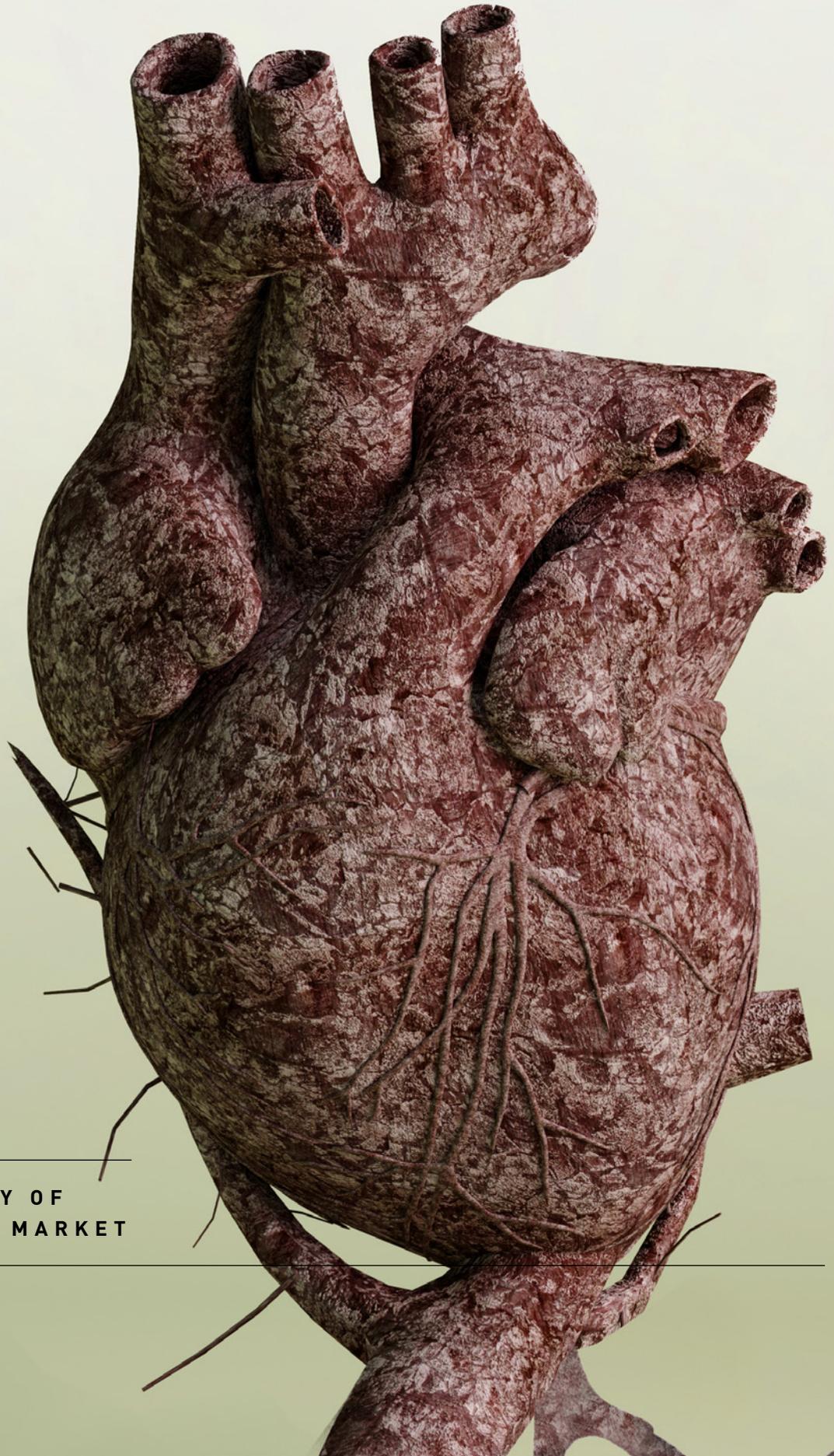


2 0 — 2 1

GREENHOUSE GAS MARKET REPORT



**THE ANATOMY OF
THE CARBON MARKET**

ieta.org

Table of Contents

ANATOMY OF THE CARBON MARKET

- 04 Introduction**
Dirk Forrister, CEO and President, IETA
- 06 Blue-sky thinking: The race to net zero**
Katie Kouchakji
- 08 2021: the year in review**
Carbon Pulse

NERVE CENTRE

- 11 Why emission trading matters: Six key trends**
Anders Nordeng and Hæge Fjellheim
- 15 Harnessing the power of markets to scale up net zero actions**
Angela Churie Kallhauge
- 19 Maximising climate ambitions**
James Edmonds, Sha Yu and Ieva Steponaviciute
- 22 Carbon, borders and trade**
Andrew Hedges
- 24 Broadening the scope**
Stefano De Clara and Kai Kellner

CONNECTIVE TISSUE

- 28 What we mean by carbon credits and carbon projects – and why they matter**
Maria Carvalho
- 32 Flexing the Article 6 muscle**
Mischa Classen
- 35 Infrastructure for innovation**
Jennifer Weiss
- 37 Financial institutions: The ligaments of carbon markets**
Anya Nelson and Martin Berg
- 40 Climate law as connective tissue**
Ilona Millar and Sharona Coutts

HEALTH MEASURES

- 44 Clarity on transparency**
Alex Hanafi, Julia Ilhardt and Maggie Ferrato
- 47 Growing a healthy VCM**
Andrea Abrahams

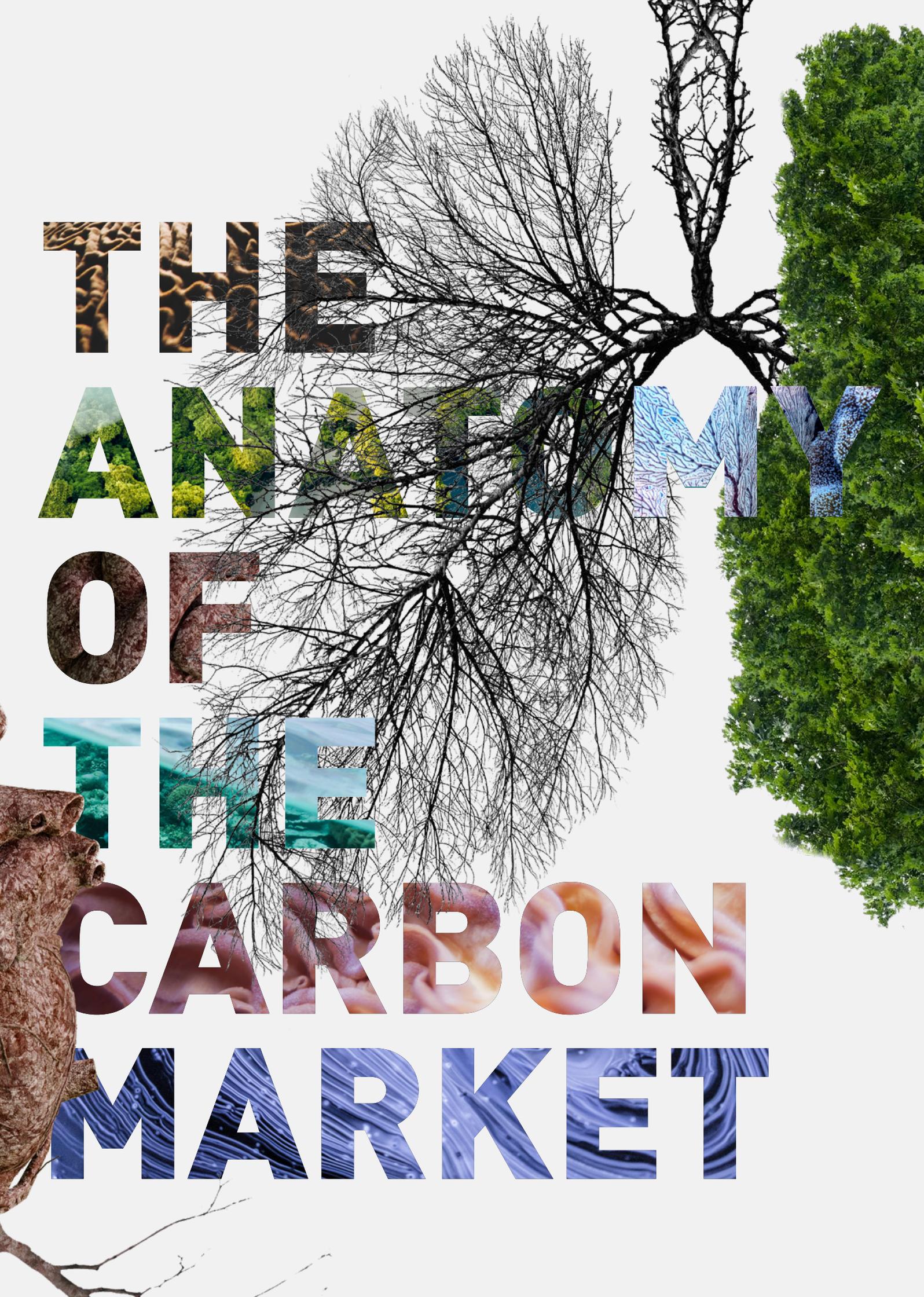
About the **International Emissions Trading Association (IETA)**: IETA is the voice of business on carbon markets around the world. Established in 1999, IETA's members include global leaders in the oil, electricity, cement, aluminium, chemical, technology, data verification, broking, trading, legal, finance and consulting industries. www.ieta.org

IETA expresses its gratitude to all authors who have contributed to this report, to the editorial committee and to all others who have worked on the publication.

Editor: Katie Kouchakji
Design: Hitman Creative Media Inc.

20
21





**THE
ANATOMY
OF
THE
CARBON
MARKET**

Introduction

This year was pivotal for global emissions trading and carbon markets. Existing markets, such as the EU and New Zealand, began making changes to be even more ambitious; new markets started operations, such as China's national ETS, or are being developed or expanded, such as Colombia and Chile. The strong interest in voluntary markets reflected surging corporate moves to net zero. And that was all before governments finalised the rules for Article 6 of the Paris Agreement at the UN climate talks in Glasgow in November, breathing life into the markets of tomorrow.

All of these advances mean that many of us in the climate and carbon markets community are seeing our numbers grow as new firms and faces join us – and will continue to grow as the urgency to act drives more businesses and governments to seek low-cost, effective and efficient solutions to the climate challenge.

With these new faces and challenges in mind, we've done a lot of thinking about what the carbon market is and how to explain its many aspects to newcomers. From that, this year's GHG Market Report theme was born: the anatomy of the carbon market. We wanted to take stock of where we are, how we got here, and how we can move forward, in robust health. We want this year's report to be a bit different, and to help serve as an informative guide to what we mean when we talk about the carbon market.

We wanted to take stock of where we are, how we got here, and how we can move forward, in robust health

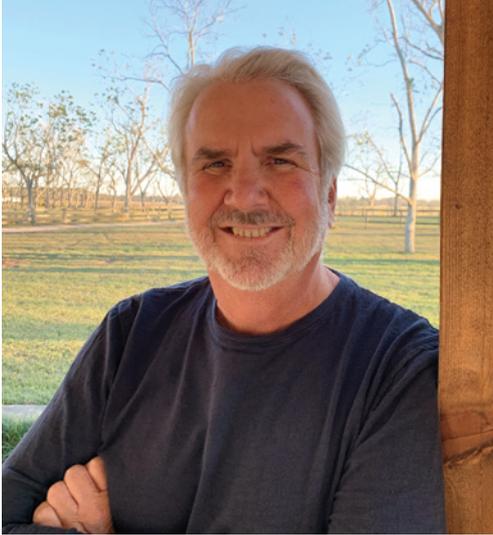
The anatomy of the carbon market

Often, many describe the carbon market as a political construct – and it is the case that compliance markets like those in the EU, California, South Korea and the north-east US, exist due to political drivers. Net zero ambitions too are driving things, including record transaction levels in the voluntary carbon market. These political and voluntary drivers combine to act as the nerve centre for the market, sending the signals to mobilise the rest of the body.

In the report's first section, highlights include a roundup by Refintiv of key trends in 2021 and the future outlook for key markets, a summary of our latest modelling work with the University of Maryland and Pacific Northwest National Laboratory on ambition and net zero, and an analysis by ICAP looks at how emissions trading is expanding to new sectors.

On the receiving end of these informational signals, we find the market's connective tissues. Offset project developers, who create links between opportunity and demand. Lawyers, who draft the contracts used for trading. Financial service providers, who underwrite innovations and help clients finance their decarbonisation journey. Standards and registries, which set ever-improving performance standards for the clean revolution and provide infrastructure for trade. Each of these parts is vital to a well-functioning market. And, like any muscle, they need to be flexed and used to stay in shape and support the wider skeleton.





Dirk Forrister
IETA CEO & President

This year was pivotal for global emissions trading and carbon markets

In this section, read about why offsets matter, what lessons can be learned from early Article 6 deals, and the roles played by the legal sector, financiers, and registries.

Even with regular flexing, there are other vital health measures for the carbon market. Transparency and accountability are crucial to maintaining confidence and environmental integrity – a market without trust will never be successful. And as the market evolves, more attention is being paid to nuances of avoided emissions versus removed emissions, and how best to contribute voluntarily to the climate fight. New entrants – as well as existing participants – need trust in the system and confidence in the value of their investments.

Some of these different aspects of the carbon market were captured in a series of videos produced by ITN Industry Productions, called Blue-Sky Thinking. The videos – featuring C-Capture, C-Quest Capital, HFW, ICE, Novartis, Verra and Wildlife Works – are available on the IETA website, and form the basis of an article in this report.

Transparency and accountability are crucial to maintaining confidence and environmental integrity – a market without trust will never be successful

Building forward better

As we move into 2022, still grappling with the Covid-19 pandemic and the ever-pressing need to cut emissions faster, we'll need to stay focused on building a better, cleaner, healthier future. Article 6 gives a way to mobilise the capital shift needed, with an estimated \$1 trillion per year in value waiting to be unlocked by 2050, if the Paris goals are to be met.

Governments left Glasgow with a call to revisit and revise pledges ahead of COP27 in Egypt, to be more ambitious with their sought reductions. Having a fully functional Article 6 can become an enormous step towards higher ambitions – if governments are bold in embracing it.



Blue-Sky Thinking:

The race to net zero

Over the past 18 months, IETA collaborated with ITN Industry Productions to produce a series of videos examining the role of carbon markets in the move to a net-zero economy. The project's partners represent a cross-section of the various pieces of the carbon market's anatomy, each with a vital role to play.

Katie Kouchakji reports

The science has long been settled and accepted: to meet the Paris Agreement's most ambitious goal of stabilising the average increase in temperatures to 1.5°C, global GHG emissions need to halve by 2030 and reach net-zero by 2050. Meeting these targets will require a full transformation of the global economy and that we redefine business-as-usual. Carbon pricing, and specifically emissions trading, can play a vital role in incentivising that transformation, if done right.

With ITN Industry Productions, IETA and partners have explained the scale of the challenge, how different aspects of the climate and business community are doing their part to support the low-carbon transition, and what more is needed to drive further change. Two extra videos prepared for IETA examine what the science is telling us is needed to get to 1.5°C, the consequences of missing that target, and also the path to net-zero.

"If you don't really meet the Paris goal, you will face significant losses because you will see increasing extreme events, and that basically costs you billions or trillions of dollars globally, so there's actually a significant cost if you're not meeting the Paris Agreement," Sha Yu from the Pacific Northwest National Laboratory (PNNL) says in the videos.

"If we don't have a market, maybe for some places it will be really hard to get to zero and we will never get to a 1.5°C world" – Sha Yu, PNNL



"One thing we know is that cooperation enables people to do more with less, with fewer resources," says Jae Edmonds from PNNL. "Article 6 was put in [to the Paris Agreement] to enable that." This could be via joint technology development efforts, for example, or via carbon markets, he says.

"If we don't have a well-functioning market, then you don't really have all these opportunities," says Yu. "Countries may still continue pursuing net-zero, but it's going to be a much harder effort for everyone, and in the worst case, if we don't have a market, maybe for some places it will be really hard to get to zero and we will never get to a 1.5°C world."

"Carbon markets give businesses flexibility to change, and to change in the ways that fit their unique circumstances," says IETA CEO Dirk Forrister, and this allows employers to reskill and reposition employees for a lower carbon future. "Giving companies and sectors the ability to chart their own transition we think is incredibly valuable."

"There is no black and white answer to it, it's all relatively murky and grey," says Peter Zaman, a partner at HFW in Singapore, talking about the move to net zero. "So what you need in our view is good counsel at that point and somebody who understands what the regulatory and policy framework is going to be in the future, what it's likely to drive by way of signal for people making decisions today, and helping our clients therefore manage that energy transition pathway that they were looking to step into."

Platforms such as ICE help facilitate price discovery for this transition, via energy trading, data services, and technology. "The world is driven by economics, so you need to know the value of energy, environmental, interest rates and so forth," says Gordon Bennett, managing director for utility markets at the firm. "We are effectively the energy transition facilitator. Net-zero is only achievable by applying market-based mechanisms, by knowing the cost of pollution and by knowing the value of green attributes; there's no other way to do it."

Novartis is already investing in renewable energies to supply its operations via a long-term virtual power purchase agreement, giving Enel Green financing for renewable investments and securing energy prices for the global medicines firm for 10 years. This is part of its



“Carbon capture isn’t really optional right now – it’s essential to meet those targets”

- Fatima Bilal, C-Capture

efforts to achieve carbon neutrality in its operations by 2025, plastic-neutral and water sustainable by 2030, and net zero across its value chain by 2040.

“We see a very close linkage between planet health and human health,” says Novartis’ chief sustainability officer Montse Montaner. “That’s why we see that we have a big responsibility to work together to fight against climate challenges and really support to improve people, and population health around the world.”

UK-based C-Capture is also tackling energy emissions, via its innovative approach to carbon capture and storage that uses a solvent. “Carbon capture isn’t really optional right now – it’s essential to meet those targets,” says Fatima Bilal, project engineer at the Leeds firm. “The hard-to-decarbonise industries – like the cement industry, the glass industry, the chemical refinery industry – where they produce a lot of CO₂, we still need those, so these industries must come onboard for us to reach our net zero targets.”

Smaller-scale technologies can also make a big difference, such as the clean cookstoves C-Quest Capital distributes in some of the poorest nations in the world, including in Malawi. The avoided emissions from reduced deforestation earn the company carbon credits, which it sells to finance the stove distribution. The projects also lead to improved health outcomes for the households and communities where the stoves are used, as well as creating local employment opportunities.

“Our ambition is to use carbon finance to achieve a long-term transition away from traditional, unhealthy and environmentally damaging cooking practices to a cleaner and more sustainable alternative,” says Alena Morris, senior operations and health specialist at C-Quest. “To achieve this, we must work at scale. In sub-Saharan Africa, we will install our stoves in 1 million households for each country in which we work.”

Conservation company Wildlife Works also focuses on the Global South – in countries such as Kenya, Colombia and Cambodia – and works with local communities to design solutions to address climate change and biodiversity loss, says CEO and founder Mike Korchinsky.

“All of these solutions around the world have similar roots, which are generally rooted in the inequity of our global society towards local communities in the Global South,” he says. “They’ve suffered mightily already from climate change, and our feeling is they need to be at the centre of the solutions to mitigate climate, especially in nature-based solutions.”

Voluntary carbon standard operator Verra is ramping up its nature-based focus, building on its history in this field to develop approaches to so-called blue carbon

“The essential thing is that this is a very substantial, very difficult-to-resolve problem of our own making, which tells you that we can solve it” – James Cameron, IETA fellow

– the emissions sequestered in coastal and marine ecosystems. “This type of area stores significantly more carbon than a forest, and it’s also photosynthesising and releasing oxygen at the same that it’s drawing down carbon,” says Amy Schmid, manager of natural climate solutions development at Verra, explaining why blue carbon is important.

Ultimately, these innovations for the future are being driven by regulatory frameworks, such as compliance emissions trading and the Paris Agreement. But, says Climate Group chair Joan MacNaughton, more can be done.

“What’s really needed to accelerate it is clear, long-term coherent policies from government that give businesses the confidence to invest,” she says, including in things like research and development, new products and new services. “The policy hasn’t kept pace with what businesses are doing ... all the research has shown that if there is collaboration globally, then the cost of doing this will be smaller than if each country goes its own way.”



“We are effectively the energy transition facilitator”

- Gordon Bennett, ICE

“The essential thing is that this is a very substantial, very difficult-to-resolve problem of our own making, which tells you that we can solve it,” says IETA fellow James Cameron. “Technology won’t do it on its own without help from a regulatory framework that is designed to help it. It’s not that you can’t have the innovation without the regulation – that’s obviously not the case. But if you want an economic transformation in a society and you want to take people with you, those are essentially political questions which have to be resolved.”

“It’s not surprising that it’s hard, but it’s also not good enough to resign yourself to it being so hard,” says Cameron.

