Subsidies to Coal Production in China

GSI REPORT

IISD
International Institute for Sustainable Development

Global Subsidies Initiative

Hao Xue
Hanjie Wang
Richard Bridle
Ivetta Gerasimchuk
Clement Attwood

December 2015

International Institute for Sustainable Development

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Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Fax: +1 (204) 958-7710
Website: www.iisd.org
Twitter: @IISD_news

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Global Subsidies Initiative

International Environment House 2,
9 chemin de Balexert
1219 Châtelaine
Geneva, Switzerland
Canada R3B 0T4

Tel: +1 (204) 958-7700
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Executive Summary

This report presents a first detailed estimate of subsidies to coal production in China: CNY 35.7 billion (USD 5.8 billion[1]) in 2013, excluding the preferential element of credit support to the industry. Credit support is certainly an important subsidy, but the estimate presented here contains significant uncertainty. To reflect this, credit support has been separated from the other subsidy estimates presented here. Depending on the assumptions, credit support can be estimated between CNY 3.5 and 35.7 billion (USD 0.57 billion and USD 5.8 billion).

The estimate presented here provides a missing piece in the puzzle of the social and fiscal costs of coal in China. Unlike the top-down estimates of fossil fuel subsidies (FFSs) to consumers and externalities associated with coal use, this review is a bottom-up inventory that links the cost of subsidies to specific policies.

The scope of the report is limited to subsidies to coal production, including subsidies to coalbed methane production, over the period of 2013–2015. The analysis covers the national-level and provincial-level subsidies in the coal-producing provinces of Shanxi, Shaanxi and Inner Mongolia.

Based on a review of individual fiscal and other relevant policies, the report identifies 18 subsidies to coal extraction operational in China over 2013–2015, and quantifies 11 of them. The most significant schemes by value are:

- Temporary tax and fee relief from provincial and local governments (USD 1.65 billion)
- Investment in fixed assets from the state budget (USD 1.27 billion)
- Compensations for the coal mines that are shut down in the coal phase-out plan (USD 1.03 billion)
- Value-added tax (VAT) rebates, including VAT rebates for coalbed methane production (USD 460 million)
- Direct subsidies to listed coal companies (USD 100 million)
- Coalbed methane production subsidies (USD 70 million)
- Research and development support from the state budget (USD 50 million)
- Special fund for risky exploration of overseas mine resources (USD 10 million)

The size of China's subsidies to coal producers appears relatively small in comparison with the level of coal production (3.87 billion tonnes per year in 2014). The estimated subsidization rate is between USD 1.5 (without credit support) and USD 3 per tonne (with credit support) per year. However, different coal producer subsidies through different methods and forms have very different impacts on coal production, processing and consumption and related activities. Coal subsidies such as credit support, investment in fixed asset from the state budget and direct grants may be more detrimental than other subsidies (e.g., VAT rebate exemptions or compensations for the shutdown of mines) by driving investments that lock in coal use for the longer term. In addition to preferential fiscal measures, other policies also play important roles in support to coal production. Even though it may be difficult to quantify non-fiscal support, it should not be overlooked. Thus this report discusses such measures qualitatively. For instance, regulation support like quality control for coal import and preferential credit conditions for state-owned enterprises (SOEs) could be equivalent to billions of CNY. Furthermore, SOEs may gain even more support through current institutional arrangements. There are other disguised subsidies, such as preferential policies for SOEs, besides credit support from banking systems among the supports to coal producers.

Subsidies are present at all levels of government. Central government and state level subsidies are often the most visible, but subsidies from provincial and local government can also be very significant. Even if the central government adopts subsidy-reducing policies, provincial

[1] USD value based on average exchange rate for 2013 (1 RMB = 0.163 US$) source: oanda.com

and local governments have discretion to offer complementary subsidies to offset central government efforts to reduce them. Further work is needed to examine the role of subsidies at subnational levels.

Throughout the world, FFSs have been found to be, in most cases, blunt—and therefore very expensive—tools that often fail to reach their targeted beneficiaries. Further, they often lead to a range of unintended consequences such as underinvestment in the energy sector, wasteful energy consumption practices, increased air pollution and emissions of greenhouse gases. China is no exception in this case. Even in instances where subsidies are believed to be efficient, it is critical to improve their monitoring.

China has already committed to phasing out "the inefficient fossil fuel subsidies that encourage wasteful consumption" under both Asia-Pacific Economic Cooperation and G-20. Moreover, as the country presiding over G-20 in 2016, China has agreed to work closely with other G-20 members to phase out such inefficient subsidies by "a date certain." (The White House, 2015)

Identification and quantification of FFSs creates transparency, which is the first step on the journey to reform inefficient subsidies. This report provides the information that can inform this journey.

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1.0 Introduction

China is taking steps to rationalize its fossil fuel subsidies (FFSs). Not only has China volunteered to undergo a peer review of its FFSs within the G-20 (along with the United States and followed by Germany), but it also committed to working closely with other G-20 members to "phase out inefficient FFSs by a date certain" under the U.S.-China Joint Presidential Statement on Climate Change in September 2015 (The White House, 2015).

Holding to the idea that "you cannot manage what you do not measure," IISD's Global Subsidies Initiative (GSI) has analyzed FFSs in more than 20 countries under a three-step approach: identify, measure and evaluate. This report follows the same logic with the objective to provide the first of its kind estimate of subsidies to coal extraction in China.

Subsidies are a key tool at the disposal of policy-makers to influence the evolution of the energy industry in general and the coal industry in particular. However, subsidies come with unintended negative impacts, including increased wasteful consumption and overcapacity, unintended environmental and social consequences, and the risk of creating vested interests.

This report presents a bottom-up inventory of subsidies to the Chinese coal industry. It starts with a snapshot of the different methodologies available for subsidy evaluation and then describes the identified subsidies to coal producers. This report is a building block to increase understanding of these subsidies and promote transparency over the policy measures shaping the policy landscape in China.

This project is part of a wider IISD-GSI project to review the role of coal in the energy sector in China and is published alongside a report examining the impact of coal subsidies on plans to increase the deployment of renewable energy (Bridle & Attwood, 2015).

2.0 The Chinese Coal Industry

China is both the world's largest producer and consumer of coal. Chinese production accounted for 47 per cent of the world total in 2014 (BP, 2015). Within China, coal consumption accounts for 66 per cent of the primary energy consumption (National Bureau of Statistics, 2015), whereby electricity generation accounts for over half of all coal consumed. Coal is of huge importance not only in terms of energy supply for economic development, and the associated employment, but also its environmental impact.

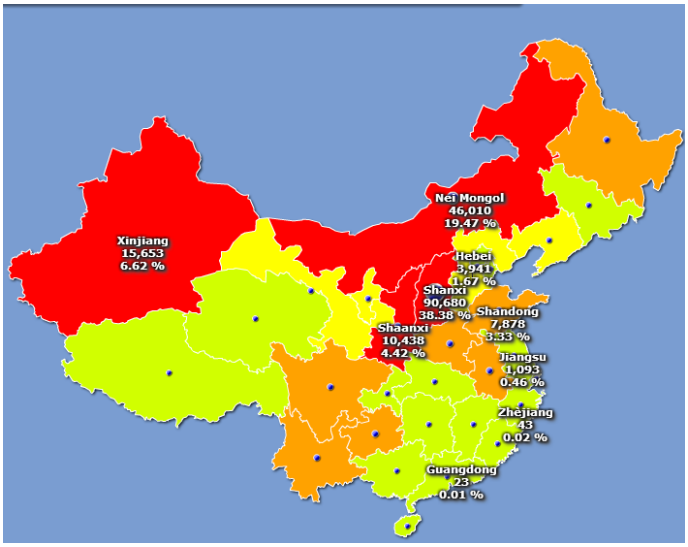

Figure 1: Distribution of Coal Reserves in China (Mt)

Source: Authors' diagram; data: National Bureau of Statistics (2014)

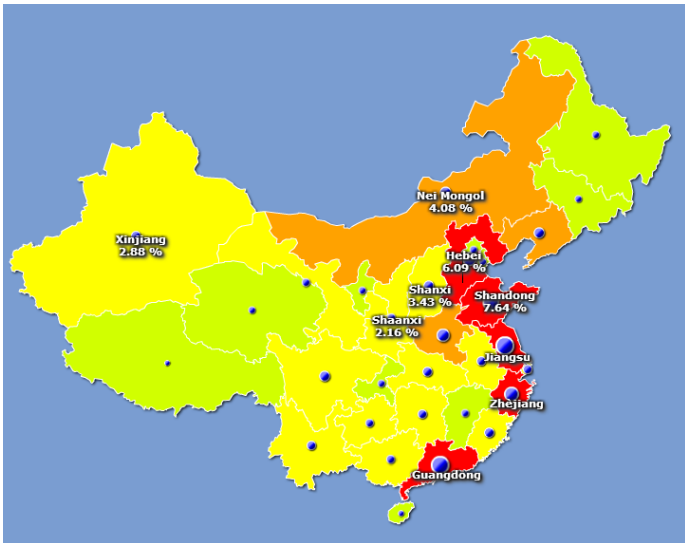

Figure 2: Distribution of Electricity Consumption in China

Source: Authors' diagram; data: National Bureau of Statistics (2014)

The dominance of coal is primarily due to plentiful domestic resources. Proven reserves were estimated to be 114,500 million tonnes (Mt) in 2013, the third largest in the world (BP, 2015). Within China, there is a mismatch in the geography of supply and demand, with the majority of reserves located in the north and west (Shanxi, Inner Mongolia and Xinjiang), while the greatest demand is in the eastern coastal provinces (Jiangsu, Zhejiang, and Guangdong) (see Figures 1 and 2 below). Matching supply and demand therefore requires large investment in transport infrastructure.

