UPDATE ON RECENT PROGRESS IN REFORM OF INEFFICIENT FOSSIL FUEL SUBSIDIES THAT ENCOURAGE WASTEFUL CONSUMPTION

Contribution by the International Energy Agency (IEA) and the Organisation for Economic Co-operation and Development (OECD)

to the G20 Energy Transitions Working Group

in consultation with:

*International Energy Forum (IEF), Organization of Petroleum Exporting Countries (OPEC) and the World Bank**

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Introduction

At its meeting on 22-23 February 2018, the Energy Transitions Working Group (ETWG) of the G20 requested that an update "that captures recent progress in countries, the peer review process and other developments to phase out inefficient fossil fuel subsidies that encourage wasteful consumption" be prepared by the International Energy Agency (IEA) and the Organisation for Economic Co-operation and Development (OECD), in consultation with the International Energy Forum (IEF), the Organisation of the Petroleum Exporting Countries (OPEC), and the World Bank. The report is to be made available for the next ETWG meeting, in San Carlos de Bariloche on 13-14 June 2018. This document responds to that request.

Since the 2009 G20 Pittsburgh Communiqué called on its members to "rationalise and phase out inefficient fossil fuel subsidies that encourage wasteful consumption over the medium term while providing targeted support for the poorest", the G20 member states have reiterated their commitment on several occasions. The effort to rationalise and phase out *inefficient subsidies that encourage wasteful consumption* is a voluntary and country-led process, and the G20 has recognised the need to support the poor and the importance of providing those in need with essential energy services.

The concept of *inefficient subsidies that encourage wasteful consumption* has yet to be explicitly pinned down, mostly because countries differ along multiple dimensions: in their macroeconomic conditions, their energy endowments and their industrial and social structures. These economic and social divergences warrant reform processes that are tailored to country specificities and national development plans, weighing the benefits of fossil fuel subsidies against their costs.

Since the last progress report, released at the Sustainability Working Group (SWG) in March 2017, momentum for reforms has remained strong among G20 countries as well as other economies countries. Several fuel and electricity pricing reforms have brought domestic prices closer to international market prices or above cost-recovery levels in the case of electricity.

The present report covers the latest developments within the G20 context, other multilateral fora, and recent developments in fossil fuel subsidy reforms. It documents progress made through peer review processes undertaken since the last iteration of the update report, and recent reforms of support measures to fossil fuels globally. Though the inefficiency criterion has been evoked both by APEC and the G20, for the phasing out of

FFS, the report does not pass any judgement on the measures that have either been phased out or reformed in the past year.[1]

G20 voluntary peer reviews of inefficient fossil- fuel subsidies

In September 2013, the G20 Leaders *welcome[d] the development of a methodology for a voluntary peer* review *process and the initiation of country-owned peer reviews and…encourage[d] broad voluntary participation in reviews as a valuable means of enhanced transparency and accountability*. The 2017 G20 Hamburg Climate and Energy Action Plan for Growth encouraged all G20 members that have not yet done so to initiate a peer review of inefficient fossil fuel subsidies that encourage wasteful consumption as soon as feasible. Countries volunteering to undergo peer reviews agree to a set of terms of reference (ToR) to establish the scope of the measures reviewed and the timeline of the review process. They then produce a report, referred to as a self-report, in which they enumerate the measures to be reviewed, and provide some context and background on their implementation and possible reform (or phasing-out).

At their discretion, G20 countries undergoing a review could invite representatives of one or more other countries to join the peer review group as a reviewer(s). Similarly, G20 countries undergoing a review could at their discretion invite third-party experts to join the peer review group. The review process, thus far, has been implemented by inviting the review team to submit questions and comments on the self-report, which are examined at an in-person meeting attended by country representatives from both the review team and the country under review. A final report, agreed to by all parties, is then prepared and issued.

The People's Republic of China (hereafter "China") and the United States were the first countries to undergo this process. Review teams were comprised of representatives from Germany, Indonesia, the United States, the IMF, and the OECD for the review of China; and of Germany, Mexico, and the OECD for the review of the United States. The OECD was also asked to chair the reviews and to act as co-ordinator. Following meetings in Beijing and Washington, D.C. in, respectively, April and May 2016, peer-review reports were finalised and published in September 2016.

Subsequent to the first successful round of reciprocal peer reviews under the auspices of the G20, Germany and Mexico agreed to a review of their fossil fuel subsidies in 2016. In addition to mutually reviewing each other's measures, the two countries invited China, Indonesia, Italy, New Zealand, the United States, and the OECD to take part. The OECD also chaired these reviews and acted as co-ordinator. A meeting of the review panel was held in Berlin in February 2017 and the final reports were published in November of that year. A third round of peer reviews began in the summer of 2017 with Indonesia and Italy. The in-person meeting for the Indonesia peer review took place early December in Jakarta and Italy's in-person meeting is expected to take place soon. The peer review process for these countries should conclude by the end of 2018.

[1]. The inefficient criterion has also been evoked by the G7, the Friends of Fossil Fuel Subsidy Reform, and for the SDG Target No. 12.C.

Lessons learned from voluntary peer reviews of inefficient fossil-fuel subsidies

These peer reviews bring to the fore the issues around fossil fuel support and the formidable task of undertaking energy subsidy reforms while providing targeted support for the poorest. Several lessons can be learned. First, participation in peer reviews encourages a country to look thoroughly at their support policies – how and why they were implemented, and how they can be reformed or eliminated. Second, preparation of the country reports and peer reviews often generate more information about policies than what is covered in countries' annual reports to the G20. Third, preparing for the reviews can be a salutary learning experience for the countries under review (including across ministries) and the peer reviewers. There has been an element of precedent-setting in the structure and conduct of these reviews, as well as in the types of policies discussed and how these were examined. Last but not least, the process has revealed differences among countries in how they interpret such terms as "subsidy" and "inefficient".

Recent global progress in fossil-fuel subsidy reform

The remaining part of this document discusses estimates of fossil fuel subsidies as measured by the IEA and the OECD. It also documents progress towards fossil-fuel subsidy reform outside the G20 context, as well as the initiatives of several international organisations.

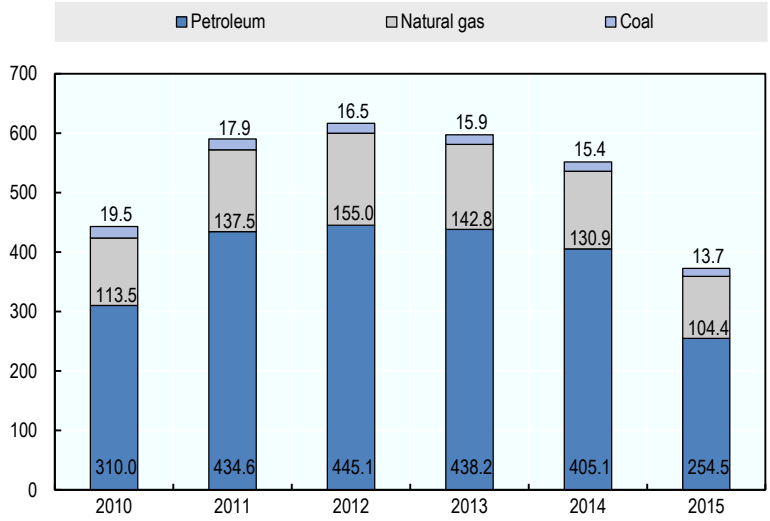
The IEA and the OECD estimates of fossil-fuel subsidies are prepared separately, but together they provide an even fuller assessment of the magnitude of fossil fuel support for the countries that they both cover. The IEA figures capture information based on prices affected by government intervention or support. The *OECD Inventory of Support Measures for Fossil Fuels* (Inventory hereafter) takes stock of individual policies that result in a transfer from the government to producers to compensate them for charging below their cost, thus translating into a price support to consumers. In addition, the Inventory includes other consumption-side support and producer support. These two approaches represent two ways of estimating consumer price support. The information gathered by both organisations, when brought together, can give a more complete and accurate picture of support.[2]

