United Nations Framework Convention on Climate Change |
| WTO | World Trade Organization |

Executive summary

A decade on from their commitment to phase out subsidies to fossil fuels at the Group of 20 (G20) Summit in Pittsburgh, G20 governments continue to provide billions of dollars for the production and consumption of fossil fuels. This report finds that they provide at least US\$63.9 billion per year in government support to the production and consumption of coal alone, with almost three-quarters of the support identified being directed to coal-fired power production.

At a time when tackling the climate crisis requires leadership and strong action from G20 countries, which account for 79% of global emissions, it is imperative that their governments transition away from all fossil fuels, including coal. Coal-fired power plants were the single largest contributor to the growth in global CO₂ emissions in 2018, and continued G20 government support for coal is incompatible with achieving the aims of the Paris Agreement. Moreover, coal-fired power is one of the main causes of air and broader environmental pollution, resulting in hundreds of thousands of deaths per year.

Yet, our analysis finds that G20 governments continue to support coal through US\$27.6 billion in domestic and international public finance, US\$15.4 billion in fiscal support, and US\$20.9 billion in state-owned enterprise (SOE) investments per year across the G20. This includes support through a wide range of instruments to prop up coal production, coal-fired power production, and other consumption of coal and coal-fired power, as well as support which is justified as a means of facilitating the transition away from coal. It must be noted that these figures are likely to significantly underestimate the actual amounts of support provided, as many measures are difficult to identify or quantify.

We also find that government support for the production of coal-fired power has increased in recent years, from just over US\$17.2 billion per year (average for 2013–2014) to nearly US\$47.3 billion per year (average for 2016–2017).

The sources of support and the activities they benefit vary across the G20:

- In terms of public finance, this year's G20 host, Japan, remains one of the largest providers of public finance for coal overseas (US\$5.2 billion per year), which threatens to undermine the credibility of Japanese Prime Minister Shinzo Abe's call for other governments to step up their action on climate change.
- China is the world's largest consumer of coal for power generation and industry, and pledged in 2014 to reduce coal consumption to 58% of total energy consumption or below by 2020. However, it continues to provide international public finance for coal mining and coal-fired power overseas (US\$9.5 billion per year).
- India's banking system is dominated by domestic public institutions that together provide around US\$10.6 billion per year of public finance for coal mining and coal-fired power domestically. This has led to significant challenges for the country's finance sector, undermined by coal assets at risk of bankruptcy driven in part by the transition to clean energy.
- Canada, China and Germany are among those countries whose governments have been providing support for rehabilitation of mining sites and for helping workers and communities. However,

there is limited information as to the beneficiaries of this support and any attached conditions regarding phase-out commitments and deadlines.

- Our research has also identified numerous mechanisms provided by governments purportedly for energy transition, but that in fact continue to support coal-fired power. These include subsidies for capacity mechanisms (designed to guarantee security of power supply) in France, Germany, Italy, Russia, South Korea, Turkey and the United Kingdom, the allocation of free allowances to industry under the European Union Emissions Trading Scheme (EU ETS), research and development (R&D) support for coal-fired power generation with carbon capture and storage, and for co-firing of biomass with coal.

Several countries also provide substantial subsidies to the consumption of coal-fired power. However, there is very limited transparency, and these measures – and the resulting support – are not easily captured. While we were unable to quantify a number of these measures, we know that Indonesia, for example, provides over US\$2.3 billion in fiscal support per year, with the stated reason being to compensate electricity generators for the increase in coal prices and for having to sell electricity to domestic consumers under regulated prices. Similar subsidies relating to provision of below-market prices for electricity consumers also exist, for example, in China, Indonesia, Mexico, Russia and South Africa, with much electricity for this consumption coming from coal-fired generation.

SOEs remain active in coal mining and coal-fired power, when they could be key to facilitating a rapid and ‘just transition’. Investments of SOEs in coal often continue unchecked, with Chinese and Indian SOEs investing nearly US\$8.8 billion and over US\$6.4 billion annually, respectively.

Despite these challenges, several G20 countries have taken important steps in moving away from coal production and consumption in recent years. These include Canada and the UK, who together created the Powering Past Coal Alliance (PPCA) to accelerate the global transition from coal to clean energy. PPCA members have committed to implementing a moratorium on new coal power plants, phasing out existing coal power generation, and restricting all types of coal finance. The PPCA now counts as members France, Italy and Mexico among G20 countries, alongside non-G20 states, plus subnational jurisdictions from the United States, Australia and South Korea. Our analysis finds that the governments of Canada, the UK and France have dramatically scaled back their support for coal over the last decade, both domestically and internationally. We also identify a fall in government support for coal production across the G20, from US\$21.7 billion per year (average for 2013–2014) down to US\$9.8 billion per year (average for 2016–2017).

To avoid dangerous climate change and make good on their commitments to end fossil fuel subsidies, the G20 must commit to rapidly ending their support for coal. They must also increase transparency by committing to conduct peer reviews of coal and other fossil fuel subsidies by 2020 and establish a regular process of tracking progress in ending subsidies and sharing the lessons learnt. Ending coal subsidies will bring environmental, social and economic benefits, including the setting of a level playing field for lower-cost clean energy. The G20 must build on existing efforts and ensure that subsidies to the energy transition do not lead to hand-outs to coal, and that any remaining support is directed to ensuring a rapid and ‘just transition’ for workers and communities.

As a first step in their wider coal transitions the G20 must:

- urgently agree to a complete phase-out of government support to coal mining and coal-fired power
- complete peer reviews of coal and other fossil fuel subsidies by 2020
- establish country-level plans for ending government support to coal, ensuring that:

-
- mechanisms with the stated aim of assisting the energy transition do not support coal production and consumption, and
 - any remaining support facilitates a 'just transition' for workers and communities, and target the most vulnerable groups during the energy transition
 - establish a standing agenda item in G20 Energy Ministerial meetings to share lessons learnt on phasing out government support to coal – and other fossil fuels – and to track progress towards phasing out coal, with support from the Organisation for Economic Co-operation and Development (OECD), the International Energy Agency (IEA), the International Monetary Fund (IMF) and other influential organisations.

The peer reviews should build on those already in progress or completed by Argentina, Canada, China, Germany, Indonesia, Italy, Mexico and the US, and would benefit from an expanded scope, including support through public finance and SOE investment.

1 Introduction

Group of 20 (G20) countries have a critical role to play in leading efforts to combat climate change. They account for 79% of global greenhouse gas (GHG) emissions, excluding emissions from forestry and land use (Climate Transparency, 2018), and indeed many of them have played a key role internationally in driving forward climate action. G20 governments have committed to ending government support to fossil fuels through a number of reform pledges (Gerasimchuk et al., 2017a), starting with the G20's 2009 commitment to phase out, in the medium term, 'inefficient fossil fuel subsidies that encourage wasteful consumption' (G20, 2009). In addition, under the Paris Agreement, all governments have further committed to 'making finance flows consistent with a pathway toward low greenhouse gas emissions and climate-resilient development' (UNFCCC, 2015, Article 2.1.c) – a pledge that applies to all forms of private and public finance. Sustainable Development Goals (SDGs), in particular target 12.C and indicator 12.C.1 under SDG 12 on Sustainable Consumption and Production, also include the reform of subsidies to fossil consumption and production (UN, 2015).

However, despite their numerous commitments, G20 governments have taken limited action to address fossil fuel subsidies.¹ They have also failed to put in place any comprehensive mechanisms to define and document the full extent of these subsidies or to hold themselves accountable for achieving these pledges (although some have taken part in a G20-led peer review of their subsidies).

This report aims to address this accountability gap and, for the first time, track each G20 country's progress in phasing out subsidies to the production and consumption of coal through: (1) fiscal support; (2) public finance; and (3) state-owned enterprise (SOE) investment. The report summarises key findings from 18 parallel country studies,² with accompanying data sheets that list all the identified support.

Our aim is to highlight the scale and scope of government support in order to increase transparency and accountability, so that G20 countries can meet their subsidy phase-out commitments.

Section 2 frames the role that coal continues to play as a power source and its decline in a climate compatible future. Section 3 summarises the approach taken to conduct the analysis on G20 government subsidies to coal (with more detailed information included in the separate methodology note). Section 4 presents the overarching findings of the analysis, trends, and findings by type of support (fiscal support, public finance and SOE investments). Section 5 presents the findings of the analysis by type of activity. Section 6 concludes and provides recommendations on steps G20 governments can take to make good on their promises to phase out their support to coal.

¹ The G20 member countries are: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the UK, the US and the European Union (EU). This report reviews the support provided by 18 of these governments (all except for Saudi Arabia, where we did not identify any government support to coal), as well as high-level commitments at EU level.

² Country studies are available for all G20 countries except Saudi Arabia, where we have found no data evidence in support of coal production and coal-fired power.

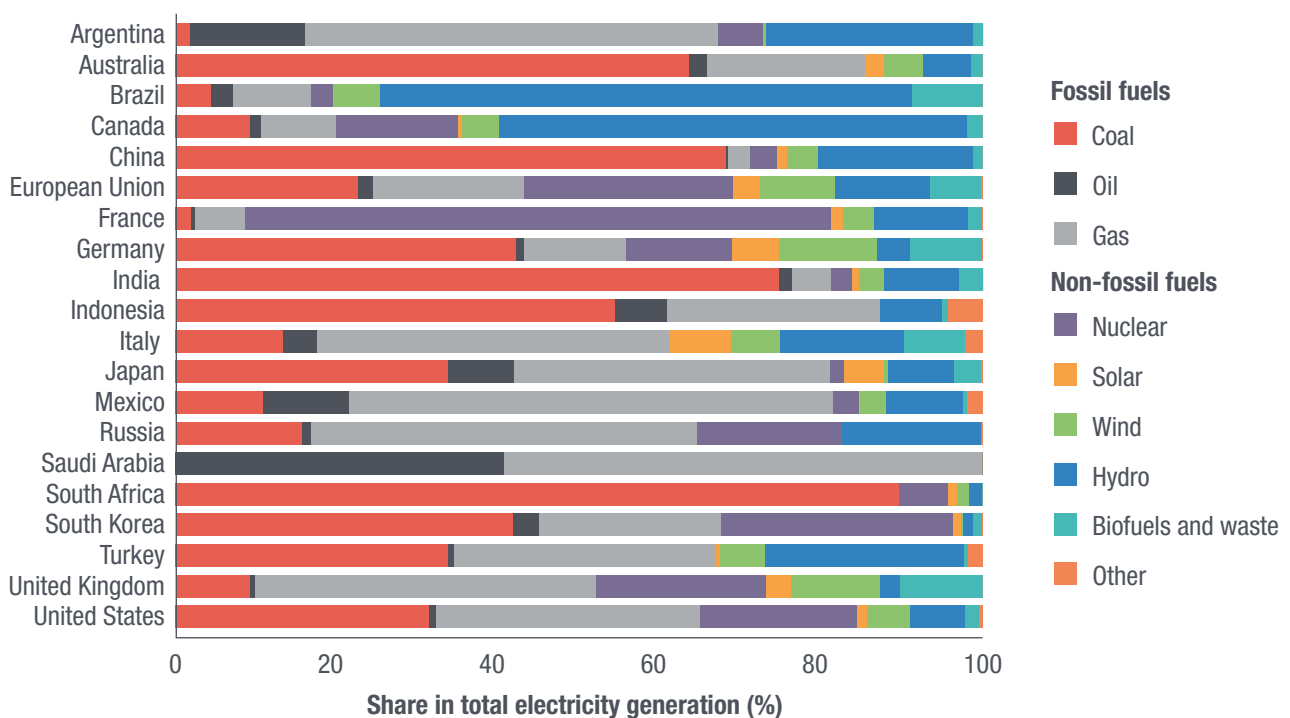
2 Background: the decline of coal

Globally the share of coal in electricity generation has begun to fall – particularly in EU countries, where coal fuelled 40% of power generation in 1990 but now supplies less than 25% (IEA, 2018a). However coal still remains the major source for electricity generation for the majority of the G20 countries (see Figure 1) (IEA, 2019a). Coal-fired power plants were the single largest contributor to the growth in CO₂ emissions observed in 2018, exceeding 10 gigatonnes (Gt) for the first time, and are therefore the main drivers of global temperature increase (IEA, 2019b).

