Brief

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Phase-out 2020: monitoring Europe's fossil fuel subsidies

Ipek Gençsü and Florian Zerzawy

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Germany

Key findings

Leading on phasing out fossil fuel subsidies by:

- Germany is demonstrating leadership across the EU in transparency of reporting on its fossil fuel subsidies. It is one of the only countries in the world that regularly reports on its subsidies, through the biannual *Subsidy Report of the Federal Government*.
- Germany's Climate Action Plan 2050 reiterates government plans to reduce environmentally harmful subsidies.
- In 2007, Germany pledged to end subsidies to production of hard coal in 2018. In 2010 this became a European Union-wide (EU) commitment.

Lagging on phasing out fossil fuel subsidies by:

- Despite recent commitments to phase out fossil fuel subsidies, Germany's subsidies to the consumption of fossil fuels, through tax exemptions in transport and electricity, remain very high.
- As recently as 2015, Germany adopted a new coal subsidy measure in the form of capacity payments for lignite plants, which replaced earlier plans to introduce a climate levy that would have penalised these polluters. A planned new capacity reserve is currently under investigation by the European Commission (EC) to determine if it is in breach of State Aid guidelines.
- Germany has also significantly increased subsidies to the use of fossil fuels in industrial processes through tax breaks for energy-intensive industries, which amounted to almost €10 billion per year between 2014 and 2016.
- Germany provides over €2.4 billion financing per year towards oil and gas projects, and fossil fuel-powered electricity, outside of the EU.

Status of the energy transition in Germany

Germany is Europe's second largest energy producer after France, and its largest energy consumer (Eurostat, 2017; Energy Information Administration (EIA), 2016). Oil and gas continue to be Germany's significant source of energy, making up 34% and 22.6% of the country's total primary energy consumption in 2015 respectively (Energy Information Administration (EIA), 2016).

As part of the country's commitment to the *Energiewende* (energy transition towards low carbon), Germany has some of the most ambitious renewable energy policies in the world. These include a commitment to generate 80% of electricity from renewables by 2050, while phasing out nuclear power by 2022 (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), 2016). This has led to a substantial increase in the share of renewables in the production of electricity, from 6.6% in 2000 to 34% in 2016, most of which has replaced the phased-out nuclear capacity (Burger, 2017).

Despite Germany's success in boosting renewable energy production, the country is still the EU's largest coal producer (Eurostat, 2017) and the world's largest producer of lignite (or brown coal),[1] which is primarily used in electricity generation (Organisation for Economic Cooperation and Development (OECD), 2016). Coal remains Germany's main source of electricity generation, accounting for around 40% (AG Energiebilanzen, 2016a). In 2016, fossil fuels also accounted for more than 52% of Germany's gross electricity generation (AG Energiebilanzen, 2016a).

While coal does play an important role as fuel for industrial processes such as steel manufacturing, the production of hard coal is now declining because of the gradual phase-out of long-term financial support from government, without which it is no longer profitable.

Domestic oil and gas production in Germany from conventional sources is relatively limited, though the country has significant refining capacity, and oil and gas is mainly imported. In the transport sector, oil accounts for almost 94% of final energy consumption, whereas natural gas is mainly used in space and water heating (AG Energiebilanzen, 2016b).

Shale gas activities in Germany have been limited to date, and estimates for potential vary greatly (Vetter, 2016). After years of debating, in June 2016 the parliament passed a law that bans hydraulic fracturing to produce shale gas as well as shale oil. However, some forms of conventional hydraulic fracturing in sandstone, as performed for decades in German natural gas fields, may continue (Shale Gas Information Platform (SHIP), 2016).

Status of fossil fuel subsidies in Germany

The European Union (EU) including all its Member States have committed to phasing out environmentally harmful subsidies, including those to fossil fuels, by 2020 (European Commission, 2011). In 2007 Germany agreed to end subsidies to uncompetitive hard coal mining by 2018, a commitment that was subsequently adopted at EU level in 2010 (Federal Ministry for Economic Affairs and Energy (BMWi), 2007; EU Council Decision, 2010). As party to the Paris Agreement, Germany has also committed to '[m]aking finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development' (United Nations Framework Convention on Climate Change (UNFCCC), 2015). As a member of the EU bloc that is party to the G7, Germany has committed to phasing out its 'inefficient' fossil fuel subsidies, and called on all countries to do so as well, by 2025 (G7, 2016). As a member of the EU, and therefore a part of the G20, Germany has repeated its commitment to phase out fossil fuel subsidies every year since 2009 (G20, 2017).

Overview of fossil fuel subsidies by Germany

Germany has shown leadership in greater transparency by being the only European country that regularly publishes an inventory of its fossil fuel subsidies.

