

ANNEX D to E/C.18/2024/CRP.33

Draft paper from the Subcommittee on Environmental Taxation for discussion and first consideration by the Tax Committee in October 2024

How to assess and correct the interaction between carbon taxes and other taxes

Proposed new title: Assessing the Interaction between Carbon Taxation and Mainstream Taxes: VAT, Personal Income Tax, Corporate Income Tax, and Excise Duties

Part A of Workstream 1, titled 'Interaction between carbon taxes and other environmental measures (emissions trading and climate policy),' was approved by the Committee during the Twenty-eighth Session. The advance unedited version of that paper is available on the Committee's [webpage](#).

This document constitutes Part B of Workstream 1, focusing on the 'Interaction of carbon taxation with other national measures in the context of a broader tax reform, with particular attention to fossil subsidies.' A brief concept note was presented for the Committee's initial feedback and comment at the Twenty-eighth session. It is presented for discussion and first consideration at the Twenty-ninth Session in October 2024. The Subcommittee expects to refine the paper based on comments received at that session and present for final approval at the Thirtieth Session.

Part C of Workstream 1, titled 'Phasing Out Fossil Fuel Subsidies' is presented in a separate document for final approval at the Twenty-ninth Session (ANNEX A to E/C.18/2024/CRP.33).

Table of Contents

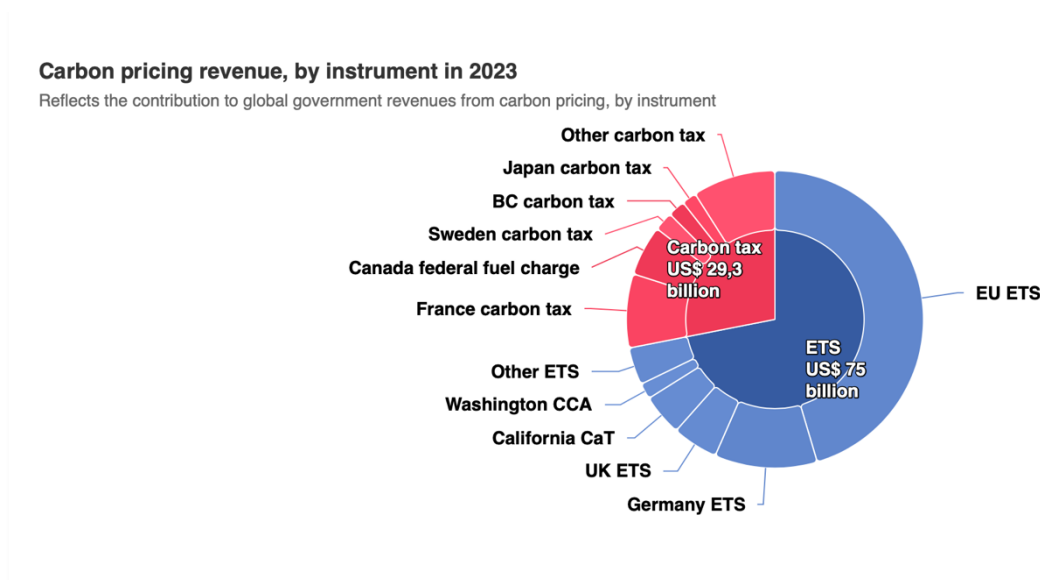
1. Introduction.....	3
2. Excise duties	5
3. Value Added Taxes.....	10
4. Personal income taxes.....	12
5. Corporate income tax.....	14
6. Conclusion and takeaways for developing countries	15

1. Introduction

Carbon taxation is a critical tool in the global efforts to address climate change. It provides an environmental steering effect to generate incentives for business and households to produce, consume and innovate more climate friendly products. By promoting investment in low-carbon options, carbon taxes play a key role in propelling the economy towards sustainability. However, carbon taxation is not introduced in a vacuum, which means that its interaction with other taxes is essential to ensure a balanced and effective approach to mitigating climate change.

The relationship between carbon taxation and other fiscal measures is particularly important in designing a ‘smart mix’ of instruments that influence carbon pricing as a signal for environmental transition. This interplay may also have a significant impact on tax revenue collection, which is often differentiated by sector – see further Figure 1.

Figure 1: Carbon pricing revenue, by instrument in 2023



Source: World Bank Carbon Pricing Dashboard for country
data: <https://carbonpricingdashboard.worldbank.org/>

The [2021 UN Handbook on Carbon Taxation for Developing Countries](#) considers the interaction of carbon taxes with other policy measures. It classifies such interactions into three categories: complementary, overlapping or countervailing. The interaction between carbon taxes with emissions trading systems and fossil fuel subsidies have been explored in other parts of Workstream 1.^{1,2} They, together with fuel excise duties, affect the carbon prices in a different manner. Thus, the OECD has recently measured positive carbon prices from fuel excise duties, carbon taxes and prices of tradable emission permits, and negative carbon prices from fossil fuel subsidies. These are used to calculate net effective carbon rates (net ECRs) for 71 countries that produced almost 80% of global emissions. Details can be found in the following box.

¹ The advance unedited version of the approved Workstream 1 Part A “Interaction between carbon taxes and other environmental measures (emissions trading and climate policy)” is available on the Committee’s webpage: <https://financing.desa.un.org/sites/default/files/2024-09/Interaction%20of%20Carbon%20Taxation%20with%20National%20Measures%20-%20Part%20A.pdf>

² Workstream 1 Part C “Phasing Out Fossil Fuel Subsidies” is presented for final approval at the Committee’s Twenty-ninth Session as ANNEX A to E/C.18/2024/CRP.33.

