

The Real Cost of Carbon Pricing

FX Quarterly Special Feature



What is Carbon Pricing?

Carbon pricing is an approach to emissions reduction that attempts to pass on the cost of polluting directly to emitters of Greenhouse Gases (GHG), primarily carbon dioxide and to a lesser extent methane, nitrous oxide, and fluorinated gases. Direct carbon pricing can take multiple forms including carbon taxes, emissions trading schemes (ETS), and carbon crediting mechanisms. Indirect Carbon Pricing Carbon pricing includes taxes and subsidies that change the price of inputs, most ubiquitously fuel excise taxes. Carbon pricing can be viewed as an attractive policy option in that they are relatively straightforward to administer and give the option of raising public revenues.

Carbon pricing has existed for decades, one such example being the sulfur dioxide cap-and-trade system implemented in the U.S. in the 1990s. The 2015 U.N. Paris Climate Agreement, however, required signatory countries to establish Nationally Determined Contributions (NDCs), or goals for reducing GHG emissions over a specified time horizon. This advent of NDCs – 120 countries have established these – has accelerated the adoption of carbon pricing as well as the creation of markets in which abatement and other carbon credits are traded.

Carbon pricing has a growing role in countries' climate change responses.

Jay Foraker assesses current mechanisms, their impact on economic growth, and the next evolution.

When U.S. Presidential Climate Envoy John Podesta recently called for a "21st century trade policy" that encourages a "race to the top for climate action",¹ it was clear that he meant business. He asserted carbon pricing would help limit emissions and China's dominance of key industries, showing the approach's growth in policy response to climate change.

However, carbon pricing is not without its challenges.

As with any tax, carbon pricing can impact inflation and therefore macroeconomic performance; their adoption at a national level also creates incentives and disincentives for countries to implement carbon pricing from a competitive standpoint.

Considering such challenges, the full economic impact of carbon pricing is understood by analyzing the current mechanisms, identifying upcoming events in the evolution of carbon pricing infrastructure, and exploring the data around the macroeconomic impact of carbon pricing where implemented.

1) Today's carbon pricing mechanisms include carbon taxes, emissions trading schemes (ETS), and carbon crediting mechanisms (CCM)

Carbon Taxes: 37 Carbon Tax programs have been implemented globally at national and subnational levels, covering 5% of global GHG emissions. Prices range from \$0.41/tonne of Carbon Dioxide (tCO₂) in Mexico to \$155/(tCO₂) in Uruguay, and with several Scandinavian and Western European countries having prices over \$80/(tCO₂). Average tax across the 37 programs is \$25.38/ (tCO₂). Such taxes generate approximately \$30 billion in government revenues globally.

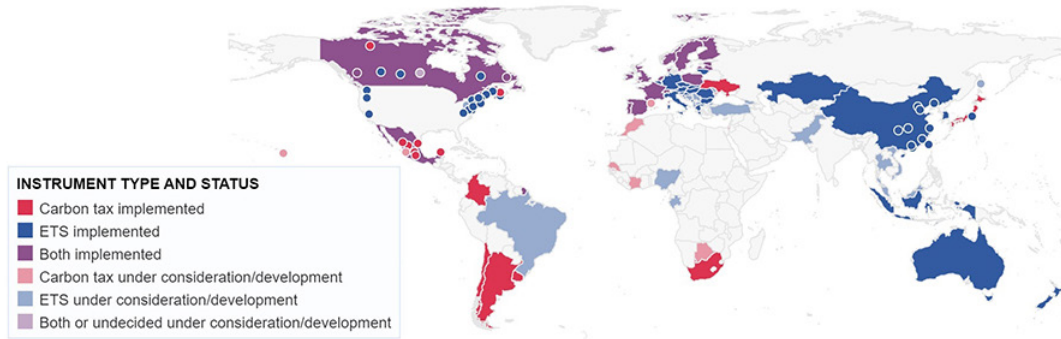
Emissions Trading Schemes (ETS): 37 Emissions Trading Schemes have been implemented globally at national and subnational levels, covering 18% of global GHG emissions. Pricing ranges from \$1.12/(tCO₂) in the Kazakhstan ETS to \$96.29/(tCO₂) within the EU ETS; average price amongst all 37 ETS is \$25/(tCO₂) and 10 of the 37 ETS are Canadian Federal or Provincial programs. These ETS generate approximately \$67 billion in government revenues globally.

