CLIMATE TRANSFORMED

Voluntary Carbon Markets

A Gold Rush

Voluntary Carbon Markets (VCM) are the bridge to a world where technologies can decarbonise global supply chains. Capital is being abundantly deployed into every facet of the VCM ecosystem from project development to derivatives, all in anticipation of a marketplace that could be worth $50 billion by 2030.

However, the economic opportunity is clouding the true intent of carbon offsets, with concerns over quality, transparency, and liqudity becoming commonplace. How can we build a model where economics and environmental mission align? **Climate Transformed's** exploration into every facet of Voluntary Carbon Markets seeks to answer this most fundamental of questions.

CONTRIBUTORS

INDEX

Voluntary Carbon Market: A Gold Rush Our Thoughts

Summary

Paul Krake, Founder of Climate Transformed provides observations from the Voluntary Carbon Market Virtual Forum held in September 2022.

The reference to our recent Voluntary Carbon Market Conference as a “Gold Rush” received the precise response I expected.

It was taken negatively.

Some viewed the title as a blatant attempt to profit from the environment, and others as having a pessimistic connotation to well-intention companies building the essential infrastructure for a thriving marketplace. Both have merit. I chose the title based on the Hollywood depictions of those who flocked to the Californian gold mining towns in the mid-1800s: The morally sound, the profit-seeking, and a minority who behaved poorly. Gold rushes are typically clouded by an absence of transparency and regulation and are subject to enormous swings in price and volume. The infrastructure around “Picks and Shovels” profited handsomely, while others were left with little. While the title of our VCM conference was for dramatic effect, given the current state of the VCM, there is an element of truth to all of this.

In a perfect world, Voluntary Carbon Markets would not exist. Our society would have the technology and know-how to irradicate carbon from all our investment processes leading to a decarbonized and sustainable global economy. With our efforts to ween ourselves off a 150-year dependency on fossil fuels still in the early innings, Voluntary Carbon Offsets can be viewed as a bridge to a Net Zero and then carbon-free existence. This utopian view of voluntary offsets has tremendous merit; hence, the broad prediction of this being a $50bn market by 2030, according to McKinsey.

The rosy scenario for VCM comes historically with embedded benefits of the UN Sustainable Development Goals, which have provided untold advantages to the world’s poorest communities and aided the global economy with its efforts toward Net Zero. Tens of millions of people across the globe have seen their lives changed for the better through the funding of nature-based solutions, cookstoves, and LED projects, to name a few. In the aggregate, we have so much more to do, but the progress has been a testament to the early adopters of VCM.

However, the members of the VCM ecosystem are doing themselves a disservice. In July, Comedian John Oliver gave a scathing and rather factually dubious assessment of the VCM. The content is not important. What was disconcerting was that a television presenter could hijack the narrative and paint the entirety of the VCM in such a negative light. This should be a wake-up call to every senior executive working with the VCM that the industry is doing a horrible job at informing global investors, corporates, governments, and the climate-concerned about the benefits of nature-based solutions in particular. We all have to do better at spreading a truly positive message that is getting lost in the complexities of the current model.

Even the most well-informed investors, developers, and advocates are mired in the complexities and lack of transparency regarding the entirety of the VCM process. Projects can take years to come to fruition. With 130 registries and over 500 Measurement, Reporting, and Verification (MRV) standards, it leaves those newly exploring the use of offsets bewildered and frustrated. Pricing is opaque, with both spot pricing and forward curves providing little true insight into the economics of projects. Intermediaries are exploiting this lack of transparency and are taking as much as 30% of the proceeds while providing negligible value.

Project delays due to the absence of digitization are another major impediment. A recent Thallo white paper found the verification delays could amount to a loss of 4.8GT of carbon savings by 2030 and $2.6 billion to project developers, some of whom say that if these issues could be solved, credits could be issued twice as fast. The registries deserve some criticism as they are not where they need to be regarding a digitized process for verification, but friction is across the entire ecosystem, resulting in a market with limited and low-quality supply.

We are massively supply-constrained.

I will allow Charles Bedford of Carbon Growth Partners to summarize the state of supply

We're currently in a supply pinch. The registries have taken most of the renewable energy off the table except for LDCs. That takes 40% of carbon market supplies off the table. Redd+ is undergoing a reckoning where people realize the baselines have been overestimated. In reality, the baselines only amount to 40% of the credits that will or have been issued. That's another 40% of the historic market.

If we take half of those credits off the table, we will be left with just 40% of the total annual output. So, we will have to move many units, construct many solar platforms in LDCs, and do Redd+ projects at a higher quality standard. As a result, we're looking at a massive supply contraction in the upcoming years.

Adding up all the outstanding unretired credits makes up four days of global carbon output. The supply is not there to meet theoretical demand to achieve Net Zero. Economics 101 implies that a tightly supplied market should be witnessing pricing pressures, but the opposite appears true. The current state of the VCM is so opaque that the demand that should be inevitable is not emerging.

Where are the billion-dollar checks?

For all the optimism around voluntary carbon markets, the asset management industry dedicated to the vehicle is tiny. When the largest VCM asset managers oversee several hundred million dollars, a rounding error in the context of other asset classes, we must ask why large asset pools such as US university endowments or sovereign wealth funds are not participating. If the opportunity in the years ahead is compelling, why aren't large allocators such as PIF in Saudi Arabia or the Yale endowment investing hundreds of millions of dollars? Like the exchanges, stand-alone asset management firms face profitability challenges until investor appetite changes.

Like many gold rushes, the VCM will be littered with booms and busts, especially among service providers. The number of exchanges and liquidity providers will be suitable if volumes scale to the extent that many predict, but it is impossible to see how any of them will reach profitability in the next several years. Well-capitalized firms such as CBL can weather the storm, but consolidation appears inevitable unless a dramatic volume increase happens soon.

"If the opportunity in the years ahead is compelling, why aren't large allocators such as PIF in Saudi Arabia or the Yale endowment investing hundreds of millions of dollars?

Standardization is not straightforward

Standardizing contracts / greater financialization of the sector is a natural first step to improving liquidity. Whether that is greater speculation from hedge funds and investment banks or broadening the use of offsets to "decarbonize" point-of-sale" transactions, the existing infrastructure needs a dramatic increase in volumes and new participants to feed not only the existing brokers but the slew of investment banks that will offer balance sheet solutions to traditional corporate clients. It is all well and good to point to organic demand growth on the back of stakeholder pressures to show progress on Net Zero pledges, but we are at the stage where we require tangible evidence of where new demand will come from when assessing the health of the ecosystem as a whole. It is conceivable that the VCM can show high-quality growth in the years ahead, and the number of liquidity providers and exchanges will shrink dramatically via competition and consolidation.

In the near term, standardization has many challenges. I do not believe that voluntary carbon offsets should be treated as commodities. There is far too much nuance on a project-to-project basis with wide dispersion in criteria, quality, and guidelines. The VCM should be thought of as having similar characteristics to the corporate bond market. While comparisons can be made to the corporate debt of, say, Google and JP Morgan, they are different companies and therefore need to be considered through vastly distinct risk parameters.

This is what makes the rise of ratings particularly interesting. While many believe that companies like BeZero, Sylvera, and Calyx are redundant given the work of the registries, differing parameters that focus on the underlying investments of individual projects will grow in importance. Suppose carbon offsets are to be treated as an asset class unto themselves. In that case, these independent investment ratings, similar to what S&P, Moody's, and Fitch have established for corporate securities, will become an essential risk tool for traders and portfolio managers.

The Core Carbon Principles

Investment banks and futures exchanges are masters of the art of scaling the use of financial products through the use of common standards and benchmarks. The uniqueness of individual VCM projects will make this difficult. Financialization and scale will require a uniformity of standards that new participants can easily follow. The Integrity Council for the Voluntary Carbon Market (ICVCM) and the release of their consultation process for the Core Carbon Principles (CCP) is a natural step towards a standardized framework.

From Annette Nazareth, the Chair of the ICVCM

Integrity is our north star because we believe it is essential to use voluntary carbon credits to accelerate our transition to Net Zero. However, to do that effectively, the credits have to be of high integrity, and we all know that today, this is not consistently the case. So, it is essential that buyers can rely on the CCP to know that what they buy are consistently high-quality credits that make a genuine impact

Adopting such standards will go a long way toward building confidence in a market that currently lacks it. While the CCP has faced criticism, most recently by Verra CEO David Antonioli, a more standardized approach is required, and the CCP will most likely be that framework.

Web3 as a partial solution

While I am a broad blockchain skeptic (a solution looking for a problem), the elegance of a distributed ledger goes a long way to eradicating many of the complexities and inefficiency of a broadly analog VCM registration and trading process. The dozens of blockchain firms looking to transform the VCM will point to the benefits of transparency, scale, double-counting avoidance, and lower frictional costs.

Blockchain technology can scale the VCM in the following ways:

- It opens access to buying and offsetting carbon credits to a larger group of people who currently do not have access to the market.
- Blockchain technology allows people to build additional use cases for carbon credits into blockchain and Web3. It allows users to access the market and help scale it by eventually funneling the money directly back to projects on the ground involving carbon sequestration and carbon avoidance.

- It provides price transparency and price discovery. Right now, the VCM suffers from the inability to determine prices in real-time. By bringing carbon credits on the blockchain, allowing them to be bundled with similar kinds of carbon credits, and then trading them in a deep liquid market, pricing becomes transparent.
- You can view all the data transparently about carbon credits, such as their creation, buyer information, information about who will be retiring them, and the projects that will be using those credits
- VCM suffers from questionable additionality, a criticism that will only be solved through enhanced data collection.

Contrary to what some hardcore Web3 advocates promote, the Verra and Gold Standard consultations are wide-ranging. It can be argued that VCM is one of the few industries studying the role of blockchain in such an all-encompassing way. They both deserve enormous credit for this stance, and while they would be first to admit that they need to do more digitally, the waves of criticism are ignorant of the intentions of the major registries. We are currently a long way from global corporates circumventing registries, and the Web3 world needs to focus on a future with the registries at the heart of the process.

The biggest challenge facing blockchain as a solution to the VCM transparency and efficacy concerns is not the technology itself but its association with cryptocurrencies that face an existential threat. Global investors and corporates are not distinguishing between the elegant solutions that Web3 companies can provide the VCM and the fraudulent actors littering the cryptocurrency world. The FTX bankruptcy does more harm to mission-driven Web3 VCM companies than any announcement directly related to VCM. It is all about credibility, and the blockchain industry has struggles ahead.

Scope 3 disclosure requirements as a demand driver

On the surface, the prospect of US public companies being forced by the Securities and Exchange Commission (SEC) to disclose Scope 3 emissions could produce the sort of demand shock that the VCM market has been yearning for. While there remains enormous skepticism amongst many public market investors that public companies will utilize voluntary offsets as that bridge to a decarbonized future, stakeholder pressure to show progress toward Net Zero pledges will grow exponentially if Scope 3 emissions are public record.

I have tremendous sympathy for this argument, and the implications are enormous.

The FTX bankruptcy does more harm to mission-driven Web3 VCM companies than any announcement directly related to VCM. It is all about credibility, and the blockchain industry has struggles ahead.

- If implemented, many firms will move responsibility for purchasing voluntary credits from sustainability to the treasury function. While the importance of the sustainability units within US public companies will only grow, offsetting publicly disclosed Scope 3 emissions will migrate from a sustainability decision to a financial one.
- While SDGs will remain influential, it is undeniable that many firms will look for the cheapest form of offsets, driving standardization and potentially lowering the quality of the offsets purchased. While many disagree with this point, it is difficult to argue against the prioritization of cheap carbon offsets to mitigate Scope 3 emissions. Verra and Gold Standard will have an issue if this trend establishes itself as it fundamentally deviates from the original intent of the VCM, but the public disclosure of Scope 3 would amplify the need for cheap carbon offsets.
- Scope 3 disclosure requirements could fast-track the blurring of lines between VCM and compliance markets. Whether under Article 6.4 or not, the overriding demand to be seen to be offsetting carbon output through the use of offsets could see rising demand for pure carbon products. The compliance market solves many of these issues and, at a minimum, a push to broaden the range of the compliance market could evolve, especially in Europe,

Notice how I said if implemented. One concern is the inevitability of a Supreme Court challenge to any efforts by the SEC to enforce such a blanket disclosure on all US publicly listed firms. The recent de-fanging of the Environmental Protection Agency over the issue of state rights implies that wide-ranging disclosure requirements by another Federal Agency may also face opposition from this conservative Supreme Court. If deemed a state's issue, disclosure requirements will fall short and be much less impactful. With states like Texas pulling mandates from asset management firms who enforce anti-fossil fuel directives, the chances of more than 50% of US states demanding disclosure of Scope 3 emissions is slim. This would be yet another policy failure for the United States, with the Inflation Reduction Act being one of the few legislative victories for climate advocates in the past two decades.

Conclusion: A tremendous opportunity for growth

Voluntary Carbon Offsets remain the cheapest way to express a pure carbon narrative for investors and corporates. Whether as a tool to offset the carbon output of a supply chain or as a reflection of carbon as an asset class, the VCM trades at a dramatic discount to compliance markets and carbon capture technologies. The complexities and vagaries of the model imply that this discount is justified, but convergence between all three markets is my base case over the next five years. While a merger between compliance markets and the VCM is likely in the years ahead, there will always be a divergence in price as compliance markets, the VCM, and carbon capture have different priorities and objectives. A ton of carbon is not a ton of carbon, and carbon removal will trade higher than Redd+ programs that protect against deforestation. While offsetting is part of the solution, true progress comes from the low-cost extraction methods. Long-term, this must be the priority.

Stagnating prices for VCM credits are a function of a market still finding its feet. It lacks the strong regulatory framework that has allowed compliance markets to thrive, and self-policing is failing to produce the uniformity of standards required for financialization and scale.

The ICVCM process is far from perfect, but it will be the framework that will generate the much-needed standardization and, therefore, investment from the tens of thousands of corporates that have yet to use voluntary credits as the bridge to a decarbonized future. Despite all the dysfunction within the VCM, it remains the singular tool for many companies who face the innovation hurdles to decarbonize their supply chains. Disclosure requirements, either mandated or from stakeholder pressures, will force firms to show progress towards Net Zero and until the technology exists to remove carbon from their commercial processes, owning VCM credits is the means to that progress.

Transparency is the key. Transparency in price. Transparency in what you are buying. Transparency into the fees being paid to intermediaries. Transparency into the science behind how much carbon is being extracted/saved. All are essential, and all require the industry to embrace technology/digitization. Web3 is not the only solution. The registries need to move quicker by adopting an entirely digitized process and cease being the bottlenecks to verification. The long lead times for a project to come to market prevent financing at the early stages. This must be solved. The absence of transparency is the primary reason for the limits in funding, and this has a data solution.

Establishing a liquid forward curve will assist in the early-stage funding requirements for projects. Giving project developers and the corporates they work with the confidence that the future benefits regarding profitability, carbon offsetting, and SDGs are achievable. This goes back to transparency, and it is only with this that the number of high-quality projects will be brought online to meet the inevitable demand. High-quality supply will drive demand as investors get comfortable that projects match their mission.

I fear that the Sustainable Development Goals will be deprioritized over time as the pressure increase for a greater focus on pure carbon offsets. Gold Standard, in particular, will be vocal against such a move as it can be argued that SDGs are the essence of the VCM. The inevitability of global corporates, in the aggregate, prioritizing carbon due to stakeholder pressures could lead to a race to the bottom as treasurers focus on finding a ton of carbon at the cheapest possible price. There will always be mission-driven organizations emphasizing SDGs as a key input into which voluntary offset they purchase, but they could be in the minority as standardization takes hold. This trend will drive the convergence between compliance markets and voluntary offsets under Article 6.4 in the years ahead.

Long-term requirements for a thriving marketplace

- Common carbon pricing with stronger links between compliance, voluntary markets, capture, and sequestration. This implies higher prices for nature-based solutions and a declining technology cost curve for capture and sequestration
- Digitization of the entire verification process to scale supply, elevate project quality, and speed up the time to market. Blockchain will play a sizable role.
- Meta-Registries where investors, exchanges, OTC liquidity providers, and rating agencies can freely access data. An essential step towards transparency.

- Establishing reliable and transparent forward curves to provide greater investor confidence to provide capital at the pre-financing stage.
- Transparency will eventually lead to lower transaction costs and a diminished role for intermediaries who provide limited value. The economics of new projects should be more evenly spread between the developers, investors, and communities/stewards of nature-based projects.
- A regulatory body: The role of governments and how they regulate their carbon assets will dramatically impact both price and market structure. We must be watching the new Lula government in Brazil for signs of the establishment of the "OPEC of Carbon Offsets."
- The merger of compliance and voluntary markets under Article 6.4

Global companies committed to Net Zero will have three budget items to tackle their carbon output.

1) Research and Development to decarbonize their industrial processes/supply chains
2) Carbon capture of the carbon they currently emit
3) Compliance market or voluntary market credits

The price of VCM credits will rise appreciably in the next several years, driven by the inevitability of demand and a supply dynamic that will improve over time but will keep the marketplace in a structural deficit. If global companies not within the compliance framework embrace the VCM as the primary tool alongside R&D and carbon capture to mitigate carbon exposure, there will not be enough supply to support this wave of demand. Despite all of the struggles facing the VCM, this is the reason for the eventual re-rating of voluntary offsets.

There are no simple solutions to our climate challenges, but the laws of supply and demand remain undefeated. Hence, my optimism that the price of all voluntary carbon offsets will move dramatically higher in the years ahead.

Thank you to all speakers who shared their intelligence and time with us. Their insights are next.

Carbon Growth Partners: Myth-busting Voluntary Carbon Markets

Featuring: Rich Gilmore, Carbon Growth Partners and
Paul Krake (moderator), Climate Transformed

Summary

Rich Gilmore tackles some of the myths and misconceptions about the VCM and addresses how to optimize financial returns and climate impact in an evolving market.

About Carbon Growth Partners

The Carbon Growth Partners group is led by a team with more than 100 years of experience in climate finance, policy and markets, investment banking, conservation, and community development. They deliver ethical, profitable, and impactful climate finance to the people and places that need it the most. They invest in diversified portfolios of carbon assets to deliver three key outcomes:

- To generate financial returns by identifying, acquiring, and managing best-value carbon assets that can deliver superior returns to investors.
- To benefit people and nature by investing in projects that deliver co-benefits to forests, grasslands, wetlands, and the people who rely on them.
- To accelerate climate action by bringing high-quality carbon offset solutions to responsible businesses that complement their emissions reductions.

The Complexity Around the Carbon Market

The carbon market is complex because the policy environment is extremely noisy. In 159 days, there have been 282 policy and guidance updates. We invest in carbon assets because we believe carbon assets are still one of the cheapest assets anyone could possibly invest in. One of the following three things needs to be true for carbon prices to rise significantly: climate pledges have to become climate actions—If corporates use the credits in actual decarbonization, more investors enter the market, or the supply of the credits continues to be constrained. We think the supply will continue to be constrained. The rising

prices are not just a function or an outcome in the market. Carbon prices are intended to rise. In the compliance market, it is achieved through capital trade; in the voluntary market, it is achieved by enhancing the eligible criteria for the projects. All these aspects are observable now.

Supply and demand dynamic in the market

The international carbon market has grown more than 1000 percent by volume since Paris Agreement was signed in 2015. The voluntary carbon market is undersupplied for achieving net zero by 2050. Net emissions must fall by 50 billion tonnes every year and forever. We are currently removing a few hundred million tonnes of CO2. Even after decarbonizing every possible industry, economy, and transportation, we will still be left with 10 billion tonnes of CO2 to be removed. Global demand for net zero is growing. According to a report by Trove Research, 219 new companies made a net zero commitment under the SBTi (Science Based Targets initiative) in July 2022. In addition, the number of companies that have set SBTi-aligned targets has more than doubled compared to the past year. The aggregate emissions of companies making pledges are also increasing. Those commitments are turning into offsets. As a result, year-on-year quarterly retirements have risen for ten consecutive quarters. The market is chronically undersupplied as in 2021, all the carbon offset projects on Earth generated a record 0.3 billion tonnes. Even in the most conservative scenarios, the future demand for offsets will be much greater than the supply.

Carbon Growth Partners' Investment strategy and process

We invest in the highest quality carbon credits. We actively manage the portfolio to deliver 20 percent to investors and make an impact on the climate.

Investment mandate

We make carbon investments along the following five-stage continuum of complexity, risk, and reward:

- Spot credit purchase: We invest more than 60 percent in these purchases to acquire large volumes of already issued credits from quality projects that are hard to substitute.
- Forward offtakes: We make around 20 percent of investments in securing multi-year supply at fixed and floating prices through forward contracts with payment at delivery.
- Project finance: We make less than 20 percent of investments in securing forward supply by providing limited capital at risk, including partial payments for credits.
- Brownfield origination: We see it as a future investment opportunity and plan to invest in the early-stage projects that have a line of sight to issuance in the medium term.
- Greenfield origination: This is another future investment opportunity. We plan to develop carbon projects from scratch through indigenous partnerships, land acquisition, leases, and other means.

"Even in the most conservative scenarios, the future demand for offsets will be much greater than the supply." – Rich Gilmore

Defining quality, integrity, and certainty

We allocate capital based on the following five key attributes across the portfolio and on a project-by-project basis:

- Compliance compatibility: The credit should be used not only as a voluntary offset but also as a compliance offset.
- Co-benefits for people and nature: Nature-based removals are scarce and will attract a widening price premium. However, it's essential to have the rigor of the additionality, so co-benefits such as women's safety and economic participation are highly valued.
- Policy alignment: We want the assets we invest in to align with regional and domestic policy.
- Standardized contracts: We are increasingly attracted by standardized contracts because of the liquidity that they bring.
- Unimpeachable additionality: Investments in the least developed countries, removals, and projects that meet anticipated evolving method and vintage additionality requirements are priorities.

Myth-busting the VCM

- **The 'gold rush' myth**

This market is still dominated by an intrinsic demand for offsets, retirement, and supply in an OTC market. There is a perception that speculative money flying into the market is pushing out prices and creating risks for the market. If we look at the demands coming through the number of credits being retired by the corporates, we can observe how the trade is going through. At least 90 percent of the market is still being transacted by companies buying the emissions for offsets, someone supplying those credits, and an intermediary between them. Investors leave retired carbon credits in the market. We have 25 million wastes a year, but at large, we are never going to retire that volume at sales. So, the 25 million tonnes in the market is providing liquidity to the people who need efficiency and liquidity of offsets. It may become a gold rush, but at this moment, it is still very much an OTC (over-the-counter) market between 10 years of purchases. There is a lot of risk around the question of integrity in the market. It is imperative to understand what and what not is being charged and claimed in terms of integrity. Projects not delivering the outcomes they should have delivered pose a risk to integrity. The argument is that those outcomes achieved verifiably and validated by independent parties were not additional to the climate. In this case, a change in the rules might make them ineligible and tighten the baselines for REDD+. Fortunately, both of those actions have happened. Verified Carbon Standard (VCS) 4.3 has already knocked out almost every new source of grid-connected electricity from generating new carbon credits. The REDD+ baseline is already under review. There is strong oversight and integrity in the market. But as the technology gets matured, more advanced, and cheaper, it should make projects that do not deliver the claimed outcomes ineligible to generate supply. This is precisely what is happening.

- **The 'voluntary' market myth**

Expecting the carbon market to be voluntary is holding back the scale of the market. Not one listed company is making emissions reductions voluntarily. They might be required to reduce their carbon

footprint by law. Companies don't buy credits voluntarily, so we should call it a Verified Carbon Market rather than a VCM, as the outcomes in this market are independently verified, validated, and audited. So to make climate change, we need to treat VCM as a verified carbon market.

- **The 'no offsetting' myth**

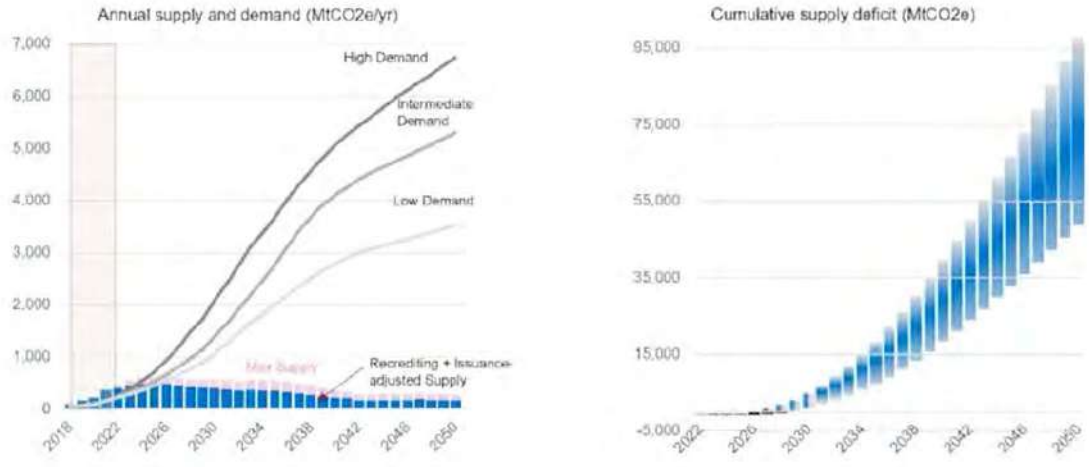
The idea of doing offsets at last or not doing them at all is one of the most harmful myths in the market. The idea of depriving people in developing countries of any sort of climate finance until every country in the west has accomplished its climate goals hinders climate actions and is extremely unjust to the people that rely on climate finance. The idea of delivering climate finance to get additional outcomes after decarbonizing every industry can hold back the climate outcomes that could be achieved earlier.

- **The 'double counting' myth**

Double counting is probably the most controversial myth in the market. If a company is not a signatory to the Paris Agreement, then it has done nothing to double count. Under the Paris agreement, no two countries can claim identical emission reductions. However, a company making a claim, communicating its investment in climate action, or buying an offset from a developing country does not mean that two actors claimed the same offset. Claiming that the emission reductions are only valid if they have a corresponding adjustment does not make sense. It does make sense between countries because those two countries might purchase under the Paris agreement.

- **The 'supply glut' myth**

If we add up every carbon credit in every registry from every vintage that has been issued but not retired, we can offset the level of emissions for four days. The market seems oversupplied to us because we don't have enough visibility on the trajectory for net zero commitments. The greenhouse gas generated by the oil and gas industry alone is quite challenging to decarbonize. The oil and gas industry has made seven billion tonnes worth of offset commitments already. The total supply in the market to achieve net zero commitments is tight.



- In 2021, all the carbon offset projects on earth generated a record 0.3 billion tonnes
- Even in the most conservative scenarios, future demand for offsets is multiples of supply

Source: taken from Carbon Growth Partners' presentation at Voluntary Carbon Markets – A Gold Rush.

- **The 'vintage' myth**

It is observable in the future markets and the OTC market that the newer credit is more valuable than the older one. It does not make sense because offsetting a tonne of CO2 matters no matter when it occurs. We only care about the newer credits because we fundamentally believe that the VCM is about meeting the Paris Agreement goals. If an offset took place in 2014 through a resource still alive today, the company making that had eight additional years of impact. Arguably, the carbon project from the renewable project in India that was granted in 2010 is more additional than the credits in 2020 because fossil fuels were still being used. So we made a pragmatic decision to focus on meeting the Paris Agreement. It is observably true that newer is better than older, but we need to make sure that it makes sense with the climate aspect.

- **The 'nature' myth**

The evidence does not support the idea that we should only invest in nature-based solutions. We need to transform energy systems. We need companies to buy and retire renewable energy credits. This will still be two-thirds of the effort to the path to net zero. Investing only in nature-based solutions will never help us achieve net-zero goals because that's not where the carbon came from. Instead, we should turn the mitigation hierarchy upside down. We can offset everything, and then as we start to decarbonize internally, we will have less demand for offsets.

- **The 'removals' myth**

We need to invest in the removals, but investing in the removals alone will do little to reduce emissions because we need to combine removals with many other climate actions to create a huge impact. The foremost thing we need to do is reduce emissions. The additionality of removals is much more observable. We have to pay people to stop emitting and do removals as a part of a holistic decarbonization strategy. If we look at the supply constraint, there are around 10 to 20 million tonnes of removal credits available in the market. Removals are economical and aid in offsetting carbon, but they are not the only way to offset emissions.

- **The 'two markets' myth**

In the future, we will not have the Voluntary Market and the Compliance Market, but we will see these markets merged to form a Carbon Market with a goal of carbon abatement. In our view, we will see more integration in the market. For example, Singapore has announced that a certain proportion of obligation on the carbon tax can be made in the international carbon market. Columbia has done the same, and the Australian government is looking at the role of international offsets in its compliance-safe government. The key to these markets is getting to net zero. That may be achieved by a UN mechanism or by regional decisions like the one many countries are already making to allow integration across carbon markets.

- **The 'CO2' myth**

CO2 is responsible for scaling global warming, but we need to tackle methane and invest more in methane projects and biogas projects because that will eventually help us tackle the big challenge. We can keep methane in the atmosphere faster even though methane does not persist in the atmosphere as long as CO2 does. Doubling down on the methane offsets will eventually help us tackle the big challenge.

The scale of methane comes from the cookstoves. Is it more of an emerging market landfill?

The US renewable natural gas and animal effluent management projects are reasonable to scale. We can create the most impact by developing projects around community-scale biogas in the least developed countries. However, they are expensive and difficult to scale.

Why should nations be allowed to consider carbon offsets from companies under their Nationally Determined Contributions (NDC)?

This is an issue around the narrative. The companies can communicate their investments in emissions reduction in any way.

What does REDD+ need to do to get back on track?

We must pay people, particularly indigenous people, to protect their forests. If projects were innovative about this, they would be revealing their baselines. Over time, they will make up any diminished volume in price. Credits from projects when they meet the baseline are seen to be inflated or have been overstated. We think those credits will be unsalable at any price. In the alignment of the baseline, we are good. Otherwise, we start to have a standard asset.

Isn't it a solution that the vintage issue just realigns the baseline?

We confirm the baselines first. Verra has done a great job. Companies can look performance of the REDD+ project at Verra by year. They can see when projects start to underperform and make an investment decision based on that. Scrutiny over the baselines is essential for confidence, but we will never get it perfectly right. If we make it 90 percent right, the effort of going from 90 to 100 percent would be 100 times more than what took you from zero to 90 percent.

ICVCM

Featuring: ICVCM board members Annette Nazareth, Kelley Kizzier, William McDonnell, Chris Leeds and Emma Cusworth (moderator), ICVCM




Summary

The Integrity Council for the Voluntary Carbon Market (ICVCM) is an independent governance body developing best practices and standards to ensure efficiency, transparency and rigour for voluntary carbon credits. Annette Lazareth, the ICVCM Chair, is joined by board members Kelley Kizzier, Chris Leeds and William McDonnell for a frank and wide-ranging conversation about the role and influence of ICVCM and the potential of voluntary carbon markets as a tool for meeting the Paris goals.

About ICVCM

The Integrity Council for the Voluntary Carbon Market (ICVCM) is an independent governance body for the VCM and is currently consulting on its proposal for its core carbon principles assessment framework. Together, those two things are designed to provide a widely shared understanding of what high-quality carbon credit is and to make them readily identifiable. The goal of that effort is to build trust, unlock investments, and help deliver climate impact at speed and scale.

Why does the market need the integrity council, and how will the Core Carbon Principles (CCP) change the market?

Annette Nazareth:

Integrity is our north star because we believe it is essential to use voluntary carbon credits to accelerate our transition to Net Zero. However, in order to do that effectively, the credits have to be of high integrity, and we all know that today is not consistently the case. So, it is essential that buyers can rely on the CCPs program to know that what they buy are consistently high-quality credits that make a genuine impact. Any respected market needs liquidity, transparency, consistency, and standardization, where you don't

have to negotiate and do due diligence on every contract. You should be able to know just as you could on an organized equity exchange, where you know that when you go to buy something, you'll know what it is. There is a disclosure process around it and listing standards.
We're borrowing those concepts and applying them to this market because we believe they could tremendously impact our climate goals.

Kelley Kizzier:

We want to build trust and clear the barriers to investment. We have an excellent experienced team onboard to work through this process.

Chris Leeds:

Through this, transparency is critical, and we want to shine a light on what is going on in the VCM, and in a lot of cases, there are a lot of good things happening. There is already integrity, and we want to take the best practice, the best of what we have, and build on that as part of continual growth and development. It is about getting money into projects that wouldn't otherwise have it. From this exercise, we'll develop a set of guidelines that reduce confusion. It is a complex market, but it can be simplified.

How is the integrity council addressing that delicate balance between stringency and workable reality?

Kelley Kizzier:

We are in the consultation phase of this draft framework. It is not unusual for draft guidelines to come out of the gate. It is necessary to test what we can do. If we didn't have a high bar during this draft phase, we would not be trying. We need feedback at this stage. We need to know where it is impractical. We want to strike a balance, and we do not want to set a bar so high that only a market 20 years from now could reach it. We are getting thousands of comments back in this consultation phase, and we are also in communication with environmental NGOs, indigenous people, and local community groups, and with standard-setting programs themselves, so that we can make sure that we're getting as much feedback as possible. The next phase is to turn all of that into a framework that is not only about integrity but also about driving this crucial investment. We know that public sector finance will not be enough to reach net zero by the middle of the century. There will be a phased market approach, so there will be things that will come in immediately and others that will come in some time later. The idea is to set a bar for what carbon credits need to achieve over time. With the boom in the VCM, we're seeing new standards come on board, and sometimes questionable standards are being created. We want to ensure that buyers can readily identify high-quality and best practices and that those new to the market or who need to improve know what they need to do.

Chris Leeds:

Standard Chartered is a buyer, and buying is difficult. There are many questions from people from audit and internal risk asking why we made that decision and how we quantified it, and it is difficult to give an objective reason. We look at the standards and talk about the ones out there that are very good, but have

inconsistencies. We, therefore, want to see more consistency across standards as well. There will be different ways to measure additionality, but we must understand what we are looking at.
It is fine for large companies who can put teams of people in there to scrutinize opportunities, but it's not practical or sustainable—even less so for small buyers who may only come in once or twice a year. They need to have confidence that what they buy is good quality.

William McDonnell:

Ultimately, this is about helping the VCM to drive more real climate action, and that's what we all get out of bed for. We must have integrity, and we must have market uptake. That is why phasing is so essential. One area of the consultation is about what should be included in presenting an initial threshold and what may realistically take more time for people to be able to comply with.

Can we afford to wait for the perfect solution? Can we afford not to wait if the present solution drives the wrong kind of impact?

Kelley Kizzier:

There is no such thing as perfect here: some math, but lots of it is a matter of preference for developing the approach. There are many variants, and we need to consider all of them. We also need to make it easy for investors and buyers by hiring the world's best experts. We must set an initial bar and keep adjusting and improving over time because the landscape changes daily. There will never be perfect, but we can constantly strive to improve and check ourselves at every step.

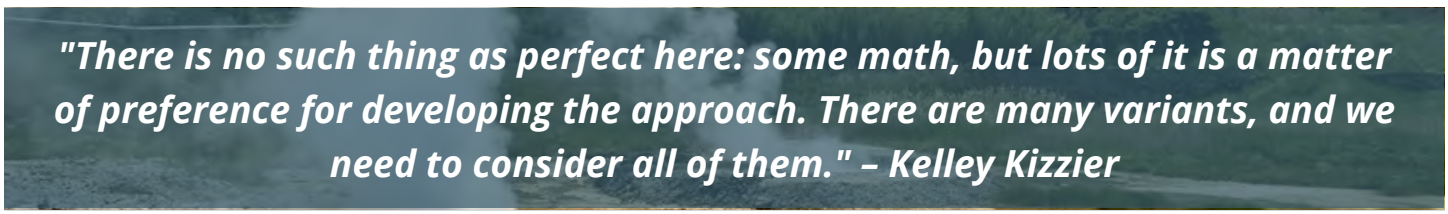
Annette Nazareth:

As a former regulator, I always dealt with these challenges: on the one hand, the accusation that we are too ambitious; on the other, the suggestion that we should wait until the perfect solution is found. A policy perspective would say that we should be as ambitious as we can be while achieving the policy goals that we are seeking and that we would review policies and raise ambition over time. We can make a very significant impact at this time toward accelerating the transition.

Are you confident that the Integrity Council will get to a place where all stakeholders have a board agreement?

Annette Nazareth:

I'm confident that we will. Sometimes it is not always clear in the first instance. We are deeply interested in everyone's comments because we are not coming to this with a hard and fixed view. We feel we've been ambitious in our proposal and are very interested to see how ambitious we can continue to be.



Chris Leeds:

There is a lot of interest to see what comes out of this from exchanges, buyers, and all the rest. The market knows we need this; the sooner it happens, the better. The nature of the market is that it will improve over time. So, for example, if a technology no longer needs support, the market does its job.

Kelley Kizzier:

We've recruited people with very different experiences and viewpoints internally, and the debate that goes on within ICVCM is adding to the strength of this process. We're trying to diversify all the time, enrich and include, as well as make the most unified approach we can. It does not make for the easiest process, but it will make it the most robust.

William McDonnell:

We are doing around 40 to 50 briefings and outreach sessions during the consultation to engage with diverse stakeholders. So, we are speaking with market folks, governments and regulators, programs, project developers, more comprehensive market participant gatherings, environmental NGOs, academics, the Indigenous Peoples and Local Communities (IPLC) sessions that we are running, and so on. We are pleased by the level of interest that we are getting across different groups. On the board, there is a broad mixture of philanthropists, market experts, experience from the United Nations, and indigenous representatives. That diversity is also reflected in the expert panel. When we start doing assessments, we'll also need further expertise.

Should the VCM be regulated?

Annette Nazareth:

It should be as regulated-like as possible, as regulated markets are efficient, standardized, and liquid. There is an active futures market for these products, which is wonderful because it will set a vital price signal and permit market participants to hedge in ways that they have not been able previously. These are very long-term contracts. The futures market is regulated, so the VCM will be closely tied to regulation and compliance markets. First and foremost, we want a market of high integrity, and with that will come scale and confidence in the market.

Will the social cost of carbon (SCC) disclosures lead to confused prioritizing and cheap carbon assets, and does that lead to co-benefits being deprioritized?

Annette Nazareth:

We would not want to see the unintended consequence of investors investing in low-quality credits. Therefore, it is important to disclose how the investor determines that the credit is of high quality. One way to do that is to say that it satisfies the CCP.

"The futures market is regulated, so the VCM will be closely tied to regulation and compliance markets." – Annette Nazareth

Chris Leeds:

It comes back to transparency. Companies will need to engage with high-quality credits. We will get the cheapest high-quality carbon credits that meet the standard. No one wants to pay more than they need, but we want the quality to be high. The supply of those high-quality credits is somewhat restricted at the moment, in contrast to what we see of these poorer-quality credits. Prices will rise, and that is okay because we want a lot of money to go into projects to reduce emissions. $2 and $3 credits probably don't do much to reduce emissions.

Kelley Kizzier:

We need regulation to reach carbon targets. But the VCM has its place as it allows companies to do more than they otherwise would. Full regulation would be ideal, but we are far from that. In the meantime, the VCM is complementary to the existing compliance markets. Transparency will act as a regulator to some extent as they will be scrutinized on what credits they're purchasing. Price discovery is a fundamental problem in this market. A higher price does not guarantee higher quality for all sorts of reasons.

"The supply of high-quality credits is somewhat restricted at the moment, in contrast to what we see of these poorer-quality credits." – Chris Leeds

Is ICVCM preparing for the merging of the VCM and compliance markets?

Annette Nazareth:

The benefit of the VCM is that we do not have to wait for regulatory processes to be set in place. We can get going already because we believe that we do not have time on our side, but the VCM can join regulated markets as they launch.

Kelley Kizzier:

The VCM will help the regulation development because it will produce a lot of data. The Clean Development Mechanism (CDM) helped countries to understand their emissions. It is not part of our mission to inform future regulators and the development of legislation. Still, those processes will likely benefit from our work as we have broad industry expertise and engagement.

Chris Leeds:

Quality CCP leading to contracts based on them are willing to trade, and trust will support trade in those credits. Then we see corporates and governments using core carbon credits, saving the time to do due diligence.

William McDonnell :

We will do our job, and it may serve as a model for regulators and may become the standard accepted system for assessing credits.

Should the ICVCM be engaging with accounting standards?

William McDonnell:

Yes, we want to build those relationships, and we have a meeting with the International Accounting Standards Board (ASB) in a few weeks. Transparency and disclosure are tremendously important. They are healthy and one of the best ways to foster change.

Kelley Kizzier:

The ICVCM is focused on the background of a credit being sold but not so much on the backstory of the buyer. Still, it is the focus of the Voluntary Carbon Markets Integrity Initiative (VCMI). So, we are working very closely, with some personnel crossover between VCMI and ICVCM.

How do you see the market impact of the CCP rolling out?

Chris Leeds:

People have realized that we are not creating new standards, but it is about looking at what the standards are already doing. We want to get things going as swiftly as possible. But unfortunately, there is a gaping hole where people want to see the CCPs. We have been talking about it for a long time. Exchanges are desperate to list core carbon and to start putting out futures contracts that people will be able to deliver in a year. If you build it, they will come—the market is crying out for that transparency and that certainty.

Will you be looking at previous vintages of credit to check that they comply with CCP?

Kelley Kizzier:

In the current framework, there is no vintage restriction. We are not trying to cut out part of the market, but we are looking to support the ongoing consistency of credits.

William McDonnell:

CCPs are universal, so they can be applied to any credits, including vintage. Additionally, it can be applied to any credit to give you an answer as to whether it meets the CCP threshold.

Chris Leeds:

It is a lens through which to view any credit. Potential buyers then have the label and can decide for themselves. I would rather see everything trade so people can decide for themselves. If someone buys bad credits, it is someone else's job to call them out via disclosure, which we mentioned concerning accounting. Furthermore, some credits will wither on the vine because there will be no demand for them. Vintage shows how the market has not been working correctly because these credits should have been retired by now. Offsetting is achieved by purchasing and retiring credits rather than sitting on them. If credits had been consistently retired over the last ten years, there would not be an issue with vintage credits.

