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Energy subsidies, international aid, and the politics of reform

Neil McCulloch*

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United Nations University World Institute for Development Economics Research
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Abstract: Energy subsidy reform is critical to achieving the Sustainable Development Goals and tackling climate change. This paper sets out the evidence on the scale of subsidies and their impact. It then reviews the actions of donors in encouraging and supporting energy subsidy reforms. I find that, outside of analytical work in support of international diplomatic efforts, the donor community has devoted remarkably few resources to supporting developing countries to remove energy subsidies. This is despite the fact that energy subsidies exceed all bilateral aid in 59 per cent of recipient countries. The reason for this low level of effort is the political sensitivity of such reforms. The paper then draws on the recent literature on 'thinking and working politically' to provide recommendations about how donors might more effectively encourage politically sensitive energy subsidy reform.

Keywords: energy subsidies, fossil fuel subsidies, aid, political economy
JEL classification: H22, H23, Q48

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*McCulloch Consulting Ltd, Romsey, UK, email: neiltheeconomist@gmail.com

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

Since the global financial crisis in 2008/09, there has been a growing awareness of the economic distortions and environmental damage caused by energy subsidies. Energy subsidies—which include subsidies to all forms of energy, including electricity (whether generated by fossil fuel or renewable sources) and subsidies to specific fuels—are very large. The International Monetary Fund (IMF) estimates that globally the sale of energy services and fuels for less than the supply cost costs in the order of US$300–500 billion each year (Coady, Parry et al. 2015). Moreover, energy subsidies—particularly subsidies on fossil fuels—have major negative environmental and social costs. These include pollution caused by the consumption of fossil fuels, as well as the additional costs of congestion, accidents, and road damage caused by excessive consumption of such fuels due to their subsidized price. Moreover, since the signing of the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement in 2015, there has been a focus on the role of fossil fuel subsidies in contributing towards global warming. Recognition of the combined fiscal, environmental, and social costs associated with fossil fuel subsidies led to the G20 putting a commitment in their communiqué in 2009 to the elimination of inefficient subsidies that encourage wasteful consumption—a commitment that has been reiterated every year since.

This paper summarizes the current state of knowledge on energy subsidies, with a focus on fossil fuel subsidies. We elaborate the latest evidence on the size of subsidies, discuss their impacts and describe the conclusions of research about the distributional implications of fossil fuel subsidies. The paper then compares the size of subsidies within developing countries with the quantity of bilateral aid that they receive. Contrary to the narrative that sees such subsidies as being an issue for only a handful of countries, we find that fossil fuel subsidies dwarf aid flows, not only in aggregate but in the majority of aid-receiving countries. This finding has major implications, since it suggests that the reduction of fossil fuel and electricity subsidies might play a much more significant role in mobilizing domestic resources in developing countries towards the achievement of the Sustainable Development Goals.

We then review international efforts to tackle fossil fuel subsidy reform from both bilateral and multilateral funders. Given the importance and size of fossil fuel subsidies, the aid flows devoted to tackling the issue are remarkably small. In particular, notwithstanding some excellent research and technical work, there is only one modest-sized programme devoted to supporting developing countries to design and implement such reforms—although much more significant multilateral flows may be linked to commitments to achieve subsidy reductions. One possible reason for this is that energy subsidy reforms are often very politically sensitive. Whilst multilateral agencies can often provide excellent technical assistance to support the achievement of reforms, they are generally unable to engage with the more political dimensions of reform. However, the evidence from multiple episodes of attempted reductions in subsidies in recent years is that reforms are frequently unsuccessful or, at least, partially reversed. We conclude by summarizing some recent developments in the use of more effective modalities for aid interventions related to politically sensitive reforms and suggest an approach to building broad support for fossil fuel subsidy reform that might complement existing technical assistance.

2 The scale, distribution, and impact of energy subsidies in developing countries

2.1 The size of energy subsidies

Global energy subsidies are very large. However, the precise size of such subsidies is a subject of considerable dispute. This is due to the variety of different methodologies in use to estimate the size of subsidies, as well as disagreements over what constitutes a subsidy. There are two kinds of subsidy: consumption subsidies—in which governments hold the price of energy or particular fuels below the supply cost, and production subsidies—which can consist of a wide variety of different kinds of payments to the fossil fuel industry, or tax allowances and credits that are specific to those industries.

The most common method for measuring the size of subsidies is the 'price-gap' methodology, i.e. multiplying the gap between the retail price and the supply cost by the volume of consumption. The International Energy Agency (IEA) has reported on the size of energy subsidies in the World Energy Outlook since 2010 using the price-gap methodology. The latest estimates suggest that fossil fuel consumption subsidies dropped in 2015 to US$325 billion from around US$500 billion in 2014, reflecting lower fossil fuel prices as well as a variety of reform efforts (IEA 2016).

Similarly the IMF, building on the work of Clements et al. (2013), has produced databases in 2013 and forecasts for 2015 quantifying the 'pre-tax' subsidy (i.e. the price-gap subsidy) for over 150 countries. These estimated fossil fuel subsidies at US$541 billion in 2013, dropping to a predicted US$333 billion in 2015 due to the falling price of oil (Clements et al. 2013; Coady, Flamini et al. 2015).

However, as Koplow (2009) has pointed out, the price-gap method is an incomplete measure of subsidies. This is because certain types of subsidy do not necessarily lower the retail price. For example, direct payments or vouchers for low-income households do not reduce the retail price. Similarly, the extent to which tax allowances and other payments to industry reduce retail prices depends on the quality of domestic infrastructure in each country as well as the market structure.

Moreover, the price-gap method is particularly inappropriate for Organisation for Economic Cooperation and Development (OECD) countries, since many of these countries apply a range of indirect taxes on the use of energy products (OECD 2015) with the result that retail prices are often above international reference prices. As a result, since 2010 the OECD started to compile a detailed inventory of budgetary expenditures and tax measures that encourage the production and consumption of fossil fuels. This was first published in 2012 and was most recently updated in September 2015 (OECD 2012, 2015), including adding major emerging market economies (Brazil, China, India, Indonesia, Russia, and South Africa). This suggested that total support in the 41 countries they cover was around US$160–200 billion annually.

Koplow (2014) added together the available data on subsidies for fossil fuels, renewable energy, and nuclear power and estimated that a total of US$840 billion was spent on energy subsidies annually in 2011 (roughly 1 per cent of global gross domestic product (GDP)), with the bulk of this support being for fossil fuels (see Table 1 of Koplow (2014)). More recently, the Overseas Development Institute and Oil Change International (Bast et al. 2015) have estimated the value of production subsidies provided by the G20 governments as US$444 billion, using the World Trade Organization's definition of subsidies. This is almost four times the value of IEA estimates for subsidies to renewables in 2013. The OECD (2017) reports overall government support to fossil

fuels in G20 countries as totalling US$376 billion in 2015, although this principally consists of consumer subsidies estimated by the IEA above plus a much smaller estimate of producer subsidies from their inventory approach. Table 1 summarizes the most current estimates of the size of subsidies by different organizations and the methodology applied.

Table 1: Estimates of fossil fuel subsidies

	Organisation for Economic Cooperation and Development (OECD)	**International Energy Agency (IEA)**	**International Monetary Fund (IMF)**	**Overseas Development Institute (ODI) and Oil Change International (OCI)**
Coverage	41 mainly developed countries (OECD and BRICS countries, and Indonesia)	40 developing countries	All countries	G20
Approach	Inventory of government producer and consumer support measures	Price-gap approach	Pre-tax subsidy uses price-gap approach; post-tax subsidy including cost of externalities	G20 subsidies to oil, gas, and coal production
Amount	US$160–200 billion per year between 2010 and 2014	US$325 billion in 2015	US$5.3 trillion in 2015	US$444 billion per year on average 2013–14

Source: Author's adaptation from Carbon Brief (2017).

Stefanski (2017) has recently developed a novel way of inferring the size of fossil fuel subsidies based on historical trends in CO2 emission intensities and a model of structural transformation of economies. This allows him to uncover energy price wedges for 170 countries over the 1980–2010 period. He interprets these wedges as subsidies and shows that they contribute to over a quarter of all CO2 emissions over the last 30 years. He estimates that the direct cost of such subsidy-like wedges in 2010 was US$983 billion. Indeed, Stefanski's estimate of the global economic cost of such subsidies is considerably larger than the IPCC (2014) estimate of the economic cost of climate change.

Furthermore, progress in reducing such subsidies has been slow. Ross et al. (2017) estimate gasoline taxes and subsidies in almost all countries from 2003 to 2015. They show that, notwithstanding the Paris Agreement on climate change, the global mean tax on a litre of gasoline fell at a rate of 1.18 per cent a year over the period, suggesting that many governments are failing to internalize the social and environmental costs of fossil fuel consumption.

In conclusion, the variety of methodologies and coverage of different estimates of subsidies makes it difficult to know the precise value of combined production and consumption subsidies for all countries—particularly given annual fluctuations associated with the price of oil. However, the available evidence suggests that the global figure is at least several hundred billion US dollars each year, making fossil fuel subsidies one of the largest global economic distortions.

2.2 The impact of subsidies

The above estimates, whether using the price-gap or the inventory approach, represent the direct financial costs associated with energy subsidies which are extremely large. Koplow (2014: 323) compares the cost of fossil fuel subsidies to consumers as a percentage of GDP, revenues, and public spending on health care in 38 developing and emerging countries. In six countries, subsidies

were more than 10 per cent of GDP (Egypt, Iraq, Iran, Saudi Arabia, Turkmenistan, Uzbekistan); in 22 countries, energy subsidies were more than 10 per cent of revenues; in 33 countries, energy subsidies were more than 10 per cent of public health expenditure (and in 18 countries they were more than 100 per cent of health expenditure).

More recently, Hoy and Sumner (2016) have calculated fossil fuel subsidies as a share of the poverty gap[1] for all developing countries for which such data exist. They show that such subsidies are equal to almost 70 per cent of the poverty gap for these countries. Since these subsidy costs are under the control of their respective governments, they conclude that the potential for pro-poor redistributive policies is very substantial indeed.

