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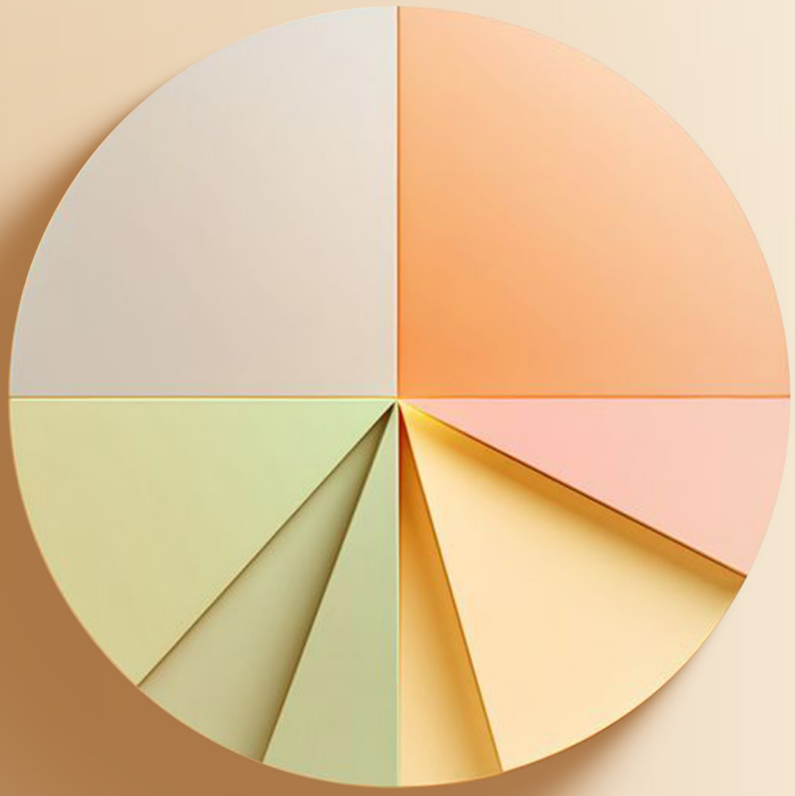
Using Carbon Credits with Confidence:

How CNaught Constructs a High-Impact Portfolio of Carbon Credits



Executive Summary

While there is broad agreement that carbon credits are a powerful tool in global efforts to avoid the worst effects of climate change, it is far too hard to be a buyer of voluntary carbon credits today. Carbon projects vary wildly on basic features like price, availability, and even whether they have climate impact at all. This makes it difficult and time-consuming for a non-expert buyer to sort through all of the noise and have confidence in their choices.

CNaught gives carbon credit buyers confidence by taking a science-based approach to purchasing that systematically maximizes impact and mitigates risk. The result is carbon credit portfolios that are diversified across project type and geography and contain projects that are highly regarded by both CNaught and objective third parties. CNaught monitors the performance of the projects in its portfolios, and adjusts the portfolio blend and the specific projects supported over time as new information emerges. Finally, CNaught gives buyers additional peace of mind by purchasing and retiring additional credits on our customers' behalf at no additional charge. Through its approach, CNaught enables anyone to access a sophisticated carbon strategy previously available to only the most experienced buyers.

Carbon Credits Are a Necessary Tool for Addressing Climate Change

The evidence is clear: we are facing a climate emergency driven by the simultaneous emissions of greenhouse gasses like methane and carbon dioxide and destruction of nature-based carbon sinks. To avoid the worst impacts of climate change, the Intergovernmental Panel on Climate Change ("IPCC") has set as goals (1) the reduction in global emissions of 45% from 2010 levels by 2030 and (2) the attainment of net-zero emissions by 2050[1]. It is estimated that any pathway to these goals will require between 100 and 1,000 gigatons of carbon removal over the course of the 21st century.[2]

"Companies and organizations will need to use every tool at their disposal to achieve emission reduction goals. 'Carbon offsets' are one such tool that–if used responsibly–can accelerate action to avert dangerous climate change."[3]

– The Stockholm Environmental Institute

[1] IPCC, 2018: Summary for Policymakers in 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 at 12 (***available at***: https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SPM_version_report_LR.pdf).
[2] ***Id.*** at 17.
[3] Securing Climate Benefit: A Guide to Using Carbon Offsets, at 5 (Nov. 13, 2019) (***available at***: http://www.offsetguide.org/wp-content/uploads/2020/03/Carbon-Offset-Guide_3122020.pdf).

Voluntary carbon credits are an important part of the pathway to Net-Zero. While there is broad agreement that we should reduce our emissions as much as possible, there is also widespread agreement that credible carbon credits are a critical piece of the climate puzzle.[4] Credits are particularly necessary for hard-to-decarbonize industries because zero emission options for things like aviation fuel and industrial processes may not be available by 2050.[5] We need effective carbon credits to help us avoid the worst effects of climate change.