When combining the two sets of data, the total estimates of support for fossil fuels (excluding support for electricity) amounts to USD 373 billion in support for fossil fuels in 2015, a decrease from USD 551 billion in 2014 (Figure 1). Over the period 2010-2015, the difference between the IEA and OECD estimates of underpricing of (mainly transport) fuels averages USD 42 billion, approximately 8% of the total number. Coal support estimates are dwarfed by support to petroleum products and natural gas, 72% and 25% respectively. The decline in total support in the form of subsidies is driven in large part by the decline in oil prices that shrink the distance between domestic and international market prices in non-OECD countries, and therefore the support needed to compensate the shortfall. The decline in consumer price support across countries ranges anywhere from an 80% to a 3% decrease between 2014 and 2015.

[2]. For more information on the method used to combine the IEA and OECD database, refer to *the OECD Companion to the Inventory of Support Measures for Fossil Fuels 2018*.

Figure 1. IEA-OECD joint estimate of support for fossil fuels

(USD billions)



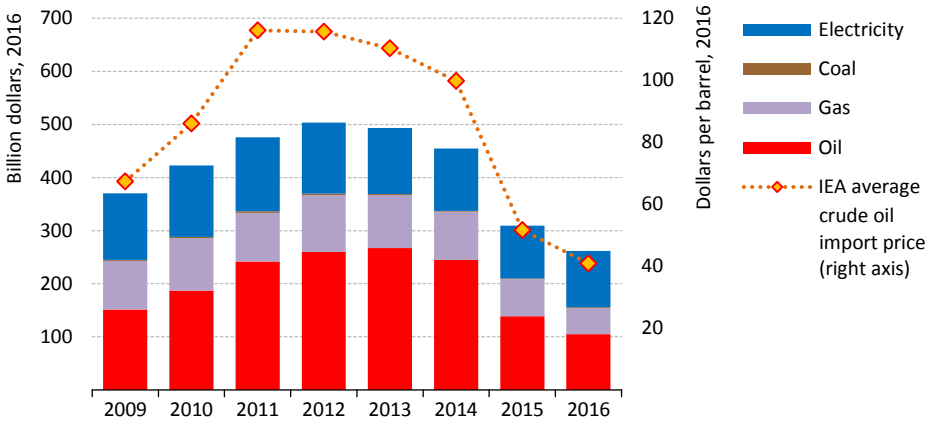
Source: *OECD Companion to the Inventory of Support Measures for Fossil Fuels 2018*.

Based on the price-gap method[3], the estimated IEA value of fossil fuel consumption subsidies fell by 18% in 2016, to USD 260 billion dollars, due in part to lower prices for the main fuels but also to continued efforts to reduce subsidies (Figure 1). Oil and electricity subsidies each constitute around 40% of global subsidies, with natural gas accounting for almost all of the remainder. Applying this method, the IEA has identified around 40 economies as subsidising fossil-fuel consumption through price interventions. In total, these countries account for over half of the world's energy consumption. The value of subsidies as a share of the total GDP of these countries averages 1.1%. The rate of subsidisation (the ratio of the subsidy to the international reference price) averages 28%. Ten countries accounted for over three-quarters of the world total of fossil-fuel consumption subsidies in 2016. Although the Middle East, where many countries increased prices for gasoline and diesel, remains the region with the largest share of total subsidies (around 30% of the total), the estimated value of these subsidies declined sharply, from around USD 120 billion in 2015 to USD 80 billion in 2016.[4]

[3]. The IEA measures subsidies based on the amount by which the price of a given fuel falls short of its reference price, which corresponds to the international market price, adjusted for the costs of transportation and distribution and value-added tax (VAT), or where appropriate the full cost of supply. The estimates cover subsidies to fossil fuels consumed by end-users and subsidies to fossil-fuel inputs to power generation. For countries that import a given product, the estimates represent net expenditures resulting from the domestic sale of imported energy (purchased at world prices in hard currency), at lower, regulated prices. For countries that export a given product, the estimates represent the opportunity cost of pricing domestic energy below market levels.

[4]. Note: some developing countries that are energy exporters are of the opinion that the reference price in their markets could be based on their cost of production rather than on import- or export-parity pricing.

Figure 2. Economic value of global fossil-fuel consumption subsidies by region*



Source: International Energy Agency.

The fall in oil prices in 2014 offered countries an opportunity to phase-out subsidies and many countries across the world have taken this opportunity. In Asia, for example, countries such as India, Indonesia and Malaysia have eliminated subsidies for gasoline. In Latin America, Mexico abolished subsidies for gasoline and started liberalising prices. Argentina also made a drastic reform to raise gasoline and diesel prices, as well as electricity prices. Momentum for reforming subsidies is not limited to net importers of fuels. Oil producing countries in Middle East, such as Kuwait, UAE and Saudi Arabia have also taken steps to reduce subsidies. Countries in Africa have also made progress in reforming subsidies. As such, the momentum to reform subsidies is growing across the world. Recent developments in fossil fuel pricing policies and subsidy reforms are summarised in Figure 2.

Figure 3. Policy developments to reduce subsidies*

Source: International Energy Agency.

The recently published *OECD Inventory* now covers Latvia, which joined the OECD in 2016, and two additional partner economies, Argentina and Colombia. This brings the total number of countries covered by the Inventory to 43. The *Inventory* contains

descriptions of more than 1 000 individual measures across 35 OECD countries and eight partner economies (Argentina, Brazil, the People's Republic of China, Colombia, India, Indonesia, the Russian Federation, and South Africa), summing up to an aggregate estimation ranging from USD 151 billion to USD 249 billion for the years 2010 through 2016.[5]

Support in OECD countries has flattened since 2014, hovering around USD 82 billion annually. For partner economies, the situation has changed dramatically as support continues its downward trend, from a peak in 2013 at USD 142 billion to USD 69 billion in 2016. While the recent low oil price regime has played a significant role in shrinking the size of support to fossil fuels, policy reforms have, although on aggregate to a lesser extent, also contributed to this trend.

Several countries have begun to reform their energy taxation systems and more broadly to reshape their energy markets. Over the past year, Mexico has progressively liberalised its gasoline and diesel prices, starting with regions for which the energy market is sufficiently competitive. During this time and until the end of November 2017, the Ministry of Finance continued to publish a maximum price for fuel prices in order to shield consumers from sharp fuel price fluctuations. Since then, the government has played a role in mitigating fuel price fluctuations through a weekly revision of the excise tax, IEPS (*Impuesto Especial sobre Producción y Servicios por Enajenación de Gasolina y Diese*l), levied on import and sale of fuel products. This government intervention is due to cease by the end of 2018.

Indonesia, like Mexico, has undertaken substantial fuel pricing reforms by greatly reducing fiscal pressure associated with its subsidies to the consumption of fossil fuels. In 2015, gasoline subsidies were completely phased out and a cap on diesel subsidies was implemented to limit outlays on support for diesel prices. In January 2017, President Widodo launched the "one price policy", which aims at providing fuel access to Indonesia's remote and underdeveloped areas. The regulation stipulates that prices of fuel in those regions should be the same as in the more developed regions of the country in order to achieve greater equity and social justice.[6] More recently, in March 2018, the president instructed ministers to keep fuel and electricity prices stable over the next two year, thus preventing future adjustments of domestic fuel prices.

