



Can The Market Limit Climate Change?

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Special Report

The Abdullah Bin Hamad Al-Attiyah International Foundation for
Energy & Sustainable Development



THE COST OF CARBON, A CLIMATE CHANGE PUZZLE

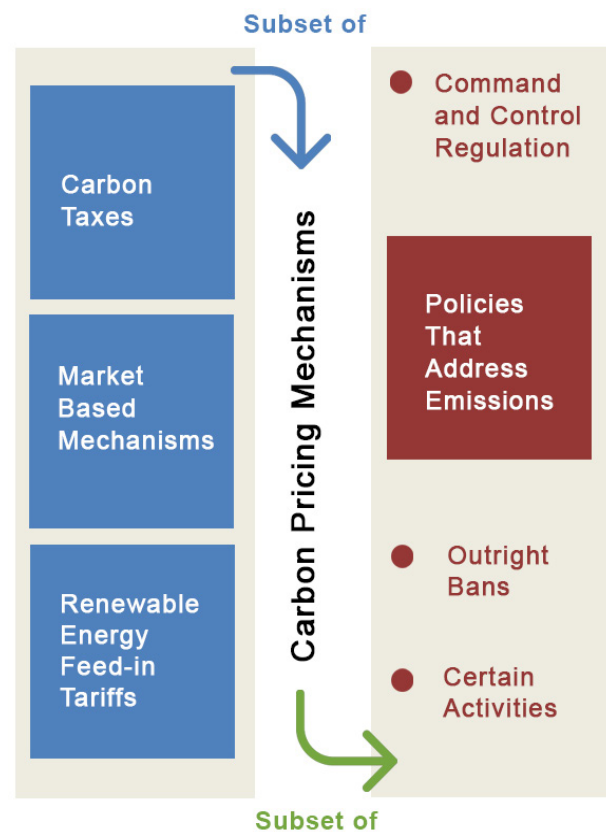


The whole idea of carbon pricing revolves around the shifting of the social costs of climate change to the source of the pollution, encouraging polluters to reduce emissions and invest in clean energy and low-carbon growth. It encompasses a scenario where the cost of carbon emissions is paid at the source, in which choices about fuel use are made and not in the form of developmental, economic, and health costs. Such a scenario, which is the bedrock of the “polluter pays” principle, would lead to a complete revamp of the incentive structures and policy framework, underpinning global mitigation of carbon emissions.

Carbon pricing is an approach to reduce carbon emissions that uses market mechanisms to pass the cost of emitting on to polluters. Market-based mechanisms are policy instruments that use markets, price, and other economic variables to incentivise the reduction of negative environmental externalities, such as pollution. The main goal of carbon pricing is to discourage the generation of carbon emissions by making it costly to produce high carbon dioxide emitting products and thereby address the causes of climate change.

By putting a price on carbon, society can hold emitters responsible for the serious costs of adding Greenhouse Gases (GHG) emissions to the atmosphere. Putting a price on carbon can consequently create financial incentives for polluters to reduce emissions, as it allows the polluters to choose between the cost of reducing emissions versus the true cost of paying for unabated emissions.

