Smooth implementation of carbon taxation: An overview of the main proposals in the UN Handbook

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ABSTRACT:

When introducing (or reinforcing) carbon taxation in fiscal systems, the design and the administration of carbon taxes must be carefully considered. How to allocate the administrative tasks? Who should be involved? How to face regional context situations? How to listen to the stakeholders' voice for addressing the good administration challenge? How to provide clear guidance and facilitate improvement? All these questions should be answered. Additionally, specific attention must be paid to the interaction with other economic instruments, the possible uses of the revenue obtained and the critical issue of public acceptability. This article analyses all these topics are succinctly.

KEYWORDS:

Carbon tax, incentives, administration, environment, sustainable development, acceptability, acceptance, earmarking

[1] The opinions expressed in this contribution are personal and not as member of the UN Subcommittee on Environmental Taxation. PI AudIT-S project "Legal and financial significance of sustainability audit schemes through smart data management" (PID2019-105959RB-I00) https://www.ucm.es/proyecto-audit-s/ .

I. Introduction

In the field of the international cooperation in tax matters, a major move has been made during the last mandate of the United Nations Committee of Experts between 2017-2021. Yet, it has mostly gone unnoticed in the academic tax debate during the past years. The political momentum and sensitiveness to address urgent matters in the 2030 Agenda led this Committee to orient its traditional work on taxation towards broader objectives, i.e., the achievement of some non-purely revenue related goals.

This historic change of focus, also favoured by the international agreements to face the climate emergency[2], implies an express use of tax tools for the satisfaction

[2] On some Spanish efforts to defend the crucial role of Tax Law in the environmental field during the COP25, see Grau Ruiz, María Amparo; Moreno Cabrera, Pilar; García Carretero, Belén; Peñalosa Esteban, Isabel; Alguacil Marí, Pilar; Villar Ezcurra, Marta; Ambrosio, Yolanda; Avilés, Carmen (2019) *Financial activity for global sustainability*, 2 - 13 December 2019, 2019 United Nations

of global social needs, accentuating their extra-fiscal character[3]. Not only is their important role recognized as a financing mechanism (when it comes to mobilizing internal resources) for the responses that public entities have to provide; but also, and this is what is really new, as a formula for universally guiding citizens' conduct in the desired direction. In this specific case, it is a question of fiscally promoting taxpayers' environmentally friendly behaviours in the current process of decarbonization of national economies, leaving sufficient room for action to all sovereign states.

Of course, only a first step has been taken. It is relatively small as far as the scope of the measures concerned, but still it is very significant in terms of highlighting global priorities and laying a foundation on which a better structure for collaboration in this area could one day be developed.

The preparation of a Carbon Tax Handbook[4] on which the various jurisdictions can rely right now in building or enhancing the relevant part of their

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Climate Change Conference, COP25. Document available at https://eprints.ucm.es/id/eprint/59173/ [last access 14 September 2021]. Although vulnerability may differ from one country to another, climate change is having an impact everywhere, and explicitly on public finances. 'It is already affecting tax revenues and public expenditure in Europe due to the increasing need to use national and EU taxes to fight against natural catastrophes'. Dourado, Ana Paula (2019) Editorial: The Priorities for EU Tax Policy, 47, Intertax, Issue 10, p. 808.

[3] On the indirect role of taxation as an instrument to accelerate the technological, social and economic changes that are necessary to fight climate change, Vanistendael, F. (2019) Reflections on sustainable taxation, *Revista Técnica Tributaria*, Vol. 4 No. 127. Available at https://revistatecnicatributaria.com/index.php/rtt/article/view/522 [last access 14 September 2021]. Taxation in a modern state comprises a regulatory goal, apart from the classic revenue-raising and redistribution. Avi-Yonah, R. S. (2011) Taxation as Regulation: Carbon Tax, Health Care Tax, Bank Tax and Other Regulatory Taxes, 1(1) Accounting, Econ., & L. 2. Avi-Yonah, R.S. (2006) The Three Goals of Taxation, 60(1) Tax L. Rev. 22–25. The regulatory taxation can be understood '*stricto sensu*, i.e. those tax measures that are enacted to achieve non-fiscal goals, either tax subsidies aimed at stimulating desirable behaviours and activities or corrective taxes intending to internalize negative externalities and discourage undesirable behaviour (so-called 'Pigouvian taxes')'. Dourado, Ana Paula; Pirlot, Alice (2020) Taxes and Regulation, 48, Intertax, Issue 4, p. 356.

[4] United Nations (2021). Handbook on Carbon Taxation for Developing Countries. United Nations Committee of Experts on International Cooperation in Tax Matters. This is the result of the work carried out by the UN Subcommittee on Environmental Taxation led by Natalia Aristizábal Mora. The full text in English is available at the following link: https://www.un.org/development/desa/financing/sites/www.un.org.development.desa.financing /files/2021-10/Carbon%20Taxation.pdf [last access 7 December 2021]. Throughout this article we have also considered the public conference room papers. Some of the chapters were renumbered to fit in the Handbook's final structure: Chapter 1: Introduction to the Handbook on Carbon Taxation for Developing Countries, Chapter 2: An Introduction for Policymakers, Chapter 3: How to Generate Public Acceptability for Carbon Taxes, Chapter 4: General Issues in Designing a Carbon Tax, Chapter

legal systems for this purpose is a useful effort. It is also valuable for the mere fact of having established a homogeneous language and offering various legislative options, pointing out their pros and cons[5]. This will probably make it possible to implement more advanced cooperation in the future.

At the present stage of institutional development in the field of taxation, the adoption of a global tax on CO_2 emissions is practically unthinkable for the time being, even though it is known that the problem is universal in scope. For this reason, it is to be welcomed, at least at the current phase, the adoption of this pro-possible strategy. If, in the near future, the introduction of this type of tax is generalized in the comparative scenario and administrative cooperation is strengthened (for example, by adapting the existing rules on mutual assistance), it will facilitate the achievement of environmental (and, where appropriate, related tax collection) objectives at an international scale.

However, all the technical efforts made in designing the relevant regulatory measures may not suffice in this forced reorientation of modern tax systems, if there is a lack of commitment and care in the proper implementation of environmental taxation. Special attention should be paid to some aspects that are, at first sight, less striking, but which are decisive for the success of the task undertaken. For this reason, the following pages focus mainly on the analysis of the relevant issues in the administrative application of carbon taxation. Other related issues arise, which eventually take on an entity of their own, such as the interactions with other pricing instruments, the ways to ensure social acceptance, or even the options for the use of the sums collected, which are also discussed. All of them should be considered;

5: Setting the Tax Rate, Chapter 6: Carbon Tax Design Approaches in Practice, Chapter 7: Addressing Undesired Effects on Households and Firms, Chapter 8: From Design to Administration: Practical Application of a Carbon Tax, Chapter 9: Revenue Use, Chapter 10: Interactions Between the Carbon Tax and Other Instruments.