Natural gas prices in Argentina have also been progressing towards market-price parity. In 2016, the government introduced measures to close the gap between the cost of domestic and imported natural gas supplies and prices paid by consumers, phasing out the outlays it needs to cover the difference through regular increases in utility tariffs. Average residential natural gas prices have increased by over 700% between 2015 and 2017 in nominal terms.[7] Helped by decreasing import costs, natural gas subsidies fell from

[5]. Generally, the data in the Inventory have been obtained from government sources. Support measures were identified mainly through searches of official government documents and web sites. In some other cases, unpublished data were furnished directly by governments. If no data could be found, the OECD estimated the value of support where it deemed the necessary calculations feasible and plausible.

[6]. See: http://setkab.go.id/en/launching-single-fuel-price-policy-president-jokowi-this-is-a-matter-of-social-justice-not-money/

[7]. IEA, *World Energy Prices 2018*.

USD 5.7 billion in 2015 to USD 2.2 billion in 2017 and are expected to stand at around USD 1.1 billion in 2018.[8]

This price convergence plan is set to be completed by October 2019 for most regions, with the exception of Patagonia, the Puna, and Malargüe, which have higher heating needs and will continue to benefit from subsidised gas prices up to 2022. In parallel, the government has created a Federal Social Tariff to direct its subsidy expenditures on vulnerable consumers only, in contrast with the previous system which benefitted the urban middle and upper classes. As of 2017, 22.5% of residential consumers had access to the Federal Social Tariff.[9]

In Argentina, the former Secretariat of Energy endorsed an outlay of temporary financial aid to companies distributing natural gas through networks, arguing that such support would cover the costs and investments associated with the normal operation of the public distribution service of natural gas through networks. This measure entailed a government outlay of ten consecutive instalments of up to ARS 2.6 billion (USD 150 million), as of its implementation in March 2015.[10] A further ARS 3.5 billion (USD 237 million) were approved in 2016, to cover for the delays in the implementation of the utility tariff increases. [11] A similar scheme exists for propane gas prices, whereby two newly issued resolutions in 2017, MINEM 74 and 474, set forth rules for the implementation of propane subsidy reductions over a three-year period, after which propane prices reach supply economic cost parity.

Other OECD countries have made progress in recent years in phasing out fossil-fuels subsidies or reforming tax expenditures. Many of these reforms relate to policies that affect fossil-fuel consumption. In 2015, both Belgium and France initiated plans to remove the tax differentiation between gasoline and diesel. Belgium implemented a ratchet system to progressively close the gap between these prices, by increasing the tax rate on diesel and lowering it for gasoline until the end of 2018. The gap between heating fuel and diesel excise tax has been recently closed and the difference stands at 0.06 EUR/litre as of January 2018.[12]

France brought the difference down to EUR 0.10 per litre from EUR 0.18 per litre by the end of 2017, and eventually would close the gap over five years (Ministère de l'environnement, de l'énergie et de la mer, 2017[5]). The OECD, in the context of its *Environmental Performance Reviews*, has recommended that France realign its diesel taxation upwards, to the level of gasoline taxation as; the additional revenue could be used for reducing the tax burden, e.g. income taxes, or public debt. In France, the excise tax exemption for fuels used in combined heat and power (CHP) generation came to an end in 2017. This concession applied to plants built before 2008 and accumulated a cost of USD 290 billion since its inception.

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[8] . See: https://www.argentina.gob.ar/sites/default/files/informe_tecnico_minem_1.pdf

[9] . *Ibid*.

[10]. Secretaria de Energia Resolucion 236/2015.

[11] . See: https://www.cronista.com/economiapolitica/Asisten-con-mas-de--3-mil-millones-a-distribuidoras-de-gas-20161230-0065.html

[12] . See: https://finances.belgium.be/fr/douanes_accises/entreprises/accises/augmentation-des-taux-des-droits-daccise-1er-janvier-2018

Other developments

This section provides information on other developments in inter-governmental organisations (IOs), provided by the individual IOs themselves.[13]

APEC peer reviews

In parallel with the G20 peer reviews of IFFS, peer reviews have also taked place under the auspices of the Asia-Pacific Economic Cooperation (APEC) Energy Working Group (EWG). Four peer reviews have been completed by APEC's member economies: Peru (2014), New Zealand (2015), the Philippines (2015), and Chinese Taipei (2017). The peer review for Viet Nam is forthcoming. APEC economies that have undergone the peer reviews agree that any measure that encourages wasteful consumption is inefficient and should be reformed in order to meet the government's objective of energy security and sustainable development.[14]

The Friends of fossil Fuel Subsidy Reform

The Friends of Fossil Fuel Subsidies Reform Group, a group of nine countries (Costa Rica, Denmark, Ethiopia, Finland, New Zealand, Norway, Sweden, Switzerland, Uruguay), was formed in 2010 to support the efforts of the G20 and APEC to phase out IFFS. Since its inception, the group has played a central role in encouraging countries to accelerate their plans to meet their commitments of phasing out IFFS. The Friends have participated and contributed to events and international processes at the Conference of Parties meetings of the UNFCCC, the World Bank and IMF "Spring" meetings, the UN Sustainable Development processes, and the Clean Energy Ministerial. Recently, they have commended Mexico for undergoing their peer reviews of IFFS, underlining the usefulness of this transparency exercise and the reforms envisioned therein.[15]

At the 11th WTO Ministerial Conference (MC11) in December, the Friends hosted a presentation of a Fossil Fuel Subsidies Reform Ministerial Statement (WT/Min(17)/54) affirming the signatory countries' (Chile, Cost Rica, Iceland, Liechtenstein, Mexico, the Republic of Moldova, New Zealand, Norway, Samoa, Switzerland, Chinese Taipei, and Uruguay) commitment to rationalising and phasing out IFFS.[16] More specifically, the statement acknowledges that inefficient FFS encourage wasteful consumption, hamper the transition to a low carbon world, and lead to investment and trade distortions. The Statement also asserts that the WTO can play an important role in establishing effective disciplines on inefficient fossil fuel subsidies "through enhanced World Trade Organization transparency and reporting that will enable the evaluation of the trade and resource effects of fossil fuel subsidies programmes."

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13. OPEC and the World Bank contributed their own text for this report.

14. See: https://www.apec.org/Publications/2017/07/Peer-Review-on-Fossil-Fuel-Subsidy-Reforms-in-Chinese-Taipei

15. See: http://fffsr.org/wp-content/uploads/2017/03/FFSR_Statement-Mexico-ENGLISH.pdf

16. See: https://www.wto.org/english/thewto_e/minist_e/mc11_e/documents_e.htm

The World Bank

The World Bank Group supports client governments in reforming their energy subsidies through knowledge, advisory services, technical assistance, and lending.

The Energy Subsidy Reform Facility[17]

Countries considering the reform of their energy subsidies have highlighted the need for support in dealing with the complexities of this issue. In response, in 2017 the World Bank's Energy Sector Management Assistance Program (ESMAP) launched the Energy Subsidy Reform Facility (ESRF). This USD 20 million Facility supports World Bank client governments in the design and implementation of their proposed or ongoing energy subsidy reform efforts.