Carbon Pricing Mechanisms



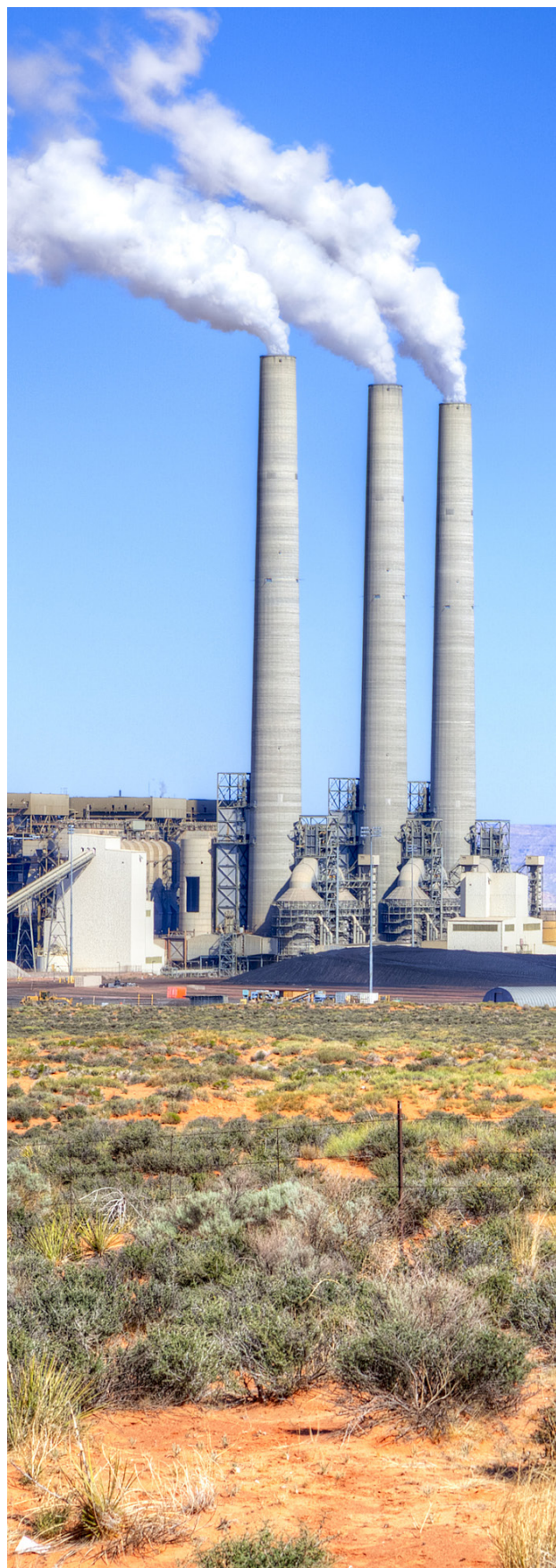
The global climate change discourse has led to a greater focus on carbon pricing, with carbon pricing instruments increasingly becoming the policy tools of choice to address global emissions. The various carbon pricing instruments that are now in common use include carbon taxes; market-based mechanisms; and renewable energy feed-in tariffs (payments made to households or businesses generating their own electricity using renewables).

THE EVOLVING TREND OF CARBON PRICING

Carbon pricing mechanisms have seen significant growth since 2002, when the three market-based mechanisms (the Clean Development Mechanism (CDM), Joint Implementation (JI), and Emission Trading (ET)) of the Kyoto Protocol came into operation. In the EU, for example, the Emissions Trading Scheme (EUETS) has clearly demonstrated its effectiveness in catalysing investment in mitigation activities. It now plays a vital role in the EU policy framework for renewables.

The World Bank, in their annual 2019 report on the 'State and Trends of Carbon Pricing', indicated that as of June 2019, there were 57 carbon pricing initiatives implemented or scheduled for operation. This consists of 28 emission trading systems (ETSs) in regional, national, and subnational jurisdictions, and 29 carbon taxes, primarily applied on a national level. In total, these carbon pricing initiatives cover 11 gigatons of carbon dioxide equivalent Gt/CO₂e, or about 20% of global GHG emissions. While carbon pricing continues to increase, more expansion and stronger prices are required to shift investment at the scale suggested by the High-Level Commission on Carbon Prices led by Joseph Stiglitz and Nicholas Stern.

Despite the increases in carbon prices witnessed in 2018 compared to price levels in 2017, prices in most initiatives are still below the \$40-\$80/tCO₂e needed in 2020 to stay consistent with achieving the temperature goal of the Paris Agreement. The outbreak of the Covid-19 pandemic would dampen carbon prices in 2020, like the world is witnessing in other commodity markets.



THE BENEFITS OF CARBON PRICING

Carbon pricing is emerging as one of the strongest policy instruments available for tackling climate change. It has the potential to decarbonise the world's economic activity by changing the behaviour of consumers, businesses, and investors, while unleashing technological innovation and generating revenues that can be put to productive use. In short, well-designed carbon prices offer triple benefits: they protect the environment, drive investments in clean technologies, and raise revenue.

CARBON PRICING AND THE PARIS AGREEMENT

The success of carbon pricing at national and regional levels has encouraged development of international carbon markets, culminating in the inclusion of Article 6 in the Paris Agreement. Article 6 of the Paris Agreement includes provisions that would allow countries to cooperate to achieve their Nationally Determined Contributions (NDCs), specifically through carbon pricing to meet mitigation commitments.

Articles 6.2 and 6.3 provide opportunities for countries to cooperate with one another to reduce emissions. In other words, country A can transfer its emission reduction to country B, which can then count this reduction toward its NDC. Under this arrangement, existing national and regional instruments can join together to form an international carbon market.

Article 6.4 establishes a mechanism by which countries both mitigate GHG emissions and contribute to sustainable development. Although its architecture and modalities are still under discussion, the mechanism

aims to expand the scope of carbon pricing programmes globally by incentivising mitigation activities by both public and private entities. It too allows for countries to cooperate and transfer emission reductions to other countries for inclusion in the receiving country's NDC total.

