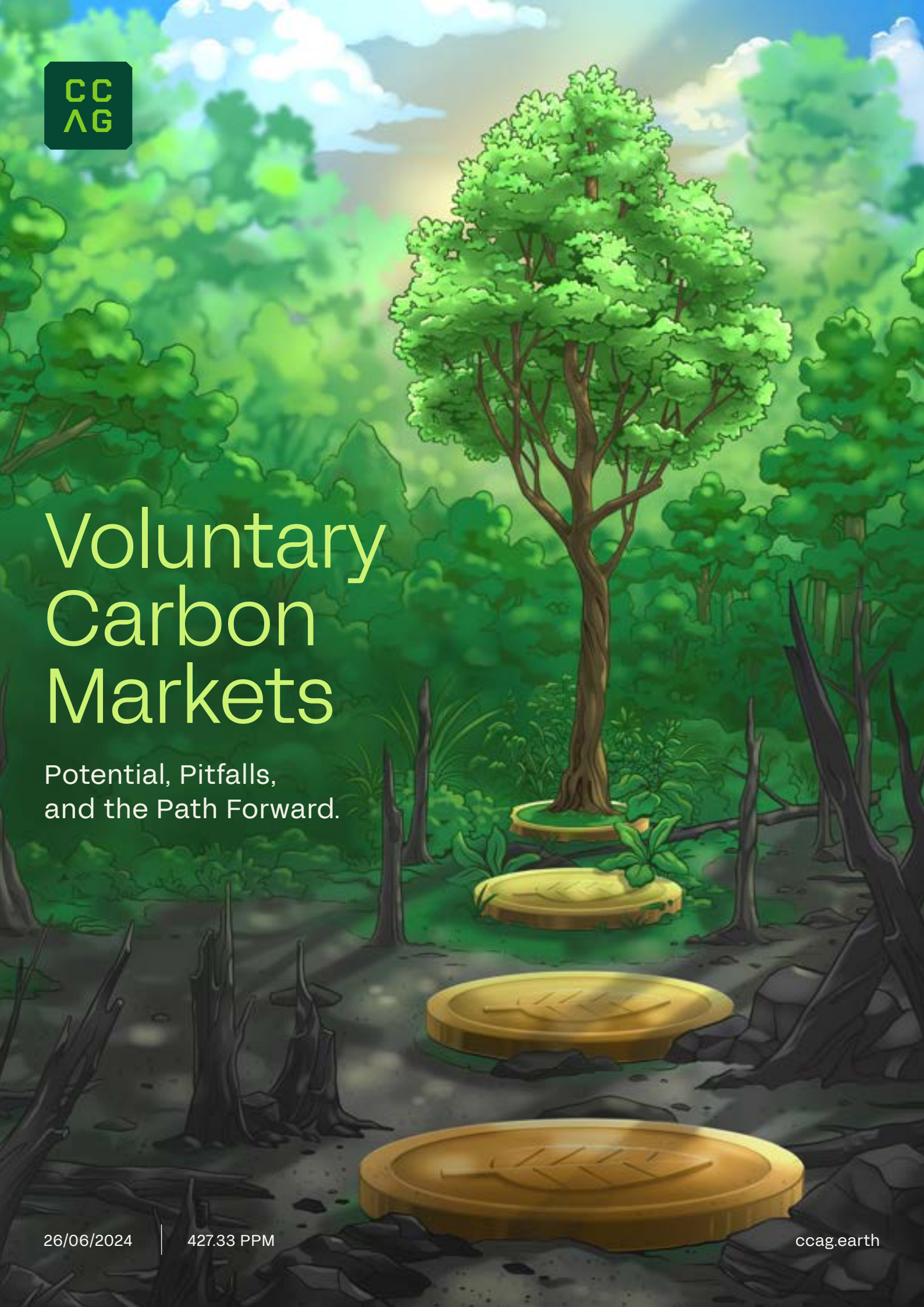




# Voluntary Carbon Markets

Potential, Pitfalls, and the Path Forward.



# Foreward

This latest CCAG report addresses the topic of voluntary carbon markets (VCMs). VCMs allow private sector operators to buy carbon credits, with each carbon credit representing either a quantity of greenhouse gases (GHGs) removed from the atmosphere, or a quantity kept locked up so that it cannot escape. The VCM system has the potential to support global emissions reductions and to speed up the removal of excess CO<sub>2</sub> from the atmosphere. As such, it is most welcome.

CCAG strongly believes that when VCM schemes are based on robust scientific principles, then confidence in their credibility is justified. When implemented, measured and monitored robustly and transparently, these schemes can make contributions to tackling climate change, while also providing important and lasting co-benefits to local communities. Of course, studies and investigations have highlighted weaknesses in the current VCM system which have led some projects to over-claim for their impact. Clearly there is room for improvement. In fact, this report lays out some of the principal areas of difficulty, and highlights the need for key players to raise their game in order to get the best from the VCM system. However, overall VCM schemes have sound underlying principles with genuine potential for significant positive impact. The very recent Nature review of VCM pathways endorses this nuanced view: there is scope for a real, inclusive contribution to emissions reductions.<sup>1</sup>

Detail, of course, is crucial, and as this CCAG report emphasises, attention to transparency and rigour in VCM project formulation and evaluation will be essential. Only through fully transparent measurement and accountability can VCM institutions dispel uncertainty and build trust in the system.

As part of the wider context of the global climate crisis, discussion about VCMs also centres on their contribution to reaching net zero – whether at a global level, or simply within the overall framework of a company's own activities. The usual target date for reaching net zero is 2050. The implication in some discussions is that 'net zero by 2050' will keep the world within the 1.5°C target of the Paris Agreement and all will be well. Because that is such a common frame of reference, it is worth remembering that net zero is not low enough, 2050 is not soon enough, and 1.5°C is already bound to be breached – with the last year (February 2023 to January 2024) averaging global temperatures at about 1.52°C above pre-industrial levels.<sup>2</sup> The reality is that there will have to be massive extractions of excess GHGs from the atmosphere as the century goes on if anything like manageable levels are to be restored.

Sir David King  
Founder and Chair  
CCAG



Furthermore, the northern and southern extremities of the world are heating some four times faster than the rest of the planet. As ice thaw accelerates, the temperature control of the Earth spirals away. And as the permafrost of the Northern Hemisphere melts, it releases quantities of GHGs beyond anything experienced so far. Arresting the rapid thawing is critical as part of efforts to control runaway global warming.

Whole communities and countries face unbearable pressures already, including relentless extreme weather events, loss of life and livelihoods. However, the implication in some commentaries on the climate crisis is that the world is OK so far – and that all the trouble lies ahead. This is clearly not the case.

For all these reasons I reiterate the necessity of a 4R Planet Strategy – with equal weight given to Reducing emissions, Removing excess GHGs from the atmosphere, Repairing systems that are reaching tipping points (whether it be the Amazon rainforest drying out, or melting ice, especially in the Arctic ocean) and building Resilience for people, communities and infrastructure.

VCMs have a part to play in supporting key elements of this strategy. As this report acknowledges, VCMs are challenging in themselves. Your view of them will shift depending on the questions you ask.

- Whether VCMs could work better than they do, and our conclusion is that they could
- Whether VCMs can be used in a meaningful way to offset emissions from fossil fuels, and our conclusion is that ultimately, they cannot
- Whether VCMs can do good on the ground and bring benefits to communities and ecosystems that need help right now, and our conclusion is they can

The challenges are deep, the limitations are considerable, but there is a place for VCMs within a set of tools that can be deployed quickly and nimbly as part of a fight for a brighter and safer future for us all.

# Current role of VCMs

A global consensus has emerged that the world should achieve ‘net zero’ emissions by 2050, with steep emissions reductions between now and then. The same analysis requires global emissions to be roughly halved from today’s levels by 2030.<sup>3</sup> This consensus is reflected in outputs from annual climate COP meetings following the Paris Agreement of 2015; it forms a background to the NDCs (Nationally Determined Contributions) proposed by countries the world over within the post-Paris process; and ‘net zero’ commitments made explicitly by countries around the world, together meaning that 90% of global GDP is covered by net-zero targets. However, scrutiny reveals that insufficient action is occurring to deliver on many of those commitments.

This report examines the role of corporate bodies and their delivery of net-zero contributions (and beyond, eventually, to net-negative contributions). The particular mechanism under review is VCMs, which are a popular means of setting a corporate pathway to net zero. VCMs have definite limitations in what they can deliver for the world. The fundamental weakness as a simple fix for ‘reducing’ corporate carbon footprints is that they allow emissions from fossil fuels to continue as long as they are ‘offset’. However, this is not a like for like substitution and offsets are provided by much less permanent forms of carbon capture, leaving the world much more vulnerable to runaway climate change. This is discussed in more detail on page 5. There is however a potential role for well-managed and transparent VCM programmes, as this report will discuss.

A recent study in Nature, conducted by researchers from leading organisations and institutions, backs this view, confirming that forest-based carbon credit programmes in particular can provide viable nature-based climate solutions.

**Of 43 carbon credit pathways assessed, “many have strong scientific foundations and can deliver meaningful climate benefits”.**

While some pathways – coral reef restoration, crop-land interventions – were found to be of uncertain mitigation efficacy, the study’s surveys revealed that “the most used pathways”, such as forest conservation and restoration, “have a solid scientific basis for mitigation” in which we should have full confidence.<sup>4</sup>

At the moment companies are often not obliged to do anything towards reducing their carbon footprint. In spite of that, many companies have made net zero pledges. However, not all have followed this with action:

“Some may have underestimated the task... Some may never have intended to achieve their stated goals, aiming only to benefit from the positive press... Many others are making good faith efforts to work towards global climate goals, but do not yet know exactly what is required, or lack capacity or resources to deliver on their targets.”<sup>5</sup>

VCMs are proposed as a smart way of channelling the good faith of companies into offsetting their excess emissions via financial support for emissions-reducing projects around the world. Although active systems have emerged for producing, evaluating and selling ‘carbon credits’ (where each carbon credit represents a tonne of carbon emissions prevented or removed), there are criticisms of, and a lack of confidence in, the VCM system.<sup>5</sup>

This report will look at how VCMs should work, but will also look at what can go wrong. It will set out the limitations of what VCMs can logically bring to the global ambitions for net zero, and will conclude with recommendations. These recommendations seek to ensure that scientific rigour and transparency are built into VCMs so their potential can be fully realised in the future. These recommendations should also secure confidence in the VCM system for all participants, who include corporate purchasers of carbon credits, project implementers on the ground, and all others who make up the VCM ecosystem.



## Limits to the Role of VCMs in a Global Energy Transition

VCMs may become much better at what they do if the recommendations of this CCAG report are followed. However, in any analysis there is a limit to what VCMs can deliver for the world, and they should not be allowed to operate as an excuse for national and global bodies to leave carbon removal and preservation of carbon sinks entirely to market forces.

There is a clear argument that you cannot, and should not purport to, equate 'black' carbon emissions (coal, oil or gas) with 'green' carbon sinks such as forests. Black carbon is drawn from carbon stocks that are hundreds of millions of years old; they should never be released and cannot meaningfully be offset with biological alternative sinks whose durability is always going to be vulnerable.

Climate models that give humanity an 'orderly phase out' carbon budget assume that black emissions will cease by the end of the phase out period, and on that basis the IPCC AR6 proposed a carbon budget of about 500 Gt CO<sub>2</sub>; that is now down to 275 Gt CO<sub>2</sub>. Crucially, these carbon budgets exist only because the IPCC made optimistic assumptions about green carbon and the job it would do – all to happen very quickly.

The five core assumptions of the IPCC carbon budget are:

1. Agriculture and other land use will transition from becoming a net emissions system to a net carbon sink. There is no current roadmap or momentum for this to happen. Such a significant 'green revolution' to be accomplished within 30 years would be possible, but would require huge efforts right now, and significant large scale coordination.
2. Intact natural carbon sinks should continue to suck up 25% of ongoing black carbon emissions.
3. Oceans should continue to take up another 25%.
4. The emissions of non-CO<sub>2</sub> GHGs must reduce in pace with CO<sub>2</sub> reductions.
5. There will be massive scaling of carbon dioxide removal from the Earth's atmosphere.<sup>6</sup>

If all of these assumptions were to be met, simultaneously, there remains a 50% chance of holding on to an increase in global temperature of 1.5°C, after an overshoot and return. All of these calculations assume that no tipping point is triggered and that no new surprises emerge from the Earth's climate system and weather patterns. It can be seen from this analysis that keeping the current systems of forest, mangrove forest, wetlands and permafrost, for example, are all taken as a given: accomplishing those things does not 'qualify' anyone to increase (or fail to reduce) their emissions.

Neither VCM nor mandatory carbon emissions regulatory systems must be allowed to perpetuate untruthful 'equality' comparisons between fundamentally different carbon storage systems: a forest planted simply cannot offset coal burned. There is a real danger with VCMs, if not closely scrutinised and monitored – and kept absolutely transparent – that they allow for playing between these different budgets.

However, the paradox is that humanity needs nature more than ever. Investment in nature in numerous ways is more important than it has ever been. VCMs bring funding into much needed projects. Even though the 'natural' or 'nature-based' carbon stores around the Earth's surface may lack durability because of the reality that trees burn down or die, and well managed soils emit CO<sub>2</sub> as soon as ploughing takes place once again, nonetheless they are crucial in the short term for the stemming of net emissions, and for the protection of millions of people and communities. But it is really important that investment which flows into support for nature-based systems is not taken as a legitimate offset against continued black carbon emissions.

The positive aspects of VCMs allow them to be part of a solution, as outlined in this report. But, in line with the report's recommendations, VCM mechanisms need to become managed and regulated so that they are ultimately implemented only in circumstances where all possible 'black carbon' emissions have been actually eliminated from the footprint of the purchaser of VCMs, so that they contribute to the removal of existing excess emissions in the Earth's atmosphere. This will require, of course, that governments and public organisations get involved as recommended in this report as well.



## Why the loss of confidence?

The loss of confidence in VCMs has arisen from a suspicion that carbon credits are an elaborate form of greenwashing. Exposés of weak or failed projects have promoted or inflamed this suspicion.<sup>i</sup> Corporate entities, the typical purchasers of carbon credits, gain nothing from this perception in the long run, since erosion of trust affects the value of carbon credits directly and the flow of trade through the marketplace created by VCM systems. By way of illustration, a negative newspaper article in January 2023 about REDD+ and ‘phantom credits’ caused nearly half of the value of carbon credits to be lost.<sup>ii</sup> This report will show why such volatility may be inevitable if underlying transparency of VCM schemes, and their chosen technologies and methodologies are not strong. In spite of these perceptions, there are good grounds for saying that the underlying science of VCMs is potentially sound, and VCM schemes could be made to work better for all participants.

As well as the science of VCMs, there is no inherent logic for a voluntary scheme such as VCMs to redirect finance where it needs to go and with sufficient urgency at sufficient scale. Global private finance is deeply financialized and VCM systems can only achieve so much against the backdrop of global financialization trends.<sup>iii</sup> This is a separate and important limitation to be remembered when evaluating VCMs and the role they can play.

<sup>i</sup> See page 33 for example.

<sup>ii</sup> The price fell to \$17/mtCO<sub>2</sub>e, bouncing back to \$2.5-\$2.75/mtCO<sub>2</sub>e within a few weeks. (S&P Global, Yin (2023) ‘Voluntary carbon credit buyers recalibrate market strategies, tighten security’ <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/021323-voluntary-carbon-credit-buyers-recalibrate-market-strategies-tighten-scrutiny>); see also Carbon Credits (undated) ‘Live Carbon Prices Today’ <https://carboncredits.com/carbon-prices-today/>

<sup>iii</sup> See for example, how from 2008 to 2017, 466 ‘S&P 500’ companies distributed \$4 trillion to shareholders as buybacks, equal to 53% of profits, along with \$3.1 trillion as dividends. ‘This warps the economy, worsens inequality, distorts corporate decision making and diverts resources from investment in employees and hard assets.’ New York Times, Lazonick et al (2018) ‘End Stock Buybacks, Save the Economy’ <https://www.nytimes.com/2018/08/23/opinion/ban-stock-buybacks.html#---text=From%202008%20to%202017%2C%20466,with%20%243.1%20trillion%20as%20dividends>.



Whatever motivates a company to get involved in VCMs (whether it is to enhance relationships with investors, customers and staff, or whether it arises from a deep commitment to play its part in a safer future), a system in which confidence is weakened will become an expensive problem for all participants. It is therefore worth looking at VCM markets from the perspective that, broadly, participants want to see a credible mechanism that is capable of doing what it has set out to do, demonstrating its achievements, and delivering worthwhile projects supporting real emissions reductions, along with meaningful co-benefits to communities in areas where projects are undertaken.

Current evaluations of VCMs take a variety of perspectives and emphasis. This report will try and acknowledge as many of these differing points of view as possible. However, the recurring themes will be the need for transparency and rigorous application of scientific principles.<sup>iv</sup> The UN High Level Expert Group report of 2023 agrees with these fundamental requirements and urges ambition, demonstrated integrity, radical transparency, established credibility and demonstrable commitment in all emissions reduction efforts by non-state actors.<sup>7</sup>

Even more recently, the joint policy statement of the US aligns with the same principles and guidelines.<sup>8</sup> These values guide the recommendations of this report.



## VCMs today

VCMs are conceptually simple and potentially nimble. They already channel two billion dollars a year through their system, with the expectation that this could grow significantly over the next decade.<sup>9</sup> The belief is that VCMs will also draw public funding into jointly funded mitigation (emissions reduction and removal) efforts. This high potential for common good makes resolving VCM problems, whilst also acknowledging the inherent limitations, worthwhile. If VCMs are asked to do what they are capable of doing, then there is potential for benefits from the system.

