

Offsets, insets and carbon credits: what organisations should consider to reach net zero

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1. Introduction and categories of mitigation measures

To achieve a [Net zero target](#), companies can adopt a combination of measures aligned with mitigation (decarbonisation) pathways that would limit global warming to 1.5°C. For more information on what Net Zero means, see The Chancery Lane Project's (TCLP's) [‘Net zero explainer’](#).

There are three categories of mitigation measures:

- **abatement** (to prevent the release of Greenhouse Gases (GHGs) within a party's own operations or value chain by reducing or eliminating their sources);

- **compensation** (measurable GHG emission reductions, resulting from actions outside the value chain of a company that compensate for emissions that remain unabated within the value chain); and
- **neutralisation** (to remove carbon from the atmosphere).¹

Offsets can be either a compensation or neutralisation measure.

*“Offsetting means reducing GHG emissions (including through avoided emissions), or increasing GHG removals through activities external to an actor, in order to compensate for GHG emissions, such that an actor’s net contribution to global emissions is reduced. Offsetting is typically arranged through a marketplace for carbon credits or other exchange mechanisms.”*²

TCLP’s definition of Offsetting can be found [here](#).

2. Carbon trading

Offsets are “*purchased credits representing a certified unit of emission reduction or carbon removal carried out by another actor.*”³

Offsetting is usually achieved by purchasing carbon credits⁴ that represent an amount of GHG reductions or removals made through an offsetting project.⁵

Common offsetting projects that **reduce or avoid emissions elsewhere** (compensation) include renewable energy (wind farms, solar photovoltaic hydropower), efficient cookstoves, destruction of industrial pollutants or agricultural byproducts, destruction of landfill methane or the reduction elements of the REDD+ programme⁶. (The REDD+ programme covers reducing emissions from deforestation and forest degradation and the sustainable management of forests, and conservation and enhancement of forest carbon stocks).

Offsetting projects that involve **carbon removal** (neutralisation) can include biological carbon sequestration (planting trees, soil carbon enhancement, etc.), bioenergy with carbon capture and storage (BECCS), direct air capture with geological storage (DACCS), or converting atmospheric carbon back into rock through remineralisation.

¹ For more on this, see [Foundations for Science-based Net-Zero Target Setting in the Corporate Sector](#); and [Race to Zero Lexicon](#).

² Oxford Net Zero: [What is Net Zero? - Net Zero Climate](#).

³ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#).

⁴ While the term offsetting can sometimes be used without mentioning credits (Wikipedia, [Carbon offset](#)); [Carbon offset definition and meaning | Collins English Dictionary](#); Offset Guide, [What is a Carbon Offset?](#); WRI, [Bottom Line on Offsets](#)), credits are essential to the verification and certification necessary to transparently measure against targets, so in practice offsetting is likely to always involve credits.

⁵ Practical Law UK, [‘Carbon Offsets’](#); LexisNexis, [‘Carbon Offsetting’](#).

⁶ [REDD+ - Home](#).

To ensure that net zero is maintained long-term, companies should commit to transition their offsets from projects that involve emission reductions to those that involve carbon removals, aiming to remove carbon from the atmosphere through long-lived storage with a low risk of reversal over centuries to millennia. For more information on the type of projects that are more effective and permanent, see [The Oxford Principles for Net Zero Aligned Carbon Offsetting](#). For a discussion of some of the issues associated with removal projects see 'Issues with offsetting' below.

There are two types of markets that trade carbon credits - the regulated market and the voluntary market.⁷ For more information, see '[Carbon offsets](#)' by Practical Law and '[Carbon markets—basic principles and future developments](#)' by LexisNexis.

2.1. The regulated (or compliance) market

The emissions of some companies (usually those in high emitting industries) can be regulated by cap and trade schemes such as the EU's emissions trading system (EU ETS)⁸. Carbon credits generated under these schemes represent ownership of the permission to emit one metric tonne of [Carbon Dioxide Equivalent](#). Often, third parties (i.e. not the companies with obligations under the relevant scheme) can purchase these credits and use them as offsets.