The net effective carbon rate

If the sum of excise taxes, carbon taxes, and emission trading is taken to be an effective price on carbon (an “effective carbon rate” in OECD terminology), then the revenue from effective carbon rates already consisted in 2016 of 95.2 percent of excise tax revenue, 3.2 percent of carbon tax revenue, and 1.6 percent of revenues from emission allowances. Recent OECD research³ has indicated an expansion in the base of carbon mitigation taxes in 2021, the latest year for which data are available. The share of emissions with a positive price in 2022 is expected to be roughly similar to 2021 given the absence of new major carbon pricing mechanisms and broadening of fuel excise tax bases in large emitters in 2022⁴. Average net ECRs continued to differ considerably between sectors in 2021. Net ECRs were highest in the road transport sector due to the predominance of fuel excise taxes. Lower net ECRs for CO₂ and other GHG emissions from industry and electricity were due to the comparably lower prices of emissions trading systems or carbon taxes; in many countries these emissions remain entirely unpriced. Despite the introduction of new emissions trading schemes, notable increases in permit prices in Canada, China, the European Union, Switzerland, and the United States, and higher carbon tax rates in eight countries, the widespread cuts to fuel excise taxes, fossil fuel subsidies from price caps and higher inflation are likely to reduce average net ECRs in real terms in 2022. The fall in real terms net ECRs in the road transport sector is expected to be stronger than for electricity and industry.

In addition, when making the choice of various instruments to achieve climate goals, governments can consider how existing tax systems will influence the expected cumulative effects of carbon pricing mechanisms, taking into account equity concerns and the need for tax packages that ensure public support.

In response to climate change, governments may deploy a broad set of fiscal policy measures that are not strictly speaking environmental taxes. These include in particular tax expenditures such as lower excise duties, reduced value-added tax (VAT) rates, reduced personal income taxes or corporate income tax deductions and accelerated depreciation programmes. These measures have the potential to either undermine or reinforce the incentives set by carbon taxes. Each of these types of taxes will be examined in this paper in terms of their complementary, undermining/countervailing or reinforcing effect on carbon taxation and its (joint/combined) potential to set incentives for transitioning towards a low-carbon economy and for channelling investments towards R&D and innovation.

The transition towards a carbon friendly economy requires fundamental changes in a wide array of sectors and consumption patterns. Efforts to reach net-zero targets will necessitate deep transitions to sectors that may currently be paying significant amounts of tax. Maintaining a stable tax base may be critical for many countries. Such transitions also require the setting of incentives by governments to support climate policies and to garner public support. Raising an adequate amount and quantity of revenue is essential for government’s broader fiscal policy and often a precondition to be able to credibly support climate change policies.

Catalysing private finance is critical because both climate mitigation and adaptation require vast amounts of funding. The transformation of the global economy needed to achieve net-zero emissions

³ OECD (2023), pp. 57-58.

⁴ ECR data for 2023 is foreseen for late 2024.

by 2050 would require \$9.2 trillion in annual average spending on physical assets, which amounts to an average annual GDP expenditure of 7.5% of global GDP.⁵ Incentivising private funding that is geared towards environmental objectives becomes crucial. With properly structured incentives, private initiatives will play an essential role in seeking out and implementing the least-cost options for climate mitigation and adaptation.

This paper will examine the interaction between carbon taxes and other forms of taxation, beginning with indirect taxes such as excise duties (Section 2) and VAT (Section 3), followed by direct taxes such as personal income taxes (Section 4) and corporate income taxes (Section 5). The paper concludes with key takeaways for developing countries (Section 6).

2. Excise duties

Excise duties are specific consumption taxes typically applied to a range of products, such as petroleum products. They are usually charged based on the volume or other physical characteristics of a good (or even its energy content). These duties are passed on to the consumer and they are not levied when the goods are finally consumed but on upstream transactions, once when the goods are released for consumption.⁶

In low- and middle-income countries, excise taxes represent a significant share of revenues within the category of taxes on goods and services. In turn taxes on goods and services contribute the greatest share of total taxes. Excise taxes also form a larger share of revenues within taxes on goods and services in low- (LICs) and middle-income countries (MICs) (56% and 51%, respectively) than in HICs. However, in many countries a recent trend has been observed: the share of excises and custom duties has been decreasing, while the VAT has been growing⁷

In 2021, the taxes on goods and services other than VAT amounted to 24%, in Africa to 26%, in Asia-Pacific to 20%, and in Latin American countries to 20%⁸.

Many countries have fuel excise duties on energy use. A carbon tax can be integrated in the existing energy tax framework and can become a component of the overall taxation of energy products. Carbon taxes in several countries are integrated with the excise tax system for energy products (e.g. the Nordic

⁵ McKinsey & Company (2022) The net-zero transition, available at: <https://www.mckinsey.com/capabilities/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring>

⁶ An indirect tax – such as VAT, an import levy or an excise duty – is a tax levied on a material or legal event of an accidental or temporary nature and upon a (legal or natural) person, who can often be an intermediary and not the person responsible for this event (hence the indirect character of the tax). European Commission: Directorate-General for Taxation and Customs Union, Taxation trends in the European Union – Data for the EU Member States, Iceland, Norway – 2022 edition, Publications Office of the European Union, 2022, p. 27 <https://data.europa.eu/doi/10.2778/417176> For example, in the European Union, excise duties are indirect taxes on the sale or use of specific products, such as alcohol, tobacco and energy. EU excise duty rules cover all energy products used for heating and transport, as well as electricity. https://taxation-customs.ec.europa.eu/taxation/excise-duties/excise-duty-energy_en

⁷ Excise revenues declined as a share of GDP in 21 countries – with all but two of these decreases being smaller than 0.3 p.p. – while they increased in six and were unchanged in ten countries. The contribution of taxes on goods and services to total revenues has fallen from 34.5% in the late 1990s to 32.1% in 2020. OECD (2023), Tax Policy Reforms 2023: OECD and Selected Partner Economies, OECD Publishing, Paris, pp. 16-19. <https://doi.org/10.1787/d8bc45d9-en>.

