

CARBON OFFSETS VERSUS REMOVALS

Tips for Avoiding Scandal and Building Credible Sustainability Practices

BY ANNE PASEK, NICHOLAS R. SILCOX, AND GEORGE RAMIREZ

How do businesses mitigate carbon emissions while still maintaining profitability? One of the most popular strategies has been to purchase carbon offsets. These are financial arrangements in which a company purchases a credit equal to a given quantity of carbon equivalents from an organization whose activities either reduce or avoid emissions. These activities can take many forms—planting trees, restoring ecosystems, avoiding environmentally damaging development, or investing in renewable energy. In return, the purchaser can claim that they’ve reversed some of their own climate impacts. If the quantity of a company’s total emissions and offsets are equal, that company can claim that they are ‘carbon neutral.’ If a company reduces their internal emissions as much as possible, and then buys certificates to cover the remaining amount, they are understood to be ‘net zero.’

However, these simple equations conceal many complexities and even some potential harms. Offsetting has been critiqued by both environmental and corporate ESG advocates concerned about the possibilities for fraud or reputational risks in these marketplaces (and in the communities where offsetting projects are located). Many offsetting projects have failed spectacularly, and are now regarded as an embarrassing waste of money and a diversion from real climate action.

Multiple forms of offset standards and certificates have emerged in response, trying to improve the credibility and performance of their offerings. But there are still no overarching regulations to structure this marketplace. Carbon removals, a different strategy for carbon sequestration, has emerged alongside carbon offsets and is growing in popularity.

While many companies are interested in becoming carbon neutral, the decision of whether to invest in offsets or removals—and if so, which ones to choose—can be fraught. This article describes some of the challenges of this process and offers some tips for building credible sustainability practices.

EARLY OFFSET MARKETS: THE PROBLEMS WITH ADDITIONALITY

Carbon offsetting first became popular in the 2000s following the adoption of the Kyoto Protocol. This international treaty set carbon targets for many high-income countries. At the same time, it allowed for the sale of offsets to compensate for any emissions that exceeded a nation’s allotment. Carbon offsetting was also popularized in a series of regional cap-and-trade programs, including the European Union’s 2005 Emissions Trading Scheme and the U.S.’s 2009 American Clean Energy and Security Act. The private sector also began to embrace offsets in both regulatory

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compliance settings (where they were bound by caps and/or targets) and a booming voluntary market (where they were not). Individuals, too, got in on the action. In this period, the idea of carbon neutrality emerged as a concept, goal, and marketing tool for people and organizations invested in balancing their carbon budgets.

This approach hypothetically offers a lot of financial advantages. Organizations can sell offsets to support valuable conservation and economic development work in regions all around the world. When done well, offsets can save forests from logging, support green economies, and encourage renewable energy adoption. Buying offsets is also almost always more cost effective than avoiding or reducing carbon emissions in industrial contexts. Developing and middle-income countries tend to offer cost-effective

“opportunities” for carbon emission reduction, which is financially attractive for higher-income countries. As a result, most buyers are based in the wealthier countries, and most projects are based in developing countries. Because our climate system is global, carbon actions across the world are perceived as equally viable and impactful in the offset marketplace.

The initial interest in offsets skewed heavily toward projects that avoided potential future carbon emissions, rather than reduced an existing emissions source. This kind of offset requires a special focus on what is called ‘additionality.’ If the sale of the offset is actually responsible for preventing emissions, it is additional. Additionality is the difference between, on one hand, using the sale of offsets to transform a timber forest into a conservation area, and on the other, selling

offsets from a forest that was already well protected from logging. In the first case, offsets generate additional carbon savings; in the second, they don’t. In practice, additionality can be very difficult to determine, especially when there’s an economic incentive to exaggerate causal connections. There’s also the problem of ‘leakage’—perhaps one forest was protected from logging in one region, but that simply pushed loggers into a different region. If the same number of trees were still cut down, there ultimately are no avoided emissions. Assessing the quality of offsetting projects requires weighing the hypothetical behavior of many interconnected actors in many distant parts of the world.

In the early years of offset markets, there were minimal regulations and protocols to ensure that these deliberations were made rigorously and consistently.

This resulted in a glut of projects with low standards of additionality, produced with minimal effort on the part of sellers. Most, in hindsight, were effectively junk. As a result, offsets in the voluntary market traded for bargain prices—some as low as \$1/ton. Meanwhile, cap and trade systems suffered from a similar surplus of dubious certificates, in addition to an overallocation of permits that effectively crashed many markets. These outcomes are harmful: companies were incentivized to buy relatively meaningless certificates, delaying reductions in their own emissions while continuing to contribute to climate change. Awareness of these failures and waning public attention to climate change all led to reduced personal and corporate participation in voluntary markets. As the 2010s began, it seemed that offsets were dead in the water.