[5] Literature from a public finance and an economic perspective is already available e.g., 'Majocchi and Metcalf's books draw attention to the role of carbon taxation both in the European Union (EU) and in the United States (US)'. 'Their primary objective was not to analyse carbon taxes from a legal viewpoint but to provide a detailed discussion as to why carbon taxation should be seriously considered by policy-makers'. Pirlot, Alice (2020) 'Literature Review: Alberto Majocchi, European Budget and Sustainable Growth, The Role of a Carbon Tax, Peter Lang, 2018 & Gilbert E. Metcalf, Paying for Pollution: Why a Carbon Tax is Good for America, OUP, 2019', 48, Intertax, Issue 1, pp. 132-134,

otherwise, some negative effects that could be caused would end up delegitimizing this laudable initiative.

II. From design to administration: practical application of a carbon tax

Once the basic design of a carbon tax has been decided, there are some key administrative issues to take into consideration[6]. This usually happens with every tax but may involve additional actions particularly related to this one due to its public significance.

In accordance with each regulatory option, in order to determine how the carbon tax will function in practice, specific administrative provisions should be adopted, involving various institutional levels -that may differ in each country.

Basically, the main issues to address are the ones following described in the following table:

Allocation of tasks	→ Who should care?
New challenges	→ What approach?
Operational aspects	→ How to offer guidance?
Continuous improvement	→ Which tools?

1. Some factors to ponder in the allocation of administrative tasks

[6] This section reflects the main aspects in the debate regarding this topic, having been the author of this article the draft leader of the chapter. Chapter 8: From Design to Administration: Practical Application of a Carbon Tax in United Nations (2021). Handbook on Carbon Taxation for Developing Countries. United Nations Committee of Experts on International Cooperation in Tax Matters. Committee of Experts on International Cooperation in Tax Matters: Revenue use, Twenty-first session, E/C.18/2020/CRP.44. Conference Room Paper available at the following link: https://www.un.org/development/desa/financing/sites/www.un.org.development.desa.financing/files/2020-10/CRP44_CarbonTaxHB_Chapter4_21stSession_SF.pdf [last access 14 September 2021].

Establishing a functional administration of a carbon tax is necessary to ensure its effectiveness. The administrative tasks are usually assigned to tax authorities in many jurisdictions. In any event, the use of the existing tools should be enhanced to ensure low administrative costs and try to generate co-benefits.

Obviously, no matter how it is arranged, the collection procedure should be in line with the provisions of the law. It is worth noting that it often comprises both acts passed by a national parliament (or similar body) and secondary legal acts (generally understood as regulations to facilitate the day-to-day management). The real performance both by the tax itself and the administration managing it should be evaluated through an ex-post analysis.

When defining the competent administrative institutions and their responsibilities, it is important to seek the involvement of the standing administrative agents. In addition, it is useful to consider how the administration may experience (external and internal) influences in a regional context. It is good to account for stakeholders' views on administrative issues as well, allowing a better public engagement. Another matter that may affect the effective administration is the need to coordinate the application of the tax with other overlapping economic instruments. In the following paragraphs, attention is paid to all these items.

a) The involvement of the relevant administrative agents

The decision on which public agency will administer the carbon tax should be made at an early stage in the design phase to later facilitate its implementation. Predictably this decision requires the allocation of sufficient public funds to cover the expected increased administrative costs, by providing enough qualified human resources and/or adequate technologies to carry on the new tasks.

Immediately, several questions arise regarding the administrative personnel:

- To what extent can the existing tax or environmental structures (e. g. already experts when it comes to collect fuel taxes or report emissions) be used to minimize the administrative costs of a carbon tax?
- What type of reinforced cooperation between them could be beneficial?

The answer will frequently depend on the approach previously chosen by the policymakers when adopting the legislation to establish the tax. Basically, the configuration of the carbon tax may take the form of a fuel or a direct emissions approach, and this will influence the subsequent administrative (re)organization.

In the case of the fuel approach, it is relatively easy to rely on the administrative structure in place to apply taxes on fuels. The main difficulty in this type of administration derives from the availability of accurate and updated emissions factors to be considered in the application of a carbon tax. The most common strategy is to rely on the work of tax authorities (either local tax offices or one central tax authority) or Customs Offices, with the mere provision of the said factors by experts in the field.

In the direct emissions approach, the best choice for the administration seems still likely to be the tax authority. However, it can count on emission data submitted by the facilities with some form of verification performed by a technical agency (independent or part of another Government office, e. g. Ministry of the Environment). Thus, it implies a greater cooperation among different agencies (and sometimes other lower levels of jurisdiction that capture these data).

b) The existence of a regional context

The expression “regional context” is employed here with the aim of relating both to a particular part of a country (e.g., where there are sub-national levels) or a particular area of the world (e.g., because of the integration in an economic organization). The way to arrange the administration must clearly consider each State's situation within and across borders (as the propensity and actions to protect the environment may not reach the same scale ubiquitously).

In the former case, especially in the context of a country where fiscal federalism is in force and the allocation of environmental competences may contrast, different multi-level governmental decisions on the design and the administration of a carbon tax may influence its efficacy at the end. To optimise its scope, well-defined administrative channels for fluent communication between all the pertinent territorial authorities (including the sub-national ones both in the tax and the environmental field) should be carefully established.

In the latter case, the risks of (un)coordinated action in regional groupings or with neighbouring countries need to be expressly assessed. In this sense, special attention should be paid to cross-border situations and regional-wide approaches to articulate modes to facilitate reasonable compliance and avoid redundant controls.

c) The stakeholders' voice for better administration

One key message in the Handbook is that public consultations are desirable. They may serve to obtain useful information for an efficient administration and to gain social acceptability in the beginning and acceptance in the end of the implementation process. So, these consultations should take place both prior and post enactment of the carbon tax. Transparency in the administrative action may show how it is dynamically accommodated to the real situation and the feedback received from selected sounding boards.

It is stressed that information campaigns often help administrative accountability and taxpayers' adaptation, avoiding any undesired lack of certainty. How the announcement of a carbon tax is made, and how the steps for its implementation are conceived, are thus crucial matters. In this regard, the length of the transition period should be enough to allow any adjustments to be made by the administrations themselves and all the affected taxpayers. The offer of a reasonable time frame to "acclimatize" to the new settings will be a condition for success.

2. The good administration challenge either under a fuel or emissions approach

The normative conformation of the identification elements of the carbon tax (taxable event and taxpayer) and the quantification elements (tax base and tax rate) will help shaping the public bodies that will best administer it and oversee its administration.

Other relevant aspects in the application of the tax will be the declaration period and the information to be (electronically) provided in the administrative forms. A particular attention must be paid to the administration of possible tax exemptions or other tax benefits, and the administration of crediting or emission offsetting schemes. The necessary mechanisms to exert a proper control have to be implemented to avoid their undue use.

