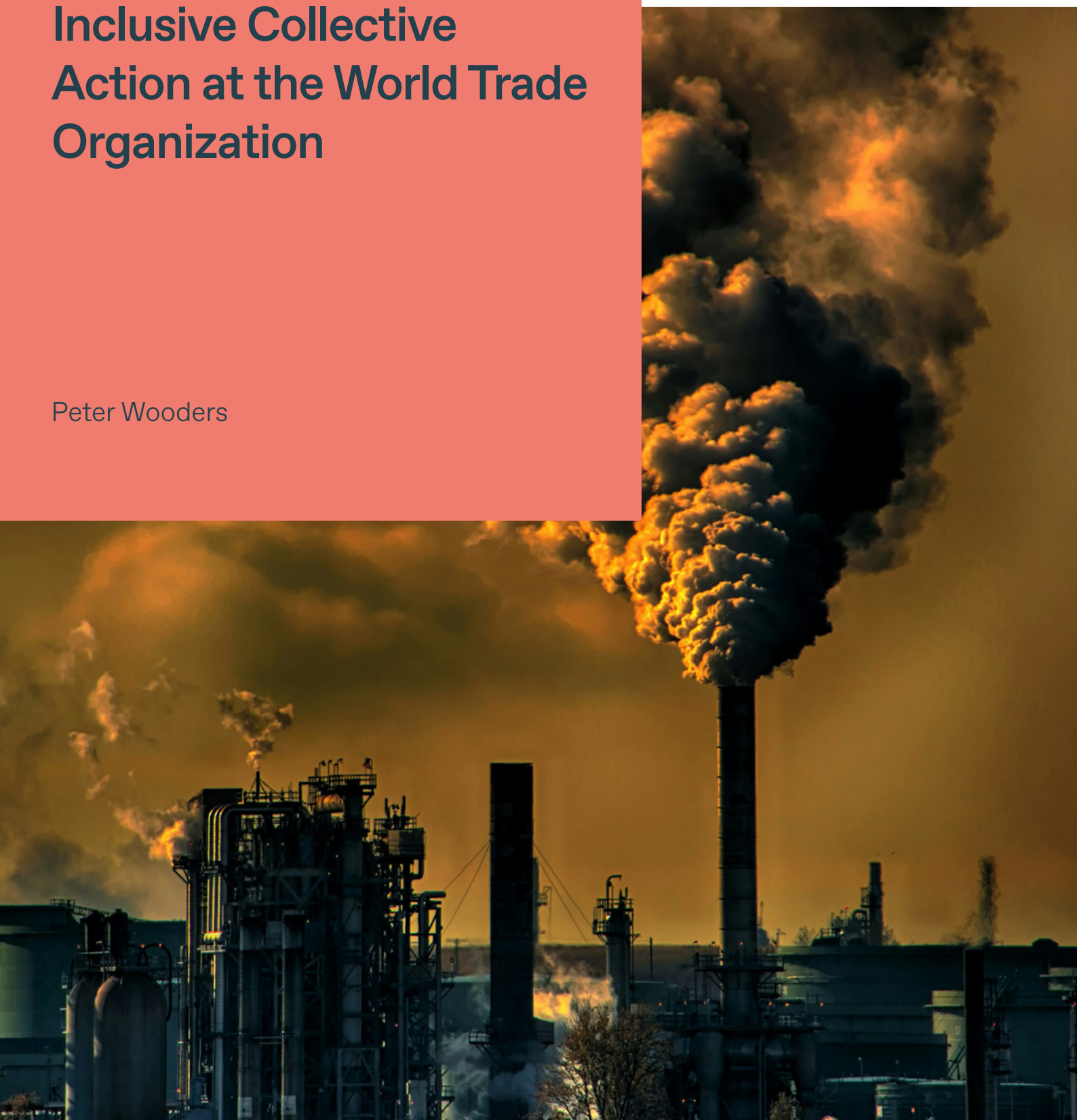


Fossil Fuel Subsidy Reform: Options for Inclusive Collective Action at the World Trade Organization

Peter Wooders



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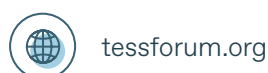
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Executive Summary

Greenhouse gases from the combustion of fossil fuels are the major man-made (“anthropogenic”) contributor to climate change. Global warming is leading to an increasing number of major climate-related events of mounting severity. Principal among these are extreme weather events such as storms, changes in rainfall patterns, heatwaves, and droughts. Many of the worst climate impacts occur in developing countries facing a range of important sustainable development challenges and can result in major loss of life and economic capacity, reversing progress on development.

Meeting the Paris Agreement’s goal of “hold[ing] global temperature increase to well below 2°C above pre-industrial levels and pursu[ing] efforts to limit it to 1.5°C above pre-industrial levels” **can only be achieved through huge reductions of these greenhouse gas emissions from fossil fuels.** Scenarios that show how the Paris Agreement can be met include the International Energy Agency’s Net Zero scenario. By 2050, this scenario allows energy sector greenhouse gas emissions to be no more than those emissions removed (sequestered) from the atmosphere. The scenario sees fossil fuel demand drop by a quarter by 2030, and by 80% by 2050.

Moving away (transitioning) from fossil fuels is now an imperative across much of the world.¹ Beyond producing greenhouse gas emissions, fossil fuels lead to a range of other adverse impacts, for example as a major contributor to local air pollution in many locations and building up significant environmental liabilities at numerous production sites. On top of diminishing these impacts, the transition will also reduce countries’ exposure to fossil fuel markets, where prices can be highly volatile.

The transition away from fossil fuels must be just—and fossil fuel subsidy reform should follow the same principle, i.e. ensuring that poor and vulnerable parts of the population and the economy are not adversely impacted by reform. Successful reform examples and good practice follow this principle. The UNFCCC COP28 decision text on the outcomes of the first global stocktake notes that inefficient fossil fuel subsidies should be phased out “as soon as possible”, except for those subsidies which “address energy poverty or just transitions.”

Subsidizing fossil fuels works against the need to reduce fossil fuel consumption as it lowers prices, increasing consumption and making fossil fuels artificially more competitive compared to alternatives such as renewables. This paper shows that there has been progress in fossil fuel subsidy reform (reduction or elimination) in many countries but that their global value was around \$600 billion globally in a typical year (noting that they doubled in 2022), with many more fossil fuel subsidies not identified or quantified (government information is often incomplete or non-transparent). Subsidies to fossil fuels remain considerably larger than to renewable energy and are many times larger than government receipts from carbon pricing.

This paper finds that 70% of global fossil fuel subsidies by value are granted to three categories: transport consumers; residential consumers; and producers of oil and gas. Major reduction of fossil fuel subsidies can only be successful if there is reform of these categories, which would free government budgets for other priorities such as poverty reduction, health, education, housing, tax cuts, boosting economic growth, or accelerating progress on clean energy. The high relative impacts of coal make coal subsidies a priority for reform. Governments in many countries also have an imperative to support consumers when prices are high and rising. This paper reviews recent experience of how to minimize the cost and duration of such support.

1. The UNFCCC COP28 decision text on the outcome of the first global stocktake (13 December 2023) calls on parties to contribute to “[t]ransitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science.”

Some of the more minor fossil fuel subsidies by value can have important development objectives and can be highly politically sensitive. Such subsidies—e.g. to remote communities or for access to modern energy sources for poor and vulnerable parts of the population—will require more careful consideration of their potential reform, with particular focus given to the development of alternative welfare systems and provision. Thus, while it is always useful to periodically review and better target all fossil fuel subsidies, many of these more minor ones will not be a priority for reform, especially within lesser developed countries. The main financial and environmental benefits will come from the reform of the larger categories of fossil fuel subsidies detailed above.

How to reform fossil fuel subsidies is now well understood: alternative support measures need to be implemented, and any remaining subsidies targeted to those who need them. But alongside the financial costs and other adverse impacts resulting from fossil fuel subsidies are the rationales for their introduction, including: to reduce household expenditure; to make transport more affordable; to encourage domestic production of coal, oil, or natural gas; or to support remote communities. There is clearly a trade-off between these expected benefits and the adverse impacts. Fossil fuel subsidies are also often highly inefficient—i.e. only a small share of the benefit they bring goes to those consumers or parts of the economy which they are designed to help. Alternatives to providing support—e.g. direct payments to households to help support their incomes—are easier to target, less expensive to the government, and cause much lower associated adverse impacts.

Developing countries face particular challenges in reforming fossil fuel subsidies. The reasons include larger parts of their populations and economies being vulnerable to the impacts of increased prices as well as having lower public and private resources available to provide alternatives and protection against price rises. Reform needs to be more carefully considered, prepared for, and designed in developing countries, and progress on reform can be expected to be slower and less complete than in developed countries. Nevertheless reducing the fiscal burden of fossil fuel subsidies can be even more important in less developed countries, and there are generally a number of subsidies where the benefits tend to accrue mostly to the richer parts of the population and to business.

There is a strong rationale for collective action on fossil fuel subsidy reform, driven by: highly competitive global fuel markets, with fossil fuel subsidies to producers and consumers distorting the market for other consumers and producers; globally connected energy markets, with the actions of one country—particularly a larger one—in increasing or reducing its consumption or production affecting other countries (ensuring security of supply is a global issue); the global impacts of energy use, notably global warming but also, for example, cross-border air pollution; and fossil fuel subsidies, and the challenges of reforming them, tend to have many commonalities across the world—e.g. all countries are concerned about the impacts on the poor and vulnerable of reform. There are however major differences between countries in the vulnerability of parts of the population and economy, and in the availability of public and private resources to mitigate against rising prices and costs.

A number of recent international agreements and processes are relevant to fossil fuel subsidy reform, including for example: the commitment to reform inefficient fossil fuel subsidies made by members of the G20, APEC, and G7; the commitment to make financial flows consistent (i.e. to reduce finance to fossil fuels and increase it to clean alternatives) under the Paris Agreement of the UNFCCC; and the annual reporting of fossil fuel subsidy inventories from 2020 under SDG indicator 12.c.1.

The World Trade Organization’s membership, experience, and responsibilities give it a number of advantages to expand the role it plays in fossil fuel subsidy reform. The WTO is the custodian of the Agreement on Subsidies and Countervailing Measures (SCM Agreement), which includes a definition of subsidies tested by a wide experience of jurisprudence. Forums where subsidies are discussed in the WTO include the Committee on Trade and Environment, SCM Committee, and the Trade Policy Review Mechanism. In 2020, 50 WTO members launched the Trade and Environmental Sustainability Structured Discussions (TESSD) to expand discussion of trade, environment, and sustainability (76 members as of March 2024), and subsidies is included within the work programme. The Ministerial Statement on Fossil Fuel Subsidies issued in 2021, which had 48 co-sponsors as of March 2024, led to the creation of a Fossil Fuel Subsidy Reform initiative. At the Thirteenth WTO Ministerial Conference in February 2024, the initiative committed to proposing “concrete options.”

Several studies have made recommendations on how collective action on fossil fuel subsidy reform could best be supported at the WTO. Building on these studies, and on the analysis of subsidies and their reform in this paper, the following options for collective action at the WTO could be considered. The options proposed in this paper require further consultation, discussion, and detail, in consultation with the WTO membership and other stakeholders active in the field (e.g. intergovernmental organizations, multilateral development banks).

Options for Collective Action at the WTO on Fossil Fuel Subsidy Reform

Category of Collective Action	Recommendation For How Support at the WTO Could be Provided
<p>Sharing problems, solutions, experience, and information</p>	<ul style="list-style-type: none"> ■ Further develop understanding on how to identify and measure fossil fuel subsidies and produce national inventories, building contacts and collaborating with key organizations.* ■ Investigate and develop options to increase transparency at the WTO and under other fora and processes, in collaboration with these fora and processes. ■ Increase experience-sharing of reform challenges, solutions, and lessons, including around managing the impacts of reform on the most vulnerable groups and sectors of the economy. This should include a particular focus on reducing temporary support/emergency response measures as soon as possible and on devising and implementing plans to minimize fossil fuel subsidies when global prices increase.
<p>Supporting the capacity to reform fossil fuel subsidies, following just transition principles</p>	<ul style="list-style-type: none"> ■ Facilitate links between WTO members planning or undertaking reform—with a focus on developing countries—and key organizations able to provide support.
<p>Enhancing coordination</p>	<ul style="list-style-type: none"> ■ Improve coordination of the activities of organizations providing information and support to fossil fuel subsidy reform globally, and the WTO should liaise with other key organizations to improve coordination globally and regionally.
<p>Assessing options for future cooperative arrangements</p>	<ul style="list-style-type: none"> ■ Review and discuss how existing WTO rules apply to fossil fuel subsidies and how multi-country reform agreements could be formulated (including how to scope which subsidies could be included within an agreement and which should be prioritized for reform). A necessary part of such discussions will be to agree on how differences in levels of economic development could be included (e.g. special and differential treatment). ■ A particular opportunity may be to instigate discussions and analysis around whether the zero taxation almost exclusively imposed on fuels used for international aviation and maritime transport could be increased.

*Key organizations include the OECD, IEA, IMF, World Bank, EBRD and other multilateral development banks, international financial institutions, and non-governmental organizations including IISD’s Global Subsidies Initiative and CEP (Council on Economic Policies).

Abbreviations

ACCTS	Agreement on Climate Change, Trade and Sustainability
APEC	Asia-Pacific Economic Cooperation
CO ₂	Carbon Dioxide
COP	UN Climate Change Conference
FFS	Fossil Fuel Subsidies
FFSR	Fossil Fuel Subsidy Reform
GHG	Greenhouse Gas
GSSE	General Support Subsidy Estimates
IEA	International Energy Agency
IISD	International Institute for Sustainable Development
IMF	International Monetary Fund
IGO	Intergovernmental Organization
IPCC	Intergovernmental Panel on Climate Change
LPG	Liquefied Petroleum Gas
MC	Ministerial Conference
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
SCM	Subsidies and Countervailing Measures
SDG	Sustainable Development Goal
TESSD	Trade and Environmental Sustainability Structured Discussions
TPRM	Trade Policy Review Mechanism
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WTO	World Trade Organization

1. Introduction

The combustion of fossil fuels is the major anthropogenic contributor to climate change. Fossil fuel subsidies (FFS) encourage the further consumption and production of fossil fuels, increasing climate change and local pollution and making the continued development and use of fossil fuels more attractive against alternatives such as renewable energy than they otherwise would be. At a time when countries around the world are looking to reduce their climate impacts by moving away from the use of fossil fuels in their energy systems and seeking to make their economies more resilient to climate impacts, it is vital to re-examine FFS, across their many forms and uses.

This paper reviews the range of reasons why governments implement FFS, including for example shielding consumers against higher prices or encouraging further domestic exploration and production of coal, oil, or natural gas. But FFS also represent a significant public cost, diverting government resources away from critical social priorities like health, education, infrastructure development, clean energy transition, or other public policy objectives. The scale of FFS means that their reform—their full or partial removal, often accompanied by complementary measures—can have a significant impact on the energy system and the transition to cleaner sources. Reform of FFS can liberate resources for other public purposes but a core reason they have proven challenging for governments to reform are the real and perceived social and economic transition costs, including the political tensions that can arise. In face the urgency of climate action and the necessary transition away from fossil fuels, a core part of the conversation on fossil fuel subsidy reform (FFSR) is to identify approaches that can respond to both the urgency at hand and the political economy realities.

The paper makes the case that collective action—action across many countries—is an important way

to drive FFSR and that the World Trade Organization (WTO) has a critical role to play to support this reform. With reference to how fossil fuels are produced, traded, and consumed, the paper starts by identifying which are the largest and most harmful categories of FFS globally, what are their aims and objectives, and how they can be better targeted. The paper recommends categories of FFS that should be prioritized for reform. The final sections then review progress and lessons on FFSR, the rationale for collective action, and how such collective action could be taken forward at the WTO in collaboration with other organizations and processes.

1.1 Production and Consumption of Fossil Fuels

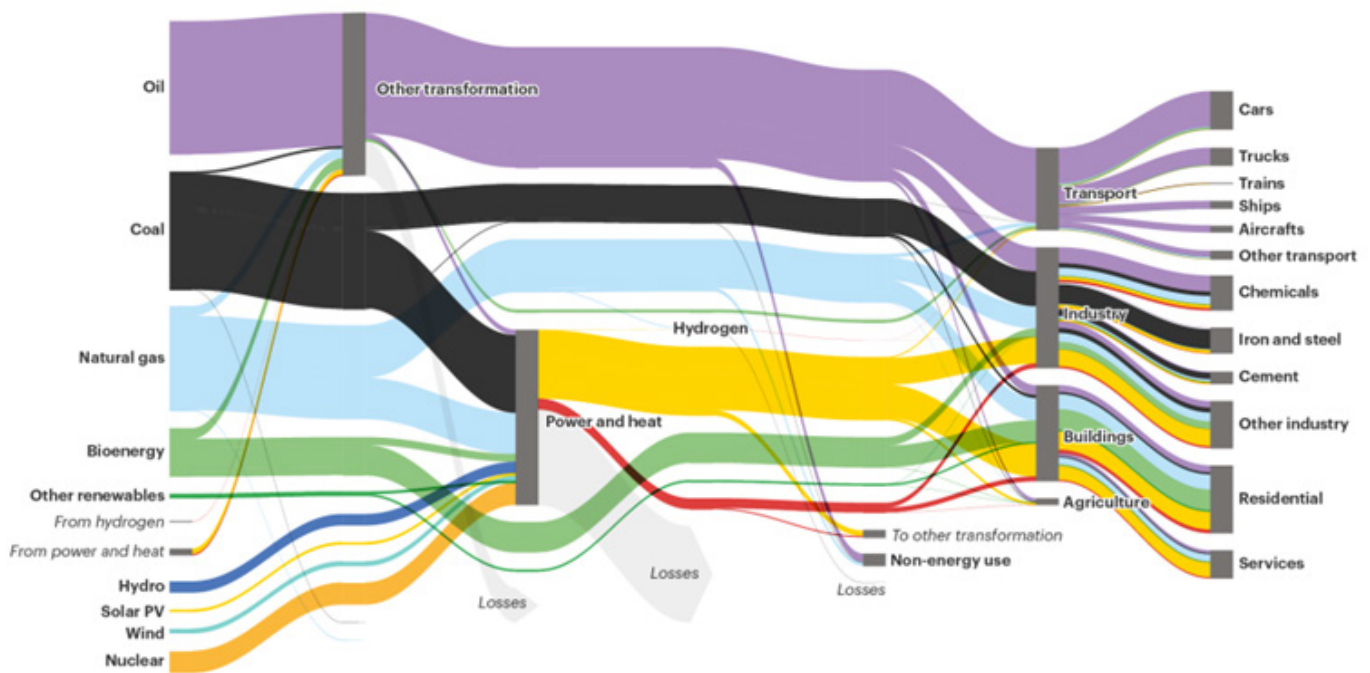
The fossil fuel system sees producers extract coal, natural gas, and oil. These fuels may then be processed or transformed, notably through the refining of crude oil to produce a range of petroleum products (e.g. gasoline, diesel, kerosene, fuel oil, liquefied petroleum gas—LPG) and through plants which generate electricity (and sometimes heat), principally from coal or natural gas, for distribution. Refined petroleum products, electricity, heat, coal, natural gas, and oil are then transported to final consumers. These consumers use energy for a variety of purposes (e.g. for heating, cooking, industrial processes) within a number of sectors: industry, transport, residential, (commercial and public) service, non-energy uses (largely feedstocks for industrial processes such as fertilizer production), and others.

Figure one depicts global energy flows in 2021. Some of the key insights shown are:

- Oil, coal, and natural gas were the main sources of primary energy, with bioenergy and renewable sources, including hydro, solar photovoltaic, and wind, playing an increasing role.

- The majority of oil is transformed and used in the transport sector (where cars are the largest consumer) and in chemicals and other industries.
- The majority of coal is used in power generation, although the iron and steel and cement industries remain major consumers.
- Just over half of natural gas is used directly by a range of consumers, including residential, chemicals, and other industry.
- Industry, transport, and residential are roughly equal in terms of final consumption of the range of fuels and energy carriers, with services significantly lower.
- A large majority of electricity continues to be generated from fossil fuels, primarily coal and natural gas. While “new” renewables (solar photovoltaic and wind) are growing very strongly and now represent the majority of new power capacity installed, their share in generation is just over 10%.
- Non-energy uses of fossil fuels (industrial feedstocks) are a minor share globally, of the order of 2% of final consumption.