Some VCM problems are quite technical: an oversupply of carbon credits is based on old, now out-dated, projects. There is a diverse and complex array of methodologies for carbon crediting.<sup>v</sup> Some problems are found at project level – where claims for carbon removal may be over-stated.<sup>vi</sup>

iv There are many examples of absence of transparency damaging the credibility of carbon credit programmes and projects. See, for example, the argument for 'a dramatic improvement in transparency across the entire value chain' in Nature Sustainability, Delacote et al (2024) 'Strong transparency required for carbon credit mechanisms' <https://www.nature.com/articles/s41893-024-01310-0> Added since V1.

v Some methodologies are based on those adopted within the Clean Development Mechanism, and these in turn were developed by individual project developers. Others emerge from public consultation and external validation processes. See, for further insights, NICA, Michaelowa (2019) 'Overview and Comparison of existing carbon credit schemes' <https://www.nefco.int/wp-content/uploads/2019/05/NICA-Crediting-Mechanisms-Final-February-2019.pdf>

vi See page 33 again for examples. See also Berkeley Public Policy (updated 2024) 'Repository of Articles on Offset Quality' <https://gspp.berkeley.edu/research-and-impact/centers/cepp/projects/berkeley-carbon-trading-project/repository-of-articles>; Berkeley Public Policy, Haya et al (2023) 'Quality Assessment of REDD+ carbon credit projects' <https://carbonmarketwatch.org/publications/quality-assessment-yw84th0r@Ywt-of-redd-carbon-credit-projects/>; Science, Jones et al (2023) 'Forest carbon offsets are failing' <https://www.science.org/doi/abs/10.1126/science.adj6951>; SSRN, West et al (2023) 'Methodological Problems Underlying Voluntary REDD+ Project Baselines Compromise the Environmental Integrity of Carbon Offsets' [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4479825](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4479825)

Other challenges arise from confidence in the market itself, as outlined above, while project-by-project weaknesses will vary from location to location. However, there are systemic challenges and weaknesses in carbon credit schemes linked to REDD+ funded programmes, for example; and these have formed the foundation for many carbon credit schemes. This link to a widely used international funding programme has been particularly disappointing for some participants, and has triggered negative stories and calls for change.

**But significant improvement and confidence in VCMs can be created with relatively simple guiding principles – in particular transparency in the system, and scientific foundations for measurement, monitoring and reporting on project capability and outcomes.**

Transparency will ensure that funds do not flow, invisibly, to financial traders instead of local communities and effective climate action. The process of voluntary market systems supporting effective mitigation of carbon emissions is always going to need monitoring and constant improvement. However, the costs of no action at all from corporate finance would be a great deal higher.

There are some important principles to tease out of the bigger picture. For example, should all mitigation efforts count? Should companies be required to lower their own actual emissions in every way possible before being allowed to count the mitigating activities of others (often thousands of miles away) as part of their own carbon footprint? This will be discussed in the body of the report. The paradox of carbon credits being used to offset ongoing emissions speaks for itself. The question, perhaps, is how a voluntary market is persuaded (and enabled) to shift towards a more stringent approach to transparency and scientific principles, without losing its participants. Claims of carbon neutrality based on offsetting have already met legal challenges.

Within the EU, companies will be required to substantiate their environmental claims with independently verified information.<sup>vii</sup> And product-level claims for ‘carbon neutral’ are now banned under an EU directive.<sup>viii</sup> These measures reflect a broader effort to halt misleading marketing practices that amount to greenwashing.

**“Carbon offsetting, at its worst, provides a greenwash allowing emissions to continue unabated.” — Sir David King, Chair of CCAG**

vii The EU ‘Green Claims Directive’ is being processed through the EU legislative system, having been agreed in principle in March 2023. EU Briefing (March 2024) ‘Green Claims’ directive: Protecting consumers from greenwashing’ [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/753958/EPRS\\_BRI\(2023\)753958\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/753958/EPRS_BRI(2023)753958_EN.pdf)

viii This directive, identified as Directive (EU) 2024/825, was signed by the co-legislators on February 28, 2024, and published in the Official Journal of the European Union on March 6, 2024 (EUR-Lex) (European Sources Online).

Perhaps the current worries within the VCM market, arising from external critiques, provide the best moment for setting out the improvements and principles required from VCMs to deliver improvements in confidence.

**VCMs are a mitigation tool in the climate crisis, and given the severity of the climate crisis and the fact that global emissions have yet to reduce, we need every single tool in the box to deal with the emission crisis now – and over the next hundred years or more.**

A well-organised system can deliver benefits for decades to come. This report will show how a reformed VCM system could make a genuine, consistent and much-needed contribution to climate efforts. If successful, VCMs will drive the growth of mitigation projects around the world, responsive to many varied demands, offering co-benefits to those communities involved in, and close to, projects, and providing consistent and transparent additionality to emissions reduction. All projects will be able to demonstrate their scientific rigour in measurement, monitoring and transparency, ending exaggerated or fanciful claims, while showing the value they bring to parts of the world where support is needed.





## VCM in the bigger mitigation picture

This report is about VCMs, but the VCM system is dwarfed by state and regional compliance or regulatory markets.<sup>ix</sup> The main compliance markets work in different ways, often via ‘cap-and-trade’ to create financial incentives to reduce emissions, broadly known as emissions trading systems (ETS).<sup>10</sup> In 2021 the value of allowances traded on ETS globally was around \$850 billion. The VCM motivations are essentially the same. But the aim is to use the power of market trading, rather than regulations, fines or taxes, to channel investment into emissions cuts and into support for mitigation programmes around the world where outcomes are effective – and explicitly costed.

## Nature-based impermanence or technical solutions with permanent storage?

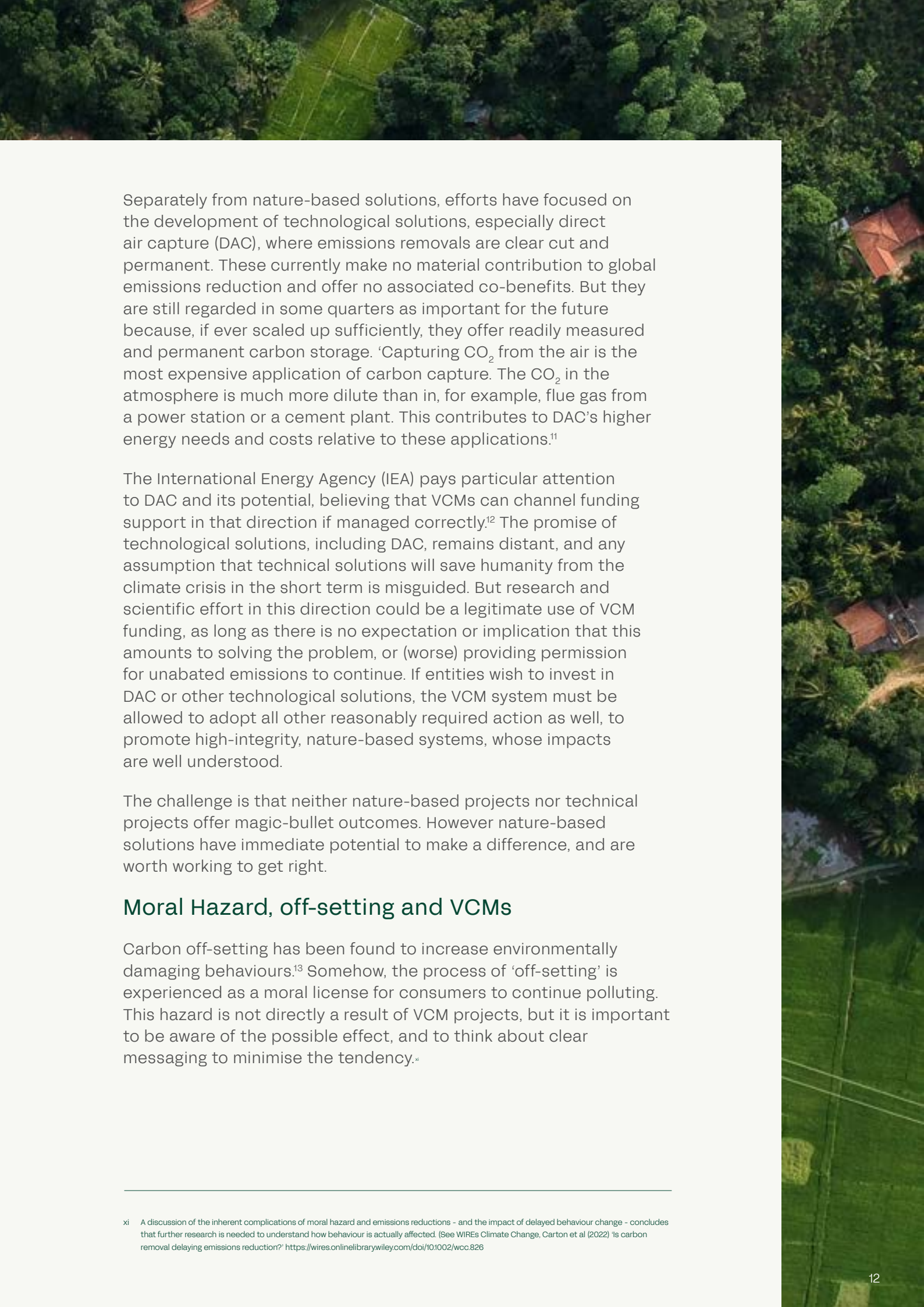
A question at the heart of the effectiveness of VCM projects is often whether nature-based solutions for emissions removal have value – or at least the value they claim. These projects offer the chance to shift funding from wealthy corporations to deserving programmes in less wealthy economies and communities. Most projects can deliver highly valuable co-benefits, ranging from improved environmental conditions to a more active economy with new opportunities for health services, education and livelihoods.

However, the emissions management provided by nature-based solutions may be temporary or vulnerable to destruction. Many VCM-funded projects are related to forests: reinstating, preserving or extending them to lock in carbon.<sup>x</sup> If the project is conceived in bad faith, or without proper care, then the carbon capture can be overstated, or the security of the capture may be exaggerated, or the efforts to keep the trees in good condition may simply tail off. These are amongst the concerns that have knocked confidence in VCM schemes.

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ix Within state regulatory systems, a country or region sets a cap on emissions from particular sectors. These industries and organisations are then either forced to reduce emissions, pay fines or fees to continue emitting, or alternatively they can trade with other sectors that can decarbonise more efficiently. This creates a carbon price within the ETS system, and market incentives to minimise emissions. Compliance markets are driven by mandatory regulations, such as the European Union Emissions Trading System (EU ETS) and California’s Cap-and-Trade Program; they have a much larger market size and influence than VCMs. The EU ETS on its own, being one of the largest compliance markets, has a market value running into tens of billions of dollars annually, compared with the two billion dollars or so of global VCMs. (See for example, World Bank (2023) ‘Record High Revenues From Global Carbon Pricing Near \$100 Billion’ <https://www.worldbank.org/en/news/press-release/2023/05/23/record-high-revenues-from-global-carbon-pricing-near-100-billion>; or Bloomberg, Qin et al (2023) ‘Global Carbon Markets Get Bigger, Even as Trading Dips’ <https://about.bnef.com/blog/global-carbon-markets-get-bigger-even-as-trading-dips/>)

x A 2023 calculation puts the share even higher, at about 67%. (One Earth, Filewod et al (2023) ‘Avoiding carbon leakage from nature-based offsets by design’ Current VCM values are largely (67%) accounted for by forestry projects. (One Earth, Filewod et al (2023) ‘Avoiding carbon leakage from nature-based offsets by design’ [https://www.cell.com/one-earth/fulltext/S2590-3322\(23\)00258-0?\\_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2590332223002580%3Fshowall%3Dtrue](https://www.cell.com/one-earth/fulltext/S2590-3322(23)00258-0?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2590332223002580%3Fshowall%3Dtrue))

An aerial photograph of a dense tropical forest. In the upper center, there is a rectangular clearing with a grid pattern, possibly a field or a small farm. To the right, a small building with a reddish-brown roof is visible, partially obscured by the trees. The forest is vibrant green, and the overall scene is captured from a high angle, looking down.

Separately from nature-based solutions, efforts have focused on the development of technological solutions, especially direct air capture (DAC), where emissions removals are clear cut and permanent. These currently make no material contribution to global emissions reduction and offer no associated co-benefits. But they are still regarded in some quarters as important for the future because, if ever scaled up sufficiently, they offer readily measured and permanent carbon storage. ‘Capturing CO<sub>2</sub> from the air is the most expensive application of carbon capture. The CO<sub>2</sub> in the atmosphere is much more dilute than in, for example, flue gas from a power station or a cement plant. This contributes to DAC’s higher energy needs and costs relative to these applications.’<sup>11</sup>

The International Energy Agency (IEA) pays particular attention to DAC and its potential, believing that VCMs can channel funding support in that direction if managed correctly.<sup>12</sup> The promise of technological solutions, including DAC, remains distant, and any assumption that technical solutions will save humanity from the climate crisis in the short term is misguided. But research and scientific effort in this direction could be a legitimate use of VCM funding, as long as there is no expectation or implication that this amounts to solving the problem, or (worse) providing permission for unabated emissions to continue. If entities wish to invest in DAC or other technological solutions, the VCM system must be allowed to adopt all other reasonably required action as well, to promote high-integrity, nature-based systems, whose impacts are well understood.

The challenge is that neither nature-based projects nor technical projects offer magic-bullet outcomes. However nature-based solutions have immediate potential to make a difference, and are worth working to get right.

## Moral Hazard, off-setting and VCMs

Carbon off-setting has been found to increase environmentally damaging behaviours.<sup>13</sup> Somehow, the process of ‘off-setting’ is experienced as a moral license for consumers to continue polluting. This hazard is not directly a result of VCM projects, but it is important to be aware of the possible effect, and to think about clear messaging to minimise the tendency.\*

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xi A discussion of the inherent complications of moral hazard and emissions reductions - and the impact of delayed behaviour change - concludes that further research is needed to understand how behaviour is actually affected. (See WIREs Climate Change, Carton et al (2022) ‘Is carbon removal delaying emissions reduction?’ <https://wires.onlinelibrary.wiley.com/doi/10.1002/wcc.826>)

## Ramping up removal

In the IPCC AR6 (Sixth Assessment Report) of 2023, climate impacts were found to be more widespread and severe than expected. Carbon removal is now judged by the IPCC to be essential to limit temperature rise to 1.5°C. Carbon removal means going beyond 'carbon neutral' to 'carbon negative' – where more GHGs is extracted every year than is emitted across the world. The level of carbon removal from the excess already in the atmosphere must occur at an unprecedented level, and climate finance for mitigation to help drive this removal (as well as adaptation) must increase dramatically.<sup>14</sup>

Beyond 2050, net-zero emissions will have to be surpassed by several billion tonnes a year. This effort will gradually shift the CO<sub>2</sub> (and other GHG) content of the Earth's atmosphere back to safer levels. The actual amount of removal (negative emissions) required depends on how quickly emissions reductions and existing climate-response targets are delivered. By 2050, the annual removal figure will need to be between 5 and 16 billion tonnes per year (Gt per year), and removal will have to climb annually from there.<sup>xii</sup> The IPCC is confident that all pathways that limit global warming to 1.5°C with limited overshoot project the removal of excess carbon dioxide from the Earth's atmosphere 'on the order of 100 - 1000 GtCO<sub>2</sub> over the remaining years of the 21st Century.' This is a challenge that will impact human activity in many ways, and in which every single contribution will be important.

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xii In its 2018 report on pathways to 1.5°C the IPCC sketched out various scenarios. Although the world has already taken insufficient steps to meet the IPCC expectations of action, these scenarios give an idea of how important negative emissions will be. Negative emissions will be required at the higher end of the IPCC projections if a plausible mid-term 1.5°C pathway is to be achieved. See figure 2.5, IPCC (2018) 'Global warming of 1.5°C - An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty' Page 113 <https://www.ipcc.ch/sr15/> In the IPCC AR6, of 2023, climate impacts were found to be more widespread and severe than expected. Carbon removal is now essential to limit temperature rise to 1.5°C, and climate finance for mitigation (as well as adaptation) must increase dramatically.



# 01. Market basics

VCMs could have the capacity to channel a trillion US dollars from the private sector into carbon credits.<sup>15</sup> For comparison, several trillion dollars a year of investment are needed to meet the Paris Agreement goals.<sup>16</sup> Any significant contribution to this overall cost challenge must be taken seriously.

The 1 trillion dollar figure could be reached by the middle of the 2030s. Current figures are more like 2 billion dollars a year. While current levels could make only a modest impact on the climate crisis and on conservation, they are large enough to demonstrate the potential of this newly and rapidly emerging market. Now is the time to analyse, critically, where the pitfalls lie and how to tackle them, and where opportunities can be enhanced.

Before examining the contestation and challenges posed by VCMs, it is important to understand and acknowledge the simplicity of the model, and its theoretical power to shift money directly to where it is most needed.

**Carbon markets, working to their full potential, will help to smooth the global energy transition away from greenhouse gas emissions, while helping to channel funds from private sector actors into cost-effective mitigation projects around the world.**

Such projects would aim to prevent current and future emissions, to remove existing excess emissions from the atmosphere, and to create greater resilience on the ground, especially within communities where the impacts of climate change are most deeply felt. The projects would be varied and specific to local skills, needs and knowledge.

For every tonne of CO<sub>2</sub> emitted (or CO<sub>2</sub> equivalent, if other GHGs are involved – CO<sub>2</sub>e), an operator purchases a carbon credit representing a tonne of CO<sub>2</sub> or CO<sub>2</sub>e that has either already been removed from the atmosphere, or will be prevented from being emitted in the first place. This structure means that the emitting operator is able to balance the impact of its current emissions through the purchase of carbon credits. Meanwhile, those in need of climate finance to accelerate development while building climate resilience, or to manage a wide range of ecosystems, have ready access to funds generated by the sale of carbon credits.



The synergy between the participants, at its best, provides ready flows of finance and collective climate benefits to the whole world.

It also offers the potential for carefully judged, well-funded projects to be initiated anywhere in the world, at large or small scale, to operate across regions or at community level.

The purchaser does not need to know the end use of their carbon credit funding. The carbon credit seller needs to have mechanisms for identifying, screening and validating projects – but need not be involved in the work itself. And the users of the funding need to demonstrate qualifying compliance, but otherwise have autonomous control of the project, and need never know who or what has funded it.

In order to deliver this system, a clear infrastructure is needed. Operators who have emissions to balance purchase carbon credits from a registry (also known as standards bodies, certification bodies, or crediting programmes) and depend on the accuracy of the registry's credit validation and counting. Projects seeking finance also sign up with a registry. Registries use a central database to prevent double counting of credits; they establish sets of rules, specific to various types of projects, establishing how to monitor project performance and how to calculate the number of credits generated. These methodologies and protocols are conceptually simple. The challenges lie in the detail. And it is the ability of this infrastructure to provide rigour and certainty that has been called into question.



