

Just over a year ago, the G7 group of nations pledged (<http://www.japan.go.jp/g7/summit/documents/index.html>) to end all “inefficient fossil fuel subsidies” by 2025.

This language disappeared from the latest annual G7 communique ([http://www.g7italy.it/sites/default/files/documents/G7%20Taormina%20Leaders%27%20Communique\\_27052017\\_0.pdf](http://www.g7italy.it/sites/default/files/documents/G7%20Taormina%20Leaders%27%20Communique_27052017_0.pdf)), signed in Sicily last month, while a similar G20 promise (<http://www.reuters.com/article/us-g20-energy-idUSTRE58O18U20090926>) to end subsidies has no deadline.

Meanwhile, on the fringes of such promises lies the perpetual discussion of what the concept of fossil fuel subsidies does – or doesn’t – actually include.

Attempts to add up the annual global total range from a few hundred billion through to the massive \$5.3tn estimate published by the International Monetary Fund (IMF) in 2015.

Carbon Brief takes an in-depth look at the ways fossil fuel subsidies are measured – and why semantic arguments over definitions may be missing the point.

- The definition issue
- Consumer subsidies
- The IEA: a consumer subsidy approach
- Consumer subsidy reform
- Production subsidies
- Does the UK have fossil fuel subsidies?
- The OECD: an inventory approach to production subsidies
- The closest thing to a definition
- The IMF stirs it up
- Can externalities be subsidies?
- What’s in a pledge?

## The definition issue

There is no universally agreed definition of what constitutes a fossil fuel subsidy. Multiple organisations make assessments each using their own, unique approach. The huge range of estimates for the value of fossil fuel subsidies is driven by both the methods they use to calculate them and the countries covered.

From government spending on infrastructure, such as oil pipelines, to price controls on domestic energy, these organisations often count fossil fuel subsidies or support in very different ways. The table below breaks down how four major bodies make their calculations. These are examined in further detail below (as are producer, consumer and “post-tax” subsidies).

Body	Organisation for Economic Co-operation and Development (OECD)	International Energy Agency (IEA)	International Monetary Fund (IMF)	Overseas Development Institute (ODI) and Oil Change International (OCI)
<b>Type of body</b>	Intergovernmental economic organisation for 34 developed economies	Intergovernmental organisation of 29 countries which aims to promote energy security, economic development and environmental protection.	International organisation of 189 countries which seeks to maintain stability in the financial system	Non-profit research and advocacy organisation
<b>What it looks at</b>	Government, producer and consumer support mechanisms using an inventory approach.	Compares government's policies which lower the domestic price of oil and gas to the international market price (“price-gap” estimates of consumption subsidies to fossil fuels).	It draws on numerous data sources including the IEA and OECD datasets and makes its own estimates of the cost of externalities such as air pollution and climate change.	G20 subsidies to oil, gas and coal production.
<b>Countries it covers</b>	41 mainly developed countries (OECD countries, BRICS countries and Indonesia)	40 developing countries	All countries	G20
<b>What it says</b>	<i>“In line with previous OECD work... the scope of the policies inventoried here is broad and differs from some conceptions of “subsidy”. It includes both direct budgetary transfers and tax expenditures that in some way provide a benefit or preference for fossil fuel production or consumption relative to alternatives.”</i>	<i>“The IEA has defined energy subsidies as any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers. This definition has been widely adopted.”</i>	<i>“This paper provides a comprehensive, updated picture of energy subsidies at the global and regional levels. It focuses on the broad notion of post-tax energy subsidies, which arise when consumer prices are below supply costs plus a tax to reflect environmental damage and an additional tax applied to all consumption goods to raise government revenues. Post-tax energy subsidies are dramatically higher than previously estimated and are projected to remain high.</i>	<i>“The analysis of subsidies...is consistent with the definition of subsidies provided by the World Trade Organisation (WTO) that has been agreed by 153 countries. We identify three types of fossil fuel production subsidies: national subsidies delivered through direct spending and tax breaks; investments by majority state-owned enterprises (SOEs); and public finance from majority government-owned banks and financial institutions.”</i>
<b>What it means</b>	The report is basically a bottom up inventory of 800 individual government policies in the generally rich countries it covers. It is not designed to be an exhaustive list incorporating all subsidies, and doesn't look at consumer subsidies as the IEA does.	The IEA's price-gap approach incorporates mainly subsidies to consumers, rather than those to producers, in developing nations, where these are more prevalent. There is very little overlap with the OECD inventory bar in a few countries such as India and Mexico.	The IMF study includes the underpricing of energy due to a failure to take into account the environmental impacts - known to economists as “externalities” alongside producer and consumer subsidies. It draws on numerous data sources including the IEA and OECD.	The joint ODI and OCI report concentrates on subsidies to producers which are prevalent in developed countries. It is similar to the OECD inventory, but aims to apply the WTO definition of a subsidy more stringently to include a wider range of subsidies.
<b>Amount</b>	\$160 to \$200bn per year between 2010 and 2014	\$325bn in 2015	\$5.3tn in 2015	\$444bn per year on average in 2013 and 2014
<b>Report year</b>	<a href="#">2015</a>	<a href="#">2015</a>	<a href="#">2015</a>	<a href="#">2015</a>

## Consumer subsidies

The subsidies in most analysis can be broken down into two types of subsidies: those given to producers and those to consumers.