Leaving aside the financial costs, and opportunity costs, of subsidies, such expenditures also have very large indirect costs (Davis 2014). Fossil fuel subsidies encourage over-consumption of fossil fuels. This contributes to climate change, through the production of additional CO2. It also generates significant air pollution, additional road congestion, accidents, and road damage. Coady, Parry et al. (2015) present a comprehensive synthesis of the evidence and an attempt to quantify the size of these additional costs. In particular, they estimate the value of the 'post-tax subsidy'. This is the difference between the prices charged to consumers and 'the price that would be paid by consumers if they paid both the full supply cost of energy, plus an appropriate "Pigouvian" tax that reflects the environmental damage associated with energy consumption and an additional consumption tax that should be applied to all consumption goods for raising revenues' (Coady, Parry et al. 2015).

Such post-tax subsidies are very large indeed—several times the value of pre-tax subsidies. The IMF estimated that post-tax subsidies in 2015 would be US$5.3 trillion—around 6.5 per cent of global GDP. Such subsidies are dramatically larger than pre-tax subsidies (which, as noted earlier, they estimate at US$333 billion in 2015). This reflects the severe environmental damage done by subsidies, particularly from burning coal. Specifically, the IMF considers the size of post-tax subsidies in four areas:

Climate change. The IMF estimates that CO2 emissions would be reduced by 24 per cent if prices were to be increased to their efficient level, taking into account all of the externalities caused by the consumption of fossil fuels. However, it is notable that climate change only accounts for one-quarter of total post-tax subsidies. The vast majority arises from domestic rather than global environmental damage.

Air pollution. Fossil fuel consumption causes environmental damage, notably the emission of sulphur dioxide, nitrogen oxides, and particulates. Most significant is particulate pollution from burning coal. Outdoor air pollution from fossil fuels and other sources was responsible for an estimated 3.2 million premature deaths a year worldwide in 2012 (WHO 2014).[2] Moving to efficient pricing of fossil fuels is estimated to reduce air pollution deaths by 55 per cent.

Congestion, accidents, and road damage. In addition to air pollution, fossil fuel subsidies also create congestion, additional accidents, and road damage. The IMF drew on the latest models of how

[1] The poverty gap is the average of the ratio of the poverty gap—the gap between the consumption of the poor and the poverty line—to the poverty line, where the poverty gap is zero for those above the poverty line.

[2] The significantly larger number of deaths from indoor air pollution are not included in the IMF estimates since the nature of the externality is less clear.

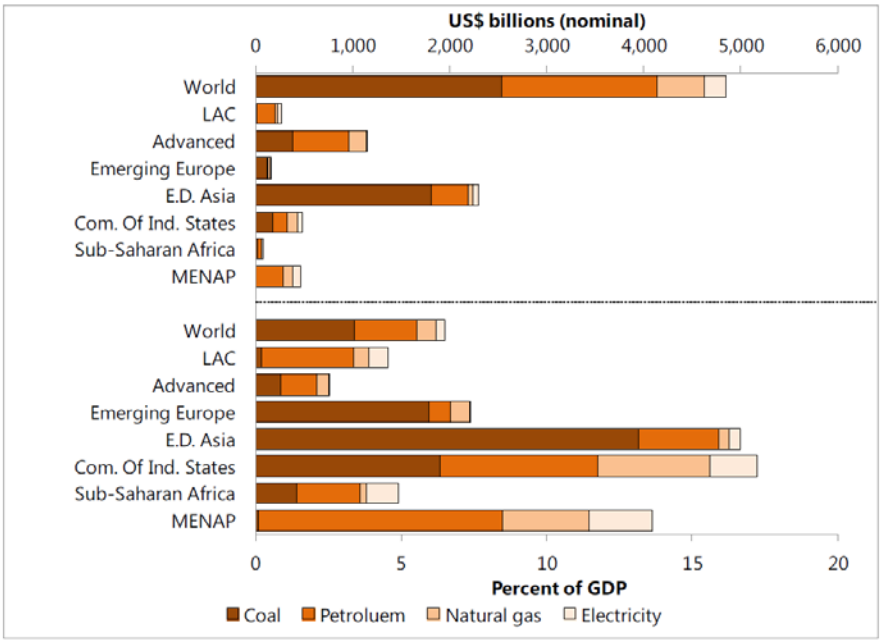
these damages would be influenced by changes in fuel prices to calculate the welfare gain from these sources attributable to efficient pricing (van Benthem 2015).

Consumption tax. Finally, the IMF argues that fossil fuels should be subject to the same rate of value added tax or general sales tax as other consumption goods. Indeed, it could be argued that fossil fuels should be taxed more than other goods because of their relatively inelastic demand. The failure to impose such taxes represents a large source of foregone revenue for many governments.

Figure 1 shows the estimates of post-tax subsidies for 2013, broken down by fuel and region. A large share of post-tax subsidies result from inefficiently low pricing of coal, particularly in emerging and developing Asia, emerging Europe, and the Commonwealth of Independent States (CIS). The second largest source of such subsidies arises from the under-pricing of petroleum, notably in the Middle East and North Africa region.

Figure 1: Post-tax subsidies in 2013 by fuel and region

(US$ billions on top axis; percent regional GDP on bottom axis)



Source: Authors' calculations, based on sources in Appendix Table 2.
Note: CIS = Commonwealth of Independent States; ED Asia = Emerging and Developing Asia, LAC = Latin America and the Caribbean; MENAP = Middle East, North Africa, Afghanistan, and Pakistan

Source: Coady, Parry et al. (2015), reproduced with permission.

2.3 The distribution of subsidies

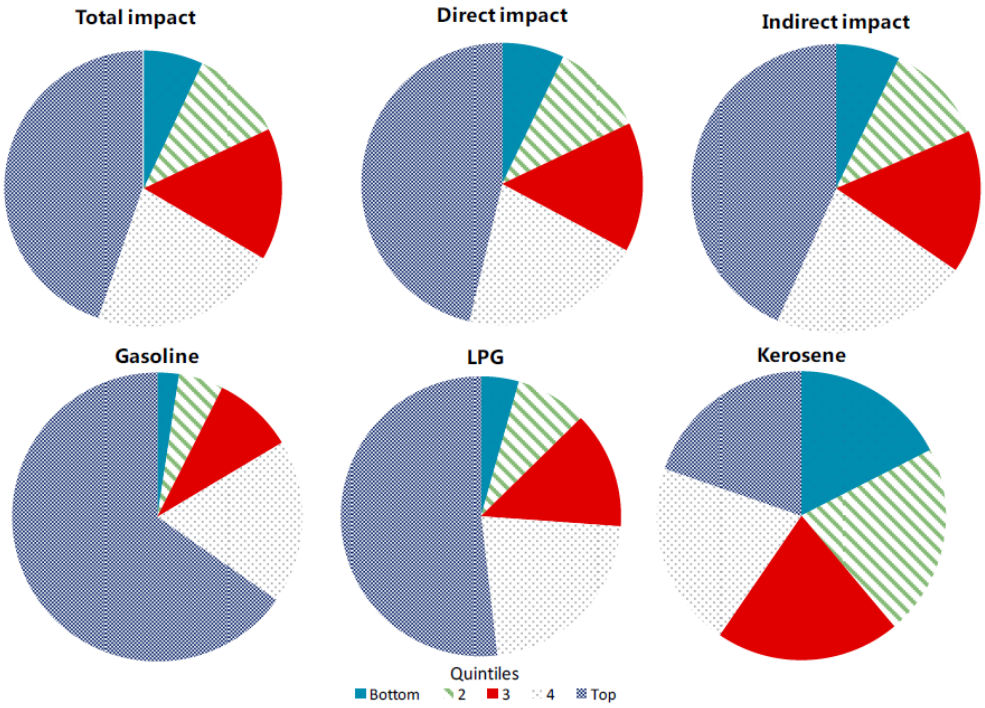
There is substantial evidence that the distribution of subsidies to different income groups is highly regressive in developing countries.[3] The IEA (2012) estimated that, of the US$409 billion spent on

[3] For rich countries, the opposite argument is sometimes made—that fuel taxation is regressive. However, the evidence for this is weak (Sterner 2012).

fossil fuel consumption subsidies in 2010, only US$35 billion, or 8 per cent of the total, reached the poorest income group (the bottom 20 per cent). Del Granado et al. (2010) estimated the welfare impact for 20 countries from Africa, Asia, the Middle East, and Latin America. They found that fuel subsidies are an extremely costly approach to helping the poor, with the top income quintile typically capturing six times more in subsidies than the bottom.[4] However, this does not mean that the impact of fuel price increases would be primarily felt by the better-off. They show that an increase of US$0.25 per litre in petroleum prices gives rise to a substantial 6 per cent loss in welfare, with the proportionate loss being similar for different quintiles. More than half of this impact arises indirectly from the pass-through of higher fuel prices into the prices of other goods.

Recently, these unequal benefits have been revisited by Coady, Flamini et al. (2015), who have extended their study to 32 countries up to 2014. Their analysis confirms that a very large share of benefits from fuel price subsidies goes to high-income households, reinforcing existing income inequalities. They also confirm the importance of the indirect impacts on household welfare resulting from fuel price increases (Figure 2).

Figure 2: Distributional impact of fossil fuel subsidies



Note: LPG = liquid petroleum gas. The indirect impact is the welfare impact of higher prices of goods and services due to an increase in the price of diesel.

Source: Coady, Flamini et al. (2015), reproduced with permission.

In general, the distributional incidence of subsidies is one of the reasons for the difficulty in reforming them. Subsidies are typically received by wealthier 'middle-class' households in urban areas that often have considerably more political influence than rural and poorer households. Also,

[4] The top quintile obtained 43 per cent of the benefit, whilst the bottom quintile received 7 per cent.

energy-intensive industries in receipt of subsidies may not be viable in their absence, creating the prospect of major disruption in energy supplies associated with subsidy reform. And the feed-through of fuel prices to domestic food and non-food prices (notably transport) can have a significant negative impact on the poor, particularly lower-income urban households reliant on goods in which fuel is an important input.