"There is confusion about the relationship between Article 6 and the VCM, with the VCM being voluntary and Article 6 being quasi-compliance once people sign up." – Chris Leeds

How long do you expect it will take to do the assessment process, and is there a danger that causes a two-speed market in which programs can't get assessed fast enough?

William McDonnell:

We recognize the market's desire, but we must also do the assessments carefully. So, we are inviting programs to apply to us, and we intend to work through them as they do so. Our initial indication is that we are aiming to assess a program within four months of receiving a complete application, but warning that it might be six months if there is a lot of traffic. Alongside that will be a process for assessing carbon credits. So, again, there will be a sequential approach and prioritization, but it will take time to work through carbon credits. By the second half of next year, we will be assessing programs and credits, so we are thinking about whether we should announce credits when they are ready or hold them back to release a few simultaneously. VCM exists already, and these things are traded and in the market, so it is not going to be a night-and-day moment. But hopefully, as we start putting the CCP label on, people will start having an interest in them.

Is it possible to have universal standards when Article 6.2 is a bottom-up platform that promotes national sovereignty and, by default, national interest?

William McDonnell:

The VCM is international and is already in flow compared with the activity under the Paris Agreement.

Chris Leeds:

There is confusion about the relationship between Article 6 and the VCM, with the VCM being voluntary and Article 6 being quasi-compliance once people sign up. The interaction between the two comes through the inventory that you're doing between the two. So, for example, if you're doing a project in Indonesia, one will hope that it will support your nationally determined contributions, which will affect whether that government will want to put support into that project. So we have to consider that interaction. Article 6 clarified that carbon credits are a sovereign asset, just as you would not go in and start drilling for oil without the government's approval. Governments will want to engage and benefit from that.

Kelley Kizzier:

The VCM is not regulated by Article 6, which is about countries. Instead, Article 6 regulates the accounting for governments. Whether VCM credits will be affected by Article 6 may be complicated because it is not so much about whether it will be double counted but whether it will undermine the value of the credit. This is a temporary problem until we all come under regulation, and I just hope it does not limit really

important projects and actions.

What does success look like for ICVCM?

Arriving at a robust and credible understanding of what a high-integrity credit looks like is the deliverable. We are making every effort to roll this out broadly. Implementation will depend on the final implementation of the framework. We aim to have the majority of the market CCP approved. A thriving VCM that drives social and environmental benefits is the ultimate goal.

Gold Standard: Twenty Years of Evolving Standards

Featuring: Margaret Kim, Gold Standard
and Paul Krake (moderator), Climate Transformed

Summary

CEO of Gold Standard Margaret Kim joined Paul for a conversation about the vital role the company has played in the evolution of standards for carbon offsets. Verification standards continue to adapt to scientific rigour, digitization and public policy and the complexities of offsets are often underappreciated by a marketplace keen on standardization. No segment of the decarbonization process faces scrutiny like carbon offsets, and they discussed these complexities through the lens of all stakeholders.

About Gold Standard

Gold Standard was established in 2003, whereby World Wide Fund and like-minded NGO groups established a gold standard to ensure environmental integrity and sustainable development in the carbon markets.
Over 20 years, we've evolved, and our standard has evolved, and we're looking at becoming a global impact standard that looks at not only carbon markets but also various financial mechanisms. This will make sure that we can ensure transparency, the credibility of impact claims, and impact assets.

What needs to be achieved to put your stamp on a quality offset?

Gold Standards framework does not exist only for offsets. There's a lot of conflation around offsetting and the concept of carbon markets. It's not the same thing. Offsetting can be one of the ways to use carbon markets but not necessarily the whole purpose of carbon markets or the market mechanisms. We are trying to ensure a carbon credit or an impact claim that we certify as real, additional, not double counted, properly consulting the project's local stakeholders and ensuring it contributes to several

sustainable development goals.
There are clear safeguarding principles that you need to follow to be Gold Standard. In addition, there are clear sustainable development measures you need to track and report on to qualify as Gold Standard, additionality, baseline setting, and all the integrity measures that other standards also have.

What do you think about scaling the VCM?

If we consider what the world needs to achieve a sustainable future, the Paris Agreement, and global goals, we need trillions of dollars invested. Yet, carbon markets right now are a tiny drop in the bucket. There are many efforts to scale the market, but what is the purpose of the carbon market?
I've always seen the carbon market as a catalytic tool to drive further private finance. The market will not solve even half of our problems, so what does it mean to scale? Where is our ambition?
Scale is not a value in itself and needs to come as something that delivers mitigation and does not deter or disrupt other mitigation or regulation. There's pressure on scaling up that I fully align with, but it should not come at the expense of environmental integrity. Offsetting done poorly is harmful. Is it the market that's harming or the use of the market? Offsetting is the use of a market mechanism, and if the offsetter or the buyer misuses it, that has a ripple effect on the reputation of the market. So we can't underestimate the 20 years of history that these independent standards have filled a policy void to catalyze action that would not have otherwise happened.
Innovation came through this market, but we're learning as we go. For example, people said that sustainable development was too complex and that only a single metric of carbon could be accounted for in any material way. Gold Standard proved that idea wrong, and everyone involved in sustainable development is a prerequisite to credibility.
Project developers are at the front end developing technology and other innovations, but they often get swept under the rug when we get criticized as a market as a whole. It is an evolving market, and I welcome efforts to create an international floor to what carbon credits should be and what the core carbon principles should be and, from there, find different ways to differentiate quality and SD impact.

What role do the carbon principles play in establishing a quality floor to move forward with?

It is a good measure but should not encourage a race to the bottom. There is a risk of over-commodification, where we revert to looking only at carbon or a type of carbon in vogue. High-impact projects that deliver, for example, provide many community-based services, such as clean energy, clean water, and clean cooking, could become uncompetitive in this highly commodified market. So how do we safeguard those projects to deliver those real impacts on the ground?

Three SDGs are needed to qualify—is that now under threat?

I always find that threats become an opportunity at some point.
Ten years ago, sustainability divisions of large corporations were small, ticking the boxes. Now it's becoming a prominent function of many large and leading corporations. But unfortunately, it took us a few years to get there.

"The regulatory bodies have a huge role in helping corporates integrate that into their planning systems." – Margaret Kim

The treasury function within the corporate is getting closer to real decision-making. It could be seen as a true decision-making measure that integrates into corporate decision-making and future business building. There is a lot of pressure from regulators, consumers, and investors. If those are disclosed and monitored, then investors and the top management need to ensure that we're not doing it the cheapest way possible. That will take another few years, and we don't have that many years of luxury, but it will take a few years for those behavioral changes to occur. I am worried that the market will be used in this context, but we need to put pressure on a global community that the most effective way of offsetting does not exist.

Are there circumstances under which you would make a carbon-only credit, with no SDGs, etc.?

No. That wouldn't be Gold Standard. There can be a mitigation impact, but what if it was at the expense of pushing out indigenous people on the project side, cutting down energy access to specific communities, or harming biodiversity at that project site?

The lack of clarity about the price of a ton of carbon is a barrier to some companies engaging with carbon credits. So how do we get to uniformity in the pricing of carbon?

The regulatory bodies have a huge role in helping corporates integrate that into their planning systems. The market mechanism has set prices. Projects with more co-benefits have had a higher price, so the extra work is reflected in additional benefits and higher prices. Corporates play their role too. A systemic pressure is required to increase the cost of carbon.

Is the convergence of voluntary and compliance markets inevitable?

One tonne is one tonne, whether in Canada or Uganda, so where it comes from doesn't matter. We just need to meet our target. We'll see more blurring between voluntary and compliance over time. What's important to me is that what's Gold Standard in one market is Gold Standard in the other. Our standard users can have that flexibility in using different market mechanisms. That's tracked clearly in our registry to avoid double counting, so people can see where it was used. As governments look to set up their domestic compliance markets, the role of standards is to be ready for that.

Should Gold Standard be applicable across any jurisdiction?

We're working with individual governments to apply as many of our principles as possible in setting up their standards and certification processes. We may not fit into all jurisdictional specifics. However, calculating the ton of CO2 non-harmful should be universal. I don't believe everybody needs to be at the high integrity end of the market, but hopefully, governments will want to adopt high standards.

How are you dealing with the bottleneck issues in the market?

We need to work on multiple solutions, and there are not enough resources to deal with them. However, efforts are to streamline the processes and how the rules are written and administrated.
Technology is a significant area of development. We've launched our GSIQ program, which digitizes every step of the carbon value chain. This is helping to reduce the inconsistency of reviews, increase efficiency and reduce cost. In addition, it will improve the quality of data that flows. We're looking at our role in enabling the digital ecosystem to address these challenges in the medium and longer term.

What did you learn from the public consultation?

There's a lot of conflation between blockchain, digital assets, and tokenization vs. digitization of the supply side. All parts of the value chain must digitize to scale with integrity, transparency, and credibility. It can't be just the demand side. Imagine if we tokenize carbon credits on the demand side, and then there's extremely heavy traffic of transactions, but we all know that pretty old-school standards still manage the supply side. So, how do we digitize the entire value chain, learning from the cutting-edge blockchain leaders to bring the whole value chain forward, not in an imbalanced way.
I recognize that blockchain can bring innovation, transparency, and greater finance to carbon markets, but at the same time, there are risks that we need to mitigate that we're still learning about. The standards need to know about these risks, but blockchain technology drivers also need to learn about them because it's not simple technology on its own. Proving environmental integrity takes a lot of work to get there.
How do we ensure we consult correctly as part of the open collaboration work funded by google.org with partners like the IOTA Foundation and Climate Check? We've now launched three working groups with a wide range of stakeholders, including blockchain technology groups, financial industries, think tanks, and academics. One is looking at digital assets, another is looking at connectivity, including Application Programming Interfaces (APIs) and connectivity between registries, and the third is looking at digital Measurement, Reporting, and Verification (MRV) solutions. We all want to use technology to drive scale with integrity. Hence, the aim is to come out with good outcomes and public consultations.

Is the issue of the Know Your Customer (KYC) theme vitally vital to you?

We're talking about tokenization, so the digital assets working group will look into this issue. The technology itself is probably the most transparent that we have today, but it is its governance of it that needs more rigor in terms of due diligence.

Is there anything you could implement now to speed up the times for verification and the like?

The second working group is looking into this. How can we use MRV to report directly to the digital workflow as it goes through the certification process? Again, that's an area that our stakeholders are also interested in because it will increase accuracy, reduce human error, increase transparency, and reduce cost.

Why should a government follow standards other than the UNFCCC compliance with corresponding adjustment features of Article 6?

Each sovereign government has a right to decide, and some are working with us to develop a system integrating aspects of the Gold Standard, although they would not produce Gold Standard credits. For example, they want to incorporate our safeguarding principles and gender equality frameworks in reviewing domestic credits.
Some are working with us under Article 6 to use our registry to make their Article 6.2 transactions. So they're coming to us for support and collaboration in driving their ambition, and we welcome that.

What's holding back the big investors from bringing the private capital needed?

We're looking for trillions of dollars, and today, we'll announce our pilots for funding requirements. Corporations need to know where they can invest, how to make those decisions, and what they can claim. Those frameworks are missing, yet we're putting pressure on private corporations to act on them. We're helping impact investors, including private equity funds to go through a Gold Standard process in designing project requirements, including the impact that comes from those funds. First, we're targeting SDGs, including environmental implications, and it will be a way of testing the appetite of these large investors to move in that direction.
Five years ago, when we came out with the idea of a very shared concept, no private equity firm wanted to talk to us. Nowadays, we have hundreds who are lined up to speak to our team. What created that change? Let us move away from tiny buckets of carbon markets discussion only and think about how we mobilize more finance for a more significant impact, how we can verify that, how these investors can claim that, and how can that be used in terms of their reporting requirements and inventory.

Does a lack of a global accounting standard come up in those conversations?

Yes. Corporates comment on reporting fatigue because there are many standards that they need to meet. We are trying to consolidate that so that they are ticking several standards if they go through Gold Standard. We are working with a number of them to proactively align so that the users of our standard can benefit from it since it is tiring even to understand the variety of standards they need to comply with.

Is there a risk that the market suits mega companies from the global north while companies from the worldwide south get left behind?

That is one of the critical drivers for Gold Standard. We want to make sure that we are not marginalizing certain groups. Large corporations need to change and lead. Smaller companies take very ambitious actions, proactively build projects, and try to offset using the WWF blueprint, so I would not underestimate the power of SMEs driving ambition.
A good role for the carbon market would be to encourage and bring forward these local community-based projects and make sure they can also play in the main stage of the market mechanism. Project developers and local NGOs can all work towards this.

What would you like companies who haven't started their carbon journey to know about Gold Standard and its role in the VCM ecosystem going forward?

We cannot assume that corporates will do purely for the public good, so we are trying to create best practices by providing them with tools and guidance while we go through this unknown era of many different global frameworks. Gold Standard can bring innovative solutions with the rigor that comes with the brand.

VERRA: The Role of Offsets in the Quest for Net Zero

Featuring: David Antonioli, Verra
and Paul Krake (moderator), Climate Transformed

Summary

In a perfect world, Verra would not exist. A fully decarbonised global economy would remove the need for offsets as we would have achieved our sustainability objectives. Unfortunately, that is not the world we live in, and therefore companies like Verra, under the leadership of CEO David Antonioli, will remain essential.

About Verra

Verra is a nonprofit organization, a global leader working to tackle the world's environmental and social challenges by developing and managing standards that help the private sector, countries, and civil society achieve sustainable development and climate action goals. Founded in 2007, Verra's global standards and frameworks serve for channeling finance toward high-impact activities that tackle some of the most pressing environmental issues.

Verra's role in the VCM ecosystem

Verra has set standards to ensure the companies carrying out the projects to reduce carbon emissions are legitimate and comply with rigorous environmental standards. It serves as a glue in the VCM ecosystem that holds the market together giving the investors confidence that they are investing in the companies that sell carbon credits by meeting robust standards.

How do you define integrity across the VCM ecosystem?

Integrity across the VCM ecosystem is the trust in the underlying quality of what's being traded. We make sure the credits we issue have integrity which means they do represent additional emission reduction

transparently and have been verified, audited, and follow all the rules and the programs. It's about ensuring that the underlying value of the credit is real and that they actually end up having an impact on the ground. Having integrity is about focusing on the bigger picture of how these climate-related projects are impacting the environment.

What are the development benefits for communities due to the evolution of VCM?

The offset market is in evolution. Every time we've updated our standards, we excluded those projects with no additional meaning. We don't certify the projects that don't add additional meaning as they don't need an extra push from the carbon finance.
Over time we've updated our standards and we will continue to do that because the best practices keep on changing with the advancement in science and technology. We need to keep updating our policies over time to stay relevant to the new challenges.
In the Voluntary Market, natural climate solutions were recognized as a key part of the solution. This standard was later excluded from regulatory markets because of some issues. VCM looked for solutions to tackle the two major issues associated with natural resources. These solutions are related to permanence and leakage.

1. Permanence of natural resources

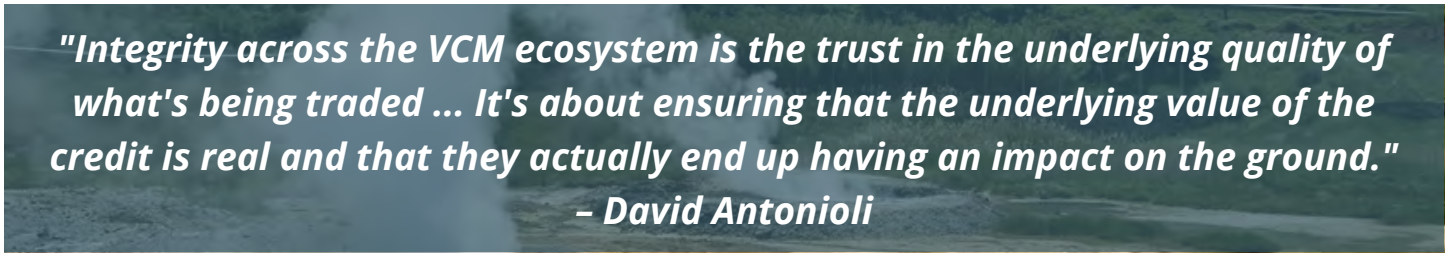
Every project with a risk of resource damage—for example, forest—has to dedicate a percentage of the achieved reduction in the buffer camp that gets used when their resource gets damaged such as a forest catching fire. These projects are transforming communities on how they see their long-term success.

2. Leakage

Companies often work to protect a certain patch of forest while deforestation happens in the nearby area. We have made standards that require companies to look at the areas in their surroundings to ensure deforestation is not happening. If it does happen, they will have to discount from their total reductions achieved.
These ways illustrate the innovation that happens within the context of the voluntary market. We issue credits and they leave a good impact on the environment as companies work to preserve the environment by planting trees and taking other such measures. Conserving natural resources will help us keep global warming in check.

Where is there alignment on standards?

All VCM programs have the same functional components. The major alignment on standards lies in the



following areas:

- Offset markets must have rules on assessing whether the project should get monetary support or not.
- They have regulations regarding independent auditing.
- They have set standards regarding Permanence and Leakage while looking at natural climate solutions.
- All of them must have a transparent climate registry to register all the documentation in the project
- They should set clear rules for developing accounting methodologies.
- VCM markets have set regulations to govern the entire standard.

The Integrity Council for the Voluntary Carbon Markets (ICVCM) is under consultation. It will keep a check on all the greenhouse gas crediting programs to see if they meet the set criteria.

How do we improve clarity over claims?

ICVCM is addressing the supply standards to ensure the carbon credits are legitimate. They are keeping a check on all the VCM markets to make sure the supply in the market is legitimate. To improve the clarity over claims companies make regarding setting a net-zero target, an initiative named Voluntary Carbon Market Integrity Initiative (VCMI) is designed around setting guidance about what kinds of claims companies can make when they buy the offsets. VCMI is trying to set up a framework that companies will have to follow regarding making claims about net-zero or carbon neutrality and they'll have to demonstrate the reduction in their footprint. Companies can achieve net-zero targets if they combine offsets with internal reduction. In the long term, initiatives like VCMI will be powerful to verify the claims companies make are legitimate.

"Companies can achieve net zero targets if they combine offsets with internal reduction." – David Antonioli

Do financialization and the need for scale lead to a deterioration in standards?

There will always be some variations regarding offset pricing across different projects as the projects are quite different across countries with different sustainable development benefits attached to them. If credits were all about staying compliant with standards, companies would have chosen the cheapest credits available. So, we have set standards with value attached to them based on what companies are doing voluntarily. Right now, companies need several resources to participate in the VCM. They have to cross certain economic barriers to get into this market, such as verifying the credits they purchase are legitimate or deciding which VCM market to buy credits from. We are reviewing our methodologies to reduce such barriers and create a level of performance with established integrity that will allow companies to easily participate in the offset market. We are developing a comprehensive climate strategy for them to figure out how they can achieve emission reduction internally, achieve their net zero goals, and what sort of offsets they can buy over time. A lot of companies will take advantage of opportunities to doing early investments in projects after getting clarity about the kinds of projects.

Should credits be applied to renewables?

While issuing credits, the critical piece to consider is what will the offsets be used for. Financing renewable projects would accelerate the projects but that is not what carbon finance is meant to do, it is meant to finance projects that would not happen otherwise.

Are jurisdictional REDD+ projects a solution to scalability?

We believe that REDD+ projects with a smaller footprint or scale are still a very valuable tool to address climate change. The challenge for us is ensuring that the projects that rely on carbon finance do contribute to the evolution and development of government programs, be it to preserve forests or the jurisdictional REDD+ program. We are revising the rules to make sure we can do both together.
The government is good at changing policies for creating a friendly environment for forest conservation. Projects help in deriving the finance directly to where it is needed. It is valuable to bring both together because they tend to rely on different kinds of finances. REDD+ projects are more community-focused. In a private sector entity, they are comfortable dealing with the government.
We believe we need to head towards a jurisdictional system as working solely with the projects will not solve the problems, which is why we need to scale it. We need to integrate the ability to deliver direct resources to communities with jurisdictional efforts. To achieve this, it is important for us to get accounting to line up to make sure the project level crediting is consistent with jurisdictional level crediting.

Do jurisdictional REDD+ programs threaten the development benefits to communities?

Jurisdictional REDD+ programs do not threaten the development benefits to communities. They are supportive of them as they provide the communities with direct access to finances. REDD+ projects are really powerful because they provide the flow of resources directly to the communities without them having to go to the government. The communities can decide what to do with the resources they receive.

What is Verra's stance on the supply and demand side of digitizing VCM?

As an organization, we need to consider incorporating new technologies into our procedures. We are in the process of digitizing our system and the need for digitizing is mostly on the demand side. Automating and digitizing VCM is crucial as doing so will reduce the friction. Businesses will be able to submit all the documentation electronically in a transparent way. In Monitoring, Reporting, and Verification (MRV) a lot of work is being done to verify the automation process.

"We need to integrate the ability to deliver direct resources to communities with jurisdictional efforts. For this, it is important for us to get accounting to line up to make sure the project level crediting is consistent with jurisdictional level crediting." – David Antonioli

How do we improve the process and respond to criticism?

We can respond to criticism by communicating to people that companies are not solely after offsetting. Most of them are reducing their footprint internally and then using carbon offsets. In the evolving market of carbon credits, we have to see whether the organizations financing the projects are following and updating their rules based on scientific evidence, evolving best practices, and novel technology, on a regular basis. We need to communicate about where the offsets sit and the role of the broader ecosystem in the internal reduction. We can report about the companies that are investing in the projects that are making an impact to support the local communities. We can improve our efforts by holding the organizations accountable for whether they are following the regulations or not.

Will Voluntary Credits be an Essential Component of an Investment Portfolio?

Featuring: Guy Turner, Trove Research; Mark Lewis, Andurand Capital Management;
Steffan Dietel, Altana Wealth; Luke Oliver, Kraneshares and Tiffany Cheung (moderator), Net Zero Markets

Summary

This panel address the key questions in the mind of investors: are voluntary carbon offsets the uncorrelated investment that long-duration investment portfolios strive for? We discussed liquidity, transparency and the idea of whether long-only, passive investors distract from the true climate mission of carbon offsets.

What are the key features and trends of the VCM?

Guy Turner:

VCM started 15 years ago on a cottage industry scale and has gradually matured. Over the last couple of years, some large companies have set ambitious climate commitments outside the compliance markets. The concept of net zero has gained transactions as it is straightforward to understand, and for chairpersons and executives to get behind. Moreover, it is a commitment set far enough into the future that generally does not apply too much pressure immediately. There has been a growing interest from customers and stakeholders for companies to contribute positively or demonstrate some effort to mitigate their climate impact. Carbon credits are relatively simple; oil companies and other carbon-intensive industries have engaged with the VCM. The VCM is relatively small at 161 metric tonnes, while greenhouse gas (GHG) emissions are 50 billion tonnes every year. This year we expect to grow to 190–220 million tonnes, with a value of $1.5–1.7 billion in primary demand. This may be a small figure, but it could see 1.5–2.5 billion tons by 2030 to 4-9 billion tons by 2054, which is just shy of 20 percent of GHG emissions. Prices should drift up as demand increases.

There is a long backlog of carbon credits, some going back 10 or 20 years, which are still valid and can be bought and retired. However, they may be used up over the next 2 or 3 years, and then the money coming into the market will need to be invested in new projects, which will be of higher quality and more challenging to achieve; for example, the land gets used up.

This is not a commodity market in the traditional sense. There is increasing demand for high-quality, high-integrity projects and carbon credits. Carbon credits vary significantly from around $8 to $50 per tonne. Over time, greater scrutiny will be applied to projects, and the Integrity Council will develop its role, which will drift towards higher quality and rates. When corporate budgets are squeezed, there will also be some contraction in the VCM, but the commitments are more than a year which bodes well for the sustainability and growth of the VCM.

Is increased market legislation a certainty that people should be looking towards?

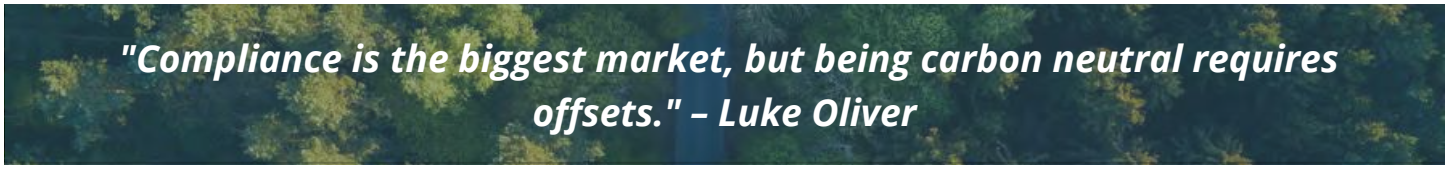
Mark Lewis:

Why would you be interested in the VCM? One reason is that they think carbon credits will go up in value. Another is to decarbonize their portfolio. A significant structural change is coming to this market, and due to Article 6, there may not even be a voluntary aspect of the carbon market in a few years. Under Article 6, countries and parties with signatories have emissions reduction credits. A corporate under the Science Based Targets Initiative (SBTI) may need to get to net zero. They would want credits that have the credibility that stems from the Paris agreement, which is the ultimate arbiter of the science as it is based on the IPCC's (Intergovernmental Panel on Climate Change) report.
Corporations might use a corresponding adjustment in a country that hosts their project, which is a mechanism that avoids double counting of carbon credits, i.e., that they can't be counted by both the host country and the corporation. Seven percent of the money that comes with carbon credits with the corresponding adjustment goes towards the overall mitigation of global emissions under the Paris agreement and a share of proceeds with the host country. So, there is a double stamp of credibility and authority that these credits will have. Carbon credits will increase in value as they will have an option value. In addition, as they will be on the inventory that makes up the Paris Agreement, they could be eligible for compliance markets around the world that are aligned with the science. The ETS, for example, is the most critical policy tool for the EU to achieve its own net zero targets by 2050, though, in fact, the calculations show that the gap should fall to zero by 2040, meaning that European companies under the current model will not be able to emit after 2040. This might prove too ambitious so that Europe may purchase these credits with the corresponding adjustment from other countries, so they are still on the inventory relevant to the Paris Agreement. In the future, we will have a quasi-compliance status intrinsically because of the alignment with the accounting framework of the Paris Agreement.
In summary, future investors will look closely to see if credits have corresponding associated adjustments. We will gravitate towards the ones that do because they'll have that additional option value or optionality.

What was the motivation for launching Altana Wealth's global carbon offset fund, which invests across voluntary and compliance markets?

Steffan Dietel:

We are more traditional energy investors historically. We concluded that investing in carbon has to work to reduce GHGs, especially over the next 10–15 years. We need the technology to advance rapidly to give



us any chance of staying within a 1.5°C warming scenario. The opportunity from an investor perspective is seeking the convergence of the VCM towards the compliance market and abatement costs. Our job is to find projects that can prosper in an Article 6 world and a REDD+ world. We see a massive opportunity as investors in the next 3-5 years, being nimble and early to engage with crypto.

What are the primary investor motivations?

Luke Oliver:

From the perspective of an asset management company that launches exchange-traded funds (ETFs), we provide access, so our bringing carbon credits to market came from us seeing that it would need to happen rather than us responding to demand. We've been successful so far in the compliance market. The VCM is more about offsetting, whereas the compliance market is about permits. We've brought those products to market early ahead of our competitors. We see significant risk and volatility, with the two aspects of the market giving diversity. The compliance market develops aligned to regulatory development, and the VCM offers decarbonization. VCM doesn't correlate to anything else in investors' portfolios, which gives them valuable variety. They should be part of the core strategy. Compliance is the biggest market, but being carbon neutral requires offsets. We're 98 percent weighted to compliance markets. As a voluntary market, it means that at some price, there's demand for destruction.

Guy Turner:

Our analysis has shown us that there is some correlation with the FTSE 2050. One issue is the willingness of companies to pay for carbon credits because, at the moment, the pricing makes it a luxury good. There are companies like Microsoft that will pay whatever is required to make it happen, while many others cap out at $5 per tonne. Fossil fuels cause a large proportion of the social and environmental ills in the world. With globalization allowing us to buy anything from anyone anytime, energy security and independence got swept under the carpet. But of course, it can be done in every country quickly, but various countries follow that route.

Are our investment goals aligned with the climate targets we're working towards?

Mark Lewis:

Yes, but you have to differentiate between different kinds of credit. Asset managers are becoming more interested in the carbon space as an investment opportunity and portfolio decarbonization. What we're addressing here is the attractiveness of carbon credits, whether it be compliance or voluntary credits, soon to be quasi-compliance credits in the future, which is the scope for capital appreciation as prices rise to reflect what is the ultimate scarce resource, which is the amount of space left in the atmosphere for GHG emissions. Economics is the science of allocating scarce resources. If we don't price that resource correctly, we're not going to solve climate change, and the planet will become uninhabitable for future generations. That is why pricing carbon in the two markets is so important. As more people understand the value of credits, they can be shown to reduce emissions without double counting. They will see that this facilitates enhanced global action on climate change. There is an abatement curve for

emissions reductions. Some projects have integrity but can be done more cheaply using technologies under development.

Steffan Dietel:

The events of the last 6-8 months have been an alarming backward step, seeing some return towards coal, for example. In addition, we're all disappointed by the scale of the VCM, and we all share the responsibility to make it work. It's challenging, but it's essential to make it grow and become more liquid. Something we've found interesting is bottom-up research providers addressing the quality issue and taking a view on volume and risks that we all have to navigate going forward.

Is there are dream project that you'd like to invest in?

Luke Oliver:

We need to make this work; it takes liquidity and distinguishing between good and bad projects. Environmental, Social, and Governance (ESG), or being green, will not move enough money, so we need to create real financial incentives. Our products would not typically be termed ESG but are all aligned with positive climate action and sound financial investments.

Guy Turner:

We ran a price forecast ourselves with multiple different scenarios, and unsurprisingly, the general picture is one of an upward trajectory in prices, which supports an extended position. However, there is a combination of less optimistic assumptions. We want to see high-quality credits, but it's incumbent on the standards-setting bodies to ensure that the rules that define how many credits can be issued are tight.
The worst-case scenario in prices is when we see a combination of moderate demand and a system that is not tight enough from the supply side. The cap and trade market works because you've only got a certain number of allowances, and only under certain circumstances will a government change them. In the VCM, a standard-setting body can allow a whole stack of credits to come to the market. So, we need to be vigilant and scrutinize those. Verifiers have also come under the spotlight, as they need to ensure that quality is maintained on the ground.

How are we seeing a different kind of investor wanting to gain exposure in this sector? Is that one of the reasons why carbon credits could become one of the essential parts of any investment portfolio?

Luke Oliver:

There is this new market that is arguably lacking in structure, and then this new technology in the blockchain lacks a use case, so there is a lot of sense in marrying those two things together to open up this market. In the same way, we create ETFs on portfolios. You could develop tradeable units to bring liquidity. That could open up this market massively. The risk I see is the added education of these offsets, some concerns we have with specific offsets, and the new technology.

"There is expected to be more intersection between voluntary carbon markets, international markets, and domestic markets." – Stephanie Russo

Tiffany Cheung:

At Net Zero Markets, we've created a multi-contract product that is an exchange-traded called The Global Emissions Reduction, and our partner for this year is AirCarbon Exchange (ACX) which does blockchain and decarbonization technology. General interest has been very high, so these people can see the use case in terms of its ability to improve transparency and accountability, two things that have plagued the VCM for a long time. But unfortunately, many people already treat blockchain highly suspiciously, and education is required. The VCM is an exciting and challenging space because we are trying to bring people up to speed and deal with criticism of the sector as a whole.

Steffan Dietel:

We don't have a proper market infrastructure. So it feels like an obvious use case, and I hope it can be done.

Luke Oliver:

Blockchain is not a nonsense coin but a real asset and should be kept pure.

Tiffany Cheung:

Some registries have released statements saying they want to pause tokenization. Still, as corporations engage in offsetting, consumers want to see ledgers demonstrating that credits have been bought and retired.

Mark Lewis:

Mark Carney was influential in setting up the task force on scaling up VCMs because he saw the scale of the problem. It'll be crucial to scaling up the supply of these high-quality credits that come with the guarantee and the credibility, corresponding adjustment under Article 6. Many credits in the past have come with reputational downsides, which can be off-putting. If we can scale up Article 6, we can improve corporate engagement and supply. We need a fast-growing supply of high-quality offset credits that can be used without anybody having to worry about the risks that have plagued this market around additionality, permanence, etc.

Are Corporate Investors Receiving the Value they Strive for?

Featuring: Fernanda Castilho, Moss Earth; Patricia Latini, Schneider Electric;
Sarah Leugers, Gold Standard and Paul Krake (moderator), Climate Transformed

Summary

In a quest for Net-Zero, companies across the globe are spending billions on carbon offset projects and the technologies that will decarbonize their supply chain. Are investors getting true value from carbon offset investments? Are supply bottlenecks inevitable as firms outbid each other for the highest quality projects? Does there come a time where cost and quality lead companies to find alternatives to the nature-based offsets they have been supporting? In this conversation, we go to the source with the firms using their capital for change.

The Gold Standard framework for quality

Sarah Leugers:

Gold Standard was created to be a quality label on top of the UN's clean development mechanism. Several international NGOs, including WWF, initiated it because of their concerns regarding two core things fundamental to carbon markets: environmental integrity and sustainable development. Our framework ensures to take care of these aspects. To ensure environmental integrity, we filter the eligibility criteria using robust methodologies, proof by the independent technical advisory committee, third party verification, and independent assessment.

Gold Standard has the strongest safeguarding principles among the international standards on the sustainable development side. We have been known to deliver sustainable development impact through meaningful stakeholder engagement. So, there are a lot of provisions that apply to any project. In some cases, we make difficult decisions to ensure both of these things are true, the credit is real, their environmental integrity is sound, and it is delivering climate justice through the sustainable development provisions.

What is the current outlook for high-quality assets?

Fernanda Castilho:

Moss Earth works with conservation projects. Not many projects are available related to that. This market has grown a lot in the past two years. We do not have a lot of options, which is why we only work with projects certified by institutions such as Gold Standard or Verra because they have a certain quality. But as we run out of credit supply, we decided to start developing our own projects.

What is your stance on small companies looking to participate in the VCM for the first time that can not develop their own projects?

Fernanda Castilho:

High-quality projects are likely to develop with the increase in the supply of credits because around five to ten years ago, people were not paying attention to the quality of projects. Now, the quality factor of the projects is becoming important for companies. This market is likely to attract more investments from companies and financial institutions that will enable projects to be developed and high-quality carbon credits to be available to any size of company. Companies will access higher-quality credits without needing to invest in high-budget projects.

Large firms will utilize high-quality projects. Is that a positive attribute of the current shortage?

Sarah Leugers:

In my view, the level of interest can drive up the quality in the market. The initiatives of the Integrity Council for the VCM (ICVCM) are looking to set a floor below which it would not be credible to purchase carbon credits or make claims around them. This can be seen as a positive development. A greater interest in the market does not guarantee an increase in quality as we see new protocols emerge all the time that are trying to redefine concepts like additionality and double counting. They are not in contact with reality regarding traditional definitions of core carbon principles. Greater attention in the market and the demand to seek bigger projects will be a positive sign. But I don't underestimate the ability of some players to come in and try to sweep up the projects that other standards won't approve or redefine or ignore the core principles of the carbon market.

What does the corporate budget breakdown around sequestration versus offsets look like?

Patricia Latini:

Schneider Electric is a consultancy company. We have dedicated teams that help clients in their commoditization journey. Corporations have the budget for high-quality offsets. We have noticed a change in the profile of corporate buyers. In the past year, corporate buyers used to be cautious about the price. Now, they are willing to pay more for high-quality removals by nature-based carbon offsets. One of the biggest challenges in the market is that supply is very limited for high-quality carbon offsets. Corporations are willing to replicate the PPI model, where they off-take the energy and bundle Energy Attribute Certificate (EAC) to get their desired credits. It is like negotiating prices with the project developers in the market to secure their demand for carbon offsets.

That will be challenging because it is difficult to find a developer willing to fix the price of the offsets in three to five years as the market is very volatile. We have some corporate clients wanting to do a flagship project, and for that, we do all the diligence in partnership with standards to ensure we find an additional, permanent project that meets all the criteria. So, they can off-take all the offsets. We have a problem with supply, so now it is challenging to find removal offsets. Most corporates look for offsets in their location. We suggesting diversify their portfolio by mixing removals and higher-quality avoidance offsets.

Fernanda Castilho:

We are noticing an increased interest in the project developers taking offset agreements because they need resources to develop their projects. Previously, project developers did not want to establish a fixed carbon price because they anticipated sizable gains in future years. They expected that trend to continue, but forward exponential price gains now appear less likely. Carbon prices can go up in the future but not as they did in the past two years. So, the interest of project developers in taking offset agreements is increasing.

> ***"We are noticing an increased interest in the project developers taking offset agreements because they need resources to develop their projects." – Fernanda Castilho***

Will financialization and SEC's disclosure requirements on Scope 3 emissions lead to deterioration in quality in the original context?

Patricia Latini:

There is a risk of deterioration of the quality of offsets, so the sustainability department needs to work with the treasury department. At Schneider Electric, we usually have the sustainability department come first. The company's top management or stakeholders decide to purchase high-quality offsets. Suppose a client reaches out to us and does not involve their sustainability department. In that case, we suggest they involve someone from their climate department to get aligned expectations and explain the importance of keeping the quality. It is important for us as a consultancy company and for our clients.

Sarah Leugers:

In my view, disclosure alone will not lead to quality deterioration, but in the compliance regime, there is that risk. We can eliminate the deterioration risk in the following ways:

- By setting up a floor to go after premium quality credits.
- By creating a paradigm shift around looking at value. Suppose we consider buying higher quality credits as an opportunity to impact society in measurable, quantifiable, positive, or independently verified ways, not just to fulfill a liability. It can increase the race to the top regarding buying high-quality credits.

Fernanda Castilho:

Companies need to view buying credits as an opportunity to create a positive impact on the climate that they can communicate to their customers and stakeholders to enhance their brand image. Many companies still view buying credits as a liability but need to stop seeing this process in terms of cost. This way, we can eliminate the deterioration risks of the quality of the credits.

Will the disclosure of Scope 3 emissions shift the mindset from striving for quality to offsetting the liability?

Patricia Latini:

Consultancy agencies need to create awareness about getting carbon credits of higher quality. They need to consult their corporate clients regarding the importance of buying higher-quality credits and why offsets should not be treated as commodities.

Are the Common Carbon Principles (CCPs) a solution to this quality deterioration threat due to financialization?

Sarah Leugers:

The ICVCM is now heading in the right direction. It is trying to answer the right questions and has identified the potential pitfalls in the way of real carbon credits. This initiative can set an effective floor. Now, we require credible consultancy companies to help corporates understand the quality of carbon credits. This should not exist in the future as we should not rely on various intermediaries describing quality based on their assessments. Not everyone is aware of the various methodologies around various standards. Some intermediaries might have incentives such as access to low-quality credits that they might end up selling. We are optimistic about the efforts of the VCM, and hopefully, that can set the floor from which we can build incentives for higher-quality credits.

Patricia Latini:

Transparency is important in the present and the future. Everything about the carbon credits should be transparent to the corporate buyers, including the origination of the offsets, the project documentation, the community related to the carbon offsets, and their location. We will have more mature buyers in the future, so transparency in this market is crucial.

Is there any role for rating agencies in the VCM ecosystem in the context of financialization?

Sarah Leugers:

The rating agencies could play a role in assessing how much more ambition a project may have for the attributes associated with the credits. We prefer neutral and well-versed agencies, preferably civil society, to issue these ratings rather than those with commercial interests.
Some worthwhile efforts have been undertaken, for example, the VCMI. But they have not assessed

"We will have more mature buyers in the future, so transparency in this market is crucial." – Patricia Latini

something with monumental importance; that is how these standards deal with grievances and over-issuance. These aspects are important for carbon credits to be truly impactful. Gold Standard has assessed these challenges. We have evolved our methodologies and taken measures to ensure that credits are real. We would like to have incentives aligned properly with the integrity of carbon credits to move toward higher-quality credits in the future.

Brazil's VCM framework

Fernanda Castilho:

The carbon market in Brazil is still in development. Brazil has a huge potential for carbon projects, especially in the forestry department, with about 43 percent of forestries worldwide, but we are still responsible for huge carbon emissions because of deforestation. The carbon market has grown significantly in the last two years resulting in an increased interest of companies and other players in the projects. Brazil is going to have its compliance market shortly. There is huge pressure from stakeholders regarding carbon projects, so it does not matter who wins the upcoming presidential election. In 2023, some large-scale projects will be voted on. A decree was published that gave the market insight into what was coming soon. A lot of companies have no idea where to start their climate journey. They will be expected to start their offset journey by the compliance market. However, we expect the VCM market to develop a lot in Brazil.

Should we be thinking about older vintages through different quality and value lenses?

Patricia Latini:

Whether before or after 2015, a tonne of carbon is a tonne of carbon because carbon offsets don't expire. However, it is important to be aware that the methodology, procedures, project development ways, and the ways we audit projects have greatly changed over time. So, we need to be cautious of the quality of older vintages, such as offsets before 2015. A project that was considered additional or permanent in 2015 might not be following the same criteria in 2022. All vintages matter and are important for both, the avoidance and the removal, of CO2 emissions. We need to be careful regarding the offsets coming from before 2015.

Sarah Leugers:

It is not easy to associate quality with vintage. The quality of vintages may vary a little based on methodology and project types. Some project types and methodologies have evolved more than others because of the access to knowledge about what's happening on the ground, better technology, and better default values that have become more conservative over time. But this is not necessarily the case for all activity types. In fact, you can make the opposite argument for renewable energy. Gold Standard has stopped registering new renewable energy projects except those in the least developed countries. We can consider earlier vintage more valuable in early renewable energy development. Climate action

taken earlier should not be penalized. We don't appreciate the idea of calling older vintages expired.

Fernanda Castilho:

Older vintages do not reflect a lower quality and should not be traded at a discount. Whether vintages are old or new does not matter as long as a quality project generates the credits.

How do we see the supply and demand dynamics in the credits?