Consumption (or consumer) subsidies are those which reduce the price of energy to consumers, for example, through government controls on the cost of petrol or power. These have often been put in place to lower transport bills or help poor families access

electricity.

Often calculations of consumer subsidies effectively measure the difference in the domestic price of the fuel compared to the global market price, although some consumer subsidies would not show up in this approach, such as those to help low-income families pay heating bills.

William Blyth, an expert in energy security and climate change policy and author of a 2013 report (<http://oxfordenergyassociates.com/uk-energy-subsidies/>) on fossil fuel subsidies for the UK's Environmental Audit Committee (EAC), tells Carbon Brief:

“It’s very easy to tell in a particular country if a price of petrol is lower than the going rate, then that’s a clear measure of the [consumer] subsidy. [...] It’s how subsidies are often done particularly in developing countries where governments want to make energy products cheaper for consumers, because it’s a popular policy decision, and that can affect, for example, petrol and diesel prices, LPG [liquid petroleum gas] for cooking, and so on.”

The trouble with this, says Blyth, is that consumer subsidies are, in fact, often applied to products, such as petrol, which only the relatively rich can afford. “That subsidy is coming from the general tax base. So, in fact, what you see is that that subsidy is actually creating a transfer of wealth from poorer to richer people,” he explains.

Much of the global attention on subsidy reform has been looking at overturning consumer subsidies. However, as they are largely absent in richer nations, this narrows the focus of subsidy reform to developing countries. “That picture of the world tended to say energy subsidies is a developing country issue and it’s not really an issue for developed countries,” says Blyth.

## The IEA: a consumer subsidy approach

In its calculations (<http://www.iea.org/publications/freepublications/publication/WorldEnergyOutlook2016ExecutiveSummaryEnglish.pdf>) of fossil fuel subsidies the Paris-based International Energy Agency (IEA) uses the “price-gap” approach ([https://www.iisd.org/gsi/sites/default/files/ffs\\_methods\\_estimationcomparison.pdf](https://www.iisd.org/gsi/sites/default/files/ffs_methods_estimationcomparison.pdf)), a method which compares domestic energy prices to the international market price and, therefore, largely incorporates only consumer subsidies. While the IEA collects energy data on almost all countries in the world, its in-depth subsidy data only covers the 40 or

so developing world countries that it judges likely to have end-user prices for fossil fuels below our reference prices.

The IEA's approach means it does not try to explain how or if producers are compensated by government for selling their products at a lower price. Instead it simply calculates the price difference and labels this a subsidy. This could have been provided via a direct budgetary transfer – which is usually considered a subsidy – or through a tax concession – which some don't consider as a subsidy. Either way the IEA doesn't report this.

While most broadly accept that what the IEA calculates can indeed be called a “subsidy”, there are some areas of discord. For instance, Assia Elgouacem, a consultant at the Organisation for Economic Co-operation and Development (OECD), tells Carbon Brief:

“One point of contention that emerges from the IEA price-gap approach is that a number of hydrocarbon-producing countries are of the opinion that the reference price should be based on the cost of production rather than on import- or export-parity pricing.”

The IEA's most recent report (<http://www.iea.org/publications/freepublications/publication/WorldEnergyOutlook2016ExecutiveSummaryEnglish.pdf>) put global fossil-fuel subsidies at \$325bn in 2015 – just 6% of the IMF's total estimate for subsidies for 2015, which included producer subsidies and externalities (see below).

## Consumer subsidy reform

The IEA's 2015 estimate was also down 35% from almost \$500bn in 2014, a drop which the IEA said reflected lower fossil-fuel prices and a subsidy reform process that has gathered momentum in several countries, from Mexico ([http://www.keepeek.com/Digital-Asset-Management/oecd/energy/oecd-companion-to-the-inventory-of-support-measures-for-fossil-fuels-2015\\_9789264239616-en#.WN5U9IPyui4#page1](http://www.keepeek.com/Digital-Asset-Management/oecd/energy/oecd-companion-to-the-inventory-of-support-measures-for-fossil-fuels-2015_9789264239616-en#.WN5U9IPyui4#page1)) to Egypt (<http://www.reuters.com/article/us-egypt-budget-subsidies-idUSKCN0X60EB>).

These concerted efforts in many developing countries to remove consumer fossil fuel subsidies are especially significant since government expenditure on such subsidies can exceed public spending on education or health in some countries (<https://www.adb.org/sites/default/files/publication/175444/fossil-fuel-subsidies-indonesia.pdf>).



In Indonesia, for example, spending (<https://www.iea.org/newsroom/news/2016/december/indonesias-steady-progress-in-tackling-fossil-fuel-subsidies.html>) on fossil fuel subsidies in 2016 is thought to have come to less than 1% of GDP, compared to over 3% in 2014, when President Joko Widodo implemented a series of reforms after taking office three years ago.

Meanwhile, in India, alongside other reforms, a campaign (<http://www.givitung.in/>) launched by Indian prime minister Narendra Modi in 2015 encouraged rich Indians to voluntarily give up their Liquid Petroleum Gas (LPG) subsidy in order to “make a personal contribution towards nation-building” and help poor people to move away from burning firewood. Over 10 million (<http://www.thehindu.com/news/national/Those-giving-up-LPG-subsidy-can-apply-after-1-year-Minister/article14251742.ece>) people have already signed up to relinquish their subsidy.