See the full collection of videos at:
www.ieta.org/blue-sky-thinking

Katie Kouchakji is a freelance writer and communications advisor for IETA. She regularly contributes to Carbon Pulse, Energy Monitor, FORESIGHT and the International Bar Association, and was formerly editor of Carbon Finance. Katie has covered energy and carbon markets for more than 15 years, from London and since 2018 from Auckland.

2021:

The year in review

The team at Carbon Pulse wrap up the main headlines from 2021.



International

The Glasgow COP26 UN climate negotiations in November saw nations forge the Paris Agreement Article 6 rulebook for international emissions trade at the third attempt. Negotiators struck a compromise by allowing a substantial transition of pre-2020 credits to be used for Paris nationally-determined contributions (NDC), a move sought by major Clean Development Mechanism project host nations Brazil, India, and China. In return, the deal sets out stringent accounting, baselines, and additionality requirements for a new centralised Article 6.4 carbon market mechanism, as sought by the EU.

Core to Article 6 is a requirement for all post-2020 internationally-transferred mitigation outcomes (ITMOs) to require corresponding adjustments (CAs) in national inventories for NDCs or other global GHG abatement purposes. This effectively means airlines will need to buy adjusted units to comply with their CORSIA offsetting mechanism for global air travel. So far only Japan, Switzerland, South Korea, New Zealand, and Australia have indicated interest in buying ITMOs to help meet their NDCs, with dozens of developing nations interested in selling.

The Glasgow summit also agreed that countries will revise their NDCs by next year's COP meeting to help keep Paris' 1.5°C global warming limit goal alive, rather than the previous 2025 date for setting new pledges. Projections by researchers Climate Action Tracker put the world on track for 2.4°C of warming if the updated NDCs were all met by 2030, while the IEA made a projection of 1.8°C. The latter was based on governments' longer-term net zero pledges, which now cover almost 90% of the global economy, and opt-in sectoral pledges on methane, deforestation, and coal made in Glasgow. Climate Action Tracker said the sectoral pledges could potentially shave another 9% of the gap to 1.5°C by 2030, with the aim of the initiatives to pressure more nations into signing up over time.

The lack of clear Article 6 guidance for the voluntary carbon market still leaves open the possibility of a two-tier system emerging of adjusted and non-adjusted units. In a sign of the emerging divide, a group of mainly European and smaller developing nations pledged not to use pre-2020 units for NDCs and to apply adjustments all voluntary market credits. Voluntary market participants in Glasgow said they expected demand for correspondingly adjusted credits to amount to anything between 10-50% of demand over the next few years, with many expecting limited initial take-up from a minority of corporate buyers seeking high quality units while pursuing science-based targets.

The voluntary carbon market underwent a boom in 2021, with transacted volume on course to almost double year-on-year to around 360 mln units, according to researchers Ecosystem Marketplace, amid a surge in companies setting net zero or carbon neutral goals. This was despite a lack of take-off for the aviation sector's offsetting scheme, CORSIA, which saw demand grounded as pandemic-era travel restrictions were lifted slowly. Price reporting agencies and exchanges developed an array of standardised assessments in an effort to streamline the market and bring more transparency – their assessments recorded a four-fold rise in the lowest price credits, which have topped \$8/t. This effort was complemented by the private sector Taskforce for Scaling the Voluntary Carbon Market, which morphed into the Integrity Council for VCM to further work on determining a global benchmark for carbon credit quality. The cross-stakeholder VCM Integrity Initiative also formed in 2021, aiming to define credible credit buying strategies.

So far only Japan, Switzerland, South Korea, New Zealand, and Australia have indicated interest in buying ITMOs to help meet their NDCs

Europe

Prices more than doubled in the EU ETS as investor interest soared. Prices were hitting new records near €70 by November. Values rose far more quickly than analysts had anticipated and as a result of a tightening of the market under the bloc's yet-to-be-agreed 'Fit for 55' legislative package, which is designed to recalibrate the bloc's climate policies to a deeper 2030 emissions target of 55% under 1990 levels, up from 40%. The proposals include extending the ETS to international shipping from 2023 and launching an adjacent market for buildings and transport in 2026. Most radically, they also include a carbon border adjustment mechanism (CBAM) to be phased in over 2026-35 as an alternative to free allocation in providing carbon leakage protection. The CBAM, which would hit carbon-intensive imports in six heavy industrial sectors, sparked protest from third countries but also appeared to spur some nations into action on climate policy in an attempt to limit its impact.

The post-Brexit UK launched its own ETS, covering emissions a tenth of the size of the EU market it detached from. UK prices trended upwards to largely keep pace with sky-high EU prices. But they traded at a persistent premium to the EU ETS amid a relative lack of liquidity and even as British emitters kept an eye on trigger values for the market's Cost Containment Mechanism as prospects for a rapid re-linking appeared dim.

Americas

Carbon allowance prices in North American compliance markets surged to record highs over the course of 2021, as new financial players and other speculators snapped up units amid a global trend towards decarbonisation and seeking long-term returns. Permit values in the linked WCI system of California and Quebec lifted above \$35/tonne on 15 November, nearly double the \$18.50 range in January. Allowance prices in the US Northeast and Mid-Atlantic RGGI programme followed suit, and were valued above \$13/short ton by mid-November, up from around \$8 at the start of the year.

Both markets appeared set for expansion as well, with Washington state legislators in the spring passing WCI-modelled cap-and-trade legislation. The state is planning to implement the programme in 2023. On the east coast, Virginia joined RGGI in January, and Pennsylvania and North Carolina may follow suit at some point in 2022 and 2023, respectively.

To the north, the Supreme Court of Canada in March upheld the constitutionality of the federal government to impose minimum national standards of GHG pricing on provinces and territories. Canadian Prime Minister Justin Trudeau's government followed up this victory in the summer by laying out a post-2022 carbon pricing benchmark. In addition to confirming the government's plan to hike the 'backstop' CO2 price by C\$15 annually from 2023 until reaching C\$170 in 2030, it also set out more stringent requirements for provinces and territories that operate their own carbon taxes, output-based pricing systems, and cap-and-trade programmes.

The post-Brexit UK launched its own ETS, covering emissions a tenth of the size of the EU market it detached from

APAC

China's national ETS was launched in July, regulating emissions from coal-fired power plants of more than 2,200 companies that emit in excess of 4 billion tonnes of CO2 annually. While trading only started this year – with prices around the \$7 mark during the first months of operation – compliance requirements were backdated to 1 January 2019 and participants must surrender allowances for 2019 and 2020 by mid-December. Several other sectors will be included over the next few years, with aluminium, cement, and steel possibly joining in 2022.

The New Zealand government introduced a raft of reforms to the country's ETS in 2021, as the amount of GHG emissions from participants was capped in absolute terms for the first time and quarterly auctions began. That helped fuel intensely bullish sentiment, with the NZU price almost doubling during the year to stabilise at around NZ\$65 in October and November. The September auction drew record demand, leading to all 7 mln units in the cost containment reserve being released as the sale cleared above the NZ\$50 CCR trigger.

Australia too experienced record high prices, with spot ACCU offsets nearing A\$40 in mid-November after trading at A\$16.50 at the beginning of the year. The government still refuses to impose stringent emissions limits for industry, and the price hike was caused by a mix of strong growth in voluntary demand and limited available supply. The government launched the Indo-Pacific Carbon Offset Scheme (IPCOS), a bilateral arrangement under Article 6.2 of the Paris Agreement, under which the private sector is expected to buy voluntary units that can also be used towards Australia's NDC. Fiji and PNG had agreed to join that market at the time of writing.

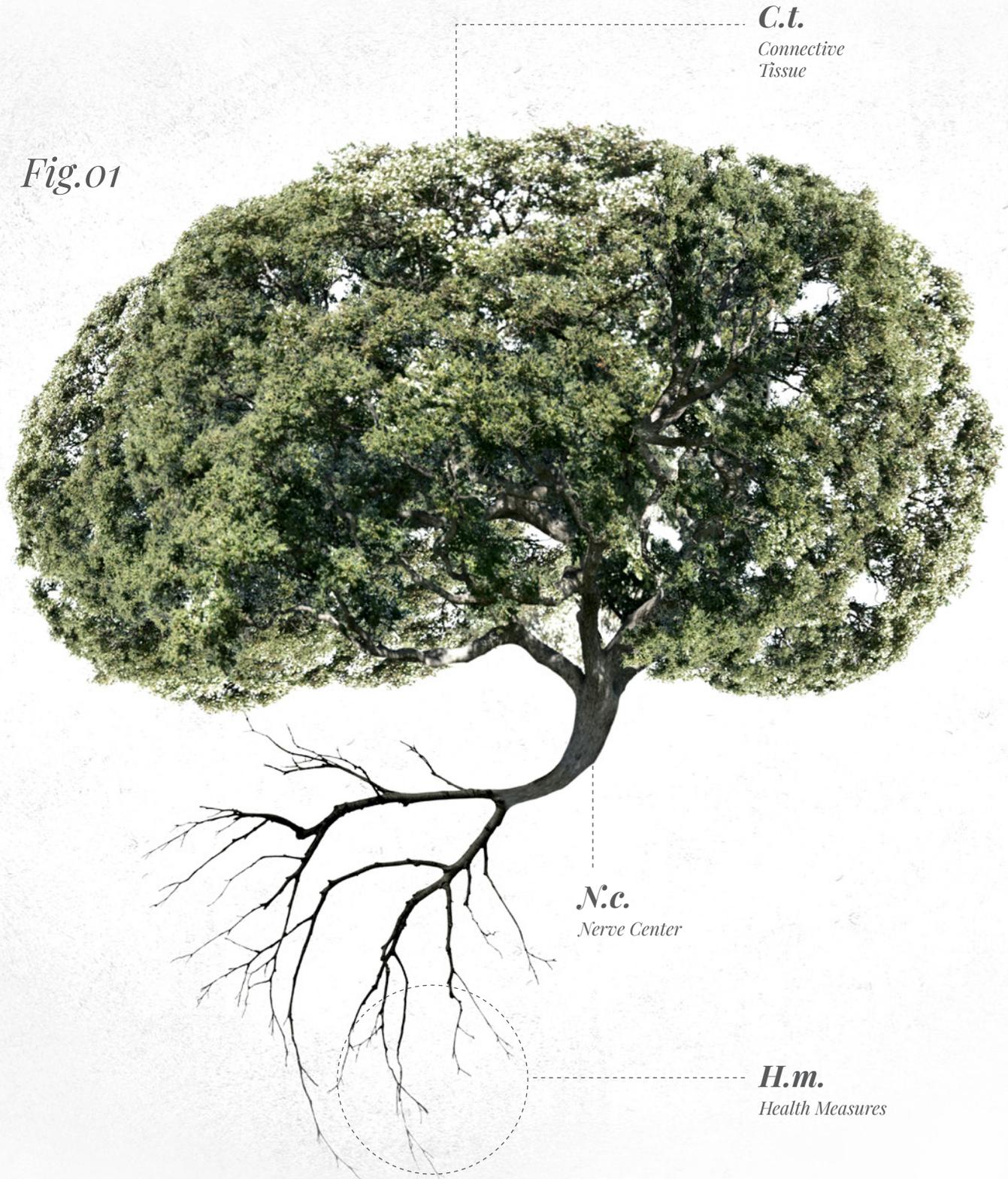
Japan has taken steps towards establishing a domestic carbon market, with two ministries setting up working groups at the beginning of the year. While there is still much to clarify, the economy ministry is planning to launch in April 2022 a voluntary baseline-and-credit market called the Carbon Neutral Top League, under which emitters can set their own targets in line with the government's net zero ambition and earn credits when they beat those. They can also use offsets for compliance, primarily generated under Japan's Joint Crediting Mechanism (JCM).

Indonesia piloted an ETS for coal-fired power plants and will run a voluntary opt-in scheme until 2025, when the government will introduce a mandatory market. Those that surrender permits under the mechanism will be exempt from paying the \$2.09/t carbon tax that will be introduced in 2022.

The Nerve Centre



Fig.01



C.t.
*Connective
Tissue*

N.c.
Nerve Center

H.m.
Health Measures

THE ANATOMY OF
THE CARBON MARKET

ieta.org



Why emission trading matters: *Six key trends*

Trends in global carbon markets in 2021 point to the growing importance of the policy option as the world ups its climate ambitions. **Anders Nordeng** and **Hege Fjellheim** explain why

Carbon trading exists as a tool for countries to meet their climate ambitions. Indeed, for most European states cap-and-trade of emission rights is an increasingly important driver of emission abatement and hence an enabler to fulfil or ramp up their Paris Agreement pledges. That kind of carbon trading does not fall under the remit of the UNFCCC, yet international climate negotiators would be wise to appreciate its potential impact, not least with the Chinese emission trading system (ETS) coming into operation.

The other kind of emission trading involves carbon offsets issued on the back of abatement projects as a way of monetising the ‘saved’ emissions. These projects are typically located in developing countries and selling offset units to western companies or governments, to be used as part of a ‘net-zero’ strategy. Much of this was once part of the Clean Development Mechanism under the Kyoto Protocol, but once European demand dried up, and in the absence of internationally recognised rules, project developers increasingly turned to the voluntary carbon market. Now that COP26 agreed on rules for international transfer and trading of emission outcomes under the Paris Agreement’s Article 6, we might expect to see a boost also in the carbon offset market.

In this article, we highlight six important trends that are, to some extent, common to all the major carbon markets around the world.

Prices for allowances in cap-and-trade programmes worldwide are going up

TREND 1: CARBON PRICES ARE ON THE RISE

Prices for allowances in cap-and-trade programmes worldwide are going up. The most significant example of this trend is in the EU ETS, but the North American carbon markets (Western Climate Initiative or WCI, which includes the state of California, and the northeast’s Regional Greenhouse Gas Initiative known as RGGI) are also seeing ever higher carbon prices, as is the New Zealand ETS.

Figure 1: Carbon prices in key carbon markets
Monthly average prices. Indexed (Jan 2021=0).

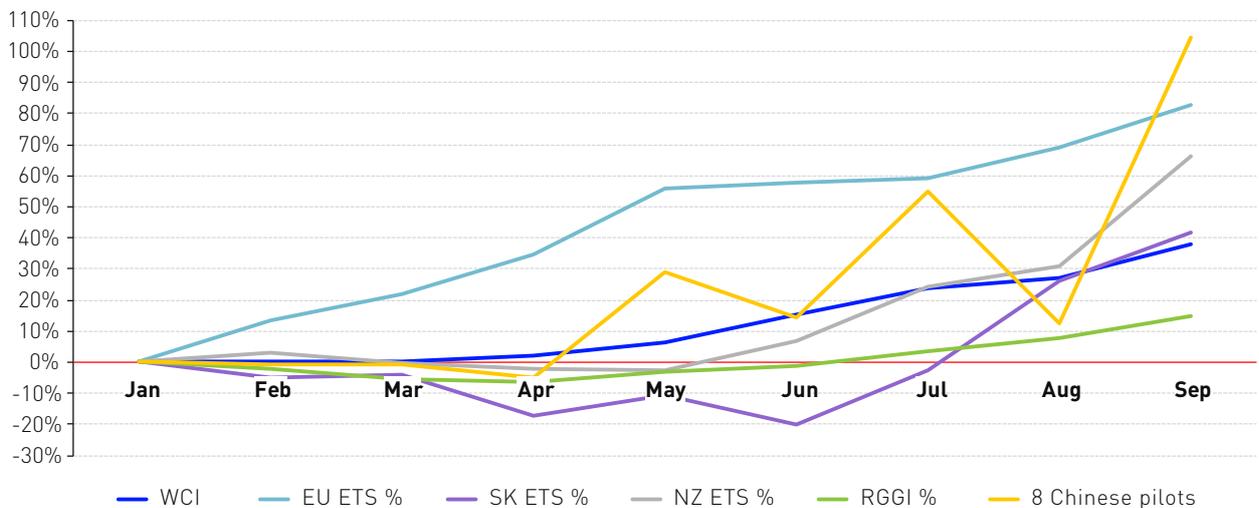


Figure 1 shows price developments in key carbon markets from January to September 2021. In this period, European carbon allowance prices (red line) have gained 80%. The yellow line shows the average of prices in all eight Chinese pilot ETSs, some of which have been operational since 2013 – the volatility of this line is in great part due to its being an average of individual, otherwise separate programmes – while China’s national ETS started trading in July and is not included in this figure. Prices for emission permits in New Zealand’s ETS (light blue) gained 66% in the first nine months of the year. South Korea (purple line) dropped in early Q2 before beginning to rise from July.

The EU ETS is still the biggest of these markets in terms of transacted volumes and total value, so its recent pattern of steady, strong price rise is significant.

Throughout much of the previous decade, demand for EU Allowances (EUAs) was modest, leading to depressed prices and little attention outside a group of regulated emitters and specialised traders. This changed in August 2018, when EUAs started an upwards trend that has led to a price level around €60 per tonne worth of CO₂, at the time of writing in late October.

Similar dynamics are playing out in other carbon markets, with the futures contract for WCI’s traded units (CCAs) gaining almost 38% from January to September 2021, RGGI’s going up 15% in that timeframe, and New Zealand Units up nearly 70%.

China’s national ETS – which is more than three times the size of the EU ETS in terms of covered emissions, at 4.5 billion tonnes annually – did not see transactions until 16 July 2021, so pricing trends are not comparable to the established markets. The price reached 52.8 CNY/t on the first day, then fluctuated over the first two months, with a short-term increase followed by a decline to daily averages around 42 CNY/t in late September.

TREND 2: AS CLIMATE AMBITIONS INCREASE, SO DOES THE RELEVANCE OF EMISSION TRADING

The countries/regions listed above are generally moving toward more ambitious climate targets, and emission trading is set to play an important, if not dominant, role in reaching them. One effect of this is the price rallies shown above, reflecting market participants’ expectations for the future supply-demand balance. We see a clear correlation between policies and prices.

Again, the case can be made most strongly for Europe where traders in 2018 reacted to ongoing/upcoming policy changes, most notably a supply-regulating mechanism introduced in January 2019. Subsequently, the launch of the Green Deal (in 2019) and discussions on the new 2030 target lent further support to prices. Currently, prices are buoyed by the Fit for 55 proposals that intend to calibrate all relevant climate policy instruments to the bloc’s new 2030 target and will also see changes to the ETS, including a faster decrease in EUA supply annually and expansion to shipping. Over the years, each time the EU’s headline target has been changed, the EU ETS is adjusted accordingly.

We see a clear correlation between policies and prices

For the EU, a mid-term climate target is a way to provide predictability to the various internal stakeholders that will need to adapt, most notably businesses. Climate targets are also a way to show to the outside world that the continent is committed to doing its fair share – in keeping with the spirit of the Paris Agreement.

Similarly, WCI prices started to pick up in the wake of the Leaders’ Climate Summit in late April, at which US President Joe Biden announced a more stringent federal emission reduction target (to reduce net GHG emissions by 50-52% by 2030 compared to 2005 levels). While this has no direct impact on the supply-demand balance in the WCI, it likely influenced overall market sentiment by creating a general expectation of future supply side tightening given the further emission curtailment that will be needed to reach more ambitious national climate goals – WCI member California is after all home to 12% percent of the US population.

Bucking the sub-national approach in the US and Canada, Mexico’s nascent ETS is designed to help the country reach its national emission target submitted to the UN – although the degree to which it would do so has not been specifically calibrated to the target, unlike the EU ETS.

The rise in the price of NZUs has been a result of reforms to New Zealand’s ETS as the country ups its overall suite of climate policies. The country is one of only a few that have enshrined a net zero emissions goal for 2050 into law, but it is still in the process of developing concrete short- and medium-term policies geared at achieving that goal and will release its Emissions Reduction Plan in 2022.

In China, emission trading is just one of many elements the government is using to meet climate pledges, including the nation’s target of net zero emissions by 2060, and to peak emissions before 2030. Direct regulation and subsidies for renewables might prove to be more important. Nevertheless, with the ambitious plan to expand the scope of the national ETS to heavy industries such as metals and petrochemicals, we expect that the mechanism will become a core policy instrument for China to achieve its climate goals.

The notion that climate policy must be “fair” is gaining extra traction with the recent spike in energy prices

TREND 3: FINANCIAL INVESTORS ARE INCREASINGLY ATTRACTED BY CARBON MARKETS

Though cap-and-trade programmes are intended to incentivise emitters to cut their GHG output to thus avoid paying for permits, players that do not have a compliance obligation are increasingly participating in markets. This group includes banks, trading houses, and even hedge and pension funds. Just like the compliance buyers, they seek to maximise their profit, but they also use emissions allowances as a proxy to counterbalance climate related risk in their investment portfolios.

In Europe, some big banks pulled out of the EU ETS following the 2008 economic crisis. Following the price rebound that started in 2018, investment funds started to build positions, attracted by the prospect of the EU heightening its climate ambitions. Carbon markets are now seen to offer both green credibility and liquidity, a combination that is appreciated by an increasing number of investors.

Recent trading data from the ICE exchange show that non-compliance participants currently hold 20-25% of the long positions in the EU ETS futures market.