Figure 1. Global Energy Flows (2021)



Source: IEA (2023a).

1.2 Trade of Fossil Fuels

Both crude energy (oil, coal, and natural gas as extracted) and transformed products can be traded across international borders. Table 1 shows that the scale of energy trade is very high. Around 50% of upstream oil was traded in 2018, with a value approaching \$1 trillion. Petroleum products from refining saw trade valued at approximately \$800 billion, with the level of competitiveness of this market rated as very high. Intensive products (i.e. those which use a large amount of energy and/or electricity in their production) are also highly traded, resulting in large flows of energy and/or electricity “embedded” in these products crossing borders. Taken together, trade of

crude (upstream oil, gas, and coal) and other products in the table totalled approximately \$3.5 trillion in 2018, representing 15–20% of total global merchandise trade.² Because crude and refined products are bulky (i.e. with a high volume compared to their value), fossil fuels represent a significantly higher share by volume.

At present, a very small share of electricity is traded across borders,³ with most countries retaining strong sovereignty over their electricity systems and interconnections between them remaining very limited. More electricity is traded by being “embedded” into electricity-intensive products such as aluminium and copper (where large amounts of electricity are used to smelt the metal from its ore).

Table 1. Affected Markets and Trade Exposure (2018)

Affected Market	Annual Trade Volume (% of global prod.)	Annual Trade Value (\$, 2018)	Competitive Density	Key Trade Impact
Upstream oil	~ 50%	943 billion	High	Battle for market share
Upstream gas	~ 25%	299 billion	High	Battle for market share
Upstream coal	~ 16%	124 billion	Medium	Battle for market share
Electricity	Very small	35 billion	Small	Obstruction for market share
Petroleum products	~ 15%	799 billion	Very high	Battle for market share; smuggling of refined fuels
Energy-intensive industry	Industry-dependent	> 1 trillion	Very high for key industries	Battle for market share
Electricity-intensive industry	Industry-dependent	> 300 billion	Very high for key industries	Battle for market share

Notes: (1) Estimates of trade value represent minimum values since they are based on a conservative accumulation of HS6 (Harmonized System) product identification codes; (2) Competitive density is about the concentration of both importing and exporting countries, with a high density (corresponding to a low concentration rate) indicating more dispersed trade; (3) Battle for market share is about the battle within dedicated fossil fuel markets, but also against potential alternatives such as renewable energy (for example by crowding out investment).

Source: Moerenhout and Irschlinger (2020).

2. Global merchandise trade in 2018 was estimated as \$19.48 trillion (WTO, 2019).

3. The share of traded electricity was estimated to be 2.8% of electricity supplied in 2018 (IEA, 2020).

2. What Are the Main Types of Fossil Fuel Subsidies and Why Are They Granted?

Fossil fuel subsidies are granted to both consumers and producers of fossil fuels across all stages of the energy system. This can include transformation (notably refineries and electricity generation) and throughout the transport, storage, and distribution stages.

Table 2 summarizes the main types of FFS, their aims and objectives, and how they may be targeted. The manner in which FFS are targeted will further affect both their impacts and costs to the public budget. Well-targeted subsidies are focused on the particular recipients the government wishes to support rather than to all consumers or producers. Targeted subsidies can therefore be significantly cheaper for governments to provide.

Consumer Fossil Fuel Subsidies

A significant proportion of FFS globally are granted to make fossil fuels cheaper for transport, notably gasoline and diesel in private cars and other vehicles. They are typically delivered by governments by fixing prices below what they would be in free market conditions, often through regulations (e.g. price caps). These FFS have the stated aim of supporting mobility of business and private consumers. Governments may subsidize transport fuels in order to help control inflation and with the objective of shielding consumers from economic shocks, which rapid rises in fossil fuel prices (principally generated by global markets) would otherwise induce.

Similarly, consumer FFS for uses in other sectors aim to support livelihoods or incomes by making energy more affordable, especially when energy prices are high or rising sharply. Consumer FFS are often delivered through intermediaries, for example fuel distributors and suppliers, pipeline operators, refineries, and electricity generators.⁴ Governments can require such operators to provide fuels or services at below market prices, and then may either make

payments to these operators or leave them with lower revenues. In either case, consumers are receiving fuels at below market rates and are being subsidized.

Governments may also use FFS to increase energy access to modern fuels such as electricity or LPG (“bottled gas”), for example by fully or partially paying for new connections. The use of modern fuels can improve the health of consumers otherwise exposed to fumes from combusting biomass or other traditional fuels and can improve their economic opportunities. However, even these subsidies can be problematic. If untargeted, they tend to be regressive and may also lead to serious budget implications. Moreover, LPG and electricity subsidies often do not reach the poorest who might not have a connection or be able to afford even the subsidized energy (especially in rural areas).

In practice, it can be difficult to distinguish between the aims and objectives of a particular FFS or of a wider programme of FFS. Stated aims and objectives may differ from their actual aims and objectives, with governments for example stressing energy access to gain political support when this may represent a small part of the ultimate aims. The aims and objectives of the subsidies may also be dated. Many FFS for example have been in place for many years and economic, environmental, and societal conditions, and hence the impacts of the subsidies, may have significantly changed.

If consumer subsidies are to be targeted (noting that they could be removed and replaced by alternative approaches such as cash transfers), this could be done through any combination of sector, fuel, income, or geographical area. For example, a subsidy may be granted only to transport fuel consumers in rural or fishing communities, and further targeted to low-income consumers, or be granted to residential

4. Many electricity utilities fail to cover their costs, including only two in sub-Saharan Africa (McCulloch, 2023).

electricity consumers who consume below a certain volume of electricity. Even in such cases, unintended consequences could arise, with for example subsidized diesel or other fuels being smuggled to other countries.

Producer Fossil Fuel Subsidies

Most producer FFS are granted to reduce costs to domestic producers, such that they can increase production and hence economic activity. Subsidies may also enhance government revenues if higher tax revenues from increased production are greater than the government's expenditure on subsidies (Laan, 2023a). Another reason for granting FFS to producers is to increase security of supply of particular fossil fuels, and thereby security of energy supply more generally. In practice, it can be hard to fully disentangle whether producer FFS are being put in place to increase economic activity or security of supply, or a combination of both.⁵ However, it should be noted that there are a range of other available options to increase security of supply, which may be more effective (better targeted) or more efficient (cheaper) than lowering production costs. Table 2 highlights some of these options, which include increasing imports and facilitating trade, diversifying the energy mix, improving the storage and distribution of fossil fuels, and increasing the resilience of the energy system against shocks such as weather events or risks including those from industrial action.

Support to increase production can be granted in many ways, with the most common being some form of tax expenditure. Here, parts or all of the industry are granted preferential tax terms against those that would normally be applied, for example reduced tax rates, a tax "holiday" (a period within which taxes are not due), or accelerated depreciation of assets. Such preferential treatment is often granted to a particular class of fields, for example those in a specific geographical area. FFS can also be delivered using other mechanisms, for example the government may undertake, or pay for, seismographic or other research to support the industry.

Other producer FFS may aim to reduce the sector's environmental impacts, for example by reducing leaks or venting of methane or converting oil platforms to use more electricity. Subsidies may also take on post-production liabilities, for example costs required to keep coal mines pumped out and safe, health costs from "black lung" or other occupational diseases, or pension liabilities from workers employed by the industry. These two categories of subsidies may increase production as they send a message to current and future producers that the government may take on costs otherwise due.

As with consumer subsidies, there are alternatives to producer subsidies for governments to achieve their aims; be these increased economic activity, reduced emissions, increased security of supply, or other priorities. If producer subsidies are to be retained, targeting can be pursued through a combination of stage, fuel, production category, or geographical area. Subsidies are generally targeted to some degree, with common mechanisms being the reduction of taxes due from producer classes (e.g. relatively small oil fields) or by geographical area (e.g. new or remote areas).

Political Expectation of Fossil Fuel Subsidies Being Granted and Maintained

The price of energy (e.g. the price at the pump of gasoline or the price of electricity or of natural gas for home heating or industry) can be highly important politically. Whether reasonable or not, large parts of the population often expect their government to be able to control energy prices. While the cost of other goods and services are also volatile and strongly influenced by changes in global market prices, energy costs are highly visible and can be a major component of the cost of living to many households or of the cost of production for some sectors of industry. The reaction of developed countries to high prices in 2022 illustrates this political imperative, with many countries introducing extensive consumer FFS for the first time in decades (Laan & Steenblik, 2023).

5. Many commentators note that producer FFS can also be used to distribute economic rent to politically favoured organizations and individuals. See for example McCulloch (2023).

Similarly, at times of low global fuel prices, producers will often demand subsidies on the basis that otherwise (in their view) industries may experience significant losses and thereby be forced to cut production and the workforce or relocate to another

country.⁶ Again, the politics are sensitive and governments are often minded to positively respond to requests for support, which can often result in new or increased FFS.

Table 2. Key Types of Fossil Fuel Subsidies, Their Aims and Objectives, and How They Can Be Targeted

Recipient	Aim	Objective	Examples of Fossil Fuel Subsidies (Government Interventions)	Targeting Options
Consumer	Make fossil fuels cheaper for transport	<ul style="list-style-type: none"> Support mobility Control inflation/limit impact of shocks 	Fix prices for gasoline, diesel, etc. below what they would be in a free market. Could be by reducing taxes below normal rates. Could also be delivered through subsidies to fuel distributors. May be applied only in periods of high prices	<ul style="list-style-type: none"> Sector (e.g. transport, residential, industry) Fuel (e.g. LPG, electricity) Income (e.g. focus on poorest)
	Make fossil fuels cheaper for other consumers*	<ul style="list-style-type: none"> Increase household or business incomes/reduce cost of living Control inflation/limit impact of shocks 	Fix prices for natural gas, heating oil, coal, electricity, etc. below what they would be in a free market. Could be by reducing taxes below normal rate. Could also be delivered through subsidies to fuel or electricity distributors. May be applied only in periods of high prices	<ul style="list-style-type: none"> Geographical area (e.g. remote or disadvantaged areas) Sector (e.g. transport, residential, industry) Fuel (e.g. LPG, electricity) Income (e.g. focus on poorest)
	Increase energy access to modern fuels	<ul style="list-style-type: none"> Improve health (air quality, indoor temperature), quality of life, safety Increase economic opportunities 	Subsidize grid development and connections of electricity or natural gas. Subsidize connections to LPG.	<ul style="list-style-type: none"> Geographical area (e.g. remote or disadvantaged areas)

*All non-transport consumers including residential, industry, commercial and public services, agriculture, and fishing.

Source: Author’s elaboration.

6. Low fuel prices occurred in 2020 for example, when the COVID pandemic significantly reduced global activity.

Table 2. Key Types of Fossil Fuel Subsidies, Their Aims and Objectives, and How They Can Be Targeted (Continued)

Recipient	Aim	Objective	Examples of Fossil Fuel Subsidies (Government Interventions)	Targeting Options
Producer	Reduce costs to producers to encourage more production	<ul style="list-style-type: none"> ■ Increase domestic production (and hence economic activity, and thereby government revenue) ■ Improve security of supply** 	Wide range of forms including reduction of taxes which would normally be due, reduction of taxes on imported equipment, government provision of information or R&D, insurance, bail outs, non-application of social and environmental norms and standards. Can include subsidies to refining, pipeline, and storage stages.	
	Support improved environmental performance**	<ul style="list-style-type: none"> ■ Reduce emissions of greenhouse gases, notably methane (CH₄) and local pollution (especially from onshore facilities) 	Support the implementation of emission reduction solutions and equipment, for example reducing leakage and venting of methane, electrostatic precipitators.	<ul style="list-style-type: none"> ■ Stage (e.g. exploration, refining, pipelines, storage) ■ Fuel (coal, natural gas, oil) ■ Specific categories of production (e.g. marginal fields) ■ Geographical area (e.g. remote or disadvantaged areas)
	Support post-production costs**	<ul style="list-style-type: none"> ■ Deal with liabilities related to facilities, the workforce, communities 	Governments pay pensions of industry workforce, health costs from exposure to dust and other pollutants, maintenance and clean-up costs of wells, mines, platforms.	
	Increase security of supply, across the fossil fuel system***	<ul style="list-style-type: none"> ■ Increase economic and social resilience 	Governments invest in diversifying the energy mix; making the energy system more resilient to inclement weather and climate change; increasing storage and the capacity of the fossil fuel pipeline and distribution network; increasing interconnections to other countries.	

** Could also be included in first producer aim (“Reduce costs to domestic producers”) as it can be argued that these costs should be borne by producers rather than government, and that government contributing to these costs encourages current producers not to make provisions against them.

***Security of supply can be improved in many ways other than increasing domestic production, including non-technical options (e.g. labour relations). It is therefore included as a separate aim.

Source: Author’s elaboration.

3. How Big Are the Main Types of Fossil Fuel Subsidies?

To support discussions on which subsidies are the largest and hence, other things being equal, would be the most important to reform, this section provides an overview of the main types of FFS. It refers to and uses some of the key classifications of FFS.⁷

3.1 Fossil Fuel Subsidies Data Availability

The availability of data on FFS varies widely across countries and subnational jurisdictions. Ideally, data would be generated by national governments and presented with full transparency—i.e. such that the data and assumptions behind them are clear and easy to understand.

In practice, few national governments generate and publicize data in this manner.⁸ Where information does exist, it is often indirect, for example referring to certain policies and measures but without classifying them as subsidies. How much these policies and measures cost is often not calculated or made public. As noted, assessments of actual or likely impacts of FFS, or from their reform, are scarce.

While there is relatively little nationally generated FFS data available, a number of organizations produce and maintain FFS data for a wide range of jurisdictions. Non-governmental organizations (NGOs) typically produce ad hoc estimates of FFS in certain countries, sometimes focused on particular sectors or fuels.⁹ Intergovernmental organizations (IGOs) have developed and published estimates of FFS for a much wider range of jurisdictions over the previous 20 years or so, with the two main resources being:

1. *OECD inventories of support measures for fossil fuels.* The Organisation for Economic Co-operation and Development (OECD) provides estimates of “support measures for fossil fuels” (which overlap very closely with FFS¹⁰) developed through their production of an inventory covering 51 countries. This inventory is based on OECD-led research, using available official data from budgets and from the policies and measures which constitute FFS that a country has in place, estimating their annual values where government data exist (in a significant number of cases it does not).¹¹ Detailed information on each measure included within the inventory is available for public download, along with accompanying country notes (OECD, n.d-c; OECD, 2023).
2. *“Price-gap” estimates of global consumer subsidies.* The International Energy Agency (IEA) and International Monetary Fund (IMF) provide estimates of consumer subsidies only, using the price-gap method (which compares prices charged to consumers to calculations of what prices would be in a free market environment) (IEA, 2023b; IMF, n.d.). These estimates are available for a much wider number of countries than the OECD inventories. The IMF also provides a “post-tax” estimate, which adds selected external costs from fossil fuel use (notably contributions to climate change and local air pollution) to the “pre-tax” estimates. This makes them roughly an order of magnitude higher (i.e. pre-tax estimates may be of the order of \$500 billion per year globally and post-tax \$5 trillion).

7. Further details on classification can be found in World Trade Organization, Fossil fuel subsidy reform (FFSR) classification of fossil fuel subsidy measures: Note by the Secretariat, WTO Doc. INF/TE/FFSR/W/2 (July 7, 2023).

8. Examples of good practices include Sweden, Finland, and the State of Hesse in Germany, among others (Gerasimchuk et al., 2017a).

9. See for example the Global Subsidies Initiative (n.d.) of the International Institute for Sustainable Development (IISD) and SOMO et al. (2023).

10. The OECD’s Inventory of Support Measures for Fossil Fuels includes general support subsidy estimates (GSSE) as well as producer support estimates and consumer support estimates. At least some GSSE may not qualify fully as subsidies to fossil fuels under WTO or other definitions, as they are not specific to fossil fuel use only (for example subsidies to port operations could benefit a range of products and sectors). GSSE typically represent a relatively small share of the total value in the inventories (less than 10%).

11. Around one-third of subsidies identified in the OECD Inventory of Support Measures for Fossil Fuels are typically unquantified.

Only the IMF produces such “post-tax” estimates, with other organizations arguing that, while external costs from fossil fuel consumption should be included within decision-making, they do not constitute a fossil fuel subsidy.

OECD inventories and pre-tax estimates of consumer subsidies have been collated into a single database by OECD and IISD (n.d). The database details the definition of subsidies used and explains what is included and how.

Looking forward, Sustainable Development Goal (SDG) Indicator 12.c.1 asks countries to report their FFS annually. The methodology developed by the United Nations Environment Programme (UNEP) to guide this reporting was adopted by the relevant UN bodies (UNEP, 2019). It envisages a two-stage process whereby countries would first use internationally generated FFS data to form their annual submission of national FFS estimates, progressively moving to nationally generated data.

3.2 What is a Fossil Fuel Subsidy? Definitions

A subsidy represents preferential treatment granted to an individual, organization, economic sector, or other category of users. Subsidies can also be granted to all users—e.g. the government could issue a regulation which required gasoline to be sold at a price fixed below free market levels to all consumers in a country.

There is no strong debate as to what constitutes a fossil fuel, with a recommendation and some of the main definitions and sources contained in the methodology report supporting SDG 12.c.1 (UNEP, 2019). This report includes electricity generated from subsidised fossil fuels within its scope.

The methodology report also summarizes the most commonly used definitions of what constitutes a fossil fuel subsidy. It recommends using the definition under Article 1 of the WTO Agreement on Subsidies and Countervailing Measures (SCM Agreement).¹² It defines subsidies as involving a financial contribution from government, which can take four forms, ranging from the direct transfer of funds (e.g. from government budget lines) to the government taking on risk from a fossil fuel operator (see Table 3). Importantly, the second category, “induced transfers (price support)”, includes FFS where governments regulate prices for consumers. The definition is not restricted to specific subsidies within the meaning of Article 2 of the SCM Agreement but also covers subsidies that are generally available.¹³

The recommended definition is applied by the OECD in its inventories, and the price-gap estimates of consumer subsidies are also covered by it (under the second category). The IEA uses a definition which has a reduced scope, limited to policies and measures which affect either the costs of fossil fuels to consumers or the costs of fossil fuels to producers.

While the view that there is no agreed definition of FFS has often been raised, in practice the WTO’s SCM Agreement applies to its 164 members (as of March 2024), and the use of the definition is also recommended by the SDG 12.c.1 methodology report, which has been approved by the Inter-agency and Expert Group on SDG Indicators (UN, n.d.). Where there is debate is around certain elements of scope and around which benchmarks should be used to measure FFS—the definitions do not go into this level of detail. The foci of the principal discussions are discussed in Box 1.

12. Marrakesh Agreement Establishing the World Trade Organization annex 1A (“SCM Agreement”), Apr. 15, 1994, 1867 U.N.T.S. 154.

13. Under the SCM Agreement, multilateral disciplines and the possibility to adopt countervailing measures only apply to subsidies that are specifically provided to an enterprise or industry or group of enterprises or industries as opposed to those that are generally available.

Box 1. Principal Debates Around Fossil Fuel Subsidy Definitions

■ *Scope*

- Certain stakeholders have a view that FFS categories outside those which involve direct transfer of funds or, sometimes, induced transfers (price support), should not be included. This would preclude the vast majority of producer subsidies, which are generally granted using tax expenditure (income that would have otherwise accrued to government).
- The definitions do not state whether external costs from fossil fuel use (e.g. from global warming or local air pollution) should be included within the scope (or not) if they are not internalized.¹⁴ All IGO work excludes such non-internalized external costs except for the IMF’s “post-tax” estimates. Including external costs would mean that subsidy estimates are higher than the fiscal savings which governments could make by removing them. External cost estimates are also uncertain and can be controversial, distracting attention from the fiscal cost.