Sarah Leugers:

Looking at issuance and retirements should not suggest that supply is constrained. Now, whether there is liquidity or credits accessible in the market, we believe many of these credits are being held by traders looking for some strong wins. We can not characterize the market as supply constrained. Millions of credits issued from REDD+ and Sovereign Carbon will be split in the VCM shortly. There are concerns about the oversupply as well. So, it is a delicate balance to manage a sufficient tension between supply and demand with a good price for developers and some certainty on the buying side.

How do we not have a supply-constrained market going forward when there are categories of projects that are not issued credits?

Patricia Latini:

Avoidance offsets have the biggest share in the market. So, we lack supply of removal offsets, and we need to increase that. We also must be aware of the types of projects to which we are issuing avoidance offsets. We can have a lot of REDD+ being issued in the market just as a matter of filtering and doing the diligence of the project and quality assessment.

Why are we not witnessing large capital flows into the VCM?

Fernanda Castilho:

There is a lot of uncertainty in the market. VCM is not a new market, but it is a reborn market with better technology and solving the issues such as transparency that existed in the past. People are hesitant and waiting for someone to initiate making a huge investment.

Sarah Leugers:

Some uncertainty is caused by the actions taken by the host governments. There has been a debate for a few years regarding whether carbon offsets claim to require a letter of approval for the corresponding adjustment by the host governments. In Gold Standard's view, in the future, the carbon offset claim will require a corresponding adjustment to ensure climate action is taken, but the purchasing and use of the carbon credit will not necessarily require one. Recently, several statements have been made by the government in India that created a lot of uncertainty around whether they will allow any project to move forward or to be claimed by the VCM. As host countries start to firm up their intentions about how they will use the VCM or not, this can lead to more certainty and investment in the future. Right now, it is fairly

early, and there is uncertainty on the part of investors.

Patricia Latini:

The Voluntary Carbon Market is immature right now, and the control of the carbon offset projects is in the hands of a few asset managers and a few project developers, such as consultancy companies with technical knowledge that develop projects for their owners. This market has huge potential, but the control is in the hands of a few firms. Traditional investors and corporate clients are willing to invest but are concerned about transparency and quality. Once we solve the issues with the market, we can have new companies coming in, offering solutions, and will help remove those barriers to bring more transparency to the market. Then we will start seeing investors investing in the projects and generating more supply.

What role will blockchain play in the VCM?

Sarah Leugers:

We are not a tech-based standard yet, but we probably move at a pace that's not typical for the tech sector. We recognize the tremendous potential for blockchain in some instances. We think this technology has good use cases, for example, in smart contracts in trying to get smaller developers potentially better market access and traceability on double counting. We are doing our diligence and consulting aggressively in response to that demand. In the next few days, you will see a consultation on the principles under which we would approve tokenization. We are slowly adopting this technology.

How can we establish a floor in quality in trying to achieve a race to the top?

Sarah Leugers:

This is fundamental to Gold Standards' DNA to ensure that sustainable development is fundamental to carbon projects. A lot of money can be made and invested in this market. We need to make sure that the projects are delivering climate justice.

Fernanda Castilho:

Greater centralization in the market and the methodologies to make the market more liquid will help us establish a floor in terms of quality that will probably be important in trying to achieve a race to the top. This will result in attracting more investments and create transparency in the market.

Exchanges and Trading: The Backbone of a Multi-Billion Dollar Marketplace

Featuring: Rene Velasquez, CBL Markets; Tom Enger, Climate Impact X; Chris Leeds, Standard Chartered; Alessandro Vitelli (moderator), Climate Transformed

Summary

This panel discussion revolved around the opportunities and challenges facing new and established entrants who are spending 100s of millions of dollars to grab market share in what can best be described as an arms race. We discussed pricing transparency, limits to high-quality supply, and whether there is a need for consolidation.

What is the concept of exchanges, and what are their services?

Rene Velasquez:

Exchanges provide a level playing field and a standardized approach to improve the liquidity of markets and allow different types of assets to be aggregated and deliverable under these contracts. They also enable the spot and futures markets to develop on the back. Exchanges act as a matching engine, matching buyers and sellers in an electronic medium.

How do you select the offsets that can be best represented in a particular type of project?

Tom Enger:

The offset products we can display in our auctions or spot trading venues are a function of demand, what kind of carbon credits are desired, and are nature-based, tech-based, avoidance, or removals. We were founded to scale both supply and demand. Therefore, it's essential to scale the variety and types of carbon credits and educate and inform the buyer to match them.

A rapidly evolving marketplace

Chris Leeds:

The market is changing rapidly with new types of technology, guarantees, and origin around renewables. As a result, there is a great variety of environmental products available. I tend to talk about the environmental markets rather than the carbon markets. We need standardization and commonality in those products to attract liquidity and trust in the market. A tension exists between creating a diversified market that brings value to things that have not been previously valued. Commoditizing tends to be a dirty word. We're trying to show that through the integrity council and core carbon principles. You can have a high threshold that everyone can aspire to.
I've been invited to talk about Blockchain and other aspects to help potential buyers. Groups like the Integrity Council, the rating agencies, and the exchanges have a strong vested interest in broadening the knowledge base.

How do exchanges help to maintain the environmental integrity of offsets?

Tom Enger:

There are recognized trusted standard setters with decades of experience and robust processes, including third-party audits and some monitoring technology. Exchanges like ours support those programs and try to supplement them with other new technologies, such as satellite images of tree cover and Environmental DNA (eDNA) analysis of biodiversity credits. These are new techniques for providing metrics for how to value the performance of carbon credits. Exchanges should support these as they develop trust and confidence.
Exchanges favor rating agencies for providing a measure of rigor or analysis of third-party evidence, which offers trust for buyers. Ratings improve performance as companies rated well tend to achieve a premium. Although technology and ratings are new to carbon, we can see they are worth promoting. Markets can improve by embracing these innovations.

How do the buyers have faith in what they are purchasing?

Rene Velasquez:

This begins within the registry ecosystem. Environmental commodity products and digital assets reside in registries, so the first step is to create the attributes within the registry ecosystem. The exchanges depend on connectivity to those registries to work with partners at the standard level. They can create flags for specific attributes, for example, if they're removal or avoidance credits. This helps you to understand at a very granular level the various attributes of the project itself, including geographic origin,

the standard, the vintage, the methodology, and also whether it is eligible for a particular futures contract. Contract specifications have then been developed that mirror what the market is looking for. At CIX and CBL, we focus on nature-based contracts, like high-quality versions of nature-based contracts that meet the rigors of the VCM but also have additional certification of the co-benefits and biodiversity impacts of those projects deliverable into those contracts. Market participants can trade at a very granular level on CBL. There are two complimentary markets where you can go by the standardized route or trade on the project-specific side. Commoditization is a way to centralize liquidity and provide greater visibility around price signals and which units are tradeable to allow the markets to evolve and price things at a premium. Our job as an exchange is to provide people with tools to access and leverage the market.

How is due diligence expressed in an exchange environment?
How does a buyer choose what to buy and know that they will get it?

Chris Leeds:

This is a problem with the scaling and development of the market, which is still pretty small. We were celebrating that it reached a billion dollars last year, but let's be honest, that's still a tiny market compared to other markets and where we want it to be. The market pushed the idea that corporates could go out and purchase whatever type of project they wanted, but that isn't quite the case, though they may be able to see co-benefits associated with a project. We can objectively price the carbon, and the other pieces tend to be a lot more subjective. The rating agencies come in and try to help with that. Developing a liquid benchmark that can be used as a price point or anchor that other credits can trade around, and we can get credentials about different projects in different locations, types, etc. That would give buyers the confidence to choose the type of project. We need this benchmark to develop the core price of carbon, to price co-benefits and differentials, but without spending extraordinary time and effort to develop that confidence. We don't have people who are forestry experts, for example. As a bank, we want to be able to sell something that we know has met the criteria, and I'm hopeful that the core carbon principles will help to develop that type of carbon credit as a high-quality threshold consistent across the standards. Now we use technology to get and provide data to platforms so buyers can see what is happening.

How does the data related to a project become expressed in an exchange environment?

Tom Enger:

Buyers need to have a benchmark and sub-attributes, such as community impact or biodiversity, that they are looking for in a project. The other way to make sense of the market is to compare carbon credits with widely differing prices. So, for example, in a cost curve, there are rainforest projects from $5–$15, and there are technology projects of $1000 per ton. They are each a tonne of carbon, but they have very different impacts. We need to express the value of both because the market needs to scale up

technological solutions and more cost-effective needs like nature-based solutions because of the many integrated benefits of those activities. This is where benchmarking becomes important, allowing buyers to look at projects categorized across common attributes.

How does data get attached to the underlying units?

Rene Velasquez:

It begins with the registry providers and then with the standards they service. Next, the standards will go through a certification process, and project developers who submit projects to them through the Measurement, Reporting, and Verification (MRV) process. Then, finally, the standard will identify the relevant attributes and, working with exchanges, unify critical attributes that the market is telling us they would like to be grouped into contracts. So it's a very collaborative process. Those attributes need to be created and identifiable in the registry so that they can then be filtered for by the exchanges so that when an attribute is deliverable to contract A, B, or C, you'd know which ones are eligible and which ones are not.

What are the benefits of exchanges for project developers developing projects in the global south?

Tom Enger:

Our exchange has an auction house that caters to this kind of scenario. Auction houses provide crystal functioning in creating early-stage price discovery for intangible goods. For example, when a new carbon credit comes to market, the market doesn't know how to price it so an auction can be a means of price discovery. In addition, rich content can be used to communicate the specific impact of that carbon credit. This might include how the local community feels about it. Auction houses are, therefore, useful in the early-stage market.

"Having reference prices that are transparent and liquid will enable people to trust and will allow developers to use that to gain the investments needed to fund the project." – Chris Leeds

What can an exchange do to support investment in new project?

Tom Enger:

Advanced market commitments, aka forwards, help suppliers to come to market, so it's inevitable that forwards become increasingly popular or need to be bought by buyers. Reliable forward curves will give project developers viability into the future cash flows of a project, giving them confidence in the viability of the venture and permitting them to raise the initial capital so vital in determining the success of the entire venture. The forward curves will always be anchored by the spot price that exchanges like ours will provide. To do a fund to create 100 mangrove projects, you'll still need a reference price or spot mangrove values. This will always be the starting point for price discovery and transparency.

Chris Leeds:

Having reference prices that are transparent and liquid will enable people to trust and will allow developers to use that to gain the investments needed to fund the project. Other commodity markets look to a reliable benchmark, which is then used in contracts that have nothing to do with the exchange but will support the financing of those projects.

What outcomes from the ICVCM consultation process are exchanges looking for?

Chris Leeds

We aim to create high-quality standards so that when we talk about additionality, permanence, or the different projects, you can view them consistently against the project registries. It's about transparency and consistency in the exchanges to know that a standard product delivers a standard quality of carbon credit. We need to see more money coming into projects that would not get it otherwise.

Are there too many exchanges, and how do they thrive?

Rene Velazquez:

We're in the infancy of this market, and these exchanges share a common goal to create price transparency and price discovery to enable the trading of these instruments, in a much more efficient electronic manner, as opposed to a laborious and opaque OTC market. Many exchanges are based in different regions, with some in North America, Europe, etc, which can compete and complement each other. Different exchanges are taking different approaches to provide the clearing and settlement. Some exchanges believe Blockchain has a role in this market, whereas others, including us, are taking a wait-and-see approach, but innovation and growth will benefit the broader market.

Tom Enger:

Carbon offsets are in demand globally, so international exchanges allow round-the-clock trading. There is growing liquidity where contracts are interoperable or where arbitrage opportunities exist, which is true of many global exchanges. There will necessarily be regional differences. For example, projects in Asia are more accessible to project developers or attractive to regional buyers and perhaps local factors. CIX was founded by Singapore entities representing Singapore as a trading hub and a financial center. We need to grow collectively, but we are at a scale currently where we all have much more work than we can take on board.

Do we get to interoperability in time to generate the kind of financing we need?

Chris Leeds:

There is a proliferation of regional exchanges, and regional jurisdictions are looking at how to develop their carbon markets. So I can't see why we would end up with a disjointed global market because we can see that interoperability is required. Every country has its own marginal abatement cost curve, and they're all at different levels. For example, abatement may be more expensive in Europe, but across the

"The exchange is nothing but a mirror of what the market is requesting, so when we launch contracts or new products, we're reflective of what the market is asking for. " – Rene Velasquez

world, there are lots of lower-cost abatement opportunities. If they can be linked together, we all benefit by reducing emissions as quickly as possible. Exchanges are very good at bringing people together to develop interoperability.

Will exchanges all work together with the same carbon characteristics?

Tom Enger:

Every country and every market has local preferences about what they need for national contributions to carbon reductions. In the latter half of this decade, there will be inter-trading between countries, domestic and international markets. All the platforms and data systems need to connect to some extent, and that's for checking double spending and double counting.

Rene Velasquez:

There won't be the same contracts, but there will be interoperability. We already share the same clients. The exchange mirrors what the market requests, so we reflect what the market asks for when we launch contracts or new products. Clients can choose whether they operate on one or several exchanges, and there may be arbitrage opportunities, and traders need to seek those out. Exchanges can facilitate that, and we all benefit from increased liquidity.

UN Article 6.4 markets have a lot of similarities to the VCM. Do you see a merger over time?

Chris Leeds:

There's confusion around the world about how the VCM fits with Article 6.4. India and Indonesia have put a moratorium on the trade of voluntary carbon credits. It always comes back to this issue around national and corporate accounting. Over time, more oversight will come from the countries themselves. So, putting Article 6 aside, if you want to do a project in India or Indonesia, there's a good chance the government will want to know what you're doing and where it fits with their own goals for NDC. It would be the same if you wanted to mine for a particular commodity in that country. Carbon credits are now sovereign assets, so there will be more oversight from governments who want to ensure that projects are compatible with their carbon goals and benefit in terms of tax and royalties. It doesn't mean that these projects must have corresponding adjustments to sit under the Paris Agreement. But, if corresponding adjustments are applied, credits become more suitable to the compliance market than the VCM. If an international company invests in a project in Indonesia, those carbon credits stay there. So that company can still say they have contributed to the country's NDC. The issue will come when the inventory for the country has been reduced, but what might the government do—would they transfer credits under 6.2 as

Internationally Transferred Mitigation Outcomes (ITMOs)? Still, they've been generated through a carbon reduction project which a company claims? So then we need to be careful how that works. Other than that, the VCM and compliance markets are pretty separate, as VCM, by definition, is non-compliance.

Will exchanges be affected by project developers going directly to investors?

Rene Velazquez:

The required level of sophistication to underwrite projects creates risk. We don't see that large corporates are doing this at scale. A very sophisticated team within an end buyer would go out and develop projects or be part of the equity stack. It's more likely to be financial intermediaries such as specialized carbon funds, hedge funds, and investment banks that can take on that level of risk. They can assess the projects, put capital at risk, take delivery of underlying units, and then deliver them to the end buyers. As the markets gain velocity, it's more efficient for corporations to work with banks that can create vast supply inventories and then buy a structured product in the underlying market or the standardized market. That's not unique to the VCM. Most companies appreciate that they are better off sticking to their core businesses and not to own land, develop projects, etc.

Chris Leeds:

Corporates will come through us. They want to use our balance sheets for commodity hedging and risk management, whether for airlines or shipping companies. We're seeing the growth of specialty carbon funds that can do that on their behalf. However, there'll still be the need for exchanges, transparent pricing, and standardization for most corporations who will not want to get involved. Airlines are big markets, but many small emitters will probably want to buy a standardized product they know and trust through their banks.

Tom Enger:

Markets, exchanges, and banks naturally spread risk, with individual projects carrying greater risk, so most large corporates will continue to engage with carbon credits through banks and exchanges.

Tactical Trading and Price Discovery

Featuring: Yuhau Lin, Morgan Stanley; Chris Kennedy, Fortinbras, Julien Hall, Climate Impact X; Juliette Vidal, SCB Group and Kerry Constabile (moderator), Standard Chartered Bank

Summary

The panel discussed how tactical trading and price discovery help the Voluntary Carbon Market (VCM) goals. This discussion is organized to bridge technical and trading expertise with the broad perspective of an increasingly diverse carbon market, particularly regarding how we can ensure integrity and quality.

The bar for the credibility and integrity of carbon credits is higher than ever due to their increased demand. Do you think the market should work to drive the cost of carbon as high as possible?

Chris Kennedy:

There are numerous studies, starting with the Organisation for Economic Co-operation and Development (OECD) and the World Bank. They all point to the necessity of a much higher carbon price to meet Paris 1.5°C. From a directional perspective, I think it will be needed, but it should be left to the market mechanisms to transition from where we are to where we want to be. To some extent, we have guidance from the Compliance Markets, and there is emerging convergence to the VCM. These two markets are coming together. The carbon price needs to be higher from an environmental point of view, and we should let the market decide the price. In the past, we have had multiple examples of government interference with the compliance market. The carbon price needs to rise, but the market should set it.

Yuhau Lin:

There is no desire to increase the price of carbon credits; it is necessary because the more we delay our efforts in achieving Paris 1.5°C or higher, the worse climate conditions are likely to become. If we think from the perspective of the Compliance Market versus the Voluntary Market, the price discovery in the Compliance Market is driven by a clear goal from a central regulator such as the EU or California. According to their regulatory goals, they want to reduce a certain number of tons in their respective

economies. Every level of reduction gets more expensive if we move across the time scale without making progress. In the compliance market, the carbon price can not be expressed as the average carbon price on the pathway to those difficult reductions. The target price from a regulatory perspective is meant to target the most expensive last tonne of carbon we need to reduce. If we want to reduce a hundred tonnes of carbon over 30 years, the last hundredth ton of carbon may cost $200 per tonne, and the first one may cost $5 per tonne. But we need the higher price of the last tons to get all the reductions into our program. The differential price in the Voluntary Market does not compel you to buy credits for a fixed amount. You can choose the cost level you want to participate in on your way up to that price level. Together, these two markets will converge the price towards that compliance level. The more seriously people take climate targets, the more seriously they will take voluntary actions, and the more it will look like a compliance market.

Juliette Vidal:

There is a supply and demand dynamic in the credits. The data this year shows the supply of credits is growing faster than the demand. Carbon prices are going down this year because of this factor.

"As long as the carbon footprints are assessed with integrity and transparency, I would support one level of bifurcation: using the idea of credit based on investment grade vs noninvestment grade." – Chris Kennedy

How would the bifurcation of the VCM impact your work?

Julien Hall:

The split of the market based on different credit types could be rather unhelpful as markets have tendencies to self-correct supply and demand dynamics. I think this segregation could be counterproductive in unexpected ways. The VCM will naturally settle into a place where clusters of credit types will behave similarly.

Chris Kennedy:

As long as carbon footprints are assessed with integrity and transparency, I would support one level of bifurcation: using the idea of credit based on investment grade versus noninvestment grade.
There are some inefficiencies in how the futures markets are set up. The concept of having buckets benchmarked will be priced according to the cheapest of the credits. This is the responsibility of VCM to move offsets from the marketing department of a corporation to the treasury department.

Juliette Vidal:

The development of futures contracts has helped segregate different types of carbon into diverse contracts. That has been helpful for various participants to come in and provide liquidity to the market. In general, businesses will not want to buy the least desirable credits, so they will likely go for high-quality credits.

Yuhau Lin:

The current VCM market has a large supply of carbon credits. VCM buyers can choose their credits based on certain categories such as the Core Carbon Principles (CCPs), particular types of CCP attributes, and SDGs. The segregation in the market goes away if we take asset class seriously. If the credit supply gets constrained, buyers will not have the luxury to choose their credits based on their characteristics, and the prices will converge. Right now, in the high supply of credits, the product is commoditized in only one dimension: the metric tons of CO2. Every other project carries a bespoke package of attributes. When companies buy credits, they buy these attributes that are undervalued in some cases, such as in industrial projects, compared to some market-driven credits that may be overvalued.
Companies can determine if they are buying permanence, leakage, or geographic risks and use their capital to manage those risks. If the futures market grows as we hope it will, those who diversify themselves across different attributes will see the relative value converging as we move forward.

On Corporate Buyer Preferences

Julien Hall:

If we talk about corporate buyer preference, there will be continued demand for both commoditization and bespoke product offerings. Some corporates have priorities, whether geographic-based or specific credit type/co-benefits, so I think single-project trading and broking will stay. There is a need to allocate credits to various corporates around the world with very diverse preferences. In a tightened market, you will see fewer price-sensitive corporates. Some corporates with good margins will likely continue to pay more for the credits they want.

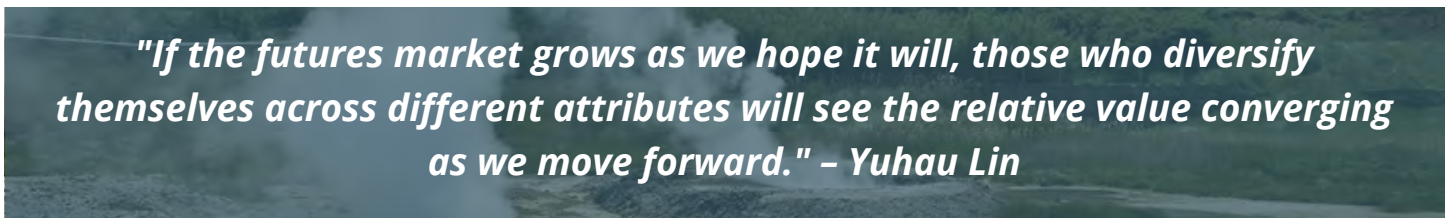
The evolution of forward markets

Juliette Vidal:

We have seen forward curves develop over time, bringing transparency into the market. It is a good measure for corporates looking into forward investments. But to bring it back to their desire to purchase spot credits, one of the concerns is why utilize futures for a certain outcome when we can have a proven solution in the present. This is exactly the case where the projects that have been existing for the last 10 years have proven and permanent CO2 emission reductions, which are the only metrics right now.

Chris Kennedy:

The forward curve is essential in the commodity market. Companies will be able to know what their carbon intensity will look like. They will have a bar about the development of creating transparency and integrity.



"The VCM will struggle to develop criteria relatable to all the current criteria. We might end up with a unit that is being traded as a project vintage combination. " – Julien Hall

Yuhau Lin:

The problem with getting exposure to the future production of offsets from projects is that the buyers take an incredible amount of operational, political, and regulatory risks depending on how the Article 6 process plays out in nations. We have already seen some nations say private contracts don't have the right to sell carbon. Some nations want to claw back the ownership of carbon rights.

The other type of forward purchase is financing a purchase of spot tonnes. If you need 200,000 credits a year for the next five years and you can find a financing partner who can buy one million credits for you that are already issued, so you don't face any operational risk and then sell them to you in pieces over time. That's one way of constructing a forward market. This is viable today.

The other interesting aspect where the futures market comes in as a useful tool is that if there is an issue where you can not standardize a product, the market will have different views on how those standardized pieces will behave over time. The benefit of having future credits is visible; you can assess that price and give yourself price exposure over time. Then the way the market trades once you have that exposure to the underlying price in, say, the December 2025 contract or beyond.

At that time, if you want to exchange (this is how power markets and future physical markets work), you head yourself with the futures, and when you approach the spot in December 2025, you can exchange your futures exposure for physical exposure. Because in 2025, you will see the winter 2024 credits that made it through all that political and operational risks. You may have to pay a little bit more to sell your futures positions and buy an available spot that is winter 2024 or beyond. But at the least, you have that relationship, so you still hedged to the underlying product.

Are we oversupplied?

Juliette Vidal:

Carbon credits come from internationally recognized registries that share all of their information. If we look at the publically available information, we can find that there are issued credits on the platform, but they have not yet been retired by consumers. There are verified credits that are not yet issued but could be used in the short term. There are a number of approved projects which will issue large volumes of credits. So, if we compile all this from several different registries, it shows that, at this moment, there is no oversupply of credits in the market. By 2050, the demand will outstrip supply, but we can't say this for the near future. We are far away from standardizing the credits on the supply side. This would be like commoditizing corporate bonds. The bonds for one company are different from the bonds of other companies. We cannot interchange them because they fit a company's exact economics and needs. This is an excellent comparison, and VCM is very complex.

Yuhau Lin:

The tension between standardization and specialization is a symptom of an oversupplied market. We are oversupplied with carbon in anticipation of ambitious carbon-neutral targets by corporates. There is no reason to doubt their sincerity, but they are not 2022 targets. In 2018, only 30 percent of the companies had written down their net-zero targets, so we have a lot of room to grow. We are in the very early days of even these targets being established.
The VCM is facing an inflection point in many aspects. From a compliance perspective, where people are compelled to buy in the voluntary space, that activity has not caught up to the actual environmental outcomes. We wonder if the market will get to a point where it treats carbon as a scarce resource. The answer to this specialization and standardization question can only be answered in a market that becomes a little more balanced between supply and demand.

Julien Hall:

I come to this market from a commodity perspective, as I have spent a lot of time in metals and agriculture. I have seen commodities develop tools to price individual criteria for commodities. The VCM will struggle to develop criteria relatable to all the current criteria. We might end up with a unit that is being traded as a project vintage combination. People will start to develop development impact fees on the project level, which has already started to happen. User preferences will become much more price sensitive, and they will be ready to consume any credit. In a tight market, the preference of corporates regarding carbon credits will diminish. I hope there will be standardization in the market, and the differences in credits will be based on the types of projects. Benchmarks in carbon credits will be a key innovation that will transform the market. Standardization is very helpful in scaling the market and bringing more financing and order. A robust benchmark is necessary to make it happen. Standardization is helpful to mobilize and organize the market as it helps create logical product differentiation, helps in creating a ground for the emergence of healthy and liquid futures, and helps create professional risk management tools. These are some reasons standardization is a precondition to a healthy and growing market.

How much does the VCM quality debate hinder liquidity development? Can high-quality supply market liquidity materially increase once the ICVCM CCP or rating agencies can define quality and price?

Chris Kennedy:

The CCP is in the process of developing professionalization in the market. In the CCP, we see ten thought-out principles. It excludes the idea of vintage carbon credits. Rating agencies and all kinds of scientific technology, such as satellite imagery, cooperate with the CCP. This is necessary for the development of the market. Corporations can choose high-quality credits for a high price or low-quality credits for a low price around a standard benchmark, depending on what they want.

Juliette Vidal:

Rating agencies are taking complex projects and reducing them to familiar financial terms. The basis of the ratings comes from mostly publicly available information listed on the registry and assuming the carbon buyers do not have the time or resources to assess the complexity of the publically available information.
There is also a question about the additionality of the rating agencies and private companies being able to determine which projects are good enough to deserve carbon finance because the basic principle of carbon markets is financing the projects which would otherwise not be possible.
If we try to shape all the projects based on the market dynamics, such as the credits being standardized or easier to purchase, it will drive us away from the main purpose of the market. The rating agencies rate some projects similarly as they have the same methodologies and documents on Verra, but they might be very different projects.

Closing thoughts

Chris Kennedy:

The role of carbon pricing will eventually be so important to the global financial system that the carbon price will be discussed in equivalent terms to the USD and treasury yields.

Julien Hall:

Tactical trading and the market attributes such as transparency, liquidity, and status will continue to evolve. Carbon markets will dramatically grow in importance.

Yuhau Lin:

Trading price discovery is a measure of the pulse of the market. Different prices suggest the way the market behaves. The market is evolving, and it is likely to become more like other markets in terms of efficiency.

Juliette Vidal:

Tactical trading enabled SCB to achieve its VCM goals via the capital we generated in the past several years. That enabled us to invest in projects we are now developing at SCB to make the capital flow back into the VCM. This is one of the key components of the market's future development, i.e., taking trading profits and recycling them back into new, high-quality projects.

Ratings: A Prerequisite for a Thriving Market

Featuring: Sebastien Cross, BeZero Carbon; Simon Crooks Fortinbras; Donna Lee, Calyx Global; Samuel Gill, Sylvera and Paul Krake (moderator), Climate Transformed

Summary

For voluntary carbon markets to be institutionalized and to fulfill both investment goals and environmental ambitions, they need to be a well-established risk framework. Just as credit markets could not function properly without a rating, the evolution of VCM will require a set of formulaic and rigorous risk assessment parameters. This is more than just price transparency. Investors need to know what they are paying for and whether it meets their objectives. Therefore, a rigorous rating methodology is essential.
The panel discussed the influence and impact of ratings on a thriving market.

Why do we need a rating system on top of existing structures, such as Verra and Gold Standard?

Sebastien Cross:

The voluntary carbon market is an intangible asset in terms of its construction and the acknowledgment that carbon is not a deliverable good. There is never a hundred percent certainty that a company has achieved a tonne of carbon emission reduction. The credit system has set up methodologies regarding how a project can issue a number of credits. The carbon credit system helps us monitor carbon reduction achievements. However, we need an effective tool to measure the validity of a carbon trading company's claim and quality. Ratings look at the core claim of a tonne of carbon being achieved. The market needs rating systems to scale as they help companies make informed decisions.

Donna Lee:

The Voluntary Carbon Market does not have a regulatory body. Instead, rating agencies play the role of providing additional oversights and accountability to the marketplace. The Big Four credit issuers—American Carbon Registry, Climate Action Reserve, Gold Standard, and VCS—are issuing varying quality credits. Rating systems can help verify each credit's quality and share this information with the market. Our mission is to race to the top in creating an impact on the climate.

What do ratings do to take things to the next level?

Samuel Gill:

There is a huge amount of complexity in the VCM, as has already been highlighted. You're looking at a wide variety of carbon credit generation activities, including both organic and non-nature-based options. Each methodology maintains a unique design and performance mechanism, making it difficult to compare them at first glance. Rating systems help provide clear insight into each methodology and its design quality, effectivity, and performance. A part of the verification process includes acknowledging the project, methodology, performance, and design. On the COD side of our spectrum, we note projects that shouldn't be issuing any credits. However, they still manage to slip through the cracks. On the bright side, we also see many excellent projects that stand out. Some projects include risk and nuance. We are trying to dig into such projects and examine the nuance with primary data and deep analytical research. Distilling this information into simpler, more understandable commentary helps it become more accessible to the average sustainability leader working in a large corporate. They can then take effective action based on this data. We are trying to capture issues where vital data may have slipped through the cracks. But, again, providing leaders with such data can help them make more sustainable choices and work with greater transparency and clarity.

An asset manager's framework for offsets

Simon Crooks:

As an ex-academic who has worked with financial markets, I have kept a close eye on these carbon markets since 2006. I am currently working on trading them with the help of my contacts, who are both project developers and end investors in carbon markets. My job is to buy and sell carbon credits. I need to ensure that I'm buying credits with the right quality, which is a challenge since we aren't working within a regulated market. The social cost of carbon (SCC) has stated that all companies must report their carbon footprint. This serves as a precursor to the SCC eventually insisting that companies reduce this footprint. Currently, the VCM deals with smaller budgets compared to these larger conglomerates. However, when the SCC declares that companies must reduce their carbon footprint, every company's CFO will want to preserve their reputation and invest in quality carbon credits at an acceptable price. However, the CFO won't be able to go through technical documentation to verify the credit's quality. They would prefer sifting through simpler, more accessible peer-reviewed insights that guarantee credit quality. This will help the CFO make smart investments and avoid being called out for purchasing low-quality credits. Carbon credit review platforms can facilitate the CFO in picking the right credit option.

How do you address the intangibles and the co-benefits of a particular credit in terms of its ratings?

Sebastien Cross:

Carbon content has only recently become the core element influencing price. SDGs held this position in the past. Before rating systems, there was no way for buyers to evaluate what was being delivered to

them beyond the binary of getting accreditation or not. So the fact that the carbon element is now driving prices is a good thing. One's ability to measure the additional benefits beyond carbon is essential. Plus, everyone's opinion of the quality and how these benefits influence it is different. But carbon quality can be measured with a simple indisputable standard: whether or not a credit achieves its tons of carbon. You can't mix the two metrics, or you risk falling into a trap where you don't have the right tools to measure or differentiate between them. The result of such research may be unusable. The delivery of the carbon commitment of the credits you're buying should be the primary concern. Everything else is secondary. Also, it's important to have the tools to assess both independently.

Are Scope 3 disclosure requirements huge benefits to the rating industry?

Samuel Gill:

When they come in, yes, they will be helpful for us because buyers will think twice about what they're purchasing before committing to a credit source. In addition, this will help drive demand for ratings because buyers will be questioned on their credits' authenticity, transparency, and quality. However, the rating market is still working on litigating an acceptable quality metric for these carbon credits. Currently, most organizations are focusing on pushing a more conservative agenda for quality measurement. So, while quality is still being litigated, we see a race to the top with more sectors demanding high carbon credit quality in a conservative sense. Only sectors with large footprints are facing the pressure of needing to purchase more affordable credits, indicating a "push to the bottom" trend.

Are ratings one of the tools that can convince smaller companies to care about quality?

Donna Lee:

It is important for companies to know that the credits they are purchasing are transparent. SCC rule combined with verifications provided by rating companies can provide transparency and help create a way to hold larger firms accountable for the quality of their credit investments. We have a separate greenhouse gas integrity rating to ensure the offset claims are accurate, and we separate it from our SDG impact rating to look at the depth of the claim. We keep these rating systems separate. There are billions of dollars of investments going into this market, so we need to ensure that there are some developmental benefits. It's important to think about this from a climate justice perspective. We must also measure benefits and greenhouse gas integrity on independent rating systems. The decision on buying the high-end greenhouse gas integrity or the ones with high attributes depends on whether companies are buying credits to claim their contribution towards climate or using credits to offset and claim their climate neutrality. Therefore, companies must consider this usage question.

Samuel Gill:

If you look at carbon offset prices, including high-quality ones, they're incredibly low. You can get one for between $10 to $15. However, the trend for carbon pricing in developed economies can go to over $100 per credit. If a company can't afford this, it is a walking debt. However, this gives way to the narrative that high-quality credits are a luxury for high-margin businesses. But this escapes the point that carbon

pricing is here to stay and will be a necessary purchase for companies in the future.

Simon Crooks:

The biggest companies are going towards easier projects leaving the expensive projects for small companies that can't afford them. Most projects are costing $50 a tonne. This means that the problem for smaller companies will get worse.

What do you think about maximizing nature-based solutions, as they are the cheapest and most efficient approach we currently have?

Simon Crooks:

I disagree with that argument. The way to net zero is not through individual households or corporations being net zero. It has to be the entire supply chain down to the end user that needs to be net zero. Some industries, like cement companies, can offset carbon on-site and be net zero. However, industries like aviation cannot capture carbon on-site and must offset their carbon through natural resources. From a scientific perspective, technology will drive our way to net zero due to the high demand for carbon credits and the inability of certain industries, like aviation, to achieve net zero.

How do ratings help fix the broken carbon pricing model?

Sebastian Cross:

Decarbonizing supply chains is not a market solution. The role of ratings in the market is to provide information about what a tonne is worth rather than to dictate pricing. Unfortunately, the voluntary carbon market is still relatively nascent and underdeveloped, but ratings can help develop it. Ratings are a tool that helps people make informed decisions. However, the VCM lacks a solid foundation; hence the cost of doing business in this market is really high. The key challenges in the VCM are credibility and transparency. But we are trying to break through that issue and provide greater transparency regarding individual credits. This transparency on our part helps create an effective pricing system.

Samuel Gill:

Educating the market to put high-quality and reliable data sets in the market around the quality of each project is important. However, credit rating agencies have been around for ages, and we are often compared to them. But if you look at our rating system in the VCM, we are still very early in our journey. So, large amounts of debt and nuance often sit behind our rating systems. There are also many technicalities that we need to read and analyze to produce an effective, transparent rating. There is little point in putting out a rating without conducting that analysis.

Donna Lee:

At Calyx Global, we think about ways to achieve our mission and what information and transparency we put out there to do this. This includes making some information public. So you will see Calyx giving more

access to the information. We have an independent greenhouse gas integrity panel and an SDG impact panel. These panels analyze our ratings and hold us accountable for them. This system ensures that Calyx Global's carbon credit rating system remains transparent and accountable.

As a carbon credit end-user, do you prioritize the quick, sharp ease of an "ABC" style company or the more thoughtful approach going into depth about the underlying assets you acquire?

Simon Crooks:

The corporations providing these ratings must be transparent in their methodologies and allow seeing the information we want. In addition, these companies must be transparent and consistent in their approach and update their customer about any changes in their approach. It's essential for customers to know what methodology their rating provider is using. If they can access such information regarding the company's methodology, they can understand it's the right one. Customers must do their due diligence on anything they're purchasing.

Samuel Gill:

We at Sylvera have a similar approach as Calyx Global. We have a consultation process with the scientific community, registries, developers, financial intermediaries, NGOs, and all sorts of regulators to release and design new methodologies. We listen to the market to understand what they care about and what methodologies they want. It is also important to share this information with the market because the consumer should know the depth of the due diligence conducted to curate ratings. It is about providing market education, and I see that as a joint mission amongst all rating agencies.

Sebastien Cross:

We must work together to help provide market education, improve our business model, and hold ourselves accountable for our ratings.

"The amount of information provided through registries is lacking, which is a major problem for companies or buyers who want complete confidence in their purchases. " – Donna Lee

How scientific are you with your data collection methodologies?

Donna Lee:

In its registry documentation, we hope the project should bear proof of its carbon calculation and the quality of the carbon credit. However, the amount of information provided through registries is lacking, which is a major problem for companies or buyers who want complete confidence in their purchases. Remote sensing and public satellite or aerial information help us check the project's claims with help from our onboard experts. However, we believe an independent assessment from a third party can provide the market with information regarding the quality of the claims.

Sebastien Cross:

The whole rating system is highly statistical, and a lot of interpretations are going into it. We need sufficient samples and population data to conduct effective data analysis. So, we're trying to get as much data as possible. But finding "the truth" without analyzing the entire population is challenging. We always try to be upfront with our clients about what they can or can't achieve.

Samuel Gill:

It's important to think about what question we are asking with the remote sensing data because it does not tell us how useful the data set is. Our data sets are structured to monitor the performance of projects, their additionality, over-crediting risks, and their permanence risk. Remote sensing is helpful for permanence risks. We can present some scales of confidence to offer certainty. The great thing about the rating model is the visibility they give to otherwise opaque situations despite the limitations presented by remote sensing.

Donna Lee:

There are many pain points around certain project types that remote sensing cannot answer, for example, the problems surrounding additionality. In addition, remote sensing can't tell about the cookstove emissions or whether the oxidation factor in the methane project is appropriate. So, this technology is overestimated.

What do you look for from the rating industry going forward to serve as a tool for your company's path to net zero?

Simon Crooks:

As a scientist seeing all the global climate disasters, a tonne of carbon should be a tonne of carbon. I want to make sure the project offers additionality and permanence. These are the two things I value more than anything else, and these are the two things the climate values more than anything else. These are also the factors a CFO will value above others. From a ratings perspective, I need to know that the project is delivered with complete confidence. The scientific approach of looking at the available data in a granular way certainly helps boost this confidence. To sum up, ratings are important to the end corporate user who can proudly say that they have invested in "the good stuff."

Practical Mitigation of Carbon Risk for Asset Managers

Featuring: Michael Lebbon, EMMI; Jan Ahrens, SparkChange; George Cheveley, Ninety One; Joanne Khew, Eastspring Investments and Paul Krake (moderator), Climate Transformed

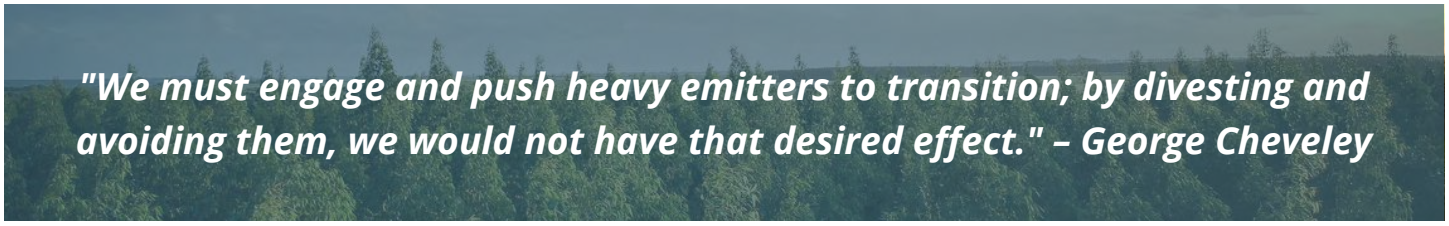
Summary

Global allocators and regulators are demanding greater transparency from public market asset managers regarding the carbon output of their portfolio companies. This discussion explored the techniques, hedging strategies, vendors, cost and implications of monitoring and offsetting carbon at the portfolio level.

How does Eastspring Investments view the risk of carbon?

Joanne Khew:

Eastspring Investments is an indirect subsidiary of Prudential PLC, and a global asset manager focused on the Asian market. We manage around $200 billion across equities, including fixed income, multi-asset, and finding alternative strategies, on behalf of institutional and retail investors globally. Carbon and ESG are integral to our operation and every part of the investment cycle in our public and private market strategies. More corporations, including Prudential, are thinking more about different sources and types of emissions, the driving forces behind emissions, and how to manage them more appropriately. We consider emissions regarding their impact on revenue and valuations. We also consider how to engage companies in our portfolio going forward. We consider risks—like mandatory systems such as a carbon tax and adjustment mechanisms like the European border adjustment, which is coming soon—and how they affect companies exporting to European countries. We assess a company's readiness for transition, seeing carbon markets as unique opportunities for value capture for our companies and risk. We look at how they set up their capabilities in this area and manage their risk, for example, institutionalizing a carbon price within their practice. We must understand the value chain and the markets in which our companies operate.



Is hedging risk a drag on portfolio performance?

George Cheveley:

I am a resource fund manager investing a lot in mining and energy companies. Two years ago, I was worried about what the transition meant and how the markets reacted to heavy emitters: should we divest or should we get out? Ninety-One was founded in South Africa, a coal economy, and still has many such assets. Our CEO believes in the transition and we are committed to it. We must engage and push heavy emitters to [transition]; by divesting and avoiding them, we would not have that desired effect. The challenge is to assist and ensure these companies are doing the right thing. We are similar to Eastspring, managing $170 billion in funds, including a Global Environment Fund focused on decarbonization. We see carbon-related opportunities in our company emissions, our portfolios, and the opportunities to invest in carbon offsetting. We have been involved in Glasgow Financial Alliance for Net Zero (GFANZ) and Carbon Action 100, looking at how they can help companies make the transition quickly and efficiently and meet their targets to meet our targets. Recent successes have been heavy emitters who have significantly progressed and improved their investibility. The energy crisis in Europe changed views about which companies need investments.