In the WCI, financials bought one-third of the offered current-vintage allowances offered on the Q3 auction in August, while emitters bought the remaining 67%. In the Q2 auction in May, the split was 20-80 between financials and emitters.

TREND 4: RISE OF CLIMATE CREDITS

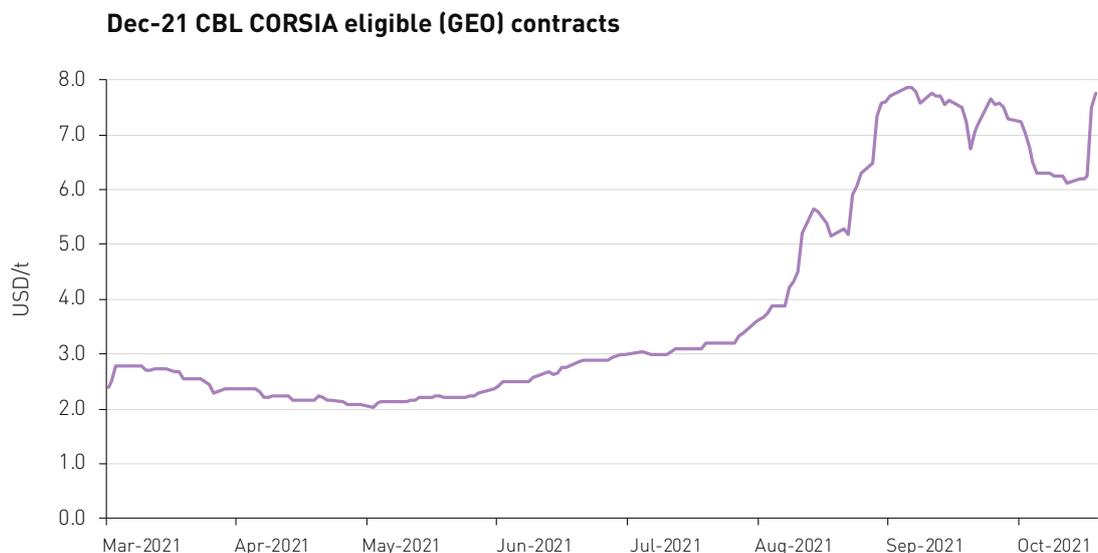
While the large carbon markets around the world are the result of governments putting limits on GHG emissions in selected sectors (and allowing trading to achieve them), individual companies can trade so-called carbon credits or offsets to meet their self-imposed targets. These voluntary purchases of units that represent emissions reduced through projects (such as tree planting or distribution of efficient cookstoves in rural areas) are becoming more popular as firms set long term climate goals similar to governments' pledges. The voluntary market has been growing rapidly over the past two years, mainly because of an increasing number of companies taking on “net zero” and “carbon neutral” targets that require offsetting of emissions the firms can't reduce internally.

Activity in the voluntary carbon market increased 81% from 2019 to 2020, according to Ecosystem Marketplace. The trend has continued this year, with a 27% volume increase already by August. Although more offsets changed hands, average prices declined during the worst of the pandemic period, before rebounding back to pre-pandemic levels in 2021.

Since corporate pledges are voluntary, no governing body defines what “counts” as an offset – efforts to standardise and set benchmarks abound, with those claiming to be most stringent or having the most sustainability benefits typically garnering higher prices. Dedicated exchanges and trading platforms (eg, CBL, AirCarbon) have recently begun offering offset contracts and pricing indices, which provide some aspect of standardisation, particularly for those eligible for the aviation-sector CORSIA programme.

Figure 2 shows the closing price of futures contracts (December 2021 delivery) for CORSIA-eligible offset units traded at the CBL exchange over March to October 2021. The price has tripled from \$2.50 in March to \$7.50 in September, suggesting that CORSIA eligibility is a major boost to an offset's desirability. CORSIA eligible offsets attract all kinds of buyers, most of whom have no compliance under the ICAO scheme.

Figure 2: Price of CORSIA eligible credits



**TREND 5:
GREEN TRANSITION MUST ALSO BE JUST**

The premise of an ETS as a policy tool is that putting a price on carbon via a market mechanism creates a technology neutral incentive to reduce emissions. This will ideally yield a large volume of abated (saved) CO₂, at a low cost. That does not mean an ETS comes without challenges. When it squeezes coal out of the power mix, it serves its purpose of reducing emissions and helping new, green industries, but it also seen by some as a destroyer of jobs, profits, and tax revenues.

Climate policy designs increasingly attempt to incorporate those most affected by climate change policies. Europe's climate revamp includes funding that aims to facilitate a "just transition" toward new careers for the affected workers in coal mining regions, and EU ETS revenues should be used to facilitate the green transition. This is channelled partly through the member states' budgets, partly through the Modernisation Fund and partly through the Innovation Fund, both of which are key aspects of the EU ETS.

The notion that climate policy must be "fair" is gaining extra traction with the recent spike in energy prices, with the European Commission suggesting that member states can use ETS revenues to help struggling households and industries.

California's ETS rules stipulate that a certain percentage of the proceeds from allowance auctions must be earmarked for energy projects in disadvantaged communities, i.e., areas whose population suffers most from higher fuel prices and hotter temperatures.

These efforts aim to address the concerns of the environmental justice movement, which opposes market mechanisms on grounds that they enable companies to "buy their way out" of mitigation requirements and worsen the lot of historically disadvantaged communities.

Many of Europe's main trading partners are suddenly taking carbon pricing more seriously

**TREND 6:
CARBON BORDER ADJUSTMENTS ARE
RAISING THE STAKES**

The EU's planned carbon border adjustment mechanism (CBAM) has stimulated greater interest in emissions trading from regions that were previously not pursuing carbon pricing. The CBAM is a levy on carbon-intensive imports, to protect competitiveness of EU manufacturers, as importers of the goods they produce will face the levy to the extent their production costs don't already incorporate a GHG price.

With implementation of the CBAM coming closer as the policy makes its way through the EU legislative bodies, many of Europe's main trading partners are suddenly taking carbon pricing more seriously:

- China has voiced opposition, but arguably less than some had feared. The country seems to have had Europe's CBAM in mind when making the scope expansion plan for its own ETS (industries that will be included here will not be affected by the CBAM).
- Ukraine is now moving forward with a previously stagnated ETS, as well as increasing its Paris Agreement goals.
- Russia's Special Presidential Envoy for Climate Change has announced plans for the country's pilot ETS to sell offsets and become recognised internationally.
- Malaysia, for whom the EU is a major trading partner in carbon-intensive goods, in September announced plans to establish an ETS to prepare local industry players for the likely implementation of carbon control mechanisms in international trade.

The idea of carbon border adjustments as part of an ETS goes directly to the intersection of climate and trade policies. For Europe, the key objective is to get other countries to increase their abatement efforts, against the threat of being subject to import levies. In Glasgow, COP President Alok Sharma insisted that CBAM was not on the agenda, but it was brought up by Canada at a high-level event on carbon pricing. European Commission President Ursula von der Leyen said Europe will introduce, slowly but surely, a carbon border adjustment mechanism that forces importers of high emission products to pay a price as if they were in the EU ETS. She added: "but we prefer you keep the money in your economy, by putting a price on carbon in your economy".

Anders Nordeng, senior carbon market analyst at Refinitiv. Throughout his 10 years at Point Carbon/ ThomsonReuters/Refinitiv, Anders has covered the EU ETS and other major carbon markets extensively, with in-depth analysis of policy developments.

Hæge Fjellheim, director of Carbon Research at Refinitiv. Hæge has vast experience of carbon market analysis and is a regular speaker at major carbon industry events. Before joining Refinitiv, she took part in several climate summits as part of the Norwegian government delegation.

Harnessing the power of markets to scale up net zero actions

Carbon markets can help deliver on net-zero goals as well as a just transition. **Angela Churie Kallhaug** makes the case for ambitions to scale up

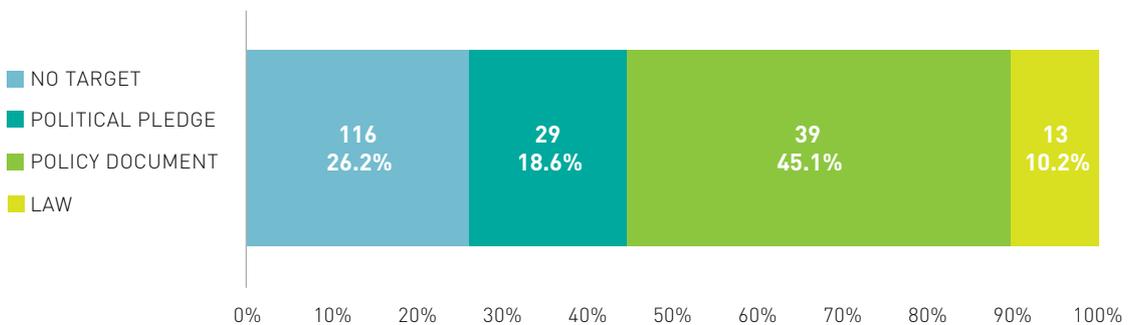
The science is clear: limiting global warming to 1.5°C requires the world curb its annual carbon emissions in half by 2030 and reach net zero by 2050. Non-CO2 emissions must also fall sharply and reach net zero before 2070.¹ According to the latest findings in the first installment of the IPCC’s Sixth Assessment Report, the remaining estimated carbon budget² is about 400 gigatonnes of CO2 (GtCO2), from the start of 2020, for a two-thirds likelihood of staying below the 1.5°C threshold and 500 GtCO2 with an even chance (50%).³ Global CO2 emissions are above 40 GtCO2 per year,⁴ meaning the remaining carbon budget will only last 10-13 years at current levels of emissions and if no additional removals are made.

Urgent and deep cuts of carbon emissions over the next decade are critical. This makes 2021 an important year for climate action to ensure that we are on track to meet the emission reduction targets. An increasing number of countries and companies – especially the financial sector – announced net zero pledges in the lead-up to and at COP26. WRI’s Net-Zero Tracker (Figure 1) indicates that 73 parties (72 countries excluding EU) have pledged a net-zero target covering 73.8% of global GHG emissions.⁵ In addition, 67 regions, 1,049 cities, 5,235 businesses, 441 investors, and 1,039 Higher Education Institutions have announced their own net zero commitments under the UN’s Race to Zero campaign.⁶

Urgent and deep cuts of carbon emissions over the next decade are critical

Despite fast-paced momentum and progress made so far, two important issues remain. First, the latest UNEP Emissions Gap 2021 report concludes that there is still a gap of 25 GtCO2e in 2030 to a 1.5°C pathway even under the best-case scenario, assuming all the NDC targets and announced net-zero pledges are fully implemented (Figure 2).⁷

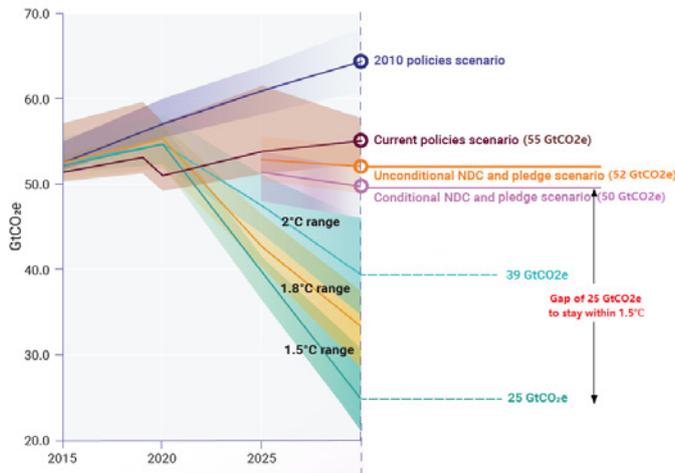
Figure 1. Net zero pledge tracker



Note: Upper numbers show the total number of Parties to the UNFCCC and lower numbers represent the share of GHG emissions covered. Graphic created by author. Data source: Climate Watch.

[1] Special Report: Global Warming of 1.5°C, 2018, IPCC [2] The scale of emissions reductions required to achieve the 2050 net zero target can be illustrated by the global “carbon budget” – the maximum amount of carbon dioxide that can be emitted to stabilise warming to 1.5°C. [3] Climate Change 2021: The Physical Science Basis, 2021, IPCC [4] Emissions Gap Report 2021, 2021, UNEP [5] Net-Zero Tracker, Climate Watch, accessed on 16 Nov 2021 [6] Race to Zero, accessed on 16 Nov, 2021 [7] Emissions Gap Report 2021, 2021, UNEP

Figure 2.
Global GHG emissions gap in 2030 under different scenarios



Note: The current policies scenario is estimated to reduce global GHG emissions to about 55 GtCO₂e in 2030, full implementation of unconditional NDCs and announced net-zero pledges is estimated to bring it down to 52 GtCO₂e, and even further down to 50 GtCO₂e with full implementation of conditional NDCs and net-zero pledges. To stay below 1.5°C in 2100, for a two-thirds chance and with no or limited overshoot, global annual GHG emissions need to be 25 GtCO₂e in 2030. Graphic source: UNEP Emissions Gap Report 2021, modified and created by author.

Second, this raises several important questions about the lack of clarity and consensus around net zero. What exactly does net zero mean and are all such targets aligned with climate science and the Paris Agreement? What are the strategies and pathways to become net zero for countries and businesses at the global, national, and subnational level? Are these pledges truly ambitious and credible, and how transparent is the pathway process? And, finally, what is the role of carbon pricing in galvanising deep decarbonisation and financing socially fair, climate-resilient and just transitions to achieve the net-zero targets?

The Carbon Pricing Leadership Coalition (CPLC), a World Bank multistakeholder initiative that catalyses action towards the successful implementation of carbon pricing around the world, released a report in September from its Task Force on Net Zero Goals and Carbon Pricing to contribute to the common understanding of net zero and to explore the role of carbon pricing in supporting the transition to net zero over the next 10 to 15 years. Key findings from this task force’s report recommend good practice for countries and business in pursuit of fulfilling net-zero commitments.

The CPLC Task Force defined net zero as a state where the sum of all anthropogenic emissions and removals is zero. This means, global net zero will be achieved when human-caused GHG emissions have been reduced to the absolute minimum levels feasible, and any remaining “residual emissions” are balanced by an equivalent quantity of human-caused removals that are permanently stored so that emissions cannot be released into the atmosphere; while carbon neutral is defined as balancing emissions by a corresponding quantity of emission reduction (eg, renewables), avoidance (eg, energy efficiency improvement), or removals (eg, tree planting or engineered CO₂ capture and storage).

Economic theory validates the power and efficiency of carbon pricing as an instrument that can incentivise least-cost emission reductions, emissions removals, drive behavioural change, technological innovation, and investment decisions – particularly for the private sector. This is also supported by the IPCC, which states that “policies reflecting a high price on emissions are necessary in models to achieve cost-effective 1.5°C pathways.”⁸

As such, the expectation is that carbon pricing policies and measures will indeed be an important part of the arsenal of measures that countries will consider driving their climate action. The Task Force notes that for countries, government-imposed carbon pricing policies – in the form of an emissions trading system (ETS) or carbon tax – can be an economically efficient means to reduce emissions, as it incentivises entities subject to the price to find the least expensive emission reductions. For businesses, offsets can provide an avenue to fulfil abatement targets, in addition to pursuing their own science-aligned emission reductions, by compensating for the emissions they cannot immediately mitigate in the short-term.

The revenue raising potential of carbon pricing is immense and should be leveraged to support mitigation and adaptation actions

[8] Summary for Policymakers, Special Report: Global Warming of 1.5°C, 2018, IPCC

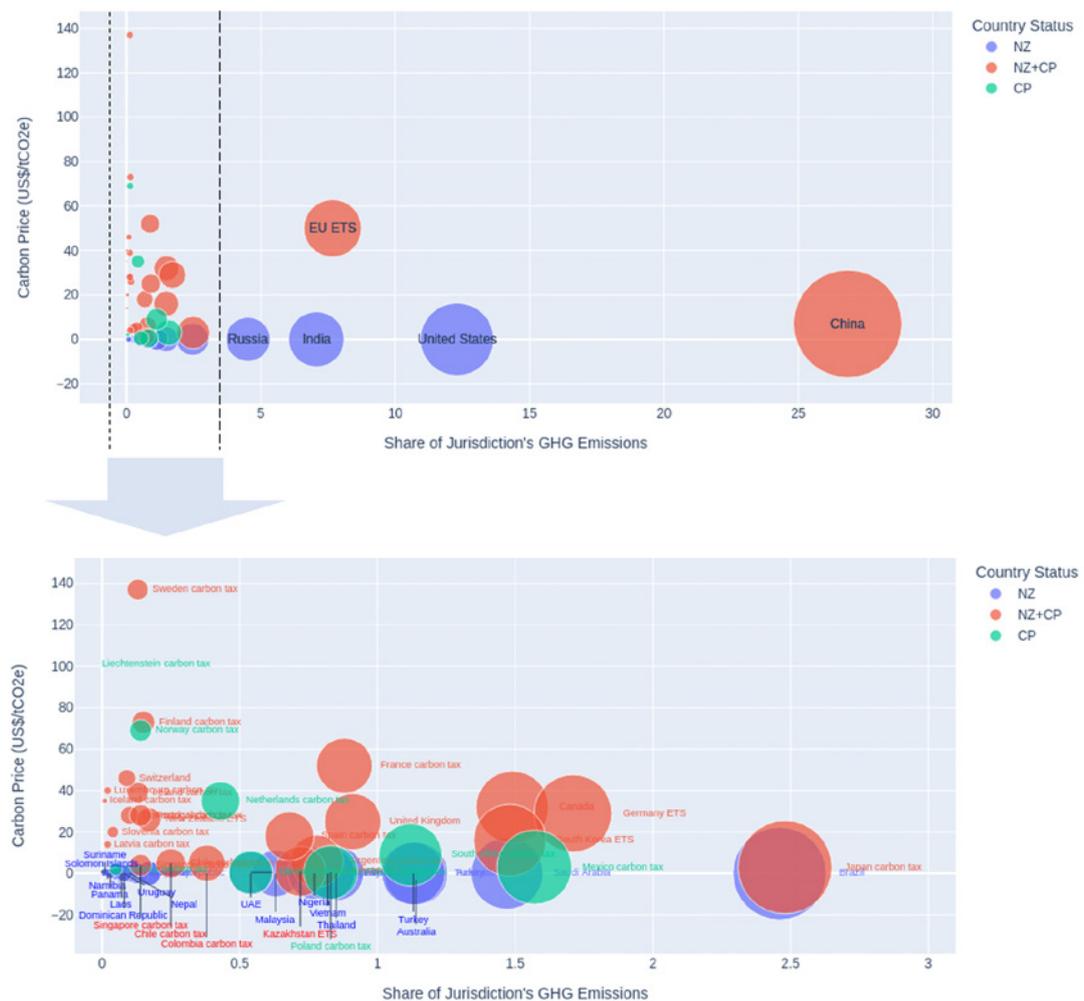
The potential of carbon pricing in driving decarbonisation and steering an economically productive net-zero pathway is still largely untapped

Despite the benefits, the potential of carbon pricing in driving decarbonisation and steering an economically productive net-zero pathway is still largely untapped. Out of the 72 countries that have made a net-zero pledge, only 24 (representing 47% of global GHG emissions) have adopted a carbon pricing policy, but capturing only 16% of global GHG emissions (Figure 3). Among those countries with a price on carbon, only a handful few currently have a carbon price level in the US\$40-80/tCO₂ range as suggested in the CPLC's Stiglitz-Stern report⁹ and which is needed to be Paris-aligned. As of 1 April 2021, only 3.76% of global emissions are covered by a price above US\$40/tCO₂.¹⁰ IMF's analysis indicates that the global average carbon price is required to be at least US\$75/tCO₂ by 2030, and yet it is only US\$3/tCO₂ today.

The CPLC's Net Zero Task Force underscored the need for carbon prices that are high enough to provide effective signals to society, to drive the level of investment and technological changes necessary to reach net zero and be taken in conjunction with complementary policy actions to make carbon pricing relevant across company value chains. This can be achieved by expanding pricing mechanisms and coordination across countries to cover a higher proportion of global emissions. For example, Canada has recently announced a carbon tax programme that is currently at C\$40/tonne and will reach C\$170/t in 2030. Studies also indicate that more and more companies are starting to adopt their own internal carbon price (ICP), mostly with a view to triggering low-carbon investments. In 2020, 853 companies disclosed use of an ICP, with a further 1,159 noting an intention to adopt one over the next two years. This represents a 20% increase above 2019.¹¹

The revenue raising potential of carbon pricing is immense and should be leveraged to support mitigation and adaptation actions, as well as activities to enable a socially fair and just transition. In 2020, carbon pricing instruments generated US\$53 billion in revenue, an increase of around US\$8 billion compared to 2019, largely due to higher EU allowance prices.¹²

Figure 3. Net zero, carbon price and share of GHG emissions covered



Note: The size of the circles is proportional to the share of GHG emissions of each jurisdiction. NZ = net zero, CP = carbon pricing. Emissions data are from 2018. Data sourced from Carbon Pricing Dashboard, World Bank; EDGAR v6.0, European Commission; Climate Watch. Graphic created by author.