From a public policy perspective, subsidies have been one of the most important factors in the development of the coal industry in China. Before the 1980s, the coal industry was managed directly by government. During the 1980s and 1990s, the government provided coal producers with subsidies that came in the form of price controls, regulation, discounted credit, direct spending on agency appropriations and contracts and provision of goods and services below market value (Li, 1996). Government policy in this period aimed to support expansion of the industry and protect it from wider economic reforms. After 2000, price controls were liberalized and, in 2013, the double-track pricing system, under which a portion of coal production was sold under regulated prices and the remainder at a market price, was finally removed, although electricity tariff regulation remained.

Demand for coal increased enormously after 2000 as a result of further industrialization and economic growth (see Figure 3). Importantly, coal production increased faster than consumption. The increase in production capacity of coal has been facilitated by huge investments in fixed assets that can be partly attributed to subsidization.

Government policy has also been able to drive consolidation of the industry to improve safety

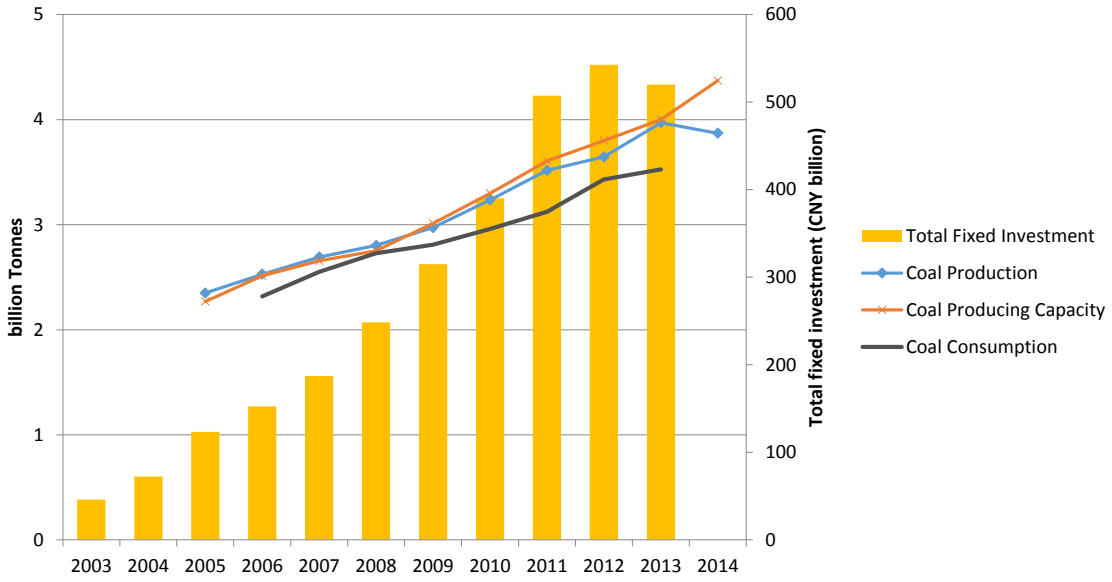

Figure 3: Coal Production and Investment in China

Source: Energy Foundation (2013) and National Bureau of Statistics (2014)

and efficiency and has led to an increase in the market share of SOEs and a reduction in private ownership, particularly of smaller mines. Despite efforts to consolidate, the coal industry is less concentrated than other energy industries in China and also compared to other primary coal producers like the United States. In 2014 the top four coal producers accounted for just 22 per cent of total annual coal production. The total annual production from the 14 largest coal-mining facilities was 3.3 billion tonnes, accounting for over 90 per cent of total coal output (Wang, 2014).

Government figures for coal production in terms of primary energy have recently been revised upwards indicating greater coal consumption than presented in Figure 3. These revisions have not yet been reflected in the official data for production in tonnes, though the effect has been estimated by the U.S. Energy Information Administration (EIA, 2015). The EIA report casts doubt on the absolute numbers, though not the trajectory, with all estimates pointing to a fall in coal production in 2014.

In 2013 international market prices began to decline in response to reducing global demand caused by the economic downturn and policies to develop other forms of electricity generation. Meanwhile, the pace of consolidation in the market is reported to have increased (Cornot-Gandolphe, 2014). Falling prices have led to falling industry profits and placed a number of coal companies in financial difficulties (Sydney Morning Herald, 2015). This context creates considerable demand for subsidies to mitigate the difficult commercial conditions and resistance to measures that would further reduce coal industry profitability.

In 2014, coal production in China (3.87 billion tonnes) decreased by nearly 3 per cent from 2013—the first decline in China's coal production for 14 years (See Figure 3). Whether this decline is due to an increase in consumption of higher quality coal, is a temporary blip or is the beginning of the planned decline in coal use that will lead to a peak in China's greenhouse gas emissions by 2030 is not yet clear (Natural Resources Defense Council [NRDC], 2015; Doyle & Stanway, 2015).

3.0 Estimating Coal Subsidies

3.1 SUBSIDY DEFINITION

Labelling specific policies as subsidies can be controversial. Therefore, it is important to establish an objective definition as to what does or does not constitute a subsidy. Subsidy definitions vary. There are some elements that are common to all definitions, such as direct payments to private companies, as well as elements that some definitions may categorize as subsidies while others do not, for example, market price support. Subsidies are often divided into producer and consumer subsidies. This report is exclusively concerned with subsidies to producers of coal.

For the purposes of this report a definition is adopted based on the Agreement on Subsidies and Countervailing Measures (ASCM) of the World Trade Organisation (WTO). Signed by 161 WTO member states, including China, this definition is the most widely accepted. It is outlined in Box 1. The subsidy estimates presented in Table 1 are classified according to the four categories listed in Box 1.

The scope of subsidy estimation methodologies, including the definition applied in this report, generally overlook under-pricing of social and environmental externalities, such as health-related costs associated with fossil fuel use. The WTO definition discussed in Box 1 does not explicitly exclude externalities, so whether to include externalities is primarily a question of interpretation and methodology. Since externalities represent a cost to society that the parties liable are not required to pay, there is an argument for considering them in the definition or for at least taking account of them otherwise. Subsidy estimates from the International Monetary Fund (IMF) are notable, as they are based on an interpretation of the definition, which include a range of externalities such as the health impacts of air pollution and the social cost of greenhouse gas emissions (Coady, Parry, Sears, & Shang, 2015).[2]

[2] A discussion of definitions of subsidies is presented in Bridle & Attwood (2015).

Box 1: What are Subsidies?

The WTO ASCM defines four categories of subsidy that exist, where governments:

1. Provide a direct transfer of funds or liabilities, such as the provision of grants.
2. Forgo or otherwise fail to collect revenue, including tax exemptions and reductions.
3. Provide goods or services below market rates, such as the provision of land, services or inputs
4. Provide income or price support, for example through price regulation.

In order to be considered a subsidy, a measure also has to be specific to its recipient: a company or an industry.

This definition makes no distinction as to whether a subsidy is efficient (justified). Subsidies may indeed be justified where they have been put in place to correct a market failure, such as the unsustainable depletion of a natural resource.

In the context of fossil fuels, subsidies are often split into two non-exclusive categories: those that reduce the cost of consuming fossil fuel-based energy, called consumer subsidies, and those that support the domestic production of fossil fuels, called producer subsidies.

For further discussion on subsidy definitions see Beaton et al. (2013).