It is not yet clear how these Article 6 provisions will be put into effect. But there is consensus that once operational, the new mechanisms will help carbon pricing deliver on its potential for cost-effective decarbonisation and adaptation.



CARBON PRICING PRACTICES IN THE ENERGY SECTOR

The private sector is finding innovative ways to use carbon pricing to identify greater opportunities for GHG mitigation and reduce climate-related financial risks. In a proactive self-regulatory approach, more and more companies are using internal carbon pricing in their investment decisions, to evaluate risks that could arise from any future mandatory carbon pricing legislations. In addition, businesses are using internal carbon pricing to manage long-term climate risks and align their investments with climate objectives. Internal carbon pricing generally takes two forms: assigning a shadow price to carbon use—that is, determining the hypothetical cost, and setting an internal carbon fee that is voluntarily charged to the different business units for their emissions. The shadow price of carbon and a carbon fee are calculated with the goal of managing climate risks and identifying opportunities in operations, projects, and supply chains to lower emissions and avoid locking investments in long-lived high-carbon capital and infrastructure. Funds generated from charged fees are channelled back into cleaner technologies and greener activities that support a low-carbon transition.

Major banking institutions are now routinely using carbon pricing approaches to review credit applications and to assess the carbon footprint of their own portfolios. The World Bank Group, for example, has announced plans to apply a shadow carbon price to relevant investment projects, using a price consistent with the recommendations of the High-Level Commission on Carbon Prices.

In the energy sector, major oil and gas companies are operating internal carbon pricing by assigning their own internal price to carbon and factor this into their investment decisions. Many member companies of the International



Petroleum Industry Environmental Conservation Association (IPIECA) use internal shadow carbon prices to inform their project investments and technology choices, increasing the robustness and resilience of their corporate strategy.

As part of their ambitious climate change programmes, several oil and gas majors, such as ExxonMobil, Shell, Total, ConocoPhillips, and BP operate some form of 'internal carbon prices'. In addition, BP, Equinor, Shell, and Total are actively engaged in the Carbon Pricing Leadership Coalition (CPLC), a voluntary partnership of 34 governments, over 164 businesses from a range of sectors, and more than 85 civil society organisations, that agreed to advance the carbon pricing agenda by working with each other towards the long-term objective of a carbon price, applied throughout the global economy.

A study by the Carbon Disclosure Project (CDP), a non-profit organisation that encourages companies to report their environmental and social impacts, revealed as far back as 2013, that these oil and gas majors were all internally pricing a tonne of carbon between US\$8-60, and referring to this as a carbon cost, fee or price. BP was reported to have set the price of US\$40 per tonne of CO₂, based on its estimates of what might realistically be expected in parts of the world. ConocoPhillips, with a carbon price range of US\$6-46, recommended that all its projects costing more than US\$75m or with potential emissions of more than 25,000/tCO₂e, must evaluate how they would work with a carbon price. The CDP report confirmed that companies were using carbon pricing as a planning tool to help identify revenue opportunities, risks, and as an

incentive to drive maximum energy efficiencies to reduce costs and guide capital investment decisions. The report, astonishingly, indicated that even prior to the adoption of the Paris Agreement, an increasing number of companies believe carbon pricing will form a part of future regulations to address climate change.

The CDP report in 2017 showed that the number of companies using internal carbon pricing to assess and control the carbon impact of their operations continues to be on the increase. More than 1,300 companies were reported using internal carbon pricing in 2017, as compared to 150 firms in 2014. These include more than 100 Fortune 500 companies with collective annual revenues of around \$7 trillion.

CONTRIBUTED ARTICLE FROM IFC/WORLD BANK

Pricing carbon is fair, cost-effective, and makes clear business sense

By Alzbeta Klein, Director and Global Head, Climate Business, International Finance Corporation (IFC)

Around the world, a growing number of businesses are leading the transition towards a low-carbon future. But to help meet the global climate challenge, they need governments to act more decisively on one key issue: assigning a cost to emissions and putting a price on carbon.

Although in recent months, the spread of Covid-19 has caused commodity prices to tumble – the price of carbon is no exception – momentum towards carbon pricing should not

be slowed by the pandemic. As the world pivots towards building back better in the Covid-19 era, carbon pricing will be critical to supporting economic stabilisation, recovery, and growth efforts in ways that build long-term sustainable and resilient economies.