⁸ See OECD (2023) Revenue Statistics in Africa 2023 – Nigeria available at <https://www.oecd.org/tax/tax-policy/revenue-statistics-africa-nigeria.pdf>, last visited 22/08/2024

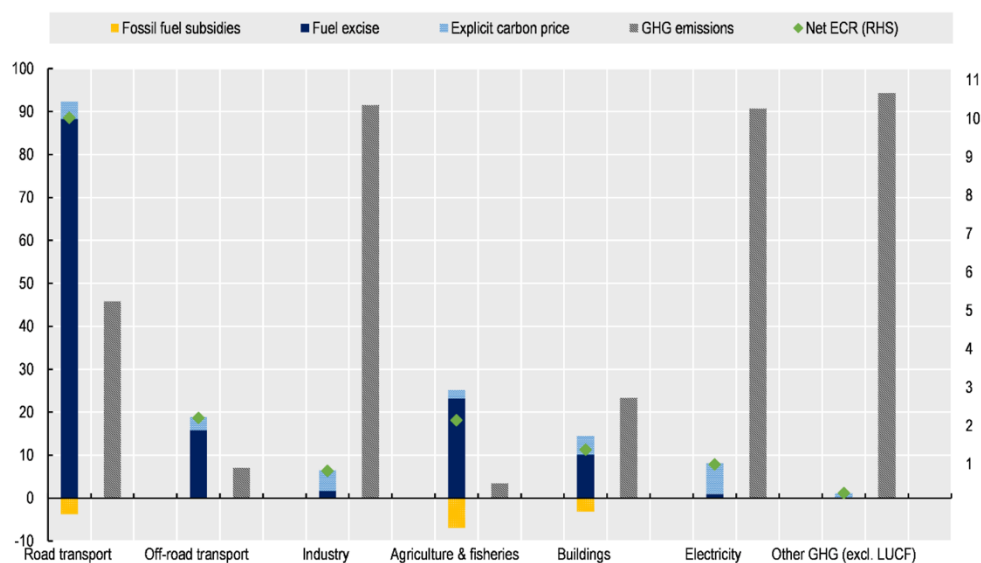
countries, France and Mexico)⁹. This integration allows governments to set a price on carbon by combining excise duties and carbon taxes on fossil fuels. It is important to carefully manage how changes in excise taxes interact with carbon pricing, as shown by data indicating that excise taxes in large emitters have influenced carbon pricing trends (as shown in the box below).

Excise taxes and large emitters

A broadening of fuel excise tax bases in large emitters is expected in data from 2022¹⁰. The widespread cuts to fuel excise taxes, among other factors, are likely to reduce average net effective carbon rates (ECRs) in real terms in 2022. For example, in the past, net ECRs were highest in the road transport sector due to the predominance of fuel excise taxes. The fall in real terms net ECRs in this specific sector is expected to be stronger than for electricity and industry.

To ensure that excise duties support the transition to a low-carbon economy, countries should assess how excise taxes affect key sectors and consider the specific strategic importance of these sectors to their economies. The interactions between carbon taxes and other excise duties may differ across sectors, and therefore, the design of these taxes should be tailored to each country’s economic and environmental objectives.

Figure 2: Average effective carbon prices and GHG emissions by sector, 2018-2021



Note: Net ECRs and its components (LHS) are averaged across all GHG emissions of the 71 countries covered in the report, including those emissions that are not covered by any carbon pricing instrument. Effective price information is for 2021, with the exception of fossil fuel subsidy estimates that are based on data for 2020. GHG emissions (RHS) are the sum of fossil-fuel related CO₂ calculated based on energy use data for 2018 from IEA (2020_[43]) and "other GHG" from Climate Watch (2020_[44]).
Source: (OECD, 2022_[42]).

StatLink 2 <https://stat.link/c1qh3f>

Tax incentives continued to be a popular policy tool to support the transition towards lower carbon consumption and production options in 2022. Some jurisdictions began to adapt these green incentives to target other economic and social considerations, including reducing foregone revenues, supporting

⁹ A carbon tax has been added to an already existing general excise tax, either as part of the general excise duty (e.g., in France) or as a separate tax (e.g., in Denmark, Finland, Norway and Sweden).

¹⁰ ECR data for 2023 is foreseen for late 2024.

domestic production, and addressing equity concerns¹¹. A small number of jurisdictions raised taxes on fossil fuels, primarily to promote environmental sustainability. Some of the jurisdictions that have undertaken reforms to increase carbon taxes, and energy tax rates for fuels, though to a lesser extent, have also provided relief through energy tax reductions. This indicates common concerns of balancing short-run energy affordability demands and longer-term environmental sustainability priorities. These types of concerns may lead to changes in the excise taxes as well. However, maintaining stability of carbon prices has been shown to limit the extent to which clean investment is foregone by risk-averse investors¹².

The countries' possibilities to adapt their own systems of excise taxes during the transition may be limited or enhanced when they have to consider regional rules. They should carefully assess their options. In regional groupings, excise duties may be (partly) harmonized¹³, e.g. the European Union, petrol taxes have been approximated substantively –both with regard to the system and some minimum tax rates. EU law defines which goods are subject to harmonized excise duties not to harm the functioning of the internal market and under which circumstances they are exempt¹⁴. Tax rebates are normally administered by the end users asking for a tax reimbursement. Another way is to introduce approval procedures for businesses, which under tax control may receive the fuels tax exempted. The Energy Tax Directive¹⁵ determines the framework for imposing excise duties on energy products and electricity. Heating fuel is usually taxed at lower levels than energy products used as propellant. Energy products are also exempt from excise duty if they are used to produce electricity¹⁶. Gradual reductions in the electricity tax rate (as proposed in Denmark) aim to promote more investment in green technologies in the energy sector and more sustainable energy use¹⁷.