This system outline shows that there are three main participants in the VCM pipeline: the purchaser, the registry and the users of the funding (carbon credit provider). It is helpful to analyse the stages in which these participants are involved to understand what works well and what can go wrong. This introduces a clear framework to reflect on the need to introduce:

- Guardrails and standards for the purchase of carbon credits.
- Regulation and standards within registries for quality control.
- Best practice standards on sharing the value of carbon credit sales and avoiding any ‘race to the bottom’ to enhance sales.
- Standards for projects, their monitoring and underlying claims for carbon capture.

It is also important to understand potential power imbalances and paradoxes when incentives align in the pipeline to claim more impact while potentially doing less. These are touched upon in the Africa section of this report in particular.





## The characteristics of the market

Purchasers are usually businesses buying carbon credits to offset current emissions. Because of this, carbon credits are often known as ‘offsets’. However, credits can be used for other purposes, including ‘beyond value chain mitigation’, as discussed later in this report. The term ‘offset’ has become somewhat linked to ‘greenwashing’, implying hollow or misleading efforts to cover up the true emissions story. In reality, carbon credits and their deployment are as good (or bad) as the standards and rigour with which they are managed.

**Rigour needs to be addressed in several dimensions. Each dimension is equally important if the whole system is to have integrity.**

The science of carbon sequestration (holding carbon in sinks, and preventing it from entering the Earth’s atmosphere) is understood and quantifiable. It can relate to re-invigorating forests to lock carbon into trees, plants and other biological systems. It can relate to the value of maintaining tundra, mangrove forests, wetlands and other natural carbon sinks. Or it can relate to transforming soil management in farming from a net-emitting process to a carbon-sequestering, regenerative ecosystem. In each case, the science is available.

**Science must lead the conversation about what ‘counts’ for carbon credits – with clear information about the limits of ‘off-setting’ black carbon emissions through the extension or protection of ‘green carbon’ systems.<sup>xiii</sup> Applied rigorously, this principle dramatically reduces opportunities for greenwashing and builds confidence.**

<sup>xiii</sup> As outlined on page 5 of this report [Limits to the Role of VCMs in a Global Energy Transition].

Following from the rigorous adoption of scientific principles, the need for rigorous metrics and monitoring emerges. Clarity about the value of any programme includes assessing how much carbon is actually being locked in; how long (and how reliably) this will last; what the immediate impacts will be on other systems in the locality; how much monitoring, defending and cost is associated with the programme, and so on. This monitoring and evaluation will establish the true value, in terms of carbon capture, of any particular scheme. Some of these calculations may be difficult to make, or uncertain. In those cases, the monitoring of projects is particularly important so that more accurate understanding can be developed over the lifetime of a project.<sup>xiv</sup>

Finally, rigorous principles of financial transparency are urgently needed. Any evaluation of a project, a registry or a particular carbon credit should clearly reveal how much the credit has cost, how much of that cost has been passed down to the recipient project, and how much is taken by the registry. The registry should be able to demonstrate the use of the funds retained and the organising principles underlying their funding arrangements.



xiv. The impact of tropical forest conservation, for example, is well understood with a 'solid scientific basis for mitigation'. However, other projects with carbon credit eligibility are less certain in their mitigation impacts. Nature Climate Change. Buma (2024) 'Expert review of the science underlying nature-based climate solutions' <https://www.nature.com/articles/s41558-024-01960-0>



## How carbon credits are currently organised

The two broad classes of carbon credit are aimed either at emissions avoidance or emissions removal. Avoidance projects aim to prevent emissions from occurring. They can be further split into reduction, reducing emissions from fossil fuel burning, and protection, protecting ecosystems that are natural carbon sinks such as forests, grasslands, wetlands and ocean ecosystems.<sup>xv</sup> Emissions avoidance projects occupy the largest proportion of carbon credit schemes at the moment.

Typical emissions avoidance projects include preventing deforestation (known as REDD+); peatland and wetland protection; distributing clean cookstoves; methane capture from landfill, mines and animal waste; programmes to promote enhanced energy efficiency; and energy transition to renewable energy.



xv Some sources use this term for all avoidance credits.

Removal projects aim to remove carbon dioxide from the atmosphere and store it. They can be divided into ‘nature-based solutions’ and technological approaches. Nature-based removal includes planting new forests (afforestation) and restoring lost wetlands or mangrove coastlines. Technological approaches include ‘direct air capture’ (DAC), ‘biochar’ and ‘enhanced rock weathering’. For more information, see page 11.

Some projects, such as improved forest management schemes, may incorporate a mixture of avoidance and removal – and this is particularly true of well-designed nature-based solutions. Local and indigenous communities can be supported to look after and maintain existing forest, with economic opportunities developed around these activities – such as the harvesting of renewable forest products (often desirable in expensive health supplements etc), and the extension of environmentally sensitive ecotourism opportunities. The same projects can include the restoration of lost forest, development of regenerative farming strategies and other ‘removal’ schemes.

The central value in such approaches is to secure the livelihoods of local people and to improve their quality of life: these are ‘co-benefits’ to mitigation projects. Co-benefits have value in their own right and also ensure that project participants are motivated to preserve and enhance what is there. There will always, of course, be a parallel need for security and regulation of forests and local communities – to prevent predation by loggers or others whose short-term interests promote forest destruction and repression of local communities.



# 02. Overarching issues



## Overarching issues

For a carbon credit scheme of any kind to make a difference, a fundamental requirement is accurate and transparent measurement of the sequestered or protected carbon. The calculations are complex – but good estimates and approximations are usually possible using good techniques and scientific understanding.<sup>xvi</sup>

Techniques may make use of fundamental principles – how much carbon is released when a measured quantity of wood is burnt? They may harness more recent technology – satellite data, for example, can support calculations of existing forest areas, tree species and tree height, as well as current sea-level, condition of coastlines, farmland and desertified areas, and even identify point sources of methane gas emissions and so on.<sup>xvii</sup>

There can be uncertainties in translating information from data into carbon measurement. For example, in some forestry projects, approximate equations are used to calculate carbon storage based on measurements of tree height and diameter. In these cases equations based on large datasets and satellite measurements (eg LiDAR) can help with biomass estimates – but work must be continuous to keep reporting and measurements at their most accurate level possible. Local information can provide detail where the ‘big picture’ is not sufficient to validate particular assertions, and academic studies can be set up specifically to add detail or clarity where needed.

The practical ‘measuring’ challenges will vary, project by project, so a measurement scheme needs to be part of the foundation for any carbon capture or protection project. In energy efficiency projects (where on-going emissions are reduced), looking at fuel bills to support calculations may be very straightforward. Other projects will inevitably be more difficult to evaluate and monitor.

For example, a project for distributing low-emission cookstoves in large rural areas will require simple calculations about local fuel emissions, but will also require surveys and on-going monitoring to understand the uptake of the technology. There is a risk of assuming that every cookstove distributed is a quantity of emission saved, which may be very far from the truth.

xvi For an overview of techniques and challenges see The Conversation, Barbier et al (2023) ‘Measuring the invisible: the tough job of calculating the carbon stocks and fluxes of a forest’ <https://theconversation.com/measuring-the-invisible-the-tough-job-of-calculating-the-carbon-stocks-and-fluxes-of-a-forest-219634>

xvii In this example, satellite imagery is combined with AI to give accurate information about the state of forests in parts of Hungary: Journal of Imaging, Monar et al (2024) ‘Forest Disturbance Monitoring Using Cloud-Based Sentinel-2 Satellite Imagery and Machine Learning’ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10817504/>



This example highlights how the efforts (and therefore the cost) of a programme may be weighted towards monitoring and reporting, even where relatively inexpensive technological solutions are being supported.<sup>17</sup> Cookstoves do, definitely, offer important co-benefits to participants.

The project design and measurements are important to reflect the real emissions reductions achieved, and the real livelihood and quality of life enhancements they make possible – especially for women.<sup>18</sup>

Accurate measurement demands transparency about the approaches taken, and clarity about progress through the lifetime of a project – and even beyond. This is a clear area where projects – and therefore the whole VCM infrastructure – must be closely aligned with science in general, and climate science in particular. Where current systems fall short, successful pressure to close the gap will yield benefits for the world. Where new insights become available, and new techniques improve calculations, these need to be fed into existing schemes and systems so that the best available information is acted upon.



It has been noted in a number of critical studies that there is potential for VCM projects to over estimate their impacts as the participants have interests that can align to encourage overstatement of impacts.<sup>xviii</sup> The alignment is summarised as follows: the purchaser of carbon credits wants to offset as much as possible for the amount of money they wish to deploy, so over-stating project results aligns by making each carbon credit less expensive. Registries want to engage with as many carbon credits as possible to enhance their own performance standing. Projects benefit from a generous assessment of impact because this draws in funding and increases the likelihood of follow-up funding, for example.

Finding the right balance within the VCM ecosystem is important because the real impact of a carbon credit matters. If claims are made for more removal than has actually occurred, then the 'offset' or balance goes wrong. Over-claimed carbon credits may end up masking actual increases in emissions, rather than achieving any reductions. These challenges of getting the carbon credit calculations right can be looked at under three headings. Measurement, discussed above, is relatively straight forward in principle. The challenges are in the technical detail of which measurements are carried out and how. More difficult are the concepts of 'baselines' (Where are we starting from?) and 'leakage' (Have we stopped emissions, or just shifted them?).



<sup>xviii</sup> This is discussed in detail in several of the sources mentioned in this report such as npj Climate Action, Lou et al (2023) 'Corporate motivations and co-benefit valuation in private climate finance investments through voluntary carbon markets' <https://www.nature.com/articles/s44168-023-00063-4.pdf>. The reality of this challenge is becoming recognised by the VCM participants, who want to build a credible system that continues to offer the intended services. The problem, and the response, are captured here: S&P Global, Yin (2023) 'Voluntary carbon credit buyers recalibrate market strategies, tighten security' <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/021323-voluntary-carbon-credit-buyers-recalibrate-market-strategies-tighten-scrutiny>



## Baselines

VCMs depend on projects being able to show emissions being reduced, stopped, or prevented. This means that all measurements have to be compared with the alternative reality in which the project did not take place. Baselines can therefore be dynamic over time, or seasonal, or dependent on other factors. If deforestation is successfully reduced or prevented, the outcome should be compared with what would have happened if no protection had been put in place.<sup>xix</sup>

However, there are numerous confounding factors: local communities will work hard to protect forests whether they are involved in a project or not; global economic shifts can rapidly change demand for wood, or for deforested areas, so that predation accelerates or slows. Sometimes the most accurate approach would be to make on-going comparisons with ‘control’ areas, where no project intervention has happened. But this could have ethical implications. Or the process of being ‘measured’ (as a control) might, in itself, have an impact on deforestation, as communities are given greater information about local forest status.

It is never possible to iron out all of these problems, but transparency about what has been considered, and what measures are taken to overcome them, will go some way to build credibility and trust. This is important. Baseline setting is particularly troublesome in ‘avoided deforestation’ projects, for example. And different baseline calculations can lead to very different results.<sup>19</sup>

The over-claiming of forest-protection projects can be discovered by comparison with control areas identified later as having similar characteristics, but where deforestation has proceeded more slowly than argued for in the project baseline.<sup>20</sup>

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xix For a clear discussion about the importance of baseline calculations, transparency and accuracy, see ‘Foundational Principles 3. and 4. in Nature Communications, Ellis et al (2024) ‘The principles of natural climate solutions’ <https://www.nature.com/articles/s41467-023-44425-2#Sec11>



## Leakage

If efforts to reduce emissions in one place end up pushing emissions increases elsewhere, then ‘leakage’ has occurred. Leakage can be driven by activity shifting, where protection from logging in one area, say, just sends the loggers elsewhere. Localised leakage can be monitored, accounted for and acted against. Where it occurs at larger scale, and markets shift from one region, country or even continent to another, a direct response is more difficult.<sup>21</sup>

Market shifts and market leakage can be quite insidious. Reducing the supply to the global timber market from significant areas (for example, tracts of the Brazilian rainforest) could push up timber prices in the market. The price rise might make new sources of timber financially viable or attractive, encouraging deforestation hundreds of kilometres away.

Similarly, energy efficiency measures can have the perverse effect of lowering the price of fossil fuels, prompting increased use across the country, region or even globe. These effects and trends are difficult to monitor and respond to, as Professor Mark Maslin, CCAG member, observes: “Leakage is a system problem that cannot necessarily be dealt with by a project. What if the deforestation it causes is 900 kilometres away?”

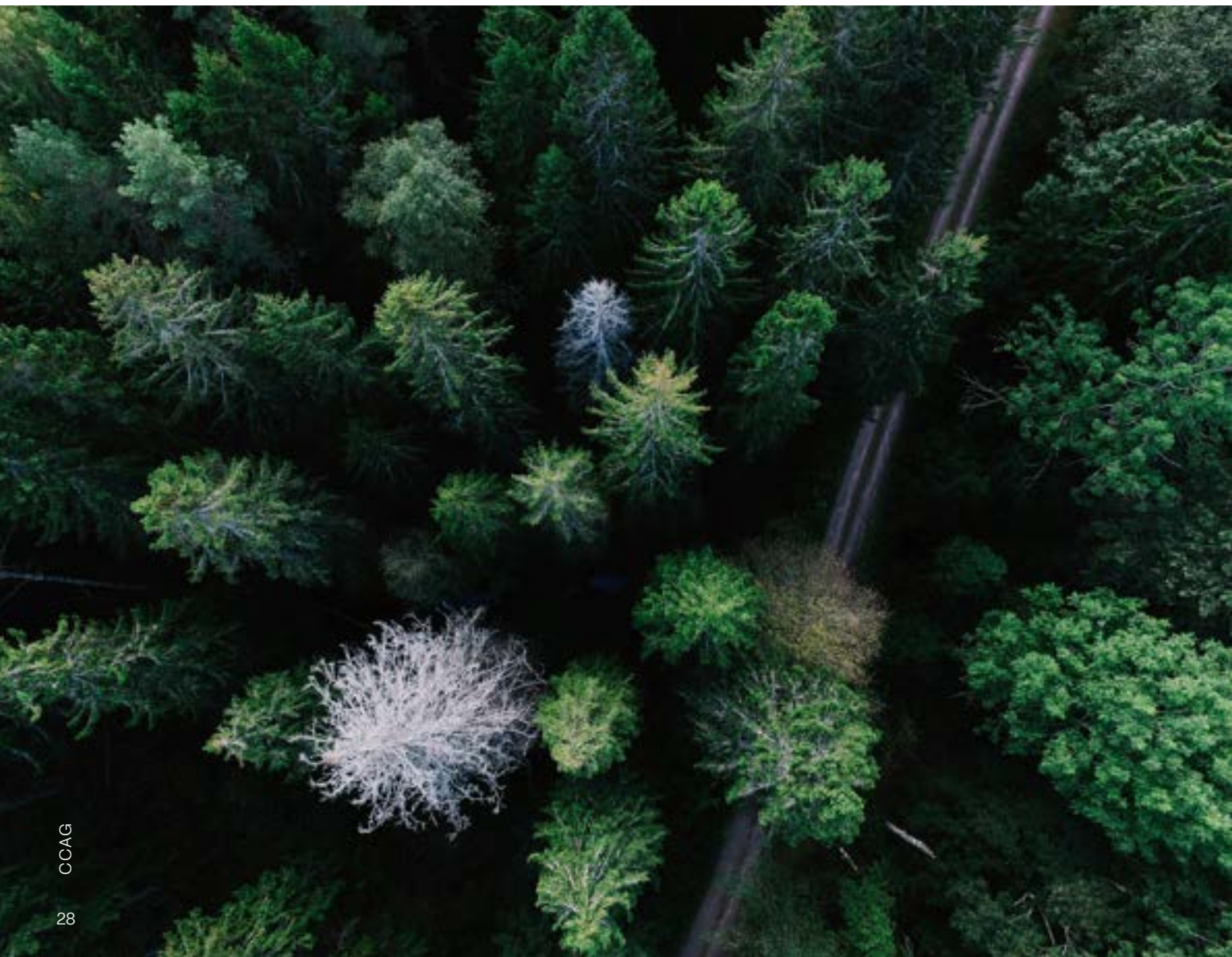
The challenges presented by market leakage effects are considerable. On some arguments leakage undermines the measurability of most programmes. Leakage is easily underestimated and current efforts to improve accounting methods are unlikely to deliver the accuracy required.<sup>22</sup>

The reality is that leakage effects are very difficult to identify. This is in part because “teasing out market leakage effects from background economic activity is extremely difficult.”<sup>23</sup> The situation is potentially serious. In a 2019 review of projects issuing credits under the California Air Resources Board’s U.S. Forest offset Protocol, 82% of credits issued were found not to represent true emissions reductions, this was found to be due to the use of lenient leakage accounting methods.

If the calculations are correct, that specific study revealed over-reporting of about 80 million tonnes of CO<sub>2</sub>. For comparison, this equates to about a third of the anticipated effect of California's cap-and-trade programme from 2021 to 2030.<sup>24</sup>

Market leakage is a systemic problem and clearly cannot be ignored. Possible corrective measures include a commitment across registries and projects to increase monitoring and update the carbon credit values of projects.

A review could share the risk of market leaking across a basket of projects, so that carbon credits carry within them an element of allowance for some market leakage. This is the sort of actuarial or statistical thinking that will ratchet up the importance and credibility of VCM projects and methodologies. Transparency about such approaches will allow external scrutiny, and build industry understanding of the need for broad brush approaches where specific analysis is not realistic.



The Oxford Principles for Net Zero Aligned Carbon Offsetting concluded that there is a lack of publicly available information on the quality of carbon credits and suggested that many projects (especially emissions avoidance projects) are built on “poor methodologies and faulty assumptions.”<sup>25</sup>

It is critically important for the future viability of projects that incentivise the maintenance of forests that these issues are addressed. Transparency about methodology, clarity about what is difficult, and over-claim risk spreading would help to answer critics and further professionalise forest protection work through VCMs.

The next few sections of this report consider a range of issues from the specific perspective of the participants in the VCM pipeline: The Purchaser; The Registry; The Project. Each has their own challenges, and each must be kept in view when evaluating schemes, methodologies and the value of VCMs to help reduce emissions and deliver a safer future for humanity – especially for local and more marginal communities in poorer countries.