Governments typically subsidize energy for a range of reasons: to support the more vulnerable sections of society and ensure their access to energy; to stimulate economic development in certain regions, or the economy as a whole; or to promote energy security. However, regardless of intentions, subsidies frequently evolve into costly mechanisms that fail to meet their original objectives and that have other adverse consequences. Among these consequences, FFSs impede the deployment of renewable energy sources and the development of a sustainable energy system by altering relative investment and generation costs (Bridle & Kitson, 2014).

3.2 SUBSIDY ESTIMATION METHODOLOGIES

Estimating the size of subsidies is often difficult due to lack of data or resources. There are two common types of methodologies for subsidy estimation. These are known as "price-gap" and "inventory" approaches.

The **inventory approach** involves constructing a listing of government support policies affecting the production and consumption of fossil fuels and considering the cost or impact of each in turn. This method is used by the Organisation for Economic Co-operation and Development (OECD) and the GSI. The method has the advantage that it not only identifies the aggregate level of subsidies, but also the policies responsible. Disadvantages include the labour intensity of the analysis, the frequent lack of available data and difficulties in establishing the overall impacts of the subsidies.

The **price-gap approach** estimates the gap between domestic energy prices and reference prices (the "price gap"). If the domestic price is lower, a consumption subsidy is deemed to exist. Both the IEA and IMF use this method. The reference price for coal is based on the cost of production, marketing and freight in individual countries. Using the price-gap approach alone is useful in order to enable comparisons among countries where the main form of support is through administrative pricing or export restrictions, but it does have some drawbacks. For example, a price-gap analysis will not reveal producer subsidies that arise when energy producers are inefficient and make losses at benchmark prices.[3]

3.3 EXISTING COAL SUBSIDY ESTIMATES FOR CHINA

Most available coal subsidy estimates focus on China's consumer subsidies and use the price-gap approach. The IEA used the price gap approach to estimate that China had USD 1.24 billion coal consumer subsidies in 2011 (IEA, 2012). Since 2011 the IEA has reported no coal consumer subsidy estimates for China; it is not entirely clear whether this is due to the methodological approach applied or the absence of data.

The IMF produces both "pre-tax" and "post-tax" subsidy estimates for coal. The latter category includes externalities. The overall post-tax estimate was USD 1,630 billion in 2013 and USD 2,133 billion in 2015. Coal externalities make up the bulk of this estimate. Excluding externalities, the IMF estimated that for all fossil fuels, not just coal, pre-tax subsidies were USD 7.21 billion in 2013, and they estimated foregone tax revenue to be a further USD 71.23 billion. Pre-tax subsidies are based on IEA consumer subsidy data for coal in 39 countries and OECD producer subsidy data for coal in 16 countries between 2007 and 2011 (Clements, 2013). Externalities of coal consumption, such as the health impacts of air pollution (World Health Organization, 2014), are estimated at USD 2.53 trillion in 2013 and USD 3.417 trillion in 2015.

A number of national estimates are available for consumption subsidies, calculated via the price-gap approach. Coal consumer subsidies were CNY 53.2 billion (USD 6.99 billion) in 2007 (Lin & Jiang, 2011), and around CNY 158 billion (USD 23 billion) in both 2008 and 2010 (Lin & Ouyang, 2014).

There is limited research focusing specifically on producer subsidies to coal. The research that does exist tends to identify objectives, define classifications and describe the operation of subsidies, rather than quantify (Peng, 2012). Joint research from the Overseas Development Institute and Oil Change International estimates subsidies to fossil fuel exploration in China and recognizes that coal producer subsidies exist, but the specific data of coal could not be disaggregated from the general FFSs (Pickard & Makhijani, 2014). IISD-GSI has previously published a report reviewing FFSs in China as a whole, and highlighting the challenges for energy governance, management systems and policy implementation in light of the unique role of SOEs in China's energy sector (Koplow, Lin, Jung, Thone, & Lontoh, 2010). IISD-GSI also found a lack of data availability and

[3] For a summary of the subsidy estimation methodologies applied by the OECD, IEA, IMF and GSI see GSI (2014).

disaggregation (Lin, 2010). Recent research from the NRDC (2015) stressed the important role of credit support to coal producers.

This study follows the same approach as the GSI work on FFSs in other countries (for example, Gerasimchuk, 2012). First, it identifies and categorizes programs that constitute government support to coal producers in China. Second, subsidies are quantified where possible. Finally, each of the subsidies is described and the most significant are discussed in a broader economic, social and environmental context. Data on policies and measures were collected from a review of international and national literature from international organizations, government agencies, academic sources and media.

4.0 Producer Subsidies to Coal

This section presents GSI's estimates of coal producer subsidies, including an outline of the scope of the estimates and the methodology used. Having presented the estimates, a discussion follows on some of the larger and more important subsidy elements, the policy context and how they may be managed in a transition from coal.

4.1 SCOPE AND METHODOLOGY

The scope of this paper is limited to identifying and quantifying, where possible, the most significant subsidies to coal production only. Thus the inventory excludes subsidies to coal consumption, including subsidies to coal-fired electricity generators. Coalbed methane subsidies are included as subsidies for coal producers, because those subsidies will be received by mostly coal producers and because coalbed methane is a direct product within coal production value chain. The inventory excludes coal-chemical, coal-oil and coal-fluid subsidies because there are many other industries including electricity, chemical and mechanical industry that get involved, and it is difficult to distinguish how much of this support is specific to coal producers.

The inventory considers data from 2013–2015. Given the consolidation dynamics in the Chinese coal industry at present as well as non-availability of data points for all years, the aim of the inventory was to produce a representative estimate of as many of the main subsidies as possible. The analysis focuses on the year 2013, as this is the most recent year for which it was possible to gather data on the widest range of subsidies.

China provides subsidies to coal both at the level of the central government and at the level of the provinces. Due to resource constraints, this analysis limited the provincial-level analysis to the China's major coal-producing provinces, Shanxi, Shaanxi and Inner Mongolia. Between them, these provinces account for around three quarters of all coal production in China (China Coal Resource, 2015).

4.2 ESTIMATES OF COAL PRODUCER SUBSIDIES

The inventory approach has identified 18 subsidies that were operational in the period 2013–2015. An overview is presented in Table 1. A detailed description of each of those listed in the table is provided in Annex 1. Of these, it has been possible to quantify 11 based on official data, other sources and certain assumptions. The total value of quantifiable subsidies is CNY 35.7 billion (USD 5.8 billion) in 2013 (See Table 1 and Figure 4) without taking credit support into account. In addition, two estimates for subsidies from credit support are presented in Table 2, illustrating the potential value of this subsidy.

Table 1: Subsidies to Coal Producers in China in 2013 (CNY billion and USD billion)

		Estimated cost of subsidies (CNY billion)			Estimated cost of subsidies (USD billion)		
Subsidy type	**Subsidy name**	**State Level**	**Regional Level**	**Total**	**State Level**	**Regional Level**	**Total**
Government revenue foregone	Value-added tax (VAT) rebates	1.71		1.71	0.28		0.28
	Resource tax reform (wipe out various charges from local fees, funds and taxes at the same time) (from 2015)						
	Temporary tax and fee relief (Shanxi 6.3, Inner Mongolia 0.72, Shaanxi 3.15)		10.17	10.17		1.66	1.66
	Tax breaks for new technology application and depleted coal mines						
	Tax breaks for occupational allowance						
	VAT rebates for coalbed methane production	1.1		1.1	0.18		0.18
Direct and indirect transfer of funds and liabilities	R&D from public budget	0.33		0.33	0.05		0.05
	Direct subsidies to listed coal companies	0.618		0.618	0.10		0.10
	Compensations for the coal mines that are shut down in the coal phase-out plan	5.54	0.8	6.34	0.90	0.13	1.03
	Coalbed methane production subsidies	0.276	0.138	0.414	0.04	0.02	0.07
	Investment in fixed assets (excluding rural households), state budget, mining and washing of coal	7.709		7.709	1.26		1.26
	Special fund for risky exploration of overseas mine resources	0.09		0.09	0.01		0.01
Income or price support	Raising import tariff						
	Waving import tariff for certain advanced equipment						
	Reduction of export tariff (from 2015)						
Provision of goods or services below market value	Exemption for land-use fee of coal mines						
	Providing Inner Mongolia producers with coal railway transportation below fair market rate		7.2	7.2		1.17	1.17
Total without credit support		17.373	18.308	35.681	2.83	2.98	5.82
Credit support	Credit Support **Scenario 1: 0.6% credit interest rate discount**			3.5			0.57
	Credit Support **Scenario 2: 5% credit interest rate discount**			35.68			5.82
Total with Credit Support under Scenario 1		17.373	18.308	39.181	2.83	2.98	6.39
Total with Credit Support Scenario 2		17.373	18.308	70.561	2.83	2.98	11.50