3 Aid expenditure and subsidies

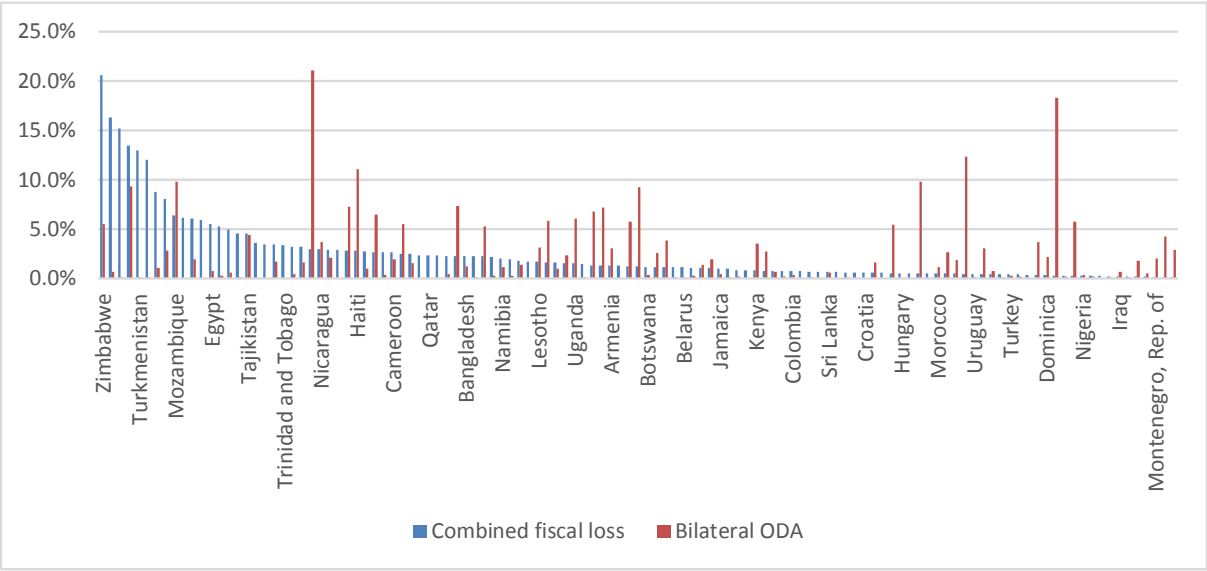
Developed countries give overseas development assistance (ODA) to a wide range of developing countries. The OECD Development Assistance Committee records annual data on the commitments and disbursements of aid by 50 individual countries, and a range of multilateral agencies, towards 182 countries, as well as a large number of multilateral and regional recipients. Total ODA has risen in recent years, reaching US$163 billion in 2015. There are a huge number of different uses of aid, including building human capital through health and education, building infrastructure, economic policy, democratic strengthening, supporting measures to tackle climate change and other environmental challenges, humanitarian relief, and much more. There is also enormous variation in the amounts given by different donors, the countries to which they give, the purposes for which they give, and the mechanisms used (see OECD 2015 for a comprehensive account).

However, implicit in the transfer of aid is the idea that financial transfers are needed. The assumption is that poor developing countries do not have the capital to fund their own development and therefore can benefit from transfers from richer countries to accelerate their development. Whilst this is certainly still the case for a wide range of poor countries, the existence of very large subsidies in some countries begs the question of whether some poor countries themselves might be able to make a much stronger contribution to poverty reduction through the reduction of such subsidies. It is therefore useful to compare the scale of subsidies and aid across countries to explore the extent to which subsidy reduction might be able to release resources for developmental purposes.

Bast et al. (2015) showed the size of subsidies and aid for 11 of the world's top subsidizing countries. This suggested an enormous disparity between subsidies and aid received. However, the countries chosen in their analysis were selective and did not present a representative picture. We have therefore extended the analysis to cover all countries for which data on subsidies are available and compared this with the latest data on aid from the OECD.

For each of the 119 countries on which the IMF has subsidy information, Figure 3 shows the share of each country's GDP spent on pre-tax subsidies plus revenue foregone by failing to tax fossil fuels at the same rate as other consumption goods. The figure also shows the share of GDP received in ODA.

Figure 3: Combined fiscal loss from energy subsidies and bilateral ODA (% GDP)



Source: Author's calculations based on Coady, Parry et al. (2015) and OECD (2015).

As Figure 3 shows, there are around 20 countries which receive a large amount of aid relative to their GDP. However, aside from these countries, for the majority of countries, subsidies dominate aid. Table 2 shows the details for the 96 countries where we have data on both subsidies and aid. Of these countries, subsidies and foregone revenues are larger than aid—in other words, for 59 per cent of countries, the removal of subsidies and a move towards the taxation of fossil fuels at the same rate as other goods would more than cover the cost of aid from all bilateral donors combined. The total value of subsidies and foregone revenue for these countries in 2015 was US$515 billion, whereas they only received US$76 billion of ODA. Of course, this result is partially the result of very large subsidies among a sub-set of countries—for the 57 countries where subsidies are larger than aid, the median ratio of subsidies to aid was 4.3. But it is important to note that this situation is not driven by outliers—across all 96 countries, the median ratio of subsidies to aid was 1.2, that is, the average developing country subsidized energy by more than it received in aid.

Examining regional breakdowns is also instructive. In the CIS, nine of the 12 countries had subsidies larger than aid; subsidies were almost 25 times the size of aid flows, with the typical country having subsidies eight times larger than all bilateral aid. Latin America and the Caribbean similarly had a very large number of countries in which subsidies are greater than aid—even aside from the spectacular subsidies of Venezuela, the average country in the region subsidized by more than double the amount it received in aid. To some extent, the results for the CIS and Latin America and the Caribbean reflect the low volume of aid flows to the region. However, a similar picture holds in emerging and developing Asia where almost two-thirds of countries subsidize by more than they receive in aid. Even taking into account countries with no or low subsidies, the average country could have covered the cost of 44 per cent of all aid by removing subsidies and taxing fuels appropriately. The same was true of the Middle East and North Africa, although the results are skewed by the very large subsidies of countries such as Iran, Egypt, and Libya. Finally, in sub-Saharan Africa—the most aid-dependent region—it was still true that more than a third of countries had subsidies greater than the aid they received. Sub-Saharan Africa is the only region which received more in ODA than it paid in subsidies and foregone revenue—but it is still the case

that the median African country could have paid for 42 per cent of all bilateral aid disbursements through reforms to their own subsidies and taxes.

It could be argued that the above comparisons are not entirely fair because the combined fiscal loss calculated by Coady, Parry et al. (2015) consists not only of the pre-tax subsidy, but also includes a consumption tax levied on a base that includes the application of a Pigouvian tax to account for environmental externalities. Moreover, the calculation does not take into account the potential reduction in demand that might result from the consumption tax. The combined fiscal loss therefore represents an upper bound of the revenue foregone from such subsidies.[5] The calculations above were therefore done again using only the pre-tax subsidy measure of the subsidy. This includes neither any correction for environmental externalities nor any consumption tax—it is simply the difference between the cost of supply of energy and the price at which it is actually sold. The results are shown in Annex Table A1. Remarkably, even using this lower bound, 38 per cent of the countries for which we have data had pre-tax subsidies larger than the bilateral aid they receive. Total subsidies amounted to more than four times total bilateral aid. Thus, the huge difference between the value of subsidies and aid is not merely due to the IMF's methodology, which (correctly) values environmental externalities, but is primarily the result of countries failing to price energy at its cost of supply.

It is important not to misinterpret these results. In particular, they do not provide an argument for reducing aid. Aid is much more than simply financing. It typically entails technical assistance and capacity building, as well as finance. As a consequence, whilst the removal of subsidies might release resources, there is no guarantee that these resources would be used as effectively for developmental purposes as aid is. Moreover, the process of reducing subsidies can be painful, including for the poorest. Although the incidence of subsidy benefits is strongly skewed towards the better-off, the costs of reform often hit the poorest hardest (IEA et al. 2010).

However, the analysis above does point to a severe resource misallocation, for which aid is only very partially compensating. This presents both an opportunity and a challenge. The opportunity is that, were efforts to support countries to reform subsidies and tax systems successful, this could release resources for developmental purposes of an order of magnitude larger than aid (see Pradiptyo et al. (2016) for the experience of Indonesia whose 2015 subsidy reforms released US$15.7 billion for infrastructure, health, and education—around 30 times the entire value of bilateral aid to the country). The challenge is that extensive experience has shown that subsidy reform is hard to do because there are often deep-seated reasons for why subsidies persist (see Koplow 2014 for an account of the nature of 'subsidy traps').

Since gaining a detailed understanding of why this misallocation exists and supporting countries to address it could yield huge returns, one would expect aid donors to have devoted considerable efforts in this direction. The following section examines the efforts of donors to tackle subsidy reform to date.

[5] I am grateful to Baoping Shang for pointing this out.

Table 2: The relationship between subsidies and bilateral aid

	Sub-Saharan Africa	**Commonwealth of Independent States**	**Middle East, North Africa, and Pakistan**	**Latin America and the Caribbean**	**Emerging and developing Asia**	**All countries**
Number of countries	28	12	15	27	14	96
Number of countries where subsidy > aid	10	9	7	22	9	57
Percentage of countries where subsidy > aid	36%	75%	47%	81%	64%	59%
Total value of subsidies (US$ billions)	26	110	187	86	106	515
Total value of ODA (US$ billions)	30	4	20	7	13	76
Ratio subsidies/aid	0.9	24.6	9.2	11.7	7.9	6.8
Median ratio	0.42	8.12	0.75	2.36	0.44	1.2
Median ratio where subsidy>aid	3.11	16.61	7.19	7.24	1.75	4.3
Max ratio	8.4	297.5	568.8	732.5	12.7	732
Max (country)	Congo, Republic of	Turkmenistan	Iran	Venezuela	Thailand	Venezuela

Note: Calculations use combined fiscal loss as measure of subsidy.

