



# Green taxation in non-OECD countries

A review of experience and lessons learned

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## Executive summary

There is a very clear need to better understand the impacts of environmental taxation in non-OECD countries. Environmental taxes have the potential to deliver multiple benefits by addressing the economic drivers behind the environmental challenges facing non-OECD countries, enhancing efficient use of resources, and mobilising revenue. However, information in the public domain is relatively sparse, and scientific research on environmental taxes in low- and middle-income countries (LMICs), aside from carbon-energy taxes and other carbon pricing mechanisms, has been rather limited.

In view of this, this report collates the results of a literature review conducted in 2022 and 2023 on environmental taxation in non-OECD countries, focussing on environmental taxes that are not carbon-energy taxes, as for these measures a great deal of evidence is already available in the public domain. The report also includes the results of five “deep dives”<sup>1</sup> to examine five environmental tax instruments in depth in Ghana, Guyana, Morocco, Viet Nam and Zambia.<sup>1</sup> The report sets out to identify data on green tax impacts where it exists, and to undertake thorough research into these taxes in non-OECD countries. Ultimately, it is hoped that this research can inform development cooperation organisations and policymakers in non-OECD countries on how best to design environmental taxes, avoid pitfalls, and manage potential trade-offs between social equity, environmental effectiveness and domestic revenue mobilisation (DRM).

Building on the literature review and deep dives, the report sets out to draw together lessons learned from existing environmental tax instruments, and to identify best and less good practices in their implementation. It also aims to highlight possible ways forward for the European Commission to engage in international policy dialogue with organisations and platforms working on environmental taxation, and to engage in a more targeted way at the national level, through EU in-country delegations.

The literature review revealed the data gaps and need for further research on environmental taxation in the context of non-OECD countries, to create a robust evidence base and foster a better understanding of the impacts and interactions of environmental taxes (4.1). It also unearthed a number of measures that existed on paper but for which very little or no evidence or information could be found in the public domain.

Research revealed that in many non-OECD countries, very few or in some cases no green taxes had been implemented, and the fiscal regime fails to address very significant environmental challenges. Indeed, in many countries, current fiscal regimes tend to exacerbate environmental problems (4.2).

In terms of tax design, the research found that tax design in practice often deviated from the theory and best practice of tax design (4.3). These deviations took place for several reasons – most commonly, due to policymakers accepting trade-offs for political economy reasons, but also as a result of lack of human and technical capacity to design environmental taxes in line with best practice.

Low tax rates in many non-OECD countries appear to have created only weak incentives to reduce pollution or change behaviour and as a result, have undermined environmental effectiveness (4.4). Design solutions to this problem are proposed, such as tax escalators or the introduction of a harmfulness index.

Many tax governance challenges were identified, exacerbated by lack of financial, technical, administrative and human capacity (4.5). This has implications for the implementation, enforcement and monitoring of environmental taxes in many countries. Closely linked to this challenge is the problem of limited transparency, in relation to revenues raised and the management and proper auditing of funds set up to disburse revenues raised by environmental taxes.

The section focussing on lessons learned regarding equity impacts (4.6) is one of the most detailed of the

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<sup>1</sup> These “deep dives” are available as Annexes to this report.

report. Concerns regarding equity impacts are a key obstacle to the implementation of environmental taxes, particularly in non-OECD countries, and the topic thus merits in-depth consideration. This section analyses existing research on equity impacts and environmental taxation, sector by sector, then goes on to explore strategies to reduce regressive impacts, and present several examples of progressive taxes in non-OECD countries. A key finding is that governments in non-OECD countries should conduct a thorough ex ante analysis of equity impacts and design environmental taxes and accompanying measures carefully to ensure that they are fit for purpose and can feasibly be implemented.

Our research also found that in many countries, revenue, expenditure and tax expenditure are not aligned with environmental and climate policies and strategies (see 4.7). Indeed, in both OECD and non-OECD countries, the value of environmentally harmful expenditures (subsidies) is often greater than favourable spending. Green budgeting approaches to tag favourable and unfavourable budget items are explored to lay the foundations for subsequent green budget reforms.

DRM is a hot topic in non-OECD countries. Indeed, raising revenue is an important secondary benefit of environmental taxation – the primary objective being to reduce environmental degradation and pollution. Taxes on fossil fuels and energy were found to have considerable potential to raise revenue, as were environmental taxes in countries with economies dominated by a specific economic sector. For other tax bases, revenues from environmental taxes were found to be quite low. The extent to which an environmental tax will raise revenue depends on the tax rate and on the elasticity of demand of the good or service being taxed. If elasticity is low, environmental taxes can provide relatively stable revenues for many years, particularly if a tax rate escalator compensates behavioural change through an increased tax rate.

Therefore, environmental taxes per se cannot necessarily be relied on by finance ministries as a means of significantly enhancing fiscal space, particularly as a proportion of revenues are often needed to fund social welfare measures or to mitigate negative impacts on business (see 4.8). Alternative tax bases and better direct taxation – e.g. targeting capital, wealth, and property – have more potential for DRM and in enhancing horizontal and vertical equity in the tax system, and will undoubtedly form an important additional pillar of DRM strategies in non-OECD countries alongside environmental taxation.

A final lesson of this report is that the design of environmental taxes in non-OECD countries requires a balancing act between administrative capacity, governance frameworks, existing legislation, and environmental imperatives. Greening existing – well enforced – taxes and other fiscal policy instruments may in many cases be preferable to developing new instruments that work well on paper, but not real-world conditions.

The report also summarises the many organisations involved in international development cooperation, which have the potential to act as springboards for further work on environmental taxes, and to collaborate closely with the European Commission in future. Obvious partners include the Coalition of Finance Ministers for Climate Action, the African Tax Administration Forum (ATAF), the Green Fiscal Policy Network, the International Tax Compact and Addis Tax Initiative, as well as development banks.

The structure of the report is as follows. Building on an introductory chapter, Chapter 2 looks at definitions of environmental taxation, tax reform, and environmental fiscal reform and places them in the context of non-OECD countries. Chapter 3 explains the methodology of the literature review and introduces its general findings. Chapter 4 explores lessons learned from the literature review on through a closer look at the environmental tax measures examined during our research, explores the theory underlying them, and develops recommendations for environmental taxation in non-OECD countries on the basis of actual country experience. Building on these lessons and recommendations, Chapter 5 examines the international institutions involved in international tax policy dialogue and agenda setting and considers how non-OECD countries can best be supported in their efforts to implement environmental taxes. Chapter 6 concludes.

## 1 Introduction

Green taxes and other green fiscal policies (GFP) are generally more cost-efficient than regulations or soft instruments in achieving environmental objectives, as they allow business and individual consumers to decide how to respond to price increases and create a dynamic incentive in favour of change. Green taxes, charges and fees are associated with very low administrative costs and can often be linked to existing revenue-raising mechanisms. As they are relatively transparent and levied on a few taxpayers and relatively immobile tax bases, many environmental taxes, especially carbon-energy taxes, are difficult to evade (Cottrell et al. 2018; Faye et al. 2015, Liu 2013).

However, as demonstrated by the 2021 European Commission report Green Taxation and other Economic Instruments, many opportunities are being missed in the EU to make polluters pay (European Commission 2021a). This is no different in non-OECD countries. Where green tax instruments are in place, rates tend to be too low to internalise the external costs of pollution or to incentivise pollution reductions. Like the EU, non-OECD countries tend to tax transport fuels for passenger vehicles heavily, while the internalisation rates for green taxes introduced for other areas of environmental damage tend to be lower. In both OECD and non-OECD countries, an obvious reason for this is that such taxes tend to be revenue raising instruments, with at most a secondary environmental purpose. Finally, as in the EU, there is clearly considerable scope to apply the polluter pays principle more rigorously in non-OECD countries, and to both expand the coverage and enhance the effectiveness of green taxes.

This process must necessarily be facilitated by better data on green tax impacts and in-depth research into existing instruments in non-OECD countries, to better understand how to design green taxes well, avoid pitfalls, and manage potential trade-offs between social equity, environmental effectiveness, while reflecting upon the imperative to increase domestic revenue mobilisation (DRM) under the 2015 Addis Ababa Action Agenda on Financing for Development. Designing green fiscal instruments in non-OECD countries also needs to carefully consider existing administrative capabilities – rather than question of “optimal” policy design. “Greening” existing – and well enforced – fiscal instruments might be preferable to developing new instruments that work well on paper, but not real-world conditions.

The research upon which this report is based was conducted with a view to delivering a better understanding of these issues and identifying what information is available in the public domain, and what is missing. It included an in-depth review of literature on green taxation and its impacts in non-OECD countries (the methodology used and the findings are described in detail in Chapter 3). Our research also set out to examine taxes on transport, pollution and resources, which are less frequently analysed than carbon-energy taxes. To inform the research, we used the categories of environmental tax bases defined by Eurostat (2023) (see Annex 1 for a list of all Eurostat tax bases). This research also provides the basis for the identification of possible lessons learned for the more effective and widespread deployment of green taxation in non-OECD countries in future.

Initial findings were presented and discussed on a panel at the Global Development Network conference on Tax Policy for Sustainable Development in September 2022. Since that time, the initial research has been complemented by five more in-depth studies of green tax instruments. These studies look at green tax instruments for circular economy in Guyana (beverage containers), Ghana (e-waste), Morocco (plastics), Viet Nam (a wide range of environmentally damaging substances, including plastics and HCFCs), and Zambia (copper). They are informed not only by literature reviews but also by interviews with Commission representatives, country experts, development partners, and government representatives.

The objective of this report is to draw the findings from all of this research together in one publication to pinpoint trends in green taxation in non-OECD countries. It also sets out to draw together lessons learned from green tax instruments already in place, and to identify best and less good practices in their implementation. Finally, the report also aims to highlight possible ways forward for the European Commission to engage in international policy dialogue and at the national level, through EU in-country delegations.

The structure of the report is as follows. Building on the introductory chapter, Chapter 2 looks at definitions of environmental taxation, tax reform, and environmental fiscal reform and places them in the context of non-OECD countries. Chapter 3 explains the methodology of the literature review and introduces its general findings. Chapter 4 explores lessons learned from the literature review on through a closer look at the environmental tax measures examined during our research, explores the theory underlying them and develops recommendations for environmental taxation in non-OECD countries on the basis of actual country experience. Building on these lessons and recommendations, Chapter 5 examines the international institutions involved in international tax policy dialogue and agenda setting and considers non-OECD countries can best be supported in their efforts to implement environmental taxes.

## 2 Green taxation in non-OECD countries

### 2.1 Definitions and approaches to environmental taxes in non-OECD countries

#### 2.1.1 Definitions: environmental taxation and environmental tax reform

There is no one agreed definition of an environmental tax in the literature, with much of the discussion focussed on whether an environmental tax must have an environmental purpose and effect (see e.g. ATAF 2021). The OECD Glossary of Statistical Terms defines an environmental tax as a “tax imposed for environmental reasons e.g. to provide an incentive to reduce certain emissions to an optimal level or taxes on environmentally harmful products”.<sup>22</sup>

The Eurostat definition of environmental taxation is quite closely aligned with that of the OECD, but focuses on the tax base, rather than the purpose of the tax: “A tax whose tax base is a physical unit (or a proxy of a physical unit) of something that has a proven, specific negative impact on the environment” (Eurostat 2013:9). Under this definition, other possible criteria, such as a stated objective, the name of the measure, and the earmarking of revenue, are considered to be supplementary information – with all three being more difficult to apply in practice, and subject to a degree of interpretation.

The European Union’s statistical body Eurostat considers the tax base to be the only objective basis for identifying environmental taxes for the purpose of international comparisons. To this end, Eurostat has drawn up a list of environmental tax bases, and classifies all taxes levied on those tax bases to be environmental taxes. The Eurostat approach is particularly helpful because it provides clarity on what is – and what is not – an environmental tax. Muddled debates, such as deliberations about whether a tax can be considered an “environmental tax” or not based on whether the tax has an explicit environmental purposes, or whether revenues are used for environmental purposes, are avoided by employing this objective approach. A clear definition on the basis of the environmental tax base can reduce the potential for misunderstandings or false reporting and facilitate international comparisons and statistical data collection.<sup>3</sup> The Eurostat

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<sup>2</sup> <https://www.oecd.org/ctp/glossaryoftaxterms.htm#E>

<sup>3</sup> The Eurostat definition is closely aligned with the OECD definition of an environmentally related tax, as a “compulsory, unrequited payment to general government levied on tax-bases deemed to be of particular environmental relevance” (OECD 2017).



definition is used throughout this report.

The four categories of environmental taxes used by Eurostat are:

- energy taxes (including transport fuels),
- transport taxes (on vehicles and public transport modes),
- pollution taxes, and
- resource taxes.

A full list of tax bases can be found in Annex 1.

Additionally, a commonly used term in OECD countries, particularly the European Union (EU), is “environmental tax reform”. In this case, the term focuses not only on the tax base, but also use of revenues, the typical model in OECD countries being the shifting of the tax burden from conventional taxes – typically on labour – towards environmental taxes (EEA 2005). In LMICs, tax shifting is less relevant, as the tax burden tends to be low and as a result, mobilising additional revenue and increasing fiscal space are high priorities for governments (Cottrell et al. 2016).

Today, many authors refer to “green taxation” or “green tax reform”. These terms are considered synonymous with “environmental taxation” and “environmental tax reform” respectively.

### 2.1.2 Environmental Fiscal Reform

The OECD Development Assistance Committee has defined environmental fiscal reform (EFR) as “a range of taxation and pricing measures which can raise fiscal revenues while furthering environmental goals” (OECD/DAC 2005: 12). EFR comprises a wide range of policy instruments including taxes, fees and charges, emissions trading schemes and reform of environmentally harmful subsidies. EFR corrects market failures by including the costs of environmental damage – e.g. pollution, greenhouse gas emissions (GHG), health impacts – in the price of goods and services. This creates a price incentive for all economic actors to consume, behave and invest more sustainably.

Thus, EFR serves two central purposes:

1. An environmental or climate purpose (to reduce pollution, GHG emissions, resource consumption, etc.)
2. A fiscal purpose (to generate revenues through taxation or the reduction or elimination of environmentally harmful subsidies and tax expenditures).

The latter tends to be a key consideration in non-OECD countries that have often much lower tax-to-GDP ratios and limited capacity to effectively raise revenue. Earmarking revenue raised from an environmental fiscal policy measure as expenditure for the same environmental goal can be effective, and is often implemented in both OECD and non-OECD countries.

Alongside environmental and fiscal policy considerations, social considerations are of fundamental importance in LMICs. The OECD-DAC definition of EFR in developing countries emphasises the importance of domestic revenue mobilisation for the specific objective of poverty reduction: “EFR can contribute to poverty reduction directly by helping address environmental problems [...] that impact the poor [...] and indirectly by generating or freeing up resources for anti-poverty programmes.”

In order to ensure political and societal support for green fiscal reforms in non-OECD countries, policymakers need to pay careful attention to the distributional effect of EFR instruments and

develop targeted and effective complementary instruments to ensure that environmental taxes do not have regressive impacts that disproportionately effect the poor (for an in-depth discussion, see section 4.6). If sufficient care is not taken to prepare the ground well for EFR and to mitigate negative social impacts, examples from non-OECD countries show that failed endeavours e.g. to reform fiscally and environmentally harmful fossil fuel subsidies, may result in widespread protests and policy reversals, as in Ecuador in 2019, and even the failure of governments, as in Indonesia in 1998.

## **2.2 The context in 2023: green recovery and domestic revenue mobilisation**

Governments in non-OECD countries are facing massive challenges in the wake of the COVID-19 pandemic. Data suggests that due to the pandemic and the Russian war on Ukraine and its effects on global energy and food prices, higher inflation, and climate change impacts, 2022 saw one of the lowest global growth rates in decades (UNCTAD 2023). Similarly, the IMF's World Economic Outlook suggests below-average growth and high levels of inflation, particularly in medium and low-income countries (IMF 2023). Many countries in the world will use fiscal measures to stimulate economic recovery to avoid a deeper and longer recession. In turn, this means that countries will need to mobilize domestic revenue when the economy has recovered to finance these stimuli. Environmental tax reforms "may be the best option to mobilize revenues" and should play a significant role in optimal tax policy (Heine & Schoder 2022).

The urgent need to address multiple environmental challenges related to climate change and the preservation of biodiversity, in addition to the corresponding international agreements<sup>4</sup>, calls for a great deal more coherence between economic recovery and these policy goals. Designing expenditure as well as tax policy for DRM in a way that is consistent with the planetary boundaries should be a key guideline for sound economic, fiscal and environmental policy.

Developments in the last five years have thrown into sharp relief the need for better climate protection and growth and development that respects planetary boundaries (see e.g. Rockström et al. 2009 and subsequent publications). It has also demonstrated that deep and transformative measures are necessary to decarbonise development. The International Energy Agency (IEA) (2020b) predicted an 8% reduction in global GHG emissions in 2020 due to falling energy use during the COVID-19 pandemic, the largest annual drop since the second world war. However, for the 1.5°C Paris target to be achieved, reductions of a similar magnitude will have to take place every year until 2030.<sup>5</sup> Already in 2023, GHG emissions have rebounded. The magnitude of the task is clear.

How these challenges are addressed will shape the economies of all countries and will impact the climate, the environment, and the economy for decades to come. With extremely limited resources, non-OECD countries must 'build forward' better, while protecting the vulnerable from the impacts of the ongoing crisis.

It is also clear that these challenges cannot be overcome using international climate finance and national public spending alone: "Pricing reforms, such as phasing out fossil fuel subsidies and taxing carbon and environmental damages, are also necessary to provide the incentives for green investments and innovation, reduce fossil fuel dependency and create a more sustainable economy" (Barbier 2020:8). The time is long overdue for the international community to live up

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<sup>4</sup> Both the Paris Agreement (Article 2.1c) as well as the last CBD COP's Decision on resource mobilization underscored the need to reform financial flows in line with climate and biodiversity goals in national budgets, development cooperation and international financial institutions (see CBD COP 15, 2022).

<sup>5</sup> UNEP estimates that GHG emissions must fall by 7.6% annually to 2030 to meet the 1.5°C target, see: <https://www.unenvironment.org/news-and-stories/press-release/cut-global-emissions-76-percent-every-year-next-decade-meet-15degc>

to the often overlooked third goal of the Paris Agreement's article 2.1c to "make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development". This means for G7 and G20 countries actually delivering on the pledges made to eliminate fossil fuel subsidies that contradict climate mitigation goals of the Paris Agreement. In G20 statements as well as the Glasgow Climate Pact, loopholes – such as the use of the term "inefficient" fossil fuel subsidies – have been built in for the sake of international agreement, but continue to delay any actual progress.<sup>6</sup> Similarly worded commitments to the elimination of fossil fuel subsidies have been made for over a decade, yet have delivered little to no progress.

In February 2023, the International Energy Agency issued a report identifying a new high for global consumption subsidies for fossil fuels – which reached more than USD 1 trillion for the first time – attributable to the global energy crisis triggered by Russia's invasion of Ukraine. These subsidies were almost evenly shared between oil, gas, and electricity (Muta & Erdogan 2023). Between 2021 and 2022, global fossil fuel subsidies effectively doubled, with subsidies in 2021 almost five times the value of those in 2020. Against this background, there are sound reasons from an energy security perspective to implement environmental taxes to incentivise energy transition and reduce dependence on fossil fuels traded on globally volatile energy markets.

Therefore, green taxes and EFR have the potential to contribute to sustainable economic development and green recovery in the 2020s, even more so in debt-constrained countries, where the capacity for governments to invest is inadequate and fiscal space tightly constrained (see Heine & Schoder 2022). Non-OECD countries often face precisely these constraints and, in such environments, governments may wish to consider the implementation of green taxes – all the more so as they are generally regarded as a more growth- friendly source of domestic revenue than other taxes (see e.g., European Commission 2015; OECD 2016).

Such an approach is in line with the priorities of DG INTPA – the Directorate General for International Partnerships. DG INTPA's approach focuses on effective DRM and sound public financial management (PFM) as key to government efforts to achieve inclusive growth part of poverty eradication and sustainable development. INTPA regards reaching a tax-to-GDP ratio of 15% as being vital for any country to provide basic services to its citizens (European Union 2022). While this is achieved in many LMICs, this is by no means the case for all non-OECD countries. EFR can play a role in delivering on this goal.

DRM is also a central feature of the 2015 Addis Ababa Action Agenda. Countries agreed to mobilise and affectively use domestic resources generated by economic growth and supported by additional measures, amongst other things, for "sound social, environmental, and economic policies, including [...the creation of...] adequate fiscal space (United Nations 2015, Article 20). This document also recognises that progressive more efficient and effective tax systems with a broadened tax base can enhance domestic revenue as part of national sustainable development strategies" and that these will be crucial to achieve the sustainable development goals (United Nations 2015, Article 22). environmental taxes which tend to be efficient, growth-friendly and hard to evade fit well within the Action Agenda approach (Cottrell et al. 2016).

## 3 Methodology

### 3.1 Literature review for non-OECD countries

The objective of the literature review was to provide an overview of reliable sources and

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<sup>6</sup> The specific examples are from the debates at the Glasgow Climate Summit. The strategy to agree to a wording that does not force a government to actually reduce and eliminate subsidies has been implemented by many other governments at other occasions as well – to the detriment of international climate mitigation.

publications available in the public domain on specific examples of green taxes in selected non-OECD countries. Thus, the focus was on identifying individual green tax measures that had been analysed and reviewed, and for which information on *economic, fiscal, environmental and social impacts* was available in the public domain.

Concretely, the objective of the review was to identify individual green tax instruments for which the information shown in Table 1 was available.

*Table 1: Key parameters for literature review*

<b>Country – key data</b>	<b>Country income classification, GDP, GDP/capita, Gini coefficient, tax-to-GDP ratio</b>
<b>Environmental field and impacts of externality</b>	Impacts on air, soil and water quality, biodiversity and ecosystems, human health, etc.
<b>Type of measure and legal name</b>	Tax, levy, fee, charge, license, cess, etc.
<b>Date of implementation</b>	When the measure was introduced.
<b>Instrument design</b>	Tax base, coverage, tax rates, objectives, major exemptions or differentiated tax rates.
<b>Revenue volumes</b>	Absolute revenue volume and as a proportion of GDP and total tax revenue, where this data is available.
<b>Impacts of the measure</b>	Fiscal, economic, environmental, and social impacts (measured, predicted, or modelled, where data is available).
<b>Literature available</b>	Publications list including hyperlinks, where available.

While the literature review set out to be as comprehensive as possible, it was not exhaustive: it would not have been possible to conduct research on all non-OECD countries within the parameters of this research project.<sup>7</sup> The methodology employed to filter results and identify cases for more in-depth research is described below.

To identify possible cases in the first instance, data on environmentally related taxes, fees and charges was extracted from the OECD PINE – Policy Instruments for the Environment – database. This database gathers detailed information on policy instruments relevant for environmental protection and natural resource management. The data extracted provided a list of countries and measures for which further research was subsequently undertaken.

The database delivered an initial list of 4,194 measures in 82 countries, which was subsequently filtered as follows. First, non-OECD countries with European Union membership were discounted. Second, environmental taxes on transport, pollution and resources were prioritised, rather than carbon-energy taxes, because carbon taxes are well represented in the literature, even in non-OECD countries, and the impacts of these taxes are relatively well-known.<sup>8</sup> Third, countries proposed by the European Commission were also investigated: Bhutan, Dominican

<sup>7</sup> Although the PINE database provides a comparatively exhaustive list of environmentally related taxes in non-OECD countries, data is sparse and there are many omissions.

<sup>8</sup> Nonetheless, selected carbon-energy tax designs – those considered to be especially applicable to non-OECD countries – were also considered within the research.

Republic, Fiji, Gabon, Guatemala, Guyana, Mongolia, Philippines, Tanzania, Togo, Zambia.

For each measure, a literature search was conducted using Google Scholar. The name of the instrument as cited in the PINE Database was searched alongside the country name, as well as variations of the instrument and general search terms, e.g. “environmental taxation Kenya”, “green fiscal policy Bhutan”, or “vehicle taxation Uganda”. This stage also entailed scanning the works of academics and researchers well known in the fields of environmental economics in non-OECD countries. A google search to identify possible relevant reports and publications was also conducted. This targeted reports by UN agencies, multilateral development banks, and think tanks such as IIED, CIRE, IISD, Green Budget Germany, and IDDRI.<sup>9</sup>

### 3.2 Further research

Once tax instruments were identified for which (some of) the information in Table 1 was available, further research was undertaken to explore some cases in more depth. In the first instance, twenty cases were identified, which we considered interesting for the Commission to showcase in its interactions with national governments in non-OECD countries. For each, a one-page summary of the tax design and its impacts were produced. In a second step, five environmentally-related tax measures – relating to the topic of circular economy – were researched in more depth, in so-called “deep dives”, which are included in separate Annexes to this publication.

When selecting examples of environmental tax instruments for the one-pagers, a key consideration was whether sufficient quantitative and qualitative data was available in the public domain, alongside other criteria:

1. Coverage of all regions of the world.
2. Coverage of a wide range of environmental sectors.
3. Coverage of different types of countries: Low-Income Countries (LICs), both Lower and Upper Middle-Income Countries (LMICs and UMICs), Least Developed Countries (LDCs), Small Island Developing States (SIDS).<sup>10</sup>
4. Coverage of a range of instruments and designs, focussing on those particularly relevant for non- OECD countries, i.a. designs suitable for countries facing regulatory challenges and administrative shortfalls, high rates of tax evasion and tax gaps, limited fiscal space and low rates of domestic revenue mobilization, large informal sectors, high poverty rates, etc.
5. Cases where detailed information on the instrument, and robust data on its predicted or actual impacts is available.
6. Cases which have delivered proven positive environmental outcomes or mobilized a significant volume of revenue, or where mitigation measures have been developed to address concerns around just transition and social equity.

The country cases and measures are shown in Table 2.

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<sup>9</sup> In some cases, however, in spite of a reference to a measure in one publication, further literature could not be identified, e.g. a tax on peatland use in Indonesia referenced in McFarland, W., Whitley, S., and Kissinger, G. (2015): Subsidies to Key Commodities Driving Forest Loss: Implications for Private Climate Finance. Working paper, Overseas Development Institute: London does not appear to have been described in detail in any other literature and thus could not be evaluated here.

<sup>10</sup> Different governance models were also included, e.g., democratic countries, socialist countries, transition economies, etc.

Table 2: Country cases by region, tax base sector, country category and instrument type

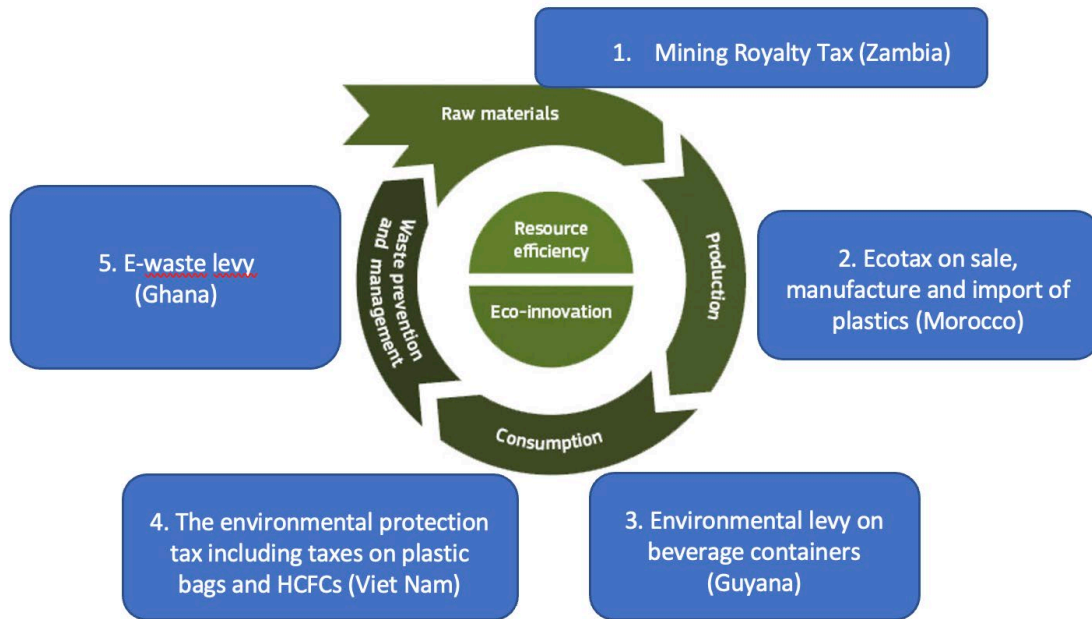
	Region	Tax base	Country category
China	APAC	Pollution (air, water, soil, noise pollution, waste)	UMIC
Ecuador	LAC	Transport (emissions from road vehicles)	UMIC
Guyana*	LAC	Pollution (non-returnable beverage containers)	UMIC
Ghana*	AFR	Pollution (virgin plastic and plastic products, e-waste)	LMIC
India	APAC	Resources (extraction of coal and coal derivatives)	LMIC
Kenya	AFR	Transport (emissions from road vehicles)	LMIC
Liberia	AFR	Resources (harvesting of biological resources – timber)	LIC, LDC
Malaysia	APAC	Pollution (industrial effluent emissions to water)	UMIC
Mauritania	AFR	Resources (fisheries licenses and catch fees)	LMIC, LDC
Mauritius	AFR	Pollution and energy (fossil fuels, plastics, HCFCs)	UMIC, SIDS
Mongolia	APAC	Pollution (effluent emissions to river basins)	LMIC
Morocco*	AFR	Pollution (virgin plastic inputs to manufacturing, imports)	LMIC
Niger	AFR	Resources (harvesting of biological resources – timber)	LIC, LDC
Philippines	APAC	Pollution and energy (coal)	UMIC
Peru	LAC	Pollution (tax on the harmfulness of fossil fuels)	UMIC
South Africa	AFR	Energy (carbon emissions from stationary sources)	UMIC
Uganda	AFR	Transport (emissions from road vehicles)	LIC, LDC
Ukraine	EUR	Pollution (nuclear waste – radioactivity)	LMIC
Viet Nam*	APAC	Pollution (air, soil, water)	LMIC
Zambia*	AFR	Resources (extraction raw materials, incl. copper)	LIC, LDC

Key: APAC – Asia-Pacific, AFR – Africa, LAC – Latin America and the Caribbean, EUR – Europe, UMIC – Upper Middle-Income Country, LMIC – Lower Middle-Income Country, LIC – Lower-Income Country, LDC – Least Developed Country, SIDS – Small Island Developing State

Five of the countries shown in the table above were subsequently subject of additional research – deep dives – which included interviews with development cooperation partners in the countries and where possible, government officials.<sup>11</sup> These countries are marked with an asterisk in the table. They were selected on the basis of additional criteria including relevance for the European Commission, availability of information in the public domain, potential to generate lessons learned for other countries, replicability, and design of the tax measures, e.g. innovative character, approach to incentivising behavioural change, potential to mobilise substantial domestic revenues. All five instruments selected have a clear relevance for circular economy and have been introduced at different stages of the value chain (see Figure 1). All cases are presented in Annex 2.

<sup>11</sup> The “deep dives” are available as annexes to this report.

Figure 1: Proposed shortlist of countries and instruments along the value chain



Source: authors

## 4 Lessons learned and recommendations

This chapter of the report details the practical findings from the twenty taxes researched for this report, including the findings of the five deep dives. The chapter identifies lessons learned, and develops recommendations for non-OECD countries seeking to implement environmental taxes and for development partners.

Where relevant, each sub-section starts with a brief explanation of the theoretical background to the issue being discussed, before drawing on specific cases to highlight practical aspects and implications which exemplify and explain the lessons and recommendations. Key lessons learned from all twenty cases are referenced in this chapter.

### 4.1 Lesson 1: Quantitative and qualitative information on specific environmental taxes in non-OECD countries is limited

The PINE database made clear that many environmental or environmentally related taxes have been implemented in non-OECD countries. However, research publications analysing these measures are very limited. For many taxes, there is little or no information available in the public domain. In some cases, particular tax measures are referenced in only one document, and despite relatively wide literature searches across a range of platforms, no further information can be found.

The literature also tends to be quite piecemeal. Publications tend to be superficial and cover only some of the key parameters listed in Table 1. Several publications were typically required to cover these elements and, in many cases, a great deal of rather basic information could not be found within the scope of this research.

In some cases, green taxes were listed in the PINE database, but it proved almost impossible to establish whether they had been effectively implemented, or whether they had been implemented only partially. For example, in Ghana, the proceeds of a 10% excise duty on plastics introduced in 2013 were intended for a plastics waste recycling fund, which was not created, so that revenue flowed instead into the general budget (MESTI 2020).

Several examples were found of “paper tigers”, instruments which existed on paper, but which had never been implemented or enforced. Similarly, in many non-OECD countries, it seemed likely that the tax was in force, but there was very little information about the measure in the public domain.

The literature review revealed that many governments in non-OECD countries – in the face of limited resources and competing policy priorities – tend not to review the effectiveness of environmental tax measures *ex post*.<sup>12</sup> Hence, even in cases where taxes with a specific and well-defined environmental purpose have been implemented, e.g. the Environmental Pollution Tax in Viet Nam (see 4.8.5), there tends to be little information available on their environmental effectiveness.

For many green tax instruments, the only data available on impacts stems from *ex ante*

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<sup>12</sup> This comment should be qualified, as the literature review did not involve interviews with relevant government ministries, and it may be that internal policy reviews have been conducted. What can be stated with a degree of certainty is that *ex post* policy reviews conducted or commissioned by governments in non-OECD countries, if they exist, tend not to be available in the public domain, and that analysing the impacts of environmental taxation *ex post* tends not to be a focus of academic research.



modelling, or from analyses that draw tentative conclusions based on consumption patterns or broad trends in behavioural change. However, a degree of caution should be exercised when drawing on data from either of these approaches.

Many of the publications about environmental taxes and their impacts focuses on revenue impacts<sup>13</sup>, including the use of revenue raised and the resulting benefits for the environment. While this is a legitimate question to ask, the theoretical purpose and rationale behind an environmental tax is that the price increase it causes results in changes in behaviour and stimulates green investment. The failure to analyse environmental taxes from the perspective of their environmental effectiveness is an important omission in the literature.

**Recommendation:** As with all policies, it is good practice to review environmental taxes regularly to evaluate their environmental effectiveness and adjust as necessary. Governments in non-OECD countries can work with development partners to build capacity and access technical and financial assistance to implement ex post review of such taxes. The research community should also consider a greater focus on ex post impact assessments, to deliver better and more robust evidence on the effectiveness of environmental taxes. Development partners can support these these efforts and act as facilitators between national partners and international bodies working on these topics, e.g. the Addis Tax Initiative.

## 4.2 Lesson 2: Fiscal regimes in non-OECD countries fail to tackle environmental challenges

Research revealed that in many non-OECD countries, very few or in some cases no green taxes had been implemented, and the fiscal regime fails to address significant environmental challenges. Indeed, in many countries, current fiscal regimes tend to exacerbate environmental problems, e.g. by maintaining high levels of environmentally harmful subsidies, or by failing to price particular goods and services commensurate with their environmental impacts. This is in spite of environmental deterioration and in some cases, very high costs of environmental degradation.

In Indonesia, for example, it has been estimated that the costs of local air pollution alone amounted to USD 34 billion in 2015 (IMF 2021a). In Tunisia, poor solid waste management – low rates of collection, and unsanitary and dangerous landfilling practices – had such severe impacts that (alongside other political issues) provoked riots in November 2021 (Guardian 2021). Nonetheless, the cost of polluting in these and other non-OECD countries remains low, with the polluter pays principle rarely implemented.

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<sup>13</sup> This reflects a common misunderstanding about the incentive effects of environmental taxation, and the secondary importance of revenue for the achievement of environmental objectives. It also underlines the advantages of defining environmental taxes using the tax base as an objective criterion.

**Recommendation:** There is considerable potential to implement green tax measures to tackle environmental challenges attributable to market failures in non-OECD countries. This potential is currently not being sufficiently realised or explored. Governments in non-OECD countries should examine the environmental challenges they face through a fiscal policy lens, evaluate whether they might be tackled using green taxes or green fiscal policies, and implement GFP where appropriate.

Development partners can support governments in these efforts through the provision of technical assistance as appropriate, or by commissioning feasibility studies and developing capacity within key ministries and agencies.

### **4.3 Lesson 3: Design of environmental taxes in non-OECD countries often deviates from best practice**

#### **4.3.1 Typical trade-offs in tax design**

In many of the countries examined, policymakers had made trade-offs between practical considerations and theoretical approaches to the design of environmental taxes, environmental effectiveness, governance, and administrative feasibility. As a result of these compromises, in some cases, environmental tax design deviated from best practice in ways that undermine the effectiveness of the tax.