The concept of carbon credits is easy to understand. A carbon credit is a reduction or removal of emissions of carbon dioxide or other greenhouse gasses that otherwise would contribute to climate change. Voluntary carbon credits are purchased without any regulatory obligation to do so. Carbon credits can sometimes also be called carbon offsets because they can be used by buyers to compensate for an equivalent emission somewhere else. We prefer the term carbon credit because credits need not be used in that way.

Carbon credits are typically measured in metric tons (or tonnes) of carbon dioxide-equivalent ("CO_2e") so that they can ideally be treated as interchangeable, no matter where or how a reduction or removal occurs or the kind of greenhouse gas that is reduced or removed. A credit buyer therefore pays a price per tonne of carbon, which can be compared easily to emissions elsewhere. In this simple concept, credits should be a commodity, different carbon credits should be interchangeable, a tonne of carbon should be a tonne of carbon, and it would be easy to be a buyer.

Unfortunately, that is not how carbon credits actually work.

[4] ***See, e.g.***, The Climate Pledge: https://www.theclimatepledge.com/.

[5] ***See*** The Oxford Principles for Net Zero Aligned Carbon Offsetting at 3 (September 2020) (***available at***: https://www.smithschool.ox.ac.uk/sites/default/files/2022-01/Oxford-Offsetting-Principles-2020.pdf).

Credit Quality Can Vary Widely Across a Number of Different Axes

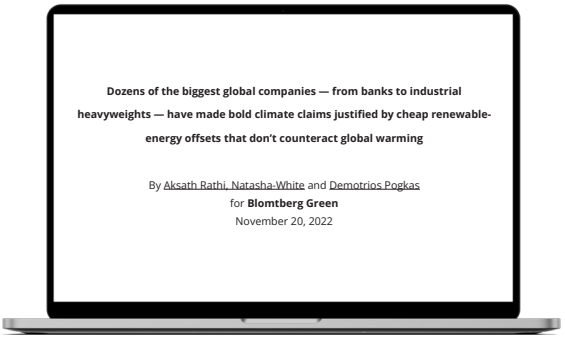
In reality, carbon credits vary widely in quality, and it is difficult for non-expert buyers to identify high-impact credits consistently. In the credit world, "quality" means that a carbon credit representing a metric ton of CO_2e actually is responsible for a reduction or removal of a metric ton of CO_2e. There are several key attributes of credit quality:

Additionality: To be additional, an credit must "represent an emission reduction or carbon removal relative to a counterfactual baseline that would not have taken place" if not for the ability to sell offsets.[6]

[6] The Oxford Principles at 5; ***see also*** Securing Climate Benefit at 19.

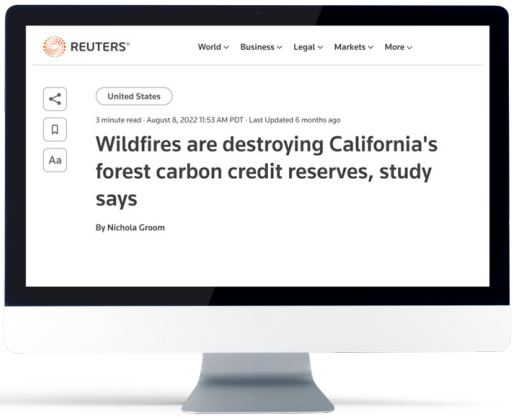
If the tonne would have been removed or avoided anyhow–for instance, because regulations required the project activity or because the activity was profitable absent the credit–the credit is not doing any work and does not actually subsidize the removal or avoidance activity.

Companies have faced criticism for supporting renewable energy credits that are not additional: in many cases, the projects are economically viable without carbon credits.



Durability: A metric ton of CO_2e, by its terms, is silent about how long an emission will be avoided or how long a removal would be stored. Yet durability–sometimes also called permanence–is a critical input to the quality of a credit. 25% of every tonne of emitted CO_2 remains in the atmosphere for hundreds to thousands of years,[7] so carbon must be avoided or stored for long periods of time to meaningfully be compared to an emission elsewhere. Durability can be an issue both during the life of a project (***e.g.***, what happens if there is a forest fire?) and after (***e.g.***, what happens to the forest after the project ends?).

Fires and infestation can undermine the durability of carbon storage in forest credits.



[7] Securing Climate Benefit at 26.

Avoiding Over-crediting Risk: While projects may actually be removing or avoiding CO_2, there are several different ways that a project developer can overstate the amount of CO_2 their project is avoiding or removing. If the amount is overstated, the impact of each credit is overstated proportionally.

- **Overestimation of the Baseline:** A carbon credit represents the value of what happened because of the credit minus what would have happened if there were no credit.[8] If the project overestimates what would have happened but for the credits, each credit issued by the project will not represent an actual metric ton of CO_2e.