2.2. The voluntary market

The voluntary market provides offset credits for organisations whose emissions are not regulated by an ETS but that wish to purchase offsets voluntarily as part of a net zero strategy. Various certification programs (e.g. the [Verified Carbon Standard](#), the [Gold Standard](#), the [Climate, Community and Biodiversity Standards](#), the [Carbon Neutral Protocol](#), the [Climate Action Reserve](#)) set standards and guidance to verify emission reductions or removals by offsetting projects. Offsetting projects must meet the certification program's requirements, apply an approved methodology and pass third party verification for credits to be issued.⁹ Once verified, offset credits are created in a registry and tracked to avoid double counting.¹⁰

Two initiatives were launched in July 2021 to promote high quality offset credits in the voluntary market:

- The Voluntary Carbon Markets Integrity Initiative (VCMI).¹¹ VCMI set 10 principles for carbon offsetting to improve the integrity of the voluntary market.¹²

⁷ Carbon Fund, [Is There a Difference Between Carbon Offsets and Carbon Credits?](#)

⁸ Around 31 emissions trading systems are in place globally: World Bank State Trends 2020 Report: [State and Trends of Carbon Pricing 2020](#). Investopedia, [Carbon Credit Definition](#).

⁹ Forest Trends, [State of the Voluntary Carbon Markets 2017](#).

¹⁰ Ecosystem Marketplace, [Carbon Offsetting: the Frequently Asked Questions](#)

¹¹ Edie, [Carbon offsetting: New 'integrity initiative' launched to tackle greenwashing](#).

¹² VCMI Consultation Report, [VCMI - Accelerating credible net-zero climate action](#).

- The Taskforce on Scaling Voluntary Carbon Markets (TSVCM)¹³ was launched to develop the voluntary carbon market to help meet the goals of the Paris Agreement. The TSVCM has published a roadmap for strengthening the integrity of the voluntary carbon market.¹⁴

3. Insetting

Insetting is a form of offsetting that finances emissions reductions or removals within a company's own supply chain communities (including the company's own activities and its entire value chain from source to distribution), verified by a carbon offset standard¹⁵. Examples include an energy efficiency project within the sourcing region of an agricultural goods company or a reforestation project benefiting the same population of local stakeholders as the one directly involved in the sourcing activity of a company.¹⁶ The use of insetting has increased in response to pressure to reduce emissions at the source and to invest in supply chain emission reductions¹⁷ and its appeal as a strategic investment, communications and marketing tool.¹⁸

4. Mitigation hierarchy (measure, reduce, offset)

The mitigation hierarchy is a crucial tool to determine the effectiveness of a company's offsetting policy. A company should prioritise abatement measures (i.e. emission reductions) over compensation or neutralisation measures (i.e. carbon offsets).¹⁹

Relying solely, or primarily, on offsetting is inconsistent with the Paris Agreement goal of achieving net zero emissions globally²⁰ and is not aligned with any of the mitigation pathways to achieving this goal.²¹

This is because:

- The company's GHG emissions remain unabated and will continue to accumulate in the atmosphere. Even if other emissions are reduced or abated, globally there will still be emissions equivalent to GHGs emitted by the company.

¹³ [TSVCM](#).

¹⁴ [Taskforce on Scaling Voluntary Carbon Markets Publishes Roadmap for Strengthening Market Integrity > Taskforce on Scaling Voluntary Carbon Markets](#).

¹⁵ International Carbon Reduction and Offset Alliance (ICROA) [Insetting Report](#); and [Foundations for Science-based Net-Zero Target Setting in the Corporate Sector](#).

¹⁶ ICROA [Insetting Report](#).

¹⁷ ICROA [Insetting Report](#).

¹⁸ Quote from Plan Vivo Foundation: The Guardian, '[Forget carbon offsetting, insetting is the future | Guardian sustainable business](#)'.

¹⁹ [Foundations for Science-based Net-Zero Target Setting in the Corporate Sector](#); VCMi Consultation Report, [VCMi - Accelerating credible net-zero climate action](#)

²⁰ [Foundations for Science-based Net-Zero Target Setting in the Corporate Sector](#).