For example, coverage of environmental taxes should be as broad as possible to prevent distortions, with exemptions kept to a minimum, to avoid distortions and minimize opportunities for tax evasion (OECD 2010). Yet in practice, research revealed that compromises are often made. This may be due to errors and oversights in tax design, difficulties in administering taxes or taxing the informal economy, or the political influence of powerful interest groups. For example, in Ghana, the plastics tax (see 4.3.2) failed to tax manufactured plastic products, but only virgin plastics, and so resulted in an influx of cheap plastics imports.

Similarly, to maximise environmental effectiveness, environmental taxes should target pollutants or polluting behaviour as accurately as possible (OECD 2010a). However, in practice, it might not be possible to target pollutants directly, due to the absence of monitoring systems, or even if monitoring equipment is in place, to enforce environmental taxes, charges and levies, due to corruption or lack of enforcement capacity, as has been the case for water pollution fees in Mongolia (see 4.3.3), while timber taxes in Niger are an example of how policymakers can tailor environmental taxes to their national circumstances without compromising environmental effectiveness (see 4.3.4).

#### **4.3.2 Virgin plastics tax in Ghana**

In Ghana, an Environmental Excise Tax (EET) of 10% was initially levied on imports of virgin plastic materials, but not on finished plastic products (Act 840 from 2012). However, initially the EET did not target manufactured plastic goods and so resulted in an influx of cheaper plastic imports, especially single-use plastic bags. The domestic manufacturing industry using virgin plastics subject to the EET could not compete with cheaper plastic imports.

Subsequently, in 2013 under Act 863, plastics and plastic products were made subject to the EET. This Act also specified that at least 50% of the revenues would flow to the Plastics Waste Recycling Fund to support industry to transition to recycling. However, this Fund still does not exist – in 2023 – and revenues have flowed into the general budget.

Overall, no or very few positive environmental effects have been discernible as a result of the tax. This is at least partially attributable to poor tax design – both the failure to ensure broad coverage of the tax and the introduction of an ad valorem tax rate of 10% of the ex-factory price, which fails to reflect the environmental damage of plastics, but is related solely to their price. The tax has recently been under review by the Ministry for Environment, Science, Technology and Innovation (MESTI), but it is unclear whether the tax will be reformed (MESTI 2020).

**Box 1: Environmental taxes: ad quantum or ad valorem?**

Nominal environmental tax rates can diminish over time due to inflation if the instruments are designed as per-unit taxes (ad quantum), i.e. per litre of fuel. If taxes are designed in this way, policymakers are likely to refrain from regularly increasing the rate as they do not want to be perceived as “tax hikers”.

At the same time, high inflation rates – or low rates of inflation over a long period – will effectively reduce the capacity of the tax to contribute to the environmental goal because while all other prices, and ad valorem taxes, will increase, per-unit taxes will not.

In Germany, the main environmental tax instrument (the Ecotax) is a per-unit tax on different types of fossil energy first introduced in 1999. The Ecotax is not pegged to inflation, and its rate has not been increased since 2003. As a result, a low rate of inflation over a long period coupled with high inflation rates in 2022-23 has greatly reduced the tax rate in nominal terms, and in its capacity to influence the behaviour of consumers and businesses. Accounting for inflation, revenue from green fiscal instruments would need to be 19% today to be on the same level as in 2003 (in real terms) (FÖS 2022b).

Several other EU countries (e.g. Denmark, Sweden, the Netherlands, Portugal, Romania or Cyprus) automatically adjust their per-unit environmental taxes to inflation to avoid this devaluation of the tax. Similarly, European Commission proposals to reform the Energy Tax Directive in 2021 suggested the introduction of an automatic adjustment of energy tax rates to “take into account the evolution of their real value in order to and preserve the current level of rate harmonisation.” (European Commission 2021b, p.14)

#### 4.3.3 Water pollution fees in Mongolia

In Mongolia, a Water Pollution Fee Law was introduced in 2019 to replace the 2012 Law on Water Pollution Fees. Under the Law, a fee was levied for discharging water, but this incorporated an overly complex model for establishing pollution charges and was ultimately never implemented. Although the 2012 Law defined water polluters and set pollution charge rates, it had still not been applied in 2018, as secondary legislation necessary for implementation had not been introduced (UNECE 2018).

Underlying the 2019 Water Pollution Fee Law is the polluter pays principle (World Bank 2019). The revised Law seeks to increase revenue generation and was accompanied by several legal documents including discharge permits and a methodology for estimating water pollution in wastewater. The rate of water pollution fees is determined by parliament for each river basin on the basis of an "ecological- economic evaluation" (Dombrowsky et al. 2018). The Law seeks to increase revenue and encourage wastewater treatment at the source of pollution (Schoderer and Dombrowsky 2020). While it is not ideal, the new proposal encapsulates a better tax design, which uses a proxy to estimate pollution emissions.

Although the design of the measure has improved, since 2012, there is still little data and monitoring of pollutant emissions (Schoderer and Dombrowsky 2020). Nevertheless, the effective implementation and enforcement of the newly designed charges are expected to lead to a reduction in pollution loads discharged by highly polluting activities and to enhance the effectiveness of water treatment processes. The fee is expected to avoid discharge of over 61 million cubic meters of effluent into the Tuul River (Water Resources Group 2020). Fees have already catalysed innovation in small-scale wastewater treatment systems.

#### 4.3.4 Timber taxes under the household energy strategy in Niger

An example of a well-designed and targeted environmental tax was identified in Niger, which imposes a tax on locally produced timber and fuel wood by species, established in 1992 within the framework of the Household Energy Strategy (HES) under Decree No. 92-037. In this case, taxes incentivise environmentally sustainable behaviours and ecologically sustainable forestry. Revenues flow to local management structures and village communities.

A key principle of the tax is that it is differentiated in line with the classification of the specific forest area from which wood is sourced and sold. 'Controlled' wood originates in forested areas with a detailed forest management plan, which specifies annual cutting quotas and restoration activities. 'Guided' wood originates in defined areas, without formal management plans. Purchase of wood sourced from 'uncontrolled' areas is discouraged by much higher tax rates. In this way, the tax encourages sustainable harvesting within well-managed forests.

At the same time, the taxes levied on timber also vary depending on the species of tree and log diameter, with rarer trees subject to higher tax rates (Hamissou 2002). Finally, stacked wood for sale at markets is taxed at lower rates in rural markets further away from urban centres to disincentivise unsustainable logging at the fringes of towns and cities.

Field research in 2010 revealed that forestry was ecologically sustainable, dead trees were harvested as a priority, and forest vegetation regenerated (Rives et al. 2010). The approach has also increased the recognition of the economic value of standing trees, and the forestry sector is an important contributor to GDP growth in Niger and to the empowerment of communities (Hamissou 2002).

**Recommendation:** To ensure that environmental taxes are designed to deliver environmental improvements, governments in non-OECD countries should take steps to build up sufficient human and technical capacity to design taxes appropriately and to collate the necessary evidence to inform this design process through an in-depth preparation process. Governments can draw on a wide range of resources available in the public domain, such as the forthcoming ATAF toolkit for environmental taxation, and other publications on best practice in environmental tax policy. Development partners can support this process through peer-to-peer exchange, study visits, and technical support.

## 4.4 Lesson 4: Environmental effectiveness is often limited due to low tax rates

### 4.4.1 The theory of setting environmental tax rates

Setting environmental tax rates is a challenge in both OECD and non-OECD countries, not least because taxation in general is politically sensitive and often strongly opposed by influential interest groups. Deviations from the theory are frequent. Theoretical approaches to setting the tax rate have evolved over time, from Pigouvian taxes, named after Alfred Pigou, to the more practical “standards and pricing” approach of Baumol and Oates (Pigou 1932, Baumol and Oates 1998). However, there is a great deal of evidence that neither approach is consistently applied in practice, for political economy reasons.

Initially, environmental taxes were referred to as Pigouvian taxes, after Alfred Pigou, and were conceived of as taxes that are set at a level which internalizes all external environmental costs within the price of a polluting good or behaviour (Pigou 1932). In practice, however, calculating the value of an environmental externality is not a simple task, and results may be disputed. Building a consensus around a tax set using this approach – particularly if the resulting tax rate is very high – might prove challenging for policymakers. Furthermore, calculating these costs tends to engender a high tax rate which is not met with political acceptance.

Tax rates in the European Union (EU) are a reflection of this. In the EU, where environmental taxes are relatively common, polluters do not pay taxes commensurate with the environmental costs associated with their behaviours. In the case of air pollution, it is estimated that only around 44% of the total costs are internalised (European Commission 2021a). In other areas of environmental damage, internalisation rates are far lower, e.g. 16% for point sources of water pollution, and less than 1% for waste treatment (European Commission 2021a). Similar results have been found in individual EU countries, e.g. in Germany. Comparing annual environmental and human health damages with green fiscal revenues in Germany suggests that the latter only make up 18% of external effects (FÖS 2022a).

An arguably more practical approach than the quantification of external costs is known as the “standards and pricing procedure” (Baumol and Oates 1998). In this case, an environmental tax rate is set at a level (the price) which can be expected to deliver a particular environmental objective (or standard). However, even in this case, finding the appropriate initial tax rate is not a simple exercise, and in some cases – where elasticity of demand is relatively low – implementing a high enough tax rate to bring about a desired objective may prove politically difficult. This approach calls for predictable tax rate increases to establish a stable policy environment and encourage investment (OECD 2010).

Ultimately, very few environmental tax rates are set in line with the theory, however, as political economy considerations ultimately drive tax rates down. The cases below exemplify the challenges governments face. In Nepal, the pollution control tax rate is simply too low to incentivise reduced pollution (see 4.4.2). In Guyana, the environmental levy has not been adjusted for many years and has lost its incentive effect due to inflation (see 4.4.3). In Tunisia, the water tariff structure does not encourage efficient water use, as tariffs levied on water consumption by volume make up only a small proportion of water bills (see 4.4.4). Best case examples are provided by two-tier licence fees to reduce pollution in Malaysia (see 4.4.5), the environmental harmfulness index developed to inform tax rate setting in Peru (4.4.6) and the carbon tax escalator in the Republic of South Africa (4.4.7).

#### 4.4.2 Nepal's pollution control tax: too little to incentivize behaviour & non-transparent use of funds

In Nepal, there is a pollution control tax of 1.5 Nepalese rupees (0.01 USD) per litre of gasoline and diesel.<sup>14</sup> The government clearly communicates that the tax has an explicit environmental purpose. In the fiscal year 2021/2022 AD, revenue from the tax was about 3.7 billion Nepalese rupees (USD 28 million) per year – 30 % from petrol, 70 % from diesel, according to data from the National Oil Corporation of Nepal.

The tax rate is not high enough to create incentives to discourage the consumption of fossil fuels and incentives a fuel switch to electric mobility. At current market prices for diesel and fuel (around 180 Nepalese rupees), the tax rate is equivalent to less than one per cent of the price paid. There are several additional taxes levied on gasoline and fuel: VAT, customs duty, road maintenance tax, infrastructure development tax. All of them have a higher tax rate than the pollution control tax.

In practice, the tax rate is too low to internalise the cost of the externalities associated with fossil fuel use in the transport sector, and is too low to change behaviour as required by the standards and pricing approach. Primarily, the tax raises revenue that flows into a government fund. Reports suggest that the fund's revenues are not being spent on environmental purposes (Himalayan News Service 2022).

#### 4.4.3 The erosion of Guyana's environmental levy due to inflation – the case for regular reviews of for per-unit taxes

Guyana introduced an environmental levy on non-returnable beverage containers made from glass, metal, plastics, and cardboard in 1995. The tax rate was – and still is – set to 10 Guyanese dollar (0.05 USD) – per container. It is a per-unit tax and not ad-valorem. During this period, inflation has increased consumer prices by an average of 289%. Thus, over time, the levy has lost its value in real terms and thereby a proportion of its potential to influence consumer behaviour (to use less single-use beverage containers) as a result of the failure to adjust the levy rate to inflation.

To have the same “steering effect” today as in 1995, the tax rate would need to be three times as high as it is. Such a regression of a per-unit tax can be addressed by regularly reviewing the rate. This is especially pertinent for the Guyana case, as the country is expecting higher rates of inflation due to the oil and gas boom and induced inflationary pressures.

#### 4.4.4 Poor tariff structures incentivise inefficient consumption: water tariffs in Tunisia

In Tunisia, the inclining rate tariff for water consumption should in theory create a strong incentive in favour of water conservation. However, it is undermined by low tariffs for the vast majority of consumers, even those that consume relatively large volumes of water, and a standing charge which makes up the bulk of water charges for the average consumer. The negative and distortive impacts of these tariffs are explained in more detail below.

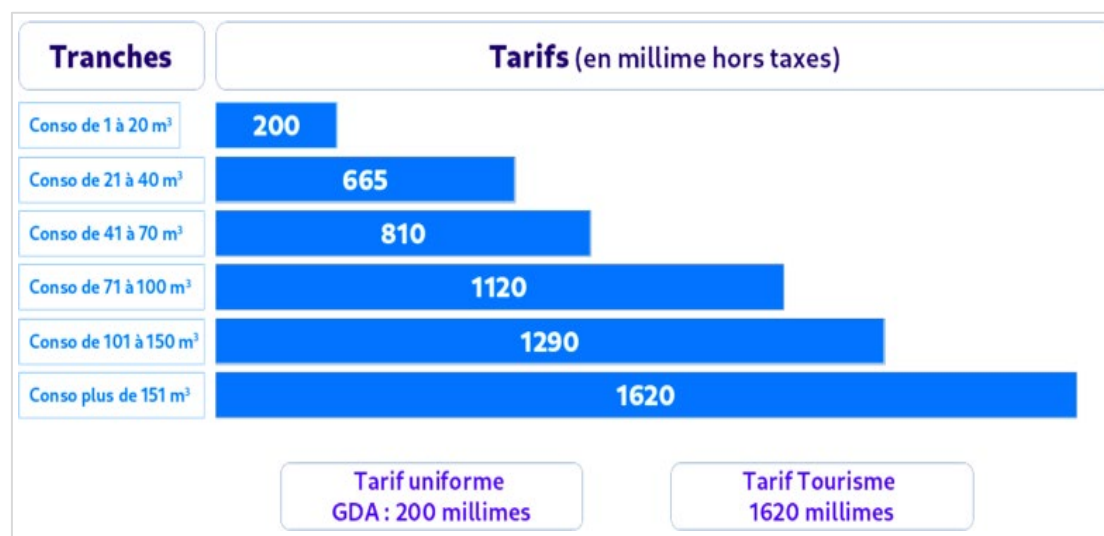
In Tunisia, drinking water prices are progressive by volume consumed, if water is supplied by the *Société Nationale d'Exploitation et de Distribution des Eaux* (SONEDE), the state-owned enterprise responsible for drinking water supply, covering 100% of the urban population and 51% of the rural population. Prices vary by sector, type of dwelling, and a standing charge levied on the diameter of the pipe and the water meter (*compteur*). Tariffs charged by SONEDE for quarterly

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<sup>14</sup> Initially, the tax rate was set only to 0.5 rupee / 0,004USD.

water consumption are shown in Figure 2.

Figure 2: Drinking water tariff blocks charges per quarterly consumption volumes (in millimes, excluding taxes)



Source: SONEDE 2022, see <https://www.sonede.com.tn/accueil/contenu-principal/espace-client/tarification-de-leau-potable>

The inclining rate tariff (IRT) – a tariff where the price paid depends on the water consumption level and total consumption is charged at the rate of the top block – means that a small increase in consumption may lead to a substantial rise in the price per unit of water. Indeed, the price increase between the lowest block and the second block is 232% (Favre and Montingoul 2018). In this regard, an IRT has the advantage of creating a strong incentive for water conservation and increases the potential to collect revenue, but risks penalising larger poor families unable to limit their water consumption while meeting their health and hygiene needs.

However, consumers also pay a standing charge based on the diameter of the pipe and water meter. The standing charge is not proportionate to the cost of water for those on the lowest tariff, and it undermines the progressive intention of the IRT, as well as its incentive effect. Around 99% of consumers pay the lowest standing charge of TDN 5,900,<sup>15</sup> but this makes up the bulk of water charges for an average consumer in the lowest block, which makes up 44% of all consumers (SONEDE 2019).

If consumption tariffs were increased, and the standing charge decreased, then stronger incentives for efficient water consumption could be realised, without regressive impacts, as household water expenditure in Tunisia is low and accounts for an estimated average of 0.54% of total household expenditure, and even just 1.5% for the poorest 20% of households – well below the generally used benchmark of 3% (World Bank 2018b). For the bulk of households, ability to pay would not be a concern in the face of a moderate price increase.

<sup>15</sup> A Tunisian Dinar (TND) is subdivided into 1,000 millimes. Hence, the currency is expressed with three zeros after the decimal point.



#### 4.4.5 Two-tier license fees on effluent emissions in Malaysia

An example of an environmentally effective approach to tax rate setting can be seen in the two-tier license fees charged on effluent emissions to land and watercourses introduced in Malaysia in 1978, largely targeting pollution emissions from palm oil mills. A package of measures was introduced: a pollution fee (referred to as a licence fee), effluent standards, and subsidies for research and development in the form of tax exemptions (Kathuria 2006). Pollution fees consisted of a small fixed component and a variable component, with fee rates linked to Biological Oxygen Demand (BOD)<sup>16</sup> concentrations, as well as other factors including effluent output, class and location of premises, and existing level of pollution (Kathuria 2006). Industries paid a low fee if emissions below required BOD standards, but the fee was increased by a factor of 10 if standards for BOD concentrations were exceeded (Sterner 2002). BOD standards specified year-on-year improvements in effluent emissions of several orders of magnitude e.g. from BOD ppm 25,000 in 1977 to 1,000 BOD ppm by 1980 (Sterner 2006).

Industry responded by building settling ponds to avoid taxes, and innovating, marketing palm oil sludge as animal feed or using it as fertilizer, or installing biogas digesters to produce methane from treatment processes (Bluffstone 2003). Revenue amounted to USD 1.2 million in 1978, the first year the license fee was levied. However, as pollution was reduced, revenue fell rapidly, to just USD 136,000 in 1991 – a fall of 86% (Sterner 2002). While it is not possible to disaggregate the impact of the tax from other measures, the package reduced BOD load dramatically in spite of construction of new mills (131 in 1975 to 225 in 1985) and BOD load fell 99% by 1985 (Kathuria 2006).

The success of the package can be attributed to the combination of standards, fees, and subsidies. Standards specified a path for rapid pollution reduction, fees created strong incentives to act quickly and decisively, subsidies supported innovation, and stringent enforcement prevented avoidance and evasion (Sterner 2002, Kathuria 2006).

Subsequently, fee rates per unit of pollution were not increased for 20 years and were gradually undermined by inflation, resulting in similar problems to those described above in Guyana and Nepal (Hojat and Rahim 2012).

#### 4.4.6 The environmental harmfulness index in Peru

A best practice case of tax design can be found in Peru. The ISC – the *Impuesto Selectivo al Consumo* – is the most important environmental tax in the country, implemented through Law 28694 in 2006. The ISC is an indirect, specific, and selective consumption tax on the import, production, and sale of goods that generate various negative externalities for society. Revenues raised by the ISC flow into general budget.

ISC tax rates are guided by a ‘Harmfulness Index’ – Índice de Nocividad de Combustibles (INC), an index agreed between the National Environmental Council and the Ministry of Finance. The index expresses a scale of harmfulness to public health and/or the environment generated by the taxable good, with consumption by economic activity, sources of emissions, and available technologies considered (Alvarado and Garreta 2021).<sup>17</sup>

The INC index takes the cleanest fuel available in the country, natural gas, as a reference base (=1) and creates a ranking of fuels used in Peru based on their polluting potential (see Table 3) (OECD

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<sup>16</sup> BOD is the amount of dissolved oxygen needed (demanded) by aerobic biological organisms to break down organic material present in a given water sample at a certain temperature over a specific time period.

<sup>17</sup> The index does not take negative externalities associated with CO<sub>2</sub> emissions into account.



2017). Fuels used in the transport, electricity, industrial and residential sectors are included.

*Table 3: Examples of indices of relative toxicity of fossil fuels in Peru 2020-2021*

Product	Natural gas	LPG	Coal	Gasohol 90+	Diesel S50/S5000	Gasohol 84	Industrial petroleum 500
Multiplier	1	2.3	6.2-9.5	10.7-13.1	14.2-16.7	29.5	36

Source: Ministerio de Ambiente (2022).

The ISC also incorporates an ad valorem tax on vehicle sale value; 10% on new gasoline and 20% on new diesel vehicles, and 40% on used vehicles. Electric and hybrid vehicles are exempt (Alvarado and Garreta 2021). In 2018, ISC tax rates were modified taking their degree of harmfulness into account, to strengthen incentives in favour of cleaner fuels. The most polluting diesel was taxed at PEN 1.70/gallon (USD 0.12/litre), the most polluting gasoline at PEN 1.27/gallon (USD 0.08/litre).

The INC index provides clear guidance for policymakers on appropriate environmental tax rates and can help to avoid harmful substitutions and distortions attributable to the introduction of unsuitable tax rates that do not reflect the relative harmfulness of goods and services.

Revenues from the ISC have been falling in recent years. This has been as a result of reduced consumption of the most environmentally harmful fossil fuels, and fuel shifting towards new and LPG-powered vehicles, as well as the increased share of gas in the energy mix, up from 29% in 2008 to 75% in 2016. In future, modelling predicts that higher ISC rates can be expected to result in greater reductions in air pollution (Colquehuanca et al. 2020).

#### 4.4.7 The carbon tax escalator in the Republic of South Africa

From its introduction in 2019, the initial carbon tax rate in the Republic of South Africa was USD 8/tCO<sub>2e</sub>. Exemptions and conditions which keep actual carbon rates 60-95% lower than this rate – depending on the type of emitter and the tax base – will be in place until 2026, dampening the incentive effect of the tax (GoSA 2020). In the longer-term, this is set to change as a carbon tax escalator comes into force.

In 2022, the tax rate increased to USD 9/tCO<sub>2e</sub>. The rate is due to increase by at least USD 1 annually to reach USD 20/tCO<sub>2e</sub> by 2026. Post-2026 the tax escalator will accelerate, so that the tax rate reaches USD 30/tCO<sub>2e</sub> by 2030 and USD 120/tCO<sub>2e</sub> beyond 2050. In 2023, carbon budgets, which set a maximum volume for GHG emissions in key sectors, will become mandatory and will be implemented alongside the carbon tax. The Treasury has proposed that companies exceeding their carbon budget are fined USD 38/tCO<sub>2e</sub> (National Treasury 2022).

If implemented as planned, the tax rate escalator will help deliver substantial emissions reductions. Without the initial tax exemptions described above, a 26% reduction in GHG emissions by 2035 in comparison to a Business as Usual (BAU) scenario was predicted, alongside an annual fall in GDP growth of 0.05-0.15% on BAU, as well as 200% more clean energy than without the tax by 2035 (PMR 2016).

**Recommendation:** Environmental taxes often face strong opposition when they are proposed, and it is not easy for governments to implement rates in line with the theory. Governments can develop a harmfulness index, to inform environmental tax rate setting, or introduce environmental tax escalators, where the tax rate increases gradually each year, and is adjusted to take inflation into account. Escalators create policy stability (because tax rate increases are legislated for), dynamic incentives for economic actors to change their behaviour, tend to deliver a stable revenue stream (at least in the short and medium term) and enable taxes to be introduced at a relatively low rate without undermining the environmental effectiveness in the medium term.

## 4.5 Lesson 5: Good tax governance: design taxes to minimise administration costs and tax evasion and close loopholes

### 4.5.1 Differences in Public Financial Management in OECD and non-OECD countries

Many non-OECD countries face substantial governance challenges and weaknesses in public financial management, as many Public Expenditure and Financial Accountability (PEFA) reports attest.<sup>18</sup> As a result, there is a significant difference between the capacity of OECD and non-OECD countries to design and administrate taxes (see e.g. Besley and Persson 2014). Many non-OECD countries have large tax gaps, e.g. in Ghana, the estimated VAT gap ranges from 18% to 39%, the import tax gap averaged 33% from 2012-2016, and the Corporate Income Tax gap is estimated between a range of 82-86% (World Bank 2020).

These weaknesses have an impact on the amount of tax countries are able to raise. Taxes raised revenue equivalent to 16% of GDP on average in 2020 in 31 African countries, 19.1% on average in 28 countries in Asia-Pacific, and 21.9% in Latin America and the Caribbean: all substantially lower than the OECD average of 33.6% (OECD 2022). This discrepancy does not reflect differences statutory tax rates but reflects the fiscal and administrative capacity to collect and enforce taxes and so prevent evasion and tax avoidance, the size of the informal economy, and a number of other factors, such as tax competition. To address this problem, reducing tax evasion and avoidance and working to enhance simplicity and transparency in the tax system should be priorities for all countries (Cottrell and Falcão 2018).

Good financial governance has the potential to create a virtuous circle of enhanced trust in government, improved tax compliance and as a result, increased tax revenue, and institution-building (Besley and Persson 2014, Bräutigam 2008). Indeed, taxation is one of the central functions of a State, necessary to raise revenue and provide the services required to support a society and its underlying economy (Besley and Persson 2014, Murphy 2015). Many experts contend that a transparent and functioning public financial management system may impact positively upon the public sense of solidarity and responsibility and so boost tax morale, and that taxation itself has the potential to “foster state building both by providing a focal point for bargaining between the state and citizenry and through the development of high-quality institutions for tax collection” (Keen 2012:19). Conversely, if environmental taxes are implemented poorly, the credibility of the tax is undermined and with it, political acceptance for the measure. The virtuous circle can in this case be replaced by a vicious circle of deteriorating fiscal governance, lack of trust in government, reduced tax compliance, etc.

These differences create a different context for the implementation of environmental taxes in

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<sup>18</sup> PEFA reports can be accessed here: <https://www.pefa.org/>

non-OECD countries.

#### 4.5.2 Governance of green taxes: considerations for non-OECD countries

In many non-OECD countries, a large informal sector limits the capacity of governments to raise revenue through direct taxes on income. Indeed, in much of sub-Saharan Africa, the informal sector accounts for as much as 50% of total employment. Introducing environmental taxes which are collected from a limited number of large taxpayers at the start of value chain e.g. at the point of extraction or import is a possible means to minimise evasion, as revenue is collected from relatively few taxpayers (Pereira et al. 2013). Moreover, when levied upstream, environmental taxes can raise revenue from both formal and informal sectors and if well-designed and administrated, are also difficult to evade.

Some authors have suggested that if revenues are recycled strategically, e.g. by introducing new or enhancing existing social welfare benefits accessible to those in the formal sector, then there may be a possibility for governments to use revenues from environmental (or other) tax measures to encourage formalisation (Fay et al. 2015, Cottrell et al. 2018).

In non-OECD countries, it is quite common for import duties to be greened, either through the introduction of additional environmental taxes, such as levies on the import of electrical appliances in Uganda, or through tax subsidies, such as zero rating of import duties and VAT on renewable energy equipment in Ghana. Our research looked into several environmental taxes levied at the point of import, both tariffs or excise duties, e.g. taxes on plastics or plastic bags in Ghana, Morocco, Tanzania and Tunisia. Yet reforming existing taxes may not deliver an ideal tax design, but create a system with omissions or loopholes, as demonstrated by the case of Uganda's import tax on second-hand vehicles (4.5.3) and Ghana's plastics tax (4.5.4).

Well-functioning and transparent environmental taxes may provide a good basis to combat corruption and weak governance and compliment other efforts to strengthen PFM (Fay et al. 2015). Linking environmental taxes to existing, functioning tax collection mechanisms can reduce evasion, minimise administrative costs, and maximise the potential revenue raised, as in the case of India's Clean Energy Cess (see 4.5.7). This approach of linking to existing collection mechanisms may also help to overcome resistance from within tax administrations (Cottrell et al. 2018).

Poor financial and institutional governance of environmental taxes can undermine trust in the measures themselves. Boycotts of environmental taxes may even result – research for this report found anecdotal evidence of plastics tax boycotts in Morocco, for example, in protest at a lack of transparency in spending of revenue. Examples of the pitfalls of failure to fully implement GFP measures in Ghana and Liberia (see 4.5.4 and 4.5.5) are described, and alternative models explored, such as the empowerment of local communities to collect revenue in Niger (4.5.6).

A final consideration for non-OECD countries is how to address challenges associated with monitoring of pollution emissions. Reform of pollution charges and the implementation of an Environmental Protection Tax Law on a wide range of pollutants in 2018 in China has addressed some of these issues by shifting collection to regional government (see 4.5.8).

#### 4.5.3 Environmental levy on second-hand motor vehicle imports in Uganda

Tagging onto existing collection mechanisms may result in loopholes or emissions in the tax law.

In Uganda, taxes on vehicle imports were reformed in 2015 and environmental considerations introduced. In this way, a green tax was implemented within existing tax collection mechanisms, through the greening of an existing tax.

Import tariffs following the environmental tax reform were 35% on passenger vehicles between six and nine years old, and 50% on vehicles over 10 years old (Forster and Nakyambadda 2021). An import ban was implemented in 2018 on vehicles older than 15 years, tax rate was increased to

35% on vehicles 5-8 years old and 50% on vehicles older than 8 years imported before the 2018 Traffic and Road Safety Act 2018, goods vehicles over 5 years old 20% levy (Granger et al. 2021, Republic of Uganda 2019).

A clear disadvantage of this strategy was that the levy on second hand motor vehicles did not – and was not designed to – impact the domestic vehicle fleet. This is an important lesson from the measure: the domestic market should also be considered when designing an environmental tax, to prevent unwanted substitutions, such as the 35% increase in registrations of vehicles older than 16 years within Uganda (Foster and Nakyambadde 2021). That said, modelling indicates that the Levy reduced imports of vehicles between 5 and 16 years old by 41% - 48%, while first-time registrations for vehicles increased by 19% (Foster and Nakyambadde 2021).

#### 4.5.4 Levies on plastics and e-waste in Ghana

Both environmental levies have faced problems in their administration and effective implementation due to governance shortcomings.

The environmental tax and levy on plastics was introduced in 2013, levied both on virgin plastic materials and plastics products (polythene bags, plastic packaging materials). The tax is realised through a 10% excise duty on the Cost, Insurance and Freight (CIF) value of plastics at the point of import (not including manufactured goods), or on the ex-factory price of plastics (Government of Ghana 2013).

When the tax was introduced, it was envisaged that at least 50% of revenues from the tax should be paid into the Plastics Waste Recycling Fund for recycling of plastics waste, production of waste bins and bags, and production and use of biodegradable plastics. However, at the time of writing in 2023, the Plastics Waste Recycling Fund had still not been created, and revenue had flowed into the general budget instead (Netherlands Enterprise Agency 2019). Industry has criticised the government, and the Ghana Plastics Manufacturers Association has issued statements calling on the government to set up an administrative structure for the Fund and release revenues, it appears that very little progress has been made, and that expectations that the Fund will be created are relatively low.<sup>19</sup>

An e-waste levy was introduced as part of the Hazardous and Electronic Waste Control and Management Act (Act 917) in Ghana in 2016, and an associated Electrical and Electronic Waste Management Fund set up to manage revenues raised through the levy, to reduce adverse impacts of e-waste on the environment and human health (Republic of Ghana 2016). The levy has been collected since 2018, according to the Environmental Protection Agency (EPA 2018). Yet also in this case, the Fund does not yet exist, although it seems to be in the pipeline and may be established in the near future. Since 2018, when collection of the e-waste levy commenced, no audited accounts of revenues collected through levy have been published.

Past weaknesses in the administration of these environmental levies, and lack of transparency in the administration of the environmental tax instruments, has the potential to undermine trust in government and willingness to pay environmental taxes and levies on the part of business. There is evidence, however, that the Electrical and Electronic Waste Management Fund will become operational in the near future: its operation is one element in a broader roadmap for Circular Economy and Extended Producer Responsibility currently in development in Ghana.

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<sup>19</sup> Information from interviews with in-country experts.

#### 4.5.5 Land rental fees in Liberia

Similarly, poor governance has posed challenges to the collection of area-based land rental fees and the appropriate disbursement of funds for sustainable forest management to forest communities in Liberia. Between 30% and 55% of land rental fees are legally required to be disbursed to the subnational level and to forest communities, depending on the ownership model (Hoare and Uehara 2022). However, revenue redistribution is intransparent. In the period up to 2017, a total of USD 2.6 million had been paid to the National Benefit Sharing Trust – a figure which falls far short of the 30% of land rental fees due to forest communities: indeed, the shortfall has been estimated to amount to USD 5 million (Hoare and Uehara 2022). A proportion of this is due to low collection rates and arrears in the payments of area-based land rental fees – USD 3.8 million was owed in 2020, USD 1.14 million to communities. Although revenues are clearly and legally earmarked, community benefits have not been forthcoming (World Bank 2018a).

Nonetheless, Liberia signalled its commitment to a transparent and sustainable forestry sector when it became the first country to report timber extraction in its 2009 Extractive Industries Transparency initiative (EITI) report. Moreover, a new system of disbursing funds was agreed in September 2021, which pays the community share within 24 hours (Hoare and Uehara 2022).

#### 4.5.6 Empowering local communities to collect revenues in Niger

There are alternative models to earmarking revenues other than the creation of national funds – as in Ghana and Liberia – which may be vulnerable to poor governance, institutional weaknesses and corruption. For example, in Niger, a decentralised tax on locally produced lumber and fuel wood species has been in place since 1992, which is collected, managed and disbursed by local populations. The tax was established by Decree No. 92.037, within political framework of the Household Energy Strategy (Hamissou 2002). One clear objective of the regime was to transfer responsibilities to people involved in the development of forest resources, and the transport and sale of wood (Hamissou 2002).

The bulk of revenues from the tax flow to local management structures and village communities, such as village and community development funds, and to local loggers. A proportion of revenue flows to central government to fund administration and monitoring. Distribution of revenues is dependent on the classification of timber exploitation in law – whether it is uncontrolled, guided or controlled (Ministry of Energy Niger 2018). Tax collection appears to be relatively effective under the regime, because villagers are entitled to retain a proportion of the taxes, so they tend “to be levied almost automatically” (Montagne and Amadou 2012:5).

This approach has been effective and there is evidence that the new system has brought about a real improvement in the lives of villagers with investments in healthcare, education, water supply, and new wealth reduced rural-urban migration by 29% and improved food security by 12% (Montagne and Amadou 2012). Because villagers have been permitted to retain a share of the taxes, they have “tended to be levied almost automatically”, and profit margins have shifted in favour of village loggers and away from hauliers (Montagne and Amadou 2012, p.5ff).

#### 4.5.7 The Clean Environment Cess in India

A possible solution to governance challenges can be to tag an environmental tax onto an existing collection mechanism, like excise. For example, the Clean Environment Cess in India was an upstream tax on coal and coal derivatives (peat, lignite) in India introduced in the 2010 Finance Act as the Clean Energy Cess. The original objectives of the Cess were to reduce coal consumption; to raise revenues for and promote investment in renewable energy and R&D via the National Clean Energy Fund (as stated in the Finance Act 2010); to signal financial risks

associated with fossil fuel investments; and to foster investment and boost business confidence in the renewable energy sector (IISD 2020; Cottrell and Falcão 2018). The initial tax rate was very low, equivalent to USD 0.6/tCO<sub>2</sub>, increased 2015 to around USD 5/tCO<sub>2</sub>.

Administration costs are negligible (Cottrell et al. 2013). All producers of coal, lignite and peat are registered with the central excise authority in India. Electronic payments are made monthly on the self-assessment payment basis with adjustments made where producers under or overpay. Hence, the administrative effort of collecting the Clean Environment Cess is minimised to the point where the Ministry of Finance has stated that the Cess was not associated with any additional costs above business as usual (Cottrell et al. 2018).

This collection mechanism is a promising approach for tax administrations where possible governance challenges in relation to tax collection must be addressed.<sup>20</sup> Today, the Cess has been redesigned, and become an important mechanism for Domestic Revenue Mobilisation (see 4.7.2).

#### 4.5.8 The Environmental Protection Tax in China

The Environmental Protection Tax (EPT) is a differentiated tax on enterprises and public institutions that discharge pollutants directly into the environment. In 2018, the EPT replaced an earlier system of pollution charging that had been in place since 1978. The EPT is administrated by regional governments, which set the tax rate, monitor pollution, and collect revenue.

The EPT is a tax on wide range of pollutants, including pollutants to soil, air, and water, noise pollution, and solid waste. Discharges from agricultural production, motor vehicles, ships, aircraft, and legitimate urban sewage treatment plants are exempt (Arimura et al. 2022).