Recently, G20 countries (and others around the world) have moved into the early stages of an energy transition – including a shift away from the production and consumption of coal. The coal transitions taking place in these countries are driven by a number of factors, including: the emergence of cheaper alternative technologies; growing concerns about air, soil and water pollution and its impacts on human health; the increasing costs of coal mining; falling power demand (in many of the G20 countries); and climate policy (Sartor, 2018).

With the Paris Agreement world leaders reaffirmed their commitment to limit the increase in global average temperature to well below 2°C, and agreed to pursue efforts to limit global temperature rise

Figure 1 G20 electricity generation by source, 2016



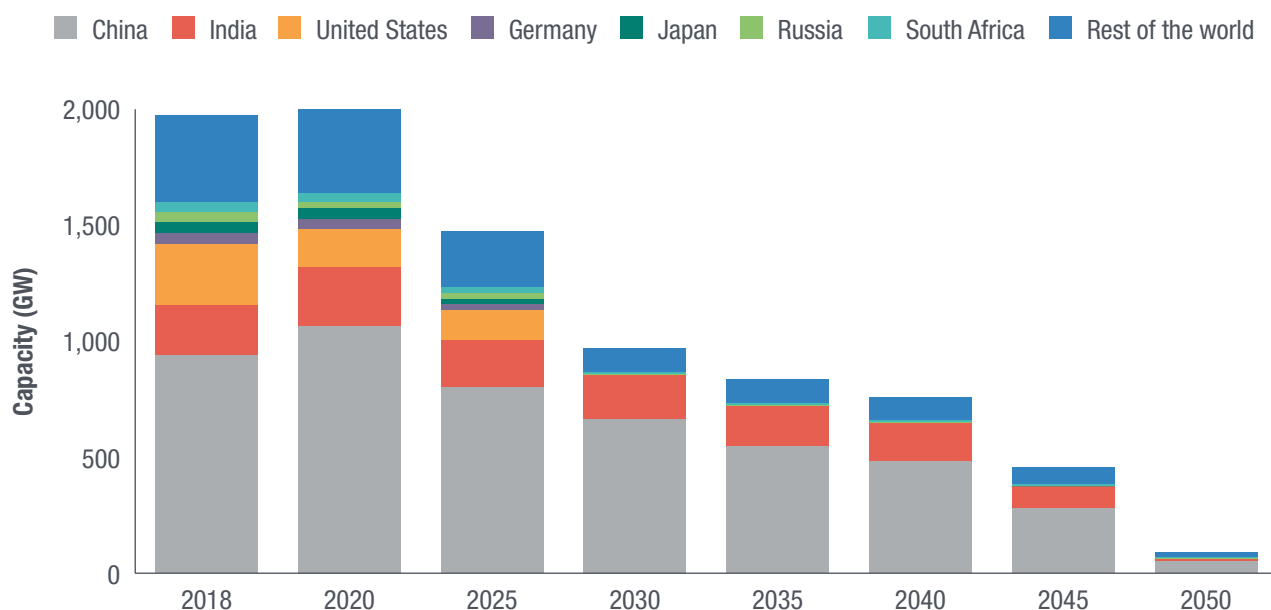
Source: IEA, 2019a.

to 1.5°C (UNFCCC, 2015). Under Article 2.1(c) of the Paris Agreement, governments have also to committed to ‘finance flows consistent with a pathway towards low GHG emissions and climate-resilient development’ (ibid.). Continued G20 government support for coal is incompatible with achieving the aims of the Paris Agreement.

A recent Intergovernmental Panel on Climate Change (IPCC) report found that to keep global warming to 1.5°C the world needs to reach net-zero GHG emissions by 2050 (2045–2055), with the use of coal for electricity reducing to almost 0% in all pathways to 2050 (IPCC, 2018). Figure 2 shows the breakdown of global installed coal-fired power generation capacity from 2018 until 2050, under one potential 1.5°C compatible pathway.³

A coal phase-out is vital to avoid the worst impacts of climate change, as well as to improve air quality across the G20 and beyond. Although global and G20-level data is limited, research has found that coal is responsible for over 800,000 premature deaths per year globally, and many millions of serious and minor illnesses (PPCA, 2017). According to one analysis, coal-related air pollution led to approximately 366,000 premature deaths in China in 2013, and coal combustion was the single largest contributor to air-pollution deaths in the country (GBD MAPS, 2016). In Europe there are an

Figure 2 Country breakdown of the global installed coal-fired power generation capacity under a 1.5°C compatible pathway from 2018 to 2050



Source: for assumptions and detailed description of methodology, see Nace (2018).

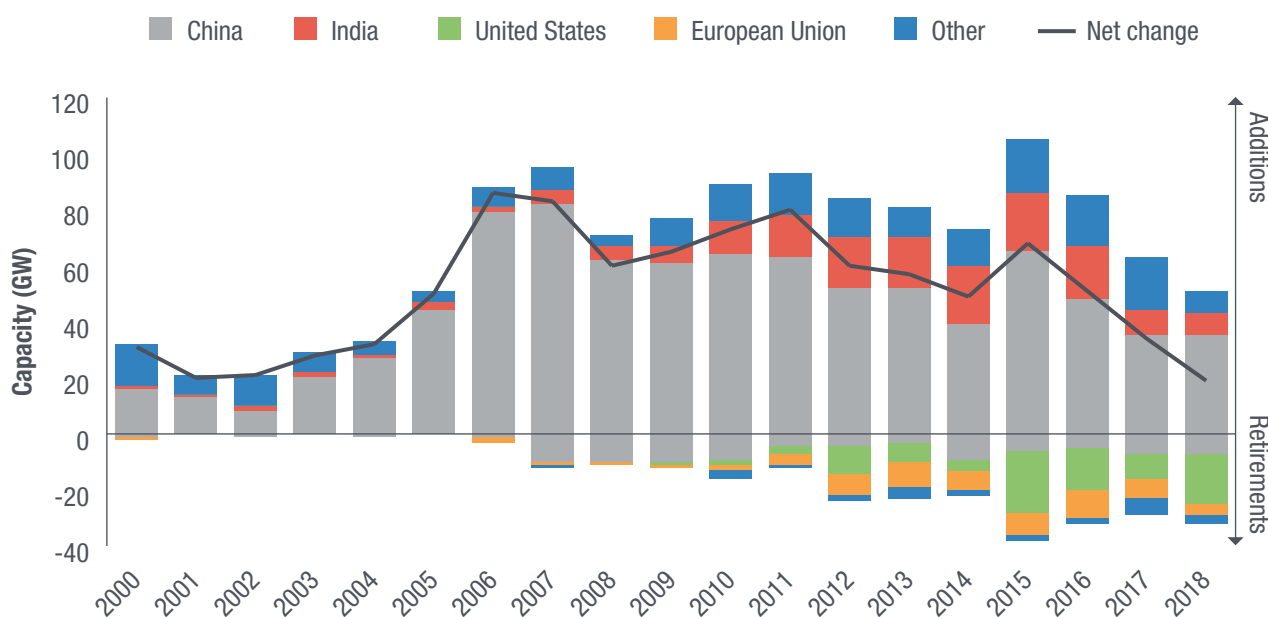
³ This data and projections are from Nace (2018). The assumptions for the projections are as follows: (1) only units of 30 megawatts (MW) or larger are included (about 98% of global capacity); (2) plants currently under construction are assumed to be completed; (3) plants in pre-construction or currently on hold are cancelled; (4) average global capacity factor begins at 52.5% in 2018 and then drops at a relative rate of 3.5% per year, ending up at 16.8% in 2050 – this is assumed to be the result of coal plants shifting from baseload to mid-load/balancing roles due to penetration of renewables; (5) CO₂ emissions are calculated according to plant-by-plant heat rate (based on type of combustion technology), size of plant, type of coal (IPCC emission factors) and average global capacity factor (for methodology, see End Coal (n.d.(a)) and Sourcewatch (n.d.)); (6) plants are retired after 40 years – if already 40, plants continue for another five years. In addition (a) all plants in OECD countries are retired by 2030; (b) if CO₂ output in a given year exceeds the IPCC 1.5°C levels, additional plants are retired in reverse age order (oldest first), until global output is within the limit.

estimated 23,000 early deaths every year because of coal burning (Jones et al., 2016). In India coal is one of the largest sources of fine particulate matter (PM2.5) today, and it will be the single largest source by 2050, responsible for 1.3 million deaths per year (Health Effects Institute, 2018). Similarly, South Korea and Turkey also suffer from very high levels of air pollution – ranking as the worst two countries within OECD countries in terms of highest levels of particulate matter pollution (Health Effects Institute, 2019).

There has been some progress in the shift away from coal, however. Recent studies have indicated that global coal demand could peak between 2020 and 2022 (Sussams and Leaton, 2017; IEA, 2018a; King and Harrington, 2018). The International Energy Association’s (IEA) most recent analysis shows a historic fall in investment in coal, with support falling by 75% over the last three years (IEA, 2019c). This fall in investment is part of the decline of most key indicators of coal power capacity expansion in 2018, including construction starts, pre-construction activity and plant completions (Shearer et al., 2019) (see Figure 3). In particular, there has been an unprecedented slowdown in coal plant permits in both China and India. China permitted less than 5 GW of coal power for construction in 2018, compared to 184 GW in 2015. India permitted less than 3 GW in 2018, compared to 39 GW in 2010 (ibid.). It must be noted that capital investment at the sectoral level is known to be uneven (i.e. periods of high investment are often followed by periods of low investment). This could also be one reason for the drastic slowdown.

Economics is driving much of this transition. According to one analysis in 2018, 35% of existing coal capacity has higher operating costs than building new renewables (and this value may increase to 96% by 2030) (Gray et al., 2018: 7). In the EU, the US, Australia, India and parts of Latin America, new investments in coal capacity have slowed or stopped due to competition from wind and solar (and natural gas in the US). In Germany, because of higher carbon and coal prices, onshore auction prices for new-build wind in 2018 were already lower than the costs of operating existing coal plants (Jones, 2018). To speed up this transition, six G20 members (Canada, France, Germany, Italy, Mexico and the

Figure 3 Global coal power capacity additions and retirements, 2000–2018 (GW)



Source: Shearer et al. (2019).

UK) have already committed to phase out unabated coal-fired power⁴ between 2023 and 2038, with all of these countries except Germany joining the Powering Past Coal Alliance (PPCA) which has a 2030 phase-out deadline for OECD countries (see Box 1) (Littlecott and Webb, 2017; Wacket, 2019). In India, at current costs, renewables could replace between 25% and 50% of existing coal capacity, and the average gap in costs compared to solar and wind is expected to increase by three to five times, by 2030 (Spencer et al., 2018).

