



RESEARCH BRIEF

CARBON MARKETS AND TAXATION



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Executive Summary

A number of activities are generating emissions of greenhouse gasses (GHG) into the atmosphere. Increasing concentration of these gasses is a major driver of global warming. GHG emissions need to be reduced drastically, and utilization of market instruments is important in achieving this goal. The idea behind using such tools is to reallocate investments and expenditures toward climate mitigation solutions and away from GHG-emitting processes. Setting a price on carbon is one such instrument.

There are two main methods of putting a price on emitted GHGs: carbon taxation and carbon markets. A carbon tax differs from a cap-and-trade plan in that it ensures the cost but not the degree of emission reduction to be achieved; whereas a cap-and-trade scheme guarantees the amount of emission reduction, but the price can be volatile as it is determined by market forces. Currently, both regulated/compliance and voluntary markets are in operation in many countries across the globe.

Trading of carbon offsets is carried out between businesses as well as between countries. Article 6 of the Paris Agreement empowers nations to collaborate with each other voluntarily to meet carbon reduction objectives outlined in their NDCs. In order to prevent leakage, whereby polluting processes shift from countries with high carbon prices elsewhere, carbon border adjustments, also known as "carbon border adjustment mechanisms" (CBAM), are going to be implemented. In order to set effective carbon emission reduction policies and quantify their impact, some governments have estimated a social cost of carbon. In general, it is a monetary assessment of the negative impact of one ton of GHG emitted into the atmosphere on society.

Many emerging and frontier economies are implementing carbon pricing mechanisms. China is the largest among them, with several such schemes operating in parallel. Emerging markets are at an early stage of their journey, and their carbon price levels are still too low to serve as a meaningful financial lever to change the behavior of businesses. Nevertheless, introduction of carbon pricing is a significant achievement, especially in developing countries, where additional levies on taxpayers face serious political and economic complications.



When looking at issuers' emission reduction plans that involve carbon offsets, investors would be wise to check which projects offsets are purchased from. Offsets differ in quality, and, in particular, their additionality should be closely monitored. Quality offsets should also be permanent, and leakage and double counting should be avoided.

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Key Terms

Additionality – a characteristic of carbon offsets which means the underlying project would not be realized without them. In other words, proceeds from a trade in carbon offsets allow an avoidance or removal of GHG from the atmosphere that would not happen otherwise.

Article 6 of the Paris Agreement – an article of the Agreement that establishes frameworks for voluntary collaboration between countries in achieving their nationally determined contributions to the global GHG emission reduction.[1]

Baseline-and-credit emissions trading system (ETS) – a type of emissions trading system in which baselines are set for participating emitters. Those who emit more have to surrender credits which can be purchased from participants who managed to stay below their baseline.

Cap-and-trade ETS – a form of emissions trading system where the government sets a cap on annual emissions, and the total allowance is divided or auctioned among participants. One of the best examples is the EU ETS. In the latter, the total allowance is trimmed each year to reach a long-term GHG emissions reduction target. Emitters who have been able to stay below their allocation can sell the balance to excess emitters on a market where the price is thus set. One unit of traded emission allowance typically entitles the holder to emit one ton of CO₂.

Carbon offset / offset credit – the terms are often used interchangeably, although there is a slight difference in meaning. A carbon offset is a reduction in GHG emissions (or a carbon removal and storage) that is used to compensate for emissions elsewhere. An offset credit is a transferable instrument based on a unit of carbon offset that can be retired to claim a reduction in GHG emissions.[2]

China Certified Emissions Reductions (CCER) – refers to activities by companies to reduce emissions on a voluntary basis, which have been certified by the Chinese government. Example activities include renewable power generation, forestry projects, and waste-to-energy projects.

[1] [The Paris Agreement](https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf) (https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf)

[2] [Carbon Offset Guide](https://www.offsetguide.org/understanding-carbon-offsets/what-is-a-carbon-offset/) (https://www.offsetguide.org/understanding-carbon-offsets/what-is-a-carbon-offset/)



Greenwashing – False or misleading claims by an organization or sovereign regarding its environmental impact.

Leakage – a characteristic of carbon offsets showing whether a project financed through this instrument helps to avoid GHG emissions that are simply shifted to another location. For example, there can be leakage if protection of a forest financed by carbon offsets leads to deforestation in another location.

Market Stability Reserve (MSR) – a market stabilization mechanism acting within the EU ETS to avoid excess volatility that may be caused by surplus allowances, financial, and other shocks. It works by regulating the number of allowances (offset credits) in circulation. MSR accumulates the credits that are deducted each year from the maximum annual emissions allowance.