Source: Author's calculations based on OECD (2015) and Coady, Parry et al. (2015).

4 Existing subsidy reform initiatives by development partners

Given the size of energy subsidies and their impact on development outcomes, one might expect that development partners would be putting considerable resources and effort into attempting to support subsidy reforms. To assess this, we contacted the top ten[6] bilateral development agencies as well as all the major multilateral development agencies involved in subsidy reform. We also draw on the work of McFarland and Whitley (2014) who undertook a comprehensive mapping of support for fossil fuel subsidy reform by development partners.

4.1 Energy subsidy reform efforts by the top ten bilateral development partners

To our considerable surprise, relatively few of the top ten bilateral funders reported significant efforts of their own on subsidy reform, despite very considerable work in the energy sector more broadly.

The US government has traditionally been a strong supporter of the need for fossil fuel subsidy reform among advanced nations and has, hitherto, championed the inclusion of statements calling for the elimination of inefficient fossil fuel subsidies that encourage wasteful consumption in the G20 communiqués since 2009 (and similar statements in G7 communiqués). They have also undertaken a review of their own subsidy policies in conjunction with China as part of the G20 peer review process (G20 2016a) and have funded and supported the review process being undertaken by the Asia Pacific Economic Cooperation (APEC) countries (OECD/IEA 2017). These efforts have been key in building a strong database of evidence about the extent and nature of subsidies. However, they have focussed primarily on developed countries. We could find no evidence that the United States Agency for International Development (USAID) has undertaken any activities on fuel subsidy reforms in poorer countries. The Presidential Initiative 'Power Africa' has touched upon the issue of subsidies in its technical support to regulatory agencies, but the focus of this programme is on facilitating transactions in the power sector in Africa—particularly those by US independent power producers—rather than transformational policy shifts away from subsidies.

Of course, all of these efforts may be influenced by the sudden reversal in the US's position under the Trump administration. The most recent G7 communiqué dropped for the first time the language on the elimination of inefficient fossil fuel subsidies and was shortly followed by the US's withdrawal from the Paris climate agreement. It remains to be seen what the US's position will be regarding furthering international efforts to reduce fossil fuel subsidies.

Germany's GIZ (German Association for International Cooperation) has been an early pioneer of work on fuel subsidy reform, maintaining a database of fuel prices in a large number of countries and sponsoring a conference of fuel price regulators in Nairobi in 2014. Germany is also a supporter of the World Bank's Energy Sector Management Assistance Programme (ESMAP) (see section 4.2.7) and endorsed the Friends of Fossil Fuel Subsidy Reform (FFFSR) communiqué in 2015 (see section 4.2.5), as well as being an active participant in the G7 and G20 processes on the issue (including as the current chair of the G20). However, there does not appear to be significant ongoing operational work on fuel subsidy reform in developing countries funded by GIZ.

[6] Ranked by ODA expenditure in 2015 these are: US, Germany, UK, Japan, France, Sweden, Netherlands, Norway, Canada, and Australia.

The UK Government has also expressed its support for fossil fuel subsidy reform through the G7 and G20 communiqués and endorsed the FFFSR communiqué. It is also a sponsor of the World Bank's ESMAP programme and has provided funding for the International Institute for Sustainable Development's (IISD) Global Subsidy Initiative's research programme. In addition to these channels, the UK's Department for International Development (DfID) has undertaken some work on fuel subsidy reform in Nigeria as part of the Facility for Oil Sector Transparency (FOSTER) project and on electricity reforms as part of the Nigeria Infrastructure Advisory Facility (NIAF2), as well as some very small analytical projects on subsidy reform in Vietnam, Indonesia, and Brazil.

The Japanese government has participated in the G7 and G20 process, although it has not yet committed to a peer review itself, but we were told that Japan International Cooperation Agency (JICA) has done no work on subsidy reductions in developing countries.

France has also participated in the G7 and G20 processes, is a supporter of ESMAP, and endorsed the FFFSR communiqué—but again we were not able to identify any other additional activities associated with fossil fuel subsidy reform.

Sweden, Norway, and Denmark have been strong supporters of subsidy reform. All three countries are members of the FFFSR and endorsed the FFFSR communiqué. All three countries are supporters of ESMAP, and Denmark and Norway have been strong supporters of the IISD's Global Subsidy Initiative. Norway also informally earmarks its support of around NOK20 million (US$2.36 million) of its NOK35 million contribution to ESMAP for work on energy subsidy reform.[7]

The Netherlands are also supporters of ESMAP, providing around 22 per cent of ESMAP's resources, and endorsed the FFFSR communiqué but indicated that they do not undertake any other work on fossil fuel subsidies outside of their support for ESMAP.

Canada, as a G7 and G20 country, has subscribed to the components of those communiqués on subsidy reform as well as endorsing the FFFSR communiqué. Canada also supports IISD, although not specifically the Global Subsidies Initiative.

Finally, Australia also funds ESMAP. However, it did not endorse the FFFSR communiqué although it has funded some research on subsidies in Indonesia.

The overall picture that emerges from the major bilateral donors is clear. Whilst most support energy subsidy reform initiatives, they do so primarily though funding the World Bank's ESMAP, as well as providing support for diplomatic initiatives such as the FFFSR communiqué. A smaller number support IISD's Global Subsidies Initiative, although to a much smaller scale. Virtually no major bilateral donors directly undertake significant subsidy reform initiatives in their operational work in developing countries, with the exception of some technical assistance work in the power sector reviewing the way in which electricity tariffs are set.

[7] See Nordic Council of Ministers (2017) for a more comprehensive account of Nordic country support for fossil fuel subsidy reductions.

4.2 Energy subsidy reform efforts by multilateral organizations

As noted above, the vast majority of effort on subsidy reform has come in the multilateral arena. McFarland and Whitely (2014) have described the key elements of support in detail—below we summarize and update the nature of the major engagements.

4.2.1 G7/G20/APEC

The G7 countries[8] and the G20 countries[9] are a key part of the international global governance architecture. In 2009 the G20 communiqué included a commitment: 'Rationalize and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption'. (G20 2009). Each year subsequently, this commitment has been reiterated (although it seems likely that the new US administration may object to this language going forward).

In February 2013, G20 Finance Ministers announced that they would seek to develop a framework for voluntary peer reviews for rationalizing and phasing out inefficient fossil fuel subsidies that encourage wasteful consumption (Steenblik 2016). Subsequently, China and the US agreed to conduct such self-reviews which were then peer reviewed by each other as well as Germany, Indonesia, Mexico, the IMF, and the OECD—these were published in September 2016 (G20 2016a, 2016b). Germany and Mexico subsequently committed to conduct reviews. These commitments have led to an extensive programme of research highlighting the scale and nature of subsidies in G20 countries, e.g. Bast et al. (2015) and Whitley et al. (2017), and the relatively slow pace at which reform to these subsidies is taking place.

The G7 nations entered into a similar commitment as the G20 in 2009. In 2016, at the Ise-Shima summit they stated: 'We remain committed to the elimination of inefficient fossil fuel subsidies and encourage all countries to do so by 2025', setting a deadline for elimination for the first time (G7 2016).

The APEC countries have made a similar commitment to eliminate fossil fuel subsidies and, with the support of the US, have started their own peer review process. Peru, New Zealand, the Philippines, and Chinese Taipei have already undergone a peer review of their subsidies between March 2014 and September 2016, and Viet Nam and Brunei Darussalam have also volunteered to undertake APEC peer reviews (Steenblik 2016).

4.2.2 International Monetary Fund (IMF)

The IMF has played a leading role in estimating the size and incidence of subsidies. As noted above, this has included compiling and updating the most comprehensive database on the size of subsidies (Coady, Parry et al. 2015), including the economic costs of the externalities which such subsidies impose. It has examined the distributional consequences of subsidy reform (del Granado et al. 2010; del Granado et al. 2012; Coady, Flamini et al. 2015) and explored the lessons and implications of energy subsidy reform (Clements et al. 2013).

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[8] The G7 countries are: Canada, France, Germany, Italy, Japan, the UK, and the US. The European Union is also represented within the G7.

[9] The G20 is comprised of 19 countries plus the European Union. The countries are: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the UK, and the US.

Whilst continuing to update and deepen this analysis, the IMF also applies this work through its operational lending. Countries experiencing balance-of-payments difficulties can borrow from the IMF through a variety of different funding mechanisms (IMF 2016). Such borrowing is generally accompanied by a series of conditions or actions to which the borrowing country commits. In circumstances where large energy (or other) subsidies are an important source of fiscal stress, reductions in these subsidies, for example through changes in energy prices, can be included as conditions which the country must comply with in order to receive the funding. How widespread such conditionality on subsidy reform is, is not known since the details of IMF technical assistance and lending arrangements are confidential.

4.2.3 Organisation for Economic Cooperation and Development (OECD)

The OECD has also played a key role in the analysis of fossil fuel subsidies. As noted above, it compiles a detailed inventory of budgetary expenditures and tax measures that encourage the production and consumption of fossil fuels—the most recent update being September 2015 (OECD 2015). This covers both OECD countries as well as major emerging market economies (Brazil, China, India, Indonesia, Russia, and South Africa). In addition, the OECD plays a key supporting role in the management of the G20 peer review process.

4.2.4 International Energy Agency (IEA)

The IEA is the main multinational body focussed on energy policy. It aims to ensure reliable, affordable, and clean energy for its 29 member countries and others. Its main areas of focus are: energy security, economic development, environmental awareness and engagement worldwide. The IEA's flagship annual publication is the World Energy Outlook (IEA 2016), which has examined the issue of energy subsidies in detail, given its implications for global energy supply and demand. It has also compiled a dataset of subsidies for 41 countries broken down by fuel type (oil, electricity, natural gas, and coal) from 2012 to 2014 as well as third-party reviews of subsidy policies in Mexico and Indonesia (Husar and Kitt 2016).

