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Environmental tax issues

**Chapter 2: An Introduction for Policymakers – Carbon Taxation Handbook
Note by the Secretariat**

Summary

The Chapter 2, **Carbon Taxation: An Introduction for Policymakers**, of the Handbook on Carbon Taxation, is presented to the Committee FOR DISCUSSION at its 20th Session.

Chapter 2 is drafted having in mind the wide range of potential users of the Handbook, from politicians to policymakers and practitioners. It seeks to review key concepts and policy options further developed throughout the Handbook. The intention is to give any user, whether it is a seasoned environmental policymaker, a parliamentarian, or just a citizen concerned with environmental issues, an understanding of issues dealt with in the Handbook.

The note gives an overview of environmental problems related to carbon emission, describes some of key issues to consider when defining the social cost of carbon emission for carbon pricing purposes. It attempts to establish guiding principles underlining policies for carbon tax as well.

A very practical and concise definition of **carbon tax** is offered here and will be referred to throughout the Handbook. The chapter briefly raises the broader issue on **environmentally related taxes and environmental taxes** without delving into controversial discussion about the difference between the two concepts. Here the subcommittee would like to hear the view of the Committee if there is need to discuss further these two latter concepts and if so whether such need would be satisfied by a short text as annex to the chapter.

Finally, Chapter 2 briefly describes the international legal framework regarding environmental protection and climate change that has been produced under the purview of the United Nations. Pursuant to the outline presented to the Committee in its 18th Session, the Subcommittee produced an Annex on *Carbon Tax in the Context of the United Nations* (formerly *International governance related to carbon taxation*), which is presented alongside draft Chapter 2. Given the inclusion of a brief description of the abovementioned international framework in the main body of the draft Chapter, the Committee is asked to give its opinion on the need to include the Annex on *Carbon Tax in the Context of the United Nations* in the Handbook.

Chapter 2: Carbon Taxation: An Introduction for Policymakers

Table of Contents

<u>2.1.</u>	<u><i>The environmental problem: Carbon emissions</i></u>	3
<u>2.1.1.</u>	<u>Carbon as a global policy problem</u>	4
<u>2.1.2.</u>	<u>Countries' commitments to lower greenhouse gas emissions</u>	6
<u>2.2.</u>	<u><i>Carbon pricing</i></u>	7
<u>2.3.1.</u>	<u>Carbon taxes</u>	9
<u>2.3.2.</u>	<u>Carbon taxes, ETS and cost effectiveness</u>	10
<u>2.3.3.</u>	<u>Social cost of carbon emissions and the role of markets</u>	11
<u>2.3.</u>	<u><i>Motives for the introduction of a carbon tax</i></u>	13
<u>2.3.1.</u>	<u>Protection of the environment</u>	14
<u>2.3.2.</u>	<u>Promotion of investment in low-carbon technology</u>	14
<u>2.3.3.</u>	<u>Generation of budgetary sources</u>	15
<u>2.4.</u>	<u><i>Core principles of carbon taxation</i></u>	15
<u>2.5.</u>	<u><i>Policy considerations in the introduction of a carbon tax</i></u>	18
<u>2.5.1.</u>	<u>Certainty about the price of carbon</u>	18
<u>2.5.2.</u>	<u>Administration of the carbon tax</u>	19
<u>2.5.3.</u>	<u>Potential distributional implications and need for corrective measures</u>	19
<u>2.5.4.</u>	<u>Perceived tradeoff between development and environmental protection</u>	19
<u>2.5.5.</u>	<u>Safeguarding the competitiveness of domestic industries</u>	20
<u>2.5.6.</u>	<u>Summary of advantages and disadvantages of carbon pricing options</u>	20
<u>2.6.</u>	<u><i>Conclusions</i></u>	21
<u>2.7.</u>	<u><i>Bibliography</i></u>	23

2.1. The environmental problem: Carbon emissions

1. Carbon dioxide (CO₂) is a naturally-occurring gas in Earth's atmosphere, and it serves the very important function of trapping some of the Sun's heat and keeping the planet at a temperature sufficient for life to exist. Without CO₂, the Earth would freeze. Gases that trap heat in the atmosphere are called greenhouse gases (GHG); currently, CO₂ makes up the majority of GHG in the atmosphere.
2. Through natural processes, the Earth keeps a balance of CO₂ in the atmosphere, through a complex carbon cycle. Just to give an example, part of the natural emissions of carbon dioxide are generated by the respiration of humans and animals, and by decomposition; and part of the emissions are captured by plants, during photosynthesis, and absorbed by the ocean.
3. Besides natural processes, CO₂ can also be produced by human activities, most notably the burning of fossil fuels;¹ these emissions are called "anthropogenic". Human activities since the industrial revolution have caused a spike in CO₂ in the atmosphere,² and disrupted Earth's natural balances. This phenomenon is causing the Earth to warm faster than normal in interglacial periods.
4. The Earth has already experienced an increase in temperature of around 1 degree Celsius since the industrial revolution. Earth's temperature cannot be controlled like a thermostat; even if we stopped all emissions today, it would take up to 200 years for the last artificially-emitted CO₂ particle to leave the atmosphere.
5. As the planet warms, a series of reactions ("positive feedbacks") kick in and amplify the warming effects, causing climate change. For example, as the planet warms, ice melts at

¹ For simplicity, we refer to fossil fuels as the main source of anthropogenic carbon emissions. However, it should be noted that CO₂ emissions are also generated by biofuels, by cement production, and by a range of other activities. Other GHG emissions too can be generated both by fossil fuel production, and by other sources: for example, methane can leak from oil wells but is also a by-product of farming and of garbage disposal in landfills.

² Concentration of CO₂ in the atmosphere rose from 280 parts per million (ppm) before to the Industrial revolutions, to almost 415 ppm in February 2020. Source: Lindsey, Rebecca (Feb 20, 2020). *Climate Change: Atmospheric Carbon Dioxide*. National Oceanic and Atmospheric Administration. <https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide>

the Poles; this results in a loss of white surface, which is crucial to reflect part of the Sun rays. With lower reflective surface, more rays are absorbed; this causes the Earth to warm.

6. In a recent report of the Intergovernmental Panel on Climate Change (IPCC, 2018), scientists estimate that a total increase of 1.5 degrees with respect to pre-industrial levels (0.5 more than today) would cause the climate to change, with severe consequences to natural and human systems. With an increase of 2 degrees, the Earth might reach a tipping point, where it is no longer possible to reverse global warming. Ice sheets melting at the Poles, as described above, might lead to one of these tipping points.

7. The effects of climate change are already visible and felt by many communities around the world, in particular the most vulnerable. These effects are extremely serious, and they include sea level rise (flooding, loss of coastal land, loss of islands); heat waves (human health, droughts); increased precipitation (flooding); more extreme weather events (hurricanes). They also cause the loss of biodiversity and migration of species (e.g. decline of marine fisheries).