To this end, the Facility mobilises experts from across the World Bank's range of sectors: in the energy sector, macro-economic and fiscal management, firm-level economics, poverty analysis and policy, social protection, governance, communications and consultations, the environment, and climate change. The ESRF also collaborates closely with other organisations that produce analysis and research and advocate for energy subsidy reforms. These include the Global Subsidies Initiative (GSI), the International Energy Agency (IEA), the International Monetary Fund, and the Organisation for Economic Co-operation and Development (OECD).

Advancing reform through technical assistance

Since its creation in 2013, The ESRF has provided technical assistance through 47 engagements in 50 countries, including country and regional engagements. In addition to analysis of subsidies, technical assistance is provided for the assessment of distributional impacts of reform at the household and macroeconomic levels, communication and consensus building strategies, as well as targeting and delivery mechanisms and energy pricing frameworks, transition plans, and social protection and other mitigation mechanisms.

In Egypt, for instance, where energy subsidies represented 7% of GDP and 22% of the national budget in 2013 – significantly more than health and education expenditures combined – the ESRF provided analytical inputs to the reform process and capacity-building to various ministries. This followed a cross-sectoral and phased approach and informed the government of socially responsible ways of reforming. As a result, within three years, Egypt managed to cut subsidies by more than half and channeled freed-up resources for health and education priorities. ESMAP support also laid the groundwork for broader dialogue that led to a three-year budget support for a broad agenda of energy-sector reform, including reduction of subsidies, and a multi-donor initiative to support the scale up solar energy.

In Serbia, the ESRF supported the design and implementation of subsidy reform, with a focus on minimising the impact on household energy expenditure, especially for the poor and the elderly. The successive increases in residential electricity tariffs over 2015-17 were then supported by a USD 200 million government loan predicated on the increase of

[17] . Note that this technical-assistance facility is just one of the instruments the World Bank Group offers to support countries with subsidy reform.

regulated residential electricity tariffs in 2016, and an increase in the budget of the Energy Vulnerable Program to enhance its coverage.

A practical guide to help government assess subsidies

The ESRF also supports clients by producing tools for assessment and decision making on energy subsidy reform. Through a collaboration of World Bank experts from 10 policy divisions, the Facility has supported the development of a comprehensive analytical toolkit and assessment framework for diagnosing energy subsidies, their impact and country readiness for reform. The *Energy Subsidy Reform Assessment Framework* (ESRAF) is a practical handbook that highlights tools, methods and practices that can be used to identify, analyse and facilitate the various aspects of energy subsidy reform. The framework will allow policymakers to appreciate the full scope of interconnected multi-sectoral reforms, and inform their decisions on how they could be sequenced and prioritised.

Facilitating energy subsidy reform through peer exchange

The Facility also offers World Bank client governments that are embarking on energy subsidy reforms the opportunity to learn from peers. The *Energy Subsidy Reform Online Community* (ESROC) is a members-only virtual community aiming to share knowledge among key stakeholders to facilitate energy subsidy reforms worldwide. ESROC hosts knowledge-exchange webinars to connect government officials and experts across the world for peer-to-peer dialogue about the technical and political challenges of reforming energy subsidies.

For example, in June 2017, ESROC organised a webinar connecting the governments of Morocco and Egypt. During the event, the architects of the fuel-pricing reform in Morocco presented their experience and answered key questions to an audience of Egyptian counterparts who were going through a similar process of reform. The webinar provided an opportunity for Egyptian government officials to learn from the Moroccan experience, with a view to applying the advice and lessons learnt in the planning and implementation of their own reforms.

In an effort to further disseminate the valuable knowledge exchange created within ESROC, ESMAP recently launched the Practitioner Exchange Series. The series of short guidance notes, each discussing important aspects of subsidy reform. In addition, the Facility supports and organises regional workshops and conferences.

Organization of the Petroleum Exporting Countries (OPEC)

Ensuring energy access for all is a challenging and complicated task – one that cannot be accomplished by any one-size-fits-all solution or list of policy options that does not take into account national circumstances and priorities. This is particularly true in the case of the developing countries, where concerns regarding sustainability and social costs are of vital importance.

Approximately 1 billion people still live without electricity, accounting for about 13% of the world's population, and nearly 40% of world's population still rely on solid biomass and fuels for cooking and heating with serious health consequences. Efforts to eradicate energy poverty are facing serious challenges, including affordability issues. Energy accounts for a significant amount of already limited household incomes in developing countries. Therefore, energy subsidies and similar schemes in many parts of the world are

presented as aiming to eradicate poverty and facilitate access to sustainable modern energy sources.

OPEC considers that, when justifying the phasing out of subsidies on the grounds of climate change mitigation objectives, then the provisions of the UNFCCC should apply, in particular the principles of equity, and common but differentiated responsibilities and respective capabilities, as well as the provision that "economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties." Therefore, international co-operation and the provision of sufficient support to developing countries, including financing and technological transfer could facilitate this process and achieve long-lasting sustainable development outcomes.

Given the above, it should be recognised that phasing out inefficient fossil fuel subsidies that encourage wasteful consumption is a sovereign issue dependent on the unique situation and priorities of individual countries. As a result, this remains a voluntary and country-led initiative.

Additionally, efforts to arrive at a global estimate for the cost of inefficient fossil fuel subsidies that encourage wasteful consumption face many challenges. A number of discrepancies prevail due to the definitions and measurement approaches adopted, the coverage of countries and fuels, energy price fluctuations, the time period and the types of support considered.[18]

The price-gap approach, described earlier in the report, is commonly used to measure subsidies based on the amount by which the price of a given fuel falls short of its reference price, which corresponds to the international market price, adjusted for the costs of transportation and distribution and value-added tax, or where appropriate the full cost of supply. However, this methodology has notable shortcomings, including the fact that it does not distinguish between efficient and inefficient energy subsidies.

In addition, this approach tends to give a distorted picture of the level of fossil fuel subsidies. For example, oil producing economies in developing countries may use their oil resources in a way that effectively promotes their general economic development, and this approach could more than offset the notional loss of value by selling the resource internally at a price below international prices. Moreover, this approach does not appreciate the government policies for consumption smoothing and avoiding inflationary pressures. Therefore, OPEC considers that the benchmark price to be used in the case of countries that are well-endowed with energy resources should be the cost of production.

[18]. As mentioned earlier in this report, differences in existing internationally available estimates may be complementary as the joint IEA-OECD fossil-fuel support estimates illustrate.

IEA reviews

In recent In-depth Reviews of IEA member countries' energy policies, the IEA has come across some examples of fossil fuel subsidies, relating to inefficient coal, oil and gas consumption and production.

The **Slovak Republic** subsidises power generation from domestic coal in the local Nováky power plant. This subsidy is allowed under EU law (Electricity directive 2009/72/EC) for reasons of security of supply (public service obligation). EU member states may give preference to power plants using domestic primary energy sources, but only up to 15% of the total primary energy use in electricity generation per year. The Slovak coal power subsidy is financed through a surcharge of about EUR 4.5 per MWh, in the same kind of system that is used to finance subsidies for renewable energy.

In **Greece**, some 500 000 households receive a subsidy for heating oil. The level of the subsidy ranges from EUR 37.5 to EUR 625 per winter, based on the number of people in the household, the value of the home, and the climate zone. By subsidising heating oil consumption, there is no incentive for households to switch to cheaper and cleaner heating sources, such as natural gas or district heating.

Chile has domestic gas production that supplies around 55 000 consumers in an isolated network in the Magallanes region in the far south of the country. The exploration and production costs have increased, and the region currently relies on more expensive unconventional gas. Given that the local population faces geographical isolation and extreme climatic conditions, the government subsidises the gas producer ENAP to cover its losses. ENAP receives an annual subsidy of around USD 100 million as compensation, which is roughly USD 2000 per customer.