A comparative analysis of the Swedish and the Chilean case is extensively made in the Handbook. For the sake of brevity and clarity, a summary of the different ways to proceed is reflected in the table below.

Comparison Sweden – Chile

	Sweden – Fuel Approach	**Chile – Direct Emissions Approach**
Taxable event	When fuel leaves tax warehouse	The emissions at the facility level
Taxpayer	Authorised warehouse keepers	Operator of facility with boiler and turbine with an energy potential of 50MW or more
Tax base	Fossil fuels	CO_2 emissions

Tax rate	In volume or weight units (litres, tons), calculated based on average CO_2 emissions	US$5 /$CO_2$ tons
Public body in charge of admin	Tax authority	Tax authority and Ministry of the Environment
Declaration period	Monthly	Facilities are required to report their respective emissions quarterly to the environmental authority, but submit a tax declaration annually
Information given in tax declaration	Amount of fuels (litres, tons) that left the tax warehouse during the declaration period or was consumed by the warehouse keeper himself	Emissions, provided by the Environmental Authority.
Administration of tax exemptions	Deductions in declaration, if relating to warehouse keeper's own consumption; reimbursement	No exemptions, however, power energy facilities who are regulated under formal contracts in the electric energy system have rebates associated with

	application to tax authority in other situations (fuels are bought taxed)	their electric generation tariff law
Additional market mechanisms		None exist at present, however a recent tax reform contemplates crediting (offsetting mechanism)
Control mechanisms	Check volumes declared by taxpayer according to general tax auditing procedures	Both the environmental agency and the tax authority can inspect emissions; no independent verification system

3. Guidance through administrative regulations

When implementing a carbon tax, the availability of sound administrative regulations to be followed by the taxpayers may make a difference. In their issuance, it is critical to consider their nature, timing, content (mainly, proportionate requirements), and accuracy. And of course, carefully address the issue of their adequate communication to all the stakeholders.

Specifically, these regulations should provide clear criteria for registration, declaration, and book-keeping. When devising them, there is an urgent need to explore and make alternative use of some data that may be already available, to avoid any overload to the taxpayers and the administration itself. To do so, it is wise to reinforce the cooperation of the tax authorities with environmental bodies when

using a Direct Emissions Approach, keeping in mind the need of permanently safeguarding the adequate levels of sensitive data protection.

In particular, when reviewing the administrative concerns that may arise at the time of using a fuel or direct emissions approach, it is helpful to highlight some lessons learnt from comparative analysis.

In a fuel approach, according to the Swedish example, it is advisable to

- consider the use of thresholds when deciding on the taxpayers' registration;
- try to combine time and forms in declarations to lower costs when taxes may have the same tax base;
- count on environmental expertise occasionally (e. g. when granting exemptions) and allow tax authority to focus on volumes; and
- explain whether guarantees are required and make explicit the book-keeping obligations.

In a direct emissions approach, the Chilean example shows that it is convenient to

- define the liable entities in terms of an environmental or technological criterion for monitoring;
- pay attention to reporting and verification systems;
- clarify the roles of the competent public authorities intervening in the administration.

4. Ex-post evaluation for improvement

To continuously improve the carbon tax design and its administration, it is beneficial to put in place methods and measures to consider possible changes after receiving feedback from different stakeholders.

To ensure that a well-functioning carbon tax scheme is in operation turns out to be an on-going process. Yet, it requires to identify as early as possible the appropriate criteria to evaluate how well the carbon tax is performing, consider the

need for further development and the opportunity to make changes to allow further progress.

If the carbon tax introduction has not been preceded by a comprehensive public consultation, the need for this sort of ex-post evaluations may be even more necessary to avoid a more profound criticism on the goals and a growing risk of institutional mistrust by the civil society, because of the perception of the system as unfair[7].

III. Other relevant aspects

In the passage from the design to the administration phase, as mentioned hitherto, basically the organization of management tasks and relations between different institutions and stakeholders should ensure proper cooperation and communication; the administrative resources needed with a fuel or emissions approach should be carefully assessed; the legislation should be adequately developed through operational administrative regulations aspiring to managerial simplicity; and the mechanisms to receive feedback should be set for continuous improvement. Nevertheless, for the application of a carbon tax, some other additional aspects deserve attention: the interaction with other instruments, the revenue use, and the acceptability. These are briefly analyzed below.

1. Interaction with other instruments

[7] The importance of the evaluation of regulatory taxes has been clearly stressed by legal academics: 'It would be worthwhile to establish rules for a monitoring procedure in the regulatory tax law itself as well as an obligation to remedy any defects, whereby the question of enforceability in court also arises in this context. Sunset-legislation should ideally encourage the parliament to condition the extension of a measure on the achievement of the desired outcome in the interim period. However, all too often such legislation is automatically prolonged without assessment, sometimes even if there is either evidence of ineffectiveness or at least doubt regarding the measure's behavioural effects. More promising are legal evaluation clauses which define both the legislative goals the realization of which is to be reviewed and the time of the evaluation. However, an enforcement mechanism is still needed even then. The option of representative action taken by qualified entities in the public interest appears recommendable'. Hey, Johanna (2020) 'Effectiveness of Regulatory Taxes: Control Through Proceedings v. Judicial Control: A German Constitutional Perspective', (2020), 48, Intertax, Issue 4, p. 368.

Policymakers usually combine different policy approaches to achieve decarbonization (and often aim at other multiple simultaneous objectives, like revenue raising, economic development, job creation or energy security). For this reason, the interaction between various instruments affecting the price on carbon is carefully analyzed in the Handbook on Carbon Taxation for Developing Countries[8], outlining the main possible relations and providing options to address them.

Evidently, carbon taxation is not introduced in a vacuum. The existing policy instruments (e.g., other carbon pricing mechanisms, like emission trading schemes, fuel or energy taxation, incentives for clean technology, and fossil fuel subsidies) may interact with the carbon tax duplicating, reinforcing or countering it.

It is obviously important to care about any unintended effects, as they may lead economic agents to choose what may not be the most cost effective, considering the available resources and technology. At the end, this increases the cost of the solution for the economy as a whole. To stimulate the uptake of low carbon energy options and provide a signal to develop low carbon technologies, the carbon price needs to be sufficiently strong and stable. In this sense, the price can be put on the carbon involved to produce a product or service, either explicitly or implicitly[9]. It is therefore possible to adjust the carbon tax design or the pre-existing policies, or to integrate carbon tax aspects into them, or introduce complementary measures.

