

Fossil fuel subsidy reforms: state of play and ways forward

Paris,
October 2017

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SUMMARY

Promoting the production and consumption of fossil fuels through subsidies is incompatible with the Paris Agreement on climate change.

While G20 countries have committed to phase out “inefficient fossil fuel subsidies that encourage wasteful consumption” since 2009, the progress towards reform has been mixed. The G20 countries still provide about USD 70 billion in production fossil fuel subsidies, while the total global consumption subsidies are estimated to be in the range of USD 320 billion to USD 5 trillion per year.

Recent examples demonstrate that subsidy reforms, combined with compensation mechanisms, are feasible. While there is no silver bullet to tackle the fossil fuel subsidy issue – and some of them are actually necessary –, the next steps towards a sounder and more efficient approach to fossil fuel subsidies may include:

- Establish clear action roadmaps for the reform of fossil fuel subsidies;
- Work within existing platforms such as the WTO to refine existing definitions in the specific case of fossil fuel subsidies;
- Reinforce existing peer-review processes and extend them through international cooperation platforms such as the UNFCCC;
- Use transparency frameworks to improve the national and international reporting on fossil fuel subsidies and their reform;
- Reinforce international initiatives that allow for transnational research, such as the Global Subsidy Initiative and the OECD/IEA works, and efforts such as the World Bank’s or IMF’s that foster capacity building on these issues.

Background: fossil fuel subsidies are incompatible with the low- carbon energy transition

The Paris Agreement (PA) adopted at the 21st Conference of Parties (COP21) to the *United Nations Framework Convention on Climate Change* (UNFCCC) set an objective of limiting the global temperature rise to “well below 2°C above pre-industrial levels” by achieving net zero anthropogenic greenhouse gas (GHG) emissions¹ by the end of the century. Reaching this objective requires cutting energy-related GHG emissions by more than 70% by 2050. This also means that a third of oil reserves, half of gas reserves and over 80 per cent of current coal reserves should remain unused (McGlade and Ekins 2015). Policies that create incentives to maintain or further the energy system’s dependency on carbon intensive energy sources are thus not compatible with internationally agreed climate goals.

Fossil fuel subsidies – i.e. “government actions that lower the cost of fossil fuel production, raise the price received by producers and/or lower the price paid by consumers”² – fall under this category of PA-incompatible policies. They also greatly decrease the efficiency of carbon pricing schemes – or those policies aiming to put a direct or indirect price on GHG emissions such as through taxes and emission trading schemes. According to the IEA’s statistics, on the one hand, carbon pricing schemes cover 11% of energy-related emissions worldwide, with an average carbon price of USD 7 per ton of CO₂; on the other hand, 13% of CO₂ emissions are covered by consumption fossil fuel subsidies, averaging USD 115 per ton of CO₂ (IEA 2015).

¹ I.e. balancing GHG emissions and sinks absorptions.

² International Energy Agency, 1999. *The IISD’s Global Subsidy Initiative recommends referring to the WTO’s definition in the Agreement on Subsidies and Countervailing Measures (ASCM). Since this definition is quite longer, we do not include it here and invite the interested reader to refer to the original document (IISD-GSI 2010).*

Despite this paradox, political progress towards fossil fuel subsidy reform has so far remained limited. Fossil fuel consumption subsidies represented USD 320 billion of public funds per year in 2011-2014 (IEA 2015). According to the IMF, taking into account tax subsidies from unpriced externalities (mainly health and environmental harm) and foregone government revenues would add USD 4 trillion to the public cost of these programs and policies (Coady *et al.* 2017).

There is nevertheless an increasing political and societal mandate for fossil fuel subsidies to be phased out. During the meeting of G20 members in 2009 in Pittsburgh, governments committed to phase out “inefficient fossil fuel subsidies that encourage wasteful consumption.” This commitment was reaffirmed again in 2013. During the G20 summit in June 2016 in Beijing, over 200 civil society organizations and insurers united to call for a commitment to phase out fossil fuel subsidies by 2020. In the run up to the G20 summit in July 2017 in Hamburg, a group of investors representing more than USD 22 trillion in assets issued a similar call to global leaders. Following the change in administration in the United States, leading to a less clear position on climate action, the 2017 G20 summit, however, failed to produce any progress on fossil fuel subsidy reforms.