Net-zero strategies should support socially fair and just transitions across all regions to be successful

The role of international carbon credit markets and results-based financing help drive financial flows to climate solutions in developing countries, including to protect carbon stocks and enhance removals, for low-carbon development and to support commercialisation of emerging technologies. These could also provide new markets and revenue sources for nations with geological storage capacity and zero-carbon energy resources that could support scale-up and commercialisation of carbon removal services. As such they can also serve to increase the ambition of actions rather than only serve to reduce costs. The recent agreement on Article 6 at COP26 in Glasgow will spur further action in this area as countries and businesses around the world embark on its implementation.

The CPLC Task Force also considered the actions being taken by businesses and other entities, through voluntary initiatives. It noted the importance of maintaining the integrity of these actions, by avoiding double counting, focusing on generation of highest quality credits and aligning these efforts with the global net zero ambition, and where possible supporting an increase in national ambition wherever the businesses operate. The Report called on companies to prioritise the mitigation of their own emissions within their value chains and strive to reduce the use carbon reduction credits as they progress towards achieving their net-zero goal.

The Task Force also explored issues relating to the transparency, credibility, and social fairness of the strategies to achieve net zero. The Report underscored the need for net-zero targets and strategies to be transparent, ambitious, inclusive, and aligned with social and economic development objectives. It further called for the use of robust accounting rules to ensure the avoidance of double counting. The Task Force noted that the use of short- and medium-term targets would be essential to enable the identification and prioritisation of specific sectoral and technological transformations and to drive immediate action and investments to achieve the mid-century goal. It also noted that, for accountability purposes, separate targets for emissions reductions and removals along the trajectory at all levels may be needed. Net-zero strategies should support socially fair and just transitions across all regions to be successful.

Sustaining the efforts over time will require concerted efforts of all stakeholders. Integrating net-zero criteria and reflecting the cost of carbon in investment decisions, including those made by development finance institutions, could provide a strong impetus to long-term planning and investments and support rapid decarbonisation across all economic sectors. Furthermore, the success of these efforts will also depend on the extent to which net-zero strategies support socially fair and just transitions in all regions. Carbon pricing, as a feature of the mix of efforts, does provide the necessary incentives while generating benefits that can be sustained over time. The careful design of such policies, informed by science, lessons learned to date, and adapted to locally specific demands, can enable decarbonisation programmes that are inclusive and effective, and that can contribute to putting the world on a path towards achieving the Paris objectives.

Angela Churie Kallhauge works in the Climate Change Group of the World Bank, where she heads the Secretariat of the Carbon Pricing Leadership Coalition, an initiative that brings together stakeholders from government, business, civil society, academic from across the world to advocate and work to put a price on carbon. She has over two decades of experience working on climate change, energy and development issues in government, academia and civil society around the world. She joined the World Bank in December 2016 from the Swedish Energy Agency where she worked for 14 years on climate change, energy and development issues at the international and national levels. She also spent a couple of years working on climate change and renewable energy programme at the International Renewable Energy Agency. Since joining the CPLC, her focus is on moving the advocacy to action, through advancing the political, social and business case for carbon pricing in a strategic manner that reflects and resonates with specific interests of different constituents.

Maximising climate ambitions

IETA has continued to work with economic modellers at the University of Maryland and the Pacific Northwest National Laboratory to explore the potential for future carbon markets in the coming decades. The economic modelling explored many aspects of policy design choices and their impacts on future market performance. **James Edmonds, Sha Yu and Ieva Steponaviciute** summarise the key findings

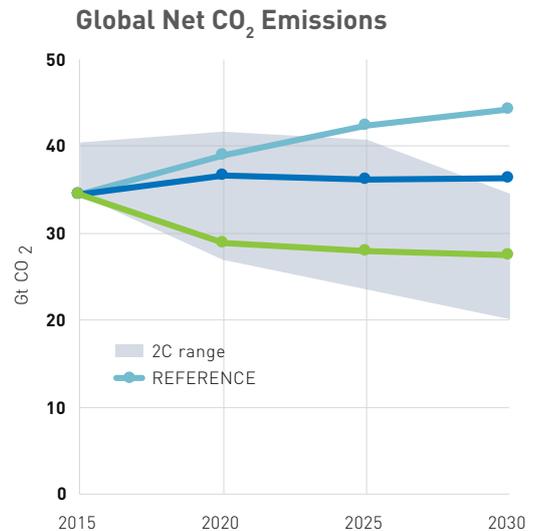
In order to document their research in the peer reviewed literature, the team at the University of Maryland and the Pacific Northwest National Laboratory published a paper entitled How much could Article 6 enhance Nationally Determined Contribution ambition toward Paris Agreement goals through economic efficiency? in the Climate Change Economics journal in June 2021.

While the paper goes deep into issues surrounding the potential for carbon markets, one of the most important findings is, put simply, that implementing Nationally Determined Contributions (NDCs) cooperatively rather than independently through carbon markets could save Parties to the Paris Agreement more than \$300 billion (2015 USD) per year by 2030.

Article 6 was introduced into the Paris Agreement to enable countries to achieve their NDC goals at lower cost, and thus increase governments' appetites for greater ambition. The team aimed to quantify increased ambition levels if the savings from the more efficient cooperative NDC implementation were reinvested to enhance ambition for mitigation. The findings published in the paper revealed that in 2030 that ambition could be more than doubled.

Figure 1 reflects these estimates before 2030. The blue line reflects the calculated potential global emissions without NDCs. The orange line reflects global emissions levels if all NDC goals were achieved, either independently or cooperatively, while the green line reflects the additional ambition that could be achieved if all of the savings potentially available through cooperative implementation of NDCs were reinvested in mitigation.

Figure 1: Global Net CO₂ Emissions. I-NDC, C-NDC and E-NDC pathways reflect country commitments recorded before 28 April 2021. Source: Edmonds et al (2021)



Implementing NDCs cooperatively through carbon markets could save Parties to the Paris Agreement more than \$300 billion per year by 2030

Furthermore, the team found that all parties could enhance their ambition for the same cost as implementing their less ambitious NDC independently. The dramatic increase in ambition comes from several sources. Firstly, carbon markets tend to transfer resources from developed to developing parts of the world. Moreover, they also tend to enable cost-effective nature-based mitigation.

The paper does warn that markets are not magic, as the choice to increase ambition lies with parties and does not automatically result from Article 6. Thus, setting up markets that avoid or at least minimise pitfalls such as leakage, hot air, double-counting, and implicit ambition reductions and which are easily verifiable, is a high priority. On the other hand, all rules need not be contained in the Article 6 rule book. Markets can have their own, more stringent, rules on trades than the official Paris Rulebook.

Reaching net-zero targets

The modelling team further explored the role of Article 6 in pathways to achieving global net-zero CO₂ emissions. These net-zero modelling exercises have been reviewed and discussed in virtual workshops throughout 2021, involving experts from several governments, non-governmental organisations, academic institutions, and businesses, and published as a working paper before COP26.

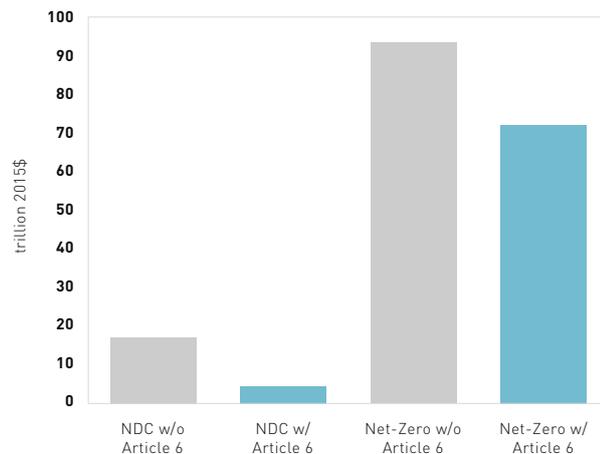
Four net-zero scenarios were explored: two Universal Net-Zero scenarios, where all countries commit to linearly reduce emissions to net-zero in 2050 with either independent or cooperative implementation, and two Staggered Net-Zero scenarios, where lower-income countries set a later date for their net-zero targets based on relative income differences, again with independent or cooperative implementation. Cooperative implementation through Article 6 compatible carbon markets allows countries to achieve net-zero targets with greater economic efficiency. For example, in the Staggered Net-Zero scenarios, cooperative implement could yield economic savings of \$21 trillion between 2020 and 2050 (Figure 2).

Although physical transfers of carbon credits get smaller as countries reach net-zero emissions, the market value of financial flows between countries increases over time, exceeding \$1 trillion per year in 2050 under both Universal and Staggered Net-Zero scenarios, driven by a sharp rise in global carbon prices. However, equity concerns arose when simulating a scenario where all countries tried to achieve Net-Zero in 2050, because some developing regions, such as India and Southeast Asia, emerged as buyers of carbon credits – and some developed countries become sellers.

The Staggered Net-Zero scenarios allow flexible timing by relaxing the assumption that all countries reach net-zero simultaneously in 2050. Instead, the achievement of net-zero emissions is brought forward by five years in countries that already have a target and pushed back after 2050 in some developing regions, staggered according to their economic development. Doing so would mean that countries responsible for 97% of 2020 emissions would reach net-zero by 2060. While this

All parties could enhance their ambition for the same cost as implementing their less ambitious NDC independently

Figure 2: Mitigation cost between 2020 and 2050 with independent (w/o Article 6) and cooperative (w/ Article 6) implementation of climate targets. Mitigation costs for the two NDC scenarios are adapted from the Climate Change Economics paper, and mitigation costs for the two net-zero scenarios are from Staggered Net-Zero scenarios in the net-zero working paper.



Sources: Edmonds et al. 2021; Yu et al. (2021).

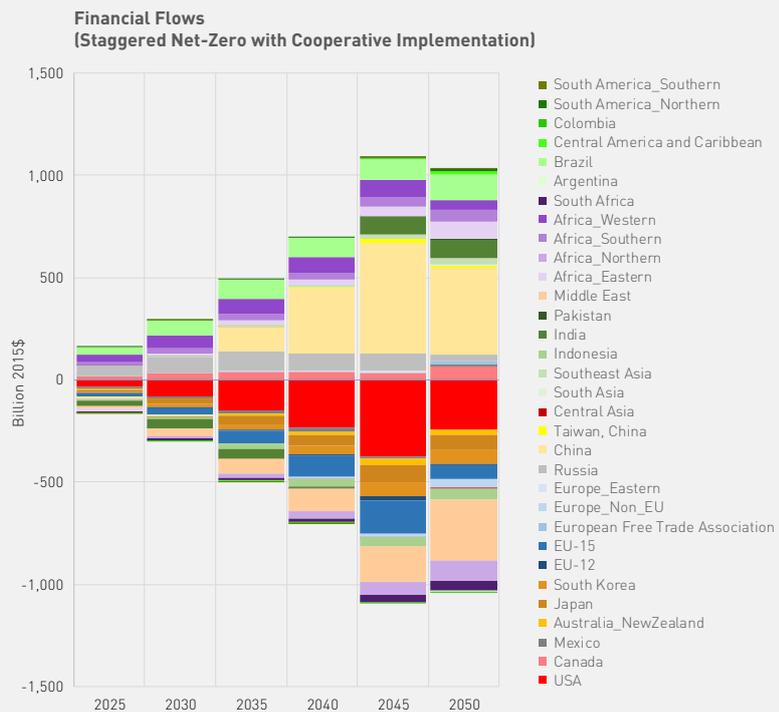
delay in achieving global net-zero emissions would lead to higher short-term temperature increases, it is still consistent with the Paris goal of limiting climate change to “well below” 2°C because of the increase in ambition by capable Parties.

Article 6 compatible mechanisms will drive an increase in land use and nature-based carbon sinks, such as decreasing deforestation and increasing afforestation and reforestation. Land sinks play a prominent role in the near term, whereas carbon sequestration technologies, including bioenergy with carbon sequestration and storage, become increasingly important towards 2050.

Article 6 cooperation can also shift capital investment from developed to developing regions (Figure 3) where it can achieve more mitigation. In particular, the Staggered Net-Zero scenario with cooperative implementation prompts growth in investment flows to China, India and most of Southeast Asia. Latin America, the Caribbean and most of Africa also become sellers of carbon credits. This shift in financial flows can create ancillary sustainability benefits, such as improved air quality, accelerated renewable energy deployment, and new energy infrastructure.

References: [1] Edmonds, J., Yu, S., Mcjeon, H., Forrister, D., Aldy, J., Hultman, N. et al. (2021). How Much Could Article 6 Enhance Nationally Determined Contribution Ambition Toward Paris Agreement Goals Through Economic Efficiency? *Climate Change Economics*, 12(02), 2150007. <https://doi.org/10.1142/S201000782150007x> [2] Birol, F. COP26 climate pledges could help limit global warming to 1.8 °C, but implementing them will be the key. *International Energy Agency*, 4 November 2021. <https://www.iea.org/commentaries/cop26-climate-pledges-could-help-limit-global-warming-to-1-8-c-but-implementing-them-will-be-the-key> [3] Du, Y., Iyer, G., Clarke, L., Edmonds, J., Fawcett, A. A., Hultman, N. et al. (2021). Can updated climate pledges limit warming well below 2°C? *Science*, 374(6568), 693–695. <https://doi.org/10.1126/science.abc8976> [4] UNFCCC, 2021. Nationally determined contributions under the Paris Agreement Revised synthesis report by the secretariat. *FCCC/PA/CMA/2021/8/Rev.1*. https://unfccc.int/sites/default/files/resource/cma2021_08r01_E.pdf [5] Yu, S., Edmonds, J., Forrister, D., Munnings, C., Hoekstra, J., Stepanovicute, I. et al. (2021). The Potential Role of Article 6 Compatible Carbon Markets in Reaching Net-Zero. University of Maryland and International Emissions Trading Association. https://www.ieta.org/resources/Resources/Net-Zero/Final_Net-zero_A6_working_paper.pdf

Figure 3:
Financial transfers between regions in the Staggered Net-Zero scenario with cooperative implementation (Sellers >0; Buyers <0).



Source: Yu et al., 2021.

The path forward

COP26 has seen a long-awaited completion of the Article 6 guidance, a flurry of updated national pledges, and an agreement to strengthen 2030 commitments by the next COP. Recent work trying to quantify the impact of the NDC updates made in the lead-up and during COP26 suggests that the new pledges may enable limiting the global temperature increase to below 2°C if they are kept (IEA, 2021; Ou et al. 2021). The future looks bright for carbon markets, as the number of Parties showing interest in voluntary cooperation under Article 6 has been growing: 85% of Parties who submitted updated NDCs pre-Glasgow indicated the possibility of using voluntary cooperation, almost doubling from 46% in the previous NDCs (UNFCCC, 2021).

The completed Article 6 guidance sets up a new structure for carbon markets in the service of the Paris Agreement goals. The decisions provide clear accounting guidance for emissions trades between countries and launch a new crediting mechanism that will give access to all countries interested in attracting green investment through carbon markets. In particular, IETA warmly welcomes the ambitious outcome on corresponding adjustments as this will assure full integrity in the accounting system from the inception of the mechanism. It is now up to countries to develop national strategies and policy frameworks that harness the potential of markets. In 2022, IETA will work with UMD/PNNL to explore this exciting new landscape and understand how carbon markets can help deliver on the enhanced ambition we all need.

Markets are not magic, as the choice to increase ambition lies with parties and does not automatically result from Article 6

Jae Edmonds is a researcher at the Joint Global Change Research Institute a collaboration between the Pacific Northwest National Laboratory (PNNL), where he is Chief Scientist and Battelle Fellow, and at the University of Maryland in College Park, where he is College Park Professor of Public Policy. He is one of the pioneers in the field of integrated assessment modeling of global change and in 1978, he began what has developed into the Global Change Assessment Model, a frontier-class integrated model of energy, economy, water, land and climate interactions. His research focuses on interactions between global and regional energy, technology, economy, land, water, atmosphere, and climate systems and global change. His most recent work focuses on international emissions trading and scenarios for climate finance risk. He has been a Lead Author in all six of the major assessments of the Intergovernmental Panel on Climate Change. He is an active member of the Integrated Assessment Modeling Consortium (IAMC), serving on the Scientific Steering Committee, manages the IAMC's external Advisory Council and co-chairing two Scientific Working Groups. He serves on numerous committees, panels and advisory boards. In 2020 the IAMC honored him with its Lifetime Achievement Award.

Dr. Sha Yu is a senior scientist at the Pacific Northwest National Laboratory and also holds a joint appointment at the University of Maryland. Her research focuses on net-zero transitions and implications for energy and economic systems.

Ieva Steponaviciute is a research analyst at IETA covering international policy. She joined the team after three years at Amazon and previously studied carbon pricing and environmental diplomacy through a double degree in Mathematical Economics and International Relations at Colgate University.

Carbon, borders, and trade

Andrew Hedges takes a close look at the EU's proposed carbon border adjustment mechanism and how the intersection of trade and climate policies could lead to greater ambition

In the coming years, the world will continue to see marked divergence between countries on the pace of change within their economies to align with the Paris Agreement. While this has been a common feature of the international landscape for some years, the acceptance of this by climate leaders such as the EU is changing. Leading countries and regions recognise that, to maintain their economies while driving change, they may need to use trade policy to level the playing field. In tandem, policymakers hope that such measures will prompt affected countries and sectors to accelerate climate action.

The EU's proposed Carbon Border Adjustment Mechanism (CBAM) provides a good example for considering the drivers for such action; the broad structure for climate orientated import rules; and the implementation challenges these pose. Canada's federal government is also consulting on a CBAM that, whilst at a much earlier stage, focuses on similar elements and issues as the EU approach. In the US, too, the Biden administration has discussed a similar initiative (although the likelihood of this proceeding is fading).

EU CBAM: why, how and when?

The European Commission released detailed proposals on an CBAM in mid-July as part of a wider package of reforms designed to implement a target of a 55% reduction in carbon emissions by 2030.

The EU (driven by industry) has been concerned for many years that taking climate action will cause certain key industrial sectors to become less competitive with non-EU producers of similar goods and risk carbon leakage. This has been a constant issue since the introduction of the EU Emissions Trading System (ETS).

There have been internal policy tools to manage carbon leakage for some years; the development in recent years is why these are no longer considered sufficient. In brief, the EU recognised that its ambitions had increased to the point that existing internal policy tools were unsustainable. Further, the structure of the CBAM proposals would potentially offer a very significant revenue generation to assist pay for the societal transformation required (potentially in the order of €13-14 billion by 2030). Additionally, the proposals can be seen as a stick for the EU to drive change globally.

The world will continue to see marked divergence between countries on the pace of change within their economies to align with the Paris Agreement

At a high level, the proposed regulation obliges importers of certain products to purchase CBAM certificates matching the embedded emissions associated with that product, unless certain exemptions apply. It will be introduced on a transitional basis starting in 2023, with full implementation for covered products from the start of 2026. The initial products to be covered are cement, electricity, iron and steel, fertilisers and aluminium. An importer of these products will need to annually submit CBAM certificates matching the embedded emissions of those imports or face financial penalties. The price for CBAM certificates will be set weekly at the average price of auctioned EU ETS emission allowances for that week.

The general approach is to use actual emissions calculations, but the use of default values is allowed where actual emissions are not available. Although the draft regulation specifies a formula for the determination of the embedded emissions of a covered product, the regulation also envisages the European Commission developing detailed rules. Such rules are likely to be highly technical but will form an important precedent. Many sectors are currently developing approaches to determining embedded emissions associated with products. This is an area where greater standardisation is needed, as well as technology solutions to deliver interim determinations at or near the time of delivery.

In terms of driving change outside of the EU, the key element is that, where it can be demonstrated that declared embedded emissions were subject to a carbon price in the country of origin, the liability to submit CBAM certificates will be adjusted. A "carbon price" is defined as "the monetary amount paid in a third country in the form of a tax or emission allowances under a greenhouse gas emissions trading system, calculated on greenhouse gases covered by such a measure and released during the production of goods." It is important to note that the EU approach does not currently recognise the potential role of carbon offsets.

There is the medium-term possibility that the operation of a CBAM can drive change in certain countries and sectors

Will carbon border adjustments drive change?

On the spectrum of possible outcomes from the introduction of carbon border adjustments, one of the more likely is disgruntled trade partners initiating challenges under World Trade Organization (WTO) rules. WTO disputes regarding trade issues arising from environmental measures date back decades. The likely focus for CBAM-related challenges will be on issues such as whether the final mechanism breaches binding tariff arrangements, discriminates between imported products and domestic products, amounts to a prohibition on certain types of imports, or amounts to discrimination among countries. It is noteworthy in this regard that the Ministerial Conference of the WTO in Geneva in December 2021 is likely to include discussions on the interface of trade policy and the environment, including border adjustments.