A jurisdiction's experience with indirect taxation may be the starting point¹⁸ to implement a carbon tax through the existing tax instruments, such as excise taxes and duties. A country may introduce, or already have in place excise taxes on fossil fuels –although rates may differ across fuel types– and taxes

¹¹ OECD (2023), p. 57.

¹² OECD (2023), p. 60.

¹³ It is important to exercise caution with a regional approach, ensuring careful design and implementation. Otherwise, the spillover effects could negatively impact the entire region, rather than just one country.

¹⁴ Council Directive (EU) 2020/262 of 19 December 2019 laying down the general arrangements https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=uriserv:OJ.L_.2020.058.01.0004.01.ENG. For further information, https://ec.europa.eu/taxation_customs/business/excise-duties-alcohol-tobacco-energy/general-overview/common-provisions_en Council Directive 2008/118/EC of 16 December 2008 concerning the general arrangements for excise duty and repealing Directive 92/12/EEC, Official Journal of 14 January 2009, Nr. L9, p.12 *et seq.* Specific directives for each category of product define the tax base and minimum tax rates (including several derogations).

¹⁵ Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity, Official Journal of 31 October 2003, Nr. L283 p.51 *et seq.*

¹⁶ Schoen, W.: *EU Tax Law: An Introduction*, Working Paper of the Max Planck Institute for Tax Law and Public Finance, No. 2019-12, pp. 82-86.

¹⁷ OECD (2023), p. 60.

¹⁸ An excise tax is usually expressed as a per unit tax established on a specific volume or unit of an item, whereas a sales tax or value added tax is an ad valorem tax and proportional to the price of the goods. There are also ad valorem excise taxes, such as the carbon tax in Costa Rica which is calculated as a percentage of the price of certain fuels. For a detailed overview of the main design features of value added taxes, retail sales taxes and excise duties (including for alcoholic beverages, tobacco, household fuel and vehicles), see OECD (2022), *Consumption Tax Trends 2022: VAT/GST and Excise, Core Design Features and Trends*, OECD Publishing, Paris, <https://doi.org/10.1787/6525a942-en>.

on energy or resource taxes, which in practice, together with tradable emission permits, set a price on carbon. This is relevant to conduct a previous benchmarking analysis and set an adequate tax rate¹⁹.

A carbon tax can be implemented as a new separate tax or be incorporated as part of an already existing excise duty levied on fuels. Although such a carbon tax is a tax on carbon emissions, in practice, the tax base is a product. The carbon tax rates are calculated on the basis of average carbon content of the fuels but expressed by weight or volume units in the tax legislation. .

Also other excise taxes that are not carbon taxes reduce energy use and hence carbon emissions, especially if they are strictly calculated on the basis of energy content. However, they do not usually do so in a cost-effective way, because they are not aligned with the carbon content or the broader pollution profile of the taxed fuels. If an excise tax is designed in proportion to carbon content, it generates an incentive for a low-carbon energy mix. In some cases, the introduction of a carbon tax has been combined with a reduction in the pre-existing excise tax covering the same fuels.

Since most jurisdictions already collect some form of fuel tax, excise duty or levy, they likely already have the necessary administrative infrastructure in place. When a carbon tax is designed using the existing excise tax administration system (Fuel Approach), existing tax collection mechanisms can be utilized to administer the tax effectively. Choosing the same taxpayer for the new carbon tax will mean low additional administrative costs for both the taxpayers and the tax authorities²⁰. Countries without experience in excise duties on energy may want to strive to grant the least exemptions/price differentiations possible to avoid complexity and thereby reduce implementation costs. A key is to consult widely with the different actors within society to get their input prior to introducing the tax.

Temporary rate reductions of excise duties and value added taxes on energy products have been quite common in recent years to allow affordability. The economic context may change unexpectedly due to many reasons (e.g. energy prices rising) and therefore it is necessary to carry out a dynamic adaptation of the 'smart mix'. As governments have sought to implement visible policy measures that could have an immediate impact on the budgets of households and businesses who had to cope with elevated energy prices, tax measures have been a key component of support packages. The extent to which governments reduced energy taxes was determined by a number of factors including national exposure to global energy markets and their transmission to consumer prices, post-pandemic fiscal space, legal limits, and accompanying policy levers (such as transfers, subsidies, and price caps) along with political economy considerations. The vast majority were introduced on a temporary basis for an initial period of 3-6 months but were extended as high energy prices transmitted into higher inflation²¹. The following table summarizes some country experiences.

¹⁹ The interaction between carbon taxes and those instruments was explored in Chapter 10 of the [2021 UN Handbook on Carbon Taxation for Developing Countries](#).

²⁰ Applying a tax to fuels normally does not require direct measurement of emissions and is often built upon existing excise taxes, thereby making thresholds unnecessary.

²¹ OECD (2023), p. 60.