If companies start using carbon pricing in their investment decisions, this will reflect their overall costs to society, and will alert them to climate risk exposure. This could help pivot investments away from high-carbon emitting projects and spur innovation that, in turn, will lead to more investments in climate-smart alternatives.

At the International Finance Corporation, (IFC), a member of the World Bank Group, we have been applying a carbon price to all project finance investments in the cement, chemicals, and thermal power sectors since May 2018.

Guided by the [Report of the High-Level Commission on Carbon Prices](#), we have set a price on carbon in these sectors at \$40-80/MtCO₂e in 2020, rising to \$50-100 in 2030, and continuing in a similar trajectory beyond then. Projects in lower-income countries will be subject to prices at the bottom end of the range and projects in middle income countries will use carbon prices at the upper end.

Pricing carbon pollution creates a critical market signal that helps reduce emissions by driving investments in clean, more efficient technologies. It reassures investors that low-carbon investments are valuable today and will be even more valuable in the future.

Critics argue that a price on carbon will curb economic growth and hurt the competitiveness of the businesses and regions where it is



implemented, especially in high emission-intensive and trade-exposed sectors such as cement and steel. Taxing carbon, they caution, could lead to 'carbon leakage', where carbon-intensive industries transfer production to other countries or regions with fewer restrictions.

But at the World Bank Group, we know that there is a way to put a price on carbon and preserve competition in the marketplace.

Last September, the High-Level Commission on Carbon Pricing and Competitiveness issued a [report that examined competitiveness concerns surrounding carbon pricing](#). The Commission found that putting a price on carbon neither limits economic and industrial growth, nor encourages big polluters to flee to other jurisdictions.

In fact, pricing carbon can increase investment opportunities and lead to the development of new industries while allowing competition to flourish, said the report by the commission, which includes CEOs from leading global companies, former senior government officials and academics.

Led by Anand Mahindra, Chairman of the Mahindra Group, and Feike Sijbesma, then CEO of the Dutch nutrition and chemicals giant, Royal DSM, the group examined the concerns of businesses surrounding carbon pricing and lessons learned in the design and implementation of carbon pricing policies around the world.

They discovered that carbon pricing has no more of an impact on the decision of businesses to invest or locate than other factors, including corporate tax rates, wage

rates, the availability of labour and energy prices.

In addition, the report found that risks to global competitiveness can be mitigated by other smart, stable and tailored policy packages, such as tax reductions and technology assistance focused on emerging sectors. When done right, this combination can drive innovation and foster remarkable opportunities and economic growth for corporations and countries. That is what happened in British Columbia after a carbon tax implemented in 2008 led to the creation of a new clean technology sector that now comprises over 200 companies and generates \$1.7bn in revenues.

Countries in the emerging world also see promise in using carbon pricing to help transition to cleaner alternatives—for example, South Africa's economy-wide carbon tax, the first carbon tax in Africa, starts at R120/tCO₂e (US\$8/tCO₂e), and will increase at a rate equivalent to the amount of consumer price inflation plus 2% annually till 2022. In 2018, Kazakhstan relaunched its ETS following



a major restructuring to account for a drop in global oil prices. Kazakhstan's relaunch underscores the importance of including flexible mechanisms within a carbon price design to account for unexpected circumstances.

Increasingly, carbon pricing is moving beyond the more traditional sectors of manufacturing and extractives, with banks and financial institutions now paying closer attention. With climate risk disclosures gathering pace across the sector, more and more banks are factoring climate risk into their decision-making, elevating internal carbon pricing as a tool to help assess risks and unlock opportunities.

New initiatives such as the Task Force on Climate-related Financial Disclosures (TCFD) provide recommendations to help banks and other financial institutions manage climate risk and to identify climate investment opportunities. More than 900 companies, financial firms and governments have already signed onto the TCFD. Mark Carney, the former governor of the Bank of England, and other leading thinkers on the topic expect this tool to become mandatory in due course.

At IFC, we know that the case for investing in climate business has never been stronger and that we must scale up major investment in infrastructure and climate-smart solutions in emerging economies.

IFC and our clients, including the Mahindra Group, DSM and many others, are already ahead of the game. We are "future proofing" our businesses by applying an internal carbon price and using this to uncover new business opportunities. Taking an ambitious approach to carbon pricing requires vision and a strong commitment, but smart business leaders know



that carbon pricing has negligible impacts on economic growth when it is well-designed. As governments implement massive Covid-19 stimulus packages, pricing carbon would help generate revenues to help transition workers to a low-carbon future.