A recent report (<http://www.norden.org/en/news-and-events/news/transferring-fossil-fuel-subsidies-to-clean-energy-could-yield-major-savings>) from the Nordic Council of Ministers found that countries such as Bangladesh, Indonesia, Morocco and Zambia, who are already undergoing energy reforms, would particularly benefit from transferring funds that normally go on fossil fuel subsidies towards sustainable energy investment, such as renewable energy and energy efficiency.

## Production subsidies

Unlike consumer subsidies, production subsidies are those which make it less costly for producers to develop resources in the first place. They can include things such as tax breaks for capital investment, requiring a lower share of profits to be given as tax from developing a resource, public finance specifically given to fossil fuel production, and, in some analysis, investment by state-owned enterprises (SOEs).

Blyth tells Carbon Brief:

“It’s basically giving more of the wealth which is generated from exploiting these fossil fuel resources to the producers, at the expense of the national government, which is the party to that kind of agreement.”

However, as Blyth explains, these type of subsidies can be hard to define. And as it is difficult to measure the effect of a particular production subsidy on the global price,

they tend not to show up in the price-gap methodology used by groups such as the IEA.

#### Fossil fuel subsidies: Why do calculations vary?



With such a large array of ways of providing production subsidies, it can also be difficult – and contentious – to label what actually is a production subsidy and what isn’t.

This has proved controversial (<https://www.desmog.uk/2016/05/30/what-does-g7-fossil-fuel-subsidy-phase-out-pledge-mean-uk>) in several countries, including the UK, which claims (<http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2017-02-06/63284>) it has no fossil fuel subsidies.

## Does the UK have fossil fuel subsidies?

The UK defines ([https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/455512/FOI\\_2015\\_15038\\_PUB.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455512/FOI_2015_15038_PUB.pdf)) fossil fuel subsidies as government action that “lowers the pretax price to consumers to below international market levels”.

Since a reduction in the usual rate of tax paid in a certain sector (such as North Sea oil and gas) doesn’t fit into this definition, the government says this isn’t subsidy.

Therefore, despite multiple (<https://influencemap.org/report/North-Sea-Oil-and-Gas-Taxation-and-Lobbying-e0c7adbf632970a44d007306b62a7d02>) reports

(<https://www.businessgreen.com/bg/analysis/2434471/uk-singled-out-among-g20-for-bolstering-fossil-fuel-subsidies>) highlighting (<http://neweconomics.org/2016/07/the-looking-glass-world-of-fossil-fuel-subsidies/>) how the UK gives frequent financial support to prop up its oil and gas industries, the government argues ([https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/455512/FOI\\_2015\\_15038\\_PUB.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455512/FOI_2015_15038_PUB.pdf)) it is simply lowering the sector's already higher-than-usual rate of tax and has no fossil fuel subsidies.

**The UK defines fossil fuel subsidies as government action that lowers the pre-tax price to consumers to below international market levels. The UK has no fossil fuel subsidies.**

Government response ([https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/455512/FOI\\_2015\\_15038\\_PUB.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455512/FOI_2015_15038_PUB.pdf)) to a 2015 Freedom of Information (FOI) request asking for information on fossil fuel and renewable subsidies. The government reiterated (<http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2017-02-06/63284>) this stance in February 2017.

For instance, chancellor Philip Hammond recently announced (<http://www.bbc.co.uk/news/uk-scotland-scotland-politics-39198839>) new help for the North Sea oil and gas industry, also highlighting the “unprecedented support already provided to the oil and gas sector through £2.3bn packages in the last three years”.

A recent Carbon Brief analysis (<https://www.carbonbrief.org/analysis-north-sea-industry-cost-uk-taxpayers-396m-2016>) found the UK's North Sea oil and gas sector actually became a net drain on public finances in 2016, with the sector receiving an overall £396m in 2016, even when tax payments were taken into account. Another investigation (<http://energydesk.greenpeace.org/2017/04/19/uk-trade-billions-export-finance-fossil/>) released by Greenpeace and Private Eye in April found the UK had pledged £4.8bn in financial support to fossil fuel firms since 2010 through UK Export Finance, the government agency that supports risky export deals to boost international trade by providing guarantees, insurance and reinsurance against loss.

As Blyth explains, the reason the labelling of production subsidies such as those in the UK is so contentious is because they are in essence the result of a negotiation on how resources that are generated from exploiting oil and gas reserves are split between the private company and the country.

He tells Carbon Brief:

“That becomes a very individual sort of negotiation in most cases, and there isn’t really an international global standard against which to measure what’s normal...The way producer subsidies are defined is a deviation from the normal tax regime of the country. But the normal tax regime for the UK is different from the tax regime of Norway and the Netherlands and wherever else, so it’s not really possible to define what [deviation from normal] means globally.”

It’s worth noting that in the same FOI document ([https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/455512/FOI\\_2015\\_15038\\_PUB.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455512/FOI_2015_15038_PUB.pdf)) quoted above, the government said it had given over £4bn in direct subsidies to renewables in 2014 to 2015.

In some ways, this goes to the heart of the debate over fossil fuel and renewables subsidies in developed countries, which often amounts to the issue of comparing often direct payments given to renewables to the tax breaks, reduced-rate VAT, investment support or even unpaid externalities which are used to support fossil fuel production.