Source: Author's compilation and estimates

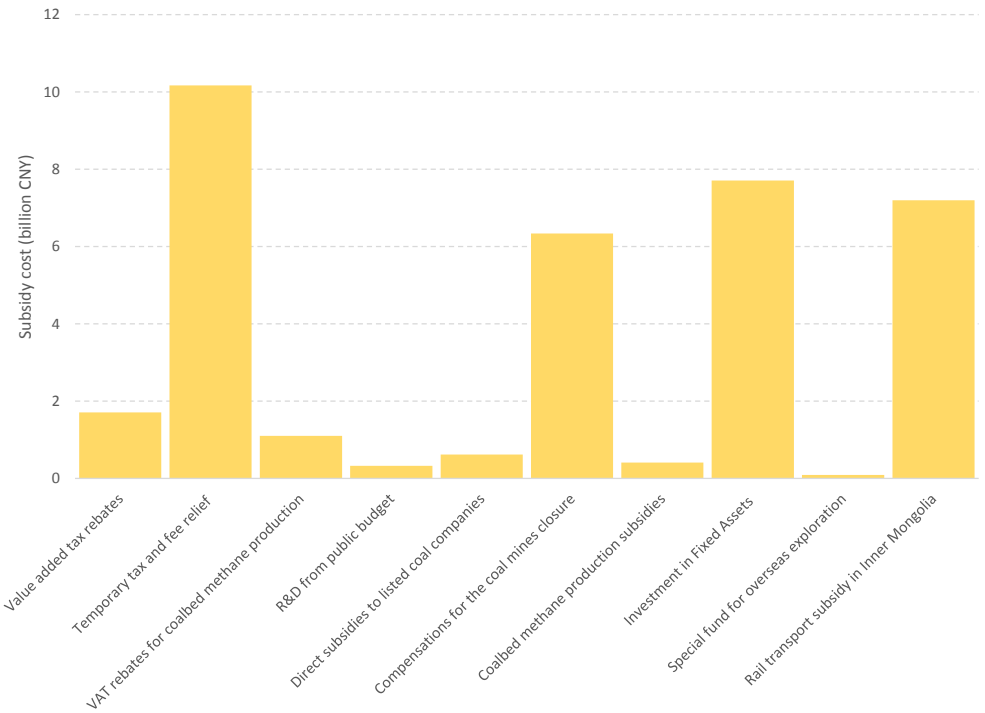

Figure 4: Quantified Subsidies (excluding credit support)

Source: Authors' compilation and estimates

4.3 DISCUSSION

This section examines in further detail some of the most significant subsidies. These subsidies were selected for more detailed consideration due to the size of the subsidy, the perceived impact on the industry and the availability of data and literature commenting on their performance. The discussion includes discussion of the rationale, impacts and performance of each subsidy. A full description of all the subsidies included in Table 1 is included in Annex 1.

4.3.1 Compensation for Phase-Out Plan: Shutting Down, Upgrading and Consolidation

One of the key changes taking place in the Chinese coal market is the implementation of a series of annual coal phase-out plans managed by the National Development and Reform Commission (NDRC). Under these plans, coal mines that were formerly privately and locally owned have been shut down, upgraded or taken into ownership of SOEs. Funding is provided to provincial governments to implement the plans. Funds are used to cover increased liabilities of SOEs, resettlement expenses and compensation for former owners and workers. The subsidy cost is estimated to be CNY 7.7 billion, which is approximately 18 per cent of the total quantified subsidy (excluding credit support).

The phase-out plans have prompted a marked reduction in the number of mines from more than 70,000 in 1995 to less than 15,000 by 2013 (Figure 5). This fall in numbers has coincided with a rapid improvement in mine safety (Figure 6), indicating that the policy is yielding positive results in this respect. However, criticisms have been made questioning whether the level of compensation is adequate for miners and about the increased costs and liabilities of mine management by the SOEs (Hu X., 2014).

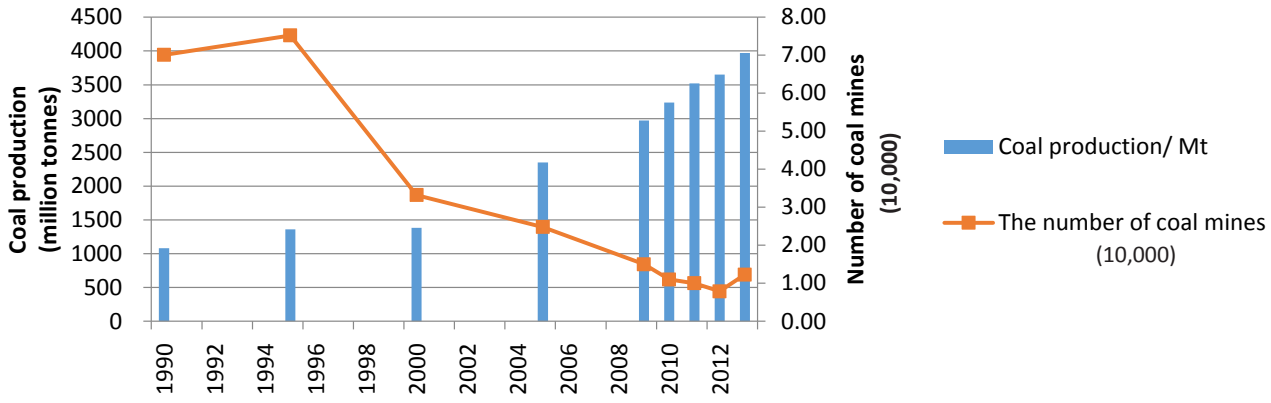

Figure 5: Coal Production and Number of Mines

Source: Energy Foundation (2013); National Bureau of Statistics (2015)

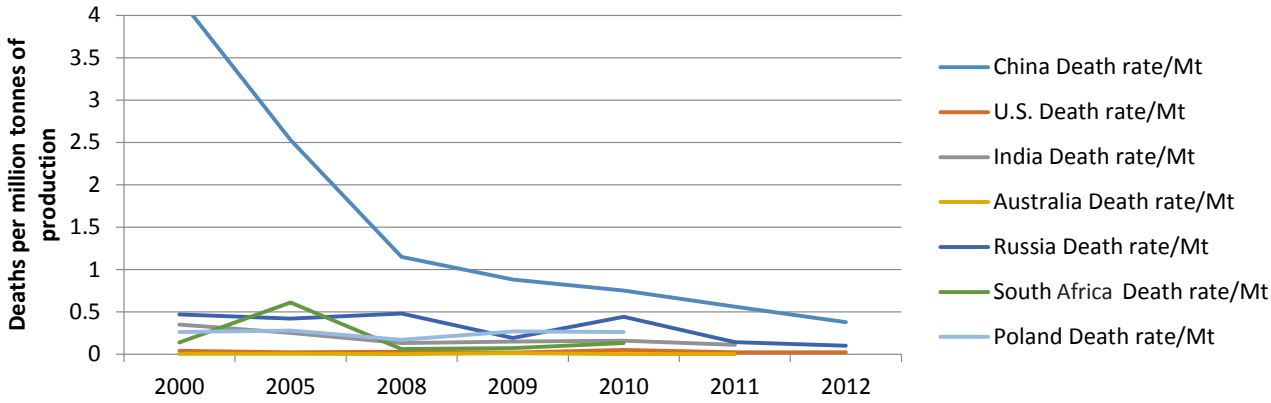

Figure 6: Coal Production Safety

Source: Energy Foundation (2013)

Improvements in safety and environmental performance in the coal industry are clearly to be welcomed. As these programs continue, further subsidy spending is expected. A detailed analysis of the performance of the coal phase-out plan would be needed to understand if the reforms are delivering benefits at a rate that is commensurate with the costs or if this money would be better invested elsewhere.

4.3.2 Direct Grants and Subsidies

Direct grants, payments from government agencies to private companies, are one of the subsidy types that are most readily identifiable as subsidies. This study shows that the overall size of these subsidies is relatively moderate at around CNY 600 million, approximately 2 per cent of the total subsidy cost (excluding credit support). However, direct grants can be targeted at specific activities or companies, so they can have significant impacts to the recipients if not the industry as a whole. Furthermore, since direct payments may not be applied universally, they may be particularly susceptible to influential organizations making requests for special support.

Strengths of direct grants is that they are relatively transparent and can be targeted to support only activities deemed cost effective. Direct payments tend to have immediate effects on companies and can be used to react to crises and improve the financial position of companies. A potential pitfall is the risk that companies will come to expect direct grants to compensate them for losses.