Table: Changes to taxes on energy use

	Rate increase/Base broadening		Rate decrease/Base narrowing	
	2021	2022 or later	2021	2022 or later
Fuels, sector specific:				
Agriculture	SWE	FRA ⁴ , NLD		SWE ¹
Heating	DNK, FIN, SWE	DNK, FIN ² , NLD	FIN ¹	DEU, NLD, NOR
Transport	FIN ² , GBR		CZE, SVN ²	NOR, NZL, PRT
Fuels, all sectors:	ALB, LVA ² , NLD	DNK ³ , GBR, JER, PRT		AUT ¹ , BGR, DEU ¹ , EST ¹ , IRL ¹ , ISR ¹ , ITA ¹ , NLD ¹ , SWE, UKR ¹ , ZAF ¹
Carbon tax	AND, AUT, CAN, DNK, FIN, IDN, IRL, LUX, LVA, NLD, NOR, UKR, ZAF ³	AND, AUT, CAN, COL, DNK, IRL, NOR, PRT, SGP, ZAF ³		GBR, SWE
Electricity consumption	SWE	NLD, SWE	DNK, FIN, NLD	AUT, BGR, DEU, DNK, EST, FRA ¹ , NLD
VAT/GST				ITA, POL

Note: 1 denotes a temporary measure; 2 tax related to biofuels; 3 taxes indexed to inflation, 4 a postponed measure. Tax expenditures for non-road diesel fuel in France (*gazole non routier*) are accessible to companies operating in the agricultural and forestry sector, as well as to the industrial and construction sectors.

Source: OECD Annual Tax Policy Reform Questionnaire.

Source: OECD (2023), Table 3.12, p. 61.

Many of these urgent tax measures may have been countervailing to the ones pursuing climate goals. While the immediacy and visibility of temporary tax cuts were advantageous, their often-untargeted nature raised budgetary costs and dampened incentives to lower energy consumption²². There has been some criticism: reduced rates weaken the price signals that can encourage behavioural change, richer households benefit more from reduced rates for necessities in absolute terms than poorer households, and the overall distributional effect of reduced rates on nonessential items may be regressive; reduced rates often entail a significant budgetary cost that may be captured by producers rather than passed through to consumers (particularly in less competitive markets) and can cause administrative complexities (given the different treatment of comparable goods and services)²³.

In some cases, excise taxes can also play a role in the transition to electric vehicles (EVs). For instance, Iceland has introduced a 5% excise tax on new vehicles, including electric ones, to raise revenue. Similarly, other countries, including the United Kingdom, Mauritius, and Thailand, have used excise

²² “Global increases in energy prices were the major driver of changes in environmentally related tax policy in 2022. Many governments, especially in Europe, cut environmentally related taxes, specifically excise taxes on road transportation fuel, to support households and businesses with energy affordability concerns, as they sought to implement visible policy responses whose benefits could be experienced immediately. [...] As the year progressed, policy makers grappled with the difficulties of transitioning from initial broad support measures towards more targeted policy responses as their fiscal cost rose and the risk of altering price signals that might discourage the transition to more environmentally sustainable energy use grew. Improving energy independence and security also became heightened concerns”. OECD (2023), pp. 56-57

²³ A number of jurisdictions introduced or extended temporary reductions in the VAT rate applied to energy products, as reported in the OECD Special Feature of the Tax Policy Reforms 2022. OECD (2023), p. 6. and p. 49.

tax policies to promote EV adoption through either tax reductions or subsidies. These examples show that excise taxes can be adapted to support broader environmental goals, such as reducing reliance on fossil fuels and encouraging the use of greener technologies. The consideration of additional policy dimensions when revising EV tax incentives, such as trade, tax revenue erosion, and equity considerations, appears to be a nascent trend in a growing number of jurisdictions, given the bias tax incentive design can exhibit²⁴.

Table 3.13. Changes to taxes on motor vehicles and other transport taxes

	Rate decrease/Base narrowing		Rate increase/Base broadening	
	2021	2022 or later	2021	2022 or later
Road transport				
Excise, import tariff and VAT / GST	JPN [†] , TUR	MUSE ^{EV} , THA ^{EV} , UKR [†] , RWA ^{EV}	CAN, ICE, SYC [†] , TUR	ISL
Registration tax		JPN [†]	DEU, IRL ^{EV} , NOR ^{EV}	JER, ZAF
Vehicle tax	PRT, SVN	CZE [†]	NLD, SWE	ISL, GBR ^{EV}
Road use tax		NLD	NLD, SWE	DNK
PIT and CIT incentives and subsidies for EV		SWE	BEL, NLD, SWE	USA ^{EV}
Air transport				
Air ticket taxes	DEU ^a	DEU ^a , GBR	NLD, PRT	BEL, NLD

Note: ^a denotes a pre-planned annual change, [†] a temporary measure, ^{EV} a measure in favour of electric vehicles. For PIT and CIT incentives and subsidies for EV, a rate increase or base broadening means that the incentives or subsidies in favour of EV is increasing.

Source: OECD Annual Tax Policy Reform Questionnaire.

3. Value Added Taxes

A value-added tax (VAT) applies to goods and services at every stage of production and sale. It can be comprehensive if it covers all economic activity from the earliest stage of the supply chain through to the retailer. In some countries, the VAT does not extend to the retail stage.

Tax rates differ between jurisdictions: Andorra for example has a tax rate of 4.5%, while Hungary has 27% and Guernsey, British Crown Dependency 0%. The differences in the tax rate are, however, described as being smaller than in the area of income taxes²⁵, often falling within the range of 10% to 20%.

The VAT accounts for 20% to 30% of government revenues. In 2021 it accounted for 28% of government tax revenues in African countries, for 26% in the Asia Pacific region, 30% in Latin American countries and for 20% in OECD countries.²⁶ It is thus an important source of revenue.

