

Solving the No. 1 Issue of Our Time: Using Blockchain Technology to Scale Climate Action



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The 1997 Kyoto Protocol implemented the objective of the United Nations Framework Convention on Climate Change (UNFCCC). The intent was to reduce the onset of global warming. This would be done by reducing greenhouse gas concentrations in the atmosphere to “a level that would prevent dangerous anthropogenic interference with the climate system.”

However, the past 25 years of progress (or lack thereof) is sharply brought into view in the IPCC’s Sixth Assessment

Report on the Mitigation of Climate Change (released on April 4, 2022). It is unequivocal in its conclusions: many of the impacts of climate change are now irreversible. The consolation is that some of the most severe impacts may still be avoided, if we can improve our performance.

Since the signing of the Kyoto Protocol in 1997, there have been attempts to mitigate climate impacts. These have ranged from multilateral climate policy at the international level to highly localized community group action. Solutions have had mixed success; they are often deployed slowly and piecemeal.

As we look forward to 2050 – our cut-off date for achieving Net Zero carbon emissions at the global level (against the pre-industrial baseline) – it is clear that action at scale must be the priority.

Mechanisms that leverage the market for climate action are of particular interest when the question of scalability is in focus. The Voluntary Carbon Market (VCM) is one such solution. The VCM looks to maximize the flow of finance to pro-climate projects across the globe. This will be achieved by using capital allocated by individuals and organizations who aim to compensate financially for their unavoidable carbon emissions.

The VCM issues carbon credits. These are tied to specific activities and projects that can demonstrably and verifiably mitigate carbon emissions or remove carbon from the atmosphere. At the point where a carbon credit is allocated to an end-consumer, the emissions are considered offset. They are removed from the market and the credit for the investment into the planet is allocated to the actor that purchased it.

However, even with the VCM's objective of tapping into market mechanisms (arguably our most efficient way of allocating resources), the incentives for companies, governments and individuals to participate have remained misaligned with

economic realities. In large part this is due to clear market failures associated with expensive and opaque administrative requirements. According to McKinsey, today's carbon credit market is fragmented and complex. There are questionable credit sale practices and limited pricing data that "make it challenging for buyers to know whether they are paying a fair price, and for suppliers to manage the risk they take on."

Growth has continued in our global consumption of hydrocarbons for energy, manufacturing and materials. In turn, with global emissions continuing on a steep upward trend, the shortcomings of the VCM are particularly acute in 2022.

Exploring new solutions that can unlock the market and enable it to scale is now a top priority. Indeed, the Taskforce on Scaling Voluntary Carbon Markets (TSVCM) was set up in 2020 in acknowledgement of the role the VCM has to play in scaling climate action. And, that the key barriers manifested within that market require addressing.

The TSVCM invited pre-eminent individuals from across the financial sector, the climate space and academia to come together. They discussed the opportunities and challenges for the market, delivering detailed reports and recommendations on how the market could be unlocked. The group has now shifted its focus to the supply of carbon credits, seemingly leaving behind the question of scale at the demand side of the market. So another group of technology entrepreneurs has been developing practical solutions to legitimately unlock the barriers to scale.

This new group leverages a stack of Blockchain and Web3 technologies for the VCM. Blockchain solutions have already been acknowledged for the role they can play in enabling the emergence of new solutions allowing for efficient market activity. For example, peer-to-peer energy trading trials in Cornwall, UK or to facilitate cross-border trading between Singaporean and Australian authorities.

The transition of the traditional market to the Blockchain is achieved by bridging verified and robust carbon credits. These are issued by leading carbon registries like Verra and Gold Standard, and on to the Polygon Network (an energy-efficient proof-of-stake side chain scaling solution for Ethereum).

This process integrates carbon credits with the Blockchain and exposes them to new opportunities for being transacted. Here they become easier to track, exchange and permanently retire. All thanks to the decentralized, transparent and permissionless nature of transactions hosted on public Blockchains.

The TSVC estimates that to deliver the 1.5-degree pathway needed to avert the worst effects of climate change, the volume of the VCM will need to grow by up to 15 times by 2030. With a coordinated launch in October 2021, carbon-bridging protocol Toucan and carbon-backed digital and other climate tech organizations in the green economy are incentivizing millions of tonnes of carbon credits to be brought on-chain.

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The impact of the entrepreneurs behind some of the most prominent organizations scaling the VCM on the blockchain is made possible by a number of blockchain-enabled solutions, including:

- **Immutable, public blockchains:** Once a carbon credit is bridged onto the blockchain, it can be exchanged by participants or burnt and removed from the market completely, without the risk of double counting. Market operations are permissionless and data is traceable, opening up the market to greater levels of participation and scrutiny.
- **Automated market makers (AMMs):** The creation of highly liquid pools that enable the transparent and efficient exchange of assets on well-established Decentralized

Exchanges such as Uniswap and SushiSwap. This overcomes a key barrier within the VCM associated with over-the-counter trading and illiquid markets.

- Native carbon tokens: By wrapping carbon credits inside blockchain-based tokens, the carbon credits inherit the functionality of other Decentralized Finance (DeFi) tokens. This allows for the creation of new sorts of financial products that can interact with other innovations being developed within the space. For example, the C3 carbon bridge launched in March leverages the gauges first developed by Curve.finance. These offer a new suite of incentives to those who bring carbon credits onto the market, which could unlock a new phase of growth for this ecosystem.
- DeFi 2.0 tokenomics inherited from OlympusDAO: The bonding and staking systems pioneered by OlympusDAO can be transposed to on-chain carbon markets. These can be used to enable users and holders of tokenized carbon credits to receive rewards for locking and permanently removing their carbon from the market.

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The projects and protocols working within the crypto-carbon space have a common goal: to prioritize investment into the planet above all else. This concept of focusing on positive activities that can have an impact that goes further than just the investments of an individual is being termed Regenerative Finance (ReFi). Through the development of inclusive, transparent and sustainable solutions on the blockchain, we can start to envisage an era where tech-enabled climate solutions can meaningfully move the dial on investment in our planet.

This ecosystem is young, with real activity kicking off in late 2021. However, these projects have a multi-decadal scope, just as the Paris Agreement itself does. Based on the latest available science, achieving our long-term temperature goals

required global GHG emissions to peak by 2020 and subsequently be reduced to zero before the end of the century. Although we have failed the first objective, if the second is to be achieved, scalable innovations require widespread adoption now.

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