OECD reviews

Reviews of fossil-fuel support policies and fuel taxation are undertaken systematically by the OECD's Economics Department and its Environment Directorate. The former's *Economic Surveys* are published every two years for each OECD member country and for some countries that are not OECD members, such as Brazil, China, India, Indonesia, and the Russian Federation, as well as accession economies, such as Colombia, Costa Rica, and Lithuania. There is also a separate *Economic Survey* of the euro area.

The *Economic Surveys*, and the work of the Economic and Development Review Committee (EDRC), which oversees their preparation, have evolved since the creation of the OECD in 1961 when the *Surveys* focused on short-term macro-economic developments. Today, their focus is mostly on policies having a potential to improve an economy's long-run performance. The hallmark of the *Economic Surveys* is to clarify links between structural policies in these areas and macro-economic performance. Accordingly, these *Surveys* have discussed issues relating to fossil-fuel subsidies and taxes on many occasions over the past decade, often making recommendations related to the liberalisation of energy markets, the pricing and taxation of carbon-based fuels and electricity, and subsidies.

A summary of selected *OECD Economic Surveys* published since 2017 that have discussed fossil-fuel subsidies or fuel taxation are listed in Table 1.

Table 1 OECD Economic Surveys published from April 2017 to May 2018 that discuss support to fossil fuels

Economy and date of Survey	Comments and recommendations relating to fossil-fuel subsidies or taxation
Brazil (2018)	Following previous OECD recommendations, Brazil increased its fossil fuel taxes in 2017. However, there is scope for further increase as they remain low in international comparison (USD 0.421 per litre for gasoline and USD 0.205 per litre for diesel). The *Survey* recommends levying higher taxes on fossil fuels, and raise the diesel tax at least to the level of the gasoline tax. Rising taxes on fossil fuels would strengthen incentives for biofuel use, and contribute to reverse the recent increase in the CO_2 intensity of the economy. Additionally, it would foster the development of a more inclusive pattern of growth as affluent households tend to consume more fossil fuels while the poor are most exposed to the negative health effects from air pollution.
Finland (2018)	Revenues from environmental taxation stand at around 3% of GDP, above the OECD median, with relatively high taxation of vehicles. However, tax rates vary across energy uses – e.g. heating and process use, power production or transport – and sectors – e.g. energy producers, manufacturing industry and households. A number of industries and fuels benefit from reduced tax rates or direct refunds. Several reforms have been taken in recent years, including increasing some energy, CO2 and vehicle taxes, removing the tax exemption on liquefied petroleum gas, and reducing allowances to deduct commuting expenses. However, most environmentally harmful subsidies remain, including subsidies to energy-intensive industries, taxing diesel at a lower rate than gasoline, low taxes on peat, tax exemptions on fuel use in the agricultural, fishing and forestry sectors, and the over-allocation of EU Emission Trading System (ETS) permits. The *Survey* suggests reducing GHG emissions further by phasing out environmentally harmful subsidies and better aligning the tax rate on emissions across sectors.
Chile (2018)	Since 2014, the tax rate on new car purchases has been based on emissions and fuel efficiency. Chile also introduced a carbon tax and a tax on local air pollutants in 2017. The carbon tax will help to increase the currently very low effective tax rates on fuels. The *Survey* recommends, however, broadening the carbon tax base as it only covers a small share of energy users, and increasing its rate, which is very low at the moment. The petrol-diesel tax differential is among the largest in the OECD. Heavy trucks get a refund on diesel taxes, and energy used outside the transport sector is effectively not taxed. The *Survey* suggests increasing taxes on fuels to levels that are aligned with their external costs, phasing out the tax refund for diesel used by trucks, and broadening the coverage of the vehicle tax to commercial vehicles.
Norway (2018)	Carbon pricing is extensive, with 80% of GHG emissions subject either to a carbon-dioxide tax or included in the European Trading System (ETS), or in some cases both. Norway has provided large incentives to electric vehicles (including exemption from VAT and registration tax, reduced annual motor vehicle tax, and free toll roads) resulting in the highest number of electric vehicles per capita in the world. Following proposals from the Green Tax Commission, Norway made the carbon-dioxide taxes on several items equivalent to those on vehicle fuels (the items covered mineral oil, natural gas, liquid-petroleum gas, hydrofluorocarbons, and per fluorinated chemicals). The *Survey* recommends that Norway continue to follow its Green Tax Commission's proposals.
Ireland (2018)	In 2014, environment-related tax revenue was in line with the OECD median, with important revenues coming from vehicle taxation. A lower rate of excise tax is paid on diesel fuel for road use than on petrol. This excise gap has broadened since the financial crisis, contributing to a notable increase in the number of kilometres driven in diesel cars. The *Survey* recommends increasing the excise tax on diesel fuel to be in line with that of petrol. The *Survey* estimates that this action would raise an additional EUR 300 million per year for the exchequer, resulting in an annual fiscal balance effect of 0.1% of GDP.
Estonia (2017)	Estonia's strategy to reduce environmental externalities has mainly consisted in increasing the use of environment-related taxation. However, most taxes remain below the environmental costs they generate, with a limited effect on pollution levels. To increase the efficacy of action on climate change, the *Survey* suggests that Estonia increase the effective cost of CO_2 emissions in most sectors of the economy -- including the oil shale industry -- and introducing carbon pricing in sectors for which CO_2 emissions are currently not priced at all. The *Survey* welcomes the Ministry of Environment's incentive to develop a method for assessing the external costs of all the main forms of pollution, with the objective of