²¹ IPCC Special Report on [Global Warming of 1.5 °C](#) —.

- Offsets may not be sufficiently additional (i.e. the reductions or removals might have happened under a business as usual scenario) or permanent (i.e. the removals may be lost if, say, the trees planted burn down).²²²³

The emissions of the offsetting company (purchaser of credits) and the offsetting project may not be like-for-like²⁴ (see ‘Issues with offsetting’ below).

This means that even if the offsetting company reaches net zero emissions by 2030, the measures taken globally would not help keep warming to well below 2°C, much less 1.5°C. Offsetting should therefore be a last resort and companies should ensure that they have reduced or eliminated as many GHG sources as they can before resorting to offsetting.

5. Offsetting in contract clauses

Companies setting science-based net-zero targets are expected to eliminate sources of emissions at a pace and scale consistent with pathways that limit warming to 1.5°C. Companies signed up to the Science Based Targets Initiative (SBTi) may only use compensation and neutralisation measures as additional contributions to supplement, but not substitute, reducing value chain emissions²⁵ and the use of offsets is not counted as reductions toward the progress of companies’ science-based targets.²⁶

Actors joining the Race to Zero must (after first limiting [Residual Emissions](#)):

- Clearly specify the sinks or credits that are used to make any neutralisation claims.
- Ensure that any credits achieve robust outcomes for additionality, permanence, and accounting, and do not undermine social justice or harm biodiversity.
- Clarify how sinks and credits are used both on the path to (net) zero, and after (net) zero is obtained.
- Include immediate contributions to the preservation and restoration of natural sinks, not necessarily linked to neutralisation claims. Any neutralisation of Residual Emissions must transition to permanent removals by the time (net) zero status is achieved.²⁷

When reviewing a contract that contains an organisational (or product, service or contract-related) net zero target, first check whether it refers to actual emissions reduction

²² Financial Times, ‘[US forest fires threaten carbon offsets as company-linked trees burn](#)’ (August 2021).

²³ Financial Times, ‘[US forest fires threaten carbon offsets as company-linked trees burn](#)’ (August 2021).

²⁴ ‘Like for like’ means a source of emissions and an emissions sink correspond in terms. of their warming impact, and in terms of the timescale and durability of carbon storage. See [Race to Zero Lexicon](#) and Carbon Market Watch, ‘[Fossil and biological carbon: a tonne is not a tonne](#)’.

²⁵ [SBTi Criteria and Recommendations](#).

²⁶ [Foundations for Science-based Net-Zero Target Setting in the Corporate Sector](#).

²⁷ [Join the race - Race to Zero & Race to Resilience](#) and [Starting Line and Leadership Practices 2.0 - In force from 1 June 2021 - Minimum criteria required for participation in the Race to Zero campaign](#)

targets or net zero targets, and then consider the following questions to see if it aligns with the **Oxford Offsetting Principles**²⁸:

- Does the contract contain targets for continuously reducing, properly accounting for and disclosing [Scope 1, 2 and 3 emissions](#) and scaling up removals within the value chain **before** using offsets (see ‘mitigation hierarchy’ above)?²⁹
- If the contract refers to a net zero target (either for a party or for contract activities), does it specify if and how offsets will be used to reach that target? Companies should be gradually minimising reliance on offsets until either reaching [Gross Zero](#) or absolute zero³⁰ emissions or offsetting only those emissions that remain after all reasonable efforts have been made to reduce emissions or Residual Emissions.
- If the contract only describes emissions reductions (and does not mention net zero), does it mention how Residual Emissions should be dealt with by offsetting? If not, it should, as companies should be aiming to balance their Residual Emissions with offsets to accelerate the global transition to net zero.
- Does the contract specify that any offsets are verified, additional, correctly accounted for, have a low risk of reversal and negative unintended consequences?³¹ It might not be necessary to specify this, as purchasers would assume this if purchasing from a certified provider, but the contract should specify that offsets adhere to a recognised verification standard (see ‘The Voluntary Market’ above).
- Does the contract include a requirement for a party to regularly revise its offsetting strategy as best practice³² evolves?
- Does the contract include a requirement for the company to gradually increase the percentage of offsets that remove carbon (neutralisation) rather than reduce or avoid others’ emissions (compensation)³³ with the aim of exclusively sourcing carbon removals by mid-century?³⁴
- What is the level of ambition of the offsetting strategy in the contract? An ambitious clause might require that the strategy specifies a shift from short-lived, uncertain and higher risk storage to long-lived storage methods which have low risk of reversal over centuries to millennia.³⁵

²⁸ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#).