1. Denning, Liam. "The White House has a New Trade Weapon Against China." Bloomberg: April 18, 2024.

Figure 1: Direct Carbon Taxes and ETS Implemented and Under Consideration/Development Globally, 2023

Compliance carbon pricing instruments around the world, 2023

Map shows jurisdictions with carbon taxes or emissions trading systems implemented, under development or under consideration, subject to any filters applied in the table below the map. The year can be adjusted using the slider below the map.



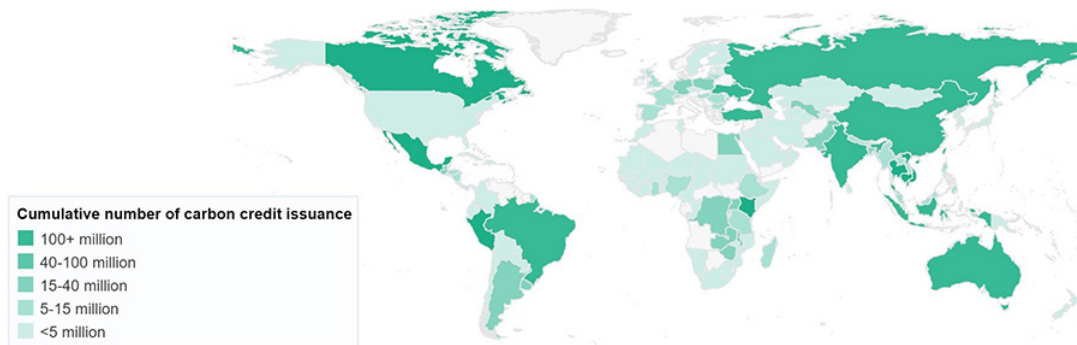
Source: The World Bank, 2023

Carbon Crediting Mechanisms (CCMs): 29 government-administered carbon crediting mechanisms are currently in place 14 at the National level and 15 at the Subnational/Regional levels; another eight are currently in development. Over 5.3 billion CCMs have been issued globally up to and including 2023, each representing one tonne of emission reduction activities (tCO₂e). Figure 2 displays the geographic concentration of issuance by country, dating back as early as 2007. Notable CCMs include the California Air Resource Board Offset Credits and the Beijing Forestry Offset Mechanism. A broad range of activities qualify under CCMs, including landfill methane capture, avoided agricultural methane, and afforestation; all of which broadly either avoid GHGs from being emitted, or sequester them from the atmosphere.

Figure 2: Cumulative Carbon Credits Issued, up to and including 2023

Cumulative carbon credit issuance, 2023

Heat map shows the level of carbon credits issued to emission reduction activities in each country (tCO₂e). Filter by mechanism type or host country income group, subject to any filters applied. The year can be adjusted using the slider below the map.



2) Evolution of Carbon Market Infrastructure

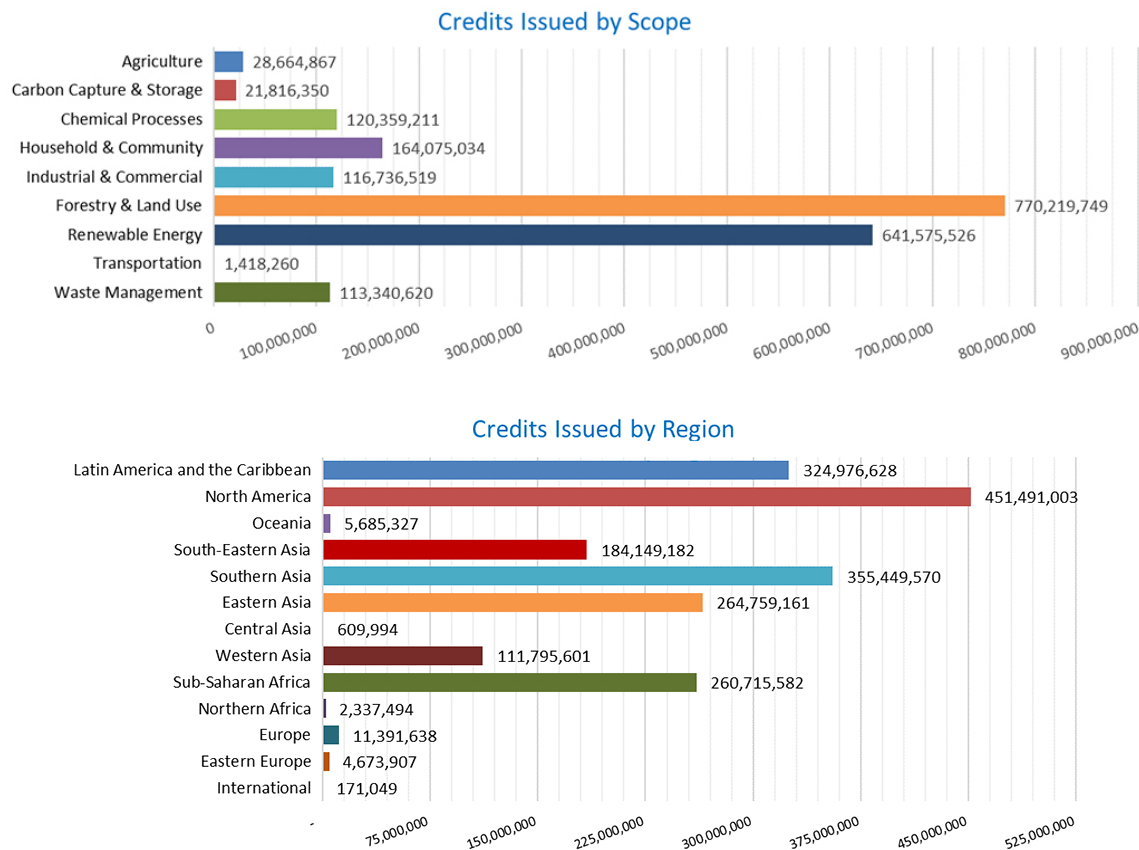
At a high level, there are two types of Carbon Markets: Compliance and Voluntary.