The first quarter of 2019 has also brought a flood of announcements from private banks, investors and businesses on their plans to pull out of (or cap) their activities in coal mining and coal-fired power. This includes announcements from a number of trading houses in Japan (the host of this year's G20 Summit) including Itochu, Marubeni, Mitsui and Sojitz, which have been some of the major global investors in coal-fired power at home and abroad (Tsukimori and Obayashi, 2018; Nicholas and Buckley, 2019; Smee and Hurst, 2019). However, these announcements should be viewed with caution

Box 1 Initial coal phase-out commitments by G20 countries

Although many G20 countries have yet to commit to phasing out coal, since December 2017 G20 countries France, Italy and Mexico, alongside non-G20 states plus subnational jurisdictions from Australia, the US and South Korea, have joined the PPCA established by Canada and the UK (PPCA, 2018a).

Since its launch at the 23rd Conference of the Parties to the UNFCCC (COP23), the PPCA has grown to 80 members. These members are committed to a Declaration that states: 'to meet the Paris Agreement, analysis shows that coal phase-out is needed no later than by 2030 in the OECD and EU28, and no later than by 2050 in the rest of the world' (this approach is informed by analysis from Climate Analytics (2016), which also indicates that an equity-based approach to this challenge would 'imply a need for investment and/or finance by wealthier countries in emissions reduction in countries with lower capacity and lower mitigation costs').

Government members of the Alliance have committed to:

- phasing out existing unabated coal power generation in their jurisdictions
- a moratorium on any new traditional coal power stations without operational carbon capture and storage
- restricting financing for unabated coal power.*

(PPCA, 2017)

The European Parliament also recently backed a non-binding 'clean air for all' resolution motion which calls on EU countries to stop burning coal for energy by no later than 2030 (European Parliament, 2019).

Germany's Coal Commission process has similarly recommended a phase-out of coal power, but with a slower timeframe which would conclude by 2038 (with the option of phasing out sooner, in 2035) (Commission on Growth, Structural Change and Employment, 2019). This date is much too late as analysis suggests that Germany needs to phase coal out of its electricity sector by 2030 to meet its obligations under the Paris Agreement (Climate Analytics, 2018).

*While it is not explicitly stated whether the commitment on financing is domestic or international, it is implicit that it applies across the board.

⁴ Unabated coal-fired power refers to the use of coal without any technologies to substantially reduce its CO₂ emissions, such as carbon capture and storage.

as some of the commitments do not apply to geographies where these companies have plans for new coal plants. Moreover, many of these policies have loopholes regarding coal plants with ultra-super critical technology⁵ and some only apply to completely new projects (i.e. not to projects already proposed and under consideration) (Nicholas and Buckley, 2019).

Regular tracking of commercial bank⁶ activity in this space has found an ever-rising number restricting direct and indirect finance for coal mining and coal-fired power (Banktrack, n.d.).⁷ Since 2013, every two weeks on average, a bank, insurer or lender has announced new coal restrictions (Buckley, 2019). Facing pressure from investors to take firmer action on climate change, Glencore (the world's top coal exporter) has vowed to cap its coal production (at planned 2019 level), with further expansion of its coal business largely ruled out (Hume et al., 2019). The G20 governments have a key opportunity to further support this transition, by making good on their repeated commitments to end fossil fuel subsidies, including support to coal, and by ensuring that the communities and workers most affected by this transition are supported. Every year since 2009 the G20 have committed to phase out fossil fuel subsidies (G20, 2018), and made related commitments under the SDGs, and the Paris Agreement.⁸

A number of international public finance institutions – including multilateral development banks (MDBs), bilateral development finance institutions and export credit agencies – have also made commitments to curtail their financing of coal. This financing should further decrease with the implementation of the OECD restrictions on some coal plant financing, which went into effect on 1 January 2017. Unfortunately, as with private sector commitments, loopholes and lack of enforcement of these restrictions mean that this financing has to date remained significant, especially for Japan (Doukas et al., 2017).

While progress is being made to transition government support away from coal (including through pledges to end public finance for coal – see Annex Table A4), this analysis shows that G20 governments continue to provide fiscal support, public finance and SOE investment for the production and use of coal (and oil and gas) which may hinder or delay these shifts.

5 Ultra-super critical coal plants are the latest technology coal plants, which have the lowest emissions intensity of all coal plants, at less than 750g CO₂/kilowatt hour (kWh).

6 While many banks call themselves 'commercial' our analysis includes all majority government-owned banks, even if they operated 'commercially'. Please see the methodology note for further information about definitions and what is included in this analysis.

7 As of February 2019, 21 and 20 banks respectively have ended direct finance for new coal mines and new coal plants worldwide; 7 banks have restricted indirect finance to coal plant developers; 12 and 17 banks respectively have restricted indirect financing to coal utilities and coal mining companies; and 4 banks have ended or restricted the selling or buying of coal assets (Banktrack, n.d.).

8 All G20 countries have also committed to the SDGs, which highlight 'rationalising' fossil fuel subsidies as a means of implementing Goal 12 to 'ensure sustainable production and consumption patterns' (UN, 2015). These commitments reflect the pledges these governments have made under the Paris Agreement to achieve zero net emissions in the second half of this century, and to make 'finance flows consistent with a pathway towards low GHG emissions and climate-resilient development' (UNFCCC, 2015).

3 Approach

This analysis aims to track the latest and most comprehensive information available on the subsidies provided by G20 governments for the production and consumption of coal, as a first step towards holding them accountable to their phase-out commitments.

3.1 Definitions

Although G20 governments have not set a definition for fossil fuel subsidies specifically linked to their phase-out commitment,⁹ they have all accepted the World Trade Organization (WTO) definition of a subsidy within the ‘Agreement on subsidies and countervailing measures’ (WTO, 1994: section 1.1).

The WTO defines a subsidy as (paraphrased): any financial contribution by a government, or agent of a government, that confers a benefit on its recipients in comparison to other market participants.

This definition has been accepted by the 164 WTO Member States, including all G20 countries, and encompasses the following subsidy categories:

- a. direct transfer of funds (e.g. budgetary transfers, grants, loans and equity infusion), and potential direct transfers of funds or liabilities (e.g. loan guarantees)
- b. government revenue that is otherwise due, foregone or not collected (e.g. fiscal incentives, such as tax expenditures)
- c. government provision of goods or services other than general infrastructure, or purchase of goods, below market value
- d. income or price support.

This report focuses on a subset of the categories (a), (b) and (c) in the WTO definition, grouped as:

1. fiscal support (budgetary transfers and tax expenditures)
2. public finance¹⁰ (loans, insurance and guarantees), often at below-market value
3. SOE investment that is often carried out at below market value.

We have not included information under category (d) of the WTO definition in this analysis due to limitations of comprehensive data around income and price support. However, these subsidies appear likely to be significant in the G20. For example, the IEA estimates that subsidies through below-market

⁹ Individual G20 countries and international organisations use different definitions, and include different types of subsidies, in their current estimates (Whitley and van der Burg, 2015; IISD GSI et al., 2017).

¹⁰ The OECD estimates that the subsidy element of loans provided by governments – i.e. the revenue foregone because the governments provide such credit support below market value – can constitute up to 20% of their face value (OECD, 2018). However, such estimates are not reported. Instead, this report uses the data on the principal amount disbursed for direct loans or loan guarantees under the category of public finance.

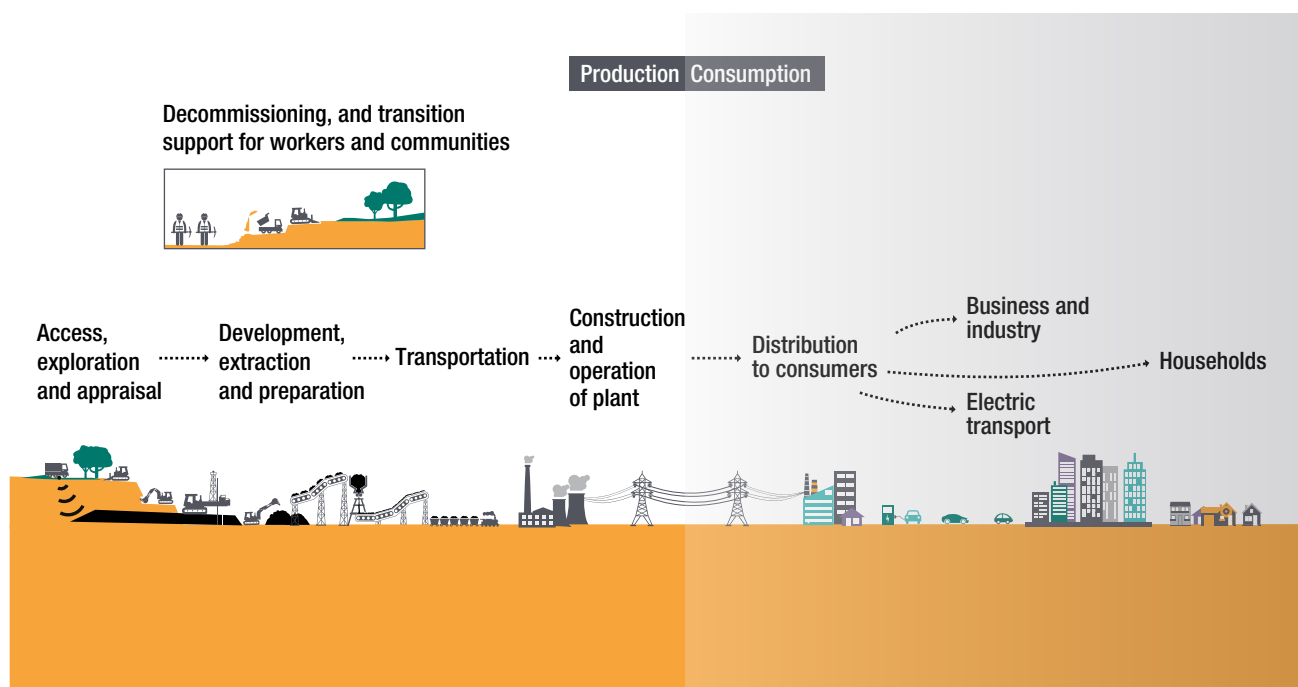
electricity prices for electricity consumers in China, Mexico and Russia in 2017 constituted subsidies of US\$21 billion, US\$11 billion and US\$10 billion respectively (IEA, 2018b), with a big portion of electricity for this consumption coming from coal-fired generation. And in China and Russia, below-market railway tariffs for coal transport provided significant support to the coal mining industry (Xue et al., 2015; Khusainov, 2018).

3.2 Activities

The reviewed G20 support to coal has been further categorised in terms of its role in supporting the following activities (see also Figure 4):

1. Coal production: including exploration, mining, coal processing, research and development (R&D) for coal mining, and coal transport.
2. Coal fired-power production:¹¹ including capacity mechanisms, biomass co-firing, R&D (including for carbon capture and storage (CCS)), and wider coal-fired power production.
3. Coal consumption: including direct consumption of coal and of coal-fired power,¹² by households, and industry and business.
4. Support for the transition away from coal: including decommissioning and rehabilitation, and support to workers and communities.

Figure 4 Stages and sectors of coal production and consumption



Source: authors' own, based on Bast et al. (2015).

¹¹ Support is also provided by G20 governments towards generation of heat from coal, as well as co-generation of power and heat. Some examples of these measures are included in the OECD database and are therefore included in our calculations.

¹² This includes consumption of coal and coal-fired power other than for its use for coal-fired power generation (or where a specific measure is for co-generation of power and heat).