Social Cost of Carbon – a metric used to estimate in dollar terms the cost of economic damages to the population from emitting one more ton of carbon. Its main purpose is to help policy makers understand the impact of their decisions.

Permanency – a characteristic of carbon offsets showing how permanent the removal is. For example, forestry projects may be prone to low permanency as the planted trees can fall victim to fires, which are becoming more frequent due to climate change.



Introduction

Ever since the industrial revolution, economic development has been relying heavily on fossil fuels, industrialization of agriculture, land use change, and other technologies and processes, which led to emission of increasing amounts of greenhouse gasses (GHG) into the atmosphere. This increasing concentration of carbon dioxide, methane, and other GHGs in the air is leading to global warming and ensuing climate changes. The sooner the net emissions are reduced down to zero, the better chances we have to stop global warming before it leads to cataclysmic consequences.

Debates about the ways to reach net zero emissions are ongoing. A market-based tool that has gained wide popularity and support is carbon pricing. Putting a price on GHGs allows economic agents to realign their operations and investments to account for the negative impacts of emissions on climate and, ultimately, on the current and future survival of humankind.

Carbon pricing is an instrument that captures and internalizes the external costs of GHG emissions and may take many different forms. There are two overarching types of mechanisms that reflect a feature of carbon pricing: (1) Compliance Carbon Market, such as an emissions trading system (ETS), and the Voluntary Carbon Market which provide clarity regarding the environmental effect while keeping the price flexible and (2) a Carbon Tax that provides more predictability around the cost per ton of GHG to emitters.

Use of carbon pricing is steadily expanding across the globe. According to a recent study of 71 largest economies commissioned by OECD,^[3] more than 40% of GHG emissions were already covered by some form of carbon price in 2021, up from 32% in 2018. In 47 out of 71 countries in the report, carbon prices increased. Yet, we cannot say that this tool has reached its maturity. Many countries, especially in the EM universe, are still in the early stages of introducing prices on carbon emissions. Where these systems are operating, by and large the prevalent price levels are too low to make an impact significant enough for the world to reach the Paris Agreement targets. The development of voluntary carbon markets is often hindered by a lack of unified and consistent rules, quality standards, and methodologies of carbon credits.

[3] [Pricing Greenhouse Gas Emissions: Turning Climate Targets into Climate Action. OECD.](#)



Carbon Taxation

A carbon tax is a government-imposed fee that polluters must pay for each ton of greenhouse gas emissions they produce. The primary goal is a reduction in emissions as a result of emitters changing their behavior in response to the fee. It is also a source of revenue for the budget. A carbon tax differs from a cap-and-trade plan in that it ensures the cost but not the degree of emission reduction to be achieved, whereas a cap-and-trade scheme guarantees the amount of emission reduction.[4]

According to the IMF, 30 carbon tax programs have been established as of 2021,[5] with British Columbia (Canada) being one of the first to do so in 2008. In the United States, there has been interest in adopting an economy-wide carbon tax, with more than ten separate carbon pricing legislation submitted to Congress in recent years.

[4] [Ceres Carbon Tax Basics](https://www.c2es.org/content/carbon-tax-basics/) (https://www.c2es.org/content/carbon-tax-basics/)

[5] [Carbon Taxes or Emissions Trading Systems?: Instrument Choice and Design](https://www.imf.org/en/Publications/staff-climate-notes/Issues/2022/07/14/Carbon-Taxes-or-Emissions-Trading-Systems-Instrument-Choice-and-Design-519101). IMF (https://www.imf.org/en/Publications/staff-climate-notes/Issues/2022/07/14/Carbon-Taxes-or-Emissions-Trading-Systems-Instrument-Choice-and-Design-519101)