Countries employ reduced VAT rates for goods or categories of goods deemed essential or important for society. The spectrum can be quite broad and include postal, medical, dental and welfare services (such as in Albania), primary groceries, medical services, financial services, education and insurance

²⁴ The adoption of new electric vehicle tax incentives has slowed in high-income countries but is becoming increasingly common in middle-income countries. Approximately two-thirds of OECD countries applied tax rebates or exemptions for electric or hybrid vehicles (EVs and HEVs, respectively). Continuing an emerging trend observed over the past three years, several HICs limited EV tax incentives or improved their targeting to address equity and efficiency concerns. OECD (2023), pp. 61-62.

²⁵ Victor Thuronyi (2003, p.312) has recently noted, “while there are differences in VAT from one country to another, compared with the income tax VAT laws are remarkably similar.” https://www.researchgate.net/publication/4983766_Value-Added_Taxes_in_Developing_and_Transitional_Countries_Lessons_and_Questions

²⁶ OECD (2023) Revenue Statistics in Africa 2023 – Nigeria available at <https://www.oecd.org/tax/tax-policy/revenue-statistics-africa-nigeria.pdf>, last visited 22/08/2024

(as in Indonesia) or needs of the elderly such as transportation or medical expenses (such as in the Philippines).

VAT tax rates can differ substantially between particular products and their usage. VAT tax rates may for example differ for a meal consumed in a restaurant and one that is taken out. VAT taxes are therefore difficult and administratively costly (both for businesses and tax administration) to collect, and offer incentives for tax avoidance, particularly in cash-based transactions.

VAT taxes focus on the value added of goods and services and as such are not environmental taxes. The costs are also often levied from parties that often have little ability to influence the carbon efficiency of production. Thus VAT tax rate reductions – even if passed on to the (end) consumers – may do little to determine production methods of companies. The environmental steering effect of VAT tax rates is therefore more indirect than that of a direct carbon tax. Polluters may not be incentivised to green production processes if they can simply pass on costs to (end-)consumers or down the supply chain. VAT, like any sales tax, drives a wedge between the price paid by the final consumer and what the seller receives. Depending on the relative steepness of the demand and supply curves (elasticity) the VAT can be passed on to consumers in the form of higher prices, leading to a decline in real income of households. To the extent that the VAT cannot be passed on to consumers, it affects sellers.

Nevertheless VAT could still be used in a complementary fashion to carbon taxation to support green transitions. VAT taxes, particular tax reductions, can be used to support carbon taxation measures and guide consumers towards more environmentally friendly consumption patterns. A ‘green VAT’ may also be viewed favourable by the public. Examples may include higher VAT rates for carbon intensive foods (meat tax) or for (plastic) packaging material. In 2021, the European Union revised its VAT directive to remove by 2030 the possibility of EU Member States to apply reduced rates and exemptions to goods and services deemed detrimental to the environment and to the EU's climate change objectives.²⁷ In the alternative a ‘green VAT tax’ rate may also encompass a reduced tax rate. The United Kingdom for example has introduced a temporary zero-rate for VAT applying to energy saving installations in residential buildings.²⁸ VAT is, however, a crude measure as it might benefit expensive goods more and thus impacts the cost-effectiveness of investments.

Moreover, different VAT tax rates may be difficult to apply for industrial products that could be produced with different processes (steel beams produced with renewable electricity or with coal) and hence be administratively burdensome, costly and prone to fraud and errors.

It also needs to be pointed out that VAT reductions narrow the tax base, which may result in unintended outcomes, such as benefiting wealthier households more than less advantaged ones.²⁹ Poorer households, for example, may not own homes or vehicles, making them less likely to benefit from VAT reductions on energy-saving installations like solar panels. Similarly, since poorer households spend larger shares of their income on consumption, VAT increases are conventionally viewed as regressive. Even though a recent OECD report finds that VAT is either roughly proportional or slightly progressive in most of the 27 OECD countries, it still emphasises that VAT increases, including VAT base

²⁷ https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6608

²⁸ Energy-saving materials and heating equipment (VAT Notice 708/6) <https://www.gov.uk/guidance/vat-on-energy-saving-materials-and-heating-equipment-notice-7086>

²⁹ Stefanie Geringer (2023), The EU VAT Rate Reform 2022 from an Environmental Policy Perspective, EC Tax Review, Volume 32, Issue 1 (2023) pp. 16 – 25

broadening measures that impact the poor, should be accompanied by compensation measures for poorer households, such as targeted tax credits or benefit payments.³⁰

In conclusion, while VAT can complement carbon taxation, it remains a crude measure and given, due to its limited environmental steering effect, cannot serve as a substitute for carbon taxation.

4. Personal income taxes

A personal income tax is a tax imposed on income of individuals. The concept of income differs between jurisdictions but often includes wages, salaries, interest, dividends, and rental income. The most typical form of income tax relates to wages and salaries and is generally withheld by employers. Income taxes on other forms of income such as rental income can be levied through payments directly by taxpayers.

Income taxes differ considerably between countries. Depending on the type of tax they can be a flat rate, progressive or regressive. There are countries that do not levy personal income taxes (the Bahamas; Bermuda, British Overseas Territory; Monaco; and the United Arab Emirates) while some countries have low income taxes even in the high tax brackets (Kazakhstan 10%; Hong Kong, Special Administrative Region of China 16%; and Iraq 15%) and others have higher income tax rates in the high tax bracket (the Netherlands 49.5%; Türkiye 40%; and Zimbabwe 45%).³¹ Regarding interest payments and dividends tax rates also differ between countries and so do capital gains taxes relating to e.g. the sale of real estate or stocks.

Personal income taxes account for 9% to 24% of government revenues³². In 2021 it accounted for 17% of government tax revenues in African countries, for 16% in the Asia Pacific region, 9% in Latin American countries and for 24% in OECD countries.³³ It is thus an important source of revenue.