²⁹ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#): Principle 1.

³⁰ See [What is Net Zero? - Net Zero Climate](#).

³¹ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#): Principle 1.

³² See Broekhoff, D., Gillenwater, M., Colbert-Sangree, T., and Cage, P. (2019). “Securing Climate Benefit: A Guide to Using Carbon Offsets.” Stockholm Environment Institute & Greenhouse Gas Management Institute: [Securing climate benefit: a guide to using carbon offsets](#) and [Carbon Offset Guide: Home](#).

³³ [Foundations for Science-based Net-Zero Target Setting in the Corporate Sector](#).

³⁴ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#): Principle 2.

³⁵ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#): Principle 3.

By including this level of specificity in contracts, parties will support and promote net zero aligned offsetting and accelerate the transition to net zero by demonstrating best practice.³⁶

6. Issues with offsetting

The four key issues with offsetting are:

- delay in real emissions reductions;
- biological carbon cannot offset fossil carbon;
- trade-offs; and
- risks of non-permanence and lack of additionality.

6.1. Delay in real emissions reductions

Prominent climate scientists have described the concept of net zero as a dangerous trap, replacing the sense of urgency to curb emissions now with a ‘burn now, pay later approach’, that over-relies on offsetting and removal technologies that have not been proven at the scale required.³⁷ The concern is that offsetting can be a distraction allowing companies to continue with unsustainable behaviour.³⁸

6.2. Biological carbon cannot offset fossil carbon

Science is emerging to suggest that offsetting fossil fuel generated GHGs with credits generated using the biological carbon cycle (e.g. tree planting) is not appropriate because fossil and biological carbon are not fungible.³⁹ Offsetting in this way raises issues of permanence (how long a greenhouse gas stays out of the atmosphere) and risk of reversal (e.g. fire or deforestation) meaning that such solutions are not a viable long term option.⁴⁰ Offsetting fossil fuel GHGs with biological carbon credits will not always be a ‘like for like’ effective neutralisation of emissions due to the timescales for fluxes in different parts of the carbon cycle, the delay between the actual emissions and the effect of the offset, limits to land area and the impoverishment and degradation of that land.⁴¹

6.3. Trade Offs

³⁶ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#): Principle 4.

³⁷ The Conversation, ‘[Climate scientists: concept of net zero is a dangerous trap](#)’.

³⁸ Greenpeace, ‘[The biggest problem with carbon offsetting is that it doesn't really work](#)’.

³⁹ Carbon Market Watch, ‘[Fossil and biological carbon: a tonne is not a tonne](#)’.

⁴⁰ [Nature-Based Solutions - Net Zero Climate; Foundations for Science-based Net-Zero Target Setting in the Corporate Sector; Understanding the value and limits of nature-based solutions to climate change and other global challenges | Philosophical Transactions of the Royal Society B: Biological Sciences; The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#).

⁴¹ Carbon Market Watch, ‘[Fossil and biological carbon: a tonne is not a tonne](#)’; Practical Law UK, ‘[Carbon Offsets](#)’.

Offsetting projects are typically nature-based solutions (NBS) for carbon removal and reduction, and these are recognised as a critical short term step in mitigating climate change. Despite their co-benefits (protecting, restoring or creating ecosystems and biodiversity, health benefits to society, incomes of local communities and climate resilience), however, the potential risks and trade-offs associated with NBS include low biodiversity value, loss of livelihood or land rights of farmers or local communities, loss of agricultural land and other unintended adverse impacts. Some commentators argue that those solutions should be promoted in their own right irrespective of the offsetting potential and not as an alternative to geological carbon storage and rapid decarbonisation. They will also be an important tool in remaining [Net Negative](#) (where removals exceed emissions)⁴² in the long term.