Time and location caveats are to be made. On the one hand, some potential interactions may arise when the carbon tax is being designed, and other ones may

[8] A foretaste of the efforts made to systematize the discussions led by Anna Theeuwes can be found in this section. Chapter 10: Interaction between the carbon tax and other instruments in United Nations (2021). Handbook on Carbon Taxation for Developing Countries. United Nations Committee of Experts on International Cooperation in Tax Matters. Committee of Experts on International Cooperation in Tax Matters: Carbon Taxation: Interaction with other instruments, Twenty-second session, E/C.18/2021/CRP8. Conference Room Paper available at the following link: https://www.un.org/development/desa/financing/sites/www.un.org.development.desa.financing/files/2021-04/CRP8_CarbonTaxHB_Chapter7Interactions_22ndSession.pdf [last access 24 September 2021].

[9] Explicit carbon pricing includes carbon taxation, emissions trading, carbon crediting, and results-based climate financing. Implicit carbon pricing creates indirectly a price on carbon through policies like fuel taxation, energy efficiency standards, fossil fuel subsidy removal and incentives for low carbon technologies.

appear once it is in place. So, it is useful to consider in advance the timeline and scope for any adjustment overtime. On the other hand, it is convenient to involve all levels of government, because carbon-related policies are frequently designed and implemented by different government entities at various levels. The core problem is that multiple instruments without enough degree of coordination will not provide an efficient price signal to ensure carbon reduction.

Most policies are usually designed to achieve their independent objectives, not conceived as a package. That is why overlapping, complementary, and countervailing policies[10] prompt additional administrative concerns and ultimately affect the effectiveness of a carbon tax. The implementation of a coordinated policy will vary country by country, because multiple combinations can exist, depending on local circumstances and also the type of relations with neighbouring countries[11].

A classification of the possible interacting policies is offered in the next table[12].

Complementary	Overlapping	Countervailing

[10] This classification follows the clear methodology used in *State and Trends of Carbon Pricing 2016* by the World Bank Group.

[11] For example, the Mexican tax is relatively simple and additional features have been implemented with the ETS in mind to link with the Western Climate Initiative.

[12] Table 3 containing some examples of policies that may interact with a carbon tax is taken from E/C.18/2021/CRP8, pp.12-13.

• 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 qualityand availability of weather forecasting to make renewable generation more predictable • Regulating methane emissions inthe oil and gas sector • Phasing out coal-based energyproduction • Electric Cars • Vehicle emission standards • Subsidies/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 electricvehicles (EVs) • Standards for energy efficient buildings • Regulations or incentives on land management practices • Land fill regulations • Offset markets for GHG reductions from waste sites	• Emission Trading Schemes • Fuel and energy taxes • Renewable energy support measures • Vehicle fuel efficiency standards • Feed-in tariffs or greencertificates • Environmental emissions regulations and standards • Social carbon price ininvestment projects • Internal carbon price inbusinesses • 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 inlandfills • Regulations on forest management practices • Fire/pest prevention measures • Retrofitting existingbuildings	• 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 (Forestclearing) subsidies • Private car and transport subsidies • Tax rebates on high emissioncars (eg. Diesel) • Public Transport taxes

The World Bank offers a very useful map with an overview of the carbon pricing initiatives at different stages (implemented, scheduled for implementation and under consideration). In 2021, these initiatives would cover 11.65 GtCO2e, representing 21.5% of global GHG emissions. The statistics show that there are 64 carbon pricing initiatives implemented, 45 national jurisdictions are covered by the

initiatives selected, and 35 subnational jurisdictions are covered by the initiatives selected[13].

Regarding many existing energy taxes, it is worth highlighting that they were not introduced for environmental reasons, but to raise tax revenue or to limit dependency on imported energy[14]. There is evidence that energy taxation has improved energy efficiency and reduced demand for energy, by affecting consumer behaviour (e. g. the EU 2003 Energy Taxation Directive). However, some targeted incentives may be needed to support investment in low carbon technology and innovation[15].

Notwithstanding this, cooperation and transparency are crucial to phase out fossil fuel subsidies, to minimize efficiency losses, and implement more equitable solutions. The gathering of reliable information to calculate the actual scale and scope of fossil fuel subsidies is still a challenge[16]. The estimates should be regularly

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[13] Santikarn, Marissa; Churie Kallhauge, Angela Naneu; Bozcaga, Mustafa Ozgur; Sattler, Leyla; Mccormick, Michael Stephen; Ferran Torres, Ana; Conway, Darragh; Mongendre, Leo; Inclan, Carolina; Mikolajczyk, Szymon; Gilde, Lieke 't; Long, Imogen; Bravo, Felipe; Lorenzo, Federico; Korthuis, Adriaan (2021) *State and Trends of Carbon Pricing 2021*. World Bank Group. Washington, D.C. http://documents.worldbank.org/curated/en/771941622009013802/State-and-Trends-of-Carbon-Pricing-2021. Updated information can be found in the following link: https://carbonpricingdashboard.worldbank.org [last access 14 September 2021]. Zachariadis, Theodoros; Milne, Janet E.; Skou Andersen, Mikael; Ashiabor, Hope (eds.) (2020) *Economic Instruments for a Low-carbon Future*, Critical Issues in Environmental Taxation series, Vol. XXII, Edward Elgar Publishing, Cheltenham. Ashiabor, Hope; Milne, Janet E.; Skou Andersen, Mikael (eds.) (2021) *Environmental Taxation in the Pandemic Era*, Critical Issues in Environmental Taxation series, Vol. XXIII, Edward Elgar Publishing, Cheltenham.

[14] OECD (2019) *Taxing Energy Use in 2019: Using taxes for climate action*, OECD Publishing, Paris. Available at the link: https://doi.org/10.1787/058ca239-en [last access 14 September 2021].

[15] In shifting form fossil fuels to renewable energy to reduce greenhouse gas emissions, comparative experiences regarding incentives are extremely valuable. 'These lessons can transcend national boundaries and contribute to an understanding of tax expenditures more generally'. Milne, Janet E.; Villar, Marta (2020) Renewable Electricity and Tax Expenditures: Lessons from Two Countries, 48, Intertax, Issue 4, pp. 369-388. They find that the following aspects, among others, are relevant: Timing incentives to need; policy stability; the real financial cost of incentives that operate quietly through the market; whether the cost falls on taxpayers or consumers; the cost-effectiveness; the surrounding policy environment; the complexity in cases of multi-level governance; or the continuing evaluation to enlighten future policy choices.

[16] The World Trade Organization, the OECD and the International Energy Agency have defined fossil fuel subsidies. Some methods to measure fossil fuel subsidies are the price gap; the inventory of support to fossil fuels; and the indicator that is part of the Sustainable Development Goals. The World Bank's initiative called The Transformative Carbon Asset Facility (TCAF, https://tcafwb.org) offers support to emerging economies in developing and implementing both explicit and implicit domestic carbon pricing policies. The Climate Emissions Reduction Facility is an umbrella fund for climate finance launched in 2020. Details available at

updated and expanded across sectors. If they become public, the governments and other stakeholders are able to work together to design and evaluate effective fossil fuel subsidy reforms and make rigorous evaluations of their effects.

