

Questions & Answers on energy subsidies in Europe

Public financial support to energy production and consumption is becoming an increasingly central issue, as the world seeks the best solutions to tackle challenges like a growing global population, energy demand, and climate change.

The International Association of Oil & Gas Producers (IOGP) is closely following this debate. This document – while not aiming to be a comprehensive review of the topic – provides answers to the most common questions linked to energy subsidies.

Key points:

- **We encourage the phase out all form of subsidies, unless supporting R&D and innovation.** These include subsidies for mature technologies and regulated prices.
- **There is no unanimous agreement on a definition of subsidy.** Different studies use different methodologies to estimate their size. As a consequence, there are diverging estimates.
- **IOGP is in favour using a clear and simple methodology** aimed at calculating the net result of government expenditures on energy sources, subtracted from government revenues from the same sources. **We do not recommend using subjective tax benchmarking to define a subsidy.**

Finally, we should not forget the external benefits generated by the relevant energy sources. Energy sources, and in particular oil and gas, have played and continue to play a crucial role in the world economic and industrial development.



Q1. What is a subsidy?

The term **subsidy** is widely used but there is no set definition for it. Different studies use different methodologies to estimate them:

- **The International Monetary Fund (IMF) says:**

“Pre-tax consumer subsidies arise when the price paid by consumers (that is, firms and households) is below the cost of supplying energy. Post-tax consumer subsidies arise when the price paid by consumers is below the supply cost of energy plus an appropriate “Pigouvian” (or “corrective”) 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.”¹

- **The International Energy Agency (IEA) defines an energy subsidy 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.”

Q2. And what does this mean?

It means that any estimate of the amount of subsidies is heavily influenced by the methodology chosen to analyse the issue and the definition adopted in doing so.

That is the case for the studies published by the International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD). They assess subsidies and other types of government support for fuels worldwide. Country and fuel coverage are also different in this case.

Q3. What are the different methods used to calculate subsidies?

The OECD uses a so-called ‘inventory approach’/‘programme approach’, which relies on government documents (produced by the 34 OECD member states) to estimate the level of support in each country.

As the OECD acknowledges itself, member states have different standards to choose what can be considered a form of support (particularly with respect to ‘tax expenditures’), making it difficult to compare the results across countries and products. Please refer to the responses to Questions 8 to 10 to have a better overview on this topic.

¹ IMF Working Paper, “How Large Are Global Energy Subsidies?”, May 2015, available at <https://www.imf.org/external/pubs/ft/wp/2015/wp15105.pdf>.

The IMF, like the IEA, uses a 'price gap' methodology. This means support is measured by comparing end-user prices to a benchmark based on the price at the nearest international hub. Additionally, the IMF estimates 'post-tax subsidies' which factor in the environmental externalities (e.g. GHG emissions, local air pollutants) from energy consumption and road traffic. The adjustment for GHG emissions in the benchmark price is based on an assumed carbon price of 34 USD/tCO₂e, which is taken from the United States Environmental Protection Agency.

In its report carried out for the European Commission, Ecofys deploys a benchmarking approach to 'monetize' the extent of government interventions in the energy markets via taxes. The second part of Ecofys' work is to estimate 'externalities', or 'external costs' that are associated with each of the electricity (and heat) generating technologies that Ecofys considers. Ecofys' last part of analysis attempts to estimate the direct costs of generation associated with each of the technologies that it considers using the levelized-cost approach.

Q4. Which types of support do they highlight?

These various and broad definitions of subsidies capture many diverse forms of support, both direct and indirect.

Some are easily recognized, such as arrangements that make fuel available to consumers at prices below international levels. Other mechanisms may be less obvious, such as feed-in tariffs that guarantee a premium to power producers for electricity generated from a particular source; the consumer sees no price benefit and instead generally pays a higher average unit price for electricity, but the producer is enabled to draw on an additional or guaranteed revenue stream.

Related types of subsidy arise from support policies that impose mandates on energy supply, such as portfolio standards which oblige utilities to buy a certain volume of renewable generation and implicitly raise the market price for renewables.

Q5. So, how would IOGP calculate subsidies?

In its report *Energy taxation and subsidies in Europe*², NERA Economic Consulting sets out an approach that reflects not only government expenditures, but also government revenues and analyzes the net contribution (or intake) of an industry to government treasury. It calculates the net result of government expenditures on certain energy sources, subtracted from government revenues from the same sources. The approach provides a straightforward and factual picture of taxation and the overall fiscal treatment of energy.