The tax rate varies according to the level of pollution emitted. Penalties for non-payment of fines are five times the tax, with higher penalties for serious offenders. Businesses are given tax breaks for emissions lower than stipulated levels. The EPT specifies a tax rate range of CNY (Chinese Yuan Renminbi) 1.2 to CNY 12 for air pollution (USD 0.19-1.66) and CNY 1.4 to CNY 14 for water pollution (USD 0.19-1.94), with taxes levied on the top three air and top five water pollutants. Example of tax rates are shown in the table below.

*Table 4: Examples of variable tax rates on pollutants in China under the EPT<sup>21</sup>*

<i>(InforEuro exchange rates 8/22)</i>	Low tax rate		Medium tax rate		High tax rate	
	(CNY/kg)	USD/kg	(CNY/kg)	USD/kg	(CNY/kg)	USD/kg
<b>Chemical Oxygen Demand (COD)</b>	1.4	0.19	4.2	0.58	5.6	0.77
<b>Ammoniacal Nitrogen (NH<sub>3</sub>-N )</b>	1.75	0.24	5.25	0.73	7.0	0.97
<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	1.26	0.17	3.78	0.52	5.04	0.70
<b>Nitrous Oxides (NO<sub>x</sub>)</b>	1.26	0.17	3.78	0.52	5.04	0.70

Source: Feng et al. 2020

The reformed design has improved governance and enhanced the effectiveness of the tax and has improved monitoring, collection and accountability at the local level (Arimura et al. 2022). The design, which incorporates differentiated tax rates and high penalties create strong

<sup>20</sup> In relation to governance challenges, it should be noted that the National Clean Energy Fund created to disburse revenues from the Cess to research and development and renewable energy deployment faced governance challenges. Indeed, it has been reported that only 47% of revenue raised by the cess has been transferred to the Fund (Kotha 2017).

<sup>21</sup> Exchange rate as at 06/2023 CMY 1 = 0.1383



incentives in favour of compliance with pollution standards. Regulation of the tax is shared between tax agencies and environmental protection authorities, with the latter providing data on the basis of monitoring for the enhanced implementation of the tax itself (Arimura et al. 2022).

Although the EPT targets the air pollutants SO<sub>2</sub> and NO<sub>x</sub>, it also reduces short-lived air pollutant emissions (particulate emissions including PM<sub>10</sub>, PM<sub>2.5</sub>, CO, VOCs, NH<sub>3</sub>, BC) and CO<sub>2</sub> emissions, particularly in regions with large economic scale and sectors with high emissions intensity. At national level, deviation from Business as Usual is estimated to amount to -2%, although this is higher in some with higher levels of industrial activity (Xiurong Hu et al. 2019).

**Recommendation:** Governments in non-OECD countries should design environmental taxes in ways which get-around the fiscal governance challenges they face, e.g. by linking to existing well-administrated collection mechanisms or decentralising tax collection, and should draw on international support to improve collection rates, reduce tax gaps and improve governance of both collection and disbursement of revenues. Development partners can support through technical assistance to enhance public financial management in line with PEFA and climate-responsive PEFA reports, which will highlight weaknesses in climate and environmentally relevant taxation.

Governments in non-OECD countries may wish to focus on introducing environmental taxes which are collected from a limited number of large taxpayers, e.g. at the point of import (Pereira et al. 2013). Particularly in countries with large informal economies, targeting households or SMEs by means of direct taxes implies a significantly higher administrative effort for tax collection and monitoring, alongside low revenue potential (Cottrell et al. 2018).

## 4.6 Lesson 6: Understand and address equity impacts

Due to its importance, this section on understanding and addressing equity impacts is comparatively long. The first two sub-sections address theoretical considerations (4.6.1 and 4.6.2), followed by a series of cases to highlight lessons learned – in the Philippines on the imperative to implement social welfare measures effectively (4.6.3), evidence of the progressive effects of vehicle taxes in Rwanda and Ghana (4.6.4), progressive fuel excise in Kenya (4.6.5), luxury taxes on vehicles in Indonesia (4.6.6), and progressive taxes on environmental pollution from vehicles in Ecuador (4.6.7).

### 4.6.1 Inequality and environmental taxation

There are four dimensions of inequality associated with environmental taxation:

1. inequality of exposure to environmental degradation
2. inequality of contributions to pollution
3. inequality of representation in policymaking
4. inequality of outcomes resulting from environmental taxation (Chancel and Piketty 2015).

A brief explanation of the first three can be found below.

Concerns regarding inequality of outcomes are perhaps the single most important barrier to the implementation of environmental taxes, particularly in non-OECD countries, which tend to have more unequal societies and large proportions of the population living close to the poverty line, and thus vulnerable to even small price increases, and a less efficient welfare state. Consequently, the remainder of Section 4.6 is devoted to an analysis of the inequality of outcomes, and how they might be addressed by environmental tax design.

#### *4.6.1.1 Inequality of exposure*

Climate related shocks and environmental degradation pose a serious long-term threat to poverty eradication and the achievement of the SDGs (Hallegatte et al. 2016). Poorer populations have fewer resources to respond appropriately to environmental degradation or natural disasters and as a result, suffer most from the impacts of exposure to harmful levels of pollution. They also tend to benefit disproportionately from environmental improvements as I tend to live in informal settlements with poor sanitation and in areas with poor air quality (Cottrell et al. 2016). In Bolivia, amongst the groups most affected by mercury pollution stemming from artisanal gold mining in the Amazon region are indigenous groups, women and children (Graham 2022, Orellana 2022).

#### *4.6.1.2 Inequality of contributions to pollution*

The inequality of contributions to pollution is well documented. In the case of GHG emissions, the wealthiest 10% of the global population emitted an estimated 48.0% of the total in 2019 and the poorest 50% of the world's population 11.5% (Chancel 2022). As a matter of course, then, implementing the polluter pays principle will have a much greater impact on wealthier income deciles than on poorer income deciles. At the same time, it is important to recall that even small changes in the price of commodities can have a negative impact on the poorest and most vulnerable. It is therefore crucial to ensure that the poorest can be protected from any regressive effects of environmental taxes.

#### *4.6.1.3 Inequality of representation*

This stems from lower levels of involvement of poorer and more vulnerable social groups in the policy process. The urban and rural poor, women, children, ethnic minorities, the elderly, and populations in geographically remote locations tend to input to the policy process far less than wealthier income groups and so, their needs and vulnerabilities are often less well understood (Cottrell and Falcão 2018). This is desirable also from the perspective of enhanced environmental effectiveness: inclusion of marginalised groups in decision-making is likely to have implications for the environmental effectiveness of policies, particularly where communities have longstanding traditions of natural resource management (Hallegatte et al. 2016). This is a case in point in Ecuador, where the involvement of local communities plays an important role in Mangrove restoration and can improve its effectiveness (Morocho et al. 2022).

### **4.6.2 Inequality of outcomes: general findings**

In the literature, general trends can be identified regarding the progressivity and regressivity of environmental taxes (see e.g. Cottrell and Falcão 2018). However, the majority of analyses focus on carbon-energy taxes, rather than other types of environmental tax, where the literature is much less established. This is a significant omission, as livelihoods in LMICs tend to be closely linked to ecosystem services, natural resources and environmental assets and as a result, these kinds of environmental taxes with relevance to natural resources, forestry and ecosystems may be regressive and have specifically negative impacts on vulnerable groups. Identifiable trends by tax base are described below.



#### 4.6.2.1 *Transport and mobile sources of energy*

Research has shown that taxes on mobile sources of energy or taxes on transport in low- and middle- income countries (LMICs) tend to be progressive – although this may not be the case for artisanal fishers or micro, small and medium-sized enterprises (MSMEs) (Flues and Dender 2017, Morris and Sterner 2013). Indeed, transport fuel taxes have been shown to be strongly progressive in LMICs (Morris and Sterner 2013; Pizer and Sexton 2017). In countries with relatively unequal income distribution, fuel and transport taxes may act as “luxury taxes”, affecting high-income households more than the poor, e.g. in Mexico, 52% of the carbon tax on gasoline was initially paid by the richest income quintile (Cespedes 2015). Similarly, an analysis of consumption distribution of transport fuels and private vehicle ownership in selected Sub-Saharan African countries conducted by Granger et al. (2021) reveals a similar pattern: the wealthiest households spend by far the largest share of their household budgets on motorised transportation, and so taxing transport fuels (for private use) and vehicle purchase and ownership tends to be progressive.

#### 4.6.2.2 *Stationary energy sources*

Findings are less clear for stationary sources of energy. Some researchers have found that carbon and environmental taxes on stationary energy uses – such as electricity taxes, pollution taxes on power generation, or taxes on fossil fuels – are often progressive in countries with low electrification rates, or where energy- consuming durable goods are beyond the reach of poorer households (see e.g. Dorbrand et al. 2019; Liu 2013; Ohlendorf et al. 2021; Pizer and Sexton 2017). As incomes and energy consumption rise, energy taxes are likely to have a disproportionate impact on low-income households (Pizer and Sexton 2017).

#### 4.6.2.3 *Pollution and resources*

There has been less research into the equity impacts of environmental taxes on pollution and resources. In common with other indirect taxes on non-luxury goods, it is reasonable to anticipate negative equity impacts in cases where green taxes directly affect the livelihoods or expenditures of poor households (Cottrell and Falcão 2018). Even in cases where the impacts of green taxes are progressive overall, effective welfare losses may be substantial in the absence of mitigation measures: even an apparently small increase in expenditure can be significant for households living in poverty (see e.g. Steckel et al. 2021).

When predicting the impacts of green taxation on social equity, direct price increases are not the only factor that should be considered. Taxes may have indirect impacts on commodity and product prices; if these prices are passed through and ultimately lead to e.g. higher food prices, negative equity impacts are likely to result. These impacts are difficult to predict, and depend on the consumption baskets of poor households, their ability to substitute for greener alternatives, and their direct and indirect sensitivity to changing transport, energy, or commodity costs (Fay et al. 2015).

#### 4.6.2.4 *Environmentally harmful subsidies are almost always regressive*

It is also worth noting in this context that environmentally harmful subsidies tend to have regressive impacts, with lower income deciles receiving far fewer subsidy benefits than wealthier income groups. In LMICs, the wealthiest 20% of the population capture 61% of gasoline subsidies and 42% of diesel subsidies, while the poorest 20% receive just 3% and 7% respectively (Coady et al. 2015). Similar distribution patterns can also be observed for other types of subsidy as well. In Tunisia, the wealthiest 20% of households typically consume four times more water than the poorest 20% and capture a far greater proportion of subsidies as a result (World Bank 2018b).

#### 4.6.3 Failure to implement social mitigation measures in the Philippines

As already discussed in Section 4.4, distributional concerns tend to exert a strong downward pressure on environmental tax rate setting. The Philippines is a case in point. The initial tax rate on coke and coal was too low to reduce emissions from combustion of coal and coke or to have significant negative equity impacts. A good design feature is that the tax is an escalator, and the rate increased from USD 0.95/tonne in 2018, USD 1.91/tonne in 2019 and USD 3.83/tonne in 2020, equivalent to an effective carbon rate of USD 1.73/tCO<sub>2</sub> in 2020<sup>22</sup> – which is still a relatively low rate (ASEAN Post 2018, ECR calculated on the basis of data from OECD 2021c).

It is thus unsurprising that modelling has found that the tax barely impacts on households, with an estimated additional cost of USD 0.03 per month for every 100 kWh of electricity consumed (ASEAN Post 2018). Because wealthier households consume more energy, the coal tax is marginally progressive – wealthier income deciles pay more tax. On average, modelling indicates that the tax accounted for 0.01% of household income in 2018, 0.02% of total household income in 2019, and 0.03% of household income in 2020 (Manasan 2018). Even with the escalator in place, the impact was negligible.

In the Philippine case, reforms to coke and coal excise were implemented as an element of a broader tax reform – the “2017 tax reform for acceleration and inclusion”, a package of revenue-raising and revenue-losing measures which aimed to create a broad-based, low tax regime (for details see Manasan 2018). Overall, the reform was expected to have a regressive distributional impact, if compensation measures were not implemented. Thus, it was essential for the success of the reform that social welfare measures were implemented effectively in a targeted and timely manner. However, the cash transfers to compensate for the regressive impacts of the 2017 reform were introduced several months after the reform itself, and some elements, such as fare discounts for public transport, appear still not to be in place. Such failures risk undermining trust in government and acceptance for tax measures and as a result, tax compliance and political acceptance of tax reforms going forward (please refer also to Section 4.5.2 for an in-depth discussion of governance questions).

#### 4.6.4 Progressive motoring taxes in Rwanda and Ghana

Research conducted by Daniel Slunge and Thomas Sterner (2012) on developing countries in Asia and Africa demonstrated that in many countries, taxes on transport fuels and on motoring act are in effect luxury taxes and are therefore progressive. Recent research conducted by the UK based Institute for Fiscal Studies backs up these findings for Rwanda and Ghana. In Rwanda, research revealed that vehicle purchases, and petrol and diesel consumption, are almost exclusively found in the top two income quintiles, i.e. the wealthiest 40% of the population, while public transport consumption is more evenly distributed (Granger et al. 2021).

In Ghana there are a large number of environmentally-related taxes on motorised transport, including fuel taxes, taxes on vehicle ownership, purchase, and import, excise on energy products including special petroleum tax and six energy sector levies, as well as an environmental tax on older vehicles. There are also several taxes on fuel (special petroleum tax, energy debt recovery levy, road fund levy) amounting to around EUR 0.24 per litre for petrol and diesel (Iddrisu et al. 2021). These taxes bear no relationship to the environmental externalities, climate impacts, public health, or other external costs associated with motorised transport. In total, these taxes amounted to 10.7% total tax revenue, or 1.21% of GDP, in 2019 (OECD 2021b). Not only do these taxes mobilise substantial amounts of domestic revenue, they also have a progressive impact.

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<sup>22</sup> It appears that the tax rate has not been increased since 2020, see: <https://www.bir.gov.ph/index.php/tax-information/excise-tax.html#taxrates>

The wealthiest households spend by far the largest proportion of their budgets on motorised transportation: the top income decile spends 3.1% on fuel, 4.7% on vehicle purchase and 6.5% on public transit. In contrast, the poorest income decile spends 1.0%, 0.7% and 2.2% respectively (Granger et al. 2021).

#### 4.6.5 Progressive fuel excise in Kenya

In Kenya, the distributional impacts of fuel excise have also been found to be strongly progressive: the poorest 70% of households spent less than 2% of total household expenditure on private transport in 2009, the wealthiest 20% spent 21% (Slunge and Sterner 2012). In spite of these progressive impacts, during the COVID-19 pandemic in 2021, parliament put pressure on the government to cut fuel taxes and direct protests against fuel taxes took place. A legal case was lodged to prevent increases of VAT and the corporate minimum tax. The government initially resisted this pressure, as it relies on transport fuel taxes as a source of revenue (IMF 2021b). But in the meantime, some adjustments were made to transport fuel prices in response to the global oil price spike following the Russian invasion of Ukraine.

The protests – in spite of the progressive impacts of fuel taxes – underlines the importance for policymakers of moving beyond a simple evaluation of whether an environmental tax is progressive or regressive: even a progressive tax can result in reduced income for households living in poverty. In such households, even a small adjustment in disposable income can be significant.

While these taxes in Kenya successfully mobilise domestic revenue and have progressive impacts, their environmental effectiveness is limited and they are not delivering on national climate targets. Between 2006 and 2017, fuel consumption increased by 61% (Ogot et al. 2018). In the context of a rapidly industrialising country, rising fuel consumption is hardly unexpected. Yet transport emissions increased by 0.6MtCO<sub>2</sub>e each year on average between 2010 and 2015, which is too rapid for the transport sector to meet its NDC targets for 2030 (Government of Kenya 2019).

#### 4.6.6 Luxury taxes on vehicles in Indonesia

One possible way to get around the problem of social equity impacts is to implement a luxury tax, targeting wealthier income groups. In Indonesia, there has been a “luxury tax” levied on vehicle purchase since 2009. In Government Regulation No.41/2013, the luxury tax structure was greened, and a zero-rate applied to cars with engine capacity of 1,200cc (gasoline) and 1,500cc (diesel), on condition they achieve fuel economy of 20km/litre (UNEP 2019). Other tax rates vary between 10-125% on the basis of engine size. This programme is known as the Low-Cost Green Car policy (LCGC).

As with similar programmes in South East Asian countries, the LCGC programme has conflicting objectives; both to improve the fuel efficiency of the fleet, and to help achieve national economic objectives to boost the automotive industry. The scheme resulted in a significant increase in the proportion of LCGC sales, while total car sales fell slightly between 2013 and 2019 (UNEP 2019). At the same time, by incentivising vehicle purchase for those previously unable to afford passenger cars the scheme may have led to higher traffic volumes and increased congestion, reduced modal shift towards public transportation, and rising concerns relating to air and noise pollution (Ministry of Transport and GIZ 2018).

#### 4.6.7 Environmental Tax on Vehicle Pollution (the IACV) in Ecuador

The IACV, a tax on land vehicle emissions, was in place in Ecuador from 2012-2019. Its objective was to create incentives for purchase of cleaner vehicles. The IACV tax rate is governed by two components – a tax payable on engine capacity, levied per cubic centimetre (cc), and a penalty adjustment factor based on the age of the vehicle of between 0% (for vehicles less than 5 years old) and 20% (for vehicles more than 20 years old) (Almeida 2016a).

Several components in the tax design aimed to prevent possible regressive impacts:

- The IACV targeted vehicles which are considered to be a "luxury" at higher tax rates.
- The overall tax burden was not permitted to exceed 40% of the value of the vehicle.
- Vehicles with an engine capacity of less than 1,500cc were not liable.
- From 2012-2014, vehicles more than 2,500cc or more than 5 years old, the public sector, passenger transport vehicles, school transport vehicles, taxis, ambulances, mobile hospitals, electric vehicles, vehicles owned by senior citizens, and vehicles for transport of people with disabilities received an 80% tax reduction, in 2015-18, a 50% discount, 0% in 2019 (Almeida 2016a; Almeida 2016b; Páez et al. 2022).

The careful design of the tax was effective in delivering progressive impacts; the tax appears to have been slightly progressive for the poorest 28% of the population, as long as the differentiated tax treatment remained in place (Almeida 2016b).

In 2019, the IACV was repealed by the government on basis of claims that it was environmentally ineffective. However, many experts do not agree, as it led to a clear increase in the purchase of smaller vehicles (<1,500 cc) and a clear reduction in purchases in all other vehicle classes. It is estimated that repeal of measure will prevent 5% energy consumption savings by 2025 (Paez et al. 2022).

**Recommendation:** Governments in non-OECD countries should conduct a thorough ex ante analysis of equity impacts and design environmental taxes and accompanying measures carefully to ensure that they are fit for purpose and can feasibly be implemented. Predicting social (and other) impacts and addressing them effectively is the single most important step governments can take to overcome obstacles to environmental taxes.

Development partners can support this process by providing technical assistance and backstopping for tax design, and by facilitating efforts to consult a sufficiently broad set of stakeholders, e.g. by commissioning impact assessments or providing advisory for national partners on suitable approaches and consideration.

### 4.7 Lesson 7: Rectify misalignment of revenue and expenditure

#### 4.7.1 Tax expenditures and environmentally harmful subsidies

The literature review revealed several cases of examples of misalignment of green revenue-raising measures and environmentally harmful subsidies and expenditures. Contradictory tax expenditures and other environmentally harmful subsidies often outweigh green revenues and undermine their environmental effectiveness. Although inefficient, this is typical in many countries. Environmentally harmful subsidies are often not categorised as such in government

budgets and are thus often ‘hidden’ and as a result, difficult to quantify and reform. They also tend to create dependency, and are often neither time-limited nor subject to regular review.

For example, in 2019 in India, the GST cess on coal raised USD 2.4 billion. However, coal subsidies were worth USD 2.3 billion in the same year (Garg and Geddes 2019). Tax expenditures can represent a huge fiscal burden, e.g. in Togo, a 2019 report on tax expenditures published by the *Office Togolaise des Recettes* (OTR) identified 312 measures (OTR 2020). In the same year, explicit subsidies for electricity consumers in Togo were worth 1.91% of GDP (IMF 2021a). Similarly, in Uzbekistan, it has been estimated that tax expenditures are worth 6.4% of GDP in 2018, almost one third of budgetary revenues (World Bank 2019).

Addressing the problem of misalignment calls for integrated approaches to PFM and fiscal policymaking, and meaningful analysis of the quantitative and qualitative impacts of tax expenditures and other fiscal measures. Several interview partners corroborated the findings of the literature review that government agencies tend not to take an integrated approach to policymaking, and that inter-ministerial cooperation is lacking. As a result, changes are made in the policy framework with little consideration of how it will impact other aspects of policy and strategy, with contradictory incentives and fiscal expenditures the result.

Implementing comprehensive green budget tagging – i.e. tagging both environmentally favourable and unfavourable expenditure lines – and reporting on tax expenditures can deliver greater transparency of revenue and expenditure. These approaches can also inform a process of aligning revenue and expenditure. In Indonesia, climate tagging has informed decision-making in climate finance and has facilitated the issuance of sovereign green Islamic bonds, so-called green sukuk. Governments might also consider implementing rules for the introduction of subsidies, to prevent lock-in of new subsidies in future. To demonstrate, two cases of extreme misalignment are touched on below – in relation to transport fuels in Ethiopia (4.7.2) and in the Philippines (see 4.7.3).

#### 4.7.2 Ethiopia: more money spent on fuel subsidies than revenue from fuel taxes

Taxation of Ethiopia’s transport sector is peculiar in several ways. While excise taxes on imports make cars very expensive in Ethiopia<sup>23</sup>, gasoline and diesel fuels are taxed at very low rates – making them much cheaper than in neighbouring countries. This is reinforced by several exemptions and reduced rates on diesel fuel. Most important is the role of the “fuel price stabilization fund” – a fund meant to stabilize fuel prices against fluctuation in the exchange rate of the Ethiopian Birr and in world market prices as the country is importing all of its fuel.<sup>24</sup> However, over time, the fund has become a tool to permanently lower fuel prices. Effectively, it uses public revenue to reduce pre-tax fuel prices by about a quarter (25.1 % for Gasoline, 23.5 % for diesel).<sup>25</sup> The expenditures for the fuel price stabilization ran higher than revenue generated from taxing gasoline and diesel for several years in the last decade. Comparing fuel taxation revenue with expenses for the fuel price stabilization fund, data by Granger et al. (2021) show that Ethiopia was effectively losing money from fuel taxation between 2016 and 2018 and was expected to do so again from 2021 onwards.

Besides the fiscal and environmental harm of such a tax regime, it should be emphasized that this policy also means that the public subsidize the fuel consumption of the wealthiest members

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23 The import taxes are up to five times the average import tax being paid in other African countries (Granger et al., 2021).

24 This does not suggest that such stabilization funds cannot work in principle. The Nepalese version of it, seems to work as intended.

25 OECD data on diesel and gasoline prices showed that Ethiopian gasoline and diesel prices (1.60 USD / 1.42 USD) were much lower in Ethiopia than for example in Cote d’Ivoire, Ghana or Senegal at the same time (all between 2.43 USD & 2.65 USD).

of Ethiopian society that can afford a car.<sup>26</sup>

#### 4.7.3 Contradictory taxes and tax expenditures on coal in the Philippines

In the Philippines, the tax rate on coal and coke is very low (refer to 4.6.3). A Computable General Equilibrium model predicted possible slight negative impacts of the tax on output in manufacturing (-1%) due to higher energy prices, with metals (-3.5%) and iron and steel (-2.5%) most severely affected. Modelling also predicted a fall in CO<sub>2</sub> emissions of around 0.8% (Castillo et al. 2018).

These positive impacts on CO<sub>2</sub> emissions are misaligned with subsidies for the coal industry. These include direct budgetary support to the National Power Corporation from the government, as well as special allowances, tax exemptions, and tariff duty exemptions on imports of machinery, equipment and spare parts for coal operations (Department of Energy 2022, OECD 2021c). In 2022, the Philippine government also reduced the tariff on coal imports to 0% from its previous level of 7% (Bloomberg 2022).

**Recommendation:** Governments in non-OECD countries should categorise taxes, expenditures, and tax expenditures as environmentally favourable or unfavourable – drawing on methodologies developed in EU countries –, evaluate whether they are misaligned with their development policy objectives. Findings should be made available in the public domain. In cases where misalignment is identified, reforms should be implemented and environmentally harmful expenditures and tax expenditures phased out.

Development partners can support this process by enabling peer-to-peer exchange between policymakers in non-OECD countries and in the European Union, where there is a great deal of momentum behind green budgeting.

### 4.8 Lesson 8: DRM is possible and feasible using environmental taxes

#### 4.8.1 DRM in theory and practice

In theory, the primary objective of environmental taxation is to reduce environmental degradation and pollution. DRM can be an important secondary benefit. However, while some environmental fiscal policies can reasonably be expected to raise substantial revenues, also over the longer term, other environmental taxes cannot necessarily be relied on by finance ministries. Revenue potential is related to the elasticity of demand of the good or service being taxed. If it is possible for economic actors to respond to an environmental tax by changing behaviour and using substitutions (i.e. if the elasticity of demand is high), they will do so, resulting in revenue that diminishes over time. Conversely, if elasticity of demand is low, environmental taxes can provide relatively stable revenues for many years, particularly if a tax rate escalator compensates behavioural change through an increased tax rate.

An important consideration in the non-OECD context is that revenues are often needed to compensate vulnerable groups in society, and to support businesses in their efforts to invest in green transition. As a result, only a proportion of revenue raised may be available to enhance fiscal space. Governments can respond to this problem by focussing on environmental tax bases

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<sup>26</sup> Ethiopia in the last decade had one of the lowest car ownership rates in the world.



of little relevance to lower income households, or by introducing taxes on luxury goods, which will not have negative equity impacts if their price increases. Further, alternative tax bases and better direct taxation – e.g. targeting capital, wealth, and property – are better suited for the purposes of enhancing horizontal and vertical equity in the tax system and are likely to form an important additional pillar of DRM strategies in non-OECD countries, given the absence of such taxes in many non-OECD countries and current international policy dialogue focussing on the issue.<sup>27</sup>

#### 4.8.2 Findings from the review and deep dives

Environmental tax revenues as a proportion of GDP from the non-OECD countries which were the focus of our research are shown in

Table 5. General observations are below. Following that, several positive examples of taxes that have been effective revenue-raising mechanisms are presented.

In some countries, taxes on fossil fuels – particularly liquid fuels – in particular have the potential to raise substantial amounts of revenue. For example, in Kenya the fuel excise raised 8.8% of total tax revenue in the 2018-19 financial year, equivalent to 1.2% of GDP – proportionately higher than in many OECD countries (OECD 2021b). In India, a cess (levy) on coal is also used as a revenue-raiser, most recently, to reduce budget deficits in Indian States (4.8.3) (IISD 2018).

In some LMICs, there is evidence that a package of environmental taxes has potential to mobilise substantial revenues. In the Republic of South Africa, environmental taxes make up 9.5% of total tax revenue, or 2.69% of GDP (OECD Stat 2021b). This is made up of a package of measures, including taxes on tyres, plastic bags, electricity, light bulbs, and vehicle emissions (National Treasury and SARS 2020). Similarly, in Mauritius, the MID levy on fossil fuels, plastics and HCFCs, combined with excise on transport fuels, raised 0.93% of GDP in 2019 and delivered a rapid increase in revenue following tax rate increases (see 4.8.4). In Viet Nam, the Environmental Protection Tax has taken on a similarly important role as a revenue-raiser, largely through taxes on transport fuels, but also through taxes on other products (4.8.5).

The political economy of energy pricing in the country concerned has a key influence on the tax rate implemented, as demonstrated by the coal tax in the Philippines, which has been implemented at a very low rate. Similarly, the carbon tax in South Africa has faced very significant political economy challenges, and the effect carbon rate has been very low (although it is set to change in future, see 4.4.7). In both cases, as a result, revenue raised is equivalent to just 0.01% of GDP.

Not only taxes on energy have the potential to deliver on DRM. But other examples of taxes which raised substantial revenues are derived from sectors which are especially dominant in the economy. This is the case in Mauretania, where a combination of fiscal policy instruments mobilise domestic revenue from the most important economic sector in the country, fisheries (4.8.6). In Zambia, the environmentally related Mining Royalties Tax on copper plays an important role in DRM in the country, but is not designed with an environmental objective in mind (4.8.7).

The remainder of the measures examined during the course of the review raised comparatively little revenue (see

Table 5). In some cases, this appears to be attributable to poor collection rates, in others, low tax rates and a narrow tax base are the cause. For example, taxes on plastics in Morocco raised just

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<sup>27</sup> For example, the influential UN tax committee has a sub-group working on wealth and solidarity taxes, see <https://financing.desa.un.org/subcommittee-wealth-and-solidarity-taxes>

0.03% of total tax revenue in the 2014-2015 financial year, while plastics taxes in Ghana typically raise revenue equivalent to 0.03% of GDP (Government of Morocco 2017; OECD 2021b). Taxes on pollution in China raise revenue equivalent to 0.02% of GDP (Arimura et al. 2022). Finally, taxes and fees on the forestry sector tend to be raised at local level, and the most successful examples are often managed by local communities. From an environmental policy perspective, they can be effective instruments for sustainable forestry management, but they appeared to have less potential to raise revenue for the general budget.

*Table 5: Revenue raised as a proportion of GDP by specific environmental taxes in 2019*

Country	Instrument	Revenue as a proportion of GDP
China	Environmental pollution tax	0.02%
Ecuador	Environmental tax on vehicle pollution	0.12%
Ghana	Environmental tax on plastics	0.03%
Guyana	Pollution (non-returnable beverage containers)	0.15%
India	Cess on coal derivatives	0.08%
Kenya	Petroleum levies	1.2%
Liberia	Forestry taxes and fees	-
Malaysia	Variable licence fees on effluent emissions	0.07%
Mauritania	Taxes, levies, royalties on fisheries	0.98%
Mauritius	MID levy on fossil fuels, plastics, HCFCs + excise	0.93%
Mongolia	Water pollution fee	0.0043%
Morocco	Plastics tax	0.01%
Niger	Taxes on timber and fuel wood	-
Philippines	Coal tax	0.01%
Peru	Selective consumption taxes on the harmfulness of fossil fuels	0.41%
South Africa	Carbon tax	0.01%
Uganda	Environmental levy on second-hand motor vehicles	0.28%
Ukraine	Taxation of nuclear fuels and radioactive waste	-
Viet Nam	Environmental pollution tax	0.77%
Zambia	Mining royalties tax on copper	1.30%

*Source: OECD 2021a; OECD 2021b; World Bank Data, authors calculations*

#### 4.8.3 India's approach to environmental taxes and DRM

In 2018, environmental tax revenues in India raised the equivalent of 1.2% of GDP, or 17.5% of total tax revenue (OECD 2023). In general, India increases fuel tax excise during times of low oil international oil prices and reduces tax rates during times of high prices to smooth the fuel price. In 2017, taxes on fossil fuel consumption raised 6.5% of general government revenue [revenue of federal and state governments] (Garg and Geddes 2019). During the pandemic, fuel excise was increased as an "emergency budgetary measure". Increase of USD 0.04/litre fuel in 03/2020 for petrol and diesel, and USD 0.13/litre for gasoline and USD 0.17/litre for diesel in 05/2020.



Revenue was used to cover revenue shortfall from other taxes and fund the emergency package (IISD 2021).

This is not the only example of environmental taxes having the very clear objective of domestic revenue mobilisation in India. The General Services Tax (GST) Compensation Cess replaced the Clean Environment Cess in the 2017-2018 fiscal year and has the objective of reducing the budget deficits of Indian States since the introduction of the GST. Coal continues to be taxed at the same rate, but revenue from the Cess flows into the GST Compensation Fund, which does not have any environmental purpose, but is used for various regional development needs (IISD 2018).

It is of note that, in addition to high DRM, these environmental taxes appear to have some positive environmental impacts. Prior to 2017-18 when it was reconceptualised, the Clean Environment Cess has been shown to have had positive environmental impacts. The cess has been one element in a package of measures that has encouraged renewable energy investment, which has remained steady between USD 6-14 billion since 2010, the fourth highest in the world (Cottrell and Falcão 2018). Moreover, due to increases in electricity prices attributable at least in part to the Cess, the measure helped to ensure that in 2017, large-scale solar energy achieved grid parity costs in India, meaning that solar could compete on the Indian energy market without subsidies (Garg and Geddes 2019).

#### 4.8.4 Environmental taxes and DRM in Mauritius

In Mauritius, environmental taxes have played a significant role in mobilising revenue for the achievement of the SDGs. In 2008, the Maurice Ile Durable (MID) Levy – an environmental tax on petroleum products, aviation, and coal – was introduced in Mauritius, with revenues earmarked for the so-called MID Fund. Other environmentally related taxes and charges in Mauritius include various excises on petroleum products, excise duty on motor vehicles and motorcycles, road tax, registration fee for imported vehicles, excise on PET bottles and other plastic bottles, environmental protection fees, a CO<sub>2</sub> feebate for motor cars, an energy inefficient products charge, and various permits and fees (UNFCCC 2019).

Altogether, these taxes enabled revenues raised from environmental taxes to increase fortyfold over a period of ten years, raising USD 270 million in 2012 (UNEP 2014). Taxes on environmental tax bases continue to mobilize significant amounts of domestic revenue: 12.2% of total tax revenue in 2020, or 2.8% of GDP (OECD 2023).

In spite of this strong focus on DRM, environmental taxes in Mauritius have had some positive environmental impacts. Revenue from the MID Levy is used to finance energy efficiency and clean energy, e.g. subsidising fluorescent lamps, financing replacement of street lighting, subsidies for solar water heaters (UNFCCC 2019). A UNFCCC report (2019) describes the MID levy as a "success" in promoting sustainable development. The MID Levy is also recognised by the government as one measure through which the transition to 60% renewable electricity by 2030 is a target to be realised (WTO 2021).

#### 4.8.5 The Environmental Protection Tax in Viet Nam

In Viet Nam, the Environmental Protection Tax (EPT) has become an important source of domestic revenue. In 2019, the EPT raised EUR 2.58 billion, or 4.9% of total state revenue, with 99% of revenue stemming from taxes on petroleum products and coal (fossil fuels) (Truong 2021). The other tax bases account for the remainder of revenue raised, and have been less effectively implemented, e.g. taxes on plastics and HCFCs (Ministry of Finance, n.d.; ISPONRE 2021).

While its performance in relation to DRM is clear, the environmental effectiveness of the EPT is

far less well-researched. Little emphasis has been placed on conducting an environmental impact assessment of the measure to understand its impacts on environmental protection. An impact assessment conducted by the Ministry of Finance focussed on the design of the EPT, administrative questions, and the potential of the EPT to target environmental tax bases effectively and without omissions e.g. of broadly similar products (i.e. the coverage of the EPT) but did not focus on the environmental impacts of the tax on e.g. carbon emissions, or consumption of plastic bags and other environmentally harmful products.

#### 4.8.6 Revenues from fisheries in Mauritania

Fisheries in Mauritania are of strategic economic importance and make up 4-10% of GDP, 29% of the national budget, and 35-50% of total exports. Reflecting the economic importance of the sector, environmental tax revenues accounted for 9.4% of total tax revenue in 2019, equivalent to 1.3% of GDP (OECD 2023), while in 2020, all fiscal measures levied on fisheries raised around 10.6% of total revenue (Occhiali 2021).

Mauritania has implemented a broad spectrum of measures to raise revenue from fisheries e.g. port taxes, licenses, customs and export taxes, municipal taxes, and surveillance taxes. Fees for catch vary by species, depending on their vulnerability as fish stocks, from EUR 75/tonne for sardines and sardinella, EUR 140/tonne for horse mackerel, to EUR 575/tonne for squid (one of the most vulnerable species to depletion). Additional flat fees are also payable, at the start of a licensing period, of between EUR 1,000-1,750 (European Commission 2021a).

Although levied on an environmentally related tax base, the sustainability impacts of the above measures are unclear. Several additional steps will be required to secure positive environmental impacts, including: better enforcement of fisheries quotas to decrease the pressure on marine ecosystems (World Bank 2017a); enforcement of limits on the use of fish to manufacture fishmeal (fishmeal exports from Mauritania rose by 16% in 2020) (Coalition for Fair Fisheries Arrangements 2022).

#### 4.8.7 Revenues from the mining royalties tax in Zambia

In Zambia, the mining sector contributes 80% of export revenue and is a key sector for tax revenue. The Zambian government is overly dependent on taxes on mining, which accounted for 31.4% of total government revenue in 2020, 13.7% from the MRT (Zambia EITI 2021). In 2021, USD 4.1 billion of tax revenue were raised from taxation on the mining sector, and revenue more than doubled (+206%) between 2012 and 2021 (ATAF, 2023).