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. In case of a carbon tax on top of an energy tax, the price signals may provide contradictory effects as approaches supporting volume reduction may not align with approaches supporting carbon reduction. To steer new energy products like hydrogen or innovative uses of existing energy sources towards lower carbon options, an adjustment could affect the already existing energy taxation to keep such products out of its scope whilst introducing a carbon tax for such new fuels.

It is advisable to look at the abatement opportunities and associated costs for different activities and tailor the policies to provoke the desired response. Whilst an Emission Trading System (ETS) works well for stationary emitters, its introduction would be more problematic in the transport sector. A carbon tax can be also a complementary measure to an ETS as a solution to excessive price volatility (e.g., in the United Kingdom).

Instead of adding a new instrument to a pre-existing instrument, another option is to adapt that existing system with features from another instruments. This avoids a duplication of tasks in implementation and administration. However, in the end, it may complicate excessively the existing instrument. Hybrids can be created between various types of instruments and aspects of carbon taxation. E.g., a fee linked to the carbon price in an ETS in the same economy, or a carbon tax with features of an emission trading system (e.g., the Australian carbon tax, although the link did not become effective). Carbon taxes in several countries are integrated with the excise tax system for energy products (e.g., France).

https://www.worldbank.org/en/news/press-release/2020/12/10/world-bank-group-announcements-to-support-countries-take-climate-action [last access 14 September 2021].

Ideally, fossil fuel subsidies should be removed before carbon taxes are introduced to avoid confusion. In practice, Governments should inform the public about the gradual removal of fossil fuel subsidies and parallel implementation of carbon taxes to reduce carbon emissions and avoid unnecessary fiscal deficits. Government leaders need to consider the long-term prosperity of their economies, versus the short-term effects of keeping fossil fuel subsidies on for political reasons (e.g., re-elections). Slow, continuous, predictable actions likely lead to success.

2. Revenue Use

In addition to their principal role as an instrument for environmental protection, carbon taxes are presented also in the Handbook on Carbon Taxation for Developing Countries[17] as a source for domestic resource mobilization. The revenue obtained with them may be used in different manners, e.g., to provide some sort of compensation to vulnerable industries and households, or to finance changes in overall tax policy (the so called green tax shifts or environmental fiscal reforms[18]).

Sometimes there are legal prescriptions assigning these revenues to specific spending purposes. Earmarking is standard practice in some jurisdictions, but it is constitutionally prohibited in others. The creation of special destination funds – environmental[19] or other– has served to ring-fence resources for specific purposes

[17] The following paragraphs try to synthetize the good job made by the team lead by Eike Meyer in Chapter 9: Revenue Use in United Nations (2021). Handbook on Carbon Taxation for Developing Countries. United Nations Committee of Experts on International Cooperation in Tax Matters. Committee of Experts on International Cooperation in Tax Matters: Revenue use, Twenty-second session, E/C.18/2021/CRP7. Conference Room Paper available at the following link: https://www.un.org/development/desa/financing/sites/www.un.org.development.desa.financing/files/2021-04/CRP7_CarbonTaxHB_Chapter6RevenueUse_22ndSession.pdf [last access 14 September 2021].

[18] Typical examples are the simultaneous reduction in taxes on personal or corporate income (including social security contributions) or capital. The rationale is to improve the overall efficiency of the tax system, raising the same amount of revenue at lower economic cost. These tax shifts may be an adequate choice in high income countries where levels of income taxation are comparatively high, but they may be less relevant for developing countries with comparatively low overall tax-to-GDP ratios and low levels of income taxation.

[19] In general, environmental funds are investment vehicles to help mobilizing, blending, and overseeing the collection and allocation of financial resources for environmental purposes. An internal governance structure is important in keeping the revenues attributed to the fund separate from a country's general budget and allowing contributions from private sources in addition to the revenues from environmental taxes. The more transparent the fund, the more likely that it will be

(e.g., in. Colombia) keeping their allocation away from the influence of political cycles. Where there is low trust in government, earmarking becomes more appealing.

Alternatively, only political commitments are made through public statements on how certain amounts of tax revenues will be used (e.g., as part of policy packages). The flexibility that the annual budgetary process entails can be easily affected by the political priorities of successive governments and it may create some uncertainty for the industry or for the citizens regarding the advantages conferred, and the efforts or investments made. Anyway, the communication on the projected revenue use well adapted to local circumstances usually garners public support.

When analyzing the potential revenue from carbon taxes, as compared to the revenue obtained from excise taxes on energy use and from ETS, it is stressed that carbon pricing presently raises less revenue than it would if the instrument were deployed more in line with its climate policy potential. Low revenues from carbon taxes are mainly attributable to low tax rates and narrow bases. The IMF and the OECD suggest that there is potential for considerable revenue increase over the next decades. However, higher carbon tax rates would likely not result in a deep structural impact on the composition of overall tax revenues of countries, and ultimately revenues should decline as the usage of carbon-based fuels declines. The revenue potential differs among countries mainly because there are substantial differences in pre-existing carbon prices, and because the carbon intensity of energy use varies across countries.

Carbon tax revenue can contribute to higher spending in general or to cutting debt, as many other taxes. Some governments may use part of this revenue for environmental spending, and reserve part to compensate those that face strong cost increases as a result of this tax. Other countries in the OECD have used these revenues to finance tax shifts, e.g., higher carbon taxes with lower taxes on personal

successful. UNDP (2017). Environmental Trust Funds. http://www.undp.org/content/sdfinance/en/home/solutions/environmental-trust-funds.html

or corporate income. The revenue can be also redistributed through general or targeted transfers (carbon dividends).

From a social perspective, in the context of a carbon tax, to mitigate disproportionate burden on low-income households, governments may compensate them for the price increase. This should be limited to the households that actually need compensation without compromising the incentive to change consumption. Households can be shielded from rising energy prices either through targeted transfers (revenue recycling) or through reduced rates or exemptions (forgone revenue). In practice, it might be difficult to understand which households are most affected by higher energy prices, and sometimes tax deductions or credits might not be an appropriate solution if they are not obliged to pay the tax.

Carbon pricing increases costs and can cause production moving to places with lower carbon prices (carbon leakage), reducing the ability of firms to compete internationally. Compensations should be designed in a conditional way that maintains the incentive to reduce carbon emissions for companies highly exposed to international trade (tax reductions or exemptions can be an alternative to revenue recycling, but they should be limited in time and phased out). Governments could also address the competitiveness concerns through measures such as tariffs on imports of highly traded emission-intensive commodities.