Income taxes are not environmental taxes. Changes in income tax rates generally do little to create an environmental steering effect and to induce environmentally friendly behaviour or production. Similarly general reductions on income derived from professional or personal economic activity (e.g. salaries or wages) may do little to incentivize green transitions. There are, however, examples of such tax reductions targeted towards environmentally friendly behaviour and hence the possibility that income taxes could offer some complementarity to carbon taxation. Belgium for example employs an income tax reduction for CO₂ efficient company cars that employers include in their employee's remuneration package³⁴, thereby aligning personal income tax policy with broader environmental objectives. Under the Belgium scheme both the employer and the employee are incentivised to opt for CO₂ efficient cars, contributing to the reduction of transport emissions.

Similarly, personal income taxes can be used to incentivize private investment in green technologies. For example, offering income tax reductions for dividends or profits from investments in renewable energy or eco-friendly technologies can help to channel private capital towards green initiatives. Accelerated depreciation programs could help to incentivize investments in green technology and help

³⁰ OECD Taxation Working Papers: Reassessing the regressivity of the VAT. OECD Taxation Working Papers. Organisation for Economic Co-Operation and Development (OECD). 2022. <https://doi.org/10.1787/22235558>

³¹ See <https://taxsummaries.pwc.com/quick-charts/personal-income-tax-pit-rates>

³² Personal income taxes here covers taxes levied on the net income or profits (i.e. gross income minus allowable tax reliefs) of individuals and does include capital gains. See OECD (2023) Revenue Statistics in Africa 1990-2021, A5, p. 329 available at https://www.oecd.org/en/publications/revenue-statistics-in-africa-2023_15bc5bc6-en-fr.html

³³ OECD (2023) Revenue Statistics in Africa 2023 — Nigeria available at <https://www.oecd.org/tax/tax-policy/revenue-statistics-africa-nigeria.pdf>, last visited 22/08/2024

³⁴ KBC (2024), Tax treatment of company cars in 2024, available at <https://www.kbcbrussels.be/business/en/products/credit/fiscaliteit-bedrijfswagens.html>

to channel investment flows towards green objectives. Depreciation is the recognition in tax that the value of an asset declines over time, due in particular to wear and tear. In bookkeeping terms the investment value is spread out over several years. In tax terms the cash income generated by an investment and over which income tax has to be paid is reduced by possible operating costs and depreciation (a fictitious non-cash expense) that represents a loss to the value of the investment. Increasing the depreciation schedule will thus reduce the amount of taxable profit over which income tax has to be paid and hence helps to reduce cash expenses. Increased depreciation can therefore help to guide investments into green technology and to propel the transition of the economy.

It is important to point out that the transition of the economy towards carbon neutrality requires vast financial resources that cannot only come from government sources. The role of personal income taxes as a guiding tool for green investments may therefore be an important complement to carbon taxation is designed well.

There is another important area where personal income taxes can play a role: mitigating the adverse effects of carbon taxation on lower income groups. Personal income taxes can be designed in a progressive way and serve redistributive and equity objectives. Lower income earners pay a lower percentage of their income in terms of taxes than higher income earners. Besides using income tax rates to achieve this, also the tax base can be adjusted via tax exemptions or tax credits that create a distributive effect. A wealth or property tax for example may be primarily paid by financially advantaged members of society. The distributive property of income tax can be used to garner public support and to mitigate the adverse effects of carbon taxation on poor households. At the same time the taxing of carbon emissions paired with the lowering of other taxes enables society theoretically to reap a double benefit of reducing environmental degradation and tax distortions while keeping the same level of government revenues (double dividend hypothesis)³⁵.

The box below briefly describes two examples where carbon taxes have been combined with income tax reductions.

Combining carbon taxation with income tax reductions – practical experiences:

Income tax reductions were combined in the 1990s in Sweden and Denmark with the introduction of carbon taxation. In Sweden which conducted a major tax reform in 1991 the carbon tax introduced in 1991 was combined with a reduction in personal income taxes and a change in corporate taxation.¹The reduction in the income tax was only partially offset by changes in value added tax and the broader Environmental Tax Reform in other tax areas. The income tax reductions in Sweden were thus not budget neutral – this was also not the intention of the Swedish tax reform. In later years, namely going forward from 2001 until 2006 the term “green tax shift” was used to mark tax policy that was aiming at reducing the tax on labour while increasing the tax on emissions.

Also Denmark used the carbon tax proceeds to reduce income taxes. Also in this case the income tax reduction was not budgetary neutral. Importantly the Danish approach ensured that proceeds raised by households would only be recycled back towards households so that there was no cross-subsidization of industry. Such an approach can help to foster more political acceptability among voters.

³⁵ D. Pearce (1991) The role of carbon taxes in adjusting to global warming, *Economic Journal*, 101 (1991), pp. 938-948

In both cases described in the box above personal income tax reductions were debt financed, and thus offsetting the carbon cost burden of taxpayers. Debt-financing of environmental tax shifts asks future generations to bear additional costs, something that they may not be able to shoulder given the often substantial debt level of low-and middle-income countries.³⁶ Income tax reductions can give rise to additional domestic demand and economic stimuli and hence public support. It needs to be pointed out, however, that also income tax reductions should be targeted towards the low income sections of society to address equity concerns because carbon pricing can be regressive.

Personal income taxes are not environmental taxes but can be used to complement carbon taxes. Since salary and wage taxes do not unfold an environmental steering effect their function is limited to mitigating the carbon costs, especially of disadvantaged members of society. Other forms of income taxes can be used to encourage private investment in green initiatives.

5. Corporate income tax

Corporate income tax is a direct tax levied by governments on business profits. Tax rates vary between jurisdictions and is generally calculated as a percentage of corporation's net income. Tax rates sometimes also differ between domestic and foreign corporations. Several jurisdictions tax the income of corporations based on their global income, regardless of where income has been earned. Other jurisdictions, such as the United States of America, employ a territorial tax system that obliges corporations to only pay taxes on income earned within the respective jurisdiction.