■ *Benchmarks*

- Benchmarks in most FFS assessments of consumer subsidies are based on comparing

the price paid by consumers to a benchmark of what the free market price would have been. This benchmark corresponds to the “opportunity cost” of the fossil fuel—i.e. what it could have been sold for to another consumer (who may be abroad). Some countries and organizations, notably those representing oil and gas producers, have at times advocated that the benchmark should instead be based on the cost of production of the fossil fuel in question.

- Benchmarks are based on domestic costs and conditions. It has been proposed that some FFS should be compared to international benchmarks, for example those relating to upstream oil and gas production or to carbon and energy taxes. While this approach has attractions, it is very difficult to choose which benchmarks should be used in practice.

Some of the debate purportedly around Fossil Fuel Subsidy definitions is a conflation of subsidy identification and measurement with their evaluation. Ideally, FFS should be identified and measured before being evaluated as to whether they are “good” or “bad” public policy; after which their reform can be considered.

14. A cost is internalized when the external cost of damage is included in the price paid, for example by the use of a carbon tax.

Table 3. The Four Categories of Fossil Fuel Subsidies Under the WTO SCM Agreement, With an Assessment of Data Availability, Complexity, and Acceptance

Subsidy Category	Data Availability	Complexity	Acceptance
Direct transfer of funds	++	++	++
Indued transfers (price support)	+	+	++
Tax expenditure, other revenue foregone and under-pricing of goods and services	+	0	+
Transfer or risk	-	-	0

++ (green) means “excellent” or “low degree of complexity”
 0 (orange) means “neutral”
 ++ (yellow) means “good” or “moderate degree of complexity”
 - (red) means “poor” or “difficult”

Source: UNEP (2019).

3.3 Scale of Fossil Fuel Subsidies

Here we discuss the two main sources of IGO FFS estimates introduced in section 3.1: the OECD inventories and the price-gap estimates.

OECD Inventories of Fossil Fuel Support Measures

The OECD inventories cover 51 countries and include estimates of both consumer and producer subsidies. Full details of each individual subsidy are publicly available (OECD, n.d.). While producer subsidies are included, they are more difficult to identify and to measure than consumer subsidies so we may expect them to be relatively underrepresented in terms of the number of subsidies included and their scale. Across all subsidies in the OECD inventories, approximately one-third of those FFS identified are not quantified. The work of the Council on Economic Policies and others have shown that, while some countries have comprehensive tax expenditure reports detailing mechanisms and quantifying them, many other countries have much less comprehensive reports or may not report at all.¹⁵ The existence of such reports is

important for estimates as the OECD only uses official government figures in its inventories.

Support measures were estimated to be in the order of \$200 billion per year over the period 2010–21 (see Figure 2). Variations between years are driven both by changes in global fuel prices, particularly the global oil price, and by progress countries make in subsidy reform.

Transportation, fossil fuel production, and other (consumption sectors) were the largest contributors. Electricity generation refers to the use of subsidized fossil fuels in electricity generation; in practice, it can be hard to differentiate some of this support from fossil fuel production, for example when coal mines and electricity generating plants are located on the same site and are essentially part of a single activity.

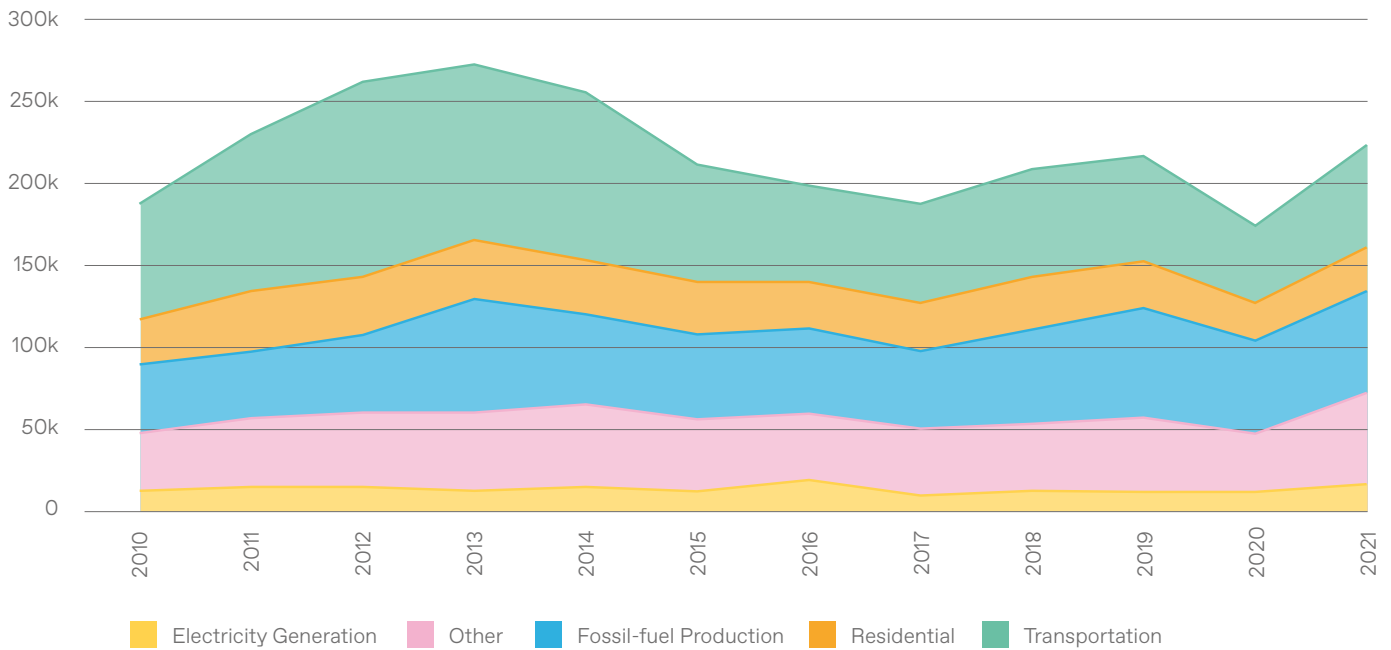
Fossil fuel production subsidies ranged from \$57–71 billion over the period 2018–21.¹⁶ Fossil fuel production from the 51 countries represents around one-half of global production (e.g. none of the OPEC members are included in the inventories). If the level of subsidization is similar in other producers as it is in the 51 countries,¹⁷ we can assume that global producer FFS could be of the order of \$125 billion.

15. See Council on Economic Policies (n.d.) for more details.

16. 2022 data from the OECD inventory was not available at the time of writing. Because of the very high global fossil fuel prices and governments' responses to them, 2022 data will be an outlier to the longer-term trends.

17. Anecdotally, it is understood that the balance sheets of state-owned enterprises are supported on an ad hoc basis in many developing countries (McCulloch, 2023).

Figure 2. Fossil Fuel Support in OECD Inventories of 51 countries, by Sector (2010–21, \$ million)

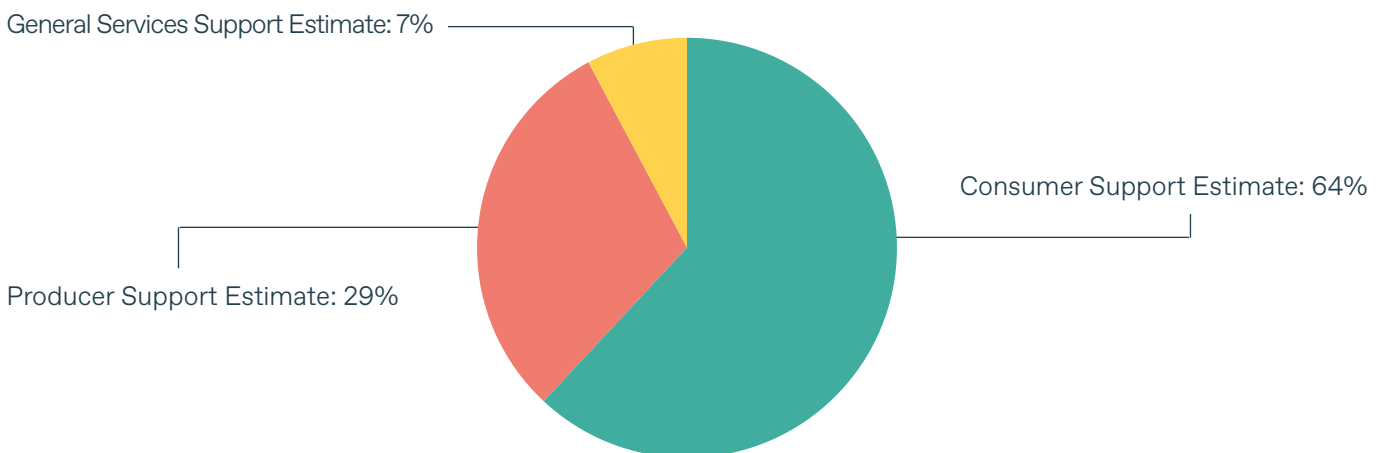


Source: OECD (n.d.).

Figure 3 disaggregates support measures in the 51 countries by type in 2021. Consumer FFS are about two-thirds of the total, with producer subsidies just under 30% and general support 9% of the total.

In terms of mechanisms used, almost all producer subsidies are delivered through tax expenditure. Globally, consumer subsidies tend to be mostly induced transfers (price support) with a significant share of direct transfer of funds.

Figure 3. Fossil Fuel Support in OECD Inventories of 51 countries, by Type (2021, %)



Source: OECD (n.d.).

Box 2. The Special Case of International Aviation and International Maritime

There is a general expectation that all goods and services should be taxed to contribute to government income and for a range of other reasons including internalizing external costs from pollution. Box 1 presented arguments on how to set the appropriate benchmark against which the existence and scale of a subsidy can then be calculated.

International aviation and international maritime present a special case in that taxes on fuels used (notably kerosene for aviation and variants of heavy fuel oil for maritime) are almost exclusively not subject to any taxation, thereby giving them a relative advantage compared to other forms of transport which are generally taxed, sometimes to significant levels (e.g. road fuel transport taxes in much of Europe). Taxation on fuel arriving in a plane or a ship travelling anywhere “on the high seas” are precluded through international conventions (the Convention on International Civil Aviation [Chicago Convention] for air travel and United Nations Convention on the Law of the Sea for maritime travel). Countries almost

entirely impose zero taxation on refuelling on their territories for reasons including competitiveness and the perceived value to their economies of reducing the costs of travel and transporting goods. However, many countries now impose a range of taxes of varying value on passengers taking flights from their territories (Faber, 2018).

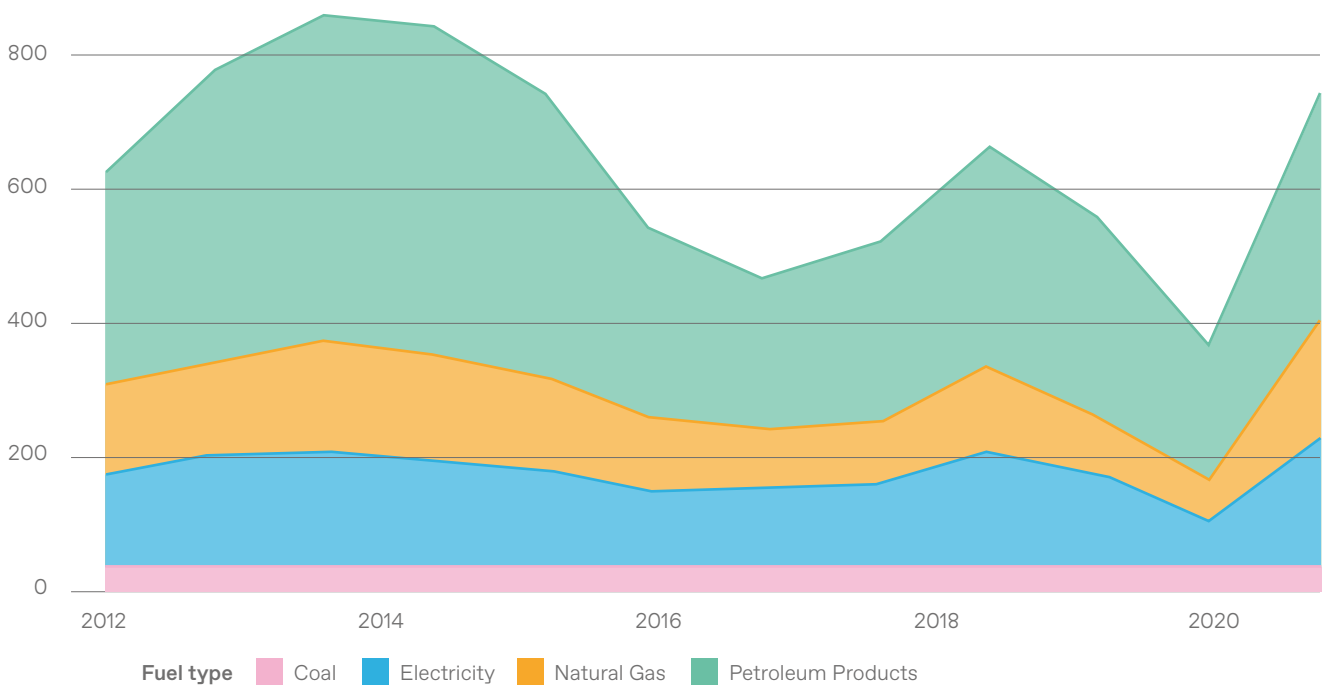
In some subsidy inventories (for example that of the Netherlands), the lack of taxation on international fuels is viewed as a subsidy, with values calculated against a benchmark (generally the rate of taxation on fuel used in other comparable activities). In such cases, calculated subsidies are generally a significant share of total subsidies; for example the Netherlands estimate in 2020 was that FFS from international aviation tax exemptions cost the government €2.45 billion (OECD & IEA, 2020). More widespread inclusion of subsidies from international aviation and international maritime could therefore be expected to add significant additional consumer subsidies to the totals discussed in this report.

Adding in Price-Gap Estimates of Global Consumer Subsidies

The Fossil Fuel Subsidy Tracker database by OECD and IISD (n.d.) combines the estimates from the 51 OECD country inventories (covering both consumer and producer subsidies) with consumer subsidies

from more than 100 other countries. Figure 4 shows the resulting estimates for the period 2010 –21. Typical annual subsidies are of the order of \$600 billion, with relatively high variability between years since a higher proportion of the subsidies are consumer subsidies (and are therefore very strongly linked to global fossil fuel prices).

Figure 4. Fossil Fuel Subsidies Globally, by Fuel (2010–21, \$ billion)



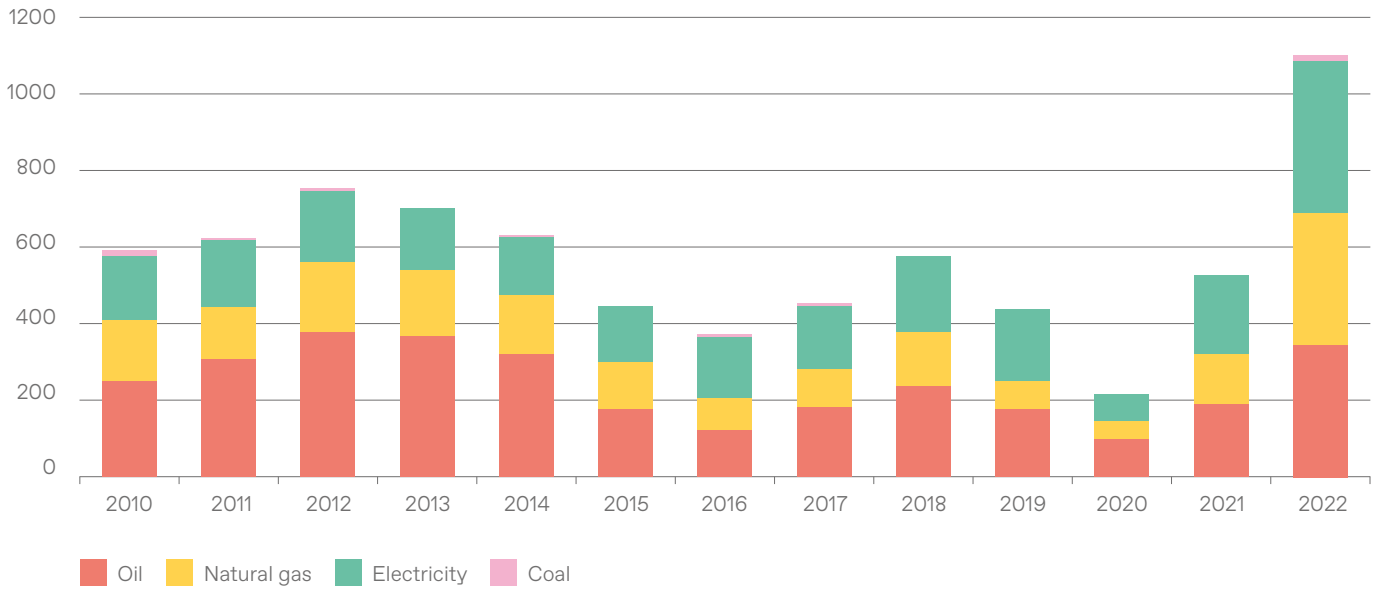
Source: OECD (n.d.).

Major Increases in Consumer Subsidies in 2022

2022 saw huge increases in consumer subsidies as many countries—including many developed countries which had had little or no consumer FFS for many years—rolled out huge support programmes in response to the high electricity, natural gas, and oil prices their consumers were facing. These high prices were driven by the war in Ukraine compounding existing supply constraints. Figure 5 shows IEA estimates where global consumer subsidies doubled

between 2021 and 2022, from approximately \$550 billion to \$1.1 trillion, by some distance their highest level in the period from 2010. Natural gas and electricity subsidies were the main drivers of this growth. That governments provided such increased support to consumers shows both how seriously they take fuel affordability and the lack of alternatives to fossil fuels that consumers have in many sectors and applications. Many of the FFS introduced were only slightly targeted, if at all.

Figure 5. Fossil Fuel Consumption Subsidies, by Fuel (2010–2022, \$ billion)



Source: IEA (2023b).

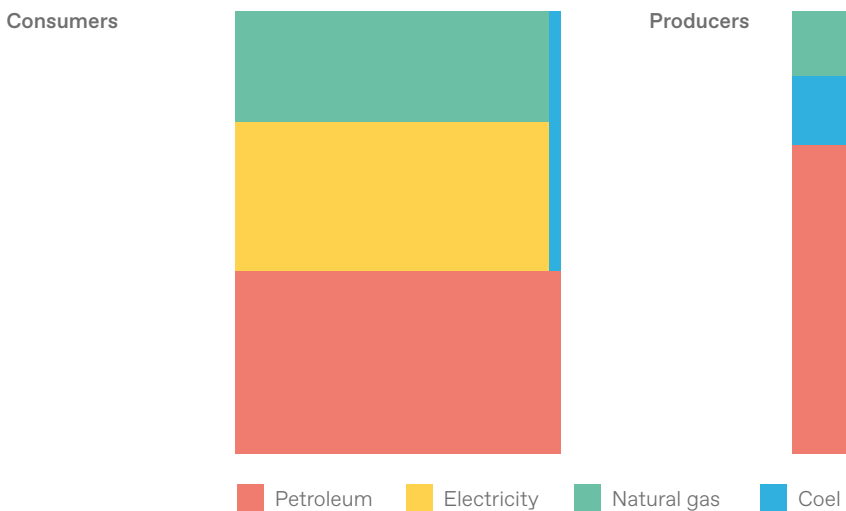
3.4 Largest Subsidies by Type

By Recipient and By Fuel

Combining estimates globally for 2021 leads to the shares shown in Figure 6. Consumer subsidies represent around 85% of the global total, with petroleum the

largest share of that total followed by electricity and natural gas. Although the share of coal is low, the relatively high external costs of coal combustion are notable. Of the 15–20% of the global total that producer subsidies account for, approximately 70% is granted to petroleum, with 15% each to coal and natural gas.