8. Global warming will likely have severe impacts on agriculture, and it could cause extensive famines. The situation would be made worse by the fact that around 60% of people will live in cities by 2030, without direct access to food sources.

2.1.1. Carbon as a global policy problem

9. Carbon emissions are a consequence of the combustion of fossil fuels. They are generated in connection to a range of human activities, including the production of consumer goods, transportation and electricity generation. High emissions are also generated by intensive agriculture and farming.

10. Whenever fossil fuels are burnt, usually to generate energy, carbon emissions cannot be completely eliminated. Unlike other pollutants, CO₂ cannot be “filtered” before being emitted into the atmosphere – at least not with current technologies.³ Currently, the only way to generate zero emissions in energy production is by using non-fossil fuel sources, for example by employing renewable sources (wind, solar, etc.).

³ Some technologies, such as carbon capture and storage, can intercept the carbon emissions before they are released in the atmosphere, and safely store them in geological formations. However, such technologies do not prevent fossil fuels from being utilized; moreover, they are not yet commercially scalable.

11. Emissions can be reduced by using more efficient technologies that require lower amounts of fuel to generate the same amount of energy. By technological abatement we mean the capacity to introduce a new technology or practice that can reduce emissions without changing the fuel source; for example, a car with a more efficient engine that will do more mileage per liter/gallon of gasoline. More efficient technologies also have important co-benefits in reducing local pollution, for example smog in cities.

12. Carbon emissions are a global problem, meaning that emissions in any part of the world contribute to warming the whole planet, and not just the location where there were generated. This is another characteristic that sets carbon dioxide apart from other pollutants, and it poses challenges but also offers opportunities.

13. An obvious opportunity in the global nature of carbon emissions is that their reduction anywhere in the world will have impacts on a global scale. As mentioned above, artificial carbon-capture technology is not yet scalable to the needs of the whole planet; however, emissions can be “absorbed” by supporting natural processes, for example by increasing the amount of forests. Because of the global nature of carbon, a power plant in the city generating emissions and a forest outside the city absorbing emissions could balance (or “offset”) each other, and result in zero net emissions. The forest could even be located in another country, or another part of the world.

14. Many countries, and even corporations, already use carbon offsets to counter their carbon emissions.⁴ For example, an airline can pay for planting a certain number of trees, or sponsor renewable energy technology in a different part of the world, to balance the emissions generated by the gasoline burnt in their planes.⁵

15. However, the global nature of carbon also poses significant challenges, most notably from the policy point of view: all countries have to act together to reduce carbon emissions and fight against climate change. The next section will discuss the steps undertaken by the international community in this respect.

⁴ Carbon offsets were introduced by the Kyoto Protocol in 1997 (entered into force in 2005).

⁵ For example, airlines they can adhere to the IATA offset program (where passengers and corporations can pay, through the airline, to offset their emissions). <https://www.iata.org/en/programs/environment/carbon-offset/>

2.1.2. Countries' commitments to lower greenhouse gas emissions⁶

16. In 2015, Member States of the United Nations committed to three ground-breaking international agreements: the 2030 Agenda for Sustainable Development (2030 Agenda); the Addis Ababa Action Agenda (which contains the foundation for financing the 2030 Agenda); and the Paris Agreement.

17. The 2030 Agenda contains 17 Sustainable Development Goals (SDGs) and 169 targets to advance the three dimensions of sustainable development: economic, social and environmental.⁷ Nine of the 17 goals contain pledges related to environmental protection, based on the consideration that environmental protection is inextricably linked to sustainable and equitable development, and that countries should aim to decouple economic growth from environmental degradation (SDG 8.4).

18. The 2030 Agenda does not contain specific commitments related to the reduction of carbon emissions, but acknowledges that the United Nations Framework Convention on Climate Change (UNFCCC) is the primary platform to address global actions to fight climate change.

19. The UNFCCC, signed in 1992, was the first international agreement on climate change. It is an umbrella convention that provides a framework for both market and non-market approaches to address climate change.

20. As follow-up agreements to the UNFCCC, the Kyoto Protocol and the Paris Agreement emphasized different climate protection instruments, each at its own time. The Kyoto Protocol introduced a market-based approach for the reduction and control of greenhouse gases. The 2015 Paris Agreement greatly broadened the set of tools to address carbon emissions and climate change, to include green financing and trading in green bonds, as well as regulatory and fiscal instruments.

21. The Paris Agreement also broadened the scope of the fight against climate change, as it requires countries at all levels of development to use their best efforts through nationally

⁶For more details about carbon taxation in the context of the United Nations, see Annex 2.

⁷United Nations (2015b). *Transforming our world: the 2030 Agenda for Sustainable Development*. ECOSOC Resolution A/RES/70/1, Resolution adopted by the General Assembly on 25 September 2015. Retrieved from http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

determined contributions (NDCs)⁸ to curb greenhouse gas emissions and to commit to the GHG reduction goals assigned under Article 2 of the agreement.

2.2. Carbon pricing

22. Economic actors, such as firms, do not usually have an incentive to adopt technologies that would lower GHG emissions deriving from their polluting activities; it is often cheaper to just continue emitting, regardless of the carbon intensity of their technologies and their effect on the environment. It is therefore fairly straightforward that policy intervention is needed to fight climate change and achieve the NDCs pledges under the Paris Agreement.

23. In general, governments can take two policy approaches to reduce carbon emissions. First, regulatory approaches that rely on the introduction of specific standards to changes in practices and improvements in the quality of the environment (e.g. regulations, reporting requirements, emission licensing, etc.); these are often known as “command-and-control” instruments. Second, market-based instruments (MBIs, also known as “economic instruments”). Both types of instruments are effective at reducing pollution. However, it is generally accepted that MBIs do so at a lower social cost (Baumol and Oates, 1988).

24. Market-based instruments (MBIs) are policy instruments that use markets, prices and/or other economic variables to provide incentives for economic agents to reduce or eliminate environmental externalities. The theoretical and empirical justification for these policy instruments is well established (Pigou, 1920, Coase, 1960, Baumol 1971) and, today, they are considered fundamental to support environmental policy, in general, and climate mitigation, in particular (OECD, 1991; CPLC, 2017).

25. Examples of MBIs include taxes, subsidies, deposit-refund-schemes, and emission trading schemes (ETS). In the context of climate mitigation, both taxes and ETS have been implemented, and since both instruments imply a price on carbon, they are commonly referred to as **carbon pricing instruments** (CPLC, 2017).

26. Carbon pricing can be used by countries to lower their carbon emissions and meet their NDC pledges under the Paris Agreement. In fact, two-thirds of all submitted NDCs

⁸ NDCs are the successors of binding targets for greenhouse gas emissions. In the UNFCCC and Paris Agreement nomenclature, NDCs are explicit commitments for climate mitigation made by the Parties (countries). Conditional NDC refer to those commitments that depend on additional financial support.

