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Global Subsidies Initiative

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CASE STUDY: CHINA

Beyond Fossil Fuels: Fiscal Transition in BRICS

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China's dependence on fossil fuels at a glance (2017 data)

$16,782
GDP per capita, purchasing power parity in current international $ (World Bank, 2019)

89%
Share of fossil fuels in total primary energy supply (Annex A in the main report)

4.2%
Share of revenue from fossil fuel production and consumption in general government revenue (Table 1 in this brief)

Proved reserves of fossil fuels. Proved reserves of fossil fuels in China amount to around 650 $GtCO_2$, of which 96 per cent is coal, with conventional oil and gas at about 10 $GtCO_2$ each (see Annex A in the main report). In other words, if burned, China's proved fossil fuel reserves alone will almost certainly take the world beyond a 1.5°C temperature increase and probably beyond 2°C (Hare, Roming, Schaeffer, & Schleussner, 2016; authors' calculations based on Intergovernmental Panel on Climate Change, 2014, Table 2.2, p. 64 and Le Quéré et al., 2016).

Fossil fuel extraction and use. China is the world's largest coal producer (accounting for nearly half of global production), 6th largest gas producer and 8th largest oil producer (BP, 2019). Fossil fuels—mostly coal—account for about 90 per cent of China's energy production and consumption (see Annex A in the main report). China is in the process of consolidating coal extraction and reducing overcapacity in the sector, including a three-year moratorium on new coal mines in place since the beginning of 2016 (Yang, 2015). More than two thirds of the country's oil consumption is covered by imports, making it the world's largest energy importer and the most import-dependent major economy in the world (China Energy Group, n.d.). China also implements a strategy of loans

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for oil and secured contracts and equity in a number of oil-exporting countries, including two BRICS nations: Brazil and Russia (Meidan, 2016). Imported crude oil is refined in China, which has the world's second largest refining capacity after the United States (BP, 2018). Refining has been a driver of the Chinese oil and gas industry's steady growth. Gas use is so far still mostly covered by domestic sources, with efforts to increase both the use of coalbed methane and imported gas. Yet, due to growing demand, this could change in the future, as China is increasingly witnessing an import dependency on natural gas (particularly liquefied natural gas) (O'Sullivan, 2019).

The role of the fossil fuel sector in the economy. The Chinese economy is well diversified and coal extraction plays a significant role in only three provinces in Western China: Inner Mongolia, Shanxi and Shaanxi. In 2017, government revenue from oil, gas and coal production and consumption stood at just 1.2 per cent of the country's GDP (see Table 1 in this brief). In other words, these revenues generated 4.2 per cent of the general government revenue (i.e., the joint budget of the Central Government, regions, municipalities, social security and other government-managed funds), with the majority of that revenue coming from fossil fuel consumption (see Table 1 in this brief). In 2017, the Chinese economy employed close to 800 million people (National Bureau of Statistics of China, n.d.), and the fossil fuel industry accounted for less than 1 per cent of that total. China is in the process of resolving a huge overcapacity in the coal sector (Chang, 2015). The number of coal industry employees shows a strong downward trend from 5.3 million in 2013 to about 4 million in 2017 (International Monetary Fund [IMF], 2017). The three state-owned oil companies—China National Petroleum Corporation (CNPC), Sinopec and China National Offshore Oil Corporation (CNOOC)—employ roughly an additional 2 million staff.

State-owned enterprises (SOEs) in the fossil fuel sector. On the list of 97 SOEs controlled directly by the Central Government through the State-owned Assets Supervision and Administration Commission of the State Council, 23 have stakes in fossil fuels. SOEs generally pay 25 per cent corporate income tax, plus an additional 10 per cent of net profits. These stakes increase the government's exposure to the risk of fossil fuel asset stranding as a result of a clean energy transition. The oil and gas industry in China has three big state-owned companies with varying shares of government-owned capital stock: CNPC (97.6 per cent) and CNOOC (64.4 per cent), which have both upstream and downstream assets, and Sinopec (92.5 per cent), which focuses mostly on downstream operations. The coal industry is more diverse, being split between national SOEs, provincial SOEs, and Township and Village Enterprises. Electricity production is controlled by SOEs for the most part, but many have subsidiaries that are listed on stock exchanges, so they are at least partly privately owned (Cunningham, 2015). In 2017, Shenhua, China's largest coal company merged with another SOE, Guodian, and formed China Energy Investment Corporation, bringing together coal mining, coal power plants and wind power in what is now the world's biggest power company. Its generation capacity includes 23 per cent renewables (Asia Times, 2017; Buckley & Nicholas, 2017; Reuters, 2017). China's State Development and Investment Corporation also vowed in 2019 to no longer invest in new thermal power plants (Bloomberg, 2019). These are encouraging signs of China's intention to lower its reliance on coal while expanding its renewable capacity.