Our partners at the World Bank Group are helping countries embarking on carbon pricing, move from readiness to rollout. At the COP25 in Madrid last December, the World Bank Group, in partnership with multiple governments, unveiled a new initiative to help 30 countries and jurisdictions to design, pilot and implement carbon pricing and market instruments. The [Partnership for Market Implementation](#) – or PMI – is an ambitious strategy to help governments implement domestic carbon pricing programmes and foster international cooperation on carbon markets through operationalisation of Article 6 of the Paris Agreement.

As the Covid-19 pandemic looks set to usher in an era of economic disruption and belt tightening, high-carbon assets will continue to bring greater financial risks to investors and the financial sector. The post-Covid-19 recovery is the time for transformative climate action. We must not allow our global society to remain vulnerable to the risks of a high-carbon path.

Carbon pricing is fair, cost-effective, and sends a clear signal that the polluter must pay. Well-designed and predictable carbon policies, when carried out alongside supportive government policies, can unleash growth without sacrificing competitiveness. It makes clear business sense.

CONTRIBUTED ARTICLE FROM ICAO

CORSIA as the global market-based measure for international aviation

By Jane Hupe, Director, Environment, Air Transport Bureau, International Civil Aviation Organization (ICAO)

Introduction

The International Civil Aviation Organization (ICAO) and its Member States have long recognised the impact of CO₂ emissions from international flights on the global climate, and have resolved to minimise this impact, while ensuring the sustainable growth of international aviation. Despite the recent challenges faced by States and the aviation industry, work in this area has continued to advance.

In 2010, ICAO agreed on two aspirational goals: i) to improve energy efficiency by 2% per year until 2050, and ii) to achieve carbon neutral growth from 2020 onwards. These goals are to be met with the implementation of a basket of measures that includes technological innovations, operational improvements, sustainable aviation fuels, and market-based measures.

In 2016, ICAO adopted the first ever sector-wide market-based measure, in the form of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), to address the increase in CO₂ emissions from international aviation above the 2020 levels. In October 2019, ICAO States reaffirmed their commitment to implementing CORSIA.

CORSIA represents a global cooperative approach that moves away from a "patchwork" of national or regional regulatory initiatives. It offers a harmonised way to reduce CO₂ emissions from international aviation ensuring that there is no market distortion, while respecting the special circumstances and respective capabilities of ICAO Member States.

Furthermore, CORSIA complements the other three elements of the ICAO basket of measures by offsetting the amount of CO₂ emissions that cannot be reduced using technological and operational improvements, and sustainable aviation fuels.

CORSIA Basics

CORSIA will be implemented in three phases: a pilot phase from 2021 through 2023, a first phase from 2024 through 2026, and a second phase from 2027 through 2035. For the first two phases (2021 to 2026), participation of States in the Scheme is voluntary. As of 15 June 2020, 84 States – representing 76.66% of international aviation Revenue Tonne-Kilometres (RTKs) – have announced their intention to participate from 2021.

From 2027 onwards, participation of States will be determined based on the volume of international aviation traffic with the aim to cover all States that account for at least 90% of the total 2018 RTK. While Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs) are exempt from participation, they could volunteer to participate in the Scheme.

To ensure no market distortion, emissions coverage under CORSIA is based on a route-based approach. This means that emissions

from all aeroplane operators performing international flights between two participating States are covered by the offsetting requirements of the Scheme. Emissions from international flights between two States are excluded from the offsetting requirements of the Scheme if either one or both do not participate in CORSIA. The route-based approach ensures that all aeroplane operators with flights on the same international routes are treated equally.

Once participating States and international routes covered by the CORSIA are defined (starting in 2021), the CO₂ offsetting requirements for individual airlines are calculated, as follows:

- a) from 2021 through 2029, by multiplying an airline's annual emissions with the international aviation sector's growth factor every year, following a so-called 100% sectoral approach; and
- b) from 2030 onwards, by taking into account both the sector's growth factor and the growth factor of an individual airline; the individual factor's contribution to the calculation will be at least 20% from 2030 to 2032; and at least 70% from 2033 to 2035.

The phased-implementation approach to participation in CORSIA accommodates the different circumstances and capabilities between States, while the route-based approach minimises market-distortion between airlines on the same routes. In addition, the sectoral approach for the calculation of CORSIA offsetting requirements means that fast-growing aviation markets will not be unduly burdened compared to more mature markets.