# 03. Purchaser issues

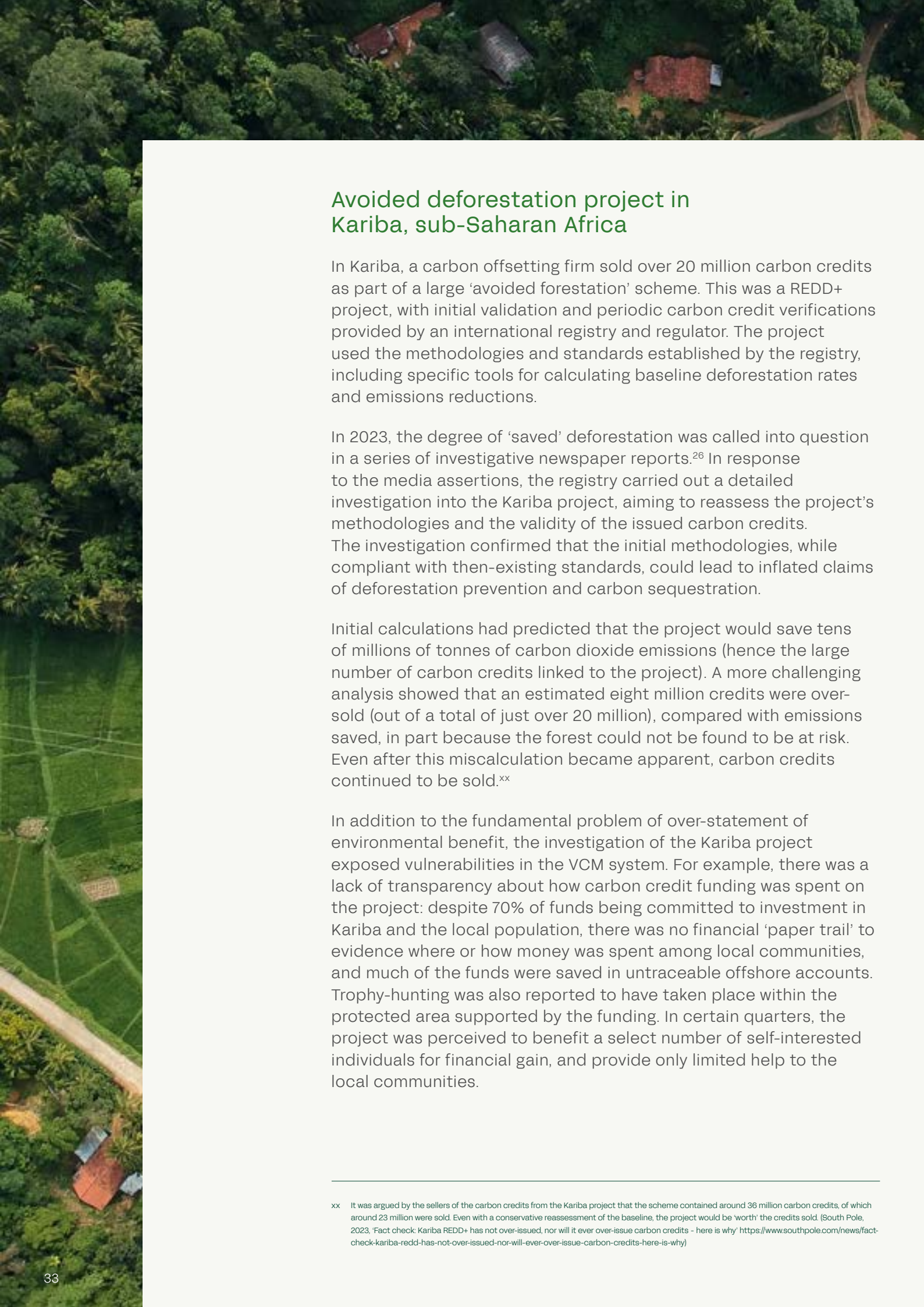
This report highlights the need for carbon credits to be transparent and scientifically sound. It also underscores the need for credits to be well measured and monitored with commitment to the principles of each project, so as to create a consistent bedrock of emissions reductions that would not otherwise have occurred.

The VCMs would not exist at all if purchasers did not anticipate some market benefit from their participation. They are non-state actors, and by definition VCMs currently fall completely outside state regulation and statutory compliance programmes. In other words, at the moment purchasers who choose to participate in buying carbon credits via the VCM are doing so over and above whatever regulatory or compliance programmes they may already be subject to. This poses a problem for those who criticise the VCM system – if it is not stringent, it may do more harm than good in a whole range of different ways. And if the barriers to access become too high then purchasers may stop participating.

In this section, we flag up some of the deepest criticisms levelled at VCMs, and note the lessons that must be learnt from these accounts. We also show how the criticisms raised are being addressed from within the VCM system, and we highlight the recent findings of an expert review showing the real value in mitigation projects within the VCM ecosystem.







## Avoided deforestation project in Kariba, sub-Saharan Africa

In Kariba, a carbon offsetting firm sold over 20 million carbon credits as part of a large ‘avoided deforestation’ scheme. This was a REDD+ project, with initial validation and periodic carbon credit verifications provided by an international registry and regulator. The project used the methodologies and standards established by the registry, including specific tools for calculating baseline deforestation rates and emissions reductions.

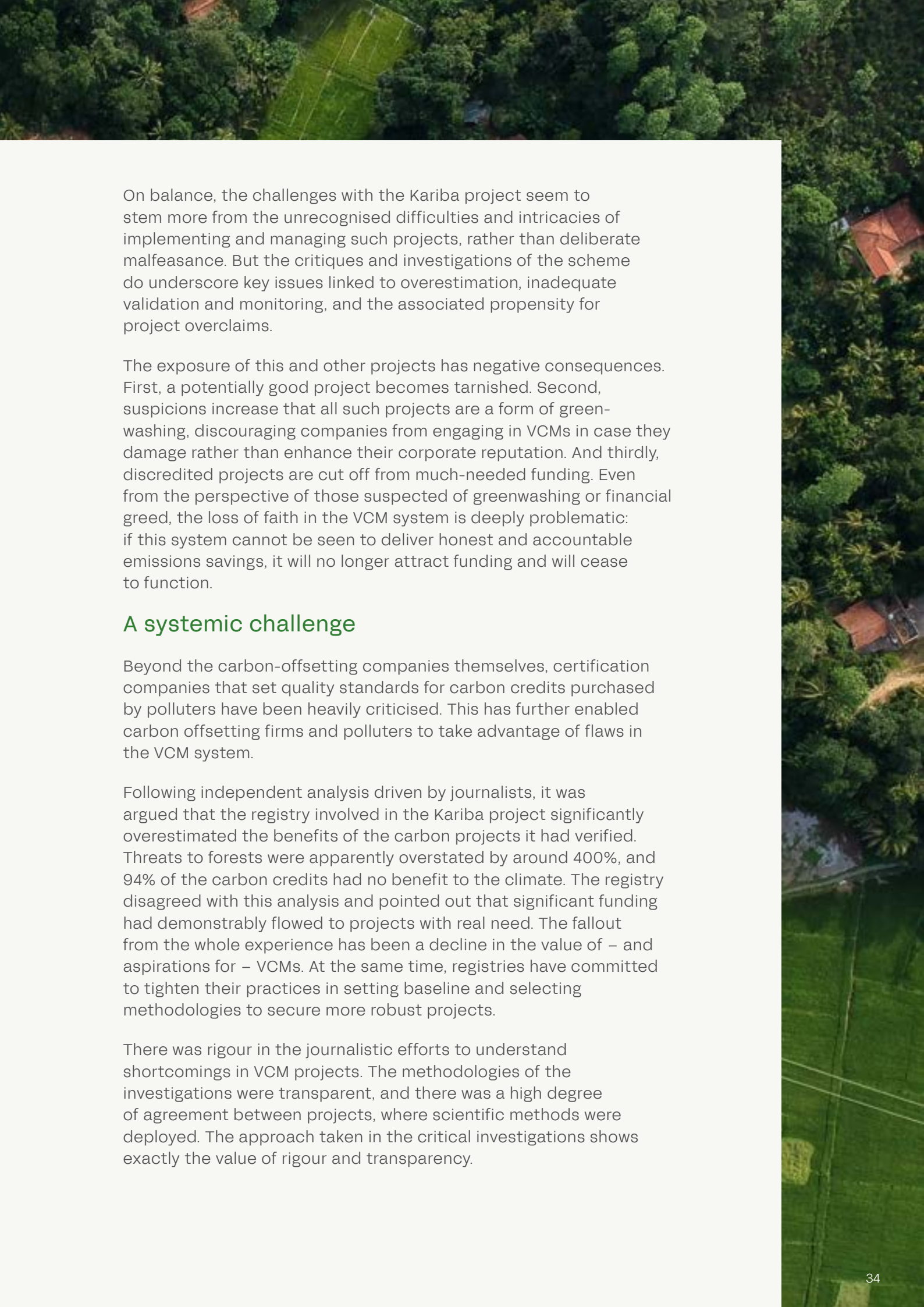
In 2023, the degree of ‘saved’ deforestation was called into question in a series of investigative newspaper reports.<sup>26</sup> In response to the media assertions, the registry carried out a detailed investigation into the Kariba project, aiming to reassess the project’s methodologies and the validity of the issued carbon credits. The investigation confirmed that the initial methodologies, while compliant with then-existing standards, could lead to inflated claims of deforestation prevention and carbon sequestration.

Initial calculations had predicted that the project would save tens of millions of tonnes of carbon dioxide emissions (hence the large number of carbon credits linked to the project). A more challenging analysis showed that an estimated eight million credits were over-sold (out of a total of just over 20 million), compared with emissions saved, in part because the forest could not be found to be at risk. Even after this miscalculation became apparent, carbon credits continued to be sold.<sup>xx</sup>

In addition to the fundamental problem of over-statement of environmental benefit, the investigation of the Kariba project exposed vulnerabilities in the VCM system. For example, there was a lack of transparency about how carbon credit funding was spent on the project: despite 70% of funds being committed to investment in Kariba and the local population, there was no financial ‘paper trail’ to evidence where or how money was spent among local communities, and much of the funds were saved in untraceable offshore accounts. Trophy-hunting was also reported to have taken place within the protected area supported by the funding. In certain quarters, the project was perceived to benefit a select number of self-interested individuals for financial gain, and provide only limited help to the local communities.

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xx It was argued by the sellers of the carbon credits from the Kariba project that the scheme contained around 36 million carbon credits, of which around 23 million were sold. Even with a conservative reassessment of the baseline, the project would be ‘worth’ the credits sold. (South Pole, 2023, ‘Fact check: Kariba REDD+ has not over-issued, nor will it ever over-issue carbon credits - here is why’ <https://www.southpole.com/news/fact-check-kariba-redd-has-not-over-issued-nor-will-ever-over-issue-carbon-credits-here-is-why>)

An aerial photograph of a dense, lush green forest. In the upper center, there is a small, rectangular clearing with a grid-like pattern, possibly a field or a small farm. To the right, a small building with a reddish-brown roof is visible, partially obscured by the trees. The overall scene is a mix of natural forest and human-made structures.

On balance, the challenges with the Kariba project seem to stem more from the unrecognised difficulties and intricacies of implementing and managing such projects, rather than deliberate malfeasance. But the critiques and investigations of the scheme do underscore key issues linked to overestimation, inadequate validation and monitoring, and the associated propensity for project overclaims.

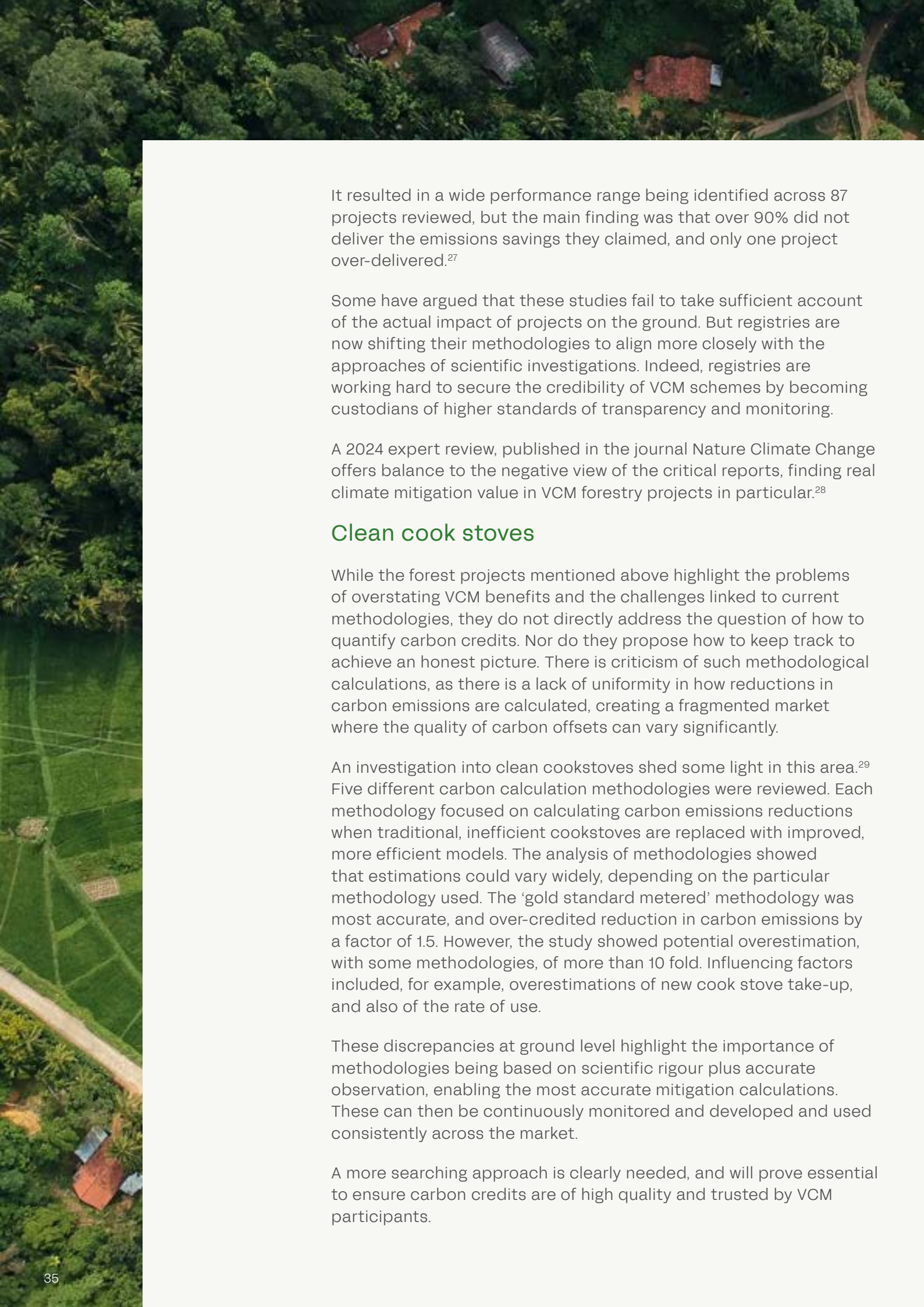
The exposure of this and other projects has negative consequences. First, a potentially good project becomes tarnished. Second, suspicions increase that all such projects are a form of greenwashing, discouraging companies from engaging in VCMs in case they damage rather than enhance their corporate reputation. And thirdly, discredited projects are cut off from much-needed funding. Even from the perspective of those suspected of greenwashing or financial greed, the loss of faith in the VCM system is deeply problematic: if this system cannot be seen to deliver honest and accountable emissions savings, it will no longer attract funding and will cease to function.

## A systemic challenge

Beyond the carbon-offsetting companies themselves, certification companies that set quality standards for carbon credits purchased by polluters have been heavily criticised. This has further enabled carbon offsetting firms and polluters to take advantage of flaws in the VCM system.

Following independent analysis driven by journalists, it was argued that the registry involved in the Kariba project significantly overestimated the benefits of the carbon projects it had verified. Threats to forests were apparently overstated by around 400%, and 94% of the carbon credits had no benefit to the climate. The registry disagreed with this analysis and pointed out that significant funding had demonstrably flowed to projects with real need. The fallout from the whole experience has been a decline in the value of – and aspirations for – VCMs. At the same time, registries have committed to tighten their practices in setting baseline and selecting methodologies to secure more robust projects.

There was rigour in the journalistic efforts to understand shortcomings in VCM projects. The methodologies of the investigations were transparent, and there was a high degree of agreement between projects, where scientific methods were deployed. The approach taken in the critical investigations shows exactly the value of rigour and transparency.



It resulted in a wide performance range being identified across 87 projects reviewed, but the main finding was that over 90% did not deliver the emissions savings they claimed, and only one project over-delivered.<sup>27</sup>

Some have argued that these studies fail to take sufficient account of the actual impact of projects on the ground. But registries are now shifting their methodologies to align more closely with the approaches of scientific investigations. Indeed, registries are working hard to secure the credibility of VCM schemes by becoming custodians of higher standards of transparency and monitoring.

