



Climate Action  
Accelerator

Synthesis paper

# The illusion of carbon offsets in achieving our goals

Why carbon offsetting should never be  
accounted for as emissions reduction

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# Glossary

**Carbon Offsetting:** Compensatory activities for greenhouse gas emissions by supporting emission reduction projects elsewhere.

**Carbon Accounting:** Process of measuring, reporting, and managing an organization's carbon emissions.

**Carbon Footprint:** Total greenhouse gas emissions attributed to a person, organization, or activity.

**Emissions Impact:** Measurable effect of activities or projects in reducing greenhouse gas emissions.

**Emission Reduction:** The process of decreasing the release of greenhouse gases into the atmosphere.

**Greenhouse Gases (GHG):** Gases trapping heat in the Earth's atmosphere, contributing to the greenhouse effect.

**Greenhouse Gas Protocol:** Standards for measuring and managing greenhouse gas emissions.

**Carbon Credits:** Tradable certificates representing a unit of emission reduction or avoidance.

**Carbon Trading System:** Market system facilitating the buying and selling of carbon credits for emission balancing.

**Carbon Neutrality:** State where an entity's net carbon emissions are offset by removal or offsetting.

**Gold Standard:** Rigorous third-party certification for carbon offset projects emphasizing integrity and sustainable development.

**Voluntary Carbon Market (VCM):** Market where entities voluntarily purchase carbon offsets without regulatory requirements.

**Compliance Carbon Markets (CCM):** Markets established by mandatory frameworks where entities comply with emissions reduction targets.

**In setting:** Initiatives within a company's value chain addressing emissions and enhancing biodiversity.

**Nature-Based Solutions (NbS):** Actions to protect, manage, and restore ecosystems, addressing societal challenges.

**Science Based Targets Initiative (SBTi):** Initiative providing decarbonization pathways aligned with Paris Agreement goals.

**Carbon Market Value:** Monetary value of traded carbon credits in the global carbon market.

**Climate-Washing:** Misleading practices or claims creating a false impression of commitment to addressing climate change.

**Greenwashing:** Providing false or misleading environmental information to appear more sustainable.

## Executive summary

According to the Intergovernmental Panel on Climate Change (IPCC), carbon offsetting refers to any activity that compensates for the emissions of CO<sub>2</sub> or other greenhouse gases (CO<sub>2</sub>-eq) by providing an emission reduction elsewhere<sup>1</sup>. These offsets can be purchased voluntarily, functioning as carbon trading system, allowing companies to 'balance' their carbon emissions. When one company removes a unit of carbon from the atmosphere during its regular operations, it may generate a carbon offset. Other entities can then purchase these offsets to mitigate their own carbon footprint<sup>2</sup>.

Unfortunately, the credibility of carbon offsets is called into question, casting doubt on the legitimacy of credits purchased by globally renowned corporations to support their carbon-neutral or net-zero assertions in sustainability reports while continuing to emit Greenhouse Gases (GHG)<sup>3</sup>. The difficulty comes from three main reasons:

- The poor quality of many credits, linked to over-crediting practices, little transparency on how estimates are calculated<sup>4</sup> and international leakage<sup>5</sup> (when improvement measures in one region inadvertently results in the displacement of the issue to another area, often crossing international boundaries);
- The ambiguity around the notion of 'last resort' which normally guarantees that any recourse to offsetting should complement maximized internal reduction strategies and achievements rather represent a primary solution or alternative.
- In all cases, even when credits are of high quality (table 3), they ought never be used to claim a firm's 'carbon neutrality' since they do not represent an actual reduction within the perimeter of the company or organization but can only contribute to an objective of neutrality at a global level<sup>6</sup>.