Whatever the possible WTO arguments for and against carbon border adjustments, the wider risk is that climate-driven trade policy will lead to retaliatory action by EU trade partners. The most affected trade partners (determined by product and import levels) include significant producers of CBAM targeted commodities such as Russia and China.

However, challenges or trade disputes can also lead to compromise solutions that support the EU's ambitions. A case in point is the attempt some years ago on the part of the EU to apply EU ETS obligations on all international flights landing or taking off in the bloc, for the entire duration of the trip. The EU was forced to back down, but its efforts drove a process that ultimately led to the aviation sector making commitments to address emissions. A similar dynamic could occur in the context of carbon border adjustments, whereby initial disagreement leads to negotiated solutions (although the greater the difference in solutions agreed with different trade partners, the more likely there is for a successful WTO challenge).

An example of how this could play out can be seen in the recent EU-US agreement on green steel and aluminium. In the next two years, they plan to agree on an arrangement that would promote a more sustainable steel and aluminium industry, including domestic policies to support the production of low-carbon steel and aluminium and to ensure that their policies for greener steel and aluminium are not circumvented by imports from other countries. This kind of arrangement indicates that the EU may be open to flexing what it will require under CBAM to demonstrate compliance (for example, a regulatory driven low-carbon solution rather than having to show that production is subject to a carbon price).

On a more positive note, there is the medium-term possibility that the operation of a CBAM can drive change in certain countries and sectors. Where, for example, the EU is seen to be generating significant revenues by imposing carbon costs on imports, many countries may recognise that imposing such costs at the point of origin (thereby avoiding the EU application of CBAM) would enable that country or industrial sector to be transformed. Indeed, Russia is already undertaking efforts to create a domestic carbon market amid concerns about the EU's policy's impact.

One area that policymakers in the EU and elsewhere should consider enhancing is the approach to what is an appropriate response measure to avoid a carbon border adjustment. For example, the EU is focused on a monetary liability in the country of origin. This seems overly narrow and does not align with the developments in industry of the use of verified emission reductions or removals in offsetting emissions associated with a product. For example, if a Russian producer of steel for the EU could show it had purchased certificates associated with the storage of CO₂ in a carbon capture and storage (CCS) facility meeting the EU CCS directive requirements, why should this not be a legitimate response measure?

Trade policies based on climate action and impacting on products and services will be an increasingly common feature of the landscape in coming years

Trade policies based on climate action and impacting on products and services will be an increasingly common feature of the landscape in coming years. The EU, as is often the case, will lead with initiatives such as CBAM. It is also possible that the EU will not be alone in this. At a political level, trade policies that impose costs on imports may form an attractive solution for convincing electorates to support sweeping changes. Whether they succeed or not, it is likely that they will drive important discussions between trade partners. At a practical level, they are also likely to drive the standardisation of approaches to determining the embedded emissions of a given product.

Andrew is a Partner at Baker McKenzie LLP, where he works across the energy transition and decarbonisation space, including carbon trading, climate finance, corporate renewable energy procurement and project development. He has been involved in carbon markets since 2004, with a long history with nature-based solutions in the voluntary markets.

Broadening the scope

Emissions trading is increasingly being applied to sectors beyond the more conventional power and industry. **Stefano De Clara** and **Kai Kellner** set out the trends and prospects for ETS sectoral expansion

As jurisdictions around the world set more ambitious climate targets, many established and emerging emissions trading systems (ETSs) are looking to expand coverage beyond the 'traditional' sectors of power and industry to meet emissions reductions goals. ETS sectoral expansion, either by broadening the programme's scope or by developing separate ETSs to cover additional sectors, is high on the agenda in Germany, the EU, in New Zealand and elsewhere. While sectoral expansion is a novel discussion topic for some jurisdictions, there are already multiple examples of ETSs that have expanded coverage beyond the power and industrial sectors. This is the case for example in New Zealand, California, Quebec, the Republic of Korea, in some of the Chinese pilots and in many other systems.

Rationale for sectoral expansion

To achieve deep decarbonisation and meet 2050 net-zero emissions targets, it is crucial to extend the reach of carbon pricing beyond only energy and industry and tap the mitigation potential of other sectors, including fuels, forestry, and aviation. ETSs can be designed to achieve this purpose and there are successful examples of how that has been done around the world, as shown below. There are several compelling arguments for sectoral expansion. A broad ETS scope means the system encompasses a greater portion of the overall emissions, giving more predictability and certainty on emission targets. Including a larger number of sectors also increases the potential to achieve cost-effective emissions reductions because there is a wider array of abatement options. Furthermore, broad coverage can reduce the likelihood of competitiveness impacts that may arise if one sector or type of emitter is included but another is not. Lastly, a broader scope may improve the operation of the resulting carbon market since increasing the number of market participants creates better liquidity and a more stable carbon price.

To achieve deep decarbonisation and meet 2050 net-zero emissions targets, it is crucial to extend the reach of carbon pricing beyond energy and industry

Current ETS sectoral coverage

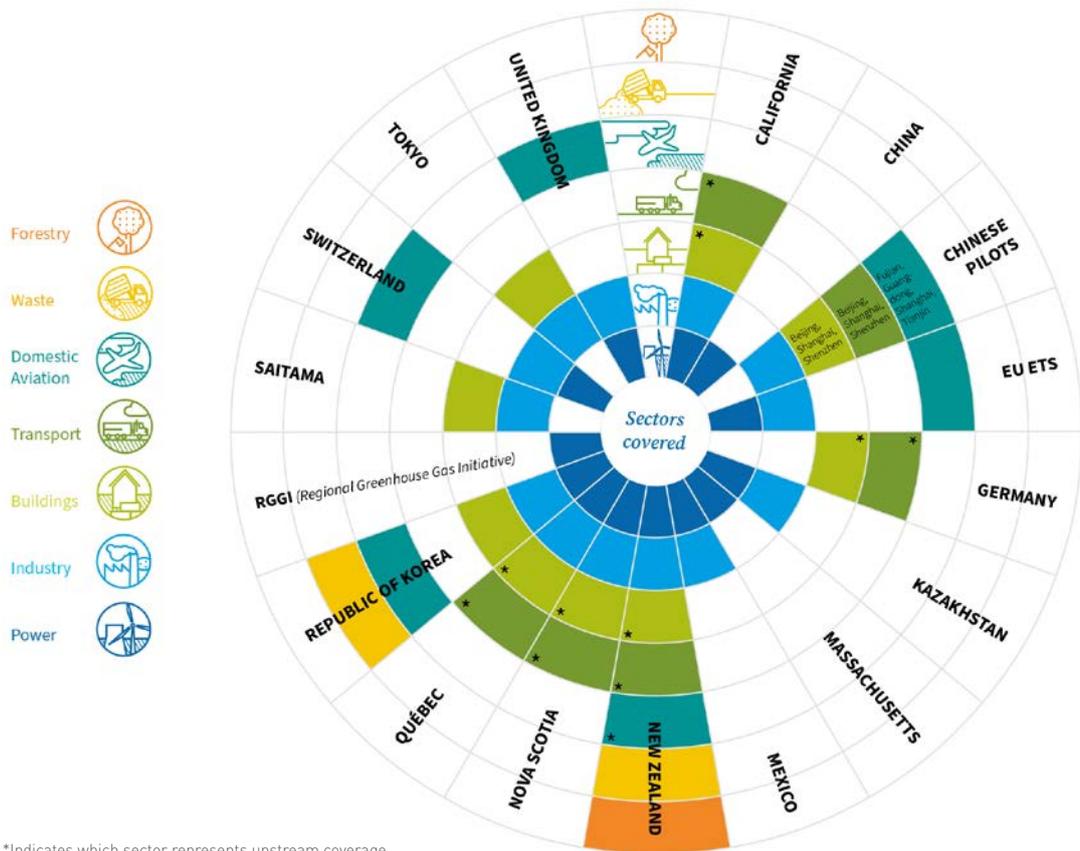
Most of the existing ETSs cover CO₂ emissions from the power sector and from industrial processes. More specifically, that means they cover emissions arising from the combustion of fossil fuels for electricity generation and large-scale centralised heat production, industrial energy emissions (eg, from burning fossil fuels in furnaces) and process emissions from high emitting industries, including iron and steel, cement, aluminium, chemicals and plastics, pulp and paper, and ceramics.

Most ETSs cover the power and industrial sectors because these sectors are, for several reasons, particularly well-suited for this policy tool. The power sector offers significant potential in reducing emissions as emitters typically are large point sources with a diverse set of relatively cost-effective mitigation options. For very similar reasons, ETSs have strong potential to incentivise abatement in the industrial sector.

Generally, an ETS is particularly effective when covered entities have technologies at their disposal to reduce their emissions, when sectors with a high consumption of fossil fuels are covered, and when covered sectors have relatively low abatement costs. Under these circumstances, an ETS can leverage emissions reductions through several avenues including through short-term operational decisions at plant level, the (earlier) retirement of particularly high-emitting plants or appliances or by incentivising (earlier) low-carbon investments in industry.

But the sectoral coverage of ETSs worldwide goes, in a number of jurisdictions, well beyond the power and industrial sectors, as shown in Figure 1 on the next page.

Of the 24 ETSs currently in operation, 19 cover emissions from other sectors of the economy such as (road) transport, aviation, buildings, waste and forestry. While the forestry sector (removals resulting from forest land use, including forest management, deforestation and re/afforestation activities) is only covered by New Zealand's ETS and waste sector emissions from waste disposal and management is only included in New Zealand's and the Republic of Korea's ETSs, the coverage of aviation, transport and building sector emissions are more common: 11 ETSs are currently covering emissions from the combustion of heating fuels used in buildings, nine cover emissions from domestic aviation and eight include emissions from the combustion of (road) transport fuels.



*Indicates which sector represents upstream coverage

Note: Agriculture is a major source of biological emissions; however, the sector does not yet face direct compliance obligations under any existing ETS. Currently, in New Zealand, agricultural emissions must be monitored and reported under the ETS, and some offset programs (e.g. California) allow for offset projects in the sector.

Estimating agricultural emissions is much more challenging than in other sectors

Examples of sectoral expansion

While sectoral expansion has clear benefits, outlined above, it also presents some challenges. For example, covering the transport and building sectors could present additional challenges compared to the electricity generation and industrial sectors, as these sectors contain multiple emission sources, such as motor vehicles, ships, and aircraft as well as homeowners whose heating systems require fossil fuels. Hence, emissions are usually covered upstream with transport and heating fuel distributors facing compliance obligations to avoid the administrative burden of tracking many diffuse or remote emissions sources.

Agriculture is another major source of emissions, however, since agricultural emissions tend to be dispersed over time and space, and because biological processes produce heterogeneous emissions, pricing, controlling, and estimating agricultural emissions is much more challenging than in other sectors. That is why the sector

does not yet face direct compliance obligations under any existing ETS although New Zealand requires that biological emissions from agriculture must be reported with an attempt to cover biogenic emissions from agriculture from 2025, with a levy or rebate system that will operate in parallel with the New Zealand ETS.

It is worth looking at how some systems have approached the coverage of sectors others than energy and industry to understand how some systems have dealt with these challenges. In California, for example, regulators have placed the point of obligation at the terminal where gas is distributed to avoid burdening thousands of gas stations across the state with reporting requirements. Since gasoline is taxed by the state outside of the California ETS, this means that distributors are already used to reporting requirements and thus do not face an additional administrative burden under the ETS. In Québec, the ETS is also designed to cover fuels by placing the compliance obligation on the first distributor that dispenses fuel when it enters the province.

Germany launched a national fuel ETS (nETS) in 2021 that mainly covers fuels used in the heating and transport sector. The German government specifically opted to use a stand-alone ETS due to challenges in expanding the EU ETS to cover fuels. The nETS places the compliance obligation on fuel distributors and suppliers, covering fuels that are combusted further down in the supply chain. While fuel oil, LPG, natural gas, gasoline, and diesel are covered from 2021, other fuels such as coal will be covered from 2023 onwards.

Including a larger number of sectors increases the potential to achieve cost-effective emissions reductions because there is a wider array of abatement options

Shortly after Germany started operating its fuel ETS, the European Commission released plans to broaden the scope of the EU ETS to transport and building sector emissions as well. According to the proposal in the Fit-for-55 package, the EU on the one hand aims to include maritime sector emissions into the EU ETS while also proposing to introduce a new and separate market mechanism that exclusively covers emissions from the combustion of fuels for the road transport and heating sector. According to the proposal, monitoring and reporting obligations for the latter would start from 2025 ahead of the 2026 start of the compliance obligation. Fuels would be covered upstream at the point of distributors, importers and refineries. To avoid double coverage with the existing EU ETS, the new system would grant ex-ante exemptions and ex-post compensations to companies that would face a carbon cost under both programmes.

Lessons learnt from sectoral expansion

Looking at these examples, it's clear that there is no single recipe for sectoral expansion, but instead many different approaches are possible. For instance, some systems have implemented a broad sectoral coverage from the outset, while others have added new sectors over time. Another key difference, determined by the characteristics of the sectors covered by an ETS among other things, is that in some jurisdictions the ETS acts as a primary tool to drive decarbonisation in a certain sector, while in others it is a backstop instrument guaranteeing a certain emissions outcome in case companion policies are underdelivering. The point of regulation, meaning where the compliance obligation is placed, can also change depending on the characteristics of the sectors covered.

Last but not least, whether and how beneficial it is to include a certain sector depends on a number of specific circumstances, including its share of overall emissions, the technical and economic potential for emissions reductions, and the administrative capacity and political context.

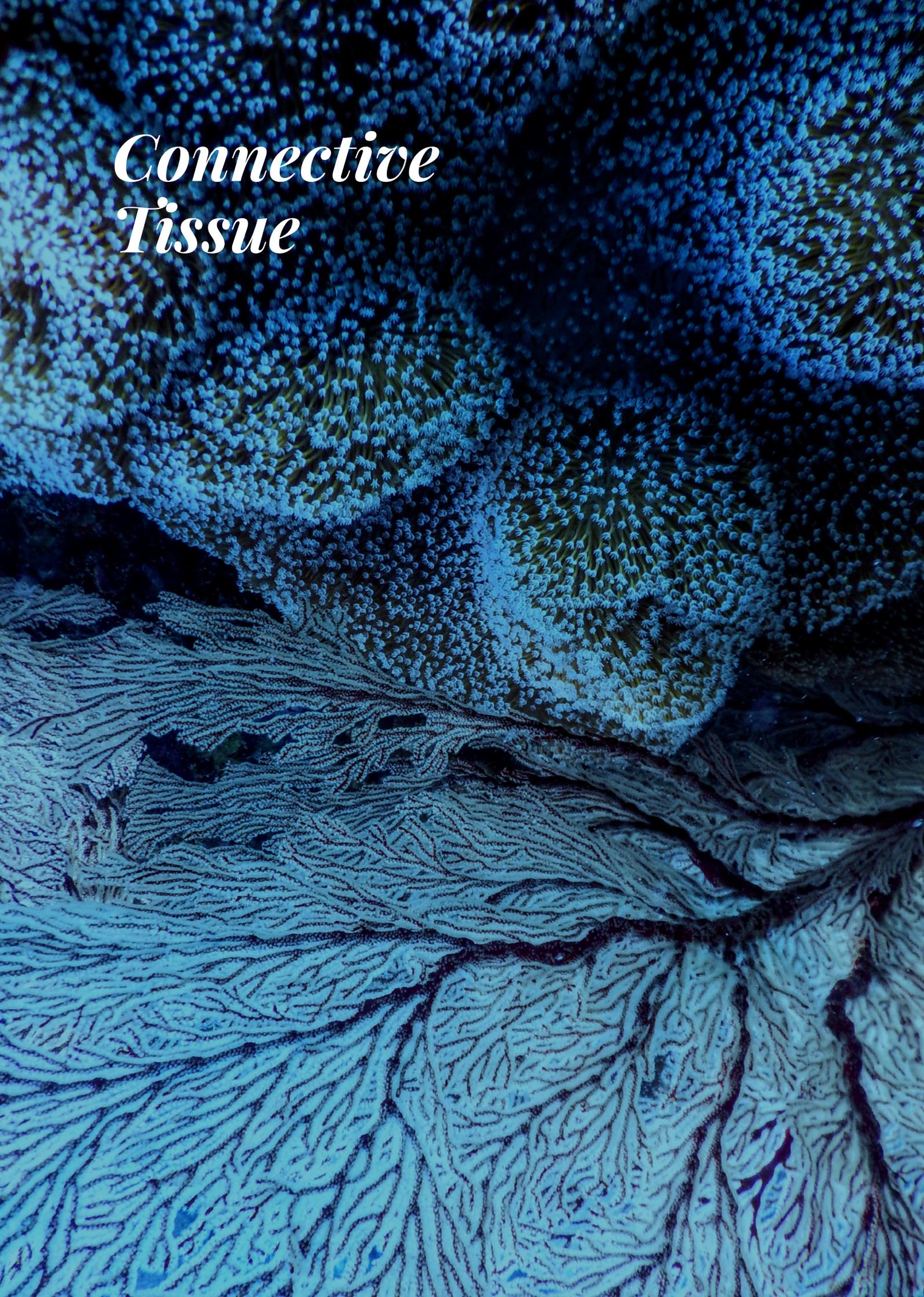
As with many aspects related to the world of emissions trading, a 'one size fits all' to sectoral expansion is not possible, but whether and how ETS coverage can be expanded depends on a number of different variables. Ultimately, every jurisdiction has to find the model that best suits its conditions, but the need to decarbonise economies at a rapid pace calls for the importance of ensuring that as many sectors as possible are exposed to a carbon price. In this context, ETSs could play a prominent role by expanding the scope to sectors beyond power and industry.

Stefano De Clara is the Head of Secretariat at ICAP, the International Carbon Action Partnership. ICAP is a forum, counting 33 members and six observers, for governments and public authorities that have implemented or are planning to implement emissions trading. Stefano leads ICAP's work across the three pillars of technical dialogue, ETS knowledge sharing and capacity building. Before his current role, Stefano was the Director for International Policy at IETA. Prior to joining IETA he focused on emissions trading in the Academia and for consulting companies. He holds a M.Sc. in Sustainable Development from the Utrecht University and a B.Sc. in Environmental Science from the University of Trieste.

Kai Kellner is a Project Manager at the Secretariat of the International Carbon Action Partnership (ICAP), where he analyses emissions trading in North America and Europe and contributes to ICAP reports, studies and articles on various technical aspects and ETS design elements. Most recently, he focused on ETSs and their contribution to net-zero emissions targets. He also organises and helps implement a range of capacity-building activities for decision makers at national and regional levels regarding the development and implementation of emissions trading systems worldwide.

Estimating agricultural emissions is much more challenging than in other sectors

Connective Tissue



What we mean by carbon credits and carbon projects:

And why they matter

With increasing pressure on governments to increase their ambition and on companies to set net zero targets, the focus on the role of carbon credits has been brought to the forefront. But what exactly are carbon credits, and how do they play a role in helping achieve the Paris Agreement's goal of reaching net zero emissions by 2050? **Maria Carvalho** has the answers

Project-based carbon finance, or the payment for a reduction of GHG emissions (generally measured in tonnes of carbon dioxide for simplicity's sake) has been around for a long time. It is used both in compliance as well as in voluntary carbon markets. Projects that prevent, reduce or avoid emissions are called carbon projects, and they range from forest protection activities, to replacing cookstoves that burn kerosene with clean cookstoves, to planting trees and direct air capture technologies (which actually remove emissions from the atmosphere and store them). A project generates carbon credits when it can prove that emissions have been prevented from reaching the atmosphere. The sale of carbon credits goes to pay for the capital, implementation and certification costs of the project.

This form of financing is unique because each carbon credit represents payment of proven results. When it comes to moving the dial on climate, these results are not just important for those who supply credits, but also for those who buy credits.

Why do carbon credits matter?

Financing via carbon credits is critical in catalysing faster climate action: it attracts funding to eligible and deserving projects that will dramatically reduce emissions in the near term. Buying carbon credits literally reveals the price companies are willing to pay to compensate for the climate impact of their emissions. Chief Financial Officers need to think critically about how they want to allocate their budgets, between reducing their own emissions or buying carbon credits to compensate for the climate impact of their entire carbon footprint. This incentive to reduce internal emissions only increases as the price for carbon credits goes up with demand exceeding supply. Higher credit prices creates the business case to develop more ambitious carbon projects.

Financing via carbon credits is critical in catalysing faster climate action

What do we mean by the integrity of carbon credits?

The critique against carbon credits, historically, is that the market is 'murky' or complex. However, it is just the opposite!

Carbon credits represent the most independent assessments of impact financing. In order to demonstrate impact, carbon credits need to prove they supported mitigation activities that would otherwise not have occurred without the technical and financial support brought by the project's implementation. What makes carbon credits so robust and transparent is that they are certified by independent organisations called carbon standards, rather than being 'self-reported' impacts whose calculations are unclear.