Although Germany is very transparent in in publishing its subsidies the information is not complete. Our research found no data for 7% of the fiscal support instruments we identified.

Despite Germany's commitments to phase out fossil fuel subsidies, the government continues to provide support domestically (and internationally) to all sectors reviewed in this brief through fiscal support and public financing.

Based on available information Table 1 below provides an estimate of the scale of Germany's fossil fuel subsidies on average per year between 2014 and 2016 (using publicly available sources).

Germany provided fiscal support worth €33.3 billion, and public finance of €2.4 billion per year, between 2014 and 2016. We did not identify any support to fossil fuels through German national-level state-owned

For more information on the sources of data and the methodology used in this report, please refer to the Methodology chapter of the summary report, *Phase-out 2020: Monitoring Europe's fossil fuel subsidies*.

1 Lignite, also referred to as brown coal, has a relatively low energy content and causes the highest CO2 emissions per tonne when burned.

Table 1: Subsidies to fossil fuel production and consumption by Germany, by activity (Euro millions, average 2014-2016)

Activity / instrument	Production				Consumption					TOTAL
	Coal Mining	Oil and gas	Electricity	Multiple activities or unclear	Transport	Industry and business	Households**	Agriculture***	Multiple activities or unclear	
Fiscal support (Budget expenditure + tax exemptions + price relief)	2,690	n/a	1,410	322	18,913	9,585	n/a	400	0	**33,320**
Public finance	47	1,001	1,310	60	0	0	0	0	0	**2,417**
Domestic and EU	*0*	*160*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*160*
International	*47*	*840*	*1,310*	*60*	*0*	*0*	*0*	*0*	*0*	*2,257*
State-owned enterprise investments*	0	0	0	0	0	0	0	0	0	**0**

Note: For sources and data, see country data sheet available at odi.org/Europe-fossil-fuel-subsidies

** We did not identify any investments between 2014-2016 by national-level SOEs that meet the definition used by this report.*

*** Direct aid is provided to poor families to cover 'reasonable' heating costs of recipients of social security benefits. But the amount is not identified.*

**** Support to agriculture is actually higher, as additional energy tax breaks are provided for the agriculture and manufacturing sectors. These were included in the total for Industry and business.*

enterprise (SOE) investment for the period of this analysis (2014-2016).

Over half the subsidies support fossil fuel consumption in the transport sector, which amounted to €18.9 billion per year between 2014 and 2016, and over €9.6 billion of subsidies were provided to the industry and business sectors, in the same period.

Fiscal support to coal mining was significant, at €2.7 billion per year between 2014 and 2016, though 76% of this went towards supporting the transition away from coal.

The following sections give more detail on subsidies provided to the production and consumption of oil, gas and coal, and to fossil fuel-powered electricity. The summary below is not comprehensive; the full list of subsidies can be found in the Germany datasheet.[2]

Coal mining

The largest support measure for coal mining is through a 10-year funding package agreed in 2007 to support a socially acceptable phase-out of the hard coal industry in the state of North Rhine-Westphalia. This aid package replaced and combined previous support programmes for Germany's hard coal industry, and was worth €1.5 billion in 2014 (OECD, 2015). This measure is due to expire in 2018 in line with EU regulation. The government provides early retirement schemes to unemployed hard-coal miners North Rhine Westphalia and Saarland, with support amounting to €168 million in 2014 (OECD, 2015).

Under the programme to rehabilitate lignite sites, established in 1990, the federal government and states together provide support for the rehabilitation of more than 200 mines in 31 lignite mining areas in the former German Democratic Republic (East Germany). In 2012, the government agreed to continue financing the rehabilitation of lignite mining sites between 2013 and 2017. Federal and state government support for this programme was €258 million per year (OECD, 2015).

Subsidies are also provided to the mining industry. Exemptions made on water extraction fees for lignite and hard coal were worth €52 million in 2014 (OECD, 2015; Küchler and Wronski, 2015). Other support measures include the exemption of open-cast lignite mining from the production charges for mineral resources, which amounts to €259 million per year (Federal Environment Agency (UBA), 2014).

Budget expenditure on research, development and demonstration (RD&D) is also provided for coal, but no data is available for the years 2014-2016. (In 2013 almost €9.5 million was provided.) (IEA, 2017).

2 Available at odi.org/Europe-fossil-fuel-subsidies

Oil and gas production

Domestic, and EU

Production subsidies to oil and gas in Germany are limited. They are mainly in the form of tax breaks for costs of intermediate inputs for manufacturers of energy products (e.g. refineries), and totalled €322 million in 2014 (OECD, 2015). This amount was accounted for in the 'multiple activities or unclear' stage of the production support, as how much of it benefited oil and gas production could not be determined.