Many carbon offsetting projects do not result in real, measurable, and additional emission reductions. Independent studies, including one by the European Commission, indicate a high failure rate of 85% for offset projects, questioning their effectiveness and the likelihood that funded project activities would happen anyway without offsetting<sup>7</sup>. As such, when it comes to emissions reduction, there is a scientific consensus that carbon offsets should never be counted for in a reduction trajectory: *"Classic offsetting is a zero-sum game. Any carbon credit trade involves one ton avoided on one side and one ton emitted on the other. From this point of view, the very logic of the system is incompatible with a reduction in overall emissions"*<sup>8 9 10</sup> (Net Zero Initiative, SBTi, Carbon 4, CDP).



The Science Based Target Initiative (SBTi) has become the main reference standard for target setting among non-state actors, offering decarbonization pathways and framework aligned with the Paris goals<sup>11</sup>. Institutions and companies may purchase carbon credits to **compensate**<sup>12</sup> their own residual emissions, but only **outside** their carbon accounting and **next** to their reduction strategy aligned with a rigorous approach<sup>13</sup>, as a funding stream to support climate and environmentally friendly projects. The Corporate Net-Zero Standard of the SBTi mandates a minimum of 90% reductions in emissions prior to engaging in direct investment or the acquisition of offset credits for carbon removal<sup>14</sup>.

Furthermore, upcoming laws against deceptive "carbon neutral" claims and the rise in climate-related lawsuits are prompting governments, public entities, and businesses to accelerate their own climate commitments<sup>15</sup>. This includes adopting ambitious goals for both mitigating and adapting to climate change, aligning with anticipated future regulations<sup>16</sup>.

Finally, outside any consideration of quality, the contribution of voluntary carbon offsets falls short of the challenge, representing in 2019 less than 1% of the required measures to follow a 2°C trajectory and a 0.4% effort for staying on course towards a 1.5°C target<sup>17</sup>. In many ways, they represent an outdated climate tool in the times of a planetary emergency, that may even have delayed the necessary shift to the absolute reduction strategies called by science.



## Recommendations

- 1** **Prioritize direct and indirect emissions reductions** within all 3 scopes of your own operations and supply chains (Greenhouse Gas Protocol). Offsetting should be a supplementary strategy rather than a primary approach to achieving carbon neutrality.
- 2** **Exclude carbon credits from your carbon accounting monitoring** and emissions reduction trajectory, in alignment with best recommended practices and in anticipation of upcoming legislation.
- 3** If offsetting is chosen to strictly **compensate residual emissions aside of your carbon accounting, ensure project integrity** by prioritizing projects with high quality standards and maximize impact by adhering to robust climate methodologies such as the Gold Standard. Consider adopting nature-based solutions projects for a holistic approach to sustainability.
- 4** **Privilege insetting as a more effective alternative** to offsetting by focusing on GHGe and carbon capture within your value chain. These initiatives should involve actions that not only address emissions but also have positive effects on communities, landscapes, and ecosystems associated with the value chain.
- 5** **Support the net zero ambition** at a global level and drop inaccurate and impossible “climate neutral” claims at an institutional level.



## What are Carbon Offsets?

Carbon offsetting is a mechanism that finances GHG emission reduction by capitalizing on specific projects that lower, sequester or avoid CO<sub>2</sub> emissions that in turn generate certificates tradable on the market<sup>18</sup>. One carbon credit permits the emission of a mass equal to one ton of carbon dioxide<sup>19</sup>. This may lead to a sense of relief for the buyer to balance the CO<sub>2</sub> they released into the atmosphere by simply paying. To issue carbon offsets, projects such as *reforestation, renewable energy facilities, waste-to-energy generation, livestock methane reduction, carbon-sequestering agricultural methods, and waste and landfill management* need to prove they reduce emissions.

