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

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September 2017

Sweden

Key findings

Leading on phasing out fossil fuel subsidies:

- Over the past decade the Swedish government has put substantial effort into phasing out subsidies to fossil fuels.
- Sweden has the world's highest CO₂ tax, which covers sectors outside the European Union Emissions Trading Scheme (EU ETS) (households, services, transport, agriculture and forestry).
- Although 11 of the subsidies identified in this study are exemptions on the CO₂ tax, Sweden has been reducing these exemptions, including abolishing the special CO₂ tax break to some industrial installations outside EU ETS. It has also reformed energy taxes on heating fuels to reflect the energy content accurately.
- The majority state-owned energy company, Vattenfall, has reduced its financing for coal-fired power in recent years, with the company's share of generation from coal falling by more than 50% between 2014 and 2016.

Lagging on phasing out fossil fuel subsidies:

- The Swedish government provides numerous tax breaks to the consumption of fossil fuels, including in the transport, industry and agriculture sectors. Support to the transport sector was worth SEK9.5 billion (€1.1 billion) per year between 2014 and 2016.
- The Swedish Export Credit Corporation (Aktiebolaget Svensk Exportkredit, SEK) and National Export Credits Guarantee Board (Exportkreditnämnden, EKN) have continued or increased financing for natural gas in the past few years.
- Vattenfall has also increased gas-fired power generation in recent years (by around 10% between 2014 and 2016).

Status of the energy transition in Sweden

In Sweden the share of fossil fuels in electricity generation is very low, and fossil fuels make up only one third of the primary energy supply – the second lowest share of any country in the Organisation for Economic Cooperation and Development (OECD) (OECD, 2016). Fossil fuels made up 1.1% of electricity generation in 2014 and 2.2% in 2015, making Sweden one of the world leaders in decarbonising electricity generation (World Development Indicators (WDI), n.d.). However, energy intensity — which is measured as the amount of energy consumed per unit of GDP — is high due to the large energy requirements of heavy industry, the country's cold climate and its sparse population.

The country is currently heavily dependent on imported oil and natural gas as it has no domestic production of oil, natural gas or coal. Fully open to competition, the Swedish oil market is dominated by Saudi-owned Preem, which owns two of the five country's refineries. Sweden has domestic peat, which it uses as a complement to biofuels (International Energy Agency (IEA), 2013).

Sweden aims to become one of the first fossil fuel-free countries in the world. It also has a target of 100% renewable electricity production by 2040. While Sweden has reduced its financing for coal in recent years in line with decarbonisation plans, it sees natural gas as a key transition fuel in industry and co-generation, and has been increasing support towards natural gas over the past years (IEA, 2013).

Energy products are subject to energy tax, CO₂ tax and taxes on other environmentally harmful components (sulphur and NO_x emissions) (OECD, 2016). Tax rates depend on fuel type, use (heating, transport) and consumer (manufacturing industry, energy industry, households); also, in the case of electricity, region (the north or elsewhere).

Pricing carbon through CO₂ taxation has been the main policy instrument to drive down fossil fuel consumption, and it has done so significantly over the past 20 years. The CO₂ tax was first introduced in Sweden in 1991 €29, alongside existing energy taxes; it has gradually increased, to €125 in 2014 for households and services. The tax is coordinated with EU Emissions Trading Scheme (ETS), which was adopted in 2005. Industrial installations covered by EU ETS are not subject to the CO₂ tax, and there are several exemptions to the tax, which are outlined below (World Bank, 2015; Ministry of Environment and Energy, 2017).

Status of fossil fuel subsidy phase-out in Sweden

The 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 addition, EU Member States are committed to

phasing out subsidies to hard coal mining by 2018. As party to the Paris Agreement, Sweden 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, Sweden 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, Sweden has repeated its commitment to phase out fossil fuel subsidies every year since 2009 (G20, 2017).

With nearly 40 other countries and hundreds of companies, Sweden signed a communiqué in 2015 calling on countries to eliminate inefficient fossil-fuel subsidies (Friends of Fossil Fuel Subsidy Reform (FFFSR), 2015).