The objective of the Mining Royalties Tax (MRT) is to raise public revenue, while providing a stable and attractive framework for the development of the mining sector, but as it is an environmentally related tax, it was covered in our research (The Chamber of Mines of Zambia, 2016). It achieves this aim: in 2021, the MRT raised USD 287 million, and USD 649 million in 2022, and is predicted to raise USD 454 million in 2023 (Deloitte 2022). However, it is not effective in terms of achieving environmental objectives, and would have to be redesigned and reconceptualised to achieve this aim.

#### 4.8.8 The importance of transparency and DRM

In several cases, revenue from environmental taxes and levies flowed into the general budget without information being made available in the public domain on the amount of revenue raised and how it might be used (see particularly the case of Ghana in Section 4.5.4, as well as the deep dive annexes on Ghana and Morocco).

Without transparency on revenue collection, and revenue use, there is a risk that environmental taxes are regarded purely as revenue raisers, which might make them less likely to gain

widespread political acceptance. In Peru, when 2018 increases to the ISC – the *Impuesto Selectivo al Consumo* – tax rate were announced they were met with opposition, with public debate indicating a lack of comprehension on the part of taxpayers regarding the purpose and rationale underlying the tax (Culquicondori 2019). Similarly, in Morocco, sources suggest that only a small share of its revenue finances recycling, and that this lack of transparency has led to strong opposition of the plastics industry to the tax.

**Recommendation:** Some environmental taxes – particularly taxes on fossil fuels and energy – have the potential to mobilise domestic revenue, as shown by the cases above. Others have shown less promise in relation to DRM, while being environmentally effective. Governments should monitor taxes carefully, to understand the environmental and fiscal impacts of taxes over time and to adjust tax rates as necessary to adjust for falling revenues, e.g. through tax escalators. A proportion of revenues may be needed to compensate vulnerable groups or mitigate negative impacts on business.

Development partners can support DRM through technical assistance to help finance ministries predict revenue flows accurately and evaluate the risk of falling revenue. Through entities such as the Addis Tax Initiative (see 5.2.3), development partners can facilitate peer-to-peer learning and deliver vital research on pertinent tax-related topics.

## 5 Deepening policy dialogue and engagement

Building on the lessons learned and recommendations of Chapter 4, this chapter examines the international policy framework and considers how development cooperation partners can support non-OECD countries in their efforts to green their fiscal systems through the implementation of green tax measures. The chapter develops concrete recommendations for the European Union to deepen policy engagement, dialogue and collaboration with international partners and individual countries on environmental taxation. The chapter can also serve as a resource for non-OECD governments seeking to identify possible partners to support them in their efforts to introduce environmental taxation.

### 5.1 Routes to gaining additional knowledge on green taxation

#### 5.1.1 Collaborate on more in-depth research on green taxes in non-OECD countries

An important contribution to the knowledge base on environmental taxation in non-OECD countries would be to commission in-depth and comparative reports on environmental taxes in particular countries or regions, which set out to describe tax design and tax impacts in detail, covering at least the information points used for the literature review produced within this project.<sup>28</sup> To the greatest extent possible, these reports should be scientifically rigorous and set out to disentangle the specific impacts of the tax from the more general impacts of regulatory frameworks or global price fluctuations.

Developing a broader and more in-depth knowledge base across regions and comparator countries would help to build knowledge on the effectiveness of environmental taxes in the unique context of LMICs. This additional knowledge could feed into international and national policy dialogue fostered through the channels suggested below and help to cultivate a policymaking environment within which instrument choice is based on robust evidence of the effectiveness – or not – of green taxes in the non-OECD context.

Improving the quality of analysis of green taxation – even when measures were not successfully implemented – can inform policymaking going forward; lessons are learned not only from best practice, but also from those instruments which did not achieve their environmental objectives.

#### 5.1.2 Facilitate exchange between non-OECD countries on green taxation

The literature review unearthed many innovative green tax designs and approaches particularly relevant for the LMIC context. There is clearly potential for non-OECD countries to exchange and learn from one another in regional or international fora, to compare and contrast experiences, and exchange information on policy challenges and how they might be addressed in the developing country context.

Peer-to-peer exchange is particularly important, as there are many examples of green tax instruments which are especially relevant to LMICs, e.g. differentiated age-based taxes on vehicle imports, or approaches to community-based taxation of the forestry sector.<sup>29</sup> Governments can

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28 One of the best examples of this kind of approach can be seen in: Almeida, M.D. (2021). Experiencias de política fiscal con contenido ambiental en países del Sistema de la Integración Centroamericana (SICA)/COSEFIN y recomendaciones de política pública. UN-CEPAL. <https://www.cepal.org/es/publicaciones/46700-experiencias-politica-fiscal-contenido-ambiental-paises-sistema-la-integracion>

29 Amongst others, Ecuador, Mauritius, Kenya and Uganda have all implemented differentiated taxes on vehicle imports to green the domestic vehicle fleet. In many LMICs, vehicle fleets are dominated by older, dirtier vehicle imports, which have severe impacts on the health of urban populations. See the examples of Liberia and Niger for community approaches to environmental taxation in the forestry sector.

also learn from the experiences of similar countries in developing measures to ensure that green taxes do not have negative equity impacts on poorer households, and in developing appropriate social welfare mechanisms.

Peer-to-peer exchange of this nature could be complemented through capacity building for governments in non-OECD countries – for finance ministries and relevant line ministries such as environment, energy, mining, or forestry.

## 5.2 Engaging with international organisations on green taxation

Possible routes for the EU to engage with international initiatives on environmental taxation and domestic revenue mobilisation (DRM) are explored below. Roughly speaking, the organisations and initiatives described below are described in order of their potential to amplify EU efforts to engage with international policy dialogue on environmental taxation.<sup>30</sup>

### 5.2.1 The Coalition of Finance Ministers for Climate Action<sup>31</sup>

Hosted by the World Bank, the Coalition has considerable reach and influence in the international policy dialogue on climate-responsive public financial management. 77 countries are currently members, including many non-OECD countries in Latin America, Africa and Asia. Several key international knowledge brokers are partners of the coalition, including OECD, UNEP, World Resources Institute, Global Green Growth Institute (GGGI), and Grantham Research Institute on Climate Change and the Environment.

Recent [reports](#) from the coalition look at the role of finance ministries in delivering on climate action, and at environmental taxation in the context of carbon pricing to drive the recovery from the Covid-19 pandemic. Exploration of synergies between climate-relevant taxes and other policy goals, such as reduction of emissions harmful to human health, or climate-related taxes to prevent deforestation (and so sequester carbon and avert biodiversity loss) merit further investigation.

There may be potential to integrate such activities in the working group for Helsinki Principle 3 (to promote carbon pricing measures). Because of its status and the high level of participation – facilitated by working groups attended by sherpas – the Coalition might be a very promising route to engage policy dialogue on green taxation amongst member countries. Moreover, given that the European Commission is already an institutional partner for activities under Principle 3, this is an obvious first avenue to explore.

### 5.2.2 The African Tax Administration Forum (ATAF)<sup>32</sup>

The African Tax Administration Forum (ATAF) will produce a handbook on environmental taxation for policymakers in African countries in 2023, with the aim of delivering concrete political economy insights for policymakers and delivering guidance specifically tailored to the African context. ATAF has also done some ground-breaking work on taxation and gender (see ATAF 2022). A preliminary step towards the development of this guidance has been the publication of a brief defining environmental taxes and subsequently, a brief on carbon taxation. Thus, there is a great deal of momentum behind environmental taxation at the forum in 2023.

This is an opportune moment for the EU to collaborate with the Forum and explore possible

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<sup>30</sup> It should be noted that the opinions of the initiatives described have not been sought, as it would not have been appropriate to do so within the scope of this project.

<sup>31</sup> <https://www.financeministersforclimate.org>

<sup>32</sup> <https://www.ataftax.org>

avenues to raise awareness of green taxation amongst policymakers in African countries.

### 5.2.3 The International Tax Compact and the Addis Tax Initiative<sup>33</sup>

The International Tax Compact (ITC) facilitates results-oriented initiatives in tax and development, and fosters networking, knowledge sharing and multi-level cooperation within and across initiatives towards financing sustainable development. It hosts the Addis Tax Initiative<sup>34</sup>, the Network of Tax Organisations<sup>35</sup> and the DRM Innovation Fund<sup>36</sup>. Aside from this secretarial function, the ITC and associated organisations serve to build networks between initiatives for tax and development and acts as an incubator for new initiatives.

Through DG INTPA, the EU already collaborates closely with the ITC and the related initiatives listed above. In a December 2021 meeting of the ATI Consultative Group 1, the ITC presented topics that could be of interest for 2022, which included: taxation of the extractive industries and environmental and environmentally related tax issues. At that meeting, DG INTPA raised environmental taxes as a possible topic, which ties in well with their work on green PFM and Integrated National Financing Frameworks (INFF). Following these deliberations, it has now been decided to introduce a new workstream on environmental taxation within ATI, which was announced at the ATI Annual General Meeting in Lusaka, Zambia, on 20-22 June 2023. Therefore, in view of these development and the existing cooperation, ITC is clearly a natural partner for attempts to further engage international policymakers on green taxes.

### 5.2.4 World Bank: Global Tax Program<sup>37</sup>

The World Bank's Global Tax Program supports advisory services and technical assistance focused on strengthening tax institutions and mobilizing revenues fairly and efficiently at the international and domestic levels and is a key vehicle of delivering the World Bank's Domestic Revenue Mobilisation (DRM) approach. Prior to COVID-19 pandemic, environmental taxes did not play a significant role at the GTP. Indeed, the 2021 GTP activities dashboard reports that just USD 894,000 has been spent so far on projects relating to environmental taxes, including taxes on carbon, out of a total of USD 52.4 million (i.e. 1.7%), clearly revealing the potential for the role of environmental taxation in GTP activities to be enhanced.

The GTP has inaugurated a new Fiscal Policy Pillar specifically for LMICs to address problems of rising public debt, debt sustainability, weaknesses in public service delivery and slowdowns in economic growth. This pillar has a great deal of potential to incorporate green taxes within policy dialogue relating to domestic revenue mobilization (DRM) and sustainable recovery. Linking environmental taxes to the issues to be addressed in the Fiscal Policy Pillar might create opportunities to fast track the topic.

### 5.2.5 OECD

The OECD is perhaps the single most important international source of knowledge and data on environmental taxation and environmental fiscal reform.<sup>38</sup> OECD researchers have a strong record on analysing not just the economics but also the political economy of environmental

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33 <https://www.taxcompact.net>

34 <https://www.addistaxinitiative.net>

35 <https://www.nto.tax>

36 <https://drm-innovation.fund>

37 <https://www.worldbank.org/en/programs/the-global-tax-program>

38 With knowledge products including the PINE database, which includes estimates of environmentally related tax revenue, and support estimates in the agricultural and fisheries sectors, as well as the inventory of support measures for fossil fuels.

taxation, the latter being especially insightful for policymakers. There are several avenues worth exploring to collaborate with OECD to engage international policymakers in dialogue on environmental taxation.

#### 5.2.5.1 *OECD: Tax and the Environment*<sup>39</sup>

The most promising of these is the OECD's work on tax and the environment, which has produced seminal research on environmental fiscal reform, including guides for policymakers on the design and implementation of environmental fiscal reform<sup>40</sup>, and in-depth studies of environmental taxes in selected non-OECD countries<sup>41</sup>.

#### 5.2.5.2 *OECD: Development Cooperation*

The OECD has several initiatives that look at development cooperation which are promising partners for policy dialogue on green taxation. The Development Assistance Committee (DAC): this serves as a forum for donors and observer bodies to agree on international principles and standards for development cooperation. In 2005, DAC published a seminal report on environmental fiscal reform for poverty reduction.<sup>42</sup> The DAC is linked to the Development Cooperation Directorate, which promote coordinated and innovative international action to accelerate progress towards the achievement of the Sustainable Development Goals (SDGs) in developing countries. Focus areas include financing for sustainable development and environment and development.

Bringing together a wide range of stakeholders in the international policy dialogue is the DAC Network on Environment and Development Cooperation.<sup>43</sup> ENVIRONET promotes environmentally sustainable, climate resilient and low-emissions development pathways, including efforts to analyse and review policies and their implementation. There may be potential for the EU to boost the prominence of green taxation in ENVIRONET discussions, and in so-doing, reach a comparatively wide audience of development actors, including LMICs, multilateral development banks, and donors.

#### 5.2.6 *Tax Inspectors Without Borders*

The OECD/UNDP Tax Inspectors Without Borders (TIWB) initiative facilitates the transfer of tax audit knowledge and skills to developing country tax administrations by sending expert tax auditors to assistance-requesting administrations. The TIWB has declared an intention to extend its activities into natural resources and environmental tax issues and is exploring opportunities to pilot activities relating to taxation of the environment and natural resources.<sup>44</sup>

This declaration of intent may prove to be a concrete opportunity for the EU to collaborate with TIWB, and for the EU to support efforts to pilot activities on knowledge transfer on green taxation to non- OECD countries. Indeed, such a collaboration might prove to be a quick win in terms of engaging international policymakers on green taxes.

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39 <https://www.oecd.org/tax/tax-policy/tax-and-environment.htm>

40 <https://www.oecd.org/tax/tax-policy/environmental-fiscal-reform-G7-environment-ministerial-meeting-june-2017.pdf>

41 <https://www.oecd.org/tax/tax-policy/taxing-energy-use-for-sustainable-development.pdf>

42 [https://www.oecd-ilibrary.org/development/environmental-fiscal-reform-for-poverty-reduction\\_9789264008700-en](https://www.oecd-ilibrary.org/development/environmental-fiscal-reform-for-poverty-reduction_9789264008700-en)

43 <https://www.oecd.org/dac/environment-development/aboutdacenvironet.htm>

44 <http://tiwb.org/resources/reports-case-studies/tax-inspectors-without-borders-annual-report-2021.pdf>



## 5.2.7 World Bank Group and IMF

### 5.2.7.1 World Bank research

Aside from activities relating to carbon pricing, the World Bank has produced several publications on fiscal policy and environmental taxation, see e.g. *Designing Fiscal Instruments for Sustainable Forests*<sup>45</sup> and *Benefits Beyond Climate: Environmental Tax Reform*<sup>46</sup> and *The Role of Environmental Tax Reform in Responding to the COVID-19 Crisis*.

At the country level, the World Bank is active in promoting green taxation and green fiscal policy. As a general rule, Country Environmental Analyses and Public Expenditure Reviews include an analysis of pricing of natural resources and a strong focus on green fiscal policy, including taxation. The first point of contact for dialogue on these national level activities should be World Bank in-country staff.

### 5.2.7.2 IMF: Fiscal Affairs Department

The IMF Fiscal Affairs Department (FAD) regularly publishes key data on pricing of fossil fuels<sup>47</sup>, carbon, environmental and health externalities, and has published many staff notes, reports, and working papers. Thus far, the FAD has had quite a strong focus on climate fiscal policy. However, if the EU were able to initiate a dialogue with the FAD and draw on the expertise of the FAD staff to increase the scope of their work to cover other environmental policy fields, it would open up the possibility of bringing green fiscal policy heavyweights to the international policy discourse on environmental taxation aside from carbon.

The Fiscal Affairs Department (FAD) at the IMF has also developed a capacity building training on climate-sensitive Public Financial Management.<sup>48</sup> While environmental taxation is not central to this programme, how revenue is raised is one important element of the approach. It may be possible to engage with the FAD and link capacity building on climate-responsive PFM capacity building workshops to capacity building elements which specifically look at green taxation from the LMIC perspective.

### 5.2.7.3 Platform for Collaboration on Tax (PCT)

Hosted by the World Bank, the PCT is a joint initiative of the IMF, OECD, UN and World Bank Group (WBG) to strengthen collaboration on domestic resource mobilization (DRM). The PCT supports countries through release of joint knowledge products, such as toolkits, technical assistance, workshops, and e-learning. The platform has not played a particularly prominent role in the international policy dialogue relating to green taxation and the PCT has not yet developed a toolkit on green taxation.

At present, the lack of focus on environmental taxation and the operational level approach of the PCT seem to make this a less interesting initiative for the EU to engage policymakers, in the short-term at least. This may change in future; the PCT recently hired an environmental tax specialist to boost this side of its portfolio.

## 5.2.8 The Green Fiscal Policy Network<sup>49</sup>

The Green Fiscal Policy Network (GFPN) was established by a partnership between the United

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45 [https://www.cif.org/sites/cif\\_enc/files/knowledge-documents/designing\\_fiscal\\_instruments.pdf](https://www.cif.org/sites/cif_enc/files/knowledge-documents/designing_fiscal_instruments.pdf)

46 [https://elibrary.worldbank.org/doi/10.1596/978-1-4648-1358-0\\_ch1](https://elibrary.worldbank.org/doi/10.1596/978-1-4648-1358-0_ch1)

47 <https://www.imf.org/en/Topics/climate-change/energy-subsidies>

48 <https://www.imf.org/en/Publications/staff-climate-notes/Issues/2021/08/10/Climate-Sensitive-Management-of-Public-Finances-Green-PFM-460635>

49 <https://greenfiscalpolicy.org>



Nations Environment Programme (UNEP), the International Monetary Fund (IMF) and German International Cooperation (GIZ) to promote knowledge sharing and dialogue on green fiscal policies. In recent times, the network has had a strong focus on green recovery. Online and in-person events bring together finance and environment ministries from all over the world to exchange on pertinent topics, such as green recovery in Latin America and the Caribbean. GFPN has also organised regional and international capacity building workshops.

### 5.2.9 Other Tax Administration Forums

Tax administration fora aside from ATAF (see number 6 above) may also prove to be useful conduits for engagement with their country members. However, thus far it appears that work on environmental taxation has been limited. Possible engagement could be explored with the West African Tax Administration Forum (WATAF)<sup>50</sup>, the Inter-American Centre of Tax Administrations (CIAT)<sup>51</sup>, the Association of Tax Authorities in Islamic Countries (ATAIC)<sup>52</sup>, and the Intra-European Organisation of Tax Administrations (IOTA)<sup>53</sup>.

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50 <https://wataf-tax.org>

51 <https://www.ciat.org/?lang=en>

52 <https://ataic.org/conferences/>

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## 6 Conclusions and recommendations

### 6.1 Lessons and recommendations

#### **Lesson 1: Quantitative and qualitative information on specific environmental taxes in non-OECD countries is limited**

The number of environmental taxes in the PINE database provides clear evidence that many non-OECD countries have implemented environmental taxation. Yet the impacts of these taxes are in many cases not well understood, aside from carbon taxation, which is outside the scope of this research. Experience in OECD countries has shown that environmental taxes have the potential to deliver benefits by addressing the economic drivers behind environmental challenges, enhancing efficient use of resources, and mobilising revenue.

To foster a better understanding of the impacts in non-OECD countries, it is essential that more information and data is made available in the public domain, and that ministries of finance and researchers focus not only on ex ante analyses and modelling, but also ex post reviews of environmental tax policies.

#### **Lesson 2: Fiscal regimes in non-OECD countries fail to tackle environmental challenges**

In many non-OECD countries, very few green taxes have been implemented, in spite of significant environmental policy challenges attributable to market failures. Indeed, in many countries, current fiscal regimes tend to exacerbate environmental problems. Governments in non-OECD countries should examine the environmental challenges they face through a green fiscal policy lens, evaluate whether they might be tackled using green taxes or green fiscal policies, and implement GFP where appropriate.

#### **Lesson 3: Design of environmental taxes in non-OECD countries often deviates from best practice**

When designing taxes, governments often have to accept a number of trade-offs between theory and practice for political economy reasons, but it is important to ensure that these trade-offs do not undermine the environmental effectiveness of the measure.

Governments in non-OECD countries should take steps to build up human and technical capacity to design taxes and collate the necessary evidence to inform the design process through in-depth preparation. Governments can draw on a wide range of resources available in the public domain, such as the forthcoming ATAF toolkit for environmental taxation, and other publications on best practice in environmental tax policy.

#### **Lesson 4: Environmental effectiveness is often limited due to low tax rates**

Environmental taxes often face strong opposition when they are proposed, and it is not easy for governments to implement rates in line with the theory. To address this problem, governments can develop a harmfulness index, to inform environmental tax rate setting, or introduce environmental tax escalators, where the tax rate increases gradually each year and is adjusted to take inflation into account. Escalators create policy stability (because tax rate increases are legislated for), dynamic incentives for economic actors to change their behaviour, tend to deliver a stable revenue stream (at least in the short and medium term) and enable taxes to be introduced at a relatively low rate without undermining the environmental effectiveness in the medium term.

## **Lesson 5: Good tax governance: design taxes to minimise administration costs and tax evasion and close loopholes**

Good tax governance in LMICs is often compromised by lack of financial, technical, administrative and human capacity. This has implications for the implementation, enforcement and monitoring of environmental taxes in many countries. Closely linked to this challenge is the problem of limited transparency, in relation to revenues raised and the management and proper auditing of funds set up to disburse revenues raised by environmental taxes.

To address these challenges, governments in non-OECD countries should design environmental taxes in ways that address them, e.g. by linking to existing well-administrated collection mechanisms, decentralising tax collection, or focussing on a limited number of significant taxpayers. Governments can draw on international support to improve collection rates, reduce tax gaps and improve governance of both collection and disbursement of revenues. Development partners can support through technical assistance to enhance public financial management in line with PEFA and climate-responsive PEFA reports, which will highlight weaknesses in climate and environmentally relevant taxation.

## **Lesson 6: Understand and address equity impacts**

When implementing environmental taxes, governments in non-OECD countries should conduct a thorough ex ante analysis of equity impacts and design environmental taxes and accompanying measures carefully to ensure that they are fit for purpose and can feasibly be implemented. Predicting social (and other) impacts and addressing them effectively is the single most important step governments can take to overcome obstacles to environmental taxes.

A second option for non-OECD governments to avoid negative equity impacts from environmental taxes is to focus on progressive environmental taxes, such as luxury taxes on expensive vehicles, or taxes on vehicle ownership.

## **Lesson 7: Rectify misalignment of revenue and expenditure**

In many countries, revenue, expenditure and tax expenditure are not aligned with environmental and climate policies and strategies. Indeed, in both OECD and non-OECD countries, the value of environmentally harmful expenditures (subsidies) is often greater than favourable spending.

Governments in non-OECD countries should categorise taxes, expenditures, and tax expenditures as environmentally favourable or unfavourable and evaluate whether they are misaligned with their development policy objectives. Findings should be made available in the public domain. In cases where misalignment is identified, reforms should be implemented and environmentally harmful expenditures and tax expenditures phased out.

## **Lesson 8: Domestic revenue mobilization is possible and feasible using environmental taxes**

The primary objective of environmental taxation is to reduce environmental degradation and pollution. DRM is a secondary benefit. For some green taxes, such as those on fossil fuels and energy, or for packages of green tax measures, revenues may be substantial. Other environmental tax bases cannot necessarily be relied on by finance ministries. If taxes are environmentally effective and substitutions are available, revenues will fall, sometimes relatively rapidly, e.g. in Ireland, where plastic bag consumption dropped by 90% following the introduction of a tax on plastic bags (Convery, McDonald and Ferreira 2007). If taxes have a significant effect on prices, a proportion of environmental tax revenue will typically be spent on mitigating negative social and competitiveness impacts.

The extent to which an environmental tax will raise revenue depends on the elasticity of demand of the good or service being taxed. If elasticity is low (as has been the case for fossil fuels,

particularly in the short and medium term)<sup>54</sup>, environmental taxes can provide relatively stable revenues for many years, particularly if a tax rate escalator compensates behavioural change through an increased tax rate.

## 6.2 Last words

The objective of this report was to draw together a wide range of experiences in environmental taxation in non-OECD countries and to pinpoint trends in one publication. It also set out to tease out lessons learned from green tax instruments already in place, and to identify best and less good practices in their implementation. Finally, the report also explores possible ways forward for non-OECD governments and the European Commission to engage in international policy dialogue and at the national level, through EU in-country delegations.

Many challenges and obstacles to environmental taxation are closely linked to a general failure on the part of governments to communicate clearly on the mechanisms underlying green fiscal policies in general and green taxation in particular. In many countries – both within the OECD and beyond it – the incentive effect of the price changes engendered by an environmental tax, and the role these price changes play in changing behaviour and investment patterns, is poorly understood.

During our research, interviews demonstrated that key stakeholders – including business, civil society and even government officials – share a sense that revenue should be used for environmental purposes for a tax to be considered a “green” policy measure. Where revenues flow into the general budget, taxes tend to be criticised or even actively resented, particularly by business. This problem is closely linked to issues around trust in government, transparency and concerns about corruption; once tax revenue flows into the general budget, it is not easy to find information on what revenue is used for, and whether it is spent appropriately.

Governments in non-OECD countries must carefully consider existing administrative capabilities when designing green fiscal instruments. Often, the challenges to be overcome are not related to optimal policy design, but to practical solutions within existing governance and regulatory frameworks. In many countries in the first instance, greening existing – and well enforced – taxes and other fiscal policy instruments might be preferable to developing new environmental tax instruments that work well on paper, but not real-world conditions.

A large number of agencies, institutions, organisations and initiatives are involved in international development cooperation and taxation, as described in Chapter 5. Many have the potential to act as springboards for further work on environmental taxes. These include the Coalition of Finance Ministers for Climate Action, the African Tax Administration Forum, the Addis Tax Initiative, the International Tax Compact and the Green Fiscal Policy Network, a collaboration between the IMF, UNEP and GIZ. Many development banks also show a strong interest in environmental taxation, including the World Bank Group, AFD, ADB and AfDB. Environmental taxation is likely to attract ever more interest in the international policy dialogue. It is hoped that the lessons learned in this report can inform and help shape development cooperation activities in the future.

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<sup>54</sup> See Sterner (2007) for an interesting discussion on the elasticity of demand for transport fuels over time.

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## Annex 1 : Eurostat environmental tax bases

### *Environmental tax bases for energy taxes*

Energy products for transport purposes	<ul style="list-style-type: none"> <li>▪ Unleaded petrol</li> <li>▪ Leaded petrol</li> <li>▪ Diesel</li> <li>▪ Other energy productions for transport purposes</li> </ul>
Energy products for stationary purposes	<ul style="list-style-type: none"> <li>▪ Light fuel oil</li> <li>▪ Heavy fuel oil</li> <li>▪ Natural gas</li> <li>▪ Coal</li> <li>▪ Coke</li> <li>▪ Biofuels</li> <li>▪ Electricity consumption and production</li> <li>▪ District heat consumption and production</li> <li>▪ Other energy products for stationary use</li> </ul>
Taxes on greenhouse gases	<ul style="list-style-type: none"> <li>▪ Carbon content of fuels</li> <li>▪ Emissions of greenhouse gases (incl. proceeds from emissions permits recorded as taxes in the national accounts)</li> </ul>

### *Transport tax bases – excluding fuel for transport (see energy)*

Motor vehicles import or sale (one off taxes)
Registration or use of motor vehicles, recurrent (e.g. yearly taxes)
Road use (e.g. motorway taxes)
Congestion charges and city tolls (if taxes in national accounts)
Other means of transport (ships, airplanes, railways, etc.)
Flights and flight tickets
Vehicle insurance (excludes general insurance taxes)

*Environmental tax bases for pollution taxes*

Measured or estimated emissions to air	NOx emissions SOx emissions Other emissions to air (excluding CO2)
Ozone depleting substances	CFCs Halons
Measured or estimated effluents to water	Effluents of oxidisable matter (BOD, COD) Other effluents to water Effluent collection and treatment, fixed annual taxes
Non-point sources of water pollution	Pesticides (based on e.g. chemical content, price or volume) Artificial fertilisers (based on e.g. phosphorus or nitrogen content or price) Manure
Waste management	Collection, treatment or disposal Individual products (e.g. packaging, beverage containers, batteries, tyres, lubricants)
Noise	Noise from aircraft take-off and landings

*Environmental tax bases for resource taxes*

Water abstraction
Harvesting of biological resources (e.g. timber, hunted and fished species)
Extraction of raw materials (e.g. minerals, oil and gas)
Landscape changes and cutting of trees

Source: Eurostat 2013

Note: resource rents are excluded from the Eurostat list, and listed under property income, rather than taxes in national accounts. Thus, taxes on oil and gas extraction are excluded from the Eurostat list of environmental tax bases. This is to facilitate more accurate comparisons between countries, and to prevent the volatility of the prices of oil and gas distorting time series analysis. Other taxes on resource extraction, such as the mining of minerals, water extraction, and forestry, should be included in the list of environmental taxes, unless it is considered that these should be treated as property income (for further information see Eurostat 2013: 17).

## Annex 2: In-depth analyses of five environmental tax instruments

Each of the cases or “deep dives” below is an in-depth description of a selected tax on an environmentally relevant tax base in a non-OECD country. These cases were selected to focus on progressive stages in the value chain, from resource extraction through production and consumption through to waste management (see 3.2). The specific instruments and the countries studied were identified in cooperation with the European Commission, particularly DG Environment and DG International Partnerships, with the support of country delegations from the respective countries.

The five deep dives are as follows:

1. E-waste levy in Ghana
2. Environmental levy in Guyana
3. Plastics tax in Morocco
4. Environmental Protection Tax in Viet Nam
5. Mining Royalties Tax on copper extraction in Zambia

Alongside literature reviews, interviews were conducted to explore the political economy of the measures described in this annex. However, time was extremely limited, and it was not always possible to interview policymakers and representatives of key implementing agencies within the timeframe of our contract. As a result, we were not always able to establish key facts about some of the measures described herein.

These cases can be read as stand-alone descriptions of environmental tax policies in non-OECD countries, but they were written in the context of the *Green Taxation in non-OECD Countries* report, inform the conclusions and lessons learned of that report, and are intended to serve as annexes to that document.

All five cases follow the same broad structure, describing the context of the instrument before examining evidence available on the instrument’s impacts on the environment, economy, government budget, and social equity. The final sections sketch out possible recommendations for improvement of the instrument, or next steps on the way to a better understanding of its incentive effect and impacts. For ease of use for the reader, the literature used in each of the cases is cited in a bibliography in sub-section 8, while sub-section 9 lists all persons interviewed for the purposes of our research.

# A. Ghana's e-waste levy

## A.1 Introduction

Driven by decarbonisation and electrification strategies, discarded electric and electronic items are one of the fastest growing streams of waste worldwide. Every year approximately 53.9 million metric tons of e-waste are generated. This figure is projected to double until 2050. Currently only 20% of e-waste is recycled appropriately and approximately 80% end up traded, on landfills or informally recycled (Owusu-Sekyere et al. 2022). While the majority of e-waste is produced in the USA, the EU, Japan and Australia, the main importers of discarded or close to end-of-life items are West Africa, India and Mexico (Baldé et al. 2022).

In Ghana, like in many developing countries, there is an absence of a robust legal framework overseeing recycling practices. Much of the recycling activity is unregulated and informal. Unsafe practices, which involve the burning of cables or the draining of liquids from batteries or refrigerators release harmful toxins to the environment and can severely harm the workers, as well as the local population.

In an attempt to regulate e-waste, Ghanaian authorities passed the Hazardous and Electronic Waste Control and Management Act (Act 917) in 2016. As part of the legislation, an e-waste levy was introduced, and an electric and electronic waste fund was established in 2018 (Environmental Protection Agency Ghana 2018).

According to country experts, interviewed for this study, the levy is collected at the point of import and the revenue is transferred into a fund created for the explicit purpose of administrating and disbursing revenue. However, there are no public records of how much money is collected or how much money is in the fund. No information is available in the public domain, no audited accounts are available. In the future, the fund is supposed to finance a system helping to formalize the e-waste management system. However, the lack of transparency makes it difficult to assess the implementation, enforcement, and impact of the legislation so far.

## A.2 The context of green fiscal reform in Ghana

Ghana's tax-to-GDP ratio is lower than the African average of 16.6%, amounting to around 13.5% in 2019 (Idrisu et al. 2021). The tax burden is distributed as follows: Value Added Tax (VAT) 26%, Taxes on Goods and Services other than VAT 26%, Corporate Income Tax (CIT) 25%, Personal Income Tax (PIT) 16%, Social Security Contributions 6%, other taxes 1%. Non-tax revenue amounted to 3.1% of GDP in 2019, 0.67% from rents and royalties and 1.3% from fees for goods and services (OECD 2022).

Tax collection in Ghana is low compared with other middle-income countries in Sub-Saharan Africa. There is an urgent need to improve Domestic Revenue Mobilisation (DRM), and the potentials to improve it through tax collection are considerable. The estimated VAT gap in Ghana ranges from 18% to 39%, the import tax gap averaged 33% from 2012-2016 and the CIT gap between a range of 82-86% (World Bank 2020b).

Ghana also has many tax expenditures in place. Foregone revenue amounted to an estimated 5.2% of GDP in 2013, with VAT exemptions and preferential VAT treatment worth 4.2% of GDP, and customs exemptions representing a further 0.9%. While statistical issues complicate comparisons between years, similar data for 2014 suggest that the foregone revenue from tax expenditures has remained broadly stable at about 5% of GDP (World Bank 2017). Since 2013, Ghana has eliminated the majority of explicit energy and utility subsidies, using saved revenues e.g. to fund education and public health. In 2015, the government committed to permanently reducing subsidy spending. The OECD identified three fossil fuels subsidies: a residual fuel oil and gasoline premix sold at below market prices; a social benefit for residential consumers of electricity using less than 50 kilowatt hours a month; and a payment of power utility debts (OECD 2021a). In 2020, the IMF estimated that explicit subsidies for residential electricity were worth around USD 30 million (EUR 27.5 million<sup>55</sup>) (IMF, 2021).

There are VAT exemptions in place for petrol, diesel, liquefied petroleum gas, kerosene, and residual fuel oil. Many fossil fuels are exempt from VAT or subject to a lower VAT rate, and the external costs of combustion,

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<sup>55</sup> The exchange rate used throughout this document is USD 1 = EUR 0.9169 (from 06/2023).



such as climate change impacts, local air pollution and vehicle externalities are not included. Thus, implicit subsidies have been estimated to be worth USD 1.1 billion / EUR 1 billion in 2020, USD 0.4 billion / EUR 0.37 billion for gasoline, USD 0.41 billion / EUR 0.38 billion for diesel, and USD 0.24 billion / EUR 0.22 billion for natural gas (IMF 2021).

In 2019, environmentally related taxes were worth 1.66% of GDP. 48% of which came from the energy sector and 52% were road transport related. Around 12.4% of total tax revenues were from environmental related taxes in 2018 (OECDStat 2023).

Ghana has expressed the will to commit to a more sustainable economic development. In its Nationally Determined Contribution (NDC) the government stated its goal of achieving a 15% reduction of GHG emissions by 2030 in comparison to projections under business-as-usual scenario by focussing on renewable energy production (OECD 2021b). At the same time, as is common in the region, fossil fuel subsidies are relatively high, with explicit and implicit subsidies amounting to USD 1 billion in 2020, or around 1.4% of GDP (IMF 2022).

## A.3 Instrument design

### A.3.1 General waste management in Ghana

Ghana has struggled with its general waste management. More than 30,000 tonnes of municipal solid waste are generated every day. Of this waste only 14% is collected; 38% is dumped in open spaces set aside as informal dumps; 24% is deposited at “community containers”; 9% is dumped indiscriminately; 11% is burned in the open; and 4% is buried (World Bank 2020a).

Plastics also pose a serious problem. Around 3,000 metric tonnes of plastic waste are generated daily, amounting to 1.1 million tonnes per year, or 10-14% of the entire municipal solid waste stream. The World Bank has estimated that 86% of this plastic waste is mismanaged (World Bank, 2020a). The result is widespread environmental and urban pollution, which has become commonplace in almost every community in Ghana over the past 20 years. Mismanaged plastics are dumped across the landscape, directly or indirectly traveling to stormwater drains, rivers, and streams and eventually to the ocean. Packaging plastics serve as a primary component of increasing accumulations of improperly disposed wastes, resulting in environmental degradation, and contributing to disasters, especially flooding and cholera outbreaks.

To tackle the major problem of plastic waste the government has introduced a 10% tax on imported plastics and plastic products in 2013 (Act 863). It is levied at the point of entry on the CIF (Cost, Insurance and Freight) value of the goods and at least 50% of the revenues are dedicated to the “Plastic Waste Recycling Fund”. The fund is supposed to enhance the recycling of plastic waste and production of waste bins and bags as well as production of biodegradable plastics (Customs and Excise (Duties and Other Taxes) (Amendment) Act, 2013 ACT 863, 2013; UNEP n.d.). However, the Fund has not been created, resulting in several billion cedis of foregone revenue (World Bank 2020a). The Environmental Tax itself is also in urgent need of review. The tax creates distortions in the market, as only virgin plastics granules are taxed. This has driven an influx of cheaper imported products from abroad, e.g. single-use carrier bags, which easily outcompete the domestic competition (World Bank 2020a).