6.4. Risks of Non-Permanence and Lack of Additionality

To ensure that offsets are effective in achieving the goals of the Paris Agreement, the offsetting project that underlies a carbon credit must be “more permanent” and additional. Permanence refers to “how long a GHG stays out of the atmosphere, whether stored in a physical reservoir or whose emission was deferred through avoidance.” More permanent offsetting projects have a lower risk of reversal - once stored or avoided, there is a low risk that the GHG will be released into the atmosphere again.⁴³

Additionality, on the other hand, means “an emission reduction or carbon removal relative to a counterfactual baseline that would not have taken place but for the offsetting activity.”⁴⁴ This ensures the quality of the carbon credit because if the underlying offsetting project does not provide additionality, the offset would not be an effective tool in reducing GHG Emissions.⁴⁵ However, because this requires a counterfactual baseline, the determination of whether a project has additionality will always have some degree of subjectiveness and will be difficult to verify.⁴⁶

7. Conclusion: Offsets as a tool to achieve net zero targets

Offsetting is a widely-used tool in an organisation’s net zero pathway, and if used responsibly, can accelerate action to avert climate change.⁴⁷ If aligned to [The Oxford Principles for Net Zero Aligned Carbon Offsetting](#) and the mitigation hierarchy (measure; reduce; offset),⁴⁸ offsetting can be an important tool in decarbonising the global economy. Offsetting allows companies to contribute to the other goals of the Paris Agreement, such as climate adaptation, climate finance, and the UN sustainable development goals.⁴⁹ Offsetting

⁴² TCLP, [Carbon Negative](#); [What is Net Zero? - Net Zero Climate](#).

⁴³ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#).

⁴⁴ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#).

⁴⁵ Offset Guide, [Additionality](#)

⁴⁶ [The Oxford Principles for Net Zero Aligned Carbon Offsetting 2020](#).

⁴⁷ [Carbon Offset Guide: Home](#).

⁴⁸ WWF, [First Things First: Avoid, Reduce ... and only after that-Compensate](#).

⁴⁹ [Foundations for Science-based Net-Zero Target Setting in the Corporate Sector](#).

projects, such as tree planting, protecting forests and peatland, renewable energy infrastructure, etc., are also important in achieving a low carbon economy, particularly in the short term.⁵⁰ Companies that are serious in their efforts to keep warming below 1.5°C should aim to reduce reliance on offsetting as they become more sophisticated in measuring and reducing their emissions, with the aim of entirely reducing emissions by mid-century and remaining net negative thereafter.

Proponents of the net zero concept argue that it has triggered authentic climate action and is gathering momentum as a catalyst to avert a climate catastrophe. Furthermore, once consensus is established over the definitions of a 'credible' carbon offset or sink it will be clearer which industries should aim for net zero emissions and which have to fully decarbonise, without undermining the entire concept of a net zero transition.⁵¹ It is hoped that the work of Race to Zero and Oxford University⁵² and the SBTi⁵³ to strengthen the integrity of the voluntary carbon markets will accelerate this process.

⁵⁰ UNEP, [Carbon offsets are not our get-out-of-jail free card](#).

⁵¹ [In defence of net zero | BusinessGreen Blog Post](#).

⁵² The term 'offsetting' has been replaced with 'sinks and credits' and requirements to specify which sinks or credits are used for which neutralisation claims, to transition any neutralisation of residual emissions to permanent removals, to undertake carbon removals without claiming neutralisation claims and ensuring that credits do not undermine social justice or harm biodiversity: [The Race to Zero strengthens and clarifies campaign criteria](#); [Race To Zero Campaign](#); [Starting Line and Leadership Practices 2.0 - In force from 1 June 2021 - Minimum criteria required for participation in the Race to Zero campaign](#).

⁵³ [What is good net-zero – and how is the SBTi helping to define it?](#)