Distr.: General
9 April 2021
Original: English

Committee of Experts on International Cooperation in Tax Matters
Twenty-second session
Virtual meeting – 23 April 2021, 9.45-11 am; and 26 April 2021, 8-10.15 am (NY time)
Item 3(h) of the provisional agenda
Environmental tax issues

Chapter 7 [former Chapter 6]: Carbon Taxation: Interaction with other instruments

Handbook on Carbon Taxation for Developing Countries

Note by the Secretariat

Chapter 7: Carbon Taxation: Interaction with other instruments is presented to the Committee FOR DISCUSSION AND APPROVAL at its 22nd Session.

The chapter was presented for discussion at the 21st Session; it was subsequently revised according to the Committee's input, and with additional feedback received by the Subcommittee.

Chapter 7 aims to support policymakers in identifying which existing policy instruments might interact with the carbon tax in a variety of ways (i.e. reinforcing it; duplicating it; or countering it), and how to address these interactions by adjusting the carbon tax, the other instrument, creating a hybrid approach or adding complementary policies. Instruments that are specifically analyzed in this chapter are other carbon pricing mechanisms, fuel/energy taxation, incentives to clean technology, and fossil fuel subsidies.

Changes are recorded in track-change, and a few comments (indicating moves/insertions) were added for clarity.

Main amendments with respect to the previous version of this chapter (presented at the 21st Session as E/C.18/2020/CRP.47) were:

(i) Revision of the introduction (section 1, Carbon Tax: to be considered in context) to define more clearly the scope and objectives of the chapter.

(ii) Streamlining of Section 6.1.1 (In scope: carbon tax to carbon taxation) of the previous version. Contents were simplified, summarized and integrated in Section 1.

(iii) Revision of the framework used to describe interactions between a carbon tax, and other instruments (currently section 2, Assessing the interaction). The framework was updated to classify the policy interaction simply as complementary, overlapping and countervailing.* This alternative approach had been presented to the 21st Session

of the Committee, and was considered preferrable, as it is much clearer and straightforward.

(iv) Revision of previous section 6.4, which contained background information on the interaction between fossil fuel subsidies and a carbon tax. The text was streamlined into current section 3d (Fossil Fuel Subsidies). The section reflects the approach, already proposed at the 21st Session, that a carbon tax can be introduced even in the presence of subsidies, which can then be phased out gradually. The section now contains a short overview of existing methodologies to define and measure fossil fuel subsidies; once these subsidies are identified, the section provides options on how to address potential interactions with the carbon tax.

*The previous framework assessed, for each instrument, what are the potential consequences of introducing a carbon tax with different four approaches (without taking into consideration the existing policy framework; to supplement existing instruments; to complement existing instruments; or to establish a hybrid form of carbon pricing). Additionally, the previous framework placed a lot of emphasis on the distinction between implicit and explicit carbon pricing, and had a detailed discussion of the instruments themselves (e.g. ETS).

Table of Contents

1. Carbon Tax: to be considered in context

1. A carbon tax ~~does not exist in isolation, and therefore it~~ should not be considered, designed or introduced in a policy vacuum. Various rules and regulations ~~(also related to other taxes)~~ that are already in place could have an impact on, or relevant interaction with, a carbon tax~~. The interactions can range from influencing~~ and its objectives. Some of these impacts could enhance or inhibit the effectiveness~~, to influencing the~~ of the carbon tax, or even prompt additional administrative concerns about (and necessary requirements ~~that will be needed to implement the carbon tax and the burden that it puts on the implementing authorities, collectors and payers.~~to) the implementation of a carbon tax.

2. When considering ~~introducing~~the introduction of a carbon tax, it is relevant to assess what other instruments are already in place or are considered for introduction, that could influence the ~~effect~~effectiveness and goals of a carbon tax~~, by putting a price on carbon or placing a burden on products that generate carbon emissions; some examples~~. Examples of ~~this~~these other instruments are energy or fuel taxes~~,~~; emission trading schemes~~, fuel taxes etc. On the other hand, there might be instruments in place that achieve the opposite result of a carbon tax by reducing the final user cost of products containing carbon (e.g.~~; or fossil fuel subsidies~~).~~ as well as different regulatory measures.

~~3. Carbon taxes contribute to the cost efficient reduction of carbon emissions. They can be effective even if other instruments are already in place that regulate, price or tax carbon or fuels. Key interactions should be taken into account in the policy design process to ensure good results.~~

3. The effectiveness of a carbon tax will therefore not only depend on its design, but also on how the proposed carbon tax will interact with other known related policies and instruments. Policy interactions refer to how these policies achieve their independent objectives and may or may not have been conceived as a package. The objective of this chapter is to outline the main possible interactions between various instruments affecting the price on carbon (or carbon-generating energy); and to provide some options about how these interactions can be addressed when designing and implementing various instruments.

4. This chapter seeks to support policy makers on the following:

- To understand the significance of potential interactions between various policies and instruments that could enhance, or conflict with, the objectives of the carbon tax. Potential interactions should be considered dynamically, from the time the carbon tax starts to be designed until after the carbon tax is in place.

- To understand and look broadly at what instruments are already in place or are considered for implementation, that could affect the price on carbon and other objectives, i.e. carbon emissions reduction; revenue raising; and/or technological development and energy efficiency incentives. Here, all levels of government should be involved. If suitable, the successful introduction of an optimal designed carbon tax may require some changes to instruments already in place or being considered at the same time.
- To consider how unintended interactions can be addressed, by adjusting the carbon tax design, adjusting the pre-existing policies, introducing complementary measures, or integrating carbon tax aspects into other pre-existing policies [hybrid option].
- To share lessons learned in other countries on combining various instruments.
- Combining various instruments that are implemented with different policies and approaches to reduce carbon may be a process that requires systematic adjustments. Defining upfront the timeline and scope for any needed adjustment overtime, can reduce the uncertainty about the effects of instruments implementation and adjustments.

~~4. The interaction between a carbon tax and other instruments can be positive or neutral, in that the various rules and regulations reinforce or support each other. The interaction could also be negative, when various rules are designed or applied in a way that they adversely affect each other; or where the carbon tax undermines the effectiveness of other instruments set up for achieving the same or even different policies, and *vice versa*.~~

~~5. The objective of this Chapter is to outline the main instruments that could be already in place to put a price on carbon or energy or that subsidize the price of fossil fuels; and to outline some considerations on their interaction with a carbon tax. Policymakers should approach the following sections by considering what instruments are already in place; what is the overall objective they are trying to achieve (i.e. carbon emissions reduction; revenue raising; and/or technological development), and whether a carbon tax can be appropriately combined with existing instruments to help achieve those objectives. Overall, a carbon tax can successfully be introduced even when pre-existing instrument are already in place, as long as those instruments are duly identified, understood and their interaction considered in the design as well as the implementation of a carbon tax.~~

~~**6.1.1. In scope: carbon tax to carbon taxation**~~

Commented [EB1]: Note for the Committee: Section 6.1.1 (In scope: carbon tax to carbon taxation) of the previous version of this chapter (presented at the 21st Session as E/C.18/2020/CRP.47) was deleted as its contents were simplified, summarized and integrated in Section 1 above (Carbon Tax: to be considered in context). To make the text easier to read, the deleted Section 6.1.1 was removed from this version.