3.3 Data sources

Fiscal support: For all countries, the source of information for fiscal support was the OECD's Inventory of Support Measures for Fossil Fuels database (OECD, 2019a). This database is built using information obtained from governments and hence provides a comparable and comprehensive list of support measures. It also incorporates information retrieved from the IEA on government energy technology R&D budgets (IEA, n.d.).

Public finance: For all countries, this report uses the information made publicly available by majority government-owned financial institutions. This data can be found in Oil Change International's (OCI) 'Shift the Subsidies' database (OCI, 2019), which includes information provided by public finance institutions, from the Infrastructure Journal Global database, and Natural Resources Defense Council's (NRDC) 'Power Shift' report database (Chen and Schmidt, 2017; IJ Global, 2019).

SOE investment: Unfortunately, limited publicly available information on government transfers to SOEs makes it challenging to identify the specific concessional sub-component of SOE investment which constitutes a subsidy. As a result, this report provides data on total capital expenditure investment by SOEs in coal and coal-fired power production (where this information is made available by the company). This information was sourced mainly from annual reports of the SOEs.

Data was obtained from all three sources for 2016 and 2017, with the annual averages calculated by dividing the total amount by two.

A separate methodology note is available which further outlines the details of what is captured under each activity, the approaches, definitions, sources of information and years we have included as part of the data collection, and any calculations undertaken.

This is available at odi.org/g20-coal-subsidies

3.4 Data gaps

As outlined above, G20 governments have made significant international commitments to phase out fossil fuel subsidies. The first step towards achieving these objectives is to clearly identify and estimate current subsidies, including through processes such as the G20 peer reviews.

Unfortunately, transparency of information on all types of government support, along with accountability for phasing out those to coal, remains limited. Overall, our analysis of subsidy reporting demonstrates the significant gap in G20 countries in terms of their reporting on subsidies (including those to coal). The UK government perhaps goes the furthest in its lack of transparency and explicitly denies that it provides any subsidies to fossil fuels, based on its specific interpretation of subsidies (UK Parliament, 2017a and 2017b), although its fossil fuel subsidies have been documented by international institutions including the OECD and International Monetary Fund (IMF).

Across the analysis for all G20 countries, numerous fiscal support measures identified were not able to be quantified in the Inventory of Support Measures for Fossil Fuels database (OECD, 2019a), while coal-related activities of some public finance and SOE investments were identified, but not quantified either.

Moreover, various government support measures exist which are not covered by the WTO definition of subsidies but are clearly to the advantage of the coal sector. This includes laws which exempt coal producers from certain taxes or provide other energy producers with additional costs, or the provision of general infrastructure that can be used for coal transportation. Our data is unable to take account of such forms of support.

There have been some positive developments in recent years. Under the G20, eight countries have taken part – or have committed to take part – in peer reviews of each other’s subsidies.¹³ This process has the objective of increasing transparency on fiscal support and identifying those that should be eliminated. While the resulting outputs have received some criticism for not always presenting a complete picture and seldom resulting in stronger commitments to phase out the subsidies identified (ODI, 2017), they are a step in the right direction in terms of transparency. Notably, the G20 peer reviews do call for the measurement of the subsidy element of loan guarantees and direct loans. However, such reviews would benefit from an expanded scope to include public finance and SOE investment (Gerasimchuk et al., 2018). Indonesia’s peer review, which was published in April 2019, does underline the role of government support for its debt-laden SOEs (OECD, 2019b).

¹³ China, Germany, Indonesia, Italy, Mexico and the US have completed, and Argentina and Canada are in the process of completing their peer reviews of fossil fuel subsidies (OECD, n.d.; Gerasimchuk et al., 2017b).

4 Findings: overarching and by type of support

In this section, we present our overarching findings on G20 government support for coal across three sources of support, and for the different activity categories. We then present trends in support to coal and coal-fired power production, comparing our results with research conducted previously. We go on to present more detailed findings for each source of support. Annex Table A1 provides an overview of the total amount of support provided through each source.

4.1 Overarching findings

Our research finds that G20 governments provided at least US\$63.9 billion of support, on average per year, for the 2016–2017 period for coal and coal-fired power production and consumption.¹⁴

We find that the vast majority of the support identified (almost three-quarters, or US\$47.3 billion per year) is for coal-fired power production. Around one-tenth (US\$6.7 billion per year) of the support identified is for the consumption of coal and coal-fired power, and around one-tenth (US\$6.7 billion per year) is for coal production. These results are summarised in Table 1 below. At a time when governments should be moving away from coal and focusing any remaining support on the transition for their workers and communities, these findings are very concerning.

Our findings also identify a relatively small amount of support for the transition away from coal mining, through rehabilitation of mining sites and support for workers and communities.¹⁵ However, it must be noted that there are other measures of government support for the phase-out of coal mining that are not captured in this data due to being very recent or a lack of detailed information regarding their beneficiaries and conditions. These include Canada’s Task Force on Just Transition for Canadian Coal Power Workers and Communities, launched in 2018, and China’s Industrial Special Fund, created by the Ministry of Finance in 2016, for resettling employment in the coal and steel sectors

¹⁴ This estimate is based on current prices for those years. Data is collected in national currencies for fiscal support measures and SOE investment. Data is collected in either national currencies or US dollars (depending on availability of information) for public finance.

¹⁵ It must be noted that rehabilitation of mining sites is standard practice when a coal mine is no longer active, and need not necessarily indicate a government’s commitment to ending coal mining. However, given that these measures technically do not support extraction of coal, and for the sake of simplicity of classification, we have decided to include all such support measures in the ‘transition support’. All of the support captured in our results for rehabilitation of mining sites was in the form of fiscal support and from the OECD Inventory of Support Measures for Fossil Fuels database.

Table 1 G20 government support to coal
US\$ millions, 2016–2017 annual average

| Instrument | Coal production ⁱ | Coal-fired power | Coal consumption ⁱⁱ | Transition support ⁱⁱⁱ | Total |
|------------------------------------|------------------------------|------------------|--------------------------------|-----------------------------------|---------------|
| Fiscal support | 2,759 | 2,785 | 6,691 | 3,135 | 15,370 |
| Public finance^{iv} | 1,456 | 26,114 | | | 27,570 |
| Domestic | 40 | 10,842 | none identified ^v | | 10,882 |
| International | 1,415 | 15,273 | | | 16,688 |
| SOE investment^v | 2,453 | 18,436 | | | 20,889 |
| Total | 6,667 | 47,336 | 6,691 | 3,135 | |

Note: slight variation in final results of added totals due to rounding.

ⁱ This category includes support for coal exploration, mining, processing and transportation.

ⁱⁱ This category includes support for consumption of coal-fired power, and of coal other than for its use for coal-fired power generation (or for co-generation of power and heat).

ⁱⁱⁱ This category includes support for closing down mining sites, and for workers and communities in their transition away from coal and coal-fired power.

^{iv} An additional US\$108 million of support per year (2016–2017 average) was identified in public finance and SOE investment in China for mixed activities across coal mining and coal-fired power production. As we were unable to allocate this to either activity, it is not included in the totals presented here (but included in the overall total of US\$63.9 billion per year).

^v While it is conceivable that there is public finance and SOE support for coal consumption (e.g. public finance for district heating which is coal-fired, or SOE support for consumption of coal by their employees at preferential rates), our analysis did not identify any such measures. Therefore, the findings presented for coal consumption in this report are through fiscal support measures only.

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

affected. These, and other similar measures, are discussed further in Section 5.4 and in the relevant country studies¹⁶.

Of the total amount of government support identified, US\$15.4 billion per year is provided through fiscal support, US\$27.6 billion per year is provided through domestic and international public finance, and US\$20.9 billion per year is through investments of SOEs in coal mining or coal-fired power operations. Annex Table A1 shows the total amount of support identified through each measure from each country. The following sections (4.2, 4.3 and 4.4) provide more detailed information on these sources of support.

It is important to acknowledge that these findings are a conservative estimate of the total amount of support being provided by governments. This is because, in many cases, data is very hard to find and, even where information about support exists, the total amount of support is difficult to quantify. For example, in countries such as China, India, Russia, South Africa and Turkey, several SOEs and public banks provide support to coal mining and coal-power activities. However, the public finance institutions and SOEs do not provide a comprehensive list of their projects or activities broken down by coal mining and coal-fired power production versus investments in other activities. Our findings and data challenges in these areas are detailed below in Sections 4.3 and 4.4.

¹⁶ To access the full set of G20 country studies and data sheets, please see odi.org/g20-coal-subsidies.

Moreover, various government support measures exist that are not covered by the WTO definition of subsidies but are clearly to the advantage of the coal sector. These are detailed below in Section 5, under the relevant activities.

The sections that follow should be read with the caveat that support for coal between countries is not directly comparable: G20 countries have very divergent circumstances, and the differences have implications for the speed of the transition away from coal across countries, and also for the responsibilities of wealthier countries in providing support to assist other countries with the transition.

4.1.1 Trends

Comparing our findings with research published in 2015 on G20 government support to fossil fuel production, which followed the same methodology, we see major shifts in the total amount of support for coal production and coal-fired power production (*ibid.*).¹⁷ We see that G20 government support towards coal production (and support for rehabilitation and transition support) decreased considerably, from nearly US\$21.7 billion per year (Bast et al., 2015, the average for 2013–2014), to US\$9.8 billion per year (this study, the average for 2016–2017).¹⁸ This shows good progress on phasing out government support to coal mining (see Table 2). However, a comparison of the two analyses also shows G20 government support to coal-fired power production has increased dramatically, from just over US\$17.2 billion per year to US\$47.3 billion per year, during the same period (see also Table 2).¹⁹ The increased support from governments coincides with an historic fall in investment in coal-fired power, with investment falling by 75% over the last three years (Cockburn, 2019; IEA, 2019c).

Table 2 Trends in government support to coal mining and coal-fired power production
US\$ millions, annual averages

| | Average for 2013–2014 (from Bast et al., 2015) | Average for 2016–2017 (analysis for this report) |
|-----------------------------|---------------------------------------------------|-----------------------------------------------------|
| Coal production | 21,722 | 9,802 |
| Coal-fired power production | 17,224 | 47,336 |

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

¹⁷ The report by Bast et al. (2015) *Empty promises: G20 subsidies to oil, gas and coal production* looked at G20 government subsidies to fossil fuel production (including coal, oil and gas, and all fossil fuel-based electricity). While there might be slight variation in the coverage of the data sources in the two different time periods, they cover the same sources of financing and key data sources, therefore these trends are significant. The sources of financing reviewed (i.e. fiscal support, public finance and SOE investment) and the main data sources, and the methodology used in both studies, are the same. However, the coverage of reporting – from public finance institutions and SOEs in particular – may vary in different years, which might mean that more of the projects or investments were captured in one analysis than the other. Nevertheless, such a strong decrease in support to coal mining, and strong increase in support to coal-fired power, is a significant finding. For more information on the sources of data and methodology, see the methodology note, available at odi.org/g20-coal-subsidies.

¹⁸ The comparison in coal production numbers includes support to the transition away from coal mining, in the form of support for rehabilitation of mining sites and support to workers and communities. This is because this support was not calculated separately in the previous analysis for Bast et al. (2015). Therefore, in order to have a like-for-like comparison, we included the transition support findings for 2016–2017 when making the comparison.

¹⁹ For this comparison, we only included support to production of coal-fired power and excluded support to its consumption.