Figure 6. Estimate of Global Shares of FFS, by Recipient and Fuel (2021)



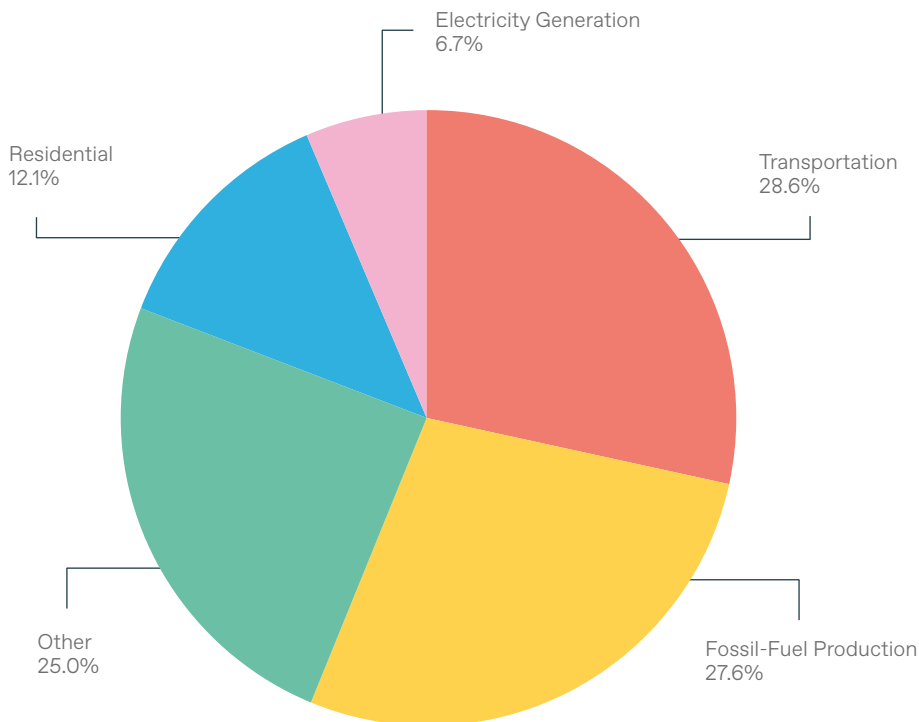
Source: Author estimates based on data from OECD (n.d.) and OECD and IISD (n.d.).

Consumer Subsidies By Sector

Information on which sectors receive FFS is available in the OECD inventories. Figure 7 shows these data for 2021, which covers consumer sectors as well as

subsidies to electricity generation and to fossil fuel production. Among consumer sectors, transportation is the largest source of FFS by value (28.6%), followed by other (i.e. consumption sectors other than transport and residential—25%) and residential (12.1%).

Figure 7. Fossil Fuel Support in OECD Inventories of 51 Countries, Including by Consumer Sector (2021, %)



Source: OECD (n.d.-a)

Figures by sector are not available in the IEA and IMF consumer subsidy estimates, but we can approximate estimates from the share of fuels subsidized, with petroleum subsidies predominantly being granted to transportation, electricity predominantly to residential, and natural gas being mixed. Combining these consumer subsidies with the OECD inventory figures, it is estimated that around one-third of global consumer FFS go to transportation and that residential FFS make up the majority of the remainder (see Table 4).

Of note is that the majority of consumer FFS are not well targeted. Typically, transport subsidies apply to the majority or all fuel users, with wealthier consumers receiving most of the benefits (based on their higher relative consumption levels). Electricity subsidies are often targeted to lower volume consumers in developing countries, but again most or all consumers typically benefit. Regarding the aims and objectives of FFS (see Table 2), only a small share of consumer FFS are typically targeted at improving energy access.

Table 4. Approximate Share of Global Consumer Fossil Fuel Subsidies, by Sector (2021)

Consumption Sector	Share of Global Consumer FFS	Share of Global Total FFS
Residential	37%	30%
Transport	33%	25%
Commercial and public services; Industry; Other	25%	21%
Non-energy uses	5%	4%
Total	100%	80%

Source: Author estimates.

Producer Subsidies by Stage

In the OECD inventories of 51 countries, two stages of production have dominated subsidies over the past decade: extraction or mining (approximately 75% of the total) and refining or processing (approximately 25% of the total). A very small share of FFS in the OECD database are granted to the transportation of fossil fuels.

Many producer subsidies are targeted, typically to fuels and to specific types of fields. This targeting takes place within subsidies, which are granted to reduce costs to producers to encourage more production (the first aim in Table 2). Few subsidies

in the OECD inventories are targeted at the other principal aims identified in Table 2 (i.e. support improved environmental performance; support post-production costs; increase security of supply, across the fossil fuel system).

Priorities for Reform by Size

In an average year over the period 2017–21, approximately 70% of FFS globally were granted to three categories of FFS: residential consumers (approx. 30%), transport consumers (approx. 25%), and oil and gas producers (approx. 15%). Without progress in these three categories, the scale of global FFS, and the adverse impacts they cause, will remain high.

4. What Are the Impacts of Different Forms of Support?

Section 2 presented the aims and objectives of FFS—i.e. the reasons why governments institute them. Yet FFS also lead to adverse impacts, principally because they induce increased consumption (use) of fossil fuels. This is driven by FFS making fossil fuels cheaper and because FFS lead to such fuels being more competitive compared to cleaner options (e.g. renewable energy). A proportion of fossil fuel production projects would be uneconomic without subsidies, and increased supply of fossil fuels has been demonstrated to increase consumption.¹⁸

4.1 Adverse Impacts of Fossil Fuel Subsidies

The Intergovernmental Panel on Climate Change (IPCC) summarize the impacts off FFS in their 6th Assessment Report as follows (IPCC, 2023):

“Removing fossil fuel subsidies would reduce emissions, improve public revenue and macroeconomic performance, and yield other environmental and sustainable development benefits such as improved public revenue, macroeconomic and sustainability performance; subsidy removal can have adverse distributional impacts especially on the most economically vulnerable groups which, in some cases, can be mitigated by measures such as re-distributing revenue saved, and depend on national circumstances (high confidence). Fossil fuel subsidy removal is projected by various studies to reduce global CO₂ emissions by 1–4%, and GHG emissions by up to 10% by 2030, varying across regions (medium confidence).” (WGIII AR6).

Environmental Impacts

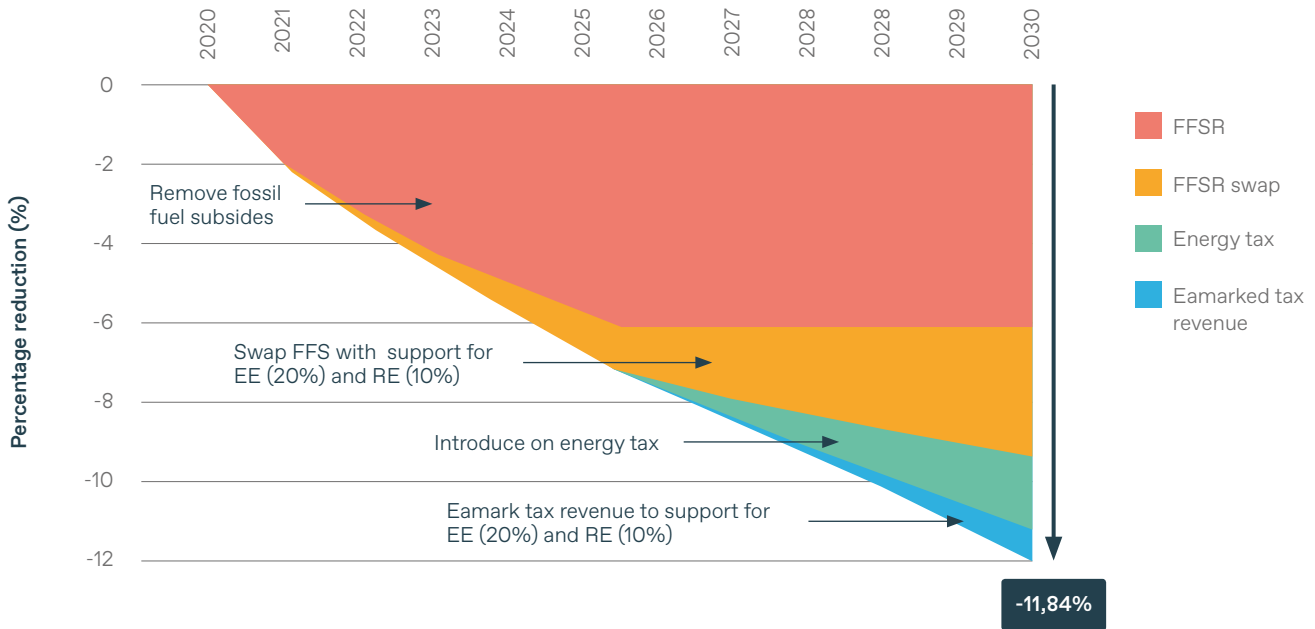
Skovgaard and van Asselt (2019) summarize the impacts FFS have on greenhouse gas (GHG) emissions as follows:

“Fossil fuel subsidies also drive greenhouse gas emissions in at least two different ways. First, by directly encouraging the burning of fossil fuels, subsidies lead to carbon dioxide (CO₂) emissions. The International Energy Agency suggests that subsidies for fossil fuel consumption accounted for 13% of global CO₂ emissions in 2014, whereas Stefanski suggests that cumulative CO₂ emissions over the period 1980–2010 would have been 21% lower if it was not for fossil fuel subsidies. Regarding production subsidies, specifically the US government’s tax breaks to the oil and gas industry, Erickson et al. suggest that ‘the CO₂ emissions associated with subsidy-dependent future U.S. oil production are equivalent to 1% of the remaining carbon budget for the entire world’ [...]. Second, fossil fuel subsidies contribute to institutional, political, technological and behavioural carbon lock-in by offering support to fossil fuel production and use at the expense of lower-carbon alternatives.”

Figure 8 is an estimate of the GHG emissions that could result from FFS reform. The study from which the figure is taken projects that removing FFS in 32 countries would result in their GHG emissions being reduced by 6% on average. Reinvesting (“swapping”) 30% of these savings into energy efficiency (20%) and renewable energy (10%) would increase average savings to around 9%.¹⁹

18. What this share would be varies by jurisdiction, fuel, and time. Certain commentators have noted that a large share of projects may be uneconomic—for example coal-fired power generation or new oil field development—and that this share is increasing. See for example Gerasimchuk et al. (2017b) and Erickson et al. (2020).
19. The impacts of FFSR are not fixed as they depend on how the savings are used. While it may not be feasible for all savings to be reinvested into clean energy (energy efficiency and renewable energy) or other GHG mitigation options, larger shares of such investment increase the impact of FFS reform on GHG emissions as well as other impacts from overconsumption of fossil fuels.

Figure 8. Average Percentage of CO₂-Equivalent Reductions Over Time From Consumer FFSR (2020–30)



Note: The figure shows the average percentage of CO₂-equivalent reductions over time from Consumer FFSR and 10% energy taxation across 32 countries, with 10% of savings and revenues invested in renewable energy (RE) and 20% in energy efficiency (EE).

Source: Adapted from Kuehl et al. (2021).

Two of the major impacts of increased consumption of fossil fuels are rising global warming and air pollution. In addition, Figure 9 also highlights other key categories of environmental impacts. These include increases in land degradation, water pollution, and plastic pollution—fossil fuels are a key

feedstock for plastic production, consuming 4% of oil produced (British Plastics Federation, 2019)—and also the impacts that result from locking-in the high-carbon economy for longer than it would have been without FFS, driving further GHG emissions and other impacts.

Figure 9. Environmental Impacts of Fossil Fuel Subsidies



Greenhouse gas emissions: an important source of GHG emissions that cause climate change



Water pollution: poses threats to waterways and groundwater



Air pollution: cause of multiple health issues, including asthma, cancer, heart disease, and premature death



Plastic pollution: source for over 99% of plastic



Land degradation: infrastructure causing fragmentation and destruction of critical wildlife habitat



High-carbon economy lock-in: slows down innovation and investment for renewable energy transition and reaps the benefits of deployment of renewable energy technologies

Source: Adapted from WTO Secretariat (2023).

Financial and Economic Impacts

Fossil fuel subsidies can represent a significant share of government expenditure. Globally, in a typical year FFS for which quantifiable data are available of the order of \$600 billion (see section 3). This represents around 0.5% of world GDP, but the share varies considerably between countries. As discussed, the manner in which savings made from reducing FFS are used can significantly alter the environmental impacts of reform.

As noted, the IMF (n.d.) estimates that the external costs from fossil fuels are an order of magnitude higher than their financial costs, typically at around \$5 trillion per year, surging to \$7 trillion in 2022. While these are not considered to be subsidies by most commentators, they represent economic costs which fall on the public, for example declining health resulting in lower productivity and higher health treatment costs.

High reliance on fossil fuels may create market access issues for exports if countries restrict or levy charges on embedded emissions in imports, for example through carbon border adjustment measures (where typically taxes are levied on imports of goods which have resulted in carbon emissions during their production) and other mechanisms, or if private companies or public organizations restrict access to their supply chains through the use of standards or labelling.

Fossil fuel subsidies also create an opportunity for arbitrage between subsidized and non-subsidized products. For example, it has been estimated that large shares of the gasoline used by Nigeria’s neighbours is gasoline subsidized by Nigeria and smuggled out of the country (Esiree, 2023). Similarly, where kerosene is subsidized, it is often used as a substitute for diesel in cars and other vehicles, with smugglers benefitting from this illegal sale. Subsidies also tend to lead to scarcity, with demand for the subsidized fuel outstripping supply. Shortages are often found far away from the main cities and

distribution centres, creating the opportunity for corruption as those able to buy the subsidized fuel can transport it to areas of shortage and sell at a significantly higher price. And for upstream production operations, the extra profits created give the opportunity for graft and payments to be made to government officials or others.

Additionally, FFS lock in fossil fuel production and consumption and hold back the deployment of cleaner alternatives. When prices rise, the economy will therefore be more exposed to the impacts of these higher prices than it would have been if it had increased its energy efficiency and the share of renewables in its energy mix. When the economy is highly exposed to fossil fuel use and therefore prices, governments will be more minded to support consumers than they would if only a small share needed fossil fuels (for example we could envisage a much lower imperative to subsidize gasoline if 75% of the vehicle fleet were electric).

The reform of producer subsidies is a high priority because this category of FFS crowds in private investment and locks in fossil fuel production.

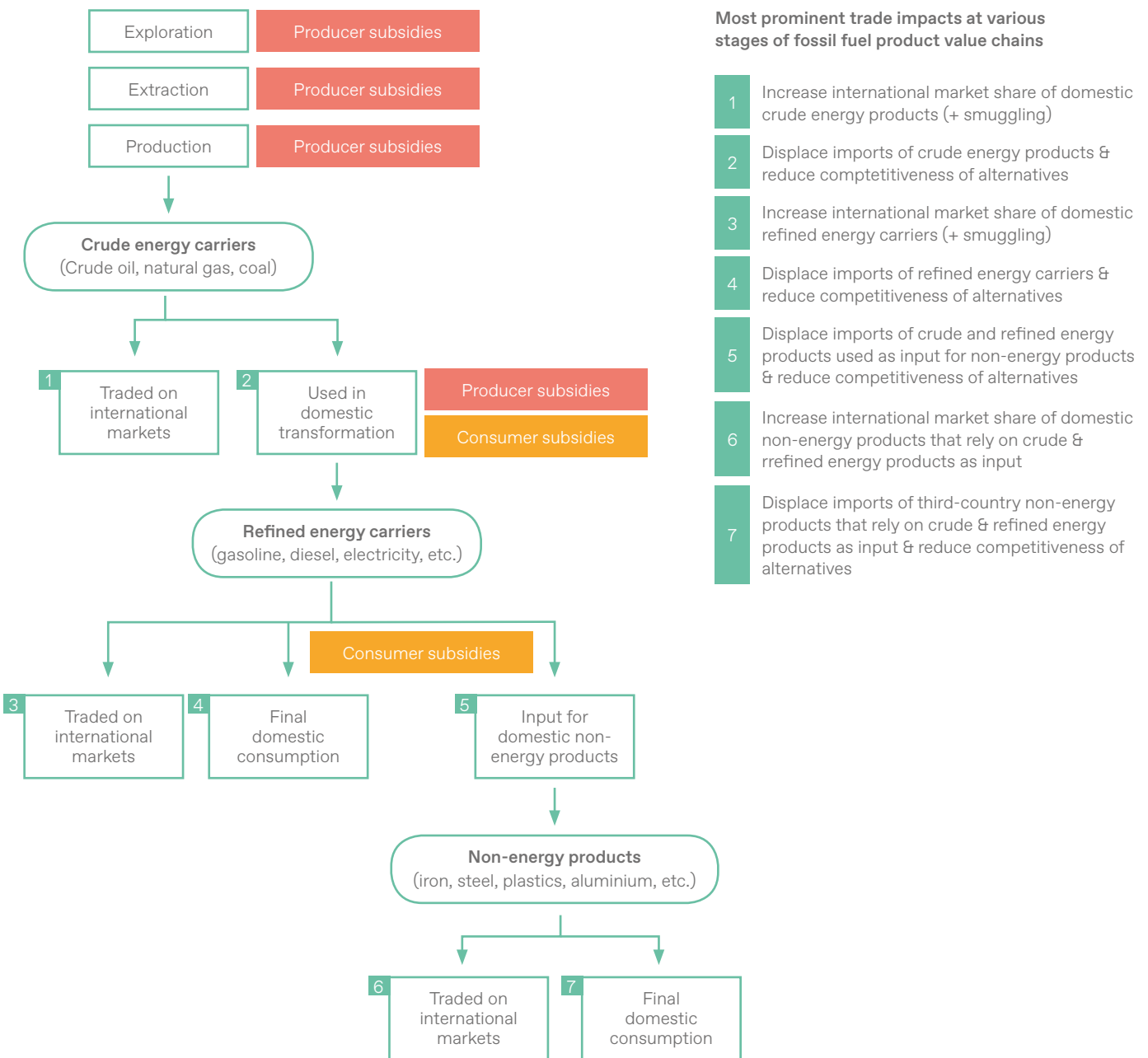
“Production subsidies may make up a [relatively] small share of total support [in 2022], but their impact should not be underestimated. Governments typically design production subsidies so that a small amount of public spending will crowd in much larger volumes of private capital investment in the exploration and development stages of fossil energy projects, encouraging more investment than would otherwise be the case. As such, these subsidies are problematic because they influence larger private investment flows, lock in higher fossil fuel production and emissions, and take up scarce fiscal resources that are needed to catalyze investments in clean energy transition solutions. Further, in some countries, production subsidies can be several times higher than consumption subsidies—such as in Argentina in 2021” (Laan et al., 2023).

Impacts of Fossil Fuel Subsidies on Trade

Figure 10 presents an overview of the impacts of FFS on trade. Impacts occur across the fossil fuel supply chain, from production through to transformation and consumption. The most prominent impacts are shown at seven points in the supply chain and generally relate to impacts on competitiveness between producers of fossil fuels, producers of energy- or

electricity-intensive goods, or fossil fuels and alternatives. As noted in section 1.2, the value of trade in many of these markets is high and the markets can be highly competitive. A number of countries or regions that are moving away from the zero taxation imposed on international aviation and international maritime fuels (see Box 2) can also expect to see significant trade impacts.

Figure 10. Trade Impacts of Fossil Fuel Subsidies at Various Stages of Fossil Fuel Product Value Chains



Source: Adapted from Moerenhout and Irschlinger (2020).

4.2 Which Fossil Fuel Subsidies Have the Largest Adverse Impacts?

An idea often proposed is that subsidies with the highest adverse impacts should be reformed preferentially. Adverse impacts can result across many areas, including on the environment, economy, finance, and trade. In practice, there is very little information on the detailed impacts of FFSR, either from empirical analysis or from modelling exercises.²⁰ Modelling exercises (e.g. Figure 8) tend to focus on aggregated analyses such as reforming all FFS in a country or region or applying a carbon tax to all energy users.²¹ Few empirical analyses have been undertaken, and it is hard to derive overall lessons from them. However, some general principles can be drawn:

- All universal FFS (i.e. non-targeted) are inefficient and regressive (i.e. more of the benefits accrue to wealthier consumers). For example, subsidy reforms with a reallocation of savings as cash transfers improve GDP growth and targeted transfers reduce poverty and inequality.
- All FFS lead to overconsumption and therefore increased GHG emissions. While it is difficult to distinguish in terms of relative impacts (i.e. increased GHG emissions per dollar of FFS granted), those FFS that are related to fuels with the highest GHG emissions per unit of energy (coal is higher than oil followed by natural gas) and those that are granted to low efficiency activities (e.g. coal-fired electricity generation tends to be of lower efficiency than natural gas-fired plants) can be expected to have higher relative impacts. Many countries still continue to tax diesel at lower rates than gasoline, even though impacts from diesel air pollution tend to be higher.
- Coal has high adverse impacts across its uses, including in terms of local air quality, very high GHG emissions per unit of energy, and effects on local nature and populations. Because of these

impacts, subsidies granted to coal across its full supply chain should be considered for immediate or at the least very rapid elimination.