THE CARBON OFFSET MARKET TODAY

Yet offsets, remarkably, are back. The 2015 Paris Agreement significantly re-energized global climate politics, and the Trump administration's attempt to withdraw from the agreement shortly thereafter had the effect of increasing corporate ambitions for climate leadership. The Paris Agreement's pledge to hold global heating to "well below 2°C" also had the effect of mainstreaming the concept of net-zero. For the world's nations to stop the greenhouse gas effect before 2°C is reached—or to claw back the global thermostat if this limit is temporarily breached—they will need to both dramatically reduce carbon emissions and remove the emissions that are already in the atmosphere. As a result, the science behind the Paris Agreement targets include presumptions about dramatic carbon removals, all of which are needed to balance the

climate system while still allowing for some level of 'hard to abate' industrial emissions to continue. In other words, it's no longer just a case of avoiding potential future emissions, it's now a matter of being accountable for all present and future emissions—and subtracting them down to nothing.

This idea has been championed by an unexpectedly large number of corporations, with repercussions for the voluntary market. Today more than 1/3 of the world's largest companies have a net-zero target. These come in various degrees of ambition and credibility, but they all rely on the promise of carbon certificates to zero-out their residual emissions. Offsets, accordingly, are booming. Revenue grew by 60% between 2020 and 2021 alone. The overall market is predicted to increase globally by a factor of 15 by the end of the decade.

This growth, however, has resulted in the repetition of many previous problems. Carbon offsets are still poorly regulated and difficult to verify, despite ongoing efforts by third party organizations and market platforms to improve their offerings. The story of Verra, a nonprofit that acts as the world's leading offset certifier, is a case in point. Earlier this year, The Guardian and "Last Week Tonight with John Oliver" each reported on the sensational failure of its rainforest project carbon offset standards. More than 90% of all projects with that standard were found to be fraudulent—equivalent to little more than 'phantom credits.' Even worse, some of the projects were found to have human rights issues connected to them, including evictions and land use conflict with Indigenous groups. These offset projects had been purchased by many major corporations, including tech and media companies like Netflix, Meta, and Disney.

Climate change itself is a further and growing challenge to the credibility of nature-based offset projects. A recent news story on this problem concerns a Verra project in Kenya, in which Indigenous herding practices were framed as strengthening local plant life and soil. However, it was revealed that such herding was both poorly monitored and that shifting ecological conditions brought about by increased droughts (a consequence of climate change) rendered the project ineffective. Forest fires similarly threaten the integrity of offsets on a warming world. California's 2022 fire season, for example, saw the destruction of 95% of the state's forestry offset insurance buffer—meant to guarantee the permanence of forest carbon offsets for 100 years time. In future fires, perhaps even this year, carbon that was supposed to be offset from the atmosphere will almost surely go up in smoke.

The failures of Verra and the increased awareness of the inefficiencies and issues surrounding carbon offsets make it difficult to endorse these sorts of programs in broad strokes. The ambiguity around verification and certification and the misrepresentation of their efficacy suggest that there are clear reputational risks when investing in carbon offsets as a mitigation strategy. While effective carbon offset programs are still possible, it is difficult for buyers to be certain that any given project is legitimately producing a positive impact (and that their names won't end up in the news with the latest offset scandal).

GROWING ALTERNATIVES TO CARBON OFFSETTING

What then should net-zero companies do? One potential answer lies in making a clearer distinction be-

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tween offsetting vs. removing climate emissions. Carbon dioxide removal (CDR) differs from offsets in that this work omits avoided emissions from consideration. Instead, removals only account for the physical subtraction of existing CO₂ in the atmosphere to be stored in a durable sink. Carbon removals sometimes include the planting of new forests to create such a sink, though directions in the market generally focus more on technical means, such as sucking carbon dioxide out of the air and injecting it into rock. Ideally, measuring and verifying such projects is much simpler than assessing avoided emissions, since the emphasis is on demonstrably sequestered carbon rather than avoided, hypothetical futures.

However, not all carbon removals are alike. In addition to different methods of removing carbon from the air, there is also variability in the reliability and duration of storage. For example, changes in agricultural practices can store carbon in soil over the course of just a few years time. Reversing these practices, however, releases this carbon just as quickly. Furthermore, newly planted trees don't sequester carbon forever, as mature forests reach an equilibrium state after some time. How long they stay in that state is a matter of fire and development risk, and so a question of indefinite maintenance rather than a permanent guarantee. In other words, carbon removals guarantee investors a time-based solution. As such, it's increasingly common for these certificates to be sold not just by the ton, but also by the ton-year.

This all amounts to more complexity and expense for the buyer. This is common enough to developing financial markets and emerging technologies, and carbon removal certificates



sit in the middle of these cross-roads. As a result, carbon removal projects are generally more expensive than offsets. Some of the most durable forms of removal can cost up to \$600/ton. As the market grows and as technologies mature, these eye-watering prices are likely to decrease as has already happened with renewable energy. Additional regulations could help build metrics and standards to increase trust and ease for buyers and ensure fairer competition among diverse sellers. Further, these removal projects and technologies are, like offsets, disproportionately available to wealthy countries and major corporations mostly concentrated in wealthier parts of the world. Removals are still new, but could face many of the same challenges that have been uncovered regarding offsets and global inequity.