Compliance markets: result from any national, regional, or international agreement or regulation and include the ETS and CCMs.

Voluntary Carbon Markets (VCM): refer to the buying and selling of carbon credits on a voluntary basis. Article 6 of the 2015 Paris Agreement provides a basis for facilitating international recognition of cooperative carbon pricing approaches, in short, a framework for supply and demand within VCM.

VCM supply originates from issuers (sovereigns and private abatement project developers) via the four primary programs: American Carbon Registry, Climate Action Reserve, Verra, and Gold Standard. VCM demand comes from nations, corporations, or other entities seeking to achieve emissions reductions states through their own NDCs or other targets. Like Compliance markets, VCM credit instruments include projects in diverse categories as carbon capture and storage, renewable energy, and REDD+, a UN framework to encourage developing countries to reduce emissions and promote GHG sequestration through various forest management activities; a breakdown by type and geography of the nearly 9,000 projects issued via these four VCM programs is shown in Figure 3.²

Figure 3: Cumulative Voluntary Carbon Credits issued via the four primary programs 1996-2023 (by Project Type and Geography)



2023 was a challenging year for VCMs. According to a World Bank report, critical media coverage during the year cast doubt on the environmental integrity of some carbon credits. Further, issuances and retirements of VCM carbon credits were down 13% from January through September 2023 versus the same period in 2022.³ In addition, the United Nations COP 28 held in Dubai in December failed to adopt key provisions of Article 6 of the 2015 Paris Agreement that would have expanded voluntary carbon market activity. Article 6.4, specifically, would have provided a new operational structure for the exchange of emissions reduction credits across borders. Opponents argued that guidance and rules around the environmental integrity of carbon removals was insufficient. The Article is likely to be taken up again at COP 29 in Baku in November 2024.⁴

2. Barbara K. Haya, Aline Abayo, Ivy S. So., Micah Elias. (2023, December). Voluntary Registry Offsets Database v10, Berkeley Carbon Trading Project, University of California, Berkeley.
 3. World Bank. 2023. State and Trends of Carbon Pricing: International Carbon Markets. © Washington, DC: World Bank. <http://hdl.handle.net/10986/40700> License: CC BY-NC 3.0 IGO.
 4. Gupte, Eklavya and Agamani Ghosh. "COP28: Lack of progress on Article 6 likely to further limit carbon market growth." S&P Global Commodity Insights: December 13, 2023.