A 2024 expert review, published in the journal *Nature Climate Change* offers balance to the negative view of the critical reports, finding real climate mitigation value in VCM forestry projects in particular.<sup>28</sup>

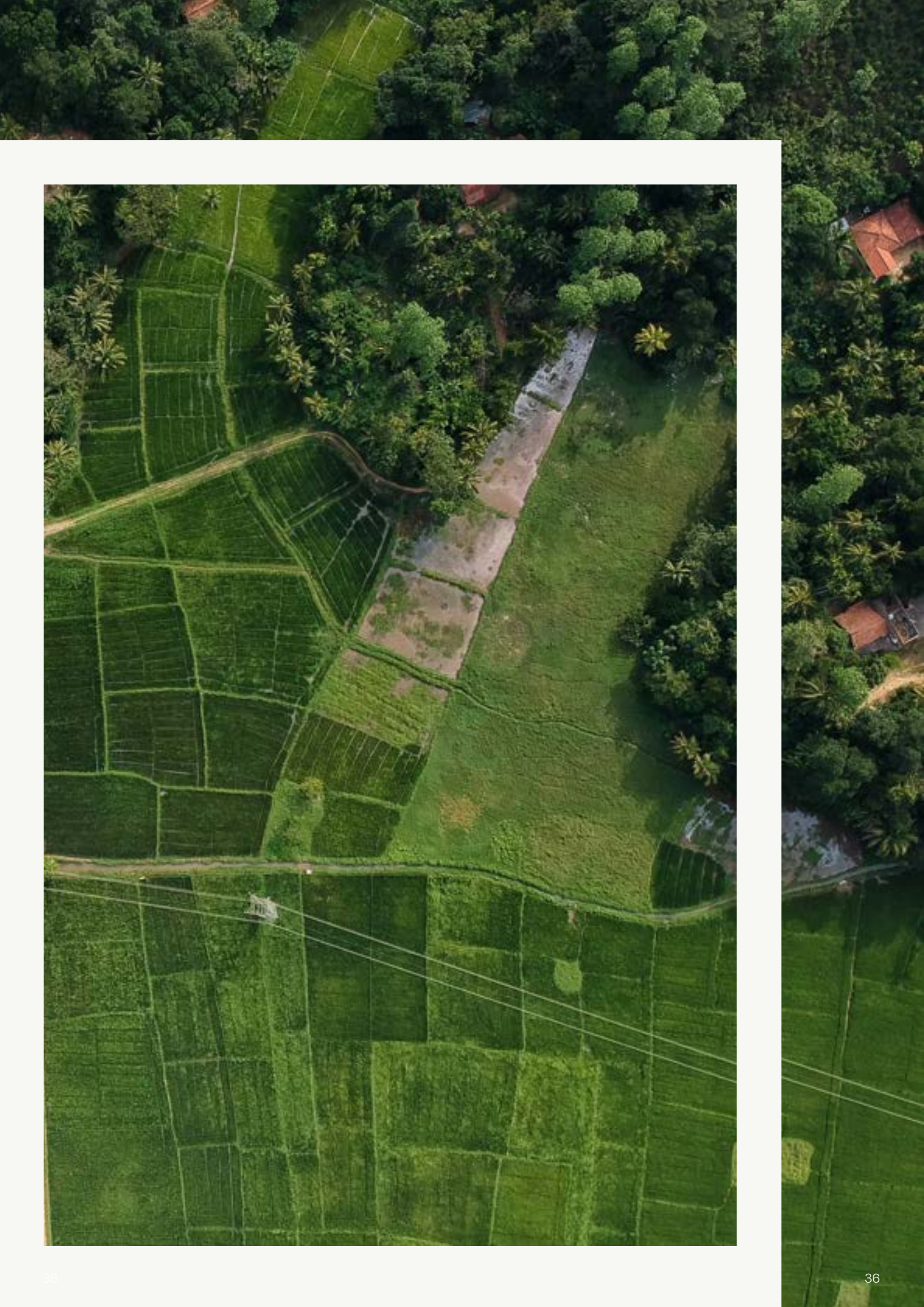
## Clean cook stoves

While the forest projects mentioned above highlight the problems of overstating VCM benefits and the challenges linked to current methodologies, they do not directly address the question of how to quantify carbon credits. Nor do they propose how to keep track to achieve an honest picture. There is criticism of such methodological calculations, as there is a lack of uniformity in how reductions in carbon emissions are calculated, creating a fragmented market where the quality of carbon offsets can vary significantly.

An investigation into clean cookstoves shed some light in this area.<sup>29</sup> Five different carbon calculation methodologies were reviewed. Each methodology focused on calculating carbon emissions reductions when traditional, inefficient cookstoves are replaced with improved, more efficient models. The analysis of methodologies showed that estimations could vary widely, depending on the particular methodology used. The 'gold standard metered' methodology was most accurate, and over-credited reduction in carbon emissions by a factor of 1.5. However, the study showed potential overestimation, with some methodologies, of more than 10 fold. Influencing factors included, for example, overestimations of new cook stove take-up, and also of the rate of use.

These discrepancies at ground level highlight the importance of methodologies being based on scientific rigour plus accurate observation, enabling the most accurate mitigation calculations. These can then be continuously monitored and developed and used consistently across the market.

A more searching approach is clearly needed, and will prove essential to ensure carbon credits are of high quality and trusted by VCM participants.



Assuming there is an appetite in the market for improving and professionalising the track record of VCM schemes, here are the opportunities and pitfalls from the perspective of the carbon credit purchaser.

For the most part, we assume the following business profile: acting in good faith, subject to typical commercial pressures; no specialist knowledge of how to optimise carbon sequestration or manage projects in developing economies; no experience of working with local communities and indigenous peoples; and no particular capacity to commit to long-term participation and monitoring of any one particular project.

These are all crucial components of successful projects – and carbon credit buyers will expect to outsource them all.

How does the buyer, then, distinguish between a poor project, a ‘good enough’ project, and a difficult or complex project where the outcome would be highly prized but might be achieved over a longer period? There is evidence that credits with higher perceived co-benefits can command premium prices, at least from some buyers. Companies motivated by efficiency prefer cheaper credits, but “companies driven by values and market competitiveness [demonstrate] a willingness to invest in high cost projects that provide significant local co-benefits.”<sup>30</sup>

In the realm of VCMs, carbon credit sellers often use labels, certifications, and rating systems to classify projects. These systems can help buyers discern the quality and impact of different carbon offset projects. However, there is no universal standard for labelling projects. There are some widely recognised frameworks and organisations providing assessments and certifications that seek to serve a similar purpose. Each framework or organisation will have its own emphasis. Here are some examples.



**Verified Carbon Standard (VCS):** VCS is widely used for certifying carbon offset projects. It ensures projects meet specific criteria for additionality, permanence and verifiability.

**Gold Standard:** Gold Standard certifies projects that contribute to sustainable development goals and deliver high environmental integrity.

**Climate, Community & Biodiversity Standards (CCBS):** CCBS standards focus on projects that deliver positive benefits to climate, local communities and biodiversity.

**Carbon Credit Quality Initiative (CCQI):** This initiative provides a scoring system to rate the quality of carbon credits based on factors like environmental impact, co-benefits and project reliability.

**BeZero Carbon:** BeZero provides ratings for carbon offset projects, assessing them on their likelihood to deliver promised climate benefits.

**IC-VCM:** Integrity Council for the Voluntary Carbon Market ensure high integrity in VCMs by developing and end enforcing robust standards and practices.

**Science Based Targets initiative:** Provides companies with a path to reduce emissions in line with the Paris Agreement goals, ensuring corporate climate targets are scientifically grounded.

**Global Carbon Council:** Certifies carbon credits with a focus on scientific rigour and transparency.

**Carbon Credit Quality:** CCQI provides independent ratings of carbon credit quality, specifically in response to calls for transparency and accountability.

Other organisations perform similar roles, or concentrate on different aspects of VCMs, such as nature based solutions, (eg LEAF coalition) or Blockchain and digital (eg Toucan or the Blockchain Alliance).

The combination of existing certification standards, ratings, co-benefit labels and transparent reporting systems can serve to differentiate the quality and impact of carbon offset projects in VCMs. However, the adoption of underlying standards and measures of transparency and scientific rigour right across the industry would strengthen the entire system considerably.

In response to this line of thinking, the largest registry, Verra, for example, has a new REDD+ methodology VM0048, requiring baselines to be established across countries or states – removing the freedom for each project to pick and choose their reference region as the basis for their own calculations.<sup>31</sup> Sorting out baselines for calculations within carbon credit schemes is thought to be able to have the biggest impact on over-crediting problems.<sup>32</sup> Similarly, a program is underway in a US National Laboratory to develop a CO<sub>2</sub> removal MRV (Monitoring, Reporting and Verification) framework, in collaboration with industry partners and CarbonPlan.

The aim is to enhance and advance technical foundations and transparency.<sup>33</sup>

If confidence in VCMs is persistently undermined by perceived weaknesses and mis-steps, buyers will cease to engage. At the same time, there is a deep need to produce more of the higher quality carbon credits if VCMs are to make a substantial difference to global emissions reductions. Buyers must be taught to be aware of different qualities of carbon credits, and a desire to purchase the better ones must be encouraged. Transparency and rigour will be fundamental to this process.

If concerns about the credibility and integrity of carbon credits and VCMs are allowed to grumble on, offsetting could remain controversial and companies may back away from this voluntary engagement. Under the credibility and integrity of offsetting ‘umbrella’ there are a number of challenges worth outlining.



## Durable or vulnerable?

Offsetting using removal projects that more or less guarantee that the sequestered carbon is gone for good is not usually controversial – this covers DAC, as the main example.<sup>xxi</sup> Claims for such projects should be transparent – but if they stand up to scrutiny all is well. However, less durable (secure) carbon removal has to be even more closely considered before it is awarded carbon credited status – and this probably covers almost all nature based solutions.

Thus the most widely available carbon sequestration options such as forestry schemes need to be extremely clear about the framework in which the carbon removal is taking place, what procedures there are for monitoring and follow up, and what limits there are on the claims that can be made for such a scheme. There is evidence that there is value in such schemes – for mitigation in the shorter term to help humanity through the next few decades. There is also evidence of the value of co-benefits linked to nature based solutions for local communities. The challenge is to be transparent about what a scheme is offering.<sup>34</sup>

Moving further away from clear-cut, secure removal is the question of protecting existing carbon stores, and preventing them from being destroyed. Is this carbon offsetting? The logic is that a forest cut down will emit all its sequestered carbon, so a forest saved should be counted in the emissions equation.

In many ways this is an area where transparency and rigour in measurement and monitoring solve part of the problem. However, there is a view that the underlying uncertainty should prevent ‘protection’ projects from counting in the offsetting process.

xxi To date about seven million durable carbon removal credits have been sold to date. (CDRFyi (undated) ‘We bring transparency and accountability to the carbon removal market’ <https://www.cdrfyi/>)



It is simply too vulnerable to exaggeration, uncertainty about ‘what would have happened’, and whether there are any true emissions savings. From the perspective of a local community this is, perhaps, a false distinction. If forests are being destroyed because of lack of policing, or absence of better economic opportunities, then offsetting is permitted to re-plant and restore what has been taken. Yet the value of a forest preserved (rather than destroyed and restored) is greater for the local community – and for the whole world, in the long run. This tension remains unresolved.

This controversial issue has recently come to the fore in detail. The Science Based Targets initiative (SBTi) sets a framework directing companies in best-practice as they set net-zero targets. In April 2024, the board of SBTi proposed allowing the use of some ‘protection and prevention’ credits in calculations for offsetting ‘Scope 3’ emissions (those arising from a company’s value chain). This proposal received some criticism from other quarters and remains in review.<sup>35</sup> However, the proposed change has been welcomed by other voices as it allows companies to engage in supporting VCM projects whilst separately reducing their own direct carbon footprint.



Overall, the buyer will be seeking to strike a balance between ‘doing the right thing’ and keeping its business viable. If targets are too strenuous and costly

“there’s a risk that SBTi becomes a club of a small number of companies, primarily from the EU. We need to ensure greater uptake and build a ramp for companies from other regions to join.”

— Guido Schmidt-Traub, CCAG member

‘Scope 3’ emissions are particularly challenging for many companies, as emissions up and down the value chain can be complex and huge in scale.

“The use of robust nature-based credits for offsetting should not be totally excluded. One reason for allowing some flexibility is that one company’s Scope 3 is another company’s Scope 1 or 2 – so these are double-counted emissions in most cases.”

— Johan Rockström, CCAG member



Buyers will engage with emissions credits if they know they are buying into a credible system, and the guardrails must be strong. This involves placing some additional responsibility on the buyers themselves, so that they play their part in creating a robust system in which all participants act with transparency and good faith.

For example, offsetting should not be used as an excuse to allow avoidable emissions to continue. Businesses need to show they have done all they can to reduce direct and indirect emissions – Scopes 1, 2 and 3. This is in line with requirements from SBTi, VCMi and Oxford Principles, and might be adopted as a requirement by highly rated registries.

The ambitions of the whole VCM system should be raised over time, so that currently permitted offsets and approaches will not necessarily be available in the future.

All businesses have to reach net zero (and beyond) before too long to meet global aspirations, so the value of avoidance credits in the longer term disappears. Only durable or permanent carbon removals will be effective once net-zero emissions is achieved, by helping to reduce the excess greenhouse gases in the Earth's atmosphere and thereby reducing global temperatures.

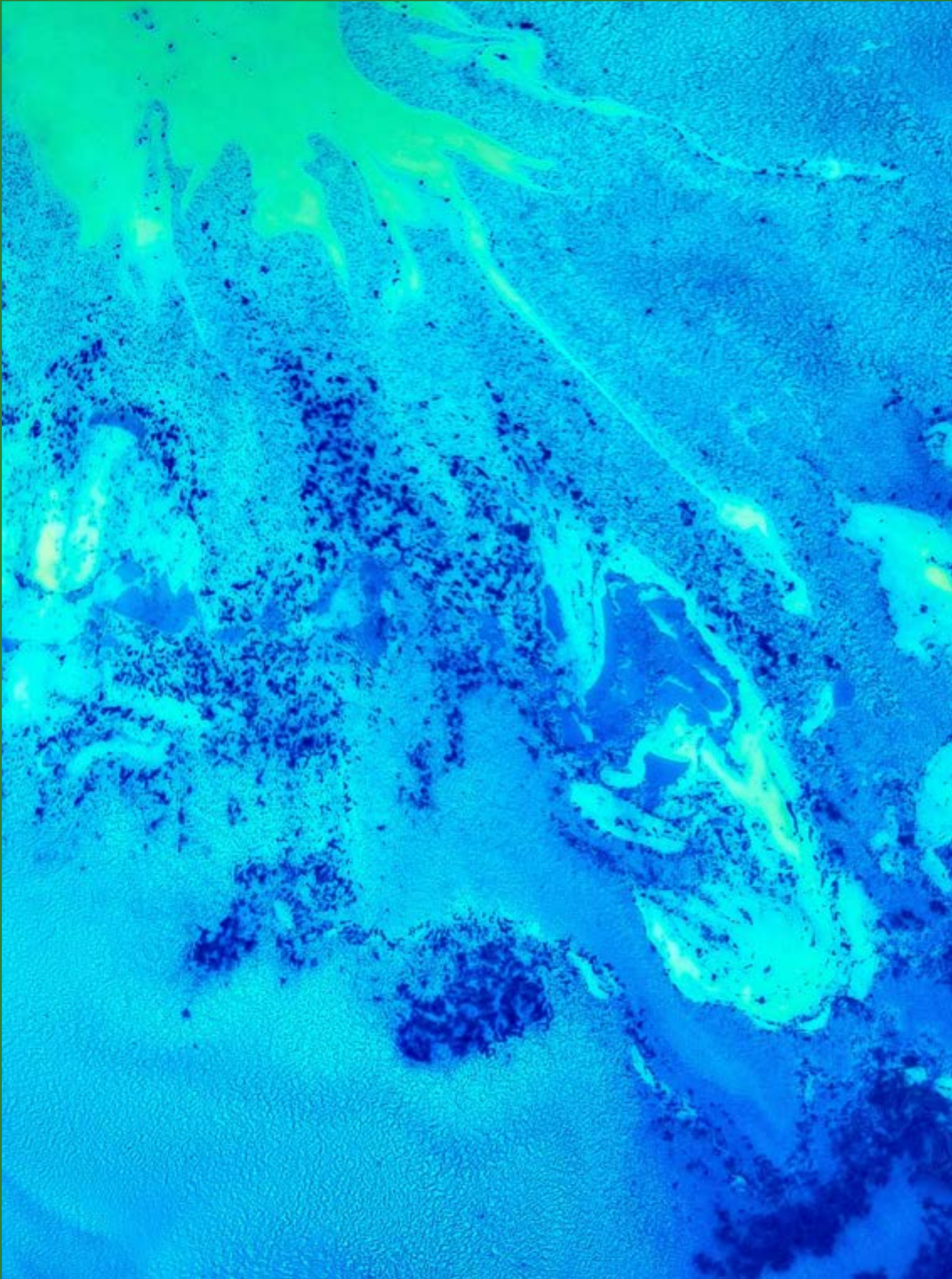


## Contribution

In addition to offsetting, carbon credits can be purchased by way of ‘contribution’ (also known as ‘beyond value chain mitigation’). In this process, credits are bought and retired but not offset against a company’s own emissions. If confidence in the VCM process was to fall completely, the ‘contribution’ would be the alternative strategy for a company.

Contribution is an uncontroversial practice, as it provides more funds for climate action without giving a smokescreen for continuing emissions. The question is what would motivate companies to do this, voluntarily, if they could no longer make claims for their own emissions reductions as a result.

VCMi is attempting to increase take-up through its Carbon Integrity Claims, with silver, gold and platinum levels achievable depending on the scale of contributions (once a company has demonstrated progress towards its science-based emissions reduction targets). Transparency, along with robust monitoring, reporting, and verification, remain a vital part of the process.



# 04. Registry Issues

The VCM came into existence to provide a mechanism for those wishing to balance their ongoing emissions with compensating emissions mitigation projects separate from their own business activities. The simplification provided by VCMs is that registries sell carbon credits, not projects. And they buy carbon credits not actual projects from independent third parties. The simple transaction within the actual VCM system masks a lot of work in the background to create this currency of 'Carbon Credits', and registries play a significant role in that work. This section will look at the issues arising when looking at registries, and the responsibilities and opportunities they have in the VCM system.

Given that VCMs are, by definition, a market place for participants to deal in carbon credits, they cannot be expected to deliver outcomes that lie outside the scope of such a scheme. Participants will require a return on their participation, and the very nature of VCMs highlights characteristics that can be perceived as shortcomings.

For example:

- Purchasers purchase carbon credits as part of their wider business proposition, whether it be to meet the requirements of their customers, or to meet the aspirations of the business owners. They are not going to be experts in the details and standards of different kinds of projects, their impacts on local communities, their durability and so on. They will depend on simple information, such as project rating systems, to guide where they choose to purchase carbon credits. There is evidence that a premium price can be taken for 'better' projects – but there may be limited pressure from carbon credit buyers to improve the quality of projects across the many different areas of potential weakness.
- VCMs require CO<sub>2</sub> removal to be the primary measure of a project's achievement. However, the protection and restoration of ecosystems in their own right is an important focus for the world, beyond CO<sub>2</sub> removal.

**'Well-governed and adaptively managed ecosystems will contribute to carbon storage over the long term, and nature based solutions will likely be needed to restore carbon released from natural feedbacks under a warming scenario, even as we achieve net zero between residual emissions and removals.'**<sup>36</sup>

The protection of ecosystems under immediate threat may be carried out within carbon credit systems as projects for the prevention from carbon emissions. However, background, steady, management of ecosystems is vital to a safer future world, but beyond the scope of projects designed and funded under the particular guiding principles of carbon removal for VCMs.