## The OECD: an inventory approach to production subsidies

The Organisation for Economic Co-operation and Development (OECD) – a collective of 34 democracies with market economies which aims to stimulate economic progress and world trade – reports ([http://www.keepeek.com/Digital-Asset-Management/oecd/energy/oecd-companion-to-the-inventory-of-support-measures-for-fossil-fuels-2015\\_9789264239616-en#.WN5U9IPyui4#page28](http://www.keepeek.com/Digital-Asset-Management/oecd/energy/oecd-companion-to-the-inventory-of-support-measures-for-fossil-fuels-2015_9789264239616-en#.WN5U9IPyui4#page28)) on fossil fuel “support mechanisms”. Its estimates broadly cover producer support to fossil fuels in the 34 OECD countries and a handful of large partner economies, such as Russia, India and China.

The OECD uses the term “support”, which it says is deliberately broader than some conceptions of “subsidy”, in a bid to get away from debates over what is and isn’t included.

Unlike the IEA, the OECD uses an “inventory” approach ([https://www.iisd.org/gsi/sites/default/files/ffs\\_methods\\_estimationcomparison.pdf](https://www.iisd.org/gsi/sites/default/files/ffs_methods_estimationcomparison.pdf)) to provide a bottom-up breakdown of the policies and instruments governments are using to support or provide preference for fossil fuels in some way over alternatives. This could include, for example, the use of budget support to provide tax breaks or consumption subsidies for diesel. “For that you have to go into the detail of national tax regimes for the oil and

gas sector etc, and it's quite a detailed study," says Blyth. It's worth noting that the OECD does not try to strictly quantify the total amount spent on fossil fuel support, although the OECD is clear it does endeavour to be as complete as possible, especially for OECD countries.

According to Ronald Steenblik, a trade policy analyst at the OECD, totalling up the IEA and OECD estimates is a reasonable way to approximate the spend on worldwide support to fossil fuels. He tells Carbon Brief:

"A golden rule for inter-governmental organisations is 'thou shalt not duplicate work that other organisations do'. So the OECD's estimates complement the information provided by the IEA... There is a bit of overlap between [the two] estimates – mainly regarding Mexico and India (we are working with the IEA to eliminate those) – but, otherwise, adding the two sets of estimates together yields a rough approximation of most of the world's support to fossil fuels."

Shelagh Whitley, head of the climate and energy programme at the Overseas Development Institute (ODI), a UK-based thinktank which publishes regular reports on fossil fuel subsidies, says the OECD's approach is actually the most practical instruction manual for those seeking reform.

This is because it gives specific policy-by-policy information on what can be changed; whether that be a certain type of support in a particular state or region, through to an oil field or mine. "The other institutions are looking more at data that can shape government policy or can shape international policy," she says.

The OECD's most recent inventory ([http://www.keepeek.com/Digital-Asset-Management/oecd/energy/oecd-companion-to-the-inventory-of-support-measures-for-fossil-fuels-2015\\_9789264239616-en#.WN5U9lPyui4#page39](http://www.keepeek.com/Digital-Asset-Management/oecd/energy/oecd-companion-to-the-inventory-of-support-measures-for-fossil-fuels-2015_9789264239616-en#.WN5U9lPyui4#page39)) in 2015 catalogued almost 800 individual measures in the 41 mainly developed countries it covers. These had an overall value of \$160bn-\$200bn per year between 2010 and 2014. The OECD noted such support "seems to follow a downward trend" – again both because of low oil prices and policy signals from governments.

## The closest thing to a definition

The OECD bases its inventory on the World Trade Organisation (WTO)'s 1994 definition ([https://www.wto.org/english/docs\\_e/legal\\_e/24-scm\\_01\\_e.htm](https://www.wto.org/english/docs_e/legal_e/24-scm_01_e.htm)) of fossil fuel subsidies –



the only internationally agreed definition of the term.

It labels subsidies as a “financial contribution by a government” which “confers a benefit” on its recipient. It specifically includes grants, loan guarantees, tax breaks and the provision of goods or services by the government in its definition. As noted above, some governments such as the UK sideline this definition, by arguing their tax breaks are not subsidies.

Like the OECD, the Overseas Development Institute (ODI) (<https://www.odi.org/>) (see above) uses the WTO definition in its reports on fossil fuel subsidies. However, it goes over and above the types of producer subsidies included in the OECD inventory to include public finance (such as loans given by majority state-owned banks) and investment by state-owned enterprises (SOEs) in fossil fuels.

In its 2015 report (<https://www.odi.org/publications/10058-empty-promises-g20-subsidies-oil-gas-and-coal-production>) on G20 subsidies to oil, gas and coal production, the ODI – in collaboration with Oil Change International (OCI) (<http://priceofoil.org/fossil-fuel-subsidies/>) – found these amounted to \$452bn a year, over twice the amount in the OECD’s inventory. (The report also singled out (<https://www.businessgreen.com/bg/analysis/2434471/uk-singled-out-among-g20-for-bolstering-fossil-fuel-subsidies>) the UK for substantially increasing support for fossil fuels production in recent years to prop up its increasingly uneconomic domestic industry.)

Blyth argues much of the reason behind this higher value comes down to what is defined as “normal” and, therefore, what deviations from the normal are.