Transfers from carbon tax revenues can be distributed by piggybacking on a system already in place to give direct cash transfers to coincident beneficiaries. Sometimes, broad or universal cash transfers are used to compensate households after the introduction of a carbon tax (e.g., in Switzerland or British Columbia) or the removal of fuel subsidies (e.g., in Iran). The salience and the inclusivity of the compensation help the acceptability of the tax, particularly when the dividend is disbursed before the tax is introduced. Alternative policy choices can be the granting of life-line tariffs, reduced rates, or vouchers. In countries with high distrust, very salient options for revenue use (like uniform lump-sum or other cash transfers) generate more public support for a carbon tax.

Some governments use revenue to finance environmentally related programs, including promoting the use of renewable energies and low-carbon technologies, the protection of biodiversity, waste and water management, etc. Carbon tax revenues can also fund energy efficiency and savings measures.

On the one hand, where the desired change of behaviour would have already been stimulated by the tax, using carbon tax revenues to provide an additional (redundant) incentive would be wasteful. On the other hand, through "filling-the-gap" policies one can aim at targeting only those entities for which the tax would not be a sufficient incentive to change behaviour. With this approach, more revenues are potentially available to spend to reduce emissions that would otherwise have been missed (e.g., small businesses that might not have the necessary capital to install solar panels).

Directing part of revenues towards promotion of low-carbon technologies and R&D can help address the issue of hard-to-eliminate emissions. For developing countries, investing in R&D might not be a priority in general; and they might opt for measures that directly impact citizens instead (such as expanding low-carbon public transport infrastructure; or the public electric grid with renewable energy) or that accommodate responsible innovation to their conditions. Being able to appreciate the visible results of the policy, contributes to increasing political acceptance of the carbon tax.

While the effects of the tax on the price of fuel products is usually felt directly by businesses and consumers as a painful price increase, the positive effects of compensating measures addressing businesses or households, or of many environmental measures is often indirect and less salient. For the political acceptance of the tax, governments should communicate clearly what purpose revenues are used for and how these purposes are meant to address negative competitiveness or fairness concerns, or further environmental objectives.

There is no one-size-fits all recommendation for carbon tax policy packages including revenue use. The right choice of revenue use will depend on specific

country circumstances (the existing tax system, income distribution and consumption patterns, industrial structure and competitiveness, trust in government or acceptance of environmental policy, among others).

3. Public acceptability

The extent to which a policy measure successfully addresses climate change does not only depend on technical or political-administrative factors. The effectiveness and cost-efficiency of a carbon tax are also clearly interconnected to acceptability (the potential to be accepted by the general public). The significance of acceptability for a feasible policy is emphasized in the Handbook on Carbon Taxation for Developing Countries[20]. Only when these three components coincide the policy measure is feasible. Feasibility has been characterized as a function of effectiveness, cost-efficiency, and acceptability.

For the sake of acceptability of carbon taxes, policymakers can refrain from optimal cost-efficiency, or set the tax at a slightly lower level than the one required to be perfectly effective. A second-best policy measure in terms of effectiveness and cost-efficiency, may be better than a completely failed implementation due to lack of acceptability.

When policymakers consider the opportunities and pitfalls of implementing policy measures to achieve the mandated emission cuts, they should answer this question: How to avoid or mitigate some factors affecting people's attitudes towards carbon taxes? This can be done through direct interventions or mixes of policies.

[20] The ideas in this section try to summarize the excellent work led by Prof. Sverker C. Jagers in chapter 3: How to generate public acceptability for carbon taxes in United Nations (2021). Handbook on Carbon Taxation for Developing Countries. United Nations Committee of Experts on International Cooperation in Tax Matters. Committee of Experts on International Cooperation in Tax Matters: Revenue use, Twenty-second session, E/C.18/2021/CRP5. Conference Room Paper available at the following link: https://www.un.org/development/desa/financing/sites/www.un.org.development.desa.financing/files/2021-04/CRP5_CarbonTaxHB_Chapter3PublicAcceptability_22ndSession.pdf [last access 14 September 2021].

Policies where the benefits accrue to broader groups in society will probably subsist to parliamentary changes. Also introducing policy measures that do not enjoy acceptability among broad layers of the public may be occasionally questioned from a perspective of democratic legitimacy. Several attempts to implement carbon taxes failed as a result of low acceptability (e.g., in France with the yellow vests protests). Low public acceptability restricts not only policy making but also implementation. In addition, once the policy has been implemented, public acceptance (i.e. attitudes formed once the policy is in place) is crucial to sustain it over time. People's acceptance is linked to their experience once they can check that the policy has intended effects (e.g., this happened with the London congestion charge).

A number of factors have already been identified as drivers of environmental policy attitudes in general, and they may constitute important drivers also for carbon taxation acceptability. First, individual-level factors (a person's core values, beliefs and personal norms, knowledge about climate change, and ideological orientation). Second, inter-relational factors, mainly interpersonal and institutional trust (trust in other people's voluntarily compliance and in the political-administrative system). Third, policy-specific beliefs (the perceived characteristics and consequences of the proposed policy). Four, interrelated-policy-specific beliefs (perceived personal outcome, distributional effects, impact on freedom of choice and perceptions of policy effectiveness).

Of course, there are also cross-national variations due to various contextual features (such as system of government and policymaking, path-dependency, economic dependencies, political culture, wealth and social capital). The differences in political and institutional quality can often explain why policy attitudes differ significantly across countries (e.g., higher levels of corruption correlate negatively with the acceptability of economic policy tools, such as taxes and subsidies).

Trust may be generated concerning a specific issue by ensuring transparency in all steps of the decision-making process and stakeholder dialogue. Deliberative practices generate acceptability when they conflict with stakeholders' short-term

self-interests. Openly displaying the use of tax revenues can be a successful way to develop higher levels of acceptability, if it can be demonstrated that welfare improvements will be targeted with the prospective revenues. Linking carbon taxation as well to the funding of various adaptation projects might be a way to increase acceptability, as it emphasizes local returns from the tax, instead of a one-sided focus on mitigation for global benefits. This may serve to build political alliances with domestic groups that benefit from climate adaptation.

Regarding the perceptions of fairness by the general public, what is seen as unfair is therefore unacceptable. An increasing number of exceptions (e.g., tax reliefs for certain industries) may likely result in negative opinions about a carbon tax. But, at the same time, allowing for exceptions among certain groups, (e.g., those proportionally more negatively affected or particularly essential for society), could deliver increased acceptability. A profound analysis of the situation is opportune.

There is typically a larger resistance against environmental tax policy before implementation than after[21]. Timing can be an important factor for increasing acceptability (empirical evidence exists where the local benefits are evident, e.g., improved air quality and less congestion). Trial-periods are a way to benefit from the possibility of gradual positive changes in the public opinion. A related strategy where the positive outcomes are primarily global (like carbon taxation) is to introduce a relatively low tax in order to gradually and transparently increase the tax rate according to actual needs.

It is important to survey the public opinion to understand the main objections against a carbon tax in each particular case[22], and eventually come up with complementary policies. As previously mentioned, if carbon tax is

[21] The expected outcomes are a key driver for pre-implementation acceptability. Once implemented, experiences tend to differ from expectations as people get familiar with the policy, see its effects first-hand and even experience the consequences as less negative than what was initially expected.