4.2 Fiscal support

Fiscal support is provided by G20 governments through budgetary transfers and through tax breaks. We identified US\$15.4 billion of fiscal support per year in this analysis (see Annex Table A1) (annual average across 2016–2017). This includes support by the governments of Indonesia (US\$3.1 billion per year, mostly in support to coal-fired electricity consumption), Germany (US\$2.4 billion per year), the US (US\$1.9 billion per year) and the UK (US\$1.8 billion per year). Significant support (ranging between US\$600 million and US\$1 billion per year) was also identified in Argentina, Australia, China, Italy, Mexico, South Africa and Turkey. However, as mentioned above, these amounts identified are not exhaustive. In India, independent analysis identified that coal is taxed at a lower rate than other minerals – if the differential is defined as a subsidy (which it is according to the WTO definition outlined), it amounts to around US\$2.3 billion per year over 2016–2017 (Soman et al., 2018). An OECD report on government support has also identified significant subsidies for coal used along the aluminium value chain, including in China (OECD, 2019c).

Around two-fifths of the fiscal support identified – US\$6.7 billion per year – benefited consumption of coal and coal-fired power by business, industry and households, and, of this, US\$6.2 billion per year benefited coal-fired power consumption.

Another key finding is that in many G20 countries, namely Australia, Germany, Indonesia, South Africa, the UK and the US, fiscal support is the biggest source of financing for coal. In Argentina, Brazil, Canada, Italy and Mexico, fiscal support was the *only* source of government support we identified for coal.

4.3 Public finance

As explained in Section 3, public finance includes the provision of grants, equity, loans, guarantees and insurance by majority government-owned financial institutions, such as national and multilateral development banks, export credit agencies and domestic banks that are majority state-owned. Annex Table A3 provides a list of the public finance institutions reviewed.

Over the period 2016–2017, our analysis found that G20 countries provided around US\$27.6 billion per year of public financing for coal, entirely directed at production of coal and coal-fired power. Of this, US\$26.1 billion was for coal-fired power – with US\$15.3 billion of this financing being provided internationally. At a time when countries are beginning to move away from coal-fired power at home, that such a large amount of their public finance goes to prolong coal-fired power in other countries is concerning.

With regard to domestic public finance identified, India provided the highest amount of support identified by far, at US\$10.6 billion per year (2016–2017 average). However, it must be noted that these findings are not directly comparable between countries; one reason behind such high numbers in India is that its banking system is dominated by government-owned banks which were nationalised in the 1960s and 1980s. These banks, despite being majority government-owned, operate predominantly as commercial entities rather than as banks driven by government policy (in contrast to the bulk of international public finance for coal described below, which is delivered through policy-driven institutions); this in part accounts for the high levels of public finance for coal mining and coal-fired power domestically in India, though it also offers another lever for the Government of India to accelerate the transition away from coal.

With regard to public finance provided internationally, all the public finance identified in China and Japan is for international projects (US\$9.5 billion and US\$5.2 billion of financing identified per year, respectively). The other two countries which provide public financing for coal abroad are South Korea (US\$1.1 billion per year) and India (US\$800 million per year). Most of the public finance identified in China and Japan, and all of the international public finance identified in South Korea and India, was for coal-fired power (see discussion on coal-fired power in Section 5.2). The international public finance identified from India was for a single coal-fired power project in Bangladesh.

A breakdown of the total finance provided internationally is shown in Table 3.

The countries which are the recipients of the largest amounts of financial support for coal from G20 governments are listed below, with the total amount of financing provided by their biggest financing countries (China, Japan and South Korea) – see Table 4.

Table 3 International public finance for coal (including coal-fired power) provided by G20 governments
US\$ millions, 2016–2017 annual average

| | International public finance |
|-------------------------|------------------------------|
| Australia | 0.04 |
| China | 9,503 |
| Germany | 24 |
| India | 800 |
| Japan | 5,152 |
| Russia | not quantified ⁱ |
| South Africa | 200 |
| South Korea | 1,057 |
| UK | 15 |
| US | 11 |
| All other G20 countries | none identified |
| Total | 16,763 |

ⁱ Support is provided by Russia’s majority government-owned Eurasian Development Bank but information was not included in the OCI ‘Shift the Subsidies’ database (OCI, 2019) used for this report, and was therefore not included in our findings.

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

Table 4 Providers and recipients of the highest amount of G20 international public finance for coal
US\$ millions, 2016–2017 annual averages

| Recipient country | Country providing the highest amount of public finance and amount | | |
|-------------------|-------------------------------------------------------------------|-----------------|-----------------|
| | China | Japan | South Korea |
| Bangladesh | 1,650 | 1,207 | none identified |
| Indonesia | 1,370 | 1,271 | 562 |
| Pakistan | 3,975 | none identified | none identified |
| Viet Nam | 880 | 1,230 | 495 |

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

Continued public finance for fossil fuels locks many countries – including developing countries – into a dirty, polluting and outdated source of energy. Some governments remain who frame their international support to coal around poverty reduction and economic development. However, this is no longer a credible argument, with both historical evidence and current data suggesting the opposite to be true (Granoff et al., 2016). Governments have a responsibility to rapidly put an end to fossil fuels, while ensuring a ‘just transition’ for workers, both domestically and overseas.

Box 2 explains the advantages of promoting clean alternatives to coal, and how coal-fired power hinders access to electricity for the many who live in remote areas and would benefit from off-grid energy.

Our analysis has also identified a very large amount of public finance for coal-fired power domestically in India – around US\$10.1 billion per year. As mentioned above, this is partly a result of the dominance of the publicly owned banking system. This finding also reflects the continued reliance on coal in India’s economic planning, due to perceptions that coal is required to help meet power demand from India’s fast-growing economy and its commitments to reliable universal electricity access. Nonetheless, this may change in future years, with 21% of India’s coal power capacity stressed and at risk of bankruptcy in 2018, and auction prices for grid-based renewable energy now comfortably competitive with coal (Worrall et al., 2019). In its National Electricity Plan, India still foresees new capacity additions for coal – 45.9 GW from 2017–2027 – but this is dwarfed by planned additions for renewable energy, with 275 GW targeted by 2027 (CEA, 2018).

Finally, across the G20, a smaller proportion of the total amount of public finance, around US\$1.4 billion per year, was provided for coal production, with the majority of this (US\$1.3 billion) being provided by Japan for coal transportation. While many public finance institutions within the G20 have committed to restrictions on finance for coal-fired power, recently some – such as Canada’s export credit agency – have committed to also ending finance for infrastructure predominantly used for the transport of thermal coal (including, for example, terminals and rail links) (EDC, 2018).

It is important to note that public finance from G20 governments goes beyond their own national public finance institutions and includes their support through their shareholding in MDBs. In this analysis, we have not included the financing they have provided through MDBs. An encouraging development in recent years has been the commitments from some MDBs and nationally owned development banks to mainstream climate considerations into their operations and lending decisions (Whitley et al., 2018). Many have committed to ending coal mining and coal-fired power. Annex Table A4 provides a summary of the commitments made by public finance institutions (PFIs) of G20 countries to phase out coal. Pressure from civil society organisations, including through the ‘Big Shift’ campaign which targets public finance institutions and builds on wider campaigns such as ‘End Coal’, which aims to end coal in Europe, has played a big role in governments and MDBs committing to ending coal finance (Big Shift, n.d.; End Coal, n.d. b; Elliot, 2017).

4.4 SOE investment

SOEs around the world – and the level of government involvement in their decision-making processes – are diverse (OECD, 2015). Nevertheless, majority government ownership of SOEs often provides a degree of effective control and government involvement in decision-making and financing. SOEs may benefit from several advantages that are linked to their state ownership and close proximity to government, including price support, preferential financing rates and low return expectations, implicit or explicit state guarantees, grants, in-kind subsidies, privileged access to information, regulatory

Box 2 The myth of coal and poverty reduction

Public financial support for coal is often motivated by the argument that it has elevated millions of people around the world out of extreme poverty both domestically and internationally (Granoff et al., 2016). Deeper analysis shows, however, that coal has not played the major role assumed in poverty alleviation over the past three decades. 500 million people in China were lifted out of extreme poverty between 1991 and 2004 (Chen and Ravallion, 2007). However, while China's expansion of coal-fired power started in 1987 and did not gather pace until after 1999, two-thirds of this poverty alleviation took place between 1981 and 1987. Analysis by the Overseas Development Institute (ODI) suggests that this reduction in extreme poverty was a result of agricultural and macroeconomic policy, rather than coal-fired power and the resultant industrialisation and economic growth (Granoff et al., 2016). Furthermore, fuel subsidies often have a regressive impact on equity and benefit the richest quartiles in society (Arze del Granado et al., 2012).

The assumption that coal is essential to poverty alleviation has historically been used by international public finance agencies, with many development banks using their explicit poverty-reduction mandates to justify investment in coal projects abroad (Piccio, 2016). The future role of Chinese international public finance is particularly relevant, with an estimated US\$1 trillion in investment expected through the Belt and Road Initiative (Kuo and Kommenda, n.d.; Perlez and Huang, 2017).

Meanwhile, countries such as India and Indonesia justify domestic public support for coal as the most direct route to poverty alleviation through electrification (Mathiesen, 2017), while South Africa identifies coal as a route to poverty alleviation through economic growth and job creation (Gordhan, 2010).

In 2016, 90% of South Africa's electricity generation came from coal (IEA, 2019a). However, the country still demonstrates only 85% energy access (SE4All, 2018). The lower cost and smaller scale of renewables projects would allow for improved energy access, undermining the myth that coal enables countries to give electricity access to poor citizens (The Economist, 2019). Given the scale of generation and grid infrastructure associated with coal-fired power, it has historically been used to power large urban centres but has often bypassed the poorest who are near the grid and excluded those in rural areas entirely (Granoff et al., 2016). Despite all the support from the taxpayer, South Africa's ageing transmission and generation infrastructure prevents coal from improving energy access (Sanzillo, 2016).

In terms of poverty alleviation, G20 public support to coal would be better targeted towards supporting the growth of both grid and distributed renewable energy, whose scale allows them to be more flexibly deployed geographically than thermal coal power plants. In spite of high up-front capital costs, renewables such as solar and wind also benefit from free fuel and not needing major water resources, both of which will potentially be drivers in tariff increases in the future as climate variability and pollution legislation make coal too expensive for poor electricity consumers (Worrall et al., 2019). In the many contexts where renewables are already cost-competitive with coal even without subsidies, removal of coal subsidies can free up domestic public funds for poverty alleviation, such as investment in education and healthcare (Gass and Echeverria, 2017).

Finally, it should be noted that the negative impacts of climate change will disproportionately hit the poorest and most vulnerable, and as such public financial support to coal contributes to the locking in rather than alleviation of extreme poverty (King and Harrington, 2018). International public financial institutions therefore have a responsibility to stop financing coal projects in other countries.

exemptions, preferential treatment of public procurement, commercial diplomacy support and other forms of support (Prag et al., 2018). A list of SOEs reviewed in this report is provided in Annex Table A5.

According to our analysis, investments by state-owned coal mining and coal-fired power companies amounting to at least US\$20.9 billion per year, were identified in eight of the G20 countries (see Annex Table A1). The highest amounts of investment identified were by Chinese, Indian and South African SOEs, which provided US\$8.8 billion, US\$6.4 billion and US\$3.4 billion per year, respectively. Significant investment was also identified from SOEs in France (US\$1.1 billion per year) and Russia (US\$0.7 billion per year). Indonesia, South Africa, South Korea and Turkey were the other countries where SOE investments were identified.