### A.3.2 The e-waste levy in Ghana

Unregulated recycling and dumping of e-waste has led to widespread environmental pollution and exposure to lead, causing illness and impacts on IQ in children, which costs Ghanaian society around USD 440 million / EUR 404 million annually, or 0.75% of GDP in 2017 (World Bank 2020a). In order to improve e-waste management, Ghana introduced the Hazardous and Electronic Waste Control and Management Act (Act 917) in 2016, which included the implementation of an eco-levy on e-waste and the establishment of a waste management fund starting from 2018.

The objective of the eco-levy, which was originally introduced in 2018, is to generate public revenue (GNA, 2022), to partially finance the Electronical and Electric Waste Management Fund (according to Act 917) in order to finance the introduction of an environmentally sound e-waste collection, treatment, recovery and recycling

system (Environmental Protection Agency Ghana 2019).

The levy has to be paid on locally manufactured as well as on import of new and used EEE (Hazardous and Electronic Waste Control and Management Act, 2016 (ACT 917), 2016). The rates of the levy are determined by law. Since their introduction, rates have been reduced. Originally, the rates of the first phase included USD 8.50 (EUR 7.79) for an air conditioning machine, USD 8.50 (EUR 7.79) for a refrigerator and freezer, USD 1.50 (EUR 1.38) for dish washing machines, USD 1.50 for a plough (EUR 1.38), USD 3.25 (EUR 2.98) for a handheld drill. Updated rates are not publicly available (Hazardous and Electronic Waste Control and Management Act, 2016 (ACT 917), 2016).

According to the law, importers are required to register and pay the levy before items enter the country. The law sets out that an external service provider may be mandated to collect the levy and perform inspections (Hazardous and Electronic Waste Control and Management Act, 2016 (ACT 917), 2016). Initially, the mandated external service provider was Societe General de Sureillance SA (SGS), a Swiss company. According to reports, SGS was entitled to 15% of net revenues from the eco-levy and 85% had to be submitted to Ghanaian government each month (Environmental Protection Agency Ghana 2018). There are no public records which document the total amount paid to the service provider. According to interviews conducted during this research, the service provider is not mandated any more, however there are no public records documenting the activities and duration of the activities.

According to the law, the Ministry of Environment Science Technology and Innovation (MESTI) and the Environmental Protection Agency (EPA) are mandated to ensure the payment of the applicable eco-levy, before allowing the item in question to pass through customs. MESTI and EPA laid down a plan to involve other ministries and ministerial agencies to guarantee that incoming shipments shall not pass customs without electronic environmental declaration form approval or clearance certificate (Ghana Business News, 2018). Retailers, distributors and wholesalers must retain a copy of the payment made by the importer or manufacturer (Hazardous and Electronic Waste Control and Management Act, 2016 (ACT 917), 2016).

The EPA may exempt importers from the duty to pay the levy, if the imported equipment can be used for recycling purposes. However, there are no public reports which document how many exemptions have been granted and which criteria are applied (Hazardous and Electronic Waste Control and Management Act, 2016 (ACT 917), 2016).

If an importer fails to register or pay, the administrative penalty is equivalent to twice the amount that would have had to be paid in the first place.

In 2022, the government extended the obligation to pay a levy on imported electrical and electronic equipment on an additional 300 products. According to a spokesperson of the EPA, this is the launch of the second phase of the Deployment of Harmonized System Codes onto the Integrated Customs Management systems (Ghana Business News 2022).

### **A.3.3 The Electrical and Electronic Waste Management Fund**

To support the management of WEEE and reduce the impact on human health and the environment the legislative act established an Electrical and Electronic Waste Management Fund. It shall provide financial resources to support the construction and maintenance of recycling plants, to conduct research and educational initiatives and offer incentives for the collection of waste. The fund is fed by the revenue from the eco levy, grants, donations and money approved by the parliament (Hazardous and Electronic Waste Control and Management Act, 2016 (ACT 917), 2016). The money from fund will be distributed according to legal act 917: 20% will be allocated for the collection of electrical and electronic waste, 40% will be used for the construction and management of recycling plants, 20% will be used for the Agency to reach the objective of Act 917, 10% will be going to the Ministry of Environment (MESTI), 5% are allocated for research and education, 3.5% will be used for monitoring activities to further Act 917, 1% shall be used to trade association and 0.5% shall be used for the administration of the fund. However, there are reports according to which 5% of the revenue is allocated to trade associations (Ghana Business News 2022).

So far, there are no public records of how much money has been paid onto the fund. According to interviews conducted for our research, the fund does exist and has received money, but how much is not in the public

domain.

Additionally, the Hazardous and Electronic Waste Control and Management Act includes Extended Producer Responsibilities such as the obligation of taking-back products and the obligation to recycle and dispose appropriately (Hazardous and Electronic Waste Control and Management Act, 2016 (ACT 917), 2016). Within the legal texts there are no further explanations and plans for the implementation, and there is no publicly available information on the status of operationalization. In March 2022, the Executive Director of EPA stated that the development of Extensive Producer Responsibility and Take Back Scheme are supposed to start “soon” (Ghana Business News 2022).

Besides these legal measures, there are several projects on e-waste management in cooperation with international organisations that have been carried out, some of which are still ongoing. The goals of the majority of projects have consisted in improving the conditions of e-waste management and disposal through networking between the different stakeholders, assistance in administration of policies and capacity building and education within the informal sector.

#### A.4 Impacts of the instruments

At the time of implementation, the Ghanaian government expected an annual revenue of USD 100 million (EUR 91.7 million) from the electronic waste levy and creation of over 20,000 full-time jobs for the youth within the first year of implementation (Ghana Export Promotion Authority 2018).

However, the rates of the levy per item have been reduced since due to pressure from the private sector. Updated rates have not been made public. For the purposes of this project, no adjusted estimates in terms of government revenue were accessible. According to the research conducted, there has not been a public impact assessment following the implementation of the levy, nor was it possible to find information on the revenue that has been generated via the e-waste levy over the past years.

An interviewee who was consulted for this study answered that importers are generally aware of the e-waste levy and that payment is enforced, but at lower rates than those established in the legal text. Other interviewees were not aware that the e-waste levy was collected and assumed that it was not enforced. The lack of official information and audited reports on the revenue of e-waste levy and the e-waste fund constitute a serious lack of information and transparency.

According to a study conducted in 2022, there was a general lack of awareness among the general public, wholesalers and retailers, recyclers and importers about Act 917. Accordingly, 88% of all stakeholders have not heard of the legislation (importers 91%, wholesalers 87%). This indicates that a strict and efficient enforcement of the regulation is lacking. 87% of respondents answered that they had not received any education on e-waste. Only 10% of respondents answered that they had made changes in their e-waste disposal practices after the enactment of the law in 2016 (Owusu-Twum et al. 2022).

#### A.5 Complementary measures: development cooperation projects

The GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) project on “Environmentally and socially responsible handling of e-waste”, executed in cooperation with MESTI, has been in place since 2016 and is currently in its third phase, which will run until 2026. It assists the government in the development of policies, funding mechanisms and administrative questions. The project also aims to connect the different stakeholders from local and national authorities, private sector and informal economy and trainings with stakeholders within the informal sector are provided (GIZ 2022).

A project funded by the European Commission between 2018 and 2021 brought together members from University of Cape Coast, Ghana National Cleaner Production Centre, City Waste Recycling and Adelphi. The goal of the project was to provide capacity building for decision-makers, organise dialogue events and administer the formalization of the informal stakeholders and the implementation of a nation-wide collecting mechanism (Kumi et al. 2019).

Another project to assist the formalization of the collection and recycling of e-waste is currently carried out by

the KfW development bank (Kreditanstalt für Wiederaufbau), a funding bank financing and supporting programmes in developing countries and emerging economies on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ) of Germany. To this end, the bank provides funds for an incentive-based system as part of which particularly toxic items, such as cables, are bought from the informal sector and forwarded to formal environmentally sound recycling. Within the first 10 months of the project, which started in October 2018, 27.3 tonnes of cables were collected and recycled. According to the project reporting, the initiative has been successful in reducing harmful emissions and generating higher revenues for the collectors and creating stable supply for the formal recycling centres. The project aims to establish a system, which can eventually be taken over through the funds of the e-waste fund, once fully operational (Manhart et al. 2019).

## A.6 The story of implementation

Global economic development, leading to higher average income, declining prices of electric appliances, continuing digitalization, urbanization as well as global electrification strategies to fight carbon emission, the consumption of Electrical and Electronic Equipment (EEE) has been growing strongly over the past years. In combination with decreasing product life cycles and the lack of reparability the amount of e-waste generated is expected to increase drastically. In 2019 the generated e-waste amounted to 53.6 million tonnes (Mt) worldwide and is projected to grow to 74.7 Mt in 2030. Less than 20% of electric and electronic items are documented to be collected and recycled properly. As a result, 44.3 Mt of waste is not documented and most likely dumped, traded or recycled in an environmentally harmful way (Forti et al., 2020). A study conducted by UNITAR estimates that almost 10% of total e-waste crosses borders, 65% in an uncontrolled manner (Baldé et al. 2022).

Although high-income countries have the highest recycling rates and well-developed e-waste management infrastructure, the amount of waste generated exceeds their capacities, so that large amounts are exported to low- and middle-income regions. The demand for cheap and used electrical devices drives up imports. The collection of valuable materials from waste has become an important source of income which further drives these dynamics. Apart from illegal waste, about 70% of imported second-hand yet functioning electronic and electric equipment are near its end of life quickly leading to more e-waste (Kumi et al. 2019). In addition to the domestically generated e-waste of 2.9 Mt, the African continent received 0.55 Mt imports of used EEE or e-waste in 2019. Of those, only 1% is officially treated in an environmentally sound way (Baldé et al. 2022).

With the Agbogbloshie dumpsite in Ghana's capital Accra being one of the biggest e-waste dumps in the world, precisely this problem applies to Ghana as well. Since there is no formal e-waste recycling system most of the handling, recycling and reuse is done by the informal sector. A study conducted by the Öko-Institut and Green Advocacy Ghana in 2010 estimated that about 20,300 to 33,600 people are employed in the informal e-waste management and refurbishing sector in Ghana handling about 10,000 and 13,000 Mt of e-waste annually (Prakash & Manhart 2010). Common handling methods like burning and manual dismantling to recover the valuable raw materials such as copper as well as illegal dumping of non-valuable materials are leading to a massive environmental burden and health risk (GIZ 2022; Kumi et al. 2019). Several studies have measured emissions, ozone-depleting substances, concentration of copper, lead, zinc, and tin significantly above critical values. Apart from the drastic environmental burden these in turn expose the workers as well as local communities to severe health risks. Possible diseases and health issues include damage of the immune, nervous or blood system, malfunctioning of kidneys as well as respiratory system. Due to the contamination of soil and dust children are one of the most vulnerable groups (Prakash & Manhart 2010).

The work in this sector is also an important source of income for many unskilled people, mostly living under the poverty lines (GIZ 2022; Prakash & Manhart 2010). Due to the crude and cheap methods, the informal sector has a cost advantage compared to the formal sector (GIZ 2022). Thanks to the big and widespread network of collectors, scrap dealers, dismantlers, recyclers, and refurbishers, the informal sector is handling about 95% of Ghana's e-waste (GIZ 2022; Kumi et al. 2019).

Integrating this informal sector into the formal economy and establishing a functioning e-waste management system would hence reduce health risks and the environmental burden, and at the same time create an economic opportunity since the value of raw materials contained in the e-waste generated 2019 is estimated at USD 57 billion (EUR 52 billion) (Forti et al. 2020).

To tackle this issue, the Hazardous and Electronic Waste Control and Management Act was passed by the government in 2016 after several years of public and international discussions on the problem of e-waste in the country. As part of this legislation, the tax on EEE as well as the fund financed through the tax revenues was resolved. Levying of the tax started 2018 (Quaye et al., 2019). In 2022, additional 300 items were added to the list on which an e-levy has to be paid (Ghana Business News, 2022).

After its initial foundation, the e-waste fund was fully restructured in 2020. Now it reports directly to the minister. Throughout the last years, the initially established rates have been adjusted. While some interviewees spoke of an official reform, another interviewee said that there was no legal reform, but trade Union and government agreed to reduce the rates in practice. The lack of transparency is problematic in terms of ensuring the interests of the public throughout implementation and enforcement and creates risks for corruption or mismanagement of the funds.

## A.7 Lessons learned and recommendations

### A.7.1 Failure to implement legislation has consequences for trust in government

In Ghana, some of our interviews hinted that the failure to implement aspects of legislation relating to the plastics levy and the e-waste levy has undermined trust in government. Businesses appear to be especially resentful of the government failure to create environmental funds to manage and disburse environmental tax revenues, as they were to be amongst the beneficiaries (see e.g. Ghana Business News 2018). Such failures risk jeopardising the future implementation of additional environmental fiscal reforms and taxes. In Ghana, it is essential that the fund for the management of the e-waste levy is created as soon as possible and managed in accordance with the principles of good financial governance.

### A.7.2 Enhance governance and transparency

Due to a lack of public records concerning the implementation, generated revenue stream, and enforcement of the eco-levy and the e-waste fund, it is not possible to assess the effectiveness of the instrument. The weak fiscal governance of the eco-levy and lack of transparency mirrors similar problems described in Section 2 above in relation to the plastics tax in Ghana.<sup>56</sup> While weak public financial management practices and poor fiscal governance are a common thread running through many countries in sub-Saharan Africa, such a lack of transparency undermines trust in government and willingness to pay taxes.

If the levy is to survive as a measure to promote the circular economy, it will be crucial for revenue use to be reported on transparently, and for the e-waste fund to be audited, with all findings published in the public domain. Especially the handling of exemptions and the cooperation with a private sector party must be publicly scrutinized. For the credibility of the measure, it is essential that MESTI and the EPA take steps to make public the existence of a fund for e-waste revenue, to publish financial flows into the fund, and to audit the fund's accounts.

### A.7.3 Poor governance has knock-on effects on environmental effectiveness

There is a strong economic case for recycling e-waste and extraction of valuable resources – indeed, the estimated value of global e-waste in 2019 amounted to around USD 57 billion (EUR 52 billion) (raw materials) (Kumi et al., 2019). However, the eco-levy and e-waste fund are failing to live up to this challenge. The failure to implement an effective instrument to tackle the e-waste problem in Ghana has had serious consequences for environmental quality in the country. Until very recently, one of the biggest e-waste dumps in the world was to be found in the infamous Agbogbloshie scrapyards in central Accra. This has now been demolished, but formalised e-waste recycling is not yet established. Informal separation of components is usually done by burning the plastics, which has a huge negative impact on both human health and the natural environment.

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<sup>56</sup> Ghana scores badly (rating D) on the PEFA for central government operations outside financial reports, as well as on budget documentation (C), see: <https://www.pefa.org/assessments/summary/351>

Although the amount of financing available in the e-waste fund is not known, interviewees reported that the failure to disburse funds to help foster a functioning market for e-waste recycling is a significant cause of the current bottleneck in sustainable e-waste management. Opportunities are being missed to reduce negative environmental impacts, with serious consequences for human health.

#### **A.7.4 Possible improvements to e-waste management in Ghana**

Experts have developed proposals to improve the e-waste scheme (Kumi et al. 2019). Currently, only 20% of e-waste components are actually useful for scrap dealers, while 80% is less valuable and is being dumped or burned as a result. By offering incentive schemes and providing monetary support to the sector, the e-waste fund could reduce cherry-picking of valuable fractions and promote the expansion of collection infrastructure. In this way, the fund could step in to sustainably manage non-vital and less valuable fractions of e-waste, providing both technical and financial support, and incentives if necessary.

In the same vein, eco-levy revenues or other incentive schemes, e.g. tax exemptions or reduced tax rates, could be used to support businesses that innovatively use the 80% of less valuable e-waste to produce useful products. This would increase the profitability of the e-waste business, and also reduce burning and pollution (Kumi et al., 2019). KfW has already developed a system of buying harmful e-waste, which could be taken over by the Fund, once it is operational.

In those cases where e-waste fractions have a negative economic value and cannot be recycled at a profit, the eco-levy should be fully applied in order to finance processing operations and/or allow shipments of such fractions to foreign treatment facilities (Kumi et al. 2019). One option would be to use draw on finance from the 5% of revenue from the e-waste levy revenue dedicated to innovative research projects and rolled out via universities and research institutions. This proposal to use the e-waste fund to address the problem of low-value e-waste represents a very concrete means by which the fund could address the current e-waste crisis in Ghana (Bogdan-Martin 2022).

#### **A.8 Bibliography: Ghana**

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## A.9 Interviews: Ghana

- Clemens Becker, EU Delegation to Ghana, advisor
- Eva Maria Estaun Sanz, EU Delegation to Ghana, advisor
- Cornelia Stolzenberg, GIZ, Team lead on e-waste management project
- Sebastian Frisch, Blackforest Solutions, Managing Director, International Business Development



# B. Guyana's environmental levy

## B.1 Introduction

The environmental levy on beverage containers was first introduced in Guyana in 1995, briefly disbanded (see section 6), and last reformed in 2017 in the reform of the Customs Act (Parliament of Guyana, 2017).

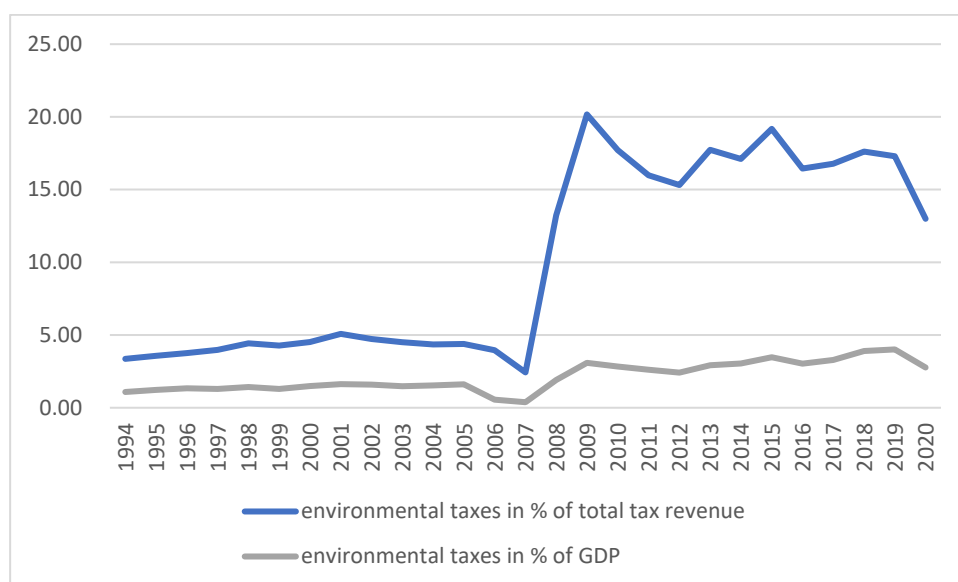
## B.2 The context of green fiscal reform

### B.2.1 Green fiscal instruments in Guyana

OECD data shows that revenue from environmental taxes play an important role in Guyana. They have increased over time and stood in 2020 at 13% of total tax revenue or 2.8% of GDP. The share of GDP is falling due to the economic boom (see below). Boodhan (2014) provides a list of environmental taxes that include:

- A withholding tax on gold miners,
- Capital gains on vehicle transfer,
- Purchase taxes on vehicles differentiated by engine capacity,
- A travel voucher tax levied at a rate of 15% of an airline ticket price (minimum tax payable GYD 500),
- A departure tax at rate of GYD 3,500 / USD 16.50 per person (EUR 15.13) (USD 11/EUR 10 for persons over 65 years of age),
- Import duties (45% on motor vehicles),
- Export duties, and consumption taxes on oil imports (50%).

Figure 3: Environmental tax revenue in Guyana, 1994-2020, in % of total tax revenue and in % of GDP



Source: (OECDStat 2023)

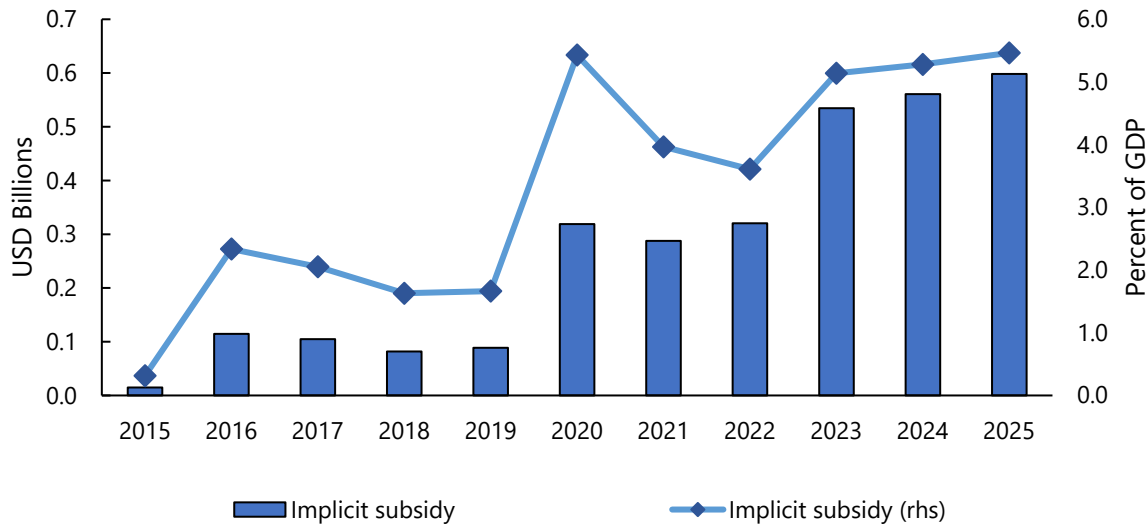
### B.2.2 Environmentally harmful subsidies

Environmentally harmful subsidies exist in Guyana on fossil fuels in the form of implicit subsidies related to oil and gas. They are expected to grow from 15 USD million (EUR 13.8 million) in 2015 to 600 USD million (EUR 550 million) by 2025 according to the IMF (IMF 2021). In 2021, 90% of the level of subsidies were related to oil, 10%

to gas. Negative externalities in 2021 were related to climate change (1.5% of GDP), local air pollution (0.5 % of GDP), vehicles externalities (0.9% of GDP) and foregone revenue (1% of GDP) (IMF 2021).

The “drop” in the share of subsidies as a proportion of GDP is not related to a reduction of the level of subsidies, but to enormous rates of GDP growth (see below).

Figure 4: Implicit subsidies for oil & gas in Guyana, 2015 – 2025, in USD & % of GDP



Source: (IMF 2021)

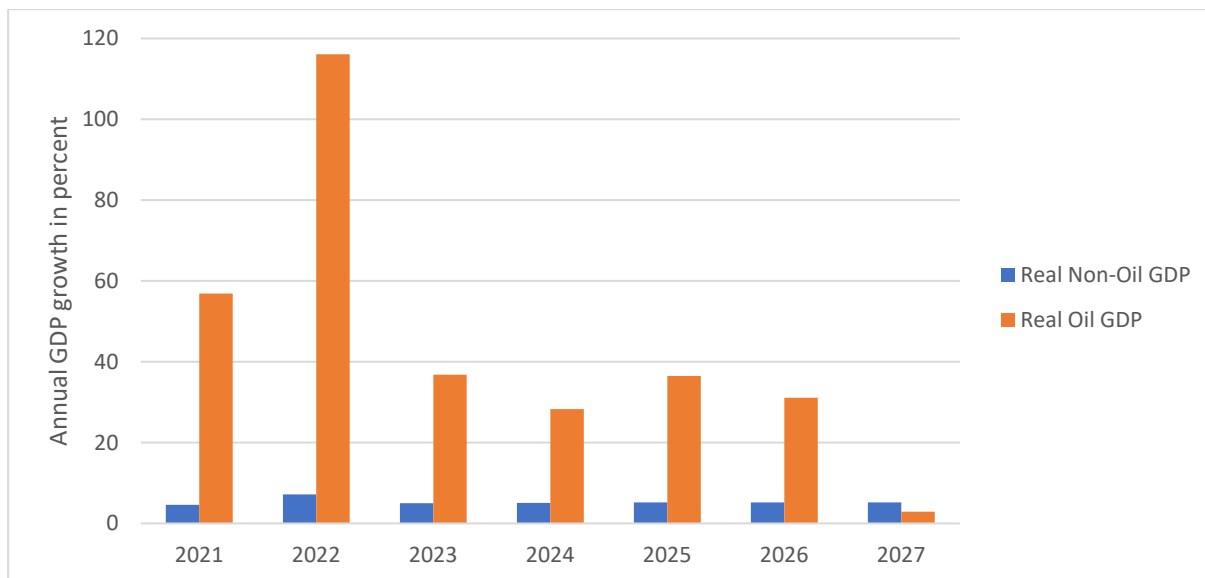
### B.2.3 Broader context: oil & gas explorations driving economic growth

The developments described are taking place in a very particular time economic (and fiscal) boom in Guyana. Recently discovered oil and gas reserves are being exploited by ExxonMobil. Reserves found in Guyana are estimated to be the third largest in Latin America and the Caribbean and among the highest per capita in the world. Oil production started in 2019 and increased step by step to reach 110,000 bpd (barrels per day). It is expected to increase more than six-fold to reach 720,000 bpd by 2026 (IMF 2022, p. 4). In 2021, a Natural Resource Fund (NRF) was established to collect oil-related revenues from royalties, the government’s share in oil and gas profits, petroleum income tax, bonuses and other fiscal instruments solely levied on oil & gas production (\$15). It’s goals (\$3) are to ensure that the oil wealth does not “lead to volatile public spending, (...) to a loss of competitiveness”, to ensure that “future generations benefit from natural resource wealth, (...) to finance national development priorities including any initiative aimed at realising an inclusive green economy” (Official Gazette of Guyana 2021). The fund is expected to reach a net worth of USD 20 billion (EUR 18 billion) in 2027 (IMF, 2022, p. 9). The country is benefiting from the boom in terms of both GDP growth and increases in tax revenue. Whether the country receives a “fair share” from oil and gas revenues cannot be answered here.

Whether Guyana can manage the economic problems related to fast GDP growth, remains to be seen (Bhattacharya 2022 outlines several challenges). The IMF therefore warns about the high risk and high impact of adverse effects of the “Dutch disease” and possible macroeconomic volatility that Guyana could fall into in the medium term (IMF 2022, p. 37).

The latest IMF reports differentiate in their economic analysis, overall GDP growth, and non-oil economic growth. During the COVID-19 pandemic, non-oil GDP shrank by 7.3 % - but oil development led to an overall GDP growth of 43.5 % in 2020 (IMF 2022). While non-oil GDP is projected to grow steadily around 5% over the next years, Figure 5 illustrates the vast contrast to growth rates in the oil sector, which was expected to more than double (+116%) in 2022, and to grow by around 30% annually till 2026 before slowing.

Figure 5: GDP growth in the non-oil and oil sectors in Guyana, 2021 – 2027, in % of GDP p.a.

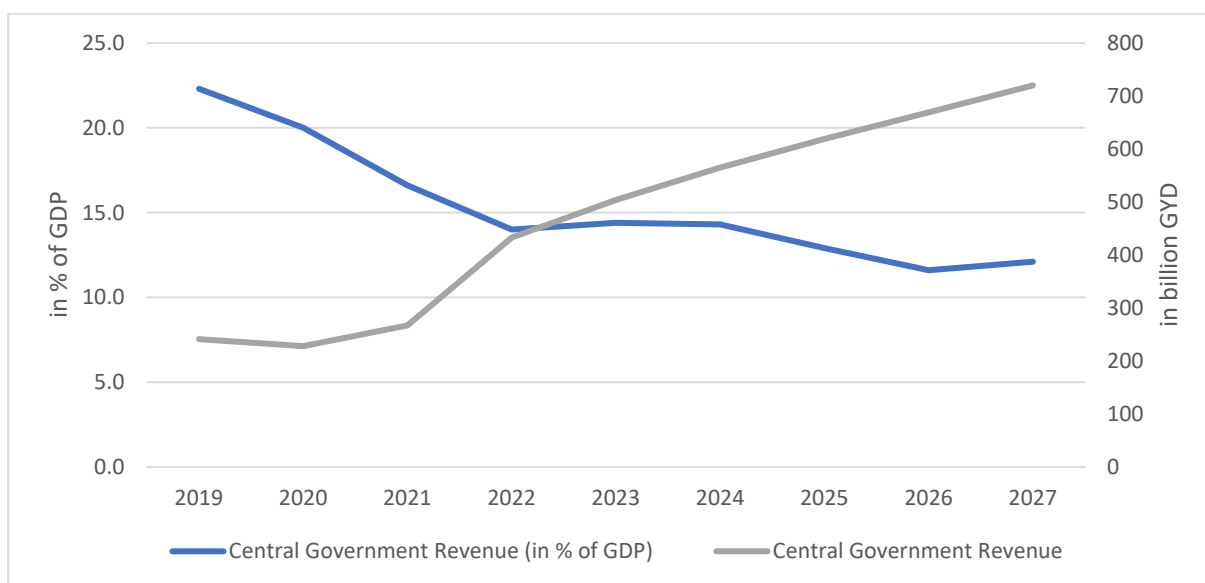


Source: IMF 2022

### B.2.4 Impact of oil growth on public revenues

Figure 6 shows the projected impact of GDP growth on public finances. In nominal terms, central government and tax revenues are projected to increase significantly over time. However, as a percentage of GDP, public revenues are projected to fall from more than 20% to 12.1% (central government revenue) or 7.3% respectively (for tax revenue), according to the IMF. As government revenue is growing fast, Guyana’s public debt peaked in 2021 and is expected to fall continuously to reach 13% in 2027 (IMF 2022, p. 9).

Figure 6: (Projected) Development of central government and tax revenue in Guyana, 2019 – 2027



Source: IMF 2022

The budget presented in January 2023 projects government revenue of GYD 578.5 billion (USD 2.7 billion / EUR 2.5 billion) – significantly higher than projected by the IMF (Alli 2023). GYD 208.9 billion GYD (USD 989 million / EUR 907 million) – more than a third – are withdrawals from the Natural Resource Fund.

## B.3 Instrument design

The instrument's legal basis is Section 7A of the Customs Act Chapter 82:01, amended in 2017 (Parliament of Guyana, 2017). The environmental levy is a per-unit tax of GYD 10 (USD 0.05 / EUR 0.05) on beverage containers. Adjusted for gross national income in Guyana and the European Union, the tax level would be equivalent to EUR 0.24 in the European Union.<sup>57</sup>

The scope of the tax is wide and includes:

- “every unit of non-returnable metal, plastic or glass<sup>58</sup>
- of any alcoholic or non-alcoholic beverage
- that is either “imported into Guyana or manufactured locally” (Guyana Revenue Authority, 2017).

The collection mechanism is different for importers and manufacturers:

- Importers pay the environmental levy “at the ports of entry into Guyana to the Customs and Trade Administration at the same time when Customs Duties are paid”
- Local manufacturers pay the levy “monthly, when the returns are submitted” (Guyana Revenue Authority 2017).

Goods warehoused by importers or manufacturers are not subject to the levy until they are “removed from the warehouse, factory, bond or other place of storage”. Beverage containers that are exported are also not subject to the levy. Failure to pay the levy will lead to a fine of GYD 50,000 (USD 241 / EUR 221) and twice the sum owed (Parliament of Guyana 2017).

## B.4 Impacts of the instrument

### B.4.1 Fiscal revenue from the environmental levy

In recent years, revenue from the environmental levy grew to close to GYD 3 billion (GYD 2.9 in 2023), equivalent to USD 13.7 million / EUR 12.7 million. The data in Figure 7 also indicate the share of environmental levy revenue as a percentage of tax revenue. Its share accounted for 0.7 – 0.9 % of tax revenue in most of the last twenty years. Recent enormous GDP growth and related growth in government revenue have led to the levy's share declining to only 0.42% of total tax revenue in 2023.

The reasons for the suspension of the levy in 2015/ 2016 and the growth in tax revenue after 2017 (due to broader tax base after the reform) are explained in section 6.2.

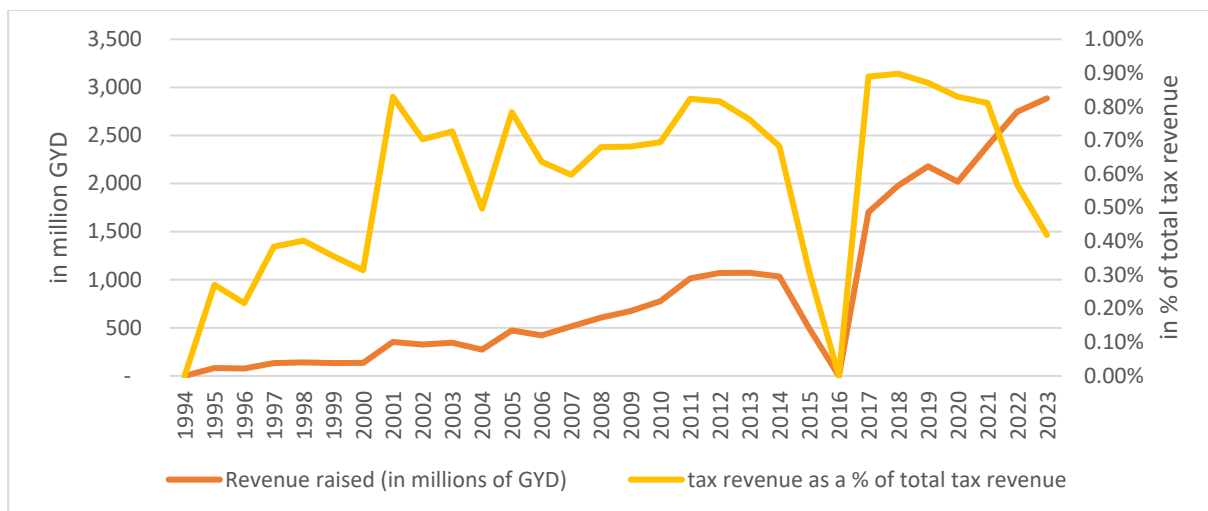
Reports point out that it is unclear how revenue is used and it is not used to improve waste management (GuyanaTimes 2018).

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<sup>57</sup> We compared “pre-oil” 2019 Gross National Income data of Guyana and the European Union average, with the latter being about 5.5 times higher than in Guyana.

<sup>58</sup> A previous version of the Customs Act also included containers made from cardboard. Why the cardboard was excluded in the 2017 reform of the law from the levy is unclear.

Figure 7: Revenue raised from the environmental levy in Guyana in million GYD and as a percentage of total tax revenue, 1994 - 2020



Source: own compilation based on OECD (OECD, 2022) data for 1994 – 2020 and national budget estimates (Guyana Ministry of Finance 2023a) for 2021 – 2023

## B.4.2 Economic, social, and environmental impacts

### Economic and social impacts

The levy is reported to have incentivized innovation in the beverage sector. At least one company started to recycle plastic within the first year of the Levy being in force (GuyanaTimes 2018). The Commissioner of the Guyana Revenue Authority also suggested that imports of plastics to Guyana have reduced due to the levy.

No information on negative social impacts is available in the public domain. In interviews, it was pointed out that most people are unaware of the levy. When we calculated an average annual tax burden per capita, we found that every citizen paid about GYD 3,400 (USD 16 / EUR 15) in 2022 in environmental levy to the government.

### Environmental

Environmental impacts are hard to estimate. The development of revenues suggest that more non-returnable beverage containers are being consumed (and therefore taxed): the number of returnable beverage containers consumed per capita annually is growing, from 212 in 2017 to a predicted 359 in 2023.<sup>59</sup> This development suggests that the levy alone is not sufficient to reduce the consumption of non-returnable beverage containers. This trend is not surprising as experts suggest there is no awareness of the levy and its environmental goal, and that a rather prevalent “throw-away” culture the norm for many people.

## B.5 Complementary measures

### B.5.1 National Solid Waste Management Strategy

The environmental levy on non-returnable beverage containers is embedded in the broader context of the National Solid Waste Management Strategy (NSWMS). The strategy was published by the Ministry of Local Government and Regional Development on 1 January 2013, and runs from 2013-2024. The NSWMS aims to provide a strategic framework through which Guyana should be able to improve the waste management to reduce the negative consequences for the environment (Ministry of Local Government and Regional Development 2013).

The three topics of a cleaner environment, better public health protection and the contribution to economic

<sup>59</sup> Own calculation based on tax data.

prosperity have been identified as the three long-term objectives for the Waste Management Strategy. Those are supported by the following six short-term goals: less litter and illegal dumping, less waste generation, better resource recovery, effective and cost-effective waste collection, better waste infrastructure and strengthened human and institutional capacity. The strategic framework lists 44 strategic actions that are assigned to the six short-term goals.