4.2.5 Friends of Fossil Fuel Subsidy Reform (FFFSR)

Set up in June 2010, the FFFSR is an informal group of non-G20 countries aiming to build political consensus on the importance of fossil fuel subsidy reform. Current members of the Friends group are Costa Rica, Denmark, Ethiopia, Finland, New Zealand, Norway, Sweden, Switzerland, and Uruguay. It meets periodically—for example, at the Conference of Parties of the Paris climate change agreement—and issues statements to try to highlight the importance of subsidy reform and to put pressure on global leaders to pursue such reform. The communiqué on Fossil Fuel Subsidy Reform issued in 2015 was endorsed by close to 40 countries including Canada, Chile, France, Germany, Italy, Malaysia, Mexico, Morocco, Peru, the Netherlands, the Philippines, Samoa, the UK, the US, Uganda, and Uruguay.

4.2.6 International non-governmental organizations (NGOs) and research institutes

Whilst they are not multilateral governmental organizations, it is important to mention the role of some major international research institutes and NGOs working on fuel subsidy reform. The only organization focussed entirely on subsidy reform is the Global Subsidies Initiative of IISD which undertakes extensive research and advocacy work, provides the secretariat to the FFFSR, and has given technical assistance to several countries particularly on communications strategies for reform.

Numerous other research institutes have undertaken extensive research on the subject, notably the Overseas Development Institute, Oil Change International, the Stockholm Environment Institute, and the World Resources Institute. These efforts have raised the profile of fossil fuel subsidies in the international arena and broadened knowledge about the issue.

4.2.7 World Bank—Energy Sector Management Assistance Programme (ESMAP)

By far the largest coordinated attempt by development partners to tackle energy subsidies is the World Bank's ESMAP programme, which describes itself as 'a global knowledge and technical assistance program administered by the World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth'. It provides both technical assistance and policy advice, as well as knowledge products and knowledge exchanges for World Bank client countries and is co-led by the World Bank's Energy and Extractives Global Practice and the Macro and Fiscal Global Practice. It is funded by Australia, Austria, Denmark, the European Commission, Finland, France, Germany, Iceland, Japan, Lithuania, the Netherlands, Norway, Sweden, Switzerland, the UK, and the World Bank Group.

ESMAP's work is split into four main themes: clean energy; energy access; energy efficient cities; and energy assessments and strategies. The majority of ESMAP's work does not relate directly to energy subsidy reform. However, one of the cross-cutting programmes of ESMAP is the Energy Subsidy Reform and Delivery Technical Assistance Facility. This consists of two major streams of work:

Energy Subsidy Reform Technical Assistance Facility (ESRF)

This facility aims to provide a comprehensive suite of technical advice and support to governments who are attempting energy subsidy reform. This can include:

- analysis of the poverty, social, fiscal, macroeconomic, political, economic, and climate change aspects
- assessment of distributional impacts of subsidies at the household and macroeconomic levels
- support for policy dialogue, communications strategies, and consensus building
- support for targeting and delivery of subsidies (e.g. technology- enhanced approaches).

ESRF has already undertaken 35 engagements—seven regional and 28 country engagements—in 19 countries. It is currently designing a standardized framework for assessing energy subsidies and the reform environment to aid in designing comprehensive, politically feasible, and socially responsible approaches to reforming energy subsidies (World Bank 2017). In addition to bespoke technical assistance on a demand driven basis, ESMAP has also provided support for the preparation of World Bank lending in support of subsidy reforms (see below).

As well as providing research and technical assistance, ESMAP has conducted eight international webinars connecting 22 governments, four regional conferences, and one international conference. For example, ESMAP partnered with the World Bank's Nordic Executive Director's Office, the US, and the FFFSR group of countries to organize an event during the World Bank Spring Meetings in April 2016 on 'Energy Subsidy Reform: Country Experiences and Progress Made'.

This ministerial-level seminar highlighted recent progress in energy subsidy reform efforts in India, Indonesia, Malaysia, and Ukraine.

Energy Subsidy Reform Online Community (ESROC)

The ESROC is a platform, which brings together government officials from around the world and experts from the World Bank Group and from other international organizations to share their insights and experiences of reforming energy subsidies. It provides a members-only online community which follows Chatham House rules, providing a safe space for open discussion and networking among peers.

In 2016 the total budget for ESMAP was US$35.9 million. However, the majority of this was for purposes other than subsidy reform. The ESMAP subsidy programme disbursed US$2.56 million during the year, which included US$1 million to East and Central Asia and almost US$482,000 to Global Programmes (World Bank 2016).

4.2.8 Links to World Bank lending

The World Bank has long been involved in supporting countries with difficult structural reforms to their economy. In the 1990s this was achieved through structural adjustment lending in which finance and technical assistance was supplied in support of a programme of reforms which were conditions of the loans provided. Whilst structural adjustment lending did help some countries to implement much needed reforms, it came under heavy criticism, in part because of the painful nature of some of the adjustments required, but also because of the ineffectiveness of the conditions applied (Dollar and Svensson 2000).

The World Bank's approach to supporting reform has evolved considerably and in 2005 they introduced development policy loans (DPLs) as a key vehicle for lending to countries to achieve major policy reforms (DPLs were later renamed 'development policy operations' (DPOs) to reflect the inclusion of non-loan instruments in the support provided). To counter the problems with conditionality that had beset structural adjustment lending, the World Bank DPOs specify a set of 'prior actions' agreed with the government which must occur prior to the loan being disbursed. The idea was that prior actions demonstrated the commitment of the government to the reforms, thereby justifying the lending, rather than the reforms being seen as externally imposed conditions required to receive the financing.[10] Since support for energy subsidy reform was often part of a broader package of reforms associated with a DPO, it is worth examining the prevalence and impact of prior actions associated with energy subsidy reform in the World Bank's DPOs.

There have been 630 DPOs since they were introduced in 2005 (plus 22 supplementary financial operations) representing US$117 billion of lending (World Bank 2015). In the immediate aftermath of the financial crisis (2009–10) DPOs represented 40 per cent of all World Bank lending, although they have subsequently fallen to around 25 per cent today.

Given the very large scale of energy subsidies, one might expect prior actions associated with subsidy removal or energy sector reforms to feature prominently in DPOs, but this is not the case. Although 30 per cent of prior actions are aimed at improving market performance, most of these

[10] It should be noted that the logic of this position is debateable since countries often received multiple DPLs over a period of time, each preceded by agreed prior actions, making the overall sequence of conditions and loans similar to that under structural adjustment lending. However, the shift from conditionality to prior actions removed much of the controversy surrounding policy lending.

measures are aimed at improving competitiveness in international and domestic markets; only 8 per cent of prior actions targeted improvements to the energy sector, although the number picked up during the boom and crash in world oil prices (World Bank 2015). Moreover, the World Bank has estimated the number of prior actions that might have a negative poverty and social impact. The changes in fuel prices and energy tariffs associated with subsidy reforms are included in this group. However, the World Bank estimates that only 4 per cent of prior actions were deemed likely to have a negative poverty or social impact. Given that this group of 4 per cent of prior actions includes all prior actions with any kind of negative poverty or social impact, this suggests that the number of prior actions associated with subsidy reform was very small indeed.

Thus, although subsidy-related reforms clearly did feature in the World Bank's DPOs, the evidence suggests that it was not a large component of those operations, although it may have been significant in some countries at particular points in time. ESMAP estimates that around US$4 billion in World Bank Development Policy Financing had energy subsidy reform prior actions or triggers, including DPOs in Egypt, Indonesia, Iraq, Jordan, Morocco, Pakistan, and Ukraine. Moreover, whilst the World Bank has done a comprehensive analysis of the efficacy of DPOs in general (Moll et al. 2015), we are unaware of any analysis specifically about the efficacy of the prior actions related to energy subsidy reform.

4.3 Strengths and weaknesses in current efforts to support energy subsidy reform

The brief summary of the efforts of development partners points to some important strengths, but also some major weaknesses, in current efforts to support energy subsidy reform. First, the vast majority of effort to date has been support for research and analysis. This is understandable—simply agreeing on a definition of what constitutes a subsidy is difficult and the variety of different approaches to measuring subsidies has yielded widely varying figures for the overall size of energy subsidies. However, although still far from comprehensive, there is now far more information about the size, incidence, and impact of energy subsidies than there was ten years ago. Moreover, the G20 review process in particular has helped to build consensus about the most appropriate way of assessing subsidies, whilst the compilation of country experience has yielded lessons about the most effective (and ineffective) ways of achieving reform (see Kojima (2016) for a comprehensive review).

Furthermore, the existence of ESMAP—and the ESRF in particular—and the comprehensive support from a large number of donors towards its work, has provided a practical mechanism for countries that wish technical advice and support for energy subsidy reforms. Most recently, such support has been a key factor in facilitating reform in Egypt and Ukraine, and there are ongoing engagements with several other countries. The availability of a comprehensive multi-sectoral package of support—from fiscal management to energy policy, to social and environmental protection—is potentially of enormous benefit to governments struggling with the multi-faceted complexities of subsidy reform. This said, three important weaknesses stand out in current provision.