The lack of transparency of information provided by SOEs makes it very difficult to quantify the total support they provide. Very few of the SOEs reviewed provided information on the breakdown of their investments in their annual reports – and even fewer provided project-level data. Moreover, the complex structures of ownership of SOEs often disguise their government ownership. China Energy Investment Corporation (CEIC) or Shenhua Group are, for example, both complex groups containing multiple distinct entities, and CEIC itself is a result of a merger between two previous groups (China Guodian and Shenhua).

There are, however, some initial signs that some coal SOEs are aware of the need to diversify their business, increase investment in renewables and begin to plan for the longer-term full transition away from coal mining and coal-fired power. These include efforts to diversify and invest in renewables by CEIC and Coal India Limited (CIL), the world's largest coal miner (IISD, 2018a).

5 Findings: by activity

In this section, we present our findings on G20 government support for each of the four main activity categories: coal production, coal-fired power production, coal consumption (other than for coal-fired power) and transition support. Section 3.2 and the methodology note provide further information on what is included under each activity type. Annex Table A2 provides an overview of the total amount of government support identified for each overarching activity type.

5.1 Coal production

Despite commitments to phase out coal mining by some key G20 members,²⁰ we found substantial government support for coal mining, processing and transportation. These activities (together labelled as ‘coal production’) received at least US\$6.7 billion per year, with mining amounting to US\$4.5 billion per year of this total. Around two-fifths of the support identified was through fiscal measures, around two-fifths was through SOE investments, and around one-fifth was through public finance. All the G20 countries, except Brazil, Mexico and Saudi Arabia, continued to provide support to coal mining. The highest amounts of support for coal mining were in India and Indonesia. Table 5 provides a break-down of support to coal from different sources of finance, at different stages of coal production.

The transportation of coal received US\$1.3 billion support per year, almost entirely provided through public finance. Over US\$1 billion of this support being provided by Japan (with all of the support by Japan being provided internationally). However, while not captured by our data sources, support measures also exist in other countries, such as preferential railroad tariffs for coal in China and Russia, to the tune of at least US\$1 billion per year in each country (Xue et al., 2015; Khusainov, 2018).

We also identified nearly US\$41 million per year that was provided for coal exploration activities, mainly through fiscal support. Most of this support was provided by the governments of Canada (US\$18 million per year) and Turkey (US\$13 million per year).

The fiscal support identified in EU countries is relatively low, in line with their commitment to end hard coal mining by 2018. We found that, partly as a result of the EU’s commitment, support to coal production in G20 countries has decreased considerably in recent years, from nearly US\$21.7 billion per year (average for 2013–2014) down to just over US\$9.8 billion per year (average for 2016–2017) (Bast et al., 2015).²¹

²⁰ EU Member States are obliged by law to remove subsidies to hard coal mining by 2018 (EU, 2010).

²¹ The comparison in coal production numbers includes support to the transition away from coal mining, in the form of support for rehabilitation of mining sites and support to workers and communities. This is because this support was not calculated separately in the previous analysis for Bast et al. (2015). Therefore, in order to have a like-for-like comparison, we included the transition support findings for 2016–2017 when making the comparison.

Table 5 G20 government support to coal production (exploration, mining, processing, R&D and transportation of coal)

US\$ millions, 2016–2017 annual average

| Instrument | Exploration | Mining | Coal processing | R&D (coal mining) | Coal transport | Total |
|-----------------------|-----------------|--------------|-----------------|-------------------|-----------------|--------------|
| Fiscal support | 37 | 1,890 | 122 | 671 | 38 | 2,759 |
| Public finance | 4 | 188 | none identified | none identified | 1,264 | 1,456 |
| Domestic | – | 28 | – | – | 13 | 40 |
| International | 4 | 160 | – | – | 1,251 | 1,415 |
| SOE investment | none identified | 2,453 | none identified | none identified | none identified | 2,453 |
| Total | 41 | 4,531 | 122 | 671 | 1,302 | 6,667 |

Note: slight variation in final results of added totals due to rounding.

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

5.2 Coal-fired power

The activity for which the highest amount of government support was identified was coal-fired power production, which received almost three-quarters of the total amount of quantified support captured in our research (over US\$47.3 billion per year). As with all our findings, these amounts are likely to be underestimates due to various pricing support measures. For example, underpricing of electricity in India costs around US\$11.6 billion per year. This figure is not captured in our data source for fiscal support (OECD, 2019a)²² since it is paid for by state-level transfers, and by cross-subsidies (which are primarily directed at another sector but benefit the coal sector).

Over half of the support identified for coal-fired power production (US\$26.1 billion per year) was provided by public finance institutions, with US\$15.3 billion per year of this support being provided internationally and US\$10.8 billion per year domestically (as noted in Section 4.3). Indian public finance institutions provided nearly all the domestic public finance support to coal-fired power (see discussion in Section 4.3 also). Internationally, China and Japan provided the highest amounts of public finance (US\$9.3 billion per year and US\$4.1 billion per year, respectively), with the rest being provided by South Korea and India (US\$1.1 billion and US\$800 million per year, respectively). Table 6 provides a break-down of the different sources of financing for coal-fired power.

Our analysis also identified over US\$18.4 billion of investment per year (average for 2016–2017) in coal-fired power by state-owned power companies. The highest amounts identified were by China (US\$7.6 billion per year) and India (US\$5.3 billion per year), South Africa (US\$3.4 billion per year), France (US\$1.1 billion per year) and Russia (US\$748 million per year).

While limited fiscal support was identified for coal-fired power production directly, it is important to note that there are a number of activities which have benefited from new and ‘hidden’ forms of support in recent years. Several subsidies with the stated objective of supporting the energy transition in fact support the continuation of coal-fired power. These include capacity mechanisms (which, depending on their design, can end up providing subsidies to coal-fired power plants to ensure security of supply),

²² For more information about data sources and activities covered, please refer to the methodology note available at odi.org/g20-coal-subsidies

support to coal-fired power producers through the EU ETS, and support to co-firing of biomass with coal. Box 3 describes these mechanisms and the countries that provide them in more detail.

Table 6 G20 government support to coal-fired power production

US\$ millions, 2016–2017 annual average

| Instrument | Coal-fired power |
|-----------------------------------|------------------|
| Fiscal support | 2,785 |
| Public finance | 26,114 |
| Domestic | 10,842 |
| International | 15,273 |
| SOE investment^a | 18,436 |
| Total | 47,335 |

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

Box 3 Coal subsidies provided in the name of the G20's energy transition

Despite their high-level pledges, G20 governments often use the energy transition, including a shift to renewables, as a justification for extending and introducing new subsidies to coal. Whether intentionally or not, these subsidies pay polluters and slow the transition itself, while providing a lifeline to high-carbon assets.

G20 governments provide support to coal in the name of supporting the energy transition through capacity mechanisms, co-generation of coal and biomass, and emissions trading schemes. This support mainly benefits electricity producers, as well as industry, and extends the life of coal-fired power plants that would otherwise be uneconomic.

Across the G20 we find that France, Germany, Italy, Russia, South Korea, Turkey and the UK have established (or are contemplating) capacity mechanisms, which offer extra payments to operators who can turn up their supply or turn down their demand. Although they may appear to provide a solution for governments seeking to balance the objectives of increasing renewable energy with ensuring security of supply, capacity mechanisms have led to large payments to coal (and other fossil fuels) at the expense of investments in low-carbon options for flexibility such as storage or import of energy. Only a few of these measures were captured or quantified in the OECD Inventory of Support Measures for Fossil Fuels, and therefore the total amount of resulting support is an underestimate of the total support to coal-fired power.

For example, the UK's annual capacity market auction has received criticism for discriminating against low-carbon options, overestimating future supply needs, favouring fossil fuels and delaying coal-plant decommissioning (van der Burg and Whitley, 2016). In November 2018, the European General Court suspended the UK's US\$1.3 billion (£1 billion) capacity market scheme after ruling that it constituted illegal state aid (McCormick, 2018). But this is being challenged by the European Commission, which believes it is consistent with state aid rules. Although several EU Member States are asking for the continuation of these coal subsidies, the EU has proposed to exclude plants emitting more than 550 grams of CO₂ per kWh from receiving capacity mechanism support (by no later than 2025) (CAN Europe, 2018).

France is using fiscal support for the co-generation of coal with biomass, worth over \$15 million per year. Similarly, emissions trading schemes, including the EU ETS, which were put in place to support overall reductions in the emissions intensity of electricity generation and industrial activity, provide considerable fiscal support to coal use through free allowances.

A major concern around the continuation of such high levels of government support to coal is that it not only results in high-level emissions year-on-year, but that it also locks countries into assets that will become uneconomical over their lifetime. The risk of stranded assets is discussed in Box 4.

Box 4 Subsidies and stranded assets

Stranded assets refer to fossil fuel supply and generation assets which ‘at some time prior to the end of their economic life (as assumed at the investment decision point), are no longer able to earn an economic return (i.e. meet the company’s internal rate of return), as a result of changes associated with the transition to a low-carbon economy’ (Carbon Tracker, 2017). In practice, stranded coal assets may include exploration infrastructure for ‘unburnable’ coal, thermal coal power plants, existing and new coal mines and transport infrastructure, including mainstream transport networks which rely on coal for a proportion of their income, for example Indian Railways (Whitley and van der Burg, 2015; Worrall et al., 2019).

The drivers of asset stranding will vary across G20 countries, but commonly include the cost of coal for fuel becoming prohibitively expensive, the increasing cost competitiveness of renewables, pollution regulation increasing the cost of extracting or burning coal, and water scarcity (which may increase with climate variability) (Worrall et al., 2018 and 2019).

Government support for coal through public finance and fiscal support can give investors the impression of policy certainty around the future of coal, leading to financial losses when coal infrastructure becomes economically unviable and inevitably closes (IISD, 2018b).

Subsidies can prolong the life of otherwise economically unviable coal infrastructure, hiding their true costs. There are three ways in which they can do this (Worrall et al., 2018). First, subsidies can drive investments into new ‘non-economic’ coal infrastructure, which is likely to become stranded. Second, they can extend the life of high-carbon assets at risk, for example supporting maintenance and retrofitting. Finally, subsidies can support the recovery of closure costs such as decommissioning and environmental remediation. Notably, this form of support is often labelled ‘transition support’, leading to public funds being used to support companies in activities they would otherwise have been required to self-finance (see Box 3).

Although it is beyond the scope of this report to quantify these, subsidies can also include policy postponements which artificially lower the cost of coal, thereby extending the life of coal infrastructure (ibid.).

As noted by Baron and Fischer (2015), concealing the potential for stranding of coal assets through public financial support makes it more difficult for governments to develop and implement decarbonisation policy. It also simultaneously provides inaccurate market signals to investors, who may mistakenly predict a higher return on investment than is feasible. Investors are increasingly awakening to this risk, with many now pushing governments to remove subsidies to coal and provide clarity on decarbonisation plans (IISD, 2018b; UNFCCC, 2017). For SOEs with non-performing coal assets this is even clearer as the costs of both sustaining and closing stressed or stranded assets are often borne by the public purse.

5.3 Coal and coal-fired power consumption

Our analysis identified US\$6.7 billion of government support per year (2016–2017 average) for consumption of coal (for purposes other than coal-fired power generation) and for consumption of coal-fired power. This was provided entirely through fiscal support.²³

These amounts are likely to be higher if consumption of coal for heat generation is included, especially for Russia and China, but due to data limitations not all subsidies to coal-generated heat are captured.