² *Energy Taxation and Subsidies in Europe*, NERA Economic Consulting. The full report is available at https://www.nera.com/content/dam/nera/publications/archive2/PUB_OGP_0514.pdf

NERA estimates the full range of financial flows both to and from different sources of energy as a result of government policy, including direct subsidies, other transfers of funds, and major taxes. It classifies government policies that either lead to government revenues (e.g. taxes, duties, licensing fees, royalties) or government expenditures (direct capital grants, consumption support payments, production subsidies) that are linked to fuels or energy sources.

On top of these, it includes indirect support, provided by government-mandated transfers – transfers that are effectively required by government policies, but which may not involve direct contributions to or demands on government finances (for example, feed-in-tariffs).

This is demonstrated by the graph below:

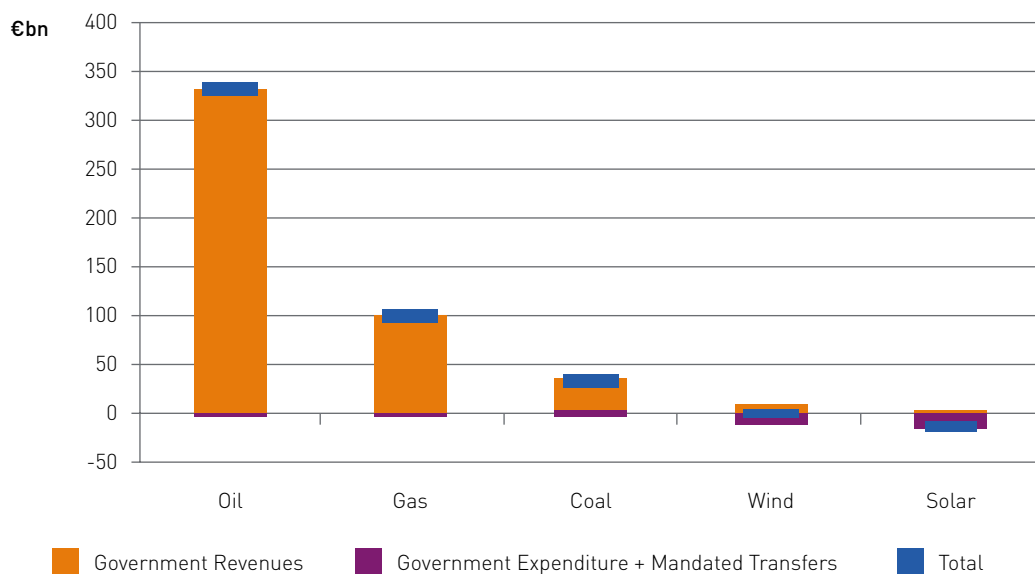
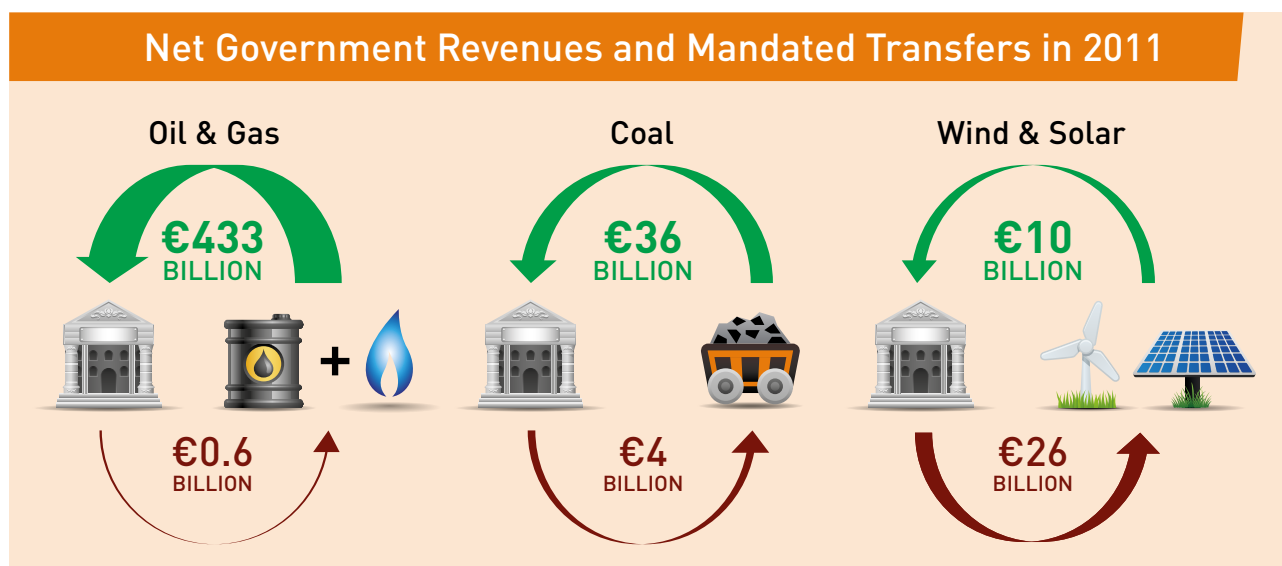