For now, large tech companies have been among the most prominent investors and buyers in this market. Most rely on well-resourced internal research teams, who end up purchasing a mixture of expensive and

cheaper certificates across a spread of projects, diversifying their risk and rewards. Meta has invested in a number of carbon removal projects and reports that they have applied 90,000 tonnes of carbon removal credits to their overall carbon accounting. Google has established a Carbon Removal Research grant to fund research into carbon removal technologies and, along with Meta and Stripe, have pledged to spend \$925 million on carbon removal purchases within the decade.

Microsoft has emerged as one of the leaders in carbon removals, particularly within the tech and telecommunications industries. Microsoft is spearheading one of the largest carbon removal projects through their endeavor to be carbon negative by 2030. They plan to deploy \$1 billion of their capital in a Climate Innovation Fund for carbon reduction and removal technology. In 2022, Microsoft announced a partnership with CarbonCapture, a company developing Direct Air Capture (DAC) machinery, to support "Project Bison," a

new DAC project in Wyoming aimed at permanently removing and storing five million tons of CO₂ from the atmosphere per year and is intended to be operational in 2023.

In addition, Microsoft invests in more standard removal projects focused on restoring ecological carbon sequestration and claims to have acquired “1.4 million tonnes of carbon removal” from various sources. Microsoft has announced an intention to have removed enough carbon by 2050 to account for all emissions from the company’s history. Carbon removals, paired with renewable, carbon free energy, are central to Microsoft’s efforts. Microsoft’s plan is ambitious and it is worth asking to what extent this proposal is possible, but this kind of commitment is only possible through investment in an approach that emphasizes reducing (and eventually eliminating) emissions released, alongside removing carbon already in the atmosphere.

OPPORTUNITIES AND STRATEGIES FOR SMALLER PLAYERS

Companies don’t need to be as large as Microsoft to participate in carbon removal projects. Shopify’s Sustainability Fund offers suggestions for purchase strategies that are simpler and less-time consuming. Their carbon removal buyer guide is a useful resource for learning how to get buy-in from internal stakeholders, construct a portfolio, and retire the credits that have been received. Broadly speaking, they recommend companies diversify purchases to mitigate the risks that come with these investments. Avoiding forestry projects and “nature-based” solutions in general is also preferred, particularly because they don’t offer many paths for permanence or certainty. In addition,

carbon removal projects should find the appropriate combination of local impact and carbon credibility in order to maximize reliability. When sellers monitor these removals closely, the project remains lucrative for future buyers, which enables this practice to continue much more smoothly over time. Shopify offers a spreadsheet as a model for monitoring progress on purchases, a crucial component to ensuring the value of these projects.

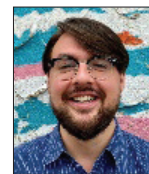
As part of our research, the Sustainable Subsea Networks research team has not found carbon offsetting or carbon removal to be widespread practices across the subsea cable industry. However, there is growing interest by many companies as sustainability and climate emissions become a broader topic of conversation. We recommend that companies make the distinction between offsets and removals when setting carbon reduction goals and to internally research projects or work with independent ratings agencies prior to investing in credits.

Net-zero, in the end, remains an ambitious goal for both countries and companies. Despite the many challenges we’ve highlighted here, there is still considerable value to be found in its pursuit—the Paris Agreement and the prospects for a just and hospitable future demand nothing less. The long history of carbon offsets and the future of carbon removals reminds us to be wary of sustainability measures that seem too good to be true. In most cases, reducing internal emissions remains the most essential and credible course of action—truly the first and primary step. Investing in on-site renewable energy, increasing energy efficiency and reducing energy consumption are all more effective and stronger long-term options. But

beyond this work, there is also a growing set of organizations working to increase the scale, transparency, and accessibility of carbon removals that could also prove essential to keeping the climate stable. Any company that takes seriously addressing carbon emissions and climate concerns should consider contributing to their efforts. **STF**



NICOLE STAROSIELSKI is Associate Professor of Media, Culture, and Communication at NYU. Dr. Starosielski’s research focuses on the history of the cable industry and the social aspects of submarine cable construction and maintenance. She is author of *The Undersea Network* (2015), which examines the cultural and environmental dimensions of transoceanic cable systems, beginning with the telegraph cables that formed the first global communications network and extending to the fiber-optic infrastructure. Starosielski has published over forty essays and is author or editor of five books on media, communications technology, and the environment. She is co-convener of SubOptic’s Global Citizen Working Group and a principal investigator on the SubOptic Foundation’s Sustainable Subsea Networks research initiative



NICK SILCOX is a Ph.D. candidate in the department of English at New York University where he is working on a dissertation on sensing and sensor technologies and environmental. Nick is also a research assistant on the Sustainable Subsea Networks project.



GEORGE N. RAMÍREZ is a PhD candidate in the Department of Media, Culture, and Communication at New York University, where his work focuses on sensation and perfor

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