



FIRST-EVER OECD INVENTORY OF SUPPORT TO FOSSIL-FUEL PRODUCTION OR USE

Key findings

- For the first time ever, the OECD has compiled an inventory of over 250 measures that support fossil-fuel production or use in 24 industrialised countries, which together account for 95% of energy supply in OECD countries. Those measures had an overall value of about USD 45-75 billion a year between 2005 and 2010.
- In absolute terms, nearly half of this amount benefitted petroleum products (i.e. crude oil and its derivative products), with the rest equally split between coal and natural gas.
- Because several OECD countries do not produce significant amounts of fossil fuels, consumer measures account for a large share of overall support. Producer support remains, however, far from negligible in those OECD countries that produce fossil fuels.
- A significant portion of the support provided in OECD countries is through tax expenditures such as tax credits, exemptions or reduced rates. These provisions provide a preference for fossil fuels compared with the “normal” tax rules in the particular country. Since normal tax rules and rates vary so much between countries, however, this type of support is not readily comparable.
- The OECD inventory marks a significant step towards greater transparency and accountability with respect to the policies that relate to the production or use of fossil fuels. While it does not evaluate the merits of individual policies, the inventory is a critical first step that will facilitate analysis and understanding of which of these mechanisms may be inefficient or wasteful, and for identifying options for reform.

The need for an inventory

The global economic crisis is not yet over. With increasing understanding of the risks of climate change, countries are struggling at home and internationally to find cost-effective measures to reduce their greenhouse-gas emissions. Policy makers are faced with having to deal with a multitude of challenges at once: nourishing growth while encouraging it to become more “green”; preventing high unemployment rates from becoming entrenched; reducing government deficits; and managing global imbalances. Implementing growth-friendly fiscal structures and public spending patterns is critical to reducing imbalances and stimulating growth.

Reforming or eliminating inefficient support for the consumption or production of fossil fuels can contribute to achieving these economic and fiscal objectives, while also helping to tackle environmental problems like climate change (Burniaux and Chateau, 2011; OECD, 2012). At the global level, reforming fossil-fuel subsidies would contribute to curbing emissions of greenhouse gases (GHGs) such as CO₂ by removing major incentives to produce or use such fuels. At the country level, reforming fossil-fuel support would also help reduce public spending and increase tax revenues, thereby improving fiscal balances. It

could free up scarce government resources for other priorities, such as protecting vulnerable households, stimulating employment creation, or helping to address climate change at home or in developing countries.

The importance of reforming policies supporting fossil fuels was explicitly recognised in the OECD's June 2009 Declaration on Green Growth, in which 34 countries vowed to "encourage domestic policy reform, with the aim of avoiding or removing environmentally harmful policies that might thwart green growth, such as subsidies: to fossil fuel consumption or production that increase greenhouse gas emissions ..." [www.oecd.org/greengrowth]. Three months later, G-20 leaders committed to "rationalize and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption", and called upon the rest of the world to do the same [www.g20.org]. In November 2009, a similar commitment was made by leaders of the Asia-Pacific Economic Cooperation (APEC) forum [www.apec.org]. Since then, the OECD, together with other inter-governmental organisations, has been actively involved with the G-20 Energy Expert Group, and has contributed to several reports on energy support prepared for G-20 Leaders.

Despite the many benefits of reforming fossil-fuel subsidies, efforts to implement such reforms have long been hampered by a crucial lack of information regarding the amount and type of support measures in place. This lack of information was most profound for fossil-fuel support in industrialised countries, including the membership of the OECD. The International Energy Agency (IEA) has been producing data on fossil-fuel consumer subsidies in emerging and developing countries for several years using an estimation approach known as the "price-gap" method, which measures the extent to which a policy keeps domestic fuel prices below an international reference price. However, the price-gap approach does not capture support to producers and tax concessions to both producers and consumers, which account for much of the support provided by developed countries, since such measures do not push final prices below the level of international reference prices. Such support and tax concessions nonetheless reflect policies that may induce greater production or use of fossil fuels than would otherwise be the case.