(around 100 countries) consider the use of carbon pricing to achieving their emission reduction targets. Carbon pricing is also a low-cost option to achieve emissions reduction and meet the targets set in NDCs: it could alone reduce the cost of climate change mitigation by 32% by 2030, and achieve full potential when coupled with coherent energy and environmental policies.⁹

27. As of June 2019, 57 carbon pricing initiatives had been implemented or scheduled for implementation; of these, 29 are carbon taxes, primarily applied on a national level. Although these instruments represent around 20% of global GHG emissions, less than 5% of emissions are priced at levels consistent with the Paris Agreement goals (World Bank, 2019). *[These figures will be updated closer to publication]*

28. Private investors are starting to take carbon pricing into account when making financial decisions even in jurisdictions where instruments haven't been introduced yet.

29. In the case of a carbon tax, the government sets the price of carbon, and lets the market determine the total emissions. As discussed in Chapter 3, the tax rate might be determined to achieve a certain emissions reduction objective. On the other hand, with an ETS the government sets a maximum limit on emissions and lets the market determine the price of carbon emissions. In effect, taxation and ETS consist of different instruments with the same objective, namely pricing environmental externalities; or, in the case of climate change, specifically carbon emissions, so that economic agents fully or partially internalize the social costs of their actions.

30. There are also hybrid systems that have design elements of both of these 'pure' instruments - for example, tax regimes that accept emission reduction units to reduce the tax burden, or ETS with floor and ceiling prices. Although these instruments have different specific design features, they are based on the same principle: to internalize environmental damage through carbon pricing (Goulder et al., 2013, Aldy and Stevens, 2012, Edenhofer et al 2015, Metcalf and Weisbach 2009, Schmalensee and Stavins 2015).

31. It is also important to note that there are a number of other instruments which a country may introduce or already have in place, which in practice set a price on carbon; for example,

⁹ <https://unfccc.int/news/carbon-markets-can-reduce-climate-action-costs-32-by-2030>

taxes on energy. The interaction between carbon taxes and those instruments will be investigated in more detail in chapter xxx [interaction between carbon tax and other instruments].

2.3.1. Carbon taxes

32. For the purpose of this Handbook, we define carbon taxation as “a tax capable of conferring a reduction in corresponding carbon-based (equivalent) emissions in the atmosphere”. It is thus regarded as having environmental purpose and effect.

33. In this sense, carbon taxes can be seen as a specific type of environmental taxes, as per the OECD definition of “[taxes] whose tax base is a physical unit (or a proxy of it) that ha[ve] a proven specific negative impact on the environment”.¹⁰ For example, in the case of a carbon tax, the physical unit would be CO₂. It is important to note the inclusion of the “purpose and effect” doctrine to the definition of environmental tax.

34. Environmental taxes, in turn, can be seen as a subset of environmentally related taxes, defined as “any compulsory, unrequited payment to general government levied on tax-bases deemed to be of particular environmental relevance.”¹¹ (OECD, 2004).¹²

Box 1: What is there to a name?

The aim of a carbon tax is to price a negative externality, namely, carbon emissions; and to factor that cost into the final price of the fossil fuels traded domestically.

In doing so, the object of taxation, or tax base, tends to be generally described as “carbon intensive fossil fuels,” meaning gasoline, coal, gas, diesel and their by-products. Many countries have already introduced carbon taxes at a domestic level; among developing countries, Chile, Colombia, Argentina, Mexico and South Africa. However, other countries have introduced taxes which may be called “carbon tax”, but should not be considered carbon taxes from a technical perspective.

For example, some countries have taxes in place that are commonly referred to as a carbon tax, but in reality are ad-valorem taxes on fuels; or taxes on motor vehicles.

The distinction is relevant because those instruments, in practice, do not act like a carbon tax, and may fail to produce the environmental effect that are usually associated to it.

¹⁰ <https://stats.oecd.org/glossary/detail.asp?ID=6437>

¹¹ OECD, Environmental Fiscal Reform, Progress, Prospects and Pitfalls, Report for the G7 Environment Ministers June 2017, pg. 6, available at: <https://www.oecd.org/tax/tax-policy/environmental-fiscal-reform-G7-environment-ministerial-meeting-june-2017.pdf>.

¹² There is still a lot of debate around the definition of carbon tax, environmental tax and environmentally-related tax, and those terms may have different meanings in different contexts. The definitions proposed here should be intended as working definitions, for the purposes of this Handbook. For some more background on the definitions of environmental taxes, and environmentally related taxes, please see Annex 3.

Since currently there is no single definition of what a carbon tax is, policy makers should be aware of possible methodologies to design carbon taxes. A comprehensive overview is provided in Chapter 3.

Policymakers should also keep in mind what the desired objective of the carbon tax is. From an environmental point of view, the tax aims to reduce the demand for fossil fuels and subsequently emissions. Broader discussion on the motives to introduce a carbon tax will be provided in section 2.3.

35. In theory a carbon tax, as any other environmental tax, should be set at the marginal social cost of the damage generated (in this case, the social cost of carbon). In the case of climate change, the marginal social cost is global, but the reduction costs are borne at the local level. As a result, a tax set to the optimum global level may be considerably higher than what a specific jurisdiction can effectively sustain economically. Therefore, governments will have to consider other factors to determine the tax rate, such as emissions objectives or commitments (e.g. the NDCs), competitiveness, the distributive impact, coherence with other policy instruments and, above all, political viability. Therefore, in practice, carbon taxes are not set in terms of the socially optimum level but the specific objectives of the jurisdictions that implement them. As a result, taxes vary considerably across jurisdictions (see chapter 3 for a discussion and for examples).

2.3.2. Carbon taxes, ETS and cost effectiveness

36. There are many obvious advantages of implementing a carbon tax instead of an ETS.¹³ It is simple, it does not require a complex monitoring, reporting and verification (MRV) system and it can be implemented through the current tax administration system. All these aspects will be discussed in this Handbook.

37. However, carbon taxes do have a disadvantage (at least in their pure form), namely they do not allow to set the maximum amount of allowed emissions. Additionally, they do not allow for offsets. In this sense, carbon taxes do not recognize the global nature of climate change, and that emissions from carbon can be abated (although not completely) in a different place than where they are emitted. This disadvantage can be partially overcome by using mechanisms such as offsets, i.e. allowing economic actors to pay for an equivalent amount of emissions to be reduced or “absorbed” elsewhere, instead of paying the tax. An example could be that a power plant in Canada pays a farmer in Zambia to plant a quantity of trees sufficient

¹³ For an overview of the advantages and disadvantages of different carbon pricing options, see section 2.5.6.

to offset the power plant emissions. This might be cheaper than paying the tax, and it can have substantial co-benefits (for example, on the livelihoods of people in developing countries).