2. Assessing the interaction

Commented [EB2]: Note for the Committee: Section 6.1.2 (Assessing the interaction) of the previous version of this chapter (presented at the 21st Session as E/C.18/2020/CRP.47) was rewritten to take into account the new approach used in this chapter to classify interactions between the carbon tax and other instruments. To make the text easier to read, the old text of Section 6.1.2 was removed from this version.

5. When focusing on reducing carbon emissions, many policies may be considered to successfully and sustainably contributing towards achieving a low carbon economy; however, to avoid inefficient carbon pricing (and potentially other adverse impact, policies should be developed taking into account the context and interactions among those instruments.

6. Environmental and carbon-related policies are often designed and implemented by different government entities, and not seldomly at various levels of government. Policy consistency via coordination between the different authorities will be important.

7. Policy interactions may have direct, indirect and unintended effects on each other's' application. Unintended effects may force economic actors to make choices that may not be the most cost effective, considering the available resources and technology, thus driving up the total cost of the solution for the economy as a whole.

8. On the other hand, no single policy may be able to achieve all the desired objectives of policy makers, for the economy as a whole or for specific sectors. In practice, policymakers often resort to a combination of different policy approaches to achieve decarbonisation, often alongside separate but linked policy objectives on air pollution, energy security, revenue raising, economic development and job creation. An instrument like a carbon tax can act as a corner stone of a jurisdiction's climate policy mix, while other instruments may be complementary to facilitate carbon reduction further, and to deal with unintended consequences. See the carbon tax as the engine and other measures as lubricating oil that makes the transition run smoother and quicker.

9. An effective and coordinated policy will vary country by country. Different countries have different needs depending on local circumstances: their development priorities, types of economy, domestic energy resources, ability to invest and national energy policies. Different needs will be balanced in different ways; hence, a multitude of combinations can exist.

10. To provide policymakers with a meaningful framework of how to assess interactions, the chapter will focus on the main types of interactions[1], whether policies are:

- Complementary, in the sense that the various policies enhance each other's performance.
- Overlapping, in that they run parallel to each other, intending the same effect.

[1] See methodology and further examples further elaborated in "State and Trends of Carbon Pricing 2016" by the World Bank Group – Climate Change, October 2016

- Countervailing, in which case that the various policies have adverse effects on the behaviour of investors, consumers etc.

~~**6.2. Interaction with other carbon pricing policy instruments**~~

11. To provide policymakers with a meaningful framework of how to assess interactions, the chapter will focus on the main types of interactions[2], whether policies are:

- Complementary, in the sense that the various policies enhance each other's performance.
- Overlapping, in that they run parallel to each other, intending the same effect.
- Countervailing, in which case that the various policies have adverse effects on the behaviour of investors, consumers etc.

a) Complementary ~~approach~~policies

12. ~~There are instances where alternative policies can complement an explicit CO_2 price signal from an ETS.~~ Complementary ~~measures can be defined as those which align with and reinforce a CO_2 price signal by addressing~~ policies are policies that can be introduced and applied together, with one policy improving the performance of the other. Complementary policies may have different objectives and generate different consequences. However, their combined effect is considered superior to the effect of one single policy.

~~6.~~13. Policies complementary to a carbon reduction policy may be less focused on reinforcing the carbon price signal, but rather address potential barriers to companies and individuals responding to the ~~CO_2 price signal.~~carbon price signal of the tax. They may ensure that both producers and consumers are responding to the compliance costs of their actions, including climate impacts.

Box 1. Case of Chile

Key complementary policies in the energy sector in Chile that complemented the carbon tax and incentivised an energy transition

The Renewable Energy Law (Law No. 20257): The first important reform for the renewable energy sector was the approval of a Renewable Energy Law, which included renewable portfolio standard (RPS). This is a quota system that encourages renewable energy generation by setting the proportion of electricity supply that must be produced from eligible renewable energy sources.

[2] See methodology and further examples further elaborated in "State and Trends of Carbon Pricing 2016" by the World Bank Group – Climate Change, October 2016

Commented [EB3]: Note for the Committee: Section 6.2 (Interaction with other carbon pricing policy instruments) of this chapter (presented at the 21st Session as E/C.18/2020/CRP.47) was rewritten to take into account the new approach used in this chapter to classify interactions between the carbon tax and other instruments. To make the text easier to read, the old text of Section 6.2 was removed from this version.

The introduction of renewable energy technologies for the first time in the energy matrix in Chile dates to 2008 with the approval of Law No. 20.257. The law aimed to support the generation of electricity of non-conventional renewable sources such as biomass, small hydraulic energy (capacity of less than 20 MW), geothermal energy, solar energy, wind power and marine energy. This law was amended in 2013 (Law 20,698, better known as "Law 20/25") stating that by 2025, 20% of the energy matrix in Chile must be composed of renewable energy.

Restructuring Public Auctions: Another important reform in Chile was to improve renewable energy generators' ability to compete in energy auctions. Renewable energy projects without a power purchase agreement ("PPAs") used to face significant obstacles to obtain funding from commercial banks. In Chile, PPAs can be achieved by bilateral negotiations or through participation in "power auctions"—carried out by the National Energy Commission (CNE)—for regulated consumers served by the distribution grid. Since 2005, Law 20,018 requires electricity distribution companies to contract their energy requirements by means of competitive non-discriminatory auctions (thus including renewables). A submitted bid with the lowest price is awarded a long-term contract (typically, a PPA) for the project. In 2014, three-time blocks were established in the bidding process, one block covering from 11 pm to 8 am, a second from 8 am to 6 pm, and a third at the time of peak demand between 6 pm and 11 pm. This modification in the structure of the auction scheme has greatly favoured renewable generators since they could now offer during the times of the day when they are producing energy.

Energy Transmission: Law 20,936, on electricity transmission, aims to create a robust interconnected transmission system allowing the unification of Chile's power grid connecting the Northern Interconnected System (SING) with the Central Interconnected System (SIC). The interconnection of the north and central grid systems will allow to merge two medium-sized markets, not only forming a more competitive marketplace, it will also allow the energy generated from large solar potentials in the north to be distributed to the central and southern part of the country.

Distributed Energy: The key regulatory instrument is Law 19,940 and Law 20,571, the first grants rights to connect in distribution projects for projects below 9 MW, creating the small energy generators market (bigger than residential, but that have facilities with an installed capacity of up to 9MW[3], the second is a system of net billing of residential generators. Essentially the law regulates energy self-generation based on Non-Conventional Renewable Energies (NCRE) and efficient cogeneration. The Law gives users the right to sell their surplus directly to the electricity distributor at a regulated price through net-billing.

~~7.~~14. of complementary policies may be more sustainable. With the main objective of a carbon tax being carbon reduction, significant decarbonisation would eventually in a long-term perspective eliminate most of the tax base for a carbon tax. As the assumption would be that energy will be needed

[3] Regulated by D.S. N° 244 of Ministry of Economy D.S. N°101 of the Ministry of Energy

long after carbon is mitigated in energy products, a complementary system would retain at least part of its taxable base. Depending on the features of the carbon tax as well as of the other policies and instruments, such combinations can also be overlapping. Consideration would need to be given to the design to avoid overlap of the instruments. Cooperation with the policy makers responsible for other instruments as well as expected taxpayers would help to identify potential overlap in the design face when connecting early on.

b) Overlapping policies

15. Where complementary policies may have different objectives and consequences whilst reinforcing each other's application, overlapping policies will in practice achieve the same goals. Overlapping policies that pre-exist or are considered together with the introduction of a carbon tax, will therefore create parallel carbon pricing.