CORSIA Monitoring, Reporting, and Verification (MRV)

The success of the implementation of CORSIA relies on the availability of reliable data on the implementation of the Scheme. To achieve this, ICAO established a transparent system, which includes robust procedures on how to monitor, verify and report CO₂ emissions as well as information on CORSIA eligible fuels and emissions units. The rules for this MRV system are prescribed in the Standards and Recommended Practices (SARPs) that were adopted in 2018 by the ICAO Council.

Since 1 January 2019, States and airlines have been working together to ensure the successful implementation of the CORSIA MRV system. In 2020, for the first time under CORSIA, airlines will report verified 2019 CO₂ emissions to their States and, in turn, States will aggregate this information and report it to ICAO. Emissions data will be submitted by States through the CORSIA Central Registry (CCR), which is an online database that assists States to upload and submit CORSIA-relevant information, while helping ICAO to perform calculations and publish CORSIA documents in accordance with the CORSIA SARPs.

ACT-CORSIA

The global acceptance and successful implementation of CORSIA relies on all Member States having a full understanding of all provisions of the Scheme. To that end, ICAO established the Assistance, Capacity-building, and Training in CORSIA (ACT-CORSIA) programme in June 2018. One component of this programme is the ACT-CORSIA Buddy Partnerships through which 114 recipient States have received training on

different aspects of CORSIA MRV thus helping to build capacity across all ICAO regions.

Under these buddy partnerships, recipient States are paired with States that can provide training specifically designed for CORSIA, with a preference for common geography, language, or culture. This approach has proved to be an effective and efficient model of capacity-building and has resulted in far more States being trained than ICAO could have done alone.

CORSIA Emissions Units

Under CORSIA, airlines will meet CO₂ offsetting requirements with a combination of usage of CORSIA eligible fuels (sustainable aviation fuels) and the purchase and cancellation of eligible emissions units.

Emissions units are generated when emissions from a specific project or programme are reduced, compared to a baseline (or business-as-usual scenario), through the implementation of emission reductions techniques/technologies. These projects or programmes can be implemented in various sectors, such as electricity generation, industrial processes, agriculture, forestry, and/or waste management.



In March 2020, the ICAO Council considered the recommendations from the first assessment cycle of its Technical Advisory Group (TAG), and approved the following six programmes (in alphabetical order) as potential sources of eligible emissions units for use in CORSIA:

- 1) American Carbon Registry
- 2) China GHG Voluntary Emission Reduction Program
- 3) Clean Development Mechanism
- 4) Climate Action Reserve
- 5) The Gold Standard
- 6) Verified Carbon Standard

The TAG continues its assessment of other emissions unit programmes, so more eligible emissions unit programmes may be approved in the coming months and years.

Conclusion

As part of its continuous efforts to ensure the sustainable growth of international aviation, ICAO has been implementing a basket of measures to achieve its medium-term global aspirational goal of achieving carbon neutral growth in international aviation. To achieve this, the Organization has put in place a concrete plan of action for the implementation of CORSIA.

ICAO Member States working together with industry and other stakeholders have been implementing the MRV aspects of CORSIA, ensuring the delivery of high-quality emissions data through the CORSIA Central Registry, which is crucial for the successful implementation of the Scheme. The ACT-CORSIA capacity-building best represents the spirit of ICAO's "No

Country Left Behind" initiative by pairing States together that can help one another to implement CORSIA.

ICAO Council's approval in March 2020 of programmes to provide eligible emissions units was a key piece of the puzzle to complete the CORSIA implementation elements. ICAO now has all of the elements in place to implement CORSIA and to achieve the aspirational goal of carbon neutral growth from 2020, while substantial work will continue to update the international standards, guidance and tools to continue to support the timely and effective implementation of CORSIA.



A perspective on carbon pricing

By Jonathan Shopley, Managing Director of External Affairs, Natural Capital Partners

When UK economist Sir Nicholas Stern presented his "Stern Review: The economics of climate change" to the UK Government in 2006, he brought the concept of carbon pricing to prominence with his widely quoted view that "Climate change is a result of the greatest market failure the world has seen" ⁽⁷⁾. The problem of climate change, he explained, is that those who damage others by emitting GHG generally do not pay. Pricing GHG emissions (also referred to as 'putting a price on carbon') is a logical way to correct this critical market failure by internalising the social and economic costs of GHG emissions.

While the logic of putting a price on carbon is solid, it is also complex. The opportunities to mitigate GHG emissions, and the costs of doing so, are unevenly spread around the world. Applying a social cost of carbon is one way of internalising the fully costed impact of the emission of one tonne of CO₂e on society and the environment. It is most used by governments when evaluating the impact of policies and large infrastructure projects. They typically fall in the range of US\$80 – US\$150/tCO₂e. By nature, they are rather qualitative.