38. On the other hand, ETS in their pure form are more complex to administer but can achieve emission reduction at a lower overall cost for society. ETS establish a maximum cap for total emissions within a specific jurisdiction and assign permits to emissions sources.¹⁴ Emitters can choose to use their permits, or to sell them to other emitters that have fallen short; they are usually allowed to trade directly among themselves, sometimes across sectors and even jurisdictions.

39. If the market works, and there is no incentive to accumulate permits or speculate due to uncertainty, ETS can take advantage of the different marginal costs of reduction across emitters. In other words, a specific emitter will find it more convenient to just buy extra permits from another firm, to avoid exceeding their allocation; while for another firm it is cheaper to install technology that lowers their emissions, or to source their energy from renewables. Even though the system is much more complex than the implementation of a tax, an ETS can be more cost-efficient as carbon emission reduction can be achieved at a lower cost. (Goulder and Shein, 2013; Aldy and Stavins, 2012).

40. However, the key design consideration for an ETS is allowing trade across firms and sectors. If this is not permitted, then an ETS in practice is the same as a tax.

41. A tax can replicate the cost-effectiveness of ETS by establishing emission limits or incorporating offsets as a complementary mechanism to reduce costs, thus implicitly facilitating emissions trading across sectors or jurisdictions. The decision on the specific design features of a tax will ultimately depend on the institutional and political context of the jurisdictions implementing the instrument. What is relevant for our purposes is that a tax can have additional complementary features that allow for more cost-effectiveness, the main advantage of an ETS.

2.3.3. Social cost of carbon emissions and the role of markets

42. Climate change is a global problem with multiple impacts. The social cost of carbon can be defined as the monetary value of the damage generated by the emission of an additional

¹⁴ Permits can be assigned to emitters through a range of mechanisms, including auctions, free allowances or an allocation of the two. For more details about how ETS work in practice, see PMR/ICAP 2016.

(marginal) unit of carbon. Significantly, since the problem is global, the social cost of carbon should (in theory) be the same anywhere; and a carbon tax should therefore be set at the same level everywhere. However, as we will discuss in Chapters 3 and 5, establishing a tax rate is often a political decision that takes into account a large number of factors, including political acceptance.

43. There is a lot of debate with respect to what the global social cost of carbon should be. It depends on estimating the impact of climate change and determining the economic valuation of the damage which, in turn, depends on a series of technical, scientific and public policy issues. Estimates vary broadly; according to the Carbon Pricing Leadership Coalition (CPLC), prices consistent with the Paris Agreement objectives vary between US\$ 40-80 per ton of CO₂ for 2020 and between USD 50-100 for 2030 (CPLC, 2017).¹⁵

44. While the social cost of carbon should, in theory, be the same everywhere, the costs of CO₂ mitigation may vary considerably across different jurisdictions. For example, the cost of labor or installing a new technology might be different depending on the country. The economic implication is that reducing emissions is more cost-efficient in jurisdictions where the cost of reduction is lower. For example, if the global social cost of CO₂ emissions is US\$50, but it costs US\$10 to reduce emissions in Chile and US\$40 to reduce in Europe, it is socially optimal to reduce carbon emissions in Chile rather than Europe. This is the logic behind integrating global markets, in short: to reduce the costs of climate change mitigation, some form of carbon market exchange is necessary. In the case of carbon taxes, this can be achieved by introducing measures such as offsets and compensations schemes across sectors and jurisdictions.

45. In fact, integrated markets can reduce global mitigation costs to almost 56% in the unconditional NDC scenario and by 44% in the conditional NDC scenario (Hof, et al. 2017). Similarly, Fujimori (2016) found that integrated market could reduce welfare losses up to 75%.

46. However, as emission reduction targets globally become more ambitious, all countries will have to contribute to the best of their abilities, and coordinate their strategies to attain a global target. In the scenario above, if all of Europe turned to Chile to offset emissions, at some

¹⁵ The 'Report of the High-Level Commission on Carbon Prices' (CPLC, 2017) includes a complete review of the relevant literature.

point the marginal cost of emission reduction in Chile would start to grow and level with that of Europe (for example, cheaper technologies reach capacity and economic actors have to start employing more and more expensive technologies; or the capacity for reforestation starts declining; etc.).

Box 2. The performance of carbon taxes to lower GHG emissions

[This box will provide an overview of the effectiveness of carbon taxes in reducing GHG emissions. It will include:

- *Brief discussion of the examples of Sweden, Denmark, Finland and Norway [or one of them]. Also, preliminary results from Chile, Colombia or other middle-income country.*
- *Brief discussion of why carbon taxes haven't performed better. Reasons include uncertainty in tax rate; and low tax rate [Haites (2018). Carbon taxes and greenhouse gas emissions trading systems: what have we learned?]. Further discussion on how to avoid these issues is provided in chapter 3*

2.3. Motives for the introduction of a carbon tax

[The sub-chapter will be integrated by including, for each goal, some considerations on the specific perspective of low-income countries]

47. Usually, the primary purpose of policy instruments such as a carbon tax is the protection of the environment. However, governments may also seek additional (and potentially as important) goals while implementing these policies; for example, they may wish to also generate public revenues. In addition, different policies provide different advantages and disadvantages; depending on their priorities, Governments may therefore prefer to implement one type over the other, or to combine elements of two or more policy categories.

48. We will provide below a discussion of some potential goals that governments may seek to address in their policies for emissions reduction; for each goal, we will discuss whether carbon taxes are the best-suited instrument, in light of the advantages and disadvantages of this measure.

49. Although the primary focus of this Handbook is on carbon taxes, we will also provide some elements of comparison with other policy options to reduce carbon emissions. The purpose of this comparison is to support policymakers in understanding whether carbon taxes are the best policy instrument for their country, depending on their desired policy objectives and institutional constraints.

2.3.1. Protection of the environment

50. Carbon pricing instruments, including carbon taxes, are considered a cost-effective way to incentivise the reduction of greenhouse gas emissions by encouraging lower-carbon behaviour, including the abatement of emissions through investments in technology. By putting a price on carbon, or setting a limit to emissions through an ETS, emitters are confronted with the environmental cost of their actions (usually approximated by the social cost) and forced to manage their carbon output. Emissions reduction might also result in additional co-benefits, such as the reduction of local pollution and lower healthcare costs.

51. The environmental effect of a carbon tax might seem lower than that of an ETS since, as mentioned, the tax does not offer the same degree of certainty on what will be the total amount of emissions reduction.

52. Such disadvantage can be somewhat reduced by the introduction of adjusting mechanisms, for example an increase in the tax rate that may apply if emissions reductions do not meet the objectives. More insight on this issue will be provided in Chapter 3 (design of the carbon tax).