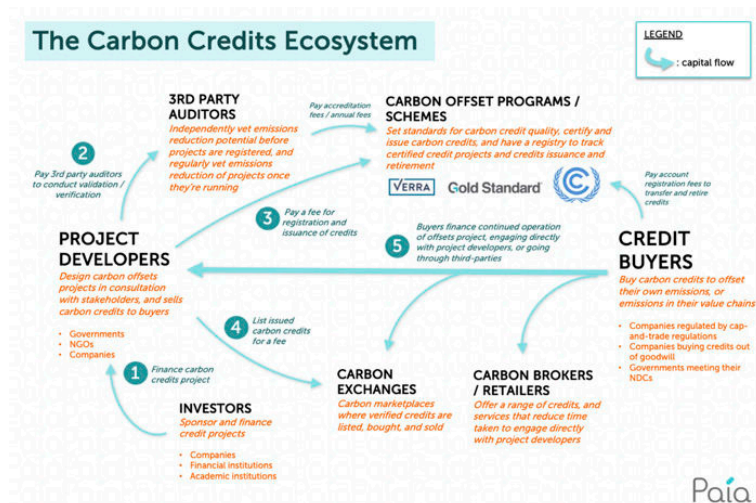


Table 1 – This table shows the voluntary carbon credits ecosystem, implementation and the different stakeholders involved in the process of offsetting<sup>20</sup>.

## Global carbon credit market

Carbon markets operate within both mandatory systems and voluntary markets<sup>21</sup>. Compliance carbon markets (CCM) are established by mandatory carbon reduction frameworks at the national, regional, or international levels<sup>22</sup>. For instance, the EU Emissions Trading System (ETS), the world's first major carbon market, employs a 'cap and trade' system where emissions allowances set a limit on greenhouse gases emitted by energy-intensive industry sectors, maritime and airlines (operating from, to and within the European Economic Area)<sup>123</sup>, with an annual reduction in the cap aligning with the EU's climate goals<sup>24</sup>.

1 Encompassing GHG emissions, including CO<sub>2</sub> emissions resulting from the combustion of aviation fuels, the EU ETS extends its coverage to domestic flights operating within EU member states and international flights arriving or departing from an airport within the European Economic Area and Switzerland. [https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-aviation\\_en#:~:text=CO2%20emissions%20from%20aviation,surrender%20allowances%20against%20those%20emissions.](https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-aviation_en#:~:text=CO2%20emissions%20from%20aviation,surrender%20allowances%20against%20those%20emissions.)

Voluntary carbon markets (VCM) operate independently of compliance markets, allowing businesses, governments, NGOs, Universities, municipalities, and individuals to voluntarily acquire carbon offsets without the primary goal of meeting regulatory requirements<sup>25</sup>. These have existed since the implementation of the Clean Development Mechanism, the Joint Implementation and the Emissions Trading program under the 2008 Kyoto protocol which operationalizes the United Nations Framework Convention on Climate Change (UNFCCC)<sup>26</sup>. Originally, this worldwide carbon market marked a significant milestone in the global effort to address climate change. However, it is acknowledged as a modest initial stride in climate change mitigation, with the latest scientific insights underscoring the imperative for more comprehensive measures<sup>27</sup>.

The global carbon credit market's traded value was US\$978.56 billion in 2022, projected to soar to \$2.68 trillion by 2028. Consequently, the traded volume in the market reached 13.22 GtCO<sub>2</sub>e in 2022, with expectations to reach 19.57 GtCO<sub>2</sub>e by 2028<sup>28</sup>.

Currently, the carbon market is primarily characterized by the regulated CCM and the unregulated VCM. Historically, the CCM has shown greater maturity and prevalence across carbon credit exchanges and trading platforms compared to the VCM<sup>29</sup>.

#### Voluntary vs. Compliance Market

	Voluntary Market	Compliance Market
Exchanged Commodity	Carbon offsets. Facilitated by the project-based system	Allowances. Facilitated by the cap-and-trade system.
How is the market regulated?	Functions outside of the compliance market.	National, regional or international carbon reduction regimes E.g. Kyoto Protocol, California Carbon Market
What is the price?	Voluntary credits tend to be cheaper because they cannot be used in compliance markets. <sup>2</sup> Several factors impact the price such as project type, project size, location, co-benefits, and vintage.	Compliance credits tend to be more expensive because they are driven by regulatory obligations. <sup>3</sup>
Who can purchase credits?	Businesses, governments, NGOs, and individuals	Companies and governments have adopted emission limits established by the United Nations Convention on Climate change
Where do credits trade?	Currently no centralized voluntary carbon credit market. Project developers can sell credits directly to buyers, through a broker or an exchange, or sell to a retailer who then resells to a buyer.	Companies that surpass their emission targets can sell their surplus credits to those looking to offset emissions. Credits can be sold under the Kyoto Protocols emissions trading scheme. <sup>4</sup>

Table 2- Here, we see the main difference between the voluntary VCM and mandatory CCM carbon markets<sup>30</sup>.