- There is some evidence that the higher up the fossil fuel production supply chain, the greater will be the impacts in relation to increased production of fossil fuels (Gerasimchuk et al., 2017b). Therefore, those FFS that support exploration would have a higher impact than those that are related to production or transport of fossil fuels.
- Air pollution is often one of the most significant causes of adverse impact. Fossil fuel activities which result in large amounts of pollution that affect the largest number of people have the highest relative impacts in this regard—for example emissions from transport, heating, or industrial facilities in built-up areas, especially when those activities lack emissions control equipment (e.g. filters) or where such equipment is poorly maintained.

4.3 Expected Benefits and Adverse Impacts of the Main Fossil Fuel Subsidy Categories

Section 2 highlighted the rationales behind government decisions to introduce, maintain, or increase FFS (e.g. to support mobility, household income, or increased economic activity through domestic production of fossil fuels) and their adverse impacts (e.g. GHG emissions, local air pollution, or crowding out cleaner alternatives in the energy system). The vast majority of FFS reduce government fiscal space, thus diminishing potential positive impacts of government expenditure.²²

Table 5 presents the key expected benefits (in green) and adverse impacts (in red) per unit of subsidy (i.e. per dollar of subsidy granted). Darker shading highlights stronger expected benefits or impacts, with lighter shading indicating lower benefits or impacts. It is clear that all FFS involve trade-offs between

20. There is more information and analysis in some sectors such as agriculture (OECD, 2023).

21. See for example the review of FFS modelling in Beaton et al. (2013).

22. Some FFS production subsidies could increase government revenue by increasing production to such an extent that increased revenues more than offset government revenue foregone from the subsidies granted.

expected benefits and adverse impacts, with adverse impacts including the reduction of government fiscal space in all cases. The expected benefits and adverse impacts presented are first order; for example transport FFS will lead to increased mobility but the government finance put into the subsidies may reduce investment in mobility which could have arisen from investing in other policies and measures.

Table 5 also includes estimates of the global share of FFS by subsidy type, taken from the analysis presented in sections 3.3 and 3.4. Around 25% of quantified global FFS go to transport consumption. These subsidies are expected to increase income and mobility and to positively impact controlling inflation and increasing economic activity. Strong adverse impacts are on GHG emissions, local air pollution, inequality, and the possible creation of opportunities for corruption or smuggling. There will also be adverse impacts on security of supply since the subsidies increase consumption. Similar expected benefits and adverse impacts result from consumer subsidies to non-transport sectors (residential and others), which account for around 55% of global FFS in a typical year (set to be higher in 2022, as noted).

On the production side, the FFS category with the highest global share aims to reduce the cost of production, which would be expected to strongly benefit economic activity and is likely to have some impact on increasing security of supply (noting that fossil fuels, especially oil, are intensively traded on international markets). Adverse impacts are again the fiscal cost to government (which can be exacerbated by stranded assets) and GHG emissions contributing to global warming and local air pollution. Yet increased production will also contribute to higher liabilities when production ends. Other categories of producer subsidies—those focused on reducing post-production liabilities, improving environmental performance, and directly increasing security of supply through means other than simply increasing production—will tend to have significantly lower adverse impacts; in some cases they have benefits.

However, based on the evidence of the detailed subsidy measures in the OECD inventories of 51 countries, few of the 15–20% of global FFS granted to producers are targeted at these aims (OECD, n.d.).

4.4 The Effect of Targeting on Fossil Fuel Subsidy Impacts

The discussion in this section has focused so far on generic subsidies in each category. Expected benefits and adverse impacts will also be a function of a range of specific factors, including where fuels are ultimately consumed (e.g. within cities or in rural areas) and interactions with other policies in the economic, social, and environmental spheres. Whether subsidies are targeted, and the extent of that targeting, can also strongly affect the impacts.

Table 2 includes options on how FFS could be targeted. Such targeting seeks to concentrate benefits on recipients that the government wishes to support (e.g. lower income groups, populations in remote areas where there is less economic opportunity, or oil and gas fields where the financial returns may be insufficient to encourage producers to invest).

Targeting is more efficient than otherwise as it will result in a higher share of benefits going to the targeted group than would be the case from general subsidy mechanisms that benefit all consumers or producers. Through greater subsidy efficiency, government fiscal costs will be lowered as will consumption (and hence adverse impacts).

As noted in section 3.3, many consumer subsidies are not well-targeted, particularly those to transport fuels, and while producer subsidies tend to be targeted at particular fuels, specific classes of fields, or geographical areas, the vast majority support increased production rather than being designed to have low adverse or even positive impacts (e.g. environmental protection, reduced post-production liabilities, or a clear focus on improving security of supply).

Table 5. Expected Benefits and Adverse Impacts of Fossil Fuel Subsidies and Approximate Share of Global Fossil Fuel Subsidies

Expected Benefits **Adverse impacts**
■ strong ■ lower ■ strong ■ lower

Generic Subsidy Type / Impact of Subsidy		Share of Global FFS (approx.)	Income	Mobility	Inflation Control	Health and Safety	Economic Activity	Security of Supply	Government Fiscal Space	GHG Emissions	Local Pollution	Production Liabilities	Corruption and Smuggling	Export Market Restrictions
Consumer	Make fossil fuels cheaper for transport	25%												
	Make fossil fuels cheaper for other consumers*	55% (30% residential, 25% others)												
	Increase energy access to modern fuels	minor (<5%)												
Producer	Reduce costs to producers to encourage more production	15%-20% (of which 3/4 to extraction or mining, 1/4 to refining or processing)												
	Support improved environmental performance**	minor (<1%)												
	Support post-production costs**	minor (<1%)												
	Increase security of supply, across the fossil fuel system***	minor (<1%)												

* All non-transport consumers including residential, industry, commercial and public services, agriculture, and fishing.

**Both could also be included in first producer aim (“Reduce costs to domestic producers”) as it can be argued that these costs should be borne by producers rather than government, and that government contributing to these costs encourages current producers to not make provision against them.

***Security of supply can be improved in many ways other than increasing domestic production, including non-technical options (e.g. labour relations). It is therefore included as a separate aim.

Note: The expected benefits and adverse impacts of FFS are qualitative, per unit of subsidy granted.
 Source: Author’s elaboration.

5. Progress, Lessons, and Priorities for Fossil Fuel Subsidy Reform

Section 4 discussed how FFS lead to a range of adverse impacts and that these impacts are highest when subsidies are not targeted. But policymakers expect that FFS will also yield benefits, which may accrue to households or some or all of the wider economy. This trade-off between expected benefits and adverse impacts can make FFS reform challenging.

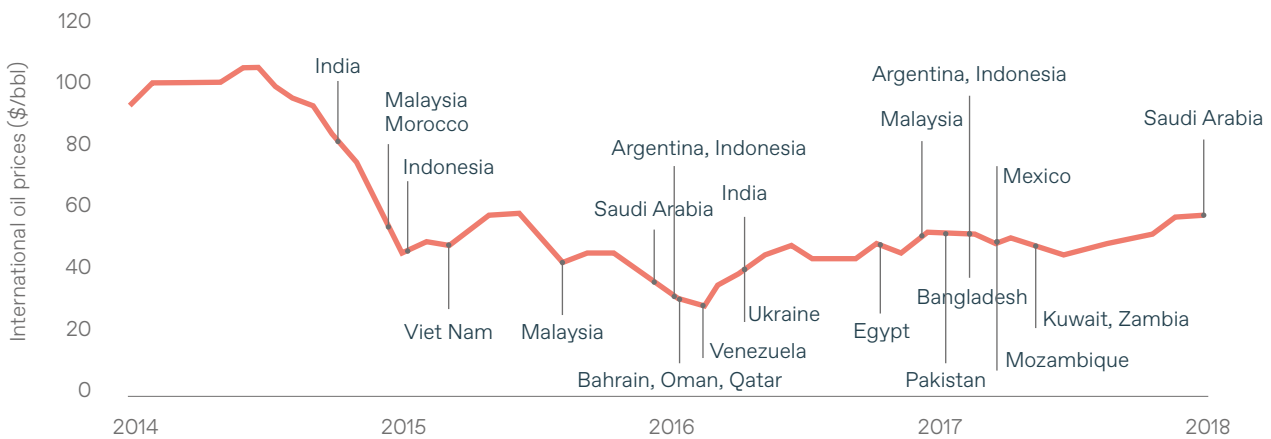
This section first reviews the progress that has been made in reforming FFS over the past decade and then summarizes the lessons that can be drawn from this experience and more widely on how best to undertake unilateral reform. It then suggests priorities for FFSR and how relatively minor FFS should be treated.

The section concludes by discussing the special considerations that should be made in times of high and rising energy prices.

5.1 Past Progress on Fossil Fuel Subsidy Reform

The IEA and OECD (2018) have reviewed where progress has been made on FFSR during the period 2014 –17 when global oil prices were relatively low (see Figure 11). The list of countries assessed includes both fossil fuel exporters and importers. To qualify, a country had to have advanced reform against at least one subsidy.

Figure 11. Countries That Advanced Fossil Fuel Subsidy Reform (2014-17)

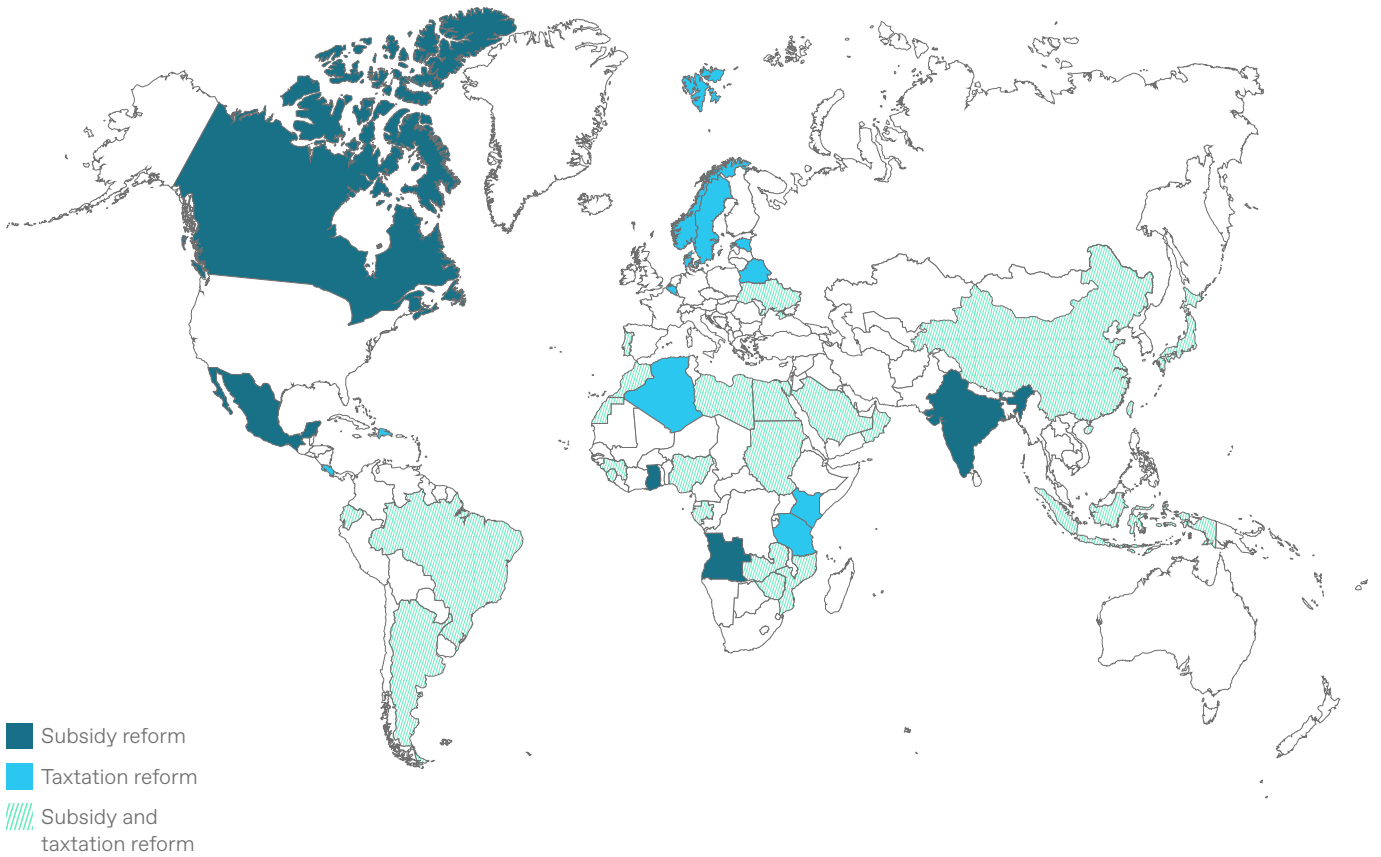


Source: IEA and OECD (2018).

Figure 12 is based on a similar review by IISD’s Global Subsidies Initiative. The review finds that no less than 53 countries reformed at least one subsidy and/or

increased at least one fossil fuel tax or did both in the period 2015–20.

Figure 12. Countries That Advanced Fossil Fuel Subsidy Reform (2015–20)



Source: Adapted from Sanchez et al. (2020).

Over the period 2010–20, at least some reform of FFS took place in many countries, which was enough to hold such annual global subsidies at around \$600 billion while fossil fuel demand grew significantly (see Figure 4). The rate of reform has not been enough to reduce absolute FFS, with many countries (e.g. Nigeria, Indonesia) at times reversing reform progress and subsidies tending to be reformed one by one.

As noted, subsidies remain strongly linked to global fuel prices, especially the price of oil. When prices are high, many countries increase or introduce subsidies to consumers—they do not find it possible to pass on the full world price rise when they are particularly high or rapidly increasing (Kojima, 2010). This trend was

illustrated strongly in 2022 when oil and natural gas prices rose sharply globally. Many countries that had not subsidized consumers in any significant way for two decades or more (e.g. many European countries) introduced subsidies, particularly to support residential and transport consumers (IEA, 2023b). Often these subsidies were not targeted and were not conditional on any improvements in efficiency or on the development of alternatives. The rationale for these subsidies was generally to support the cost of living. Globally, subsidies doubled in 2022 compared to an average year.

Conversely, when global oil prices are low, producer subsidies tend to increase. The United Kingdom’s

upstream tax regime for oil and gas provides a good example, where tax rates have varied regularly as economic conditions have changed. With fields in the United Kingdom becoming more marginal and expensive to develop (as has been the case across much of the world), the trend has been for taxes to decrease.

A range of factors have slowed the rate of progress on FFSR. Governments remain nervous in exposing their populations—particularly the poorest and most vulnerable as well as other consumers— and strategic industries even though they have very little or no control over global fuel prices. This exposure is reduced as alternatives to fossil fuel consumption are developed. Exchange rate devaluation against the US

dollar and other “hard” currencies can reverse FFSR, as fuel prices are denominated in local currency. Institutional factors can also hold back reform, for example a lack of coordination between ministries covering energy and finance.

5.2 Lessons for Unilateral Reform

The process of FFSR is made up of three main stages (Figure 13). It is first necessary to (i) identify an individual fossil fuel subsidy (against a definition) and then, where possible, measure it. Each subsidy should then be (ii) evaluated to see if it is an effective and efficient measure. Where it is not, (iii) reform of the subsidy should be undertaken.

Figure 13. Stages of the Fossil Fuel Subsidy Reform Process



Source: Based on Wooders and Lang (2010).

The “identify and measure” stage was discussed earlier in sections 2 and 3 of this paper. We now present an overview of the “evaluate” and “reform” stages.

Evaluate: Reviewing the Impacts of a Fossil Fuel Subsidy

Best practice on how to reform FFS is increasingly understood and has been summarized in a number of guidance documents and recommendations. In essence, a country reviewing one or more subsidy should be asking two questions:

1. Are there other ways of delivering the benefits of the subsidy (for example mobility or supporting incomes) that would be cheaper (lower the cost to government) and that would result in lower adverse impacts (ideally because alternatives are delinked from fossil fuel consumption or production)?
2. If the subsidy is to continue at least partly, how can it be better targeted towards the groups, sectors, or areas the policy is aimed to support?

Such a review would ideally use data or modelled analysis of the cost of the subsidy, who the recipients are (distributed by income group, location, etc.), and the positive and adverse impacts for both the subsidy and the alternatives being considered. In practice, data and modelled analysis may be much less available, and even the cost of the subsidy to government may not be known. The lack of perfect data and modelled analysis does not need to stop the reform process—the generic impacts of FFS are known (see for example Table 5), and it is understood that FFS are generally highly inefficient (when compared to alternatives) at delivering benefits to targeted recipients.

Reform of a Fossil Fuel Subsidy: Best Practice

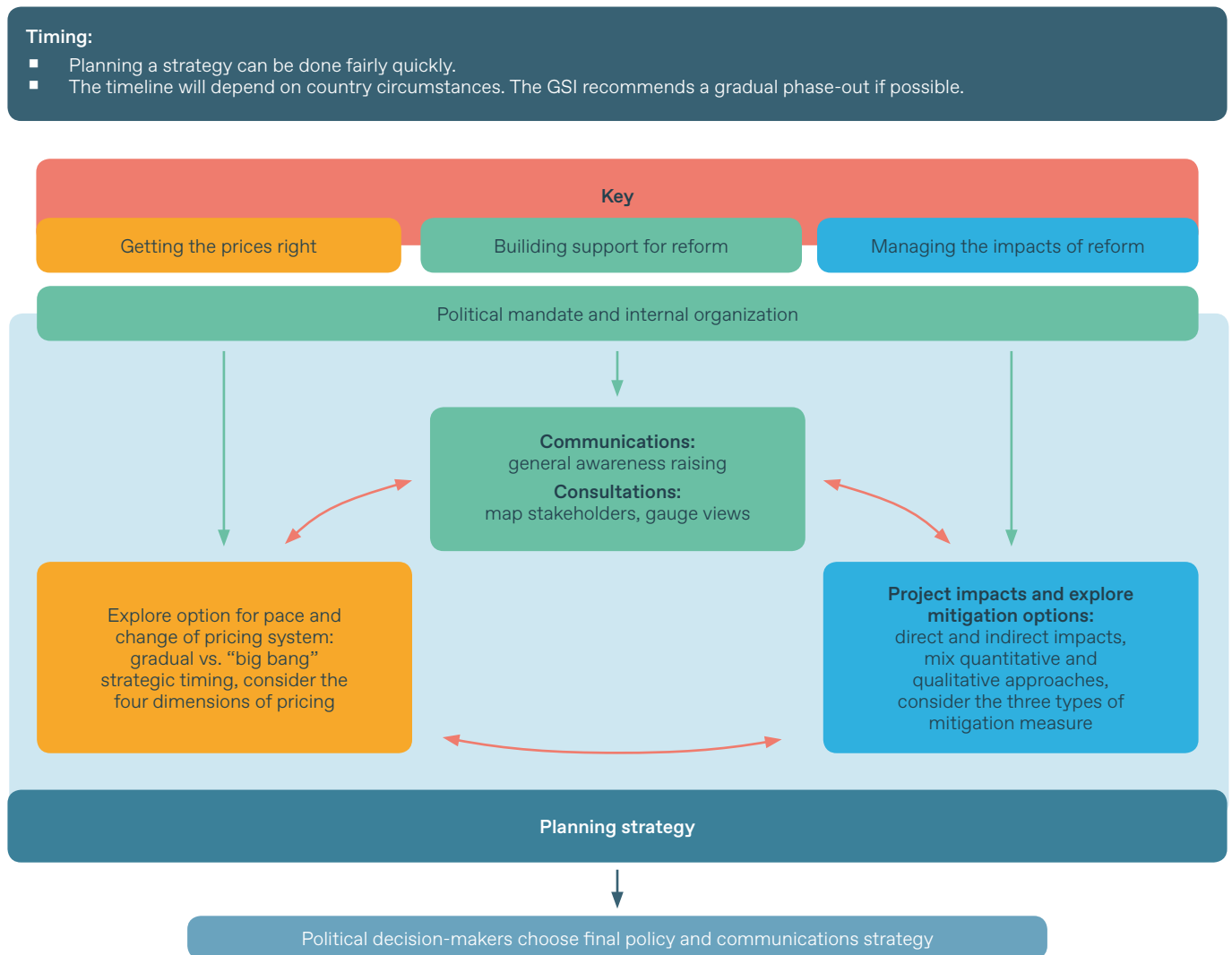
When a decision has been made to reform (eliminate or reduce) a subsidy, a reform process then needs to be undertaken. Guidance is available from a number of sources, and these are generally consistent in the advice they give. Figure 14 depicts an ideal reform process developed by the Global Subsidies Initiative (Beaton et al., 2013). There are three main pillars:

1. Getting the prices right: How the subsidy will be reformed needs to be designed and specified by getting the prices right. For consumer subsidies, this would mean for example that governments replace price-setting gasoline on an ad hoc basis using regulations to institute an automatic pricing mechanism applied independent of the political situation. How quickly reform is undertaken is a key consideration. The Global Subsidy Initiative recommends a gradual phase-out if possible.²³
2. Building support for reform: It is necessary to build support for reform, across government and in the population as well among other key stakeholders. Communications and consultations are key elements, as is timing—when a government is popular or when inflation is low are examples of factors that influence when reform could be considered.
3. Managing the impacts of reform: Reform will have differing impacts on various stakeholders. For those that the government is particularly concerned about—for example consumers in lower income groups or public or freight transport—governments will want to ensure that any adverse impact due to the reform is mitigated. A government may offer a cash payment for example to compensate for increased prices. The existence of strong welfare systems able to deliver benefits to consumers when FFS are reformed is a major advantage.