How should asset managers access corporate carbon forecasts?

Michael Lebbon:

We are helping asset managers to understand what a company's targets need to be. We do not wholly disregard company forecasts, but we must assess what a company says it will do. We need to engage carbon-risky companies, but they need to be held to account for the risk they bring to the portfolio. But, the big questions are what are their targets and when will the transition be? We need to be net zero by 2050, and we will lose companies along the way before that. At Emmi, we want to understand not what a company says it is going to do, but what it needs to do if a particular scenario were to play out in a carbon-constrained world. Many companies say what they can do, and Emmi asks whether that is enough from a carbon budget perspective. So, we are helping asset managers understand what a company's targets need to be if it were to be a 1.5°C increase world, a 2°C increase, etc. We use all sorts of scenarios to explore what a company needs to do. We also create a risk quantification by assessing a company against where it needs to be. As a global society, we have not agreed to give up on international flights, so we need to consider how the budget will be allocated. If, for example, it is accepted that airlines can't function without carbon emissions, then part of the global carbon budget can be assigned to the air industry. In contrast, the power industry needs to decarbonize as the technology is available. We can consider or model what happens if carbon prices go through the roof. For example, if the airline industry simply has to decarbonize, what does that look like? That would be reflected in the risk model and lead to

"We need to look at an emissions-specific level, and consider different routes and subsidies, to see how each corporate is exposed to carbon pricing." – Jan Aherns

different investment dynamics.

What tools do asset managers have to them to measure, monitor, and manage carbon risk?

Jan Ahrens:

On top of measuring what a company is doing, including Scope 3 emissions—which are uncertain as they cover the supply chain—Emmi also looks at what the company needs to do. We can look at who is transitioning, where are the change stories and who will be more carbon efficient going forward. Investors can engage and apply pressure on companies to invest in relevant technologies and systems to make the transition.

At Sparkchange, we think about what can be done that has an immediate impact. For example, carbon offsetting has merit if it is done in addition to decarbonizing your activities. We link financial and compliance carbon markets, which are 600 times the size of the voluntary carbon market, covering 22 percent of global emissions. We want to unlock this asset class to create an exchange rate backed by physical allowances. In addition, we provide data intelligence so they can apply this asset class to decarbonize their asset portfolio faster. They can invest in carbon allowances, instead of offsets, to put additional pressure on heavy emitters to decarbonize by taking away permits from polluters, so they can no longer spoil and have to do more about it. The carbon market is designed to implement emissions reductions where it is cheapest, so applied to companies with the lowest abatement costs. But we can invest in companies that decarbonize and are profitable in the process, but there is minimal data available. However, 80 percent of emissions are not priced. Price ranges from less than a dollar to more than $160, and the average price is $5—so what is the actual carbon price? We need to look at an emissions-specific level, and consider different routes and subsidies, to see how each corporate is exposed to carbon pricing. We then need to consider how companies with no carbon footprint are exposed to carbon pricing. For example, a renewable energy company in Europe is closely linked to wholesale carbon market prices, so as carbon prices go up, the renewable energy company will make more money. We are creating a dataset that will look in detail at how more than 6,000 corporations are exposed to carbon risk and how they will perform in different scenarios, marrying returns and impact to help investors back green companies that will outperform in the future.

Do your firms buy carbon offsets to hedge carbon risk in your portfolios?

George Cheveley:

We have looked at it, but if you are buying offsets, you should be retiring them. We have offset our hard-to-abate offsets, but not in our portfolios. We see others buying offsets, but it is not clear whether they are retiring them or not.

Joanne Khew:

We are not there yet, either offsetting our company emissions or portfolios, but we are considering opportunities to do that. We see the carbon markets as a growing space, especially where more transparency comes in around the voluntary carbon market, and more liquidity, with companies increasing net-zero commitments. We see companies with a well-positioned offset strategy or looking at the whole supply chain, including offset development companies.

Is hedging carbon exposure at the portfolio level double counting?

George Cheveley:

If offsets are bought to hedge a portfolio, you should be clear that you're retiring them. We are at the start of a process, and the primary motivation for ourselves and those we manage portfolios should be decarbonizing—and offsets are required. In the VCM, we are talking about harder-to-abate offsets that should be towards the end of the process. So, decarbonize first, and then offsets will become increasingly important.

"If they see regulators making abrupt changes, it will affect confidence and investment." – Michael Lebbon

Russia's invasion of Ukraine has created major distortions and price spikes for energy. What are the implications for carbon markets near term?

Jan Ahrens:

The carbon price to switch from coal to gas is over 100 euros. That being said, there are windfall profits in European energy companies at the moment because coal-powered plants make a lot of money. Therefore, by taxing their emissions intensity, governments can make a windfall tax that could be used to invest in low-carbon energy. A low-carbon steel plant in Sweden has a carbon price of 60 euros, so the steel industry can also decarbonize at scale. Chemical and airline industries in Europe also now have pressure to decarbonize. Europe's main problem is not carbon prices, but the reliance on fossil fuels. A reduction would have minimal effect on gas prices, but it would cause significant damage to the carbon market because these companies invest based on 20–30 years' projections. If they see regulators making abrupt changes, it will affect confidence and investment.

Michael Lebbon:

Changing carbon prices hurts the market. Australia had a stable carbon price for two years, leading to a decarbonizing trend. Regulators responded to concerns that power prices were rising by affecting the carbon price, which gave a short-term reduction in power prices, which have since become higher than they've ever been, and we have no carbon price. Australia has had a 15-year drought on policy, and we've failed to make any sense of the transition because no one knows what the investment criteria will look like. We have a bit more wind and solar, but we don't know how to integrate it.

Does a uniform global carbon price necessarily lead to a race to the bottom?

Michael Lebbon:

Kyoto was set up to have a globally consistent carbon price where we'd have fungibility through assigned amount units. So we would have the Clean Development Mechanism (CDM) that would work and the joint implementation. It doesn't lead to a race to the bottom because we internalize the carbon price so that market forces activate the most efficient abatement, and companies can sell surplus abatement to those that can't achieve abatement themselves. But, unfortunately, that broke down, so now it is challenging for companies to know what they're investing in. What SparkChange are doing is great because they are working within a compliance system, so you know you have liquidity. We need to focus on decarbonizing by asking ourselves what the emissions will bite, and whether they will be problematic if you're still emitting in specific sectors in 2 or 4 years. Probably not in an airline, but in energy, you might be gazumped by someone else because the technology exists to decarbonize (i.e., renewables).

Is the only path to price transparency some form of uniformity between the price of capture and the price of offsets?

Michael Lebbon:

We need the capital markets to integrate the risk of living within a carbon-constrained world into their investment decisions so that it's not just about sequestration but also that carbon emissions, in general, carry a financial risk. The system does not treat carbon risk like inflation or credit risk. When it does, we will start to get transparency, not from a specific carbon price or credit, but it comes through in the cost and availability of capital. For example, a triple B-rated bond has different risk characteristics than a double B-rated bond. We see the same thing happening in carbon, but you need consistency in the framework and transparency across the language of how we explain it. Then you will get that price transparency through the cost of capital.

How are asset managers viewing carbon as an investment opportunity?

Joanne Khew:

The variety of disparity of value in carbon credits affects how asset managers think about carbon credits. We see an opportunity in the VCM due to regulatory-driven changes, for example, in Singapore, where the government allows 5 percent of a carbon tax to be offset within the market, so we'll see companies that take advantage of that, like how they understand pricing. This brings us back to assessing company readiness. For example, do they have the right skills to develop a trading desk, or are they modeling offsets into their operating model? We look to get early exposure to the offset market through these companies. We're thinking about what kind of internal carbon pricing we might use to decarbonize our portfolios. We see companies preparing to take advantage of the VCM by developing solutions or as an intermediary to hold credits.

Why should we be retiring credits used to hedge portfolio risk?

George Cheveley:

If you're claiming to offset carbon in an investor's portfolio, then you need to honor that by retiring them. You may wish to hedge because you think carbon might go up. You've got to be careful about what you're claiming. The dynamics are constantly changing with mispricing, and you can argue that the cost of capital was much higher for heavy emitters than it is today. The market is trying to price this as credit risk and inflation and sometimes gets it wrong. Some might say that it's always going to get tougher for heavy emitters, but that's not necessarily going to be a straight line. Some of our companies have emissions targets for 2035 and may make no progress for five years, and then shut a coal mine, and suddenly a cliff edge emissions change. All sorts of environmental factors will be priced, including biodiversity and water usage, so it's essential to understand how those prices will change, meaning massive opportunities if you can price them quickly or predict a trend.

Michael Lebbon:

You need the flexibility to understand that transition is not a straight line. Whether clients are managing a temperature alignment or a carbon risk or not determines what you do with carbon credits. For temperature alignment, you need to retire them; for carbon risk, it's about holding them and trading them.

How do we eradicate greenwashing from this debate?

Jan Ahrens:

VCM suffers from questionable additionality. Additionality means that revenues from a carbon credit are required to fund a decarbonization project. It is the root cause of our fragmented VCM. Hopefully, the Paris Agreement Article 6.4 will eradicate this, where you have the corresponding adjustment, meaning that if a project doesn't deliver the carbon reductions that they claim. This will reduce the question of whether projects deliver what they promise. Do companies follow through on what they pledge to do, and how do they compare to their peers? Do asset managers do due diligence? Fear of greenwashing slows them down and leads to inertia. But we don't have time. So don't be blocked by fear of greenwashing.

Transparency: The Essential Element for Sustainable Growth

Featuring: Paula Van Laningham, S&P Global Commodity Insights; Nico Girod, ClearBlue Markets; Marcelo Labre, Viridios AI; Raúl Rosales, Imperial College Business School
and Paul Krake (moderator), Climate Transformed

Summary

The Transparency panel dove deep into the essential element of how this industry thrives. Without project and pricing transparency, VCMs will struggle to meet their moral and commercial ambitions.

Why is transparency so important to the future viability of the VCM?

Paula Vanlaningham:

Transparency means different things to different people. It is about knowing what is being traded, where, and when. It is also a window into quality. Price transparency has been a challenge throughout the history of VCM. Credits are sold in an opaque over-the-counter way, so it has not been apparent to participants in the OTC markets what the current pricing actually is and what the particular attributes of the different types of credits are. We're trying to bring transparency to pricing benchmarks, which is different from simply tracking trading history. These benchmarks are designed to help VCM scale up effectively.

"There's a big question about price transparency, which has been a challenge throughout the history of VCM." – Paula Vanlaningham

What is the role of benchmarking in creating price transparency?

Marcelo Labre:

Benchmarking is extremely important in any financial market. There needs to be a reference point to understand what's going on. Essential for asset managers, bankers, etc., to assess risk and make financial projections. We produce seven benchmark indices on different project types. This includes soil carbon, household devices, reforestation, aforestation, conservation of forests, REDD+, and blue carbon. The nature of VCM is that no single point of reference covers all prices. Carbon has different pricing in different regions and for various project types. As a result, there is immense complexity. VCM resembles more a credit market than a commodity market. While all companies differ, you can benchmark diverse sectors or risk factors to develop indices for reference pricing. The same applies to the VCM.

VCM is more like a credit market than a commodity market. There are some loosely used benchmarks, but nothing like you have with other assets. Could that hold back the financialization of voluntary carbon credits and inhibit the VCM scaling up?

Nico Girod:

When you try to commoditize carbon, you get the lowest common denominator, which is a flaw in the market. The markets are not very liquid yet. There's an open interest of around 15 million tons, so it's small, but it is a signal that aids transparency. There is a futures market, which is open to be manipulated because there's not that much liquidity. The OTC market is more representative but, at the same time, less transparent. It serves a purpose for financial investors trying to use contracts for hedging purposes. A financial market will be useful, but it is very specific to the end buyer and country. As more products are listed, it will create more confusion than anything else, so we're trying to keep track of what's happening for clients.

"The nature of VCM is that no single point of reference covers it. Even carbon has different pricing in different regions and for various project types." – Marcelo Labre

Are benchmarks essential to scale?

Paula Vanlaningham:

Carbon is like a commodity, but a commodity with variabilities, like crude oil, where a shipment may have different characteristics leading to different grades and prices. We have set up our spot market pricing around a similar concept so we can control for different attributes and normalize for other attributes, so you can still get that OTC spot benchmark that is so important. Most buyers are very invested in the attributes of the assets they try to buy. We've created a specific definition around benchmarking, so you can use it as a reference. If you have a slight variation, you know you can price it at a premium or

discount. In this way, the VCM operates just like any other commodity market.
We're looking at a paradigm shift in the VCM, which could be to follow that route or become completely commoditized, which you typically see as a compliance market in something like an EU ETS. This would be similar to natural gas markets, where the contracts are broadly homogenous. However, this is not possible in the VCM. Benchmarking would help as we could price everything off a reference price, with individual credits trading at a premium or discount to that reference. We have a burgeoning and expanding futures market using different benchmarks. Over time, some will succeed and generate liquidity, while others will fail. There's some confusion about what happens first: the scaling up or the financialization.

How does benchmarking consider SDGs, and is it inevitable that future benchmarks will focus on nothing more than carbon attributes?

Marcelo Labre:

Our indices link to project contributions to SDGs. This has been a development over the years of the VCM, driven from the bottom up, with corporates demanding a co-benefit impact from projects. There will be a limit to the commoditization of the VCM because of the demand for project differentiation and the need for varied co-benefits.

Paula Vanlaningham:

There will always be those two sides to the VCM: Those that want the cheapest ton of carbon and those that want the details on the true impact of their investment. We've been working on pricing those differentiations in co-benefits. As the market grows, we'll have more data to help us further develop clear differentiation.

Nico Girod:

When a corporate comes to us, they have a budget, and we try to optimize around that budget. Co-benefits are essential, and we see both types of clients either look for the cheapest carbon or the most significant project impact. It is essential to us that credits do deliver on what they say they will.

What role should exchanges have in promoting the quality of the assets?

Nico Girod:

Financial product exchanges help developers fix prices on their projects, and people hedge future risk.

"Carbon offsets are treated as intangible assets and inventories but should be treated as financial instruments." – Raúl Rosales

Where are we in terms of the global adoption of accounting standards?

Raúl Rosales:

Transparency, liquidity, and pricing are the three essential elements for scaling VCM. They are the prerequisites for scaling up, mobilizing funds, and institutional investor engagement. Accountants, auditors, and users of financial statements now want a standardized system for carbon accounting measures and financial disclosure. This will lead to transparency and integrity in the VCM. We need a level playing field for the regional accounting of carbon offsets. This should be set up as soon as possible. Key questions include: How should carbon credits be valued at purchase? When should they be reported in the income statements? How should liabilities be valued over time, where should they be reported in the company statement, and how should they be recorded? There are no uniform answers to these questions right now.
A representative carbon accounting system must be based on consistency across all transactions, incorporating high-quality data while calculating all the uncertainty. It will allow risk management. We talk about VCMs, but from a capital markets perspective. The lack of regulation is astounding right now. The International Sustainability Standards Board was created in November 2021, which is an important step, but although it has specific requirements for reporting, it doesn't have particular requirements about carbon accounting. The International Financial Reporting Standards (IFRS) do not specify accounting for GHG emissions. Carbon offsets are accounted as intangible assets and inventories but should be treated as financial instruments. To be considered as financial instruments, they must also consider valuation metrics, which is critical going forward.

Have you put a price on co-benefit and SDGs?

Nico Girod:

I believe that markets price everything into a specific contract. We work with a pricing agency, and we see that projects with more SDG impact trade at a higher premium. Each project is very explicitly priced according to supply and demand.

Paula Vanlaningham:

These things are very dynamic. For example, you could say that adding clean water to a project will earn you 20 cents more per ton. More typically, a nature-based project, for example, would have the related SDGs built into it, such as Life On Land and Life Below Water. You'd expect certain types of projects to have specific standards. This all changes with market dynamics, so models need to be able to move with the markets. Premiums are attached to projects that demonstrate extra SDG value.

Marcelo Labre:

How can you extract data to explore the current premium price for a particular project with its SDG dynamics? AI is required to combine those complex project dynamics to produce a calculation.

What is the importance of blockchain for transparency?

Paula Vanlaningham:

The efficacy of blockchain as a mechanism has less to do with carbon credits themselves than it has to do with the intricacies of international carbon accounting. First, carbon accounting needs to be standardized. Part of the challenge is the complex mathematics around carbon accounting, and blockchain has potential opportunities and use cases. I see blockchain as potentially more useful for international carbon accounting than for specific use cases in VCM.

Raúl Rosales:

There are no local or international regulations for carbon accounting, the rationale for which is the lack of understanding of regulators and policymakers. Blockchain doesn't help without standards already being in place.

"I've seen the efficacy of blockchain as a mechanism has less to do with carbon credits themselves than it has to do with the intricacies of international carbon accounting." – Paula Vanlaningham

How important are the common carbon principles in getting to standardization?

Nico Girod:

It helps investment banks and so forth to get more comfortable with the market. Investment banks are new to the VCM and will emphasize standardization as their means to scale transactions. They are still coming to grips with the business model. Sometimes I wonder if we're repeating things that Verra has already implemented, so shouldn't we get comfortable with Verra and the other registries and assume that those projects are of sufficient quality?

Marcelo Labre:

Many methodologies are already embedded, but it's evolving rapidly, and we need the registries to host, verify and certify projects effectively. Our mission is to produce transparency on the project level.

Paula Vanlaningham:

Over the last year, the nebulous concept of carbon credit quality has evolved towards definition with the help of the core carbon principles. However, the speed at which the VCM is evolving creates challenges. Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) dominated the conversation a year ago, but we've moved far beyond that. Can the core carbon principles keep up with a very dynamic market? They could become outdated within six months. In the last 18 months, the VCM has grown exponentially, and though it may not reach $30 billion by 2030, it is incredibly dynamic and growing.

Can accounting standards across the globe agree on a single approach?

Raúl Rosales:

The International Accounting Standards (ISD) Board has to set this aside as a priority. They have set aside research on regulatory accounting bodies, but that's not a priority. It's a mess, and they need to prioritize the standardization of global carbon accounting.

What is one improvement that would improve transparency?

Nico Girod:

A registry publishing transactions and transaction prices, even at the end of the month or the quarter.

Marcelo Labre:
Yes, a meta-registry would help to unlock the potential to view and engage data.

Raúl Rosales:

I'd ask the ISD Board to set up a team to work seriously on this project, not only for the reporting but for the accounting of carbon offsetting, and also to revisit the definition of financial instruments in the accounting framework.

Paula Vanlaningham:

The fixation on fixed price transactions is a significant shortcoming to growing the market to transition away from thinking about things on a spot price basis.

Compliance Markets: You Can't Have One Without the Other?

Featuring: Michael Evans, S&P Global Commodity Insights; Yan Qin, Refinitiv; Ben Rattenbury, Sylvera and Rupert Rowling (moderator), Climate Transformed

Summary

While this conference focuses on voluntary carbon markets, it is impossible to have a thorough analysis without a complete assessment of the opportunities, challenges, and future direction of compliance markets. The faultlines around Article 6 and Compliance markets will drive standards in VCM in the years ahead, and we will look at the impact of compliance markets in the EU, US and China.

Defining compliance markets

Yan Qin:

The best example of a compliance market is the EU Emissions Trading System (ETS). First, the government sets a cap for specific emissions and hands out allowances to more significant emitters over a threshold. This could be a power plant, industrial facility, or airline. The authority limits the supply of allowances, and trading occurs via auctions or in the marketplace. These entities need to surrender their allowances equal to or no less than their emissions each year, and if they have a shortage of those allowances, they can purchase from those with a surplus.

Ben Rattenbury:

It's a mandatory market, and the players are not there by choice. The cap and trade system is the dominant format for a compliance market, but recently we have seen novel types of carbon markets emerge, which are variations on that theme. For example, several governments have implemented a carbon tax. They have said that as part of your carbon tax liability, you can use carbon credits, so there's now a tax and credit mechanism, a type of carbon market in a compliance setting. Still, it also allows VCM credits, although with specific restrictions. Carbon Offsetting and Reduction Scheme for International

Aviation (CORSIA) is another compliance market that will come stream in a few years, specially for the airline industry. It's currently in a voluntary trial phase, but soon it will become mandatory. It's essentially a cap and offset mechanism. Arguably the original compliance market was the Kyoto Protocol which was a global cap and trade system with a significant component of offsetting, so it wasn't about issuing allowances. There's an increasing plethora of compliance markets out there. It's important to realize that they're much bigger than voluntary carbon markets. Last year's trading in VCMs was about $2 billion, and in compliance markets, the revenues earned by governments were over $850 billion, so the trading volume is much bigger. As we see an increasingly porous border between VCMs and compliance markets, the scale of compliance markets will start to influence VCMs in all sorts of interesting ways.

Michael Evans:

Compliance and VCMs ultimately have the same aim. Caps are set in markets through different means. For example, China uses an intensity-based cap and sets an absolute limit on annual emissions. Compliance markets, like VCMs, don't all target the same sectors or do the same things; they're not homogenous designs.

Will the VCM come to mimic the more straightforward pricing in the compliance markets, or will they remain separate?

Yan Qin:

The scale of compliance markets is enormous compared to VCMs for example, China's ETS is 4.6 gigatons, though trading volumes are lower because much of the allowances are given freely. The trends show that the voluntary markets are evolving quickly, and both will continue to grow.

"As we see an increasingly porous border between VCMs and compliance markets, the scale of compliance markets will start to influence VCMs in all sorts of interesting ways." – Ben Rattenbury

Arguably the VCMs have only grown due to failures in the compliance markets. Is that a fair analysis?

Ben Rattenbury:

Compliance markets covering only 25 percent of global emissions is a failure of the political process at the international and national levels. It varies in different regions, but VCMs only exist because there is not full coverage by compliance markets. Moreover, political challenges around compliance markets (not a purely economic rationale) make it difficult to implement a genuinely robust compliance market.

Michael Evans:

The first VCMs came about simultaneously as the first compliance markets. For example, the EU pilot

scheme in 2002 was very similar to the early discussion about VCMs. There is some integration of voluntary offsetting in compliance markets, certainly in the EU market up until the end of 2020. Others continue to accept a percentage of obligations with offsets. Still, those percentages remain extremely low at 10 percent or less in most cases and even below five percent of annual deficits in many jurisdictions. Both markets have co-existed for different reasons. Compliance markets have generally come about where jurisdictions have formed their climate targets. The voluntary side has been a bottom-up approach to developing a market. The foundation of the market is a company's willingness to make its environmental commitments and then look to match with offsets. At some point, we may see more offsets used in compliance markets.

Why is there such a big difference in price between compliance and some elements of the voluntary sector, with EU ETS at about $65 per ton and some areas of the voluntary sector at $3-$4?

Yan Qin:

The China ETS is around $7–$8 per ton. Prices can significantly go up and down. In the compliance market, some regulators control the supply, and the supply is more foreseeable because it is linked to a climate target. Abatement costs can also have a significant impact on carbon pricing.

How does political interference affect carbon markets?

Ben Rattenbury:

Compliance markets work best when there is less political interference. When caps in the EU ETS have been tightened in the past, it has pushed the price of carbon and increased the emissions savings. Loosening requirements would harm the EU's ability to meet its short and medium-term climate commitments.

A research paper came out saying that the social cost of carbon is about $850 per ton, way above any of the current prices in compliance markets. So in terms of the core economic principle, if climate change and GHG emissions are an externality, i.e., a cost not borne by those responsible, then, of course, encouraging companies to bring those costs in-house and reflected in their internal decision-making is vital.

Even though the EU ETS price has fallen over the last few months, it was still quite far short of that social cost of carbon, and it is currently around where the International Monetary Fund (IMF) says it should be the minimum of approximately $70 per tonne. I would imagine that the IMF has had a team of scientists modeling the optimum decarbonization trajectories for the world and the best price for which you can achieve some kind of Paris compliance of 1.5°C or 2°C degrees by 2050 while allowing trading to reduce the overall cost.

Of course, we can meet any target by ceasing all economic activity. Still, if we want financial stability, it becomes a complex conversation about where to implement those emissions reductions. For some sectors, it's much more expensive than for others. It will always be cheaper to reach decarbonization goals if you allow trading because the market can find where is the lowest cost abatement. So that is the basic assumption that the IMF would have used to come up with that price.

"We've seen how regulatory intervention can change the sentiment. But, we remember that the price trends in these markets are not just a function of supply and demand, but of the climate targets we're all striving to meet." – Michael Evans

Is there any scenario where the carbon price structurally falls over the medium term?

Michael Evans:

We've seen how regulatory intervention can change sentiment. But, we remember that the price trends in these markets are not just a function of supply and demand but of the climate targets we're all striving to meet. If climate targets were to be met, it suddenly changes demand. If we alter how we regulate and introduce offsets and allowances in the compliance markets sphere, we can change supply. Hence, those two fundamentals can be adjusted according to the demands and the needs of the day and how the government wants to take its commitments forward.
While we see the momentum for COP26 last year and COP27 coming up very shortly, political momentum grows to take climate action urgently. Based on that, we'd expect fewer allowances in the compliance markets. Coupled with increasing demand, that is the basis of our price forecasts. We forecast EU ETS consistently at $100 per tonne by 2030, which is a function of the EU's 55 percent emissions reduction target by 2030, and reforms at the EU ETS are underway to deliver that.

Do you have an equivalent forecast for the Chinese ETS?

Michael Evans:

The Chinese ETS was launched at the start of last year. China has a target for peak emissions by 2030, which we believe is still deliverable. Still, in the meantime, we expect emissions to continue to increase, with additional coal capacity being exploited in China. All of that suggests that there will be demand for Chinese emission allowances. China has a net-zero target for 2060. Whether that becomes stringent will set a long-term price trend for carbon on the Chinese ETS.

Yan Qin:

We have a very detailed forecasting model for the China ETS. The intensity will be tightened each year, gradually eliminating the surplus. Therefore, we expect an average price of 65 euros for this year and around 72 for next year. If a certain percentage of allowances were to be auctioned from next year onwards, that would also support the price.

How will the Chinese ETS impact the transition to a low-carbon economy?

Yan Qin:

China is the biggest emitter, and its per capita emissions are rising. On the other hand, China announced the carbon neutrality goal, which is still quite a surprise. That announcement has made carbon neutrality a buzzword in China. Even my parents suddenly understand my work as a carbon analyst. China finds its way, and policy documents are coming out almost weekly.

A more immediate target is peak emissions by 2030 and boosting wind and solar capacity to a combined 1200 gigawatts by 2030. I am confident that will be reached because of China's global dominance in these technology supply chains. Until now, there hasn't been so much allowance pressure and not so much market clarity, so the price has been low, around 8 euros. The Chinese ETS started with the power sector and will now broaden to include broader investor sectors, including other energy-intensive industries. Smaller emitters do not need to comply with the national ETS. Still, there is potential for a multi-layered carbon market, with different provinces having their carbon market to work with smaller emitters. The 1+N is a one-plus carbon neutrality framework comprising more than 30 policy documents covering all sectors. This policy is at the national level, but then it is distributed and implemented at the provincial level. There can be regional initiatives, too, like the Great Bay Area.

Ben Rattenbury:

There are plenty of countries that still have higher per capita emissions than China. China is an export economy, so part of its growing emissions is that countries worldwide consume Chinese products on a vast scale, effectively externalizing their emissions associated with manufacturing those goods. There is an ongoing debate about production emissions vs. consumption emissions. Currently, emissions are accounted for where they are generated, which leads to Europe having comparatively low emissions, and China having relatively high.

> ***"There's a growing focus on quality in the market, which is helping to shift the average policy of what is happening." – Ben Rattenbury***

What is the difference between carbon neutrality and net zero?

Ben Rattenbury:

The difference is not fully resolved. The key is in the word net, that you can have emissions in some sectors and that it nets out at zero. This could involve carbon removal, though the dominant forms of emissions removal are trees and oceans. Carbon neutrality is about not emitting, whereas net is about balancing.

Michael Evans:

Carbon-neutral growth is one of the core concepts behind CORSIA.

Where are we on the journey to transition?

Ben Rattenbury:

Looking at the emission projections at the moment, you'd have to say that we're off track. The infamous graphs produced by United Nations Development Programme (UNDP) show yearly what the emissions are and where we need to be in future years. Every year, we're still going up, and year on year, the future downward requirement gets steeper and steeper. There are positive signs, including in VCMs. The

Integrity Council for VCMs will set a benchmark. New sectors, such as carbon credit ratings, are emerging that didn't exist three years ago. There's a growing focus on quality in the market, helping to shift the policy at a meta-level. At the same time, the market is expanding.

How is Britain getting on with policy developments?

Michael Evans:

The UK has launched its ETS, which has been going for twelve months, and the government is looking to expand the scope to include more sectors and robust targets. In the voluntary market, the UK is moving forward with the integrity initiative announced this year, which is parallel but separate from the ongoing development of the compliance market. There are signs that the UK and EU ETSs could co-exist and work together towards climate goals. There is now no acceptance of offsets against obligations in these markets. The voluntary market has a real need to develop integrity and transparency.
The compliance market's challenge is ensuring it's fit for purpose, delivering emission reductions, and ensuring the integrity of the markets in which it operates. Article 6 lays the foundation for an international compliance carbon market to come through.

How long until compliance and voluntary markets become one?

Yan Qin:

Until we are carbon neutral.

Michael Evans:

We're still in the early phases of these schemes, and they're growing by the day. Hopefully, in decades to come, we'll be much closer to meeting those targets, and the policy tools we need will change. So we might harmonize approaches as we get closer to that point.

The Implications of Article 6

Featuring: Andrea Bonzanni, IETA; Marisa Martin, Pollination; Hugh Salway, Gold Standard; Duane Newman, E&Y and Alessandro Vitelli (moderator) Climate Transformed

Summary

A broad conversation about the true intent of Article 6 and how this is often lost and underappreciated by investors who treat offset markets as nothing more than commodities. The goal of this discussion was to bridge the gap between Article 6 and how VCMs are evolving.

What is Article 6? What does it do?

Hugh Salway:

At the heart of the Paris Agreement are nationally determined contributions that countries set themselves to meet the Paris Agreement's long-term goal. Article 6 allows countries to cooperate to meet their targets, which can be through non-market approaches. Still, it can also be through market mechanisms, so emission reductions achieved in one country are being used in another country towards their target. Article 6 can also be used by voluntary actors, including airlines, under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) scheme. There are three different parts to Article 6. Article 6.2 is about accounting and allows countries to cooperate, avoiding double counting. Article 6.4 creates a new crediting mechanism, essentially a new and updated version of the previous Clean Development Mechanism (CDM). Article 6.8 concerns non-market cooperation outside the trade of carbon credits and emissions reductions.

How legally binding is Article 6 for the countries that signed up for it?

Marisa Martin:

Article 6 is a voluntary cooperative mechanism. Most countries have indicated that they would like to participate in Article 6, partly because there are expected cost-savings for those participating. For example, emissions avoidance is cheaper in some countries, and Article 6 allows participants to benefit from those cheaper opportunities outside their borders. It's a bottom-up approach, so once a country decides to participate, they decide how or what they want to do within the guidance issued about reporting and transparency. Some countries were already engaged in 6.2 transactions before that guidance came out. 6.4 is top-down, a methodology laid out by the UN.

What opportunities do 6.2 and 6.4 create?

Andrea Bonzanni:

Under 6.2, countries decide on their mechanisms to trade Internationally Transferred Mitigation Outcomes (ITMOs). We expect to see significant opportunities for both governments and the private sector. For countries, it provides flexibility to access lower-cost mitigation actions. All countries have NDCs and targets and increasingly net zero commitments. A significant aspect of this is accessing international financing options. The role of the private sector is vital, with opportunities for project developers to generate credits from projects in host countries. We expect a traded market to buy and sell this credit in a liquid and efficient market.

How does Article 6 coexist in the VCM?

Hugh Salway:

At Gold Standard, we see ourselves involved in carbon credits that can be used in compliance and voluntary carbon markets. Instead of considering the VCM as an ecosystem, we consider the voluntary use of the carbon market. Companies will buy credits entirely separate from Article 6 or Gold Standard, without the host country or corresponding adjustment. However, there will be others within Gold Standard, with the corresponding adjustment that must meet the Article 6 guidance, and governments or companies could buy those. Article 6 is very flexible, but it comes down to companies. They use the market voluntarily, and they may choose to use credits with the corresponding adjustment. This ensures that the credit is not double counted, that a country has not used I,t and that it uniquely belongs to the company.

Discuss the interaction between the two markets.

Duane Newman:

South Africa has a carbon tax system where you can use your offsets to reduce your tax liability. However, the credits must be from the local market on local projects in the South African boundary. The voluntary market is very active with the large corporates in the African market. The main reason is the price difference, with a higher price obtained in the VCM because the carbon tax price drives the compliance market price. However, some feel that the carbon tax price is too low, so companies are looking to sell their voluntary credits on the international market.

Will Article 6 help to address the price arbitrage between voluntary and compliance markets?

Hugh Salway:

There are still challenges over price transparency, but we've seen a lot of improvement. For example, we've seen more price discoveries in the past two years, not due to Article 6 but due to the growth of exchanges and contracts. We don't know the value of an Article 6 authorized credit because we don't have live examples. Therefore, I don't expect there to be a solution that comes out of Article 6. Still, we hope for a distinction in price between credits with corresponding adjustments and those without, partly because they have wider application. They may also come from projects that represent higher-hanging fruit because governments may not be so willing to provide the corresponding adjustment for credits

that relate to cheaper abatement. Instead, they want it to count towards their indices, reserving their authorizations for more ambitious projects that otherwise wouldn't be achieved in the jurisdiction.

Can further functionality be brought into the legal side for corporates trading credits?

Marisa Martin:

This will need to be considered in contracts. Bilaterally negotiated contracts have transferred many credits. What you're transferring is an exclusive GHG reduction underpinning the carbon credit. The buyer gets that credit, and they can claim it. The difference is if there are two types of credits, one adjusted and authorized and the other not. The buyers must know what they get, and the sellers are selling something appropriate. The challenge is that no country has an Article 6 governance scheme, so you can't make a corresponding adjustment. Project developers and buyers are all trying to figure it out right now. There is a lot of activity and investment going into carbon reduction in these host countries, and you need contracts around that. In the voluntary market, the country has a lot of control over what it will do with the voluntary credits, which will also be influenced by what buyers want.

Will the price depend on the outlets, and will optionality be included?

Andrea Bonzanni:

I think we're far away from seeing a single price for credits. Problems based on transparency will be resolved as the market matures. The mature market will still have price differentiation for various reasons, such as the different technologies used to generate credit. Reduced or avoided emissions will have other price implications. Whether the credit has a corresponding adjustment will affect the price also. In a mature market, trading activity will converge around one or a few key contracts, providing a benchmark with other contracts that are priced concerning that.

How does the South African government consider the value of offsets from different sources when redeemed in a domestic tax regime?

Duane Newman:

The government is trying to set pricing, which they have started to do in US dollars. The price is linked to the nominal carbon tax rate, and that's how they're being bought. So they're bought at 80 to 90 percent of the carbon tax price on the market. The biggest challenge is a shortage in the market. There's a significant need for many more carbon offset projects to reduce carbon tax liabilities. Another problem is double counting, including where projects have claimed incentives for carbon credits and some other aspect of the project also.

What is the role of a host country government in a voluntary offset project which is not going to be used for Article 6? Do they have jurisdiction over it?

Hugh Salway:

We have seen this in Indonesia, Honduras, and other places. Article 6 is one of the drivers, and some countries are thinking about what they want to authorize. Many countries now have a target for 2030, so they must think carefully about what activities are taking place in their country, and whether they can register them or provide approval. Many governments are thinking about how to incentivize climate action.

How can we fast-track the development of an entirely new market?

Marisa Martin:

It is most relevant to 6.4. It's a new mechanism, so it can't just take everything from CDM. A lot of institutional knowledge will go from CDM to 6.4. It will not be "CDM 2.0."

When should people expect the first availability of 6.2 credits?

Andrea Bonzanni:

The first issuance of credits may be around the end of 2023, though I predict it won't happen until 2024. There was a significant delay with the appointment of the advisory body. We were expecting a rapid appointment after COP26 last year, but we had to wait until June, so work could not start in the first half of this year. They are now working at a good pace, having had two meetings to date and another planned ahead of COP27. Nevertheless, the amount of work they need to go through is huge.

What can the Article 6 advisory body learn from VCMs and the CDM to get off to a flying start?

Hugh Salway:

In the text for 6.4, the supervisory body was asked to go and look at what other programs like VCMs are doing rather than just the CDM. There's been particular mention of learning from sustainable development goals in the VCMs. There's mutual learning with Gold Standard taking lessons from the 6.4 texts. Gold Standard and Verra did a lot of learning from the CDM.

What is South Africa doing to be part of this market, to deliver credits into the market?

Duane Newman:

Large corporates struggle to understand what Article 6 means for their business, how carbon credits fit into their climate targets, and which credits they should use. We're helping them to set a policy at a corporate level around what credits they want to use and whether they're linked to their sustainable development goals. Some corporates have started to disclose what their internal price on carbon is.

Suppose at least the UN is the compliance market for those participating in it. Thus, will the UN's decisions about the methodology for Article 6 change VCMs methodologies?

Marisa Martin:

There'll be a lot of mutual learning. What the UN finally agrees upon in methodology will influence who participates in that market, and project developers and countries will choose to go through the 6.4 or Gold Standard. There could be a price difference between the two. Under 6.2, governments may also set up their methodologies. So there are a lot of opportunities, but also a lot of confusion about what a carbon credit is.

Hugh Salway:

We're always looking to keep up with science and technology. Our drivers right now are Article 6 and the integrity council on the VCM side. Hopefully, the two of them will give similar messages.
So we have these two mechanisms giving expectations for standards, and we want to ensure that our credits achieve and work with both of them.

Is there a risk that VCM and Article 6 markets take different lines on central themes, for example, whether renewable energy can be credited?

Hugh Salway:

There will always be some differences, but the two seem to follow in a similar direction. Renewable energy comes down to additionality, which will become ever more critical.

What can developers do now while waiting for Article 6 to land?

Andrea Bonzanni:

If the project was registered under the CDM, Article 6 includes a transition period so they could still receive credits until the end of 2025. In the meantime, we don't have an Article 6 mechanism up and running, so these projects are expected to transition, but they are not taking credits now. So if they want to stay within the UN compliance system, the only option they have is to wait. Projects can re-register on a different standard.

Hugh Salway:

We've created an enhanced route to help projects go from CDM to Gold Standard. There are rules and restrictions in place to ensure that they are projects requiring finance. Some of them are vulnerable projects that need finance from the sale of credits to come through.

How will Article 6 deliver a robust marketplace in a way that CDM did not?

Marisa Martin:

There were strong results and successes with the CDM. Article 6 focuses on environmental integrity, which is core to raising ambition and developing cost savings to help countries meet their Paris goals together. Defining environmental integrity can get tricky. Under 6.2, countries are required to contribute to environmental integrity. Integrity is core, and that's what we're trying to figure out now.

Will Article 6 and the ICVCM inform South Africa of its carbon tax system?

Duane Newman:

There's been a need and a desire to align with global standards. There has been resistance to thinking about the cost of compliance. South Africa is developing a local framework that considers how to reduce the cost of compliance. There's a natural driver for Gold Standard and other standards to keep the cost of compliance down at a level that makes the market accessible. Article 6 creates a robust framework for countries to examine their country framework. It'll lead to more market certainty and environmental integrity.

Will there be tension between the top-down 6.4 with potentially 190 countries developing their frameworks?

Andrea Bonzanni:

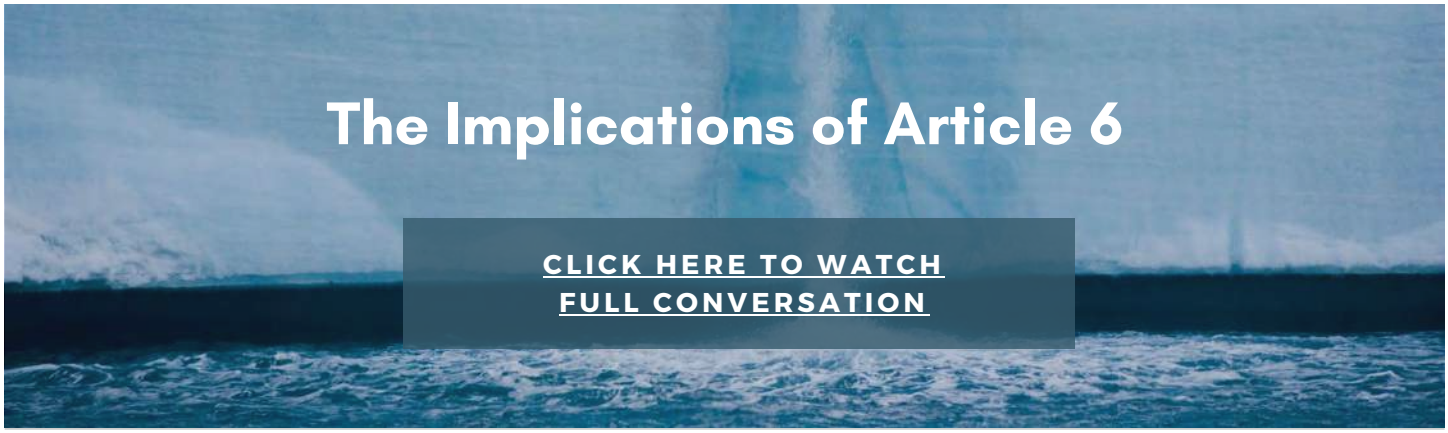
Fragmentation is inevitable. Article 6 is voluntary, so it's up to individual countries. A difference between 6.4 and CDM is that the credits are now generated by the host country where the project takes place. Therefore, without the authorization of the host country, there is no authorized 6.4 unit. Therefore we are dependent on individual countries' policies. The sooner we go through this phase, the better so that every country knows what they are doing and has its systems established.