This policy brief presents the current fossil fuel subsidies in G20 countries, discusses their perceived benefits, key reasons for phasing out and remaining challenges.

Fossil fuel subsidies in G20 countries: at least USD 70 billion per year and mixed progress towards the reform

Fossil fuel subsidies are used to support either actors and companies involved in the production of fossil fuels – through *production subsidies* – or fossil fuel consumers – through *consumption subsidies*. In some instances, it is difficult to clearly identify what constitutes a fossil fuel subsidy in a given country as the definition is dependent on national energy market, national taxation and supply and distribution costs (see **Box 1**).

According to a study by the Overseas Development Institute (Bast *et al.* 2015), G20 countries provided USD 70 billion in fossil fuel production subsidies only per year in 2013-2014 (**Figure 1** below). Among G20 countries Russia, the USA, Australia and Brazil have the highest levels of fossil fuel subsidies in value. In Russia, most of these subsidies were for production activities – such as extraction, property tax exemptions and customs duty tax reductions for oil and gas companies. In the USA, the fossil fuel subsidy landscape is more complex with a broad array of different subsidies at both federal and state levels, at all stages of the resource value chain. Looking at fossil fuel subsidies as a percentage of GDP (at PPP), Argentina also emerges as a country with significant levels of subsidization.

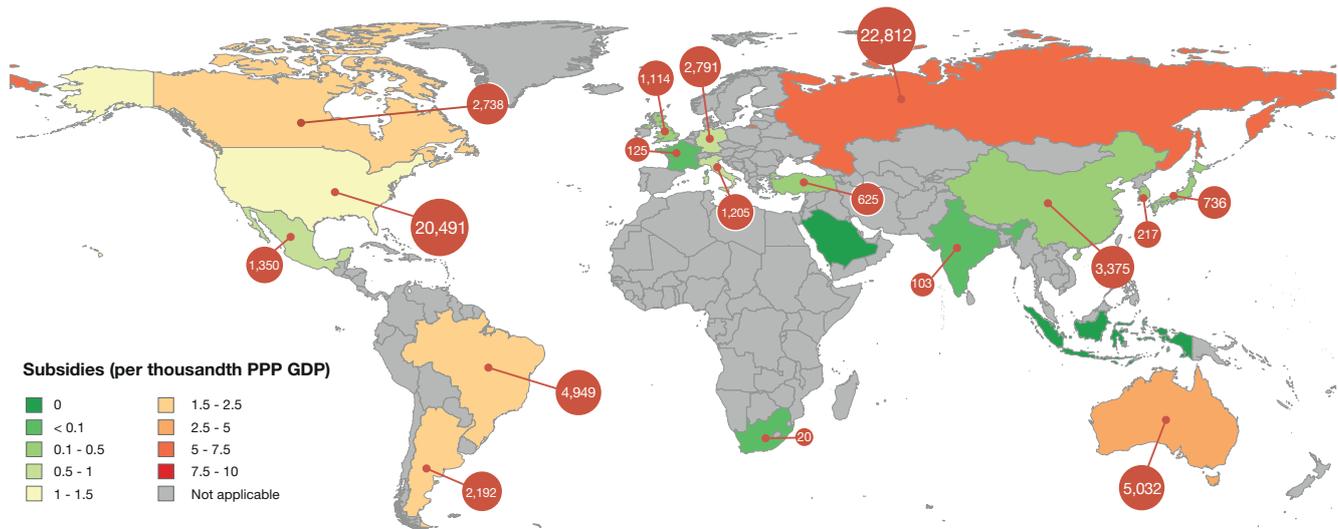
BOX 1. DIFFERENT APPROACHES TO IDENTIFYING AND CALCULATING THE VALUE OF FOSSIL FUEL SUBSIDIES