Sweden has made significant progress in phasing out fossil fuel support. It is one of the frontrunners in ending fossil fuel subsidies, and it aims to become one of the first fossil-free countries in the world.

Overview of fossil fuel subsidies by Sweden

The government of Sweden does not publish a full inventory of its fossil fuel subsidies or environmentally harmful subsidies. This is in contrast to Germany, which demonstrates higher transparency in publishing regular inventories (see Whitley et al., 2017). In the absence of systematic government reporting or a roadmap for the phase-out of fossil fuel subsidies, it is challenging to assess whether Sweden is on track to meet its subsidy phase-out commitments.

Due to limited transparency in Sweden, our research found no data for 8% of the fiscal support instruments or for any of the projects and programmes supported through public finance.

In June 2016, the Swedish environmental protection agency, Naturvårdsverket, published a report on subsidies with potential environmental damage, as a follow-up to a report published in 2004 (Naturvårdsverket, 2017). Naturvårdsverket's latest report was published after we had concluded our analysis, so its data is not included in this study.

Despite Sweden's commitments to phase out fossil fuel subsidies, the government continues to provide support both domestically and internationally to all sectors reviewed, through national subsidies, public financing and SOE investment.

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

Vattenfall provided SEK4.5 billion (€539 million) per year to fossil fuel-base electricity between 2014 and 2016,

but apart from this, support to fossil fuel production in Sweden is limited.

Our research also identified financing for fossil fuel projects by Swedish public finance institutions, mostly for international gas-fired power. However, our analysis found no information on the value of this support.

All consumption subsidies identified are tax exemptions, granting reductions or full exemptions from energy and CO2 taxes for specific end use. There are subsidies for end users in industry and business, the energy sector, agriculture and households. The rationale is to avoid carbon leakage in sectors subject to international competition. There is also a wide range of subsidies to the transport sector.

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 country data sheet.

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*.

Coal mining

Our research found no support measures directed at coal mining in Sweden between 2014 and 2016.

Oil and gas production

International

The Swedish Export Credit Corporation (SEK) has made significant efforts in recent years to increase support for renewable energy (SEK, 2017). However, a comprehensive list of SEK's support to energy projects and the amount of financing provided for fossil fuels is not publicly available.

The Swedish National Export Credits Guarantee Board (Exportkreditnämnden, EKN) reports its support for natural-gas infrastructure internationally, and frames this as an important component of transitioning towards a low-carbon economy so 'users can switch to cleaner fuel, with a positive effect on the local environment' (EKN, 2017a). It recently announced its decision to invest in the Yamal LNG (liquefied natural gas) project in the Russian Arctic, which develops natural-gas extraction fields and will include an LNG plant, storage and marine loading facility (EKN, n.d.a). In 2015, EKN invested in the South Caucasus Pipeline Expansion (SCPX) project in Azerbaijan, which has been in operation since 2006 (EKN, n.d.b). The purpose of the expansion is to increase the capacity for gas transport by about 16 million m3 of gas per year from the Caspian Sea in Azerbaijan to the Georgia-Turkey border (EKN, 2017b). However our research found no

Table 1. Sweden's subsidies to fossil fuels and electricity (millions Swedish Krona, average 2014-2016)

Activity / instrument	Production				Consumption					TOTAL
	Coal production	Oil and gas production	Electricity production	Multiple activities or unclear	Transport	Industry and business	Households	Agriculture	Multiple activities or unclear	
National subsidies (Budget expenditure + tax exemptions + price relief)	0	0	280	14	9582	1940	n/a	1090		13,183
Public finance	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<i>Domestic and EU</i>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<i>International (outside EU)</i>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
State-owned enterprise investments	0	0	4492	0	0	0	0	0	0	4,492

Notes: this table is in the local currency, but numbers are compiled in Euros for the overall analysis presented in the summary report. For sources and data, see country data sheet available at: odi.org/Europe-fossil-fuel-subsidies

comprehensive list of EKN's investments in fossil fuel projects between 2014 and 2016.

EKN has also provided guarantees for gas turbines for a power plant in Argentina, equipment for two gas-based CHP plants in Israel, and a gas terminal in Finland (EKN, 2017a).