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Carbon Markets

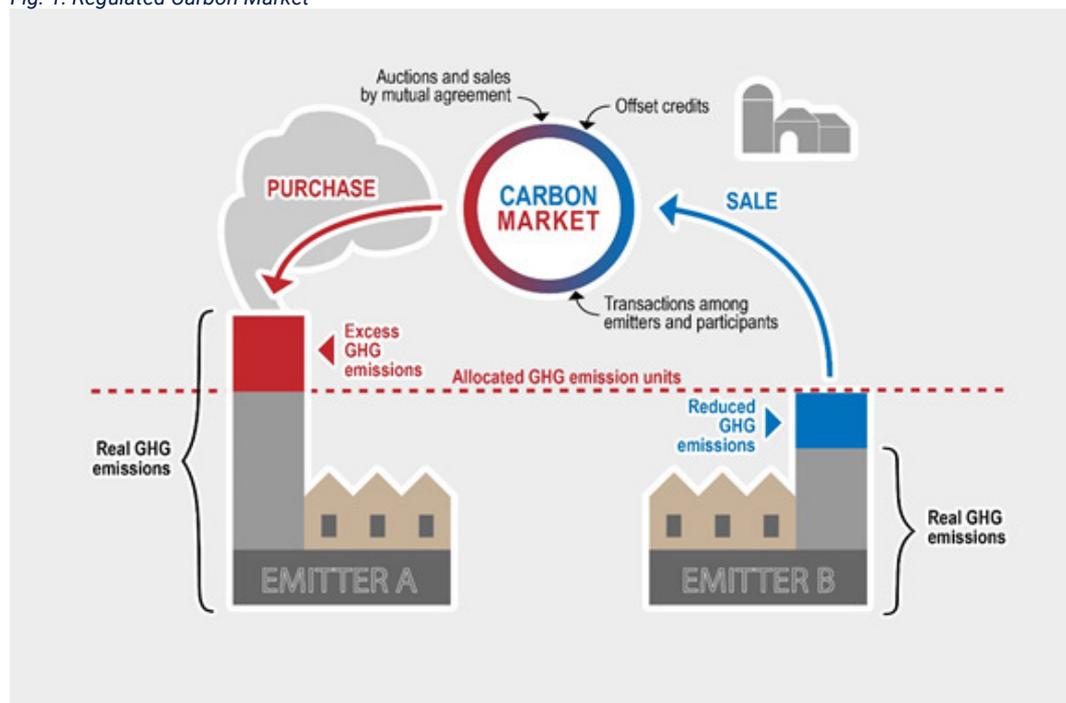
With the Paris Climate Agreement and its Article 6 being in effect, businesses are under increasing pressure to find ways to decrease their carbon footprint. Carbon markets are one of the scalable methods recognized internationally to reduce emissions. A carbon market is a trading structure for buying and selling carbon credits. One carbon credit is equivalent to one tonne of CO₂ sequestered or avoided.

Carbon markets are classified into two types:

1. A regulated or compliance carbon market (CCM) governed by "cap-and-trade" legislation created at the regional, national, or international level.
2. A voluntary carbon market (VCM) in which corporations and people purchase credits to offset their carbon emissions of their own volition.

In the regulated markets, each firm participating in a cap-and-trade scheme receives a certain allowance of carbon credits each year. Some of these firms generate lower carbon dioxide emissions than the amount of credits assigned to them, resulting in a surplus of carbon credits. On the other hand, some businesses emit more emissions than the amount of credits they receive and these organizations are looking to purchase carbon credits to offset their emissions.

Fig. 1: Regulated Carbon Market



Source: [Land Trust Alliance](https://climatechange.lta.org/carbon-markets/) (<https://climatechange.lta.org/carbon-markets/>)



The voluntary market works slightly differently: companies and people can acquire or buy carbon credits directly from projects and companies on a voluntary basis, primarily to fulfill their net zero ambitions or carbon emission reduction objectives within their value chain.

There are four main participants in a voluntary carbon market:[6]

1. Project Developer: They play an important role in establishing projects that issue carbon credits, which can range from large-scale, renewable energy projects to smaller community-based programs like regenerative agriculture.
2. End User: These are businesses or individuals that want to lower their CO₂ emissions.
3. Retail dealers: They operate as intermediaries between the project developer and the final buyer.
4. Standards: These are organizations, generally non-governmental, that certify that a certain project satisfies its specified objectives and volume of emissions.

While there are several advantages to expanding carbon markets, there are also many risks, such as double-counting of GHG emission reductions, human rights violations, and greenwashing. One of the key challenges posed to companies is acquiring good quality certified carbon credits. To ensure success these issues and risks will need to be addressed.

Carbon credits that have been validated by one of the approved registries assure the quality of the projects and the overall carbon credit.

Carbon Offset Registries

Carbon offset registries develop standardized protocols for project registration (to issue carbon credits), assure quality, keep track of available credits in the market, and make certain that the environmental advantages associated with individual credits are not shared by several firms.[7]

[6] [SPG Global: Voluntary carbon markets: how they work, how they're priced and who's involved](https://www.spglobal.com/commodityinsights/en/market-insights/blogs/energy-transition/061021-voluntary-carbon-markets-pricing-participants-trading-corsia-credits) (https://www.spglobal.com/commodityinsights/en/market-insights/blogs/energy-transition/061021-voluntary-carbon-markets-pricing-participants-trading-corsia-credits)

[7] [Carbon Offset Registries: An Overview](https://carbonbetter.com/story/carbon-offset-registries/) (https://carbonbetter.com/story/carbon-offset-registries/)



Carbon offset registries track projects and issue offset credits for each verified and certified unit (1 tCO₂e) of emission reduction or removal. Each verified offset credit is assigned a serial number. When a credit is sold, the serial number is moved from the seller's account to the buyer's account and is retired if the buyer claims the offset against their emissions.