Three major international organizations in the field (the IEA, the OECD, the IMF), employ three different definitions:

- The *price gap* definition, used by the IEA (and by the IMF for its *pre-tax* calculations), considers the difference between the domestic price and international prices for a commodity that is traded internationally (e.g. oil). This is the most straightforward method, yet could lead to large counting fluctuations given the volatility of international markets.
- The IMF’s *tax subsidies* further this idea, by considering a *theoretical* tax benchmark that would include a state’s budget need, and considering that all non-priced (or underpriced) externalities are hidden subsidies. In practice, this benchmark’s estimates could vary drastically, depending on the model used to calculate them and the underlying assumptions about the social costs of externalities. Using the IMF definition results in the total post-tax fossil fuel subsidies amounting to a staggering 6-7% of global GDP (Coady *et al.* 2017). The IMF’s methodology and its results are controversial in literature, yet they provide a high-end for global fuel subsidies and interesting considerations on a variety of externalities.
- The OECD lists *all support mechanisms individually*, and the global amount of money transfers/foregone revenues they entail. This approach is less standardized and more data-intensive, yet it is adapted to national circumstances. It still requires exogenous assumptions, e.g. on the actual costs incurred by producer countries that set their internal prices below international market levels.

Overall, these definitions imply the use of a variety of benchmarks with strong underlying assumptions, and there is therefore no consensus on the precise definition and means of calculation of fossil fuel subsidies beyond this point.

FIGURE 1. FOSSIL FUEL PRODUCTION SUBSIDIES IN G20 COUNTRIES (MILLION USD)



Source: IACE based on Bast et al. (2015)³

Justifications for subsidizing energy systems: a change of tide needed to move from fossil fuels to low-carbon technologies

While today incompatible with climate-related objectives, fossil fuel subsidies have been put into place historically for a number of reasons, some of which may remain valid for ensuring energy supplies and access for countries and consumers. The benefits put forward to justify fossil fuel subsidies can be roughly divided into three categories, namely incentivizing exploration and new technologies, promoting domestic production and energy security and, finally, increasing energy affordability. However, most of these benefits can be harvested through renewable support and/or *ad hoc* specific support schemes, rather than fossil fuel subsidies.

- Promoting domestic production and energy security:** Lowering the operating costs of fossil fuel producers or the price paid by consumers in fossil fuel producing countries supports the domestic production of these fuels. This support is said to help domestic producers benefit from economies of scale (Narayanamurti *et al.* 2011), thus becoming more competitive against international producers even if the subsidies are rolled back in the longer term. This increase in the domestic production of fossil fuels also serves to improve energy security by lowering the dependency on imports. Today, a similar benefit could be achieved through the identification of renewable energy potential within a given country and subsidizing the deployment of the investments.
 - Nigeria provides an example of a country that was successful in developing a competitive domestic fossil fuel industry supported by fossil fuel subsidies. However, this did come at a cost of significant forgone tax revenue (van Dorp 2016).

- Increasing energy affordability:** Fossil fuel subsidies often fulfil distributional goals. Low-income household energy consumption satisfies at times only basic needs and as such, it is relatively inelastic. Lowering the price of energy thus increases access to affordable energy, with the aim of reducing poverty and increasing productivity to further development-focused energy access objectives (Whitley and van der Burg 2015). However, studies such as (IRENA 2016) have demonstrated that subsidies targeting renewable energy can also have substantial benefits to energy access and increase affordability for low-income households.
- Incentivizing exploration and new technologies:** Production fossil fuel subsidies were historically used to promote exploration of new fields and the development of new technologies (Narayanamurti *et al.* 2011). To overcome risks and support exploration, governments have often encouraged these activities by reducing the associated risks, e.g. through direct financial incentives (for example in R&D) or indirect subsidies such as favourable tax treatment for exploration. Advocates argue that higher corporate tax revenues then recoup foregone revenues from subsidies as private enterprises thrive with the assistance from governments. Today, the challenge will be to modify these policies to support renewable energy sources and technologies.
 - An illustration of this is the subsidising of the unconventional oil and gas industry by the US government during the 1990's and 2000's. The government provided oil and gas juniors with R&D and exploration subsidies, which played an important role in the explosive development of fracking technologies in the country.