In the private sector, a similar concept is the shadow price of carbon, which allows businesses to apply a hypothetical carbon price to investments and business decisions. This is used to future-proof capital investment plans against future regulatory requirements, such as carbon taxes and emissions cap-and-trade schemes. Shadow pricing is increasingly also used to quantify operational and supply

chain risks. Like the social cost of carbon, it is a planning tool and as such does not directly increase prices that could change the supply and demand balance in markets, and nor does it generate finance directly for GHG emission abatement. CDP research, indicates a range of US\$2 to US\$900 across 416 companies using a shadow price of the 4,765 declaring their carbon pricing practices to the CDP in 2016 ^(1, 2). Despite the wide range, this is a critical first step in addressing climate risks in decision-making.

Policy options for carbon pricing that do directly affect the flow of finance fall broadly into two categories. Carbon taxes impose a price, and in doing so generate revenues to the administering government. Those revenues may or may not be used to fund emission reduction initiatives. The price signal certainly changes the supply and demand balance and that generally leads to reduced emissions – but the extent to which they do is not known in advance.

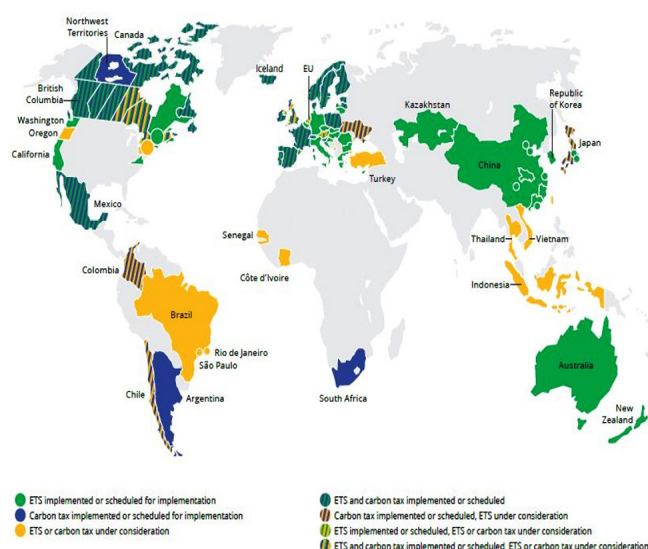
Emissions trading schemes, on the other hand, use markets to determine the price to achieve a pre-determined emission reduction target or cap (hence known as Cap & Trade – C&T). Governments raise finance when they sell emission allowances to entities covered under the scheme. However, those revenues may or may not be used for further mitigation.

As of April 2020, 44 countries and 31 provinces or cities operate a carbon pricing scheme, across jurisdictions representing 60% of global GDP, covering over 20% of global GHG emissions ⁽⁴⁾. Prices range from less than US\$1 to US\$140/tCO₂e, with 75% of regulated emissions covered by a price below US\$10. For reference, the High-Level Commission

on Carbon Prices recommended carbon prices between US\$40 and US\$80/tCO₂e by 2020, and between US\$50 and US\$100/tCO₂e by 2030 to limit warming to less than 2°C⁽⁸⁾. In aggregate, these pricing schemes generated more than US\$45bn in public sector receipts in 2019 – of which about half were allocated to climate or related programmes.

An extension to cap and trade is carbon offsetting – when entities finance emission reductions beyond the scope of a cap-and-trade programme and count those towards their reduction targets under the regulated cap. Businesses can also use carbon offsetting to realise reduction targets ahead of or beyond regulation on a voluntary basis. Most do so to reach and claim carbon neutrality as an immediate response to climate risks and to contribute to the longer-term goal of a net zero economy. Recent prices in the voluntary carbon market range widely from below US\$1 to US\$125, with a weighted average of around US\$5/tCO₂e⁽³⁾.

Carbon pricing initiatives implemented, scheduled for implementation and under consideration (ETS and carbon tax).
World Bank Group, 2020



The value of this approach derives from the fact that carbon offsetting is a powerful driver of change for two reasons:

- The price of carbon finances mitigation. Finance raised from the initial sale of emission reductions goes to the projects and programmes that deliver the reductions. Voluntary offsetting has raised over US\$5bn during the past 15 years.
- The carbon price drives emission reductions. It provides a tangible signal that helps answer the difficult question businesses face when using offsets as part of a carbon management strategy—how to find the right balance between internal abatement and external emission reductions. Internal abatement makes business sense when that can be done below the market price of carbon. The price of carbon credits provides an informed yardstick.