16. Policy makers must manage overlapping policies to achieve combined objectives and must certainly be wary of not generating an excessive economic burden on economic agents or an excessive administrative burden on governments.

17. Parallel carbon pricing may create an excessive carbon cost. In the case of a carbon tax, overlapping policies could undermine the carbon tax price signal, and lead to less cost-effective CO_2 abatement measures being undertaken.

18. When a carbon tax is introduced, other existing taxation per unit of production, distribution and consumption of energy needs to be considered, whether generated through a pre-existing and overlapping emissions trading system, energy related tax or other implicit pricing instruments. For example, Argentina reformed its fuel taxes maintaining the same overall revenue adopting a carbon tax rate, while the full mitigation effect is yet to be determined, the relevance of the policy is that it acted both as an important signal committing the country carbon pricing and changed the relative prices of fuels to be consistent with their carbon content.[4]

Box 2. Introducing carbon taxation in Mexico

[4] OECD, 2019 Taxing Energy Use 2019: Country Note – Argentina online at https://www.oecd.org/tax/tax-policy/taxing-energy-use-argentina.pdf

The General Climate Change Law of April 2012 paved the way for both reforms to fuel taxes and the introduction of the carbon tax. In 2013, as part of a comprehensive tax reform, Mexico became the first Latin American country to impose a carbon tax. The tax was implemented through a reform of the Law on Special Tax on Production and Services (LIEPS, 1980).

The initial tax was set at MXN $ 39.80 (approximately US $ 3.2). It is an upstream tax on fuels with a rate based on the carbon (only CO2) content of fuels with exemptions for gas production and imports and instituting a price cap on some high carbon intensity fuels. Since its implementation, the tax has been adjusted annually for inflation, but it is still low, approximately US$3 per tCO2. In addition, the tax rate was limited to 3% of the sale price of the fuel.

The Mexican carbon pricing policy is interesting because it was conceived from the beginning as a strategy to develop an ETS and link with the Western Climate Initiate, it was viewed as a first step in a broader strategy, so although the tax is relatively simple, there are a series of additional features that have been implemented with the ETS in mind. MOUs were signed with the State of California, United States, the States of Ontario, and Quebec in Canada, to this effect.

Among the most important initiatives are the Law on the Special Tax on Production and Services allows the for tax-crediting by using carbon credits from Certified Emission Reductions of Mexican projects approved by the UNFCCC. The new legislation also included language for entities subject to the tax to deliver certified emission reductions (CER) from Mexican projects in lieu of the tax (CDC, EDF and IETA 2015; IEPS Law 2013). In December 2017, the regulations allowing for CERs were published allowing for credits for up to 20% of the carbon tax obligation.

Furthermore, in November 2013, a voluntary carbon exchange, MEXICO2, was established to trade carbon credits as a potential means of complying with the carbon tax. In August 2016, the Ministry of Environment (SEMARNAT) and the Mexican Stock Exchange signed a MOU to implement a simulation exercise for an ETS to develop capacities and generate more information.

In parallel the authorities have been developing the National Emissions Registry (RENE). The RENE from 2015 requires companies or facilities that emit more than 25,000 tCO2e / year to report their GHG emissions from the previous year, which includes nearly 3,000 companies from various sectors. This will be the basis for the reporting system under the linked ETS.

Although the system has experienced delays, the ETS starting, in January 2020, its three-year trial period.[5]

[5] ICAP, 2020, online retrieved June 4, 2020 https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems[]=59, and SERMANAT, online retrieved June 4, 2020 https://www.gob.mx/semarnat/acciones-y-programas/programa-de-prueba-del-sistema-de-comercio-de-emisiones-179414

~~8.~~19. Introducing a carbon tax in a way that it is overlapping other pre-existing policies to achieve the appropriate level of carbon taxation should be managed carefully. However, in certain situations, the carbon price from a single instrument may not be sufficient or applied sufficiently broad to stimulate investment in low-carbon technologies. Especially for carbon pricing to be effective in stimulating the uptake of low carbon energy options, as well as provide a price signal to develop low carbon technologies, the price needs to be sufficiently strong and stable.

~~9.~~20. Faced with the reality that the level of "effective" CO2 price needed to drive the necessary changes may not be politically achievable, ~~these~~carbon pricing efforts ~~are being~~through a carbon tax may be strengthened by ~~less transparent~~ measures such as technology mandates, emission performance standards and energy efficiency measures ~~to create~~, creating an implicit, less ~~transparent and high~~transparently higher CO2 price. ~~Implicit~~ If overlap from such measures on a carbon ~~pricing~~tax are not considered, such policies have the potential to undermine an explicit carbon price~~, e.g. from an emissions trading system~~ through a carbon tax. In the context of explicit CO2 pricing mechanisms like ~~an ETS or~~ a carbon tax, an overlapping policy can be described as any policy which results in additional emissions reductions beyond what would have been intended to and is driven by the ~~ETS or~~ tax. Distortions could include additional renewables targets, mandates or subsidies which support high~~-~~-cost renewable energy, badly designed energy efficiency measures ~~and energy taxes and~~or levies that alter the economics of investments~~, such as building a new CCGT.~~. These policies ~~will~~may be more costly in terms of reducing CO2 emissions, compared to emissions reductions driven by ~~an ETS[6] or~~a carbon tax that reflects the marginal cost of abatement.

c) Countervailing policies

21. Countervailing policies refer to policies that contradict the objectives of each other. With respect to a carbon tax, ~~overlapping policies~~a countervailing policy would be one that undermine the objectives and goals of carbon pricing. Such a type of policy may have a different set of objective and goals, e.g. support lower income groups, geographic regions or strategic economic sectors, but they could result in more carbonisation.

~~[6] In the case of ETSs, overlapping policies reduce demand for tradable allowances under the cap causing the allowance price to fall meaning that the prevailing market price in the ETS could cease to be the primary driver of abatement action, since more expensive abatement options occurred, driven by the overlapping regulation;~~

22. When considering introducing a carbon tax, it is particularly crucial to determine the country has policies that subsidize carbon, both at the consumption and production levels. The co-existence of such subsidies together with carbon pricing needs to be evaluated by the countries' policy makers in order to avoid confusion, complexity and ineffectiveness of a carbon price ~~signal,~~policy.

3. Policies and instruments interacting with carbon tax

23. Given the role of carbon, particularly as it relates to ~~less cost~~ important sectors such as energy and agriculture, with great important to business and household expenditure, jurisdictions have and will consider a series of related policies and instruments to deal with energy, environment or income support that are closely related to climate mitigation. A carbon tax will therefore be embedded in a complex policy landscape.