- There is an urgent global need of support for innovative removal methods and project development – even though the initial carbon removal in such projects may be low. Where there is uncertainty about the effectiveness of new methods of removal, funding for study and development may not come from carbon credit sales, because the ‘offset’ will not be assured. Funding in such cases may have to be made available elsewhere, being beyond the scope of VCMs.
- As a marketplace, financial flows from VCMs can be unreliable. The recent drop in confidence in the value and honesty of carbon credits has slowed activity, leading to a financial shortfall for projects seeking funding. The VCM market is organised so that funds are moved from purchasers to projects – but only if purchasers make funds available by purchasing carbon credits.



Registries themselves are funded by the sale and purchase of carbon credits, just as carbon removal projects are. There is, therefore, a potential conflict between the funding requirements at registry level and the funds that reach projects, actually delivering carbon removal or protection, plus their host of co-benefits, whether for conservation of ecosystems, livelihood development, or resilience in the face of ongoing climate change. Some registries are run on a 'not-for-profit' basis, implying that a smaller proportion of funds are required to cover their running costs, leaving the balance to be delivered into carbon removal and protection projects.

There is inevitably something of a power imbalance between registries and projects, given that registries ultimately control project funding flows. The registries therefore have the responsibility for ensuring that funds are distributed fairly, without undue loss outside of project activity. Transparency in financial dealings is an important principal for demonstrating such fairness.

In this analysis 'registry level' is used to encompass the numerous services and intermediaries involved in the system between the purchaser of carbon credits and the implementers of projects. Registry level is, itself, a diverse system of brokers, exchanges, resellers and registries. In addition, independent third party organisations assess and verify project potential for carbon removal. Follow up monitoring across the lifetime of projects – and beyond – must also be provided by third party organisations.

None of this is, in itself, unacceptable for a functioning market place. However, the system currently lacks transparency. There is rarely any way of knowing what proportion of a carbon credit price ultimately ends up with projects on the ground, or in supporting their evaluation, monitoring and verification.

This lack of transparency is not a new observation, with criticisms dating back to the early days of VCM. Whilst a review of REDD+ programmes in 2014 reveals how important funding from VCMs can be, the lack of transparency and variability of funding flows is a cause for concern – for climate action, but also for credibility within the VCM marketplace itself.<sup>37</sup>

Critics of VCM systems argue for transparency so that the financial flows can be roughly followed. For example, VCMs are 'dominated by a handful of major credit resellers. Pricing models are corporate secrets, and few offset providers openly disclose their margins.'<sup>38</sup> The possibility of excessive revenues being absorbed by the many financial intermediaries would be reduced if the information was clear and available to those buying carbon credits.



Transparency adds value to all aspects of the VCM system, and must be consciously developed. Transparency would reveal actual investment levels in projects, disclosing the amount reaching community level implementers; it would highlight commitments to monitoring, reporting and verification – which are fundamental to the success and credibility of VCMs.

The degree of transparency of financial deployment could be seen as a primary indicator of the quality of registry level services. Given that the whole VCM system revolves around what registries are prepared to buy and sell, it is registries themselves that have unique capacity to influence their own practices, but also those of third party verifiers, project implementation systems, financial intermediaries and so on. All need to be bound into commitments of transparency. In particular the fees of registries, brokers and intermediaries must be visible to those participating in VCM schemes.



“We want to provide countries with more funds to protect nature; but it cannot be a way to concentrate wealth again. Instead, it should redistribute money – it should be part of the just transition [to net zero], the transformation we need in our economies.”

— Professor Mercedes Bustamante, CCAG member

The challenge is to make the system more rigorous and transparent so that real results are delivered and can be seen to be delivered.





## The challenge of legacy credits

As the VCM has grown, registries and developers have begun to improve the quality of carbon credits. Improvements apply to all new projects, but older projects, registered in the past with poorer quality controls, have continued to issue credits. The volume of 'legacy credits' in the system is large in relation to demand. 'In principle, historic credits may have some legitimacy, but in practice they risk swamping the market and undermining well intentioned efforts to invest in genuine emission reductions.'<sup>39</sup>

Registries therefore have a number of clear challenges to address. They relate to business standards and practices, project quality and monitoring, and legacy credits.

The key challenges:

- Transparency of cash flows through the system from carbon credit purchase to project implementation, monitoring, measurement and verification;
- Quality of technical services and standards: scientifically rigorous methodologies for calculation of carbon quantities, capacity of third party project selection and verification, monitoring and measurement;
- Adherence to principles of science-led project standards and scrutiny throughout;
- Securing projects for investment where carbon removal is demonstrably long-lived, or where credible maintenance systems are in place as part of the project proposition (durability);
- Addressing legacy credits created in out-dated (below current standards) projects.

Solutions may involve developing standards and codification at the many levels within the VCM chain. Registries could promote ‘gold standard’ accreditation for companies who have taken all reasonable steps to reduce their emissions before purchasing carbon credits to offset any balance.<sup>xxii</sup> They could rate themselves and their intermediaries against their standards of transparency, scientific rigour and ethical consistency – knowing that this would result in a ‘premium registry’ standard against which all registries would be measured.<sup>xxiii</sup>

This approach is being developed by VCM participants such as ICVM in which the first ‘Carbon Integrity Claim’ was made in February 2024, after assessment of more than 100 methodologies was commenced.<sup>40</sup> Under this approach projects continue to be rated for their durability and capacity to remove carbon, and also for their commitment to monitoring and measuring. Others will assess projects for the co-benefits they deliver, the ethical engagement with local communities and the delivery of funding to community level, for example.<sup>41</sup>

The registries are in a pivotal position to articulate the current concerns and to address them by establishing transparency in every part of the VCM system – and a commitment to scientific rigour in setting measurement methodologies, monitoring and scrutiny of projects. Where necessary, VCMs must welcome regulatory support for these principles, as exemplified in the new EU interventions.<sup>42</sup> All of these efforts must become the norm for VCMs so that they are valuable to all participants in the system.

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xxii This is the area in which SBTi (Science Based Targets initiative) concentrate, for example.

xxiii A range of organisations are tackling ratings and creation of premium projects and premium registries. See for example, GCC (Global Carbon Council), GS (Gold Standard) VCS (Verified Carbon Standards), IC-VCM (Integrity Council for the Voluntary Carbon Market) and so on.



Projects financed through VCMs have the potential to deliver impact on the ground: lasting positive impact for regions and communities affected by the climate crisis.

These projects can be both large and small in scale. They might encompass activities such as managing forests and other vulnerable or depleted ecosystems, building renewable energy infrastructure, transitioning to regenerative farming and soil management, distributing clean cookstoves, or funding institutional arrangements to support critical climate initiatives.

In this section, we discuss some of the key challenges confronting VCM-funded projects, possible solutions to these challenges, and the co-benefits of climate mitigation schemes.



## Challenges

Projects funded through the trading of carbon credits face a number of challenges; they must demonstrate ‘additionality’ as well as dealing with standard-setting, quality control and verification.



## Additionality

VCM-funded projects have the potential to achieve additionality – that is, to deliver emissions reduction, removal or avoidance that would not have occurred in the absence of those projects. And in this additionality lies the unique value of voluntarily driven climate action.

However, determining additionality can be difficult. Firstly, in the context of VCM funding, a project can only be defined as ‘additional’ if its core activities occur as a result of income generated through the sale of carbon credits.<sup>xxiv,43</sup> And this analysis depends on counterfactual reasoning: what would have happened if there had been no prospect of income from carbon credits?

Secondly, additionality can be undermined by two key factors: profit and policy. For example, a project might be financially profitable without income from carbon credits, as is often the case with renewable energy, which tends to be cheaper today than traditional fossil fuel energy. Projects promoting renewables may therefore not need the subsidies created through carbon credit schemes, thereby invalidating any claim to additionality. Similarly, government policy may enable and support the type of activity being delivered by a particular project, for example through national laws protecting forested areas. In this instance, the carbon sequestration achieved would not be the result of initiatives made possible through carbon credits alone: it would have occurred anyway.

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xxiv Additionality can be defined in various ways. Many sources use a definition that encompasses the effectiveness of a project – so a project is additional if it results in more removal or avoidance than would have happened in its absence. We use a narrower definition of additionality here, with effectiveness being part of “quantification”. See for example, Nature Climate Change, Fankhauser et al (2022) ‘The meaning of net zero and how to get it right’ <https://www.nature.com/articles/s41558-021-01245-w>; Energy Policy, Greiner et al (2003) ‘Defining Investment Additionality for CDM projects – practical approaches’ <https://www.sciencedirect.com/science/article/abs/pii/S0301421502001428>



## Durability

VCM-funded projects are often evaluated according to their durability, or permanence. If a project stores carbon for only a few years, it is deemed capable of making only a minimal contribution to assuaging the climate crisis. Storage for several decades may be useful in reducing peak warming, assuming global net zero can be reached by the middle of this century.<sup>44</sup> Storage for centuries would be much more desirable, as suggested by the EU's new Carbon Removals and Carbon Farming Regulation<sup>45</sup>, which asserts that “permanent carbon removal refers to activities removing carbon dioxide from the atmosphere and storing it securely and durably for several centuries”. And of course, storage for millennia is the ideal, because geological processes will reabsorb released CO<sub>2</sub> over a similar timescale.



However, projects that achieve shorter-term carbon removal and less permanent mitigation impacts can still deliver real value. Indeed, there are clear arguments that impermanent nature-based projects can deliver long-term social benefits by delaying the onset of harmful climate change, giving societies more time to adapt and build resilience.<sup>46</sup>

Given that every option for tackling the climate crisis must now be deployed, these arguments should not be overlooked.

According to the United Nations University Institute of Natural Resources in Africa (UNU-INRA), the current focus on durability within project evaluation is problematic. Standard-setting companies, they argue, “are more proficient in carbon-accounting than on-the-ground social assessments and would benefit from improving their capacity in understanding the social consequence of...carbon projects.”<sup>47</sup>

Whilst the duration of projects may vary from a few years to several decades, any insistence on ‘permanence’ as a foundation of valid carbon credits would reflect yet again an imbalance of power – where communities most able to benefit from nature-based interventions become excluded in favour of high-cost, highly technical processes – such as DAC (direct air capture) with few, if any co-benefits.





**A lack of ‘permanence’ does not mean a lack of impact, and the social implications of smaller-scale projects, whose mitigation or removal outcomes are shorter-term, can still be significant.**

“Standard-setting groups...should shift from a focus on the technical requirements of additionality and permanence to other social [considerations].” — UNU-INRA<sup>48</sup>



### Verification and incentives

Challenges and issues also arise through the process of project verification. Under the current system, projects appoint auditors known as Verification & Validation Bodies (VVBs). VVBs check that a project’s design and monitoring documents are consistent and conform to the methodologies set out by registries. They also make site visits and conduct independent measurements.

Current dynamics in the VCM system risk, in the short term, incentivising overstatements of emissions avoidance or removal. Registries are paid by projects and projects are free to choose the registry they join, providing an incentive for registries to be less stringent in their requirements – to be more welcoming to projects. This reduction in stringency has, arguably, contributed to a deterioration of standards:

**“This race-to-the-bottom dynamic helps explain why low-quality projects dominate.”<sup>49</sup>**

At the heart of voluntary systems and market-led processes inherent pressures to overstate impact have grown, creating major implications for verification. According to the European Corporate Governance Institute (ECGI): “Each of the players in this game, starting with the project developer, the standard setter and the VVB, has incentives to overstate offset claims...It is project developers who hire and pay VVBs, while it is standard setters who decide which VVBs to accredit and hence which VVBs can be hired by project developers. Thus, VVBs have incentives to cater to the preferences of both project developers and standard setters.”<sup>50</sup>

In a series of interviews with key stakeholders, a critical review of voluntary carbon offsets again highlights how “verification may be challenging because sellers of carbon offsets may have little incentive to report information accurately to the program administrators concerned, and the buyers may have little incentive to investigate the quality of offsets on their own.”<sup>51</sup> Costs were also found to be a deterrent to rigorous verification.



## Solutions

Despite the complex issues facing VCM-funded projects, it is important to remember that just two decades ago these projects didn't exist at all. The sheer fact of their presence today, of voluntary mechanisms operating outside of national commitments and frameworks, shifting finance from the developed Global North to vulnerable regions of the Global South, is cause for optimism. It is true they are far from perfect, but they also have a major role to play in tackling the climate crisis and creating a safer space for humanity.

**In spite of the critical evaluations noted in this report, the overarching view is that VCMs provide real emissions mitigation, as well as valuable co-benefits in many cases.<sup>52</sup>**

There are signs, now, of emerging solutions to the challenges described above; solutions that could help set VCM-funded projects on a more stable and sustainable pathway. Arguably, the balance is tipping so that the whole VCM system is responding to the pressure to improve its transparency and rigour in order to build trust and secure its future.





## Quality

If the carbon credits traded through VCMs can be shown to be high-quality, with full transparency and minimal scope for overestimation, then the system will increasingly be trusted and enabled to provide the reliable climate services and funds-transfers intended.

A cross-market effort to raise the quality of carbon credits is already underway. The Integrity Council for the Voluntary Carbon Market (ICVCM), created in 2021 as an independent governance body, is setting a benchmark for credits based on its ten Core Carbon Principles (CCPs)<sup>53</sup>, covering issues such as effective governance, transparency and robust quantification.

All the major registries have applied to the ICVCM to have their methodologies assessed against these principles. In parallel, the Voluntary Carbon Markets Integrity Initiative (VCMII) will require that companies buy CCP-compliant credits to qualify for its corporate carbon claims.

“The work of these initiatives, alongside efforts by standard setting bodies (e.g., Gold Standard, Verra and ART TREES), carbon credit ratings agencies (e.g., Calyx, Sylvera and BeZero), and other partnerships such as the Carbon Credit Quality Initiative...[has] led to greater convergence and consensus-building within the carbon market ecosystem of actors on what high integrity is and how to achieve it.”<sup>54</sup> — UNDP High Integrity Carbon Markets Initiative

This clearly shows plenty of steps in the right direction.

“Quality challenges are deep, but are getting addressed, and the Core Carbon Principles are a decent start.”  
— Guido Schmidt-Traub, CCAG member

“ICVCM is important. It is a bit late... but better late than never. It is solving the problems of the recent past. We also need to be aware of problems of the future, such as the need for independent monitoring and imposing penalties.”

— Professor Mercedes Bustamante, CCAG member



## Grassroots empowerment

In order to address issues of equity and ownership, it is crucial that local communities and indigenous peoples are involved in VCM-funded projects from the outset. The more agency these key stakeholders have, the more likely a project is to protect local rights, store carbon durably and safeguard biodiversity.<sup>55</sup>

The importance of engaging local people in project design and execution is confirmed in on-the-ground studies.

“Socioecological co-benefits... are unlikely to be realized unless the local communities engaged with these projects are granted ownership over implementation and outcomes”<sup>56</sup>.

“The presence of a formal community management association and local participation in rule-making are consistent predictors of multiple positive outcomes.”<sup>57</sup>



In Africa in particular, there is a need for clearer frameworks to ensure community participation in carbon projects, and more equitable participation in carbon markets. To this end, rigorous assessment is required to determine not only community engagement but the impact projects are having on local people. UNU-INRA's report on carbon markets and climate action in Africa, commissioned by CCAG, makes a compelling case for greater community enfranchisement within the VCM system. The report builds from interviews with those who have direct programme experience.

“New standards need to come in to make sure that genuinely any project assessment has a full social, environmental and other form of assessment that makes sure that local communities have been involved in the design of the project. That it isn't just negotiated with the local chief, that there is a proper analysis of different genders, ethnicities, ages and wealth groups. So that you get a sense of who's going to lose and who's going to gain from these projects.”<sup>58</sup>

And in the same report:

“Do communities really understand what they are giving away? Farmers may not actually understand how the investments work and will be in poverty later. The success of projects depends on how farmers are integrated into the project from the beginning.”<sup>59</sup>



### Incentives and labelling for removals

Government incentives can play an important role in driving up demand for durable removals, which are more expensive than other credits. In the US, for example: The Carbon Dioxide Removal (CDR) Purchase Pilot Prize will enable companies to compete for the opportunity to sell carbon dioxide removal credits directly to the Department of Energy (DOE).<sup>60</sup>

At present, the Science Based Targets Initiative (SBTi) stipulates that removals don't count until the time of net zero, which doesn't provide a mechanism for the industry to grow. By allowing durable removals for offsetting, or better still setting a target for companies to buy durable removals, the VCM system could stimulate the demand needed now. Rigorous assessment and classification of credits, to ensure they are appropriately priced, will also help to drive progress in this area.



## Beyond carbon: the potential co-benefits of VCM-funded projects

Carbon, of course, is not the only consideration. If mitigation projects are badly designed, they can do harm. For example, it would be wrong to drain a unique wetland in order to plant a forest, generating carbon credits at the cost of biodiversity, even if (which is unlikely) there would be a net gain in carbon sequestration.

But if projects are well designed, they can have many co-benefits. Nature-based mitigation schemes in particular are known to deliver compelling co-benefits, and are the focus of much of the literature on this topic. By conserving, restoring and sustainably managing natural ecosystems, such projects help to safeguard biodiversity, improve food and water security, reduce pollution, reinforce indigenous land rights, boost local livelihoods and increase climate resilience.

These co-benefits are well articulated in a 2023 study of community forest governance:

**“Forest landscape restoration has emerged as a key strategy to sequester atmospheric carbon and conserve biodiversity while providing livelihood co-benefits for indigenous peoples and local communities.”<sup>61</sup>**

Indeed, carbon projects could protect as much as 58% of Southeast Asia’s threatened forest area.<sup>62</sup> As well as saving more than 800 million tonnes of CO<sub>2</sub>e through avoided deforestation in Southeast Asia, projects could support the diets of more than 300,000 people from pollinator-dependent agriculture, improve water quality and protect 25 million hectares of Key Biodiversity Areas (as defined by the International Union for Conservation of Nature). Clearly, allowing natural forests to regenerate in biodiversity hotspots could be one way to leverage the co-benefits of nature-based projects at low cost.<sup>63</sup>

In Africa, meanwhile, Climate Action Platform for Africa (CAP-A) analysis reveals that nature-based carbon removal opportunities alone, priced at US \$50 per tonne, have the potential to generate US \$15 billion in annual revenue, and create better livelihoods and new employment opportunities for over 85 million Africans. Moreover, at a rate of US \$100 per tonne, these opportunities could yield US \$57 billion in yearly revenue, supporting over 140 million people on the continent.<sup>64</sup>

## The community co-benefits of mangrove preservation<sup>65</sup>

In Southern Kenya, the Mikoko Pamoja project, a Blue Carbon initiative, sold carbon credits from mangrove preservation, reducing 3,000 tons of CO<sub>2</sub>e emissions per year through the VCM system. As the first community-based project to successfully trade mangrove-derived carbon credits, Mikoko Pamoja showcases the potential of carbon trading to generate financial benefits for local communities and support climate mitigation efforts. By promoting sustainable forest management and preserving critical ecosystems, carbon trading initiatives can provide valuable economic and environmental benefits for African communities.