Consumption of coal-fired power received most (US\$6.1 billion per year) of the total amount of support identified for coal consumption.²⁴ Support to the direct use of coal mostly went to business and industry and, while detailed information is limited, coal-fired power consumption support benefited households and business and industry sectors in roughly equal amounts. Table 7 shows the amounts of support to consumption of coal and coal-fired power that benefit households versus business and industry (and support which was for a combination of those sectors or where information was not available to determine which sector it benefited).

The highest amounts of total support to coal consumption (to coal and coal-fired power together) were identified in Indonesia (amounting to US\$2.3 billion per year), Italy (almost US\$870 million per year), Australia (US\$870 million per year), the US (US\$708 million per year) and the UK (US\$682 million per year).

The main measure of support captured in Indonesia was providing electricity at below-market levels, mainly targeted at households. Similar measures providing below-market prices for electricity consumption are also in place in China, Mexico and Russia. Unfortunately, we were unable to capture

Table 7 G20 government support to coal and coal-fired power consumption

US\$ millions, 2016–2017 annual average

| | |
|----------------------------------------------------|--------------|
| Coal consumption | |
| Households | 374 |
| Industry and business | 147 |
| Total | 521 |
| Coal-fired power consumption | |
| Households | 3,714 |
| Industry and business | 1,465 |
| Multiple or unclear (coal-fired power consumption) | 991 |
| Total | 6,170 |

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

²³ This analysis did not identify any support for consumption of coal through public finance or SOE investment. While it is conceivable that there is public finance and SOE support for coal consumption (e.g. public finance for district heating which is coal-fired, or SOE support for consumption of coal by employees at preferential rates), our analysis did not identify any such measures.

²⁴ Much of the data provided for the support towards electricity consumption is across all forms of fossil fuel-based electricity. Therefore, this report estimates the proportion that benefits coal by making pro-rata calculations based on the share of coal in the country's electricity mix. For more information, see the report's methodology note at odi.org/g20-coal-subsidies

these measures as they were not channelled through the budget, and therefore not included in the OECD database.²⁵

One type of financing for coal-fired power which could only be partially captured in our analysis due to lack of comprehensive data was the EU ETS. This was put in place to support overall reductions in the emissions intensity of electricity generation and industrial activity. However, in its current design, the EU ETS provides a considerable volume of fiscal support to carbon-intensive operators in the form of free allowances. (See Box 3 for a detailed discussion on the subsidies that were put in place in the name of transitioning to a zero carbon economy, but which benefit the use of coal.)

5.4 Support for the transition away from coal

Our research found US\$3.1 billion of government support per year being provided to support the transition away from coal, all provided through fiscal support. This includes support measures to help workers and communities as they transition away from mining, as well as support towards decommissioning and rehabilitation of mining sites. Support is also captured in this section for covering the liabilities of mines. While support is often provided for rehabilitation of mining sites as standard practice, without any intention to transition away from coal mining, it is difficult to make the distinction in our database given the lack of detailed information available. Therefore, all support for the rehabilitation of mining sites was included in the data set.

It must also be noted that measures are in place in a number of countries which were not included in our analysis due to the lack of availability of comprehensive data. For example, in May 2016 China's Ministry of Finance established a US\$15 billion Industrial Special Fund for transition of workers in coal and steel industries (Bridle et al., 2017). Unfortunately, this was not captured in the OECD database, and therefore is not included in our totals. Moreover, there is currently limited information on what proportion of this support benefits the coal as opposed to the steel industry.

Most of the support identified in this analysis (US\$2.1 billion per year) was from the German government, and the remainder was from the UK (US\$975 million per year) – in the form of inherited liabilities due to closure of mining sites – and South Korea (US\$49 million per year). In 2018, the Canadian government created a Task Force on Just Transition for Canadian Coal Power Workers and Communities, and in its 2019 budget allocated US\$143 million over five years for an infrastructure fund that will finance priority projects and economic diversification in affected communities to support the transition away from coal (Department of Finance Canada, 2018 and 2019). While France closed down its coal mines in the 1980s, it continues to support former miners through the National Agency to Guarantee Miners' Rights (Agence Nationale pour la Garantie des Droits des Mineurs) (French Senate, 2019). However, the amount of support provided is not available. In the US, while numerous state-level support initiatives exist, we have found no evidence of federal support for miners and communities for their transition away from coal mining and coal-fired power production.

Similar support measures for the transition away from coal were not identified in any of the other G20 countries.

Ensuring support for workers and communities as part of the wider transition away from fossil fuels (including coal mining) is recognised as a critical component of the energy transition. However, in

²⁵ For more information on the data sources and methodology used in this report, please see the methodology note, available at odi.org/g20-coal-subsidies.

managing this process it is essential that there is consideration of the respective responsibilities of the country governments and other key players in the sector (such as the companies themselves), and that mechanisms with the stated aim of assisting the energy transition do not support fossil fuel production and consumption. Box 5 details some key issues around ensuring a ‘just transition’ away from coal.

Box 5 Subsidies and the ‘just transition’

There is a strong link between reforming public financial support for coal and financing a ‘just transition’ away from fossil fuels. To ensure transitions are equitable and do not leave workers and communities in the coal supply chain behind, subsidy reform must be managed carefully (Gass and Echeverria, 2017). There are few historical examples of this taking place, however, with coal transitions generally having taken place rapidly and with little attention paid to ensuring equity (Littlecott, 2016).

The relationship between public support for coal and a ‘just transition’ has two different dimensions. First, existing public financial support to coal could be redirected towards a ‘just transition’, but is instead working against it. Public support for coal often extends the life of economically unviable assets, for example in the case of India (Worrall et al., 2019). Where this occurs, large sums of public finance which could be used to support the development of alternative low-carbon sectors remain locked up in coal and, when coal infrastructure does inevitably become unviable, closures are often rapid and unequitable, hitting coal workers and communities hard (Littlecott, 2016). There are examples of G20 countries considering the social development implications of removing subsidies for other fossil fuels. In 2015 Indonesia removed \$15 billion of support to oil and gas, reallocating funds to infrastructure, education and health, and bolstering the social safety net for the poorest (Gass and Echeverria, 2017).

Second, it is possible to look at where public support measures are explicitly earmarked for ‘transition support’ for workers and communities. Where a ‘just transition’ away from coal is required, various considerations must be taken into account, including (1) the scale of public support needed; (2) to whom this support should be allocated and how; (3) the conditions attached when finance is allocated (e.g. guarantees that financial support will be provided to workers in the form of cash transfers or retraining); and (4) how to ensure a consultative and inclusive process to decide the above.

Germany’s Commission on Growth, Structural Change and Employment (informally known as the ‘Coal Commission’) is a good example of how this process can play out. In June 2018 the German Federal Government established a commission of government, private sector, unions and non-governmental organisations to make recommendations on how Germany could phase-out coal (Wehrmann, 2018). In March 2019 it released its report, recommending a 2038 deadline for closure of all coal-fired power stations and mines, along with a reported public budget of €46 billion promised as a compensation to the industry to ‘foster structural change, including new research institutions, new jobs, new industries and the expansion of new train connections’ (Buchsbaum, 2019). This will be paid for entirely by taxpayers, rather than through increased electricity prices or by coal companies themselves (although they may face other costs). It remains unclear exactly how these funds will be allocated, and it will be important to differentiate between ‘just transition’ support and compensation for private actors who argue for loss of profits (IndustriALL, 2017; Whitley et al., 2017). Moreover, critics have stated that the 2038 deadline means that Germany will not be compliant with either the Paris Agreement on climate change or its own 2020 emissions commitments (Climate Analytics, 2018).

One positive development has been that ensuring support for workers and communities as part of the wider transition away from fossil fuels is recognised as a critical component of the

Box 5 Subsidies and the 'just transition' (cont'd)

wider European energy transition. To that end, the European Parliament has voted to revise the EU ETS Directive, to create a Just Transition Fund. If passed by the European Council, this mechanism will allow some of the funds raised by the auction of emissions certificates to be used for 'just transition' measures. These include education and training, job-seeking support, business creation and mitigating the impacts of transition on physical and mental health.

Finally, it is important to note that challenges of 'just transition' assistance will be very different for advanced economies with existing administrative systems for employment insurance and assistance, and for countries that are still developing administrative frameworks to help assist the unemployed (even within the G20).

6 Conclusion and recommendations

Coal phase-out is critical for the energy transition and to ensure financial and economic sustainability, to fight air pollution and to achieve climate targets. It also presents an opportunity for the G20 to make good on their commitment to end fossil fuel subsidies, demonstrating leadership both at home and abroad.

Our study finds, however, that despite repeated commitments to phase out inefficient fossil fuel subsidies, G20 governments continue to support coal production and consumption to the tune of at least US\$63.9 billion per year through fiscal support, public finance and SOE investment. As we highlight above, this is a conservative estimate given that many sources of finance are not captured in the most comprehensive data sources and therefore in our totals. It is likely that in many cases this G20 support to coal has subsidised the same assets multiple times, by (1) incentivising the building of new coal infrastructure; (2) propping up the operations of those same mines and power plants; and (3) paying them out to shut down early or install CCS technologies. The G20 also continues to support coal mining and coal power indirectly by failing to charge companies for the health and climate damages they cause.

These tens of billions of dollars a year of G20 support to coal are not just locking in the high-carbon economy and leading to stranded assets, they are also a missed opportunity to support a clean energy transition and to achieve other sustainable development objectives.

Another way is possible. Across the G20, coal transitions can (and must) be implemented in a way that is highly coherent with the socioeconomic objectives of these countries, including the provision of affordable and universal access to electricity, ensuring energy security and supporting a ‘just transition’ for workers and communities who are potentially the most affected (Sartor, 2018).

As a first step in their wider coal transitions the G20 must:

- urgently agree to a complete phase-out of government support to coal mining and coal-fired power
- complete peer reviews of coal and other fossil fuel subsidies by 2020
- establish country-level plans for ending government support to coal, ensuring that:
 - mechanisms with the stated aim of assisting the energy transition do not support coal production and consumption, and
 - any remaining support facilitates a ‘just transition’ for workers and communities, and target the most vulnerable groups during the energy transition
- establish a standing agenda item in G20 Energy Ministerial meetings to share lessons learnt on phasing out government support to coal – and to other fossil fuels – and to track progress towards phasing out coal, with support from the OECD, IEA, IMF and other expert organisations.

The peer reviews should build on those already in progress or completed by Argentina, Canada, China, Germany, Indonesia, Italy, Mexico and the US, and would benefit from an expanded scope, including support through public finance and SOE investment.

Governments can also work with and learn from the positive example of the PPCA, which is trying to use practical cooperation and diplomatic leadership to help find solutions to the transition from coal to clean energy. The PPCA has begun building positive relationships and sharing real-world examples and best practices to support the phase-out of unabated coal, and the UK and Canada have provided international funding to support the PPCA's work (PPCA, 2018b).

G20 governments have a clear opportunity to align their fiscal and financial tools with the transition away from coal, by removing subsidies to and increasing taxes on coal. By expanding the fiscal space available, G20 governments will have additional resources to: establish national or regional coal transition bodies and 'just transition' funds (into which companies also pay); support affected coal regions, communities and workers; develop or augment existing wider social protection programmes; and increase funding for health, education and low-carbon public infrastructure.