Table 3 Examples of policies that may interact with a carbon tax

Complementary	Overlapping	Countervailing
- Electric energy reform - Energy efficiency packages, allowing for fuel switching. - Facilitating energy trade and daily contracts. - Regulate and incentivize smart grids. - Flexible demand side response. - Encourage electric storage. - Policies that support the quality and availability of weather forecasting to make renewable generation more predictable - Regulating methane emissions in the oil and gas sector - Phasing out coal-based energy production - Electric Cars - Vehicle emission standards - Subsdies/Investment in the charging stations and other infrastructure needed to support wide-scale adoption of transformative zero-emission options. - Percentage targets for vehicle manufacturers' sales of electric vehicles (EVs); - Standards for energy efficient buildings. - Regulations or incentives on land management practices. - Land fill regulations	- Emission Trading Schemes - Fuel and energy taxes - Renewable energy support measures - Vehicle fuel efficiency standards. - Feed-in tariffs or green certificates. - Environmental emissions regulations and standards. - Social carbon price in investment projects. - Internal carbon price in businesses - Land use and deforestation policies - Taxes on high emission cars - Payments for ecosystem goods and services (e.g., paying farmers to retire marginal agricultural land). - Recycling regulations - Banning organics in landfills - Regulations on forest management practices Fire/pest prevention measures - Retrofitting existing buildings	- Fossil fuel subsidies - Price wedge across fuels, (fuel taxes may distort prices of fuels not consistent with carbon content,eg. diesel and gasoline) - Land Use change (Forest clearing) subsidies. - Private car and transport subsidies. - Tax rebates on high emission cars (eg. Diesel) - Public Transport taxes

- Offset markets for GHG reductions from waste sites		

24. To allow an effective assessment of the interactions, it will be relevant to be understand other policies that are often considered in combination. Such other aspects could already be in place or they could be considered for introduction at the same time as the carbon tax. These other aspects can be managed or considered at the same time by other parts of Treasury or the Ministry of Finance, by other parts of the government in the broader sense or by other levels of government, e.g. at subnational level. Some of these aspects are tax related but others are not.

a) Carbon tax as one of the carbon pricing mechanisms

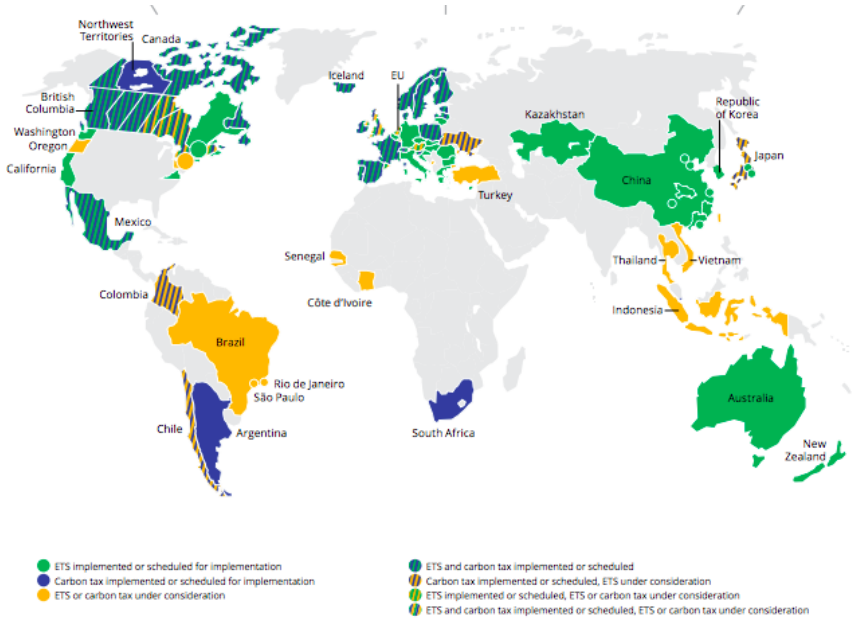
~~10.~~25. Imposing a carbon price[7] throughout an economy is a powerful mechanism to reduce carbon emissions.[8] ~~CO_2 abatement measures being undertaken compared to what would have been undertaken~~Public policy to impose a cost on carbon emissions is already in place, or under ~~the carbon tax.~~consideration, in many countries - to achieve the goal of limiting global warming and climate change. Such mechanisms will put a price on the carbon involved to produce a product or service, explicitly or implicitly. Explicit carbon pricing includes carbon taxation, emissions trading, carbon crediting, and results-based climate financing. On the other hand, implicit carbon pricing creates

[7] The World Bank features considerable information on carbon pricing. Its website on the subject, https://carbonpricingdashboard.worldbank.org/what-carbon-pricing, explains concisely what carbon pricing is, the main types of carbon pricing, international aspects of carbon pricing as well as national and regional initiatives. It also covers forms of internal carbon pricing, how various organisations and economic participants internalise the Price of carbon in their economic decisionmaking.
decision-making.

[8] See Chapter 2 – additional information and references can be provided

indirectly a price on carbon through policies like fuel taxation, energy efficiency standards, fossil fuel subsidy removal and incentives for low carbon technologies. [9]

Figure 4 Carbon pricing initiatives implemented, scheduled for implementation and under consideration



Source: World Bank State and Trends of Carbon Pricing 2020

~~11. Many of these actions are underpinned by a tacit expectation that, once sufficient momentum for change is generated, alignment of the objectives will result in harmonisation of policies under an explicit carbon price regime.~~

~~**6.3 Interaction with other taxes**~~

b) ~~A~~ Fuels and energy taxation

[9] The World Bank's State and Trends of Carbon Pricing report presents the distinction between explicit and implicit carbon pricing (World Bank; Ecofys; Vivid Economics (2016)).

~~12.~~ It is not unlikely for a carbon tax ~~will generally~~to be introduced within an existing tax framework which may include taxes on the production or consumption of fuels or energy.[10]~~,~~ The forms of taxation that are most closely related to the carbon tax on fuels or ~~emission~~emissions, include types of indirect taxation on the ~~use or~~ consumption of energy and energy products, be it through excises, energy taxation or sales and consumption taxes on energy products ~~or their consumption. When introducing a carbon tax, the interaction with energy taxation, with excises as well as with specific energy consumption taxes should certainly be considered.~~

~~13. Other forms of taxation could be relevant to the extent they impose an additional burden on energy and carbon throughout the value chain of producing and distributing energy and energy products.~~ ~~This subchapter will focus on the more indirect forms of taxation on transfer and consumption of energy. [*Need for contribution on these other forms of taxation to be assessed at this time]*~~

~~6.3.1. Energy tax, excises and consumption taxation~~

~~14.~~26. ~~Levying taxes on energy products is fairly common. The tax can cover excise type levies, which are indirect taxes on the sale or use of specific [energy] products, or energy taxation which cover energy products, used for heating, transport or other purposes, as well as electricity. Consumption taxes like value added taxation, sales taxes can also be levied on the sale of energy products for consumption.~~ The scope and rates from such taxes are diverse.[11] When introducing a carbon tax, the interaction with such pre-existing taxation should be considered. Other forms of taxation could be relevant to the extent they impose an additional burden on energy and carbon throughout the value chain of producing and distributing energy and energy products. ~~[12]~~~~.~~

[10] Further elaborated in Chapter ~~3A~~4A

[11] The OECD monitors the use of energy taxation on a regular basis. "Taxing Energy Use in 2019: Using taxes for climate action" is one of the more recent overviews, available at https://www.oecd-ilibrary.org/sites/058ca239-en/1/1/1/index.html?itemId=/content/publication/058ca239-en&_csp_=733ba7b0813af580090c8c6aac25027b&itemIGO=oecd&itemContentType=book

~~[12] The OECD monitors the use of energy taxation on a regular basis. https://www.oecd-ilibrary.org/sites/058ca239-en/1/1/1/index.html?itemId=/content/publication/058ca239-en&_csp_=733ba7b0813af580090c8c6aac25027b&itemIGO=oecd&itemContentType=book "Taxing Energy Use in 2019: Using taxes for climate action" is one of the more recent overviews.~~

~~15.~~ Certain countries have a long history of taxing energy products~~[13]. When implemented in the past, these~~.[14] In several countries,[15] it is the main or only tax specifically covering energy use. These types of taxes were generally not introduced for environmental reasons, but rather as a fiscal instrument used to raise tax revenue or to limit dependency on energy imports.