³ Data presented in this section is primarily sourced from information collated by the Overseas Development Institute (ODI). Since estimates of the magnitude of fossil fuel subsidies highly depend on the methodology and definitions used (cf. Box 1), these amounts differ from estimates presented in other sources, e.g. the International Monetary Fund (IMF) or the International Energy Agency (IEA).

Challenges to fossil fuel subsidies reform are mainly political

A number of challenges exist in reforming or phasing out fossil fuel subsidies. These challenges are mainly political and are related to strong vested interests and the difficulty of putting in place compensation mechanisms.

Political challenges and communication issues

Fossil fuels still account for over 80% of the global primary energy demand, and fuel prices impact consumers in a very direct way; fossil fuel subsidies are thus powerful levers to build political capital and, on the other hand, the huge political costs of removing them have often been an obstacle to subsidy phase-outs. India is a good example of such political influences: after getting rid in 2002 of its Administered Price Mechanism (APM) that controlled, among others, diesel prices, the ruling party re-introduced diesel subsidies in the build-up to 2004 national elections (Clarke 2015).

Communication is also a crucial dimension of fossil fuel subsidy phase-out. Saudi Arabia is notorious for failing to reform its fossil fuel subsidies mostly on communication grounds; on the other hand, the television allocation by the King himself in Morocco, about the co-benefits of the reform, was a key component of the country's successful phase-out (Wooders *et al.* 2016).

Vested interests and stranded assets

Subsidies often allow governments to provide benefits to powerful political actors and pressure groups (Victor 2009). Successful fossil fuel subsidy reforms thus must take into account political economy and often require broader improvements in public administration and compensation to political losers.

The USA provide a very sharp and recent example of these barriers. Based on data from the Federal Election Commission, the Center for Responsive Politics' (2017) analysed that more than two-thirds of donations from the oil and gas industry to political parties 1990 had been to the Republicans; for the 2016 election cycle this figure rose to 88%. President Trump's first political moves acknowledged these strong ties by launching a slew of measures to support the fossil fuel industry and withdrawing the country from the Paris Agreement.

Cushioning impacts on low-income populations and smoothening the transition

An important share of the world's poorest population still relies on subsidised fuels to support their most basic needs; close to 50% of African households use subsidised kerosene for lighting and cooking. It is thus important to ensure that these populations are not too strongly impacted by fossil fuel subsidy reforms: framing an appropriate phase-out plan that smoothenes the transition is thus a highly complex issue, which has been extensively studied. Mechanisms such as sunset clauses, direct cash transfers or minimum incomes are possible options to cushion vulnerable populations (Sovacool 2017; Merrill *et al.* 2017; Lindebjerg, Peng, and Yeboah 2015). Ensuring that the revenues benefit the economy in an optimal manner and preventing nationwide economic shocks also pose technical challenges to planners and policymakers

BOX 2. FOSSIL FUEL SUBSIDY REFORMS IN INDIA

Between the years 2002 and 2012, India witnessed a colossal rise in diesel subsidies. By 2012, the budget allocation for diesel subsidies reached USD 12.1 billion, far exceeding the allocation for flagship social programs such as the National Rural Employment Guarantee Act (USD 5 billion) and the Sarva Shiksha Abhyan which guaranteed primary education to children (USD 3.8 billion) (Clarke 2015).

In the recent years, India strongly reduced its LPG subsidies, from USD 4.8 billion in 2012 down to USD 1.8 billion at the end of 2015, offsetting the reform's impacts through a direct benefit transfer scheme. In 2014, the country also undertook an ambitious plan to deregulate diesel prices and link them to market prices. In combination with the increase in the number of LPG connections in the country and rural electrification, this policy led to a fall in kerosene subsidies from USD 3.9 billion in 2012 to USD 1.5 billion by the end of 2015. LPG subsidy phase-out was then offset through one of the world's most ambitious cash transfer schemes: between 2009 and 2016, India issued unique 12-digit ID cards to all of its 1.1 billion residents, to enable direct transfers along with multiple other social security benefits to the bank accounts of eligible recipients.