Economy and date of Survey	Comments and recommendations relating to fossil-fuel subsidies or taxation
	aligning environmental taxes to the damages they generate. Changes to the tax system are planned for 2019. Road transport is the only sector facing any substantial tax on CO_2 emissions. Following previous OECD recommendations to gradually align and raise tax rates on energy sources according to their CO_2 emissions content, fuel excise taxes were increased by at least 10% both in 2016 and 2017. Estonia also had a generous electric car-purchase subsidy scheme (around EUR 15 000 per car) which ended in 2015. In addition, a road-charging system for heavy-duty vehicles will be introduced in 2018. According to the *Survey*, Estonia could go further to address the environmental damage from road transport by introducing a road-pricing system for all motor vehicles, phasing out subsidies for company cars and introducing a vehicle tax reflecting the environmental characteristics of each vehicle.
Japan (2017)	The *Survey* explains that the "Tax for Climate Change Mitigation", a tax on fossil fuels introduced in 2012, was hiked in 2016, and it is projected to generate about JPY 260 billion (0.1% of GDP). The revenue is used to support renewable energy and energy conservation. The *Survey* notes that, despite this recent hike, Japan's environmentally related taxes were well below the OECD mean, as of 2014. Given the rise of carbon intensity of Japan's energy mix since 2011, the *Survey* recommends increasing environmentally related taxes, in order to meet its climate policy goals while raising public revenues.
Argentina (2017)	The *Survey* finds that public expenditures have risen strongly over the year, but not all of this spending has contributed to strong inclusiveness or growth. Spending efficiency could be improved by reallocating spending while ensuring a strong social safety net. One recommendation to promote inclusivity in the *Survey* is to phase out energy subsidies while providing cash transfers to vulnerable populations. The Survey also points to the opportunity for additional savings in many state-owned enterprises, including oil and gas SOEs, many of which have been underperforming financially. The state thus should define more clearly the rationale for owning individual SOEs and possible review that rationale, while establishing and monitoring the implementation of financial and non-financial targets. Levelling the playing field between SOEs and private enterprises would also enhance the scope for competition. The Survey notes that, however, a review of corporate governance of SOEs to align practices with OECD and G20 Guidelines on SOEs is currently underway.
China (2017)	The *Survey* encourages the effective implementation of the December 2016 Environmental Protection Tax law, which came into effect on 1 January 2018, by stepping up enforcement efforts and raising environmental taxes. Also, to curb pollution from transport, the Survey recommends that the fossil fuel subsidies be replaced by cash transfers in order to mitigate potential regressive effects and reduce poverty. The *Survey* underlines that the coal sector is one of the several sectors in China suffering from overcapacity and emphasises that keeping loss-making polluting firms afloat takes a toll on the environment, slows down the necessary adjustment towards less a carbon-intensive economy, and imposes a large burden on the budget.
Sweden (2017)	Climate change is the government's top environmental priority. Many exemptions from energy and CO_2 taxes have been reduced or removed; the largest remaining tax expenditure is the favourable tax treatment of diesel used in transport, notwithstanding a tax rate on diesel that is one of the highest in the OECD. Energy- and CO_2 taxes on gasoline and diesel will be uprated in line with GDP growth from 2017. The government plans to improve tax incentives to buy cleaner vehicles by mid-2018, and is also considering a road-use tax for heavy vehicles and taxing air travel.
Austria (2017)	Austria does not have an explicit carbon tax, but carbon prices for energy users reflect specific taxes on energy use and the EU Emissions Trading System. Only 57% of Austria's non-road energy related CO2 emissions were priced in 2012, and only 26% were priced above EUR 30 per tonne of CO2, that is, above a conservative estimate of their climate cost. Variations across sectors are large and result in mixed price signals. The authorities should extend the use of environmentally-related taxes beyond transport and energy-producing sectors with a view to providing consistent carbon price signals across the economy. The *Survey* noted that there is also scope to increase tax rates on fossil fuels. Tax rates on petrol and diesel are lower than in many neighbouring countries, which encourages motorists from neighbouring countries and freight haulers (as many international roads cross Austria) to fill their tanks in Austria. This "fuel tourism" contributes to around one third of Austria transport-related GHG emissions, and, by increasing traffic, to higher levels of air pollution. Although air quality has generally improved, nitrogen oxide emissions remain above the national limit. Road transport is the major source of NOX

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	emissions, largely due to a high share of diesel in the overall vehicle fleet. Austria has made some progress in reforming support measures for fossil fuels. For example, the country phased out an excise-tax reduction on diesel fuel for farmers in 2013. But a number of poor incentives remain, including a tax reimbursement scheme for industrial energy consumers, which can reduce incentives for energy efficiency. Tax incentives for company cars and commuting costs are also in place, which can encourage private car use, long-distance commuting by car and urban sprawl, increasing emissions of GHG and local air pollutants, noise, congestion and accident risks. The 2016 tax reform has marginally reduced the implicit tax subsidy for highly polluting company cars albeit from one of the highest levels in Europe. Environmentally-related taxes are relatively high in international comparison, at 2.9% of GDP in 2014 against the OECD average of 1.6%. However, only half of these taxes are raised on actual CO2-emissions (fossil fuels).The other half stems from one-offs levies on vehicles and transport equipment (and the purchase of low-emission cars is further subsidised since 2015/16 tax reform). Increasing the share of CO2-related taxes, in particular excise duties on fuel, would help reduce CO2-emissions and cut incentives towards fuel tourism.
Iceland (2017)	A previous *Survey* recommends broadening the base for the carbon tax and raising its rate to increase cost-effective abatement of GHG emissions. This goal has been partially achieved. A carbon tax was introduced in 2010 and levied on liquid fossil fuels. The base has not been broadened beyond liquid fuels to other carbon–based fuels (except liquefied petroleum gas). Rates have not been raised although they have been adjusted for inflation. However, current plans are to double rates and consider further reforms.
Belgium (2017)	The *Survey* explains that increasing the tax rate on diesel fuel to at least the level of that on petrol, as planned by the end of 2018, is one of the ways to increase a less distortionary tax base to compensate for the lower labour taxation. The *Survey* observes an increase in energy taxation for residential use. Indexation of electricity and gas prices, on the basis of market-based parameters and elimination of reduced VAT rate on electricity as of September 2015 for residential consumers and higher consumption tax on electricity in the Flemish Region.
Luxembourg (2017)	The *Survey* welcomes the 2017 reform of the tax treatment of in-kind benefits that increases the cost of company cars and incentivises firms to build fleets of less polluting and hybrid vehicles. Nevertheless, the *Survey* considers that this reform should be complemented by a reform of transport fuel taxation as taxes and excise duties on transport fuel are lower than in neighbouring countries. In addition, as in most countries, taxation on diesel fuel is lower than on petrol. The *Survey* recommends increasing taxes and excise duties on transport fuel in order to lower demand for transport fuel, mitigate the negative environmental effects and reinforce the move to sustainable mobility promoted by the government. It also suggests to complement this measure by introducing a congestion tax to further incentives for a shift to public transport or car sharing.
Australia (2017)	The *Survey* observes that inflation indexing on retail-fuel excise has been re-introduced, a welcome move that will end erosion of the real value of fuel taxation and help boost the level of environmental taxation. Room for further improvement in fuel taxation remains. Currently, Australia charges the same excise per litre on diesel and gasoline, which is a superior approach to that of those countries where excise on diesel is less than that on gasoline. However, as argued in an OECD working paper (Harding, 2014), in light of diesel's additional disadvantages, notably in terms of local air pollution, the optimal excise on diesel ought to be above that for petroleum.
Spain (2017)	The *Survey* recommends that the government should reform taxation of transport fuels and fossil fuels used in electricity generation and heating so that the per-unit tax is based on the amount of CO2 emissions and other pollutants per unit. This would encourage better allocation of capital and investment decisions by better aligning of pricing signals with environmental costs. The *Survey* finds that Spain has considerable scope to make the tax system more environmentally friendly, as environmental tax revenue as a share of GDP is low compared to most OECD countries. There is scope to raise tax rates on fuel for road transport, which are below OECD average. Moreover, diesel is under-taxed relative to gasoline encouraging consumers to buy diesel cars despite diesel cars produce more CO2 emissions per litre than gasoline, and diesel cars emit more health damaging air pollutants per kilometre driven. The government should increase taxation per litre of diesel to at least the level of taxes on gasoline, and should increase diesel prices further if differences in local pollution costs are to be reflected in fuel prices. Simulations suggest that additional EUR 4 billion of revenues could be raised by taxing diesel at the same rate in energy terms as gasoline. There is also scope to reduce exemptions to broaden