~~16. Whether a long or a more recent history, having the infrastructure in place for taxing energy products, will generally provide a helpful framework for taxing carbon. Potential gains from interaction on the choice of type carbon tax or the collection of carbon tax will not be covered in this chapter[16].~~

~~6.3.1.1. Taxation of energy~~

~~17. Fuel excise taxes tend to form the most common type of energy taxation. In several countries[17], it is the main or only tax specifically covering energy use. Electricity excise taxes, levied on electricity consumption by end users, are also widespread.~~

~~18.~~27. ~~As revenue raisers, energy taxation – in particular excise duties on petroleum products – continues to be a relevant and stable instrument.~~ E.g. in the EU countries, energy taxation on fossil fuels constitute on average nearly 5% of their total tax revenue[18]. Estimates for OECD countries are similar[19].

~~19.~~28. Apart from being an effective revenue raiser, there is ample evidence that energy taxation has improved energy efficiency and reduced demand for energy. Once energy taxation attains a certain level, it tends to affect consumer ~~behavior~~behaviour. E.g. since the introduction of the EU 2003 Energy ~~Tax~~Taxation Directive, aligning energy taxation on fuel products ~~in~~building on an earlier Mineral Oils Directive from the 1990's, it has had influence on energy efficiency in ~~Europe~~the

~~[13] E.g. Sweden has taxed petrol since 1924, diesel since 1937, and coal, oil and electricity for heating purposes have been taxed since the 1950's.~~

[14] E.g. Sweden has taxed petrol since 1924, diesel since 1937, and coal, oil and electricity for heating purposes have been taxed since the 1950's.

[15] The OECD overview on Taxation of Energy Use 2019 considers countries like Australia, China, Indonesia, Israel, Korea, New Zealand, Russia and the United States as only having fuel excise duties burdening the use of energy.

~~[16] Relevant interactions in this respect included in Chapter 3A~~

~~[17] The OECD overview on Taxation of Energy Use 2019 considers countries like Australia, China, Indonesia, Israel, Korea, New Zealand, Russia and the United States as only having fuel excise duties burdening the use of energy.~~

[18] https://ec.europa.eu/energy/data-analysis/energy-prices-and-costs_en?redir=1

[19] http://www.oecd.org/environment/indicators-modelling-outlooks/policy-instrument-database/

EU. The car market moved to more energy efficient cars in EU ~~member~~Member states, rather than Europeans driving less.

~~20.~~29. Whether a long or a more recent history, having the infrastructure in place for taxing energy products, will generally provide a helpful framework for taxing carbon. Potential gains from interaction on the choice of type carbon tax or the collection of carbon tax will not be covered in this chapter.[20]

~~21. Overall, a carbon tax will impose an additional cost burden on energy products. The additional burden will be immediately obvious when introducing a fuel based carbon tax. The impact may be slightly more indirect when introducing an emissions based carbon tax, especially to the extent that an emissions based carbon tax could put an additional burden on products that are not immediately covered by an existing energy tax. The interaction between taxation on energy and a carbon tax can be assessed along the same lines as the interaction between carbon tax and other carbon pricing instruments.~~

~~22. Therefore, when a carbon tax is introduced, other existing taxation per unit of production, distribution and consumption of energy needs to be considered.~~

~~**a) Multiple instruments**~~

~~23.~~30. Introducing a carbon tax without consideration for pre-existing energy taxation will increase the cost of energy and energy products. Where a carbon tax intends to focus on stimulating the reduction of carbon emissions, an energy tax affects volumes rather than carbon. In the total absence of coordination between the different types of taxation, the effect of both instruments will not necessary be re-enforcing carbon reduction. ~~A~~E.g. a number of low carbon fuels tend to have a lower energy content than more conventional, fossil fuel alternatives. Switching to a lower carbon fuel alternative may require the use of a higher volume of energy for the same effect. E.g. running a car on biodiesel for 100km will require a higher volume of biodiesel than the volume of diesel required to run a car for 100km. ~~The introduction of a carbon tax on top of an energy taxation without further consideration may therefore have contradictory effects.~~

c) Investment incentives

[20] Relevant interactions in this respect included in Chapter 3A

31. As for the innovation and support for investment in low carbon options, a well-designed carbon tax should drive businesses and households to lower-carbon products and services; this will not only support carbon reduction but also generate revenues which may be used to support low-carbon solutions and innovations. Depending on how the carbon tax is set up and on the low-carbon options available, the introduction of a carbon tax may not be sufficient. Targeted [tax] subsidies or incentives[21] may be needed to support investment in low carbon technology and innovations.

d) Fossil Fuel Subsidies

32. A policy to subsidize fossil fuels can be shortly defined as a deliberate policy action by the government that specifically targets fossil fuels, or electricity or heat generated from fossil fuels, and has one or more of the following effects (see Kojima and Koplow (2015):

- To reduce the net cost of fossil fuels and energy purchased
- To reduce the cost of production or delivery of fuels, electricity, or heat [generated by fossil fuels]
- To increase revenues (via transfers) to owners of fossil fuels, or suppliers of fossil fuels, electricity, or heat.

33. Various and more extensive definitions of fossil fuel subsidies have been elaborated by organizations such as the World Trade Organization (WTO), the OECD and the International Energy Agency (IEA). These definitions depend on the form of policy intervention by governments (WTO, OECD), or the effect of some of these measures on cost and prices (IEA). (See UNEP, OECD, IISD (2019)).

34. To measure fossil fuel subsidies, one can use: 1) The Price Gap; 2) The Inventory of Support to Fossil Fuels; and 3) The Indicator that is part of the Sustainable Development Goals (SDGs). See Box 3. In any of these measures of fossil fuel subsidies, one could add an estimate of negative

[21] In the framework of energy transition, subsidies and tax incentives seem most sustainable if they meet a number of conditions:

- They should be targeted to support investments that seek to reduce carbon emissions whilst being technology neutral (i.e. carbon reduction standards are set by the regulator, but firms are free to adopt the most cost-effective or otherwise appropriate technology that can meet those standards);
- Besides being focused on a specific objective, they are limited in time and [gradually] expire under a predictable time schedule;
- They support the discovery, development, demonstration and deployment of carbon reducing investments and innovations. They are not intended to subsidise end-users, certainly not in the long run [,[i.e. the new technologies must have a horizon to be self-sustainable].

externalities from energy consumption, known as the Pigouvian tax, as suggested by the IMF (see Parry and Small (2005) and Clements et al. (2013) for further details).

Box 3 Methodologies to define and measure fossil fuel subsidies

1. **The price-gap approach.** This is a widely used methodology for estimating consumption subsidies (Kosmo (1987), Larsen and Shah (1992), Coady et al. (2010), Kojima and Koplow (2015), Mundaca (2017 a,b), OECD (2018). It compares average end-user prices paid by consumers (the local price) with the price of fossil fuel that is likely sold in a deregulated competitive market (reference price, adjusted for miscellaneous costs and quality).

Subsidy per unit of fossil fuel consumed = (Reference fossil fuel price – End-user fossil fuel price)

This price gap can be positive or negative. It is negative when the producer in a net exporter country is subsidized.