Figure: EU28 + Norway Net Government revenues and Mandated Transfers (2011)

Q6. Who gets the subsidies?

Any conclusion how big a subsidy for a given energy source is will depend on the methodology behind the calculation.

Using its clear methodology, NERA estimates that oil and gas contributed €433 billion to the EU and Norwegian government treasuries in the reference year 2011 and received only €0.6 billion mainly devoted to R&D, making it a net contribution of just over €432 billion.



Some common threads emerge also from analyzing other studies:

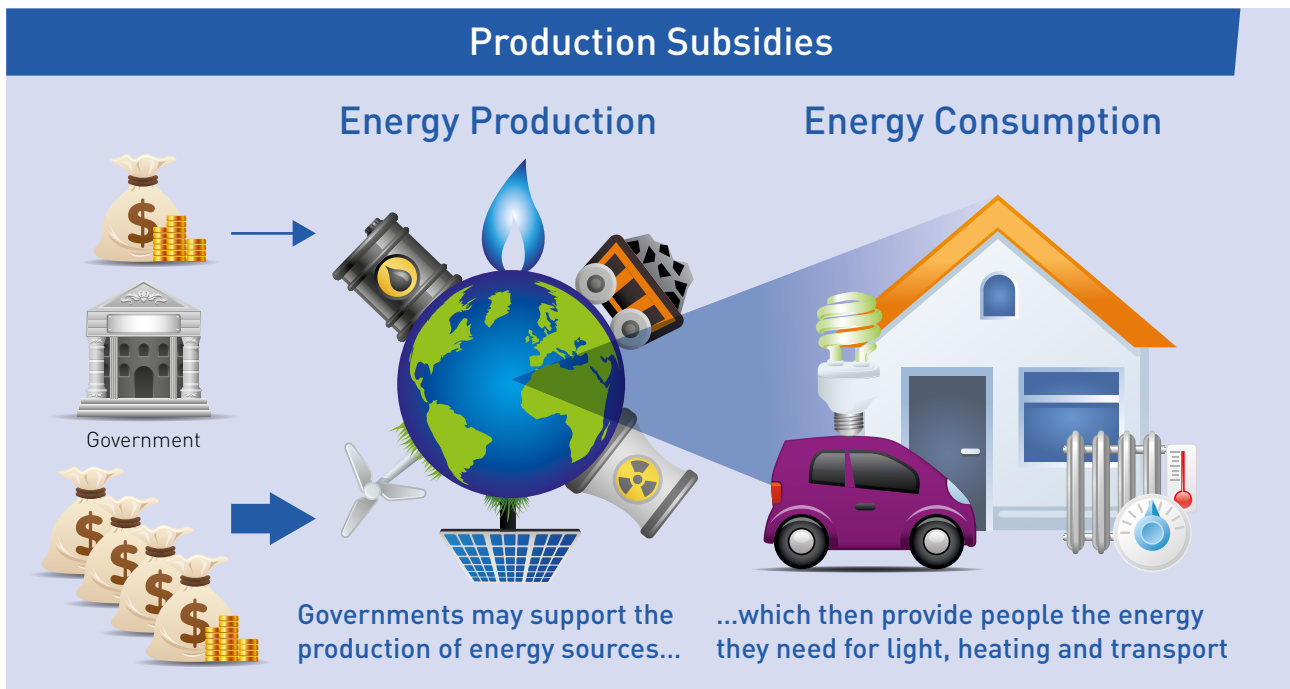
a) Subsidies to oil and gas are very limited in the European Union.