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	the environmental tax base, as some users in agriculture, mining, aviation, navigation and railway transport are exempted from fuel tax or the excise duty on electricity.
India (2017)	The *Survey* observed that fiscal consolidation has been pursued by central government since FY 2012-13 and its deficit declined from 4.9% in FY 2012-13 to 3.9% in FY 2015-16. The government took advantage of low oil prices to eliminate diesel subsidies, to better target other subsidies (in particular for cooking gas) and to raise excise duties on petrol, diesel and coal. The government launched the direct benefit transfers (DBT) scheme for gas in the entire country in 2015. Since then, all gas cylinders are sold at the market price and the implicit subsidy is transferred directly to consumers' bank accounts. This move allowed weeding out almost 140 million dubious beneficiaries, reducing the subsidy cost significantly. It has also helped ensure that the poor receive as much as the rich. A campaign asking the rich to voluntarily opt out from the implicit gas subsidy ("Give it up") was launched in autumn 2015. The *Survey* explains that instead of the opt-out approach, the government could ask consumers to opt in for the subsidy by certifying that their household income is less than a set amount – studies have revealed that choice of default options can have a significant impact on consumer behaviour.
Portugal (2017)	The *Survey* notes that mainly because of higher energy taxation, Portugal generates significantly higher revenues from environmental taxation than the OECD average, and somewhat higher than the European average. Fuel excise taxes have been raised further in 2016, but continue to be lower for diesel fuel than for petrol, despite the absence of an environmental justification for this. However, tax credits, allowances and exemptions are widely used and sometimes exempt particular sectors or groups of people from environmental taxation. For example, reduced fuel tax rates in agriculture and fishing should be reconsidered. As part of a green tax reform, a carbon tax has been applied on the use of oil products in non-ETS sectors since 2015, with rates indexed to carbon prices under the EU ETS, subject to a floor.
Colombia (2017)	The *Survey* welcomes the December 2016 tax reform that contains measures to deal with environmental challenges, such a carbon tax, fee on plastic bags and new fuel taxes. The *Survey* explains that the comprehensive tax reform of December 2016 will help the economy adjust to lower oil prices and reduce the dependence of the budget on oil revenues. Higher tax revenues would increase the scope for redistributive policies to reduce inequality and sustain public investment.
South Africa (2017)	The *Survey* observes that the diesel fuel levy refunds for the electricity sector were reduced from April 2016. The 2017 Budget proposed a review of the VAT exemption of transport fuels in consultation with stakeholders, and draft legislation for the carbon tax has been published.
France (2017)	Environmentally-related tax revenues are low compared to the OECD average, reflecting in part low CO2 emissions (as France relies heavily on nuclear energy) but also low average effective tax rates on heating and process energy and on CO2 by international standards. The *Surveys* welcomes the incorporation of a carbon component into fossil fuel taxation in 2014. Following previous OECD recommendations, France also increased diesel taxation to bring it closer to petrol taxes, and the new government plans to align the taxation of diesel with that of petrol by 2022. The new government also announced its intention to close nuclear power stations in step with the expansion of renewable energies. The *Survey* suggests to continue raising the carbon tax to its target of 100 euros per tonne of CO2 in 2030. It also recommends to remove environmentally damaging fuel tax exemptions, for example for road haulage, agricultural machinery and public works, which cost more than 2 billion euros per year.
Slovenia (2017)	Slovenia's environmental indicators are generally good. The tax revenues associated with road transport help to achieve an above-average share of GDP from environmental taxes, slightly below 4% of GDP. Following previous OECD recommendations, Slovenia increased its CO2 tax from 0.0144 to 0.0173 EUR per kg of CO2 in 2015. In order to further reduce particle emissions, the S*urvey* suggests to adjust transport fuel taxes to reflect their emissions of particles and CO2 - which would results in relatively higher diesel taxes - and to replace commuting allowances with general tax credits.
Slovak Republic (2017)	Over the past few decades Slovak Republic has made good progress in shifting from fossil fuels to renewables in power generation and energy consumption. The country has substantially reduced its greenhouse gas (GHG) emissions and the

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	energy intensity of its economy as well as enhanced its air quality. The implicit tax rate on energy, however, remains one of the lowest among EU countries, and there are several tax exemptions, such as on household electricity consumption, and harmful environmental subsidies to domestic coal production for electricity generation and heating. The *Survey* recommends to make the tax system more environmentally friendly by removing tax exemptions and coal subsidies and increasing fees or taxes linked to air pollution. This would lead to better economic and public health outcomes. The *Survey* also suggests to base car registration fee on vehicles' emissions as is done in most EU countries.
Italy (2017)	Italy's economy has long been significantly less energy intensive than the OECD average. It also has lower greenhouse gas (GHG) emissions. Tax revenues from environmental taxation are above the OECD median, at around 3% of GDP, thanks to important revenues coming from energy taxation. The *Survey* recommends, as in 2015 (i.e. date of the previous economic survey), to reduce the gap between diesel and petrol taxes in order to lower pollution generated by diesel vehicles. It also suggests shifting the tax burden from electricity to the energy products used to generate it – with the respective rates based on the pollution of each electricity source. It would accelerate the deployment of renewable energy sources. As for now, no progress has been made in this direction.
Mexico (2017)	The *Survey* welcomes the gradual deregulation of gasoline and diesel prices, which began in 2017 and should be completed by 2018, as well as the significant increase in rates of the "Special Tax on Production and Services", improving the extent to which taxes reflect the external cost of emissions. Mexico also increased significantly the effective tax rates on gasoline and diesel. 2016 tax rates are comparable to those of many lower-tax OECD countries. However, since those fuels are used mainly for road use, the tax burden is levied mainly on the transport sector, which accounts for roughly a third of energy use and carbon emissions in Mexico. Carbon emissions outside the road sector (residential heating, industrial processes and electricity generation) are partially taxed under the carbon tax (introduced in 2014) but at very low rates, or are entirely unpriced. Natural gas, which accounts for a third of carbon emission from energy use, is exempt from the carbon tax and overall only 40% of carbon emissions from non-transport sectors energy use is subject to the carbon tax. The *Survey* thus recommends to increase the carbon tax rate, particularly in the non-road sectors, and to broaden its base (e.g. to include natural gas). It would significantly increase tax revenues from the energy sector. In addition, it suggests to make to carbon tax reflect fuels' carbon content more uniformly.
Switzerland (2017)	Total environmentally related taxation is low relative to GDP, and collected mostly via taxes on energy use and motor vehicles. Still, Switzerland prices 82% of its CO2 emissions from energy use, and 63% at over EUR 30 per tonne of CO2. Following previous OECD recommendations, Switzerland increased its CO2 levy from CHF 60 to CHF 84 per tonne of CO2 in 2016 and will increase it again to CHF 96 in 2018. In addition, negotiations to link the Swiss and EU emissions trading systems via mutual recognition of emissions allowances were concluded in 2016. Signature of the agreement is imminent. The Energy Strategy proposes increasing the existing electricity network surcharge, which is used for the promotion of renewable energy, and energy efficiency. In order to meet current ambitious targets in terms of GHG emissions reduction, the *Survey* recommends widening the CO2 tax base and increasing other taxes designed to reflect externalities. Additionally, the *Survey* suggests to further reduce the earmarking of these revenues for environmental programmes to allow for greater flexibility in meeting changing needs.
UK (2017)	Following previous OECD recommendations to move towards a uniform carbon price across sectors and fuels, the government has announced that it will rebalance the Climate Change Levy rates between energy sources. From 2019, the government will gradually move from a ratio of 1:2.9 and reach parity between gas and electricity in 2025. The *Survey* recommends to raise environmental-related taxation in order to address air pollution and increase revenue collected from green taxes. At the moment, revenues from environmental taxation are considerably below the median OECD country although the UK is one of the few countries that do not tax diesel road fuel at a lower rate than petrol.
Latvia (2017)	Eurostat data show relatively high environmental tax revenue, about 2.5% of GDP and nearly 10% of total government revenue. As in all countries, the bulk of this is energy tax revenue and transport-related taxes. Implicit carbon pricing levels (i.e. taxes on emitting products and activities) are uneven across energy sources and sectors. Taxes for heating are much lower than for transport. Latvia's implicit tax rate on energy is among the lowest in the EU. The *Survey* recommends to gradually raise and harmonise the taxation of fossil fuels in transport and heating according to

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	their carbon content. However, higher taxes on heating fuels would need to be accompanied with measures to ensure real incomes of low-income households are protected.