In the estimation of the price gap, countries need to consider among other things:

- Whether their foreign exchange markets are not free floating. If they are not, it becomes difficult to convert import- or export-parity prices and consequently the estimation of the price gap.
- That the reference prices are calculated on the basis of international fuel prices and need to take into consideration costs of transportation (both international and domestic), quality, insurance, storage, distribution, and retailing. Petroleum products face international benchmark prices applicable to all countries. In contrast, coal and natural gas are traded much less frequently across national borders, and electricity even less.

For net exporters of fossil fuels, the domestic subsidies are implicit, and do not have direct budgetary impact as long as the price covers the cost of production. For net importers, subsidies are explicit, representing budget expenditures arising from the domestic sale of imported energy at subsidized prices.

Some net exporting countries might consider that the reference price in their markets should be based on their cost of production, rather than prices in international markets. Even in this case however, such countries miss the opportunity of collecting public revenues, curbing inefficient demand and production of fossil fuels, and reducing CO2 emissions.

The price gap methodology is useful because it measures the size of the net tax or subsidy, even in the presence of i) government policies that affect fossil fuels at different points in the supply chain: taxing or subsidizing the extraction, import, refining, or transportation of fuel, in ways that ultimately affect the retail price; ii) direct changes in the retail price by governments that are not necessarily taxes. The price gap measure renders an estimate of the aggregated effects of these policies (Mahdav et al. (2020)).

2. **Inventory of Support to Fossil Fuels (Inventory methodology).** The OECD has been leading and producing this inventory and maintains it online systematically (see OECD (2018)). This OECD project identifies, documents, and estimates tax expenditures and

how public resources are transferred to benefit or give preference to fossil fuel production and consumption relative to alternatives. The aims are to encourage transparency about governments' budgetary policies related to fossil fuel subsidies which can be utilized for learning and sharing best practices on optimal public finance and reforms. A detailed exposition on the accounting framework for producer support estimates and consumer support estimates can be found in OECD (2018). The 2017 Inventory includes more than 1000 individual policies identified as supporting the production and consumption of fossil fuels in OECD countries and eight country partners: Argentina, Brazil, Colombia, the People's Republic of China, India, Indonesia, the Russian Federation, and South Africa. The OECD is announcing that the data for the EU Eastern Partnership countries: Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine) are forthcoming.

3. **Indicator of Fossil Fuel Subsidies in the Context of the Sustainable Development Goals (SDGs).** This indicator measures the amount of fossil fuel subsidies per unit of GDP (see UNEP, OECD, IISD (2019)). It requires the following information: 1) direct transfer of government funds; 2) induced transfers (price support); and 3) (optional) tax expenditure, other revenue foregone, and under-pricing of goods and services. To design this indicator, this methodology suggests collecting national data, and supplement it with two international datasets: i) the fossil fuel subsidies from the IEA; and ii) the data on fossil fuel producer and consumer subsidies collected by the OECD (see (3) below).

These methodologies face all a common challenge: the gathering of credible and reliable information to calculate the actual subsidies. Cooperation, transparency and diffusion of information is crucial to all countries to phase out all types of fossil fuel subsidies, to minimize efficiency losses, and implement more equitable distributional solutions among the countries' citizens.

35. The International Energy Agency (IEA) finds that as a result of subsidy reforms in 42 countries that have been keeping end-user prices artificially low, consumption subsidies dropped by USD 120 billion in 2019, largely due to lower global fossil fuel market prices.[22]

36. OECD finds that as a result of tax breaks and spending programs linked to the production and use of coal, oil, gas and other petroleum products in 44 OECD and G20 economies, the total fossil fuel support rose by 10% to USD 178 billion in 2019, ending a five-year downward trend. The analysis builds on the OECD Inventory of support measures for fossil fuels.[23]

37. Important reductions in fuel consumption and consequently CO2 emissions can be achieved by reducing fossil fuel subsidies. Assuming a scenario with an increase in the price of diesel and

[22] See IEA key findings on energy consumption subsidies: https://www.iea.org/topics/energy-subsidies
[23] See http://www.oecd.org/fossil-fuels

gasoline by 20 US$ cents per litre, the reductions in the consumption and CO2 emissions can be from 50% to 10%, depending on the country and type of fuel (see Mundaca (2017b)). Coady et al. (2015) find that the MENA region as a whole could reduce average CO2 emissions by 36%.

38. Fossil fuel subsidies can have the following impacts on countries:

- Foster inefficient allocation of resources in economic activities that are more capital-intensive, but do not spur growth of productive employment. This challenge is exacerbated in countries endowed with relative abundant labour force.
- Encourage energy intensive economic activities leading to increases in CO_2 emissions.
- Deficits in fiscal budgets, and public debt.
- Adverse effects in the balance-of-payments of oil-importing countries; and lost opportunity of raising income in oil-exporting countries, especially when international oil prices are high.
- Divert resources away from productive public investment.
- Lead to major distortions in the production structure.
- Encourage excessive, wasteful and inefficient fossil fuel consumption.
- Benefit mostly high-income households who constitute a small proportion of the population.
- Discourage investment in renewable energy.
- Create incentives for smuggling.

39. Such impacts affect the overall long-run economic performance and economic growth, and contributes to global warming, environmental pollution and other environmental problems, all of which can have significant economic consequences. (see Mundaca (2017 a,b)). People that are exposed to air pollution can also exacerbate their vulnerability to pandemics like the Covid-19 (OECD (2020)).

4. Addressing interactions

40. Carbon taxing policy will be more effective if it is aligned with the broader policy landscape. Once there is an overview of what policies could interact with the carbon pricing policy through the carbon tax, and the type of interactions is established, consideration should be given how to address especially overlapping and countervailing interactions. Cooperation with the policy makers responsible for other instruments as well as expected taxpayers would help to identify potential overlap in the design face when connecting early on.

41. For most effect and efficiency, the interaction should be considered both in design and implementation. When considering the interaction in design, it can be addressed:

- through adjusting the design of the carbon tax to be introduced~~motives for~~ the scope, taxable base or rate of the carbon tax can be adjusted to avoid policies overlapping;
- through adjusting the design and/or application of the other policies. E.g. fossil fuel subsidies can be reduced in scope or phased out to avoid the overlap or even countervailing policies;
- by introducing ~~a carbon tax:~~complementary policies to address negative aspects of e.g. overlap;
- by incorporating the carbon tax into the other policies, by creating a hybrid tax or other pricing system.

Multiple instruments without coordination will not likely provide an efficient price signal to ensure carbon reduction;

- The revenue raising capacity may increase by introducing an additional taxation. The long-term effects of uncoordinated combination of multiple instruments are unclear;
- The support for innovation coming from the uncoordinated introduction from a carbon tax on top of an energy tax may not be efficient. The price signals may provide contradictory effects and not create a sustainable support for innovation as approaches supporting volume reduction may not align with approaches supporting carbon reduction.