To help fill this critical data gap, in 2010 the OECD started collecting data on budgetary support and tax expenditures that relate to fossil fuels. In October 2011, the OECD released a first-ever *Inventory of Estimated Budgetary Support and Tax Expenditures For Fossil Fuels* for 24 OECD countries,¹ which together account for about 95% of the OECD's total primary energy supply. The inventory represents an important improvement in transparency with respect to these support measures, and one that will help inform future discussions of energy policies, both nationally and in international forums.

How fossil fuels are supported in OECD countries

Governments support energy production in a number of ways, including by: intervening in markets in a way that affects costs or prices; transferring funds to recipients directly; assuming part of their risk; selectively reducing the taxes they would otherwise have to pay; and undercharging for the use of government-supplied goods or assets. Support to energy consumption is also provided through several common channels: price controls intended to regulate the cost of energy to consumers; direct financial transfers; schemes designed to provide consumers with rebates on purchases of energy products; and tax relief. Figure 1 provides an organising framework for examining different types of support to fossil fuels, reflecting their formal incidence and the transfer mechanisms used.

1. The 24 OECD countries covered by this first inventory are: Australia, Belgium, Canada, Chile, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Spain, Sweden, Turkey, the United Kingdom, and the United States. Inventories for the other ten OECD countries will be developed in the near future.

Figure 1. Matrix of fossil fuel support measures, with examples

		Statutory or Formal Incidence (to whom and what a transfer is first given)								
		Production							Direct consumption	
		Output returns	Enterprise income	Cost of intermediate inputs	Costs of Production Factors				Unit cost of consumption	Household or enterprise income
					Labour	Land	Capital	Knowledge		
Transfer Mechanism (how a transfer is created)	Direct transfer of funds	Output bounty or deficiency payment	Operating grant	Input-price subsidy	Wage subsidy	Capital grant linked to acquisition of land	Capital grant linked to capital	Government R&D	Unit subsidy	Government-subsidized life-line electricity rate
	Tax revenue foregone	Production tax credit	Reduced rate of income tax	Reduction in excise tax on input	Reduction in social charges (payroll taxes)	Property-tax reduction or exemption	Investment tax credit	Tax credit for private R&D	VAT or excise-tax concession on fuel	Tax deduction related to energy purchases that exceed given share of income
	Other government revenue foregone	Reduced resource-rent tax		Under-pricing of a good, government service or access to a natural resource		Under-pricing of access to government land; reduced royalty payment		Government transfer of intellectual property right	Under-pricing of access to a natural resource harvested by final consumer	
	Transfer of risk to government	Government buffer stock	Third-party liability limit for producers	Provision of security (e.g., military protection of supply lines)	Assumption of occupational health and accident liabilities	Credit guarantee linked to acquisition of land	Credit guarantee linked to capital		Price-triggered subsidy	Means-tested cold-weather grant
	Induced transfers	Import tariff or export subsidy	Monopoly concession	Monopsony concession; export restriction	Wage control	Land-use control	Credit control (sector-specific)	Deviations from standard IPR rules	Regulated price; cross subsidy	Mandated life-line electricity rate

Source: OECD, 2011a.

The OECD inventory takes stock of the broad set of measures identified by governments that effectively “support” fossil-fuel use or production, as defined using the PSE-CSE framework, which has already been used extensively to measure support, most notably in agriculture.² The scope of “support” is deliberately broad, and is broader than some conceptions of “subsidy”. It covers a wide range of measures that provide a benefit or preference for a particular activity or a particular product, either in absolute terms or relative to other activities or products. The data in the inventory were sourced from official government documents and web sites, complemented by information provided directly by government agencies. The valuations are generally those estimated by the respective governments, though the OECD has allocated support among the different fuels based on production and consumption volumes where such information is not available from government sources.