53. On the other hand, an ETS provides certainty about the amount of emissions generated in the economy in a certain period of time, as this limit is set by the regulator; therefore, it allows greater control over which degree of environmental protection to target in a specific time frame. However, as discussed, an ETS might present a different set of challenges.

54. As mentioned above, while command-and-control instruments can also be useful to reduce carbon emissions, they are not the most cost-effective instrument for this purpose, as they do not provide appropriate incentives to reduce emissions beyond the threshold set by regulation.

Promotion of investment in low-carbon technology

55. Putting a price on emissions is the most cost-effective way to reduce them because it encourages producers and consumers to seek out the lowest-cost options to reduce their emissions. Price certainty is potentially important for mobilizing investment into clean technologies or other alternative technologies.

56. In this respect, carbon taxes provide a continuous incentive to invest in emissions abatement and encourage alternative solutions (e.g. renewable energy) by making them more

cost-competitive than fossil fuels. Ideally, over time continued investment in technologies for emissions reduction would result in technological progress and reduce the cost of clean energy. A secondary effect is that technical innovations may create new jobs while offering a competitive edge to industries.

2.3.2. Generation of budgetary sources

57. The primary objective of carbon taxes is usually to decarbonize a country's economy through the price signals sent to the market. However, carbon taxes also typically increase public revenue.

58. Considering the potentially significant amount of revenues to be generated from carbon taxes, governments, particularly in developing countries with typically low tax-to-GDP ratios in comparison with developed countries, may want to look to carbon taxes as a source for domestic resource mobilization.

59. Given the specific political economy of carbon taxes, there are strong arguments for using parts of the revenue for compensating affected industries and low-income households (use of revenues will be discussed in chapter 5). In this respect, an efficient redistribution of revenues may also foster sustainable growth, creating new business and employment opportunities (the "green growth"), and offset some of the regressive effects of the instrument.

60. Also, reflecting the particular nature of carbon taxes as both tax and environmental policy instrument, governments may choose to use (part of the) revenues for environmental spending. Finally, some countries, particularly in the OECD world, have used revenues from carbon and energy excise taxes to finance changes in overall tax policy, lowering other taxes simultaneously (tax shifts).

2.4. Core principles of carbon taxation

61. When introducing carbon taxation, policy-makers are implicitly applying four core principles, even though they might not be stated in national legislation. These principles are (i) the polluter-pays principle; (ii) the preventive principle; (iii) the precautionary principle; and (iv) the principle of common but differentiated responsibilities. The section provides an overview of these principles, and their theoretical underpinning.

- (i) The **polluter pays principle** promotes the internalisation of environmental costs through the use of economic instruments, taking into account the approach that the polluter should bear the cost of pollution, rather than shift it to the community.¹⁶ It runs from the premise that pollution that is unaccounted for through markets is borne by society at the individual and public level. Some examples include loss of health and property, loss of biodiversity and natural resources, and impact on general governmental budget by means of higher costs of healthcare, disaster reduction, and mitigation of environmental degradation.
- A carbon tax is capable of internalizing the environmental cost of pollution by making the polluter pay a tax that is directly proportionate to the polluting content of the product consumed, produced or extracted.
- (ii) The **principle of prevention** is stated in multiple international environmental conventions, but most explicitly in Principle 2 of the 1992 Rio Declaration on Environment and Development (Rio Declaration).¹⁷ It provides that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. It thus delves on inter-State responsibility and duty of care, to make sure that the economic activities pursued in one's territory do not generate a harmful environmental impact in neighbouring or third States.
- A carbon tax does not impede economic activity per se, although countries with high carbon tax rates (e.g. above USD40) may render carbon intensive investments less appealing. In essence, countries employing carbon taxes

¹⁶ The 1972 OECD Recommendation used the “polluter pays” terminology, but it did not have such a wide scope. It merely stated that the polluters should cover the costs of the abatement measures that governments legislated; it was principally a non-subsidisation principle. As per Tobey, James, and Henri Smets. ‘The Polluter-Pays Principle in the Context of Agriculture and the Environment’. *The World Economy* 19 (3 April 2007): 63–87. <https://doi.org/10.1111/j.1467-9701.1996.tb00664.x>.

¹⁷ The full text of the Rio Declaration can be found at https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_C_ONF.151_26_Vol.I_Declaration.pdf

continue making use of their sovereign right to exploit their own resources pursuant to their own environmental and developmental policies. However, by attaching a price to one's right to pollute (i.e. by costing the environment), countries employing carbon taxes at a high enough rate not only prevent the widespread use of carbon intensive fuels and technologies, they also employ the required duty of care to make sure that the activities within the control of their jurisdiction do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

- (iii) The **precautionary principle** is based on the concept that preventative measures should be put in place when there is a risk of future long-term harm to the environment, that cannot be fully assessed at the time of the decision-making process. The risk does not need to be eminent, nor does it need to be certain (introduced in principle 15 of the Rio Declaration).¹⁸
- By conceding to employ a tax instrument of environmental control, countries automatically acknowledge that there is a risk of future long-term harm to the environment if their emissions are not reduced or eliminated. Therefore, the introduction of a carbon tax is also the indirect embodiment and endorsement of the precautionary principle.
- (iv) The **principle of common but differentiated responsibilities** assumes that all countries are to share the responsibility for avoiding environmental degradation, but with differentiated levels of engagement depending on their social and economic development (introduced in Principle 7 of the Rio Declaration).¹⁹ The principle of common but differentiated responsibilities might only appear evident within the body of international and regional environmental agreements, when countries commit to certain targets and approaches taking into account their national circumstances.
- The principle is implicitly included in every national carbon tax legislation in the form of the tax rate adopted by the country. Based on this principle, it would appear that low- and middle-income countries are more prone to apply lower tax

¹⁸ Text adapted from T. Falcão and Jacqueline Cottrell "A Climate for Fairness: Environmental Taxation and Tax Justice in Developing Countries", Vienna Institute for International Dialogue and Cooperation (VIDC), November 2018.

¹⁹ T. Falcão, "A Proposition for a Multilateral carbon Tax Treaty" 2019, Books, IBFD.

rates, whereas high income countries are more likely to employ higher taxes. However, this correlation is not always as straightforward, as further demonstrated in chapter 3B.

2.5. Policy considerations in the introduction of a carbon tax

62. When introducing a carbon tax, as mentioned, policymakers will take into consideration what their goals are; and why a carbon tax provides advantages over other instruments, given the specific policy goals. This section analyses some of the main features to be taken into account, as well as the advantages and disadvantages of a carbon tax as compared to other instruments.