According to NERA Economic Consulting, gas received €0.4 billion in 2011, the study's reference year.²

Table: EU28+Norway Net Government Revenues and Mandated Transfers (2011), May 2014.

Source	Government Revenues	Government Expenditures and Mandated Transfers	Total	Primary Energy Consumption
	€ billion	€ billion	€ billion	Mtoe
Oil	333	-0.2	332	511
Gas	100	-0.4	100	390
Coal	36	-4	33	286
Wind	8	-9	-1	16
Solar	2	-17	-15	4

Source: *Energy Taxation and Subsidies in Europe*, NERA, p.36.



In a study done for the European Commission, Consultancy Ecofys estimates that support to natural gas reached €6.6 billion in 2012.³ Cogeneration or district heating in Spain, Italy and Germany are the largest beneficiaries (combined heat and power – CHP – reduces emissions per unit of energy: when gas is used in CHP systems, efficiency is over 80%).⁴

b) Coal production still benefits heavily from subsidies in a number of EU countries.

According to NERA, coal subsidies reached €4 billion in 2011. According to Ecofys, in 2012 coal benefitted from €9.7 billion in subsidies.⁵ Contributions to coal were designed to ensure that domestic coal remained competitive with imports.

c) Subsidies to renewable energy are fairly sustained.

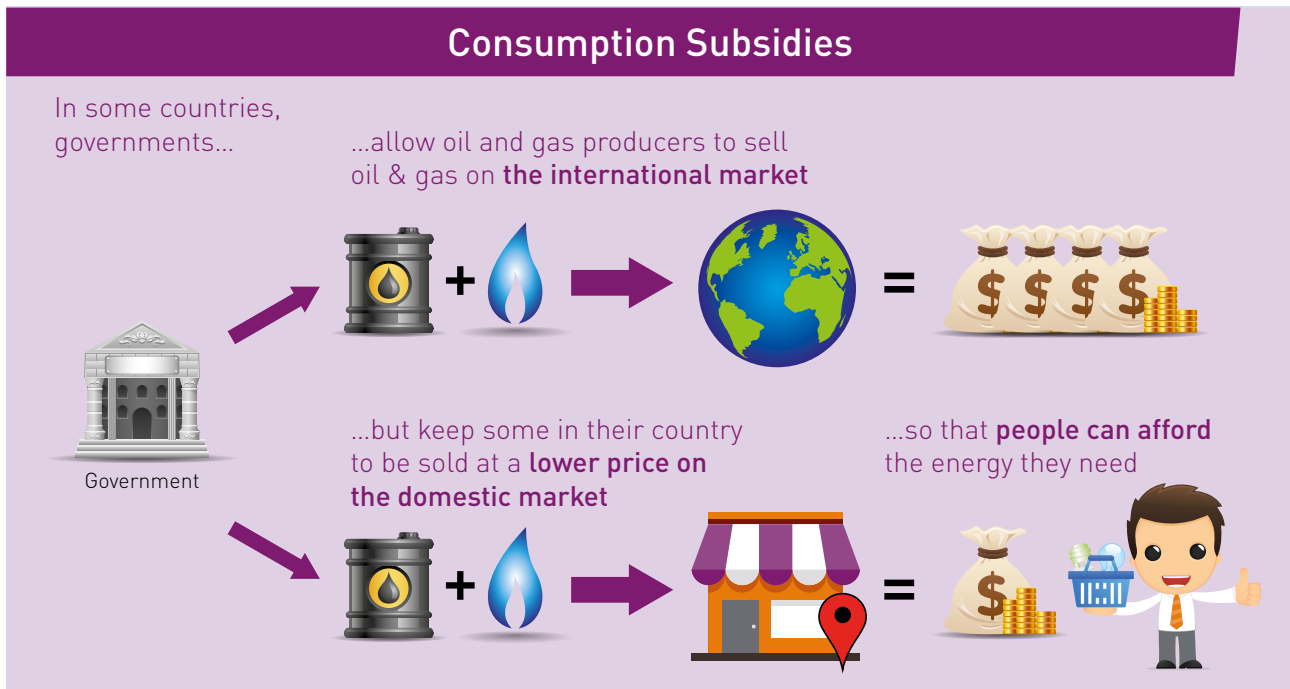
According to the IEA, in 2014 the EU was the largest supporter of renewable energy and spent over \$70 billion for this sort of energy.⁶

³ ECOFYS Report on subsidies, Source available https://ec.europa.eu/energy/sites/ener/files/documents/ECOFYS%202014%20Subsidies%20and%20costs%20of%20EU%20energy_11_Nov.pdf page 11.