The scale of this project indicates the complexity associated with phasing out fossil fuel subsidies while minimizing the political and economic costs. The success of the Aadhar Direct Benefit Transfer scheme, which has saved the exchequer USD 4.1 billion in LPG subsidy expenses between 2014 and 2016, serves as a model for developing countries grappling with the challenge of minimising the economic strain of fossil fuel subsidy phase out on vulnerable populations.

Reforming fossil fuel subsidies: countries seeing a new way of ensuring a low-carbon future

Despite these challenges, several G20 countries have made significant steps forward in reforming their policies on fossil fuel subsidies in recent years (Bast *et al.* 2015). Indonesia has been successful in rolling back fossil fuel consumption subsidies totalling USD 15 billion as well as a portion of their production subsidies. Mexico rolled back its consumption subsidies in 2016, although some production subsidies remain. Germany, in its attempt to reform fossil fuel subsidies, has committed to eliminate all public funding for hard coal domestically by 2018.

Among the arguments for conducting these reforms, let us mention three fundamental reasons: reducing environmental and health impacts; decreasing fossil fuel consumption for both economic and risk-related reasons; and reducing the burden on public budgets.

Reducing environmental and health impacts

Fossil fuel consumption results in significant environmental costs for society, including climate change, air pollution, degradation of landscapes and the loss of biodiversity. While these negative externalities would deserve to be internalized, fossil fuel subsidies actually increase the consumption and encourage the production of fossil fuels, imposing significant additional costs on the society as a whole. The IMF estimated that removing all fossil fuel subsidies and actually pricing the hidden costs attached to fossil-fuel related externalities would result in a net decrease of global GHG emissions by 21% (Coady *et al.* 2017).

Beyond their environmental costs, fossil fuels also generate significant public health issues, due to both fossil-based power generation and internal combustion engines used for transport. The World Health Organization attributes 3 million pre-mature deaths per year to ambient air pollution. The aforementioned IMF study considers that if fossil fuel were correctly priced, deaths from outdoor air pollution would fall by 55% globally.

Decreasing consumption for economic and risk-related reasons

Fossil fuel subsidies reduce the market price paid by the end user, in turn increasing consumption. Beyond the environmental reasons mentioned above, there are a number of economic and risk-based reasons to reduce fossil fuel consumption. Firstly, a large portion of oil extraction would not currently be economically viable without the help of subsidies. Erickson *et al.* (2017) estimate that at a price of 50 USD/barrel, half of the US oil fields they analysed would not turn a profit without government support. In this context, misaligned incentives to invest may create stranded assets.

Artificially low prices for consumers also increase the inefficiencies of operations in terms of energy use. With low fossil fuel prices, the benefits from increased energy efficiency may be outweighed by the capital cost associated with the investment. For example, there is proven evidence that heavily subsidized energy prices contributed to high energy intensity of the economies of the former Soviet bloc (Grubb 2014).

Conversely, high energy prices act as powerful lever to improve energy efficiency, as demonstrated by the oil shocks of the 1970s and the energy efficiency policies in the OECD countries that followed (Grubb 2014). The IMF considers that eliminating fossil fuel subsidies could generate additional revenue equivalent to up to 4% of GDP and increase welfare by up to 2% (Coady *et al.* 2017).