[22] Consultation procedures can primarily provide important qualitative input for designing the tax. Through survey instruments, aspects of potential objections of the tax can be discovered (e.g., which factors matter most). Experimental approaches can be used to determine if a certain policy package will be more friendly received compared to other.

implemented as part of a broader tax-reform, governments will be able to clearly signal the interlinkages and potential plans for revenue use.

IV. Directions and tools for further development of carbon taxation

The new Membership of the UN Committee of Experts on International Cooperation in Tax Matters, during its first session, agreed to create a Subcommittee on Environmental Taxation Issues for the 2021-2025 period[23]. The need to continue the work in this field is clear after the achievements of COP26 in Glasgow[24].

Some current directions and tools in progress might serve to make the bid for environmental taxation (not only carbon taxation) more solid in the coming decade. They are pointed out below: the transition to a circular economy, the need of greater business engagement in green innovation, the use of new accounting systems, and the possibility of joint administration (as a sort of culmination of previous steps if the policymakers are capable of reaching ambitious agreements).

In the pursuit of sustainable development, it is clear the need to move towards a circular economy -as opposed to the traditional linear economy (take, make, dispose). Circularity emphasizes the three "R's" (reduce, reuse and recycle)[25]

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[23] Committee of Experts on International Cooperation in Tax Matters. Twenty-third session, Virtual meetings of 19 to 28 October 2021, Item 5 (g) of the provisional agenda: Environmental and environmentally-related taxation, Note by the Secretariat, 11 October 2021. E/C.18/2021/CRP .26 https://www.un.org/development/desa/financing/sites/www.un.org.development.desa.financing/files/2021-10/CRP.26%20Environmental.pdf [Last access 7 December 2021].

[24] 'A key outcome is the conclusion of the so-called Paris rulebook. An agreement was reached on the fundamental norms related to Article 6 on carbon markets, which will make the Paris Agreement fully operational. This will give certainty and predictability to both market and non-market approaches in support of mitigation as well as adaptation. And the negotiations on the Enhanced Transparency Framework were also concluded, providing for agreed tables and formats to account and report for targets and emissions'. COP26 Reaches Consensus on Key Actions to Address Climate Change, UN Climate Press Release, 13 November 2021 https://unfccc.int/news/cop26-reaches-consensus-on-key-actions-to-address-climate-change [Last access 7 December 2021].

[25] UNEP (2019) Advancing Sustainable Consumption & Production: Circularity in the Economy of Tomorrow, United Nations, p. 7. Available at this link: https://www.unep.org/resources/factsheet/advancing-sustainable-consumption-production-circularity-economy-tomorrow [last access 14 September 2021]. European Commission (2020) *Leading the way to a global circular economy: state of play and outlook*, Commission Staff Working Document SWD(2020) 100 final, Brussels, 11.3.2020.

and demands that tax authorities take into account the totality of the productive chain and circulation processes of goods to maximize their utility. Circular economy aims to originate a new closed system of valuable materials returning to the economy to allow a better use of natural resources. Production capacity and subsequent consumption, both present and future, depend on the sensible use of natural resources and the final stage of the product's life cycle. In this context, linear taxation, governed by the fiscal neutrality principle, indifferent to the dynamics of expenditure and sensitive to collection, is somehow making way for a new model of circular taxation that prioritizes the protection of the environment by tax authorities[26].

States through environmental taxation may send signals to companies and investors in all economic sectors -manufacturing, production, distribution and waste management, to incorporate green innovation as a key element in achieving the proposed objectives in the global agenda. Greening taxes may also result in both innovation for more efficient production processes and investments in infrastructure to accelerate energy transition, in line with the Sustainable Development Goals (e.g., SDG7 and SDG12). In cases where it is not possible to distinguish which part of a product is reusable or recyclable, there should be a stimulus that favors its identification[27].

To allow further development in the field of environmental taxation[28], the parallel progress made at the United Nations in the area of environmental

[26] Uricchio, A. (2017) "I tributi ambientali e la fiscalità circolare", *Diritto e Pratica Tributaria*, No.5, p. 1849. Alfano, R.; Billardi, C.; Bourget, R.; Bisogno, M.; Tomo, A. (2019) "Medidas fiscales y medioambiente: principios UE y su concreta aplicación en países europeos en tema de imposición sobre las emisiones de CO_2", in Cubero Truyo, A.; Masbernat, P. (dirs.), *Protección del medio ambiente. Fiscalidad y otras medidas del derecho al desarrollo*, Thomson Reuters Aranzadi, Cizur Menor, p. 405.

[27] For instance, this could be achieved by implementing a system of exemption for those manufacturers who introduce into the market materials that they themselves undertake to submit to a public or private process of reuse or recycling, or by designing a system of consignment, in the form of a refund of the tax previously paid, if the objects are reintegrated for further treatment. Vaquera García, A. (2020) *De la tributación ambiental a las medidas financieras incentivadoras de la economía circular [From environmental taxation to the financial measures incentivizing circular economy]*, Aranzadi, Cizur Menor, 2020, RB-5.12.

[28] Note that the views expressed in section are solely of the author.

accounting with the current System of Environmental Economic Accounting[29] should be sensibly observed. Some synergies, already detected with the tax field, might be expanded upon, and generate very useful outcomes in the coming years, considering the amount data speedily available through digitalization.

Finally, a formula of joint administration of carbon taxation could even be envisaged at a later stage. As it is well-known, international taxation is primarily concerned with the interaction of national tax systems; whilst global taxes are taxes imposed not by any one nation but by a group of nations on a regional or even worldwide basis[30]. Could a global tax on CO_2 be implemented in the future? A counterargument to the validity of global taxes on the basis that taxes are not paid for the extraction of other natural resources of universal patrimony is not enough, since this constitutes a deficit of the international system and not a legal principle. Outside the jurisdiction, there is no sovereignty of a State, but rather of the group of States, and the only way to establish and administer taxes is through joint formulas between all countries[31].

Let us take the deep-sea mining as an example. The Area and its resources are the common heritage of mankind for the benefit of mankind. Therefore, an inspiring system could be found there, where the International Seabed Authority (ISA) was created. Its powers and functions are those expressly conferred upon it by the Convention. The Draft Exploitation Code proposes regulation regarding royalties (DR 60-82) and fees (DR83-86). Looking at the financial obligations (article 13.2, 3 and 4 [32]) there is a levy for the administrative cost of processing an

[29] UNDESA (2020) How Natural Capital Accounting Contributes To Integrated Policies For Sustainability, SEEA United Nations, https://seea.un.org/sites/seea.un.org/files/seea_-_overview_-_web_ready.pdf [last access 24 September 2021].

