Carbon Pricing Metrics:

Analyzing Existing Tools and Databases of Platform for Collaboration on Tax (PCT) Partners

EXECUTIVE SUMMARY













1. Introduction

A growing need for carbon pricing metrics

The number of carbon pricing instruments has increased steadily over the last three decades. In 2022, 68 carbon pricing instruments are in operation (World Bank, 2022). Fuel (excise) taxes are older, more widespread, and, in some regions, of larger magnitude than explicit carbon pricing instruments. For instance, fuel taxes dominated effective carbon rates in the OECD countries in 2018, representing 93% of the ECR marginal rates (OECD, 2021).

This increase in the use of carbon pricing instruments coincides with the development of a wide range of carbon pricing metrics. Over the last decade, International Organizations have played a leading role in developing metrics to inform carbon pricing's current state, trends, and progress against benchmarks. These metrics help policymakers, businesses, and other stakeholders to make informed decisions on carbon pricing.

This diversity of approaches provides a rich perspective on the different forms of carbon pricing: direct, indirect, positive, and negative. However, it also risks confusing policymakers and other stakeholders. Metrics may differ in their instrument coverage or geographical scope. For example, while some of these metrics consider direct (also called explicit) carbon pricing, others focus also on indirect carbon pricing (also called implicit prices). Additionally, metrics may differ in the methodologies chosen.

The aim of this paper is to facilitate the comparison of the various metrics. The paper showcases carbon pricing metrics focusing on the Partner Institutions of the Platform for Collaboration on Tax (PCT). The PCT is a joint initiative of the International Monetary Fund (IMF), the Organisation for Economic



Over the last decade, **International** Organizations had a leading role in developing metrics to inform carbon pricing's current state, trends, and progress.









Co-operation and Development (OECD), the United Nations (UN), and the World Bank Group (WBG) to strengthen collaboration on resource mobilization. As part of these efforts, and according to their respective mandates, PCT Partners undertake analytical work to benefit the collective membership of their four organizations and to provide developing countries with clear, coherent, and practical tools to address a range of contemporary tax issues. This paper is embedded in the workstream dealing with environmental taxation/climate and tax and, while it explores the metrics developed by the PCT partner institutions, it also analyzes other carbon pricing metrics.

2. PCT Partners' metrics

Understanding the diversity in the approaches

Over the last decade, a wide array of carbon pricing definitions and metrics have been developed by the PCT Partners, and other academic and civil society institutions. In 2013, the OECD introduced "Taxing Energy Use" (TEU), a publication series reporting on tax-based carbon prices. In 2016, the OECD started tracking the "Effective Carbon Rates" (ECR), which reports on the total price of carbon emissions resulting from taxes (carbon and fuel taxes) and emissions trading. Besides positive carbon prices, the OECD tracks subsidies employing an inventory-based approach which dates to 2012. The IEA produces estimates of fossil fuel subsidies using the price gap approach (comparing prices on international markets against prices paid by domestic consumers). In that sense, the OECD and the International Energy Agency (IEA) produce complementary databases of government support for fossil fuels – with the OECD focusing on an inventory approach of budgetary transfers and tax breaks and IEA on fossil fuel subsidies measured by the pricegap approach. A combined OECD-IEA's dataset covers 51 major economies (OECD-IEA, 2022).











A wide and diverse array of carbon pricing definitions and metrics have been developed by the PCT Partners. The study finds that the **existing metrics are complementary**, and together they provide a **comprehensive description of the carbon pricing landscape**.

The IMF also tracks subsidies. In a series of fossil fuel subsidy publications, the IMF measures and tracks the efficient fossil fuel prices (see section 2.1) and subsidies implied by charging fossil fuel prices below efficient fuel prices.

The World Bank tracks the global and country-level developments of explicit carbon prices (emissions trading and carbon taxes) in its flagship yearly publication, the States and Trends of Carbon Pricing (States & Trends). Finally, in 2021 UN published the <u>Handbook on Carbon Taxation for Developing</u> <u>Countries</u>. The Handbook provides practical guidance for countries that have or are considering introducing a carbon tax.

The UN has also contributed to a better measurement of fossil fuel subsidies in developing countries. The UN's 2019 flagship report on <u>Measuring Fossil</u> <u>Fuel Subsidies in the context of the Sustainable Development Goals (SDGs)</u> provides a methodology that countries can apply to measure subsidies.

The metrics developed have different policy and country coverage, meaning that some of them concentrate on certain instruments, (e.g. historically the World Bank's States and Trends focused on direct/explicit carbon pricing instruments, while only recently it started discussing instruments that indirectly price greenhouse gas (GHG) emission. Table 1 describes the metrics, databases, and approaches of each of the four PCT partners.

The carbon pricing metrics of PCT Partners use different terminologies, complementary methods, and cover different types of policies. Yet, features that a priori seem to diverge, have unifying concepts.