Research by Natural Capital Partners into the climate strategies of the Fortune Global 500 in 2019 shows⁽⁶⁾ that a quarter have commitments to carbon neutrality, 100% renewable power or Science-Based Targets by 2030, with significant increases since the December 2015 Paris Agreement.

Those companies benefit from an array of mitigation opportunities with different price points by combining internal abatement, switching to renewable energy, and using carbon credits to compensate for unabated emissions.

For the private sector, a portfolio approach to selecting and combining internal and external mitigation options can drive the abundance of affordable climate solutions that is required to reach net zero. Carbon

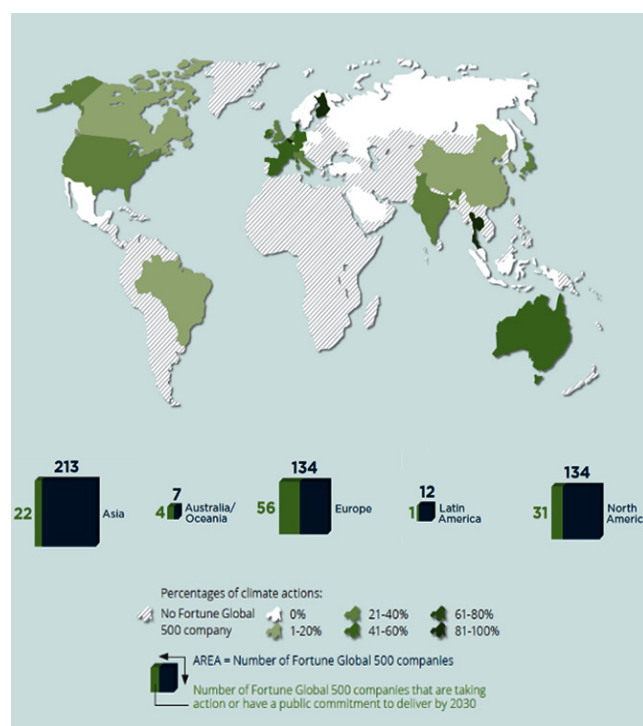
offsetting offers cost-effective credits from highly additional projects (such as grid connected renewable energy in developing economies) solely focused on mitigation, as well as higher cost credits from mitigation projects that deliver a host of co-benefits to local communities and ecosystems (for example, reforestation and forest protection, rural household biogas or solar electrification projects). Credits from as-yet rare, innovative engineered solutions (for example, carbon capture and storage) will be painfully expensive until economies of scale and learning kick-in. However, their inclusion in the mix sends a critical market signal that will drive their costs down in the future.

We know that there are emission reductions opportunities for less than a US dollar per tCO₂e, and that prices over \$100/tCO₂e would drive rapid and deep decarbonisation across the economy. Civil society organisations and progressive governments will tend to favour high prices over low within reason. Across the private sector, businesses looking to maintain and strengthen their competitive position through their voluntary action on climate will be seeking a price that delivers business value and environmental impact. Research published by the International Emissions Trading Association and the CPLC highlights the cost efficiencies of market-based approaches to carbon pricing. It points to the importance of operationalising Article 6 of the Paris Agreement which seeks to build collaborative approaches to establish an internationally relevant price of carbon⁽⁵⁾.

We can expect an increase in the average price of carbon by tonne, in both voluntary and regulated markets, over time. That will be a natural consequence of the rising marginal

costs of abatement. Ideally, this will be a steady trajectory. However, we must also anticipate some volatility along the way as carbon pricing policies and approaches are applied unevenly across the global economy. A business can hedge against this with a diversified portfolio of climate mitigation solutions. By adopting and deploying carbon pricing, businesses are financing projects and programmes that collectively play a crucial role in delivering a stable climate and promoting sustainable development.

Percentage Fortune Global 500 companies across countries and continents that are already or are publicly committed to delivering carbon neutrality, 100% renewable power or a Science Based Target by 2030. Natural Capital Partners, 2019



APPENDIX

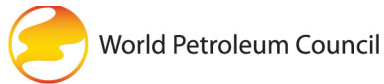
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OUR MEMBERS

Currently the Foundation has over fifteen corporate members from Qatar's energy, insurance and banking industries as well as several partnership agreements with business and academia.



Our partners collaborate with us on various projects and research within the themes of energy and sustainable development.





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