[30] Bird, R.M. (2015) "Global taxes and international taxation: Mirage and reality", *ICTD Working Paper 28*. First published by the Institute of Development Studies in January 2015, Brighton, UK, p. 6.

[31] Masbernat, P.; Ramos, G. (2019) "Una introducción al problema sobre la tributación y la regulación de la minería en los fondos marinos profundos, el Área" (An introduction to the problem about the taxation and the regulation of the mining in the deep seabed, the Area), in Cubero Truyo, A.; Masbernat, P. (dirs.): *Protección del medio ambiente. Fiscalidad y otras medidas del derecho al desarrollo*, Thomson Reuters Aranzadi, Cizur Menor, p. 187 *et seq*.

[32] In the Working Paper of the International Seabed Authority (2014) "Making the most of deep seabed mineral resources developing financial terms for deep see mining exploitation", a lot of

application for approval of a plan of work in the form of a contract, and an annual fixed fee from the date of entry into force of the contract is established for the contractor. The levies (fees) must respond to the administration cost of ISA, and the benefits must belong to ISA for its financial equilibrium and its operation. Regarding the royalties, a sufficient amount must be collected to compensate for the States' losses in their patrimony. The collection of royalties must be given to the owners of this common patrimony (all the States).

The Paris Agreement (as reached in 2015) literally acknowledges "that climate change is a common concern of humankind" [33] and recognizes "that Parties may be affected not only by climate change, but also by the impacts of the measures taken in response to it". Isn't this the case of carbon taxation? What one State does, in and to its own environment, affects not only the territory of other States and common areas but something far larger –the global environment shared by all[34]. This may be the ground to expand international tax cooperation to cover carbon taxation and even devise a prospective formula of joint tax administration.

V. Final remarks

interest is shown in the tax regime. www.isa.org.jm/files/documents/EN/Regs/FinTerms2014.pdf [last access 14 September 2021].

[33] Text available at https://unfccc.int/sites/default/files/english_paris_agreement.pdf [last access 14 September 2021]. The notion of the 'common heritage of mankind' has had a slow and perhaps incomplete introduction into the rules of international law. […] It is increasingly recognised as a significant, if not fundamental, legal notion that facilitates useful and sustainable human activity in areas with respect to resources that transcend national boundaries. […] the common heritage of mankind, together with the **common concern of mankind** […], **is a notion capable of acting as the legal foundation for a complex legal regime in which norms relating to economic development and environmental protection can be effectively and rationally balanced** [bold added]. Henley, P.H. (2011) Minerals and Mechanisms: The legal significance of the Notion of the 'Common Heritage of Mankind', in the Advisory Opinion of the Seabed Disputes Chamber, Melbourne Journal of International Law, Case Note, Vo. 12, p. 377. The principle of common heritage of humanity in certain contexts can be understood as a rule of international *ius cogens* (e.g., art. 136 UNCLOS, United Nation Convention on the Law of the Sea of 10 December 1982).

[34] Taylor referred to a new principle of International Law: 'the common heritage of life'. There has been a growing tendency to see the atmosphere as belonging to the global commons, i.e., the shared resources of mankind. The interlinked ecosystems of the earth do not obey the boundaries which emerge from the concept of sovereignty. The greenhouse effect is the consequence of cumulative and globally dispersed atmospheric pollution. What one State does, in and to its own environment, affects not only the territory of other States and common areas but something far larger –the global environment shared by all. Taylor, P. (1998) *An ecological approach to international Law, Responding to challenges of climate change*, Routledge, London-New York, pp. 97 and 111.

The United Nations' strategy to fix common lines of action for carbon taxation worldwide in order to coherently move towards the Sustainable Development Goals, although limited in appearance is quite robust. The strategy employed has great potential in itself. Not only does it lay the foundations of carbon taxation to promote regulatory progress to the extent of the capabilities of each State while respecting its sovereignty, but it is also firmly committed to a good path, perhaps silent and slower in pace than other impressive international plans (such as the BEPS multilateral convention). By having focused the attention particularly on the implementation aspects from the conception, this anticipation can lead to a less complex application in the end, which in turn may make the difficult mission of converging tax systems in the protection of the global environmental interest a bit simpler.

In international tax cooperation under the auspices of the United Nations, because of its broad perspective (geographically and materially speaking), the needs and capacities of developing countries have always been given special attention. Perhaps for this reason, an emerging principle in the tax law of this century is naturally taken into account: the principle of practicability. Alongside the traditional basilar tax principles of economic or contributory capacity and profit (which are after COVID-19 experiencing great tension between them -almost everywhere- to allocate the costs in the process of economic recovery), this other upstart is quietly appearing. What is feasible and practicable by the administration ends up altering the actual configuration of the tax rules. Thus, the subsequent application of the law affects the creation of the law itself, as it aims to deliver efficacy in the public policies. This tendency can be seen even more clearly in the new world of infinite technological possibilities that now shake critical balances between taxing powers and some rights achieved during previous eras.

When any administration is called upon to work to meet the needs of citizens on a wider scale (in terms of its material and territorial scope) and has more means at its disposal, it is only logical that more responsibilities should be demanded of it. Accordingly, the request for good administration requires that the perception of

justice, legal certainty, and equality in the application of the law is not undermined. Hence the need for transparency in every administrative action and the need to facilitate the participation of stakeholders through mechanisms designed to improve it, especially when major changes are introduced in the tax system with the intention of making them long-lasting. The final message is clear: it is in everyone's interest that carbon taxation (comprising both tax and incentives to encourage the desired private sector's involvement in the achievement of SDGs[35]) achieves its intended purposes, so special care in the correct application of this tax for its smooth implementation should be promoted.

With the passage of time, a more advanced step will have to be taken, combining both territorial and personal perspectives. The polluter-payer principle will have to be duly complemented by the principle of the protector-receiver. This approach should not be only understood as valid for countries at the international level under the common but differentiated responsibility principle of the UNFCCC. Today there are individuals or companies in many different states that generate positive environmental externalities free of charge globally. It is a matter of fairness to build the necessary administrative bridges to effectively compensate them. Through an improved international coordination of the policies affecting the public financial activity (including tax regimes), payments for environmental services could also play a decisive role in climate action[36].

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[36] As an example, 'Brazil has just enacted the National Policy on Payments for Environmental Services, setting forth a wide range of programs to foster and sponsor the conservation of strategic natural assets and the restoration of ecosystems. It introduces new opportunities to public and private funding, both nationally and internationally. [...] voluntary cooperation policies set forth under Article 6 of the Paris Agreement can scale up national policies such as these to the global level and thus contribute decisively to net zero targets and countries contributions'. Zanocchi, Jose (2021) The New Brazilian National Policy On Payments For Environmental Services: Implementing Green Deals With Nature-Based Solutions, Book of abstracts - Conference Program of the 22nd Global Conference on Environmental Taxation, 23 – 24 September 2021, University of Groningen, p. 47.

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