Carbon standards have requirements, protocols and methodologies to ensure each credit certified represents real impacts that can be measured and independently verified by an accredited organisation. These independent assessments ensure the robustness of monitoring, reporting and verification systems used by carbon projects to measure impacts that go beyond a well-defined baseline, are permanent (ie, mitigate risks of emissions being released), and uphold sustainable development. Carbon standards also have databases that can track the issuance, transfer and retirement of carbon credits by assigning each one with unique identifiers. These unique identifiers enable the traceability of each credit to its original project, and also ensures no two buyers can retire the same credit to compensate for their emissions.

The use of carbon credits can go a long way towards raising – rather than undermining – climate ambition of buyers

However, not all carbon standards are equal in terms of their quality of certification. High quality carbon credits are those certified by the most robust and credible carbon standards. In 2008, the International Carbon Reduction and Offset Alliance was set up to assess and endorse those carbon standards that upheld its Code of Best Practice. More recently, the Taskforce on Scaling the Voluntary Carbon Markets has taken on the task of defining 'core carbon principles' to certify carbon projects and assess the carbon standards who uphold these principles.

How can carbon credits raise – rather than undermine – ambition?

The perennial risk of using carbon credits to offset emissions is that it may lessen a company's willingness to reduce its own emissions. However, in order to further minimise the risk of greenwashing, mechanisms can be designed so that buyers only use carbon credits to compensate for the climate impact of their unavoidable emissions.

What is an unavoidable emission? It is one that a company really can't avoid at this time, but might be able to in the future, as new technologies are developed. For example, shipping companies cannot currently revamp their ships to run on renewable energy, and still stay in business. Both governments and sectoral initiatives need to determine which emissions are unavoidable, based on existing policy incentives; the maturity, cost-effectiveness and access to abatement options; and the risk of carbon leakage.

Figure 1: Market Size by Traded Value of Voluntary Carbon Offset, Pre-2005 to 31 August 2021



Figure 2: Market Size by Traded Volume of Voluntary Carbon Offset, Pre-2005 to 31 August 2021



However, it's still clear that we are running out of time. Different economic sectors need to undertake radical transformations. So, how can we push climate action along, and ensure that ambition grows fast enough? Both governments and voluntary initiatives, such as the Science Based Targets initiative (SBTi), can play a key role. With the right rules, regulation and guidance, the use of carbon credits can go a long way towards raising – rather than undermining – climate ambition of buyers.

RAISING AMBITION IN COMPLIANCE SCHEMES

In the case of a compliance scheme, governments can use carbon credits to 'plug the emissions gap' for more ambitious and stringent compliance – particularly in meeting net zero targets. For example, companies can help their governments exceed national net zero targets by buying credits from projects in other countries at a lower cost than it would be to reduce emissions in their own country. This way, carbon credits act as a cost containment measure for emissions that are covered under compliance schemes, but that are difficult or very costly to avoid.

However, governments must be willing to adopt ambitious targets and put safeguards in place so that the use of carbon credits does not dilute the carbon price signal. To ensure the environmental integrity of the compliance scheme, the incorporation of carbon credits into compliance schemes must achieve greater emissions reductions than if carbon credits were not allowed.

Possible safeguards include putting quantitative and/or qualitative restrictions on the use of carbon credits. For example, most national and sub-national jurisdictions that allow carbon credits to be used for compliance have quantitative restrictions. Governments can also put qualitative restrictions to ensure carbon credits are certified by high quality carbon standards, and only to specific types of projects, and geographies.

Reporting how many carbon credits are surrendered in comparison to the company's carbon footprint helps understand the significance of finance

RAISING AMBITION IN VOLUNTARY CORPORATE ACTION

In contrast, voluntary use of carbon credits cannot be used by companies towards their corporate reduction targets. In other words, a company can use carbon credits to compensate for their current emissions, but they cannot claim it is part of their emissions reduction strategy because the credits don't represent their own reductions, but rather the financing of someone else's efforts.

This 'no net accounting' rule is adopted by both the SBTi and the GHG Protocol by requiring companies to transparently disclose their Scope 1, 2 and 3 emissions, and separately disclose how they are financing greater climate action by the amount of carbon credits they have surrendered. This rule is singularly essential in creating a transparent accounting framework to see exactly how much companies are reducing their own emissions versus financing mitigation that contributes to broader global efforts to reach the Paris goals.

This transparency is necessary in preventing companies from greenwashing and preventing 'overclaiming' by making it clear how companies are taking climate action within and outside of their value chains. It holds companies to account in reducing their own emissions to targets they have set for themselves. Reporting how many carbon credits are surrendered in comparison to the company's carbon footprint helps understand the significance of finance from a volume-to-volume basis. Carbon credits thus represent financing of emissions reductions that are needed to stop the global carbon budget depleting – particularly due to the companies' own unabated emissions.

Companies that clearly show such ambitious and transformational action can provide governments with greater confidence to step up their game as well.

Carbon credits key in reaching Paris climate targets

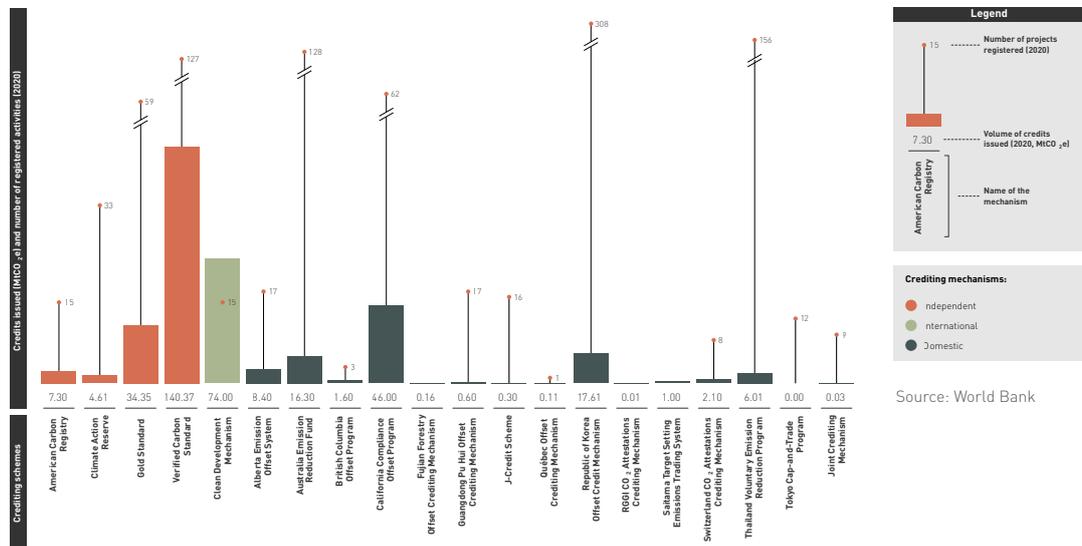
International climate negotiators in Glasgow finally reached agreement on how an international market for carbon credits – known as Internationally Transferred Mitigation Outcomes (ITMOs) – will be transferred between countries under Article 6 of the Paris Agreement. Governments can thus adopt more ambitious targets in their 2022 NDC update, with the option to use ITMOs to meet these targets.

While it is unclear whether more governments will set net zero targets in 2022, what is clear is that there is greater pressure on the private sector to voluntarily step up by committing to more ambitious climate action through adopting science-based targets and

reductions within their value chains, and financing further emissions reductions through carbon credits to contribute to global reduction efforts. Companies that clearly show such ambitious and transformational action can provide governments with greater confidence to step up their game as well.

Dr Maria Carvalho is the Head of Public Affairs at South Pole, a sustainability solutions company. She has over 13 years of experience researching and advising governments, international institutions, and the private sector in addressing climate challenges amid rapid technological and societal change. She has worked previously for New Energy Finance, and Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science.

Figure 3: Credit Issuance and Number of Projects Registered by Mechanism



Notes: (1) Data for Spain FES-CO2 program and Taiwan GHG Offset Management program was insufficient to present annual changes to credits issued and registered activities. Also, data for the crediting mechanism in Colombia was not available at the time of publication. These crediting mechanisms are omitted from the figure. (2) In addition, the following crediting mechanisms did not register any new projects or issue credits in 2020 and were therefore excluded from the graph: Joint Implementation Mechanism, Beijing Forestry Offset Mechanism, Beijing Parking Offset Crediting Mechanism, China GHG Voluntary Emission Reduction Program, Fujian Forestry Offset Crediting Mechanism, Saitama Forest Absorption Certification System, and South Africa Crediting Mechanism.

Flexing the Article 6 muscle

Early and regular exercising of Article 6 mechanisms will make for a healthier ecosystem and deliver on ambition quicker, writes **Mischa Classen**

Article 6 could be characterised as an oddity within the body of the Paris Agreement. It came in late to the negotiation table and scraped into the final text, against all odds – and the resistance of many, since the spirit of the Paris Agreement is primarily about sovereign parties' ambitions and less about cooperation.

An anatomical view

If the Paris Agreement's elements were to be bones, muscles, nerves and skin, then Article 6 would certainly be the tendons. They link the different parts and build in flexibility into the Agreement – flexibility that allows for raising ambition where a party alone could not lift it on its own. This is exactly what Switzerland put forward in its Nationally Determined Contribution (NDC). As a rich and service-oriented economy, relevant emission cuts are not easy and come at considerable cost – resources that could generate a multiple in mitigation outcomes abroad. In this spirit, Switzerland upped its domestic 2030 emissions reduction target from 30% below 1990 levels, which seemed the reasonable pledge for domestic action, to 50% by means of international cooperation under Article 6.

If the Paris Agreement's elements were to be bones, muscles, nerves and skin, then Article 6 would certainly be the tendons

Switzerland's target, KliK's obligation

In June 2021, the Swiss population confirmed that a 30% reduction domestically is a true resistance level by rejecting a proposed revision of the CO2 Act that would have set a domestic target of 37.5% in a referendum. But in the ramp up to COP26, the parliament backed the higher targets to encompass overseas reductions, giving the basis for legislative action up until 2030.

This means that the KliK Foundation, by fulfilling the mandatory offsetting of transport emissions under the CO2 Act on behalf of fuel importers, is finally set to bring about the up to 40 million residual reductions to fill the gap between effective domestic efforts and the legislated target. The KliK Foundation does so under Swiss law by surrendering internationally transferred mitigation outcomes (ITMOs) to the administration, while Switzerland, as a party to the Paris Agreement, reports those against its NDC.

Architecture of the Swiss approach

This setting has similarities with a public private partnership but is in fact a regulator-regulated relationship, with clear responsibilities and division of work. This is also reflected in the architecture of the bilateral agreements that constitute the backbone of Switzerland's approach to reach its NDC target.

While the Swiss diplomats negotiate binding bilateral agreements that provide for minimal requirements, including corresponding adjustments upon first transfer and the basic modalities of transfers, the KliK Foundation engages with owners of mitigation activities in private contracts that refer to the mechanics in the agreements. Commercial aspects of the transfer are thus the sole responsibility of seller and buyer, while the quality requirements of the transferred ITMOs are under the competence of the sovereign parties involved. In other words, the countries have no say on the negotiated price, and the seller and buyer have no say on the eligibility of a specific activity.

Irrespective of UN rules, Switzerland may apply more ambitious standards to activities it will support via ITMO purchases

Highest standards

Irrespective of UN rules, Switzerland – a signatory of the San Jose Principles for High Ambition and Integrity in International Carbon Markets – may apply more ambitious standards to activities it will support via ITMO purchases. The by-law excludes biological sequestration (forestry, and all nature-based solutions), activities in the oil and gas sector, and large hydro.

In the Kyoto Protocol era, the Swiss government had a whitelist of eligible Clean Development Mechanism (CDM) activities for compliance. Going forward, CDM activities registered before 2016 and reductions generated before 2021 will not be eligible – tougher than the CDM transition rules agreed at COP26, which allows credits from 2013 to be used for the first NDC period. Generally, the sovereign parties have the right to specify further requirements in addition to the above. The bilateral agreement provides for independent audits (eg, validation, verification) while stakeholder consultation and appeals procedures shall be governed in the respective jurisdiction.

KliK Foundation Procurement Programme

Against these standards, the KliK Foundation is actively pursuing the procurement of ITMOs since 2018. To this end, as of the time of writing, it has conducted four calls for proposals and is developing promising candidates under the framework highlighted above. The success of these efforts shows that the approach works:

- Switzerland has concluded agreements with Peru, Ghana, Senegal Vanuatu and Georgia, and is in talks with Thailand, Morocco, and Dominica. More countries are interested and may see an agreement within the next months.
- The portfolio of the foundation today consists of 22 activities, 11 of which are being developed. These 22 activities are expected to generate around 15 million ITMOs by the end of 2030.
- In Peru and Ghana, new proposals can be submitted on an ongoing basis. Respective national procedures will be instituted early next year – a process that was aided by the concrete decision needs resulting from the development of the first activities under the agreements.
- The KliK Foundation established a top-down development approach as an alternative to private-entity-driven, tender-based periodic calls. In this approach, the foundation leads and finances the development of programmes in close cooperation with the host country's administration.

To fund all these different activities, the KliK Foundation has so far committed more than \$1.5 million to build up capacity and produce the Mitigation Activities' Design Documents (MADD). The cooperation is most intensive with Peru, Ghana and Senegal. While in the first phase many of the decisions were made ad hoc, from next year dedicated processes, committees, and registries for reporting will be available in these countries and allow for an ordered authorisation process.

Lessons from developing Art. 6 activities

Through the development of MADDs, a wealth of lessons have been learned and shared with relevant governments; the following are worth noting.

Political decision capacity: The activities' design must concur with the various requirements for Article 6 and respond to the priorities of the transferring country. Competent local decision bodies are therefore crucial to determine the suitability of specific design features. These bodies require a political mandate, without which they cannot function as intended.

Realities matter most: The scope of the activity must be consulted on, as provided for by the participation criteria in the MADD. It is the concrete effect of the activity on the ground that matters to the transferring country, and this requires early buy-in from all relevant stakeholders. Among other aspects, it must be assured that the mitigation activity does not compete with other interventions or create unwanted market distortions.

Countries without a certain degree of preparedness will not be able to engage in Article 6 in a meaningful manner

Methodologies create understanding: The methodologies constitute a central piece in the activity's design. They connect the activity's scope with the definition of the crediting baseline. Through this link, the additionality of resulting mitigation outcomes with respect to the policies and measures is evidenced in a comprehensive and transparent narrative.

Manage expectations on financing: One must understand that results-based carbon finance does not mean direct investments, but investments into improving the market conditions to render investments into mitigation activities attractive.

Learning by doing: Without a concrete cause, there is no political mandate to establish such capacity. Even after the adoption of the Paris Rulebook, only concrete interest and development on the ground will justify the administrative resources required to Article 6 management.

How to grow muscles

Going back to the initial concept of Article 6 as tendons, one could say that both tendons and corresponding muscles are needed to flex joints. In the context of Article 6, these muscles are administrative bodies with decision-making power – not only to govern Article 6, but also things such as the transparency framework, adaptation, and the voluntary carbon market. The earlier and the stronger these muscles are trained, the more the country can benefit from the Paris Agreement.

Last call to action

The horizon for the current Paris Agreement NDCs stretches until 2030, and this is true for the legal obligation of the KliK Foundation and likewise for many compliance buyers. It is this window of opportunity in which finance is committed to boost investments and generate ITMOs. As time elapses, the window closes fast, and so too does the potential for carbon revenue from Article 6 activities.

Countries without a certain degree of preparedness will not be able to engage in Article 6 in a meaningful manner after the window has closed. Considering the timeline to establish bilateral agreements, administrative processes, and to implement mitigation activities, it is expected that the scope of those countries that engage in Article 6.2 will be concluded in 2023, latest 2024. All other countries will see their chance in activities under Article 6.4, when the Sustainable Development Mechanism becomes operational.

Mischa Classen works with the KliK Foundation, where he oversees the development of the procurement of international mitigation outcomes that will be required to fulfill the legal obligation of the KliK Foundation. He is a carbon professional with a strong focus on carbon accounting methodologies in various schemes and aspects of their governance. For over a decade he has contributed analytical pieces, eg for the Swiss government or the UNFCCC, with view on devising laws and policy dialogues. He has also developed and operationalised various programmes with transactions in excess of \$100 million.

Infrastructure for innovation

Jennifer Weiss explains why registries are a critical part of the carbon market’s connective tissue and how they contribute to its health

With the completion of the Article 6 rulebook under the Glasgow Climate Pact, the world is going to continue to see growing interest in and support of carbon markets. These mechanisms are crucial to keeping 1.5°C within reach, enabling investment in carbon reduction activities, encouraging voluntary action, attracting participation from different sectors and supporting local community social and environmental benefits.

With so much at stake and so much interest from various entities – from local communities to NGOs to private companies looking to grow their businesses – it is imperative that carbon markets are healthy systems operating under rigorous, transparent standards. Only healthy carbon markets will truly contribute to global climate goals and address the climate crisis.

Only healthy carbon markets will truly contribute to global climate goals and address the climate crisis

RESERVE STANDARDS ENSURE THAT 160 MILLION OFFSETS ARE:

- REAL** (Icon: Bar chart with upward arrow)
- ADDITIONAL** (Icon: Plus sign)
- PERMANENT** (Icon: Padlock)
- VERIFIABLE** (Icon: Checkmark)
- ENFORCEABLE** (Icon: Gavel)

AND ACHIEVE KEY BENEFITS:

- BRING A WIDER RANGE OF THE ECONOMY INTO ADDRESSING CLIMATE CHANGE** (Icon: Earth globe)
- ACHIEVE COBENEFITS FOR LOCAL AIR QUALITY, HEALTH, AND ECOSYSTEMS** (Icon: Leaf)
- SPUR INNOVATION & INVESTMENT IN THE LOW CARBON ECONOMY** (Icon: Dollar sign with circular arrows)
- RAISE AMBITION & COLLABORATION WITHIN THE GLOBAL COMMUNITY** (Icon: Chain link)

A key component of a healthy carbon market is the offset registry, which serves as the foundation of the market, connecting project developers, verifiers, buyers, local communities, the public and other participants. The offset registry sets the standards for how to quantify, monitor, report, and verify voluntary emissions reductions, ensures offset projects are developed according to those standards, provides information on voluntary offset projects and issues credits to the public and supports compliance offset programmes in various capacities. Its reach is far and critical for a well-functioning carbon market.

A system cannot function without its various components being connected. And a system cannot function well if those connective links are weak or poor. The Climate Action Reserve was created by California State mandate in 2001 to establish a connection among the state government, early corporate actors and early standards for calculating and reporting emissions. It was originally launched as the California Climate Action Registry, and back then the intention was to provide a trusted body for entities to voluntarily measure and publicly report their carbon footprints and to encourage early, voluntary action on reporting and reducing emissions. The registry provided rigorous, comprehensive guidance for measuring emissions in specific sectors through protocols and a publicly accessible registry for reporting emissions and providing transparency in the process.

In 2007, the California Registry took its knowledge and experience with emissions accounting and transitioned into the Climate Action Reserve, officially entering the voluntary carbon market. It serves as an offset registry for the voluntary market and California’s Compliance Offset Program, and its mission is to develop, promote and support innovative, credible market-based climate change solutions that benefit economies, ecosystems and society. All offset credits issued by the Climate Action Reserve are real, additional, permanent, verifiable and enforceable.

As mentioned earlier, an offset registry sets the standards for voluntary emissions reductions, ensures offset projects are developed according to those standards, provides a means for sharing information on voluntary offset projects to the public and supports compliance offset programmes in various capacities (eg, five of the six protocols in use in California were developed by the Reserve).

A key component of a healthy carbon market is the offset registry, which serves as the foundation of the market

The Climate Action Reserve sets standards through its offset protocols. The protocols provide specific guidance on what qualifies as an offset in a particular sector, how to measure the emissions reductions or avoidance, how to report that information and how offset credits will be issued. The protocols are developed in a regulatory-style public process guided by a workgroup consisting of subject matter experts from different sectors and with different perspectives, followed by a public comment period that brings in additional viewpoints and perspectives before going to the Board of Directors for adoption. This transparent public process and diverse workgroup makeup are important for ensuring a protocol – and offset credits that will be generated from it – is comprehensive, conservative and directed towards environmental benefit.

To ensure offset projects are developed according to its high-quality protocols, the Climate Action Reserve oversees independent, accredited verification bodies that verify projects and it also reviews all project documentation directly. Staff members of verification bodies must participate in training and pass tests for each protocol for which they provide verification services. Additionally, Climate Action Reserve staff members spend considerable time working directly with offset project developers and verification bodies to answer questions and, again, ensure offset projects are developed according to protocols.

After offset projects have been submitted and verified as adhering to Climate Action Reserve protocols, the organisation issues offset credits that each have a unique serial number to provide clear traceability and avoid double counting.