First, the resources devoted by development partners to energy subsidy reform are tiny. ESRF is by far the largest initiative and spends around US$5 million each year. The resources flowing to research institutions and NGOs for studies are significantly smaller than this figure. With the exception of one or two small-initiative bilaterals, donors effectively spend nothing other than their contributions to ESMAP. Given that energy subsidies constitute US$325 billion each year—more than five times the annual lending of the World Bank—this level of investment seems disproportionately low. This is particularly the case when compared to the very large resources spent by development partners on, for example, renewable energy. This suggests that, if effective, the return on expenditures on subsidy reduction are likely to be orders of magnitude higher than

similar sized investments in renewables (or other areas) due to the very large potential domestic resources that such reforms might release. Of course, one of the reasons for this very low level of funding is that money cannot purchase reform—subsidy reform is a domestic political decision. Thus, additional expenditure, particularly on technical assistance, would not necessarily lead to more reform. Nonetheless, if the total global spend on support for energy subsidy reform was US$30 million a year (almost certainly a considerable overestimate[11])—this suggests a potential return of US$10,000 released in domestic resources for every US$1 spent. Even if the rate of return on this expenditure was one-hundredth of this figure, it would represent one of the most effective development interventions available, suggesting that it should merit a higher priority than it currently does.[12]

Second, one of the possible reasons why funding for energy subsidy reform is low is the belief that such interventions are not very effective. Energy subsidy reforms are extremely politically sensitive and are frequently reversed. Whilst technical assistance may accelerate or improve the quality of reforms for countries that have decided to undertake reforms, such assistance will not be effective if there is no political will to reform. This relates to the second weakness in the current provision in this area—the lack of evaluation. To our knowledge there have been no systematic evaluations of the efficacy of efforts to support subsidy reform. ICF International conducted an external evaluation of ESMAP in 2015 (ICF International 2016) which pointed to the strong performance of ESMAP—but it did not provide any analytical evidence regarding the success of the subsidy reform initiatives. Given the large number of reform initiatives that have been undertaken by various countries in recent years, this is an area which would benefit from more research, particularly insofar as it can provide guidance on the relationship between the level of support and the likelihood of sustainable reform.

Third, the support that development partners have provided for energy subsidy reform to date has been almost entirely in the form of research and analysis, knowledge sharing, or technical assistance. However, as noted above, energy subsidy reform is a particularly sensitive political issue in almost all countries. In several countries, reforms have been accompanied by protests and civil unrest as a result of the increases in fuel prices, most recently in Sudan and Mexico. Governments have therefore been reluctant to pursue reform, despite the long-run benefits, because of the considerable short-term costs, both politically as well as the economic hardship imposed on poorer sections of the population. Consequently, reforms are often only pursued during times of crisis when the government can no longer afford the high cost of subsidies. And despite the reforms which have taken place, numerous developing countries (and developed countries) maintain large subsidies which divert substantial resources away from developmental objectives, such as health

[11] No reliable figures are available for bilateral expenditure on energy subsidy reform other than their contributions to ESMAP and some research grants. If we assume that each of the major bilateral donors spends around US$2 million per year in various subsidy-related initiatives aside from their ESMAP contribution then this would yield a total of around US$20 million per year, plus the ESRF spend of US$5 million and the AFREA spend of US$5 million (although this is mostly not focussed on subsidies). This is likely a significant overestimate since most of the identified expenditure of bilateral donors outside of their ESMAP contribution are significantly smaller than US$2 million per year.

[12] According to the OECD Creditor Reporting System database, there have been a total of 22 climate-related ODA-funded (disbursed) projects aimed directly at fossil fuel subsidy reform during 2010 to 2015. The total spend of these projects was US$13.7 million over the five-year period. Whilst these projects only cover climate-related projects, this result is consistent with the low figures that we have found (Nordic Council of Ministers 2017).

and education. The current approach of supporting research and technical assistance, whilst important, appears insufficient to address the deeply entrenched political barriers to reform.

In response to this, several programmes, include those supported by ESRF, have started to undertake political economy analysis to ascertain politically feasible pathways for reform. Inchauste and Victor (2017) provide four recent case studies of the political economy of energy subsidy reform from Indonesia, Ghana, Jordan, and the Dominican Republic. Conducting such analysis and then embedding such considerations into the design of reform programmes may well improve their effectiveness.

However, recently, several development partners have begun to explore a different approach to programming known as 'thinking and working politically' (Booth and Unsworth 2014). This approach entails working with domestic actors, including those outside government, including business, civil society, the media, and parliamentarians, to find the most appropriate ways of supporting domestically driven reform agendas. The following section describes the approach in more detail and how it might be applied to facilitating energy subsidy reform.

5 A new approach to supporting energy subsidy reform

Traditional approaches to aid have typically eschewed tackling the political barriers to fossil fuel subsidy reform in developing countries because of the sensitivities involved. However, in recent years, a new model for engaging in the politics of reform has emerged that protects the funders from reputational risk whilst achieving significant reform. This model has come to be known as 'thinking and working politically' (see TWP Community of Practice (n.d.) for extensive literature and case studies). The approach has two key characteristics. First, it is flexible and adaptive—rather than specifying a set of deliverables in detail in advance, the approach allows politically savvy local programme managers to identify and implement the projects that they believe will have the most impact on the reform objective. Second, it is locally driven. The key proposals are devised by the local team (although with oversight and approval by the funder) ensuring that they are closely tailored to what is politically feasible. And the activities are predominantly implemented by reform-minded local actors and organizations as part of their own agenda, creating genuine legitimacy and buy-in for the reforms.

This approach has had some remarkable successes in extremely challenging environments. For example, the UK-funded FOSTER (the Facility for Oil Sector Transparency) in Nigeria has succeeded in supporting far-reaching reforms in the politically sensitive oil sector by employing this approach (Buckley et al. 2017). The same approach has been used successfully in Myanmar by the Pyoe Pin programme to promote inclusive, accountable, and fair governance (Booth and Unsworth 2014).

This experience suggests that bilateral donors could play a key role that would be complementary to existing initiatives being undertaken through the multilateral institutions. In particular, bilateral agencies have four characteristics that make it much easier for them to 'think and work politically' on energy subsidy reform in a way that multilateral institutions cannot:

1. **The ability to support politically sensitive reforms.** Multilateral institutions are forbidden by their charters from engaging in activities that could be described as 'political' and therefore tend to focus heavily on technical assistance and finance. However, as noted, the challenges of energy subsidy reform are predominantly political. Bilateral agencies are

able to, and frequently do, lend support to reform agendas to promote good developmental outcomes.

2. **The ability to work across government.** Bilateral aid agencies are able to draw on the other branches of their own governments. Indeed there has been a move in several countries, including Australia, Canada, the Netherlands, and the UK, to spread responsibility for ODA activities across several government departments. Whilst the jury is still out on the overall effectiveness of this approach, it may be of benefit when tackling political challenges. Being able to draw on the knowledge and expertise of the foreign office, or defence or business ministries may provide alternative entry points for influence over domestic reform agendas.

3. **The ability to work with multiple partners.** Multilaterals typically work directly with and lend to governments. Yet, a key lesson from the experience of subsidy reform in the last decade has been the importance of building coalitions of support outside of government (Rentschler and Bazilian 2016). Unless reforms have broad-based support, they are likely to fail. Bilateral aid programmes can frequently reach further across society, working with business associations, the media, parliamentarians, civil society groups, and research institutions, as well as the government. Moreover, they can do so in a neutral way—not as an advocacy organization, but rather as a way of providing evidence and encouraging debate about policy options. Reform efforts which have taken sometimes quite considerable amounts of time to inform and debate the issues in public prior to implementation have tended to be more successful because, by the time implementation occurs, everyone is expecting it, understands the reason for the change, and is aware of the complementary and compensatory mechanisms that will be put in place. Longer-term 'voice and accountability' projects, such as those typically supported by bilateral funders, can be an important mechanism for supporting open debate and promoting broader understanding.

4. **The ability to use multiple instruments.** Although there has been a growth in new instruments among multilateral development banks, it is still the case that multilaterals often structure technical assistance around project or programme lending e.g. the technical assistance around the World Bank's Development Policy Lending operations. Bilaterals have significantly enhanced the ability of multilateral institutions to provide technical assistance separate from lending, e.g. through the creation of large multi-donor trust funds such as ESMAP. However, bilateral funders have greater overall flexibility in the nature of the funding instruments that they use. For example, some funders are now experimenting with 'returnable capital' (effectively providing an additional lending instrument) in addition to their ability to provide grant funding to a range of organizations, including those outside of the government. Such instruments are sometimes better suited to programmes of coalition building than traditional lending and technical assistance instruments.

Applying these general capabilities to energy subsidy reform suggests a number of potential areas where both multilateral and bilateral funders could make a significant difference.

5.1 Understanding the politics of subsidy reform

Whilst there are some good political economy analyses of fossil fuel subsidy reform (e.g. Lahn (2016) on the Middle East and Victor (2009) on the general political economy of subsidy reform), there are remarkably few such studies of energy subsidy reform at the country level. The most recent volume from the World Bank (Inchauste and Victor 2017) goes furthest in providing a simple conceptual framework for understanding the political economy of reform and applying this to reforms in four countries (Ghana, Indonesia, Dominican Republic, and Jordan). The authors argue that this should be seen as the starting point for more widespread analysis of the ideas, interests, and institutions that shape subsidy reform efforts in other countries. This might be done by undertaking a series of 'problem-driven PEAs [political economy analyses]' (Fritz et al. 2014) on energy subsidy reform in countries which maintain large energy subsidies.

Moreover, although Inchauste and Victor (2017) provide an excellent account of the internal politics of reform in each of the four countries, they provide only suggestive evidence about the sorts of political determinants of success and failure that may translate across countries. Rentschler and Bazilian (2016) do attempt to provide a review of the lessons from several instances of subsidy reform—but they do so from a technical perspective and do not touch upon the political determinants of success or failure. Yet such factors matter. Is reform more likely to be successful early in the term of a new government or near the end? Does it work better in authoritarian regimes or in democratic ones? Is reform undertaken during fiscal crises more or less sustainable than that undertaken in other times? How does reform undertaken by oil exporters during times of low oil prices compare to the reforms undertaken by fuel importers during times of high prices? There is still a great deal to learn about how the political context shapes the kinds of reforms which are and are not feasible.