Marisa Martin:

Each country will use 6.4 and utilize those credits within the country, or they might export them. Therefore, each country will likely have a different approach. The worst would be if a country lets all the credits leave the country and then fail to meet its nationally determined contributions. But, at the same time, we're asking countries to make their NDCs more stringent, and they don't have control over what's going in and out.

Hugh Salway:

Sovereignty is core to the success of Article 6, but it doesn't mean every country has to take a wildly different approach. It's frustrating that there's a rush into the VCM right now, just as we're experiencing so much uncertainty. It would have been nice if negotiators had agreed on these rules a couple of years ago, so we would be at the stage of being settled, with investment flowing in. We need patience at this stage of establishing the platform that will see the VCM scaling up over the next few decades.



Resource Sovereignty: Are Nature-Based Offsets Next?

Featuring: Martin Berg, Climate Asset Management; Natalia Arango, Fondo Accion; Tony Lent, Capital for Climate; Stephanie Russo, Carbon Growth Partners, and Paul Krake (moderator), Climate Transformed

Summary

Paul Krake of Climate Transformed hosts Climate Asset Management's Chief Investment Officer Martin Berg, Natalia Arango from Fondo Accion, Capital for Climate Founder Tony Lent, and Stephanie Russo from Carbon Growth Partners to share their perspective.

What is the role of the nation-state in determining how VCM should operate?

Natalia Arango:

Governments have a vital role in keeping the VCM healthy. They need to set up a stringent regulatory framework and enforce it vigorously. A healthy market promotes business between project owners and landowners of the forests. I am referring to REDD+ projects. There is a solid flow of resources from the private sector to communities and landowners who need the resources to replace the non-sustainable use of forests. I have seen this happen in the last five years in the Colombian market and witnessed how a significant amount of money is going to indigenous communities who are making their own development decisions. They are using carbon revenue to build schools, hospitals, and roads.

What are the developmental benefits as the carbon offset market grows? How are they currently working within the framework?

Martin Berg:

The VCM takes the bottom-up approach. Since it is voluntary, it takes a different approach than what we would see in a compliance market worldwide. There are various players in the voluntary market. Some view this as a gold rush—an opportunity to secure carbon quickly at arguably lower prices.

However, there are corporations with a developmental perspective on this. Since the United Nations Framework Convention on Climate Change (UNFCCC) started looking into how markets could help this problem, we've seen different waves and attitudes under the Kyoto markets. The EU Emissions Trading System (ETS) was a heartless compliance market, and the approach was completely different because of the thoroughly commoditized markets. With the voluntary market that we have now, there is a different approach. Several corporations are not only searching for the cheapest one, but they are also looking at the quality, credibility, and impact, particularly on the local community.

Is there a conflict between global standards and the priorities of individual governments?

Stephanie Russo:

It is more than just the standards. Different drivers and obligations are playing out at different levels. The idea of sovereignty and ownership over natural resources is not new. However, some of the challenges we face are playing out, particularly between top-down and bottom-up approaches, ensuring that economic and social benefits reach the local communities and indigenous people as part of that process. We've seen that play out in other markets.

On top of that layer of ownership of resources, there is another layer on the obligations of different national governments under the UN framework to meet their climate targets. Based on Article 6 of the Paris Agreement, countries have control over these markets and can determine the need to participate. Thus, the command is within the national government. For example, India implemented a moratorium on credit sales into the voluntary carbon market, driven by several factors. One of these factors is their autonomy to formulate their climate targets. Another factor is the financial gain from the leakage of those resources. Indonesia and Papua New Guinea are taking a similar approach as India, while other countries, such as Singapore, explicitly allow voluntary carbon credits to be used within their compliance regime.

We also see a similar approach in Australia. The Asia Pacific countries leveraging the voluntary carbon market infrastructure can sell to Australian companies for their voluntary obligations. Colombia has a national framework and regulation that supports the sale of those credits into the voluntary carbon market. Harmonizing the standards at the global level is a challenge because countries are taking different approaches.

Is there a concern about having large multinationals as buyers of carbon offsets?

Tony Lent:

It is a concern, but if you look at it from a sizeable emitting industry perspective, about 85-90 percent of their investment will be within their value chain, which is a relatively expensive capital cost to transition

"Several corporations are not only searching for the cheapest [credits], but they are also looking at the quality, credibility, and impact, particularly on the local community." – Stephanie Russo

their production practices. Thus, they will look for opportunities to offset about 5-15 percent of their emissions. Other options depend on how the market is structured over time. One of the promising options is to offset in high forested countries in emerging markets. They can offset in their own country, in forests, or other natural assets for carbon removal, but it is more expensive in the West. There is more attention to emerging markets for two reasons: cheaper cost as well as the highest quality for a just transition. Another question is whether voluntary credit fits into their national scheme. Singapore is an interesting example because it shows the potential inclusion of voluntary carbon into the national strategy. Those "quasi-compliance credits" are a fascinating advent in the marketplace. The voluntary market would be healthy if more credits were included in the national systems.
Another issue is double counting and leakage. We are witnessing a rapid development of high-quality registries for voluntary projects. The leakage problem will probably be on the margin at two to three percent, but about 95 to 97 percent of the market is fully trackable.

Given the use of voluntary credits in compliance schemes, is there no such thing as a voluntary market?

Martin Berg:

It is essential to make one correction. If Brazil sells credit to Microsoft, they cannot use it for their compliance. The decision is entirely in Brazil's hands. They can tell Microsoft that the credit is either fully authorized, that is, that they are not using it for our nationally determined contribution (NDC), or they are not allowing it, and then you get the credit which still counts to their NDC.
In the end, there is a possibility that corporations that are not obliged to check for net zero targets will put a specific credit into compliance. Nobody tells large corporations to use a particular credit to claim net zero. They are almost self-regulated, with some taskforce such as the Voluntary Carbon Market Integrity Initiative (VCMI) and the Integrity Council for the Voluntary Carbon Market (ICVCM), which both try to address the problems in the market. However, there is no regulation that tells what type of credits to use now. Everybody should look for authorized credit, but we are not there yet. The million-dollar question for this market is whether there will be an alternative to monetary carbon credits in the future. If that is the case, then we would see a very different market then, but if not, there is a high chance that we would have two markets operating in parallel: a market between governments where they exchange units to help achieve their targets and a market with companies getting unaccounted standalone credits.

What is the Colombian experience in the evolution of voluntary offset markets?

Natalia Arango:

The Colombian experience has been unique, at least in the region. The active Colombian market cannot

a compliance market because voluntary companies can decide to pay the carbon tax or go through offsets and at the same time also allow international transactions. The Colombian market also promoted establishing projects in the fields and facilitated transactions between corporations and project owners. The increase in capital for carbon projects has led to several external expressions of interest, placing the communities at risk of not having an equitable distribution of benefits. The ethnic communities are not prepared for complex transactions. The good thing about Colombia is that we have safeguards in place. There are regulations to protect communities, but the government needs the capacity to implement them.
The Colombian situation is open to new standards and registries, but this can pose a risk because you need to be very cognizant of quality. It has been a fantastic journey where Colombia has been at the forefront of making decisions that allow for deals between communities and corporations. However, the increased attention that we are receiving from several participants also poses risks to the health of the market in Colombia and equitable distribution for the project owners.

What are the pros and cons of REDD+ projects?

Stephanie Russo:

REDD+ projects were not an architecture of the voluntary carbon law. The REDD+ framework was designed to allow local communities to be paid for protecting essential forest assets. Deforestation is driven by financing and providing policy support to protect forest assets at the national and sub-national levels. This is critical framing because one of the challenges emerging here is that finances have been beginning to be channeled into carbon markets. Based on Article 6, there are questions about whether REDD+ projects should exist within that framework and whether carbon credits from REDD+ projects should be eligible to be traded. At the same time, within the voluntary carbon market, we see that avoidance credits and credits from the protection of forest assets are essential and a source of supply. One of the benefits of the REDD+ framework is the ability to start shifting the economics in the drivers of deforestation. Local communities look at their options in the management of their resources, and when there is either an absence of government policy to protect and prevent deforestation, it provides a mechanism to channel finance to fill the gap where the policy doesn't fit. One of the challenges is around the jurisdictional nested REDD+ projects and where forest protection provides a counting mechanism at the national level and meets obligations, climate targets, and NDCs.
Another challenge is on an accounting side, finding where it should fit in terms of forest protection and avoidance, avoiding that loss in their NDCs, and ensuring that money is genuinely being channeled to those communities undertaking that forest protection. The loss of forest assets and deforestation is not just the result of the policy's limitations, but it's also about ensuring that local communities with more limited options in economic development can benefit from those efforts.

Do REDD+ projects hurt developmental goals at the grassroots level?

Natalia Arango:

I see REDD projects as an opportunity to develop these communities. That is what we have been witnessing in the past ten years. What I see is quite the opposite. Carbon markets, especially in the REDD+ space, provide opportunities for developing and actively conserving forests. This is not just for

green carbon but also for blue carbon. Based on the progress that we see in Colombia, it is a game-changer. This does not mean that there are no risks. Civil society and governments must ensure that the carbon market revenue is distributed equitably to project owners.

Is there an automatic disconnect between scale and development?

Martin Berg:

Some corporations that we work with see it that way. If they are going into REDD+, they want to ensure they can at least combine this with administrative activities. Many want to be close to the projects to inspect all the issues that need to be addressed. It goes back to the problem that we don't have one framework for going to net zero. There are industry-led initiatives that assess the quality of carbon credits. Ultimately, the Paris Agreement is structured as a bottom-up agreement. It's an actual experiment for the international community. Everybody comes without targets, which indicates a lack of process and coordination. Still, with the funds from the corporations going into this, then this means that this is still something positive. They feel they are responsible for the absence of governmental regulation and need to do something about it.

What if countries are unwilling to help provide solutions to these global problems? Should we still impose international standards on them?

Tony Lent:

There are two interesting examples. First is the Gabon market. They are releasing 90 million tonnes in a self-regulated system, but they are issuing their tonnes into the voluntary market. They said about 5 percent of the proceeds from those tonnes go into a vehicle that benefits local communities. This is an example of the scale of sovereignty and a linkage to the voluntary market. The other example is the Brazilian president Luiz Inácio Lula da Silva trying to link the Brazilian market, the Indonesian market, and the DRC market into a unified coalition or a unified front similar to G20 regarding how people will pay for carbon. If that happens, that would be a historic shift in the market structure, and we would have to analyze the implications of this.
We should ask what percentage of the profits or investments of high-emitting industries are likely to be invested in non-value chain investments. Then of those investments, what will be allocated to natural stocks and carbon? I'd make an argument that it's even at the maximum amount. It's nowhere near sufficient to address what many people have said are somewhere between the $150-$250 billion forest and conservation finance gap we have every year. As a result, it is not unlikely that we'll see this market develop. It will become a multibillion-dollar market, but it'll still be massively insufficient for infrastructure payments. Voluntary markets provide a massive infrastructure for tracking where carbon is and feeding systems to manage the entire industry, including trading systems, which we don't have in the compliance market. Currently, the voluntary market is establishing the procedures and infrastructure necessary to drive future capital efficiently. It is essentially priming the market now.

"Currently, the voluntary market is establishing the procedures and infrastructure necessary to drive future capital efficiently. It is essentially priming the market now." – Tony Lent

Can we fast-track the protection of nature-based assets?

Stephanie Russo:

One factor often left out of the discussion around climate action and the scale of the market is the time component. We need to accelerate responses and do what we can immediately in terms of climate action rather than wait until no more forests and communities are dependent on those resources. Another is the market divide around no protection or avoidance credits, mainly about nature-based solutions versus removal credits. If we are not protecting our nature-based assets, we are not just deferring the action that will take place in climate change but also not protecting the assets essential to our climate. Another complicating factor is the mitigation hierarchy (a set of guidelines established through the International Finance Corporation's Performance Standard 6, meant to help development projects prepare for impacts and aim to achieve no net loss of biodiversity).

Martin Berg:

Discussions have led to the removal of credits from corporations. If they are not acting in the short term, then on deforestation, we will not be able to achieve our targets. From a commercial perspective, it makes sense to have some avoidance in there because they tend to be early, so you can smoothen out some of that curve that you'll see with the removals. Nature-based solutions are not just readily available; they're cheaper and have one of the longest track records in history. Nature-based solutions are a good option for the next 10-15 years.

Natalia Arango:

Coming from a mega-diverse country, I agree that nature-based solutions are the primary option. It provides opportunities for human development, nature conservation, and carbon sequestration. The scaling issue is a legitimate concern, but I would like to emphasize that it might be a trap to consider that if you have deals between governments and governments or governments and corporations, you are going to reach scaling with the quality needed. We need to promote and ensure that projects are doing their job legitimately because deals between governments and between governments and corporations will not help deforestation at the velocity we need.

Is a hybrid combined VCM compliance market the best way to deal with the mid-term global carbon targets and resource sovereignty in the global south?

Stephanie Russo:

We are seeing the convergence of compliance and voluntary markets. Historically, we have thought about them as largely separate markets, wherein the voluntary carbon market is run by nongovernment organizations and used by companies to meet claims due to shareholder pressure or corporate social responsibility. In contrast, the compliance markets are being purely regulated by the government where mandatory demand exists. This dynamic is starting to change because we are seeing the voluntary carbon market being used to express the difference between the governance arrangements and the kind

"There is expected to be more intersection between voluntary carbon markets, international markets, and domestic markets." – Stephanie Russo

of source demand or who is using those credits. There is expected to be more intersection between voluntary, international, and domestic carbon markets.

Is it inevitable that an individual nation's sovereignty is pushed to one side?

Tony Lent:

I don't think so. It is expected that there will be a coalition of motivated and willing nations working together more quickly in a more forceful way. The literature on tipping points keeps getting more concerning. People will have an improved sense of urgency on this, leading them to action. We are running out of time.

Project Development: The Challenge of Supply

Featuring: Ryan Letourneau, GRAIN Ecosystem; Megan Reilly Cayten, Climate Asset Management; Charles Bedford, Carbon Growth Partners and Rupert Rowling (Moderator), Climate Transformed

Summary

The key area we would like to explore is whether or not the availability of high-quality and transparent supply can keep up with the extraordinary demand for offsets and feed the growth in exchanges and trading platforms in recent years. Issues such as transparency, scientific verification, and, of course, infrastructure costs will also be addressed.
The panel discussed the challenge of carbon credit supply from a supply-side project developer's perspective.

What are the barriers to supply?

Megan Reilly Cayten:

Time and patience. Most emerging nature-based markets exist within developing places, unlike New York City, that lack the tools and skilled human capital to convert them into carbon projects. Additionally, those skills are generally in short supply in global markets, which adds to the struggle.
Furthermore, the market also lacks consistency and transparency about what credit is. We also need more capacity-building practices to help investors understand how the carbon market works. This will ultimately help us improve the carbon credit supply in the market. I realized this when working with a sophisticated Mexican environmental NGO that was recently granted a $200 million endowment. So, we see that large firms such as this one are still struggling to understand how to engage with carbon markets, which proves to be a problem for the supply chain.

Ryan Letourneau:

When I entered the Voluntary Carbon Market space, most of my presumptions about it were from the media. The biggest assumption was that everything was related to liquidity and transparency. So, I assumed that the credits would ultimately be of better quality if there were better transparency.

> ***"A recent study reports that 1 percent of carbon market projects were non-additional. That's a pretty fatal flaw for the market." – Charles Bedford***

However, when I started talking to developers, I learned that the media primarily highlighted the buyer's side problems, not the supplier's.
We have a distinct framework to help describe supply problems. It's a six-step formula used by project developers. First, you must identify an opportunity for land development and check if it's a viable option. Then, you need to check for feasibility and whether your development methodology applies to it. This branches into the third step, which includes finding an expert. This is a challenge because there are not many experts out there. You must then look into offtake and spot agreements and decide which ones to use. Additional facilitations to access capital and resources are also critical to unlocking the market's supply side. The last step includes working through documentation, which includes hiring an expert if you are not one yourself and filing for registration. It is challenging for small project developers like myself to get a response from the larger registries. This can lead to frustration and a decision to quit, which is a huge pain point for developers like me.
This summarises the supply side's struggles but also that investment piece is also remarkably critical.

Charles Bedford:

The complexity of the carbon market project development process is no friend to rapid decarbonization. There's a cookbook with 600 recipes, and each has the same complexity as building an atomic bomb! If you can't get a project standing up in 18 months, especially after getting millions of dollars in funding, that's a massive barrier to entry into the carbon market's supply chain. To a certain extent, it's all self-inflicted because it's a *voluntary* carbon market where we have created standards ourselves after inspiration from Clean Development Mechanism (CDM) and UN projects. It is great that the environmental community, including Greenpeace and Carbon Market Watch, is policing the market. But we have also simultaneously created a systemic scale that is pretty unattainable. As a result, our projects are not high in quality. A recent study reports that 1 percent of carbon market projects were non-additional. That is a pretty fatal flaw for the market. So, how do you get around it and simplify the market entrance process to ensure that people don't have to cut corners to succeed? This includes not having to report exaggerated numbers in, for example, economic additionality or in solar and wind projects. Too much is left to the project developers to build the projects independently. There is also too little oversight happening from the certification bodies.

How do you see these problems solving themselves as the market grows?

Megan Reilly Cayten:

The Voluntary Carbon Market has grown exponentially in the last few years. I bought my first carbon credit in 1999 and found myself on the internet faced with fundamental questions about the value and activity of credits. We have answered some of those questions from 1999, but many are yet to be answered.
The value of a quality land-based credit remained at $5 but in 2020, the market grew by three times in

just one year. There is a huge opportunity and a massive amount of capital to go into the market and search for answers to the aforementioned questions. It would be nice to have all the rules figured out so we could direct the capital easily, but we are still getting there. The VCM is currently a testing ground for other international regulatory markets if you consider the future of Article 6 of the Paris Agreement.
To summarise, there is plenty of capital available, and people are beginning to address prominent questions. They are also developing emerging market carbon development platforms where they're going out trying to secure high-quality projects and bring them to the carbon market. There are also comparatively more people with higher skill sets readily available for work. So there's plenty of activity in the market to help determine a carbon credit's quality and regulate quality for future credits. There's also a sense of urgency about getting this right due to the climate justice cause.
I've also noticed people taking the VCM more seriously than before, which explains the backing through the capital.

Charles Bedford:

We're currently in a supply pinch. The registries have taken most of the renewable energy off the table except for LDCs. That takes 40 percent of carbon market supplies off the table. REDD+ is undergoing a reckoning where people realize the baselines have been overestimated. In reality, the baselines only amount to 40 percent of the credits that will or have been issued. That's another 40 percent of the historic market. If we take half of those credits off the table, we will be left with just 40 percent of the total annual output. So, we will have to move many units, construct many solar platforms in LDCs, and do REDD+ projects at a higher quality standard. As a result, we're looking at a massive supply contraction in the upcoming year. I don't think people will buy the old credits, like the old CDM credits or Gabon/REDD+ type credits. So, we're looking at a dramatic supply constraint. But, we have many experts working towards getting more quality projects into the market, which is a good thing.

Ryan Letourneau:

We're all in agreement that prices are climbing. However, when we speak to forest developers, they talk about wishing the price was higher so they'd have a greater incentive to do carbon projects instead of something else. When we look back at some of the major registries, like Verra, in the past two years, only 70 active and registered project developers are on the platform. That's a remarkably small number of suppliers compared to the supply requirement. Hence, we see that capacity-building is critical.
So, we need to empower project builders, especially those in low-income places or third-world countries, by giving them the tools they need to help measure baselines and build eligibility statements.
At some point, we're going to run out of space for reforestation. So, we must consider things like biochar, direct air capture, and blue carbon. Then we need to empower project developers to act out these projects.

Are big investors like Climate Asset Management looking into removal credit?

Megan Reilly Cayten:

We are interested in nature restoration methods like direct air recapture. We consider removals as

nature restoration and think of avoided credits as conservation. The reason is that we desperately need to conserve the nature we already have and find a way to pay for its maintenance and rebuilding it, or else we won't reach our climate goals by 2050. If we were to deploy all technology in the world to reduce air pollution and meet the Paris Agreement's parts-per-million goals without conserving the nature we already have, we would fail to achieve our goal of a livable planet. So, nature must be the center of this project. Nature-based efforts are the most scalable, sustainable, and affordable projects. They also offer that blend of avoidance and restoration to help smooth out the economic J-curve over time. We're interested in such investments, especially when credits for removals have a higher price.

Ryan Letourneau:

Everyone wants renewable credits, but the supply is remarkably low. Only 4 percent of the market in 2021 was renewable. So, this is a space we're focused on, and we are helping project developers thrive in it.

Charles Bedford:

We see that although credit prices are rising, they still aren't enough to fund the removals. And even if it is, it's usually because the land is a plantation that's earning by "doing its stuff" without being economically additional. There's also volatility around the price. For example, if a carbon developer is considering a 60-year time frame, but prices have fluctuated so much, it is challenging to make business decisions effectively. So, price stability and higher prices would both help encourage project developers to join the market.

Megan Reilly Cayten:

Ecosystems are sustained by both reforestation and deforestation. For example, we have seen a mangrove project where every mangrove they planted counted as removals, and everyone they conserved counted as avoidance. They were simultaneously using these two methodologies in the project. It's difficult to bring such projects to the market because you need to review them twice (because they have two working methodologies) while bringing transparency and granularity to the forefront. Ideally, people will want to work for restorations in mangrove areas where some mangroves already exist and can be preserved to restore the hydrological flows for the whole asset. So, the prices fluctuate so often it's challenging for project developers working in such areas to continue their work.

What is an offtake agreement and how does it work?

Charles Bedford:

We work in Columbia with a project developer from an indigenous background. They're doing an excellent job. However, they weren't aware that three platforms had rated their credits. I have a similar story from an NGO in Peru that doesn't have a specification to do an offtake agreement. So, we had to

hire someone they trusted to walk them through it. We have to explain the concept of earnest money and escrow accounts, which they had not heard of. This capacity is lacking. Unfortunately, intermediaries have taken advantage of many such people over the past ten to fifteen years and now they don't know where to go next.

Megan Reilly Cayten:

We have looked at large investments in countries that don't prioritize off-take agreements and are challenging to operate within. From an institutional capital perspective, one way to get comfortable with that is knowing that there is a governance structure in place to track where the capital is going and how you, as a project developer, will get paid back. If you're exporting the carbon credit to another country or selling in the stock market, you can choose to ride the price wave, which can turn out positively or negatively. Offtake contracts provide certainty to the developer to fund the 18-month-long project, including paying for technical workers. It also clarifies what kind of credits are being delivered under which market conditions. It also plays a role in determining benefit sharing. But if you're talking to people who don't know what escrow agreements are, they might also not understand the price they'll get upfront versus the price they'll get in the stock market in 20 years. This can make them feel like they gave away their rights ahead of time and are now being taken advantage of.

"I think we're starting to see more acknowledgment of the need to bring more south-led representatives into these conversations because we don't want to make the carbon market a north-led resource extraction process." – Megan Reilly Cayten

Are intermediaries another barrier to supply?

Charles Bedford:

There are many market examples of long-term profit-sharing projects, but they aren't publicly available. So we're creating agreements as we go. However, there isn't much capacity around it yet.

Megan Reilly Cayten:

I have seen some efforts around protected areas in the global south seeking to build the capacity to develop a situation where people don't need to rely on intermediaries. One of the challenges associated with indigenous workers is having to pay high prices to intermediaries to help them access global markets. I think we're starting to see more acknowledgment of the need to bring more south-led representatives into these conversations because we don't want to make the carbon market a north-led resource extraction process. Capacity-building can also help you understand what risks you're taking, especially because it's a new market that's rapidly changing. It's also essential to put things into a local language that people understand so they know what they're getting into in the long run.

Charles Bedford:

We're trying to create flexible templates that will be widely available to many people. It is a problem, but it's slowly getting solved. We're trying to build agreements that align without incentives. We're trying to fund costs upfront so that when credits start generating, our investors are not getting the sole windfall, but rather sharing the windfall. We also present minimum price guarantees to project developers. There are many ways to construct such agreements, but it isn't common because people are so used to the prevailing broker-led model.

Given the supply constraints, are you bullish on prices, and if so, on what type of credits?

Ryan Letourneau:

We are bullish on prices, or else there won't be any market growth. However, we aren't as bullish on direct air capture because we expect market prices to decrease.

Megan Reilly Cayten:

Yes, we are bullish on prices. But I'd caveat that by saying we are in this business for the long term, although it's hard to predict future carbon prices. So, while we're bullish on prices, we are also looking at realistic value for the long term while trying to focus on sharing profits with local credit producers.
We currently can look at projects in compliance markets. It is interesting to see how these markets would change, and we conduct scenario analysis on it. I also think the market between now and 2030 will be the most telling in terms of the supply pinch-hitting and prices possibly shooting up.

Charles Bedford:

I'm more bullish on the corporate commitments and seeing if they stick. The commitments were with the market and CSR side of things, but it's now moved to the corporate treasury function. But most of these corporations have commitments on a board level, which makes it harder for self-respecting companies to exit the commitment. Regarding projects, you need to do your due diligence and look at the developer, country, and associated risks. You're ultimately going to end up with a very small list of projects with the right quality to make a strong investment. We're winnowing through all that with the help of ratings agencies and consultants.
It's important to look at the tendency of companies in countries like Papua New Guinea, Congo, or Gabon to say that we've promised them a lot of climate finance in the global north, but it's only coming in the form of loans, and loans aren't of much use to them. So, they're now offering credit issuance, which would typically be beneficial for country-to–country agreements, but is now being pushed into the voluntary carbon market. However, these credits aren't internationally verified. It would help to dramatically increase supply from the REDD+ projects—but we'll see where that goes.

"We're trying to decide if we need two or three standard trade contracts or if we should continue with the thousands of contracts we have that people need to know about in order to comfortably buy credits." – Charles Bedford

On a market scale, how feasible is it for every credit to undergo careful scrutiny?

Charles Bedford:

The market's been debating this for some time. We're deciding if credits are a commodity or a stock, a tangible or intangible token like non-fungible token (NFT). Currently, carbon credits are in the middle of all of these. We're trying to decide if we need two or three standard trade contracts or if we should continue with the thousands of contracts we have that people need to know about in order to comfortably buy credits. People lately are very concerned about credit quality and are keen to examine

How do we feel about many projects entering the market without backing from large registries?

Megan Reilly Cayten:

These projects are smaller in number. However, we can see the Verra and Gold Standard have been around for ages, but they're overburdened. So, we're seeing newer registries, like Puro.earth, which I am not endorsing yet. But it sounds promising and offers longer methodology pages. They're also trying to be more streamlined and focus on a specific credit subset that there is a higher-priced premium market. We are also observing an increased willingness amongst people in the Blue Carbon space to self-publish methodologies and seek buyers accordingly. We have seen an organization willing to buy from such projects and do its own due diligence. They also view large registries as a hindrance to bringing quality supply to the market. I do not think that's coming to scale anytime soon, but it is an interesting development moving toward market democratization.

Closing remarks

Ryan Letourneau:

There are many examples of credits coming to market without a registry involved. This is because of large multinationals like Shopify and Microsoft that deep dive into the quality of the credit as they have the resources to do so.
However, registries help medium to small-scale businesses that can't afford to do the due diligence to purchase standard-backed credits. So, we need to support the registries to help more companies access quality credits.

Moss Earth: Scaling the Amazon

Featuring: Luis Adaime, Moss Earth
and Paul Krake (moderator), Climate Transformed

MOSS

Summary

Climate Transformed hosted Luis Adaime, the CEO of Moss Earth, to talk about preserving the Amazon forests. Luis highlights how technology can combat deforestation and help achieve sustainability.

About Moss Earth

Moss is an organization working on intermediate carbon credits. It aims to use technology to combat the threats faced by Amazon forests. They offer API software to guide companies on carbon offsetting logistics, trade tokenized credits to prevent double counting, and design NFTs to have real-time monitoring of forests. Founded in 2020, Moss Earth is all set to offer advanced solutions to advanced problems of Brazil.

Challenges encountered

We established Moss Earth to address issues in the global ecosystem services, the most prominent being outdatedness. The system is not updated since 1998; it is slow and inefficient. It involves much analogue work, like visiting forests and counting trees manually. This all increases the overall cost and obstructs efficient monitoring.

Proposed solutions

Moss Earth sees digitalization as the only way to grow exponentially. They have an automated system that monitors around 5 million REO properties in Brazilian states. The company can detect the people who lay their claims on indigenous land and filter them out. We also propose downstream solutions by supplying software and funds to the companies working to conserve forests.

Technology integration

By introducing technology, Moss Earth aims to accelerate the carbon offsetting process. We use blockchain to avoid double counting. We also originate both tokenized and traditional carbon credits to meet the needs of everyone instantaneously. We are the only company with tokenized credits (MCO2) listed at centralized exchanges like Coinbase and Gemini.

Achievements

Moss Earth is working on seven projects in the Amazon rainforest, expanding to around 600,000 hectares. The projects are estimated to yield about $16 million of gross profit per year.

Efficient strategy

Moss Earth formulates strategies that can result in cost and time savings. For example,

- Meeting a forest owner, proposing the project, and sending technical experts to do the feasibility study takes around 6-12 months. We save you time and effort by already finding owners with a high carbon inventory.
- We also allow real-time monitoring of the forest through satellite imaging. Thus, reducing the fieldwork.
- The B2B2C API lets companies have software that can help with carbon offset logistics, finances, and other technical impediments.

Benefits

The impacts of Moss Earth have expanded far beyond the environment. Some of the socio-economic benefits include:

- We are affiliated with several organizations, including Banco do Brasil and Gol, to fund social initiatives.
- Each project produces between 50 to 100 jobs for those living below the poverty line.
- Establishing water tanks and filters for rainwater to avoid infant mortality due to drinking impure water.
- Creating Amazon land non-fungible tokens (NFTs) that offer ownership, real-time monitoring, and protection from Moss Earth.

Incentivising reforestation

Breaking the rationale behind deforestation is essential. With an average hectare costing around $100, it is easier for the owner to buy land, burn out the trees, and resale the land for about $500 to farming interests. But, if the cost of a hectare is increased to $1000, soybeans and cattle farming are less profitable, making conservation and carbon credits the only viable option.
The Amazon forest can be conserved by making reforestation profitable through financing and crowdfunding.

Brazil: The Saudi Arabia of carbon credits

Mckinsey has forecasted that NBS (Nature Based Solutions) will provide for 65–85 percent of the future volume of carbon credits. Given this point, Brazil, with its most extensive forests, is the country to invest in to get carbon credits. But around 1 million hectares of Amazon forest are burned every year. To avoid this, we need to limit burning forests, as fossil fuels are not an issue for us, given that 70 percent of our energy is generated through renewable sources.

What are the returns on investing in Amazon forests?

Mathematically, if 50,000 hectares of land are bought, it will generate about $100 per hectare yearly. This makes $5 million of revenue per year for 30 years straight. In the beginning, you have to pay the certification cost, and you will start receiving the returns in 12 months.

Why aren't big investors like Norges Bank or Yale University taking an interest in Brazil?

Well, it's beginning, but it will take time. Carbon Streaming, a Canadian company, recently invested $3 million in Amazon rainforests. Opportunities aren't flowing out of Brazil because of the risk perception of Brazil and its government. Since they are notorious for being anti-conservative, investors try to avoid investing much in Brazil. But I think, once we get validation from local investors and they start cutting big cheques for us, international organizations like World Bank or International Finance Corporation (IFC) will eventually start investing here.

How much investment is required to protect the forests?

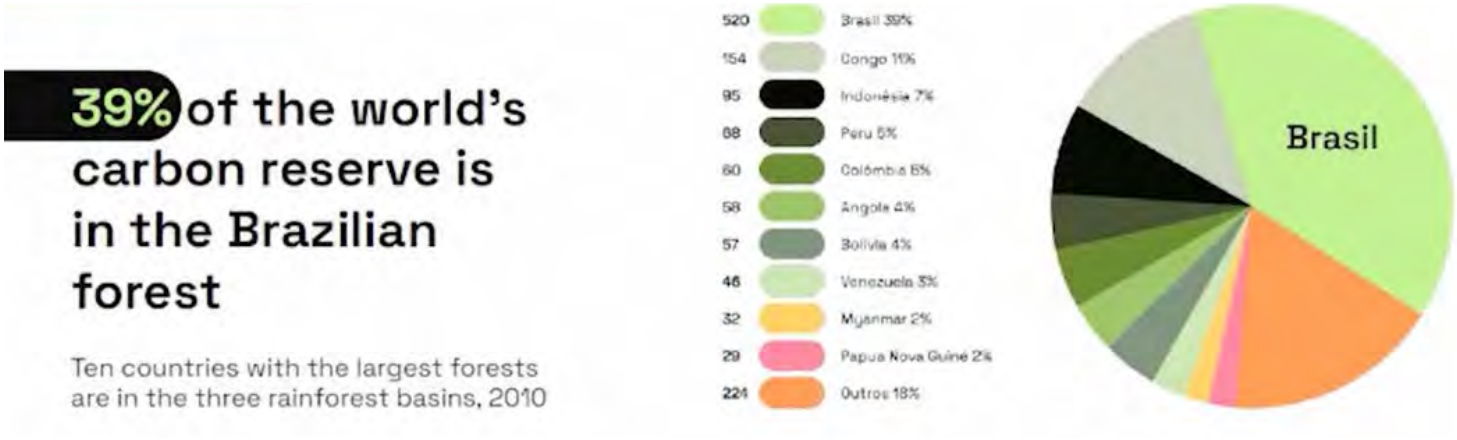
The Amazon forest in Brazil spreads over around 600 million hectares. But we don't need to protect the central part, and it's protected by nature. We need to protect the vulnerable part, i.e., the borders. Now the borders are between 20 to 50 million hectares, that's only 3-4 percent of the Amazon. If we build some green walls and carbon credit projects there, we can protect the entire 600 million hectares. More interestingly, protecting this much requires only 1 percent of our GDP or 0.02 percent of the global GDP.

How do you plan to combat deforestation?

By making it uneconomic for the people to burn forests for cattle farming or producing soybeans. At, let's say $1000 per hectare, they become uneconomic. The government is also putting forward capital for forests via the development bank. For example, the development bank held a $2 million initial carbon credit auction, they later raised it to $20 million, and the cost is still increasing. But that's not enough as we have already lost 30% of rainforests in the past 40 years. Nonetheless, carbon credit pricing has boomed, and the farmers are convinced that it's profitable.

Why blockchain and large investors only?

We do transactions in traditional credits as well. But blockchain is suitable for faster registration and



Source: taken from Moss Earth's presentation at Voluntary Carbon Markets – A Gold Rush.

transparency. Secondly, Moss Earth needs big investors to collect the estimated $100 million in funds. However, individuals can also participate through crowdfunding.

Are satellite imaging and technology speeding up the process?

We still depend on third parties like registries and auditors because it's a part of the public consultation process. But it's not like the process hasn't sped up. There are various innovations—we negotiate with the owners, conduct feasibility tests, and do forest inventory to save time. We can now digitally prove forest conservation. Moreover, with reduced fieldwork, we have reduced the cost and timing. Once big parties like Microsoft validate us, the process will further speed up.

Is there a way to self-verify your project?

You cannot verify the credits by yourself; that would be pro-governance in general. But you can digitize. There are digital structures where scientists around the globe form communities to peer-review methodologies. The individuals can get to provide services at such institutions. They can go digital in that way.

Do you think the quality of projects is improved after being backed by international corporates? Does this imply that lower-quality developers are being pushed out?

Yes, I think so. The corporates have strategic M&As supplied by large companies. Shell, for example, invested in a Brazilian company called CarbonX. The way how corporates help improve governance and quality is by making sure the companies are compliant with good governance principles. And as these companies grow, the inefficient and manual developers are being crowded out. But, that being said, there are very few players to confront the gigantic challenge in Brazil. There are around 5–6 companies, including Moss Earth. In contrast, what we need is around 15 to 20 investors. Nonetheless, in Brazil, you cannot acquire land without having local knowledge. Large corporates can offer financial support, but you need local players to deal with the uncertainty of the property deals.

What about Amazon land ownership issues? How can you avoid multiple claims?

The land ownership of Amazon forests is as follows: 50 percent of the government, 25 percent of indigenous people, and 25 percent of large owners. This implies that 50 percent of the land is owned by the government and 50 percent by the public. As for the indigenous people, it is an unfortunate situation. The Brazilian government holds some historical prejudice against them, and frequently, the indigenous people don't have any title to the land. Plus, the miners, farmers, and others frequently invade indigenous lands illegally. This all makes creating projects with the indigenous people challenging.
To meet these challenges, we have collected all federal databases in Brazil. Out of 5 million properties, we have filtered out 661,000 that don't overlap with national reserves or indigenous lands. With real-time monitoring, we have mapped out all the areas in Brazil that have the potential to generate carbon credits from avoided deforestation. I would say the technology is here; let's use it.

Illegal logging is one big threat to Amazon. What other threats do you see?

If you use Google satellite mapping to locate the Brazilian part of Amazon, you will find a wide span of area shaded in light green. Now, if you zoom in, you will see that it's not illegal logging but agriculture or grazing farmlands. So, though illegal logging is a threat, the two biggest threats to Amazon are:

- Soybean farms
- Cattle grazing farms

They are burning the Amazon through illegal logging. If you drive to any of the projects there, you will find clouds of smoke. This indicates that people are burning forests to plant soy or breed cattle, which grants them more significant returns. And unfortunately, large and small farmers are involved in this activity, which is spreading rapidly.

Most of your projects are REDD+ projects. How can we bring improvements to the baseline issue?

REDD+ is the best possible solution on the ground that we have. Though the issue of baseline calculation is justified, I think technology will soon bring the required precision to it. Satellite images, for example, can improve baselines. Also, the jurisdiction of the baseline will lead to conservative baselines. But to criticize REDD+ without offering a better alternative serves nothing but counterproductiveness.

Is Blockchain Essential for VCM Transparency? (Americas Focused)

Featuring: Corinne Boone, AirCarbon; Phil Fogel, Flowcarbon; Hayley Moller, Thallo; Alexsandra Guerra, Nori and Robert Schmitt (moderator), Toucan Protocol

Summary

The panel discussed the use and importance of blockchain technology in the Voluntary Carbon Market. The speakers talked about using Blockchain to democratize carbon offsets, the exponential growth in the number of vendors, and whether Blockchain plays a credible mission-oriented role in accelerating change towards decarbonising supply chains.

The Value Proposition of Using Blockchain Technology in VCM

Phil Fogel:

Blockchain technology is essential for scaling the VCM in the following ways:

- It opens access to buying and offsetting carbon credits to a larger group of people who currently do not have access to the market.
- Blockchain technology allows people to build additional use cases for carbon credits into blockchain and Web3. It allows users to access the market and help scale it by eventually funneling the money directly back to projects on the ground involving carbon sequestration and carbon avoidance.
- It provides price transparency and price discovery. Right now, the VCM suffers from the inability to determine prices in real-time. By bringing carbon credits on the blockchain, allowing them to be bundled with similar kinds of carbon credits, and then trading them in a deep liquid market, pricing becomes transparent.
- You can view all the data transparently about carbon credits, such as their creation, buyer information, information about who will be retiring them, and the projects that will be using those credits.

Hayley Moller:

Blockchain technology offers efficiency in carbon trading. The current carbon market is extremely fragmented. Many intermediaries capture value in the middle of the chain, project developers get less value from their projects, and the buyers have to pay the premium. Blockchain technology will help cut out these intermediaries. This technology helps build trust due to the transparency it provides, and the transactions happen much faster than the current procedures. Once you have tokenized a carbon credit, you can essentially add additional features to that carbon credit by tagging it with different information. So, when the credit has been issued, you can figure out whether or not it meets the core carbon principles that the ICVCM has put forward. You can also add a royalty for the secondary carbon credit trades that go back to the additional project developers so they can participate in the secondary market.

How blockchain solves the quality question?

Corinne Boone:

Blockchain allows us to connect seamlessly with all the registries when it is used for the right purpose. When we tokenize the carbon credits, they never leave the registries until retired. When physically delivered, the credits go to someone else's account on the registry. Registries have a whole credit documentation process, validation, verification, monitoring, and issuance. They provide trust to buyers and sellers regarding the carbon credits being real, verifiable, unique, and meeting all the criteria of the core principles of ICVCM. Blockchain allows buyers to identify the untradable credits that do not meet the criteria of ICVCM. It helps you follow the history of the credits and enables trade in a much faster way. To be taken seriously, we must ensure that every trade is clear, transparent, and real. Blockchain supports all of these elements.

Phil Fogel:

We can tag these credits with a tremendous amount of metadata. Quality standards come from a lot of different places. All the quality metrics can be tagged with the credits. Credits can be bundled together based on those quality metrics. Over time, when we create this transparency and accessibility in the market, the market will determine the quality based on the price. We will see a price difference in the higher and lower quality credits.

What is the market likely to look like in three years and beyond? How do you see blockchain scaling the VCM?

Alexsandra Guerra:

We have already seen an increased awareness of carbon trading in the past five years. We will have a fully robust system in the next three. We need to familiarise people with the carbon market, and blockchain technology will give everyone access to credits. So, people need to be aware when making buying decisions. Nori is developing a vertically integrated marketplace. As an alternative to those registries, we develop the methodology, share credits transparently, and get feedback on it periodically. We create a supply of a non-fungible asset of carbon credits that can be traded or resold. As soon as they

are purchased, they are immediately retired. The idea is to get as much funding for the project developers. We have created a marketplace at Nori, now we will be launching a price discovery mechanism. This technology will give us the ability to develop price discovery on carbon. Blockchain provides everyone with a tool that can be used creatively to make carbon registries and carbon markets the best possible way.

Corinne Boone:

The credits need to stay true to the purpose of their creation which is to combat climate change. So, they must stay in the registries. Creating a token, selling it, and taking it off the registry is not useful. This issue has held back the market from tokenization because of the questions about what these tokens are used for. At AirCarbon, we do Permission Tokenization, and the carbon credits never leave the registries. So, there is always traceability through the blockchain regarding their position and use. Taking credits off the registries will create a sense of mistrust. We can all work towards the future of tokenization in the best way possible.