Finally, the Carbon Tracker Initiative and other research initiatives have indicated that governments, companies and the broader global economy are exposing themselves to a significant systemic risk due to their continued dependence on fossil fuels. Continued high levels of investment into the exploration and exploitation of fossil fuels – as well as the infrastructure and durable goods consuming these resources – introduces a risk of stranded assets and premature devaluation. If 80% of known fossil fuel reserves are to stay in the ground in order to meet the objectives of the Paris Agreement, this would have substantial impacts not only on the fossil fuel industry itself, but more broadly on the economies dependent on fossil fuels whether for consumption or production.⁴

BOX 3. FOSSIL FUEL SUBSIDY REFORMS IN CHINA

China's fossil fuel subsidies, in place since 2006, aimed primarily to cushion the impact of high oil prices on vulnerable groups and strategic economic sectors. The country used to support industrial fuel users and state-owned oil and gas companies through direct payments, yet the cost of these subsidies jumped from USD 4bn in 2010 to USD 14bn in 2013, heavily straining the national budget (Shuang 2016). China took advantage of the low international prices from late 2014 on to withdraw this support and launch a more extensive national energy price reform. The country now raises excise duties on multiple fossil fuels, up to USD 0.22 per litre.

However, China can still further this reform and retrieve additional forgone state revenue: the inventory confirmed in late 2016 in the China / USA cross-peer review of fossil fuel subsidies identifies no less than nine remaining fossil fuel subsidy programs. Six could not even be valued, the three remaining totalling a USD 15.5 billion cost to the country (OECD 2016).

⁴ See *The Implications of 2015 for the Coming "Green Energy Revolution": Low-Carbon, Climate-Resilient Development* by Cochran, Deheza and Leguet in the 2016 edition of *Atlantic Currents*. https://www.i4ce.org/wp-content/uploads/2016/12/AtlanticCurrents_2016.pdf

Financial costs for tax payers

The last key reason to phase out fossil fuel subsidies is that they are enormously costly for government budgets, and ultimately tax payers. Subsidies to well-established actors and mature production processes can also quickly turn into free hand-outs providing windfall profits to energy companies and potentially stifling innovation. Ill-calibrated production subsidies thus generate market distortions and inefficiencies (Parry *et al.* 2014).

Moreover, many prominent policymakers and economists see increasing energy affordability through fossil fuel subsidies as inefficient (Ellis 2010; Sterner 2011). The IEA estimates that only 8% of the money spent on fossil fuel consumption subsidies reaches the poorest 20% of the population (IEA 2015). In many instances, the administration of these subsidies in practice is difficult resulting in subsidies paid to households who already have affordable access to energy, thus representing an unnecessary cost to the taxpayer.

Conclusion: Need for a roadmap for the fossil fuel subsidy reform and reinforcement of various transparency processes

There appears to be an increasingly accepted mandate and understanding that reducing fossil fuel subsidies is needed. However, there does not appear to be any single silver bullet means of achieving this. In many cases, fossil fuel subsidies have been implemented to achieve valid energy-related goals in terms of access and security. Today, the challenge of ensuring these objectives while at the same time reducing greenhouse gas emissions requires a new series of policies and support schemes.

The next steps forward will need to take a range of country- or region-specific issues into consideration, including: level of current dependence on fossil fuels, level of development and access to capital to shift to carbon-free energy sources, feasibility of replacing subsidies with *ad hoc* support schemes in the case of energy poverty.

A first step forward is to exchange best practices between the countries and learning from positive experiences can help governments advance the reforms. This should focus both on the steps taken to achieve the reduction technically and politically, as well as clear documentation of how this has had positive impacts for the country.

On the international level, the next steps for governments of the G20 countries may include:

- Establish clear action roadmaps for the reform of fossil fuel subsidies, which is one of the targets (12c) under the 12th Sustainable Development Goal “ensure sustainable consumption and production patterns”;
- Work within existing platforms such as the WTO to refine existing Agreement on Subsidies and Countervailing Measures (ASCM) definitions in the specific case of fossil fuel subsidies;
- Reinforce the peer-review processes existing within e.g. the G20 and APEC and extend them through other international cooperation platforms such as the UNFCCC;
- Use transparency frameworks (such as, again, the UNFCCC and WTO) to improve the national and international reporting on fossil fuel subsidies and their reform;
- Reinforce international cooperative initiatives that allow for transnational research, such as the Global Subsidy Initiative and the OECD/IEA works, and those that foster capacity building, such as the IMF and World Bank efforts.

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