## Principles of voluntary carbon credits

Nevertheless, growing demand comes from VCMs since these are open to anyone, are of voluntary participation and allow to undertake an unlimited volume of projects thus credits<sup>31</sup>. To issue carbon credits, the Core Carbon Principles<sup>32</sup> from the *Gold Standard foundation* function as a set of inter-linked principles to define a threshold standard that ensures integrity in the voluntary carbon market.

These are linked to:

1. **Emissions Impact** with the principles of additionality (ensuring that GHG emission reductions or removals from mitigation activities are genuinely additional), permanence, robust quantification of emissions reductions and removal and no double counting.
2. **Governance** with effective governance and tracking, transparency, and a robust independent third-party validation and verification body.
3. **Sustainable development** with sustainable development benefits and safeguards and a real contribution towards net zero transition<sup>33</sup>.

Aligned to this, the Voluntary Carbon Market Integrity Initiative unveiled in June 2023 its *Claims Code of Practice*, with the aim of providing a rulebook for high-integrity voluntary use of carbon credits on the path to net zero<sup>34</sup>.

Quality objective	Criteria
(1) Robust determination of the GHG emissions impact of the mitigation activity	a. Additionality b. Vulnerability c. Robust quantification of emission reductions and removals
(2) Avoiding double counting of emission reductions or removals	a. Avoiding double issuance b. Avoiding double use c. Avoiding double claiming with international mitigation targets d. Avoiding double claiming with domestic mitigation targets or emissions trading systems
(3) Addressing non-permanence	a. Significance of non-permanence risks b. Robustness of approaches for addressing non-permanence risks
(4) Facilitating transition towards net zero emissions	a. Enhancing adoption of low, zero or negative emissions technologies b. Demonstration of host country commitment to the global temperature goals
(5) Strong institutional arrangements and processes of the crediting program	a. Overall program governance b. Robust third-party auditing c. Transparency and stakeholder consultation
(6) Enhancing positive and preventing negative environmental and social impacts	a. Assessment of environmental and social impacts b. Contribution to improving adaptation and resilience c. Supporting the poorest and most vulnerable and affected by climate change

Table 3- This table shows, and overview of the quality objectives and criteria used to assess the quality of carbon credits and serves as a carbon credit guidance for buyers<sup>35</sup>.

## Standards

To ensure good practices and enforce a high-quality carbon standard, the *Gold Standard for the Global goals* represents a rigorous certification standard for carbon offset projects. It was developed by a consortium of NGOs and is now managed by the Gold Standard Foundation<sup>36</sup>. Originally created to ensure the environmental integrity and sustainable development benefits of projects, some key features include validating additionality by aligning projects with UN SDGs, rigorously measuring, and verifying emissions reductions, and mandating third-party verification<sup>37</sup>. More than 170 types of projects were available over 2020–2021, with forestry and land use accounting for 46% of traded volumes in 2021<sup>38</sup>. For example, projects include planting trees on initially “non-forest land”, allowing for planned programme of treatments such as *conservation forests, forests with selective harvesting, and rotation forestry, while also permitting agroforestry or pasture activities*<sup>39</sup>.