Electricity production

Domestic, and within Europe

In the energy sector, fossil fuels used in CHP plants are subject to a reduced energy tax rate, and peat used for electricity generation is fully exempt from CO₂ tax.

Under EU ETS, economic operators (utilities and industry) are required to obtain emission permits or allowances for each tonne of CO₂ they emit. Although auctioning is supposed to be the default mode for acquiring emission allowances, almost half the total allowances are handed out to these companies for free. As a result, in its current design EU ETS provides a considerable amount of subsidies to carbon-intensive operators in the form of free allowances. No data was available on the total value of the permits allocated in Sweden.

Vattenfall, the majority state-owned energy company, has reduced its financing for coal-fired power in recent years. In 2017, the company sold its coal-fired plants and coal mines in Germany, and its share of generation from coal fell by more than 50% between 2014 and 2016. Two thirds of its remaining CO₂ emissions come from its coal-fired condensing/combined heat and power (CHP) plants in Germany and the Netherlands, and most of the remainder from gas-fired units in the two countries. In 2015, it sourced 7.2 million tonnes of hard coal for usage in its hard-coal-fired power stations (Vattenfall, 2017). However, in spite of decreasing its carbon intensity, Vattenfall continues to invest heavily in fossil fuels, mainly through gas-fired power.

Transport

The reduced energy tax rate for diesel used in transport is the single largest subsidy identified in our research, worth SEK7.6 billion (€837 million) per year between 2014-2016. Diesel is completely exempt from energy and CO₂ tax when used in diesel-powered trains.

Exemptions for natural gas and LPG used in transport amounted to SEK200 million (€22 million) in 2014. Natural gas and LPG are also subject to a reduced CO₂ tax rate (30% reduction), worth SEK357 million (€39

million) in 2014 (OECD, 2015). All fuels used for domestic aviation and shipping are fully exempt from energy and CO₂ tax, resulting in subsidies worth SEK680 million (€75 million) and SEK320 million (€35 million) per year (OECD, 2015), respectively. Sweden also exempts some passenger transport from VAT: international and intra-community passenger transport services are taxed at a zero rate, while domestic passenger transport is taxed at a reduced rate of 6% (EC, 2014).

Other support schemes, which have recently declined, include CO₂ tax exemptions for domestic aviation and shipping.

Industry and business

The CO₂ tax rate is reduced for fossil fuels used for heating by industrial consumers outside EU ETS, energy-intensive companies, diesel used in the mining industry, and district heating supplied to industry (OECD, 2015). The value of this subsidy is estimated at SEK990 million (€109 million) per year. A 30% reduction in the energy tax rate is applied to heating fuels for industrial consumers, worth SEK660 million (€73 million) per year.

The mining industry benefits from a 70% reduction on the energy tax rate for diesel used for stationary machinery, worth SEK160 million (€18 million) per year. Mining companies also receive an energy tax reduction of 86%, costing Sweden SEK110 billion (€12 million) in 2014. This tax expenditure is calculated against a benchmark of the energy tax rate on heating oil (OECD, 2015). Industrial consumers are granted a 30% reduction on the standard energy tax rate on heating fuels.

Households

Our analysis identified no support measure for consumption of fossil fuels by households.

Agriculture

There is a significant reduction on the CO₂ tax rate for diesel used as fuel for machinery in agriculture and forestry. This reduction has been decreasing over time, from 79% in 2010, to 70% in 2011, to 53% in 2016.

The energy tax rate is reduced by 30% for fuels used to heat greenhouses and in other agricultural activities (OECD, 2015). Furthermore, there is a reduction on the CO₂ tax for fossil fuels used for greenhouses and agriculture, and for diesel used as fuel in machinery (OECD, 2015).

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This material was funded by the Oak Foundation, Hewlett Foundation and the KR Foundation.

The authors are grateful for support and advice on this country brief from Rolf Lindhal and Gunnar Lind (Greenpeace Sweden), Anders Friström – (Swedish Society for Nature Conservation) and Ron Steenblik (OECD).

The authors would also like to thank Sophie Kershaw for editorial support, Chris Little and Charlie Zajicek for communications support, and Matthias Runkel, Shelagh Whitley and Leah Worrall for their comments.

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.



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