⁴ Source available http://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/bbest_chp.pdf.

⁵ There are differences in numbers in two report as the ECOFYS report considers the EU support.

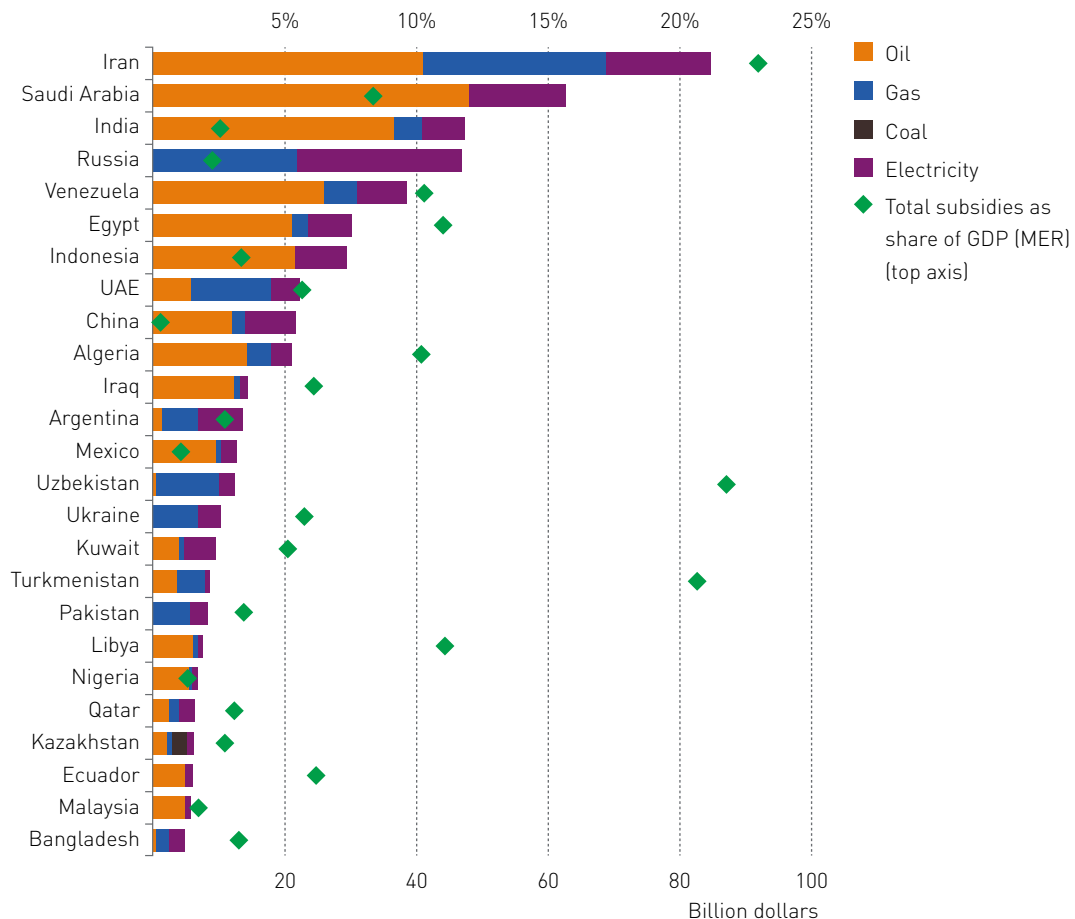
⁶ World Energy Outlook 2015, IEA.



Q7. Ok, this is production. But what about money used to lower prices for the consumers?

Consumption subsidies are understood as money used to reduce the end-user cost of energy products (in transport, heating, power).