Figure 14 shows that all three pillars interact with each other and should be delivered based on a planned strategy. Accounting for how the political economy (i.e. the interaction between politics, institutions, and the economy) works is a key consideration to design workable reform proposals that can garner the necessary support (McCulloch, 2023). In reviewing the experience of gasoline subsidy reform in a wide range of countries between 1990 and 2018, Martinez-Alvarez et al. (2022) conclude that gasoline subsidy reform has often been reversed and that the development of alternatives, or at least the expectation that such alternatives will be developed, is a key factor in a successful political economy settlement between a government and the population.

23. The manner in which India reformed its diesel subsidies (i.e. monthly announced increases over a period of around two years) provides a good case study (Clarke, 2015).

Figure 14. Ideal Fossil Fuel Subsidy Reform Process



Source: Adapted from Beaton et al. (2013).

Among the wide range of materials available to provide further guidance, we can cite the World Bank’s Energy Subsidy Reform Facility, which “generates knowledge to support governments to design and implement sustainable energy subsidy reforms while safeguarding the welfare of the poor” (World Bank, 2020). The Energy Subsidy Reform Assessment Framework includes a large set of resources, ranging from how to design a reform

strategy to specific elements of the strategy—e.g. how to communicate around reform or how to design a targeted cash transfer scheme (ESMAP, n.d.). The framework is one of the outputs of the World Bank’s Energy Sector Management Assistance Program (ESMAP), which has been providing assistance to countries around the world over the past three decades, including in some cases with respect to subsidy reform.

Reform in Developing Countries: Particular Challenges

Developing countries face particular challenges when considering whether to reform their FFS. Compared to developed countries, they generally have larger parts of their populations and economies that are vulnerable to rising prices or other disruptions. They also tend to have lower public resources and less developed systems to provide benefits in alternative forms (for example welfare payments), and there are fewer private resources available for people and businesses to cushion themselves against shocks.

These challenges are widely recognized in international agreements and statements. For example, the Ministerial Statement on Fossil Fuel Subsidies issued at the Thirteen WTO Ministerial Conference in February 2024,²⁴ “pledges to take into account “the particular needs and circumstances of developing countries” and to “minimise possible impacts and address essential energy needs of vulnerable groups, particularly in developing countries.”²⁴ Sustainable Development Goal 12.c notes that FFSR considerations should be undertaken after “taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities” (UNEP, 2019). Similar language is contained in international commitments, agreements, and statements by the Asia-Pacific Economic Cooperation (APEC), G20, United Nations Framework Convention on Climate Change (UNFCCC), and others (Gerasimchuk et al., 2017a).

As noted, FFS are a highly inefficient way to provide benefits to target beneficiaries and alternative mechanisms, where available, can be much more effective. Fiscal savings from reform tend to be highly valuable in developing country settings compared to developed countries, yet the need to protect the poor and vulnerable against the impacts of increased prices is often more critical in the former. In the absence of capacities to identify and provide benefits to these

populations through alternative mechanisms, reform can induce serious economic consequences, reversing development progress. Reform can therefore be expected to proceed more slowly in developing countries than in developed ones, as it may require the development of alternative mechanisms and targeting systems to provide welfare and cushion any adverse impact.

Reform plans in developing countries thus need to be very carefully considered, prepared, and designed. It is also important to consider that the reform of different types of FFS will have varying impacts on development. For example, reform of a tax advantage granted to oil and gas producers will have very different impacts to that of reforms which affect the cost of kerosene sold to the population for cooking and lighting needs. Developing countries should first look to reform those subsidies where little of the benefit goes to the poor and vulnerable. For example, a large majority of subsidies to gasoline for transport tend to benefit wealthier parts of society, as do untargeted subsidies to electricity. As discussed in section 5.3, a high proportion of the value of FFS tends to be allocated to a few subsidies, many of which are not targeted. Beyond this narrow set of FFS, there is a wide range of subsidies which are lower in value but often have important development benefits. This includes, for example, subsidies supporting energy access as well as those designed to support modern energy access in remote areas and communities.

International agreements also recognize that developed countries should take the lead in making progress on FFSR given their larger contribution to climate change and other adverse impacts from fossil fuel use and also due to their greater availability of resources and capacities to support reform. Yet there nonetheless remains compelling domestic reasons for developing countries to reform many FFS and to better target them, noting again the need to carefully plan the reform process and that reform is likely to progress more slowly compared to what can be achieved in developed countries.

24. World Trade Organization, Ministerial Statement on Fossil Fuel Subsidies of 26 February 2024, WTO Doc. WT/MIN(24)/19 (2024).

5.3 Which Fossil Fuel Subsidies Should Be Prioritized for Reform?

Table 5 indicated that all FFS, whether to consumers or producers, have both expected benefits and adverse impacts. Section 4.2 concluded that it is generally difficult to assess which subsidies have the highest adverse impacts, but that certain FFS should be prioritized for reform:

- *Coal combustion*, which generally leads to high relative local impacts, has the highest GHG emissions per unit of energy, and is often used in low-efficiency electricity- and/or heat-generating plants;²⁵

- *FFS that support exploration*, which tend to have a higher impact than those related to production or to transport of fossil fuels; and
- *Fuels used closest to population centres*, which have relatively high adverse impacts in terms of air pollution.

This analysis is per unit of subsidy (i.e. per government dollar spent). But earlier analysis showed that globally certain types of subsidies are much larger than others (see section 3). Box 3 summarizes the largest FFS by value globally.

Box 3. The Largest Fossil Fuel Subsidies Globally by Value

1. Insufficiently targeted, expensive consumer subsidies (especially to the (1a) transport [$\sim 25\%$ of global FFS] and (1b) residential [$\sim 30\%$ of global FFS] sectors).
2. Many separate mechanisms offering producers preferences to (2) encourage more production, particularly across oil and gas supply [$\sim 15\%$ of global FFS].

Significantly reducing global FFS will require progress against the three largest reform challenges identified in Box 3.

- 1a. *Transport subsidies*. Economically, transport subsidies for private use (which is dominated by gasoline consumption) are amongst the most regressive subsidies (i.e. where large amounts of the benefits accrue to the highest income groups). In addition, subsidies to diesel accrue to larger vehicles, including buses and trucks/lorries, which provide public and freight transport essential to mobility and economic opportunity for many, including lower income groups. Alternatives to ease reform include the deployment of electric vehicles or behavioural change (for example cycling or remote work). Targeting particular groups is difficult for gasoline but differential pricing is somewhat easier for diesel (for example

lower prices for agriculture by dyeing the fuel made available to those consumers). As noted, fuel prices are often highly sensitive politically, with an expectation that governments should not allow prices to rise quickly. Successful FFSR typically requires that fuel pricing is depoliticized (i.e. moved to a predictable, automatic pricing mechanism or liberalized) (Beaton et al., 2013) and that the government is seen to be supporting those affected (including the middle class) in other ways. Government intervention when prices suddenly spike can be a political necessity in many countries. In the longer term, risk exposure to global oil prices can only be met by adopting alternative modes of transport (e.g. electric vehicles, public transport) and by changing behaviours (supported by planning that minimizes transport needs).

25. One response to this has been the Powering Past Coal Alliance, launched in 2017 to “advance the transition from coal power across the world” (PPCA, n.d.).

- 1b. *Residential subsidies*. Residential subsidies are delivered through many fuels and energy carriers, including natural gas, electricity, LPG, and kerosene. Securing household incomes can be attained more efficiently using cash transfers and other mitigation options. More targeting is almost always part of the reform solution, especially in the short term. Access to subsidized fuels and energy carriers can be limited by a range of techniques, including differential tariffs for electricity consumers based on the volume of electricity they use or registries that allow only certain consumers, or consumers in certain areas, to buy fuels at subsidized prices. Politically, reform needs to be accompanied by other ways of transferring income to the poor and vulnerable, through both cash transfer schemes but also potentially through a range of other channels such as reducing the costs of health provision or other essential services. The financial savings from such FFSR are generally more than adequate to finance a range of alternative welfare support measures, even if such measures are not perfectly targeted (i.e. when some recipients outside the target group also gain benefits).
- 2. *Producer subsidies to encourage more production of oil and gas*. Producer subsidies are found in all producer countries under the OECD's inventories (see section 3.3) and can be confidently expected to be present in all other producer countries. Such FFS tend to be targeted to at least some degree, with national circumstances pointing to what may work best to increase production. A range of alternative

government investments could deliver the desired positive impacts of the subsidies, notably increased economic activity and security of supply. Oil and gas investments have tended to become increasingly risky financially over the recent past, as average production costs have risen. Oil and gas producers can wield considerable political and economic power, and governments tend to prioritize domestic production within their security of supply strategies. Successful reform requires a recognition by governments that oil and gas production (and ultimately consumption) are not part of their long-term future,²⁶ that public money should not be risked on further exploration and production, and that other parts of the energy system need to be built up (e.g. electrification and expanded electricity grids). Ensuring a just transition for affected workers and communities as part of the reform process, whereby income is supported and alternatives are deployed, can play an important role in managing sectoral decline.²⁷

While it is important to focus on reforming these three largest FFS types, the fact that a subsidy is large does not automatically mean it should be eliminated. However ongoing review, better targeting, and the progressive implementation of alternatives are indicated. It is unrealistic to assume that all major FFS can be reformed immediately, or that all FFS can be reformed in parallel. In jurisdictions where alternatives are less developed and where welfare systems and resources for mitigation are relatively weak, getting the reform process right will matter more, which may imply phasing planned reforms over a longer period.

26. See for example the Beyond Oil & Gas Alliance (n.d.).

27. The just transition away from fossil fuels and towards clean energy sources has received increased focus (see for example the Task Force on Just Transition for Canadian Coal Power Workers and Communities (Government of Canada, 2018) and the Just Transition Centre (International Trade Union Confederation, n.d.). The majority of this attention to date has been on coal, but some of the approaches and learnings also apply to oil and gas, noting that the latter sector tends to be a much lower local employer than coal.

5.4 Reforming Minor Fossil Fuel Subsidies

Beyond the three last types, other FFS make up around 30% of the global total. These subsidies also lead to adverse impacts and reduce the available public budget, and therefore the default approach should be to reform them.

However, some of the more minor subsidies can have strong expected benefits and may also be politically sensitive. Such FFS would not be priorities for immediate reform and potentially include subsidies covering:

- Research activities
- Assistance to disadvantaged regions
- Adaptation of existing facilities to new environmental requirements
- Reduction of GHG emissions or other forms of pollution
- Support to poor, vulnerable, or remote consumers
- Improving security of supply²⁸
- Support provided after fossil fuel production has ended

Countries may wish to discuss how to deal collectively with subsidies within these categories. Despite the positive impacts associated with some of the subsidy categories listed above, FFS should not remain over the long term as they are not consistent with the achievement of a low-carbon economy: alternatives and better targeting are still indicated.

5.5 Dealing With High and Rising Fossil Fuel Prices

As noted, governments face a particularly strong challenge in not allowing consumer FFS to increase when fossil fuel prices are high and when they are

rising. The global financial crisis of 2008–09 saw rapidly rising global fuel prices. Analysis of the impact on FFS shows many countries, especially those from the developing world, were unable to pass on these global price increases fully to their consumers (Kojima, 2010). The same effect has since been seen with the historically high global oil and gas prices experienced in much of the world in 2021–22. This cost-of-living crisis (i.e. high increases in the costs of energy and other essential goods significantly raising household expenditure on these items) saw many countries, including developed ones, provide subsidies to transport and fuel consumers, with several providing widespread subsidies for the first time in years.²⁹

While governments feel a responsibility to protect their consumers from high prices, volatile prices are a function of markets for fossil fuels and a range of other goods and services, including commodities and food. Goods and services that have volatile prices (e.g. gasoline) should be less attractive to consumers than those whose prices are stable (e.g. electricity supplied from solar photovoltaic is essentially governed by the cost of building the generating plant, with the generation costs then low and stable). Therefore, to the extent possible, government intervention should be limited and resist political pressure.

Given the volatile nature of fossil fuel prices, governments need to prepare for episodes of high and increasing prices. Over the medium and long term, the priority should be to reduce exposure to fossil fuels by promoting alternatives such as renewable electricity and electric vehicles and by improving energy efficiency throughout the economy. In the shorter term, there is a need to develop responses in advance so that hurried measures (which will likely be suboptimal) do not need to be implemented. The key principles are that any fossil fuel subsidy implemented as an emergency response measure should be targeted at those who need them and time-limited, removed as soon as is possible.³⁰

28. Noting again that there are a wide variety of methods to improve security of supply and that greater security of supply is generally only a minor aim of increased domestic production of fossil fuels (see discussion in section 4). Subsidies aimed at improving security of supply should be focused on the most efficient solutions.

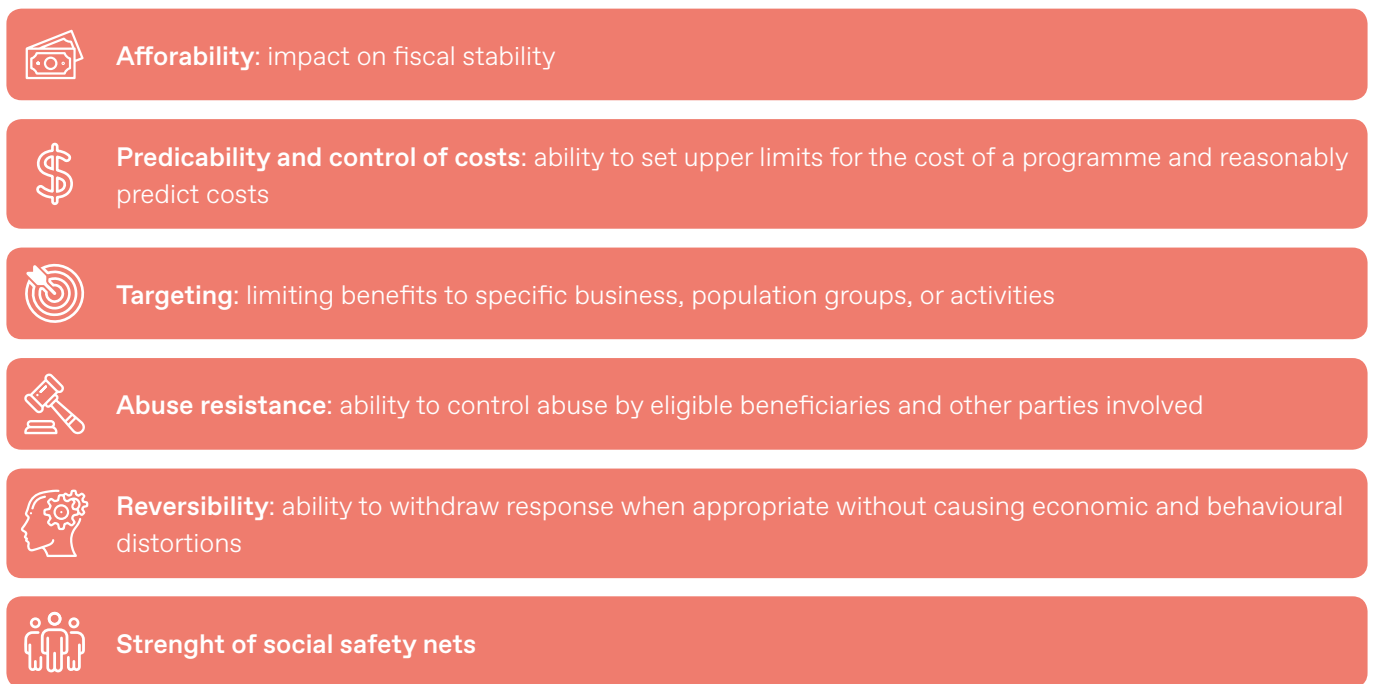
29. The major increases in FFS were mostly to transport and residential fuel users, which is expected to increase the share of these two FFS categories beyond the combined 55% estimates from previous years.

30. See for example McCulloch (2023).

A full review of evidence and considerations as well as recommendations on how decision-makers should proceed with temporary support measures and phase outs is provided in the factual note developed by the WTO Secretariat (2023) at the request of the Fossil Fuel Subsidy Reform initiative. The highlights note that “[g]overnments’ responses to the recent energy crisis have focused largely on price control”—with price support accounting for around 60% of total

support given between October 2021 and December 2022 and income support accounting for around 40%. The vast majority of FFS granted during that period (over 90%) were not targeted. The factual note highlights also note that “[g]overnments’ responses vary based on energy mix and end-users’ vulnerability to price shocks.” It recommends that “[p]olicy responses must be based on an assessment of fiscal and welfare trade-offs” (see Figure 15).

Figure 15. Assessments of Fiscal and Welfare Trade-Offs in Policy Responses to High Fossil Fuel Prices



Source: Adapted from WTO Secretariat (2023).

6. International Cooperation on Fossil Fuel Subsidy Reform: Rationale, Options, and Role of the WTO

6.1 Rationale for Collective Action on Fossil Fuel Subsidy Reform

The key reasons for collective action on FFSR include the following:

- *Global fuel markets are generally highly competitive* (see section 1.2), especially for oil and petroleum products. Fossil fuel subsidies to producers and consumers distort these markets to the detriment of other producers and consumers. Fossil fuel producers can exploit this situation by “shopping around” for subsidies, proposing to continue investment or bring in new investment to jurisdictions where the overall fiscal regime—including subsidies offered—is most favourable.
- *Energy markets are globally connected and the actions of one country, particularly a larger one, in increasing or reducing its consumption or production will affect all others.* Ensuring security of supply is therefore a collective problem and actions to reduce consumption and price volatility in one country will benefit others.
- *The impacts of energy use can be global*, through GHG emissions, which drive climate change, but also through cross-boundary air pollution, which leads to acid rain for example. The UNFCCC’s Paris Agreement is a global commitment to limit global warming to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels. There is a collective need in the energy sector to rapidly increase the scale-up of renewable energy deployment and, to a large extent, to avoid any new fossil fuel developments. Rapidly phasing out fossil fuel development should be led by those countries that have historically benefited the most from

fossil fuels and that have contributed the most to the increase of GHG concentrations in the atmosphere. Scaling-up renewables adds to the collective experience of how best to design, finance, construct, and operate renewable energy projects, which—if supply is maintained—tends to drive down costs through learning. The rapid reduction of costs in solar photovoltaic and wind over the past decade illustrates this benefit.