Direct grants may be aimed at the purchase of equipment that reduces emissions to air, and this would seem to have positive environmental impacts. However, if this, in turn, frees up resources to allow a continuation or expansion

of production, then the overall impacts could, in fact, be negative.

4.3.3 Investment in Fixed Assets from State Budgets

Investment in fixed assets from state budgets is one of the three largest coal producer subsidies costing approximately CNY 8 billion (US$ 1.3 billion) in 2013—approximately 22 per cent of the total (excluding credit support). The objectives of the subsidies are to support investment to expand production, develop coal mines, improve the efficiency of coal production and promote market consolidation.

It is difficult to assess the extent to which subsidies of this type really do increase efficiency and environmental performance. Theoretically, market consolidation and the creation of larger coal mines create opportunities for the deployment of technologies to reduce energy use and environmental impacts. An industry consisting of fewer, larger, more sophisticated players is also easier to regulate and capable of adopting environmental and health and safety management systems.

It can certainly be shown that the market has consolidated. According to the China National Coal Association data, 92 per cent of annual coal production was generated from 14 large coal mining facilities in 2013 (Hu J., 2014). It is less clear whether this consolidation has improved environmental performance.

Support for investment also contributes to the current overcapacity in the sector. This increase in capacity may also bring about additional environmental impacts. This may have the effect of cancelling out any environmental gains from increased efficiency. It is beyond the scope of this paper to assess the overall impact of the subsidy.

While the subsidies to fixed assets are significant compared to other subsidies, they are relatively low compared to the scale of investment driven by the consolidation. Furthermore, the investment in fixed assets from state budgets has grown steadily during a period of very rapid consolidation, indicating that they are not the primary source of finance for that transition.

4.3.4 Resource Tax Reform

The resource tax in China is a tax on coal production. Reforms in December 2014 switched the resource tax from a tax based on production volumes to a tax based on the price (ad valorem) together with the removal of a number of other taxes and charges to simplify the resource tax (State Council, 2014).[4] The goals of resource taxes generally include reduction of dependency, shifting the tax system from labour to consumption, reflecting the external costs of pollution and promoting efficient allocation of resources between current and future generations (Eckermann et al., 2012).

The reform of the resource tax may be considered a subsidy if it reduces the cost to the companies that pay the tax. The reforms have coincided with a period of low coal prices. At current prices the reforms have led to a net reduction in the effective tax imposed on coal companies. This reduction in the tax burden is deemed a subsidy. If coal prices recover, it is possible that the reform will eventually lead to a reduction in the effective subsidy.

The reform of the resource tax has also led to the removal of charges for environmental resilience purposes without alternative mechanisms in place. The reforms took place in 2015 so do not appear in the overall estimate for 2013. The motivation to simplify the system of resource taxation is that it will lead to the reduction in costs for the industry and therefore an increase in subsidies.

The resource tax is a key mechanism for placing charges and taxes on the extraction of natural resources. In the context of a struggling coal industry, there is considerable pressure to reduce the cost of resource taxation. Reports indicate that Shanxi has removed up to 20 measures in 2013, as its coal producers saw their profits erode (China Daily, 2014).

As long as resource tax rates remain as they are and prices are low, then they amount to a subsidy to the industry that could be directed elsewhere. In the medium term, the overall burden of

[4] For example, some provinces waive the charge from the fund for coal prices adjustment.

resource taxation on coal should be gradually increased to provide a clear price signal to the market to consume less coal for all the reasons listed above. The poor economic position of many coal companies and the related concerns for workers and the resource-dependent cities can motivate politicians to use the process to do the opposite, reducing the tax burden on coal companies.

4.3.5 VAT Rebates

The issuing of VAT rebates to coal producers is a measure that was introduced to mitigate the imposition of VAT on coal in the 1990s. This measure has persisted until today, though the value of the rebate has remained fixed since its introduction at a level of CNY 1.71 billion, approximately 5 per cent of the total subsidy estimate for 2013.

The analysis performed here does not extend to determining if these rebates are distributed evenly throughout the industry. There is certainly a case that, having had nearly 20 years to adapt to the imposition of VAT, the need for rebates has now diminished.

Proponents for retaining the rebates argue that the current system places the coal industry at a disadvantage because of the inability to claim VAT deductions on expenses, including investments in auxiliary facilities, working conditions, coal mine resilience and equipment upgrades. In 2014, the coal industry was taxed over CNY 200 billion in VAT, over twice that of other energy or mining industries (Shen, 2015). Further work on the VAT rebates looking at how the rebates are allocated and the possibility for reform would be welcome to understand if this subsidy can be justified.

4.3.6 Credit Support

Credit support is a form of subsidy where financial institutions, state run or otherwise, provide credit to investors at below-market interest rates. Credit support mostly comes from commercial banks, of which most are state-owned, and policy-oriented banks like China Development Bank. Up until 2011 the China Development bank also provided long-term[5] policy-oriented credit support for domestic investment in infrastructure and technology development. Since 2012 credit interest rates from the China Development Bank and commercial banks have started to converge,[6] but rates for coal producers still remain below the benchmark interest rate. The China Development Bank provides credit support for overseas investment, while the Export-Import Bank of China provides credit support for the import of advanced technologies to domestic coal production. It is not possible to quantify either of these elements due to a lack of available data.

Between 2007 and 2014, coal producers in China received at least CNY 5.71 trillion in credit from policy-oriented banks and commercial banks—of this, CNY 5.51 trillion of credit from 16 commercial banks between 2008 and 2014 and CNY 202 billion from the China Development Bank between 2007 and 2013 (author's calculations; NRDC, 2015). A recent report shows that the rate of credit growth actually increased from 2012 to 2013 despite the fact that this is a difficult time for the coal industry (NRDC, 2015; China Development Bank, 2011, 2012, 2013, 2014). Most of this credit went to large SOEs, the exploration sector and the regions with rich coal reserves. The distribution of credit to larger enterprises is largely due to consolidation of the sector post-2011. Given the large amount of credit provided and the preferential rates of credit given to coal producers, this constitutes a significant subsidy.

The common way to calculate credit support is to calculate the difference between the reference rate and actual credit interest rate received. For example, if a coal mine can obtain credit at an interest rate of 5 per cent and the rate available to other similar projects from commercial lenders is 10 per cent, then the project can be said to receive a subsidy equivalent to the additional interest payments that would be required to service the debt at the higher rate.

[5] Over 80 per cent of loans provided by the China Development Bank are long-term loans. See China Development Bank (2011, 2012, 2013, 2014)

[6] Credit interest rates were at least a tenth lower than commercial banks before 2011, with an average credit interest rate of 5.62 per cent from the China Development Bank compared to 6.56 per cent for commercial banks in 2011. However, they have begun to converge since 2012. See China Development Bank (2011, 2012, 2013, 2014).

In our case, we do not have sufficient data to calculate the average credit interest rate for all coal producers, so we are unable to quantify the actual size of credit support. However, we have used the data of two the largest SOE coal producers (Shen, 2010) as a proxy together with the benchmark interest rate set by Chinese central bank. Survey data on financing, available for 2009 until present, suggest that there is no credit support for private coal producers in China, meaning SOEs are able to get better interest rates than private companies (Wu, 2012). For SOE producers, there was no credit support in 2009, as the credit interest rates were at the level of the benchmark interest rate. We consider that there was credit support after 2009, as the benchmark interest rate remained stable, while credit interest rates for SOE producers decreased.

As for private companies, from 2013 to 2014, commercial banks raised the interest rate for small private coal producers significantly. High credit interest rates are common for the private sector in China, and this is also the case for private coal producers, with the sector receiving rates of over 10 per cent—significantly higher than the benchmark interest rate ((Ze, 2013; Liu & Zhou, 2009). There are, however, other types of credit support that coal producers receive. For example, some provincial governments now have some bailout plans for local coal companies. In Henan and Shanxi provinces, local government has started to request that commercial banks keep the interest rates at a low level and extend the maturity of the credits given to provincial SOEs and local coal companies (Gao, 2014).

To illustrate the approximate size of credit support, two scenarios are considered. In the first scenario, the reference rate is set at the benchmark interest rate set by the Chinese central bank. The interest rate is considered to be equal to the average interest rates observed in data from the SOEs Shenhua and China Coal. In Table 2, the difference between the reference rate and the average rate is approximately 0.5 per cent (Ze, 2013). Applying this interest rate difference, the credit support is estimated to be CNY 28.1 billion from 2007 to 2014, equivalent to CNY 3.5 billion per year. In the second scenario, the reference rate is equivalent to the rates observed for private coal producers. The difference between the reference rate and credit interest rates for SOE producers is 5 percentage points (Ze, 2013). In this case, it is estimated that coal SOEs received subsidies of CNY 35.68 billion in 2013.