In order to finance the strategy, the financial mechanisms mentioned are council rates on the one hand and the environmental tax on the other. The environmental tax that is mentioned is still the old environmental tax on imported non-returnable containers that is considered in more detail at 6.2. The council rates are paid by Georgetown City residents for waste management and other basic municipal services, even though the rate of collection is reported to be low (Ministry of Local Government and Regional Development 2013). Outside Georgetown City, garbage fees are paid by residents to private garbage companies.

Looking at the institutional framework of the strategy, the Ministry of Local Government and Regional Development (MLGRD) through the Solid Waste Management Authority are named as responsible for the overall coordination and implementation and formulation of national waste management policies. Other main entities involved in solid waste management in Guyana are the Environmental Protection Agency (EPA), the Regional Democratic Councils (RDCs), the Neighbourhood Democratic Councils (NDCs) and the Town Councils.

### **B.5.2 Government spending on waste management**

There is no direct revenue recycling of the revenue generated from the environmental levy. While the environmental levy is collected by the central government, actual responsibility for waste management lies with local governments. The Ministry of Local Government and Regional Development coordinates with them.

The national budget indicates that programme 134 on “Local Government Development” is focused on supporting waste management and garbage collection at local levels (Guyana Ministry of Finance 2023b, p. 87). However, the central government does not itself implement waste management. The programme budget stood at GYD 1.6 million (USD 7,552 / EUR 6,924) in the 2023 budget.

A waste-related investment project within programme 134 is the “Solid Waste Disposal Programme” (2021 – 2023), managed by the Ministry of Local Government and Regional Development. The central government is expected to invest GYD 2.2 billion (USD 10.4 million / EUR 9.6 million) in the provision of landfill site, the closure of dumpsite and landfill gas management systems (Guyana Ministry of Finance 2023c, p. 95).

### **B.5.3 Voluntary measures: voluntary DRS system**

Complementary to the environmental levy, the Guyanese beverage manufacturer Banks DIH is operating a deposit-return programme for its beer and soda sold in refillable glass bottles. It charges a deposit of GYD 600 (USD 2.85 / EUR 2.61) for every case of beer and GYD 240 (USD 1.14 / EUR 1.04) for a case of soda sold and refunds the deposit when returned (Banks DIH 2020).

If we compare the deposit for a case of beer (incl. 20 bottles) with the deposit rates in Germany (EUR 1.5 per case + EUR 1.6 for 20 glass bottles), we find that the economic incentives are much higher in Guyana (given the differences in per capita income). However, there is no data available on the scale and effectiveness of the voluntary deposit return scheme.

## **B.6 The story of implementation**

### **B.6.1 Early evolution of the instrument**

The Environmental Levy was first introduced in Guyana in 1995 as part of the Customs Act reform (Parliament of Guyana, 1995). In its original form, it also included beverage container made from cardboard. The levy only applied to imported beverage containers – not domestically manufactured ones. Its objective was to reduce the negative environmental impacts of non-returnable beverage containers, to encourage recycling, and to enhance resource efficiency.

## **B.6.2 Complaint against the environmental levy: Rudisa Beverages & Juices vs. Guyana and final reform of the law**

In 2014, the beverage producer Rudisa Beverages & Juices N.V., based in Suriname, sued the Government of Guyana alleging that the environmental levy on imported non-returnable containers breached the regulations of the Revised Treaty of Chaguaramas (RTC - the founding document of CARICOM), which prohibits the imposition of import duties on goods of community origin (Demerara Waves Online News 2016). Due to the CARICOM (Caribbean Community) membership of Suriname and Guyana, the containers therefore qualify as goods of community origin. Additionally, Rudisa Beverages & Juices N.V. demanded compensation for the damage caused by the environmental levy.

The decision of the Caribbean Court of Justice (CCJ) found that the environmental levy was discriminatory and in violation of the regional trade rules because local companies had not been charged the levy (Caribbean Court Of Justice, 2014; Demerara Waves Online News, 2017). As a result, the Surinamese beverage company, Rudisa Beverages and Juices N.V. secured a judgement that forced the government of Guyana to repay funds from January 1, 2006 to the date the tax was repealed August 2015<sup>60</sup>, which resulted in a repayment of around GYD 1.27 billion (USD 6 million / EUR 5.5 million) (iNEWS Guyana, 2015).

In 2017, the customs act was reformed in accordance with the ruling. The levy was kept at the previous rate but treated domestic and foreign producers of non-returnable beverage containers the same.

## **B.7 Lessons learned and recommendations**

### **B.7.1 A solid source of revenue, but ineffective for the environment**

The environmental levy has been a stable source of revenue for Guyana for a long time. On its environmental effectiveness, there is anecdotal evidence, but little quantitative data. The rate of the levy is relatively high when taking purchasing power and income levels into account. Yet, from an environmental perspective, it was pointed out by experts by there is little actual awareness in society of the tax and its environmental purpose to reduce the consumption of on non-returnable beverage containers. It was pointed that a “throw-away” culture is still very present in Guyana and that among the public, there is little aware that there even is a tax that is intended to discourage the consumption of such non-returnable beverage containers. Thus, government should consider using the tax revenue to fund measure to address and improve this “throw-away” culture (and thus reduce tax revenue). This point highlights a trade-off between fiscal and environmental goals of an environmental tax.

### **B.7.2 A throw-away culture is affected little by an unknown tax**

There seems to be little attention being paid to the fact that every consumer pays a relatively high tax on each non-returnable beverage container in Guyana. An expert suggested that most people are simply not aware that such a tax exists and therefore do not consider the environmental purpose of the tax; to reduce the consumption of non-returnable beverage container and to use alternatives. Rather, the expert suggested that revenue from the tax should first of all be used to raise awareness of the environmental problem of waste being disposed into the environment to tackle the prevalent “throw away” culture in the country.

### **B.7.3 The environmental levy has been “eaten away” by inflation**

One recommendation for the tax is related to a common problem of environmental taxes that are designed as per-unit taxes (and not as ad-valorem taxes): their ability to steer behaviour (here: consume fewer disposable beverage containers) is devalued over time. Inflation causes the comparative size of the economic incentive to

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<sup>60</sup> This also explains the comparatively low tax revenue from the levy in 2015 as shown, since the tax was only collected until August of that year.



diminish over time, despite nominal revenue increasing. In view of this, it is even more remarkable that the rate of the levy has not changed since 1995 when it was already set to GYD 10.<sup>61</sup> Between 1995 and 2021, inflation has caused prices increase almost three-fold (+289%<sup>62</sup>) – thus deteriorating the steering effect of the environmental levy enormously.

Inflation is expected to continue to rise. The economic boom is likely to increase inflationary pressures<sup>63</sup> despite inflation in Guyana being lower than in other commodity-exporting Caribbean countries (IMF 2022, p. 20). Adjusting the environmental levy to a higher level should be considered. It can be addressed by pegging the levy's size to inflation<sup>64</sup> annually or by regularly reviewing its setting every few years. The current law does not foresee any such review.

#### **B.7.4 Designing environmental taxes in a fair & non-discriminatory way**

The legal battle about the instrument (and its subsequent temporary suspension) is an important lesson for the design of instruments to treat imports and domestically manufactured goods the same and to avoid discrimination of foreign businesses – and, as in the case of Guyana, a temporary suspension of the levy and loss of revenue. As many non-OECD countries participate in different forms of regional economic integration, designing green fiscal instruments in line with trade rules is an important requirement. The problems in Guyana also demonstrate that trade rules and market integration generally are not at odds with green fiscal instruments, but that there is a clear need to apply laws to domestic and foreign actors in the same way.

#### **B.7.5 Managing public finances during times of an oil-induced economic boom**

Beyond the question of the Environmental levy, managing the oil-spurred economic growth and its impact on public finances is a major challenge for Guyana, in which it can benefit from the expertise of other countries which have faced similar situations in the past. The key challenge for the country is likely to ensure that the seeming “blessing” for the country will be managed well. Part of this challenge will be not to “forget” about smaller fiscal instrument, such as the levy, that can play an important part in waste policy.

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<sup>61</sup> It should be noted that it was designed to apply only to beverage containers imported to Guyana in the first version.

<sup>62</sup> Own calculation based on OECD & World Bank data.

<sup>63</sup> E.g., the IMF emphasizes that „there is significant risk of appreciation pressures if inflation accelerates and if significant oil receipts are brought onshore“ (IMF 2021, page 39).

<sup>64</sup> This is done in several European countries, such as in Denmark, Sweden, the Netherlands, Portugal, Romania or Cyprus (FÖS & FFU, 2020).



%20reform%20in%20non%2DOECD%20countries%2Fliterature%2FGuyana&p=true&wdLOR=c74FE1EEC%2D9472%2D4CC8%2D814F%2DDF569A8D85EB&ga=1

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## B.9 Interviews: Guyana

- Federico Suárez, Programme manager for Guyana, Delegation of the European Union to Guyana
- Prof. Abdullah Ansari, University of Guyana, Department of Biology, expert for waste policy in Guyana



# C. Morocco's plastics tax

## C.1 Introduction

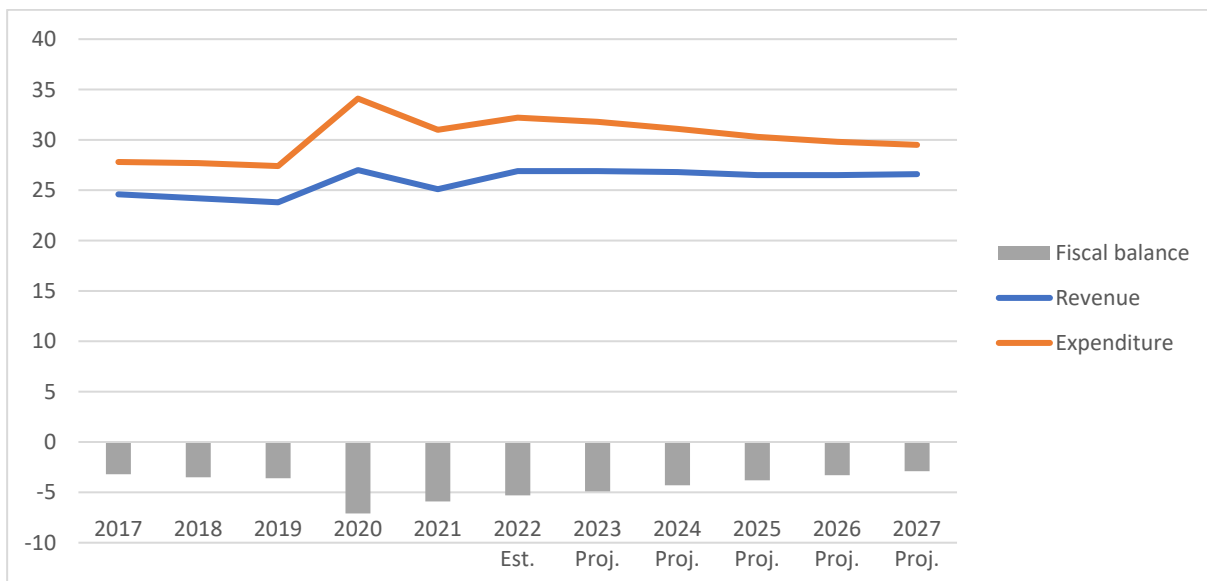
The Kingdom of Morocco implemented an ecotax on plastics in 2014. The taxation is set on sale, manufacture, and import of plastics or products made of plastic materials. The tax is part of the National Household Waste Program (PNDM – Programme National des Déchets Ménagers) developed in 2008 (Ghariani, 2015; Royaume du Maroc, 2012b).

## C.2 The context of green fiscal reform in Morocco

### C.2.1 Overall economic and fiscal development

Economic development in Morocco has been stagnating for several years. Particularly per capita GDP did not increase between 2014 and 2020 and only recently started to grow again (World Bank 2022b). This is one reason why central government revenues in Morocco have been consistently lower than expenditure. Thus, Morocco has been running an annual budget deficit between 3% and 7% for several years, and is projected to continue to do so (see Figure 8).

Figure 8: Public revenue, expenditure, and annual deficits ion Morocco, 2017 – 2027 (projected), in % of GDP



Source: (IMF 2023)

### C.2.2 Green fiscal instruments in Morocco

#### Overview of environmental tax instruments

Morocco has implemented a broad range of different green fiscal instruments in a variety of sectors. The country showed an early interest in environmental fiscal reforms, implementing some waste-water related instruments in the mid-1990s (Green Fiscal Policy Network 2017). In 2011, the new constitution included a commitment to sustainable development (Green Fiscal Policy Network 2017). In 2014, there were public debates about environmental taxation within the national charter on the environment and sustainable development. Various taxation options with different effects on the environment were implemented (e.g., the exemption from the motor vehicle tax for public transport and electric or hybrid vehicles; lower VAT for sales of solar water heaters, tax on cement, concrete iron, sand and extraction of quarry products, charge for

wastewater, etc.) (Errochdi & El Haddad 2021). Table 6 provides an overview. Many instruments have not yet been assessed for their effectiveness and some planned instrument were not adopted due to opposition, e.g. from the association of Moroccan enterprises (CGEM) (Climate Chance 2020).

Table 6: Examples for green fiscal instruments and environmentally related fiscal instruments in Morocco

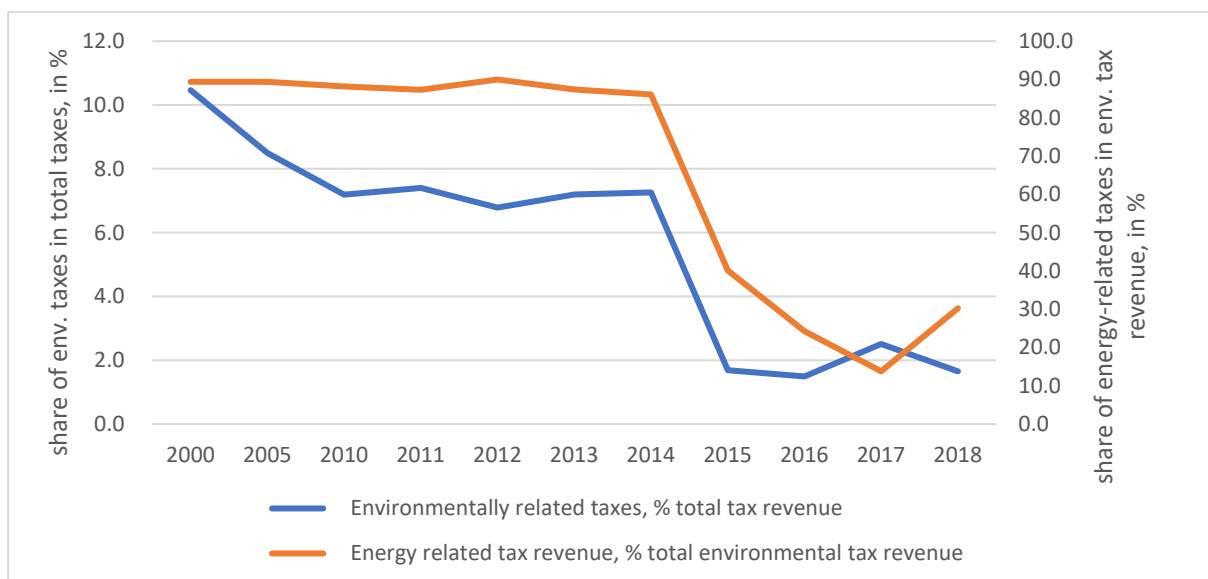
Taxes	Fees	Tax expenditures
<ul style="list-style-type: none"> <li>• Tax on extraction of quarry products</li> <li>• Special tax on sand</li> <li>• Special tax on cement</li> <li>• Verification tax on vehicle older than 5 years</li> <li>• Domestic consumption tax on energy-intensive products, electric devices and vehicle batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Royalty on phosphate mining</li> <li>• Wastewater treatment fee</li> <li>• Fee on discharges in surface or groundwater</li> <li>• Landing fee related to airfields</li> </ul>	<ul style="list-style-type: none"> <li>• VAT exemptions for sales of water pumps running on renewable energy</li> <li>• Reduction of VAT on solar water heaters</li> <li>• Exemption from annual tax on motor vehicles for public transport vehicles, electric vehicles, and hybrid vehicles</li> </ul>

Source: own compilation based on (Boukhari & Bentaleb 2022; Tabet & Bougantouche 2018)

### Revenue from environmental taxes

Data on revenue from environmentally related taxes is available from the OECD Policy Instruments for the Environment (PINE) database. It shows that the environmental taxes accounted for about 2% of tax revenue until 2014 before dropping to 0.2% in 2015 and appreciating again to stand at 0.6% in 2019 (see Figure 9). The sudden drop in tax revenue in 2014/2015 equivalent to MDH 6.2 billion (USD 1.7 billion / EUR 1.6 billion) is related to “concessions” made in the context of the reforms for direct fossil fuel subsidies (see next section). While before 2015, over 90% of environmental taxes came from energy-related taxes, the share (and total environmental tax revenue) sharply fell afterwards.

Figure 9: Shares of environmentally related taxes in total tax revenue and energy-related tax revenue in % of environmentally related tax revenues in Morocco



Source: (OECD, 2022)

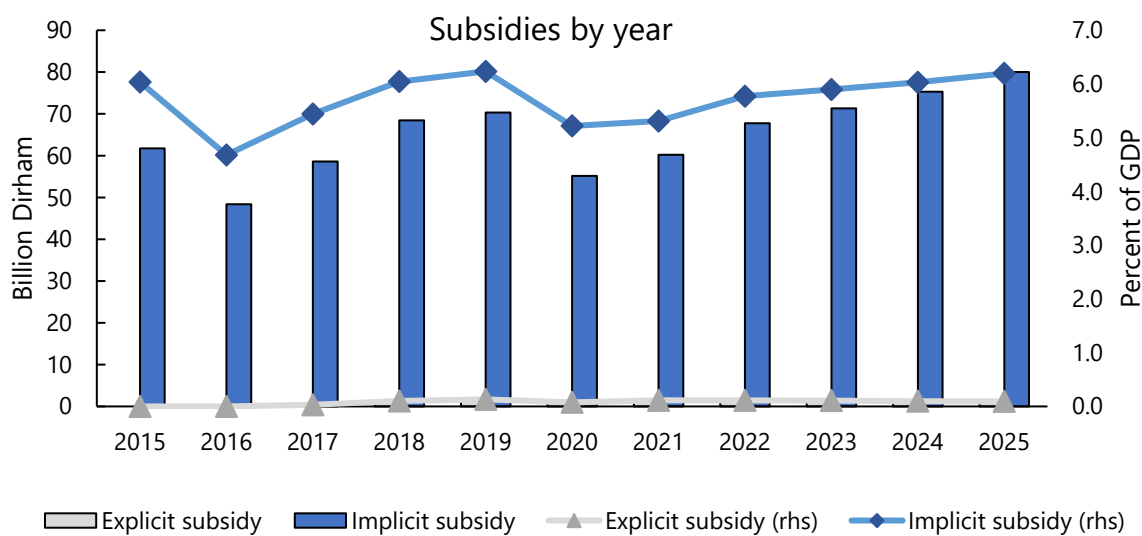
### C.2.3 Fossil fuel subsidy reform in Morocco

Morocco was one of the first countries in the Middle East and North African region to reform fossil fuel subsidies. It is often considered and portrayed as a success story in the reform of explicit fossil fuel subsidies between 2012 and 2015 (Pashley 2015; Reuters 2014). Morocco is particularly credited because the country “maintained subsidies that disproportionately benefitted poor and rural communities, while reducing government support for fossil fuels and reinvesting the savings in renewable energy projects that created sustainable jobs and increased the country’s energy independence” (WRI 2021). The government deliberately retained subsidies on butane gas that is often used by poor households for cooking and lighting. In 2021, a 12kg bottle of butane would have cost EUR 10 on the open market in Morocco but was available for EUR 4 a bottle – with the difference paid by the Caisse de Compensation. Although this measure is clearly important for social equity reasons, it is important to also understand that it also effectively also serves as a disincentive to switch to solar cookers.

Subsidy reform was part of a package of measures aimed at improving public finances, as a condition for continued credit from the IMF (Reuters 2014). Morocco’s 2016 NDC report emphasizes the countries intention to continue this path. In order to achieve 2030 emission reductions goals, it emphasizes the goal to “substantially reducing public fossil fuel subsidies, building on reforms already undertaken in recent years” (Kingdom of Morocco 2016).

One needs to note that while explicit government spending on (explicit) fossil fuels subsidies has been ended, implicit or indirect subsidies still accounted for around MAD 68 billion in 2022 (USD 6.8 billion / EUR 6.3 billion) or close to 6% of GDP – not as government spending, but in the form of foregone revenue, non-internalized climate change impacts, local air pollution and vehicle externalities. This development has been stable and is expected to continue (see Figure 10). More than a third of the subsidies are related to coal, more than a quarter to diesel and LPG, some to oil and electricity (see IMF 2021). Similarly, UN Stat data shows that fossil fuel subsidies in Morocco have increased (again) between 2015 and 2019 (UNECE 2022, p. 77).

Figure 10: Fossil fuel subsidies in Morocco



Source: (IMF, 2021)

## C.3 Instrument design

### C.3.1 Description of the plastics tax

#### Setting of the tax

The plastics tax (Taxe écologique sur la plasturgie) went into effect in 2014 and was amended in 2016 (Royaume du Maroc 2012a). In its current form, it applies a 1% as valorem tax on sales, ex-factory sales and on imports of plastics and synthetic materials as well as products made thereof. The specific materials and products mostly fall into category 39 of the Harmonized System classification. The specific products covered are listed in an appendix 4 of circular no 5580/210 (2015) (Administration des Douanes et Impôts indirect 2015).

The tax owed is collected by customs in case of imports. On locally manufactured products, the tax needs to be paid provide to the local treasury offices within a month of the sale of the products. Companies are required to provide “a statement specifying the quantities and value of the said materials and works sold” (Royaume du Maroc 2012a). The law stipulates also that there shall be no double taxation. A fine of 25% is ought to be applied in case of failure to declare the correct amount and value of materials and goods, payment is delayed or insufficient.

#### Use of revenue

The tax revenue is one source of funding for the National Environmental Protection and Sustainable Development Fund (FNEDD) (Ghariani 2015; World Bank 2022a). In general, there is a lot of criticism regarding the lack of transparency about the use of tax revenues in Moroccan government. Some authors suggest that FNEDD is a positive exception and credit its rather specific and transparent use of tax revenue (Boukhari & Bentaleb 2022).<sup>65</sup> FNEDD uses some of its revenues to fund PNDM (see below).

The FNEDD fund is supposed to strengthen the plastics sector and the circular economy by supporting the recovery of plastic waste, waste separation and recycling. According to the allocation rules a minimum of 20% of total tax revenues are assigned to informal waste collectors, while the gender in fund distribution get a special attention (World Bank 2016). The use of plastic tax revenues is governed by several structures:

- A Strategic Orientation Committee (COS) with representatives from the public and private sector as well as businesses,
- a tax allocation mechanism (whose development was supported by the World Bank) and
- an operational manual that defines conditions for planning and use of revenues for the intended purposes and institutions (Ghariani 2015; World Bank 2022a).

### C.3.2 Strategic framework: PNDM & SNVRD

The National Household Waste Programme (PNDM) builds the framework for several policy measures on the national and municipal level regarding plastic and plastic waste (Climate Chance 2020). The tax on plastics was part of the second phase of the programme and now is a key element of it. Figure 9 below shows a range of complementary measures.

The programme was developed in 2008, involved parties are the Secretariat of State for Sustainable Development and the Ministry of Interior, and is supported by the World Bank. The programme is governed by an inter-ministerial steering group consisting of the Ministry of the Interior, the Ministry of Economy and Finance, and the Ministry of Energy, Mines and the Environment (UNECE 2022, p. 232).

The goal was to modernize the waste sector by 2023 to implement collecting and separating household waste, professionalizing the waste sector or increasing the recycling rate (Government of Morocco 2018). Specific

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<sup>65</sup> The authors underscore that this is an exception and that most of the revenue generated from green fiscal instruments is not being used to fund environmental programmes but finances the general budget.

targets were (UNECE 2022, p. 232):

- To expand the coverage of solid waste collection from 70% to 90%,
- Increase the rate of (sanitary) landfilling in urban areas to 100%,
- Close & rehabilitate all dumpsites, and
- To develop sorting, recycling, and recovery activities to reach the recycling rate of 20% (of all waste produced).

It was estimated that funding of about USD 16 million (EUR 14.7 million) annually was needed (World Bank 2022a).<sup>66</sup> The PNDM is financed by local authorities (73%), state budget (9%), international cooperation (4%), taxes (12%) and funding from the Clean Development Mechanisms (3%) (Climate Chance 2020).

UNECE (2022, p. 77 & 228) gives some examples of their work & spending:

- Awareness-raising actions on waste sorting and recovery (7.2 million dirhams) (2016),
- Plastic bag collection campaigns (83 million dirhams) (2016–2017),
- Setting up sorting centres at controlled landfills for the benefit of 14 local authorities and an association for the recovery of agricultural plastic (277.1 million dirhams) (2018–2019),
- Support for 20 waste sorting and recycling centres, financed by plastics tax revenues.

The PNDM is complemented and specified by the National Strategy for the Reduction and Recovery of Garbage (Strategie Nationale de Reduction et de Valorisation des Dechets / SNVRD). It is meant to develop a circular economy at the local level. Its main goals are:

- reduce the waste to be disposed of in controlled landfills,
- and improve the recycling recovery rate; and – in doing so:
- create sustainable green jobs (UNECE, 2022, p. 24).

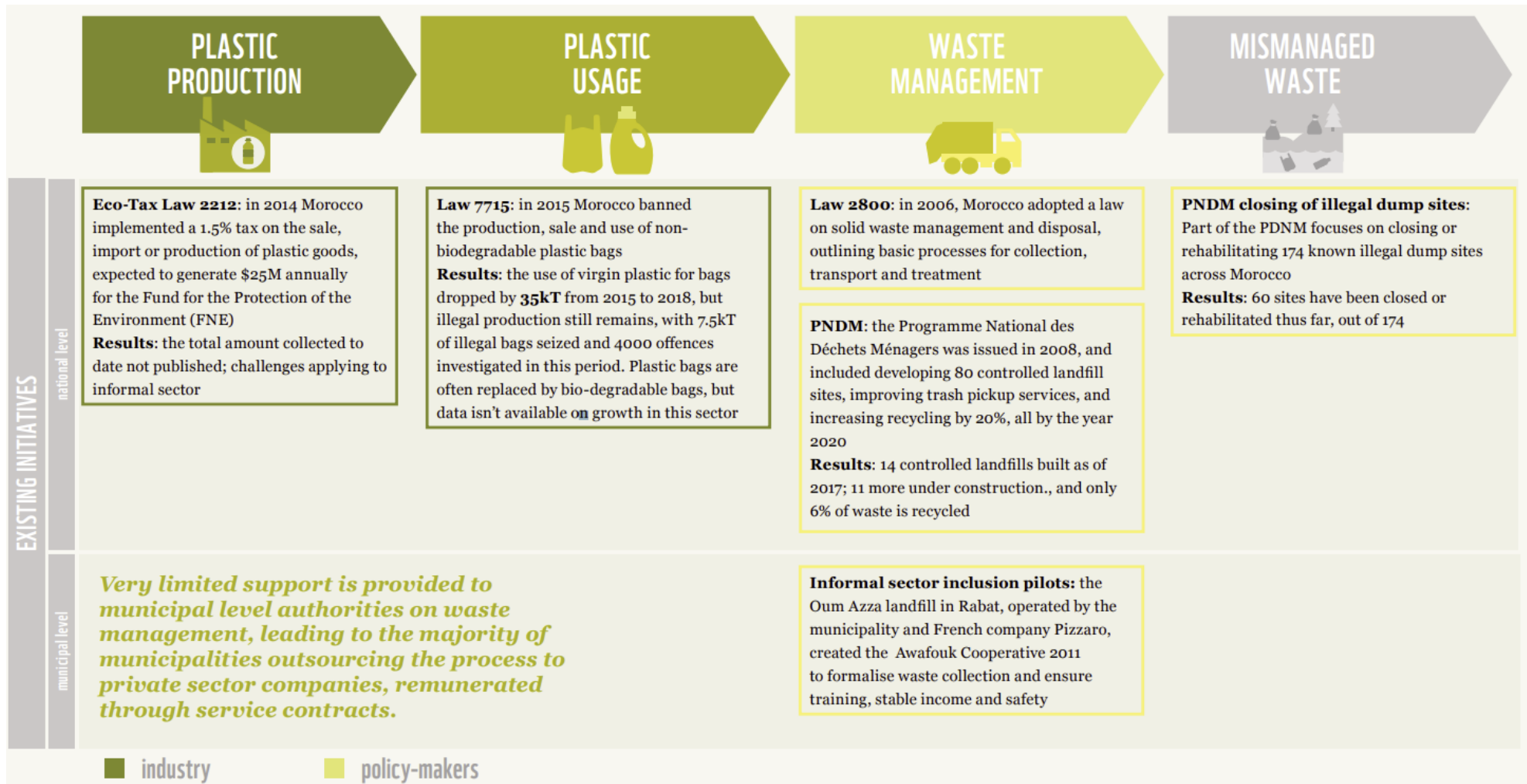
It provides targets for all kind of waste streams. The strategic targets for plastic are to increase the recycling rate to 50% by 2025 and 70% by 2030. The plastics tax is considered the main financing instrument to achieve this goal (see table 5 in Royaume du Maroc & GIZ 2019). Other “new” financing instruments are mentioned to be explored, such as fees or extended producer responsibilities.

Figure 11 provides an overview of the most important policy instrument regarding plastic waste in Morocco. The plastic tax is a key instrument in it. Other complementary ones are discussed in below.

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<sup>66</sup> This is very close to the annual revenues generated from the plastic tax.

Figure 11: Policies on plastic, waste management and recycling in Morocco



Source: (WWF Mediterranean Marine Initiative & Dalberg Advisors 2019)



## C.4 Impacts of the instrument

### C.4.1 Impacts of the plastics tax

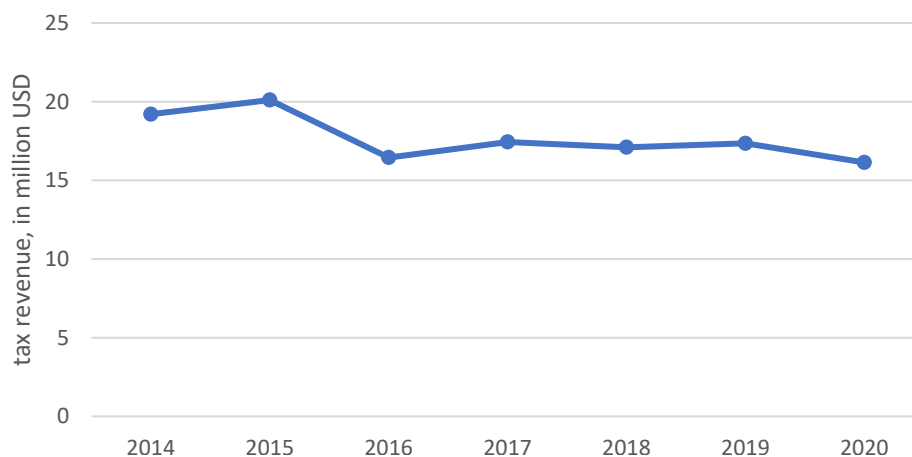
Assessing the success and failure of all waste-related policies – including the plastics tax – is hard in Morocco given a general lack of data on waste as well as the complicated governance structure with multiple overlapping strategy documents. Finally, the unclear relationship between different sources of funding – like the plastic tax revenue – and expenditure on waste policies and programmes make assessments very difficult. This basic premise was emphasized in an UN review stating that “as of June 2021, no study assessing the impact of the ecotax has been carried out” (UNECE 2022). This chapter presents the data that is available.

#### Revenue from the plastics tax

In 2020, the plastic tax raised MDH 168 million (USD 16.1 million / EUR 14.8 million) in revenue (Figure 12 below). This is equivalent to 0.05% of total tax revenue (2020). Revenue has fallen since 2014.

The reduction of the tax rate from 1.5% to 1.0% surely had an impact and the ban on plastic bags should also play a role. Some have suggested ending the tax following the ban on plastic bags and given the low revenues, the profitability of the tax is in question compared to the enforcement costs (Climate Chance 2020; Lakir & Habboub 2020). Trade-data show that plastic imports to Morocco are growing significantly, which should increase tax revenue (see Figure 12 below).

Figure 12: Revenue from the plastics tax, 2014 – 2020, in million USD



Source: (UNECE, 2022)

To which degree revenues are being spent and for what purposes, is unclear. Some sources suggest that large amounts of revenue have not been spent (“several hundred million dirhams collected are still sleeping in the state coffers” (L’Usine Nouvelle 2016).

#### Economic impacts

There are no quantitative assessments on the instrument’s economic impacts.

Generally, the tax creates incentives for plastics recycling and was expected to reduce expenditure on primary materials by 20%. Government claims that the use of plastic waste as a resource will enhance resource efficiency and reduce costs for business and estimates that using recycled raw materials can reduce the cost of manufacturing inputs by 20% and so have measurable positive impacts on competitiveness (Government of Morocco 2018).

The revenue from the tax is intended to support the creation of new SMEs in the waste sector by subsidising capital investments in sorting schemes and bringing together informal waste-pickers into formalised cooperatives to recycle waste. Increased recycling rates will reduce plastics imports, generating foreign

currency savings. Use of plastic waste as a resource will enhance resource efficiency and reduce costs for business – using recycled raw materials can reduce the cost of manufacturing inputs by 20% and so have measurable positive impacts on competitiveness (GoM 2018a). Voices from the plastics industry point out that the plastics sector in Morocco is still relatively small and nascent – pointing out that investment hardly pay off in an environment where it is cheaper to “bury” waste on landfills rather than to recover and recycle resources (Marzak 2022).

Furthermore, there is evidence that such approaches are being taken up in other value chains, such as batteries, used tyres, and waste oils – which may boost competitiveness across the economy in the future.

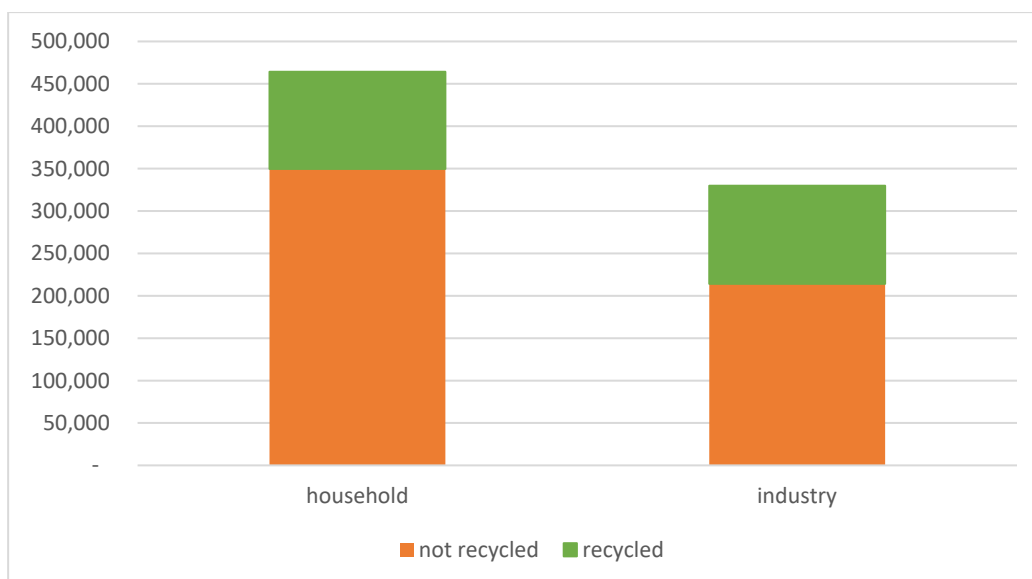
### Environmental footprint

A 2021 review of the PNDM shows significant progress over the programme’s lifetime, yet it provides no insights on the achievement of its key targets, but description of the kinds of programmes implemented (not their results) (see UNECE 2022, p. 232). PNDM was credited with successes in the field of waste collection in urban areas. A UN report also underscored that “challenges still remain in almost all the municipalities, related to establishing at source sorting of waste and increasing the rate of waste recovery and recycling” (UNECE 2022, p. 233).

A 2019 review of the SNRVD presents data on waste streams from the 2015 (Royaume du Maroc & GIZ 2019). It shows that plastic waste makes up between 20% and 35% of all non-hazardous waste in all regions of Morocco. 58% of all plastic waste comes from household consumption, 42% from industrial sources. 25% of household plastic is being recycled<sup>67</sup>; for plastic from industrial source, the rate is 35%. In 2015, there were close to 800,000 tons of plastic waste annually (see Figure 13). The government’s own projection for 2030 expect the annual amount of plastic waste to grow by 70% to 1.35 million tons per year (Royaume du Maroc & GIZ 2019). This growth could suggest that the tax rate is too low to discourage the consumption of plastic products or a significant amount of evasion of the ban on plastic bags.