Major carbon registries in voluntary carbon market:

1. Voluntary Registry Offsets Database | Berkeley Carbon Trading Project
2. American Carbon Registry
3. Climate Action Reserve
4. Gold Standard Impact Registry
5. Verified Carbon Standard (Verra)
6. Climate, Community, & Biodiversity Standards (CCBS)
7. Plan Vivo

Internal Carbon Pricing

Regardless of trading and taxation schemes, many companies, as well as governments and other organizations, are beginning to implement shadow carbon prices. This is often done in order to build long-term budgets and plans, assess investment opportunities, and/or to be prepared for climate transition risks. In some instances, internal prices are used as fees on carbon emissions which are then applied to finance carbon emission reduction or removal projects. According to the World Bank, nearly half of the world's largest 500 companies are already using or planning to begin using an internal carbon price. Many of them are from the energy or financial sectors. While the US boasts the largest number of companies using or intending to use internal carbon prices, on a regional basis, Asia leads the pack.[8]

There is a marked lack of transparency in how internal carbon prices are determined and used. These prices are often dynamic, with adjustments within one company being made through time or across different regions and business lines. Based on data reported to CDP, they vary widely and start from \$6 per ton, with the lowest prices reported in Africa. While there is no consensus on the required level of internal carbon prices, the High-Level Commission on Carbon Prices (affiliated with the World Bank) believes that, in order to achieve the Paris Agreement targets, these prices need to reach between \$50 and \$100 by 2030.[9]

[8] The World Bank. 2021. "State and Trends of Carbon Pricing 2021" (May), World Bank, Washington, DC. Doi: 10.1596/978-1-4648-1728-1. License: Creative Commons Attribution CC BY 3.0 IGO

[9] [The state of internal carbon pricing, McKinsey & Co.](https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-in) (https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-in)



Policies Supporting Sovereign Decarbonization

With the Paris Climate Agreement and its Article 6 being in effect, businesses are under increasing pressure to find ways to decrease their carbon footprint. Carbon markets are one of the scalable methods recognized internationally to reduce emissions. A carbon market is a trading structure for buying and selling carbon credits. One carbon credit is equivalent to one tonne of CO₂ sequestered or avoided.

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Article 6: Development and Scaling of Carbon Market [11]

At a high level, Article 6 of the Paris Agreement empowers nations to collaborate with each other voluntarily to meet carbon reduction objectives outlined in their NDCs. Emission reductions that have been allowed for transfer by the selling nation's government may be sold to another country, similarly to compliance carbon markets, and only one of these countries may credit the emission reduction toward its NDC. Thus, Article 6 encourages the establishment of international compliance carbon markets based on the Paris Agreement norms, in which governments can exchange carbon credits.

[10] <https://www.imf.org/en/Publications/fandd/issues/2021/09/how-to-drive-deep-decarbonization-stock>

[11] <https://www.worldbank.org/en/news/feature/2022/05/17/what-you-need-to-know-about-article-6-of-the-paris-agreement>



Carbon Pricing: Implementation of Carbon Taxation to Support Decarbonization

To meet these ambitious goals, substantial decarbonization on a national scale is required. One method to accomplish this is to create a strong sectoral carbon pricing regime to address technological status and institutional challenges at a more nuanced level. A carbon price that begins moderately and rises reliably will incentivize individuals to adopt lower-carbon energy sources different from fossil fuels, as well as corporations and power generators to shift away from fossil fuels and toward low-carbon primary energy sources.[12] Another mechanism to adopt is an economy-wide carbon tax paired with government subsidies for renewable energy that may bolster sovereign decarbonization efforts.