5.2 Creating a standard for reviewing subsidies in developing countries

As described above, the G20 and APEC countries have started to undertake voluntary reviews of their subsidies. However, there is no similar such process for developing countries and many poor countries lack the technical expertise to conduct such analysis. This suggests the need to develop a *standard review offering* to developing countries that have major subsidies. This would allow interested governments (and civil society) to receive a detailed account of the various subsidies and their likely costs to the country. ESMAP claim to be working on a standard analytical framework that could be used for this purpose, but currently subsidy reviews in developing countries are tackled in an ad hoc way based on a request for support from the relevant government. An internationally agreed process would enable countries to access support whilst maintaining ownership of the process. It could also provide a focal point for domestic civil society to press for greater transparency about the allocation of subsidies and more open debate about the uses of such subsidies.

5.3 Building South-South collaboration on reform

Since energy subsidy reform is generally politically sensitive, the decision to pursue reform is almost always taken at the highest political level. However, the leaders of some developing countries may not wish to receive advice from representatives of rich countries (particularly where those countries maintain significant subsidies themselves). Rather, they may be more interested in listening to the experience of the leaders of other developing countries that have had to wrestle with the politics of reform. This suggests that it would be useful to encourage and support South-South dialogue and support on subsidy reform. At a technical level, this is currently being done through ESMAP's Energy Subsidy Reform Community (ESROC) which brings together officials from countries attempting reform. However, there is, to date, no comparable mechanism for

bringing together political leaders and actors to share their knowledge and experience of managing the politics of subsidy reform in a confidential way.

5.4 Building demand for reform

Political economy analyses (PEAs) of subsidy reform often point to the need to build a broad coalition of support around reforms. Reforms cannot be implemented as a technocratic exercise. Rather, it is essential to ensure that the issues are widely understood and that the government has a good grasp of people's knowledge, concerns, and attitudes about reform in order to build constituencies of support and effectively communicate the need for change. Development partners could contribute to this in several ways.

First, there are very few surveys of public opinion about subsidies (Calvo-Gonzalez et al. 2015 is an exception). However, such surveys can provide essential information for designing a reform programme. Development partners could fund a series of perception surveys in relevant countries. These could help government to design appropriate communications strategies for planned reforms.

Second, subsidy reform could be embedded in civil society engagement programmes. Including subsidy reform as a topic for such engagement would enable such programmes to work with the media, CSOs, and parliament to raise awareness of subsidies and debate, and contest the way in which they should be reformed.

Third, many donors are increasingly supporting the private sector to invest in developing countries and the private sector are sometimes keen advocates of reform. Development partners might therefore consider how their work with private sector associations might help domestic and international businesses to communicate the practical implications of subsidy policies and the potential economic benefits from subsidy removal.

5.5 Funding compensation and supporting resource reallocation

Successful subsidy reforms are typically accompanied by some kind of compensation mechanism, often, but not always, in the form of a cash transfer. Development partners are already heavily involved in supporting countries to develop social protection mechanisms and universal health coverage. Programmes in relevant countries could be encouraged to explicitly consider how they might support energy subsidy reform, through the design of appropriate compensation mechanisms.

Moreover, if subsidy reform is successful, it often entails very substantial budget reallocations (witness the US$15.7 billion budget reallocation resulting from the Indonesian reforms in 2015—Pradiptyo et al. (2016)). It is important that such reallocations are done in a transparent fashion and that the funds are used to further the country's development. Several development partners support economic development programmes that attempt to improve the governance and transparency of resource allocation. Again, such programmes could be asked to explicitly consider how to support the process of ensuring that energy subsidy reform gives rise to reallocations that are consistent with national development objectives.

5.6 Supporting complementary policies

Finally, energy subsidy reform often requires a set of complementary policies, notably investments in energy efficiency, renewable energy, and other sectoral policies. Development partners already have significant investments in energy-related projects, as well as projects supporting power sector

reform. Such programmes could be asked to explicitly consider how they might support energy subsidy reform through complementary investments or regulatory changes. From a practical point of view, the delivery of such initiatives could be done in two ways.

First, it would be possible to design bespoke energy subsidy reform projects in countries where this is a critical development need. This could be achieved by contracting a consortium likely including: a development management consultancy; private sector actors with an interest in fossil fuel subsidy reform in developing countries; research institutes; technical assistance providers; and local organizations. The winning bidder would manage a local team of skilled and politically smart staff who would then identify and support locally driven initiatives in favour of reform. Such initiatives might include: studies by local research organizations on the need for reform; civil society advocacy for reform; technical assistance to government departments to help design and implement reforms; support to parliamentary groups pressing for reform; and training for journalists to help them understand and report on the issues. Whilst relatively small, the major advantage of bespoke reform initiatives of this kind is that they can take a multi-faceted approach focussed on a clear reform agenda. This approach has seen considerable success in other settings e.g. FOSTER in Nigeria.

Alternatively, energy subsidy reform could be embedded within the existing portfolio of activities undertaken by development partners. Different elements of the above activities could be introduced into existing technical assistance and civil society reform programmes. Achieving impact would require careful management and coordination to ensure that the individual actions add up to more than the sum of their parts and were not seen as peripheral to the main agenda of those programmes. This approach would allow the development partner to have a much wider engagement on the topic rather than focussing only on a small number of countries.

6 Conclusions

Energy subsidies are very large—globally in the order of US$300–500 billion per year. This figure includes only the fiscal cost (and loss) of such subsidies—it does not include any estimate for the significant damage that results from the over-consumption of fossil fuels due to the under-pricing of carbon. When the impact of energy subsidies on climate change, air pollution, congestion, traffic accidents, and road damage is taken into consideration, the overall economic cost of subsidies is in the order of ten times greater. The benefit of such subsidies goes primarily to the better-off who consume more electricity and fossil fuels. By any reasonable measure, energy subsidies are a major welfare-reducing and disequalizing economic distortion.

Whilst the size and impact of energy subsidies have been known for some time, the issue has sometimes been regarded as one that affects only a relatively small number of countries. One reason for this is that there are only a small number of countries where the size of energy subsidies has a major influence on the macroeconomic stability of the country and so attract the attention of the international community. Another may be that, whilst many of the countries that are the largest contributors to greenhouse gas emissions also have large subsidies, such subsidies are typically a much smaller share of the economy in these mostly richer economies. However, this paper shows that energy subsidies are very prevalent in developing countries. Of the 119 developing countries in the IMF database, 68 have fiscal losses from energy subsidies that exceed 1 per cent of their GDP. In 59 per cent of developing countries, energy subsidies exceed all bilateral aid—indeed in the typical developing country, energy subsidies are 20 per cent larger than all bilateral aid, and overall fiscal losses from energy subsidies in developing countries are over six times larger than the entire value of the bilateral aid they receive.

Given the economic significance of such subsidies, donor efforts to tackle them have been tiny in comparison. Although significant efforts have been made at the diplomatic level in the G7 and the G20, these have not resulted in any significant lessening of subsidies, and may now be under threat as a result of the withdrawal of the USA from the Paris Agreement. Efforts to support developing countries have almost exclusively consisted of technical assistance provided by one component of a small World Bank trust fund and the efforts of a handful of international NGOs. Faced with fiscal losses in developing countries from subsidies of over US$500 billion each year, the international community almost certainly spends less than US$30 million each year to support reforms—and perhaps as little as half that amount.

The reason for this low level of effort is that energy subsidy reform is extremely politically sensitive. Multilateral agencies are typically forbidden from undertaking programmes that would be seen to be interfering in the domestic politics of their members; bilateral donors need to consider such actions in the light of their broader bilateral relationship with the country in question. At the same time there is a growing recognition among donors that long-term development often requires fundamental, politically sensitive institutional reforms, not just capability building and technical assistance. A large new literature has emerged pointing to the need to understand the underlying political settlement of the contexts in which aid attempts to work, as well as the micro-politics of individuals sectors and issues. New techniques and approaches have been developed—often described as 'problem-driven iterative adaptation' or 'thinking and working politically'—and have been applied with success in some contexts. Such approaches have been championed, in particular, by bilateral donors because they typically have greater flexibility to work with indigenous civil society and non-governmental actors supporting reform agendas. It remains to be seen whether donors will consider deploying such approaches to address the large economic misallocations associated with energy subsidies.

References

Bast, E., A. Doukas, S. Pickard, L. van der Burg, and S. Whitley (2015). *Empty Promises: G20 Subsidies to Oil, Gas and Coal Production*. London: Overseas Development Institute and Oil Change International.

Booth, D., and S. Unsworth (2014). 'Politically Smart, Locally Led Development'. ODI Discussion Paper. London: Overseas Development Institute.

Buckley, J., N. McCulloch, and N. Travis (2017). 'Donor-supported Approaches to Improving Extractives Governance: Lessons from Nigeria and Ghana'. WIDER Working Paper 2017/33. Helsinki: UNU-WIDER.

Calvo-Gonzalez, O., B. Cunha, and R. Trezzi (2015). 'When Winners Feel Like Losers: Evidence from an Energy Subsidy Reform'. Policy Research Working Paper 7265. Washington, DC: Central America Country Management Unit, World Bank.

Carbon Brief (2017). 'Explainer: The Challenge of Defining Fossil Fuel Subsidies'. Available at: https://www.carbonbrief.org/explainer-the-challenge-of-defining-fossil-fuel-subsidies (accessed on 2 October 2017).

Clements, B., D. Coady, S. Fabrizio, S. Gupta, T. Alleyne, and C. Sdralevich (eds) (2013). *Energy Subsidy Reform: Lessons and Implications*. Washington, DC: International Monetary Fund.

Coady, D., V. Flamini, and L. Sears (2015). 'The Unequal Benefits of Fuel Subsidies Revisited: Evidence for Developing Countries'. IMF Working Paper WP/15/250. Washington, DC: International Monetary Fund.

Coady, D., I. Parry, L. Sears, and B. Shang (2015). 'How Large are Global Energy Subsidies?'. IMF Working Paper WP/15/105. Washington, DC: International Monetary Fund.

Davis, L. (2014). *American Economic Review: Papers & Proceedings 2014*, 104(5): 581–85. doi:10.1257/aer.104.5.581.

del Granado, J.A., D. Coady, and R. Gillingham (2010). 'The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries'. IMF Working Paper WP/10/202. Washington, DC: International Monetary Fund.

del Granado, J.A., D. Coady, and R. Gillingham (2012). 'The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries'. *World Development*, 40(11): 2234–48.