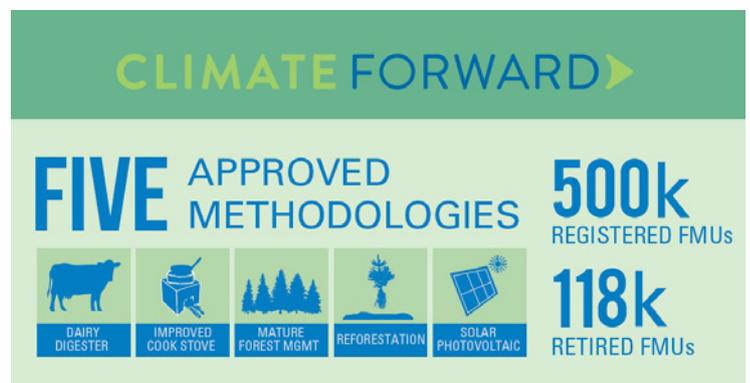
The Climate Action Reserve's registry is publicly available and provides a way for anyone to view offset project information, project documentation and details on the credits issued, including the serial numbers. This publicly accessible registry provides transparency and credibility.

Innovation is crucial to the evolution and improvement of systems. Throughout its history, carbon markets have seen evolution through experience and innovation, such as new technologies that allow for precise and accurate GHG accounting, new modelling and calculation tools that bring ease and efficiency to project registration and new research, development, and implementation of emissions reduction opportunities to expand and strengthen the carbon market.

One notable innovation developed by the Climate Action Reserve is the opportunity to make early investments in future emissions reductions. The Climate Forward programme has provided a new path for addressing the climate crisis by specifying that the world cannot afford new investments that put a future burden on others to mitigate emissions from the investment—any new investment ought to quantify its future emission impacts, accept responsibility for those emissions now,

and invest in credible strategies for mitigating those emissions. This innovative programme emphasises the Climate Action Reserve's core principles of rigour, transparency and high standards, ensuring that any emission reductions benefit the fight against climate change.

Climate Forward supports early action and early financial investments in emissions reduction/avoidance projects through an approach similar to futures contracts in financial markets. Projects are able to receive advance funding to get projects off the ground, reducing emissions faster and making an impact sooner rather than later. Investors and credit purchasers have more flexibility in project locations, allowing them to invest in their own local communities and support local environmental and social benefits. Early investment in GHG reduction projects expands the scope and scale of diverse, flexible and creative emissions mitigation actions.



Innovation is crucial to the evolution and improvement of systems

Carbon markets can be a lifesaving system. We're looking to them to play a critical role in addressing the climate crisis and avoiding severe consequences in the very near future, including as a major pathway for investment in developing countries to assist them in building a sustainable, clean future for their citizens. We all need to be vigilant about ensuring these markets are healthy systems with all components functioning well. Offset registries serve an important role in carbon markets: developing rigorous protocols, connecting diverse sectors with a multi-sector approach, providing transparency in project registration and offset credit issuance, facilitating transactions, linking jurisdictions and, most importantly, innovating opportunities for emissions reductions to ensure that we meet the climate crisis at the scale and urgency required.

As Vice President, Communications and Business Outreach for the Climate Action Reserve, Jennifer Weiss shepherds the organisation's brands and oversees outreach to encourage collaboration in and support of the organization's work to address the climate crisis. She also manages the Reserve's annual conference, Navigating the American Carbon World.

Financial institutions:

The ligaments of carbon markets

Much like a body's ligaments, financial institutions play an important role in connecting buyers with sellers, and can support the rapid growth of carbon markets that many now predict, say **Anya Nelson** and **Martin Berg**

IETA and the University of Maryland (UMD) estimate that if Parties to the Paris Agreement work cooperatively under an international mechanism such as Article 6 and engage in emissions trading to reach net-zero emissions, then the carbon markets could facilitate transactions of approximately \$1 trillion per year by 2050.¹ These transactions would lead to significant emission reductions and, depending on the type of projects, support for local communities, sustainable development, conservation and restoration and renewable energies, in addition to a huge redistribution of capital across regions from buyers to sellers.

However, looking at today's fragmented carbon markets, we are currently far from this. There are regional compliance carbon markets, valued at \$272 billion in 2020², and voluntary carbon markets, which although growing (from \$146 million just four years ago and on track to exceed \$1 billion this year³), still have a long way to go.

To reach \$1 trillion of transactions per year, this huge volume of capital flows will require more carbon market regulations and infrastructure to support it, alongside a robust and efficient financial system to support it.

Financial institutions such as commercial banks, investment banks, investment managers, exchanges, and brokerage firms play a critical role in society: they act as facilitators and intermediators, transfer risks, create liquidity and transparency, and build capacity. Their role in carbon markets should be no different. These core functions will help transition voluntary

carbon markets currently characterised by opaque over-the-counter (OTC) trades to a widely accessible liquid and transparent market with fair pricing.

Whilst some compliance markets have been liquid and transparent for many years, the huge surge in carbon trading activity that is expected to come from increasing regulation will create many opportunities for financial institutions. How the financial sector reacts to this increased activity will ultimately lay the foundations for a functioning Article 6 market, when carbon markets are no longer fractured and siloed.

There is a plethora of roles for the financial sector in both compliance and voluntary carbon markets, with brokers, banks, and institutional investors visible across the carbon credit creation process – from project development to secondary trading.

Financial institutions as facilitators and intermediators

COMPLIANCE MARKETS

Within compliance markets, carbon is traded like any other commodity. Brokers, traders and banks with carbon trading desks act as intermediaries between buyers and sellers and facilitate trading. These trading desks were prevalent in the early 2000s with Phase 1 of the EU Emissions Trading Scheme (ETS) and as the Kyoto Protocol's Clean Development Mechanism (CDM) took off. However, from 2012 onwards, with low prices in the EU ETS, the demise of the CDM and the end of the Kyoto Protocol era, many banks dramatically reduced their carbon trading operations, shifting activity from banks to other trading houses.

However, in the current Paris Agreement era, banks are beginning to redevelop this functionality and rebuilding their expertise, and are consequently taking a large and increasing share of compliance market trading.⁴ Global carbon markets have seen an influx of financial players in recent months, from California to New Zealand, which have driven prices to record highs.

The huge surge in carbon trading activity that is expected to come from increasing regulation will create many opportunities for financial institutions

[1] Assuming rising marginal abatement costs and an increase in the global carbon price to \$620/tCO₂e by 2050. Source: IETA & University of Maryland, The Potential Role of Article 6 Compatible Carbon Markets in Reaching Net-Zero, October 2021 [2] S&P Global Platts, Global carbon market grows 20% to \$272 billion in 2020, 27 January 2021 [3] Ecosystem Marketplace, State of the Voluntary Carbon Markets, September 2021 [4] Johanna Cludius and Regina Betz, The Role of Banks in EU Emissions Trading, The Energy Journal, International Association for Energy Economics, vol. 0(Number 2), pages 275-300, 2020.

FACILITATORS / INTERMEDIARIES	LIQUIDITY PROVIDERS	TRANSFERRING RISKS	CAPACITY BUILDING
INVESTORS / ASSET MANAGERS			
COMMERCIAL BANKS / INVESTMENT BANKS			
TRADERS			
BROKERS			
	EXCHANGES		

VOLUNTARY MARKETS

The pricing of voluntary carbon credits is currently much more complex than that of compliance carbon credits; the frequent and liquid trading of compliance markets means prices are based on the dynamics of supply-and-demand.

There is currently no liquid market for voluntary carbon credits and there are very few transparent reference points to allow a buyer to differentiate between quality and risk of various projects and ascertain a price – although there are efforts such as S&P Platts’ weekly assessments and standardised contracts on CBL, amid thin volumes though. Voluntary carbon credits are not homogenous goods and valuing them is more like valuing a house – with factors such as preferences over location, scarcity and quality indicators such as additionality, permanence, leakage, co-benefits, and other vernacular that many buyers do not understand, making price discovery very difficult.

This complexity means that costs and perceived risk can be too high for buyers to enter the market. For example, building a team of carbon market specialists to source and execute on transactions will incur significant costs and/or take employees away from their day jobs.

There are many issues on the supply side too. Carbon prices are currently too low for many projects to be viable (ie, nature-based solutions, technology or engineered solutions). Carbon project developers lack access to finance to develop projects because of market opacity and low investor risk appetite. Furthermore, they lack the capacity to efficiently market their credits to multiple buyers.

Financial institutions have an important role to play in reducing these frictions for both buyers and sellers. Given the largest buyers of voluntary carbon credits are corporates, banks and asset managers have far greater access to and knowledge of potential buyers than project developers, creating a more efficient matching process between buyers and sellers. Experienced asset managers, brokers, or trading desks at large banks can help facilitate price discovery and reduce the need for companies to develop specialist “in house” expertise. In addition, pooling resources from multiple buyers or multiple sellers can create economies of scale and reduce transaction costs on both sides.

Then there are those institutions that can provide finance, including asset managers, banks, and investment banks. These actors can source and originate deals, providing the much-needed capital to scale the market through sophisticated financial instruments which buyers may not be able to structure themselves.

However, the nascency of the market and the current inconsistency of demand is acting as a barrier. As corporates continue to refine and begin to execute on their decarbonisation and net zero strategies, demand signals for voluntary carbon credits will become clearer and more structured, allowing financial institutions to invest in and scale their carbon operations, and provide this vital service of facilitating and intermediating transactions.

There is a plethora of roles for the financial sector in both compliance and voluntary carbon markets, from project development to secondary trading

Financial institutions as liquidity providers

COMPLIANCE MARKETS

Liquidity and transparency are necessary for efficient trading – discovering price, reducing costs and volatility. In addition to acting as intermediaries, exchanges, brokers and banks’ carbon trading desks act as market-makers that can trade on their own account to increase market liquidity.

VOLUNTARY MARKETS

One of the key issues identified by the Taskforce for Scaling the Voluntary Carbon Markets (TSVCM) is the lack of efficient trading with illiquidity in the voluntary carbon market. This is largely because of the heterogeneity of carbon credits and the discrepancies in pricing as outlined earlier.

Banks' low cost of capital and ability to use their own balance sheet allows for the design of sophisticated products which aim to reduce risks for buyers

However, efforts are being made to overcome this. Earlier this year, NatWest, NAB, CIBC and Itaú Unibanco formed Project Carbon – a marketplace for voluntary carbon credits with the hope of supporting price discovery. Similarly, CIX, supported by several financial institutions including DBS Bank, Standard Chartered, and Singapore Exchange, recently held an auction to create a competitive price discovery mechanism.

As these initiatives and pilots are expanded and others appear and are made more widely available, we are likely to see a much greater frequency of trading and market liquidity, which will lead to pricing transparency and reduced volatility for both buyers and sellers.

Financial institutions' role in transferring risks

COMPLIANCE MARKETS

Financial institutions play an important role in facilitating effective compliance markets. Banks' low cost of capital and ability to use their own balance sheet allows for the design of sophisticated products which aim to reduce risks for buyers.

For example, EU ETS auctions are conducted at spot pricing, but energy companies need to match their future electricity sales with forward EUA purchases – this creates a mismatch between spot supply and forward demand. Banks can alleviate this by forward selling carbon certificates whilst dynamically hedging their own exposure and minimising transaction costs and future price and supply risks for compliance buyers.

VOLUNTARY MARKETS

As mentioned above, CBL lists Global Emissions Offset Futures and Nature Based Global Emissions Offset Futures, however volumes are currently low. A liquid forward market could help companies to manage the carbon price risk associated with a decarbonisation strategy that includes voluntary offsetting.

Let's assume a company has residual unavoidable emissions of 1 million tCO₂e in 2030. Currently, that 1 million tCO₂e could cost them just over \$3 million⁵, but they don't need to offset 1 million tCO₂e right now. The company could be looking at a future liability of \$90 million if the price of carbon rises to the IETA/UMD estimate of \$90/tCO₂e in 2030⁶. As consensus over future carbon credit prices becomes clearer and trading becomes more liquid, financial institutions may have the opportunity to offer hedging and derivative products within the voluntary carbon market to manage these future price risks.

Financial institution's role in capacity building

Financial institutions do not just write cheques, they also write reports, analyse data, and synthesise market information in a way that the "layperson" buyer may not be able to do (or at least in a cost-efficient way). Educating stakeholders can help to remove frictions and reduce information asymmetries, leading to smoother market functioning.

Financial institutions can also provide finance and build capacity within ancillary services that support and innovate carbon markets. As GreenBiz recently wrote: "Carbontech is getting ready for its market moment."⁷ Financial institutions can supply seed or growth capital to these pioneering ventures that will become an integral part of the carbon markets.

Reaching a \$1 trillion market

Carbon markets are currently siloed, illiquid, opaque, and volatile. The decisions on Article 6 taken in Glasgow have the potential to change this and prompt the proliferation of carbon markets.

Voluntary carbon markets in particular have a long way to go before they reach efficiency and scale of compliance markets, let alone form part of a \$1 trillion market. And whilst activity from companies, project developers, and financial institutions is increasing, like everything climate-related, the pace of development of these functionalities will depend on market signals and regulation.

Should Article 6 be used by governments and corporates to link compliance markets and voluntary schemes into larger connected carbon markets, this will bring a huge amount of opportunity for asset managers, banks, brokers, exchanges, and other financial institutions to invest in the infrastructure to connect global carbon markets and achieve net zero.

Anya is an Investment Manager for Climate Asset Management's Nature Based Carbon Strategy. Prior to Climate Asset Management, Anya worked in impact investing for Mustard Seed, an impact VC, and before that in investment banking for Goldman Sachs and Macquarie Capital, where she was a Vice President.

Martin Berg is Head of Natural Capital Impact Strategy at Climate Asset Management. He has over 20 years of experience in environmental finance and policy. He is the former head of Environmental Fund & Climate Finance Policy at the European Investment Bank and previously led the carbon origination team of Merrill Lynch, and worked at RNK Capital, OECD and UNFCCC.

[5] Based on an average price of \$3.13 in 2021 from Ecosystem Marketplace's State of the Voluntary Carbon Market, 2021 [6] IETA & University of Maryland, The Potential Role of Article 6 Compatible Carbon Markets in Reaching Net-Zero, October 2021 [7] Greenbiz, Carbontech is getting ready for its market moment, 28 October 2020.

Climate law as connective tissue

Ilona Millar and **Sharona Coutts** explain how the legal sector connects the wider carbon market body – and is essential for its functioning

Law underpins much of how the world works. In the analogy of the carbon markets as a “body”, law is probably most like the connective tissues that brings together various parts and make them all work harmoniously.

Each time a state or country announces a new climate policy, someone has to draft that policy. Somehow, that policy has to be converted into concrete mechanisms to make it a reality. Usually, that requires legislation. And every project, deal, and trade needs to be negotiated and documented, or they can’t occur. These are all tasks taken up by lawyers, who are ideally both technical experts, strategic guides, and trusted advisors.

Lawyers have been at the centre of crafting the international treaties and conventions that create the global framework for climate action. Many have been part of these negotiations for more than 25 years. Some lawyers act on behalf of the countries taking part in the negotiations, while others advocate for observers, including the civil society groups pushing for greater climate action. Still others act as sherpas for private sector clients hoping to engage in the mysterious and technical process of hammering out these laws.

Law is probably most like the connective tissues that brings together various parts and make them all work harmoniously

At the recent negotiations, COP26, negotiations finally resulted in agreement on the ground rules for what will likely become a truly global carbon market. This success followed six long years of wrangling over the details, and careful, painstaking choice of words in the documents that make up the rule book for the technical aspects of the Paris Agreement. The agreement itself envisages different forms of international trading of “mitigation outcomes” but doesn’t flesh out what the system would be or how it would work. Contributing ideas for the form these systems could take, and how to encapsulate those on paper, is part of what climate lawyers do. The successful conclusion of that process is thanks in some degree to that attentive work.

As to how lawyers assist in developing climate policies and domestic legislation to implement it, a recent example comes from Fiji, which has just passed what is widely seen as a leading national climate law, the Fiji Climate Change Act. Lawyers from the Solicitor-General’s Office of the Government of Fiji were instrumental in crafting this law, supported by expert climate lawyers from Baker McKenzie and Pollination advising on the best practice from around the world as well as offering ideas of how to integrate requirements for the implementation of the Paris Agreement.

Where countries have functioning carbon markets, those have often been set up with help from lawyers. Not just by crafting legislation and rules, but also through helping to craft the methodologies that underpin the development of carbon projects that can generate credits. This is true in Australia, where the Commonwealth Government recently announced several new methodologies including blue carbon and carbon capture and storage. The view from behind the scenes included many stakeholders contributing ideas to the development of this methodology, with lawyers honing it through legal drafting.

Then there are the contracts and other transactional documents without which a deal can’t take place. The structuring, drafting and negotiation of these documents is a core part of a climate lawyer’s job. Lawyers are also involved in “due diligence” to ensure that a carbon project meets the important requirements related to underlying legal title to carbon credits, ensuring projects have free prior and informed consent of local communities and stakeholder and ensuring they are able to actually deliver climate benefits.

Where countries have functioning carbon markets, those have often been set up with help from lawyers

While there is a lot of truth in the idea that law provides the connective tissue for carbon markets in these and other ways, we'd be remiss not to mention some other important contributions that climate lawyers make.

Litigators, including strategic litigators, are playing an increasingly important role in persuading courts to recognise new duties relating to climate change. Recent cases have found that nations must demonstrate that their policies will enable them to meet legal commitments they have made to reduce climate pollution. They have led to the recognition of new duties of care on the part of governments and even private companies to prevent climate harm. And they have embarrassed defendants into taking measures to better disclose and manage their climate risks.

Even for climate lawyers not involved in this type of litigation themselves, it is essential to advise clients of the new litigation risks that these cases present. This will often include advising clients to consider measures regarding their own climate change risks. In that way, these strategic lawsuits can have effects that ripple through the whole legal system.

And there are recent initiatives by lawyers to push the legal profession itself to become a fulcrum for climate action. The Net-Zero Lawyers Alliance launched earlier this year as part of the Race to Zero initiative that is central to this year's climate negotiations. Members of the alliance commit to "accelerating [the] transition to net zero emissions by 2050", and to help "reinforce, accelerate and support the implementation of internationally coherent legal frameworks and guidelines for transition to net zero by 2050." The programme also highlights the importance of building the capacity of clients and in-house counsel, whose employers often come to them for strategic and creative discussions and advice that extends beyond purely legal issues – a task which the London-based Lawyers for Net Zero is focusing on.

So perhaps climate lawyers (though, certainly not all lawyers) provide the connective tissue for the carbon market's body. But in some ways, we also help usher that body in a particular direction, which is increasingly towards greater climate action.

Sharona Coutts is an associate in the Environmental Markets team at Baker McKenzie, with a focus on climate change law and policy. Prior to joining Baker McKenzie, Sharona spent nearly two decades as an investigative reporter, editor and executive, based mostly in New York City and Los Angeles. She served as Associate to Justice Michael McHugh QC, AC at the High Court of Australia in 2005.

Ilona Millar is a partner and the head of Baker McKenzie's Global Climate Law & Finance practice. She has worked for the last 20 years on climate change law, including the development of law and policy and its implementation by both governments and the private sector. This experience extends to complex multi-jurisdictional transactions as well as the development of innovative responses to climate change and sustainability problems.

An aerial photograph of a river meandering through a lush, dense green forest. The water is a deep teal color, and the surrounding land is covered in thick, vibrant green trees. The text "Health Measures" is written in a white, elegant serif font in the upper left quadrant of the image.

*Health
Measures*

Clarity on transparency

Transparency is key to the health of any emissions trading market.

Alex Hanafi, Julia Ilhardt, and Maggie Ferrato provide clarity on why this matters

Carbon markets can be an engine of climate ambition, enabling the world to go farther and faster on the path to a net zero emissions future – but only if they are designed with effectiveness, transparency, and equity in mind. Research demonstrates that high-integrity, global carbon market cooperation could help countries nearly double their current planned emissions reductions at no additional cost¹.

But how do we know if carbon markets are actually achieving their goals? Transparency is one of the critical “rules of the road” for well-functioning carbon markets because it is essential to understanding their efficacy and equity.

Transparency equals confidence

Information sharing and review – and the associated lessons learned – make it possible to provide confidence to key actors in the carbon market ecosystem. In particular, transparency can provide:

1. Confidence to the public that carbon credits effectively reduce emissions, and that their political leaders can be held accountable for environmental goals and policy promises.
2. Confidence to investors that credits have environmental and financial value, and that they will be accepted for their intended purpose.
3. Confidence to countries that their sovereign peers are taking promised steps to reduce their own emissions, thus building trust and ratcheting up domestic ambition.
4. Confidence in the environmental and social integrity of the system, with carbon credits delivering measurable emissions reductions in a way that promotes equity and well-being.

Transparency is one of the critical “rules of the road” for well-functioning carbon markets

Transparency and sound carbon accounting form the connective tissue of a healthy, well-functioning carbon market, and can help to fuel a virtuous cycle of tighter targets and higher climate ambition over time. Drawing on healthy transparency rules, observers can trace emissions reductions back to the source, investors can protect against financial and reputational risk, companies can be certain that their purchased emissions reductions will only be used once, and governments can enforce their laws and learn how they can be made more effective and fairer. With these pieces in place, markets can scale in a way that benefits both people and the planet.