Policy features that support fossil fuels have been put in place for various policy reasons. While a number of the measures may be inefficient or wasteful, others may not be. The inventory does not analyse the impact of specific measures or pass judgement on which ones might be usefully kept in place and which ones a country might wish to consider for possible reform or removal. Its purpose is to provide information about policies that provide some level of support, as a starting point for further analysis about the objectives of particular measures, their impacts (economically, environmentally and socially), and possible reforms and alternatives.

Overall, the OECD has identified over 250 measures in 24 countries, estimated to have an overall value of about USD 45-75 billion per year over the 2005-10 period. The inventory provides important information about incentives created within each national economy. Caution is required, however, in interpreting the support amounts and in aggregating them. This is particularly the case as the majority of support mechanisms identified in the inventory are tax expenditures. Tax expenditures are *relative* preferences within a country’s tax system that are measured with reference to a benchmark tax treatment set by that country. Since the benchmark or “normal” tax treatment varies considerably from country to country, the value of this type of support is not comparable across countries. With respect to aggregation, the estimates generally do not take into account interactions that may be involved where multiple measures are removed at the same time.

As indicated in Figure 2, in absolute terms, petroleum products (i.e. crude oil and its derivative products) have generally been the prime beneficiaries of the fossil-fuel support measures listed in the inventory. This reflects to some extent the large share of oil in countries’ total primary energy supply, along with the fact that petroleum products are now consumed in OECD countries mainly in transport, a usage which is more heavily taxed on average. The peak seen in 2008 was driven partly by transfers via Mexico’s Petroleum Revenue Stabilisation Fund which is linked directly to world crude-oil prices.³

In terms of recipients, Figure 3 shows that measures relating to the consumption of fossil fuels accounted for about two thirds of total support in the year 2010; producer measures accounted for about 22%. This difference in part reflects the fact that several major OECD countries included in the inventory do not produce fossil fuels on a significant scale but are important consumers (e.g. France, Italy, Japan and Sweden).

-
2. The PSE-CSE framework distinguishes among those measures that benefit producers (PSE: Producer Support Estimate), consumers (CSE: Consumer Support Estimate), and those that benefit producers collectively, or that do not support current production, such as industry-specific R&D (GSSE: General Services Support Estimate). For more information, see the OECD’s PSE Manual, available online at: www.oecd.org/agriculture/PSE
 3. The spot price of West Texas Intermediate (WTI) light sweet crude oil averaged about USD 100 per barrel in 2008.

Figure 2. Support to fossil fuels in OECD countries by year and type of fuel

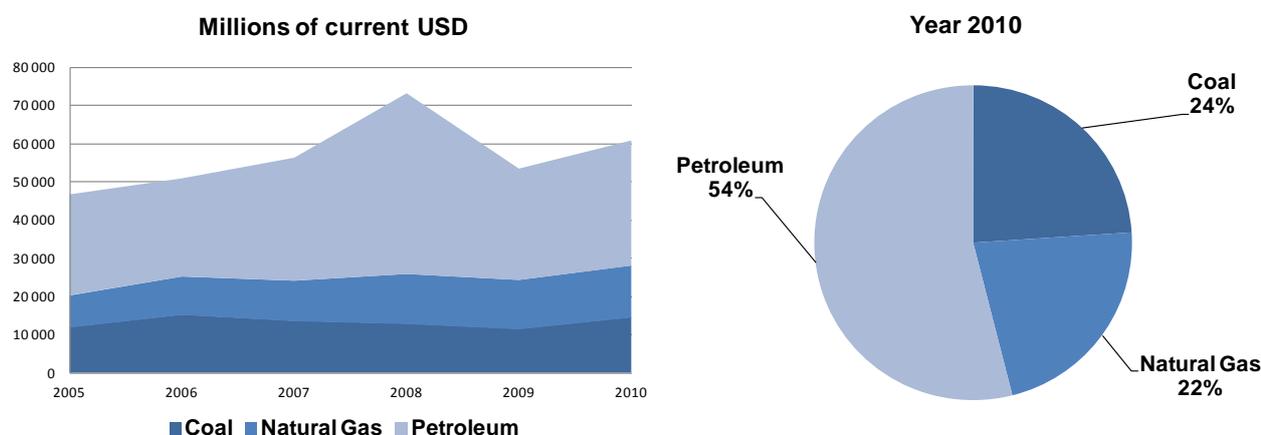
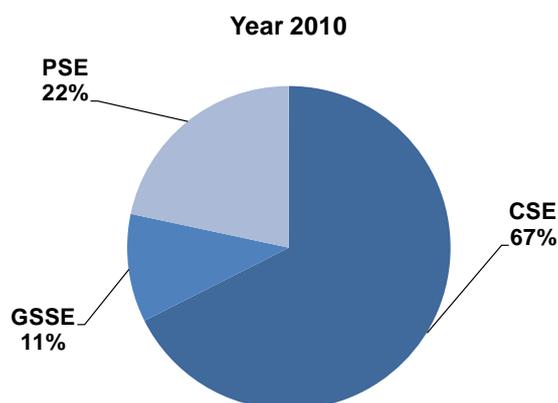