Table 2: Credit Interest Rates

	2008	2009	2010	2011	2012	2013	2014
Benchmark	5.31%	5.31%	5.81%	6.56%	6.00%	6.00%	5.60%
Shenhua	5.72%	5.60%	5.39%	4.95%	4.95%	4.95%	3.75%
China Coal	5.56%	5.06%	4.82%	6.39%	6.41%	6.07%	6.31%

Source: Ze (2013)

These figures provide a likely range for credit support, but some caveats must be made on these calculations. First, the figure for credit to coal producers quoted above is reported to include credit to producers of coal to oil, coal to chemicals and some classifications of electricity generation. Second, other factors are important in determining credit support, including length of term and contract flexibility. Third, SOE and privately owned companies tend to be quite different in terms of size and technologies, so the interest rates are not directly comparable. Nevertheless, the estimates presented here provide some indication of the approximate size of credit support.

The future trend in terms of the level of credit support available to SOEs to invest in coal production activities is uncertain. A report from Greenhub and People's Bank of China contains an analysis of the impact of the financial policy framework on coal. The report has received a lot of public attention, and reports that the Chinese government will require banks to designate new energy and renewable energy sectors as priority destinations for lending (Greenhub & People's Bank of China, 2015). The cost of borrowing for privately owned producers and smaller SOEs may be set to rise. Tightening controls over bank lending has created liquidity problems in many coal producing regions (Ifeng, 2013).

Credit support subsidies are significant and are perhaps the largest subsidy of all, but there is considerable uncertainty regarding the overall cost of these subsidies due to a lack of data, transparency and the methodological challenges of estimation.

5.0 Conclusions

This report presents a comprehensive breakdown of subsidies to coal producers. Many subsidies still remain to be quantified but the subsidies that are possible to evaluate are estimated at CNY 35.7 billion (USD 5.8 billion) in 2013, excluding the preferential element of credit support to the industry. Depending on the assumptions, the latter can be estimated between CNY 3.5 and 35.7 billion (USD 0.57 billion to USD 5.8 billion). Among these subsidies, the most significant in terms of value include tax relief from provincial and local governments, investment in fixed assets and provision of infrastructure to the coal industry. A preliminary analysis of low-cost credit provided by state-owned banks suggests that this also represents a significant subsidy, but further detailed evaluation is needed.

Further subsidies for which it has not been possible to estimate a monetary value include a range of tax breaks, a number of import and export tariff measures, and exemptions from land-use fees. Furthermore, while the report has assessed subsidies in some of the largest coal-producing provinces, it has not presented a comprehensive inventory of provincial subsidies. Identifying the costs associated with these subsidies remains an area for further work, and this would be greatly aided by greater transparency on the existence of subsidies and their value.

While this research has highlighted the costs of subsidies, it has not evaluated the performance of these subsidies against objectives. In general terms, it seems counterintuitive that subsidies should be in place to promote one of the most technically mature and most polluting sources of energy. In aggregate, these subsidies drive increased coal consumption and act as a barrier to the deployment and operation of other forms of energy. However, within the policy set, there may be subsidies that help to mitigate the impacts of coal use (e.g., grants to environmental technologies) or the transition away from coal use (e.g., assumption of pension liabilities for coal miners).

The next step, therefore, is to evaluate the effectiveness of the identified coal production subsidies in meeting their stated policy objectives. Where subsidies are identified as inefficient, a comprehensive plan for phase-out should be developed, including complementary policies to mitigate negative impacts. In support of this, establishing mechanisms to report on subsidies and to evaluate their effectiveness and efficiency should be a priority.

As demonstrated by the reform practice in many countries, FFS phase-out should be part of the broader policy environment (Beaton et al., 2013; Cottrell et al., 2013). In particular, environmental taxation, such as the resource tax, is already established in the fiscal system, but it does not yet play a significant role in the fiscal system, and has actually decreased in recent reforms. Further expansion of environmental taxation could drive reductions in environmental pollution while raising revenue or reducing taxation on more socially useful activities.

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Annex 1: Subsidy Descriptions

2.0 GOVERNMENT REVENUE FOREGONE

2.1 Value-Added Tax Rebates

This subsidy removes some of the burden on coal producers to pay value-added tax (VAT) by offering rebates. Coal production, along with other energy resources, became liable for VAT following tax reforms that took place in 1994. At the same time, the State Administration of Taxation and Ministry of Finance introduced annual rebates on VAT to avoid a sudden increase in tax burden. From 1995 until present, the government has issued a fixed amount of CNY 1.71 billion of rebates annually to coal producers. To help support coal production in the context of low international market prices for coal, the Ministry of Finance is undertaking a feasibility study looking at lowering the rate of VAT from 17 per cent to 13 per cent (Yang, 2015). The introduction of a reduced VAT rate would constitute a further subsidy.

2.1.1 Temporary Provincial Tax and Fee Relief

A series of subsidies introduced at the provincial level have supported producers after the drop in coal prices in 2012. The three largest coal-producing provinces, Shanxi, Inner Mongolia and Shaanxi, provided the largest subsidies packages. Many coal-producing provinces adopted reciprocal supply guarantees to protect local coal producers. The effect of this policy, however, was just to change the distribution of coal producer subsidies within the country, so it has not been taken into account.

In August 2013 Shanxi province removed fees that went to coal mine resilience guarantees and a fund for diversification away from coal, which totalled an estimated CNY 6.3 billion in 2013.[7] In September 2013 Inner Mongolia reduced fees for a coal price adjustment fund and railway transport tariffs. Subsidies for rail transport are detailed later in Section 4. Excluding the subsidies for rail transport we estimate the subsidy in Inner Mongolia to have been CNY 0.72 billion (Zhao, 2013). Shanxi province introduced the same measures as Shanxi, so, based on coal production in 2013, we estimate a subsidy of CNY 3.15 billion in that year.

Subsidies in the three provinces above totalled CNY 10.17 billion in 2013. We have been unable to gather similar estimates for other provinces, although most adopted general supporting policies rather than subsidies. Nevertheless, the estimates for the three provinces cover almost 70 per cent of coal production in China.[8] The subsidies discussed were in place until the resource tax reform started in 2015.

2.1.2 Resource Tax Reform and Removal of Local Fees and Taxes

Subsidies that come from resource tax reform consist of two elements: the removal of fees and taxes at local government level and the changing of the resource tax to be value based rather than volume based.

The removal of taxes and fees charged by local government took place in 2014 and was designed to support coal production through a difficult time. The Central University of Finance and Economics estimates that local taxes and fees account for around 43 per cent of coal producers' profits. The change also came from a desire to create more centralized macro-controls on the industry.

The removal of fees and taxes was accompanied by a change in the resource tax from volume based to value based (ad valorem) with the purpose of making coal production more responsive to price changes. This change was implemented at a point when the low coal prices led to a drop in the overall tax rate and therefore effectively constitutes a subsidy. The Ministry of Finance set the range of resource tax rates between 2 and 10 per cent, with provincial government being able to set their own

[7] The removal of fees reduced production costs by and estimated CNY 15/tonne based on the data in Zhao (2014b), and coalstudy.com.

[8] Coal production in Shanxi, Shaanxi and Inner Mongolia are 0.96 billion tonnes, 0.493 billion tonnes and 0.994 billion tonnes respectively. Total coal production in China is 3.7 billion tonnes in 2013.

rates within this range. Major coal-producing provinces have set higher rates, as taxes on coal production form a significant part of their revenue. The four largest provinces in terms of production have introduced the ad valorem tax between 7 and 9 per cent, which currently produces a higher burden than with the previous regime. However, when accounting for the removal of local fees and taxes, the total fee per unit of coal is reduced by around 50 per cent. This reduction is even greater in provinces that have chosen a lower rate of ad valorem tax. Data from the State Administration of Tax show that coal producers received CNY 2.23 billion of relief in the first two months of 2015 (China Coal Industry Association, 2015). While this currently creates a subsidy to the industry, we do not know how coal price changes will affect this in future. Some estimates suggest that the coal price has bottomed out (e.g., China Coal Industry Association, 2015) and that coal prices will increase as the economy becomes more buoyant. Considering Inner Mongolia as an example, if coal prices were to double, and if production costs remained the same, then the total tax burden will be greater than prior to the reforms and therefore no longer a subsidy.