Hayley Moller:

There is a need for information such as Know Your Customer (KYC), focusing on who is buying the credits. We need to know the names of the companies attached to the retirement of the credits. The entire lifecycle of the credits, from their creation to their purchase, use, and retirement, will be transparently traceable. We don't want entities that are completely anonymous. We can program and build into our contract that once tokenized credits are purchased, they get immediately retired. People in the VCM need to be thoughtful regarding creating checks and balances throughout the lifecycle of carbon credits to maintain integrity.

Phil Fogel:

The average life of a carbon credit is six years before it is retired because there is a supply and demand mismatch. The investor class wants to access the asset class. Allowing more people to access the market will cause more carbon removal because the money will flow back to the projects. As more projects get done, this will enable us to meet net-zero targets.

How can we bring more people into using blockchain technology in the VCM?

Corinne Boone:

We need to educate the registries and the people in the VCM space that we will be using blockchain only to address the existing issues around carbon credits. We are doing so to reverse the climate change that we have created.

Alexsandra Guerra:

We can work together with investors and corporates to figure out the solutions for climate change. We can use evolving technologies like blockchain to combat climate crises rather than blaming each other for destroying the climate. This way, we can find more creative ways to achieve net-zero targets.

"The credits need to stay true to the purpose of their creation which is to combat climate change." – Corinne Boone

What is the risk associated with not using blockchain technology?

Hayley Moller:

The biggest challenge in the VCM is fragmentation. By moving something on the chain in a way that may not align with everybody and the registries who have been institutional players, we risk further fragmentation. To solve that, we need to collaborate and quickly learn about blockchain. In the past years, people used to deny climate change because of a lack of awareness. We need to work with the corporations and the people in VCM on integrating blockchain into the market while maintaining the integrity of the credits because we can not argue over its usefulness in the next five years as carbon dioxide levels are rising quickly.

How does blockchain help the accessibility of carbon credits?

Phil Fogel:

We are all trying to avoid fragmentation. The assets built on the public blockchain become usable in other protocols. The credits on the chain can be used in one ecosystem and can move across that ecosystem. The idea is that liquidity will develop over time in various places. We want to build a system in a protocol that allows that access to that liquidity from anywhere. All the credits created, especially from the Web3 issuers of credits, are accessible to everyone on-chain and off-chain.

Is the controversy around the energy use of blockchain now over?

Phil Fogel:

The "proof of stake" in comparison to "proof of work" is a consensus mechanism blockchain uses to secure the chain with the number of transactions and keep the ledger secure. In a “proof of work” system, we use powerful specialized mining equipment and energy-intensive computers that perform the computation to devise a solution that secures the blockchain.
In a "proof of stake" environment, instead of using proof for computation, we just run a server and secure it with money because if someone is caught cheating, they lose their stake. Proof of stake blockchains are very energy efficient.

The role of the existing standards and registries in the new market from the blockchain perspective?

Corinne Boone:

Blockchain helps us enhance the speed of the process, enhances efficiency, and enables us to link with the registry, allowing us to find the data with a click. Registries promote good projects; they give product developers directions and accountability on ensuring that their projects are viable and lead to real emission reduction.

"If we create awareness around carbon credits, we can help buyers make decisions regarding purchasing credits." – Alexsandra Guerra

Registries give confidence to the regulators regarding the offsets associated with the credits being monitored by a third party. Blockchain provides credible information that goes along with all the project documentation across registries. This is an efficient approach that will lead to a truer market. The financial markets are heavily regulated. If we want to be treated like any other market and have a highly commoditized carbon market, then we need to be efficient and effective. Considering all the checks and balances and the registry standards will give the investors confidence and lead toward developing trustworthy projects.

Phil Fogel:

Standards and registries apply a framework policy to a set of data given to them by a validator. This is another good use case for blockchain to strengthen the claim and the ability of the standards to issue high-quality credits that meet the goal of what the credit actually is. The regulation we have comes down from the U.S. Securities and Exchange Commission. It is around reporting, which means you have to be transparent about the basis of your claim while making an offsetting claim. Blockchain gives this ability for free as we don't have to build any new reporting tools. Additionally, if we are retiring carbon credits on the chain and making it public, everyone can see it. That will further help build quality indicators in the market. Reputable companies carefully choose carbon credits for them; you can view the carbon credits they use and purchase with confidence. Some of the standards today have been around for a decade, and they have done an important job in building a reputation and trust in the market. New standards can emerge, creating even greater credibility. As a community, we are collaborating to form more credible standards.

Alexsandra Guerra:

For the framework, registries are some types of standards, but they are not the ultimate solutions. Five years ago, we created registries at Nori that were pretty slow. We were focused on carbon removal because, at that time, 95 percent of the reductions came from avoidance, and only 5 percent of the reductions came from removal. We have created our own alternative to the registries but in the same framework where we looked at what other registries have done. At Nori, we work with our partners with models and tools to ensure all projects are consistently quantified with the data. Everyone should have a clear framework that does not necessarily have to be those registries existing today. If we create awareness around carbon credits, we can help buyers make decisions regarding purchasing credits.

Hayley Moller:

The market has to scale at least 15 times by 2030. Removals, in particular, need to scale. More standards are required to reach that scale. For now, the new technical methodologies around carbon credits don't have standards yet. The question is how to ensure the standards have integrity and credibility when everyone has a different definition of quality. The teams buying carbon credits are getting smarter. At

the same time, there are only a few people with enough expertise to discern what quality means. We need to work collaboratively to define standards in a transparent fashion. We will see many changes regarding developing standards in the coming year.

What role can blockchain and on-chain carbon play in helping to accelerate the scale of carbon removal from where it is now to where it needs to be?

Hayley Moller:

Financing is one of the major bottlenecks. We talk to the project developers daily regarding their challenges, and they identify the long timelines for project approval, lack of standards, and not getting early financing. Many of the removals are capital intensive and getting early finance is important for the new project developers in this space who do not have much experience building new technologies. Blockchain can help with this in a few ways, as many investors in the blockchain space have a higher risk appetite than traditional investors. So, they may be more willing to invest earlier in projects

Corinne Boone:

One hundred thirty billion dollars are ready to be invested in good projects, so, in my view, financing is not an issue.

Phil Fogel:

We launched a pilot project intended to help forward financing. We took a forward contract and put that into a structured product. The intention is to scale it to get a lot of forward contracts, put them into a pool and start tranching them. This way, we can give different investors different risk appetites or different parts of the investments. By doing this on-chain, you create a system that tokenizes available carbon on-chain, and you can deliver carbon credit back into new products in which companies can invest money and get a stream of carbon credits delivered back to them over their lifecycle.
There is plenty of capital waiting for projects and a systematic investing method. Right now, we lack standardization and hope blockchain will solve this issue.

Alexsandra Guerra:

Financial additionality is something people hold to. Financial additionality entails the provision of financing that is not readily available from the commercial market at reasonable terms. We must reward everyone involved in removing carbon to encourage others to do so.

Is Blockchain Essential for VCM Transparency? (Asia/EU Focused)

Featuring: Charlie Pool, Toucan Protocol; Christopher Mbanefo, Oxi-Zen; Guy Dickinson, BetaCarbon; Hum Wei Mei, AirCarbon Exchange and Stian Reklev (moderator), Carbon Pulse

Summary

This discussion covered using blockchain to democratize carbon offsets, the exponential growth in the number of vendors, and whether blockchain plays a credible mission-oriented role in accelerating change towards decarbonising supply chains.

What flaws in the VCM does blockchain address?

Hum Wei Mei:

At AirCarbon Exchange, we think of credits as electronic warehouse receipts. We have carbon credits and issue tokens against them, which are receipts that carry a lot of details on these carbon credits. So we trade these tokens on our exchange at high velocity. They are frictionless and highly transparent as we can track who is buying them, what is being purchased, and who has possession of them. Blockchain facilities address many problems in the carbon markets, including transparency, avoiding double selling carbon credits, and avoiding disputes over the nature of the carbon credits—for example, whether they have the certifications that were represented at the point of sale. Many over-the-counter (OTC) transactions can move to an exchange-traded basis which is easier for many end users. Blockchain can be linked back to the specific project so that profits from selling credits can be returned to the communities that created these carbon credits in the first place, effectively moving upstream or downstream of these projects that generate carbon credits.

Blockchain is essential for the future of the carbon markets because the current dichotomy between compliance and voluntary markets is a bit artificial. Therefore, blockchain will become necessary to scale up the carbon markets. Many countries have different approaches to the Paris Agreement's Article 6.2 and 6.4, with some trading carbon credits on a bilateral basis. Still, they are also engaging with VCM status, and we need a way of linking these two systems, and blockchain can do that.

"The downside is that crypto has become mistakenly identified with blockchain. Education is required to separate the two. Market performance over the last quarter has not helped. We've seen fear and misunderstanding around blockchain." – BreeAnne Yek

Chris Mbanefo:

We were going to set up an airline in Geneva with a double CO2 offset as a unique selling point, and our aim was to create a future business model for the coming of non-fossil airline fuels. As an emitter, they went looking for carbon credits seeking a carbon credit product that would let them know where each ton is offset and how the funds are used. We didn't find these, so we decided to create a product to fulfill these transparency requirements. The key questions were:

- Is there a metric to measure carbon sequestration?
- What technology would be ideal?
- Who are the players needed?

We identified blockchain as the technology that would provide the transparency needed. We worked with the global science network to explore a single metric and develop carbon credits that link to our investors' ESGs. We are here to provide accountability between carbon emissions and carbon sequestration, which is lacking in the current market, which means that it is missing the point and failing to deliver on the desired impact.

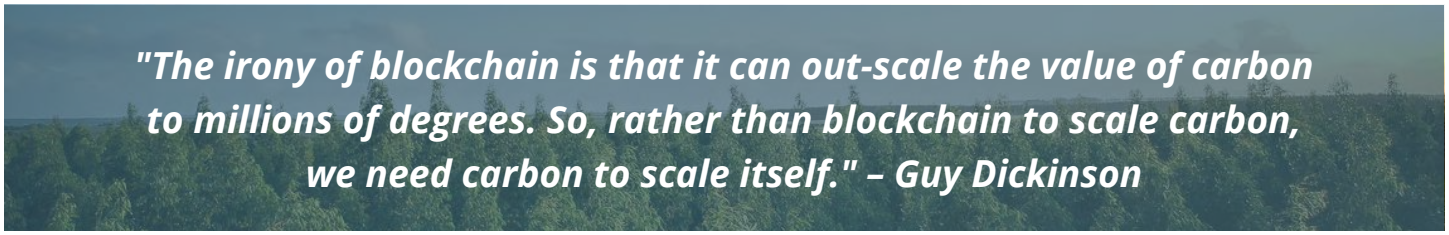
What are the benefits and risks of tokenizing carbon credits?

BreeAnne Yek:

CarbOn.fi is centered on hardware that deals with recycling plastic waste. It was not initially focused on blockchain, but then we encountered challenges in finding liquidity for projects and transparency, and we wondered why it is so difficult to justify what is clearly of value to the planet. While trying to answer the liquidity question, we mapped out how the value and supply chains work. We discovered that blockchain seems to be an effective tool that lends itself to the transparency of actions and creates the basis on which people and projects can become interoperable. Blockchain lends itself to scale and transparency. We look at what energy we consume while running a business and see that blockchain is constantly reinventing itself to get better. Humans consume the same amount of energy, but computer systems can be optimized to run processes more efficiently—with sustainability as the outcome. This becomes a feature of the solution that you build.

The downside is that crypto has become mistakenly identified with blockchain. Education is required to separate the two. Furthermore, market performance over the last quarter has not helped. We've seen fear and misunderstanding around blockchain.

Blockchain is a tool, a digital platform, and the people and systems must change to bring true innovation. Some flaws and gaps need to be identified to achieve what we hope blockchain will fulfill for the VCM.



Guy Dickinson:

In Australia, we had 60 people passing carbon credits amongst themselves, which was quite convenient for them. However, the price stayed stagnant without any demand. Therefore, we wanted to open up the market. Even for the non-compliance market, the barriers to entry are significant: six to eight months OTC, onboarding, and the minimum transaction size is half a million dollars. VCM in Australia is a financial product, making it difficult from a legal perspective. Crypto rules in Australia allowed me to devise a solution for distributing carbon units in a slightly different fashion. Hence, it is not a digital twin, but the carbon backs the token 100 percent as a fair price representation.

We're not trying to drive up the price of carbon. The irony of blockchain is that it can out scale the value of carbon to millions of degrees. So, rather than blockchain to scale carbon, we need carbon to scale itself.

The market in Australia will need to grow by about 25 times to do what it needs to do under climate commitments. The key is ensuring the money goes to projects that matter to the investors, bringing choice and transparency back in. This asset class is not cheap in Australia, so we broke it up into smaller units to ensure that individuals could get involved as investors through a micro-investing process or merchant application. So, we are trying to make it available to the unrepresented 98 percent of people who are the most willing to start the journey.

Verra has stated they won't allow blockchain companies to tokenize retired carbon credits on their registry. Why did Toucan start with retired carbon credits and how do you plan to make it work going forward?

Charlie Pool:

At the time, Verra issued 70 percent of carbon credits, so the original Toucan team wanted to create a minimum viable product that linked to Verra registered carbon credits. This had enormous early uptake over three months as people started to realize that this was a possibility as it tapped into a demand that wasn't previously available—which could be described as crypto-rich demand.

At Toucan, we don't tokenize, but we provide the software so that other people can. Project developers, aggregators, and traders were engaging and tokenizing carbon credits. An organization called KlimaDAO created an incentive structure to state carbon, use it as an asset and hold it in a treasury, which provides the means for the Web3 demand to buy and hold carbon. The point of the carbon is for it to be retired, so it is eventually worth zero. Unfortunately, however, the demand began to fizzle out at the beginning of this year. Then in February, the Russian invasion of Ukraine was a macroeconomic trigger for commodities and crypto markets to fall, leading to downward pressure on the price of tokenized carbon.

After that, we had the Verra announcement: they have blocked previously tokenized carbon, which is now around 26 million tons and is being used by a whole load of different protocols.
We speak to Verra weekly, if not daily, and they say that there is a period of consultation as to how we can bring carbon on-chain in a tokenized form but more robustly than how KlimaDAO was launched and do it properly this time. Blockchain is a superior technology. Using blockchain is like transitioning from CDs to cassettes—some people continue to hold on to their cassettes because their car has a cassette player. A lot of the infrastructure isn't there yet, but the vision is, and the infrastructure will follow; it is just a matter of time until it does.

Hum Wei Mei:

Although our interface allows you to retire carbon credits, the credit is not technically retired. At Air Carbon Exchange, there are no retired carbon credits. Instead, the tokenized credits are a receipt of the actual carbon credit that remains unretired with Verra or Gold Standard. Investors can request that the actual carbon credit be transferred to another account or be applied to something else.

Will the Verra blockchain consultation process help to get the VCM back on track?

BreeAnne Yek:

I don't think the VCM was on track. I think the consultation process is a catalyst for change.

Christopher Mbanefo:

To achieve transparency, every ton of carbon that has been scientifically verified as sequestered is a token, immutable, to geolocation: who that person is and what that project is about. It can only be redeemed once, linked to a particular project, or product batch, so anyone can now see the link between the two. That is required, but it remains to be seen whether the market will provide that.
We want clients to scan a QR code on any product to see what carbon was involved and whether and where it was balanced. The technology to arrive at that vision is blockchain. Blockchain technology is improving efficiency to avoid blockchain transactions costing more carbon than they save.

Verra wants to introduce know-your-customer (KYC) regulations. How would this affect blockchain use, especially for smaller investors and individuals?

BreeAnne Yek:

KYC was going to be part of the accountability for us to be able to transfer and retire credits, especially if you want to claim the tech benefit. If you're on VCM, it's even more critical to demonstrate the benefit of what you're doing to shareholders. The KYC function is about honing the use of what you're doing and proving that to investors. This is essential to Web3, blockchain, or legacy corporations. We want to return liquidity to the originators of these projects and accelerate new projects. We have the expertise and technology to adopt practices that determine what practices genuinely contribute to this. The open consultation is a move in the right direction.

Guy Dickinson:

The Australian market is a hybrid, voluntary, real credit, not an allowance, so it looks like the Verified Carbon Unit (VCU) market. There are specific regulatory requirements that affect how credits are retired. Around 200 companies are about to enter the market, adding to the five or six that exist today.
In exchange, we issue tokens similar to AirCarbon.
It is essential to make it available to everybody, so if Verra requires KYC, it is just something that we move on with. Will the diehard Web3 people say it's not going to work? Of course, they will, because as much as we've got the market incumbency trying to protect it, we've got the other side trying to through it wide open. We'll end up with digital assets that look like the dashboard we see today in the traditional financial markets. The important thing is that everyone here is trying to drive value back to the projects and that, in principle, at least it would be a success for everyone here if we all get put out of business—if it's so successful that we've changed the way we emit, then we've all won. Blockchain would allow the data to come to the fore, so the carbon market is not just a marketing battle between projects trying to get double value through marketing and carbon investment.

South Korea accessed retired UN registry credits and reissued them on the domestic market as Korean offset credits—is that a problem?

Charlie Pool:

It is not a case of legitimacy, but a case of the credits being moved elsewhere. The on-chain credit shows the status of the actual credit, including if it was retired.

Wei Mei:

The cancellation brings Certified Emission Reductions (CERs) into the Korean scheme. They are brought into Verra or Gold Standard by a similar approach—I guess it is a question of who got to do that.

How big is the tokenized market likely to be?

Hum Wei Mei:

It will be as big as the oil markets, if not bigger. So we're entering a world where we need to offset our footprint, with the compliance and voluntary markets coming together. At some point, we need a level playing field for a global carbon price, but in the meantime, we might have something like carbon clubs, and we have to deal with fragmented carbon markets. We are moving in the right direction: KYC, Anti-Money Laundering (AML) are helping reduce problems we've seen in the past. We think things are going in the right direction in consultations with Verra, Gold Standard, and American Carbon Registry (ACR).

if digital After Repair Value (ARV) becomes more common and robust, can we look forward to a future where on-chain credits are upstream from registries rather than downstream?

Charlie Pool:

Yes, we probably can, with a type of tokenized credit that has gone through traditional standards and a purely digital credit for the decentralized finance (Defi) world that will be directly issued by projects bypassing the whole system.

Toucan: The Backbone of Carbon Tokenization

Featuring: Julian Sommer, Toucan
and Vandana Sebastian (moderator), S&P Platts

Summary

The Toucan Protocol is the backbone for over 100 blockchain firms striving to bring efficiency to carbon markets. During this session, Julian Sommer, CEO and founder of Toucan, sat down with Vandana Sebastian of S&P Platts to discuss how Web3 can revolutionize offsets from both a demand and supply perspective. Toucan is on a mission to make Defi work for the Earth.

About Toucan

Toucan enables the trading of tokenized credits and the application of web3 solutions to the Voluntary Carbon Market (VCM). They tokenize carbon for integrity and scale. Toucan's infrastructure brings programmable carbon to Web3, unlocking its potential for a regenerative economy. The current carbon markets are fragmented, opaque, inefficient, and lacking access. Toucan builds tools to bring carbon markets on the blockchain.

Toucan's solutions to improve the VCM

We have several modules that start with the Toucan bridge that brings credits from the traditional registries on the chain into an on-chain registry (meta-registry). This will hopefully connect with different carbon standards over time and enable carbon to go through a layer of blockchain that we call "layer one" so that the carbon can flow freely across the on-chain carbon market. The core of our infrastructure is Reference Tokens (TCO2)—the one-to-one representation of credit in the registry with all the attributes to recognize and filter them.
We also enable pooling. Users can generate carbon pools, which bundle multiple project-specific tokens into liquid carbon index tokens, enabling price discovery for different classes of carbon assets. This core infrastructure piece allows transparency, instant trade, and liquidity in the market.

"Web3 is a pathway to market scale because it enables smart contracts, reduces barriers to entry, and has a developer-friendly infrastructure."
– Julian Sommer

Why Toucan believes that Web3 can help scale carbon markets

By design, blockchain provides high-integrity accounting as it is immutable. It also prevents double counting and provides intangible assets that are carbon credits. Web3 is based on open source and richer data that travels with the credit. It allows common data standards across credits and reduces barriers to innovation. It enables transparency and traceable transactions. Furthermore, it enables programmable carbon, which allows potential automation of retirements and opens new opportunities for a regenerative and distributive economic system. Web3 helps unlock new sources of capital and demand, reducing barriers to market participation and allowing carbon offsetting across Web3 projects. Web3 is a pathway to market scale because it enables smart contracts, reduces barriers to entry, and has a developer-friendly infrastructure.

Toucan's building blocks for on-chain carbon markets

We have different standards: Carbon Standard 1, Carbon Standard 2, and Carbon Standard 3. Toucan's building blocks contain various bridges to connect particular standards. At the core, we have an Accessible Climate Registry with a reference carbon token associated with any type of retirement. There is an additional data storage to store information about credits. Then, there are Application Programming Interfaces (APIs) and Software Development Kits (SDKs) which are the communication tools between Web3 apps and Web2 apps so that they can interact with this infrastructure, TCO2, or pool tokens.

Toucan's products

Toucan has released two carbon tokens named Base Carbon Tonne (BCT) and Nature Carbon Tonne (NCT), which are verifiably linked to real carbon credits. BCT is very permissive. On the other hand, the NCT is restrictive regarding what type of credits could go in, what criteria need to be met, and whether the criteria are updated or moving with time.

Carbon credits created to date V1

These credits have been created with architecture and by Toucan alone. Therefore, we consider them a safe solution based on a method that is a transfer of registry from a standard registry to an on-chain registry. When the credits come to the Toucan tokenization platform, they are still alive. They then retire throughout the tokenization process. KYC happens within the central registry for all the account holders that have been able to bridge. Once these tokens are on-chain, they can be used for different functions such as pool/ transfer and integration into various applications, or they can be retired and used for certain types of claims.

IETA's token design proposal

Verra is the primary registry from where we tokenize our credits. Verra has banned tokenizing retired credits as it confuses the market. This aligns with what we are discussing with Verra. We are planning a more integrated architecture which is an outcome of the process we are going through with the International Emissions Trading Association (IETA). IETA's framework is emerging in terms of classification and nomenclature. We see two different approaches; one is classified as Native Tokenization, in which standards issue tokens, and the other is Reference Tokenization, in which a third party approved by a standard issues tokens. Both these classifications have two further approaches; a direct approach in which the environmental attributes sit with the token and a secured approach which means the traditional credits move into a vault. All of this can be pooled into a Pooled Token.

How we will create our carbon tokens (V2) two-way bridge by standard and Toucan

Once we work with the standards towards a two-way bridge, it will benefit the overall infrastructure market because it helps the lock-in effect once we bridge credit. So, it will reduce the barrier so people can bring higher quality credits on chain, and with less hesitation. The market and the pricing in that scenario will also come closer together, and any user will have more flexibility. The standard registry will have three states of live and retired credits. KYC will be associated with tokenization. Therefore, we recommend omitting KYC done by the registries with information related to tokenization. That means the wallet addresses will have a fixed link with the central registry account. When on-chain, we recommend the pooling and transfer integration not be restricted by further KYC. We realize the value in having KYC for retirement, use, consumption, and on claim-making to see who makes the private claim and what footprints we would be verifying. We will be preventing double use and the double issuance of the credits.

Toucan's position in the on-chain market (reference tokenization)

Right now, we are focused on the issuance and transfer of tokens, not on the MRV side. We want to accelerate on that side as well. Over time, we also want to build infrastructure tools to bring transparency while ensuring integrity around claim-making.

Toucan's approach

We are building systems that are regenerative by design. We are focusing on bringing high-quality credits on-chain and bringing value to the originators of these credits while keeping the process transparent. The blockchain market is evolving in different spaces, and we are playing our role in the carbon market space. Carbon is a new Web3 building block. We are empowering an emerging ecosystem of climate and crypto applications.

"We are building systems that are regenerative by design." – Julian Sommer

From a laymen's perspective, help us understand the advantages of bringing carbon credits on-chain for buyers and sellers.

For a seller, it brings more originality and flexibility than in a traditional market; most sellers don't have access to the market. Still, with an on-chain market, they can reach consumers directly. They can have a better understanding of the prices and can finance new projects in a better way. This market will provide direct access to both buyers and sellers. Buyers will get benefits from great transparency and tangible trade. This infrastructure will make carbon more tangible for any type of stakeholder.

Last year we saw a lot of activity around the Base Carbon Tonne (BCT) token. So why do you think there is no such traction now?

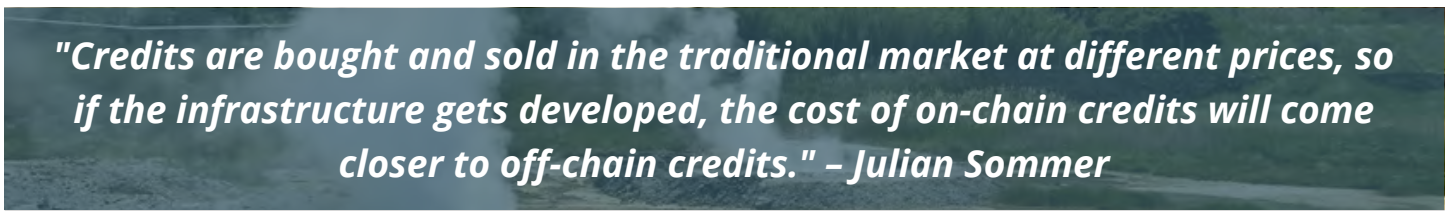
There are various reasons. The crypto market has faced a setback overall. Now, the demand for BCT is at a different point than it used to be. Earlier in our journey, there was one type of demand. We are trying to diversify that by bringing different types of chains and different demand sources through this asset. There was a situation where this credit could not go back, so they are sitting on the chain now. Statements from Verra were also creating uncertainty around these assets. We are working through that at the moment. We are not concerned about the demand because we believe it will come back. Eventually, we will see any type of asset on-chain.

According to a report, the evaluation of the on-chain credits is 62 percent lower than those of off-chain credits, and the on-chain credits are servicing a lower-cost section of the market. How do you see this?

I don't think this is the correct conclusion as this is a temporary situation where the large volume of the credits on-chain are MBCT, and they display the lower end of the spectrum in terms of quality. There is a lot of development toward higher-quality credits. We, along with our partners, will launch other pools. Credits are bought and sold in the traditional market at different prices, so if the infrastructure gets developed, the cost of on-chain credits will come closer to off-chain credits.

There are trust issues around crypto trading. Does that impact Toucan's attempt to tokenize credits? If it does, how will you resolve this?

Crypto exists because the existing financial system has some problems. People active in crypto trust crypto more than the traditional financial system. This is the question of whom you talk to; over time, we believe that many financial systems will run on-chain. In addition, some crypto aspects are anonymous, making people suspicious about them. We would like to address these concerns and find a way to interact with the traditional market and crypto world to innovate and improve the system.



How do you see anonymity and transparency around crypto going hand in hand?

There are certain principles in crypto to create trust. One is decentralization, and the other is anonymity, as people don't want to be supervised or monitored. There is a balance. Not every piece of information needs to be anonymous to maintain transparency in transactions. Requiring identification at every step or transaction of every trade will create a lot of friction to a certain extent, and it is also not implemented in today's market. The question is who needs to have access to which information. In our space, there is also some loss of privacy as the transactions are on the chain, which brings transparency to claims.

Quality concern is plaguing the carbon market. Will Toucan be taking measures to ensure the credits on-chain have certain quality?

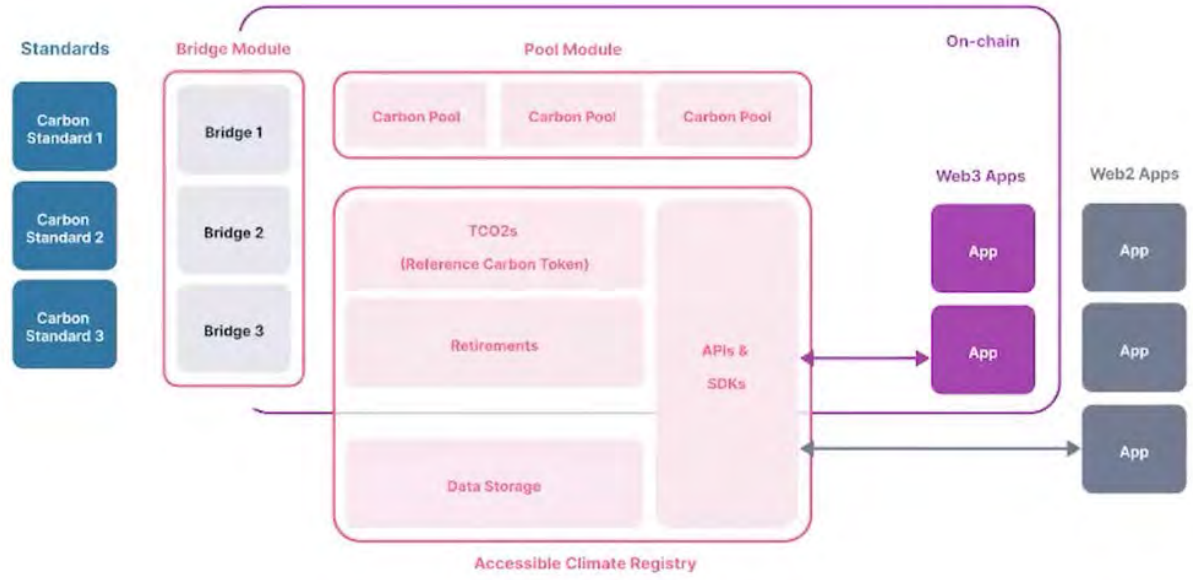
We are keen to work on standards to bring quality credits on-chain. We will filter credits and develop specific acceptance criteria for them upon launching the carbon pool. Toucan brings infrastructure, and we want other companies to build things and launch pools. We are working on the right type of governance model to have enough control and influence over what types of pools are launched as every pool will be associated with us. At the same time, we want technical expertise in the market, whether sitting with standards or rating agencies, to help govern what comes on the chain and what it is being labeled as.

What are your expectations from Verra inviting participants from the market regarding their feedback on tokenization and crypto credits?

We expect that it will be a fair process. We understand why this is necessary and why it is difficult for Verra to reach out to a particular party and determine what the market thinks, what different solution providers propose, and the buyer's requirements. We have been engaging with parties that provide references for the policy-making of Verra and the other standards. We hope to work with the standards towards a good set of products. This joint architecture will address some of the issues in the current architecture for bringing more flexibility and utility to the users. We are also looking for solutions for the credits that have been bridged because the environmental claim is not consumed. I guess this is the key point that matters.

Is there any change in the stance of other registries that were not allowing the tokenization of credits?

American Carbon Registry has invited inputs as a part of the consideration process. Development is happening in the blockchain space, but everyone is looking for someone to bring out a general guideline. We expect that the standards will look into the tokenization of credits to determine what they would favor and to what degree they will implement it. The market needs to reach a point where implementing technology to provide solutions is considered sufficiently safe. Then the buying behavior will decide how much trade will be carried out on-chain and how much will occur traditionally. We expect people will get used to this new technology over time, and the segregation between the traditional market and the on-chain market will cease to exist.



Toucan's building blocks for on-chain carbon markets. *Source: taken from Toucan's presentation at Voluntary Carbon Markets – A Gold Rush.*

Verra will not be tokenizing retired credits. What is Toucan's stance on the tokenization of retired credits?

We have not implemented it since Verra's announcement. Once people enter the process, the credits will be live and will be retired in the process. Buyers will not be retiring credits in the registry and then come to us for tokenization. Tokenization is a secure process, and there can not be double counting. Toucan has worked towards a different approach, and we consider the approach taken so far as legit.

Do you think that crypto trading in the VCM space has seen a setback because of the different standards carrying out a consultation regarding that?

That has impacted the market for sure. However, it also needs to be known that many projects that have addressed carbon do not meet the quality standards. Toucan is trying to bring quality credits on-chain, and we are on a path to doing so.

Do you have plans to introduce more specialized tokens?

Toucan, along with our partners, can bring tokens around agriculture, blue carbon, and different types of categories that make sense to pool and find a place in the market. We can also mention different types of curators, such as established brands creating their own pools or rating agencies getting involved in acting as curators. We can see this becoming a branded tool not necessarily from Toucan but by other parties with brand recognition in the market.

Many countries have imposed high taxes on crypto trading to discourage it. How can it impact this in the crypto carbon space?

There is uncertainty around crypto from various perspectives, including regulatory perspectives. We are

discussing tokenization. The issuer's jurisdiction is relevant because it clarifies the vast part of the crypto landscape. Jurisdictions have different rules for trading. Wherever you operate, you need to understand how the jurisdiction views these types of transactions, as this is the responsibility of users. The token issuer has its own kind of responsibility regarding compliance. Over time, we see institutions moving in the market. We anticipate this ecosystem to emerge. The Regulatory System will bring more certainty resulting in more institutional capital. The overall adoption of tokenization will have many ups and downs.

How do you view the exchangers because the participants can put the credits on-chain or onto a contract? Do you see the exchangers as competitors?

To a degree, they are competitors, and to a degree, they are a certain type of customers who may prefer these types of exchanges. We are sorting out another type of demand set. Over time, if more corporate demand comes on-chain, whether directly by using the infrastructure we have or through layers on top, the buyers have options to buy such an exchange or buy tokenized credits. Buyers would be able to decide if the trading experience is efficient. Both have a place, and we should let the market and the buyers signal what they prefer.

Crypto trading tends to be speculative. Do you see the end buyers coming to the platform looking for credits for end use, or is it primarily traders?

It is a myth that the majority are traders. There is speculation around crypto as well as in the traditional carbon market. Now, more corporate clients buy crypto credits to make claims and focus on the end use. We encourage our builders to build on-chain carbon sinks so that we don't see these credits being traded all the time. It needs to be a mix of use cases where there are reasons for people on-chain retiring credits and using carbon as an asset to back the currency. A secondary market is also needed if enough people use it to retire. The more diverse the demand for credit becomes, the more diverse would be the use case. With that, the overall system will get better.

Flowcarbon

Featuring: Dana Gibber, Flowcarbon
and Paul Krake (moderator), Climate Transformed

Summary

How do blockchain and tokenization help voluntary carbon markets? This most fundamental question was explored by Dana Gibber, the founder and CEO of Flow Carbon, a Web3 company where carbon, and sustainability, meet technology. The role of blockchain is vigorously debated, but it is tough to find another industry exploring the benefits of blockchain and tokenization, like voluntary offset markets. Like it or not, it will play a role.

About Flowcarbon

Flowcarbon is a platform that uses blockchain innovation to scale the Voluntary Carbon Market (VCM). It operates at the intersection of carbon and new technology to protect the earth's natural carbon sinks and scale quality carbon reduction and removal projects. It was founded and built by a team with collective experience across carbon, sustainability, and technology. Their goal is to accelerate decarbonization by preserving and protecting the earth's natural ecosystems, which are among the most immediate and cost-effective carbon sinks while investing in longer-term carbon removal and reduction projects. They set out to bring carbon credits onto the blockchain to create democratized access, price transparency, immutable tracking of credits as they change hands, and incentivize high-impact climate change mitigation projects.

Process development

The project proponent finances a project that removes carbon through conservation, reforestation, or other ways. The project proponent gets the project off the ground and undergoes a rigorous quantification of the project's carbon impact by measuring how much carbon that project might conserve, sequester, reduce, or remove. This impact is verified by a neutral third-party verification body

called the validation/verification bodies (VBB), which then submit the evidence and auditing to a global standard, one of the most well-known standards is Verra. Verra has developed methodologies that are checklists for different types of projects to qualify. As a result, the projects must meet certain requirements, including carbon quantification. The VBB audits the projects for verification. When the projects get certified by standards, they get credits issued, and those credits reside in the registry associated with that standard. These credits are sold for revenue.

Major inefficiencies in the VCM

The following are some major efficiencies in the VCM that make it slow, difficult to scale, and keep the value from project proponents:

- Liquid markets: Most transactions are over-the-counter, fragmented across numerous selling agents.
- Non-transparent, tedious price discovery: This market lacks benchmark pricing and is slow and inefficient.
- Value extraction by middle persons: There are numerous brokers and marketing agents between projects and end buyers.
- Complex sale cycle for corporates: Voluntary offsets are not treated as commodities with clear pricing and quality ratings; instead, need for diligence reliance on third parties and widely variable pricing.
- Close to retail buyers: Structurally almost impossible for retail and many institutions to hold voluntary credits.
- Difficult to secure finance: Fragmented and opaque market makes it difficult for project developers to secure financing needs.

The supply-demand dynamics are inefficient because the spot market is inefficient as it does not allow a liquid environment where we can realize demand efficiently. Flowcarbon wants to enhance this market by making it more transparent and liquid. We view tokens as a way of doing that and believe that the above challenges can be solved by blockchain technology.

Flowcarbon's tokenization structure

A tokenized carbon credit is not like cryptocurrency, but it is more like a depositary receipt. Project proponents do projects around conservation. They get specific carbon credits issued to them that are unique to the project. At Flowcarbon, we allow the project proponents to warehouse their carbon credits with us and emit tokens backed one-for-one by their carbon credits. We get the tokenized representation of the credits in our warehouse that can be grouped with those of other project developers doing similar projects. Similar projects that were issued carbon credits under a similar methodology by Verra that want to sell together to maintain liquidity in the market can group together their tokens into our tokenized bundle and sell as REDD+ tokens to the market.

We have the same concept for cookstove and renewable energy bundled tokens. Some criteria allow project developers with similar project types to group their projects and sell together. This is one key innovation. Tokens enable easy bundling and grouping. The second piece is where these bundled tokens are sold. They get listed on crypto exchanges like coinbase, giving buyers access to these carbon credits, so the tokens again reach back one-for-one by a carbon credit.

In the exchanges, these carbon credits are accessible at the same time and price to millions of people and businesses of all scales. Crypto exchanges are widely accessible, allowing people to buy carbon credits in any amount. This structure allows people to retire a carbon credit and visibly claim the offset. People can bring their tokens to us and redeem them for their carbon credit. After having consultations with many legal officials, we can say that people don't need a know-your-customer (KYC) to transfer this sort of depository receipt, which is the token from one wallet to another. But, on the other hand, if they trade credits for money, they will need KYC.

Why tokenize carbon credits?

Tokenization unlocks a transparent, efficient, liquid spot market, enabling the financing of new projects. Anyone with a crypto wallet can access the VCM. Tokens are much more accessible than actual carbon credits. Right now, individuals can not buy carbon credits, but they can purchase them in tokenized form. Web3 can help us scale this market quickly. There are a lot of blockchain companies with a tremendous demand for tokenized carbon credits to address the emission-associated criticism and to hold them as a green asset in their treasuries.
Flowcarbon has seen a demand worth $200 million for carbon assets from their Web3 partners in the past month. Tokenized carbon credits offer deeper liquidity. This groups together small projects and creates a fungible unit. Tokenization offers a transparent price signal. Tokens are traded in the same way as stocks and are traded at the same time, at the same price. We can program the carbon unit to send revenue back to a local community whenever it changes hands, and no one can tamper with it. This creates an ongoing co-benefit. A liquid spot market with clear benchmark prices helps underwrite project finance significantly. An ongoing co-benefit royalty stream is an innovation that is only possible through tokenized carbon. So, this structure makes finding more projects possible.

Flowcarbon's blockchain-enabled carbon value chain

Flowcarbon, as a company, is active in every part of the carbon value chain. We have announced some partnerships that show the infrastructure we are building. We have recently announced our partnership with Allcot, a well-known project developer. We are working with them to determine what the first blockchain project development could look like. We did a financing pool of a debt instrument last week, which sold out. We took a forward contract from a phenomenal project and financed it with a partner, Centrifuge. So, we create new financing opportunities for project developers, especially smaller ones. There are a lot of blockchain applications for digital measurement, reporting, and verification (MRV). Blockchain can help create a lot of efficiencies in data analysis associated with getting projects certified by going through the project data, presenting it to the standard, and getting it certified as a real project.

"Blockchain can help create a lot of efficiencies in data analysis associated with getting projects certified by going through the project data, presenting it to the standard, and getting it certified as a real project." – Dana Gibber

Flowcarbon has focused a lot on the spot market. There are additional innovative use cases. All these applications send money back to high-quality carbon projects.

How did your experience in environmental philanthropy forge the mission of Flowcarbon?

It was seeing firsthand the limitations of philanthropy as a primary financing mechanism for these kinds of projects. Financial solutions provided by philanthropists to finance sustainable projects are insufficient to scale them in the timeframe we have. This is why we have alarming stats such as the amount of pristine tropical rainforest lost across the globe increased last year is the equivalent of a football pitch disappearing every six seconds. These lands are suffering because we lack the finances to secure them. This is why we need the VCM. Flowcarbon wants to help scale the market and address some of its challenges.

Do you see yourself becoming a project developer in the future to generate high-quality credits for your customers?

Large-scale corporations with high-end expertise and finance can develop their own projects. This way, they can control both the quality and the price of carbon credits. But this way, we cannot scale the VCM. Flowcarbon is active on the origination side of the projects as well. There is a vast pipeline of high-impact projects. Project developers contact us all the time, so we are really interested in the origination level. Where is the private capital? What is holding back big responsible institutions from investing?
Giant companies are not making heavy investments in the projects because of the following reasons:

- Less ability to properly evaluate and underwrite these projects
- These high-risk projects mainly exist in the developing world with political, national, and policy uncertainties
- There are a lot of climate risks associated with these projects
- There is no liquid spot market
- Accessing the potential revenue streams coming out of the projects is also difficult
- Many technologies are emerging to monitor and assess the projects that can help mitigate these risks

What is your stance on the tension between blockchain companies and the standards like Verra and Gold Standard?

The standards should get credit for their twenty years of work in evaluating tokenization and watching it as an innovative technology tool for the market. The VCM community sees the main governing bodies and the key stakeholder membership associations taking up the question of using blockchain in the market and tokenizing carbon credits formally, such as Verra having public consultation. This market has internalized that there are some significant potential benefits of blockchain to the market, and they are pursuing formal processes to consider this solution. All the standards, particularly Gold Standard, are very innovative regarding viewing tokenization. Standards are thinking about the challenges in the current VCM and the guidelines that must be followed to ensure the tokenized credits support environmental integrity.