For instance, he says, the OECD tends to say things such as tax breaks on capital investment for decommissioning of old oil rigs are managing the end of life rather than production subsidies. The ODI/OCI study, on the other hand, says any sort of tax break – even for decommissioning old oil rigs – would still count as a subsidy, since this lowers the overall cost to the industry.

(It’s worth noting here that the OECD is currently in the process of updating its inventory, with the new version set to be released this autumn. According to the OECD, this will include a method for measuring the “subsidy-equivalent” of concessional loans

and loan guarantees along with some examples.)

The ODI analyses often concentrate mainly on economies with producer rather than consumer subsidies, with its reports looking at blocs such as the G20 and the EU. In its most recent report (<https://www.odi.org/publications/10788-cutting-europes-lifelines-coal-tracking-subsidies-10-countries>), released last month, it found 10 EU member states had given an average of €6.3bn per year in subsidies to coal over the past decade. Six of these had even introduced new subsidies – worth a collective €875m per year – to support the coal sector since 2015, the year the Paris Agreement (<https://www.carbonbrief.org/interactive-the-paris-agreement-on-climate-change>) was made.

The list of organisations calculating subsidies in one way or another goes on, with calculations by a raft of others including the World Bank (<http://documents.worldbank.org/curated/en/579011468765581746/World-fossil-fuel-subsidies-and-global-carbon-emissions-in-a-model-with-interfuel-substitution>) and the Asian Development Bank (<https://www.adb.org/publications/fossil-fuel-subsidies-asia-trends-impacts-and-reforms>), alongside many non-profit or research bodies, such as the Stockholm Environment Institute (<https://www.sei-international.org/fossil-fuels-and-climate-change/publications>) (SEI), Bankwatch (<http://bankwatch.org/news-media/for-journalists/press-releases/energy-dissonance-how-eu-development-funds-fuel-climate-ch>) and Influence Map (<https://influencemap.org/report/Fossil-Fuel-Subsidies-the-countries-compared-45ad7388e7f8b7f9c8d9e5194f8ea0ee>).

But there is one organisation which a few years ago took a more radical (and fiercely debated) approach to calculating fossil fuel subsidies: the International Monetary Fund (IMF).

## The IMF stirs it up

The International Monetary Fund (IMF), conceived at a UN conference in 1944, is a Washington DC-based body of 189 nations which works to promote international economic cooperation and standardise exchange rates. Its mandate (<https://www.imf.org/en/About>) was updated in 2012 to include all macroeconomic and financial sector issues that bear on global stability.

Back in the lead up to the UN Paris climate conference in 2015, the IMF released a major (<http://www.imf.org/external/pubs/cat/longres.aspx?sk=42940.0>) working paper which reignited the discussion over the worldwide cost of fossil fuel subsidies.

The report estimated that the world would be spending a colossal \$5.3tn on energy subsidies in 2015, with most of this supporting fossil fuels. Equal to \$10m a minute, this is an amount greater than the total annual healthcare spend by all the world's governments. It is also around ten times the IEA and OECD values combined.

If all these subsidies were eliminated, the paper said worldwide government revenue could be raised by \$2.9tn, around 4% of the global economy in 2015 (<http://databank.worldbank.org/data/download/GDP.pdf>). Meanwhile, global CO2 emissions would be cut by over 20% and air pollution deaths more than halved, it said.

These are huge numbers. However, as several commentators noted (<https://www.vox.com/2015/5/20/8630913/IMf-fossil-fuel-subsidies>), the IMF's report looked at something rather different than most of the other attempts to add up subsidies to the energy sector. This is because it was one of first estimates of energy subsidies which incorporated "externalities" (or, as it called them, "post-tax subsidies") into its calculations.

The IMF paper effectively said that any failure to factor in the full costs of using fossil fuels should be counted as a subsidy. This included any financial burden which fell on society due to the effects of air pollution or climate change caused by using fossil fuels. Removing these subsidies would, in practice, mean increasing the price of energy to cover the full health and environmental costs of using fossil fuels.

The paper, concluded (<https://www.theguardian.com/environment/2015/may/18/fossil-fuel-companies-getting-10m-a-minute-in-subsidies-says-imf>) all this made its calculation an "extremely robust" estimate of the true cost of fossil fuels – and how much they were being propped up by governments. It's worth noting here that this "working paper" represented the views only of the authors and not of the IMF as a whole).

According to Blyth, the IMF report was important as it brought together the subsidy debate and carbon pricing debate, which had previously taken place in parallel. He says:

“Basically, what they’re saying is that the new normal should be to include, for example, carbon prices and carbon taxes into the price of the fuel, so that you’re paying for the external environmental damages and so on within the price of that fuel. And if that’s not priced in then that’s counted as a subsidy. That’s really changing the game in terms of subsidy definition.”

The grid below gives a basic breakdown of the types of subsidy (or otherwise) covered by the four main organisations covered in this piece.