2.5.1. Certainty about the price of carbon

63. A carbon tax ensures cost certainty as the cost is the amount of the tax, and whatever the incidence of the tax (i.e., whether it can be passed on to consumers or not), the cost cannot rise above the tax rate. An ETS, on the other hand, suffers from inherent cost uncertainty. While allowances may be initially distributed for free, businesses will eventually have to pay for them, and the cap may be reduced. The key question for businesses that need to acquire allowances (following, for example, a reduction in the cap) is what would be their future price.

64. On the other hand, a carbon tax offers stable carbon prices: economic actors are aware that they will have to pay a certain price when the triggering event occurs, i.e. when they emit above a certain level. This enables businesses to plan ahead their investments on low-carbon technologies based on reliable decision-making elements. Therefore, a carbon tax provides certainty about the cost that the polluter will take into account when making decisions on the activity (whether or not to carry on the activity, how it is done, or its extent). In addition, in situations of emissions reductions (e.g. economic downturn), the tax will continue to provide a price signal.

65. In order to ensure the continued reduction of emissions, policymakers should review periodically the tax rate and check whether the rate is still suitable to achieve the desired emission targets. However, revision of the tax rate might provide uncertainty; a way to lower uncertainty is to be explicit in the law, and inform businesses that the tax rate might be increased up to a certain percentage every so many years.

2.5.2. Administration of the carbon tax

66. A carbon tax is often simple, easy and quick to implement as well as easy to administer and collect at low costs. The system usually works with a proxy (i.e. an assumed amount of carbon released when burning certain types of fossil fuels). The proxy price generally avoids the complexities of an ETS, which requires intricate systems for monitoring, reporting and verification of emissions.

67. However, administration of a carbon tax may be complicated with the introduction of exemptions, subsidies or refund mechanisms, sometimes applied to support or compensate certain industries affected by the tax (e.g. agriculture, fisheries, etc.).

68. Additional details on the administration of carbon taxes, and on which elements may simplify or complicate their implementation, will be found in Chapter 4 (Issues in the administration of carbon taxes).

2.5.3. Potential distributional implications and need for corrective measures

[This section will be expanded and cross-references to ensure coherence with Chapter 5].

69. Introducing a carbon tax may have distributional effects that raise concerns, in particular where such effects are regressive in the sense that they impact more on low-income household and consumers, with low capability to pay, and relatively less on the wealthy part of the population.

70. As previously mentioned, in order to mitigate the overall negative economic distributive effects of certain taxes and levies, governments may need to consider other changes to the tax system to alleviate the tax burden of low-income citizens; a more detailed discussion of how to design a carbon tax with this purpose will be provided in Chapter 5 (Use of revenues).

2.5.4. Perceived trade-off between development and environmental protection

71. A major challenge for developing countries is to support their growing industrialization while reducing emissions. How to balance economic growth and environmental protection poses a crucial policy approach to both developed and developing countries which intend to decarbonize their economy.

72. In order to reduce emissions while sustaining economic growth, many countries are shifting towards renewable energy over traditional sources. In the EU, for example, renewables

are expected to reach at least 27 % by 2030. Similarly, some oil producing and importing countries have developed plans in the medium and long-term to reduce their dependence on oil and diversify their respective economies (e.g. Vision 2030 plan or China’s National Climate Change Programme). However, other countries are still strongly reliant on fossil fuels to develop their economy.

2.5.5. Safeguarding the competitiveness of domestic industries

[This section will be expanded and cross-references to ensure coherence with Chapter 5].

73. In the absence of a global agreement, some countries or regions have unilaterally adopted a carbon price. A carbon price, whether in the form of a carbon tax or another instruments, forces domestic producers to partially internalize the cost of environmental damage, and therefore can raise their cost of production.

74. When the carbon tax is not imposed on producers outside that country or region, this can reduce the competitiveness of domestic producers as compared to foreign companies. The result may be that a polluting activity is reduced in geographical areas where environmental standards are higher, but increased or taken over by competitors in places with laxer regulatory regimes (“carbon leakage”).²⁰ Determining the extent and nature of competitive disadvantage and potential carbon leakage is important for government to gain industry acceptance of climate policy, including carbon pricing.

2.5.6. Summary of advantages and disadvantages of options to reduce carbon emissions

75. A summary of the main advantages and disadvantages of carbon tax and other instruments currently used to lower emissions, can be found in table 2.1 below.

	Advantages	Disadvantages
Carbon tax	<ul style="list-style-type: none"> • Generation of public revenues • Certainty in costs for economic actors 	<ul style="list-style-type: none"> • A-priori uncertainty in quantity of emissions reduction (however, the tax rate can be adjusted over time to meet emission

²⁰ Ex-post studies have found little evidence confirming the existence of carbon leakage. See for example Partnership for Market Readiness. ‘Carbon Leakage: Theory, Evidence and Policy Design.’ *Partnership for Market Readiness Technical Papers*. World Bank, 2015. <https://openknowledge.worldbank.org/handle/10986/22785>

	<ul style="list-style-type: none"> • Depending on the format, can require more or less administration; however, usually easier to administer than other instruments • Cost-effective 	reduction goals; see Chapter 3B, 3.4 for more information on how to dynamically set the tax rate).
Command & Control	<ul style="list-style-type: none"> • Depending on the format, can require lower administration than carbon pricing • Easier to enforce 	<ul style="list-style-type: none"> • Regulation is usually insufficient by itself to achieve carbon reduction goals • Does not generate revenues • Costly (as in, not cost-effective), as firms are given low flexibility on how to abate their emissions.
ETS	<ul style="list-style-type: none"> • Generation of revenues (in case of allocation of permits through public auctions). • Provides certainty in emission reduction goals • Cost-effective 	<ul style="list-style-type: none"> • Uncertainty in costs doesn't necessarily incentivize investment in low-carbon technology • Administratively more complicated than other measures, e.g. carbon tax, due to the need to set up a carbon market, auctions etc.
Offsets	<ul style="list-style-type: none"> • Offsets can be cost-effective, provided that they are properly administered and monitored, as they allow reduction of emissions at locations where abatement costs are lower, even if they are far from the emission source. • Provide incentives to reduce emissions beyond the tax base 	<ul style="list-style-type: none"> • Market not well developed and subject to manipulation • Risk of low additionality (due to manipulation and/or other uncertainties)

Table 2.1: Summary of the advantages and disadvantages of policy measures to reduce carbon emissions

2.6. Conclusions

[The conclusions are currently in outline form, and they will be revised and drafted as the chapter is finalized]

- Carbon emissions are the main driver of climate change, which will have extremely negative consequences for humans and for the environment. Even a warming of 1.5 degrees will impact ecosystems and societies much more severely than previously thought; considering that the Earth temperature has already increased by 1-degree post-industrial revolution, it is imperative to act quickly.