2.1.3 Tax Breaks for New Technology Application and Depleted Coal Mines

In order to promote sustainable extraction, China offers coal producers multiple tax breaks for the application of new technologies. Based on the information available, coal producers can apply for tax breaks for use of technology in coal mining for filling and extraction to promote efficiency, increase safety, save water and protect the environment. Note that these tax breaks are not specific to the coal industry. In addition, depleted coal mines can receive a 30 per cent deduction from resource tax (Ministry of Finance, State Administration of Taxation, 2014). Among those new technology applications, since 2013, coal producers have a 50 per cent resource tax deduction if applying coal mining filling technology. The rule also applies to the new ad valorem resource tax that became effective in 2014. As for other new technology applications, coal producers can deduct 10 per cent of the investments on new technology facilities from corporate income tax (Ministry of Finance, State Administration of Taxation, 2008). We are unable to estimate the size of those subsidies due to limited available data.

2.1.4 Tax Breaks for Occupational Allowance

Following a directive of the State Council to improve working conditions of coal miners in 2005, the Ministry of Labor and Social Security, National Development and Reform Commission and Ministry of Finance came up with a new policy to provide allowances for difficult working conditions in underground coal mines. This policy has been effective since 2006, and coal companies are required to provide underground miners with three types compulsory allowance payments: underground working allowances (CNY 10–30 /person), lunch allowance (CNY 6–10 /person) and night shift allowance (CNY 6–12 /person). These allowances are tax deductible for coal companies, reducing the tax burden on the coal industry, and are therefore considered to be a subsidy. It is not possible to quantify the size of the subsidy due to lack of data. The occupational allowance expenditure is likely to increase in the future given the ongoing upgrade and mechanization of the industry.

2.1.5 VAT Rebates for Coalbed Methane Production

The Chinese government has provided coal producers with VAT rebates for coalbed methane production since 2007. The policy aims to promote coalbed methane to meet increasing demand for energy and mitigate serious air pollution caused by coal use. In order to qualify, coal producers must invest VAT rebates into coalbed methane R&D and production expansion. Data shows that only 40–46 per cent of coalbed methane produced can be used for consumption or further processing due to technology limitations (Economic Information Daily, 2015). Based on this utilization rate (taken to be 40 per cent), a 13 per cent VAT rate and annual coalbed methane production in 2013, we estimate there was a CNY 1.1 billion VAT rebate for the coalbed methane industry in 2013.

Despite this policy, there has been no significant increase in production or utilization rate of coalbed methane since it was put in place (Feng, Zhai, Du, & Long, 2014).

2.2 Direct and Indirect Transfer of Funds and Liabilities

2.2.1 Research and Development Expenditures from the State Budget

This is a subsidy to coal production that comes from government spending on research and development (R&D). This includes basic research, applied research and experimental development and is aimed at improving production safety and efficiency and in reducing emissions. According to data from the National Statistics Bureau, all sectors[9] in China spent a total of close to CNY 16 billion on coal R&D respectively in each year between 2011 and 2013. Based on our assumptions (see Box A1), we estimate coal producers in China received CNY 330 million in subsidies from state budgets for R&D support. It is likely that some coal producers are receiving further R&D investment from public finance, given that many are SOEs with direct public funding. A lack of available data means that we are not able to quantify this. In all, China spends around twice as much on R&D in coal exploration and processing every year than it does on oil and gas. R&D spend has stayed stable for the past few years and, although private companies are cutting R&D expenditures due to the recession, government R&D expenditure may increase due to their strategy of wanting to upgrade technology in production.

2.2.2 Direct Subsidies to Listed Coal Companies

The Ministry of Finance and State-owned Assets Supervision and Administration Commission directly subsidises coal companies (state owned and other) for technology development and upgrade purposes. Prior to 2005 they also provided subsidies for nominal loss. Similar subsidies are also provided by provincial and local government. It is not clear whether these subsidies are also aimed at helping an ailing coal industry.[10] In 2013 19 companies received direct grants worth CNY 618 million, an increase of 15 per cent on the previous year (Tang, 2014). In 2014 Shenhua Group and the China Coal Group (the two largest coal companies in China) alone received CNY 614 million in direct subsidies. In 2014 subsidies received by the China Coal Group accounted for 11 per cent of its annual profits compared to just 1 per cent in the previous year. Coal producers also receive other types of subsidies, tax breaks for example, but there is insufficient data for these and may be included in other parts of this analysis. Nevertheless they are not significant based on the information we do have available.

Box A1: R&D Expenditure Estimate

The R&D expenditure from state budgets was estimated by observing that in 2009, the most recent year for which data was available, the National Bureau of Statistics data recorded that 2.2 per cent of mining industry R&D expenditure was funded by public funds. This figure was assumed to remain constant to 2013 thereby allowing an estimate of public research to be calculated from the total expenditure on coal industry R&D. The result is CNY 330 million expenditure on coal R&D in 2013 (National Bureau of Statistics, 2009, 2010, 2011, 2012, 2013).

2.2.3 Compensation for Coal Mines Shut Down in the Coal Phase-Out Plan

This subsidy is compensation for coal mines that are shut down due to health and environmental concerns as part of the coal phase-out plan. Following the removal of restrictions on private investment and other entry restrictions to coal production there was a rapid increase in the number of small private mines (SPMs) and township and village enterprise (TVEs) mines. By 1998 there were approximately 80,000 mines in operation over 90 per cent of which were SPMs and TVEs. Despite their proliferation these smaller mines only accounted for 43 per cent of national production; this fact coupled with concerns about safety, environmental impact and overproduction led the government to put in place a phase-out plan.

[9] Government, state-owned coal companies, industry associations, private companies and research institutes

[10] In the 19 companies we analyzed, profits were down 26 per cent in 2013 and continued to decline in 2014 and 2015.

The phase-out, which included shutting down, upgrading and consolidating mines, was effective in reducing the number from more than 70,000-25,000 by 2005 (State Administration of Coal Mine Safety, 1997, 1998, 1999, 2000, 2001, 2002a). Despite the decrease and improvements in safety, further central government funds were allocated in the 11th Five-Year Plan to increase the efficiency and effectiveness of the phase-out plan. In the period of the plan (2006–2010) CNY 2.7 billion was spent on compensation with targets and commensurate compensation being allocated to the provinces. No data is available on expenditure for each year. We have therefore assumed that expenditure is in line with the absolute number of mines phased out each year. Between 2009 and 2014, the number of mines phased out remained constant, so we have taken expenditure in 2013 to be the same as in the 11th Five-Year Plan (2006–2010), which is to say, CNY 540 million. Provincial government is responsible for the implementation of the phase-out and is expected to match funding provided by the central government. It has not been possible to calculate the further subsidy that results from this match-funding, as it varies by province and the data are not readily available. However, there are some examples of state-level funding in the literature. In Hebei province, local and provincial subsides were reported to be CNY 800 million in 2013 (State Administration of Coal Mine Safety, 2012a; China Coal News, 2014).

In addition to compensation for mine closures, the central government has also provided subsidies through treasury bonds for upgrades to improve the safety of mine operations. In the 11th Five-Year Plan, this subsidy totalled CNY 3 billion annually, rising to CNY 5 billion since 2012. In total, we estimate the subsidy received as part of the phase-out plan to be CNY 5.54 billion in 2013. Table A1 shows an increase in the number of mines being shut down since 2013. We expect that the annual compensation from the central government budget will increase in the coming years because it generally requires more funding to support coal mine closures than upgrades.

Table A1: Number of Mines and Production Capacity Phased Out (2013–2015)

	2013		2014		2015	
	Mines	Production (10,000 tonnes)	Mines	Production (10,000 tonnes)	Mines	Production (10,000 tonnes)
Shut down	509	2,669	800	4,070	1052	6,391
Upgraded	479	1,674	402	1,766	202	1,388
Consolidated	268	2,075	523	5,912		
Total phased out	**1,256**	**6,418**	**1,725**	**11,748**	**1,254**	**7,779**

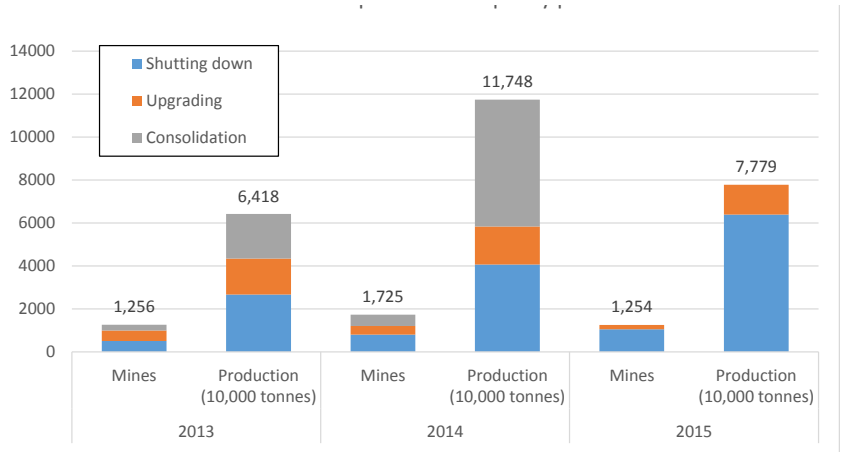

Figure A1: Number of Coal Mines and Production Capacity Phased-Out in China

Source: Energy Foundation (Energy Foundation, 2013)