Subsidy/ support type	Example	OECD	IEA	ODI/ OCI	IMF
Direct spending	Government spending on infrastructure that specifically benefits fossil fuels	X		X	X
Tax breaks	Tax deductions for investment in drilling and mining equipment	X		X	X
Public finance	Loans given by a majority state-owned bank			X	
Support to state-owned enterprise (SOE)	Investment by SOEs – a legal entity created by a government to undertake commercial activities on its behalf – in fossil fuel production			X	
Price lower than international rates*	Government subsidies or controls which keep domestic prices lower than international market rates		X		X
Failure to price externalities	Failure to account for the financial impacts of carbon dioxide or air pollution on society				X

Comparison of the subsidies or support to fossil fuels covered by different organisations. \*Note that this is a broader metric which may in some cases capture the impact of the other subsidy types. Grid by Carbon Brief

## Can externalities be subsidies?

The IMF report prompted much (<https://www.forbes.com/sites/timworstall/2015/05/19/imf-report-on-5-3-trillion-in-energy-subsidies-careful-its-not-quite-what-you-think/#5080a3594bfa>) debate on whether externalities can really be labelled as subsidies. “[T]here is something rather Orwellian about describing a failure to tax

something as a subsidy,” wrote Sam Bowman in the Daily Telegraph (<http://www.telegraph.co.uk/finance/comment/11627647/IMF-fuel-subsidies-are-not-what-they-seem.html>). “Rebranding externalities as subsidies might make for good headlines in the left-wing press, but it also makes for stifled debate and woolly thinking.”

Brad Plumer in Vox (<http://www.vox.com/2015/5/20/8630913/IMF-fossil-fuel-subsidies>), meanwhile, pointed out that even if you accept the premise of allowing externalities to be subsidies, the IMF included some that are pretty tenuous to say are caused by fossil fuel use, such as traffic fatalities and congestion. Still, it’s worth pointing out that the lion’s share of the cost of externalities in the IMF report were from global warming and air pollution.

Others rejected (<https://www.forbes.com/sites/timworstall/2015/05/19/imf-report-on-5-3-trillion-in-energy-subsidies-careful-its-not-quite-what-you-think/2/#2b7280fc3b5e>) the IMF’s inclusion of consumption subsidies, such as lower-than-typical VAT rates (as occurs in the UK, where the VAT rate (<https://www.gov.uk/guidance/rates-of-vat-on-different-goods-and-services#power-utilities-energy-and-energy-saving-heating>) on gas and electricity is just 5% compared to the standard 20%). “They’ve simply assumed that everything consumed in the economy should be paying much the same tax rate in order to raise revenue to pay for government,” wrote Tim Worstall in Forbes (<https://www.forbes.com/sites/timworstall/2015/05/19/imf-report-on-5-3-trillion-in-energy-subsidies-careful-its-not-quite-what-you-think/2/#237ad2773b5e>). “This just isn’t what we would normally describe as a subsidy although we can, if we want to, stretch the meaning to include it. However, do note that this means that renewables are gaining very much the same subsidies.”

(It’s worth noting that some experts, including Blyth, do consider reduced VAT rates a consumer subsidy. “The UK is almost unique in the OECD countries in having such a low VAT rate,” he tells Carbon Brief. “Normal economic theory would say that you should as far as possible keep the same VAT rates across all products. So that means, in my view, that it is subsidies.”)

But many also rallied to praise the inclusiveness of the IMF report, which some viewed as illuminating the unfair wider financial support with which fossil fuels are often



privileged. Nicholas Stern, climate economist at the London School of Economics and author of the influential 2006 Stern review, said (<https://www.theguardian.com/environment/2015/may/18/fossil-fuel-companies-getting-10m-a-minute-in-subsidies-says-imf>) the report “shatter[ed] the myth that fossil fuels are cheap” by showing “just how huge their real costs are”.

According to Blyth, one of the most interesting things about the IMF calculation was to see how much the scale of the externalities – whether or not they are acknowledged as subsidies – tended to dominate that of subsidies under their normal definition.

For instance, the figures for air pollution and global warming externalities alone added up to over \$4tn, compared to just \$333bn for the more conventional forms subsidies (“pre-tax subsidies”). Blyth says:

“I think it puts it into a wider context: ultimately, the community of analysts and so on who are trying to push against subsidies are, ultimately, doing it for environmental reasons, so I think it puts the whole thing on a common sort of footing.”