Dollar, D., and J. Svensson (2000). 'What Explains the Success or Failure of Structural Adjustment Programmes?'. *The Economic Journal*, 110: 894–917. doi:10.1111/1468-0297.00569.

Fritz, V., B. Levy, and R. Ort (2014). *Problem Driven Political Economy Analysis: The World Bank's Experience. Directions in Development*. Washington, DC: World Bank. doi:10.1596/978-1-4648-0121-1. License: Creative Commons Attribution CC BY 3.0.

G7 (2016). 'G7 Ise-Shima Leaders' Declaration'. 26–27 May, Japan. Available at: http://www.consilium.europa.eu/en/press/press-releases/2016/05/27-g7-japan-leaders-declaration/ (accessed on 5 July 2017).

G20 (2009). 'The Leaders Statement: The Pittsburg Summit'. 24–25 September, Pittsburgh. Available at: http://www.g20.utoronto.ca/2009/2009communique0925.html#energy (accessed on 5 July 2017).

G20 (2016a). 'The United States' Efforts to Phase Out and Rationalise its Inefficient Fossil-fuel Subsidies: A Report on the G20 Peer-review of Inefficient Fossil-fuel Subsidies that Encourage Wasteful Consumption in the United States'. Report Prepared by Members of the Peer-review Team: China, Germany, Mexico, and the OECD (Chair of the Peer Review). Available at: http://www.g20-insights.org/wp-content/uploads/2016/11/04-USA-Review.pdf (accessed on 5 July 2017).

G20 (2016b). 'China's Efforts to Phase Out and Rationalise its Inefficient Fossil-fuel Subsidies: A Report on the G20 Peer-review of Inefficient Fossil-fuel Subsidies that Encourage Wasteful Consumption in China'. Report Prepared by Members of the Peer-review team: Germany, Indonesia, the United States, the IMF and the OECD (Chair of the Peer Review). Available at: https://www.oecd.org/site/tadffss/publication/G20%20China%20Peer%20Review_G20_FFS_Review_final_of_20160902.pdf (accessed on 5 July 2017).

Hoy, C., and A. Sumner (2016). 'Gasoline, Guns, and Giveaways: Is there New Capacity for Redistribution to End Three Quarters of Global Poverty?'. Working Paper 433. Washington, DC: Center for Global Development.

Husar, J., and F. Kitt (2016). 'Fossil Fuel Subsidy Reform in Mexico and Indonesia'. Partner Country Series. Paris: International Energy Agency.

ICF International (2016). 'External Evaluation of ESMAP and ASTAE'. Final Report. Available at: https://esmap.org/sites/esmap.org/files/External%20Eval%20ESMAP_Final%20Report_16Mar16_OPTIMIZED.pdf (accessed on 26 June 2017).

IEA (2012). *World Energy Outlook: IEA Analysis of Fossil-fuel Subsidies*. Paris: International Energy Agency.

IEA (2016). *World Energy Outlook*. Paris: International Energy Agency.

IEA, OPEC, OECD, and World Bank (2010). 'Analysis of the Scope of Energy Subsidies and Suggestions for the G-20 Initiative'. IEA, OPEC, OECD, World Bank Joint Report, Prepared for Submission to the G-20 Summit Meeting, Toronto (Canada), 26–27 June. Available at: https://www.oecd.org/env/45575666.pdf (accessed on 5 July 2017).

IMF (2016). 'IMF Factsheet: IMF Lending'. October 2016. Available at: http://www.imf.org/en/About/Factsheets/IMF-Lending (accessed on 5 June 2017).

Inchauste, G., and D. Victor (2017). *The Political Economy of Energy Subsidy Reform*. Washington, DC: World Bank. Available at: http://documents.worldbank.org/curated/en/745311489054655283/pdf/113262-PUB-PUBLIC-PUBDATE-3-22-17.pdf (accessed on 2 October 2017).

IPCC (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds)]. Cambridge, UK and New York, NY: Cambridge University Press.

Kojima, M. (2016). 'Fossil Fuel Subsidy and Pricing Policies: Recent Developing Country Experience'. Policy Research Working Paper 7531. Washington, DC: Energy and Extractives Global Practice Group, World Bank.

Koplow, D (2009). 'Measuring Energy Subsidies Using the Price-gap Approach: What Does it Leave Out?'. Global Subsidies Initiative of the International Institute for International Development. Geneva: International Institute for International Development.

Koplow, D. (2014). 'Global Energy Subsidies'. In A. Halff, B.K. Sovacool, and J. Rozhon (eds), *Energy Poverty: Global Challenges and Local Solutions*. Oxford: Oxford University Press.

Lahn, G. (2016). *Food Fuel and Utilities Price Reforms in the GCC*. London: Chatham House.

McFarland, W., and S. Whitley (2014). 'Fossil Fuel Subsidies in Developing Countries: A Review of Support to Reform Processes'. EPS PEAKs Helpdesk Request. London: Overseas Development Institute.

Moll, P., P. Geli, and P. Saavedra (2015). 'Correlates of Success in World Bank Development Policy Lending'. Policy Research Working Paper 7181. Washington, DC: World Bank.

Nordic Council of Ministers (2017). *Making the Switch: From Fossil-fuel Subsidies to Sustainable Energy*. Copenhagen: Nordisk Ministerråd.

OECD (2012). *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*. Paris: OECD Publishing. doi:10.1787/9789264128736-en

OECD (2015). *OECD Companion to the Inventory of Support Measures for Fossil Fuels 2015*. Paris: OECD Publishing. doi:10.1787/9789264239616-en

OECD (2017). *Investing in Climate, Investing in Growth*. Paris: OECD Publishing. doi.org/10.1787/9789264273528-en

OECD/IEA (2017). 'Tracking Fossil Fuel Subsidies in APEC Economies: Towards a Sustained Subsidy Reform'. IEA Insights Series 2017. Paris: International Energy Agency.

Pradiptyo, R., A. Susamto, A. Wirotomo, A. Adisasmita, and C. Beaton (2016). *Financing Development with Fossil Fuel Subsidies: The Reallocation of Indonesia's Gasoline and Diesel Subsidies in 2015*. Geneva: Global Subsidies Initiative, International Institute for Sustainable Development.

Rentschler, J., and M. Bazilian (2016). 'Policy Monitor: Principles for Designing Effective Fossil Fuel Subsidy Reforms'. *Review of Environmental Economics and Policy*, 11(1): 138–55.

Ross, M.L., C. Hazlett, and P. Mahdavi (2017). 'Global Progress and Backsliding on Gasoline Taxes and Subsidies'. *Nature Energy*, 2: Article Number 16201.

Steenblik, R. (2016). *An Overview of the G20 and APEC Voluntary Peer Reviews of Fossil-fuel Subsidies, International Conference on Fossil Fuel Subsidy Reform*. Paris: OECD.

Stefanski, R. (2017). 'Dirty Little Secrets: Inferring Fossil-Fuel Subsidies from Patterns in Emission Intensities'. School of Economics and Finance Discussion Paper No. 1705, St. Andrews: School of Economics and Finance, University of St. Andrews. Available at: http://ideas.repec.org/s/san/wpecon.html (accessed on 5 July 2017).

Sterner, T. (2012). *Fuel Taxes and the Poor: the Distribution Effects of Gasoline Taxation and their Implications for Climate Policy*. Abingdon, Oxon: RFF Press.

TWP Community of Practice (n.d.). 'Thinking and Working Politically'. Available at: www.twpcommunity.org (accessed on 5 July 2017).

van Benthem, Arthur (2015). 'What Is the Optimal Speed Limit on Freeways?'. *Journal of Public Economics*, 124: 44–62.

Victor, D. (2009). 'The Politics of Fossil-fuel Subsidies'. Untold Billions: Fossil-fuel Subsidies, their Impacts and the Path to Reform Series—Global Subsidies Initiatives (GSI). Ottawa: Institute of International Development, Ottawa.

Whitley, S., L. van der Burg, L. Worrall, and S. Patel (2017). 'Cutting Europe's Lifelines to Coal: Tracking Subsidies in 10 Countries'. Policy Briefing, Shaping Policy for Development. London: Overseas Developing Institute.

WHO (2014). 'Public Health, Environmental and Social Determinants of Health'. Geneva: World Health Organisation. Available at: www.who.int/phe/health_topics/outdoorair/databases/en/ (accessed on 5 July 2017).

World Bank (2015). *Development Policy Financing Retrospective: Results and Sustainability*. Washington DC: World Bank.

World Bank (2016). *ESMAP 2016 Annual Report*. Washington, DC: World Bank.

World Bank (2017). 'ESMAP Energy Subsidy Reform Technical Assistance Facility Fact Sheet'. Washington DC: World Bank. Available at: http://www.esmap.org/node/3043 (accessed on 26 June 2017).

Annex

Table A1: The relationship between subsidies and aid—using pre-tax subsidy

	Sub-Saharan Africa	Commonwealth of Independent States	Middle East, North Africa, and Pakistan	Latin America and the Caribbean	Emerging and developing Asia	All countries
Number of countries	28	12	15	27	14	96
Number of countries where subsidy > aid	8	6	6	12	4	36
Percentage of countries where subsidy > aid	29%	50%	40%	44%	29%	38%
Total value of subsidies (US$ billions)	16	69	157	41	25	308
Total value of ODA (US$ billions)	30	4	20	7	13	76
Ratio subsidies/aid	0.5	15.3	7.8	5.6	1.9	4.1
Median ratio	0.30	0.95	0.59	0.54	0.00	0.28
Median ratio where subsidy>aid	2.15	18.06	11.68	5.53	3.57	5.4
Max ratio	7.7	245.6	560.2	638.6	3.6	639
Max (country)	Congo, Republic of	Turkmenistan	Iran	Venezuela	India	Venezuela

Source: Author's calculations.