The implementation of robust rules for review and oversight also works to ensure that system flaws can be quickly identified and remedied, much like vital signs used to monitor for symptoms of illness. In the initial implementation of the EU Emissions Trading System (ETS), emissions allowances were allocated based on entities’ own estimates of emissions, with no independent or historical data on pollution sources and volumes. Only when entities had to provide detailed emissions information during the ETS pilot phase did it become clear that permits had been over-allocated. As with living bodies, carbon markets are imperfect, but transparency standards enable the rapid identification and correction of mistakes.

The Clean Development Mechanism (CDM) established under the Kyoto Protocol has faced criticism for its lack of transparency, which allowed ineffective projects to slip through the cracks. For instance, credit purchasers were unaware that hydroelectric projects in Brazil caused unaccounted deforestation, methane emissions, and displacement of local communities². While the EU ETS initially allowed CDM projects to be used for a portion of carbon reduction requirements, concerns over credit quality led to the EU’s creation of tight restrictions on eligible credits.

The CDM also catalysed widespread calls for reform that – if implemented – could significantly improve the next generation of international carbon crediting approaches under Article 6 of the Paris Agreement. Effective transparency systems can provide the information needed to continuously improve carbon market performance, if their results are incorporated into routine, periodic reviews and updates of carbon market targets and governance.

As with living bodies, carbon markets are imperfect, but transparency standards enable the rapid identification and correction of mistakes

What are the elements of transparency in carbon markets?

Any high-integrity market-based programme for addressing pollution has three core transparency and accounting components: emissions tracking, credit tracking, and a system that enables comparison of these emissions and credits.

1. An effective and transparent carbon market emissions tracking system requires all participants to measure and report their total greenhouse gas (GHG) emissions. These GHG inventories can be used to determine the effectiveness of mitigation measures, which is essential to ensure the atmospheric integrity of any emissions-cutting approach. Without an understanding of emissions levels, it is impossible to tell whether the environmental goals of a carbon market are being met.
2. Publicly available registries enable key stakeholders to track units held, transferred, cancelled, and retired by market participants. This system can, for example, help to ensure that successful mitigation outcomes are not claimed by two different countries toward the achievement of the Paris Agreement's temperature goals, a form of double counting prohibited by the 2015 agreement. Avoiding double counting of emissions reductions is another bedrock principle essential to the efficacy of any carbon market. Public registries constitute a fundamental component of a robust emissions accounting system, allowing for visibility into the use of credits or units toward climate targets.
3. Finally, GHG inventories and credit registries must be compatible for comparison, so that if any emitter has emissions in excess of the number of units it holds, they are held to account.

Effective transparency systems also help carbon crediting projects or regulated emitters account for social impacts, engage with Indigenous Peoples and local communities (IPLCs), and promote adaptation and resilience³. For example, accurate emissions reporting allows for the identification of pollution burden in frontline communities, and associated investments or benefits sharing to advance social justice and wellbeing. Ecosystem Marketplace reports that 62% of voluntary credits purchased in 2019 were co-benefits certified, with both European and American buyers paying extra for outcomes beyond emissions reductions, such as poverty alleviation and capacity building⁴. Clear and complete reporting allows for these additional carbon credit attributes to be understood and valued by the market.

By one estimate, IPLCs manage at least 17% of forest carbon⁵, and growing evidence indicates that indigenous territories are some of the most robust buffers against large-scale carbon emissions from forest conversion, degradation/disturbance, and deforestation⁶. Market mechanisms can be designed to reduce emissions as well as share benefits with – and support the livelihoods of – local stewards, but only with the implementation of regular and accurate reporting on key, relevant performance metrics.

Effective transparency systems also help account for social impacts, engage with Indigenous Peoples and local communities, and promote adaptation and resilience

Who are the key actors involved in carbon markets?

Transparency in carbon markets depends on several well-structured governance bodies and independent actors. In some cases, governments and multinational institutions oversee carbon markets, such as the EU ETS or the Kyoto Protocol's Clean Development Mechanisms and its potential successor, a centralised mechanism under Article 6.4 of the Paris Agreement.

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), established by the International Civil Aviation Organization (ICAO), allows carbon crediting programmes (ie, voluntary standard-setting bodies) to apply for CORSIA eligibility, which allows regulated entities (ie, airlines) to apply eligible credits toward their obligations. CORSIA rules require carbon crediting programmes to obtain host country attestation confirming that the emission reduction or removal units will be counted only once towards CORSIA obligations, and not towards the host country's emissions target under its Paris Agreement Nationally Determined Contribution (NDC). As compliance and voluntary carbon markets increasingly converge, transparency measures are important to safeguard the integrity of CORSIA and to support high-quality crediting programmes that ensure real climate benefits.

In the voluntary carbon market, corporations or individuals offset their emissions by voluntarily purchasing credits directly from carbon crediting programs, which act as standard-setters and issuers of carbon credits. A number of ongoing and high-profile initiatives are seeking to offer much-needed guidance to voluntary carbon market actors, and academics or civil society groups are often involved in establishing best practices and reviewing existing programmes.

In the race to net zero global emissions, carbon markets hold enormous potential to enhance international climate ambition, to engage corporate and government actors, and to promote sustainable development and social co-benefits. Transparency is essential for carbon markets to scale with integrity, and to provide confidence to the public, investors, and governments that carbon markets can successfully deliver on that potential.

Alex Hanafi is Director of Multilateral Climate Strategy and Lead Counsel at Environmental Defense Fund. Alex has led EDF's research and advocacy work at the international climate negotiations, designed to promote policies and build institutions that effectively apply economic incentives to reduce GHG emissions around the globe.

Julia Ilhardt is a High Meadows Fellow at the Environmental Defense Fund. Her work focuses on carbon markets and international equity, and she is based in Boulder, Colorado.

Maggie Ferrato is a Senior Analyst at the Environmental Defense Fund, where she supports the organisation's policy advocacy in various forums, including the United Nations climate agency. Prior to joining EDF, she worked to advance climate action at the United Nations and the US Senate.

[1] For example, The power of markets to increase ambition, EDF, 2018, and The Economic Potential of Article 6 of the Paris Agreement and Implementation Challenges, IETA, 2019. [2] Brazil's Amazon Hydroelectrics in the United Nations Clean Development Mechanism (CDM): Defrauding Investors, Cheating the Atmosphere?, EDF, 2017 [3] Carbon Credit Quality Initiative criteria, <https://carboncreditquality.org/criteria.html> [4] Ecosystem Marketplace's Carbon Survey data, <https://www.ecosystemmarketplace.com/articles/whats-in-a-carbon-credit-new-tools-help-quantify-the-sustainable-development-benefits-of-carbon-offset-projects/> [5] A Global Baseline of Carbon Storage in Collective Lands, Rights + Resources, 2018 [6] The role of forest conversion, degradation, and disturbance in the carbon dynamics of Amazon indigenous territories and protected areas, Wayne S. Walker et al., 2020

Growing a healthy VCM

Carbon markets globally have seen phenomenal growth in 2021 – but none quite as much as the voluntary market. With mounting attention on the non-compliance market amid a surge of corporate net-zero pledges, **Andrea Abrahams** clears up some of today’s pressing issues for buyers to be aware of and to ensure the health of the market for the future

Amid growing momentum and record levels of carbon credit demand, 2021 will be marked as a very important year for the voluntary carbon market (VCM). Ecosystem Marketplace claimed that the VCM had already hit \$1 billion in transactions by early November, with nearly 300 million units traded. And with COP26 finally adopting the rules for Article 6 of the Paris Agreement, the VCM received an additional boost that is likely to accelerate its growth even more.

However, with the growing prominence there comes a plethora of challenges that need to be tackled to ensure that the growth is not only unhindered but also well managed. The VCM is a decentralised structure grounded in standards and best practices of voluntary adoption, composed of several organisations, each one with different mandates and activities, which both complement each other and have overlapping functions. Different from the UN-ruled CDM (or the newly formed Article 6.4 of the Paris rulebook), there is no centralised governance, but rather several initiatives led by civil society and the private sector.

The increased demand for carbon credits to complement corporate net-zero strategies is accompanied by growing scrutiny

The common ground for all participants in the well-established VCM is the certainty that climate action must be based on science, led by the private sector, and upscaled by carbon finance. And, of course, it must be done now. The increased demand for carbon credits to complement corporate net-zero strategies is accompanied by growing scrutiny of market players, corporate decarbonisation strategies, and their offsetting paths, thus proving a higher level of maturity in the market. This is a natural and healthy outcome as the volume of capital invested in these markets has the potential to grow up to \$40 billion in 2030, according to analysts at Trove Research. To reach that target, according to Trove, the market needs more transparency and confidence to navigate the complexities effectively. Ensuring that high integrity credits are traded in a robust and transparent infrastructure appears to be one of the priorities.

The future of the market also depends on how well it will be structured and governed, which is the goal of both the Integrity Council for Voluntary Carbon Markets (IC-VCM; previously known as the Taskforce for Scaling the Voluntary Carbon Market) and the Voluntary Carbon Market Integrity Initiative (VCMI). However, only by ensuring the credibility and integrity of all market players on both the supply and demand side, will there be a healthy, functioning and growing market in the coming years.

The role of the VCM

ICROA stands firmly in support of greater climate action and believes that putting a price on carbon creates a tangible impact. Whichever mechanism is used – emissions trading schemes and/or carbon taxes – putting a price on carbon will help to reduce the dependency on fossil fuel across all sectors.

The VCM contributes to closing global climate policy gaps and enables non-state actors to take meaningful action ahead of and beyond regulation

The VCM exists to enable non-state actors to take climate action ahead of and beyond regulation. By itself, it will not achieve the Paris Agreement’s goals. The VCM contributes to closing global climate policy gaps (mitigation, finance, ambition) and enables non-state actors to take meaningful action ahead of and beyond regulation and in support of countries’ Nationally Determined Contributions (NDCs). It channels finance to mitigation and adaptation projects, through a transparent, third-party verified and results-based approach.

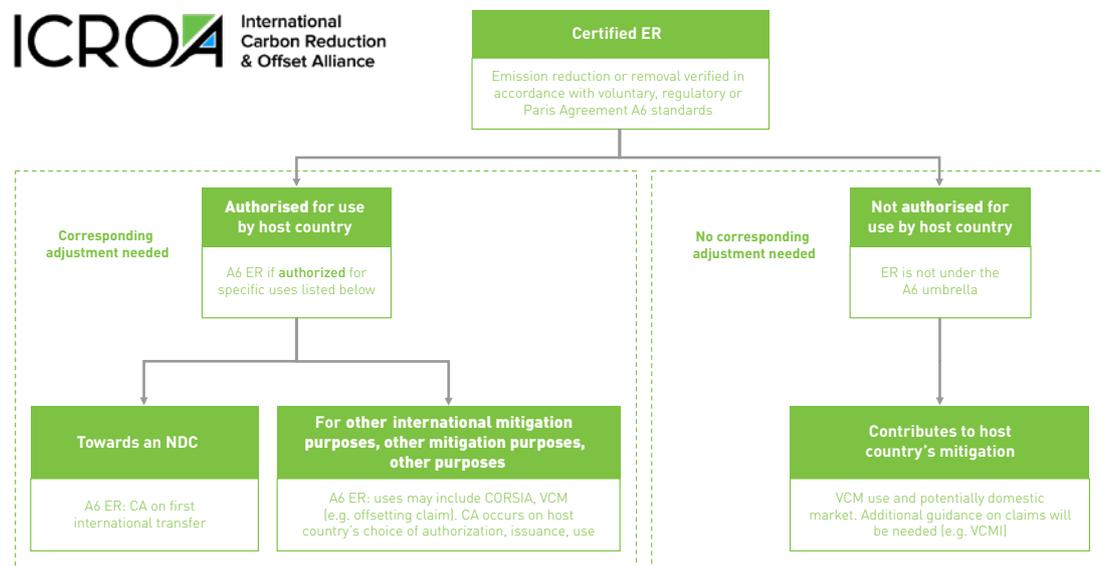
Carbon finance through the VCM helps governments and the private sector achieve greater climate ambition and therefore accelerates the transition to net-zero emissions (balance between anthropogenic emissions by sources and removals by sinks of GHGs) globally, as required by the 1.5°C pathway of the Paris Agreement.

The VCM and the Paris Agreement

With the uncertainties of Article 6 of the Paris Agreement now largely addressed after the Glasgow climate talks, the environmental integrity fundamentals of carbon markets are now better-established. In setting Article 6 rules, Parties to the Paris Agreement took the approach of defining what is required within NDCs and for related cooperative market mechanisms. They did not define what is excluded or not permitted. The final Article 6 text approved in Glasgow requires that all Article 6 Emission Reductions (A6ERs) need corresponding adjustments (CAs), but it does not state that the trading of other ERs in the VCM is not permitted. Article 6 does not therefore directly regulate the VCM, but it is conducive to increased convergence of the Paris and voluntary markets.

Ensuring the healthy growth of the VCM

The immense potential of the VCM has manifested itself through the spiking demand in 2021. This has also highlighted several new challenges ahead, but most of all, it has drawn public attention to the nuances of the market that have resulted in multiple debates and deliberations, as well as pertinent questions by stakeholders. To ensure the healthy growth of the VCM, focus should be placed on the quality and credibility of the voluntary market’s main commodity: carbon credits. Let’s try to address a few important questions below:



To ensure the healthy growth of the VCM, focus should be placed on the quality and credibility of the voluntary market's main commodity: carbon credits

1. Avoidance vs removal

The VCM allows corporates to compensate their unavoidable GHG emissions by purchasing carbon credits issued by projects that remove emissions from the atmosphere or avoid generating the emissions in the first place.

Removal credits stem from activities that pull carbon out of the atmosphere such as many nature-based solutions (eg, forests, peatlands, mangroves, and seagrasses) as well as engineered methods such as direct air capture and accelerated mineral weathering. Avoidance credits come from projects that reduce emissions by preventing their release into the atmosphere. These projects reduce emissions compared with the most likely scenario – the baseline. For example, REDD+ projects reduce forestry loss and preserve the existing one. All renewable energy projects also generate avoidance credits, by avoiding the use of fossil fuels. Here, current emissions are reduced by better alternatives, but existing CO₂ is left untouched.

Both types of credits have their merits and play an equally important role in addressing climate change. Removal credits, particularly those coming from nature-based solutions, seem to be preferred by corporate buyers due to their compelling narrative and multiple co-benefits. However, removal projects need significant lead times and will most likely not match the growing credit demand in the coming years.

It needs to be noted, too, that the removal of carbon doesn't address the initial problem of GHGs being released into the atmosphere. Therefore, supporting avoidance projects is also crucial in our fight against climate change. It is imperative that all carbon credit types are valued and promoted.

2. Financial contribution vs reduction claims

It is evident that the net-zero transition is gaining momentum, establishing itself as the way forward. The private sector is now playing a pivotal role, with nearly half of the world's largest 500 companies by market value adopting internal carbon pricing and many more actively engaging in climate action. As part of their corporate climate strategies, which must focus on science-aligned scopes 1-2-3 emission reductions, high-quality offsetting plays an important role in addressing what cannot be reduced now (residual emissions). Reduction claims are therefore part of the process. However, at a time when the VCM is rapidly growing, increased attention needs to be paid to claims such as net-zero and carbon neutral. More clarity on these claims is a necessary step in gaining credibility and trust in the VCM and to further strengthen corporate climate action.

ICROA works closely with market stakeholders, civil society, the private sector, governments, and key initiatives to agree on a sensible way forward for corporate climate action claims that ensure the highest level of quality, integrity and impact.

Another approach is the so-called "contribution claim", where corporates can finance a climate project but not make an "offsetting" claim against their own GHG inventory – instead, they make a statement that they have contributed (financially) towards an emission reduction beyond their boundary which would not otherwise have occurred. The goal would be to support the host country towards their Paris Agreement targets as a way of driving sustainable development, particularly in the Global South.

Such an approach could include corporates setting internal carbon pricing policies where they would price their own GHG emissions and commit to spend some or all of the equivalent amount to finance climate action in other countries. However, this approach has its shortcomings and could potentially slow down the flow of climate finance due to a lack of sufficient incentives and adequate impact verification tools and methods that normally come with an offsetting claim. However, new hybrid forms of climate financing could emerge in the future and benefit both the host countries and the corporates in a transparent and just manner.

The future of the VCM

Next year will be very important for the VCM and will show how the growing trend translates into establishing a concrete structure of the market through the work of several initiatives such as the IC-VCM and VCMI. The health of the market largely depends now on all the market players and their actions towards fostering the integrity and credibility of the VCM.

To help ensure the environmental integrity of the corporate climate action, ICROA offers an Accreditation Programme where organisations can be accredited against a Code of Best Practice and provides guidance and continuous support through advocacy and action-oriented working groups. This and other initiatives all combine to keep the VCM healthy and fit for the long-term.

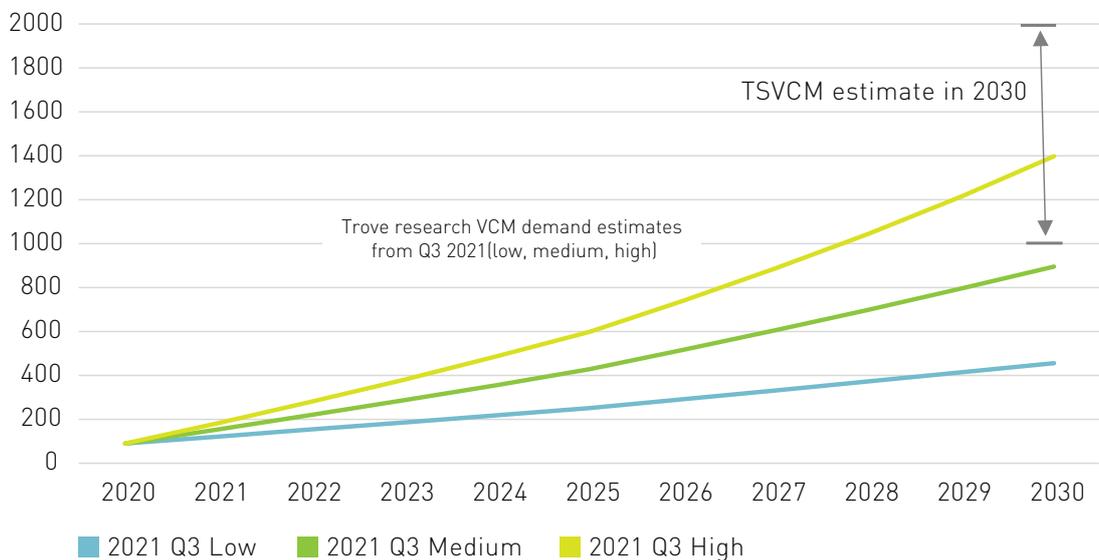
ICROA works closely with market stakeholders, civil society, the private sector, governments, and key initiatives to agree on a sensible way forward for corporate climate action claims that ensure the highest level of quality, integrity and impact.

Andrea Abrahams is the managing director of ICROA. Formerly, she was Director for Energy Transition at BP and head of BP Target Neutral. As head of BP Target Neutral, Andrea led a world-class carbon management programme developing carbon reduction and offsetting programmes for BP and its customers.

The International Carbon Reduction and Offset Alliance (ICROA) represents the interests of service providers in promoting emissions reductions and offsetting to the highest standards of environmental integrity and in support of the Paris Agreement. ICROA provides an Accreditation Programme and supports organisations through advocacy and action-oriented activities aimed at advancing best practice in the Voluntary Carbon Market (VCM). ICROA is a non-profit initiative housed within IETA.

The ICROA Accreditation Programme defines and promotes best practice in the financing of high-quality emissions reductions and use of carbon credits as an effective carbon management tool. The Programme is open to all organisations who provide a carbon offsetting service. Participation requires membership to both IETA and an ongoing annual independent audit to assure compliance to the ICROA Code of Best Practice. ICROA Accredited organisations may use the ICROA Accreditation Label.

Figure 1:
Comparison to Voluntary Carbon Credit Demand Forecasts (MtCO₂e/yr)



(1) Special Ecosystem Marketplace COP26 Bulletin, Ecosystem Marketplace, 10 November 2021. (2) Future size of the voluntary carbon market, Trove Research, 29 October 2021. (3) "ER" is referring here to VCM carbon credits, which can be reduced/avoided emissions or removals. (4) According to the CDP.



**2021
GREENHOUSE GAS
MARKET REPORT**

HEADQUARTERS

Grand-Rue 11
CH-1204 Genève
Switzerland
+41 22 737 05 00

BRUSSELS

Rue du Commerce
Handelsstraat 123
1000 Brussels
Belgium
+32 289 55 747

WASHINGTON

1001 Pennsylvania Ave. NW
Suite 7117
Washington, DC 20004
+1 470 222 IETA (4382)

TORONTO

180 John Street
Toronto, ON
M5T 1X5
Tel.: +1 416 500 4335

IETA also has
representation in:
Beijing, London and
San Francisco.

ieta.org