Nonetheless, planting trees to absorb carbon during their growth may often represent a distraction from genuine climate change solutions. While restoring forest is vital, it should not replace direct emission reduction efforts. Newly planted trees may take up to 20 years to capture the CO<sub>2</sub> amount promised by carbon-offset schemes. Offsetting a fraction of global emissions would require planting and protecting an immense number of trees for decades, with the risk of setbacks from droughts, wildfires, diseases, logging, and deforestation. When trees die, most of the trapped carbon is indeed released back into the atmosphere showing “permanence” concerns<sup>40</sup>.

As such, the difficulty of verifying the environmental benefit of the specific project participates in making carbon offsetting a concern for actual climate change mitigation. This by giving a free pass for companies and countries to pursue business as usual<sup>41</sup>.

## Price

In 2021, the voluntary carbon market value had already topped the US\$2BN<sup>42</sup> mark with a total volume of 298.4MtCO<sub>2</sub>e “avoided”<sup>43</sup>. Still, this is very low since it represents 0,8% of 2021 global annual emissions<sup>44</sup>. However, the credits were issued at historic prices, which may lack relevance when considering the current and future impact of emissions.

The Gold Standard advocates for prices to better reflect the social cost of carbon and the economic value they deliver utilizing market mechanisms to



do so efficiently. (*Formula = investment costs + project cost + carbon cost + business margin – Revenues = Fairtrade minimum price*)<sup>45</sup>.

As such, the pricing is not standardized and varies depending on many international factors: ranging from just a few cents per metric ton of CO<sub>2</sub> emissions to as high as \$300/mtCO<sub>2</sub>e for advanced technology removal projects like CCS. Afforestation and reforestation projects may fall in the range of \$15 to \$20/mtCO<sub>2</sub>e (2021)<sup>46</sup>. This is very low. Indeed, forests could potentially absorb a significant amount of carbon, roughly 16 GtCO<sub>2</sub> per year by 2030<sup>47</sup>. According to the OECD, about half of this carbon absorption could be done in a cost-effective way, with an ideal social cost of carbon set at \$100 to \$200/mtCO<sub>2</sub>e<sup>48</sup>.

## Are claims to Carbon neutrality & Net zero based on carbon offsets a legitimate practice at the level of an organization?

Due to the low prices of carbon credits, most corporate climate strategies rely heavily on carbon offsets, particularly in hard-to-abate sectors. This has sparked a contentious discussion regarding the effectiveness and trustworthiness of carbon credit markets, as well as the legitimacy of using carbon offsets in decarbonization strategies<sup>49</sup>. For this reason, the SBTi “*requires that companies set targets based on emission reductions through direct action within their own boundaries or their value chains*”<sup>50</sup>. Furthermore, it is important to stress that reference organizations such as UNFCCC, Science Based Targets Initiative, Bilan Carbone, ISO 14064, and GHG Protocol strictly forbid the inclusion of carbon credits, even of high quality, to offset emissions in GHG reports<sup>51</sup>. Offsets should only be used to finance additional emission reductions beyond science-based target or net-zero target and should not be accounted for in an absolute emissions reduction trajectory<sup>52</sup>.

### Net zero and Carbon neutrality

**Net zero** CO<sub>2</sub> emissions “*are achieved when anthropogenic CO<sub>2</sub> emissions are balanced globally by anthropogenic CO<sub>2</sub> removals over a specified period with the stringent goal of reducing emissions to zero*”<sup>53</sup>. The concept of **carbon neutrality** is similar in that anthropogenic GHG emissions may be offset although there is no specific reduction trajectory prescribed<sup>54</sup>.

As such, action to reach Net Zero is generally possible only at a global scale and requires the collaboration of world governments, private and third sector, meaning that Net zero claims at an institutional level are irrelevant<sup>55</sup>. Unless it implements direct carbon removals within its value chain, a company is not “carbon neutral” but contributes to neutrality as a collective objective by first cutting down direct and indirect CO<sub>2</sub> emissions from activities across supply chains before investing in offset programs (Carbon4)<sup>56</sup>.