- *Fossil fuel subsidies, and the challenges of reforming them, have many commonalities across the world* (as shown by the data and analysis presented earlier in this paper). For example, all countries are concerned about the impacts on the poor and vulnerable as well as on strategic sectors if consumer FFS are reformed. Moreover, governments are also concerned about maintaining economic activity and security of supply if domestic fossil fuel production decreases. While there are major differences between countries in the vulnerability of their populations and in the availability of public and private resources to mitigate the impacts of rising prices, there is also much that countries around the world can learn from each other’s experiences and plans around subsidy reform.

6.2 Key Recent International Agreements and Processes Relevant to Fossil Fuel Subsidy Reform

There is no single, leading international forum or process where FFSR is discussed or where agreements are made. Table 6 highlights the key recent international efforts. In 2009, the G20 members introduced a commitment to “rationalise and phase-out inefficient fossil fuel subsidies that

encourage wasteful consumption” and this language has been repeated in subsequent commitments by the members of the G7 and APEC among others (Gerasimchuk, 2017a). SDG target 12.c incorporated this language, also asking UN members to report their fossil fuel subsidies inventories annually from 2020. APEC built on the language in 2021, asking its members which are “in a position to do so” to consider committing to a standstill (i.e. no further increase) of their FFS.

More recently, initiatives have been launched with links to trade fora and disciplines. A Fossil Fuel Subsidies Reform Ministerial Statement was first issued at the Eleventh WTO Ministerial Conference (MC11) in Buenos Aires in December 2017,³¹ followed by a Ministerial Statement on Fossil Fuel Subsidies at MC12 in December 2021, which launched the Fossil Fuel Subsidy Reform (FFSR) initiative.³² Both statements were co-sponsored by a subgroup of WTO members. Table 6 notes that the 2021 statement calls for “ambitious and effective disciplines on inefficient fossil fuel subsidies [...], including through enhanced World Trade Organization transparency and reporting.” The member-led FFSR initiative (48 WTO members as of March 2024) was established to support implementation of the ministerial statement, including through proposing concrete options and the sharing of “information and experiences to advance discussions at the World Trade Organization,” drawing on inputs from other stakeholders as needed (WTO,

n.d.-b). At MC13 in February 2024, a further ministerial statement was released which included a focus on three pillars: “Enhanced Transparency; Crisis Support Measures; and Identifying and Addressing Harmful Fossil Fuel Subsidies;” and laid out a programme of work for 2024–25 leading up to MC14.³³

A group of six countries are also part of the Agreement on Climate Change, Trade and Sustainability (ACCTS), which was announced in September 2019. One of the four focus areas of these negotiations is “disciplines to eliminate fossil fuel subsidies.” Multiple rounds of negotiations had been undertaken by the end of 2023 (Government of New Zealand, n.d.).

Fossil fuel subsidies have also been included in UNFCCC decisions. The Paris Agreement of 2015 called for finance to be redirected from fossil fuels to clean solutions, implying both the reform of FFS but also that the savings be “swapped” into clean energy. At the 2021 UN Climate Change Conference (COP26) in Glasgow, parties then explicitly called for a phase out of FFS, again with the “inefficient” qualifier, and also asked for “targeted support to the poorest and most vulnerable” and that a just transition (away from fossil fuels) should be part of the considerations (UNFCCC, 2021). In Dubai in 2023, COP28 provided further clarity, with parties requesting that inefficient FFS be phased out “as soon as possible,” except those contributing to reducing energy poverty or supporting just transitions (UNFCCC, 2023).

31. World Trade Organization, Fossil Fuel Subsidies Reform Ministerial Statement of 12 December 2017, WTO Doc. WT/MIN(17)/54 (2017).

32. World Trade Organization, Ministerial Statement on Fossil Fuel Subsidies of 14 December 2021, WTO Doc. WT/MIN(21)/9/Rev.1 (2021)

33. World Trade Organization, Ministerial Statement on Fossil Fuel Subsidies of 26 February 2024, WTO Doc. WT/MIN(24)/19 (2024).

Table 6. Recent International Diplomacy Efforts on Fossil Fuel Subsidy Reform

Venue	Year	Goal	Actions Taken
G20	2009	Medium-term rationalization and phasing out of inefficient fossil fuel subsidies that encourage wasteful consumption, while providing targeted support for the poorest	Peer reviews completed for the United States and China, Germany and Mexico, Indonesia and Italy; Argentina and Canada, India and France have also committed to peer reviews in the future.
G7	2009	Phasing out inefficient fossil fuel subsidies that lead to wasteful consumption; encouraging all countries to do so by 2025.	Phase-out date set for 2025, progress report in 2023, possible joint inventories, pledge to end new international fossil fuel finance by the end of 2022.
APEC	2009	Rationalization and phasing out of inefficient fossil fuel subsidies that encourage wasteful consumption while recognizing the importance of providing those in need with essential energy services. Regional capacity building.	Four peer reviews have been completed and are available publicly (Peru, New Zealand, The Philippines and Chinese Taipei). Exploring options for voluntary standstill.
	2021	“to explore options, for those members that are in a position to do so, to undertake a potential voluntary standstill on inefficient fossil fuel subsidies.” (APEC Committee on Trade and Investment, 2021)	APEC members are encouraged to explore a “standstill” of inefficient FFS, which could be based on not increasing the value of FFS granted and/or the number of fossil fuel subsidy measures
SDGs	2015	SDG Target 12.c. UN members, “Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities” (UNEP, 2023).	Indicator 12.c.1 asks that these members report annually, from 2020, the [national] “Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels” (UNEP, 2023).
ACCTS	2019	Disciplines to eliminate harmful fossil fuel subsidies will help remove the perverse effects of these environmentally harmful and socially regressive subsidies.	Multiple negotiating rounds; work proceeding in fossil fuel subsidies’ working group.
WTO FFSR initiative	2021	Ambitious and effective disciplines on inefficient fossil fuel subsidies that encourage wasteful consumption, including through enhanced WTO transparency and reporting.	Initiative launched in December 2021; workplan adopted; concrete options to advance this issue at the WTO presented at MC13 in February 2024.
UNFCCC	2015 (COP21)	Paris Agreement Article 2.1(c), “calls on governments to make finance flows consistent with a pathway toward low GHG emissions and climate-resilient development” (UNFCCC, 2015).	FFS act against this call: meeting it would require that FFS are reformed and that the savings from such reform are reinvested in clean energy (dominated by renewable energy and energy efficiency).
	2021 (COP26)	Accelerated efforts towards the phase-down of unabated coal power and phase-out of inefficient fossil fuel subsidies. Targeted support to the poorest and most vulnerable in line with national circumstances and recognizing the need for support towards a just transition.	39 governments and public finance institutions committed to ending all new support for unabated coal, oil, and gas by end of 2022, signing the Statement on International Public Support for the Clean Energy Transition (the “Glasgow Statement”). [Public finance reform overlaps with FFSR, as both can increase fiscal space]
	2023 (COP28)	“[c]alls on Parties to contribute to the following global efforts, in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches: [...] (h) Phasing out inefficient fossil fuel subsidies that do not address energy poverty or just transitions, as soon as possible” (UNFCCC, 2023)	

Source: Updated from Baršauskaitė (2022).

At COP28, the Netherlands launched an international coalition to phase out fossil fuel subsidies.³⁴ Analysis by the Dutch Government showed that in the Netherlands launch statement about half of all fossil benefits are tied

up in international agreements. “So if countries want to phase out these subsidies, they will have to join forces with other countries” (Government of the Netherlands, 2023). The initiative focuses on 3 pillars (see Box 4).

Box 4. Pillars of the International Coalition to Phase Out Fossil Fuel Subsidies Launched at COP28

1. Transparency

The first step to reduce fossil subsidies is to gain insight. Member countries want to publish an overview of their fossil fuel subsidies before the next UN Climate Conference (COP29) in 2024. Cooperation between countries and international organizations (such as IMF, OECD, WTO, IEA, International Maritime Organization, and International Civil Aviation Organization) is crucial for this. This includes developing a methodology that can be used by any country.

2. International Agreements

The coalition is working together to identify and address international barriers to phasing out fossil subsidies. The Netherlands recently conducted

an inventory showing that half of all subsidies stem from international agreements. Examples include the exemption from tax on heavy fuel oil in shipping and the exemption from tax on fuel consumption in international aviation. Other countries run into the same barriers and we need to address this together.

3. National Action

There will be an international dialogue to share knowledge, develop national strategies for phasing out fossil benefits, and seek joint action to minimize carbon leakage. This will also help maintain a level playing field between countries. This international dialogue can take place annually at COP meetings.

Source: Government of the Netherlands (2023).

6.3. How the WTO Could Increase Its Role in Supporting Collective Action

The WTO as a Natural Forum to Discuss Fossil Fuel Subsidy Reform

The WTO has broad membership (covering more countries than for example the G7, G20, APEC, IEA, OECD, or the multilateral development banks) supported by their missions in Geneva.

As the custodian of the SCM Agreement and the jurisprudence that has been built up through a number of subsidy cases, the WTO is a natural forum for deliberations and rule-making on subsidies. The SCM Agreement provides the only multilaterally agreed definition of subsidies (see section 3.2), recognized by 164 countries. There is also precedent at the WTO of designing international disciplines based primarily around sustainable development concerns, for example through the recently concluded Agreement on Fisheries Subsidies (see Box 5).

34. Countries joining the coalition included: Antigua and Barbuda, Austria, Belgium, Canada, Costa Rica, Denmark, Finland, France, Ireland, Luxembourg, the Netherlands, and Spain.

Box 5. The WTO Agreement on Fisheries Subsidies as a Precedent

“The conclusion of fisheries subsidies negotiations at MC12 in June 2022 demonstrated that the WTO is ready to engage more actively in issues of sustainable development. Even more importantly, while this new agreement uses the [SCM Agreement’s] definitions, the Fisheries Subsidies Agreement’s disciplines are based on environmental considerations, restraining the most harmful types of subsidies, and installing prohibitions in the most dangerous situations where subsidies would otherwise be provided to illegal, unreported, and unregulated fishing, to overfished

stocks, or to fishing in the unregulated high seas where no fisheries management regime can be applied. This demonstrates the readiness of WTO members to create new rules addressing subsidies that have a significant environmental rather than trade-distorting impacts. The experience of fisheries subsidies negotiations is likely to inform any further trade and environment negotiating processes and will certainly serve as a useful reference for discussions on fossil fuel subsidy reform” (Baršauskaitė, 2022).

Subsidies are already addressed in a number of bodies and venues including the Committee on Trade and Environment, the Committee on Subsidies and Countervailing Measures (SCM Committee), and the Trade Policy Review Mechanism (TPRM). In 2020, 50 WTO “announced their intention to intensify work on trade and environmental sustainability at the WTO by organizing ‘structured discussions’ for interested WTO members as well as a dialogue with external stakeholders” (WTO, n.d.-c). One of the four working groups of the member-led Trade and Environmental Sustainability Structured Discussions (TESSD) that emerged from this initiative covers subsidies, and considerations have included presentations and discussions around fossil fuel subsidies. As of March 2024, 76 WTO members were participating in TESSD. As highlighted above, the 2021 Ministerial Statement on Fossil Fuel Subsidies subsequently revised in June 2022 provides a forum to advance discussion in the WTO aimed at achieving ambitious and effective disciplines on inefficient fossil fuel subsidies that encourage wasteful consumption.

In support of these deliberations, the WTO Secretariat has produced a range of reports and analyses, including a publication that covers a set of 10 trade policy tools for climate action on the occasion of COP28 in late 2023. Policy tool #6 on subsidies is dedicated to “[u]nlock[ing] additional resources to assist climate action by reforming environmentally harmful support measures” (WTO, 2023c).

Options for Collective Action at the WTO

As highlighted in section 6.1, there is a clear rationale for collective action on FFS. A number of studies have proposed options to reform FFS, including with a focus on how to support such efforts at the WTO. A brief summary of some of the key studies and their recommendations is presented in Box 6.

In practice, however, reaching consensus on the crafting of international disciplines on FFS has remained elusive, not least given the many political sensitivities and difficult trade-offs that exist, as highlighted in section 4 and Table 5. In spite of these difficulties, large values of FFS cannot remain in the low-carbon economies the world is working towards in order to meet the Paris Agreement objectives and limit global warming.

Figure 16 illustrates the actions required to support collective efforts regardless of where the reform takes place. Some of these actions could be centred at the WTO. Overall, actions are needed across the three stages of the reform pathway discussed in section 5.2: identify and measure, evaluate and reform. Given existing sensitivities, a first step may consist in promoting collective action around four main priority areas in support of these reform pathways. These could include: (i) sharing problems, solutions, experience, and information; (ii) supporting the capacity to reform FFS; (iii) enhancing coordination; and (iv) assessing options for future cooperative arrangements.

Box 6. Selected Studies and Recommendations on How to Support Fossil Fuel Subsidy Reform at the WTO

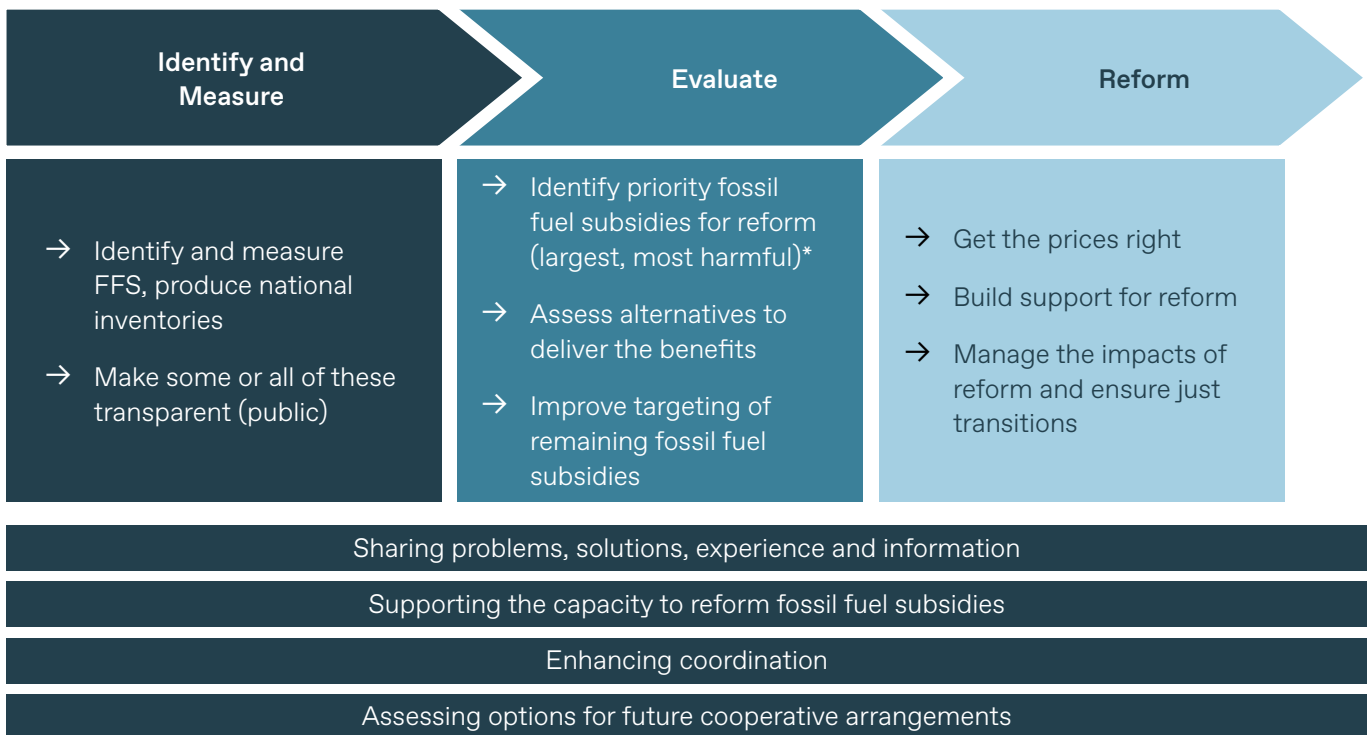
Moerenhout and Irschlinger (2020) and Verkuil et al. (2017) present five categories of options. The first considers improving transparency, including through improved notifications and counter-notifications under the SCM Agreement, using the TPRM more systematically and strengthening notification requirements. Options to support capacity building are outlined along with recommendations that a pledge, report, and review commitment mechanism could be implemented. The studies also include options to clarify how existing rules should apply to FFS and how WTO members could negotiate new subsidy disciplines.

Eriksson et al. (2021) propose a set of priority actions which could be included in an initiative to promote climate goals with a WTO agreement. One of the priority actions is FFSR, and the authors make recommendations around an Agreement on Disciplines for Fossil Fuel Subsidies. Such an agreement would require a number of elements, including setting out: objectives; scope; disciplines; special and differential treatment; enforcement and dispute settlement; and institutional support.

Monkelbaan and Steenblik (2021) propose seven options. In addition to those highlighted above, they also propose that WTO members discuss the issue at the Committee on Trade and Environment and in the SCM Committee, noting that this option has not been used much to date. They add that there is the opportunity to (i) make FFS the focus of in-depth policy reviews (including through the TPRM but also making use of review mechanisms under the G20, APEC, and other fora and processes), (ii) improve the more systematic notification of FFS, and (iii) enforce existing trade rules through litigation and trade remedies.

Verkuil et al. (2017) and van Asselt and Moerenhout (2020) find that it is already likely possible to challenge some production subsidies. They also propose that WTO members could seek a mandate to negotiate a stand-still agreement on FFS. Additionally, the latter study recommends that WTO members further research through in-depth studies on the trade effects and legality of FFS and undertake practical analysis for rules on FFS with a focus on environmental impacts.

Figure 16. Required Action on Fossil Fuel Subsidy Reform (All Fora and Processes)



* FFS to residential consumers, transport consumers, producers of oil and gas, and all FFS to coal.

Source: Author's elaboration.

Sharing problems, solutions, experience, and information

When approaching the fossil fuel subsidy reform process, individual countries can be isolated from wider international experiences and there are considerable advantages in sharing problems, solutions, and experiences (both good and bad). Such sharing to the benefit of WTO members could be advanced through formal or informal discussions around particular aspects of the issue in the various fora that the WTO offers. Specifically, this knowledge and experience sharing could focus on the following three elements.

First, members could further develop a shared understanding on how to identify and measure FFS and how to produce national inventories, developing and using contacts within key organizations.³⁵ This work could build on that of the Joint Subsidy Platform, a transparency initiative providing information on subsidies (with FFS as one of the sectors covered) launched in 2021 by the IMF, OECD, World Bank, and WTO (WTO, 2023b; Subsidy Platform, n.d.).

Second, members could investigate and develop options to increase transparency at the WTO in collaboration with other fora and processes. Some or all WTO members could consider increasing the transparency of their FFS, using existing notification procedures and potentially the TPRM. Outside the WTO, annual reporting under SDG Indicator 12.c.1 remains weak and the WTO could help to improve this situation in collaboration with other key organizations. Sharing data and information may come with confidentiality concerns and setting out the modalities for this eventuality is indicated.

Third, noting that FFS tend to have many commonalities across the world in their type, impact, and reform solutions, WTO members could very usefully share reform problems, solutions, and lessons learned, including around managing the impacts of reform on the most vulnerable groups and sectors of the economy. This could include a particular focus

on reducing temporary support/emergency response measures as soon as possible and on devising and implementing plans to minimize FFS when global prices increase. WTO members that have not already done so could also consider undertaking national peer reviews, following for example the protocols and methodologies developed with the G20 or APEC (Gerasimchuk et al., 2017a), or by countries such as Finland, the Netherlands, and Sweden. Here too, external expertise from key organizations could be enlisted for support, since the details on past FFSR experiences and the options going forward are often not widely known or fully understood in all countries.

Supporting the capacity to reform fossil fuel subsidies

Members could facilitate connections between countries planning or undertaking reform and key organizations able to provide support. Due to the particular challenges they face, such support could focus on developing countries, which historically are responsible for only a small share of global environmental damage and have relatively low levels of public and private resources and capacities to mitigate increased prices (see section 5.2). Successful reform and good practice should follow just transition principles, including through ensuring that the poor and vulnerable are supported through mechanisms such as welfare programmes if prices increase.