The IEA counts 40 countries all over the world that use this type of subsidy for coal, oil or natural gas.⁶ The following chart from the IEA's World Energy Outlook 2014 shows the top 25 countries. Most of the \$548 billion subsidies for the consumption of coal, oil and gas occur in producing countries of those sources (e.g. Iran, Saudi Arabia, India, Russia, Venezuela) and developing countries (e.g. India, China, Pakistan). Mexico is the only OECD country in the list, which notably does not include any EU country. The IEA estimated that the global subsidy bill in 2014 was around \$490 billion and it would have been around \$610 billion without reforms enacted since 2009.



Note: MER = market exchange rate

Source: *World Energy Outlook 2014*, IEA, p.321.

Figure: Economic value of fossil-fuel consumption subsidies by fuel for the top 25 economies, 2013.

Q8. What is tax benchmarking and why do you think it is not a good way to estimate subsidies?

To **monetize** the extent of government interventions in the energy markets via taxes, several institutions has adopted a benchmarking approach, which compares energy types against other fuels, or sections of the economy based on a subjective assessment of the appropriate tax regime to use as a comparator.

The benchmark selection is subjective. Selecting one implies certain assumptions about the optimum level at which taxes should be set, and these judgments are far from consensual. The definition of an appropriate common benchmark is

one of the most complicated and contentious issues in measuring levels of tax expenditure. The scientific literature on this topic does not provide any widely agreed solution to the problem.⁷

Second, the benchmarking approach ignores possible motivations for different tax rates that justify government intervention to improve social welfare. Providing access to energy to the poorer parts of the population may for example be a legitimate motivation behind a lower level of taxation on a given energy source. Moreover, it is not always easy to assess whether a high or a low rate of tax should be used as the benchmark. For example, if electricity consumption is taxed at a lower rate than that of gas, it is not clear whether this should be perceived as a support to the electricity industry or simply a higher tax burden placed on gas consumption.

Third, this approach complicates the comparisons across countries. The OECD, in its report *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*⁸, notes that “a simple cross-country comparison of the tax expenditures can lead to a misleading picture” of the relative treatment of fossil fuels.” This is because tax expenditures reported in the OECD inventory are based on estimates constructed by and for individual member states, and there is a lack of consistency across countries in their approaches to issues that are fundamental to the identification and estimation of tax expenditures.²

Q9. What is a tax expenditure?

A tax expenditure is the difference between the actual tax rate applied to a commodity and a hypothetical higher **benchmark** rate.

The UK is a good case study. There, the VAT rate on natural gas consumed by households is 5%. But different VAT rates are applied to different product and services: 0% on food; 5% on residential electricity consumption; and 20% on gasoline. At the same time, the EU legislation defines a **standard rate** of VAT at 15%, but it does include various exemptions for different products, including natural gas, electricity and heating.

It is therefore not straightforward to determine what an appropriate ‘benchmark’ VAT rate is. Depending on the subjective judgment of what constitutes the benchmark rate, different conclusions can be reached about whether domestically consumed natural gas in the UK is ‘supported’ by the UK’s 5% VAT rate.

⁷ *Enhancing comparability of data on estimated budgetary support and tax expenditures for fossil fuels*, Institute for European Environmental Policy (IEEP) – commissioned by the European Commission’s Directorate General for Environment. Page 7.

⁸ OECD (2013), “Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013”

Q10. What's the difference between a tax relief and a subsidy?

Tax reliefs involve **no public cash disbursement, but reduce the amount of tax to be paid by a business and only when it is making a profit.**

Tax relief is normally **assigned to speed up**, or secure additional, investment by an industry which might otherwise shift to other countries or other investment options. This in turn will lead to additional tax revenues in the future through increasing the tax base with projects that otherwise would not materialize. In any industry, it is normal for investments and operating expenses to qualify for tax relief. The timing of that relief varies between different kinds of expenditures and from country to country.

Q11. What does IOGP think about tax reliefs?

IOGP doesn't consider a tax relief as a subsidy. Companies receive tax relief on investment when they are making a profit. The aim of such tax reliefs is not to subsidize consumption, but to actually increase tax revenues.

In most developed countries, the oil and gas industry is subject to special taxes at significantly higher rates than other industries: in Europe, the production of oil and gas is heavily taxed, with sector profits facing tax rates that can reach as high as 80% – far above the average EU corporation tax of 23%. In certain upstream regimes, oil and gas production is levied by royalties. Another example is that, in developed countries, oil products are a prime vehicle for tax collection, such as through excise duties.