	size of subsidy							
	\$ billion				percent of global GDP			
	2011 Clements et al.	2011	2013	2015	2011 Clements et al.	2011	2013	2015
<b>Petroleum</b>								
post-tax subsidies	<b>726</b>	<b>1,366</b>	<b>1,613</b>	<b>1,497</b>	<b>1.0</b>	<b>1.9</b>	<b>2.2</b>	<b>1.8</b>
pre-tax subsidies	220	241	267	135	0.3	0.3	0.4	0.2
externalities (net of any fuel taxes)	398	942	1,121	1,162	0.6	1.3	1.5	1.4
global warming	100	166	202	209	0.1	0.2	0.3	0.3
local air pollution	113	266	291	299	0.2	0.4	0.4	0.4
congestion	100	271	335	359	0.1	0.4	0.4	0.4
accidents	78	219	271	271	0.1	0.3	0.4	0.3
road damage	1	19	23	24	0.0	0.0	0.0	0.0
foregone consumption tax revenue	108	183	224	200	0.2	0.3	0.3	0.2
<b>Coal</b>								
post-tax subsidies	<b>709</b>	<b>2,124</b>	<b>2,530</b>	<b>3,147</b>	<b>1.0</b>	<b>3.0</b>	<b>3.4</b>	<b>3.9</b>
pre-tax subsidies	6	7	5	5	0.0	0.0	0.0	0.0
externalities (net of any fuel taxes)	695	2,098	2,506	3,123	1.0	2.9	3.4	3.8
global warming	532	531	617	750	0.7	0.7	0.8	0.9
local air pollution	164	1,567	1,889	2,372	0.2	2.2	2.5	2.9
foregone consumption tax revenue	8	18	19	20	0.0	0.0	0.0	0.0
<b>Natural gas</b>								
post-tax subsidies	<b>376</b>	<b>436</b>	<b>482</b>	<b>510</b>	<b>0.5</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
pre-tax subsidies	116	111	112	93	0.2	0.2	0.2	0.1
externalities (net of any fuel taxes)	238	282	322	371	0.3	0.4	0.4	0.5
global warming	239	232	267	308	0.3	0.3	0.4	0.4
local air pollution	-	50	56	62	-	0.1	0.1	0.1
foregone consumption tax revenue	22	42	48	46	0.0	0.1	0.1	0.1
<b>Electricity</b>								
post-tax subsidies	<b>179</b>	<b>231</b>	<b>233</b>	<b>148</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.2</b>
pre-tax subsidies	150	163	156	99	0.2	0.2	0.2	0.1
foregone consumption tax revenue	29	68	76	49	0.0	0.1	0.1	0.1
<b>Total</b>								
post-tax subsidies	<b>1,990</b>	<b>4,157</b>	<b>4,858</b>	<b>5,302</b>	<b>2.8</b>	<b>5.8</b>	<b>6.5</b>	<b>6.5</b>
pre-tax subsidies	492	523	541	333	0.7	0.7	0.7	0.4
externalities (net of any fuel taxes)	1,331	3,323	3,950	4,655	1.9	4.7	5.3	5.7
global warming	871	929	1,086	1,268	1.2	1.3	1.5	1.6
local pollution	277	1,884	2,235	2,734	0.4	2.6	3.0	3.4
congestion	100	271	335	359	0.1	0.4	0.4	0.4
accidents	78	219	271	271	0.1	0.3	0.4	0.3
road damage	1	19	23	24	0.0	0.0	0.0	0.0
foregone consumption tax revenue	167	311	367	313	0.2	0.4	0.5	0.4

IMF breakdown of post-tax subsidies by energy type and externalities. The breakdown of the figures in the 2015 report discussed in this piece are circled. Note that much of the data is collated from different sources, including the OECD, the IEA, and the USA Energy Information Agency. Source: IMF working paper. How Large Are Global Energy Subsidies 2015 (<http://www.imf.org/external/pubs/cat/longres.aspx?sk=42940.0>).

## What's in a pledge?

Fossil fuel subsidies have featured on and off in G7 statements since 2009 (at the time G8, before Russia's ejection), but 2016 was the first time the group had set a concrete deadline for phase out.

But while campaigners cautiously welcomed (<https://www.theguardian.com/environment/2016/may/27/g7-nations-pledge-to-end-fossil-fuel-subsidies-by-2025>) this 2025 pledge, many urged the G7 to go further by agreeing on a comprehensive phase out of fossil fuel subsidies by 2020. Now, with this pledge dropped from the latest communique (<http://www.g7italy.it/sites/default/files/documents>

[/G7%20Taormina%20Leaders%27%20Communique\\_27052017\\_0.pdf](#)) last month, it remains unclear whether or not erasing fossil fuel subsidies will remain a priority for the G7. (The 2025 pledge was included, though, in the communique ([http://www.minambiente.it/sites/default/files/archivio\\_immagini/Galletti/G7/communique\\_g7\\_environment\\_-\\_bologna.pdf](http://www.minambiente.it/sites/default/files/archivio_immagini/Galletti/G7/communique_g7_environment_-_bologna.pdf)) issued today by the G7 environment ministers meeting in Bologna.)

In March, though, G20 countries affirmed (<http://www.g20.utoronto.ca/2017/170318-finance-en.html>) their commitment to phasing out “inefficient fossil fuel subsidies that encourage wasteful consumption” (essentially a nod to consumption subsidies). Their communique (<http://www.g20.utoronto.ca/2017/170318-finance-en.html>) also included for the first time a call for all G20 countries to undergo a peer review of such subsidies. (It’s worth noting that the UK has declined (<http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2017-02-06/63284>) to take part in this, arguing it does not need to since under its own definition ([https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/455512/FOI\\_2015\\_15038\\_PUB.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455512/FOI_2015_15038_PUB.pdf)) of fossil fuel subsidies it doesn’t have any).

However, the G20 pledge continues to address only a “medium term” phase out despite calls (<http://www.climatechangenews.com/2017/04/24/vulnerable-nations-call-g20-end-fossil-fuel-subsidies-2020/>) from climate vulnerable nations to set a deadline for this, preferably of 2020.

The table below sets out the statements on fossil fuel subsidies given by both the G20 and the G7 each year since 2007.