Beyond reform experiences that can be shared among WTO members, a range of organizations and agencies offer support to governments considering FFSR. Technical assistance and capacity building is provided by institutions and programmes including the World Bank's Energy Sector Management Assistance Program, which is often accessed as part of wider energy sector support and can include financial support (ESMAP, n.d.). Similar assistance is offered by other multilateral development banks and through many bilateral assistance programmes. This support can include the commissioning of surveys and research to establish evidence as well as the development of communication strategies and plans.

35. These include the OECD, IEA, IMF, World Bank, European Bank for Reconstruction and Development and other multilateral development banks, international financial institutions, and NGOs, including the Global Subsidies Initiative and CEP (Council on Economic Policies) Zurich.

The Just Energy Transition Partnership announced at COP26 to support the energy transition can also include a focus on FFS reform (Stone, 2023). Liaison with the ACCTS process—an initiative that could play a pathfinder role—is also recommended, particularly when a number of countries are jointly looking to progress reform.

NGOs and research institutes can also provide support, including when “outside track” activities intended to increase public awareness of the impacts of FFS and the benefits of reform would be helpful. NGOs can further support the identification and measurement of FFS and the production of subsidy inventories, which IGOs, including the OECD, IMF, and UNEP, could harness.

Enhancing coordination

Beyond the WTO, a wide range of diplomatic initiatives on FFSR are being undertaken (see section 6.2). Links between the WTO and other fora and processes should be strengthened such that the WTO supports the implementation of commitments made, including those under the UNFCCC, G20, APEC, and G7, and the wider use of their tools such as peer review mechanisms. These fora and processes include the Friends of Fossil Fuel Subsidy Reform (n.d.), an informal group of 10 non-G20 countries, which since 2010 has been “aiming to build political consensus on the importance of fossil fuel subsidy reform.” As noted, the Netherlands (one of the group’s members) launched in December 2023 an international coalition to phase out fossil fuel subsidies (see Box 4). Canada, which joined this coalition, announced in 2023 a self-assessment review framework and associated guidelines to meet its G7 commitment to phase out inefficient FFS by 2025 (Government of Canada, 2023). Under the UNFCCC, two potential entry points are the need to shift financial flows (from fossil fuels to clean energy) under Article 2.1(c) of the Paris Agreement and the potential to include FFSR as part of a country’s nationally determined contribution. It is also significant that the COP28 decision text on the outcome of the first global stocktake identifies

that inefficient FFS should be phased out and that subsidies that support energy poverty and just transitions of the energy sector could be exempted (see Table 6) (UNFCCC, 2023).

In all of these initiatives there is a clear need to coordinate better the activities of organizations providing information and support to reform FFS, and the WTO should liaise with key organizations to improve coordination globally and regionally. A first step could be relatively straightforward and include, for example, a quarterly meeting between key organizations where their respective recent and planned work on FFSR is presented. Coordination activities could also include: generating a repository of experiences and information supporting unilateral or peer reviews as required; arranging meetings and events for enhanced coordination and to improve understanding of the scale of FFS and their impacts and reform options; and commissioning research as needed.

Assessing options for future cooperative arrangements

While most WTO members may not be ready to engage in the crafting of international disciplines on FFS, discussing how existing WTO rules apply to FFS and how multi-country FFSR agreements could be formulated (including how to scope which FFS could be included in an agreement and also which should be prioritized for reform) would be useful preparation. Discussions in the FFSR initiative have highlighted, in particular, the need to identify forms of support that are more likely to be harmful and would need to be addressed as a priority. This paper has shown that the vast majority of FFS are granted globally in three categories, with 70% directed to transport consumers, residential consumers, and oil and gas producers. Without progress in these three categories, the scale of global FFS, and the adverse impacts they cause, will remain high. A further category of subsidies—those granted to coal across its full supply chain—are considered to have such high adverse impacts that they should be considered for immediate, or at least very rapid, elimination.

The ACCTS, where negotiations on disciplines covering FFS are ongoing, may provide inspiration and a useful precedent. Proposals on the form of such agreements and the elements they could contain have been put forward in several studies (see Box 6). These proposals include options such as a commitment mechanism to pledge, report, and review—i.e. each party would pledge which FFS it will reform and then report against progress with a review by other parties to the agreement. Another option is a “box” approach where, for example, certain subsidies would be immediately reformed (red box), others subject to gradual reform (amber box), and others reformed more slowly or retained (green box), with possible variants.³⁶ A necessary part of discussions would be to agree on how differences in levels of economic development would be included (e.g. special and differential treatment). Longer time periods to deliver commitments, higher de minimis shares, and lower

percentage reductions in any cap-based scheme are some of the principles which could be included.

A first step towards meaningful action on FFSR through collective action could be a “standstill” (i.e. no increase in FFS, by value and/or number of FFS), perhaps building on the voluntary standstill approach APEC proposed in 2021 to those member economies “in a position to do so” (APEC Committee on Trade and Investment, 2021).

A particular opportunity for interested countries may be to instigate discussions and analysis around whether the zero taxation almost exclusively imposed on fuels used for international aviation and maritime transport could be increased (see Box 2). Trade and competitiveness impacts mean that multilateral action would be preferable to individual countries and/or regions and implementing reform of these taxation rules.

36. The Agreement on Agriculture has amber, blue, and green boxes plus a special “S&D” box with exemptions for developing countries (WTO, n.d.-a).

References

- APEC Committee on Trade and Investment. (2021). *Options for Taking Forward a Potential Voluntary Standstill Commitment on Inefficient Fossil Fuel Subsidies*. APEC Secretariat. <https://www.apec.org/publications/2021/12/options-for-taking-forward-a-potential-voluntary-standstill-commitment-on-inefficient-fossil-fuel-subsidies>
- Baršauskaitė, I. (2022). *Background note on fossil fuel subsidy reform*. IISD. <https://www.iisd.org/publications/brief/background-note-fossil-fuel-subsidy-reform>
- Beaton, C., Gerasimchuk, I., Laan, T., Lang, K., Vis-Dunbar, D. & Wooders, P. (2013). *A guidebook to fossil-fuel subsidy reform for policy-makers in Southeast Asia*. IISD. <https://www.iisd.org/publications/report/guidebook-fossil-fuel-subsidy-reform-policy-makers-southeast-asia>
- Beyond Oil & Gas Alliance. (n.d.). *Redefining climate leadership*. <https://beyondoilandgasalliance.org/>
- British Plastics Federation. (2019). *Oil consumption*. https://www.bpf.co.uk/press/Oil_Consumption
- Clarke, K. (2015). *Diesel subsidy reform in india: Lessons learned*. IISD. <https://www.iisd.org/publications/report/diesel-subsidy-reform-india-lessons-learned>
- CEP. (n.d.). *Council on Economic Policies*. <https://www.cepweb.org/>
- Energy Sector Management Assistance Program (ESMAP). (n.d.). *Energy Subsidy Reform Assessment Framework (ESRAF)*. <https://www.esmap.org/esraf>
- Erickson, P., van Asselt, H., Koplow, D., Lazarus, M., Newell, P., Oreskes, N., & Supran, G. (2020). Why fossil fuel producer subsidies matter. *Nature*, 578 E1-E4. <https://www.nature.com/articles/s41586-019-1920-x>
- Eriksson, E., Gisselman, F., & Swanson, N. (2021). *Trade and climate change – promoting climate goals with a WTO Agreement*. Swedish Board of Trade. <https://www.kommerskollegium.se/en/publications/reports/2021/trade-and-climate-change/>
- Esiree, D. D. (2023, June 26). As Nigeria scraps fuel subsidy, a vibrant black market collapses. *Reuters*. <https://www.reuters.com/markets/commodities/nigeria-scraps-fuel-subsidy-vibrant-black-market-collapses-2023-06-26/>
- Fabier. (2018). A study on aviation ticket taxes. <https://cedelft.eu/publications/a-study-on-aviation-ticket-taxes/>
- Friends of Fossil Fuel Subsidy Reform. (n.d.) *What is the Friends of Fossil Fuel Subsidy Reform?* <https://ffsr.org/>
- Gerasimchuk, I., Wooders, P., Merrill, L., Sanchez, L. & Kitson, L. (2017a). *A guidebook to reviews of fossil fuel subsidies: From self-reports to peer learning*. IISD. <https://www.iisd.org/publications/guide/guidebook-reviews-fossil-fuel-subsidies-self-reports-peer-learning>
- Gerasimchuk, I., Bassi, A., & Merrill, L. (2017b). *Zombie energy: Climate benefits of ending subsidies to fossil fuel production*. IISD. <https://www.iisd.org/publications/report/zombie-energy-climate-benefits-ending-subsidies-fossil-fuel-production>
- Global Subsidies Initiative. (n.d.). *Where we work*. IISD. <https://www.iisd.org/gsi/where-we-work>

- Government of Canada. (2018). *Final Report by the Task Force on Just Transition for Canadian Coal Power Workers and Communities*. Environment and Climate Change Canada. <https://www.canada.ca/en/environment-climate-change/services/climate-change/task-force-just-transition/final-report.html>
- Government of Canada. (2023, July 24). Government of Canada delivers on key climate commitment to phase out inefficient fossil fuel subsidies. *News release*. <https://www.canada.ca/en/environment-climate-change/news/2023/07/government-of-canada-delivers-on-key-climate-commitment-to-phase-out-inefficient-fossil-fuel-subsidies.html>
- Government of the Netherlands. (2023, December 9). *COP28: Netherlands launches international coalition to phase out fossil fuel subsidies*. <https://www.government.nl/latest/news/2023/12/09/cop28-netherlands-launches-international-coalition-to-phase-out-fossil-fuel-subsidies>
- Government of New Zealand. (n.d.). *Agreement on Climate Change, Trade and Sustainability (ACCTS) negotiations*. <https://www.mfat.govt.nz/en/trade/free-trade-agreements/trade-and-climate/agreement-on-climate-change-trade-and-sustainability-accts-negotiations/>
- International Energy Agency (IEA). (2020). *Electricity Market Report - December 2020*. <https://www.iea.org/reports/electricity-market-report-december-2020>
- International Energy Agency (IEA). (2023a). *Energy Technology Perspectives 2023*. <https://www.iea.org/reports/energy-technology-perspectives-2023>
- International Energy Agency (IEA). (2023b). *Fossil Fuels Consumption Subsidies 2022*. <https://www.iea.org/reports/fossil-fuels-consumption-subsidies-2022>
- International Energy Agency (IEA) & Organisation for Economic Co-operation and Development (OECD). (2018). *Update on recent progress in reform of inefficient fossil fuel subsidies that encourage wasteful consumption*. <https://www.oecd.org/fossil-fuels/publication/update-progress-reform-fossil-fuel-subsidies-g20.pdf>
- International Monetary Fund (IMF). (n.d.). *Climate change: Fossil fuel subsidies*. <https://www.imf.org/en/Topics/climate-change/energy-subsidies>
- International Trade Union Confederation. (n.d.). *Just Transition Centre*. <https://www.ituc-csi.org/just-transition-centre>
- Intergovernmental Panel on Climate Change (IPCC). (2023). *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>
- Kojima, M. (2010). *Rockets and feathers: Asymmetric petroleum product pricing in developing countries*. https://www.researchgate.net/publication/281240650_Rockets_and_Feathers_Asymmetric_Petroleum_Product_Pricing_in_Developing_Countries
- Kuehl, J., Bassi, A.M., Gass, P. & Pallaske, G. (2021). *Cutting Emissions Through Fossil Fuel Subsidy Reform and Taxation*. IISD. <https://www.iisd.org/publications/cutting-emissions-fossil-fuel-subsidies-taxation>
- Laan, T., Geddes, A., Jones, N. et al. (2023b). *Fanning the Flames: G20 provides record financial support for fossil fuels*. Geneva: IISD. <https://www.iisd.org/publications/report/fanning-flames-g20-support-of-fossil-fuels>

- Laan, T. & Steenblik, R. (2023). *Challenges and Opportunities for the Reform of Fossil Fuel Tax Expenditures in Developing and Emerging Economies*. Council on Economic Policies. <https://www.cepweb.org/challenges-and-opportunities-for-the-reform-of-fossil-fuel-tax-expenditures-in-developing-and-emerging-economies/>
- Martinez-Alvarez, C.B., Hazlett, C., Mahdavi, P., & Ross, M.L. (2022). *Political leadership has limited impact on fossil fuel taxes and subsidies*. Proceedings of the National Academy of Sciences. <https://www.pnas.org/doi/full/10.1073/pnas.2208024119>
- McCulloch, N. (2023). *Ending fossil fuel subsidies: The politics of saving the planet*. Oxford: Practical Action Publishing.
- Moerenhout, T. & Irschlinger, T. (2020). *Exploring the trade impacts of fossil fuel subsidies*. IISD. <https://www.iisd.org/publications/report/exploring-trade-impacts-fossil-fuel-subsidies>
- Monkelbaan, J. & Steenblik, R. (2021). *Fossil fuel subsidy reform: What role for the world trade organisation?* Quaker United Nation Office and Fredrich Ebert Stiftung. <https://quno.org/resource/2021/10/fossil-fuel-subsidy-reform-working-paper-no-3-tess-series>
- Organisation for Economic Co-operation and Development (OECD). (n.d.). *Fossil fuel support data and Country Notes*. <https://www.oecd.org/fossil-fuels/countrydata/>
- Organisation for Economic Co-operation and Development (OECD). (2023). *OECD inventory of support measures for fossil fuels: Country notes*. <https://doi.org/10.1787/5a3efe65-en>
- Organisation for Economic Co-operation and Development (OECD) & International Energy Agency (IEA). (2020). *The Netherlands's effort to phase out and rationalise its fossil-fuel subsidies*. <https://www.oecd.org/fossil-fuels/publication/2020-OECD-IEA-review-of-fossil-fuel-subsidies-in-the-Netherlands.pdf>
- Organisation for Economic Co-operation and Development (OECD) & International Institute for Sustainable Development (IISD). (n.d.). *Fossil Fuel Subsidy Tracker*. <https://fossilfuelsubsidytracker.org/>
- Power Past Coal Alliance. (n.d.). *Our story*. <https://poweringpastcoal.org/our-story/>
- Sanchez, L., Wooders, P., Mostafa, M. & Bechauf, R. (2020, August 19). 53 Ways to Reform Fossil Fuel Consumer Subsidies and Pricing. *Subsidy Watch Blog*. <https://www.iisd.org/gsi/subsidy-watch-blog/53-ways-reform-fossil-fuel-consumer-subsidies-and-pricing>
- Skovgaard, J. & van Asselt, H. (2019). The politics of fossil fuel subsidies and their reform: Implications for climate change mitigation. *WIREs Climate Change*, Volume 10, Issue 4, e581. <https://wires.onlinelibrary.wiley.com/doi/abs/10.1002/wcc.581>
- SOMO, Oil Change International, & MilieuDefensie. (2023). *Phasing-out fossil fuel subsidies in the Netherlands*. <https://www.somo.nl/phasing-out-fossil-fuel-subsidies-in-the-netherlands/>
- Stone, L. (2023, May 25). JETPs 101: *Helping emerging economies go from coal to clean*. <https://rmi.org/jetps-101-helping-emerging-economies-go-from-coal-to-clean/>
- Subsidy Platform. (n.d.). *Subsidy Platform*. <https://www.subsidydata.org>
- United Nations (UN). (n.d.). *Inter-agency and Expert Group on SDG Indicators*. <https://unstats.un.org/sdgs/iaeg-sdgs/>

- United Nations Environment Programme (UNEP). (2019). *Measuring fossil fuel subsidies in the context of the Sustainable Development Goals*. <https://www.unep.org/resources/report/measuring-fossil-fuel-subsidies-context-sustainable-development-goals>
- United Nations Environment Programme (UNEP). (2023). Target 12.2. *Fossil Fuel Subsidies*. One Planet Network SDG12 Hub. <https://sdg12hub.org/sdg-12-hub/see-progress-on-sdg-12-by-target/12c-fossil-fuel-subsidies>
- United Nations Framework Convention on Climate Change (UNFCCC). (2015). Paris Agreement (All language versions) (as contained in the report of the Conference of the Parties on its twenty-first session, FCCC/CP/2015/10/Add.1). <https://unfccc.int/process/conferences/pastconferences/paris-climate-change-conference-november-2015/paris-agreement>
- United Nations Framework Convention on Climate Change (UNFCCC). (2021). *The Glasgow Climate Pact – Key outcomes from COP26*. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-glasgow-climate-pact-key-outcomes-from-cop26>
- United Nations Framework Convention on Climate Change (UNFCCC). (2023). First global stocktake, Draft decision -/CMA.5, Outcome of the first global stocktake, U.N. FCCC/PA/CAM/2023/L.17 (December 13, 2023). https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf
- van Asselt, H. & Moerenhout, T. (2020). *Fit for Purpose? Towards trade rules that support fossil fuel subsidy reform and the clean energy transition*. Nordisk Ministerråd. <https://www.norden.org/en/publication/fit-purpose>
- Verkuijl, C., van Asselt, H., Moerenhout, T., Casier, L., & Wooders, P. (2017). *Tackling fossil fuel subsidies through International Trade Agreements*. Climate Strategies. <https://climatestrategies.org/publication/tackling-fossil-fuel-subsidies-through-international-trade-agreements/>
- Wooders, P. & Lang, K. (2010). *A How-to Guide: Measuring subsidies to fossil-fuel producers*. <https://www.iisd.org/publications/report/how-guide-measuring-subsidies-fossil-fuel-producers>
- World Bank. (2020). *Energy Subsidy Reform Facility*. <https://www.worldbank.org/en/results/2020/11/12/energy-subsidy-reform-facility-generates-knowledge-to-support-governments-to-design-and-implement-sustainable-energy-subsidy-reforms-while-safeguarding-the-welfare-of-the-poor>
- World Trade Organization (WTO). (n.d.-a). *Domestic support: Amber, blue and green boxes*. https://www.wto.org/english/tratop_e/agric_e/negs_bkgrnd13_boxes_e.
- World Trade Organization (WTO). (n.d.-b). *Fossil fuel subsidy reform*. https://www.wto.org/english/tratop_e/envir_e/fossil_fuel_e.htm
- World Trade Organization (WTO). (n.d.-c) *Trade and environmental sustainability*. https://www.wto.org/english/tratop_e/tessd_e/tessd_e.htm
- World Trade Organization, Fossil Fuel Subsidies Reform Ministerial Statement of 12 December 2017, WTO Doc. WT/MIN(17)/54 (2017). <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN17/54.pdf&Open=True>
- World Trade Organization (WTO). (2019). *World Trade Statistical Review 2019*. <https://www.wto-ilibrary.org/content/books/9789287047816>

World Trade Organization, Ministerial Statement on Fossil Fuel Subsidies of 14 December 2021, WTO Doc. WT/MIN(21)/9/Rev.1 (2021). <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN21/9r1.pdf&Open=True>

World Trade Organization, *Fossil fuel subsidy reform (FFSR) classification of fossil fuel subsidy measures: Note by the Secretariat*, WTO Doc. INF/TE/FFSR/W/2 (July 7, 2023). <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/INF/TEFFSR/W2.pdf&Open=True>

World Trade Organization (WTO). (2023b, May 25). International organizations launch platform to promote access to subsidy information. *WTO News*. https://www.wto.org/english/news_e/news23_e/scm_24may23_e.htm

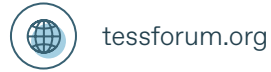
World Trade Organization (WTO). (2023c). *Trade policy tools for climate action*. https://www.wto.org/english/res_e/publications_e/tptforclimataction_e.htm

WTO Secretariat. (2023). *Temporary fossil fuel support measures and phase-out best practices*. Highlights from factual note by the WTO Secretariat [Presentation]. https://www.wto.org/english/tratop_e/envir_e/presentation_by_wto_secretariat_temporary_ffs_and_phase_out_best_practices.pdf

World Trade Organization, Ministerial Statement on Fossil Fuel Subsidies of 26 February 2024, WTO Doc. WT/MIN(24)/19 (2024). <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN24/19.pdf&Open=True>

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