Do you envision a meta-registry that provides digital access to everything?

We have a climate warehouse, the World Bank's metadata registry for informational purposes, with a data feed of all established national and private registries. This is where we can see all of the projects across all credible registries and types of projects, quality of credits, etc.
For informational purposes, this is an amazing effort. While for the access standpoint, Flowcarbon intends to provide access to credits from credible standards. We believe blockchain technology, in general, is accessible to all. For the tokenized credits, Flowcarbon will become an interface where people will be able to view all tokenized carbon units across registries and access them instantly. This does not represent the entire market, as most of the market will not be tokenized.

Do you envision a time when you will also have to do a consultation with the compliance market?

The trendline suggests that there will be conversions, especially at the national level in certain jurisdictions. So, this is possible that we will also be doing a consultation with the compliance market. Within the US, some regional decarbonization legislation enables the use of offsets, and there is a lot of movement on a city-wide level where you can use voluntary offsets to fulfill some of your commitments under a compliance scheme, so there are definitely conversions. So, we think we may engage with the compliance market.

Have you considered working with places like Viridious Capital and S&P Global Platts to formulate these bundles around standardized benchmarks?

Yes. in terms of the quality of bundles. For any tokenized carbon unit, people can see what's in the bundle with one click in real-time. It is basically looking at the Verified Carbon Units (VCU), Voluntary Emission Reduction (VER), or any sort of carbon credits along with all the information about them. It is easier to do so with our interface.
We only use carbon credits from the established standards created in recent years after Paris Agreement. Forest burning down is a question related to the standards, and Flocarbon is a sales channel that tokenizes quality carbon credits.

The verification process for smaller projects can be pricy. Have you thought about pre-financing to assist in the first two to three years of project development?

Yes, this is what pre-issuance finance is. It is financing with equity debt or other structure finance products so that finance can be used to get through the certification process.

What do you think about forward pricing in the line?

We financed a forward contract last week. To the best of our ability and knowledge about the market, we were able to effectively price it to the project assessment, find a great project, and finance it accordingly. This will become easier as it scale.

What do you need to do differently to change the perception of blockchain's role in VCM?

There are some questions in the minds of people who have been in this market for a while as they have devoted a significant amount of their professional time and energy to it. They want to protect and preserve the market's integrity and are concerned about blockchain in many ways, including from a reputational standpoint. I feel a tremendous responsibility to talk a lot about the role of Flowcarbon and why we think using blockchain as a technology tool in this market, will unlock a lot of benefits. The benefits of blockchain in the VCM are worth it. The blockchain companies and the third parties on the blockchain side have a real responsibility to operate with integrity and be really upfront regarding what they are doing. So, there is an educational component to the rest of the market. I also think there is a component that a lot of us are newer to the market, so we have the responsibility to forge relationships and have conversations with those who have been in the market for a while. It is much of a relationship development effort as the hard work of maintaining integrity is already happening at the standards and in Flowcarbon.

Microsoft:
A Case Study in Net Zero

Featuring: Eveline Van Wezel, Microsoft
and Paul Krake (moderator), Climate Transformed

Microsoft

Summary

Paul Krake sat down with Eveline van Wezel to discuss the company's journey to a sustainability leader and model for companies beginning their path towards sustainability. The firm has lofty goals, and discussion revolved around how they are doing and the strict internal benchmarks they hold themselves to. Development projects, carbon-neutral services, and customer collaboration are part of their framework, and there are lessons to be learned for companies, large and small.

Inside Microsoft's sustainability strategy and journey

We believe climate change and humanity's response to it is the greatest challenge in the way of sustainability. Therefore, we need to focus on stabilizing our climate by building toward a net zero-carbon economy to ensure we survive in this economy and thrive in it. At Microsoft, we prioritize sustainability in all our operations, whether we build a data center, create new products or services, or invest our capital. Especially when we build or maintain a data center, we see it as a three-way partnership between Microsoft, the local community, and planet Earth. We see all these stakeholders as equal and ensure they are happy with the results. This is a good approach because often, it is easier to look at only a two-way approach or only consider the company's impact. We can achieve this three-way approach by using science and technology together. Science will probably help us understand our current situation, while technology will provide us with the tools to manage resources, help us mitigate climate risks, and transform ourselves.

Plans on achieving carbon negative future

We prioritize carbon, but we also focus on social and governance aspects. Our biggest ambition is to be carbon negative by 2030. We must remove the equivalent of all the emissions we had emitted since 1975, when Microsoft was founded, by 2050. This is a bold goal because we cannot trace all the emissions. We

need to make a smart model to trace our historical emissions. We want to achieve zero waste by 2030 and focus on circulatory there. Microsoft has circular centers at their data centers.
We want to be water positive by 2030, meaning we will replenish more water than we use. By 2025, we want to protect more land than we use for our operations. We are looking forward to setting up a planetary computer. We are trying to procreate a GitHub of geospatial data. We have a catalog of data sets that other companies can utilize to build models, so we are trying to empower companies through the data we have gathered.

Leading platform provider of technology solutions to environmental challenges

We support all the UN goals. We will discuss environmental sustainability in the four key areas; carbon, water, ecosystems, and waste. We focus on creating products and services to help our customers become carbon negative. In addition, we provide companies with the tools to help companies understand their baseline measurements. We focus on helping our customers and partners through several mechanisms. For our partners, we have a carbon fee to ensure we restrict the amount of carbon they emit. We advocate for the policies to achieve corporate and social goals. We ensure all our operations align with science and international climate goals.

Microsoft's Commitment

Because the people affected by climate change are the ones who are least responsible, we aim to empower them to become more resilient to the effect of climate change. On the other hand, we help companies understand their baseline measurements and focus on reducing their carbon emissions. We have a motto at Microsoft that those who can move faster and go further should do so. So, we are taking a leadership role by having an ambitious pledge. We believe we should start taking responsibility for our environmental footprint and help our customers understand how they can take responsibility for theirs. We see it as an obligation to set a big commitment and use it to inspire others and help drive that global effort. Microsoft focuses on reducing carbon emissions and high-quality carbon removal to make up for the emissions they cannot further reduce.

Essential principles for high-quality carbon removal

We have set up a list of some principles with a collaboration of companies, one of them is Carbon Direct. These principles look at high-quality carbon removal and the characteristics of high-quality projects. Following is the list of our principles:

- Additionality and baselines: A project around carbon removal needs to be additional, which means it cannot occur without carbon finance. It needs to show that the project we are investing in is not a common practice but something that takes additional effort for the communities to undertake. We also require the project developers to show a clear baseline representing a conservative scenario for what would have happened if the carbon finance had never occurred. So, we want them to show the counterfactual.
- Carbon accounting method: We have a rigorous accounting method which means we want the project

developers to account for their carbon emissions and the lifecycle assessment of all the carbon emissions that have occurred during the project's development. We want those projects to be accounted for. We want a transparent and comprehensive lifecycle assessment to ensure no double-counting of the emissions that have been sequestered.

- Harms and benefits: We want to ensure no economic, social, or governmental risk or harm is caused by the carbon removal project.
- Durability: We consider the stored carbon's longevity and its risk of reversal. We want to get a plan from the projects to mitigate the risks of reversal. In addition, we want them to assess the risk of carbon being leaked.
- Environmental justice: We discuss the project's social aspect and ensure the local community is engaged in the working composition. Projects need to diminish the amount of community displacement.
- Leakage: This one is about economic leakage. We want to diminish the economic leakage of the affected area where the displacement of the activities occurs.
- Monitoring, reporting, and verification (MRV): We ensure the project developers adhere to the plan for long-term monitoring of the sequestered carbon. This helps us ensure that the quality of the projects stays the same as the one we initially signed the contract for. Third-party also verifies the captured carbon.

We have a few other considerations that include the duration of the storage, the design for mitigation of climate conditions, and ease in the scalability of the projects. Carbon Direct helps us assess different projects. In 2021, we purchased 1.3 million metric tonnes of carbon removals. 80 percent of our projects are focused on carbon reduction through removal.

Lessons learned so far.

Microsoft is trying to set the bar high as there is a lack of standards in the market. As a result, we have learned the following lessons in the first round of our phase:

- There is a lack of market definitions and standards. As a result, there is no clear indication of an avoided emission and the actual removal of carbon. Due to such loopholes in the market, Microsoft has set its criteria for the quality of carbon credits.
- The supply of high-durability solutions is limited and expensive. So, we purchased all the available supplies. We need to focus on increasing supply. We need to help farmers and other companies to enable this change and direct carbon finance to a specific and important cause so that the finance being spent on offsetting would be directed to the suitable space.
- We see that forestry and soil carbon removal offer short-term climate value. The short-term benefits are also crucial to the climate and the social aspect of climate change. We help decrease peak warming and support the local communities to become more resilient to the effects of climate change.

Acorn: Microsoft's project with Rabobank's collaboration

Acorn is a global, transparent, technology-enabled, and trusted carbon marketplace and ecosystem for carbon sequestration. Rabobank is a large agricultural bank in the Netherlands. They have a motto of

growing a better world together. Microsoft has a similar motto as they use their technology and data to create a climate and social impact. We have created a carbon marketplace for smallholder farmers with less than 10 hectares of land. This project focuses on combating climate change and its effects on the community and farmers. We are fighting their land degradation to mitigate the risks of desertification. We are increasing their supply of food.

Strategies to reduce emissions

We have different strategies to reduce emissions. We can switch to different types of emissions, such as using removable energy and reducing deforestation. Microsoft focuses on removing emissions by capturing and storing carbon from the atmosphere. We do that through nature-based solutions such as agroforestry, by incentivizing farmers to plant trees in areas with little or no plantation, and by participating in the VCM to ensure farmers receive incentives.

Incentivizing smallholder farmers to switch from monoculture to agroforestry and sequester carbon

Most farmers in our portfolio are subsistent farmers who grow monoculture crops. Some drawbacks of a monoculture include risks of pests, soil depletion, increased sensitivity to climate change, low nutrient diversity, and deforestation. We want to help these farmers transition to agroforestry. Agroforestry has many benefits, including improved soil health, increased resilience to climate change, nutrient retention, improved yield, income, and afforestation.

Acorn's three building blocks

- Marketplace and ecosystem: We connect farmers with corporations such as Microsoft to connect emitters and offsetters on the market with an ecosystem of partners.
- Technology and trust: We use technology-driven monitoring (satellite, AI, and machine learning) to be certain about carbon-capturing places. Before assigning contracts to the project developers, we compare the historical and current data of the land to ensure transparency.
- Transparency and quality: We ensure to set up a protocol including the elements of remote sensing to have the high-quality assurance the corporates need for purchasing carbon removals. We have kept high criteria for both buyers and project developers. The buyers need to reduce their internal emissions before buying the removals.

Carbon sequestration marketplace

Farmers are the offsetters that sequester carbon. They work with intermediaries that help the farmers to plant trees. We help the farmers understand the contract. The intermediaries collect the data to measure the polygon of the part of the land of the farmers. We register all the data in our marketplace, where we get the biomass data from a third party that analyzes the captured biomass and the baseline measurement. Suppose there is an interested buyer such as Microsoft. In that case, we generate a carbon removal unit that is immediately retired to ensure there is no double spend on that carbon removal unit. Then 80 percent of

the carbon removal unit goes directly to the farmer. We are ambitious to plant four billion trees and empower 150 million farmers so that each farmer may plant 250 trees. We have issued 120,000 carbon removal units and have helped 25,000 farmers so far.

Have you thought about working with the government to scale your efforts to help farmers?

We have considered this, but for now, we have chosen to work through intermediaries of Rabobank to ensure that we get the first projects live. Rabobank owns the marketplace, and they are considering scaling the solutions by making new types of investments and new ways for companies to invest regularly regardless of purchasing their carbon removals. The engagement of NGOs and governmental bodies is part of that. Before this, it was complex to start this project. So, we started with the basics and looked at the customers we could reach through the Rabobank network.

What do you think about offsets versus removal? Are you engaging with traditional offsets?

Offsets and removals are often used synonymously. We have a firm policy of either talking about offsets or removal. In Rabobank, we don't use the term carbon credits, but we use carbon removal units because they should not have a monetary value. In our strategy, we have also avoided emissions, but we are highly focused on removals when investing in carbon credits. Meeting our goals is not possible with carbon removal only, but it is a preferred solution. So, we need to access both avoided and removed. We have a climate innovation fund of one billion dollars. We will focus on advancing technologies for direct carbon capture, investing in projects, and increasing the supply of high-quality carbon credits. We have specific criteria in place for avoided emissions as well.

Is Microsoft working on sequestration technology or investing in external technologies?

At Microsoft, we have an extensive research department that focuses on different segments, one of them which is agriculture and sustainability. We focus on investing and building technology, technological foundations, and infrastructures for other companies to build a carbon market. So, we can aggregate different types of data, sources, and partners of an ecosystem. We don't focus on building sequestration technology ourselves. At Rabobank, we work with a third party to analyze biomass growth because specific knowledge of the agronomists is required to build the models. Being a data and technology company, we focus on what we are good at and work with other departments to achieve climate goals faster.

How do you work with companies like Carbon Direct to leverage your skills and theirs?

We have principles and criteria that Microsoft and Rabobank need to adhere to and show a plan for adherence to these projects. We have put up Chinese walls between the team working with Carbon Direct and the team working with Rabobank on developing to access the project from an outside perspective and see if this is a high-quality carbon credit.

Source: taken from Microsoft's presentation at Voluntary Carbon Market – A Gold Rush.

Microsoft offers prefinancing to the project developers. What is the plan for the decade between breaking ground and the credits to be available?

The projects don't start to sequester right in the beginning. We help the farmers move to agroforestry and learn new farming practices. From the first year, we start paying the farmers, then we even that out by the money received after some years when the trees start sequestering. We take an average of the farmers' potential revenue and start leveling that out. If that increases, we adjust. We need to look at the impact on the farmer, which we also realized in our research. We supported the farmers, not in terms of finance but also in educating them on farming practices. We also get a consultation from agronomists to assess what sort of plants can thrive in a specific ecosystem.

How do you see the overall supply dynamic? Will it affect the scalability of projects?

We do have supply issues, especially around the availability of high-quality credits. The current market lacks standards, and not everyone has as high a standard as Microsoft. Soil carbon capture has enormous potential, but measuring that potential is challenging, and a large part is on the MRV side. Most of the sensors don't take remote sensing into account. If we consider remote sensing, ensuring there was no double spend is challenging. Supply is a significant problem, and we should focus on reducing emissions. We need more scale in technologies to capture and store carbon. We need to focus on the scalability of our project by getting more farmers to plant trees.

Do you think there will be a time when you will not be doing your own projects without the independent verifications of the established registries?

We believe if we can move faster, we should do so. We follow the same approach while purchasing carbon credits and work with all the registries and verification parties. However, we have realized that we must do more and take risks to scale this nascent market.

If a project makes a promise or intends to adhere to the verification registry criteria, then we assess that plan and rely on parties such as Carbon Direct. We are open to evaluating projects that do not adhere to certain policies yet, but they have a clear plan of adhering to the protocol shortly.

Have you thought about biochar projects as a direct carbon capture way?

We have looked at one of these diversities at Rabobank, but it is still in the research phase. Acorn is only one of the carbon marketplaces we have set up. We have not advanced much on these projects yet because of the complexity of everything, the immaturity of the market, and the extreme scrutiny that has been placed on this market. We are still researching this and focusing on how we can measure the carbon it captures.

How can we solve the problem around the price of carbon credits?

The market should focus on distinguishing the low-quality carbon removal units that only focus on avoided sequestration and don't follow any type of protocol. Rabobank has introduced the Acorn auction, where we auction 100,000 credits to know the price corporates are willing to pay, and we have buyer criteria for it. To understand what the market is willing to pay, we take the average of the three highest bidders and use the lowest to price our carbon credits. We have publicly mentioned the price of the removals that Microsoft pays or Acorn asks. We really need to ensure what the market is willing to pay and how money is spent for the right purposes.

What are some practical things small companies can learn from Microsoft?

We share our progress report every year. It is easy to pledge, but we need to show how we are progressing and what is working and what isn't working for us. We do this so that the other companies do not make the same mistakes as ours. For example, we are trying to remove diesel generators from our value chain that makes up 1 to 2 percent of our carbon footprint. Removing that percentage of our footprint is incredibly challenging. The point is that even reducing emissions on a smaller scale requires a lot of time to reengineer those solutions. We communicate our efforts and mistakes openly and transparently so that other companies can learn from them.

Standard Chartered: Paving the Way for High Integrity Carbon Markets

Featuring: Chris Leeds, Standard Chartered and
Paul Krake (moderator), Climate Transformed

Summary

The carbon markets are an important bridging tool for sourcing billions of dollars to finance projects to reduce carbon emissions that would not happen otherwise but to ensure the markets work efficiently; it's essential that both supply and demand are of the highest quality. This means that not only do carbon credits have to meet the highest quality standards – in other words, those embodied by the Core Carbon Principles of the Integrity Council – but buyers must ensure they are using them as part of their transition to net zero. High integrity carbon markets can be linked to create a global market that will put a price on carbon emissions and drive capital into projects around the world that will support a just transition

About Standard Chartered

Our goal is to help clients reduce emissions. By 2025, we aim to be Net Zero in our operations, with scope 1 and 2 emissions offset with high-quality carbon credits. By 2050, we aim to be net-zero in our financed emissions. We have a relatively small net impact, around half a million tonnes, typical of the service sector, but the indirect impact is massive at about 45 million tonnes. We work with power and other heavy industry and want to support them in reducing their emissions.
We were part of the original Carbon Related Financial Disclosures (CRFD) task force and are working with other banks and institutions to provide quality data.
For a while, companies and governments were making big statements for a long way in the future, but we want to work towards credible paths with three broad elements: measure emissions and set emissions targets, reduce emissions through changes to own operations, and adopt appropriate technologies, and compensate and neutralize by purchasing high-quality carbon credits. We have mobilized $300 billion of green and transition finance, deployed a Transition Acceleration Team, and launched new products and

solutions. We have also winded down the financing of thermal coal.

Standard Chartered carbon market experience

Bill Winters, CEO of Standard Chartered, chaired the Taskforce for Scaling the Voluntary Carbon Markets (TSVCM). The TSVCM set up the Integrity Council of the Voluntary Carbon Markets (ICVCM) to govern voluntary carbon markets. I sit as a board member.
Climate Impact X (CIX) is a collaboration of DBS Bank, Singapore Exchange, Standard Chartered, and Temasek, providing high-quality carbon credits to address hard-to-abate emissions. It was a unique business model integrating end-to-end capabilities along the carbon value chain.
We have worked with other countries to help them develop their carbon trading markets.
Standard Chartered has established an Energy Transition trading desk within the company, where they trade EU, UK Emissions Trading System (ETS), and VCM. They currently trade through CIX and CME but plan to expand their operations to trade through other exchanges and jurisdictions. They see London and Singapore as key hubs for VCM, but the development of complementary regional hubs around the globe forms an effective global market.

Compliance and voluntary markets

Compliance and voluntary markets will become increasingly integrated until it's hard to tell the boundary between the two, or even to a point where the voluntary market effectively gets squeezed out. Remember, the voluntary market virtually exists because we don't have a fully functioning regulatory market.
The Emissions Trading System (ETS) has been a great success, well set up, etc., and is the primary tool to get the EU to meet its 55 percent 2050 emissions reduction target. However, it is limited in scope to heavy stationary emitters. For a while, the primary way to reduce emissions was to switch from coal to gas, which produces about a quarter of the mission; however, with gas prices where they are, it has become more challenging. The next cheapest technology is green hydrogen, but very little of it is available. Therefore, the risk is that emissions are reduced by leaking them to other countries.
China set up its ETS in 2021 with about four gigatons of emissions, which accounts for slightly less than 10 percent of global emissions. For now, it's pretty ineffective as the targets aren't strong enough, but it will become more effective towards the middle of the decade as they tighten up.
Offsetting is, in fact, a use case for carbon credits. Offsetting is retiring credits against carbon. Offsetting has been the primary driver in establishing the market for carbon credits. Without offsetting, there would be no demand for carbon credits. Through offsetting, we get money into projects that otherwise would not access that funding.

Client considerations when purchasing credits

- Cost: In the VCM, the higher the price, the more impact you'll have. Clarity and transparency are essential to ensure that a reasonable proportion of the money invested reaches the project rather than just the intermediaries.
- Geography: Some investors will specifically want to contribute to or avoid certain countries or regions.
- Co-benefits: Gold Standard insists that on top of SDG 13: Reducing Emissions, there are always at least two other stated SDGs. We should be giving positive value here, not just avoiding harm.
- Connection to value chain: We want to see how it impacts the wider value chain to multiply impact.
- Storytelling: We look for projects that offer a positive story to show how this investment benefits the world.

However, it is important to remember that the main measure is the amount of carbon we'll be reducing.

Carbon credit project types

We're increasingly seeing investors who want to differentiate between different projects. Avoidance projects include avoiding deforestation and improving agricultural cultivation. Removal projects include re-afforestation and new techniques. Both avoidance and removal projects may be nature—or technology-based. Technology-based projects are expensive, up to $1000 a tonne in Iceland. We need a balance between innovation and the maximization of present-day carbon reduction.

Recognized standards

Several recognized standards include Verra, Gold Standard, Climate Action Reserve, and American Carbon Registry. Verra dominates with around 70 percent of the market share and Gold Standard with approximately 17 percent. We want to help to support this infrastructure to alleviate bottlenecks that affect market growth. We work with the exchanges and the registries to achieve this.

Integrity Council of the Voluntary Carbon Markets (ICVCM)

The ICVCM has developed and focused on 10 Core Carbon Principles: additionality, mitigation activity information, no double counting, permanence, program governance, registry, robust independent third-party validation and verification, robust quantification of emission reductions and removals, and sustainable development impacts and safeguards.

The transition toward net-zero emissions

The aim is to have the first programs assessed by the end of 2022 and exchanges listing core carbon credits in 2023. Integrity is vital to the scale and development of the carbon trading business. We are starting to develop our carbon trading business, currently going through a phased rollout with some test trades, but we expect to have client capabilities by the end of the year.

"The voluntary market is global by default, but there isn't an international oversight. " – Chris Leeds

Would Standard Chartered develop its own projects to ensure the quality of the projects they sell?

We don't need to. We hope to finance projects, mostly debt. We expect the market to come up with quality. The exchanges will ensure quality. The Core Carbon Principles (CCPs) are designed to ensure that quality.

What external partnerships will you develop to ensure that the products you sell are genuinely the high quality they claim to be?

We'll work closely with exchanges and rating agencies, though part of their work is to look at value and quality. Often projects are judged on a very subjective basis. Valuing carbon is the number one piece of the puzzle for objective comparison. We need a benchmark reference price, and pricing can then be taken from there. Exchanges should be vetting what they're trading. Gold Standard and Verra will be doing the same. Finally, there has to be an oversight. The voluntary market is global by default, but there isn't any international oversight.

The International Swaps and Derivatives Association, for example, is owned and paid for by its members, who have mandated that it should ensure standardization in swaps trading. We are working with regulators worldwide to develop our understanding of how to play that role.

Is convergence between compliance and voluntary markets necessary to get us toward uniformity in carbon pricing?

I saw VCM as creating a global carbon market from the bottom up. So, you make a consistent benchmark, fungible credit that is interchangeable and recognizable worldwide. We're starting to see it now with some of the regional schemes that are going on. For example, Singapore is talking about using its carbon credits against a carbon tax. So, if companies worldwide could use CCPs against their obligations, you start to see the knitting together of those markets.

I think we should be focusing on marginal abatement cost curves. Currently, we've got a series of disconnected country abatement cost curves. Everyone got their curve, but they're not linked together. That is destroying the efficiency of trading. The point of international trading is that we link them together and find where the least cost reductions are.

The EU ETS is a closed system. One of the most realistic ways to reduce emissions is through green hydrogen, but there's not enough. The signal is there that this is the way we need to go. If you use carbon credits within the EU, they'd be able to go out and buy credits from much lower cost emissions reductions. The countries where those projects are being developed would need to consider how that will impact their costs, but it is the same as you would with any commodity. You can still control it, but you want to have an export market for your commodity if you're a producer, and we'd look at it similarly.

What projects/trading opportunities will be executed in your division?

We're focusing on anything that's purely carbon-based. If there's a project that generates carbon credits on the back of a hydrogen project, then that will sit in our wheelhouse. A carbon credit for that will sit within our trading book if you're looking at a project around the early decommissioning of fossil fuel plants. Just like we do for other commodities, we finance oil, natural gas, and metal projects, and then we're able to support that financing through our trading business. That is the way that we're going to be going. There is a transition finance team, and carbon will be a part of that. Transition finance is broader, looking at the use of proceeds.

How does Article 6 affect Standard Chartered's VCM business?

The voluntary markets are nothing to do with Article 6. However, countries will want oversight over projects in their jurisdictions to ensure that they do not have any adverse effect on their Article 6 obligations.

What is the benefit to customers of integrating voluntary and compliance markets in, for example, Singapore?

We want carbon credits to succeed. Looking at who is backing CIX and whether they want the market to thrive and grow is essential. There's an interest in having some kind of hub in Singapore, but that's not my area to work on. The plan had always been that it would be a global exchange. We've got the Singapore connection, but we've also got a broader global reach. It is about connecting globally with other exchanges looking to develop and need the expertise. We understood from the early stages that there must be cooperation in this market. There needs to be the development of some kind of interoperability. Carbon is a global phenomenon, and it needs a global response. Every other commodity has a worldwide price, which we require for carbon.

Countries, governments and private sectors with net zero commitments. *Source: taken from Standard Chartered's presentation at Voluntary Carbon Markets – A Gold Rush.*

What is the importance of having a liquid functional forward curve?

It goes back to price discovery and signals that we want the market to respond. Transparent, liquid, and reliable forward curves allow governments and companies to manage risk. Some mistakenly think that it predicts where the prices will go. It's a plotting of where supply and demand are at any point in time going into the future. For a carbon credit, there's usually a pretty strong relationship between the different points in time, but ultimately that is what it shows. Therefore, if someone wants to sell forward carbon credits to underpin the financials of their project with a reliable forward curve, they can do that. They don't have to wait for someone to come in a give them a price or negotiate a long off-take contract. People can see where the price is and what they can do to manage that risk. We see the same in any commodity or financial market.

What does zero emission of financing emissions by 2050 practically mean?

The more information we get from them, the better, but a lot of the work is being done by specialist consultants who've come in and been able to help us put that information together. We'll then work with companies to support that transition. We can't force them to transition, but we can encourage them and give them guidelines. Our most significant sanction is whether or not we want to do business with them. We don't intend to quit companies at the moment but to support them in transitioning.

What does your division look like in five years?

It'll be an essential part of our commodity trading business, sitting where it does now in the energy trading business. There'll be a strong connection between fossil fuels and carbon prices. Hopefully, in 5 years, there'll be a benchmark, not EU ETS but maybe something. We'll get money into emerging markets, where risk and opportunities to capitalize exist. This will be an essential tool in this transition. There's a lot that needs to be done.

SCB Group: On Site in Africa

Featuring: Kevin McGeeney, SCB Group
and Rupert Rowling (moderator), Climate Transformed

Summary

Rupert Rowling sat down with Kevin McGeeney, CEO of SCB Group, to discuss the amazing developmental work SCB is supporting in Africa. From Senegal to Malawi, SCB is proving the sceptics wrong regarding the developmental benefits of carbon offsets to vulnerable communities. McGeeney and his team are proof that climate, development and economic drivers can intersect.

About SCB

SCB in the VCM is a merchant. We assist end users in sourcing the best carbon credits that suit their purposes. Our ideal clients want to minimize costs and the hassle of achieving their environmental goals. We work with many developers worldwide and develop projects which we believe fit the end user goals as well as possible. We've been in environmental markets for 17 years. We have five offices around the globe. We believe this gives us local expertise on a global scale.
SCB believes in creating an experiential touchpoint for our environmental outreaches. We have been to Antarctica and the north pole. The purpose of these outreaches is to provide extra motivation and a story to tell customers and stakeholders about the importance of our mission and how everything we do in our daily work life contributes to this. We were in Malawi to develop school solar to combine boreholes and cooking stoves for the communities.

SCB in Malawi

Twenty SCB team members visit Chang'ombe in Malawi as community guests to celebrate their newly built school. The school was built by the US-based NGO Build On in cooperation with the local community and authorities and part-funded by SCB. This is the third such development in which SCB has been

involved. Last year, SCB funded a pilot project to provide solar power to nine rural schools throughout Malawi, including the one in Chang'ombe. The electricity grid in rural Malawi is patchy, so the addition of solar power enables the school to be used, even after dark, as an adult education center.
UN SDGs call for affordable access to reliable and modern energy services. With solar, hydro, and wind, Africa has the capacity for 1000 times its current electricity consumption from renewables.
SCB has registered the school solar as a voluntary carbon market project under review. The VCMs can provide critical funding for genuinely life-changing projects. At SCB, we're looking to expand our engagement and commitment with NGOs on carbon offset projects to make the developments self-sustaining and aid-free.
Five hundred million people across Africa have no access to electricity, and the continent has a per capita consumption of only a seventh that of Europe. As Africa develops and its population increases, we must decouple the connection between electricity provision and CO2 emissions. If renewable CO2 avoidance projects don't get the funding they need, we'll end up with more CO2 to remove, possibly more CO2 than we can remove. For this reason, I see no difference in merit between additional CO2 avoidance projects and any nature-based CO2 removal project.
We at SCB are excited to play our small role in Africa's development and energy transition. Taking 20 colleagues to work with their hands on a live carbon project, education, and SDG galore project invigorates us all to work towards our mission of a low carbon future.
At the macro level, Africa has a continually rising GDP per capita, considerable population growth, and a big push to urbanization. Over the last ten years, carbon emissions have been all about India and China, but looking forward, the emissions problems in the next 20 to 30 years will be dominated by Africa. There is a real need for a large-scale effort to provide modern and reliable energy services, which can only come from renewable energy.

How can others get involved with projects like the ones that you have?

As we develop the number of projects we're involved in, we would like to invite customers to send a representative with us to bring the project to life for that end user customer. One of our core values is to stay connected to the community, which isn't just our investors and direct stakeholders.

Is there a risk that SCB is like a white knight telling Africa what is best for it?

The VCM mirrors historical involvement in Africa from European and North American cultures in some ways, but additionality is genuinely about making projects more beneficial to the world. The additionality aims to bring funding to projects that wouldn't have happened otherwise. It would be wildly inaccurate to think that the African market is flooded with capital, so there is genuine merit and local benefit in these projects.

"The VCM mirrors historical involvement in Africa from European and North American cultures in some ways, but additionality is genuinely about making projects more beneficial to the world." – Kevin McGeeney

How do you balance the need for scaling up and commoditization with the need for high-engagement projects that focus on individual communities?

The efforts to commoditize the market are early, and that adoption would be a higher priority. Often "the best" gets in the way of "better." If too much time is spent looking for the right market before something takes place, isn't that just an excuse to do nothing? Isn't that the same outcome as a climate change denier?

What are the next steps from here?

From this micro example, our goal is to crack NGO funding that's self-sustaining and aid-free, and I assure you we're not there yet. The idea is to promote education, provide primary schools in remote locations, and put solar, which would be a carbon project. A borehole at the exact location would make the education center even more central to the community. The provision of improved cooking stoves for the surrounding community. If you do all three in one location, you can minimize cost and turn it from an aid situation to self-sustaining.

Which aid partners are you working with, and has the Malawi government been helpful in this process?

We are the aid partner funding it, but we are trying to make it so that the sale of carbon would compensate for the total investment. We are nowhere near, but that is the plan.

Is there another project planned?

We have project developers and a pipeline. We are looking at projects not just in Africa. We are using recycled profits from previous activities. Banks are not ready for that.

Was the education theme something that motivated you, particularly with this project?

That is where we first came to it. The best investment you can make to change the future is in education, so we have long supported our corporate social responsibility (CSR) program of educational projects. So when we were first introduced to VCM, industry partners thought this was precisely what we've been looking for.

While in Africa, have you seen any effects of climate change?

You can certainly see the deforestation for biomass energy for cooking. Over 15 years, Ethiopia's forested land cover has gone from 15 to 12 percent. So, you can see people going to ever more extraordinary

"We are using recycled profits from previous activities. Banks are not ready for that. " – Kevin McGeeney

lengths for biomass. We visited a borehole that was no longer functioning because the water table had shifted, so the village had experienced their long-term pumped water suddenly drying up.

Do we need lots of companies looking to deliver similar projects to scale up?

Demand for credit retirements is growing 30 to 40 percent per year. I think we could do more to celebrate companies that are meeting their environmental claims as a way to draw others into it. I see us very early in bringing the corporate world into scope. By creating as many ambassadors as possible within organizations, they'll go on to spread the word. Will that be needed in 10 years? Hopefully not, but it certainly is now. In time we'll shift from selling the concept to selling a product in the form of carbon projects

What are the next steps in trying to recoup the investment?

Malawi solar is already a registered project with ECS. Many protocols talk about the importance of removal projects for balancing once one has achieved net zero, which I agree with. But, the time frame discussed is 2030 to 2050, rather than now. If the avoidance projects are not funded, our plans for 2050 will be irrelevant because we'll be so far off base.

Would you like to see less debate and more action?

We've been involved in the Carney Winters taskforce, the Taskforce on Scaling Voluntary Carbon Markets (TSVCM). We monitor all of the documentation that's come out, which we think provides a good model for standardizing requirements. Following the current consultations, another reason to do nothing goes away.

Do you think 2023 will be the tipping point at which carbon promises made in the 90s will become a reality?

I think 2023 will be a more game-changing year than 2022, even though changes are coming from COP26 and Article 6.

What has the SCB group said it would do, and how is it making steps toward those goals?

Our strategy is voluntary carbon to target end users with environmental goals they wish to achieve as cheaply as possible with as little fuss.

How do new products get created?

As a merchant, we're client-led, so we'll sell the t-shirts to whatever concert. First, we find out what our clients want to do, and then we help them achieve it as cheaply as possible, with little administrative hassle.

Which products have seen the most growth, and which do you expect to see the most over the next 5-10 years?

There has been some talk of the shift from PR to treasury carbon consumption. We sense that it was always that, a vital issue of price. Let's say you have a larger organization that made environmental commitments and was looking to become carbon neutral. Still, it also had an existing CSR department that did great work over decades. Stakeholders don't necessarily want to take money from CSR and give it to environmental projects. Because of the SDGs, CSR has so much offset style work. It's up to each company to decide if it's a balance where it wishes to have its resources. The company might want to be carbon neutral and have its CSR local to its location. We would work with people who would do that.
This year we saw an increase in corporate demand for CDM trends. COP26 gave CDM life until 2025 for NDCs. There was an understanding that if CDM is ok on the governmental level, it's certainly ok for the corporate level. Q1 and Q2 saw a significant increase in CDM products, driven by companies who wanted to keep their CSR somewhat separate from their environmental commitment, whether as a conscious choice or a reflex.

How do you feel about the Environment, Social, and Governance (ESG) movement as a whole?

I am tremendously excited by the ESG movement as a whole. Reports show that ESG leads to better outcomes, so higher risk adjustment for returns on ESG investments is fantastic. The most significant financial impact is avoiding blowups, such as Enron, in the past.
I am pretty saddened by some of the reactions in Texas and Florida, making it very difficult for firms, banks, and financial institutions that wish to use these criteria as they make financial sense. Even the reddest of republicans should still support ESGs based on economic logic. Unfortunately, this probably gets worse before it gets better. If the primary goal were profit, you would still adopt ESG criteria.

As an early mover, will you shout from the rooftops or quietly nudge others?

Our philosophy is to be understated. We are not the story. Instead, our mission is to promote a low-carbon future by minimizing the cost of adopting low-carbon alternatives. One account is about the end-user corporate that lives up to its promises, and the other is about the beautiful projects on the ground.

What is your view on the removal space?

I see benefits in both removals and avoidance. I think sequencing is key, and maybe not quite right currently. Our projects tend to be community projects on a smaller scale, for example, community deforestation or community mangrove. We don't have the heft to borrow from global banks at zero. Direct Carbon Capture is a long way off. I see the practical being avoidance and then nature-based removals. The calculation for our end-of-year report for 2021 was that we had positions in 139 different credits, and it is undoubtedly more now.

How do you ensure the long-term performance of the project on the ground?

We don't want to work with purely transactional projects developed instead. Instead, we work with long-term projects maintaining a relationship as the carbon and the community grow. These project-length relationships, 5 to 15 years, are permanently involved.

How are the mangrove projects or early projects looking now?

It was only in 2022 that we directly funded projects. Through 2021 we identified projects, and 2022 is the rollout.

How hopeful are you for the future of Africa?

China funds and manages many projects in Africa. In 2013 the African Union adopted Agenda 2063, a 50-year program to turn Africa into a global powerhouse. China has achieved that and is a natural partner to Africa. I do not have any concern about Chinese involvement, but I see it as a comfort, as they bring technical experience and knowledge.

Aspiration: Carbon Standards for a Sustainable Future

Featuring: Andrei Cherny, Aspiration
and Paul Krake (moderator), Climate Transformed

Aspiration

Summary

There is saying, and there is doing. Andrei Cherny, CEO of Aspiration, is a corporate leader who matches his words with action and, in doing so, is vaulting Aspiration to the forefront of what a sustainability-first business model can achieve.

How did working for Al Gore and Bill Clinton define your career?

As I worked closely with the Vice President, I spent a lot of time working on the issue we called back then, global warming. So I had a front-row seat in discussing political and moral issues.
Vice President Al Gore was at a critical juncture around leadership at that time. I was with him during his presidential campaign when he was traveling around the country. As he was giving talks about the upcoming possible climate crises resulting from the high CO2 levels in Antarctica, people started questioning him about not addressing the issues related to fundamental public concerns. But Gore kept highlighting climate issues because he knew their importance and saw his role as a leader in the climate crisis. He kept trying to rally Americans and the world around impending cascading climate crises that would impact people's lives even before they came into daily existence. A decade and a half later, those experiences led to the start of Aspiration with the idea of bringing climate change fighting actions into people's daily lives and allowing them to take real, substantial, meaningful steps considering it their personal responsibility to have a direct impact.

What was Aspiration's original business plan, and how did it pivot from a fintech company to a B2B company?

The initial idea was to bring real actions around climate into the decisions people make daily.

Aspiration's transformation was less of a pivot and more of an evolution. We began with financial services because they directly tie into people's daily lives. Debit or credit cards are one of the few products people pick up and use multiple times a day. At that point, we were already seeing the growth of sustainable and ESG investing, which has grown by leaps and bounds since then. Yet, very few individuals had a meaningful part of their financial life tied to investing. Everybody makes their day-to-day spending decisions and the decisions around saving money. There is a nexus between their money and what happens in the climate. So, we started around building a fossil fuel-free bank that would not be taking people's deposits and lending them to oil and gas pipeline drilling, unlike other large banks. Then, we created Aspiration Impact Measurement that would show users their personal sustainability and how their spending decisions impacted the environment and the community, allowing them to make spending decisions based on that. Our business model allowed climate-conscious people have the power and the ability to make climate-friendly decisions. We continued to grow, and now we have 8 million members in our community.

We noticed that we were forcing millions of transactions, not just financial transactions. But, they were moments of interaction where we could build sustainability products, tools, features, and services. So, we created Planet Protection with automatic carbon offsets for the actions you take. We offer services such as planting a tree with every purchase. Due to those services, companies started coming to us looking to get to net zero in a credible and automated way while building their business. That led us to open a new set of avenues to take our technology and products and bring them to the companies that were looking to embed climate change fighting actions into their operations, the same way we do that for individuals.

"Everybody makes their day-to-day spending decisions and the decisions around saving money. There is a nexus between their money and what happens in the climate." – Andrei Cherny

The currently available climate solutions are for large-scale companies. How is your business offering climate solutions to the entirety of your customer base?

Things will look different in the coming years because of the speed of the transformation. We can observe many actions on the individual level, so we've built out the tools. Giant companies have started making real net-zero commitments and taking actions and steps that have validity, and this process is playing out in real time. Over the next few years, you will see all Fortune 500 companies and other large companies taking those steps. In the next 3 to 4 years, we will be at a place where consumers' expectations regarding climate solutions will not be just for giant companies such as Microsoft or Amazon. But, they will have these expectations from small businesses such as coffee shops. That's where Aspiration will be able to help in getting individuals, small businesses, and giant companies to net zero. We are creating a one-stop-shop solution with technology around carbon footprinting that will make our portfolio of high-quality solutions, including carbon credits. In addition, we would allow those companies to communicate their actions to their customers.

Corporations have budgets for CapEx on the innovation for decarbonizing the supply chain, spending on carbon capture technology, and buying offsets. Where is the focus of Aspiration?

We play across all those areas. We have built more technology and are continuing to develop it around carbon footprinting, especially our ability to have fine-tuned approaches around Scope 3 emissions. We have made significant investments in bringing a portfolio of half a billion metric tons of carbon removal credits. We are focused on a higher quality tier of those credits, and we highly believe we will achieve that.

Is there a shortage of high-quality credits?