The only public finance towards oil and gas domestically that has been identified for this report is the acquisition of a 45% stake in Bayernoil Refinery by KfW in 2014, which cost €39 million (Oil Change International (OCI), 2017).

Fiscal support for RD&D is also provided for oil and gas, but no data is available for the years 2014-2016. (In 2013 almost €7.6 million was provided (IEA, 2017).) An additional €41 million was provided for fossil fuel-related RD&D in 2014, but it is unclear what fuel type and activities this funding supported (IEA, 2017).

International (outside the EU)

Public finance for oil and gas infrastructure internationally was €840 million per year, based on data for 2014 and 2015 (OCI, 2017). This includes, most prominently, a loan by Euler Hermes to the Nghi Son oil refinery and petrochemicals complex in Viet Nam in 2014 (€118 million), and a loan by KfW to the Sohar Refinery expansion in Oman in 2014 (€126 million). It also includes financing of two offshore vessels used to foster deep-sea offshore oil fields in Norway, each at €315 million (OCI, 2017).

Electricity production

Domestic, and EU countries

In 2006, the German government abolished the taxation of gas and oil used for power generation, which means that none of the fossil primary fuels in this sector are subject to taxation (UBA, 2014). In 2015, the exemption for coal amounted to €153 million (Destatis, 2016).

A new support measure was introduced in 2015 for coal-fired power. Known as 'capacity reserve payments', this measure will provide operators of eight lignite coal-fired power plants with compensation for keeping power plants in standby mode, but retaining them from the eltricity market, until 2021 (European Commission, 2016). The subsidies for the sale of German coal for electricity generation and to compensate impacts of capacity adjustment were estimated at €1.2 billion per year between 2015 and 2016 (Federal Ministry of Finance (BMF), 2016).

The capacity reserve was introduced after initial plans for a climate levy that would penalise heavy polluters were dropped in the face of opposition from energy utilities, trade unions and local politicians (Littlecott, 2016).

In April 2017, the EC launched an investigation into a new proposed capacity reserve, which would require German network operators to procure 2 Gigawatt (GW) of capacity that would be held in reserve outside the market. The EC expressed concerns that it might distort competition and favour power plant operators over demand response operators (European Commission, 2017).

Although not included in the analysis of this report because it is municipally owned, one of Germany's key utility companies, EnBW, has mostly coal-fired electricity generation. EnBW, the third largest utility in Germany with 5.5 million customers and a 13 GW generation portfolio, is 98%-owned by a collection of municipalities in Baden-Wurttemberg.

International (outside the EU)

Outside the EU, Germany invested almost €1.3 billion per year on average between 2014 and 2015 in gas-powered electricity generation. This included, most notably, €1.2 billion of financing by Hermes in 2015 in the Beni Suef Power Plant in Egypt, as well as €247 million by Hermes and KfW together in 2015 for the Hamitabat Gas Fired Power Plant in Turkey, and two measures of support (a loan and a guarantee), worth €199 each, for the San Gabriel gas-fired combined cycle power (CCGT) power plant in the Philippines (OCI, 2017).

Transport

The highest amounts of German subsidies for fossil fuels are provided for consumption in the transport sector. Oil in the transport sector is heavily subsidised, through tax relief on diesel (almost €8 billion per year between 2014 and 2016), and tax relief for fuels used in commercial aviation (more than €7.5 billion per year in 2016) (Zerzawy et al., 2017). Tax exemptions are also provided for fossil fuels used in internal waterway transportation (€160 million per year) (OECD, 2015).

Since the expansion of the diesel tax relief (compared to petrol) in the 1980s, the share of diesel vehicles in newly registered vehicles has been steadily growing, reaching an all-time high in 2014 (almost half all cars) ((Federal Motor Transport Authority) (KBA), 2017).

Tax advantages are available for company cars, worth €3.1 billion in 2014 (Fiedler et al., 2017). Exemptions are also made for aviation tax, worth €86 million per year between 2014 and 2016 (BMU, 2016).

Support is provided to maritime transport, through direct budgetary contributions of €58 million per year (Federal Ministry of Finance (BMF), 2016).

Industry and business

While electricity prices in Germany are higher for private end users than in other European countries, industry largely benefits from generous tax exemptions. There are different subsidies for electricity consumption, such as tax reliefs for agriculture (see below) and manufacturing, as well as for energy-intensive processes or the Peak Equalisation Scheme, which allows companies to get refunds on their electricity and energy tax bills.