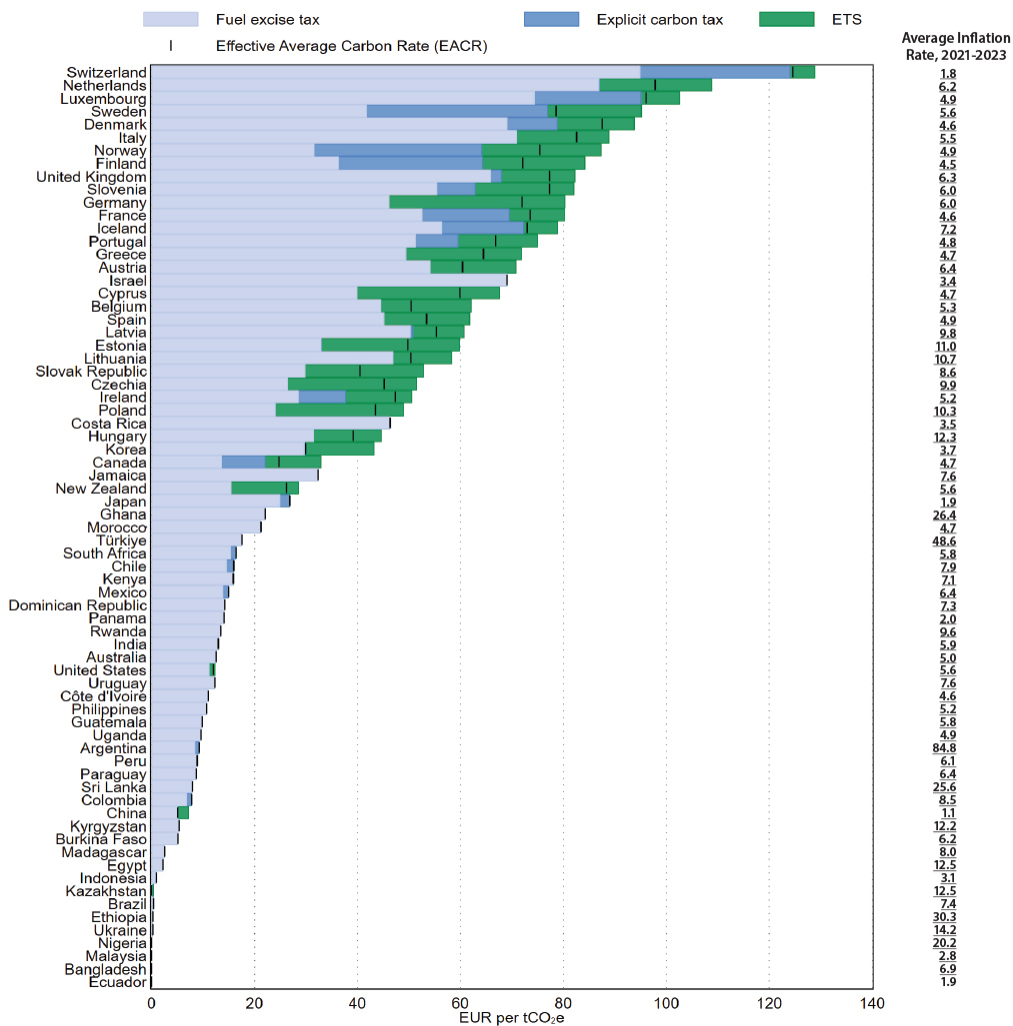
3) The Macroeconomic Impacts of Carbon Pricing

Considering the current scope of both Compliance and Voluntary Carbon Markets, paired with their growth since the 2015 Paris Agreement, it is timely to consider the impact of increased carbon pricing on economic growth.

Differing perspectives on its impact have emerged. A recent IMF Working Paper has found limited impact of the EU ETS and national carbon taxes on inflation within the Euro area, noting that the impact of Russia’s invasion of Ukraine had a larger and more direct impact on inflation.⁵

A separate 2023 study by the International Chamber of Commerce found that carbon pricing will lead to short-term inflation, particularly with energy and critical minerals; however, it will gradually decelerate in the long run unless action on GHG emission reduction is delayed.⁶ Our own analysis of OECD Effective Carbon Rates (Combined Fuel Excise Taxes, Carbon Taxes and ETS) across 71 countries, versus their current inflation rates does not exhibit a strong correlation in Figure 4.

Figure 4: Effective Carbon Rates (2021) and Average Inflation Rates, 2021-23



5. Maximilian Konradt, Thomas McGregor, and Frederik Toscani. "Carbon Prices and Inflation in the Euro Area: IMF Working Paper February 2024.

6. ICC (2023), Carbon pricing and inflation: a dilemma?

More Pricing Ahead

Carbon pricing has seen exponential growth in the past decade. Given the deglobalization trend and Podesta's latest remarks, it looks certain its impact on public policy will grow more central in the coming decade as national governments determine their short- and long-term responses to climate change.

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