Other sources suggest that recycling rates for plastic waste in Morocco is well below 10% (WWF Mediterranean Marine Initiative & Dalberg Advisors 2019). Virgin plastics are imported for production, while bulk plastic waste is exported, according to interviewed experts. According to UN data for the year 2014, the share of plastic in household waste was between 6-10% of municipal waste collected; 10% of which was being recycled (UN Statistics Division 2022).

Figure 13: Amount of plastic waste in Morocco (2015) from households and industry, and shares being recycled.

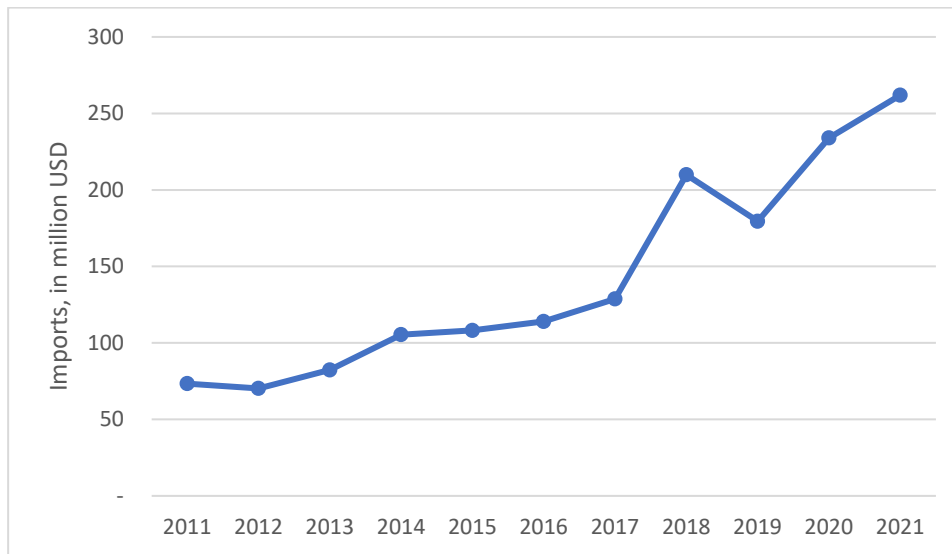


Source: (Royaume du Maroc & GIZ 2019)

<sup>67</sup> Sources do not distinguish between material or thermal recycling.

Trade data similarly shows that imports of goods (plastics & synthetic materials) in classification HS39 to Morocco have almost quadrupled between 2011 and 2021 (UN Comtrade 2023). Trade data by the observatory of economic complexity (OEC) shows a much higher trade volume for plastic & rubber products.<sup>68</sup>

Figure 14: Development of HS39 imports to Morocco, 2011 – 2021, in million USD



Source: (UN Comtrade, 2023)

## Social impacts

The tax creates extra costs to every consumer of plastic products, but these are relatively low. For example, the cost increases resulting from the tax amount to just over half a dollar cent on a 1.5 litre bottle of water (Government of Morocco 2017). Expenditure financed by the tax's revenues has generated positive social impacts: By January 2016, i.e., after the first two years of the tax, a total of USD 44 million (EUR 40 million) had been allocated to the FNE. Eighteen recycling projects had been awarded funding, expected to generate around 1,000 jobs for waste pickers (World Bank 2016). Funds are used to encourage the formation of waste picker cooperatives, thus creating new economic opportunities for waste pickers at regularly inspected and sanitary landfill sites. Formalising the system enables informal waste pickers to become the owners and employees of waste sorting facilities, thus improving working and sanitary conditions, and providing a more stable source of income, including social insurance provision.

## C.5 Complementary measures

The plastics tax is primarily a financing instrument (for FNEDD & subsequently PNDM & SNVRD) embedded in a broader waste management strategy framework (see Figure 11). The ban on plastic bags is an important complementary measure to reduce the consumption of plastics. A range of alternative financing instruments as well as incentives for investments in the waste sector are discussed in Morocco to improve waste policies and recycling to achieve the SNVRD's 2030 targets.

### C.5.1 Ban on plastic bags

One of the main plastic pollution issues in Morocco are the large amounts of plastic bags used. In 2016, the government started the "Zero Mika" (zero plastics) campaign and introduced a ban on production, import, sale, and distribution of single-use plastic bags (law 77-15, Article 2). Bags intended for industrial or agricultural use, freezer bags, garbage bags etc. remained allowed (Morocco World News 2019). The introduction was opposed by citizens, market stand owners as well as the industry complaining about too little time for preparation and

<sup>68</sup> The two data sources are not directly comparable as OEC data includes a wider range of products (HS classification 39 and 40 together). OECD data suggests that the import value of plastics & rubber products to Morocco in 2020 was 2.7 billion USD, more than half of it coming from EU countries.

missing alternatives (Morocco World News 2019). The government itself assessed the measure a success – others less so (see below). A national program to collect dumped plastic bags took place, authorities checked local markets and illegal stocks of plastic bags were seized. Larger supermarkets had fewer problems than local markets implementing the ban where enforcement is harder and reports suggest the use of plastic bags seems to be still common (Heinrich Böll Stiftung 2020; Morocco World News 2019).

A study conducted in 2018 by the Association Zero Zbel on markets of large cities found that 41% of people interviewed thought that the consumption of plastic bags stayed the same since introduction of the ban. 65% of consumers stated they still use 4-15 plastic bags each time they shop and 66% of merchants have never or rarely customers who use alternative bags. The main reasons not to use alternatives were their price, lack of practicability as well as habit (Association Zero Zbel 2019). The study forced the government to increase checks on illegal manufacturing, increase transparency of imports of raw materials used for plastic bag production and increase fines (Heinrich Böll Stiftung, 2020).

To conclude, the ban's assessments are mixed. Critics underscore the lack of communication, planning time ahead, too little awareness of the severe impacts of plastics and availability of actually more sustainable alternatives as remaining problems (Association Zero Zbel 2019; Heinrich Böll Stiftung 2020; Morocco World News 2019). The ban was complemented by a (different) fund to help companies to switch production to environmentally friendlier alternatives. It dispersed about USD 7 million (EUR 6.4 million) of which 40% supported the transition to non-woven bags raising their production by 56% compared to 2016. Since these are made of polypropylene fabric their eco-friendliness can be questioned (Heinrich Böll Stiftung 2020).

### **C.5.2 Fiscal instruments to generate revenue and induce investments in the waste sector**

The Strategie Nationale de Reduction et de Valorisation des Dechets (SNVRD) identifies additional financing instruments related to waste streams (strategic axis 3, action 9). It mentions fees and contributions and the extended producer responsibilities of producers of plastic products.

The SNVRD also highlights fiscal incentives to encourage investments in the waste sector (strategic axis 3, action 10). It specifically mentions the introduction of financial aid for such investments or tax incentives (Royaume du Maroc & GIZ 2019). The fund being set up in the context of the plastic bag ban is an example to support capital investments in sorting schemes and recycling technologies.

## **C.6 The story of implementation**

The legal basis of the plastic tax forms the National Charter for the Environment and Sustainable Development (law 99-12). It builds a framework for the development of policies, programs related to environmental protection and sustainable development (Royaume du Maroc 2014; World Bank 2022a). Key articles and goals that “paved the way” for the plastics tax are:

- Duty to protect the environment and contribute to a sustainable development (Article 5).
- The government is responsible for a good framework for the environmental governance (Article 24).
- Creation of financial and fiscal incentives to promote the financing of projects in environmental protection and sustainable development (Article 28).
- Introduce an environmental taxation to build incentives against environmental pollution (Article 30).

The law introducing the plastics tax was passed in late 2012. At the time, Morocco was among the first countries in the world to do so. This was very much related to Morocco having the second-highest per capita consumption of plastic bags in the world at the time at “more than 900 plastic bags annually” (UNECE 2022, p. 228). It was implemented as a result of negotiations with the plastics industries and was a political choice.

The plastic tax was implemented in Morocco in 2014, first with a tax of 1.5 % on sale, manufacture and import of plastics or products of these materials (Chapter 39 of the Harmonized System (HS)) (Climate Chance 2020; Government of Morocco 2017). The main objective of the eco tax on plastics is to develop a plastic recycling industry (Government of Morocco 2017) And further to get revenues for developing a sustainable, environmentally friendly plastic waste sector and to support the transformation of the municipal waste

management (Ghariani 2015).

The 2015/2016 reform of the tax contained to major elements (see Administration des Douanes et Impôts Indirect 2015). First, the tax rate was lowered to 1% as a reaction to demands from Moroccan industry. Observers point out that besides concerns about additional cost, the lack of transparency about how the funds were used, were a major area of concern. Secondly, the scope was changed: 222 product categories were added while 78 were removed from the list (L'Usine Nouvelle 2016; UNECE 2022; World Bank 2022a). Since then, the law remained unchanged. Indirectly it has been affected by the ban on plastic bags, which reduces consumption and thus demand to produce new plastic bags and reduces imports of input materials.

## C.7 Lessons learned and recommendations

### C.7.1 Improve transparency of revenue & expenditure side

Boukari & Bentaleb (2022) point out several observations regarding Moroccan environmental taxes that apply to the case of the plastics tax as well. They underscore that there is little direct connection between the environmental taxes in a sector and the use of revenues (e.g., waste-related instruments finance waste-related expenditures). Instead, plastic tax revenues first fund the FNEDD, before being appropriated back to waste-related policy goals.

Reports also suggest there is a weak enforcement of environmental taxation. There is a need to remove tax loopholes and other regulations that create inconsistencies and instead introduce environmentally positive tax incentives to encourage the development of a Green Economy (Boukhari & Bentaleb 2022).

One expert suggested that a major criticism of the plastic tax is related to the lack of transparency about the use of its revenue. Sources suggest that only a small share of its revenue accounts for financing the tax's share in the PNDM programme and other report say that much of the revenue is not being spent at all. The research similarly shows that the multitude of strategies, funds, and the interconnections between different funds and programmes make assessments difficult. Added on top of that is the complex and intransparent financial relationship between the central government level (that raises plastic tax revenues) and local governments that are key to the success of waste and recycling related policies and investments.

EU and cooperation activities on public financial management and good financial governance could offer a lot to improve the status quo. Activities could work to improve transparency on the use of revenues, provide support for regular review of the plastics tax and its role in improving Moroccan plastic waste management on the national and municipal levels.

### C.7.2 Explore new financing mechanisms

The EU's own framework on the Extended Producer Responsibility (EPR) and the Single-Use Plastics directive can be a useful reference point for Morocco. The directive identifies single-use plastic that can be easily replaced by non-plastic alternatives and thus be banned (e.g., plastic cotton buds, straws, plates, cutlery, beverage stirrers) and others for which producer responsibility is extended and Member States are required to pass on the costs created by single-use plastic products to the producers of these products (Zero Waste Europe, 2019). The costs considered are related to the collection, clean-up/ littering costs as well as awareness campaigns against littering, etc. Single-use plastic products covered in the EU legislation are food containers, wrappers, bags and beverage containers, cigarette filters, etc. The specific implementation in the EU is complex (e.g. chapter 6 in Postpischil et al. 2022). However, it can serve as a helpful guideline for Morocco to develop their own approach to extended EPR. Introducing EPR seems to have considerable potential in the Moroccan context to prevent and reduce plastic waste and boost recycling rates.

Another financing option to consider are landfill taxes to finance the necessary investment in alternative waste management and recycling facilities (WWF Mediterranean Marine Initiative & Dalberg Advisors 2019).

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## C.9 Interviews: Morocco

- Maddalina Dali, European External Action Service, EU Delegation in Morocco
- Manuel Cocco, GIZ Morocco, Senior Advisor on Energy & Climate

# D. The Environmental Protection Tax in Viet Nam

## D.1 Introduction

In 2012, Viet Nam introduced an Environmental Protection Tax (EPT), a broad-based environmental tax targeting a range of polluting products including fossil fuels – petroleum products and coal – and a range of polluting goods – HCFCs, plastic bags, herbicides, pesticides, and some chemicals. Individuals and organisations that manufacturer or import harmful goods are liable to pay the tax; export goods are exempt. All revenue from the tax flows to the general state budget; there is no hypothecation. The National Assembly EPT Standing Committee may introduce new taxable objects, although it has not done so since 2012, and it may also decide on which tax rate is applicable within the specified tax rate ranges.

The legal basis for the EPT is the Environmental Protection Tax Law No. 57/2010/QH12 and its 2012 supplement, which corrected the 2010 text and expanded on some aspects of the measure. The tax came into force on 1 January 2012. In 2020, the new Environmental Protection Law (EPL) No. 72/2020/QH14 was promulgated, which will have implications for the design and revision of the EPT, as it has created the possibility to include waste under the EPT (ISPONRE 2022). Thus, a reform of the EPT is anticipated in the mid-2020s.

At the time, the introduction of the EPT marked a new era in policymaking in Viet Nam in the application of economic instruments for the goal of environmental protection (GIZ 2021). As a relatively broad raft of environmental taxes, the EPT is often lauded as an example of international best practice in a middle-income country, particularly in terms of the tax design (GIZ 2013). The EPT was perceived by the Vietnamese government as an important policy instrument for the realisation of the Viet Nam Green Growth Strategy (VGGs) 2011-2020.

## D.2 The context of green fiscal reform in Viet Nam

### D.2.1 The economic and fiscal policy context

Viet Nam is a fast-growing lower middle-income country in South East Asia, which aspires to achieve upper middle-income status by 2045. In terms of conventional economic indicators, Viet Nam is a strong performer, with consistent GDP growth rates observed during the Covid-19 pandemic of 2.9% in 2020 and 2.6% in 2021, and GDP growth of 6.5% forecast for 2022 and 6.7% for 2023 (ADB 2023). This is in line with Viet Nam's target of achieving upper middle-income country status by 2030, which a government master plan estimates requires GDP growth rates of 7%.

In 2022, the current account balance in Viet Nam was 1.5%, substantially lower than many other countries recovering from the impacts of the Covid-19 pandemic and the global energy price crisis stemming from the Russian invasion of Ukraine. In 2020, government debt as a proportion of GDP was also relatively low, at less than 40%, while the tax-to-GDP ratio in Viet Nam is above average for developing Asia, at 22.7% of GDP in 2020 (OECD 2022).

Rapid growth has taken its toll on environmental quality in Viet Nam, which is ranked 178th on the Yale Environmental Performance Index (Yale 2022). Nonetheless, Viet Nam is below average in terms of air pollution (ADB 2022).

### D.2.2 Environmentally related charges, fees, and taxes

Alongside the EPT, Vietnam has quite a wide-ranging number of environmentally related taxes, fees, and charges to incentivise green economy transition, in line with the targets of the Vietnam Green Growth Strategy, now in its second iteration, the VGGs-2 2021-2030. In general, the country is open to green and climate-friendly policies and is committed to climate action, as its recent pledged on coal phase-out and achievement of net zero GHG emissions by 2050 attest. At the same time, implementation of environmental policies sometimes



proves challenging, due to lack of funding or access to appropriate technologies, coordination challenges and competing policy priorities resulting in low prioritisation of environmental policy goals.

In relation to environmental taxation in Viet Nam, there are two broad trends that can be identified. On the one hand, the fee or service charge rates levied are very low and do not provide cost-recovery for the services they provide, or the pollution emissions that they are levied to address. On the other, some environmentally related taxes have quite high tax rates and are in fact domestic revenue-raising mechanisms, rather than instruments of environmental policy. In Viet Nam, dependence on consumption taxes is relatively high; this is reflected in the number of environmentally related taxes and fees in the country (ADB 2022).

### Environmental protection charges

Viet Nam has several environmental protection charges in place, some of which are relevant to circular economy. However, these are seldom sufficiently high to incentivise behavioural change. In the case of waste charges, rates are insufficient to cover the cost of waste management.

An environmental protection charge for solid waste was implemented in 2007 but has not been applied since 2015. The charge was payable on ordinary and hazardous solid waste generated from production and business processes. Today, a waste treatment cost – a service charge – is payable instead to the waste treatment facility (GIZ 2021). Cities also collect a ‘sanitary’ fee for waste management service delivery from waste generators. The fee ranges around VND 21,000 (USD 0.9 / EUR 0.83) per household per month in urban areas and VND 17,000 USD 0.7 / EUR 0.64 in rural areas. The waste fee is equivalent to 0.5% of the average household expenditure and covers less than 60% of the total waste management costs – indeed, in some municipalities it is enough to cover only 20-30% of the total operation cost (Aoki 2020).

A wastewater fee on domestic was entered into force in July 2020. The charge rate is collected on the basis of the amount of freshwater consumed, as a percentage of the selling price of fresh water. This tax is thus quite far removed from an ideal tax design, as it taxes a proxy – but one that is measurable, presumably, in a context where metering of wastewater is not feasible. The environmental protection fee for domestic wastewater is 10% of the price of 1m<sup>3</sup> of tap water, not including consumption tax. Entities discharging more than 20m<sup>3</sup>/day of wastewater are also subject to an environmental protection fee, calculated on the basis of a fixed amount (VND 4 million from 2021), and a variable fee depending on pollution concentrations in the water (chemical oxygen demand, total suspended solids, mercury, lead, arsenic and cadmium) (Aoki 2020).

### Severance tax

The severance tax is applied in accordance with the Law on Royalties 45/2009/QH12 passed by the National Assembly on November 25, 2009, effective from July 1, 2010. The tax is an indirect tax which is collected on exploited natural resources. It has several purposes, as listed below, but primary among them is as a mechanism to mobilise domestic revenue. Average tax revenue 2011-2020 amounted to 4.9% of total state budget revenue, with revenue from crude oil accounting for almost 80% of the total (GIZ 2021).

- Strengthen state management of natural resources to protect, exploit and use resources economically and efficiently.
- Minimise losses on resources in the process of exploitation and use and minimise the exploitation of exhausted resources or exploitation of resources seriously threatening the environment.
- Contribute to raising awareness about the importance of natural resources for sustainable economic development.
- Generate revenue for the state budget to serve the interests of society regarding the use of resources.

Taxable objects include metallic minerals, non-metallic minerals, crude oil, natural gas, coals, etc. The tax is levied on the value of the resource extracted, and rates are set by the National Assembly Standing Committee (GIZ 2021). Non-renewable resources are subject to much higher tax rates.

## Excise and other green tax instruments including tax exemptions

Excise also includes regulations to encourage people and businesses to use products that emit low greenhouse gas emissions, e.g. on fossil based gasoline, or air conditioners. Biofuels are subject to a lower rate of excise than fossil gasoline.

Excise on passenger cars is an interesting case. Excise is payable based on cylinder capacity (cc) and type of fuel, to encourage purchase of more efficient, cleaner vehicles. Excise on vehicles ranges between 40% and 150% for vehicles over 6,000 cc (GIZ 2021). Motorcycles less than 125cc are not liable to excise tax, making the measure a 'luxury' tax in many respects. Excise on passenger cars is regulated under the Special Consumption Tax Law No. 27/2008/QH12 (subsequently amended in 2014 and 2016), which also provides tax incentives for environmentally friendly products, e.g. electric vehicles, solar technologies, low-emissions vehicles.

There are corporate income tax exemptions in place for companies in the field of environment, and import duty exemptions for machinery, equipment, vehicles, tools and materials directly used for waste treatment or renewable energy production. The current CIT law provides for a tax rate of 10% for the whole project life or enterprises operating in the field of environment as well as other relevant tax exemptions. Recycled products and waste are exempt from export taxes, to encourage the recycling industry (GIZ 2021).

## Emissions trading

Under the 2020 Environmental Protection Law, which came into force in 2022, Viet Nam will introduce a pilot emissions trading system by 2025, and a full operational scheme by 2027 (ADB 2022).

### D.2.3 Fossil fuel subsidies

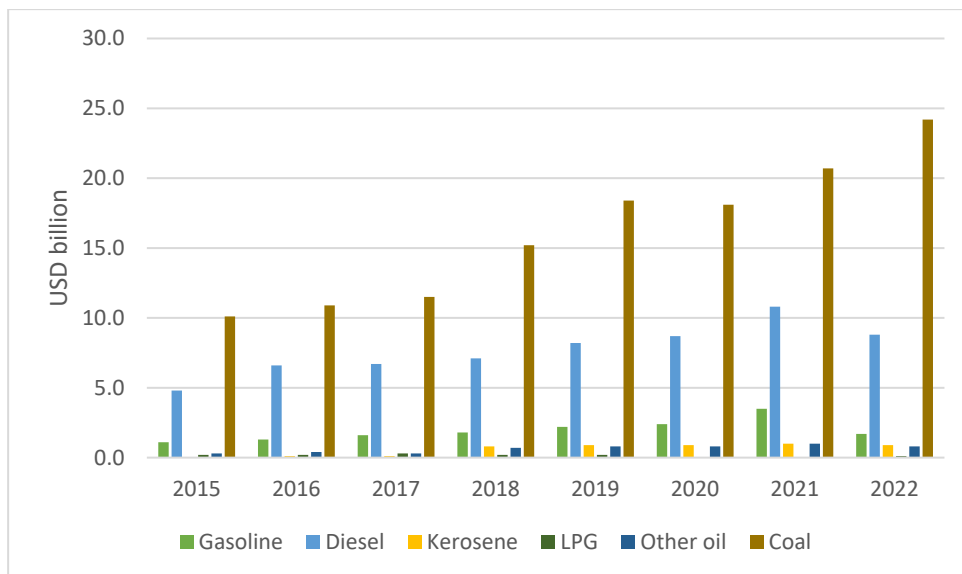
IMF data from 2022 reveals that the bulk of fossil fuel subsidies in Viet Nam – worth the equivalent of 10% of GDP in 2022 – are implicit, although explicit consumer subsidies on electricity do remain. The single most important fossil fuel subsidy is to coal, shown as the brown bar in the chart below. This is very significant for climate change policy, as coal emits more CO<sub>2</sub>e per unit of energy produced than other fossil fuels.

Fossil fuel subsidies should be seen in the context of the recently signed Just Energy Transition Partnership Agreement (JETP) between the 'International Partners Group' (EU, UK, USA, Japan, Germany, France, Italy, Canada, Denmark and Norway) and the Vietnamese government.<sup>69</sup> The political agreement recognises the scale of the challenge faced in Viet Nam to shift away from coal and achieve net zero by 2050, and peak emissions by 2030. The JTEP envisages the mobilisation of USD 15.5 billion (EUR 14.2 billion) over 3-5 years to be used, through a Resource Mobilisation Plan currently being developed with the support of UNDP, to drive a rapid energy transition and coal phase out. In this new policy context, fossil fuel subsidies in Viet Nam for coal are likely to be scaled back very rapidly.

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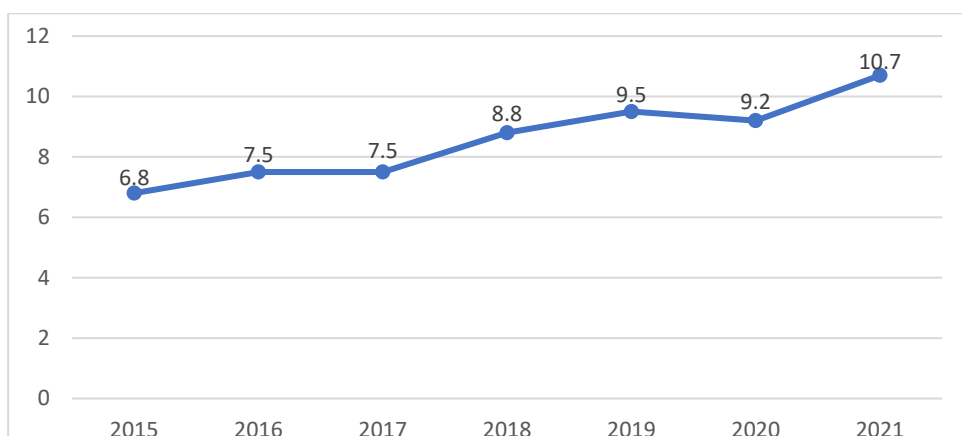
<sup>69</sup> [https://ec.europa.eu/commission/presscorner/detail/en/statement\\_22\\_7724](https://ec.europa.eu/commission/presscorner/detail/en/statement_22_7724)

Figure 15: Fossil fuel subsidies in Vietnam 2015-2022



Source: International Monetary Fund 2022: <https://www.imf.org/en/Topics/climate-change/energy-subsidies>

Figure 16: Fossil fuel as a percentage of GDP 2015-2021



Source: International Monetary Fund 2022: <https://www.imf.org/en/Topics/climate-change/energy-subsidies>

### D.3 Instrument design

The government has specified a relatively large number of objectives for the EPT over time. These can be summarised as follows (GIZ 2021):

- Environmental protection
- Taxation of polluters
- Pollution reduction
- Enhance awareness of environmental protection
- Mobilise more resources to protect the environment
- Encourage economic and efficient use of energy
- Reduce negative impacts of production and consumption on the environment

The EPT covers a wide range of pollutants, as shown in Table 7. The EPT Law stipulates a tax rate range for each type of tax, i.e. minimum and maximum tax rates per unit of the taxable good. The National Assembly sets ranges of tax rates for environmental pollutants, with a Standing Committee within the Assembly setting the specific tax rate.

Although at first the tax rate ranges gave the Standing Committee within the National Assembly the freedom to adjust the tax rate with little administrative effort – many were initially introduced at the minimum level – by 2015, the upper values in most tax rate ranges have been reached. An attempt in 2018 to increase the range of possible tax rates for petroleum products was unsuccessful and the proposal prepared by the Ministry of Finance was rejected. In 2019, the tax rate on plastic bags was increased to VND 50,000/kg (Tong and Duong 2021). Since that time, it has not been possible or feasible to revise tax rate ranges upwards for political reasons. As a result, the EPT has lost its incentive effect over time, because prices of taxable goods have increased while the tax rate per unit has remained the same.

As shown in Table 7, even at the upper end of the tax rate range, and accounting for purchasing power parity, EPT Tax rates are low, and their potential to incentivise changes in behaviour is limited as a result. For mixed fuels (biofuels), the tax rates are calculated based on the proportion of fossil fuels in the fuel (ISPONRE 2022). As in many other countries, some EPT taxes were temporarily reduced to mitigate the negative equity impacts of the pandemic and the subsequent energy price crisis.

*Table 7: Environmental Protection Tax – tax bases and tax rate ranges – in VND and EUR (2023 prices)<sup>70</sup>*

Tax base	Gasoline	Diesel	Lignite	HCFCs	Plastic bags	Pesticides	Herbicides
Tax rate (VND)	1,000 – 4,000/litre	500 – 2,000/litre	10,000 – 30,000/tonne	1,000 – 5,000/kg	30,000 – 50,000/kg	1,000 – 3,000/kg	
Tax rate (EUR)	0.04 – 0.16/litre	0.02 – 0.08/litre	0.39 – 1.17/tonne	0.04 – 0.20/kg	1.17/kg – 1.96/kg	0.04 – 0.12/kg	

Source: ISPONRE 2022

## D.4 Impacts of the instruments

In common with many other countries examined during the course of this research, ex post impact assessments of the EPT in Viet Nam tend to be qualitative, rather than quantitative, and evidence of actual quantifiable impacts of the EPT is not available. The Ministry of Finance’s own impact assessment of the EPT was rather general, concluding that: “after nearly 5 years of implementation, the EPT policy has achieved the expected objectives and requirements (on institutionalization of the Party and Government’s mainstream and policy on environmental protection; encouraged economic development linked to environmental pollution reduction; increased environmental protection consciousness of the whole society; contributed to reasonable resource mobilization from society, generating additional revenue to resolve environmental matters...” (Ministry of Finance 2016).

Fiscal, economic, social and environmental impacts are described below, where evidence is available. There is less information available if the EPT is examined through a circular economy lens, i.e. with a focus on plastic bags and HCFCs, than on impacts of the measure on fossil fuel consumption and climate change.

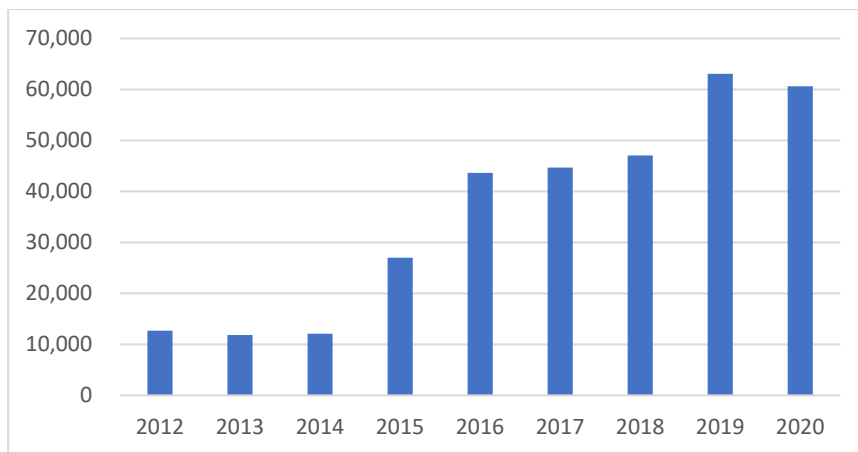
### D.4.1 Fiscal impacts

The EPT is an important source of domestic revenue for the Vietnamese government and has become ever more so over time. In 2020, revenue from the EPT contributed 4.70% of total tax revenue, raising the equivalent of 0.96% of GDP (GIZ 2021).

Figure 17 shows the development of revenue from the EPT since it was introduced in 2012. It is notable that 99% of total revenue raised is attributable to fossil fuel taxation (Truong 2021). Revenue flows into the general budget and is used to “carry out socio-economic tasks of the country, including spending on environmental protection” (ISPONRE 2022).

<sup>70</sup> Exchange rate used from Infocourier 02/2023: EUR 1 = VND 25,567

Figure 17: Revenue raised through the EPT 2012-2020 in billion VND



Source: ISPONRE 2022

#### D.4.2 Economic impacts

Ex post modelling indicates that the EPT had a marginal negative impact on GDP growth of -0.2% in 2012 and -0.1% in 2013 in comparison to a reference scenario, lower sectoral outputs (9.1% in 2012 and 9.5% in 2013) (Huong 2013). Clearly, this can be considered to be a relatively minor impact, particularly in the context of annual GDP growth of over 5%. Later studies also found minor negative impacts on GDP growth and investment, and higher inflation, offset by increases in employment and other welfare benefits (Nong 2018).

Some experts place emphasis on the governance benefits of the EPT and its importance as a means of institutionalising a legal framework for taxation as a tool of environmental policy (ISPONRE 2022).

#### D.4.3 Environmental impacts

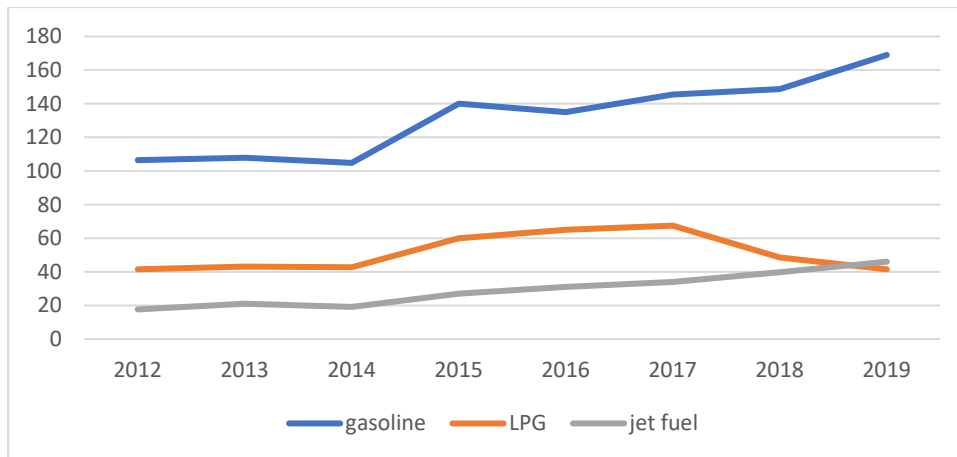
##### Impacts on fossil fuels

The design of the tax – with tax rates on coal extremely low, far lower than on LPG or other fossil fuels – is a concern in terms of creating distortions and potential incentives in favour of substitutions effects towards coal, a fuel with considerably higher CO<sub>2</sub> emissions per unit of energy than natural gas (GIZ 2016).

An impact assessment using a computable equilibrium model conducted prior to the implementation of the tax analysed various scenarios for the EPT. The modelling predicted CO<sub>2</sub> emissions reductions of 2.3% in a low tax scenario, and 7.5% in a high tax scenario (Willenbockel 2011). An ex-post analysis conducted in 2014 suggested a fall of about 2 million tonnes of CO<sub>2</sub> in both 2012 and 2013, equivalent to 1.3% of CO<sub>2</sub> emissions in 2012, and 1.2% in 2013 (Huong 2014). Revenue trends and fuel consumption statistics demonstrate that while the tax seemed to stabilise consumption from 2012-2014, since 2015, fuel consumption and revenue have been increasing – which is to be expected in a rapidly industrialising middle-income economy. CO<sub>2</sub> emissions in Viet Nam have more than doubled between 2011 and 2019, as the country industrialises (World Bank Data 2023).

Figure 18 shows trends in the consumption of transport fuels in Viet Nam between 2012 and 2019.

Figure 18: Consumption of transport fuels in Viet Nam 2012-2019, in thousand barrels/day



Source: [https://www.theglobaleconomy.com/Vietnam/gasoline\\_consumption/](https://www.theglobaleconomy.com/Vietnam/gasoline_consumption/)

### Impacts on circular economy

Very little analysis has been conducted on the impacts of the EPT on plastic bags and other taxable goods. One investigation of the impact of the EPT on plastic bag use is available in the public domain, published in 2021 (Tong and Duong 2021). Clearly, the plastic problem remains acute: Viet Nam generates around 3.27 million tonnes of plastic waste each year, and the Ministry of Natural Resources and Environment estimated in 2019 that on average, each household used approximately one kilogramme of plastic bags each month, with around 80 tonnes of plastic discharged into the environment every day around Hanoi and Ho Chi Minh City (cited in Tong and Duong 2021).

In a 2016 paper, GIZ write that “the most obvious effect of the Environmental Tax Law in the first phase could be observed in the usage of plastic bags: consumers are now using less plastic bags, many of them reuse them, or bring durable bags or containers from home to the market” (GIZ 2016, p.2). The report also notes that substitutions for plastic bags were limited and unpopular, especially in the North, which was preventing efforts to strongly limit plastic bag use. Thus, there is some anecdotal evidence that plastic bag use decreased in Viet Nam following the introduction of the EPT.

Tong and Duong conclude on the basis of survey results and statistical analysis that the EPT on plastic bags “may fail to change the habit of using plastic bags in Viet Nam”, as the tax rate is too low, plastic bags remain extremely cheap – around VND 18,000-45,000/kg (USD 0.76-1.89 / EUR 0.70-1.76) –, and plastic bag use remains very widespread (Tong and Duong 2021). This problem was recognised by the Ministry of Finance in its proposed reform of the tax in 2018, when a new tax rate on plastic bags of VND 200,000/kg was proposed (USD 8.53 / EUR 7.80) (GIZ 2018). It was also mentioned as a point of criticism during interviews for this project.

Further challenges to the effectiveness of the EPT in reducing plastic bag use pertain to the failure to clearly define the tax base. Although corrections to the EPT Law of 2010 were made in 2012 under Decree No. 69/2012/NĐ-CP, which defined more clearly which types of plastic bag were to be subject to the tax, the Ministry of Finance speculated in 2016 that this change undermined the legitimacy of the definition and the provisions of the tax and called for the inclusion of clearer provisions for tax objects in a new legal document (Ministry of Finance 2016). Because the EPT is too general in describing the tax base, it is also not clear which plastic bags are eco-friendly (and why), and whether they can be specifically deducted from the taxable object (ISPONRE 2022).

In spite of the apparent failure of the EPT to create a meaningful incentive to reduce plastic bag use, there are a number of additional measures in place to reduce plastic pollution and marine litter, including the promulgation of a regulation on eco-friendly plastic bags and several regulatory measures to enhance control of plastics pollution (GIZ 2018).

Finally, in relation to other products, such as HCFCs and chemicals, there is no robust evidence available to indicate that the EPT has had any effect on consumption.

#### D.4.4 Social impacts

Ex ante modelling of a low and a high tax rate for the EPT indicated that the social equity impacts of the tax would be slightly progressive, with the impact as a percentage of household welfare lowest for the poorest income quintile (Willenbockel 2012). This finding is corroborated by a slight improvement in income distribution in Viet Nam and thus, a modest decrease in the GINI Index of 0.4204, as opposed to 0.4203 (GIZ 2016).