Q12. What is a capacity mechanism?

Capacity mechanisms are the prices to be paid to have a secure electricity supply. To keep electricity production stable, variable renewable sources such as wind and solar need a flexible back-up, which is best provided by natural gas.⁹

Renewables have a close to zero operating cost which means that gas power plants run much less than they could, lowering the return on the investment of their owner and discouraging operators from building new ones (in fact, in Europe, many are mothballed) in spite of their key role in supporting security of electricity supply.

Capacity payments are therefore designed to remunerate them for the backup service they provide. An alternative approach would be for gas plants to rely on scarcity pricing (i.e. price spikes) in the commodity market during periods of shortage but these are unpredictable in both terms of timing and also magnitude.

⁹ For each unit of electricity produced, GHG emissions from natural gas-fired power plants can be about half those of an equivalent coal plant.

Q13. So this is a subsidy?

No. A capacity mechanism corrects that market distortion by creating an incentive in keeping a gas plant active, albeit running at a slower pace than it could.

That said, capacity mechanisms should be harmonized across Europe, where member states developed different approaches, risking to lead to a fragmentation and divergence in the European power markets.

Q14. What about the externalities caused by the use of energy?

Some institutions, like the IMF, estimate **externalities/external costs** that are associated with each of the electricity (and heat) generating technologies. Remember that externalities are costs (or benefits) that, as a result of an activity or market transaction, are imposed on a party that is not directly involved in that activity or transaction.

There are various externalities that are often linked to different activities along the value chains of different energy sources, some more directly than others.

Examples of externalities include: emissions of 'local' pollutants, security of energy supply¹⁰, innovation spill-overs, 'disamenity' value of wind farms and other generating capacity, water scarcity, road congestion – and many others.²

The IMF's post-tax estimate of subsidies includes a component for externalities like GHG emissions, local air pollutants, and a selection of transport externalities (for example, congestion and accidents). This approach appears to attribute these externalities entirely to the energy sources, and then considers whether end-user prices, inclusive of taxes such as excise duties, cover such externalities. In practice, however, other forms of taxation are typically applied, in conjunction with taxes levied directly on energy sources, to reflect externalities. Such taxes are ignored by the IMF's approach.

Governments charge for such externalities in a variety of ways, including taxes levied on fuels, taxes on vehicles (often with charges differentiated by vehicle type and technology), road pricing schemes, etc. The variety of instruments used reflects the fact that the cost of the externality depends on several factors – and may not even be related directly to the fuel used.

¹⁰ For example, EU legislation (Directive 2006/67/EC followed by Directive 2009/119/EC) requires countries to retain minimum petroleum reserves with a view to maintaining security of supply. Individual member states use different approaches to maintaining strategic reserves. In some cases, the obligation is passed on to energy companies. The benefits accruing to society from energy companies holding such supplies represent a positive externality.

Q15. Bottom line: should we not just remove energy subsidies?

Yes – our industry supports the phase out of subsidies for all energy sources. IOGP believes that all forms of public interventions in the energy market should be phased out. These include subsidies for mature technologies and regulated prices. It won't always be easy, though.

Support to oil, natural gas and coal is mainly found in developing countries. There, consumption subsidies are a form of wealth redistribution, protecting poorer people from the effects of changing international energy prices and serving as an element of broader social policy frameworks.

That said, energy subsidies are not the most desirable form of welfare policy because they alter consumer decisions. Welfare transfers not focused on consumption of specific products are usually more efficient.

Subsidies for renewable energy also distort competition among energy sources and increase the overall cost of energy supply. They should also be phased out, unless they are targeted at R&D and innovation. In fact, much of the support for renewables takes the form of targets and price top-ups which are paid for directly by consumers. Many of these subsidy programmes are now being reduced or eliminated in Europe because governments are worried that they are making consumer bills over-expensive.

Q16. But subsidies to R&D for low-carbon technologies are good, right?

Subsidies for R&D and innovation are needed to bring new technologies to the market. Therefore low-carbon energy technologies should be confined to the early stages of technology development.

Subsidies, or other forms of public support such as mandated transfers (e.g. feed-in tariffs), should stop once a given technology is mature, proven and capable of being commercially deployed at scale, for example onshore wind and solar.

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