Figure 3. Support to fossil fuels in OECD countries by type of indicator



Note: The above charts are based on an arithmetic sum of the individual support measures identified for a sample of 21 OECD countries, i.e. the 24 OECD countries included in the inventory net of those countries for which estimates have not been collected yet (Chile, Iceland and Luxembourg). It includes the value of tax relief measured under each jurisdiction's benchmark tax treatment. The estimates do not take into account interactions that may occur if multiple measures were to be removed at the same time.
Data Source: OECD, 2011a

Some countries are more transparent than others when it comes to budgetary support and tax expenditures, which has implications in terms of the coverage of support mechanisms in the inventory, with the largest number of support mechanisms listed for those countries that are most transparent. Part of the value of this inventory is that it provides a standardised template for reporting measures. This common platform will encourage countries to become more open in quantifying and reporting on policy measures that affect fossil-fuel production or use.

More generally, the OECD inventory marks the beginning of an ongoing process that will be broadened and deepened over time. The inventory will gradually be expanded to cover all OECD countries. Measures at the sub-national level in federal countries were only canvassed at this stage on a selective basis, due to time and resource constraints. Numerous other forms of support — notably those provided through risk transfers,

concessional loans, injections of funds (as equity) into state-owned enterprises, and market price support — were not quantified in this initial inventory. The data requirements for estimating the transfers associated with such measures are greater than for budgetary transfers and tax expenditures, and the calculations to estimate the support elements more complex.

Lessons learned from country experiences in managing fossil-fuel subsidy reform

Experience shows that it is not easy to reform or phase-out environmentally harmful and costly subsidies, given the vested interests of those that benefit from them and limited available data on these subsidies. Despite this, a number of countries have made significant progress in phasing-out fossil-fuel subsidies in recent years (Box 1).

Box 1. Examples from specific countries

Germany — The production of hard coal in Germany has traditionally attracted government support for geological, historical and political reasons. The total, nominal value of estimated producer support for hard coal amounted to about EUR 5 billion (0.25% of GDP) in 1999. As the production of hard coal in Germany remains largely uneconomic, the government has decided to phase out its support to the industry by 2018. This gradual phase out is already reflected in a reduction in the total amount of estimated producer support by more than half, to about EUR 2 billion (0.09% of GDP) in 2009.

Mexico — Mexico supports the consumption of petroleum products through a price-stabilisation fund, the Petroleum Revenue Stabilisation Fund (FEIP). The FEIP was created in 2000 and is directly linked to world oil prices since domestic prices are set every month based on a benchmark import price. With world crude-oil prices reaching USD 100 per barrel in 2008, the total value of consumer support jumped to a record MXP 197 billion (USD 17.7 billion; 1.61% of GDP). The subsequent decrease in international oil prices a year later brought total consumer support down to MXP 9.3 billion (USD 692 million; 0.08% of GDP). As part of Mexico's ambitious energy strategy aimed at cutting national greenhouse-gas emissions by 50% by 2050 compared with 2000, the government is working to better target energy subsidies, while bringing prices more in line with costs (OECD, 2011b). The government has started to implement a new cash-transfer scheme connected to its *Oportunidades* programme to help poor households cover their energy needs with fewer distortions than under the current system. Mexico has also started a pilot programme to replace electricity subsidies for pumping irrigation water with direct cash transfers in some states, thus removing the price distortion that has led to significant over-exploitation of groundwater.