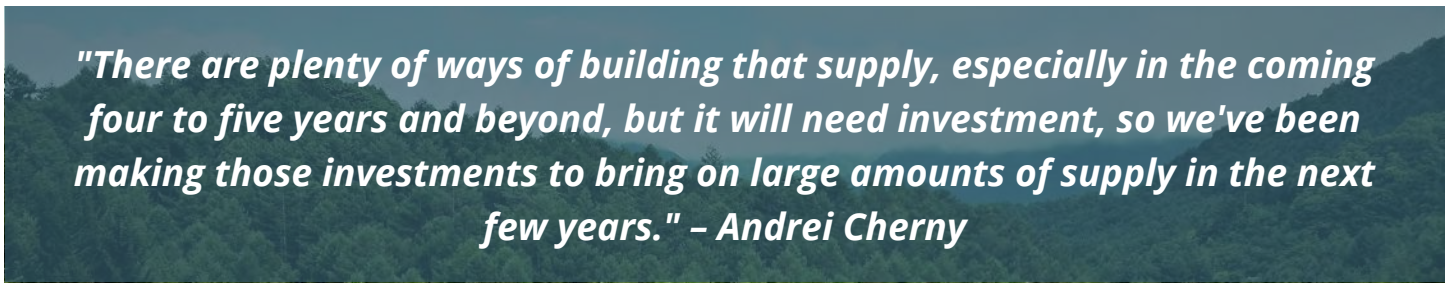
The supply and demand are imbalanced, driving the carbon credits prices up significantly, and will continue to do so. We have created the Aspiration Standard, the set of criteria we look at to bring credits into our Aspiration Portfolio, be it in short-intermediate terms or long-term aspects of that portfolio. We are looking at the elements around additionality, permanence, survivability, biodiversity, and co-benefits, such as dealing with the local community on the ground not only in terms of employment but in terms of long-term appreciation for the economic value that they are creating. Looking at the verified credits landscape, only 10-25 percent of those verified credits meet our standards. So, if we eliminate 75 to 90 percent of those verified credits in a market with a relative undersupply of credits, we will have an even more constrained supply. We are also bringing investment into expanding the supply to prevent it from falling short. There are plenty of ways of building that supply, especially in the coming four to five years and beyond, but it will need investment, so we've been making those investments to bring on large amounts of supply in the next few years.

How do you work on project development?

We not only provide the financing but are in regular contact with those developers. We co-develop the projects using our expertise and experience in this space.

How can the companies that have yet to start the climate journey acquire their first assets of high quality to achieve the goals they have set for themselves?

We will be bringing the Aspiration brand and Aspiration credibility into their business so that they don't have to create their own sustainability team and their own assets. They would know that when they get credits through Aspiration and put the Aspiration seal on their business, it will depict them as climate-zero or even climate positive. Because of our climate-conscious consumer base and as a recognized name in the climate space, we can leverage that credibility and allow companies not in the credit development space but with net zero targets to bring that credibility into their business model. We will help them create the impact they tell their customers, employees, and stakeholders about.



"We are very clear about who we are. We are not a large financial institution, but we are in the business of fighting the climate crisis. This makes it very easy for us to decide who to work with." – Andrei Cherny

Is Aspiration offering all-encompassing services to corporates?

We are not a consulting firm or a broker, but we offer companies one-stop-shop services that allow us to leverage technology to show them their carbon footprint and a path to net zero.
Companies need to reduce their carbon footprints not just because of top-down pressure from the SEC or investors but also due to bottom-up pressure. Their customers and employees are demanding and expecting them to take steps around climate and build that into their daily offering.
At Aspiration, we have the experience, technology, and mechanisms to bring climate solutions to life for those customers and employees. The businesses are taking climate-friendly steps, thinking it will make them more profitable by building their brand around sustainability internally for their employees and externally for their customers. Aspiration is unique in what we offer.

How do your sequestration products work?

Offsets alone will not save us, but nothing can save us alone. We are working on reducing as well as removing the carbon footprints. We are working around nature-based solutions as well as technology. We believe that companies, as well as individuals, need to take action. We are going to do all of the above. Aspiration is building a one-stop-shop home for individuals and businesses that are looking to take steps around getting to climate zero and the tools required to achieve this. We offer all such solutions to help our customers achieve Net-Zero targets.

Aspiration's revenue model

There is so much to what we do. For example, for the individual-based part of our business, we have Aspiration spend and save account where we get paid like any other bank, such as interchange revenue and interest income.
We generate revenue on the trees we plant; we have an Aspiration zero credit card and an Aspiration sustainability subscription.
For businesses, we get paid per carbon credit we bring to those businesses, usually in a value-added way. So, with that credit, we will bring in the footprinting technology and the ability to market around the Aspiration brand. We will use it in the path for that business to get to Net Zero.

What message do you have for the communities that have built infrastructures around carbon?

We are very clear about who we are. We are not a large financial institution, but we are in the business of fighting the climate crisis. This makes it very easy for us to decide whom to work with. We have individual customers and businesses in all 50 states and many parts of the world. We only work with those

individuals and companies that want to bring the fight against climate change into their activities.

Is blockchain technology a red herring, the future, or something in between?

Blockchain technology is a tool that will not change the fundamental nature of the problem or a solution out there. There are probably use cases where putting tokens on the blockchain will be helpful, but I don't believe it will be truly transformative for the space. Again, it comes down to what you are trying to solve.

Will Aspiration offer tokenized products to its customers?

Absolutely, yes. It is in development.

Will you ever embrace credits that may not be on the registry but have the scientific rigor to meet the Aspiration Standards?

Yes, and I think the registry plays a vital role for certain customers. Through our market research, surveys, and speaking to our potential customers, we found out they don't care whether the credits are registered. They only want to know whether they can trust the credits. There are a lot of registered credits out there you can't trust, and they don't meet our standards. We can bring some credits to the market that don't necessarily need to be registered, provided that they meet our standards, and we can put Aspiration's name behind them.

What do we need to see from a public policy and market adoption standpoint to grow nature-based solutions in the United States?

There are two parts to that; one is looking at the cost curve in the US. Credits have been developed around aforestation in the US, and people receive more significant economic incentives for cutting trees and selling them in Europe. There should not be economic incentives for such activities.
We are undertaking several projects in the US to bring economic value that is competitive with what we bring globally. We need to bring cost-effective and cost-competitive projects to the United States.
The other part is making those projects work better around the world. We see pushback in developing countries regarding climate solutions because we have not dealt with those communities into the value they create. Another version of Extractive Economics can't happen in the carbon market in the way that has occurred in the developing world for other natural resources. We are creating another natural resource, carbon removal. Economics must be shared with the communities and individuals fighting to save the planet. They have to be dealt with the economics that would come around. That is going to mitigate some pushback.

Why are companies not offsetting in the regions where the pollution is occurring?

We are facing a global crisis. The greenhouse gas emitted in Washington State by, say, Boeing is having an impact on the sea level around the world. The solutions will often be local, but the impacts are happening globally, just like the current flooding in Pakistan and India. Climate change is impacting the globe, so the solution must be designed in a globalized fashion.

What is the state of public policy in the US in the context of big structural issues we have to deal with?

We can see a tradition of inaction in the federal government for decades. We've seen the pervasive force of special interest action in Washington D.C. for generations that have stopped progress at every point. In the Inflation Reduction Act, an exception proves that rule because it is a monumental step forward. Yet, if you look at it from those decades of history, you can assume we will not get another Inflation Reduction Act. All of the studies show Inflation Reduction Act can get us halfway to where we need to be by 2030. I assume the other half will not come from the government but from the rest of us. This is where we are focused on empowering businesses and individuals to combat climate change.

How do you view global policies in the context of global cooperation around climate issues?

Climate solutions are expensive, but we are seeing a new generation and a set of coming generations that look at the cost difference. We undertook a study on climate-conscious consumers and will release its results soon. We found that income or education does not impact climate-friendly decisions, but age does. Millennials, Generation Z, and this new generation have different views on the cost. They are willing to pay more even when they don't have more money than the older generations because they understand that the cost they spend will impact the many coming decades. I believe this will speed up our efforts to reduce carbon footprints.

Carbon Direct: Overcoming the Limits to Growth

Featuring: Jonathan Goldberg, Carbon Direct
and David Ryan (moderator), Climate Change Solutions

Summary

Jonathan Goldberg, CEO and Founder of Carbon Direct, discussed how the company is using climate science to inform companies' decisions on how to most effectively reduce their emissions. Carbon Direct believes that science-led carbon management is the key approach to ensure that climate goals are achieved in the short time left available. Its carbon management systems explore the full gamut of climate technology ranging from sustainable air fuels through to which are the best sectors to buy carbon-removal credits from.

About Carbon Direct

Carbon Direct started three years ago and has two main strands:

- An investment business focusing on deploying capital to high-growth technologies, from carbon capture to carbon conversion. This business is independent but compliments our client-facing business.
- We are working with companies and governments on various forms of their net zero commitments, using carbon removal or carbon management strategies. We apply a scientifically rigorous approach to those strategies.

How does the Inflation Reduction Act (IRA) feed into the reductions in carbon in the atmosphere?

We were excited to see it pass. It is huge for climate goals. When it comes to carbon capture and carbon removal, there are a couple of considerable provisions.

A point source carbon capture is what you get for capturing CO2 from the point of emissions, which went from $50 to $85. That's a big deal. The technology costs of carbon capture are going down quite quickly, increasing the economic incentive for customers to implement carbon capture and storage (CCS). It expands the types of customers you can have. Today, if you have ethanol production next to a pipeline, $50 probably works for you to do a CCS retrofit, but if you're further from geological storage, it's more challenging. This is addressing more than five Gt of carbon abatement. The Jenkins piece shows an eight-times increase in CCS capacity. Certified Emissions Reductions (CER) also got a huge boost going to $180 if you're directly capturing CO2 and sticking it under the ground. The current cost is still above $180 but what we're seeing from our clients is a voluntary market that's trying to bridge the gap between the current high price and the longer-term regulatory support. The $180 means you have a lot of incremental revenue coming to the CER company, and private markets can diverge. There is a lot of good stuff in the IRA, including green hydrogen, sustainable aviation fuel, and renewable power expansions.
Overall it is a great bill and quite supportive of CCS. We are still far off climate targets that we need to hit, and we're pretty far from the scale of carbon management that we need to do.

How do you feel about Microsoft's path for carbon removal?

I do not think any individual company's carbon removal purchase will solve anything. It's important to contextualize what these early programs are doing. They are removing carbon from the atmosphere, but more importantly, they are putting our guardrails for how the industry can grow.
There is now more governance scrutiny about how CCS will work. As a result, high-quality reports that we can right work with some of the other efforts. Microsoft also addressed historical emissions, which is consistent with science, and it's great to see them doing it scientifically. It's not just the 40 billion tonnes per year that we need to address but also the historic 1.67 trillion going back to 1750.

Is Microsoft a template for how you're working with other customers? And, what solution do you have for smaller corporates so they can engage also?

On carbon removal, the process by which we work with our partners to evaluate carbon removal options and ultimately procure them is pretty similar, however much you're buying.
There are evaluations of the options out there, and you need to understand the different products. With different budgets, you're able to make different types of purchases. Some purchases are forward agreements. A company like Microsoft has an outstanding balance sheet, so it can do these long-term commitments and have them backed up by credit. That framework can be applied to both big companies and small ones. We've developed software in addition to our traditional advisory services. That's growing quite quickly and is precisely intended to help smaller companies and B2B companies.
We're working with one called Scope3 that's working to decarbonize advertising. They have several partners in their ecosystem who want to tap into high-quality carbon removal, and we can facilitate that.
Carbon removal isn't just for big companies; there are some advantages to big companies going first. If they can get some of the supply going, it creates excess supply that smaller companies can tap into. So I think that's how the market should grow.

In terms of the overall client base, the carbon removal element is similar across clients, but the carbon management is very different. For example, we have clients in the aviation space, and their most significant source of emissions is petroleum fuel. Therefore, they are interested in their options for sustainable aviation fuels and how to scale them into their purchases over time.

What do you think about avoidance strategies?

It's a big part of what we do. We don't advocate for purchasing avoidance offset, but we think that avoiding them in the first place is a key criteria. Dr. Julio Friedmann, our chief scientist, says he likes the hard-to-abate stuff because that, in many ways, is what we're here for. We have unique expertise with steel and cement where it's been hard to abate, but also, there's been no incentive, which is now changing. One of the applications for green hydrogen is in the steel sector. We tackle hard to abate head-on, recognizing the scale of the challenge. We're at such a small base right now that even if you apply very high growth rates, there will still be a lot of emissions going forward. A combination of removal and avoidance will take us in the right direction.

Could you talk about any of the investors you've got in your growth portfolio?

We're excited about where the investment opportunities are in carbon management, and carbon direct capital management operates separately from the advisory business. Still, it shares the same mission of scientific support for the carbon ecosystem. We invest in various spaces, including carbon removal such as direct air capture, mineralization, converting waste biomass into products, and carbon storage through companies that take residual waste biomass, turn it into electricity, and store CO2.
About 40 percent of our portfolio is in the conversion of CO2 into stuff. So, for example, companies like Twelve are turning CO2 into carbon monoxide or, ultimately, into things like jet fuel.
We like the part of the market where you can get low or negative carbon materials and products in vast areas of emissions. So it could be a small green premium to start, but I have reason to believe that green premium will quickly dissipate to nothing. The IRA and the commercial transaction we see across the spectrum are pretty exciting.

What are the most exciting mineralization or enhanced weathering prospects that you see?

The verifiers are a bit behind, but we don't find mineralization a difficult thing to do in terms of measurement. Our science team has plenty of experience. You can weigh and check the changes in CO2. It's easier to measure than some other carbon offset approaches.
When we look at the ratings agencies broadly, we're happy they're there and want to work with them, but methodologies keep coming out, so having an approved method isn't key to progress. We've worked on protocols with a company called Charm. The market is still trying to figure out the right verification strategy.
The key is to have the scientific path to understanding carbon storage, whether engineered or nature-based and then to give some measurement over a long period, particularly true in biological solutions. Clients are paying for climate storage and need to know it will last.

"Even when companies have less money to buy carbon credits, they still focus on energy supply and security." – Jonathan Goldberg

Are you doing any work in agriculture?

We've got a fantastic team of soil carbon scientists, and we have projects in the pipeline. Carbon Plan has written about the current state of the soil. We're working with some clients doing exciting things in the field but aren't quite ready to announce anything yet. We have just added another soil scientist to our team. Soils have held huge amounts of carbon over time and released huge amounts of carbon over time. But, there are ways to improve that performance.

Is general economic turbulence affect demand for you?

In short, no. Energy security is a hot topic now within a net zero framework. Even when companies have less money to buy carbon credits, they still focus on energy supply and security.

What about converting palm oil liquid effluence, a methane-emitting bio waste, into bio-CNG? Would that be interesting enough for Carbon Direct to consider carbon finance?

I have no comment in the abstract on that. We would need to look at the life-cycle analysis (LCA) of the particular process the person is looking at, what feedstocks are used, and other factors.
If you're looking at carbon removal, ensure that you carry out complete LCA. Hydrogen can be a potent tool for decarbonization, but only if you consider upstream emissions, methane flaring, and other things.

Where are we on the dollars per ton for CCS?

The spot market for direct air capture is small, with fewer than 50,000 tonnes per year. The price ranges go up to $2000 per ton; call it $1000 on average. We see the cost declining over time relatively quickly. We'll see the increased implementation of direct air capture. It could be about $200 per tonne by the decade's end. In the context of levelized carbon abatement, which is a suped-up marginal abatement cost curve, it's somewhat reasonable. You could spend more than that now per tonne of carbon abated in several different industries. If we're pushing towards that cost by the end of the decade, it's a good sign for the industry.

How long does it take, on average, to develop a carbon removal strategy for the companies you work with?

We have educators in our team in addition to software engineers. Different companies are coming to this stage at different points in their journey. Some are well-staffed with big sustainability teams or have a background in carbon science. For others, we start with a broad overview of what carbon removal is and why it's essential and then move into purchasing. Those can be 3-4 month engagements. Others are

ready to buy. Then, they need to purchase and do the footprinting work with the software. That can be pretty immediate, though. There's still some integration, but it's not complicated.

Where is the private capital in offsets?

All GDP has a function of carbon emissions associated with it. The public market could be $2 billion in terms of VCM spending. Private capital is coming into things that will generate more credits over time, both in the VCM and compliance market. So there's money coming got help to facilitate transactions. The significant capital that's needed is the demand signals. We need more companies to purchase credits and purchase credits of high quality. We need more companies to buy carbon removal. Those demand signals will help to incentivize more private capital. If there's no transparent market for it, the investment will be limited, or at least limited in terms of the overall economy and framed against emissions.

Can smaller companies access credits via you through the software?

We haven't done it through our software, and we support the client doing it themselves. We are less about providing the credits and more about ensuring that the client has the scientific grounding to purchase well, knowing that good MRV is associated with it. It's making sure that the available supply is scientifically rooted. It's looking out for the credit and helping it scale. Our priority is physically getting the carbon into the ground.

What's your view on the world's path to the Paris Accord and reaching those objectives?

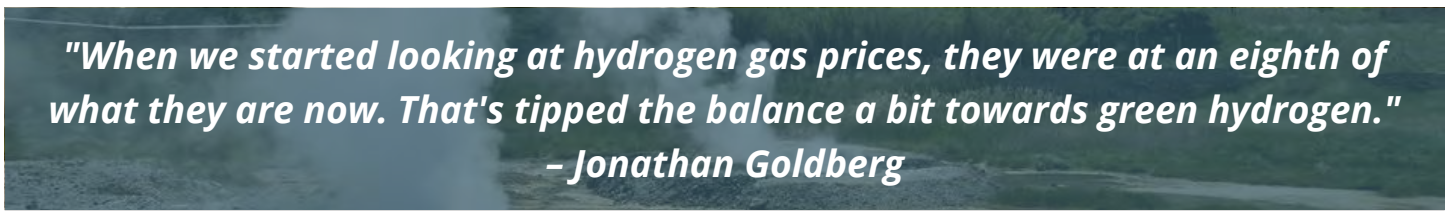
We're off track. We're heading towards a global temperature rise that is not only bigger than what Paris allows for. We're not adapting very well to 1.2 degrees, so the impetus is to act with much more aggression. We will tell our clients that every bit of work that can be done helps to limit the impacts of climate change and that carbon removal matters quite a lot, and that's why we need to accelerate this whole industry.

Which carbon capture method do you think we should be paying more attention to?

All have their strength and are more effective under certain circumstances, but we must do them all quickly. CO2 removal will always be more expensive than point source CO2, but removal allows us to deal with the historical stock of carbon in the atmosphere.

On CAPEX, the scale of green hydrogen required is daunting. Do you have an idea of how that would scale on the timeline?

We'll need a vast amount of renewable power. When we started looking at hydrogen gas prices, they



were at an eighth of what they are now. That's tipped the balance a bit towards green hydrogen. Hydrogen has its challenges, including supply chain and production gaps. It has a massive part to play, but it's not the answer to total industrial decarbonization.

What will the business look like in five years?

Our model is to work with clients who need help to decarbonize. For example, we have clients who need to purchase removals. We started with big successful clients, but we want to bring that to smaller companies too.
There is a tendency for technology companies to want a simple one-line answer, but this is a more complex problem than that, and we've got tools to take that into account.

Climate Vault: Funding Carbon Tech via Compliance Markets

CLIMATE VAULT

Featuring: Michael Greenstone, Climate Vault
and Oghosa Erhahon (moderator), Energy Transition & Sustainability Advisor

Summary

Climate Vault is an innovative non-profit from the University of Chicago using compliance offsets as a tool to fund cutting-edge sequestration projects. CEO Michael Greenstone joined us for a conversation about how Carbon Vault is upending the funding of carbon capture projects via a donor model where carbon offsets enable his firm to sign multi-year offtake agreements rather than providing equity or grant capital.

What's the distinction between voluntary and compliance markets?

In the voluntary markets, the buyer, seller, and agent get what they want, but there's no proper control to ensure that actual emissions are reduced. Compliance markets are all about verifiable emissions, much more tightly controlled and enforced by the relevant government.

How long have you been going, and what have been the challenges?

It was easy to register as a purchaser. We are now purchasing credits on behalf of our donors. Vanderbilt university went net zero, and Morning Star has been a significant client. Vanderbilt went carbon neutral almost overnight once they realized how easy it was to purchase offset credits.

How do we get other institutions to speed up?

They think it's challenging, and they have an enormous distrust of traditional offset programs. They have buildings or other assets that can't immediately be decarbonized. But, once they realize that they can just purchase the carbon through Carbon Vault, it releases them from the long grass.

Is Climate Vault involved in mineralization?

We've announced to the world that if someone can sequester a tonne of carbon in a verifiable way, we'll trade one of our credits for a ton of carbon sequestered. We have a group of experts who assess the credibility of sequestration projects. To date, they have not authorized any mineralization projects.

What does the cost curve look like for direct air capture?

Direct air capture is essential, but it's like a science project. Climeworks are at the front end of the industry, and they have done around 4000 tons only at $1000 per tonne. So, our clients mainly want the lowest cost offset they can have. Climate Vault is about carbon reduction today, not waiting for the technology to emerge. In addition, investors can help foster innovation. Then, when those innovative technology prices come down, you'll be able to swap your reduction in the compliance markets for carbon removal.

What is stopping people from using compliance markets?

You have to be registered with a market to purchase credits. But, again, Climate Vault has the solution.

How is the global market now?

There are about 25 compliance markets around the world now. Compliance markets are so appealing because they are regulated by governments capable of charging large fines. The voluntary market is still very immature, based mainly on emotive marketing. It needs to become laser-focused on delivering cost-effective carbon. There was a tiny VCM for a long time, but over the last few years, there has been increasing demand as companies release large targets. There is an incredible opportunity for anyone with disruptive ideas for the supply side.

Are the 45Q tax credits a game-changer for the Carbon Capture and Storage (CCS) cost curve?

It is super important. It will help unlock the cost reductions necessary to make those technologies into ranges people are willing to pay for.

What is the 45Q?

It is primarily for CCS that catches carbon out of the stack. They pay $50–$85 per tonne, and it starts to provide payment for specific technologies. Climate Vault also wants to provide a price signal for a more comprehensive set of technologies for the same reason: to get money into those technologies that need

"The voluntary market is still very immature, based mainly on emotive marketing. It needs to become laser-focused on delivering cost-effective carbon." – Michael Greenstone

to be developed. The inflation reduction act is essential in American history, as it was the first moment of actual climate policy, though it does not cover every sector of the economy. It gets America out of the gates and allows them to negotiate reductions better. It's a seminal piece of legislation.

Did your role in the Obama administration affect your view of compliance markets?

The goal was to work on climate and energy broadly, and the center was to pass a carbon market for the states. It passed the House but not the Senate. So I thought it was an obvious idea to use voluntary reductions.

How does the Climate Vaults model differ from Shopify?

Shopify is very expensive per ton. It's essential to the work that they're doing, but they're far away from what many families and businesses have available. They're around $1000 per ton. Carbon Vaults are about reducing carbon today through compliance and trying to stimulate removal, and if removal becomes equal in price, we will switch your investment over to removal.

Do Climate Vault companies pop in, purchase, and go, or is there an ongoing relationship with the customer?

They have long-running relationships, and it takes people a while to start doing it, and it solves the problem they had. The renewal rate is about 100%. So everyone who signed up in 2021 is back in 2022.

Emissions Trading System is around $60, and on VCM as low as $3, so how does Carbon Vault price its credits?

Carbon reductions are $20 per tonne. That broad spread of prices in the VCM is because credits come from various sources. Carbon Vault offers a credible reduction for our more stable price.

Will VCM prices be more stable as more countries get into VCMs?

I've been doing some work in Gujarat, particularly with airline companies. The state of Gujarat has now announced that it will set up its compliance markets. There are roughly 25 operating in the world and 20 in the pipeline.

How easy is it for countries to launch a compliance market?

Not all compliance markets allow non-polluters to participate. For example, we purchase credits from the Quebec/California combination and RGGI, but we're always looking into other possibilities.

Are there any particular CCS technologies that Climate Vault is working with?

We held a call for proposals; out of the 20, we sent four out for a deeper onsite audit. Now our technology chamber is investigating those four to see which meet our standard for quality, and then

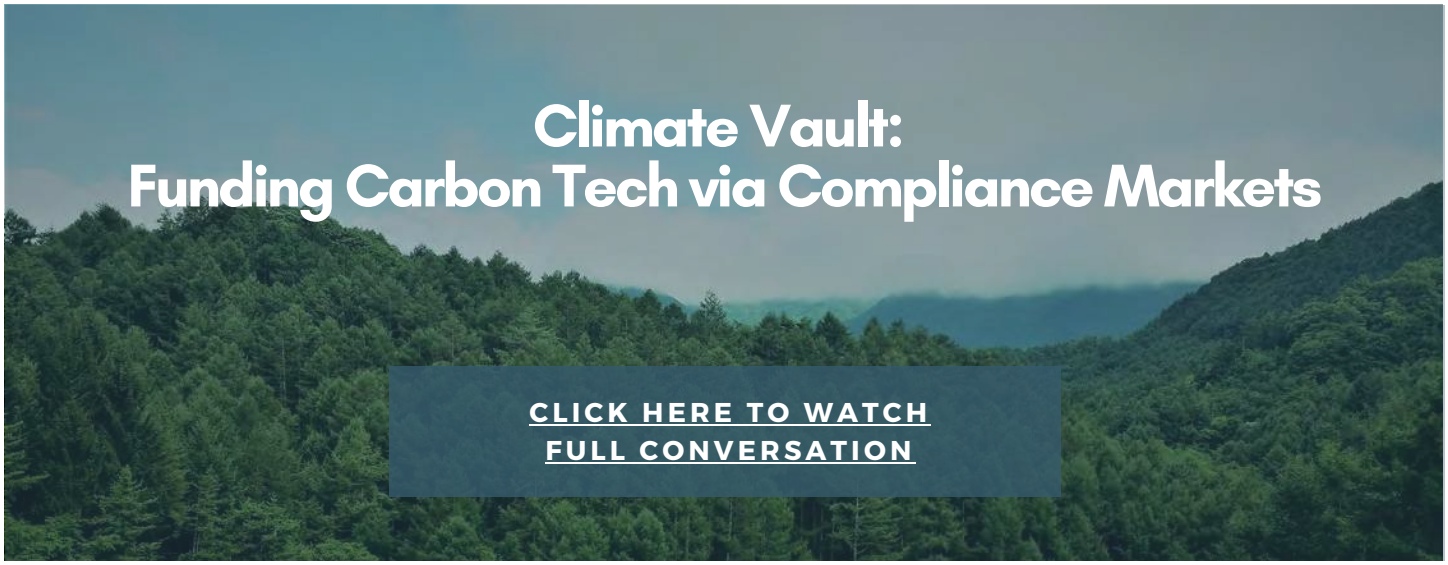
based on it, we'll get recommendations about whether to move forward with any of them. It was a treat watching them discuss the fine details of those projects, a master class in those technologies. The technology chamber is still going through that selection process.

What kind of organizations or sectors is engaging with you?

In the education sector, many students are pushing organizations forward, and we've got a lot of traction in financial markets because they're already comfortable with market processes. Getting a major energy company in would be a huge coup. Software companies have also shown promising signs. We offer a new take on ESG, which is that investors can show Climate Vault their portfolio, claiming a percentage of their investments emissions corresponding to their percentage ownership, add it all together to sum up, their whole portfolio, and then purchase the credits through Carbon Vault to make their entire portfolio net zero. This is much more effective than common ESG strategies as it focuses on the one thing that drives it all: carbon emissions.

How do you guard against greenwash?

Regulated carbon markets do what they do to ensure genuine value, and we have our team of scientists to analyze credits.



ClearBlue Markets: In It from the Start, Now We Are Here

Featuring: Michael Berends, ClearBlue Markets
and Paul Krake (moderator), Climate Transformed

Summary

ClearBlue Markets aim to increase transparency and confidence in the sometimes-opaque world of carbon markets. Michael Berends, ClearBlue's Managing Director of Origination Michael Bereends joins us to discuss the importance of having easily available and trusted prices to allow offsetters to purchase credits safe in the knowledge that the money is going to the projects themselves rather than ending up in the hands of third parties. ClearBlue sees harnessing the power of markets to create solutions is the most effective way of overcoming the huge obstacles the world faces to tackle the climate crisis.

About ClearBlue Markets

ClearBlue was founded in 2016 by a team rich in compliance market experience going back two decades. We're supporting our clients from an advisory, analysis, and advocacy perspective on all major markets. We have over 200 clients, including Dupont, Chevron, ExxonMobil, and Amazon, who have been with us for 5 or 6 years. We're proud to offer market analysis across all types of markets, including the VCM. Our market analysis team produces weekly updates and reports on anything unique happening in the markets. We also have supply and demand reports and bespoke reports. We're very busy with market transactions. The market is very bespoke. Most clients are not regularly active on the market, so they need help understanding what they are buying and what contracts look like. We've developed the portal over six years, a one-stop place for our clients to see what is happening in the markets that matter to them and their position and exposure. Our EYE machine learning tool enables our clients to see the value today of their offsets. It's essential in the VCM because of the variance in price. It allows them to understand what their actual portfolio value is.

Carbon Market 2.0

The EU Emissions Trading System (ETS) was managed mainly from an environmental team perspective until around 2018-2019, with the environmental managers simply transferring over the free allocations they had once a year. So there wasn't much concern about exposure and the need to go to the market. The market took off after COVID. There was less allowance in the system, and more players realized that they needed to be active in this market, and financials came in. A similar story is in the Western Climate Initiative. We watch which corporates are setting emissions targets and see a daily uptake of target setting. We've seen corporates making their commitments but still figuring out what they will do, so they are not so active yet, but that will come. We've categorized offsets to help customers understand what they are because corporates often want to purchase offsets related to specific locations or technologies. An issue going forward may be whether or not there is sufficient liquidity in the markets. It's great that there are more standardized contracts, but is there enough liquidity to support them? Offsets are part of the solution but not the endgame. They help companies who need time to adapt processes and assets to achieve their targets over time. We forecast an upward trend in offset pricing. Carbon pricing is here to stay, and we're seeing the need to support VCM and engagement with compliance markets.

Does your customer prioritize a ton of carbon over everything else?

We must educate our customers on what the aim is here. For example, co-benefits are significant in solving sustainability issues. Suppose your net zero targets include sustainability targets. In that case, it's more important to have co-benefits, but if your priority is reducing CO2, you may not give importance to co-benefits or technology innovation. So it's essential to understand what you are buying and why.

Why wouldn't they just go straight to the ETSmarket for someone whose job is to offset carbon?

Buying an allowance doesn't mean that you made a reduction. Purchasing allowances may be required to comply with that program. Still, it doesn't mean I've done anything for carbon neutrality because it hasn't come from a project that has reduced anything. Also, if you're looking for a low-cost option, you wouldn't go to ETS.

As 10,000s of companies are suddenly required to purchase carbon offsets, is there a risk of a race to the bottom?

Our take on it is that if you're working with an accredited registry, the quality of those credits is assured. If the body issuing that offset is credible, the office should be equally credible to other offsets. If your declaration says that you're looking for other co-benefits, those things need to be considered. I don't see it as a race to the bottom. I see it as a race to get credible offsets.

"We've categorized offsets to help customers understand what they are because corporates often want to purchase offsets related to specific locations or technologies." – Michael Berends

Are you doing pre-issue finance to help developers?

Yes, we want to support these projects from day one and get a reasonable price for their offsets. So that, to us, has a lot of value. The price shouldn't tell you if the project is good or not, but the project itself.

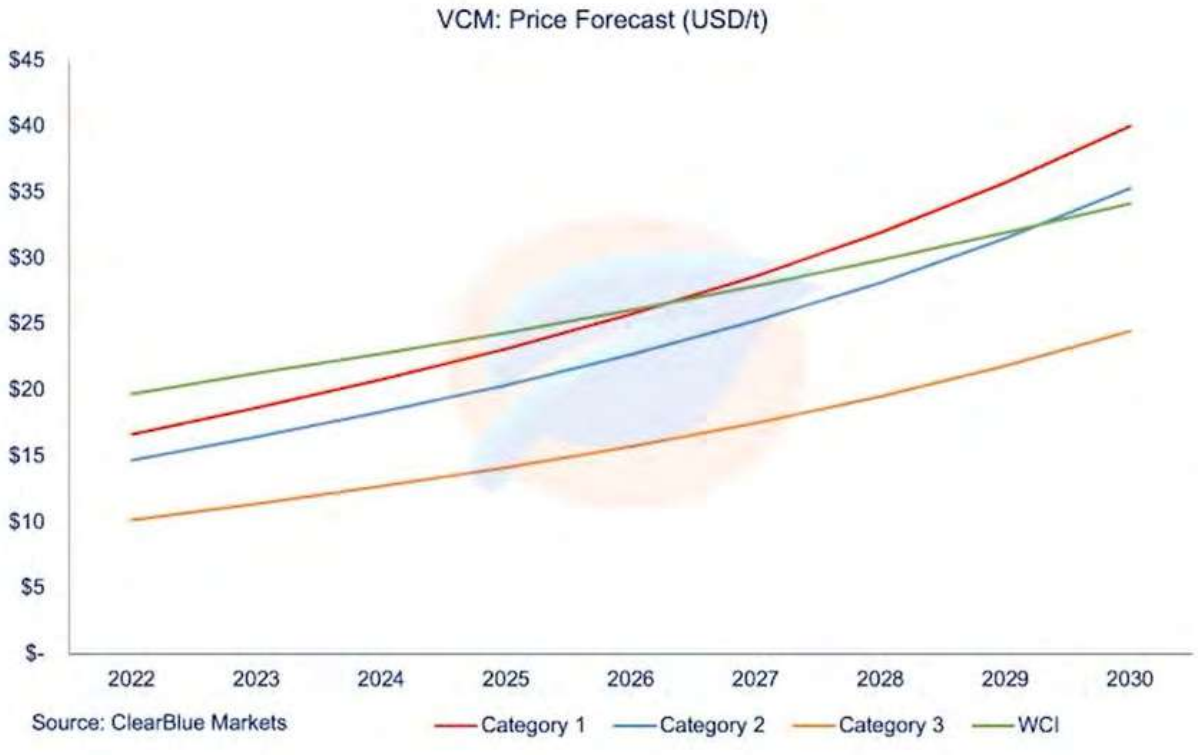
How do you assess prices and price variation?

The real value will always be a tricky question because of the bespokeness of the market. However, if your strategy and aims are clear, you can develop a clear procurement strategy. Going in with a specific price in mind should be thought about carefully because offsets may be mispriced. It's not easy to produce an offset, so Verra and Gold Standard are doing their job in ensuring the quality of offsets.

What do you need to have price discovery on forwarding markets?

.

Adequate liquidity—if I can't hedge any forward volume that I expect to come, it's tough to use that forward curve, so when we're helping clients to price offsets, we mustn't necessarily price the offset on a price forecast. So a forward curve is significant, and we have that as part of our model, including the rates of that offset project and how they go up. If I were a risk manager and someone came to me and said that they had a portfolio of offsets, I'd like to know if future volumes could be hedged against something. That's what we're probably still missing today, that liquid market. In the past, Carbon Emission Reductions (CERs) were trading on the ICE with significant liquidity so that you could forward hedge your portfolios, which added a lot of value. We're looking into that, and it would make portfolio management much more sophisticated.



Source: taken from ClearBlue Market's presentation at Voluntary Carbon Markets – A Gold Rush.

Is there a role for rating agencies in your framework?

The value of the rating agencies goes back to the discussion about co-benefits. They're beautiful for giving value to all the co-benefits, but has it reduced actual CO2? But, again, that is the job of Verra, ACR, etc. I don't think it's the role of a rating agency to say if something is additional or not, only credible registries.

Is there a place for self-verification?

The moment anything goes wrong, if someone self-verifies their offsets, questions would be raised. Emitters send relevant data to a third party verifier. Their report is then submitted to a regulator who approves it.

Has the quality of the project manager improved in the last 12 months?

I think people realize that it's not so easy to set up an offsetting project. It's one thing to sign off on a project, but it's another to bring it all the way through to implementing, managing, and monitoring it. Yes, the project managers may be getting better, but I think there are still a few in for a big surprise.

What are some of the critical elements that could bring liquidity to the market?

The financials and oil players, and commodity traders are getting involved. In addition, corporates are increasingly going direct to project developers, which means that those credits never go through an exchange, which is a potential challenge. How do we bring volume to our exchanges? We also need to focus on having liquid contracts. My concern is having too many bespoke contracts on different exchanges may impact liquidity. Corporates buying on the secondary market that don't have active trading commodity floors are not active on an exchange. We may never see them entering the exchange, so the issue is how to bring them on board.

Note: The terms of this report are subject to and qualified by the terms of the Subscription Agreement between VFTP Financial Publishing LLC ("VFTP") and Investing Transformed Inc (CT) and client receiving this report. Unless otherwise specified herein, in the event of any conflict between the terms of this Disclaimer and the terms of the Agreement, the terms of the Agreement shall govern. Defined terms not otherwise defined herein shall be as defined in the Agreement.

The comment in the reports are editorial and reflect our interpretation of the comment made by speakers during the Climate Transformed Panel discussion on September 13-14, 2022.

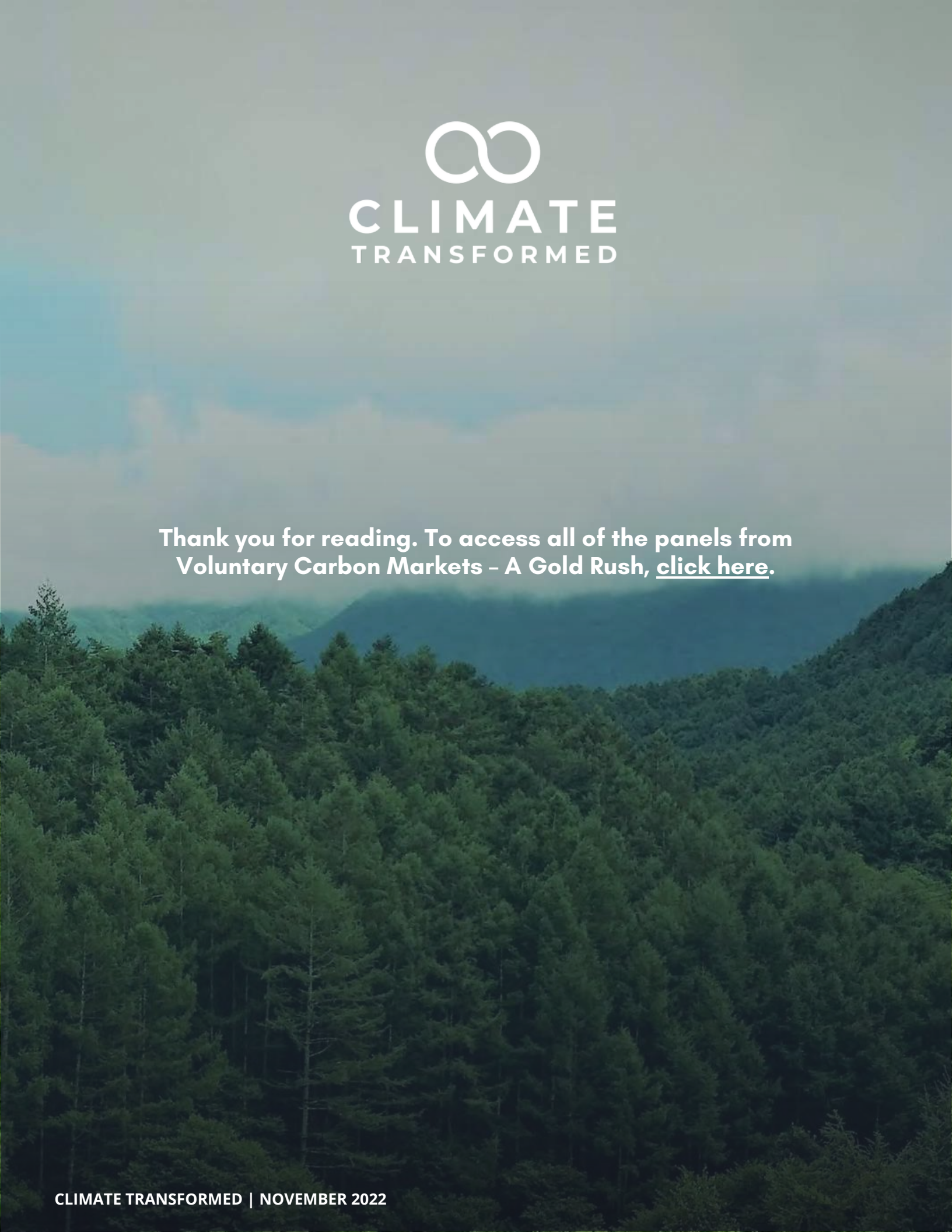
All Sources Bloomberg unless stated

Analyst Certification

The analyst(s) named in this report certifies that (i) all views expressed in this report accurately reflect the personal views of the analyst(s) with regard to any and all of the subject securities and companies mentioned in this report and (ii) no part of the compensation of the analyst(s) was, is, or will be, directly or indirectly, related to the specific recommendation or views expressed by that analyst herein.
Required Disclosures
The analyst named in this report (or their associates) does not have a financial interest in the corporation(s) mentioned in this report. Additional information will be made available upon request.

Global Disclaimer

This report is for the use of intended recipients only and may not be reproduced, in whole or in part, or delivered or transmitted to any other person without our prior written consent. By accepting this report, the Recipient agrees to be bound by the terms and limitations set out herein. The information contained in this report has been obtained exclusively from public sources believed by VFTP to be reliable and the opinions contained herein are expressions of belief based on such information. Except as otherwise set forth herein or in the Subscription Agreement, no representation or warranty, express or implied, is made that such information or opinions is accurate, complete or verified and it should not be relied upon as such. Nothing in this Report constitutes a representation that any investment strategy or recommendation contained herein is suitable or appropriate to a recipient's individual circumstances or otherwise constitutes a personal recommendation. It is published solely for information purposes, it does not constitute an advertisement, a prospectus or other offering document or an offer or a solicitation to buy or sell any securities or related financial instruments in any jurisdiction. Information and opinions contained in this report are published for the reference of the recipients and are not to be relied upon as authoritative or without the recipient's own independent verification or taken in substitution for the exercise of the recipient's own judgment. All opinions contained herein constitute the views of the analyst(s) named in this report, they are subject to change without notice and are not intended to provide the sole basis of any evaluation of the subject securities and companies mentioned in this report. Any reference to past performance should not be taken as an indication of future performance. Except in the case of fraud, gross negligence or willful misconduct, or except as otherwise set forth herein or in the Subscription Agreement, VFTP does not accept any liability whatsoever for any direct or consequential loss arising from any use of the materials contained in this report.
Distribution or publication of this report in any other places to persons which are not permitted under the applicable laws or regulations of such places is strictly prohibited.



Thank you for reading. To access all of the panels from Voluntary Carbon Markets – A Gold Rush, click here.