2.2.4 Coalbed Methane Production Subsidies

This is a subsidy for coal producers that have diversified into the production of coalbed methane with the aims of increasing production, reducing safety risks and improving efficiency. The policy, which started in 2007, subsidizes coalbed methane at CNY 0.2/m^3 of production (Ministry of Finance, 2007). The National Energy Administration (2011) has CNY 720 million allocated for coalbed methane subsidies. Part of the aim of this subsidy is to increase the usable output of coalbed methane production (i.e., utilization rate)—the subsidy only applies to usable methane. Despite the subsidy, there appears to have been no improvement in utilization rate between 2007 and 2014, with the rate staying between 40 per cent and 46 per cent (Economic Information Daily, 2015). We therefore assume that about 40 per cent of the total exploration volume is utilized and only 5 per cent of utilized methane is eligible for the subsidies. Given the state subsidy levels, we estimate that coalbed methane producers received CNY 251 million and CNY 276 million from the state budget in 2012 and 2013, repectively. Information from China Coal Information Institute shows that provincial and local governments provided matching subsidies at CNY 0.1/m3 since 2007. In total, then, coalbed methane producers received CNY 376 million and CNY 414 million in 2012 and 2013, respectively (Guo, 2012). In 2012, a proposal was submitted to the legislature for raising the subsidy rate from CNY 0.2/m^3 to CNY 0.4–0.6/m^3, but there are no signs of this being implemented.

2.2.5 Investment in Fixed Assets (Excluding Rural Households), State Budget, Mining and Washing of Coal

The Chinese government invests heavily in fixed assets every year with the aim of promoting economic growth. Specifically with regard to coal, the government significantly increased investment between 2005 and 2014 with the aim of incentivizing higher concentration and consolidation levels in the industry (i.e., fewer but larger coal bases). The 12th Five-Year Plan specified that the construction of large coal bases will focus on technology upgrade and integrating the coal-electricity and coal-chemical industries. As an important component of the new policy, the National Development and Reform Commission approved the Large Coal Base Construction Plan[11] in 2006 and added Xinjiang Zhundong Base to the plan in 2014. The plan is to build or improve infrastructure for 14 large coal bases from 2006 to 2020 (National Development and Reform Commission, 2014). Between 2008 and 2013, the Chinese government invested CNY 2.59 billion, 4.54 billion, 4.77 billion, 7.39 billion, 7.89 billion and 7.71 billion respectively on fixed assets in mining and washing of coal (National Bureau of Statistics, 2009, 2010, 2011, 2012, 2013). This funding is spent through the central government, provincial governments and state-owned enterprises (SOEs). Provincial government and SOEs also provide match-funding or infrastructure support, but it is impossible to quantify this due to a lack of available information. Based on the Large Coal Base Construction Plan, there will be stable growth in the investment from state budget to fixed assets in the coal industry until 2020.

2.2.6 Special Fund for Risky Exploration of Overseas Mine Resources

In response to China's "going out" policy, coal producers are increasingly investing in overseas mines and plants. Increased overseas investment in coal production is being driven by stricter domestic regulation (environmental protection and production capacity), demand decline, credit support from the China Development Bank and other policy-oriented financial institutions and reduced shipping costs (from reduced petroleum costs). In addition, as part of the "going out" policy, there is a special fund for risky exploration of overseas mine resources, which started in 2005. There have been more than 100 coal exploration projects implemented in Mongolia, Australia, Russia, Indonesia, Vietnam, Pakistan and other countries, and most projects are

[11] The plan includes Shendong Base, Shanbei Base, Huanglong Base, Jinbei Base, Jinzhong Base, Jindong Base, Mengdong Base, Lianghuai Base, Luxi Base, Henan Base, Jizhong Base, Yungui Base, Ningdong Base and Xinjiang Base.

Table A2: Coal Import Tariff

	Jan. 2005	Apr. 2005	Nov. 2006	Jan. 2008	Jan. 2014	Oct. 2014	July. 2015	2016	2017
Coking coal	0	0	0	0	0	3	0	0	0
Steam coal	6	3	1	0	3	6	4	0	0

Source: Ministry of Finance (2014)

financed by this fund. This fund amounted to CNY 270 million between 2010 and 2013 (China Energy News, 2013). Assuming that this funding was equally split between the three years, CNY 90 million was invested in coal production abroad in 2013.

2.3 Income or Price Support

2.3.1 Raising Import Tariff

Coal imports account for less than 10 per cent of domestic coal consumption in China. China applies different levels of import tariffs to different coal specifications. Import tariffs are designed to protect domestic producers from international competition. From 2014, China provided subsidies for domestic producers by raising tariff rates. The tariff rates for steam coal and coking coal were raised to 6 per cent and 3 per cent, respectively, in October 2014 in order to reduce competition with domestic coal producers. Major coal producers responded to that policy right away. For example, Shenhua Group raised its prices for all kinds of coal by CNY 15 per tonne in response to tariff increase (Zhao, 2014a).

The system of import tariffs may soon become untenable. According to the new China-Australia Free Trade Agreement, coking coal imported from Australia will have zero tariffs as of July 2015 and steam coal will decrease to zero by 2017. Given that Australia contributes to 50 per cent of import of steam and coking coal in China, the agreement will significantly reduce those subsidies. The effective removal of these subsidies will reduce the competitiveness of Chinese coal producers. A complete removal of coal import tariffs is estimated to increase revenues to Australian coal producers by USD 222 million (Coal Industry Communication Information Center, 2015).

2.3.2 Waving Import Tariff for Certain Advanced Equipment

Chinese customs waives the import tariff for equipment listed in the Catalogue of Critical Equipment, Technologies and Products. The policy is designed to allow technologies that cannot be procured from national sources to be imported to improve production efficiency and competitiveness. The policy started in 2007 and the list of eligible technologies was revised in 2014. The policy covers a range of industries aside from coal. This subsidy has not been quantified due to a lack of available data.

2.3.3 Reduction of Export Tariff

The export tariff for coal was reduced in 2015 to 3 per cent to increase the price competitiveness of domestic coal. The rate had been set at 10 per cent since 2008. The reduction of the tariff is designed to reduce the cost of exports, to provide an outlet for overcapacity of coal production and to bring the national market closer to the international market. The revenue that the government could have collected on the exports is a subsidy under the definition applied here. The subsidy has been calculated from the tariff level and the available data on coal exports (1.88 million tonnes) in the first five months in 2015 (Shen, 205). Based on this, the subsidy has been USD 13 million during this period. Despite the subsidy the exports have actually decreased by 32 per cent compared to the previous year, indicating that the export tariff is just one factor among many that influence levels of exports. The subsidy estimate does not appear in the summary table, as this subsidy was not in place in 2013.

2.4 Provision of Goods or Services Below Market Value

2.4.1 Exemption of Land-Use Fee for Coal Mines

In 1989 the State Administration of Taxation issued rules permitting exemption of land-use fees for SOEs under certain circumstances. According to article 1, coal producers can be exempted from land-use fees for land uses, including waste dumping, drainage, roads and railway lines among others. Article 1 is still in effect in 2015. It is not possible to quantify the value of exemption issued to coal producers, but since land-use fees for industrial land are not usually a significant operational cost in China, the total value of the subsidy is expected to be relatively small in comparison to other subsidies identified (Yicai Daily, 2014).

2.4.2 Providing Inner Mongolia Producers with Coal Railway Transportation Below Fair Market Rate

Inner Mongolia has large coal resources but is located at a considerable distance from the major markets in the east of the country. As a result, the cost of rail transportation is a key factor in the operational costs of producing and marketing coal in Inner Mongolia. To address this cost, tariffs for coal transported by rail have been reduced considerably (Zhao, 2013). The reductions amount to a subsidy through the provision of transport services below market rates. It is estimated that this subsidy is worth approximately CNY 7.2 billion in 2013, making this the most significant subsidy received by coal producers in Inner Mongolia (Zhao, 2013).

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Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Fax: +1 (204) 958-7710
Website: www.iisd.org
Twitter: @IISD_news

Geneva Office

International Environment House 2
9 chemin de Balexert, 1219 Châtelaine
Geneva, Switzerland

Tel: +41 22 917-8683
Fax: +41 22 917-8054
Website: www.iisd.org
Twitter: @IISD_news

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