Social Cost of Carbon

In order to set effective carbon emission reduction policies and quantify their effects, some governments have estimated a social cost of carbon. In general, it is a monetary assessment of the negative impact of one ton of GHG emitted into the atmosphere on society. The calculation of this metric is clearly not an easy task due to various approaches and input parameters that can be used. For example, the US government is currently using the cost of \$51 per ton in its policy making. However, the US Environmental Protection Agency has recently come up with a proposal to increase this number to \$190/ton. You can read more about the ongoing discussion [at the organization's website](#).[13]

Carbon Border Adjustment

Carbon border adjustments, also known as "carbon border adjustment mechanisms" (CBAM), are a new set of trade policy measures aimed at preventing carbon-intensive economic activity from shifting out of jurisdictions with stricter climate policies and into those with laxer regulations.[14] It is simply a tariff on imports depending on the quantity of carbon emissions produced by the product in question and the carbon pricing applied, if any, in the exporting country. It discourages emissions by acting as a carbon price. The adjustment has an impact on production and exports as a trade-related metric. The European Union (EU) is in the process of implementing a CBAM.

[12] <https://www.imf.org/en/Publications/fandd/issues/2021/09/how-to-drive-deep-decarbonization-stock>

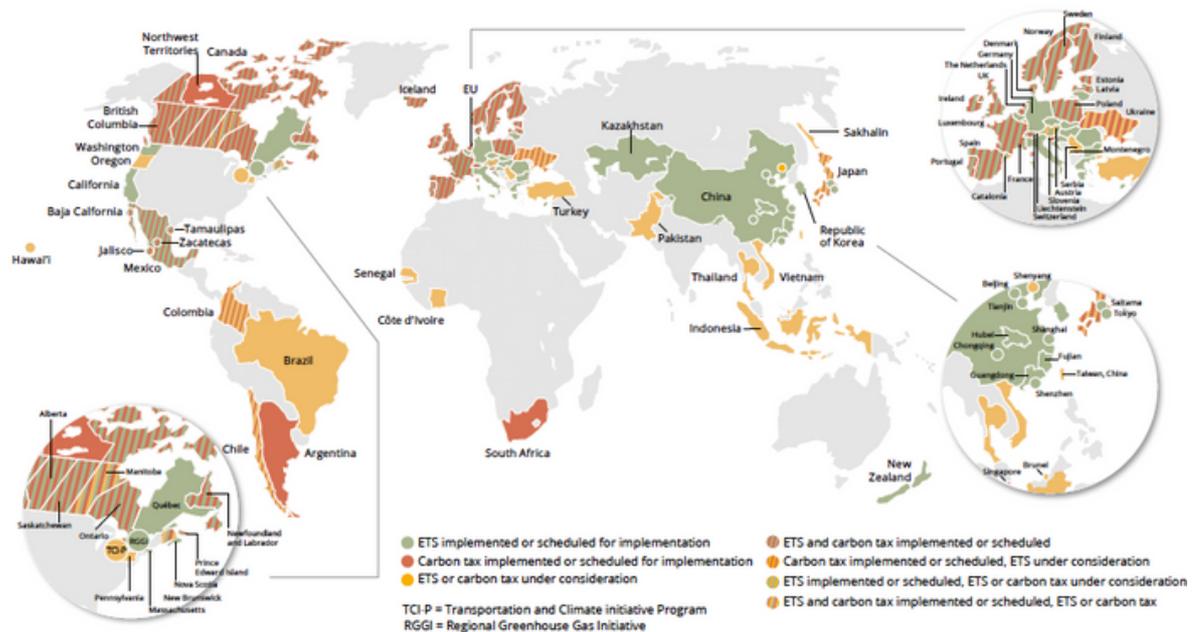
[13] https://www.resources.org/common-resources/the-us-environmental-protection-agency-introduces-a-new-social-cost-of-carbon-for-public-comment/?mc_cid=33116766a8&mc_eid=30bacb72b8

[14] <https://www.c2es.org/content/carbon-border-adjustments/>

Overview of Carbon Markets and Taxation Schemes in Emerging Markets

As shown in the map below, carbon markets or taxation schemes are no more an exclusive prerogative of developed markets. Many emerging and frontier economies are also implementing such mechanisms. According to the World Bank, as of 2021 carbon tax has been implemented in Poland, Estonia, Mexico, Chile, Colombia, Argentina, South Africa, Latvia, and Slovenia. Carbon markets, at various stages of development, are functioning in China, Kazakhstan, and South Korea. More countries are considering their implementation.

Fig. 2. Map of carbon taxes and emission trading systems



The large circles represent cooperation initiatives on carbon pricing between subnational jurisdictions. The small circles represent carbon pricing initiatives in cities. In previous years, Australia was marked as having an ETS in operation. However, the Safeguard Mechanism functions like a baseline-and-offsets program, falling outside the scope of the definition of ETS used in this report. Therefore, the system was removed from the map. Rio de Janeiro and Sao Paulo were marked as considering the implementation of an ETS based on scoping work done in 2011 and 2012 respectively. Given there have been no updates since, these were removed from the map.