~~**b) Hybrid system**~~

~~24. A carbon tax may be introduced by converting a pre-existing energy tax system to reflect a more carbon-based system of taxation. Especially a fuel-based carbon tax would lend itself to a hybrid form of carbon taxation. The energy tax would continue to tax energy used or sold per volume but rather than carrying a certain tax rate per volume of energy product or electricity, the tax rate could be based on the carbon content per volume of energy product sold or used.~~

~~25. When considering the motives for introducing a carbon tax:~~

- ~~A hybrid system, moving a purely volume-based energy taxation into a carbon content based energy taxation, would likely provide a more effective price signal to carbon reduction than an ordinary energy tax system;~~
- ~~The revenue raising capacity may or may not increase by morphing an energy tax system into a carbon content-based energy tax system. The increase will likely depend on the tax~~

~~rates introduced, their relative difference, especially for no-carbon fuels. E.g. will no-carbon fuels carry a zero-rate energy taxation in the long term? If decarbonisation is mainly pursued through carbon taxes or similar price-based policies, then prices per tonne will need to be pushed up and revenues would rise in the short and medium run. However, in case of significant decarbonisation of fuels developed and used, a carbon content-based energy tax would eventually lose its tax base;~~

a) Adjusting the carbon tax

42. An example of an adjustment in design of the carbon tax to avoid it overlapping with a pre-existing system when a carbon tax focused in scope to be introduced only for sectors which have not been covered by another carbon pricing instrument. Whilst an ETS works well for stationary emitters, it is more problematic to introduce for example in the transport sector. Certain types of carbon pricing instruments may be more problematic to introduce for certain types of activities, e.g. an instrument based on measuring specific emissions would be more complex to apply for carbon emissions resulting from private transport. Also, carbon abatement costs are not the same for all kind of carbon generating activities. It may be more effective to look at the abatement opportunities and associated costs for different activities and tailor the policies to elicit the desired response. This could be done by introducing overlapping instruments. By focusing the carbon tax through a reduction in scope, the negative effect of an overlap can be reduced.[24] Its efficiency would depend on what sectors are to be covered and what fuels are used. E.g. a fuels-based carbon tax taxes the carbon content of a certain fuel. If a certain type of fuel is only used for a certain type of sector, a specific carbon tax could be very relevant. On the other hand, in case the same fuel is used in different sectors, the new carbon tax would need to include specific features to avoid the double taxation of the fuel used in the sector. Facilitating two different tax rates for the same fuel tends to be fraud prone.

b) Adjusting pre-existing policies

43. Ideally, fossil fuel subsidies should be removed before carbon taxes are introduced to avoid confusion and uncertainty among the public about the actual goals of these policies.

[24] Michael Skou Anderson, "Europe's experience with carbon-energy taxation" – Veolia Environnement 2010

44. The gradual removal of fossil fuel subsidies and implementation of carbon taxes should have both the same objectives and goals: to reduce carbon emissions and all possible environmental externalities caused by excessive fossil fuel consumption; and to avoid unnecessary fiscal deficits, while maintaining the overall spending power of poor households by means of for example cash transfers. Fossil fuel subsidies do not always benefit the poor population as it is often assumed.

45. Governments could however introduce carbon taxation, even when their countries have not yet phased-out fossil fuel subsidies. It is crucial though that they inform the public that a carbon tax will be gradually introduce and that it will therefore imply a reduction in fossil fuel subsidies, that over time the subsidies will be removed, and a positive carbon tax will rather be in place.

46. Sufficient institutional development greatly facilitates the design of effective carbon tax policies and plans to phase-out fossil fuel subsidies to achieve critical and necessary economic, social and environmental objectives (i.e., meaningful CO2 emission reductions).

47. Government leaders need to have the political will to design long-term policies for their countries, and consider the trade-off between the long-term effects of maintaining fossil fuel subsidies on climate change and long-term prosperity of their economies, versus the short-term effects of keeping fossil fuel subsidies on political acceptance and/or forthcoming re-elections.

48. Fossil fuel price reforms will be more likely to be successful and effective if they are consulted with, fully explained, and made totally understandable to the public. Citizens should have adequate information about the scale and scope of fossil fuel subsidies in their countries; and their effects on their countries' economies, and global climate change, to avoid mass protests.

49. It is fundamental to have correct estimates of the scale and scope of fossil fuel subsidies (See Box 3, OECD (2018); UNEP, OECD and IISD (2018); and UNEP, OECD and IISD (2019) for guidance on how to track subsidy inventories). These estimates should be regularly updated and expanded over time within sectors, across sectors within a country, and transparently become public. The governments and other stakeholders can together use this information to design and evaluate effective fossil fuel subsidy reforms, and make rigorous evaluations of the effects on fiscal deficits, and in general the costs and benefits of upholding any level of subsidies.

50. Governments need to realize, and widely communicate to the public, that a fossil fuel subsidy reform (and carbon pricing) might require economic adjustments in the short run, with increases in energy prices while technology and innovation to substitute energy generated from fossil fuels emerge. In the interim period, the poorest should be monetary compensated for the losses that they incur, but citizens in general should be recommended to be mindful and switch to greener viable

consumption alternatives. Governments can use their savings from subsidies to make the cash transfers to the poorest of the population, investment in for example education, health, and research, improving public transport, and perhaps subsidize effectively green investments and make low-carbon vehicles more accessible and affordable.

- It is desirable to implement fossil fuel price reforms in a gradual, predictable, incremental roll-out manner. Slow, continuous, and secure actions are highly likely posed to success.~~Transforming a conventional energy tax system into a carbon-based energy taxation would support the innovation and investments in low-carbon initiatives. Low and zero-carbon initiatives would carry a lower energy tax burden than their carbon-content rich fossil fuel alternatives, therefore stimulating the development of a market for such alternatives which carry a higher cost of production than conventional [fossil fuel] energy.~~

~~**c) Complementary system**~~

~~26. In case of there is a pre-existing energy tax framework, a carbon tax may be introduced in a complementary way. The carbon tax would be integrated in the energy tax framework and would become a carbon tax component of the overall taxation of energy products.~~

~~27. Carbon taxes in several countries are integrated with the excise tax system for energy products. E.g. this is the case in the Nordic countries, France and Mexico as further elaborated in Chapter 3A. In some cases, the carbon component is entirely additional to pre-existing excise taxes, whilst in other cases the carbon component would partly [or even fully replaces] excise taxes. Generally, one levy would be due on energy, comprising of various components. The various components and how much of the tax burden on the energy would relate to carbon would not necessarily be visible to the user. A system complementing an energy tax with a carbon tax component would be more easily applicable for a carbon tax based on the Fuel approach.~~

~~28. When considering the motives for introducing a carbon tax:~~

- ~~A complementary system, where a carbon tax component is added to a pre-existing energy tax system, may not necessarily be a more effective tool for carbon reduction. It tends not to expand the tax base of the existing tax. Very often the various components of the tax on energy is not clear or detailed to the fuel user, often while administratively burdensome. This would constitute a less transparent price signal. Depending on the ultimate level of the total taxation and difference in total taxation between high and lower carbon fuels, the difference may not be sufficient to instigate a move to lower carbon options.;~~

- ~~The revenue raising capacity of a complementary system may become more sustainable though. With the main objective of a carbon tax being carbon reduction, significant decarbonisation would eventually eliminate most of the tax base for a carbon tax. As the assumption would be that energy will be needed long after carbon is mitigated in energy products, a complementary system would retain at least part of its taxable base;~~
- ~~Whether a complementary system would improve the support for innovation and investments in low carbon initiatives depends on the composition of the overall burden as well as the transparency of the price signal. The effect on innovation from a complementary system would likely be better than uncoordinated multiple systems though.~~

~~d) Supplementary system~~

~~29. Under a supplementary system, carbon taxation would be introduced for energy production or the use of energy products that are not covered by energy taxation. Energy taxation systems can be fairly static as far as scope and taxable base is concerned. Often significant volatility exists with respect to the rates though.~~

51. ~~The static approach with respect to scope would keep innovative uses of existing energy sources as well as new energy sources out of the scope of energy taxation.~~ The public should be given the opportunity to be part of every step of the process.