Government plans on energy and climate. The aim to reduce air pollution is an important driver of energy policy, including a gradual switch from coal to gas as well as renewable energy sources. The strategy is to reduce coal burning in the eastern part of China, especially in metropolitan regions, while expanding "coal bases" in the western part. Another driver in recent years is the aim to reduce the huge overcapacity in both the mining and the coal power sectors. Conventional gas and coalbed

methane have been increasingly used to improve air quality due to the switch from coal. China is trying to develop its domestic shale gas potential, but water scarcity imposes a natural limitation on these efforts.

The current 13th Five-Year Plan (2016–2020) focuses on more efficient use of coal, building more oil and gas infrastructure, and pushing forward unconventional oil and gas development. Total energy consumption is capped at 5 billion tonnes of coal equivalent by 2020 (Central Committee of the Communist Party of China, n.d.), which is a 16 per cent increase from 2015 levels (London School of Economics, 2016). As part of its 13th Five-Year Plan, China also seeks to cap coal consumption at the national level for the first time at 4.1 billion tonnes by 2020, or to less than 58 per cent of total energy consumption (Fei, 2018). In addition, regions and cities with heavy air pollution have set coal reduction targets as part of national and local air pollution action plans, including large coal consumers such as Tianjin, Hebei and Shandong. China's Nationally Determined Contribution, submitted under the UN Framework Convention for Climate Change, establishes a peak in carbon dioxide emissions around 2030, with efforts to peak earlier; a reduced emissions intensity of GDP by 60–65 per cent in 2030 from 2005 levels; and increasing the share of non-fossil primary energy to 20 per cent by 2030 (People's Republic of China, 2016). However, despite the aim to move beyond coal domestically, through its Development Bank and Export Import Bank and as part of its Belt and Road Initiative, China is sending mixed signals by financing other countries' fossil fuels and renewables, with the majority of those investments still going toward coal, oil and gas (Chen, 2019; Climate Home News, 2019).

Fossil fuel production and fiscal space. The Chinese government's tax and non-tax revenues from fossil fuel production in 2017 were at 0.2 per cent of the GDP or 0.6 per cent of the general government budget (see Figure 1 and Table 1 in this brief). A corporate income tax of 25 per cent is a major source of revenue from fossil fuel production. A resource tax is levied on all fossil fuels and goes mostly to subnational governments. The resource tax for oil and gas was set at 5 per cent in 2011 and raised to 6 per cent in 2014, shifting profits from SOEs to the government (S&P Global Platts, 2014). The Coal Resource Tax was reformed in 2014 to an ad-valorem model, simplifying procedures. It now follows price developments and captures excessive windfall profits of coal producers. After this reform was implemented at a moment of very low coal prices, prices picked up and generated an increase in this revenue stream for the government (Xinhua, 2017). While the reform resulted in an increase in revenues for local governments, it may be creating an incentive for keeping mines open longer than required by the Central Government's coal cap policy.

Fossil fuel consumption and fiscal space. Authors' calculations indicate that government revenues from taxes on fossil fuel consumption amount to 1 per cent of GDP or 3.6 per cent of the general government revenue. Crude oil, gasoline, diesel and coal sales are subject to a 17 per cent value-added tax (VAT).[1] VAT is one of the most significant revenue streams originating from fossil fuels in China. A previously raised business tax was integrated into the VAT in 2016. An excise tax called the Consumption Tax is levied on refined petroleum products, including on gasoline (CNY 1.52 per litre) and diesel (CNY 1.2 per litre), and is another significant source of revenue. An urban maintenance and construction tax and an education surcharge are added on top of the amounts paid for business tax, VAT and excise tax.

[1] The VAT tax regime slightly changed in 2018, moving from 17 per cent to 16 per cent for the sale and importation of goods; it was further reduced from 16 per cent to 13 per cent in 2019. However, these changes do not affect the calculations in Figure 1 and Table in this brief, which only go up until 2017.

China also implements carbon pricing via a cap-and-trade approach. Since 2011, several regions have developed pilot emission trading systems, and a national scheme is planned to be operational for the power sector in 2020 (Holder, 2017; Xinhua 2018). As part of its global exercise, the International Monetary Fund (IMF) estimated the value of under-taxing fossil fuel consumption in China in 2017 at USD 449 billion in terms of climate change effects[2] and USD 1,094.4 billion in terms of air pollution impacts on human health (Coady, Parry, Nghia-Piotr, & Shang, 2019; IMF, 2018). In other words, the IMF estimates of fossil fuel under taxation are roughly equivalent to half of the entire general government revenue.