Achieving “carbon neutrality” in companies through the process of measuring, reducing, and offsetting emissions is fraught with limitations. It more often than not fails to adequately address the most significant emission sources, falls short of the required global emission reductions for Paris Agreement compliance, and relies on questionable principles and practices of offsetting<sup>57</sup>. This approach obscures the evolution of emissions over time, and the reliance on offsets as a solution undermines the imperative for concrete, source-based emissions reduction<sup>58</sup>. Some authors consider it has diverted time and energy from the much-needed absolute reduction trajectories called for by the IPCC.

## Net Zero Claims and Regulations

To combat false claims and greenwashing regarding consumer products, the EU Parliament and Council have introduced in September 2023 a new agreement to ensure consumers are provided with more reliable and transparent product information, by amending the *unfair commercial practices directive* (UCPD) and the *consumer rights directive* (CRD) and adapting them for the green transition<sup>59</sup>. The directive marks a significant step in preventing misleading advertisements and promoting responsible business practices. These rules, set to take effect by the last fourth quarter of 2026<sup>60</sup>, will prohibit broad environmental claims like “climate neutral” or “eco” unless companies can substantiate their accuracy<sup>61</sup>. Additionally, claims relying on emissions offsetting, often used to assert carbon neutrality, or reduced environmental impact, will no longer be permitted<sup>62</sup>. The EU's actions aim to enhance transparency and reliability in environmental marketing practices<sup>63</sup>. They provide institutions and companies a chance to anticipate forthcoming legislations to which they will inevitably be subject to, change practices and reduce exposure to risk induced by potential climate-washing allegations<sup>64</sup>. Indeed, upcoming legislations from the European parliament and EU Council are inspired by the growing scientific consensus on and envisage firmly banning misleading “carbon neutral” advertisements, specifically targeting claims based on emissions offsetting schemes<sup>65</sup> by 2026, follows advocacy efforts that have called out greenwashing practices in major corporations, the

FIFA World Cup<sup>66</sup>, supermarket products, and fossil fuel companies<sup>67</sup>. The surge in court cases over climate change reflects the growing significance of litigation in tackling the climate crisis, with climate cases nearly doubling in the last three years<sup>68</sup>.

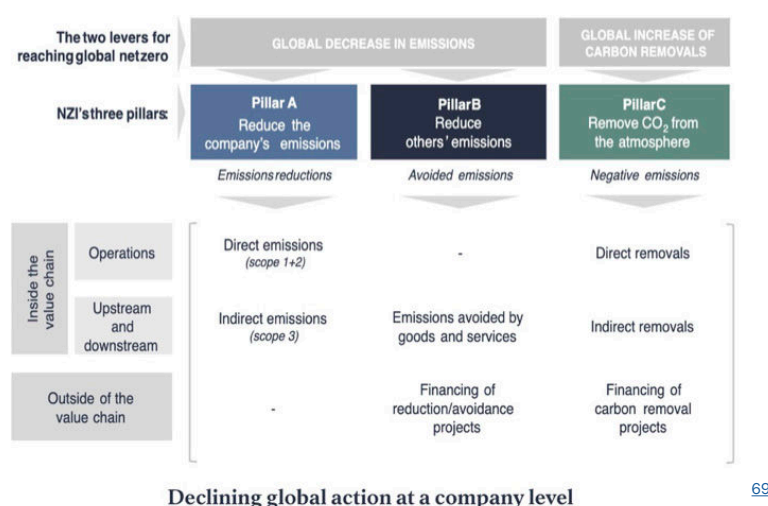


Table 4 – The Net Zero Initiative framework goes beyond the carbon footprint concept. It includes the carbon footprint (Pillar A) and adds two more indicators: a company's ability to support others in reducing emissions (Pillar B) and its capability to remove carbon (Pillar C). These three Pillars are distinct and cannot be interchanged<sup>70</sup>.

## Insetting through “Nature Based Solutions” as a potential alternative to carbon offsetting

Even though offsetting outside the value chain shouldn't be counted as an emissions reduction or carbon removal, many private and public sector still rely heavily on voluntary offsetting in their strategy. If it is the chosen route, it is critical to identify high integrity projects that at least adhere to robust climate methodologies<sup>71</sup>. They can then represent a very valuable funding stream for impactful climate and environmentally-friendly projects.