Year	G7 statement	G20 statement
2007	No mention.	We looked forward to the IMF examining best practices on fossil fuel subsidies.
2008	No mention.	No mention.
2009	[W]e call for a reduction of subsidies that artificially encourage carbon-intensive energy consumption [...]. <b>Other measures, including, where appropriate, [...] progressive reduction of fossil fuel subsidies</b> [...], designed and applied consistently with our international obligations, can also be useful in the context of policies that promote green and sustainable development models and accelerate the transition towards a low carbon society.	Today we agreed to <b>phase out and rationalise over the medium term inefficient fossil fuel subsidies</b> while providing targeted support for the poorest. Inefficient fossil fuel subsidies encourage wasteful consumption, reduce our energy security, impede investment in clean energy sources and undermine efforts to deal with the threat of climate change.
2010	No mention.	We welcome the work of Finance and Energy Ministers in delivering implementation strategies and timeframes, based on national circumstances, <b>for the rationalisation and phase out over the medium term of inefficient fossil fuel subsidies that encourage wasteful consumption</b> , taking into account vulnerable groups and their development needs. We also encourage continued and full implementation of country specific strategies and will continue to review progress towards this commitment at upcoming summits.
2011	No mention.	We reaffirm our commitment to rationalise and phase-out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption, while providing targeted support for the poorest.
2012	[W]e strongly support efforts to rationalise and phase-out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption, and to continue voluntary reporting on progress.	We welcome the progress report on fossil fuel subsidies, and <b>we reaffirm our commitment to rationalise and phase out inefficient fossil fuel subsidies that encourage wasteful consumption over the medium term</b> while providing targeted support for the poorest. We ask Finance Ministers to report back by the next Summit on progress made, and acknowledging the relevance of accountability and transparency, to explore options for a voluntary peer review process for G20 members by their next meeting. We also welcome a dialogue on fossil fuel subsidies with other groups already engaged in this work.
		<b>We reaffirm our commitment to rationalise and phase</b>

For instance, a detailed study (<https://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-WP-2017-02-US-oil-and-gas-production-subsidies.pdf>) released this year by the Stockholm Environment Institute (SEI) looking at the impacts of US government subsidies on oil production and CO2 emissions found that, even at today's low oil prices, almost half of the new oil fields in the US depend on them in order to go ahead. The report estimated these subsidies could shift about 20bn barrels' worth of still-undeveloped oil reserves from unprofitable to profitable. Once burned, this oil would emit around 8 billion tonnes (Gt) of CO2 – about 1% of the world's remaining carbon budget (<https://www.carbonbrief.org/analysis-four-years-left-one-point-five-carbon-budget>) under the Paris Agreement's 2C target, the SEI said.

It's worth noting that the US has already undergone (<https://www.theguardian.com/environment/2016/sep/20/us-and-china-release-fossil-fuel-subsidy-peer-reviews>) its fossil fuel subsidy peer review under the G20 – as has China – and has itself identified (<http://www.climatechangenews.com/2016/09/20/us-and-china-release-fossil-fuel-subsidy-peer-reviews/>) 16 subsidies it gives to fossil fuel producers. However, Peter Erickson, a co-author of the SEI report, tells Carbon Brief he would be “surprised” if the new administration under Donald Trump continues to look as closely at these subsidies as past administrations have.

*“To review: the U.S. Govt lists 16 subsidies to fossil fuel producers. Somehow @RexTillersonHQ (<https://twitter.com/RexTillersonHQ>) wasn't “aware” of this <https://t.co/rydQpVYorv> (<https://t.co/rydQpVYorv>) [pic.twitter.com/n3FAfwmpKi](https://t.co/rydQpVYorv) (<https://t.co/n3FAfwmpKi>) — Peter Erickson (@SEI\_Erickson) January 11, 2017 ([https://twitter.com/SEI\\_Erickson/status/819327833210109956](https://twitter.com/SEI_Erickson/status/819327833210109956))”*

The ODI also looks into the climate impacts of fossil fuel subsidies. Another of its report (<http://www.iisd.org/media/ending-fossil-fuel-production-subsidies-cuts-greenhouse-gas-emissions-37-gt-over-2017-2050>), released in February in collaboration with the Global Subsidies Initiative (GSI) (<http://www.iisd.org/gsi/>), estimated that a complete removal of subsidies to fossil fuel production globally would reduce the world's emissions by 37GtCO<sub>2</sub> between 2017 and 2050. At an average of 1.1GtCO<sub>2</sub> per year, this is the equivalent of eliminating all emissions from the aviation sector, the report said.

But even in the case of agreement to phase out such fossil fuel subsidies, there is a need for agreement as to what counts within this – and what doesn't. The G20 and G7 have no concrete definition of what should be included, leaving the door open to arguments – see the UK – that certain types of support for fossil fuels simply don't count.

The multitude of different organisations looking at subsidies using different approaches, arguably, doesn't help this debate. As Whitley argues, the issue is not necessarily that organisations disagree on the “definition” of a subsidy – it is simply



that they are looking at different types of support, often in different countries.

Ultimately, she tells Carbon Brief, the definition argument is beside the point:

“The issue is not whether or not [countries] by definition have subsidies. The issue is whether they are providing support to fossil fuels when they have pledged to end the use of fossil fuels under the Paris Agreement.”

#### Why is it so hard to end fossil fuel subsidies?



The point, she says, is that governments are using a range of tools to provide support for those developing fossil fuels. And these tools are important to identify, not just to see a shift away from this support, but also to allow those same tools to be used to support other things, such as green energy. She says:

“We’re often told by governments we don’t have resources, we don’t have the funds to support green energy, we don’t have the money to give to climate finance. But actually if you look at the tools that are used for our current energy system a lot of that is to support fossil fuels and those tools are there.”

The question then becomes not whether this or that tax break counts as a “subsidy”, but whether governments are gearing their full support towards decarbonising their countries’ energy systems in order to avoid dangerous temperature rises, as they have promised to do in the Paris Agreement.