Other forms of mitigation can also provide substantial co-benefits. For example, clean cookstove projects can improve gender equality and health, freeing women from time-consuming firewood collection and cutting air pollution from traditional biomass-burning stoves.<sup>66</sup> Energy efficiency and renewable energy projects may also reduce air pollution from fossil fuels and improve energy access. Meanwhile, various carbon removal approaches, including biochar, can improve soil condition and increase crop yields, depending on local conditions.<sup>67</sup>

There is evidence that credits with higher perceived co-benefits can command premium prices. Whilst different buyers behave differently, “companies driven by values and market competitiveness demonstrated a willingness to invest in high-cost projects that provide significant local co-benefits,” although other companies, motivated by efficiency, preferred cheaper credits.<sup>68</sup>

With some nature-based solutions, protection overlaps with removal:

**“IPCC models put a lot of emphasis on removal. Novel mechanisms are not there yet so we need to use traditional methods of photosynthesis such as forests. But we cannot afford to throw money at initiatives that don’t work.”**

— Professor Mercedes Bustamante, CCAG Member

But given the sometimes limited durability and scale of nature-based removals, novel approaches to removal will be required at scale. The Voluntary Carbon Markets Integrity Initiative (VCMI) says that “the importance of early investment in carbon removal projects should be reinforced...these solutions are fundamental to achieving net-zero emissions and need to be scaled up. VCMI encourages companies to use carbon dioxide removals as part of their carbon credits portfolio and invest in future carbon removals.”<sup>69</sup>

The VCM is one of the few mechanisms available to channel corporate funds into the early development of these technologies. Because it is a rapidly developing and flexible funding and technology system, VCM offers chances for regulators and governments to learn from the VCM experience – and perhaps even bring some of the VCM participants within regulatory systems in the longer term.

The VCM system offers a place for experimentation and innovation. Innovation can include long-term agreements to provide certainty, which in turn supports funding for well-managed and more durable



carbon removal projects; it can support funding for innovative and integrated investments in ‘beyond value chain’ experimentation and development for durable storage techniques.<sup>70</sup> In the longer term all offsetting will be required to transition along the continuum towards more durable removals, with decreased risks of reversal.<sup>71</sup> This shift would present a potentially vast market with opportunities for multiple positive impacts and co-benefits.



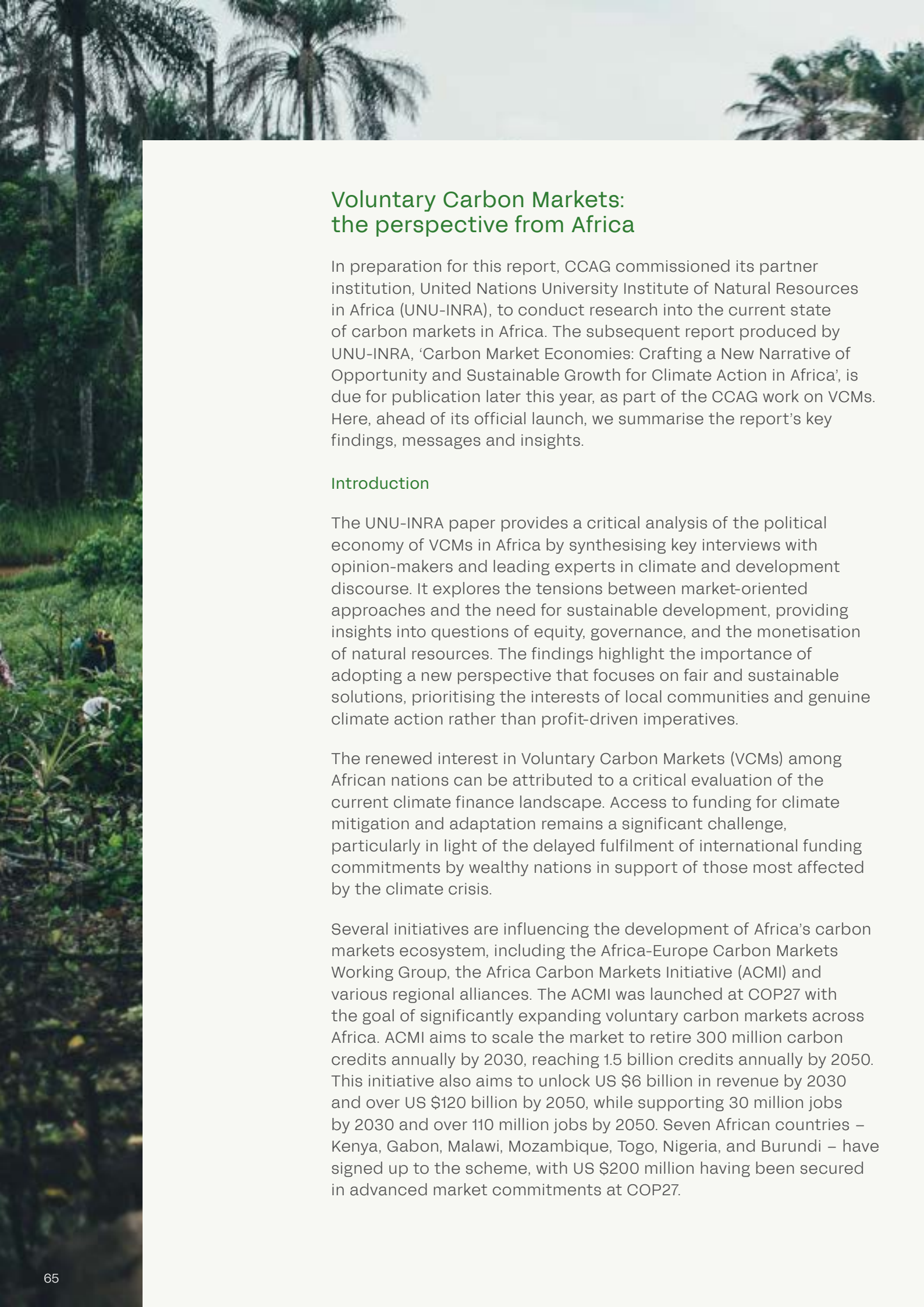
### Tackling transparency

There are concerns about how to measure project impacts on biodiversity, and about whether local communities actually see much benefit. In 2013 it was reported that:

**“The evidence suggests that host communities often benefit little from carbon market projects and find it difficult to protect their interests.”<sup>72</sup>**

In fact, in some cases social tensions and forest clearance continue within forest carbon credit schemes, highlighting the importance of local power structures and the need for co-development of projects.<sup>73</sup>

If the full potential co-benefits of carbon projects are to be felt by indigenous communities, greater contractual transparency will be required, while monitoring, reporting and verification remain vital. To maximise co-benefits and minimise negative side-effects, projects should follow the IUCN Global Standard for Nature-based Solutions, while organisations in general should align their corporate objectives with the goals of the Kunming-Montreal Global Biodiversity Framework.<sup>74</sup>



## Voluntary Carbon Markets: the perspective from Africa

In preparation for this report, CCAG commissioned its partner institution, United Nations University Institute of Natural Resources in Africa (UNU-INRA), to conduct research into the current state of carbon markets in Africa. The subsequent report produced by UNU-INRA, 'Carbon Market Economies: Crafting a New Narrative of Opportunity and Sustainable Growth for Climate Action in Africa', is due for publication later this year, as part of the CCAG work on VCMs. Here, ahead of its official launch, we summarise the report's key findings, messages and insights.

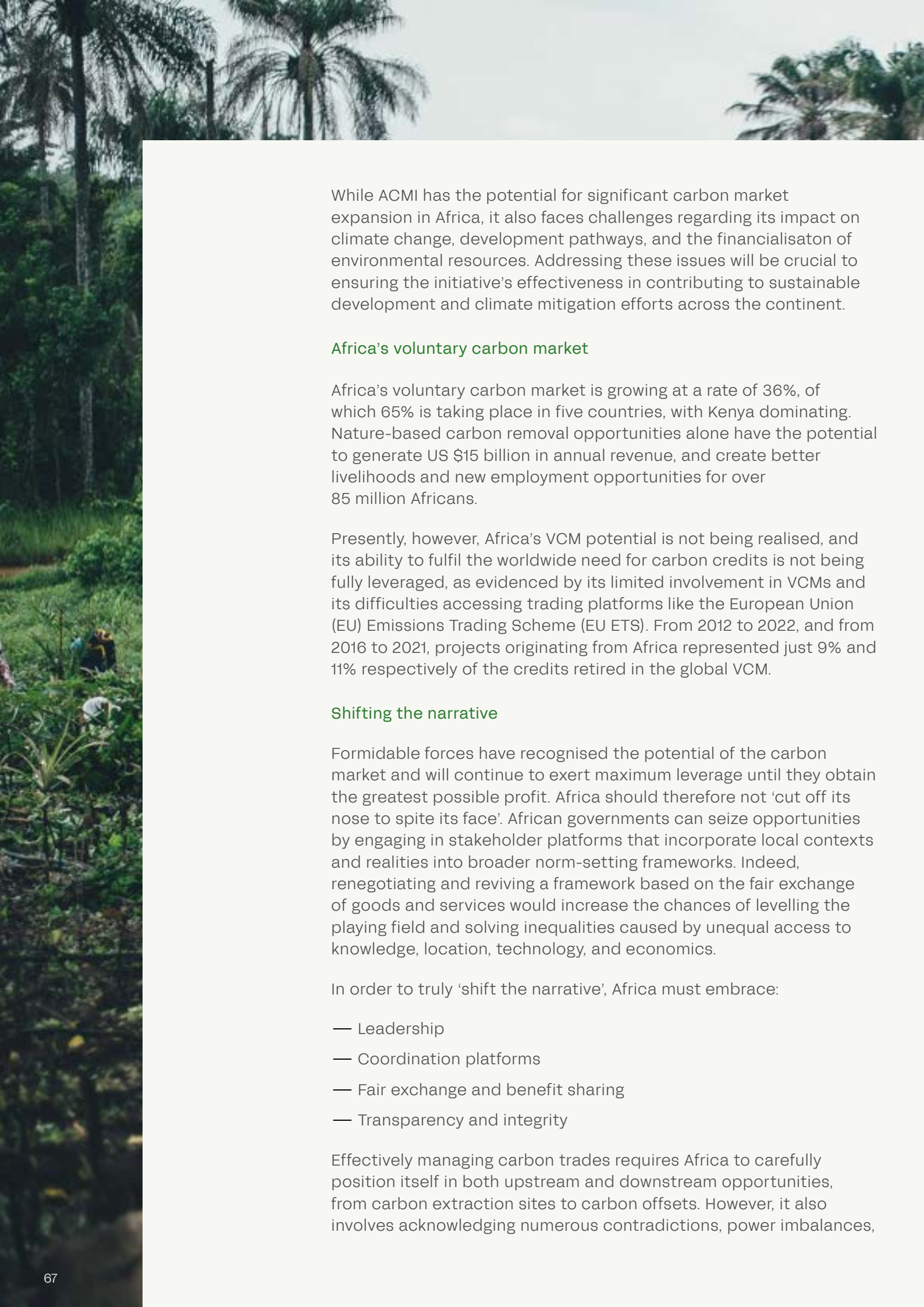
### Introduction

The UNU-INRA paper provides a critical analysis of the political economy of VCMs in Africa by synthesising key interviews with opinion-makers and leading experts in climate and development discourse. It explores the tensions between market-oriented approaches and the need for sustainable development, providing insights into questions of equity, governance, and the monetisation of natural resources. The findings highlight the importance of adopting a new perspective that focuses on fair and sustainable solutions, prioritising the interests of local communities and genuine climate action rather than profit-driven imperatives.

The renewed interest in Voluntary Carbon Markets (VCMs) among African nations can be attributed to a critical evaluation of the current climate finance landscape. Access to funding for climate mitigation and adaptation remains a significant challenge, particularly in light of the delayed fulfilment of international funding commitments by wealthy nations in support of those most affected by the climate crisis.

Several initiatives are influencing the development of Africa's carbon markets ecosystem, including the Africa-Europe Carbon Markets Working Group, the Africa Carbon Markets Initiative (ACMI) and various regional alliances. The ACMI was launched at COP27 with the goal of significantly expanding voluntary carbon markets across Africa. ACMI aims to scale the market to retire 300 million carbon credits annually by 2030, reaching 1.5 billion credits annually by 2050. This initiative also aims to unlock US \$6 billion in revenue by 2030 and over US \$120 billion by 2050, while supporting 30 million jobs by 2030 and over 110 million jobs by 2050. Seven African countries – Kenya, Gabon, Malawi, Mozambique, Togo, Nigeria, and Burundi – have signed up to the scheme, with US \$200 million having been secured in advanced market commitments at COP27.





While ACMI has the potential for significant carbon market expansion in Africa, it also faces challenges regarding its impact on climate change, development pathways, and the financialisation of environmental resources. Addressing these issues will be crucial to ensuring the initiative's effectiveness in contributing to sustainable development and climate mitigation efforts across the continent.

### Africa's voluntary carbon market

Africa's voluntary carbon market is growing at a rate of 36%, of which 65% is taking place in five countries, with Kenya dominating. Nature-based carbon removal opportunities alone have the potential to generate US \$15 billion in annual revenue, and create better livelihoods and new employment opportunities for over 85 million Africans.

Presently, however, Africa's VCM potential is not being realised, and its ability to fulfil the worldwide need for carbon credits is not being fully leveraged, as evidenced by its limited involvement in VCMs and its difficulties accessing trading platforms like the European Union (EU) Emissions Trading Scheme (EU ETS). From 2012 to 2022, and from 2016 to 2021, projects originating from Africa represented just 9% and 11% respectively of the credits retired in the global VCM.

### Shifting the narrative

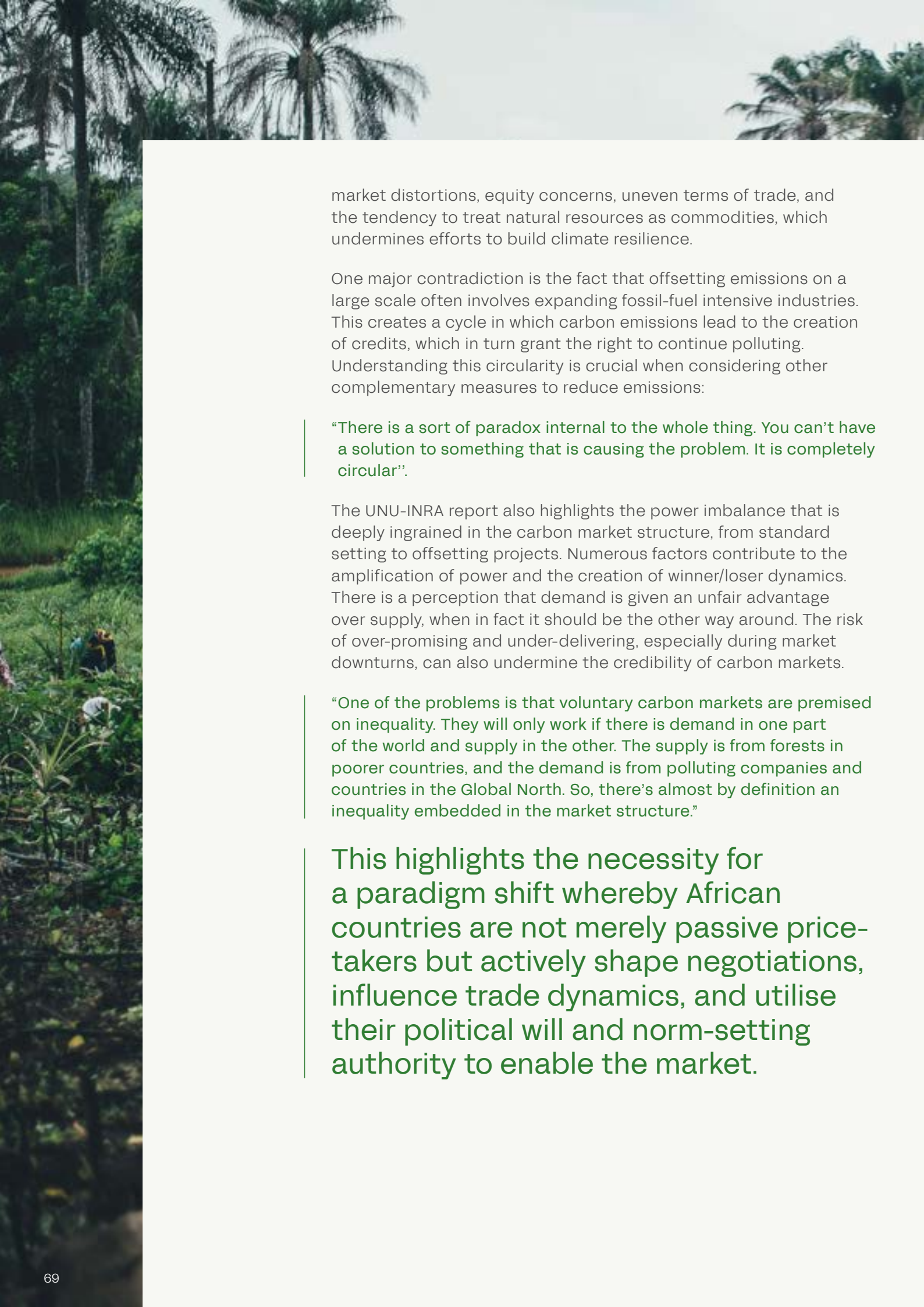
Formidable forces have recognised the potential of the carbon market and will continue to exert maximum leverage until they obtain the greatest possible profit. Africa should therefore not 'cut off its nose to spite its face'. African governments can seize opportunities by engaging in stakeholder platforms that incorporate local contexts and realities into broader norm-setting frameworks. Indeed, renegotiating and reviving a framework based on the fair exchange of goods and services would increase the chances of levelling the playing field and solving inequalities caused by unequal access to knowledge, location, technology, and economics.