'Insetting' projects are initiatives within a company's value chain aimed at addressing GHG emissions and storing carbon, while also benefiting communities and ecosystems<sup>72</sup>. These efforts often involve *regenerative agriculture* practices and *agroforestry* programmes at the farm level and with local communities. They help restore natural carbon sinks by conserving and revitalizing surrounding landscapes, including forests, wetlands, coastlines, and marine ecosystems.



Organizations can significantly reduce challenging Scope 3<sup>1</sup> emissions by investing in the decarbonization of their value chain partners' operations and energy use. This direct action within the value chain lessens dependence on the climate actions and data of various suppliers and distributors. Collaborating with suppliers not only enables organizations to monitor their activities but also fosters enduring relationships and community building<sup>73</sup>.

Building on the expert consensus that any viable path to decarbonization should adhere to a "greenhouse gas mitigation hierarchy" that prioritizes the actual reduction and avoidance of carbon emissions, insetting practices may reflect a wiser use of scarce investment resources under the form of nature-based solutions<sup>74</sup> within the direct control and perimeter of an organisation.

If compensation becomes necessary, opting for insetting with Nature-Based Solutions (NbS) is preferred. This approach offers greater environmental benefits compared to other projects like renewable energy generation, as it takes a more holistic approach by capturing carbon and fostering biodiversity<sup>75</sup>. NbS are *"actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits"*<sup>76</sup>. These solutions differ from "nature-derived" or "nature-inspired" approaches, such as wind and solar energy or biomimetic materials. NbS also address multiple societal issues like climate change, natural disasters, human health, food and water security, and biodiversity loss<sup>77</sup>. These practices can be classified into *forestry practices, wetland related practices, restorative agriculture, and ocean-based practices*<sup>78</sup>. They can help achieve net zero by sequestering and storing carbon, while accompanying swift fossil fuel emissions reductions<sup>79</sup>. They can also enhance agricultural practices, reduce waste, and boost efficiency for businesses<sup>80</sup>.

To scale up these solutions, AI and Satellite technology have emerged as a cost-effective solution for transparent and verifiable data on carbon sequestration in forests and other ecosystems<sup>81</sup>.

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<sup>1</sup> Emissions are categorized into three groups known as Scope 1, 2, and 3:

- Scope 1: Direct greenhouse gas emissions produced by a company, such as those from operating vehicles.
- Scope 2: Indirect emissions, such as those resulting from purchased electricity or energy used for cooling buildings.
- Scope 3: All greenhouse gas emissions along an organization's supply chain, encompassing not only supplier-related emissions (similar to Scope 2) but also emissions generated by customers using the company's products. Measuring Scope 3 emissions is crucial as they often make up over 70% of a business's carbon footprint. Managing these emissions encourages eco-friendly supplier relationships, improves product energy efficiency, and reevaluates distribution networks, leading to a substantial reduction in overall climate impact.

<https://ghgprotocol.org/blog/you-too-can-master-value-chain-emissions>

## In conclusion

To achieve global carbon neutrality, societies must act on the reduction of emissions (CO<sub>2</sub> emissions of fossil fuel origin and from deforestation) and the increase in sinks (*afforestation/reforestation, agricultural practices, and technological solutions*). Currently, the lack of global usage standards leads many organizations to voluntarily use carbon offsetting as an emissions reduction alternative. The prevailing scientific consensus regarding the use of carbon offsets in emissions reduction strategies indicates that such practices should be banned<sup>82</sup>. Each institution or company is encouraged to measure its performance, set ambitious objectives, and dynamically manage its progress against the three pillars mentioned above<sup>83</sup>. If carbon credits are used to compensate for residual emissions and cannot be integrated through insetting initiatives, then they should be reported outside an organisation's carbon accountancy, of high quality, conforming to best standard requirements and under the form of nature-based solutions.



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