On the whole, social impacts appear have been relatively insignificant: other taxes were reformed at the same time as the EPT was introduced and in the past, falling international oil prices have shielded households from price increases. Ex post modelling has found that the poverty rate declined slightly more slowly than would otherwise have been the case – a deviation of 0.2% in 2012 and 0.1% in 2013 (Huong 2014). Ex ante modelling indicated some geographical disparities in the impacts of the EPT on poverty, which have been more pronounced in poorer geographical regions (Willenbockel 2012).

Nonetheless, concerns regarding the possible social impacts of EPT increases appear to have been an underlying reason for opposition to the tax rate increases proposed in 2018.

#### D.5 Complementary measures

When the EPT was implemented, explicitly complementary measures to address social equity or competitiveness concerns were not introduced. Tax revenue was not earmarked but flowed into the general budget.

There were attempts made to minimise the possible negative impacts of the EPT, e.g. on economic development and poverty. But these measures have been contained within the instrument itself – through the maintenance of relatively low tax rates, and the reduction of taxes deemed potentially harmful to poorer income groups during the Covid-19 pandemic and subsequent (and ongoing) energy crisis stemming from the war in Ukraine.

To enable the introduction of higher tax rates and so enable the EPT to fulfil its potential not only as a revenue-raising measure, but also as an environmentally effective tax, it will be necessary to develop targeted welfare measures which can compensate the vulnerable for price increases while allowing the tax to create stronger incentives within the economy to reduce consumption of plastics, fossil fuels, pesticides, herbicides and HCFCs.

#### D.6 The story of implementation

Several factors contributed to the successful implementation of the tax. In 2004, prime minister Nguyen Tan Dung asked for an environmental tax law to be implemented by 2012 (GIZ 2016). The political will of Nguyen Tan Dung and the determination of Ministry of Finance (MoF) staff to implement environmental taxation was key. At the same time, the EPT reflects an increasing awareness of the need to integrate environmental policies within other measures to boost growth, restructure the economy, address energy security concerns, and access international finance – particularly climate finance (Zimmer, Jakob and Steckel 2015). That the EPT “has demonstrated the commitment of the Vietnamese Government to the international community in environmental protection” is often mentioned in official documents and reports on the EPT (see e.g. GIZ 2021, ISPONRE 2022). The process was also supported by GIZ through advisory, capacity building and peer-to-peer exchange with ministry staff (GIZ 2016).

In terms of timing, the introduction of the EPT was fortuitous and well planned. The tax was introduced gradually and had little impact on prices at first, as oil prices were falling and the gasoline surcharge regulation was abolished at the same time. Later tax rate increases on transport fuels were similarly accompanied by reductions on import tariffs on fuels. Thus, trade-offs have been made between environmental effectiveness, revenue-raising and political feasibility. Over time, these factors may become better aligned, if the tax is reconceptualised to conform with the Environmental Protection Law 2020.

Since 2012, there have been several tweaks in the tax rates levied on products under the EPT. However, a broader reform has not been implemented, and new tax bases have not been introduced, even though this was initially envisaged when the tax was first promulgated.

Attempts in 2018 to raise the tax rate ceilings were unsuccessful. Strong opposition was voiced in the media to



the tax – which portrayed the measure as a tax grab and questioned the environmental credentials of the tax increase.

## D.7 Lessons learned and recommendations

### D.7.1 Revenue mobilisation has been prioritised above environmental effectiveness

The EPT is often lauded as a best practice example of an environmental tax package in the industrialising country context. With its implementation, Viet Nam became a frontrunner in South East Asia on environmental taxation (GIZ 2016). The tax design covered a wide range of pollutants and including a range of tax rates that could be adjusted relatively easily in response to changing environmental or economic conditions – at least, until tax rate ceilings were reached. Tax collection could be easily tagged on to existing fuel excise collection mechanisms. The tax has become an important source of revenue for the country and is a good example of the application of environmental taxation for domestic revenue mobilisation to finance development. In this regard, the approach taken to tax design is replicable in other countries.

However, the environmental effectiveness of the tax is less clear, indeed, there is no evidence that the tax has had a significant environmental impact. Prices for diesel, gasoline, coal and natural gas are below the “efficient” price in the country, i.e. a price which takes into account environmental externalities (Parry, Black and Vernon 2021; cf. Figure 13). Despite great potential to improve the EPT, and a clause in the legal text which would have made reforms to the EPT possible, the EPT has not been reformed since it was put into law in 2010, aside from minor amendments in 2012. In part, this failure is down to lack of political will to reform of the EPT and low prioritisation of such a process, as well as concerns within government that higher tax rates might have a negative impact on economic growth. Consequently, many pollutants remain untaxed.

### D.7.2 Tax rates too low to deliver environmental benefits

Tax rates thus far have not been set at a level which is commensurate to the environmental harm that specific products cause; indeed, some experts claim that the EPT rates have not been defined with pollution reduction as their primary objective.

On the other hand, although tax rates are too low, having such a measure in place is an important step in the right direction, and EPT tax rates are very likely to be increased in future. Indeed, the 2020 EPL has created a very concrete opportunity to introduce new tax bases, such as waste, and to reform the tax. Currently, however, no agency is responsible for analysing and assessing the impact of the EPT, and so an accurate basis for appropriate adjustment is lacking (ISPONRE 2022).

### D.7.3 Improved communication has the potential to reduce opposition to tax increases

Lack of understanding of the rationale of the tax on the part of consumers, i.e. that the tax creates a price incentive which is intended to change their behaviour, is also often cited as an obstacle to behavioural change and thus to environmental effectiveness of the tax (ISPONRE 2022). Similar challenges have also been observed in other low- and middle-income countries.

### D.7.4 Need for reform for the EPT to foster circular economy

In terms of development cooperation, circular economy is clearly a prominent issue. Indeed, Vietnam’s Institute on Strategy and Policy on Natural Resources and Environment (ISPONRE) – interviewed during our research – recently contacted DG ENV with a request for cooperation and several points where it would like to exchange and seek advice. Provision of advisory and input to the development of the National Action Plan for the implementation of circular economy in 2023 appears to be a possible area of cooperation, which would be welcomed by ISPONRE and could build on their existing work to analyse the EPT in quite some depth (ISPONRE 2022).

Revisiting and reforming the design of the EPT in the context of circular economy would also be aligned with the 2021-2030 National Action Plan on Sustainable Consumption and Production, which calls for the



introduction of “incentive policies for production, distribution and consumption of ecofriendly packaging instead of non-biodegradable or single-use plastic products; and regulations on green public procurement” (Government of Vietnam 2020, p.2).

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## D.9 Interviews: Viet Nam

- Pia Buller and NGO Thi Kim Thu, EEAS-Hanoi (EU Hanoi delegation)
- Dr. Lai Van Manh (Institute on Strategy and Policy on Natural Resources and Environment (ISPONRE))

# E. Deep dive: Zambia's mining royalty tax

## E.1 Introduction

Zambia is a large and sparsely populated country in southern Africa. Between 2000 and 2019, the country was one of the fastest growing economies in Africa. After the Covid-19 pandemic, the country fell into a severe recession, requiring assistance from the IMF. Its reliance on mineral resources, especially copper, has made the country vulnerable to price volatilities. Despite economic growth and massive Chinese investments, the two-thirds of the population remain in poverty (BBC 2021). Zambia's population is expected to almost double from 19 million in 2021 to approximately 39 million people until 2050 (Worldometer 2023).

Current president Hakainde Hichilema has been in office since August 2021. To revive the economy, Hichilema announced extremely ambitious plans to increase the output of copper (Lusaka Times 2022).

In the past, Zambian governments have introduced several short-term changes to the taxation regime on copper, shifting between aiming to maximising government revenue and incentivizing new investors. Since 2016, the Zambian mineral royalty tax (MRT) is levied according to sliding scale, which means that the rate is determined by international copper prices. Resulting frequent changes to the taxation regime have led to an unstable environment for investments and failed to create a stable stream of revenue for the country.

## E.2 The context of green fiscal reform in Zambia

### E.2.1 The macro-economic context

Between 2001 – 2010 the Republic of Zambia was one of the fastest growing economies in Africa, when the economy grew by an average of 7.5%. In the following years, economic growth slowed down to an average of 3.6% (2011 – 2020) (World Bank 2022). In 2020, Zambia was hit particularly hard by falling international copper prices, the COVID-19 pandemic, and later an energy supply crisis due to the Ukraine war and the economy contracted by 2.8% (IMF 2022). Total tax revenue grew slowly but steadily in the last decade by 73% from USD 7.8 billion (EUR 7.1 billion) (PPP) in 2012 to USD 13.5 billion (EUR 12.4 billion) (PPP) in 2021 (ATAF 2023).

Due to much higher government spending, central government debt increased almost six-fold from 18.0 % of GDP in 2011 to 103.7% of GDP in 2020 (World Bank 2022). While Zambia's debt servicing costs had been stable and low (<1.5% of GDP) between 2006 and 2013, they rose rapidly to >10% of GDP in 2019-20, crowding out social protection and other policy priorities. In 2021, Zambia became the first country to default on external debt since the Covid-19 pandemic. Zambia and the IMF drafted a bailout plan within the framework of the Extended Credit Facility (ECF). However, the weight of the debt remains as a threat to long-term economic stability (GIS 2022).

Zambia's mining sector contributes 80% of export revenue and is a key sector for tax revenue. In 2021, USD 4.1 billion (EUR 3.8 billion) of tax revenue was raised from mining; revenue more than doubled (+206%) between 2012 and 2021 (ATAF 2023). The government has adjusted taxes on mining several times, reacting to developments on international commodities markets.

Since 2016, Zambia applies a mineral royalty tax (MRT). Its rate is determined according to a sliding-scale system, which adjusts the applicable tax rate according to the international price for copper. In 2019, Zambia made the MRT non-deductible for income tax. The de facto double taxation alongside high tax rates disincentivized investors (Mwaba & Kayizzi-Mugerwa 2021). In 2023, motivated by an ambitious plan to increase copper production from 800,000 metric tonnes per year in 2022 to 3 million tonnes by 2030, Zambia adjusted its tax regime to make it more attractive, which may result in lower tax revenues in future (Lusaka

Times 2022, ZEITI 2023).

### **E.2.2 Green fiscal policy in Zambia**

In Zambia, taxation measures to tackle environmental issues are rare and have been inconsistent. In general, fiscal instruments focus exclusively on general revenue generation. There is a legal framework in place for GFR: the polluter pays principle has been enshrined in the Environmental Management Act since 2011. However, only a few green taxation measures have been implemented to enforce it.

Zambia has a Motor Vehicle Surtax on vehicles older than 5 years. It is a flat tax levied at a rate of ZMW 2,000 (equivalent to around USD 103 / EUR 94), which is added to import duty. This tax sets out to tackle a very typical environmental and public health challenge in African countries: imports of second-hand, high-polluting vehicles (see e.g. Granger et al. 2021). Nonetheless, this measure has been subject to criticism because it is perceived by many as a means of mobilising revenue, rather than as a disincentive to import older vehicles. Without further research, it is impossible to make a definitive statement on the environmental effectiveness of the measure, but the ZMW 2,000 tax rate does not appear to be sufficiently high to disincentivize the import of second-hand vehicles. Bearing in mind that revenues are not used to address environmental and health issues stemming from road transport, and that there are few incentives to buy newer, cleaner cars in place – aside from a reduced rate of customs duty on electric vehicles of 15% (full rate 30%) – the environmental impact appears to be limited, and the tax risks creating an incentive for the purchase of even older cheaper cars (UNEP 2018; Zambia Daily Mail 2016). Similar trends have been observed in other countries when such taxes on vehicle age were introduced, e.g. Uganda (Forster & Nakyambadde 2021).

In 2022, a 5% excise duty on coal was introduced, as was an ad quantum tax of ZMW 40/tonne on cement (USD 2.4 / EUR 2.2), both presumably as revenue-raising measures, but nonetheless, both are levied on environmentally related tax bases (PWC 2022). In addition, Zambia has a 30% excise duty on plastic carrier bags (PWC 2022)

In addition to the MRT, mining activities are taxed with a corporate income tax (CIT). The high-upfront investments of mining, usually imply that mining operations do not generate profits in the first phases of mining. A CIT therefore usually only generates income after some time. Royalty payments generate income for the government from the outset, because they are related to output instead of profit. After some time, the CIT usually becomes the more significant source of government revenue (The Chamber of Mines of Zambia 2016).

In relation to mining, aside from the CIT and MRT, mining companies are required to transfer monies to the Environmental Protection Fund, so that funds are available for remedial action, should it be necessary. However, this is not an environmental tax as such, and unless remedial action must be taken, all payments are returned upon expiry of a mining license or permit (Government of Zambia, 1998).

### **E.2.3 Green and brown expenditures**

Zambia's updated NDC from July 2021 envisages a 25% reduction of greenhouse gas (GHG) emissions by 2030 on a business-as-usual scenario, drawing on domestic resources and existing levels of international support (around USD 15 million / EUR 13.8 million). With "substantial international support" (around USD 35 billion / EUR 32 billion) the level of ambition rises to 47% (UNFCCC 2021). The government of Zambia must therefore review, as a matter of urgency, its fiscal policy frameworks, both revenues and expenditures, to ensure that they are aligned with the achievement of these climate targets.

The budget allocation for environmental protection has remained low at around 0.6% of GDP. Of this, only 26% is financed via government spending while the rest has been financed through donors (statement the team leader of BIOFIN Zambia) (UNDP 2019). There are some relatively minor tax expenditures for green products, e.g. solar street lights and solar charge control units (PWC 2021).

Price controls for transport fuels were removed in October 2016 and a cost-pricing methodology was introduced (IISD 2018). However, subsidies were reintroduced in response to the Covid-19 pandemic and

perpetuated due to the subsequent global energy price crisis due to the war in Ukraine. In 2019, fuel prices were frozen at 2019 levels for two years, and in 2021, excises on petrol and diesel were also reduced, and zero-rated for VAT purposes (IMF 2022). This step was taken to minimise negative equity impacts due to the oil price crisis – a critical concern in the country in the light of very high inequality and a poverty rate estimated at 59.9% in 2021 (IMF 2022). However, research has shown that fuel and electricity subsidies are regressive in the country, with the wealthiest 10% of the population capturing 90% of the total available fuel subsidies in 2015 (De La Fuente et al. 2017). Agricultural subsidies also increased from 1.9% of GDP in 2019 to 3.0% of GDP in 2020 – however, also in this case, the bulk of agricultural subsidies are not captured by poor households (De La Fuente et al. 2017; IMF 2022). Fuel subsidies associated with excise and VAT have already been reformed, and it is envisaged that agricultural subsidies will also be phased under the Extended Credit Facility.

In the past, another major subsidy was paid to electricity users. The state-owned electricity company ZESCO is financially weak and has operated at a loss for the last years. Electricity tariffs and fees were not cost-reflective for many years, leading to an accumulation of financial losses. Between 2015 and 2016 the government paid subsidies of USD 26 million (EUR 24 million) per month on average. However, as is typical in many countries, these subsidies mainly benefited large companies operating in the mining sector which consumed 55% of electricity (IISD 2018).

In December 2020 ZESCO approved a strategy to introduce cost-reflective tariffs etc. while maintaining lifeline tariffs for vulnerable households. In 2021 ZESCO recorded a profit, showing that reforms were successful (IMF 2022).

### E.3 Instrument design

The Mining Royalty tax on copper is charged in addition to corporate income tax (CIT). It is payable on copper, cobalt and vanadium, base metals, precious metals, gemstones, energy minerals, industrial minerals – as a percentage of their value (typically 5-8%). For copper the rate is adjusted in line with international commodity price for copper, where rate varies between 4% and 10% (National Assembly of Zambia 2022).

The objective of the MRT is to raise public revenue, while providing a stable and attractive framework for the development of the mining sector (The Chamber of Mines of Zambia 2016). It is paid by the holders of mining rights and licenses on minerals produced. For copper, the tax rate is based on the norm value of copper, which is determined according to the monthly average London Metal Exchange cash price per tonne in USD, multiplied by the quantity of the metal or recoverable metal sold. If the metal price is not quoted on the London Metal Exchange, the monthly average Fastmarket MB cash price or other approved exchange markets is used as reference (Zambia Revenue Authority 2021).

Tax rates are adjusted on a sliding scale. If the price is below USD 4,000 per tonne (EUR 3,667), the MRT rate is 4%. If the international price increases, the tax rate increases. Under the pre-2023 regime, tax rates varied from 5.5% to 10%, and the entire earnings were taxed according to the global copper price. Under the reformed regime, which entered into force in 2023, the tax has been reduced to between 4% and 10%, while the calculation of the MRT has been restructured. Now, only the incremental value in each price range is taxed when the price crosses the threshold (National Assembly of Zambia 2022). Tax rates under the old and new regime are shown in Table 8.

There has been some instability in the structure of the MRT. Prior to 2019, the MRT was deductible from CIT and treated as a business expense, as is the case in the majority of countries. If this tax deductibility is not permitted in tax law, then a company is effectively required to pay income tax on an income that they have never received, because it was paid to the government as a royalty (Zambia Chamber of Mines 2018). In 2019 the Zambian government decided to depart from this principle, and this tax deductibility was no longer permitted, making the effective tax burden in Zambia 93% (compared to 65% in the Democratic Republic of Congo). This decision has since been reversed effective from 2022 (Hill & Mitimangi 2021; Mwaba & Kayizzi-Mugerwa 2021).

A further weakness in the design of the MRT is that the tax is levied based on the US dollar price. However, the

exchange rate of the Zambian Kwacha (ZMW) has been very unstable against the US dollar over the past ten years. This exchange rate volatility also has impacts on the stability of the revenues raised by the MRT.

Table 8: MRT tax rates on copper pre-2023 and following the 2023 reform

Previous regime			2023 regime		
Price range	Tax rate (%)	Taxable amount	Price range	Tax rate (%)	Taxable amount
Less than USD 4,500 per tonne	5.5	Full price	Less than USD 4,000	4	The first USD 4,000
> USD 4,500 – USD 6,000	6.5	Full price	>USD 4,000 – USD 5,000	6.5	The next USD 1,000
> USD 6,000 – USD 7,500	7.5	Full price	>USD 5,000 – USD 7,000	8.5	The next USD 2,000
> USD 7,500 – USD 9,000	8.5	Full price	More than USD 7,000	10	balanced
More than USD 9,000	10	Full price			

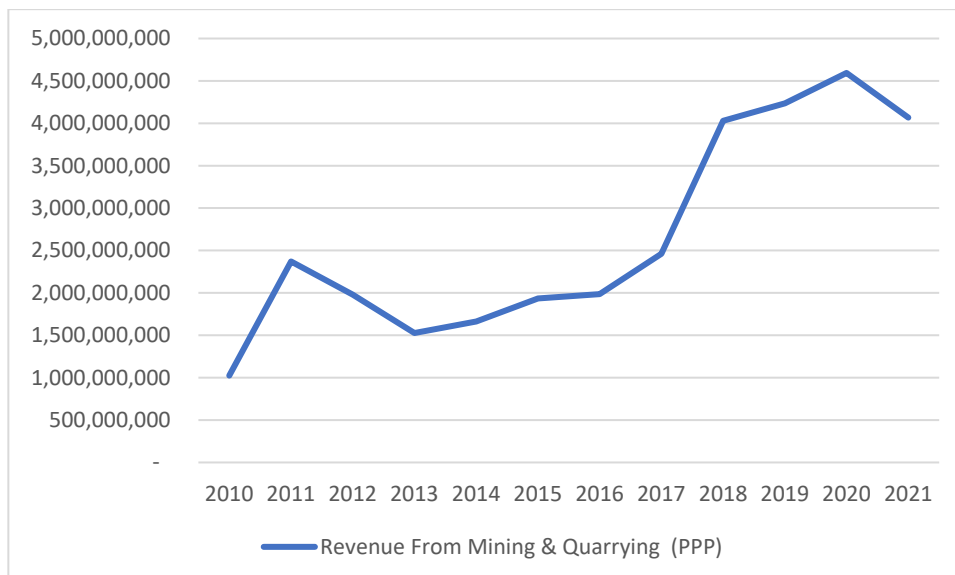
Source: (National Assembly of Zambia 2022)

## E.4 Impacts of the instrument

### E.4.1 Fiscal impacts

The objective of the mineral tax regime has been to boost revenue and encourage development; the MRT does not have any explicit environmental objectives. Since 2011, total tax revenue from the mining sector has increased significantly, as shown in Figure 19.

Figure 19: Total tax revenue from mining in Zambia, 2010 – 2021, in USD



Source: ATAF

In 2020 alone, revenue increased by 41% in comparison to 2019, due to the changed tax law. The MRT amounted to USD 287 million / EUR 263 / ZMW 5,686 million in 2021, USD 649 million / EUR 595 million / ZMW 12,839 million in 2022, and USD 454 million / EUR 416 million / ZMW 8,986 million in 2023 (Deloitte, 2022). The

Zambian government is overly dependent on taxes on mining, which accounted for 31.4% of total government revenue in 2020, 13.7% from the MRT (Zambia EITI, 2021). Total tax revenue from the extractive sector amounted to USD 1.6 billion in 2020 / EUR 1.5 billion / ZMW 27.3 billion (Zambia EITI, 2021). The Zambian Authorities expect a drop of income from the MRT reform amounting to around ZMW 2.8 billion / USD 164 million / EUR 150 million.

*Table 9: Mineral Royalty Performance 2021 (actual), 2022 and 2023 (estimated)*

Revenue Type	2021		2022		2023	
	Actual Collection (million ZMW)	% of Domestic Revenue	Estimated Collection (million ZMW)	% of Domestic Revenue	Estimated Collection (million ZMW)	% of Domestic Revenue
Mineral Royalty	12,417	12.8%	12,839	13.0%	8,986	8.0%
Total Domestic Revenue	97,214		98,859		111,643	

Source: (National Assembly of Zambia 2022)

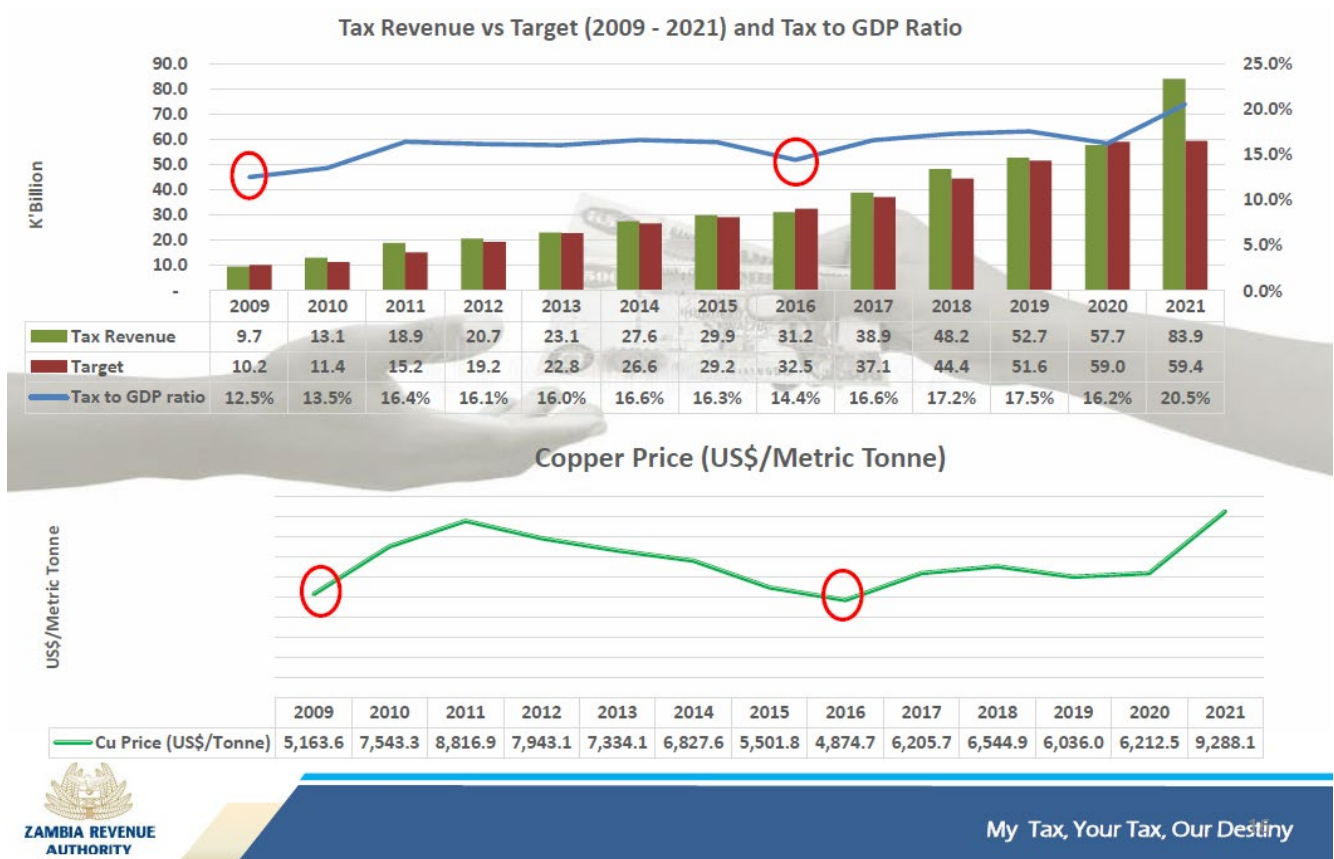
*Table 10: Revenue Contribution by Sector: January – June, 2022 collection by January – June 2021 collection (in million ZMW)*

RANK	Tax Type	Jan – June Collection			Jan – June (%) Contribution		
		2022	2021	Variance	2022	2021	Variance
1	Company Tax	14,052	8,543	64.5%	29.10%	21.20%	7.9%
2	PAYE	8,996	7,448	20.8%	18.6%	18.50%	0,1%
3	Import VAT	6,461	6,133	5.3%	13.40%	15.20%	- 1,8%
4	Mining Royalty	6,241	6,352	-1.8%	12.90%	15.80%	2,9%

Source: (National Assembly of Zambia 2022)



Figure 20: Revenue performance and copper price, 2009 - 2021



Source: (Zambia Revenue Authority 2022)

#### E.4.2 Economic impacts

The MRT on copper has been criticised by mining companies because it disincentivises investment. However, in actual fact, copper production volumes were quite consistent between 2010-20 (around 800,000 tonnes annually), despite significant fluctuations in tax rates and export values. In 2020, mining delivered 11% of GDP, 80% of exports, and 2% of employment (Zambia EITI, 2021).

Although the aim of mineral tax regime appears to be to boost revenue and stimulate development, frequent tax changes in response to copper price shocks [rapid drops] have resulted in an unstable policy environment (Mwaba & Kayizzi-Mugerwa 2021). As noted above, mining companies have commented on previous policy changes and inconsistencies as a disincentive to investment. The current government is expected to deliver a more stable mining policy.

#### E.4.3 Environmental impacts

Mining has a long history of poor environmental management, causing air, soil and water pollution, occupational disease, and heavy metal poisoning. Issues include acidification of water and land due to the use of sulphuric acid in mining, and increased lead concentrations in the population. Ambient air pollution level of SO<sub>2</sub> and particulate matter have been found to exceed “safe levels” in townships around mines and dust on crops has been found to contain harmful heavy metals (Mwaanga et al. 2019). Over the past 10 years, multiple incidents as well as negligent mining practices have led to entire villages to have become inhabitable and people suffering serious health consequences, due to the contamination of water and previously fertile lands (Voller & Glent Overgaard 2016). A potential increase in small-scale mining – which appears necessary to extract 3 million tonnes of copper annually – will increase serious risks for the environment and vulnerable populations. There



are no incentives within the current fiscal framework to use safer or less resource-intensive methods, and tax revenues are not used to mitigate negative environmental or human health impacts. Any future fiscal framework on mining should stabilize revenue generation, while also addressing environmental concerns.

No reliable data is available on the impacts of the MRT on the environment. It has been designed as a revenue-raising instrument and greening mining not taken is not an explicit aim of current tax regime (Mwaba & Kayizzi-Mugerwa 2021).

### **E.4.3 Social impacts**

Social expenditures in 2020 from mining amounted to USD 15 million / EUR 13.8 million in voluntary cash payments and USD 5 million / EUR 4.6 million “in kind”. These funds are used i.a. for health, school, and road infrastructure, market gardening and promotion of agriculture. The general public claims that mining benefits have not ‘trickled down’ to the common citizen (Webby & Besa 2016).

## **E.5 Complementary measures**

The design of the MRT has not taken any social equity impacts into account, and neither did it call for the introduction of any complementary measures to protect the poor from the impacts of the tax, as it is paid by large mining enterprises.

The 2023 reform of the MRT – both the revised tax rates and the legal changes to permit the treatment of the MRT to be deductible from CIT – were undertaken with a view to improving the attractiveness of Zambia for Foreign Direct Investment in mining. This step should also be seen within the broader political context of the President’s target to increase copper exports to 3 million tonnes by 2030. Moreover, the Zambian government is acutely aware that it must compete with the Democratic Republic of Congo in terms of its tax treatment of mining, while maximizing DRM potential from the sector and avoiding a race to bottom in terms of tax competition.

## **E.6 The story of implementation**

Zambia has abundant mineral resources, many of which are still undiscovered (just 55% of the country has been geologically mapped). Nonetheless, Zambia’s economy is already highly reliant on its resource extraction sector. The mining sector is the main driver of the economy. It is the largest purchaser of goods and services and the largest spender on salaries, apart from the government, and one of the major formal employers (Deloitte, 2022).

Zambia privatized its mining sector in 1997. Since that time, there have been several significant changes to the tax regime. The first regime allowed companies to carry forward losses for 15-20 years to allow for a stability period and attract investors. The conditions for private companies under the development agreements were very favourable. Following societal pressure, the terms for resource extraction were renegotiated. Over the following years, multiple adjustments were made. In 2007 a new legislative regime was introduced for projects that were not part of any previously negotiated development agreements with a fiscal stabilization clause. In 2008 a new regime was introduced for all companies, including those that had been covered by a fiscal stabilization clause. The CIT was increased and a mining royalty tax was applied at 3% of the norm value of base metals, diverting from the rates of the development agreements (PwC 2016). After pressure from the private sector the government reduced the taxes in 2009.

In 2012, a new government imposed high royalty rates of 6%. In 2013, the capital depreciation allowance was tightened (PwC 2016). In 2015 the government proposed a drastic increase of the royalty tax to 20% for open-pit mines. In the same year the government diverted from this plan and settled at a rate of 6- 9%. The 2015 tax regime was relatively high in comparison to other countries. While the CIT was commonly between 25% - 30%, most countries only applied a royalty of 2-5 %. In the Democratic Republic of Congo, the CIT was at 30% and the Royalty was only at 2% in 2015 (Manley, 2017; The Chamber of Mines of Zambia 2016).

In 2016 the sliding scale for the MRT rate on copper was introduced, with the aim to ensure a stable and responsive mining tax regime (PWC 2016). In the following years several changes to the CIT and the royalties were made (Nyangu 2020).

In 2019 Zambia issued a reform to make MRT non-deductible for income tax. The aim was to significantly increase tax revenue. However, this reform was met with strong opposition from several industry stakeholders due to the resulting double taxation (PWC 2021). Many companies claimed that the reform made mining operations in Zambia economically unsustainable. As a result, the Zambian mining sector saw a loss of investment as companies reduced their manpower, deferred mine development and froze capital expenditure (Deloitte 2022). To avoid further damage to the mining sector, the deductibility of the MRT from the taxable income was reintroduced in 2022.

In 2023, the MRT rates were reduced, and the taxable base recalculated to further decrease the tax burden for companies. The concessions made in 2022 and 2023 have delivered strong financial benefits for mining companies by lowering the tax rates in addition to reintroducing deductibility.

These changes are motivated by a new ambitious strategy of the Zambian government to increase copper extraction for the following years. While production stagnated at an annual average of just below 800,000 metric tons over the last 5 years, the government aims to extract 3 million tonnes by 2030 (Lusaka Times 2022). According to the Zambian Minister of Finance, the country is at threat of being left behind in the copper boom, due to the unstable investment climate (see Deloitte 2022).

Electrification of transport and other applications is driving the global demand for copper. Copper prices are expected to increase over the next few years and remain high. Growth rates of demand for copper have been in sectors linked to net-zero policies, which indicate an increasing demand by 4.5% annually until 2030. Over the past two decades, demand has increased by 2.1% annually. Exact forecasts differ from Goldman Sachs predicting average copper prices of USD 9,750/t for 2023 and USD 12,000/t in 2024 (EUR 8,938 and EUR 11,000 respectively). The Bank of America is expecting a price increase to USD 12,000/t in the second quarter of 2023. Other forecasts are more cautious due to global economic slowdown and prospected rise in Chinese copper output as well as recycling and circular economy strategies (CNBC 2022).

## E.7 Lessons learned and recommendations

### E.7.1 Instability within the tax regime disincentivises investment

Zambia has abundant mineral resources, many of which there is an increasing global demand for. Therefore, it is reasonable for the Zambian government to reflect on ways to retain a significant proportion of revenue from copper mining, while balancing this with the need to encourage foreign direct investment.

The application of an MRT, which varies according to international copper prices is interesting, because it allows Zambia to retain higher proportion of overall revenue when prices are higher. The maximisation of retaining resources from natural resource exploitation is particularly important for Zambia, which urgently needs additional revenue to stabilize the economy, combat poverty and pursue sustainable development goals.

However, Zambia has not achieved a stable generation of tax revenue while creating an attractive environment for investments. Zambia's taxation system has been highly reactive to global price developments as well as political and societal pressures, making frequent adjustments to achieve short-term goals. As a result, tax rates that had been set to high caused pressure from the private sector and disincentivised future investments. Tax rates that were reduced to low as a response, caused a lack of tax revenue which had to be corrected again.

The frequent adjustments of the tax regime led to an erosion of trust between the government and private sector (Mwaba & Kayizzi-Mugerwa, 2021). The anticipation of the 2019 reform, which included the non-deductibility of the MRT, led to a drop in copper production of 300 000 tonnes in comparison to what was originally expected. This drop in production led to a loss of USD 130 million / EUR 119 million in royalties in 2018/2019 (Zambia Chamber of Mines, 2018).

### **E.7.2 Moving towards a more stable, environmentally effective, tax framework**

Moving forward, Zambia requires a mining taxation framework, that is carefully designed, balancing all interests at stake on the basis of a thorough analysis. The determination of the tax rates is very important, as either too high or too low will lead to external pressure and the need for short-term adjustments. The case of Zambia shows, that too high rates can hinder expansion and new investments, which ultimately can lead to lower tax revenue. A stable fiscal environment is important to ensure continuity of mining operations, which ensures a steady stream of revenue. In addition, Zambian authorities must communicate plans and reforms in advance to increase stability and trust. At the same time, it is important that any reforms also take the environmental impacts of mining into account, and endeavour to incorporate environmental and human health considerations in the taxation of the mining sector (see E.7.4 below).

### **E.7.3 Tax compliance calls for political commitment**

Alongside efforts to stabilise the tax regime, it is essential in Zambia that the authorities also ensure a high level of tax compliance. To achieve this, the capacity of the Zambian Revenue Authority (ZRA) must be strengthened. Zambia must also invest in capacity building to meet multinational cooperations at eye-level, in negotiations as well as enforcements (Mwaba & Kayizzi-Mugerwa 2021; Zambia Chamber of Mines 2018).

### **E.7.4 Introduce green taxes to tackle pollution from mining and boost DRM**

While mining activities have a poor environmental track record, there is no fiscal instrument which targets environmental externalities. Mining is leading to air pollution with SO<sub>2</sub> and PM, soil acidification and heavy metal pollution. Unsafe concentrations of heavy metals have been found in children and adults, which can cause serious illness (Mwaanga et al. 2019). Environmental taxes e.g. on water or air pollution – or differentiated e.g. in line with installed effluent treatment technologies, or technologies to reduce SO<sub>2</sub> emissions – could incentivise change and implement the polluter pays principle, while mobilising additional revenues.

To decrease the country's economic vulnerability as well as environmental impacts, Zambia should also explore other sources of revenue generation. While demand for copper is predicted to increase over the coming years, long-term developments cannot reliably be predicted. A package of environmental taxes would have more potential to mobilise a steady revenue stream over the medium term than one measure and would also provide for broader coverage of environmental fiscal instruments.

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## E.9 Interviews: Zambia

- Christine Neumann, GIZ - Good Financial governance advisor
- David Schlutz, GIZ – Finance and tax policy, Advisor
- Eric Vitale, EU Commission – Public Finance Sector, Project Manager

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