The OECD's Environmental Performance Review (EPR) programme was launched in 1992. Reviews are conducted within a peer-review framework. To date, the OECD has conducted over 80 country reviews, including reviews of key partner economies, such as Argentina, Brazil, China and South Africa. The reviews occur in cycles, and OECD countries are now being reviewed for the third time. A summary of the Environmental Performance Reviews published since the second quarter of 2017 that have discussed fossil-fuel subsidies or fuel taxation is provided in Table 2.

Table 2. OECD *Environmental Performance Reviews* published from April 2017 to May 2018 that discuss support to fossil fuels

Country and year of review	Comments and recommendations relating to fossil-fuel subsidies or taxation
Korea (2017)	The *Review* notes that Korea provides substantial subsidies to fossil fuels, both at home and abroad. It should adjust energy prices and taxes to better reflect environmental externalities and phase out fossil fuel subsidies to achieve tangible GHG emission reduction and deploy low-carbon markets and innovations. The *Review* recommends for Korea to progressively phase out domestic fossil fuel subsidies, such as those for the agriculture and fishing sectors, fuel subsidies for buses, trucks and taxis, and subsidies for producers of coal briquettes used by low-income households. Progressively phase out export credits and other official flows supporting fossil fuel extraction and use. The *Review* also recommends that it strengthens measures to reduce transport-related GHG emissions, air pollution and congestion, such as raising the excise tax on diesel to at least match that on petrol, and index the tax on both fuels to inflation to avoid erosion of its value in real terms.
New Zealand (2017)	Support to fossil fuel consumption is low in New Zealand compared with most other countries. New Zealand is a founding member of the Friends of Fossil Fuel Subsidy Reform, an informal group of non-G20 countries that advocates policy reforms of these subsidies globally. Leading by example, in 2015 New Zealand voluntarily underwent a peer review of fossil-fuel subsidies in the context of the Asia-Pacific Economic Co-operation. The review concluded that none of the eight measures analysed encourage wasteful consumption, in part because they do not lower domestic fuel prices. The OECD estimates, however, that some of these measures cost the New Zealand government about NZD 60 million in tax breaks and budgetary transfers in 2014. In addition, the free allocations of NZ ETS emission allowances to energy-intensive, trade-exposed activities represent forgone revenue that the government could raise if it auctioned. The government provides some tax and royalty incentives to oil and gas exploration. As the OECD indicated, these incentives can distort investment decisions in favour of fossil fuel production and potentially counteract New Zealand's efforts to address global climate change. The *Review* recommends that New Zealand systematically assess fossil fuel subsidies and tax exemptions, with a view to identifying those that are inefficient and encourage wasteful consumption and fossil fuel production and should, therefore, be removed. Also, it recommends that New Zealand expand the use of environmentally related taxes, charges and prices, possibly within the framework of an overall reform of the tax structure, with a view to encouraging more efficient use of energy and resources and supporting the ongoing fiscal consolidation efforts: consider introducing an excise duty on diesel and ensure that petrol and diesel taxes and charge rates take account of environmental externalities.
Canada (2017)	The *Review* welcomes the introduction of carbon pricing in several provinces and the move towards federal carbon pricing in 2018. The *Review* explains that it will correct currently weak price signals from Canada's energy tax system. The government estimates that federal carbon pricing will bring CO2 emissions' coverage to 70-80%.However, the level of the average effective carbon price on Canadian emissions would likely remain moderate in international comparison.

Country and year of review	Comments and recommendations relating to fossil-fuel subsidies or taxation
	As a member of the G7, Canada committed in 2016 to "the elimination of inefficient fossil fuel subsidies" by 2025. Canada's fossil fuel support was reduced by almost half between 2005 and 2014, mainly driven by a significant reduction in consumer support. During the same period however, producer support increased. According to the OECD Inventory of Support Measures for Fossil Fuels, some CAD 3.6 billion in fossil fuel subsidies remained in place in 2014, targeting mostly oil and natural gas fuels. Provincial and territorial fossil fuel support makes up the majority of remaining support. These include measures such as Alberta's Crown Royalty Reductions and provincial tax credits for drilling; tax exemptions for fuel use in farming, fishing and other activities; as well as energy cost rebates for low-income households. Overall, the *Review* recommends to adjust the taxation on energy use, taking into account the progressive implementation of carbon-pricing at the federal level, to make sure that energy prices adequately reflect the societal costs of GHG and air pollutant emissions. It also suggests to reduce the petrol-diesel gap, and to reform taxes on vehicle in order to increase incentives for the purchase of lower emission vehicles. Regarding fossil fuel support, the *Review* encourages provincial and territorial governments to make further effort in order to phase out remaining fossil fuel subsidies, including tax exemptions.
Switzerland (2017)	Final consumption of energy in Switzerland is dominated by imported fossil fuel products, with oil (37%) and natural gas (11%) representing close to 50% in 2014. As Switzerland does not produce crude fossil fuels, its support to fossil fuel consumption only concerns industrial and final consumers. The annual support has been estimated at CHF 260 million since 2012, exclusively in the form of tax expenditure. This places Switzerland among countries with a relatively low ratio of tax exemptions for fossil fuel consumption to total tax revenue (0.1%, compared with the OECD average of 0.4%). Support to fossil fuels mainly takes the form of excise and CO_2 tax refunds and exemptions. First, road fuels are not covered by the CO_2 tax. SMEs can be exempted from the CO_2 tax if they commit to CO_2 emission-reduction targets. GHG-intensive large enterprises are also exempt from the tax due to their inclusion in the ETS. However, the price of emission credits under the ETS is much lower than the CO_2 tax level. A noticeable trend in fossil fuel subsidies is the growing share represented by CO_2 tax exemptions, a consequence of the gradual increase of the tax rate (the tax rate increased from CHF 12 in 2008 to CHF 84 as of early 2017). Exemptions to the tax thus implicitly provide a rising subsidy for GHG emissions. In keeping with international conventions, aviation kerosene used in international flights is not subject to any taxation. Aviation kerosene and gasoline for domestic flights are, however, subject to the oil tax and VAT but not to the CO_2 tax. The agricultural sector also benefits from fossil fuel support mainly in the form of reimbursement from oil tax. The *Review* recommends the phasing out of remaining tax exemptions and rebates for fossil fuel consumption as well as the widening of the CO_2 tax base to include road fuels in particular. Phasing out support to fossil fuel consumption would free up resources and create further incentives on the supply side to develop renewables, including hydropower, and improve energy efficiency on the demand side.

The OECD's Environmental Action Programme (EAP) Task Force also undertakes reviews of energy subsidies in the EU's six Eastern Partnership (EaP) countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine); during 2016 it carried out reviews in all of the six countries. This survey revealed a number of policies that support fossil fuels in the region generating subsidy amounts that for some countries were larger than national budget deficits in 2014, the latest year for which the estimates were available. Energy subsidies in Azerbaijan, Moldova and Ukraine stood at 2.3%, 4.6% and 12.8% of GDP, respectively.[19]

The situation has since improved in Ukraine, as the government has undertaken significant reforms to its energy subsidies, increasing natural gas tariffs to meet cost recovery and eventually reaching import parity by April 2016. These efforts have been

[19] . See: http://www.green-economies-eap.org/resources/Discussion%20Paper%20Brussels%2029-30%20June%20Final.pdf

accompanied by social protection measures, the Housing and Utilities Subsidy (HUS) programme, providing target assistance to low-income households, reaching 6.5 households in early 2017.[20]

[20] . See: http://documents.worldbank.org/curated/en/884621506493335975/pdf/120076-26-9-2017-11-9-3-FINALESMAPCountryBriefUkraine.pdf