- **Underestimating Actual Emissions:** If projects have residual emissions after the creditting activity, mismeasuring those residual emissions can similarly overstate the impact of the credits.[9]

- **Leakage:** Projects must accurately model their indirect effects, or else they will be simply shifting emissions from the project location to another location.[10] To take the simplest example, a credit is not effective if it preserves one forest but simply shifts logging activity to the forest next door.

Forestry credits can dramatically overstate their impact by relying on overly pessimistic baselines.

[8] *See generally id.* at 23.

[9] *See generally id.*

[10] *See generally id.*

Avoiding Double-Counting: Each tonne of carbon removed or avoided can only generate one credit for one buyer. What's more the avoided or removed emission cannot be separately claimed by the project developer if they are also selling it as a credit.[11] A credit buyer must be sure they are getting the exclusive right to the tonne of carbon.

Choosing the Wrong Credits Has Real Downsides

- If a credit doesn't actually lead to removed or avoided carbon, the buyer is not actually getting what they paid for and the climate is worse off than it should be.
- Project developers are not incentivized to develop projects that deliver real impact.
- The public could lose trust in carbon credits. Credits are one of the best tools we have to make an immediate dent in climate change, but they have to deliver impact for the public to believe in their promise.
- A buyer typically purchases credits voluntarily because they want to do their part to address the climate crisis. If the credits don't deliver, what should be a brand benefit can become a brand detriment.
- The voluntary credit market as a whole is smaller than it should be because some buyers may choose to stay on the sidelines in the face of uncertainty.

[11] *See generally id.* at 29.

Most Buyers Should Be Purchasing a Portfolio of Credits to Drive Impact and Mitigate Risk

Building a portfolio of carbon credits across project types and geographies maximizes climate impact and mitigates the risk of credit selection. In the same way that non-performance of a single stock in an index-fund does not overly reduce the returns of the fund as a whole, diversification across multiple projects reduces the quality impact of a problem with any single project and ensures that a buyer still drives climate impact. This approach reflects research recommending the best ways to reduce risk when using carbon credits,[12] it is followed by the most cutting-edge companies using credits, like Stripe and Shopify, and it is recommended by the World Economic Forum.[13]

In September 2020, the University of Oxford published the Oxford Principles for Net Zero Aligned Offsetting. The guidance recommends that credit buyers (i) purchase a portfolio that covers various technologies and (ii) reweight that portfolio over time as new technologies come online and emissions patterns change. The Oxford Principles set out a blueprint for how to buy a balanced portfolio that drives impact at scale and supports the global transition to net zero by 2050.

[12] *See, e.g.*, SGFC, Forestry Backed Assets Design (December 2022 (*available at*: https://imperialcollegelondon.app.box.com/s/ejajo17eynozt9c5hndd1y3yfpvctqvs).

[13] *See* World Economic Forum, The Voluntary Carbon Market: Climate Finance at an Inflection Point (January 2023) (*available at*: https://www3.weforum.org/docs/WEF_The_Voluntary_Carbon_Market_2023.pdf).

The Oxford Principles set out five categories of credits that should make up a portfolio:

Category 1: Avoided Emissions or Emissions Reductions without Storage (Emissions Reductions): This category can include projects like renewable energy, cleaner cookstoves, or capturing methane emissions.

Category 2: Emissions Reductions with Short-Lived Storage (Conservation): This category can include projects like avoided deforestation with storage typically coming in plants, trees, or soil.

Category 3: Emissions Reductions with Long-Lived Storage (Capture and Storage): This category typically is industrial, point source carbon capture (***e.g.***, at a smokestack), with the carbon then stored for the long-term, for instance in underground caves or wells. There is currently a limited availability of this category of credits.

Category 4: Carbon Removal with Short-Term Storage (Short-lived storage): This category involves removing existing carbon from the air and storing it in new plants, trees, or soil through steps like reforestation or ecosystem restoration..

Category 5: Carbon Removal with Long-Term Storage (Long-lived storage): These tend to be cutting-edge technological solutions that, currently, have a lot of promise but have limited availability and are not yet ready for scale. Good examples include direct air capture technology and storage of carbon through enhanced rock weathering.

The Oxford Principles recognize that, over time and in order to reach net zero, buyers should be moving from avoided emissions to carbon removal and from short-term to long-term carbon storage. Put differently, by 2050 a portfolio should be heavily weighted toward Category 5. However, the Principles also recognize that starting with such a portfolio "is not necessary, nor is it currently feasible."[14]

[14] The Oxford Principles at 7.