Poland — The bulk of state aid to the energy sector in Poland is apportioned to the coal industry. The total amount of producer support for coal over the 1999-2009 period is estimated by the OECD to have exceeded PLN 20 billion (USD 5.5 billion). Prior to the collapse of Communism, the production of coal was mainly supported through the provision of various social benefits to coal miners and the regulation of coal prices. With the economic transition of the 1990s, the state started to restructure the coal sector to make it profitable through a series of capacity-adjustment programmes, which resulted in the shutting down of unprofitable mines and a reduction in employment. These programmes proved, however, ineffective and the state decided (as in Germany) to gradually phase out government support. Most of the remaining costs are now associated with historical liabilities.

Sweden — Sweden has minimal fossil-fuel energy resources and today annually harvests only 2.2 million cubic metres (about 1.2 million tonnes of coal equivalent) of peat for energy use. Since all of the country's oil, natural-gas and coal needs are met through imports, producer support measures are negligible. Sweden does, however, provide numerous exemptions and reductions from energy- and CO₂-taxes that benefit particular users and uses of fossil fuels. Together, the tax expenditures that directly relate to fossil-fuel consumption were estimated to amount to about SEK 27.8 billion (USD 3.9 billion) in 2010. Although being important, this amount largely stems from Sweden's ambitious carbon-pricing policy. The country bases its tax-expenditure estimates related to energy on the assumption that all fuels should generally be subject to the same rate of tax (either per unit of energy content or per unit of carbon, depending on the tax in question). In 2010, 41% of the tax expenditures relating to fossil fuels (SEK 11.4 billion; USD 1.6 billion) were due to the use of diesel in transport, which is taxed at a lower rate than gasoline. Sweden has announced plans to increase the tax rates on some fuels and uses, which will therefore reduce their tax expenditures in the coming years.

United States — In the case of the United States, the OECD inventory estimates that total producer support, including tax expenditures at the federal level and for some states, represented slightly more than \$5 billion in 2009 (about 0.04 percent of GDP); the federal budget for FY2012 proposes to eliminate a number of tax preferences benefitting fossil fuels, which could increase revenues by more than \$3.6 billion in 2012. Some measures can also be found at the sub-national level, where states sometimes provide additional tax expenditures benefitting oil and gas producers. Based on a limited sample of states (Alaska, Texas, and West Virginia), the OECD found that sub-national measures accounted for about 40% (USD 2 billion) of the USD 5 billion of total estimated by the OECD for producer support in 2009.

Recent reforms to coal subsidies in a number of European countries provide examples of how governments have addressed these distributional concerns in the past few decades. Reforms of coal subsidies in Germany and Poland were accompanied by social assistance related to the closure of mines and, in the case of Poland, generous severance packages for affected workers. Reforms of the UK coal-mining industry were initially imposed with little adjustment assistance, leading to problems such as high unemployment and poor health in the affected regions. However, in 2000, the UK government began providing some financial support to assist the remaining parts of the coal industry to adjust their operations to be able to enter into commercially realistic investment projects that maintain access to coal reserves, provide employment opportunities in disadvantaged areas, and create an enabling environment for the development of alternative economic opportunities in coal-mining areas. This support has now ended.

Case studies on reform of subsidies to fossil-fuel consumption also indicate that increasing the availability and transparency of energy support data is essential. First, improved data on the scope and nature of fossil-fuel support can be useful in dispelling myths and misinformation and can encourage informed discussion and debate among both those with an interest in maintaining the policy features that provide support and those interested in their reform.