Note: Carbon pricing initiatives are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date. Carbon pricing initiatives are considered "under consideration" if the government has announced its intention to work towards the implementation of a carbon pricing initiative and this has been formally confirmed by official government sources. The carbon pricing initiatives have been classified in ETSs and carbon taxes according to how they operate technically. ETS not only refers to cap-and-trade systems, but also baseline-and-credit systems as seen in British Columbia. The authors recognize that other classifications are possible.

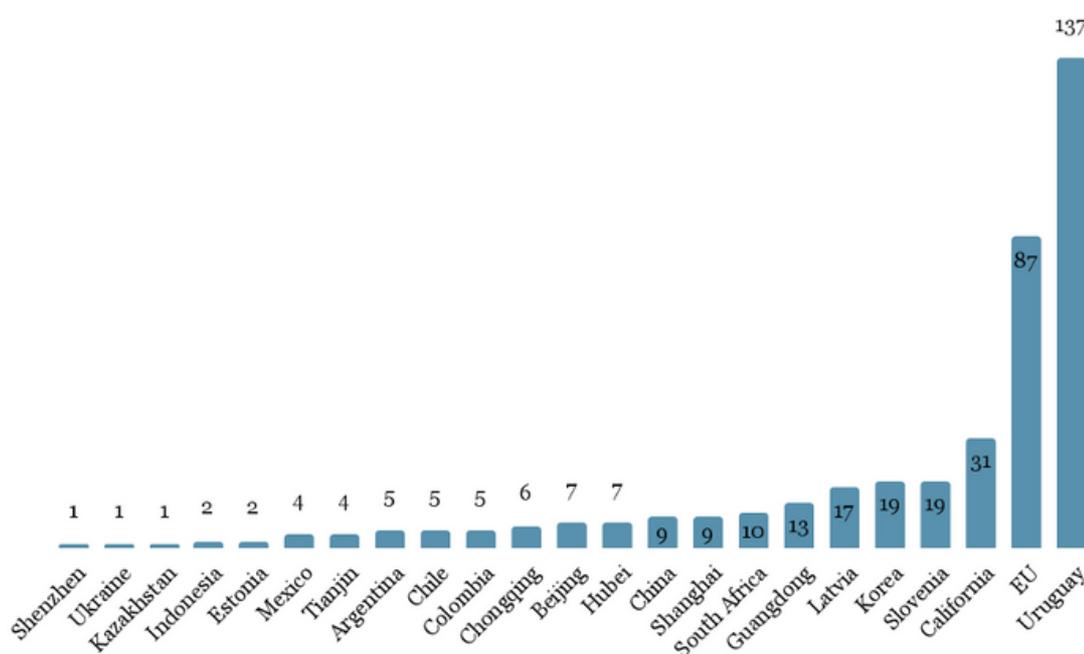
Source: The World Bank. 2021. "State and Trends of Carbon Pricing 2021" (May), World Bank, Washington, DC. Doi: 10.1596/978-1-4648-1728-1. License: Creative Commons Attribution CC BY 3.0 IGO

In terms of emissions coverage, the largest carbon market in the world is in an emerging country. China launched its Emission Trading System (ETS) in February, 2021, with a planned coverage of 2,225 entities emitting 4,000 MtCO₂ per year (around 30% of the total national emissions). As the system is relatively young, the level of carbon prices there is low.

In addition to the national ETS, China had launched eight pilot projects during 2013-2016, which are going to continue to operate in parallel with the national system. These sub-national pilots include Beijing, Fujian, Guangdong, Shanghai, Shenyang, and Tianjin.

The following chart, based on the World Bank’s data, shows the levels of carbon prices (including ETS and taxation schemes) at a selection of emerging markets and a few developed markets for comparison. As shown below, emerging markets are at an early stage of their journey, and their carbon price levels are still too low to serve as a meaningful financial lever to change the behavior of businesses. Nevertheless, introduction of carbon pricing is a significant achievement, especially in developing countries, where additional levies on taxpayers face serious political and economic complications.

Fig. 3. Prices in EM carbon pricing initiatives as of Apr. 2022 in USD/ton CO2e



Note: Nominal prices on April, 01 2022 Prices are not necessarily comparable between carbon pricing initiatives because of differences in the number of sectors covered and allocation methods applied, specific exemptions, and different compensation methods. Due to the dynamic approach to continuously improve data quality and fluctuating exchange rates, data of different years may not always be comparable and could be amended following new information from official government sources. In addition, data for a limited number of initiatives may be incomplete as they are in the process of being validated and will be updated following confirmation from official government sources.