Fossil fuel subsidies. According to an Organisation for Economic Co-operation and Development (OECD) estimate (which includes both budgetary transfers and government revenue foregone due to tax breaks), fossil fuel subsidies amounted to 0.1 per cent of GDP or 0.5 per cent of the general government revenue in 2017 (see Figure 1 and Table 1 in this brief). Subsidies to fossil fuel production come in the form of direct grants to SOEs and targeted reductions of the resource tax, encouraging enhanced oil recovery and production from geologically challenging deposits (OECD, 2019a), research and development support to enhance fossil fuel production, and import duty waivers for equipment (Xue, Wang, Bridle, Gerasimchuk & Attwood, 2015). Shale gas and coalbed methane receive a direct per-unit subsidy. In the case of shale gas, this subsidy is being reduced in a stepwise fashion from CNY 0.4 per cubic metre in 2015 to CNY 0.2 per cubic metre in 2019 (OECD, 2019a). Yet, China reduced consumer subsidies, mainly for gasoline and diesel, from USD 29 billion in 2014 to USD 13 billion in 2016, taking advantage of the drop in oil prices during that time period (OECD, 2019b).

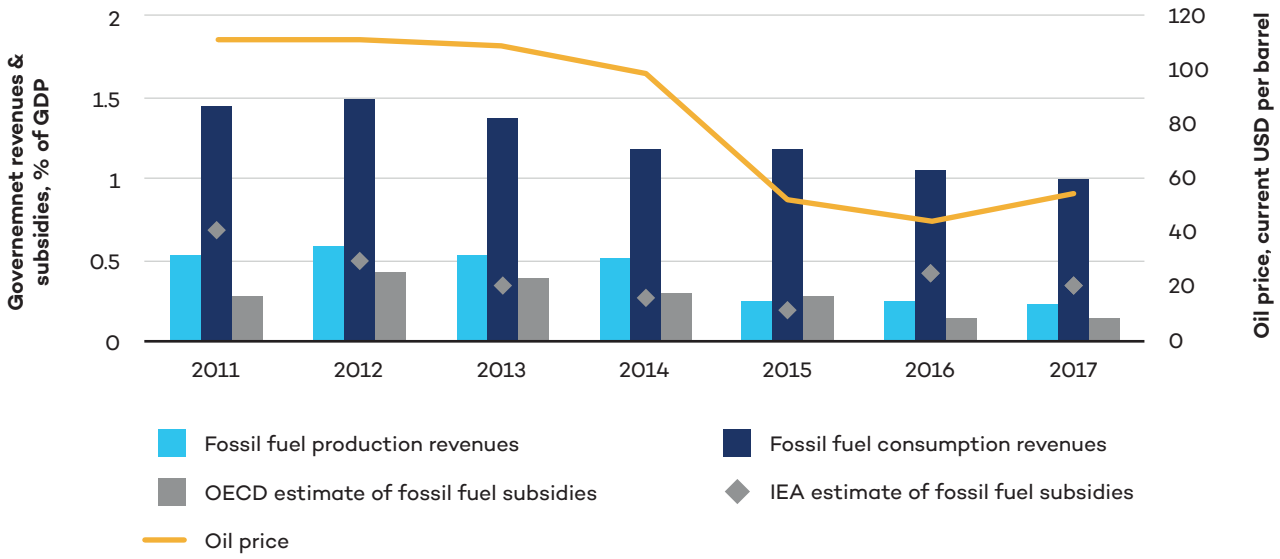
In 2008, and again from 2010 to 2012, price caps were put on thermal coal to try to strike a delicate balance between coal mines and power generators, both of which are state owned. The direction of reform is toward consolidation in bigger mines and companies and toward a more open market. Some other fossil fuel products (natural gas, coal gas, liquefied natural gas and coal for residential use) enjoy a preferential VAT rate of 13 per cent. Imports of oil products, coal and gas are exempt from VAT (OECD, 2015). Aviation fuel used in domestic flights is exempt from the excise tax, which represents one of the largest fossil fuel consumption subsidies in China (OECD, 2015, 2018). China also indirectly subsidizes coal mining through preferential rail freight tariffs on coal transport, but these are not included in the OECD subsidy estimates (Chen & Gencsu, 2019).

In the electricity and heat sector, prices are also regulated and tariffs are tiered depending on the category and volume of consumption (Zhang & Qin, 2015). Most utilities are state owned and required to supply certain categories of consumers at below-cost prices for electricity and heat. Utilities can then be compensated by government or through capped prices for coal and other feedstock, which creates a flow of subsidies in the sector. The International Energy Agency (IEA, 2019a) estimated subsidies to electricity consumption in China at nearly USD 25 billion in 2018. However, these price subsidies to electricity consumers are not fiscal and thus are not reported by the OECD database, which remains the benchmark source of subsidy estimates in this report.