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Annex

Table A1 Total amounts of G20 government support identified for coal production and consumption, through fiscal support, public finance and SOE investment

US\$ millions, 2016–2017 annual average

| | Fiscal support | Public finance (international) | Public finance (domestic) | SOE investment |
|--------------|-----------------|--------------------------------|---------------------------|-----------------|
| Argentina | 596 | none identified | none identified | not quantified |
| Australia | 819 | 0.04 | none identified | none identified |
| Brazil | 281 | none identified | none identified | none identified |
| Canada | 32 | none identified | none identified | none identified |
| China | 760 | 9,503 | none identified | 8,760 |
| France | 94 | none identified | none identified | 1,114 |
| Germany | 2,394 | 24 | none identified | none identified |
| India | 88 | 800 | 10,595 | 6,440 |
| Indonesia | 3,055 | none identified | 286 | 147 |
| Italy | 902 | none identified | none identified | none identified |
| Japan | 68 | 5,152 | none identified | none identified |
| Mexico | 996 | none identified | none identified | none identified |
| Russia | 28 | not quantified | 2 | 748 |
| Saudi Arabia | none identified | none identified | none identified | none identified |
| South Africa | 629 | 200 | none identified | 3,380 |
| South Korea | 204 | 1,057 | none identified | 3 |
| Turkey | 659 | none identified | none identified | 329 |
| UK | 1,818 | 15 | none identified | none identified |
| US | 1,948 | 11 | none identified | none identified |
| Total | 15,370 | 16,763 | 10,882 | 20,922 |

Note: slight variation in final results of added totals due to rounding.

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

Table A2 Total amounts of G20 government support identified (through fiscal support, public finance and SOE investment) to each key stage of coal production or consumption

US\$ millions, 2016–2017 annual average

| | Coal production (incl. infrastructure) | Coal-fired power production | Consumption | Transition support |
|--------------|-------------------------------------------|--------------------------------|-----------------|--------------------|
| Argentina | 227 | 368 | 0.4 | none identified |
| Australia | 14 | none identified | 805 | 0.05 |
| Brazil | none identified | 281 | none identified | none identified |
| Canada | 14 | none identified | 17 | none identified |
| China | 1,975 | 16,870 | 68 | 2 |
| France | 0.5 | 1,129 | 78 | none identified |
| Germany | 103 | 24 | 185 | 2,106 |
| India | 1,246 | 16,673 | none identified | 3 |
| Indonesia | 154 | 1,013 | 2,320 | none identified |
| Italy | none identified | 33 | 870 | none identified |
| Japan | 1,088 | 4,132 | none identified | none identified |
| Mexico | none identified | 992 | 3 | none identified |
| Russia | 29 | 748 | none identified | none identified |
| Saudi Arabia | none identified | none identified | none identified | none identified |
| South Africa | 260 | 3,380 | 570 | none identified |
| South Korea | 140 | 1,076 | none identified | 49 |
| Turkey | 333 | 281 | 374 | none identified |
| UK | 15 | 161 | 682 | 975 |
| US | 1,068 | 173 | 718 | none identified |
| Total | 6,667 | 47,336 | 6,691 | 3,135 |

Note: slight variation in final results of added totals due to rounding.

Source: the data summarised in this table is based on multiple sources. For more information, see the country data sheets and the methodology note, available at odi.org/g20-coal-subsidies.

Table A3 List of public finance institutions included in the OCI 'Shift the Subsidies' database

| G20 public finance institutions | |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Argentina | Banco de Inversión y Comercio Exterior (BICE), Government of Argentina |
| Australia | Export Finance and Insurance Corporation, Clean Energy Finance Corporation, Australian Renewable Energy Agency |
| Brazil | Brazilian Development Bank (BNDES), Banco de Brasil, Banco de Desenvolvimento de Minas Gerais, Banco do Nordeste do Brasil, Banco Regional de Desenvolvimento do Extremo Sul, Caixa Economica Federal |
| Canada | Export Development Canada (EDC), PPP Canada, Business Development Bank of Canada (BDC), Sustainable Development Technology Canada (SDTC) |
| China | Agricultural Bank of China, Bank of China, Bank of Communications, China CITIC Bank, China Construction Bank, China Development Bank, China Export and Credit Insurance Corporation, China Silk Road Fund, Export-Import Bank of China, Industrial and Commercial Bank of China |
| France | Agence Française de Development (AFD), BPI France / Compagnie Française d'Assurance pour le Commerce Extérieur (Coface), Proparco, Caisse des Dépôts (CDC) Group |
| Germany | Deutsche Investitions und Entwicklungsgesellschaft (DEG), Euler Hermes, KfW Bank, KfW-Export Finance (IPEX) Bank |
| India | No data on coal for the majority government-owned banks for the most recent year assessed in this study ⁱ |
| Indonesia | Bank Mandiri, Bank Negara Indonesia, Bank Rakyat Indonesia, Bank Tabungan Negara, Indonesia Eximbank, Indonesia Infrastructure Finance, Indonesia Infrastructure Guarantee Fund, Sarana Multi Infrastruktur ⁱⁱ |
| Italy | Cassa Depositi e Prestiti (CDP), Servizi Assicurativi del Commercio Estero (SACE) |
| Japan | Japan International Cooperation Agency (JICA), Japan Bank for International Cooperation (JBIC) and Nippon Export and Investment Insurance (NEXI), Japan Oil, Gas and Metals National Corporation (JOGMEC) |
| Mexico | Banobras, Nafinsa, Bancomext |
| Russia | VTB Bank, Vneshecombank, Sberbank, Government of Russian Federation, EXIAR |
| Saudi Arabia | National Commercial Bank, Public Investment Fund, Saudi Fund for Development, Saudi Industrial Development Fund |
| South Africa | Development Bank of Southern Africa (DBSA), Industrial Development Corporation of South Africa (IDC), Export Credit Insurance Corporation of South Africa (ECIC) |
| South Korea | Export-Import Bank of Korea (KEXIM), K-Sure, Korea Development Bank (KDB), Korea Information Certificate Authority (KICA) ⁱⁱⁱ , Korea Finance Corporation (KFC) |
| Turkey | Halkbank, Ziraat Bankasi, Vakifbank ^{iv} |
| UK | Royal Bank of Scotland (RBS), Department for International Development (DFID), Commonwealth Development Corporation Group (CDC), Department for Business, Innovation and Skills (BIS) |
| US | Export-Import Bank (ExIm), Overseas Private Investment Corporation (OPIC) |

Note: these institutions have been reviewed for their support to coal or coal-fired power production.

ⁱ The India country study instead relied on recently published aggregate data from Worrall et al. (2018), which reviewed various national data sources. For more details, see the India country study and data sheets at odi.org/g20-coal-subsidies/india

ⁱⁱ Limited data was identified for Indonesia, but this is most likely an issue regarding transparency and data availability. It is almost certain some of these banks have been involved in recent coal transactions but the OCI database was unable to quantify these.

ⁱⁱⁱ Post-2013 KFC no longer existed as it had merged with KDB.

^{iv} While no public finance for coal was identified, this is most likely because of the lack of transparency and it is very likely that these institutions do provide financing for coal given its prominence in Turkey's energy policy.

Source: OCI (2019).

Table A4 G20 country commitments to end public finance support to coal and coal-fired power

| G20 country | Commitment at MDB level (beyond WBG, EIB, EBRD)? | Commitment at national development agencies and banks? | Commitment at national/domestic export credit agencies? | Export credit restriction in OECD? | Notes | Source |
|-------------|--------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Australia | x | x | x | ✓ | – | OECD statement |
| Argentina | x | x | x | x | – | OECD statement |
| Brazil | x | ✓ | x | x | Brazilian Development Bank BNDES has announced it will no longer support coal plants. | Statement by BNDES Infrastructure Director Marliene Ramos |
| Canada | x | x | ✓ | ✓ | In addition to the OECD Arrangement, EDC will not finance coal plants in Equator Principle designated countries unless equipped with CCS. | OECD statement |
| China | x | ? | x | x | China's Green Credit policy and associated regulations pushed all Chinese public and private banks to reduce financing to highly polluting industries, including coal, though these restrictions were not rigid. | Information on China's Green Credit Policy and restrictions on highly polluting industries; US–China joint statement |
| France | x | ✓ | ✓ | ✓ | US–China joint statement included a restatement of this principle, that China would strengthen 'regulations with a view to strictly controlling public investment flowing into projects with high pollution and carbon emissions...' | France's Speech at the Environmental Conference at Elysée; prior statement regarding bilateral finance through AFD |
| Germany | x | ✓ | x | ✓ | Restrictions on export credits for coal plants without CCS and with no CO ₂ storage. Restrictions on bilateral development finance for coal. Restrictions on coal finance at bilateral institutions. KfW IpeX-Bank restrictions still allow for coal plants under 500 MW and over 500 MW if they meet a minimum efficiency standard. | Federal Government report on the financing of international coal-related projects for the Economic Committee of the Bundestag |
| India | x | x | x | x | – | – |
| Indonesia | x | x | x | x | – | – |
| Italy | x | x | x | ✓ | – | OECD statement |

Table A4 G20 country commitments to end public finance support to coal and coal-fired power (cont'd)

| G20 country | Commitment at MDB level (beyond WBG, EIB, EBRD)? | Commitment at national development agencies and banks? | Commitment at national/domestic export credit agencies? | Export credit restriction in OECD? | Notes | Source |
|--------------|--------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Japan | x | x | x | ✓ | – | OECD statement |
| Mexico | x | x | x | x | – | – |
| Russia | x | x | x | x | – | – |
| Saudi Arabia | x | x | x | x | – | – |
| South Africa | x | x | x | x | – | – |
| South Korea | x | x | x | ✓ | – | OECD statement |
| Turkey | x | x | x | x | – | – |
| UK | ✓ | ✓ | x | ✓ | Issued policy statement similar to US and Nordic joint statement restricting coal finance overseas, but did not apply to export credits. | Statement |
| US | x | ✓ | ✓ | ✓ | Joint statement with US and Nordic countries: ending public financing for new coal-fired power plants overseas (at MDBs and in bilateral finance) except in rare circumstances | Prior Treasury guidance precluding support for coal projects via MDBs has been replaced by Trump Administration |

Note: WBG = World Bank Group; EIB = European Investment Bank; EBRD = European Bank for Reconstruction and Development.

Source: Doukas et al. (2017), with further updates from the report's authors.

Table A5 List of majority government-owned national-level SOEs identified in G20 countries which have operations in coal or coal-fired power production

| Majority government-owned national-level SOEs | |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Argentina | – |
| Australia | – |
| Brazil | – |
| Canada | – |
| China | China Coal; China Huaneng Power International; China Datang International Power Corporation; China Guodian Group Ltd; Shenhua Group; China Energy Investment Corporation (conglomerate formed in 2017 of China Guodian Group and Shenhua Group); Huadian Resources; China Resources Power |
| France | Electricité de France |
| Germany | – |
| India | Oil and Natural Gas Corporation India (ONGC); National Thermal Power Corporation Limited (NTPC); Damodar Valley Corporation (DVC); Bharat Heavy Electricals Limited (BHEL); Neyveli Lignite Corporation (NLC); Coal India Limited (CIL) |
| Indonesia | PT Bukit Asam (PTBA) |
| Italy | – |
| Japan | – |
| Mexico | – |
| Russia | Gazprom |
| Saudi Arabia | – |
| South Africa | Eskom Holdings |
| South Korea | Korea Electric Power Corp (KEPCO); Korea Coal Corporation (KoCoal) |
| Turkey | Turkish Coal Operations Authority (TKI); Turkish Hard Coal Enterprises (TTK); Electricity Generation Company (Elektrik Üretim Anonim Şirketi - EÜAŞ) |
| UK | – |
| US | – |

Source: various, based on analysis conducted for this report. For more information, see G20 country study data sheets, available at odi.org/g20-coal-subsidies.



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