Source: The World Bank’s Carbon Pricing Dashboard[15]

[15] [The World Bank’s Carbon Pricing Dashboard](https://carbonpricingdashboard.worldbank.org/map_data) (https://carbonpricingdashboard.worldbank.org/map_data)



Carbon Policy - China

More than 130 nations and territories have committed to carbon neutrality since 2021. China has declared its intention to reach peak carbon emissions by 2030 and carbon neutrality by 2060. Over a decade ago, the Chinese government established regional carbon markets to conduct local pilots of carbon trading. To guarantee that the market works, authorities must precisely measure emissions from industries and plants and then verify that polluters do not cheat by concealing or changing emissions data. However, with China's large industrial base and relatively lax regulation, this can be difficult.[16]

The national ETS was announced in 2017 and officially began operations in early January 2021. Trading began on the Shanghai Environment and Energy Exchange platform in July 2021. The other carbon market trading platform to see some activity in 2021 was the Beijing Green Exchange, which serves as the national trading platform for voluntary emission reductions (VERs) and China Certified Emissions Reductions (CCERs). CCERs can be counted toward carbon compliance by the operators that are covered by the national ETS.[17]

Initially, the market was meant to include steel production, cement production and other businesses, as well as power plants. However, it limited the scope to only coal and gas facilities that provide power and heat – a sector with fewer firms, higher data quality, and simpler management.

[16] <https://www.nytimes.com/2021/07/16/business/energy-environment/china-carbon-market.html>

[17] <https://chinadialogue.net/en/climate/the-first-year-of-chinas-national-carbon-market-reviewed/>



Fig. 4. China carbon market snapshot

Carbon emissions allowance trades in the main segments of China’s carbon market, 2021

	Trade volume (million tonnes)	Value (million \$)
National ETS	178.79	The first year of China’s national carbon market, reviewed
Regional pilots	63.58	371.05
CCERs	169.68	N/A
Total	412.05*	1,672.83

Note: *Total volume includes allowances transacted in pilot ETS, national ETS and CCER transactions. Value includes only allowance units (as CCERs are mainly traded over-the-counter, there is no publicly available source for prices). Transactions of local offset units in the separate pilots are small, and not included in our assessment.

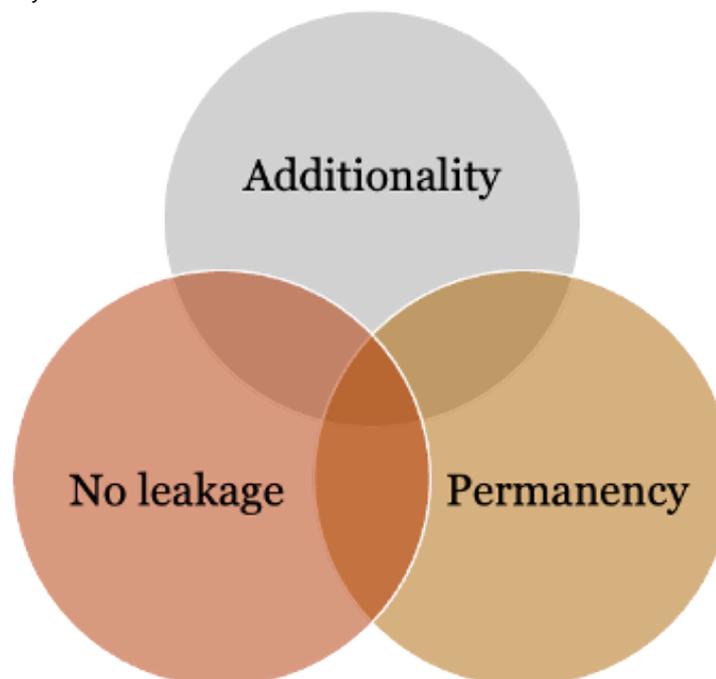
Source: China Dialogue (<https://chinadialogue.net/en/climate/the-first-year-of-chinas-national-carbon-market-reviewed/>)[18]

[18] <https://chinadialogue.net/en/climate/the-first-year-of-chinas-national-carbon-market-reviewed/>

Guidelines for Investors

When looking at issuers' emission reduction plans that involve carbon offsets, investors would be wise to check which projects are offsets purchased from. **Offsets differ in quality**, and, in particular, their additionality should be closely examined. Quality offsets should also be permanent, and leakage and double counting should be avoided.

Fig. 5. Carbon offsets quality dimensions



On top of that, these projects should not contribute to other social or environmental harms. The quality of offsets can be checked with their registry. The corresponding project documentation should be available there. Some information can also be made available by the issuer directly in its sustainability reports. Please refer to the Stockholm Environment Institute's [Carbon Offset Guide](#) for more information.