52. Fossil fuel price reforms, together with the provision of economic safety nets in the poorest countries, can benefit the subsidizing countries overall in terms of higher economic growth and welfare, and reduction of CO2 emissions (Mundaca (2017 a,b), and help to achieve the Sustainable Development Goals (SDGs).87.

53. Countries seeking to make fossil fuel reforms could be aware of the World Bank's initiative called The Transformative Carbon Asset Facility (TCAF: https://tcafwb.org) which is an instrument that offers support to emerging economies in developing and implementing both explicit and implicit domestic carbon pricing policies, TCAF can contribute to building the needed momentum, knowledge and capacity for policies such as energy subsidy reform. Upon the host country's agreement to implement the proposed policy reforms, TCAF aims to provide results-based payment against the Emission Reductions (ERs) generated by the policy. TCAF is one among the World Bank's many ongoing initiatives to support countries in taking climate action, including the new Climate Emissions Reduction Facility (CERF), an umbrella fund for climate finance.

c) Adding complementary policies

~~30.~~54. In order to steer new energy products like hydrogen or innovative uses of existing energy sources towards lower carbon options, it could be considered to adjust already existing energy taxation to keep such products out of scope for energy taxation whilst introducing a carbon tax for such new fuels.

~~31.~~55. ~~When considering the motives~~Instead, complementary system would improve support for ~~introducing a~~ innovation and investments in low carbon ~~tax:~~ initiatives for the energy products coming in scope of the supplementary system ~~would have~~. No such effect ~~towards carbon reduction, E.g. where new lower carbon energy products~~ would become ~~subject to a carbon tax rather than an~~available for energy ~~tax, but equally~~products solely covered by a traditional volume-based energy taxation. Equally, when some high carbon fuels, like coal, would be covered by an additional carbon tax~~. It would~~, it could help steer innovation primarily to lower or even zero carbon alternatives. On the other hand, by keeping a solely volume-based energy taxation in place for existing energy products, existing energy use may not receive significant price signals to reduce carbon.~~;~~ The revenue raising capacity of a complementary system depends on the scope and framework of the existing energy taxation. Setting up a different system for different fuels, especially when focusing the carbon tax on low carbon fuels, may only slightly increase tax revenue whilst creating the need to expand the existing collection system as well as MRV requirements. However, in countries where energy taxation does not include high carbon fuels (such as local coal or petroleum production), or in countries with low and narrow energy taxes, a supplementary carbon tax could generate significant additional revenue~~;~~.

56. Policymakers should consider whether a higher carbon price would achieve better emissions reduction targets (at the lowest cost for society) and whether it is sustainable for economic actors. In case the carbon cost from the overlapping instruments is considered excessive, mitigating instruments are available and can be included in the carbon tax if and when it is introduced as an overlapping instrument.

57. However, introducing multiple instruments may duplicate the effort for government and taxpayers. The cost and resources that industry requires in order to comply with overlapping policies can be broadly grouped into two areas: administrative costs, which include the regulatory compliance costs, and the $/tonne price of CO_2.

58. An example of an effective overlapping approach would be a carbon tax, introduced as a bottom price for a pre-existing emission trading system [ETS]. The overlapping introduction of a carbon tax would reinforce or stabilise the price signal from the ETS. Abatement options would

influence the main carbon price signal introduced through an ETS but in order to ensure a minimum price, an additional carbon tax instrument would be set up. In order to ensure an effective introduction of a carbon tax in addition to a pre-existing ETS or in any other way in combination to an ETS, the way the carbon price under the tax interacts with the ETS price needs to be considered (price floor, additional, component of a minimum price), as the interactions will differ depending on the set up of the pricing instrument already in place. A carbon tax can be a complementary measure to an ETS as a solution to excessive price volatility, which can include combining them with taxes[25]. The UK has introduced such a tax[26].

d) Hybrids

59. The assessment of the interaction considers how different policies may interact in achieving their respective objectives. Generally, the assessment will consider the interaction between different instruments. Occasionally, various interacting policies can be combined into one instrument, often creating a hybrid instrument.

60. Hybrids can be created between various types of instruments and aspects of carbon taxation. E.g. a hybrid option can introduce a carbon tax system linked to emission allowances or credits, e.g. through a linked fee, which is a tax linked to the carbon price in an Emission Trading System [ETS] in the same economy[27]. It is also possible to introduce a carbon tax with features of an emission trading system.

61. [***Proposal to include Australian example in a frame***] One of the first hybrid systems to be set up was the Australian carbon tax. The explicit carbon pricing instrument was introduced as an

[25] https://www.oecd-ilibrary.org/taxation/carbon-pricing-design-effectiveness-efficiency-and-feasibility_91ad6a1e-en

[26] http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=COM/ENV/EPOC/CTPA/CFA(2007)31/FINAL&docLanguage=En

This document, written by Prof. Stephen Smith of University College, London, discusses the economic efficiency and practical use of environmentally related taxes, with some differentiation in tax rates, versus tradable permit systems, with some element of grandfathering of permits. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=COM/ENV/EPOC/CTPA/CFA(2007)31/FINAL&docLanguage=En

[27] The linked fee covers targeted entities that lie outside of the ETS, and the fee is determined by an historical value of the carbon price under the ETS, and adjusted on a periodic basis. A linked fee might occur as a result of a compromise between regulators who wish to put a sector under an ETS and the regulated party who advocates for a straight tax.

ETS, with certificates and allowances set up but with the trading of the certificates being unavailable for the first 5 years. In absence of a market, the price per tonne/carbon was pre-set by the issuing authorities in the first 5 years. Once the market would be established, the price would be released, and trading would set that price. The priced carbon was linked to carbon emitted. As the carbon pricing was set up as an ETS, arrangements had been made for the Australian carbon market, once established, to be linked to the EU ETS market. The system came into effect in 2012 but was repealed in 2014, having never reached the stage where the market was established, the price was released and the link became effective.

62. In case there is a pre-existing energy tax framework, a carbon tax could be integrated in the energy tax framework and would become a carbon tax component of the overall taxation of energy products.

63. Carbon taxes in several countries are integrated with the excise tax system for energy products. E.g. this is the case in the Nordic countries, France and Mexico as further elaborated in Chapter 4A.

64. The main advantage of using a hybrid system, is that rather than adding an additional instrument to a pre-existing instrument, the existing system could be adapted with features from another instruments. A hybrid system can lead to a more effective use of resources, as it does not require a duplication of implementation and administration. However, adding features of other instruments may unnecessary complicate an existing instrument and it can be easier and more complex to introduce a second instrument.

~~**6.4 Instruments reducing price on carbon, subsidies and incentive policy**~~

Commented [EB4]: Note for the Committee: Section 6.4 (Instruments reducing price on carbon , subsidies and incentive policy) of this chapter was presented at the 21st Session (as E/C.18/2020/CRP.47) for background/information purposes, and to serve as the basis to draft a section on fossil fuel subsidies (now section 3.d). To make the text easier to read, the old text of Section 6.4 was removed from this version.