Table 1. PCT Partners' carbon pricing metrics and databases:Instrument and period coverage

Partner	Database/ publication	Metrics	Instruments covered	Data available	Level of disaggregation
OECD	ECR (OECD)	ECR	ETS, carbon taxes, fuel taxes, ex-post fossil	2012, 2015, 2018, 2021	Fuel and sector, by country
	ECR (OECD)	Net ECR	ETS, carbon taxes, fuel taxes, ex-post fossil fuel subsidies	2018, 2021	Fuel and sector, by country
	TEU (OECD)		Energy taxes, carbon taxes and ETS (since 2018)	2012 2015, 2018, 2021	Fuel and sector, by country
IMF	Fossil fuel subsidies	Explicit and implicit subsidies	Explicit and implicit subsidies, carbon taxes, energy taxes, and ETS	1990-2021	Fuel and sector, by country
WB	Carbon pricing dashboard (World Bank)	Carbon rate levels and coverage	ETS, carbon taxes	1990-2021	Jurisdiction level
UN	<u>UN Handbook</u> <u>on Carbon</u> <u>Taxation</u>	The Handbook does not include metrics, but includes practical guidance on how to implement carbon taxes.	Carbon taxes	N/A	Jurisdiction level

Source: Authors.









3. Comparing the metrics and approaches

5

Proposing a typology for facilitating the comparison

Figure 1. Typology and comparison of PCT Partners' carbon pricing metrics along three dimensions



Note: Positive and negative carbon pricing may overlap.







WORLD BANK GROUP

MIGA



The analysis highlights a key dimension of convergence: Despite the diversity, PCT Partners concur in considering both explicit and implicit (also called direct and indirect) metrics of carbon pricing.

To facilitate the comparison, the paper proposes a typology for analyzing and understanding carbon pricing metrics. The typology comprises three dimensions: policy coverage referring to the types of carbon pricing instruments that the metric covers, rate or form of carbon pricing describing whether the metrics tracks positive (carbon taxes and ETS), or negative (subsidies), implicit (fuel taxes) or explicit (carbon taxes) carbon pricing forms.

The intersections of these three dimensions help clarify the differences and complementarities of PCT metrics. Each PCT partner metric can be placed within the three dimensions, noting that the exercise of providing a typology naturally resorts to simplification.

The importance of excise taxes (and subsidies) as contributing to equivalent carbon pricing is reflected in the carbon pricing metrics and/or approaches of PCT partners. In the diversity, there is also convergence on the metrics of PCT partners looking at positive carbon pricing in both its explicit/direct and implicit/indirect forms. For instance, OECD's ECR aggregates the price signals emerging from explicit carbon pricing instruments such as carbon taxes, ETS and fossil fuel taxes. Similarly, the World Bank has started exploring the importance of indirect carbon pricing signals emerging from fuel taxes on consumption (World Bank, 2022).









MIGA MI

4. Common messages from PCT Partners on carbon pricing

This paper finds that PCT partners concur in a crucial message: carbon pricing signals to date are insufficient. Energy prices are poorly aligned with climate, environmental and health costs. Price signals are inconsistent with carbon content, as the most polluting fuels face the lowest carbon price rates (see Figure 2). This is a message highlighted by most PCT partners' approaches, noting that not all PCT partners disaggregate the pricing data at the fuel and sector level. The diversity of carbon pricing metrics responds to carbon pricing instruments taking several forms.

According to the OECD, in 2018-2021, 59.3% of GHG were not subject to a positive carbon price, implying considerable opportunities to advance CO2 pricing (OECD, 2022). The World Bank highlights that while direct carbon prices recently hit record highs in many countries, less than 4% of global emissions are currently covered by a direct carbon price within the range needed by 2030 (World Bank, 2022). The IMF stresses the need to get energy prices right by charging the efficient fuel pricing levels (Parry et al., 2021). Finally, the UN highlights the need to align fuel taxes with their carbon content (UN, 2021c), to eliminate fuel subsidies that undermine carbon taxes (UNEP-IISD, 2019; UN, 2021; UN 2021b; UN, 2021c), and highlights the key role of environmental taxes in aligning fiscal policies with the commitments of the 2030 Agenda for Sustainable Development, the Addis Ababa Action Agenda, and the Paris Agreement on Climate Change (UN, 2021).



Carbon pricing signals to date are **insufficient**. Energy prices are **poorly aligned** with climate, environmental and health costs.









WORLD BANK GROUP

Indeed, a comprehensive approach to price energy prices right will involve removing (explicit, pre-tax) fossil fuel subsidies, increasing direct carbon prices to reflect the social costs of GHG emissions, and setting fuel tax rates based on the carbon content of the fuels. International cooperation on these aspects is important to support countries in their efforts to achieve net zero targets.

Figure 2. PCT Partners' metrics across different fuels and sectors A. OECD membership: Carbon pricing across fuels (2021)





B. OECD membership: Carbon prices across sectors (2021)

8

Strategies to improve alignment include the removal of fossil fuel subsidies, higher direct carbon prices (via carbon taxes or ETS) and broadening the tax base of fuel taxes and **aligning the rates with the social cost of carbon.**

WORLD BANK GROUP

MIGA 🔛

IFC









Carbon Pricing Metrics:

Analyzing Existing Tools and Databases of Platform for Collaboration on Tax (PCT) Partners

EXECUTIVE SUMMARY