Assessment of the quality of carbon offsets is always a balance of the value in question vs. the resources available to the investor. Using an external expert or advisor is an option. If doing the assessment in-house, the depth of analysis should be aligned with the quality risk of the underlying projects. The following table classified the most popular projects by such risk.

Fig. 6. Carbon offsets projects by risk

Low risk	Medium Risk	High risk
CO2 usage	Methane capture and utilization	Agriculture
Methane destruction (w/o utilization)	Methane avoidance	Biomass energy
N2O avoidance from nitric acid production	Energy distribution	Energy efficiency, industrial demand side
N2O, adipic acid	Energy efficiency, household demand side	Energy efficiency, supply side
Ozone-depleting substance (ODS) destruction	PFCs & SF6 avoidance/reuse	Forestry & land use
Direct air carbon capture and storage	Renewable energy, small scale	Fossil fuel switching
Enhanced weathering		Fugitive gas capture or avoidance
		Low-carbon transportation measures
		Renewable energy, large scale

Source: Carbon Offset Guide [19]

The higher the risk, the more questions should be asked. The Carbon Offset Guide contains an extensive list of questions many of which can be used by investors when discussing the quality of carbon offsets utilized by a company to compensate for their GHG emissions or when conducting their own assessment of these offsets.

[19] Carbon Offset Guide (<https://www.offsetguide.org/sticking-to-lower-risk-project-types/>).



Looking at the carbon credits, according to one of the leading standard setters Verra, the following characteristics indicate a high quality credit:

- Real;
- Measurable;
- Permanent;
- Additional;
- Independently verified;
- Transparently listed;
- Uniquely numbered;
- Conservatively estimated.

This list is based on Verra's presentation at the EMIA webinar on carbon pricing held on February 14, 2023.

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Conclusion

Carbon pricing appears to be a widely accepted tool of internalization of negative effects of GHG emissions. It allows for utilization of market forces in reducing these emissions. Carbon taxation and carbon trading have their pros and cons, yet more and more countries are applying them. In most cases, the process is at an early stage, and carbon prices will need to go up significantly.

Investors will see increasing application by companies and governments of carbon pricing schemes and CBAMs. In most cases, valuation models will have to accommodate payments for carbon. It will also be important for investors to understand the quality of carbon offsets used by companies and engage with the management to adjust their policies and approaches if needed. We hope that our brief will help our audience to navigate through the emerging carbon pricing mechanisms, and we encourage them to keep abreast of the rapidly evolving regulatory and market environment using the sources of information listed in the Appendix.



Appendix: Additional Resources

Integrity Council for the Voluntary Carbon Market (ICVCM)

The ICVCM is an independent governance body for voluntary carbon markets. They set quality standards for carbon credits with an aim of making these markets transparent, trustworthy, reliable, and potentially compatible with mandatory markets. The organization is currently developing the Core Carbon Principles (CCPs) and Assessment Framework that will define which carbon-crediting programs and methodology types are CCP-eligible.

International Emissions Trading Association (IETA)

IETA is a non-profit organization aiming at establishing market-based trading systems for GHG emissions and removals. Its website offers plenty of educational resources on the fundamentals of carbon offsets and markets, GHG market reports, reviews of country carbon markets, and topical articles and news.

Resources for the Future (RFF)

RFF is a US non-profit research organization whose mission is to improve decision making in the environmental, energy, and natural resource areas. It is a research leader in environmental economics, and its web site contains a wealth of information on a broad range of issues. RFF's World Carbon Pricing Database is a flexible tool comparing carbon pricing across countries and sectors, as well as through history.

The World Bank Carbon Pricing Dashboard

The World Bank's resource provides many interesting statistics about carbon pricing initiatives around the world. Using this interactive tool, one can easily get a broad picture of the development of ETS or taxation schemes in emerging and other countries, including the current levels of carbon prices and other useful data. The tool allows users to zoom in on an individual country and get an overview of the carbon pricing scheme used. The web site also contains a list of links to other sources of relevant information.



The Sovereign Decarbonization Program focuses on engaging with emerging market sovereigns to promote best practices regarding improving their sustainable development and environmental policies, including those for carbon tax and pricing, with the aim to halt new fossil fuel capacity and transition to alternative energy.

The Carbon Transition Initiative aims to study the impact of climate change in emerging markets and identify best practices available to the investment community to help assess and manage climate- and transition-related risks and opportunities.

TERMS AND CONDITIONS

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