- Carbon taxation is one of the instruments available to countries to reduce carbon emissions; this measure can be used in conjunction with other environmental taxes, as well as other forms of regulation, to promote environmental protection and fight against climate change.
- This chapter provided an overview of what are some of the Market-Based Instruments (MBIs) that Governments can choose to lower GHG emissions, and to achieve a range of other policy goals, such as to raise revenue. The chapter outlined the advantages and disadvantages of such instruments as opposed to carbon tax, to allow policymakers to identify which are their most pressing concerns, and whether carbon tax is the right instrument.
- To be effective, however, carbon tax has to be well designed. In the next chapter, we will go into more detail on how to design a carbon tax from the practical point of view, to ensure this instrument is effective at achieving the goals set by policymakers.

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Annex 1: Carbon Taxation in the context of the United Nations

Last updated on 12 April 2020

Table of Contents

A1.1.	The United Nations Framework Convention on Climate Change.....	1
A1.2.	The Kyoto Protocol and Cap and Trade Systems.....	2
A1.3.	The Paris Agreement	3
A1.4.	The Broader United Nation Agenda: The Sustainable Development Goals.....	5

The United Nations has produced three key climate change agreements foreseeing targets for the reduction of greenhouse gas emissions. In chronological order the agreements are: the United Nations Framework Agreement on Climate Change (UNFCCC)¹ (United Nations 1992), the Kyoto Protocol (United Nations 1997),² and more recently, the Paris Agreement.

A1.1. The United Nations Framework Convention on Climate Change

The UNFCCC, the first international agreement on climate change, is an umbrella convention that provides a framework for both market and non-market approaches to address climate change. It was approved in 1994 and contains an open pledge “*to achieve ... [the] stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.*”

While the UNFCCC targeted all signatory countries — both developed and developing — only developed countries listed in Annex I committed to adopting national policies and taking corresponding actions to mitigate climate change by, among other things, limiting their emission of greenhouse gases. Annex II countries, a more restricted group of countries, had the supplementary obligation to provide financial resources to meet all costs incurred by developing country parties in complying with UNFCCC obligations.

¹ United Nations (1992). *Framework Convention on Climate Change*. Doc.FCCC/INFORMAL/84. June 4, 1992.

² United Nations (1997). *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. December 11, 1997.

Thus, the UNFCCC established different rights and obligations between developed and developing countries. However, it did not foresee a specific mechanism by which countries were to meet those limited rights and obligations.

In spite of that, the UNFCCC foresaw (and brought into the body of the Convention)³ all of the principles of environmental protection that are still employed to date, when devising new economic and fiscal instruments for the internalization of externalities, namely: the polluter pays principle, the preventive principle, the precautionary principle and the principle of common but differentiated responsibilities.

These four principles have formed the basis of all the international environmental agreements, negotiated since and even before the admission of the UNFCCC. They may therefore be considered the core principles of international environmental law, and of international environmental taxation.

A1.2. The Kyoto Protocol and Cap and Trade Systems

The Kyoto Protocol was adopted only five years after the UNFCCC entered into force. It was clear in introducing a market-based approach for the reduction and control of greenhouse gases. The close proximity within which the UNFCCC and the Kyoto Protocol were ratified made it appear like trading in emissions permits was, at least in political terms, the only admissible instrument under the umbrella of the Convention.⁴

Because of that choice, many countries and regions introduced cap-and-trade systems. The largest and most well-known emissions trading system is the one in the European Union, launched in January 2005, and herein referred to as the EU Emissions Trading Scheme (ETS).⁵

The Kyoto Protocol was therefore partially responsible for disseminating cap-and-trade regimes as the staple policy instrument in carbon pricing, for over twenty years. In spite of that, some countries, particularly in the EU, employ a mixed policy approach to carbon pricing, through the introduction of carbon taxes (i.e. Sweden, Denmark, Norway, Finland and the United Kingdom) and other types of environmental taxes (i.e. Spain, the Netherlands and others).

The Kyoto Protocol recognizes that developed countries are principally responsible for the high levels of greenhouse gas emissions in the atmosphere as a result of more than 150 years of industrial activity. Therefore, the protocol only places an obligation to reduce greenhouse gases on certain

³ Although the principles in themselves already existed prior to the ratification of the UNFCCC, the Convention arguably had the effect of making them into general principles of international law. The polluter pays principle, for example, was developed by the OECD in the 1970s. See OECD, *Recommendation of the Council of 26 May 1972 on Guiding Principles Concerning International Economic Aspects of Environmental Policies*, available at <http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=4&Lang=en&Book=False> ; and OECD, *Recommendation of the Council on the Implementation of the Polluter-Pays Principle*, available at <http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=11>.

⁵ In the EU in particular, the decision to go with an ETS was also premised on the fact that a new tax requires unanimous

approval from all Member States within the EU to be accepted. European Union (2003). Consolidated version of EC Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, OJ L 275. Oct. 25, 2003.

developed economies (listed Annex I countries), applying the principle of common but differentiated responsibilities as a justification for that approach.⁶

Over the course of the years in which the Kyoto Protocol has been in force, cap and trade systems have been criticized for (i) not being capable of inputting a high enough price on carbon,⁷ (ii) being complex instruments of difficult administration, not easily implemented by developing and least developed countries;⁸ (iii) never reaching the phase where the governments sell (rather than give away for free) the initial permit offering; and (iv) generating high compliance costs.⁹

In spite of that, it is to be recognized that both taxes and trading systems are flip sides of the same coin, meaning they are both instruments capable of inputting a price on carbon. Whereas a cap and trade system adopts an *ex-post* approach, by allowing the market to define the price of carbon according to the market conditions,¹⁰ a tax instrument is an *ex-ante* approach where the government imposes a price on carbon, and allows the market to adjust to that price accordingly. In short, a tax approach fixes prices and the quantities (of emissions) follow, whereas the ETS fixes quantity and the prices follow.

It took the U.N. and its Member States over twenty years to build the momentum to achieve a new consensus in the instrumentalization of carbon pricing policies, and to formalize a broader agreement that would be capable of furthering both tax and cap and trade alternatives to meet the objectives of the UNFCCC. That was achieved through the adoption of the Paris Agreement.

A1.3. The Paris Agreement

Introduced in 2015, the Paris Agreement broadened the scope of tools available for Member States to address carbon emissions specifically and climate change more generally — tools that include

⁶ Centre for International Sustainable Development Law, Legal Brief, *The Principle of Common but Differentiated Responsibilities: Origins and Scope For the World Summit on Sustainable Development 2002*, available at http://cisdl.org/public/docs/news/brief_common.pdf

⁷ It was always expected that the permits would be a valued commodity operated in the ETS markets, but that expectation has as of yet not been fully fulfilled.

⁸ That is in fact demonstrated by the Chinese pilot ETS program. Initiated in 2014, it is only expected to become fully operational in 2020, for the electricity sector. The schedule to gradually expand the coverage of the ETS to other industries is not public yet. For further information on the China ETS project see: World Bank, *Market Readiness Proposal (MRP): Establishing a National Emissions Trading Scheme in China* (National Development and

Reform Commission, World Bank,) 2013, available at: <http://projects.worldbank.org/P145586/china-partnership-market-readiness?lang=en&tab=documents&subTab=projectDocuments>.