In order to truly 'shift the narrative', Africa must embrace:

- Leadership
- Coordination platforms
- Fair exchange and benefit sharing
- Transparency and integrity

Effectively managing carbon trades requires Africa to carefully position itself in both upstream and downstream opportunities, from carbon extraction sites to carbon offsets. However, it also involves acknowledging numerous contradictions, power imbalances,





market distortions, equity concerns, uneven terms of trade, and the tendency to treat natural resources as commodities, which undermines efforts to build climate resilience.

One major contradiction is the fact that offsetting emissions on a large scale often involves expanding fossil-fuel intensive industries. This creates a cycle in which carbon emissions lead to the creation of credits, which in turn grant the right to continue polluting. Understanding this circularity is crucial when considering other complementary measures to reduce emissions:

“There is a sort of paradox internal to the whole thing. You can’t have a solution to something that is causing the problem. It is completely circular”.

The UNU-INRA report also highlights the power imbalance that is deeply ingrained in the carbon market structure, from standard setting to offsetting projects. Numerous factors contribute to the amplification of power and the creation of winner/loser dynamics. There is a perception that demand is given an unfair advantage over supply, when in fact it should be the other way around. The risk of over-promising and under-delivering, especially during market downturns, can also undermine the credibility of carbon markets.

“One of the problems is that voluntary carbon markets are premised on inequality. They will only work if there is demand in one part of the world and supply in the other. The supply is from forests in poorer countries, and the demand is from polluting companies and countries in the Global North. So, there’s almost by definition an inequality embedded in the market structure.”

**This highlights the necessity for a paradigm shift whereby African countries are not merely passive price-takers but actively shape negotiations, influence trade dynamics, and utilise their political will and norm-setting authority to enable the market.**

### Key observations, recommendations and insights

- Africa should not be used as a carbon sink.
- International markets have little incentive to behave in line with national development priorities. Their interest is based on emissions reduction and not on long-term resilience outcomes.
- The prevalent price-taking approach poses a major challenge to the carbon value chain, as communities often lack influence in determining prices.
- A 'follow the money' approach can be compounded in countries with weak or non-existent regulation, if investors seek cheap offsets, possibly overlooking the displacement of communities and the loss of land, particularly in forestry-related offset projects.
- Without adequate safeguards and benefit-sharing mechanisms in place, vulnerable populations may be adversely affected by carbon-market initiatives, while carbon projects may conflict with local agrarian and land-based livelihood systems.
- There is a paradox in that climate change was created through capitalism and the industrial development that underpins the economic system. Yet we are trying to solve this problem through market mechanisms and the capitalist system that exacerbates it.
- There is a need for intervention to regulate carbon emissions and a paradigm shift in climate action and development strategies in Africa, moving away from market-based approaches that have proved ineffective in addressing the continent's unique challenges.
- Do offset systems simply relocate environmental harm instead of tackling the underlying issue?
- Carbon offsets should be a mechanism used in addition to other emissions reduction targets, and not the main focus of net zero strategies – and even then they should only be used for residual, hard-to-reduce emissions.
- There is a strong link between climate change and development, as industrial progress leads to higher carbon emissions, while climate change impacts hinder development efforts.
- African countries face various structural obstacles that limit their ability to shift towards low-carbon production systems. Therefore, it is crucial to ensure that development strategies are in line with climate objectives. Addressing development challenges inherently helps to strengthen climate resilience.

- Many African countries lack the institutional capacity, technical expertise, and financial resources needed to participate effectively in voluntary carbon markets. This includes challenges related to carbon accounting, project development, monitoring and verification, and regulatory compliance.
- Transparency is a huge issue limiting the ability of carbon credit suppliers and local communities to make fair and just deals based on knowledge and data.
- African countries must develop knowledge and understanding of carbon markets to be able to influence the market and set their own agendas.
- Governments should prioritize integrating livelihoods into carbon projects so that nature-based solutions do not prevent communities from economic activity, and alternative livelihood activities are created.

Overall, the report highlights that participating in VCMs presents economic opportunities for African countries by monetising carbon sequestration and emissions reduction activities. At the same time, it underscores the need for Africa to have a unified voice that ensures it participates in VCMs on its own terms, enables negotiations for fair and equitable engagement with the market, and guarantees its needs are met:

**“Africa stands to gain, but only if we dance to our own tune.”**

Progress is still being impeded, and there is a lot of untapped potential that has yet to be realised because of gaps in regulatory knowledge, limitations in capacity, and various structural issues. Without intervention, disparities in capacity and information will continue to create an environment that allows for exploitation. Ultimately, strategic policymaking, capacity-building, resource value addition, and an inclusive just-transition approach are crucial for Africa to fully harness the economic and sustainable development advantages of engaging in global carbon markets.





# Recommendations

## 01

### Transparency, including financial transparency:

Every aspect of VCMs will be strengthened if transparent processes and calculations become the norm. Transparency is a recurring theme in this report, no matter the perspective from which the system is viewed. Transparency brings clarity and honesty – and allows discussion about things that may be difficult to get right, as well as removing any smokescreen for hiding poor practices. A demonstrable commitment to transparency is essential for building and maintaining confidence in the VCM system.

In a transparent system, measurement and methodology become open for discussion, and as industry norms are strengthened, opportunities for ‘shopping around’ by buyers and sellers into VCMs are reduced. Transparency about financial allocations along the VCM pipeline will help to expose unethical practices, and secure a fair deal for communities and project implementers. All transparency matters, but financial transparency is especially important as a step towards building and enhancing trust in VCMs.

The huge range and diversity of private sector funders, multilateral and bilateral public finance sources, national and local government, civil society and NGOs involved means that inculcating and defining transparency throughout the system is a challenging proposition.

There is no third party charged with responsibility for defining and monitoring standards within VCMs, and various organisations (some commercial, some not) have entered the space to provide certification and benchmarking. They do not (yet) share common analytical processes or standards. Thus, transparency about their own particular priorities and standards is an important part of building integrity into the VCM system.

Participants often look to the GCF (Green Climate Fund within the Paris Agreement process) to provide guidance on financial transparency. The GCF seeks to provide support by integrating civil society and other non-State actors into its own deliberations. The GCF is also developing mechanisms to include the participation of civil society directly in globally significant projects such as REDD+.

But the absence of international and state regulation means that inclusion of civil society does not always occur, and even when it does this does not guarantee full financial transparency. Purchasers and Projects would benefit from more transparent practices, and Registries themselves can play a critical part by agreeing on an industry-wide basis to introduce financial transparency, instantly adding value to the VCM proposition.<sup>75</sup>

## 02 Improve Monitoring, Reporting, and Verification

MRV (Monitoring, Reporting, and Verification) is fundamental to carbon pricing and management mechanisms, supporting transparency and integrity by ensuring emission reductions are real and verifiable. These principles underpin all other improvements to VCMs because they begin to enable transparency and meaningful scrutiny.<sup>xxv</sup>

Monitoring, reporting, and verification processes should progress towards standardisation wherever possible, and always be conducted in an open and transparent manner. The inconsistency of existing standards, and the absence of a shared regulatory structure for binding offset providers makes sector-wide rigour more difficult.

A clear system of validation and accreditation would add credibility and build trust.<sup>76</sup> A small number of major standard setters hold significant power in this potential process, enabling a decisive shift to be possible if the major standard setters move together.

These challenges will begin to be addressed by implementing transparency requirements in MRV for both standard setters and validators. In the longer term it would be helpful to see the establishment of independent oversight bodies at national, regional – and ultimately global level. Modifying fee structures to create direct links between the measurable quality and performance of certified offsets, rather than the mere quantity of offsets certified, would also enhance the importance and impact of MRV processes.<sup>77</sup>

There may also be scope for smart solutions to unlock implementation of some aspects of standard setting, such as implementing industry-wide carbon market standards supported by blockchain technology.<sup>78</sup>

## 03 Do-no-harm credits and appropriate co-benefits: taking a holistic approach

Climate change mitigation efforts, including carbon trading, can unintentionally lead to harm, even to human rights breaches, especially in the lives of indigenous people and local communities whose lives and livelihoods are intertwined with the resources under consideration. To avoid such unintended consequences, trustworthy carbon credit projects must be governed by ‘do-no-harm’ principles, ensuring they not only avoid causing harm, but also codify and record appropriate co-benefits. Transparency, monitoring, reporting and verification are essential to this approach.

xxv A complete helpful review of standards as found, and as needed, is set out in a review article published in 2015. (Nature Climate Change, Bellassen et al (2015) ‘Monitoring, reporting and verifying emissions in the climate economy’ [https://hal.science/hal-01190149/file/2015%20-%20Bellassen%20et%20al%20-%20NCC%20-%20MRV%20in%20the%20climate%20economy\\_preprint.pdf](https://hal.science/hal-01190149/file/2015%20-%20Bellassen%20et%20al%20-%20NCC%20-%20MRV%20in%20the%20climate%20economy_preprint.pdf))

A 'rights-based' approach in VCMs can protect and include Indigenous Peoples and local communities, guaranteeing their active participation in project formulation and ecosystem management. Financial transparency, in particular, will enable scrutiny of how these approaches play out on a project by project basis – showing whether local and indigenous stakeholders have meaningful voices, participation and receipt of co-benefits.

A collaborative framework involving financial institutions, multinational corporations, governments, and indigenous and local communities at project level, could significantly enhance the ethical standing of investments in the clean energy transition in developing countries, promoting global sustainable development and a just transition. This holistic approach secures efforts to combat climate change that do not inadvertently create new problems or exacerbate existing inequalities.<sup>xxvi</sup>

## 04 VCM credits for emissions removal preferential to credits for emissions reductions or avoided emissions

In an ideal world, carbon removal from the atmosphere is to be preferred as opposed to emissions reductions (which should happen anyway, as part of a business commitment to net zero), or to 'avoided emissions' (where measuring and counting becomes even more difficult, since it depends on assumptions about what would happen to a carbon store, such as a forest, if no project was in place).

Although there are challenges involved, even non-permanent carbon removals through nature-based approaches play a crucial part in reducing the peak of global warming and are to be welcomed. For instance, a project that captures one ton of CO<sub>2</sub> for a period of 50 years is roughly equivalent in its impact on the planet to the permanent sequestration of about one third or half a tonne of CO<sub>2</sub>. While temporary carbon storage projects may not be as efficient as permanent storage, they definitely provide significant value.<sup>79</sup> To ensure and cement the value of non-permanent carbon removals projects, a system might be developed whereby different storage projects, together with their potential durability, could be assigned carbon credit values to reflect their aggregate impact on the global climate crisis.<sup>xxvii</sup>

xxvi See, in particular the recommendations and the 'Five Principles' in the report of the UN High Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities (2023) 'Integrity Matters: Net zero commitments by businesses, financial institutions, cities and regions - Report from the United Nations' High-level expert group on the net zero emissions commitments' page 13. [https://www.un.org/sites/un2.un.org/files/high-level\\_expert\\_group\\_n7b.pdf](https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf). See also Journal of Business Ethics, Dhandia et al (2011) 'The Ethics of Carbon Neutrality: A Critical Examination of Voluntary Carbon Offsets' <https://link.springer.com/article/10.1007/s10551-011-0766-4>;

xxvii For an approach to calculating the 'equivalence' of carbon storage of differing durability, see Nature, Groom et al (2023) 'The social value of offsets' <https://www.nature.com/articles/s41586-023-06153-x>

## 05 Carbon credits should eventually be allowed only for residual emissions

Carbon credits should only serve as a tool for compensating a company's residual carbon footprints if all feasible measures to reduce emissions have been taken. The concept of net zero emphasises the necessity for comprehensive emissions abatement across all operational sectors, everywhere along the value chain, and anywhere in the world.<sup>xxviii</sup> Carbon credits, therefore, should not be seen as a primary strategy for achieving emissions targets, but rather as a supplementary measure, used only after a company has implemented all possible reduction technologies and strategies. This ensures that carbon credits contribute genuinely towards achieving global climate goals, rather than allowing companies to bypass the substantial reductions required under net zero commitments.<sup>80</sup>

In the end 'emissions offsets' will only be acceptable if no realistic means exist for reducing those emissions to zero. This is the ultimate goal of an optimal VCM, and increased transparency and rigour will lay the foundations for this to, ultimately, become the norm.

## 06 Increase demand for 'high quality' credits

To stimulate demand for high-quality carbon credits, where monitoring, reporting and verification and financial transparency are given prominence, a robust framework of incentives for companies should be implemented, preferably through targeted government interventions and regulatory mechanisms.

These interventions could include tax benefits, subsidies, or direct regulatory requirements that promote the acquisition of premium credits over lower-quality alternatives. A comprehensive pricing mechanism is a crucial component of this approach and would ensure that companies opting for less expensive, lower-quality carbon credits, would have to purchase a greater quantity to achieve an equivalent environmental impact when compared objectively with the higher-quality (more expensive) credits. A rating system to identify high-quality credits and grade others would further enhance market transparency, build trust, simplify decision making and encourage companies to invest in superior options.

xxviii Nature Climate Change, Fankhauser et al (2022) 'The meaning of net zero and how to get it right' <https://ora.ox.ac.uk/objects/uuid:945700f9-ef6c-410f-be46-5af74d886459/files/r1g05fct2c>

## 07

## Government/International support and regulation

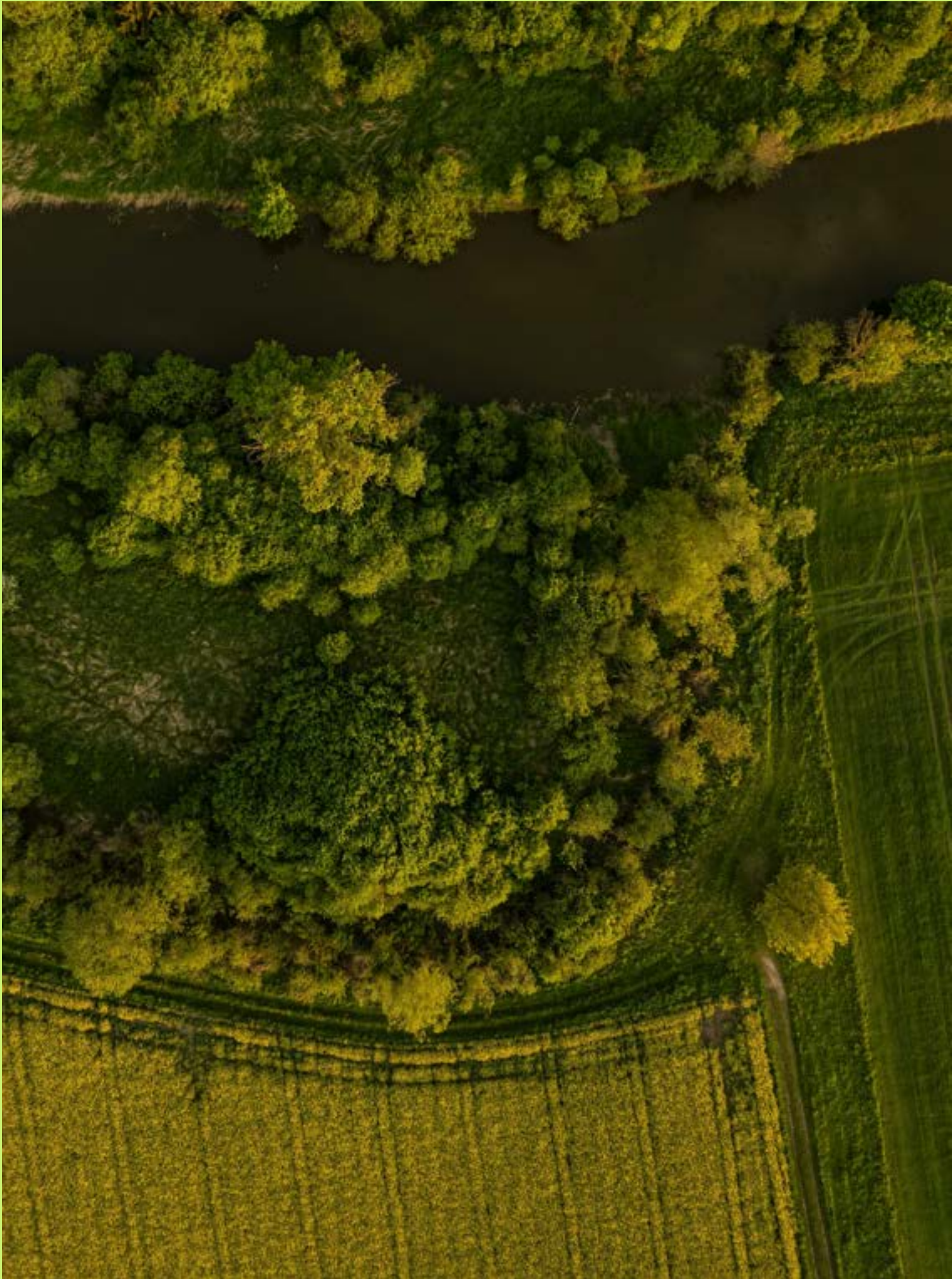
Throughout this report and the preceding recommendations, the importance of strong political support for regulation, transparency and governance principles at national, regional and international levels is evident. Effective support will establish and enforce regulations that guarantee carbon credits are contributing effectively to emission reductions in accordance with the host countries' Nationally Determined Contributions (NDCs). Strengthening political infrastructure in relation to VCMs will enhance the market's credibility and ensure that carbon offsetting schemes contribute meaningfully to global emission reduction targets over the long term, making them an integral part of a global strategy for climate action.<sup>81</sup>

There is scope for interaction between existing state regulation and VCM schemes. For example, a regulating authority such as the EU could decide that every company within the EU-ETS could match say, 10% of its emissions with high-quality VCM credits. The scheme would retire one emissions allowance for every credit used. This would not be offsetting, because the physical emissions from the EU would remain the same. The UK's net zero strategy already hints at doing this: "We have committed to consider how the UK Emissions Trading Scheme could be expanded in future to provide a long-term support mechanism for [GHGs removals]."<sup>82</sup>

### Conclusion

Science shows that we are in a major climate and environmental crisis – and greenhouse gas emissions and negative land use changes are still increasing. The VCM offering has recently faced criticisms and challenges, pointing out weaknesses in its systems and highlighting projects that have suffered as a result.

This report suggests that ongoing reforms and new standards could mobilise billions of dollars of private money to support projects that actively reduce carbon emissions and provide a large range of co-benefits for local communities and their environment. Following the seven major recommendations in this report could allow the VCM to achieve its potential in scale and impact and to make an effective contribution to combating the climate crisis.



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