An important condition for successful subsidy reform is the credibility of the government's commitment to compensate vulnerable groups for energy price increases, and, more generally, to use the freed public funds in a beneficial way. Governments need to ensure public trust in the reform agenda through broad communication, and appropriate timing of subsidy removal and implementation of compensatory social policies. Groups that are severely affected by subsidy reforms — including but not restricted to the poor — may need to be compensated.

Looking across the experiences of governments that have managed to successfully reduce fossil-fuel and electricity subsidies, some common strategies for success can be identified:

- *Increasing the availability and transparency of support data.* The new OECD inventory is most helpful in this respect. Improved data on the scope and nature of fossil-fuel support can be useful in dispelling myths and misinformation, especially with respect to the distributional and competitive effects of reform. Increased transparency can encourage informed discussion and debate among both those with an interest in maintaining policy features that provide support and those interested in their reform. In addition, collection and transparency of data with respect to support can promote peer review and encourage compliance with any future subsidy reform processes.
- *Providing financial support for economic restructuring or poverty alleviation to smooth the path for fossil-fuel subsidies reform.* However, such support should be well-targeted, temporary, and transparent. It should not be automatically provided, but an assessment should be made of the extent to which the economy and society can absorb the impacts of the reform, especially if the reforms are phased-in over a long period.

- *Where possible, integrating reforms to fossil-fuel subsidies in a package together with broader structural reforms.*
- *Ensuring credibility of the government's commitment to compensate vulnerable groups and, more generally, to use the freed public funds in a beneficial way.* Governments need to ensure public trust in the reform agenda through broad communication, appropriate timing of subsidy removal, and implementation of compensatory social policies. A fine-tuned communication strategy is needed to explain the reform rationale and the associated compensatory measures that will be taken, before they are introduced, so as to establish trust in the reform programme and to convince potential losers from reforms that the costs to them will not be as onerous as some may fear.

For further information about OECD work on fossil fuel support and to download OECD reports, see: www.oecd.org/g20/fossilfuelsubsidies

Relevant OECD reports

Burniaux, J-M. and J. Chateau (2011), “Mitigation Potential of Removing Fossil Fuel Subsidies: A General Equilibrium Assessment”, *OECD Economics Department Working Paper No. 853*, OECD, Paris.

OECD (2007), *Subsidy Reform and Sustainable Development: Political Economy Aspects*, OECD, Paris.

OECD (2009), *Declaration on Green Growth*, Adopted at the Meeting of the Council at Ministerial Level on 25 June 2009, Ref. C/MIN(2009)5/ADD1/FINAL, Paris. [www.oecd.org/greengrowth]

OECD (2011a), *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*, OECD, Paris.

OECD (2011b), *Economic Survey of Mexico*, OECD, Paris.

OECD (2011c), *Economic Survey of India*, OECD, Paris.

OECD Secretariat (2011), “Fossil-fuel Subsidies Removal”, OECD Background Paper to the report to G20 Finance Ministers on “Mobilizing Climate Finance”, OECD, Paris.

OECD (2012, forthcoming), *OECD Environmental Outlook to 2050*, OECD Paris.

OMB — Office of Management and Budget (2011), *Terminations, Reductions and Savings — Budget of the United States Government*, Office of Management and Budget, Executive Office of the President of the United States, Washington, D.C.

Further enquiries about this work should be addressed to:

- *Inventory of fossil-fuel support:* Ronald Steenblik, OECD Trade and Agriculture Directorate (Ronald.Steenblik@oecd.org)
- *Tax expenditures:* James Greene, OECD Centre for Tax Policy and Administration (James.Greene@oecd.org)
- *Reform of fossil-fuel subsidies:* Anthony Cox, OECD Environment Directorate (Anthony.Cox@oecd.org)



The publication ‘Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels’ has been produced with the financial assistance of the European Union. The views expressed therein can in no way be taken to reflect the official opinion of the European Union.