⁹ See for example, the Chinese experience setting up an ETS as reported in World Bank Group, *State and Trends of Carbon Pricing 2019*, June 2019, pg. 35.

¹⁰ A cap and trade's operation system is not dissimilar to the trading of bonds in a stock market. The greater the demand for permits, the higher the price of carbon (i.e. the higher the price of the corresponding permits). Conversely, a low demand for carbon permits will lead to a low carbon price and to market failure from an environmental perspective, to the extent the market is incapable of accounting for the environmental cost of pollution. The under-valuation of carbon in a market or fiscal approach means that society is ultimately paying for the environmental cost of production and transport of carbon intensive products and activities, because the cost of production and transport is not factored into the final price of the goods sold.

green financing, trading in green bonds, regulatory and fiscal instruments. It also broadened the scope of application of these instruments, by inviting all of the UN Member countries, at all levels of economic development to adopt the Agreement and to commit to the GHG reduction goals assigned under Article 2. The Paris Agreement is thus the first international environmental agreement delving on climate change of true global application, and that feat was achieved by eliminating the differing obligations originally bestowed on Annex I and Annex II countries.

The Paris Agreement requires all parties (developed and developing) to use their best efforts through nationally determined contributions to curb greenhouse gas emissions and to continue to strengthen those efforts in the years ahead. The agreement is thus a return to the original objective of the UNFCCC¹¹ to the extent it formally acknowledges a broader array of instruments to fight climate change and reduce Greenhouse Gas Emissions.

The Paris Agreement is either a story of success or of failure, depending on the eye of the beholder. Whereas some criticize it for having failed to deliver a binding commitment for GHG emissions reduction, others celebrate the fact that the agreement has put forward a broader set of tools to address carbon emissions (as opposed to supporting only emissions trading) specifically and climate change more generally — tools that include green financing, green bonds, and environmental taxes, amongst which are included carbon taxes, the most popular behaviour-influencing instruments aimed at setting an *ex ante* price on carbon.

However, targets for the reduction of greenhouse gas emissions under the agreement are voluntarily determined and reported, national pledges are often conditional, and there is no enforcement mechanism and verifiability of implementation of pledges. Some of the common criticisms attributed to the Agreement are based on the fact that it has no built-in mechanism to ensure delivery on commitments. Furthermore, intended contributions fall short of required emissions cuts and are unlikely to be able to contain global warming to the required threshold, absent an intense carbon pricing campaign that is geared towards the effective reduction of emissions.

The UNFCCC, ¹² Kyoto Protocol and the Paris Agreement all delve on seven GHGs in particular: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), Sulphur Hexafluoride (SF₆) and Nitrogen Trifluoride (NF₃). ¹³

CO₂ equivalent emissions is a measure of the total greenhouse effect created from all GHG emissions over a given timeframe, by means of which the non-CO₂ emission levels may be compared

¹¹ T. Falcão, *A Proposition for a Multilateral Carbon Tax Treaty*, IBFD Doctoral Series, 2019

¹² United Nations, *UNFCCC reporting guidelines on annual inventories for Parties included in Annex I to the Convention*, FCCC/CP/2013/10/Add.3, available at: <https://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=2>.

¹³ The UNFCCC mentions broadly the term greenhouse gases without specifying the exact name of the gases it refers to. The Kyoto Protocol mentions the first 6 gases as greenhouse gases covered under the agreement, not including therefore Nitrogen Trifluoride (NF₃). The Paris Agreement covers all seven gases.

to a CO₂-equivalent basis. According to the Intergovernmental Panel on Climate Change (IPCC), CO₂-equivalent emission is the amount of CO₂ emission that would cause the same change the global mean equilibrium temperature, over a given time horizon, as an emitted amount of a long-lived GHG or a mixture of GHGs. The equivalent CO₂ emission is obtained by multiplying the emission of a GHG by its Global Warming Potential (GWP) for the given time horizon. GWP is therefore basically an index of how much a GHG may contribute to global warming over a period of time, typically 100 years.

Therefore, under a carbon tax system, the mere use of carbon as a proxy for pollution, would allow countries to also target other GHGs through the tax, if emissions of these other gases are measured in Carbon Dioxide equivalent emissions (CO₂e).

A1.4. The Broader United Nation Agenda: The Sustainable Development Goals

Fortuitously but perhaps not by accident, 2015 was also the year the Addis Ababa Action Agenda (AAAA) was adopted, providing the foundation to support the implementation of the United Nations 2030 Agenda for Sustainable Development. The AAAA foresees a global framework for financing sustainable development by aligning all financing flows and policies with economic, social and environmental priorities.

The 2030 Agenda for Sustainable Development is a plan of action for people, planet and prosperity, which furthers 17 Sustainable Development Goals (SDGs) and 169 targets to build on the Millennium Development Goals. They seek to realize the human rights of all and to achieve gender equality. They are integrated and indivisible and balance the three dimensions of sustainable development: economic, social and environmental.¹⁴

The 17 SDGs are currently the basis against which all UN Actions Plans are reported. The environment is such an important dimension of sustainable development that it features in nine of the seventeen goals,¹⁵ with a dedicated action plan specifically referencing it – SDG 13 on Climate Action.

The AAAA and the 2030 Agenda for Sustainable Development have emphasized the need for countries to mobilise resources in order to enhance development and meet the required goal. Several

¹⁴ United Nations (2015b). *Transforming our world: the 2030 Agenda for Sustainable Development*. ECOSOC Resolution A/RES/70/1, Resolution adopted by the General Assembly on 25 September 2015. Retrieved from http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

¹⁵ Goals: (i) 3: Good Health and Well-being; (ii) 6: Clean Water and Sanitation; (iii) 7: Affordable and Clean Energy; (iv) 9: Industry, Innovation and Infrastructure (v) 10: Reduced Inequality; (vi) 11: Sustainable Cities and Communities; (vii) 12: Responsible Consumption and Production; (viii) 14: Life Below Water; (ix) 15: Life on Land. That is not to mention the potential for new conflict and mass migration if climate change is not addressed. Environmental issues could therefore come to affect peace and security (SDG 16) and increase poverty (SDG 1) if not addressed in a timely manner.

agencies have been set in order to monitor countries' progress in this field, and the UN itself produces frequent reports on countries' initiatives for resource mobilization.¹⁶

¹⁶ See in this respect, United Nations, *2019 Financing for Sustainable Development Report* of the Inter-agency Task Force on Financing for Development, (2019), available through the link: <https://developmentfinance.un.org/2019-financing-sustainable-development-report-preparatory-materials>.)