CNaught makes it easy to access a portfolio of high-quality carbon credits

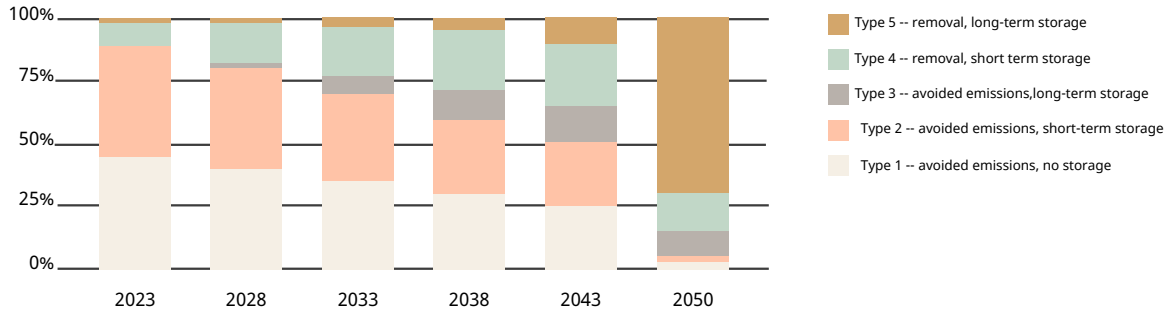
CNaught does the hard work of selecting credit projects and building a high-quality credit portfolio for our customers. The credit market is hard to navigate, so we believe it is insufficient to provide information to buyers so that they can do their own research and build their own expertise. For CNaught customers, all it takes is a handful of clicks to procure a high-quality credit portfolio. Here is how we do it:

CNaught's Portfolio of Credits Drives Impact by Finding Quality and Mitigating Risk

CNaught follows the best science to construct a credit portfolio balanced for impact, to mitigate risk within that portfolio, and to select high-quality projects for that portfolio.

The right portfolio. To drive impact now, our portfolio is weighted toward high-quality emissions reductions that are already available at scale. The specific allocation across categories reflects our best judgment on impact in the current market. Consistent with the Oxford Principles, the weight of our portfolio will shift toward removals over the coming decades. Even now, however, we dedicate some of our portfolio toward removals with long-term storage because creating demand for those kinds of projects will incentivize the technological development we need.

Illustrative Example of How the CNaught Portfolio May Evolve Over Time



Mitigating Risk. Within our portfolio, we diversify across technologies and geographies to mitigate risk. Research indicates that the performance of different credit projects are not correlated, so having a portfolio that includes different projects using different technologies in different locations is a core way to mitigate the risk of a single non-performing project.

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Project-By-Project Diligence. At the project level, we do in-depth due diligence to find the projects most likely to deliver real impact. In the fractured world of carbon credits, there are resources like the Carbon Offset Guide[15] and project ratings agencies like BeZero, Calyx Global, Renoster, and Sylvera that can help buyers do the arduous work of sorting through different projects. For every project we consider, we rely on available inputs from those resources, and do our own review across the criteria that constitute project quality:

[15] *See* Securing Climate Benefit.

- **Additionality:** We ensure that projects would not have happened without the sale of carbon credits. We look at things like the economic feasibility of the project without credits or whether the policy environment already requires the steps taken by the project to determine whether the project is additional.

- **Durability:** Our approach to durability varies somewhat by project type. For certain types of projects, like methane destruction, durability may not be an issue. However, for nature-based solutions we look closely at things like the lifetime of the project, whether the project is adequately prepared for events like fires or infestations during the project lifetime (and whether such events have already occurred), and what will happen to the carbon storage after the project ends.

- **Overcrediting:** We and our partners look closely at project assumptions to ensure that the project appropriately models its expectations for project emissions and what would have happened if the project did not exist. What's more, we examine what has actually happened for projects when they are already underway–including whether the project assumptions were overly aggressive.

Just as our portfolio will shift in its weight toward removal over time, we will constantly monitor and update the specific projects that make up our portfolio to ensure consistent high quality. As new projects come online and new information about existing projects becomes available, we will continuously evaluate the projects we support so that we can continue to drive climate impact.

Finally, we recognize that different categories of credits have different risk profiles. Projects in Oxford category II currently face elevated risk of issuing too many credits and of being more susceptible to reversal, for instance through a forest fire. Projects in Oxford category IV share this risk of reversal but have less overcrediting risk. We take active steps to mitigate this risk by retiring additional credits at CNaught's expense in the CNaught Reserve. This additional step effectively doubles the buffer for nature based projects already required by the leading carbon credit registries and gives CNaught buyers further confidence in portfolio impact.

Conclusion

Most carbon credit buyers should purchase credits from a diverse array of projects to create a portfolio that aligns with the Oxford Principles. However, building a high-quality, Oxford-aligned portfolio is too hard for all-but the most sophisticated buyers to take on themselves. CNaught democratizes that approach and makes a high-quality portfolio of carbon credits available to everyone.