[2] The estimate is based on an illustrative value of roughly USD 40 per tCO_2.

Earmarked funds. China is implementing fiscal reform that is expected to do away with most earmarking. China's 13th Five-Year Plan includes the CNY 100 billion (USD 14.5 billion) Industrial Special Fund for employment restructuring in the coal and steel sectors in view of overcapacity cuts (Bridle et al., 2017). These job reallocation efforts are partially funded from surcharges on coal-fired power (Kang et al., 2016), with other funds coming from both the Central and provincial governments.

Figure 1. Government revenues versus subsidies to fossil fuels in China as a percentage of GDP



Authors' calculation based on BP, 2019; CNPC n.d.; CNOOC, n.d.; IEA, 2019a, 2019b; National Bureau of Statistics of China, n.d.; OECD, 2019b;World Bank, 2019; Sinopec, n.d.; SxCoal, 2018.[3]

[3] Only the coal resource tax is excluded from the graph due to lacking data from 2011 to 2015.

Table 1. Government revenues versus subsidies to fossil fuels in China in 2017[4]

	CNY billion	USD billion	Percentage of GDP	Percentage of general government revenue
GDP	**82,075**	**12,143**	**100.0%**	**362.3%**
Total general government revenue[5]	**22,387**	**3,312**	**27.6%**	**100.0%**
Fossil fuel revenues:	**962**	**143**	**1.2%**	**4.2%**
Total revenues from fossil fuel production[6]:	**140**	**21**	**0.2%**	**0.6%**
Operation Revenue of state-owned capital, petroleum and petrochemical enterprises	6	0.9	0.01%	0.03%
SOE oil and gas production taxes, including:	64	9.4	0.08%	0.3%
Sinopec	16	2.4	0.02%	0.1%
CNOOC	12	1.7	0.01%	0.1%
CNPC	36	5.3	0.04%	0.1%
Coal resource tax	67	9.9	0.1%	0.3%
Operation revenue of coal SOE's	3.4	0.5	0.0%	0.02%
Total revenues from fossil fuel consumption[7]:	**822**	**122**	**1%**	**3.6%**
VAT on gasoline, diesel and coal	308	46	0.4%	1.4%
Excise taxes on diesel and gasoline	514	76	0.6%	2.3%

[4] Totals and subtotals may not match due to rounding.

[5] General government includes the Central Government, regional governments, local governments, social security and other government-managed funds.

[6] The total for revenues from fossil fuel production is a conservative estimate since it relies on the structure of government reporting whereby some data are not disaggregated. In particular, for SOE production taxes, only corporate income taxes are listed in the table and not all other taxes were available from 2011 to 2017. Corporate income taxes were available for Sinopec, CNOOC and CNPC for all years, but other production taxes (resources tax, education fee, special oil proceeds, urban maintenance and construction tax) were only available from 2011 to 2017 for CNPC and from 2012 to 2016 for Sinopec, and not available at all for CNOOC.

[7] The total for revenues from fossil fuel consumption is a conservative estimate since it relies on the structure of government reporting whereby some data are not disaggregated. For the calculation of VAT on gasoline, diesel and coal, IEA final consumption volumes were used from 2011 to 2017. A 1 per cent VAT rate was applied to all three fuels, using GIZ (n.d.) data for gasoline and diesel prices considering that prices at the pump already include VAT and excise taxes. For VAT on coal, Qinhuangdao spot prices were used from BP. For the determination of excise taxes on diesel and gasoline, an excise tax of USD 0.25 per litre was applied to gasoline sales and USD 0.18 per litre for diesel sales.

	CNY billion	USD billion	Percentage of GDP	Percentage of general government revenue
Fossil fuel subsidies:				
OECD estimate (direct transfers and tax expenditure):	**109**	**16.17**	**0.1%**	**0.5%**
Fossil fuel production subsidies	11	1.67	0.01%	0.1%
Fossil fuel consumption subsidies	98	14.5	0.1%	0.4%
IEA estimate (regulated prices):	**277**	**41**	**0.3%**	**1.2%**
Subsidies to oil consumption	122	18	0.2%	0.5%
Subsidies to consumption of fossil fuel-based electricity	155	23	0.2%	0.7%

Source: Authors' calculation based on BP, 2019; CNPC, n.d.; CNOOC, n.d.; IMF, 2019; IEA, 2019a, 2019b; National Bureau of Statistics of China, n.d; OECD, 2019b;World Bank, 2019; Sinopec, n.d.; SxCoal, 2018.

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