Corporate taxes differ substantially from country to country. In some countries, the rates are very low (Guernsey, British Crown Dependency has a low tax bracket of 0% tax Cayman Islands, British Overseas Territory has no corporate income tax, Barbados and Hungary for example only has 9%). In other countries corporate tax rates are higher: In Indonesia the tax rate is set at 22%, Pakistan at 29% and in Kenya and Mexico it is set at 30%.³⁷ Differences thus still seem to persist even though in 2021 136 countries agreed to a plan of the OECD to implement 15% global minimum tax rate.

Corporate income tax accounts for 9% to 19% of government revenues. In 2021 it accounted for 19% of government tax revenues in African countries, for 18% in the Asia Pacific region, 15% in Latin American countries and for 9% in OECD countries.³⁸ It is thus an important source of revenue.

Even though corporate income taxes account for substantial shares of government income, it bears mentioning that there is tax competition between jurisdictions, despite initiatives for a global minimum tax rate. Multinational corporations may act upon different tax rates and move corporate profits abroad. Such tax competition puts pressure on corporate income taxes and may lead to the broadening of income tax incentives taking the form of specific deductibles or accelerated depreciation schedules.

Corporate taxes focus on corporate profits and are not environmental taxes. Changes in corporate tax rates for entire sectors will therefore do little to unfold an environmental steering effect that could incentivize more environmentally friendly production within a sector.

Corporate taxes could nevertheless be used in a complementary fashion to carbon taxation if they are used to support green transitions. Corporate income tax rates, particularly derogations from standard rates, could in theory constitute subsidies for corporations and incentivize ecologically friendly behaviour, i.e. investments in particular sectors. As outlined above under personal income taxes also

³⁶ Over the past decade the external debt stock of low- and middle-income countries has risen and outpaced economic growth. This gives rise to concerns about these countries' ability to service their debt. World Bank (2023) International Debt Report 2023

³⁷ <https://taxsummaries.pwc.com/quick-charts/corporate-income-tax-cit-rates>

³⁸ OECD (2023) Revenue Statistics in Africa 2023 — Nigeria available at <https://www.oecd.org/tax/tax-policy/revenue-statistics-africa-nigeria.pdf>, last visited 22/08/2024

accelerated depreciation programs could help to incentivize investments in green technology and help to channel investment flows towards green objectives and help to catalysing private finance towards a green transition of the economy.

It should, however, be pointed out that reduced corporate tax rates or accelerated depreciation is a crude instrument that does little to incentivize green investments within advantaged sectors as it is not geared to estimate or reflect the actual externalities.

6. Conclusion and takeaways for developing countries

The use of explicit carbon pricing³⁹ mechanisms is growing as jurisdictions seek ways of quickening the transition towards low carbon economies. Nine jurisdictions increased carbon tax rates in 2022 and announced scheduled rate rises for the future, as well as greater stringency of measures, to support national green transition and carbon neutrality plans. For instance, South Africa raised its carbon price by 7% to ZAR 144 in 2022, while Ukraine tripled its carbon rate to UAH 30 (EUR 0.75). Colombia broadened its carbon tax base to include coal and announced it will gradually increase the tax rate applied to coal from 25% of the carbon tax rate in 2025 to the full rate by 2028⁴⁰.

Carbon taxation is only one of various instruments that can be used to address climate change. In practice several instruments are employed in conjunction with each other – ideally in a smart mix, that reflects the unique circumstances of each country.

Carbon taxes must consider the already operating domestic tax framework that usually includes personal and corporate income taxes, VAT and excise duties. Carefully crafted tax incentives and reductions in traditional taxes as well as accelerated depreciation can support the effectiveness of carbon taxation. A sound combination of tax incentives can help change consumption patterns, promote investments in green technology and thereby propel the transition of the economy towards decarbonization.

These are the main takeaways for developing countries:

- Public support for environmental measures is needed and may be provided through incentives in different taxes.
- However, keeping government revenue streams is vital, especially in countries with high debt levels. Therefore, attention must be paid to the cost of tax expenditures.
- Private investments are critical for a successful transition of the economy. Carefully designed tax incentives will contain an economic steering effect and encourage parties to adopt environmentally friendly behaviours.
- The impact of tax incentives should be assessed together with other tools employed in the transition, paying attention to interactions with other tools and the consequences for strategic sectors of the economy. The design of carbon taxes and related incentives should focus on simplicity and transparency to ensure effective implementation.
- Revenues from carbon taxes are generally low in comparison to traditional sources of revenue. Traditional sources of revenue may come under pressure as the economy moves towards decarbonisation.
- In developing countries, excise duties, for instance, contribute a significant share of total tax revenue. Thus, when defining a carbon tax in relation to other existing excise duties,

³⁹ Explicit carbon prices are measures designed specifically to target GHG emissions or the carbon content of fuel.

⁴⁰ OECD (2023), p. 59.

governments should consider how both taxes can be structured to complement each other without negatively affecting revenue.

Developing countries face challenges in decarbonizing their economies. As they work toward achieving climate objectives, maintaining fiscal stability, and fostering public support, a well-designed combination of carbon pricing and other tax measures will be critical.

In conclusion, while carbon taxes play a crucial role in driving the transition towards a low-carbon economy, they need to be implemented in a way that reflects the broader fiscal and economic context of each country. Developing countries can advance tax policy as a lever for both economic growth and environmental protection by integrating carbon taxation with personal, corporate, and consumption taxes, while using targeted incentives to support green investments and enhance sustainable development.