Through the Peak Equalisation Scheme, certain companies receive additional refunds on their electricity and energy tax bills in cases where the decrease in pension contributions did not prove large enough to offset the new tax burden on electricity inputs. These were estimated to be worth over €1.4 billion of support on average per year in between 2014 and 2016.

Many other subsidies for electricity consumption are independent from state budget as they are paid by other users. An example is the Special Compensation provision for the Renewable Energy Sources Act (EEG-Umlage), which partially exempts energy-intensive companies in the manufacturing sector from the payment of the surcharge for renewable energy, which has resulted in €2.5 billion financial benefit on average per year between 2014 and 2016 (Freericks et al., 2017). Similarly, self-generating electricity in industry was also completely exempt from the EEG levy, which resulted in 1.2 billion of financial benefit between 2014 and 2016 (Freericks et al., 2017).

Other subsidy measures which result in the highest amounts of support are: energy tax relief for energy-intensive processes (€598 million per year); electricity and energy tax breaks for agriculture and manufacturing (€704 million per year); reduced electricity grid charges for energy-intensive industry (€413 million per year); electricity tax exemption for electricity-intensive processes (€388 million per year); energy tax relief for LPG and natural gas used in engines (€227 million per year); and reduction of the combined heat and power (CHP) levy for the economy (reduced rates for electricity-intensive companies as well as rail-bound transport and railway infrastructure companies, €260 million per year), all estimated for the period between 2014 and 2016 (OECD, 2015; BMF, 2015; 50Hertz, 2013; 2014; 2015).

Overall, Germany has significantly increased subsidies to the use of fossil fuels for industrial processes, through tax breaks for energy-intensive industries. These grew fivefold, from €30 million a year in 2006 to around €150 million a year in 2014 (OECD, 2015).

In industrial heating, subsidies such as energy tax breaks for fuels and the Peak Equalisation Scheme incentivise fossil fuel consumption by reducing the price for fuels. A lower tax rate compared to other fuels is applied when coal is used for heating, which would need to be taxed six times higher if energy content and CO_2 emissions were to be considered, based on the rate for heating oil as reference. This subsidy amounted to more €195 million per year between 2014 and 2016 (Freericks et al., 2017).

Under the EU Emissions Trading Scheme (ETS), CO_2 emission allowances have been allocated free of charge to installations in the industrial sector. As a result, the operators of the installations are able to continue emitting CO_2 at no cost, under the allowances allocated to them. This regulation also benefits coal consumption, such as in the steel industry (UBA, 2014). Our analysis was not able to identify the total worth of the free permits allocated. In addition, industrial actors and electricity producers in Germany have received profits from the over allocation of EU ETS emissions allowances, estimated at an annual average of €939 million between 2008-2015 (Bruyn et al., 2016). We did not include this in the total amount of support provided by the German government, as it is an indirect form of support.

Households

Domestic, and EU

Direct state aid is provided to poor families to cover 'reasonable' heating costs of recipients of social-security benefits. But the amount is not identified.

International (outside the EU)

The construction of a new coal-fired district heating system in Linxia province and modernisation of another coal-fired district heating system in Jinzhong, both in China, cost KfW €40 million and €36 million in 2014 respectively.

Agriculture

Subsidies for agriculture in Germany include tax refunds for diesel used in agriculture and forestry, worth €400 million per year between 2014 and 2016. In addition, as discussed in the Industry and business section, tax breaks to energy and electricity use apply to the agriculture and manufacturing sectors. These were worth €704 million per year between 2014 and 2016 (OECD, 2015), but were not counted in the agriculture total as the amount going towards agriculture was not able to be confirmed.

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This country brief is part of a series of 11 country briefs and an EU-level brief, the findings of which are collated in the summary report *Phase-out 2020: Monitoring Europe's fossil fuel subsidies,* available at **odi.org/Europe-fossil-fuel-subsidies**

For the purposes of this country study and accompanying country data sheet, fossil fuel subsidies include: fiscal support from governments (budgetary support, tax breaks, and price and income support), public finance, and investment by state-owned enterprises (SOEs). The years for which data was collected and analysed is 2014, 2015 and 2016, and findings are expressed in annual averages across this period.

The summary report *Phase-out 2020: Monitoring Europe's fossil fuel subsidies* provides a more detailed discussion of the methodology used for this country study. The authors welcome feedback on both this country study and the accompanying country data sheet to improve the accuracy and transparency of information on fossil fuel subsidies.

Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
Tel +44 (0)20 7922 0300
Fax +44 (0)20 7922 0399
www.odi.org
info@odi.org

CAN Europe
Rue d'Edimbourg 26
1050 Brussels, Belgium
Tel: +32 (0) 28944670
www.caneurope.org
info@caneurope.org

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